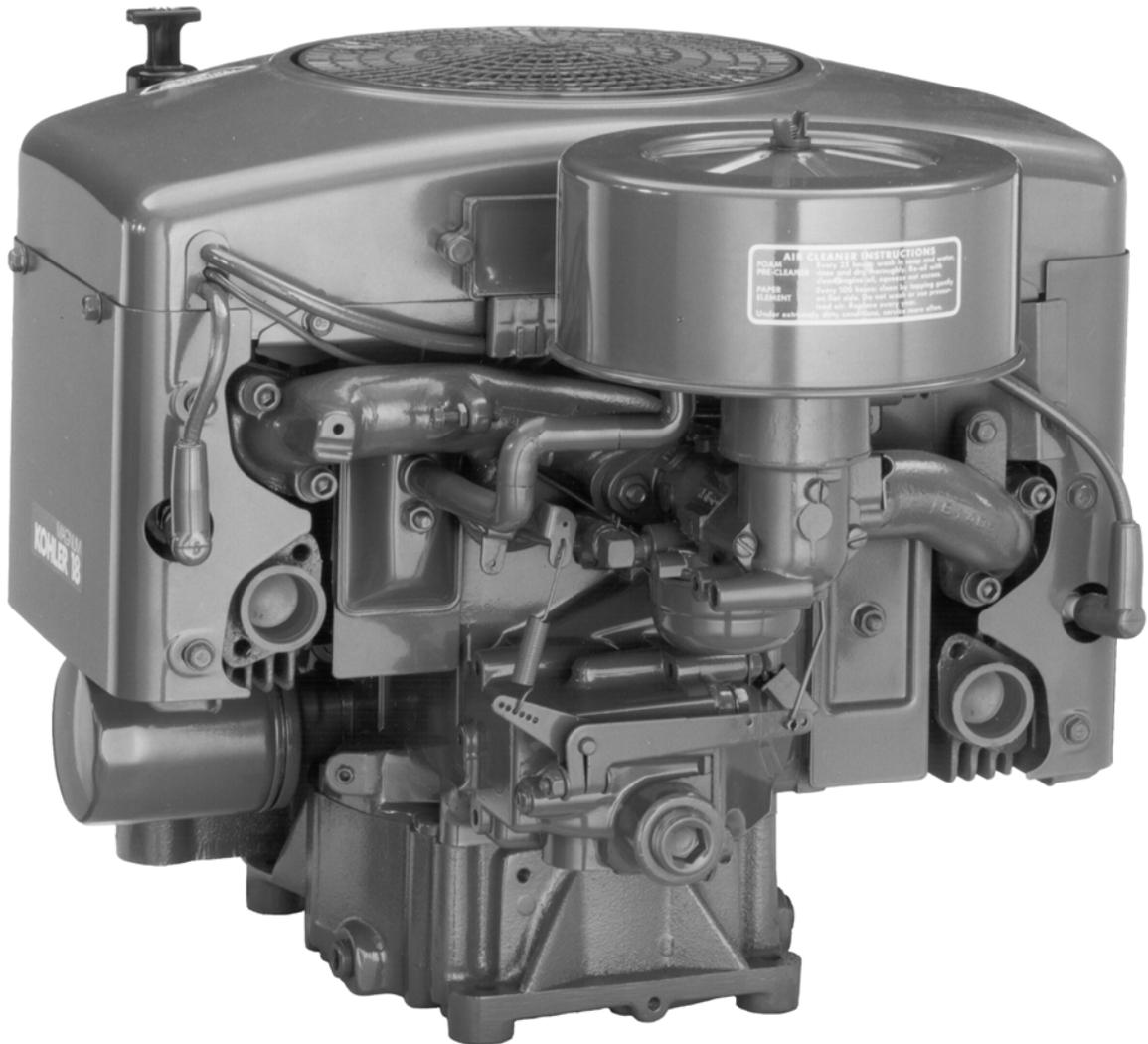


OWNER'S MANUAL

MAGNUM 16,18,20 HP **VERTICAL CRANKSHAFT**



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
<p>Explosive Fuel can cause fires and severe burns.</p> <p>Stop engine before filling fuel tank.</p>

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 ignited 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
<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.

