OWNER'S MANUAL

KOHLER® Command PRO®

CH640, CH730, CH740

HORIZONTAL CRANKSHAFT

Liquefied Petroleum Gas (LPG) or LPG/Natural Gas (NG) Fueled

KOHLER® ENGINES

Safety Precautions

To ensure safe operations 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.

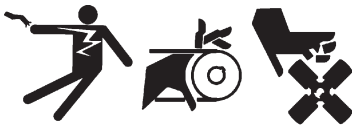
WARNING
Warning is used to indicate the presence of a hazard that *can* cause *severe* personal injury, death, or substantial property damage if the warning is ignored.

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.

WARNING



Accidental Starts can cause severe injury or death.

Disconnect and ground spark plug leads before servicing.

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.

Before disconnecting the negative (-) ground cable, make sure all switches are OFF. If ON, a spark will occur at the ground cable terminal which could cause an explosion if hydrogen gas or LPG/NG fuel vapors are present.

WARNING

Rotating Parts can cause severe injury.

Stay away while engine is in operation.

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

Electrical Shock can cause injury.

Do not touch wires while engine is running.

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

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.

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.

Safety Precautions (Cont.)

⚠ WARNING

Explosive Fuel can cause fires and severe burns.

If a gaseous odor is detected, ventilate the area and contact an authorized service technician.

Explosive Fuel!

LPG *is extremely flammable and is heavier than air and tends to settle in low areas where a spark or flame could ignite the gas. Do not start or operate this engine in a poorly ventilated area where leaking gas could accumulate and endanger the safety of persons in the area.*

NG *is extremely flammable, is lighter than air, and rises. Do not start or operate this engine in a poorly ventilated area where leaking gas could accumulate and endanger the safety of persons in the area.*

To ensure personal safety, installation and repair of LPG/NG fuel supply systems must be performed only by qualified LPG/NG system technicians. Improperly installed and maintained LPG/NG equipment could cause fuel supply system or other components to malfunction, causing gas leaks.

Observe federal, state and local laws governing LPG/NG fuel, storage, and systems.

⚠ WARNING

Carbon Monoxide can cause severe nausea, fainting or death.

Do not operate engine in closed 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

Explosive Gas can cause fires and severe acid burns.

Charge battery only in a well ventilated area. Keep sources of ignition away.

Explosive Gas!

Batteries produce explosive hydrogen gas while being charged. To prevent a fire or explosion, charge batteries only in well ventilated areas. Keep sparks, open flames, and other sources of ignition away from the battery at all times. Keep batteries out of the reach of children. Remove all jewelry when servicing batteries.

Before disconnecting the negative (-) ground cable, make sure all switches are OFF. If ON, a spark will occur at the ground cable terminal which could cause an explosion if hydrogen gas or LPG/NG fuel vapors are present.

Congratulations – You have selected a fine four-cycle, twin 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 and full pressure lubrication 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, spark plugs, and carburetor) 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. Because the cylinder liner can be rebored, these engines can last even longer.
- 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.

