



[Home](#) » [Kohler](#) » **Kohler XT650 Small Gasoline Engines User Manual** 

Contents [[hide](#)]

- [1 Kohler XT650 Small Gasoline Engines User Manual](#)
- [2 Product Overview](#)
- [3 Pre-Start Checklist](#)
- [4 Starting](#)
- [5 Maintenance Instructions](#)
- [6 Fuel Recommendations](#)
- [7 Troubleshooting](#)
- [8 Engine Specifications](#)
- [9 References](#)

KOHLER

Kohler XT650 Small Gasoline Engines User Manual



IMPORTANT

- Read all safety precautions and instructions carefully before operating the equipment. Refer to the operating instructions of the equipment that this engine powers.
- Ensure the engine is stopped and level before performing any maintenance or service.
- Warranty coverage is outlined in the warranty card and on [KohlerEngines.com](https://www.kohlerengines.com). Review carefully, as it provides your specific rights and obligations.
- To maintain compliance with applicable emission regulations, exhaust system backpressure may not exceed limits which can be found on [KohlerEngines.com](https://www.kohlerengines.com) by Model No., then select the Specs tab.
- Kohler Engines has published CO2 values on the [KohlerEngines.com](https://www.kohlerengines.com) website.

Record engine information to reference when ordering parts or obtaining warranty coverage.

- Engine Model
- Specification
- Serial Number
- Purchase Date



Safety Precautions

⚠ WARNING: A hazard that could result in death, serious injury, or substantial property damage.


CAUTION: A hazard that could result in minor personal injury or property damage.

NOTE: is used to notify people of important installation, operation, or maintenance information.

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. Spilled fuel could ignite if it comes in contact with hot parts or sparks from ignition.
- Never use gasoline as a cleaning agent.

WARNING

-  Rotating Parts can cause severe injury.
- Stay away while the engine is in operation.
- Keep hands, feet, hair, and clothing away from all moving parts to prevent injury.
- Never operate the engine with covers, shrouds, or guards removed.

WARNING



- Carbon Monoxide can cause severe nausea, fainting, or death.
- Avoid inhaling exhaust fumes.
- Never run the engine indoors or in enclosed spaces.
- Engine exhaust gases contain poisonous carbon monoxide.
- Carbon monoxide is odorless, colorless, and can cause death if inhaled.

CAUTION

- Electrical Shock can cause injury.
- Do not touch wires while the engine is running.