WARNING
<p>Hot Parts can cause severe burns.</p> <p>Do not touch engine while operating or just after stopping.</p>

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.

<p>California Proposition 65 Warning</p>
<p><i>Engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.</i></p>

Safety Precautions (Cont.)

 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.

 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 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 gasoline 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:

- Parts subject to the most wear and tear (like the cylinders, crankshaft, and camshaft) are made from precision formulated cast iron. Because the cast iron cylinders can be rebored, these engines can last even longer.
- Dependable, maintenance free electronic ignition system 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.
- 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.

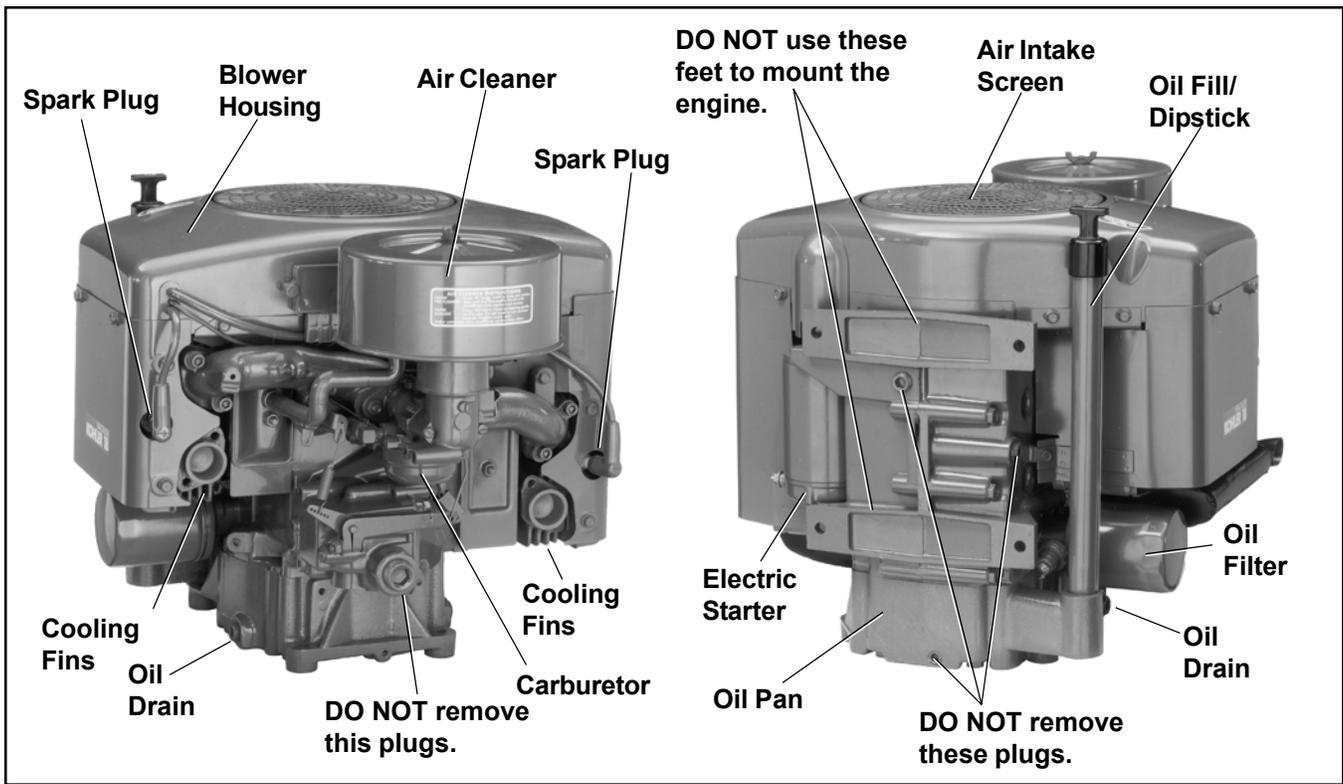


Figure 1. Typical Magnum Vertical Shaft Engine.

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 (or decals) affixed to the engine shrouding. Include letter suffixes, if there are any.