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

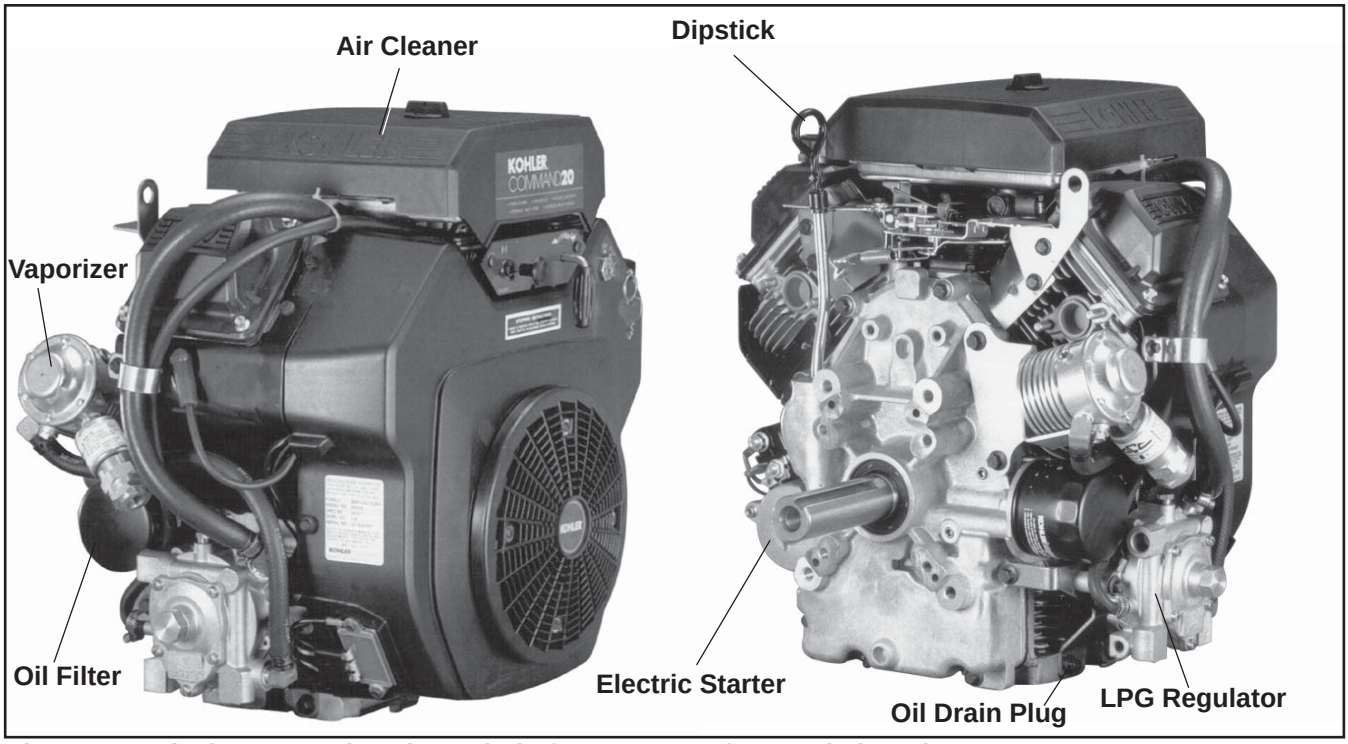


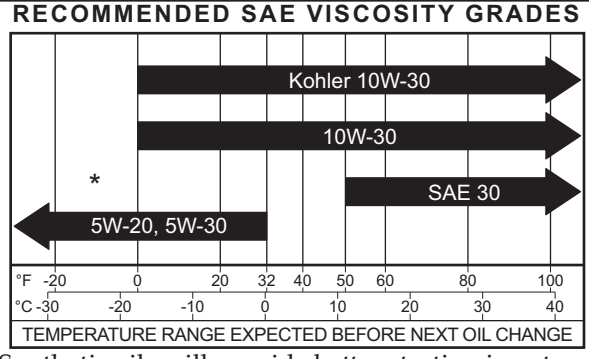
Figure 1. Typical Command Horizontal Shaft LPG or LPG/NG Fueled Engine.

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. Using oil that is incorrect or dirty can cause premature engine wear and failure. **Synthetic oil** is recommended for use in LPG/NG fueled engines because there is less oxidation or thickening, and deposit accumulation on intake valves is substantially reduced. Conventional petroleum-based oil may be used, but valve service will be required every 500 hours to remove the accumulated deposits.

Oil Type

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



*Synthetic oils will provide better starting in extreme cold below -23°C (-10°F).

Figure 2. Viscosity Grades Table.

NOTE: Using other than service class SG, SH, SJ or higher oil or extending oil change intervals longer than recommended can cause engine damage.

A logo or symbol on oil containers identifies the API service class and SAE viscosity grade. See Figure 3.

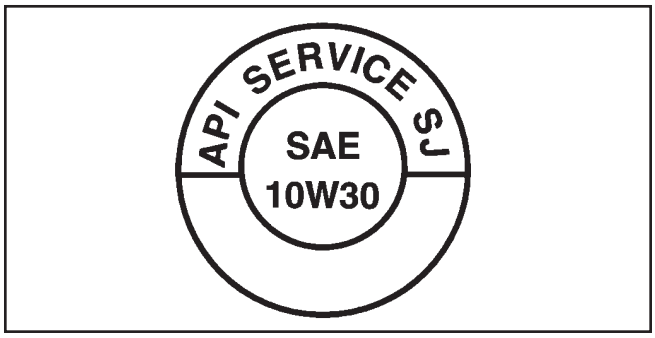


Figure 3. Oil Container Logo.

Refer to Maintenance Instructions beginning on page 8 for detailed oil check, oil change, and oil filter change procedures.

Fuel Recommendations

CH640 and CH740 engines are certified to operate on LPG or NG.

CH730 engines are certified to operate on LPG.

LPG Engines

LPG from an appropriate LPG fuel tank (supplied separately) is required to operate this engine.

WARNING: Pressurized LPG!

Fuel tanks are filled under pressure and should be handled with care. To prevent tank damage which could endanger the safety of the operator or persons in the area, do not drop or drag tanks on any surface. Use a hand truck when moving, or tilt the tank on its footring in a position slightly off vertical and roll it.

Avoid personal contact with LPG fuel to prevent frostbite. See a physician if frostbite occurs.

WARNING: Explosive Fuel!

LPG is extremely flammable, is heavier than air and tends to settle in low areas where a spark or flame could ignite the gas. Do not start or operate this engine in a poorly ventilated area where leaking gas could accumulate and endanger the safety of persons in the area.

LPG fuel consists primarily of propane, although the fuel supplier may sometimes mix other gases with propane.

Fuel tanks must be filled only by persons qualified in the handling of LPG. Tanks are filled by weight and should not be overfilled (never to more than 80 percent of total capacity). An air space must be present in the tank to allow fuel to expand.

Tanks must be removed from equipment before filling.

NG Engines

NG from an approved system or source of supply can be used to operate this engine.

WARNING: Explosive Fuel!

NG is extremely flammable, is lighter than air, and rises. Do not start or operate this engine in a poorly ventilated area where leaking gas could accumulate and endanger the safety of persons in the area.

Fuel Conversion

Some engines are equipped to convert between LPG and NG. The models with the fitting and jet shown below should follow these instructions for conversion. Other metering valves should be installed following the instructions given by the equipment it powers. Shut off fuel supply before any servicing is performed.

NOTE: Engines with a DSAI system will have leads located near the fuel regulator. Connect the leads for NG and leave disconnected for LPG.

LPG Operation

Installation of jet in regulator fitting is required for LPG operation.

Switching from NG to LPG

NOTE: When switching from NG to LPG fuel, the battery must be temporarily disconnected for safety and to reset the system.

Remove the fuel inlet hose. Inspect the internal threads of regulator fitting to ensure they are clean and dry. Install jet into the fuel elbow orifice for LPG operation. See Figure 4. Reconnect and fully tighten the fuel inlet hose.

NOTE: Turn on fuel supply and check all fuel line connections with soapy water before starting or putting engine/system into service.

Outlet pressure should be checked and if required, set at the secondary regulator to 4.0 to 5.0 PSI by qualified personnel.

NG Operation

Removal of jet from regulator fitting is required for NG operation.

Switching from LPG to NG

NOTE: When switching from LPG to NG fuel, the battery must be temporarily disconnected for safety and to reset system.

Remove the LPG fuel jet from the regulator fitting. Disconnect the hose, remove the jet from the orifice (Figure 4), and reconnect the hose.

NOTE: Turn on fuel supply and check all fuel line connections with soapy water before starting or putting engine/system into service.

Recommended fuel inlet pressure for NG systems is 11 in. water (engine off). Reduced pressure could result in hard starting.

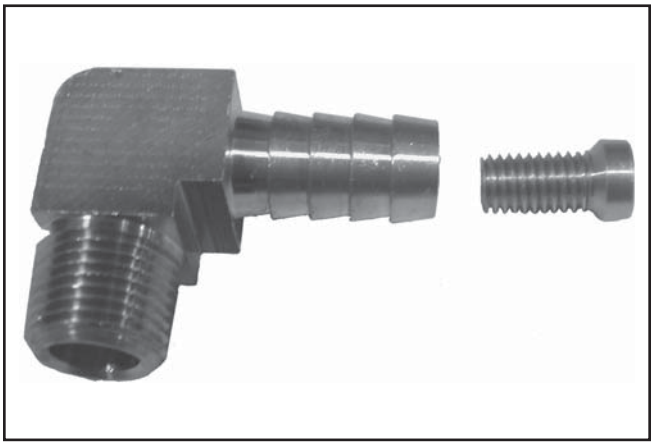


Figure 4. Fitting and Jet.

Model Designation

Model CH730 for example: C designates Command engine, H designates horizontal crankshaft, and 730 indicates the numerical model designation.

Engine Identification Numbers

When ordering parts, or in any communication involving an engine, always give the **Model, Specification, and Serial Numbers** of the engine.

The engine identification numbers appear on a decal affixed to the engine shrouding. Include letter suffixes, if there are any.

Emission Compliance Period

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 CARB emission requirements. The following table provides the Engine Compliance Period (in hours) associated with the category descriptor which may be found on the certification label.

CARB	Moderate 125 hours	Intermediate 250 hours	Extended 500 hours

Refer to certification label for engine displacement.

Exhaust Emission Control System for gaseous fuel models CH640, CH730, and CH740, is EM for U.S. EPA, California, and Europe.

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 gauge on LPG tank. Tanks should be filled to a specific weight. To ensure safety and proper fuel system operation, tanks must not be overfilled.
- Check fuel lines, regulator, and other system components for leaks. Do not start engine until leaks are eliminated.
- 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: 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.

Although LPG/NG burns more efficiently and emits less carbon monoxide than gasoline, some carbon monoxide is produced. Avoid inhaling exhaust gases, especially over prolonged periods of time. Do not allow engine to run unattended.

Cold Weather Starting Hints

1. Be sure to use the proper oil for the temperature expected. See Figure 2 on page 4.
2. Disengage all possible external loads.
3. Be sure the battery is in good condition. A warm battery has much more starting capacity than a cold battery.

Starting

1. Place the throttle control in the **idle** position. Place the choke control (if equipped) into the **on** position. See Figure 5.

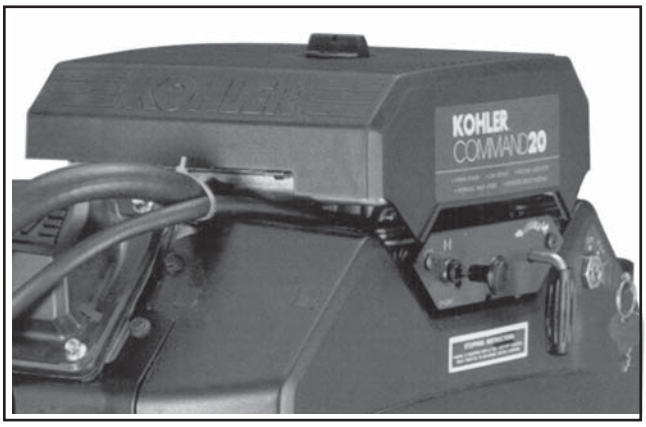


Figure 5. Optional Engine Mounted Throttle and Choke Controls.

2. Slowly turn the fuel valve on the LPG (propane) tank or the NG line (if equipped) to full open position.

3. Start the engine by activating the key switch. Release the switch as soon as the engine starts. Return choke to **off** position after engine starts. On a cold engine, it may be necessary to leave choke partially on until engine begins to warm up.

   NOTE: Do not crank the engine continuously for more than 10 seconds at a time. If the engine does not start, allow a 60 second cool down period between starting attempts. Failure to follow these guidelines can burn out the starter motor.

   NOTE: If the engine develops sufficient speed to disengage the starter but does not keep running (a false start), engine rotation must be allowed to come to a complete stop before attempting to restart the engine. If the starter is engaged while the flywheel is rotating, the starter pinion and flywheel ring gear may clash, resulting in damage to the starter.

If the starter does not turn the engine over, shut off starter immediately. Do not make further attempts to start the engine until the condition is corrected. Do not jump start using another battery (refer to Battery). See your Kohler Engine Service Dealer for trouble analysis.

NOTE: Upon start-up, a metallic ticking may occur. This is caused by hydraulic lifter leakdown during storage. Run the engine for 5 minutes. The noise will normally cease in the first minute. If noise continues, run the engine at mid-throttle for 20 minutes. If noise persists, take the engine to your local Kohler Service outlet.

Stopping

LPG Fueled Engines

1. Remove the load by disengaging all PTO driven attachments.

2. Turn fuel valve on LPG tank to full closed position and allow the engine to continue running until it runs out of fuel. Turn ignition switch to **off** position.

   In an **emergency**, move the throttle control to **stop** or turn the ignition switch off.

   NOTE: Backfiring may occur when using the emergency stop method!

NG Fueled Engines

1. Remove the load by disengaging all PTO driven attachments.

2. Turn fuel valve on NG line, if equipped, to full closed position and allow the engine to continue running until it runs out of fuel. Turn ignition switch to **off** position. Switching off the ignition prior to allowing the engine run out of fuel may create a backfire.

Battery

A 12 volt battery is normally used. Refer to the operating instructions of the equipment this engine powers for specific battery requirements.

If the battery charge is not sufficient to crank the engine, recharge the battery (see page 12).

Operating

Angle of Operation

This engine will operate continuously at angles up to 25°. Check oil level to assure crankcase oil level is at the **F** mark on the dipstick.