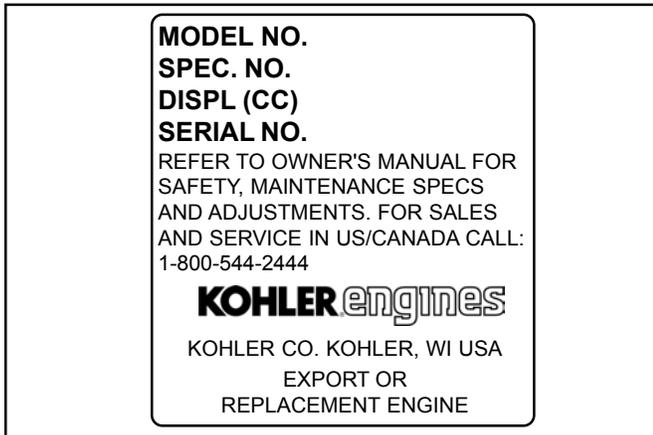


Figure 2. Engine Identification Label.

Record your engine identification numbers on the identification label illustration (Figure 2) for future reference.

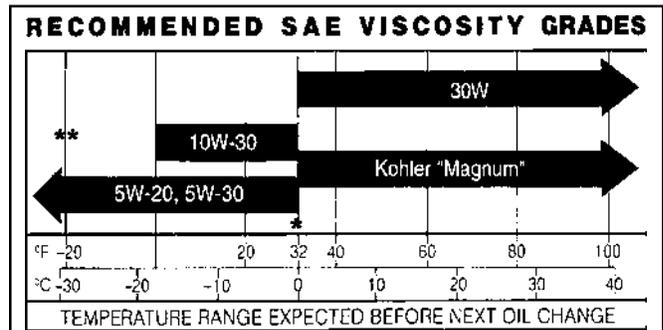
Oil Recommendations

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

Before each start, make sure the crankcase is filled with proper type and quantity of oil.

Oil Type

Use high-quality detergent 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 table.



*Use of synthetic oil having 5W-20 or 5W-30 rating is acceptable, up to 4°C (40°F).

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

Figure 3. Viscosity Grades Table.

Straight 30-weight (Kohler "Magnum") oil is preferred. SAE 10W-30 oil is not recommended above 32°F. Using this oil substantially increases oil consumption and combustion chamber deposits.

NOTE: Using other than service class SG, SH, SJ or higher oil or extending oil change intervals longer than recommended could cause engine damage which is not covered by the engine warranty.

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



Figure 4. Oil Container Logo.

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

Fuel Recommendations



WARNING: Explosive Fuel!

Gasoline is extremely flammable, and its vapors can explode if ignited. Store gasoline only in approved containers, in 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; wipe up spills immediately. 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.

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. Leaded gasoline may be used in areas where unleaded is not available and exhaust emissions are not regulated. Be aware however, that the cylinder head will require more frequent service.

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 are not approved.

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 engines. 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: Lethal Exhaust Gases!

Engine exhaust gases contain poisonous carbon monoxide. Carbon monoxide is odorless, colorless, and can cause death if inhaled. Avoid inhaling 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 Figure 3 on page 4.
2. Declutch all possible external loads.
3. Set speed control at part throttle position.
4. A warm battery has much more starting capacity than a cold battery.
5. Use fresh winter grade fuel. NOTE: Winter grade gasoline has a higher volatility to improve starting. Do not use gasoline left over from summer.

Starting

1. **On a Cold Engine** – Place the throttle control **midway** between the “**slow**” and “**fast**” positions. Place the choke control into the “**on**” position.

On a Warm Engine (normal operating temperatures) – Place the throttle control **midway** between the “**slow**” and “**fast**” positions. Place the choke control into the “**off**” position.

2. Start the engine as follows:

For a Retractable Start Engine – 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.

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



WARNING: Accidental Starts!

Before extending and checking the retractable starter rope, remove the spark plug leads to prevent the engine from starting accidentally. Ground the leads to prevent sparks that could cause fires. Make sure the equipment is in neutral.

For an Electric Start Engine – Activate the starter switch. Release the switch as soon as the engine starts.

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”), the 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” on page 7). See your Kohler Engine Service Dealer for trouble analysis.

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3. Gradually return the choke control to the “off” position after the engine starts and warms up.

NOTE: After starting the engine, it may be necessary to leave the choke partially “on” for a few minutes before moving it to the “off” position.

Stopping

1. Remove the load by disengaging all PTO attachments.
2. Move the throttle control to the “slow” or “low” idle position. Allow the engine to run at idle for 30-60 seconds; then stop the engine. If the carburetor on the engine is equipped with a fuel solenoid, move the throttle control back up between half and full throttle just before stopping the engine.

Battery

A 12 volt battery with a rating of approximately 250 cold cranking amps is normally used. Refer to the operating instructions of the equipment this engine powers for specific information.

If the battery charge is not sufficient to turn over the engine, recharge the battery (see page 11).

Operating

Optional spark arrestor mufflers are available from your Kohler Engine Service Dealer. Check your local laws and statutes regarding engine spark arrestor muffler requirements.

Angle of Operation

The maximum angles of operation are: 30° with carburetor up or down; 25° with cylinders up or down. (Intermittent operation with crankcase filled to “F” mark on dipstick.)

NOTE: Do not exceed these angles of operation as engine damage may result from lack of lubrication.

Refer to the operating instructions of the equipment this engine powers. It may have more stringent guidelines as to angle of operation due to equipment design.

Cooling

NOTE: If debris builds up on the grass screen or other cooling air intake 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.



WARNING: Rope Starting Pulley Is Not a Drive Pulley!

Do not use optional backup rope starting pulley as a drive pulley. Using starting pulley as a drive could loosen the flywheel fastener, resulting in bodily harm.

Maintenance Instructions



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.

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	<ul style="list-style-type: none"> • Clean air intake screen.¹ • Check oil level. • Fill fuel tank. • Check or replace fuel filter.
Every 25 Hours	<ul style="list-style-type: none"> • Service foam precleaner.¹ • Change oil (Without filter).
Every 50 Hours	<ul style="list-style-type: none"> • Clean cooling fins and external surfaces. • Change oil and filter. (With filter SAE 30 oil above 32°⁴.) (With filter Multiviscosity oil below 32°.)
Every 100 Hours	<ul style="list-style-type: none"> • Replace paper air cleaner element.¹ • Check spark plugs.
Every 200 Hours	<ul style="list-style-type: none"> • Replace fuel filter.
Annually or Every 500 Hours	<ul style="list-style-type: none"> • Have valve tappet clearance checked.² • Have cylinder head serviced.^{2,3} • Have starter motor drive serviced.²

¹Perform these maintenance procedures more frequently under extremely dusty, dirty conditions.

²Have a Kohler Engine Service Dealer perform this service.

³250 hours when leaded gasoline and/or multiviscosity oil is used.

⁴25 hours continuous and/or heavy duty operations.

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 and resting on a level surface. Also make sure the engine is cool and the oil has had time to drain into the sump.
2. Before removing the oil fill cap/dipstick, clean the area to keep dirt and debris out of the engine.
3. Remove the dipstick and wipe oil off. Reinsert the dipstick and push it all the way down into tube.
4. Remove the dipstick and check the level. The oil level should be up to, but not over, the "F" mark on the dipstick. See Figure 5.

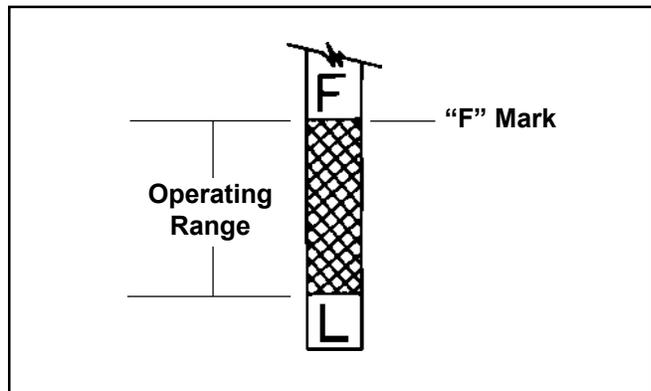


Figure 5. Oil Level Dipstick.