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 flywheel 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.

WARNING: 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.

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 speed for these engines is 3750 RPM, no load.

Maintenance Instructions

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.**

For safety and health reasons, many states require special licensing or certification for servicing LPG/NG fuel systems. Check local and state regulations before choosing a repair establishment to perform fuel system repairs.

WARNING: 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.*

Before disconnecting the negative (-) ground cable, make sure all switches are off. If on, a spark will occur at the ground cable terminal which could cause an explosion if hydrogen gas or LPG/NG fuel vapors are present.

Maintenance Schedule

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

Frequency	Maintenance Required
Daily or Before Starting Engine	• Check fuel gauge on propane (LPG) tank. • Check oil level. • Check air cleaner for dirty[1], loose, or damaged parts. • Check air intake and cooling areas, clean as necessary[1].
Every 25 Hours	• Service precleaner element[1].
Every 100 Hours	• Replace air cleaner element[1]. • Change oil. • Remove cooling shrouds and clean cooling areas[1]. • Check oil cooler fins, clean as necessary (if equipped). • Check spark plug condition and gap.
Every 200 Hours	• Change oil filter.
Annually or Every 300 Hours	• Replace spark plugs.
Annually or Every 500 Hours	• Check all lines (high pressure/vacuum) including fittings for leaks. • Have electric starter serviced[2]. • Have lock-off/filter serviced[3]. • Have combustion deposits removed if using non-synthetic oil. • Drain regulator of accumulated fuel deposits (Nikki regulators only).
Every 1500 Hours	• Have regulator disassembled, cleaned, and reset[3]. • Have vaporizer disassembled, cleaned, and serviced[3].

[1]*Perform these maintenance procedures more frequently under extremely dusty, dirty conditions.*
[2]*Have a Kohler Engine Service Dealer perform this service.*
[3]*Must be performed by an Authorized Kohler Engine Dealer or qualified LPG personnel* ***only****.*

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. To keep dirt, debris, etc., out of the engine, clean the area around the dipstick before removing it.

3. Remove the dipstick; wipe oil off. Reinsert the dipstick into the tube and press all the way down.

4. Remove the dipstick and check the oil level.

   The oil level should be up to, but not over, the **F** mark on the dipstick. See Figure 6.

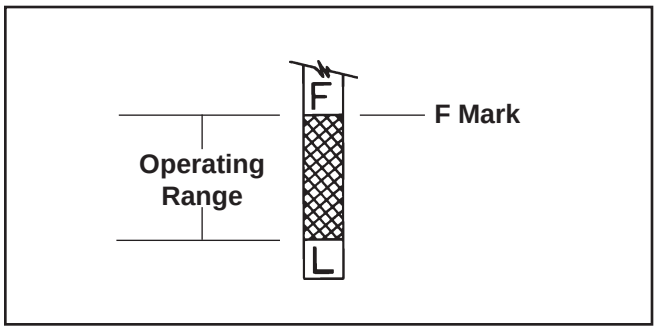


Figure 6. Oil Level Dipstick.

5. If the level is low, add oil of the proper type, up to the **F** mark on the dipstick. (Refer to Oil Type on page 4.) Always check the level with the dipstick before adding more oil.

   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 below the **L** mark or over the **F** mark on the dipstick.

Oil Sentry™

Some engines are equipped with an optional Oil Sentry™ switch. This switch is designed to prevent the engine from starting in a low oil or no oil condition. The Oil Sentry™ may not shut down a running engine before damage occurs. In some applications this switch may activate a warning signal. Read your equipment manuals for more information.

NOTE: Make sure the oil level is checked **BEFORE EACH USE** and is maintained up to the **F** mark on the dipstick. This includes engines equipped with Oil Sentry™.

Change Oil and Oil Filter

Change Oil

Change oil after every **100 hours** of operation. Refill with service class SG, SH, SJ or higher oil as specified in the Viscosity Grades table (Figure 2) on page 4.

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

Change the oil as follows (see Figure 7):

1. To keep dirt, debris, etc., out of the engine, clean the area around the oil fill cap/dipstick before removing it.

2. Remove one of the oil drain plugs, oil fill cap, and dipstick. Be sure to allow ample time for complete drainage.

3. Reinstall the drain plug. Make sure it is tightened to **13.6 N·m (10 ft. lb.)** torque.

4. Fill the crankcase, with new oil of the proper type, to the **F** mark on the dipstick. Refer to Oil Type on page 4. Always check the level with the dipstick before adding more oil.

5. Reinstall the oil fill cap and tighten securely. Reinstall dipstick.

   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 below the **L** mark or over the **F** mark on the dipstick.

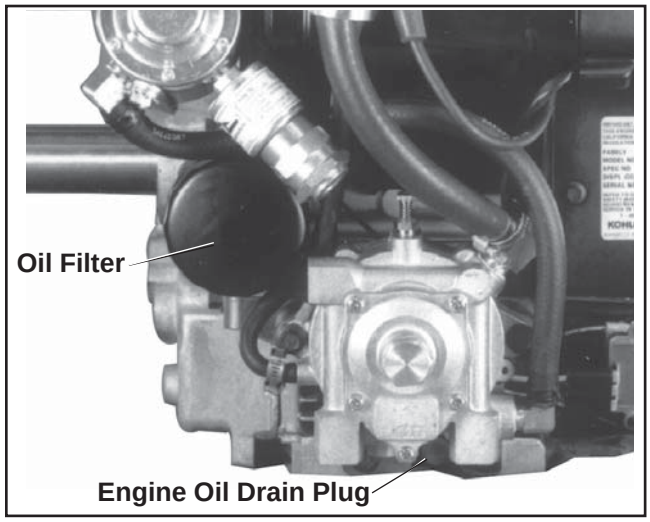


Figure 7. Oil Drain Plug and Oil Filter.

Change Oil Filter

Replace the oil filter **at least every other oil change (every 200 hours of operation)**. *Always use a genuine Kohler oil filter.* Use chart below to determine part number to order.