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 optional Oil Sentry™ oil pressure switch monitor. If the oil pressure decreases below an acceptable level, the Oil Sentry™ will either shut off the engine or activate a warning signal, depending on the application.

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

Change Oil and Oil Filter

Change Oil

Change oil as shown in the “Oil Change Intervals” table.

Oil Change Intervals

Temperature	Oil Type	Engine Type	Interval
ABOVE 32°F (0°C)	SAE 30	With Filter	50 hours*
		Without Filter	25 hours
	Multiviscosity	With Filter	25 hours
		Without Filter	25 hours
BELOW 32°F (0°C)	Multiviscosity	With Filter	50 hours
		Without Filter	25 hours

*NOTE: 25 hours for continuous and/or heavy duty operation.

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

Change the oil as follows:

1. To keep dirt, grass clippings, etc., out of the engine, clean the area around the oil fill cap before removing it.
2. Remove the oil drain plug and oil fill cap. Tilt the engine slightly towards the oil drain to obtain better drainage.
3. Reinstall the drain plug. Make sure it is tightened securely.
4. Fill with new oil of the proper type to the “F” mark on the dipstick. Always check the level on 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.

5. Reinstall the oil fill cap. Make sure it is tightened securely.

Change Oil Filter

Some engines are equipped with an oil filter. Replace the oil filter *every other* oil change, in accordance with the “Oil Change Intervals” table above. Always use a genuine Kohler oil filter, Part No. 52 050 02, and replace as follows:

1. Drain crankcase oil. Remove the old filter and wipe off the filter adapter.
2. 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.
3. Apply a thin film of clean oil to the rubber gasket on the new filter.
4. Install the replacement oil filter to the filter adapter. Turn filter clockwise until rubber seal contacts the filter adapter, then tighten filter an additional **2/3 to 1 turn**.
5. Fill the crankcase with new oil of the proper type, to the “F” mark on the dipstick. Add an additional 1/2 pint of oil for the filter capacity. See “Specifications” on page 14.
6. 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. Make sure oil level is up to but not over the “F” mark on the dipstick.

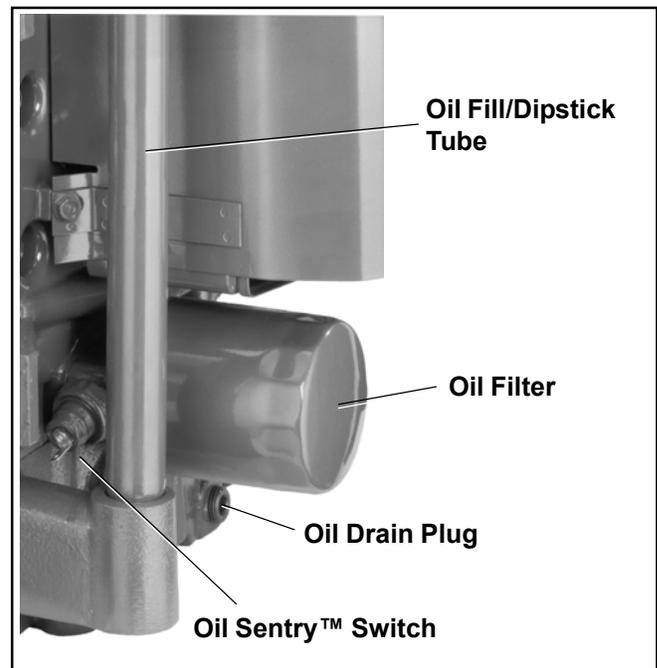


Figure 6. Oil Fill/Dipstick Tube, Oil Filter, Oil Drain Plug, and Optional Oil Sentry™ Switch.

Clean Air Intake/Cooling System

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 **50 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.

Ignition System

This engine is equipped with a dependable electronic ignition system. Other than periodically checking/replacing the spark plugs, no maintenance, timing, or adjustments are required with this system. 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.

Precleaner and Air Cleaner Element

This engine is equipped with a high density paper air cleaner element. Some specifications are also equipped with an optional oiled foam precleaner which surrounds the paper element.

Service Precleaner

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

1. Remove wing nuts, air cleaner cover, element cover seal, and element cover.
2. Remove precleaner from paper element. Wash the precleaner in warm water with detergent.
3. Rinse the precleaner thoroughly until all traces of detergent are eliminated. Squeeze out excess water (do not wring). Air dry.
4. Saturate precleaner in clean, fresh engine oil and squeeze out excess oil.
5. Reinstall precleaner over paper element.

Service Paper Element

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

1. Remove the precleaner (if so equipped) from paper element.
2. **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 sealing surfaces are bent or damaged.
3. 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, seals, and breather tube for damage or improper fit. Replace all damaged air cleaner components.

NOTE: Damaged or loose components could allow unfiltered air into the engine causing premature wear and failure.

4. Reinstall the paper element, precleaner, element cover, element cover seal, air cleaner cover, and wing nut. Tighten wing nut 1/2 to 1 full turn after nut contact cover. Do not overtighten.

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:

1. Before removing spark plugs, clean the area around base of plugs to keep dirt and debris out of engine.
2. Remove plugs and check 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 to **0.035 in. (0.89 mm)** by carefully bending the ground electrode. See Figure 7.
4. Reinstall the spark plugs into the cylinder heads. Torque the spark plugs to **10-15 ft. lb. (14-20 N·m)**.

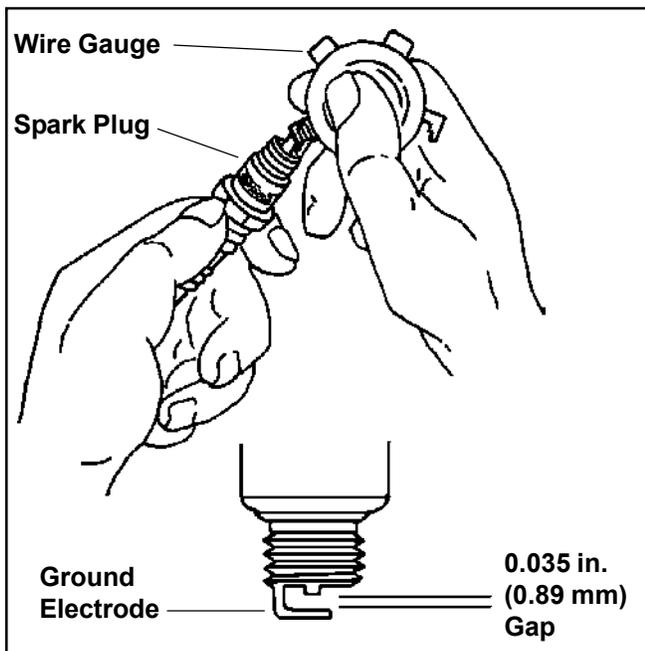


Figure 7. Servicing Spark Plug.

Battery Charging



WARNING: Explosive Gases!

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 gasoline vapors are present.

NOTE: Do not apply 12 volt DC to kill terminal of ignition module.

Fuel Filter

Some engines are equipped with an in-line fuel filter. Periodically inspect the filter and replace with a genuine Kohler filter **every 200 operating hours**.

Carburetor Troubleshooting and Adjustments

Kohler MV16,18,20 engines are equipped with one of two basic types of Walbro carburetor—*fixed main jet* or *adjustable main jet*.

The carburetor is designed to deliver the correct fuel-to-air mixture to the engine under all operating conditions. The main fuel and idle fuel needles on adjustable jet carburetors are set at the factory and normally do not require further adjustment. On fixed jet carburetors, the low idle fuel needle is also set at the factory and normally does not need further adjustment. The main fuel jet is calibrated and installed at the factory and is not adjustable.*

*NOTE: Engines with fixed main jet carburetors, operating at altitudes above approximately **1830 m (6000 ft)**, may require a special “high altitude” main jet. See your Kohler Engine Service Dealer for further information.

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 fuel is reaching the carburetor. This includes checking the fuel shut-off valve, fuel tank filter screen, in-line fuel filter, fuel lines, and fuel pump for restrictions or faulty components, replace as necessary.
- Make sure the air cleaner base and carburetor is securely fastened to the engine using gaskets in good condition.
- Make sure the air cleaner element is clean and all air cleaner components are fastened securely.