Oil Filter Part No.	Length
12 050 01-S	2-1/2"
52 050 02-S	3-3/8"

Replace the oil filter as follows:

1. Drain the oil from the engine crankcase by removing one of the drain plugs and allowing ample time for complete drainage.

2. Before removing the oil filter, clean the area around the oil filter to keep dirt and debris out of the engine. Remove the old filter. Wipe off the surface where the oil filter mounts.

3. Place a new replacement filter in a shallow pan with the open end up. Pour new oil of the proper type in through the threaded center hole. Stop pouring when the oil reaches the bottom of the threads. Allow a minute or two for the oil to be absorbed by the filter material.

4. Apply a thin film of clean oil to the rubber gasket on the new filter.

5. Install the new oil filter to the filter adapter or oil cooler. Refer to instructions on the oil filter for proper installation.

6. Reinstall the drain plug. Make sure it is tightened to **13.6 N·m (10 ft. lb.)** torque.

7. Fill the crankcase with new oil of the proper type to the **F** mark on the dipstick.

8. Test run the engine to check for leaks. Stop the engine, allow a minute for the oil to drain down, and recheck the level on the dipstick. Add more oil as necessary so the oil level is up to but not over the **F** mark on the dipstick.

Service Precleaner and Air Cleaner Element

This engine is equipped with a replaceable, high density paper air cleaner element. Most engines are also equipped with an oiled, foam precleaner which surrounds the paper element. See Figures 8 and 9.

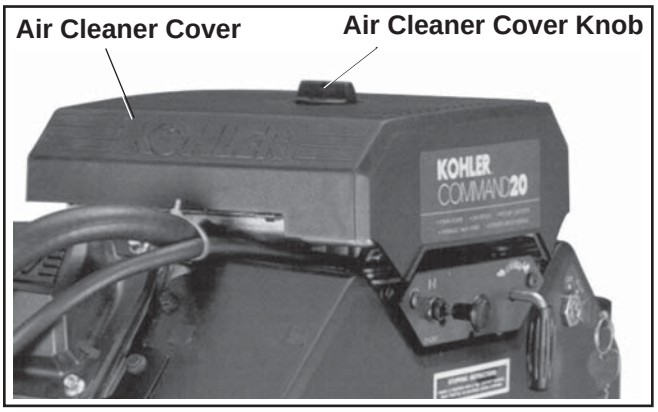


Figure 8. Air Cleaner Housing Components.

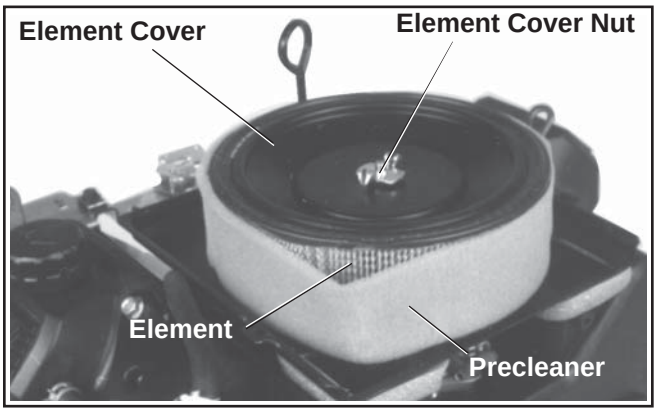


Figure 9. Air Cleaner System Components.

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 so equipped, wash and reoil the precleaner every **25 hours** of operation (more often under extremely dusty or dirty conditions).

1. Loosen the cover retaining knob and remove the cover.

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. Saturate the precleaner with new engine oil. Squeeze out all excess oil.

5. Reinstall the precleaner over the paper element.

6. Reinstall the air cleaner cover. Secure cover with the cover retaining knob.

7. When precleaner replacement is necessary order genuine Kohler parts. See chart below.

CH640	CH730	CH740	Height of Precleaner
24 083 02-S	24 083 02-S	24 083 02-S	61 mm (2.4 in.)
-	24 083 05-S	24 083 05-S	71 mm (2.8 in.)

Service Paper Element

Every **100 hours** of operation (more often under extremely dusty or dirty conditions) replace the paper element.

1. Loosen the cover retaining knob and remove the air cleaner cover.

2. Remove the element cover nut, element cover, and paper element/precleaner.

3. Remove the precleaner (if so equipped) from the paper element and service as instructed above.

4. **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.

5. When servicing the air cleaner, check the air cleaner base. Make sure it is secured and not bent or damaged. Also, check the element cover for damage or improper fit. Replace all damaged air cleaner components.

NOTE: Before air cleaner reassembly make sure rubber seal is in position around stud. Inspect, making sure it is not damaged and seals with the element cover.

6. Reinstall the paper element, precleaner, element cover, element cover nut, and air cleaner cover. Secure cover with cover retaining knob.

7. When element replacement is necessary order genuine Kohler parts. See chart below.

CH640	CH730	CH740	Height of Element
24 083 08-S	47 083 03-S	24 083 08-S	66 mm (2.6 in.)
-	24 083 03-S	24 083 09-S	74 mm (2.9 in.)

Clean Air Intake/Cooling Areas

To ensure proper cooling, make sure the flywheel 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 flywheel screen, dirty or plugged cooling fins, and/or cooling shrouds removed, will cause engine damage due to overheating.

Ignition System

CH640 and CH730 engines are equipped with an electronic CDI system. CH740 engines are equipped with an electronic DSAI system. Other than periodically checking/replacing the spark plugs, no maintenance, timing, or adjustments are necessary or possible with these systems.

NOTE: Engines with a DSAI system will have leads located near the fuel regulator. Connect the leads for NG and leave disconnected for LPG.

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

Check Spark Plugs

Every **100 hours** of operation, remove the spark plugs, check condition, and reset the gap or replace with new plugs as necessary. **Every 300 hours or annually** replace the spark plugs. Refer to the chart below for replacement spark plugs. Equivalent alternate brand plugs can also be used.