If, after checking the items listed above, starting or engine operation problems continue, it may be necessary to adjust or service the carburetor.

Walbro Carburetor Adjustment

In general, turning the adjusting needles **in** (clockwise) decreases the supply of fuel to the carburetor. This gives a *leaner* fuel-to-air mixture. Turning the adjusting needles **out** (counterclockwise) increases the supply of fuel to the carburetor.

NOTE: Carburetor adjustments should be made only after the engine has warmed up.

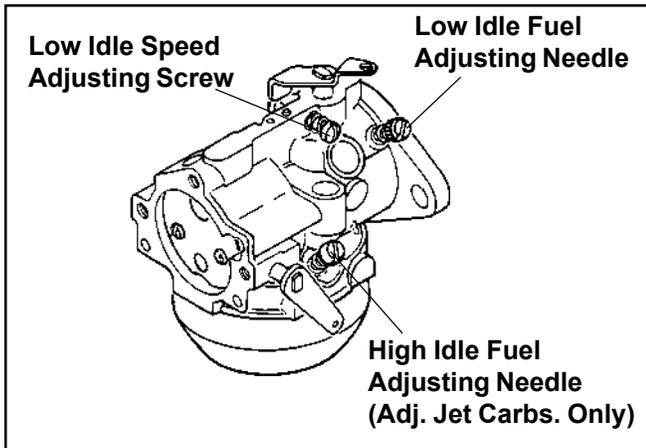


Figure 8. Carburetor.

1. With the engine stopped, turn the adjusting needle(s) **in** (clockwise) until it bottoms *lightly*.

NOTE: The tip of the idle fuel and main fuel adjusting needles are tapered to critical dimensions. Damage to the needles and the seats in carburetor body will result if the needles are forced.

2. **Preliminary Settings:** Turn the adjusting needles **out** (counterclockwise) from lightly bottomed as follows to the rich side of adjustment.

Walbro Fixed Jet	Low Idle
MV16	1-1/4 turns
MV18	1-1/4 turns
MV20	1-1/4 turns

Walbro Adj.	Low Idle	Main Fuel
MV16	1-1/4 turns	1-1/4 turns
MV18	1-1/4 turns	1-1/4 turns
MV20	1-1/4 turns	1 turn

3. Start the engine and run at half throttle for five to ten minutes to warm up. The engine must be warm before making final settings (steps 4, 5, and 6).
4. **Main Fuel Needle Setting:** *This adjustment is required only for adjustable main jet carburetors. If the carburetor is a fixed main jet type disregard this setting.*

Place the throttle into the "fast" position.

Turn the adjusting needle **in** (clockwise). The engine speed may increase, then it will decrease as the needle is turned in (lean). Note the position of the needle. Back the needle out approximately 1/8 to 1/4 turn. See Figure 9 for best main fuel performance.

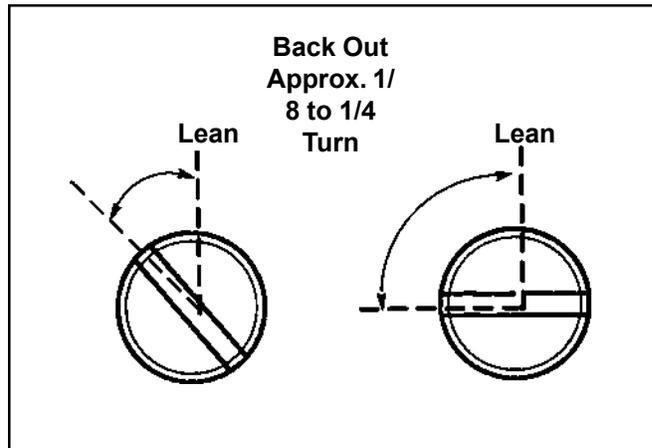


Figure 9. Optimum Main Fuel Setting.

5. **Low Idle Speed Setting:** Place the throttle control into the "idle" or "slow" position. Set the low idle speed to **1200 RPM*** (± 75 RPM) by turning the low idle speed adjusting screw **in or out**. Check the speed using a tachometer.