Model	Kohler Part No.	Champion©	Gap mm (in.)
CH640	25 132 14-S	XC12YC	0.51 (0.020)
CH730	12 132 02-S	RC12YC	0.76 (0.030)
	25 132 14-S	XC12YC	0.76 (0.030)
CH740	12 132 02-S	RC12YC	0.76 (0.030)
	25 132 12-S	3071	0.76 (0.030)
	25 132 14-S	XC12YC	0.76 (0.030)

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 plugs 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 according to the chart by carefully bending the ground electrode. See Figure 10.

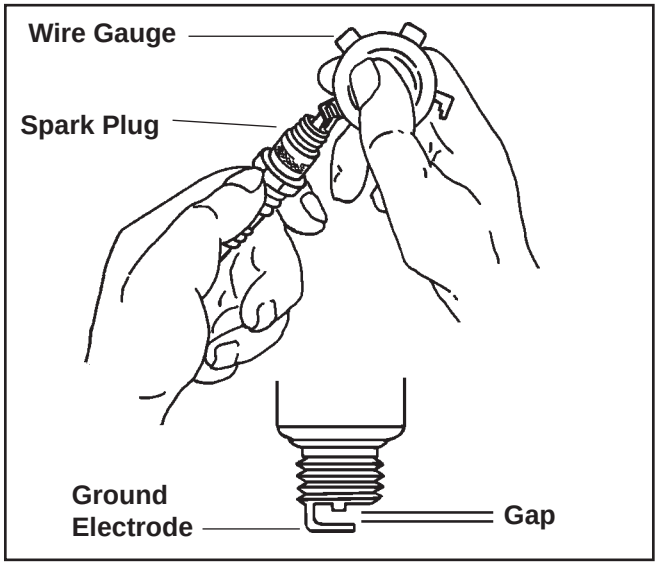


Figure 10. Servicing Spark Plug.

4. Reinstall the spark plug into the cylinder head. Torque the spark plug to **24.4-29.8 N·m (18-22 ft. lb.)**.

Battery Charging

WARNING: Explosive Gas!

Batteries produce explosive hydrogen gas while being charged. To prevent a fire or explosion, charge batteries only in well ventilated areas. Keep sparks, open flames, and other sources of ignition away from the battery at all times. Keep batteries out of the reach of children. Remove all jewelry when servicing batteries.

Before disconnecting the negative (-) ground cable, make sure all switches are OFF. If ON, a spark will occur at the ground cable terminal which could cause an explosion if hydrogen gas or LPG/NG fuel vapors are present.

Charging of battery should be performed as outlined by the original equipment manufacturer (OEM) in their operator's manual.

Fuel Filter

The filter of the LPG/NG fuel system is an integral part within the lock-off/filter assembly. All service relating to the lock-off/filter is to be performed by an authorized Kohler Engine Service Dealer or qualified LPG personnel only. Servicing of filter is recommended every 500 hours.

Fuel Line

These engines use low permeation rated fuel lines, certified to comply with California and U.S. EPA evaporative emission requirements. Fuel lines that do not meet these requirements may not be used. Order replacement hose through a Kohler Service Center.

Carburetor Troubleshooting and Adjustments

In compliance with government emission standards, the carburetor and the regulator are calibrated and preset to deliver the correct fuel-to-air mixture to the engine under all operating conditions and cannot be adjusted, except for low idle speed. Carburetor servicing is to be performed by an authorized Kohler Engine Service Dealer only. See Figure 11.

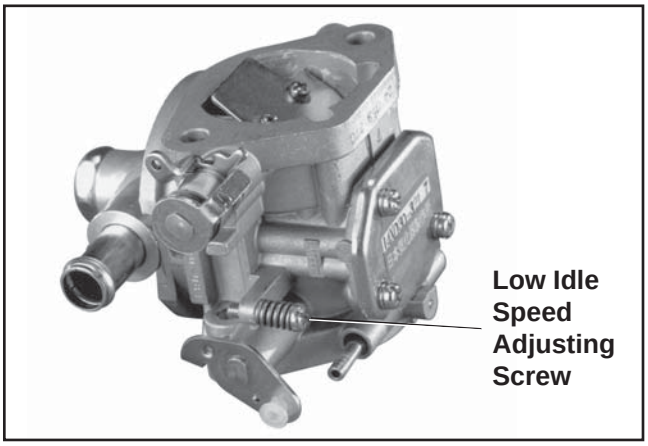


Figure 11.

LPG Regulator

In compliance with government emission standards, the regulator is preset at the factory to provide the proper supply of fuel. No adjustment or resetting of regulator is to be made. All service relating to the regulator must be performed by an authorized Kohler Engine Service Dealer or qualified LPG personnel only.

Over time, fuel deposits can accumulate inside the regulator. Removing these deposits is recommended (Nikki regulators only) every 500 operating hours, or annually, whichever comes first.

Nikki Regulators

Every 500 hours/annually drain regulator:

1. Turn fuel supply valve off, run engine out of fuel, and turn off ignition switch.

2. Disconnect and ground the spark plug leads.

3. Remove the 1/8" pipe plug from the bottom of regulator. Remove any accumulated deposits. See Figure 12.

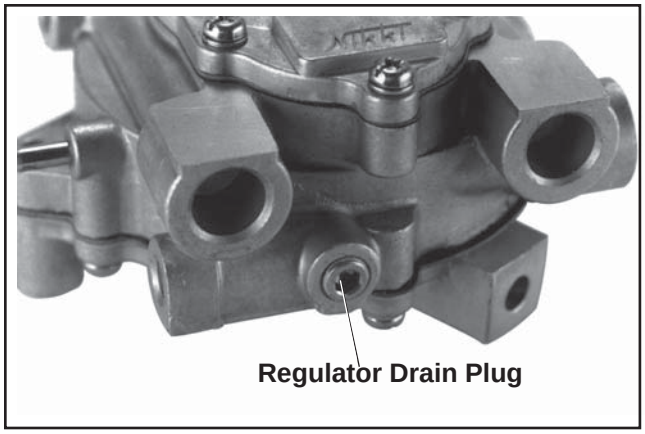


Figure 12. Nikki Regulator Drain Plug.