*NOTE: The actual low idle speed depends on the application. Refer to the equipment manufacturer's instructions for specific low idle speed settings. To ensure best results when setting the low idle fuel needle, the low idle speed must not exceed 1500 RPM.

6. **Low Idle Fuel Needle Setting:** Place the throttle into the "idle" or "slow" position.

Turn the adjusting needle **in** (clockwise). The engine speed may increase, then it will decrease as the needle is turned in (lean). Note the position of the needle.

Back the needle out approximately 1/8 to 1/4 turn. See Figure 10 for best low idle fuel performance.

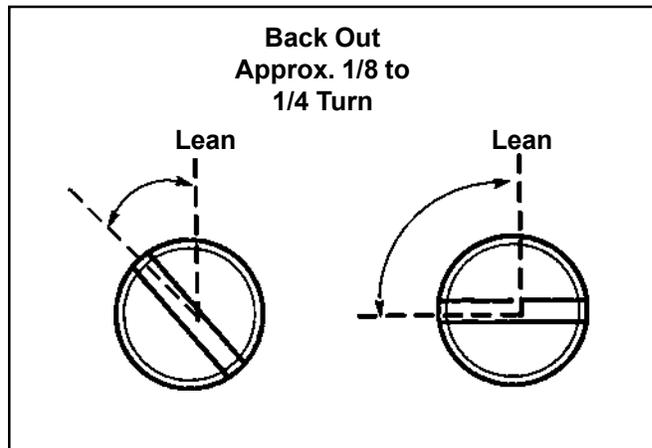


Figure 10. Optimum Low Idle Fuel Setting.

Troubleshooting

When a problem occurs, 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 items or any items that require special timing or adjustment procedures (governor, valves, etc.). Have your Kohler Engine Service Dealer do this work.

Possible Cause Problem	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 approximately two months or more, use the following storage procedure:

1. Clean exterior surfaces of the engine.
2. Change oil and filter when engine is still warm from operation. See “Changing Oil” and “Oil Filter” on page 9.
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.

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

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

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 4.

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. However, major repair generally requires the attention of a trained mechanic and the use of special tools and equipment. Your Kohler Engine Service Dealer has the facilities, training, and genuine Kohler replacement parts necessary to perform the service. For Sales and Service assistance call 1-800-544-2444 (U.S. and Canada) or contact your Kohler Engine Dealer or Service Distributor, they're in the Yellow Pages under Engines–Gasoline.

Model Designation

Model MV18S for example: M designates MAGNUM engine, V designates the vertical crankshaft, and 18 designates horsepower. A letter suffix designates a specific version as follows:

Suffix	Designates
S	Electric Start
T	Retractable Start

Specifications

Model: MV16 MV18 MV20
Bore: inches (millimeters) .. 3.12 (79.20) 3.12 (79.20) 3.12 (79.20)
Stroke: inches (millimeters) .. 2.75 (69.85) 2.75 (69.85) 3.06 (78.00)
Displacement: cubic inches (cubic centimeters) .. 42.18 (691.3) 42.18 (691.3) 46.98 (769.8)
Power (@3600 RPM): horsepower (kilowatts) .. 16 (11.90) 18 (13.40) 20 (14.9)
Max. Torque: ft. lbs. (N·M) @RPM .. 26 (35) @2600 .. 29 (39) @2600 .. 32.8 (44) @2600
Compression Ratio: 5.8:1 6.0:1 6.0:1
Weight: lbs. (kilograms) .. 130 (59) 130 (59) 130 (59)
Oil Capacity (w/filter): U.S. quarts (liters) .. 2.0 (1.9) 2.0 (1.9) 2.0 (1.9)
Lubrication: Full Pressure w/full Flow Filter

*For best results, fill to "F" mark on dipstick as opposed to adding a given quantity of oil. Always check level on dipstick before adding more oil.

LIMITED 2 YEAR MAGNUM ENGINE WARRANTY

Kohler Co. warrants to the original consumer that each new MAGNUM 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 part or 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[®] ENGINES

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

ENGINE DIVISION, KOHLER CO., KOHLER, WISCONSIN 53044

FORM NO.: 52 590 03
ISSUED: 12/04
REVISED:
MAILED:

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