4. Reinstall plug using Teflon® pipe sealant (not Teflon® tape) on threads and tighten securely. If required, a replacement plug is available as Kohler Part No. 25 139 60-S.

All Regulators
Every 1500 Hours:
Complete cleaning (disassembling, servicing, and resetting) of regulator at 1500 hour intervals is recommended. As all adjustments and settings must be reset using specific test equipment, this must be performed by an **authorized Kohler Engine Service Dealer or qualified LPG personnel only**.

Lock-Off/Filter Assembly

This opens, closes, and filters the liquid fuel flow from the supply tank before reaching the vaporizer. Servicing, if required, is to be performed by an authorized Kohler Engine Service Dealer or qualified LPG personnel only. See Figures 13 and 14.

Vaporizer

The vaporizer changes the Liquefied Petroleum (LPG) from the supply tank to a gaseous/vapor state. Cleaning should be performed on a regular basis, more frequently under dusty or dirty conditions. The vaporizer should be disassembled, cleaned, and serviced using a rebuild kit every 1500 hours by an authorized Kohler Engine Service Dealer or qualified LPG personnel only.

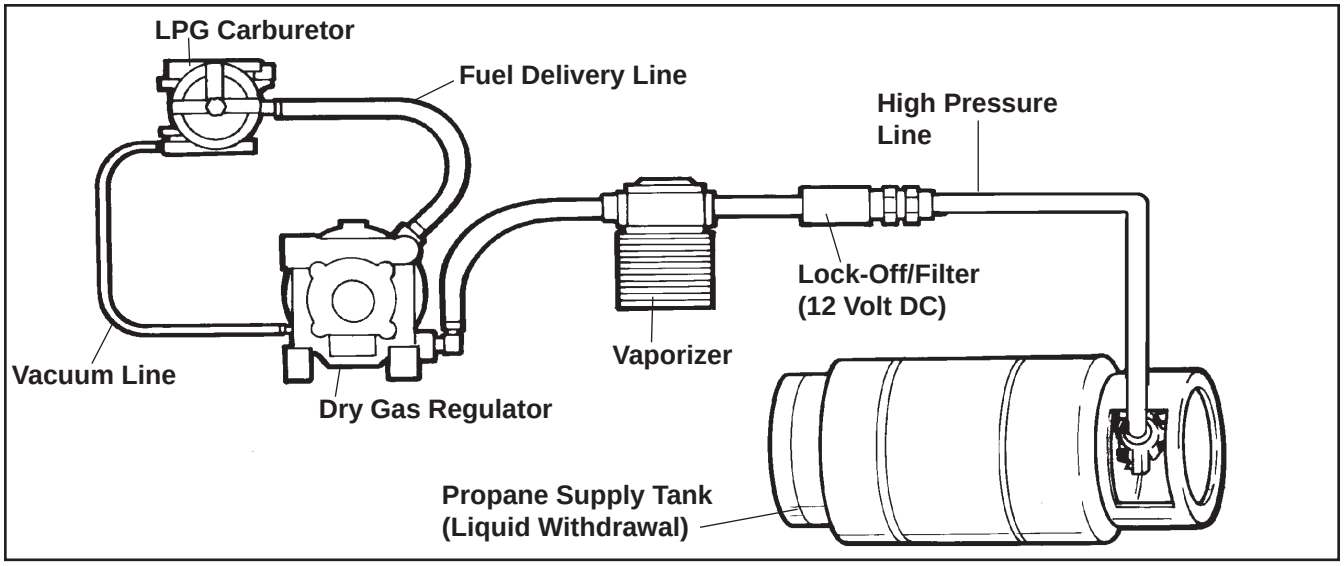


Figure 13. Schematic Showing Components of LPG System.

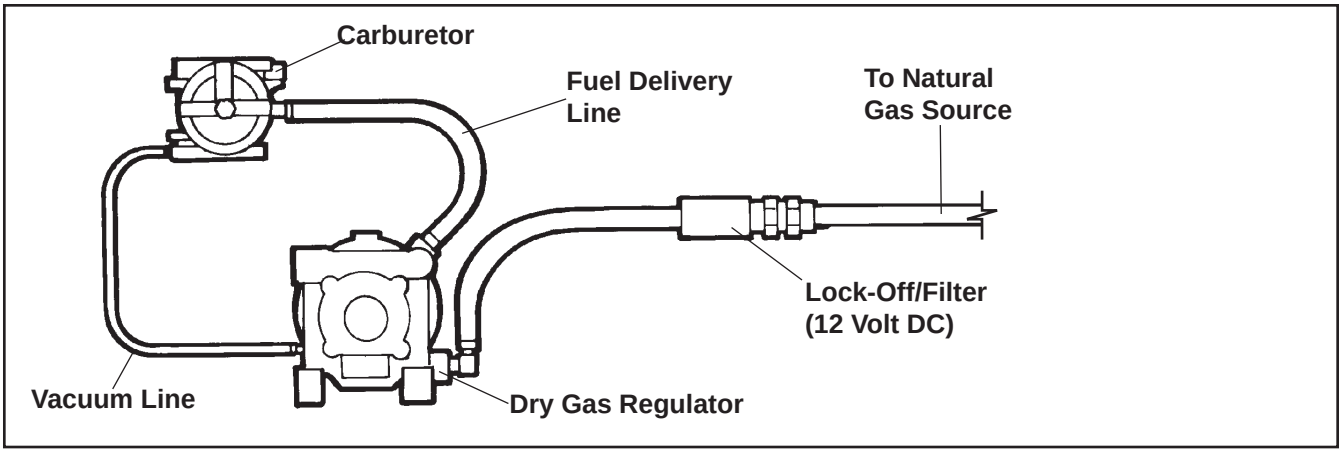


Figure 14. Schematic Showing Components of NG System.

Leakage Check/Testing

Every 500 hours or annually. With LPG tank valve fully opened, engine not running, turn key switch **ON.** Check all LPG system connections and lines for leaks using soapy water. Any leakage must be corrected **before** restarting engine. Have service performed by an authorized Kohler Engine Service Dealer or qualified LPG personnel only.

Troubleshooting - Fuel Related

If engine problems are experienced that appear to be fuel system related, check the following areas before seeking service assistance.

- Make sure the LPG tank is properly filled (never to more than 80 percent of total capacity). An air space must be present in the tank to allow fuel to expand.
- Make sure the air cleaner element is clean and all air cleaner components are fastened securely.
- Check for loose, kinked, or cracked vacuum lines causing regulator not to open.
- Check to make sure the fuel valve on LPG tank is fully open.
- Check gauge on LPG tank to make sure pressure is sufficient to open the regulator.

If after checking the items listed above, the engine is hard to start, runs roughly, or stalls at low idle speed, qualified fuel system servicing may be necessary. Contact your nearest authorized Kohler Engine Service Dealer for further assistance.

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 following table.

Do not attempt to service or replace major engine components, or any items that require special timing or adjustment procedures. Have your Kohler Engine Service Dealer do this work.

Possible Cause Problem	No Fuel	Improper Fuel	Dirt In Fuel Line	Dirty/ Restricted Lock-off Fuel Filter	Dirty Flywheel Screen	Incorrect Oil Level	Engine Overloaded	Dirty Air Cleaner	Faulty Spark Plug	Dirty/ Restricted Regulator
Will Not Start	•		•	•	•	•	•	•	•	•
Hard Starting	•	•	•	•	•	•	•	•	•	•
Stops Suddenly	•		•	•	•	•	•	•		•
Lacks Power		•	•	•	•	•	•	•	•	•
Operates Erratically		•	•	•	•		•	•	•	•
Knocks or Pings		•		•	•		•		•	•
Skips or Misfires		•	•	•	•			•	•	•
Backfires			•	•				•	•	•
Overheats		•	•	•	•	•	•	•		•
High Fuel Consumption							•	•		

Storage

When the engine is not in use, use the following storage procedure. Federal, state, or local laws governing LPG fuel tank storage may also apply. Follow the applicable storage laws.

1. Clean the exterior surfaces of the engine.

2. Change the oil and filter while the engine is still warm from operation. See Change Oil and Oil Filter on page 9.

3. Turn valve on LPG tank off and run engine until the fuel system is empty. Turn ignition key switch off. Separate LPG tank from the unit and store separately in an area designated for safe LPG tank storage.

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

5. Store the engine in a clean, dry place. Store the fuel tank in a designated safe LPG storage area at all times when not in use.

Parts Ordering

The engine Specification, Model, and Serial Numbers are required when ordering replacement parts from your Kohler Engine Service Dealer. These numbers are found on the identification plate which is affixed to the engine shrouding. Include letter suffixes if there are any. See Engine Identification Numbers on page 6.

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

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 Dealers have the facilities, training, and genuine Kohler replacement parts necessary to perform this service.

For the nearest Sales & Service location:

- visit our website www.kohlerengines.com
- call 1-800-544-2444 (U.S. & Canada)
- look in the yellow pages under Engines-Gasoline

Specifications

Model	Bore mm (in.)	Stroke mm (in.)	Displacement cm^3 ($in.^3$)	Max. Torque N·m (ft. lb.)	Compression Ratio	Weight kg (lb.)	Lubrication	Oil Capacity (w/filter)*
CH640	77 (3.03)	67 (2.64)	624 (38)	44 (32) @ 2500 RPM	8.5:1	41 (90)	Full Pressure w/full Flow Filter	1.6-1.8 L (1.7-1.9 U.S. qt.)
CH730	83 (3.27)	67 (2.64)	725 (44)	54 (39.5) @ 2400 RPM	9.0:1	43 (94)		
CH740	83 (3.27)	67 (2.64)	725 (44)	57 (42.3) @ 2400 RPM	9.0:1	43 (94)		

*approximate, determined by oil filter and oil cooler used.

Exhaust Emission Control System for gaseous fuel models CH640, CH730, and CH740, is EM for U.S. EPA, California, and Europe.

LIMITED 2 YEAR COMMAND 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 two (2) 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 two (2) 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, and click on SALES AND SERVICES to use the locator function, consult your Yellow Pages or telephone 1-800-544-2444.

ENGINE DIVISION, KOHLER CO., KOHLER, WISCONSIN 53044

KOHLER CO.
FEDERAL AND CALIFORNIA EMISSION CONTROL SYSTEMS
LIMITED WARRANTY
SMALL OFF-ROAD AND CLASS 1 LSI ENGINES

The U.S. Environmental Protection Agency (EPA), the California Air Resources Board (CARB), and Kohler Co. are pleased to explain the 2011 and later Federal and California Emission Control Systems Warranty on your off-road equipment engine. "Emissions" means both exhaust and evaporative emissions. For California, small off-road engines, and Class 1 LSI (Large Spark Ignited engines at or below 1.0 liter) must be designed, built and equipped to meet the state's stringent anti-smog standards. In other states, 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

Small off-road engines and Class 1 LSI engines are warranted for two years in California and other states. 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.

Small off-road engines and Class 1 LSI engines are warranted for two years in California. 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.

Continued on next page.

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)
- Fuel lines, fuel line fittings and clamps (if equipped)
- Spark advance module (if equipped)
- 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
- Fuel metering valve (if equipped)
- Air filter, fuel filter, and spark plugs (only to first scheduled replacement point)
- 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

FORM NO.:	24 590 18 Rev. B
ISSUED:	10/10
REVISED:	4/11

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

KohlerEngines.com

ENGINE DIVISION, KOHLER CO., KOHLER, WISCONSIN 53044

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