WARNING

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

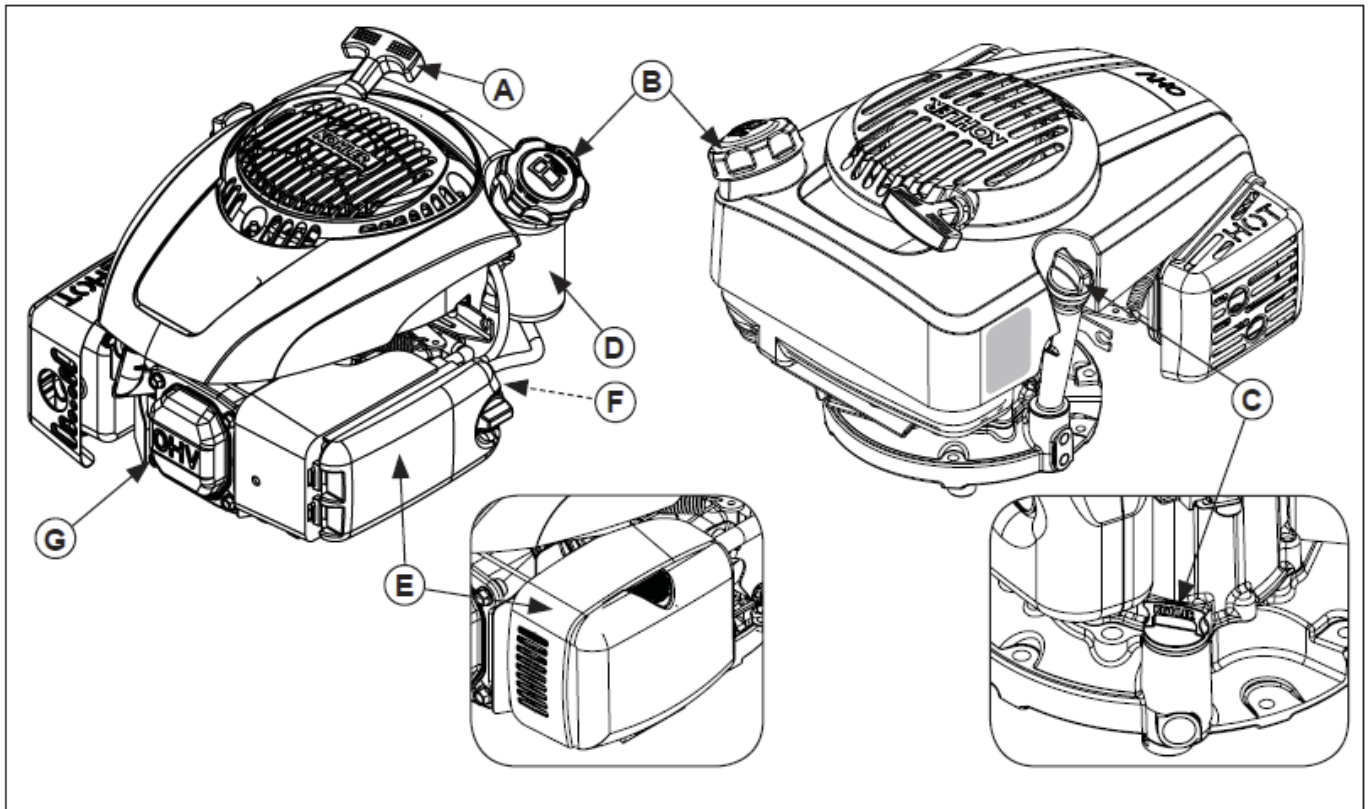
WARNING



- Hot Parts can cause severe burns.
- Do not touch the engine while operating or just
- After stopping.
- Never operate the engine with heat shields or guards removed.

⚠ WARNING: This product can expose you to chemicals including carbon monoxide and benzene, which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information, go to www.P65Warnings.ca.gov.

Product Overview



- A Starter Handle
- B Fuel Cap
- C Oil Fill Cap/ Dipstick
- D Fuel Tank
- E Air Cleaner
- F Fuel Shut-Off Valve
- G Spark Plug

Visit KohlerEngines.com for service parts information and purchasing options.

Pre-Start Checklist

1. Check oil level. Add oil if low. Do not overfill.
2. Check fuel level. Add fuel if low. Check fuel system components and lines for leaks.
3. Check and clean cooling areas, air intake areas, and external surfaces of the engine (particularly after storage).
4. Check that air cleaner components and all shrouds, equipment covers, and guards are in place and securely fastened.
5. Check spark arrestor (if equipped).

Starting

WARNING



- Carbon Monoxide can cause severe nausea, fainting, or death.
- Avoid inhaling exhaust fumes.
- Never run the engine indoors or in enclosed spaces.
- Engine exhaust gases contain poisonous carbon monoxide.
- Carbon monoxide is odorless, colorless, and can cause death if inhaled.

WARNING



- Rotating Parts can cause severe injury.
- Stay away while the engine is in operation.
- Keep hands, feet, hair, and clothing away from all moving parts to prevent injury.
- Never operate the engine with covers, shrouds, or guards removed.

NOTE: Choke position for starting may vary depending upon temperature and other factors. Once the engine is running and warm, turn the choke to the OFF position.

NOTE: Extend the starter cord periodically to check its condition. If the cord is frayed, have it replaced immediately by a Kohler authorized dealer.

1. Turn fuel shut-off valve to ON position (if equipped).
2. Turn the engine on/off switch to the ON position (if equipped).
3. Start the engine as follows:
 - a. Manual Choke Models: Cold engine: Place the throttle control to FAST position. Pull choke control into CHOKE/ON position.
 - Warm engine: Place the throttle control to the RUN/FAST position. or
 - b. Smart-Choke™ Models: This feature automatically adjusts the choke on start-up.
4. Retractable Start: Slowly pull starter handle until just past compression- STOP! Return starter handle; firmly pull straight out to avoid excessive rope wear from the starter rope guide.
5. Electric Start: Key switch (refer to operating Instructions for the equipment that this engine powers).

6. Gradually return choke control to the FF position after the engine starts and warms up.
7. 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.

Cold Weather Starting Hints

1. Use proper oil for the temperature expected.
2. Disengage all possible external loads.
3. Use fresh winter-grade fuel.
4. Winter grade fuel has higher volatility to improve starting.

Stopping

1. If possible, remove the load by disengaging all PTO driven attachments.
2. If equipped, move the throttle control to the slow or idle position; stop the engine.
3. If equipped, close the fuel shut-off valve.

Angle of Operation

Refer to the operating instructions of the equipment this engine powers. Do not operate this engine exceeding the maximum angle of operation; see the specification table.

Engine damage could result from insufficient lubrication.

Engine Speed

NOTE: Do not tamper with the governor settings to increase maximum engine speed. Overspeed is hazardous and will void the warranty.

High Altitude Operation

If this engine is operated at an altitude of 4000 ft. (1219 meters) or above, a high-altitude carburetor kit is required. To obtain high altitude carburetor kit information or to find a Kohler authorized dealer, visit KohlerEngines.com or call cCall1-[800-544-2444](tel:800-544-2444) (U.S. and Canada). This engine should be operated in its original configuration below 4000 ft. (1219 meters). Operating this engine with the wrong engine configuration at a given altitude may increase its emissions, decrease fuel efficiency and performance, and result in damage to the engine.

Maintenance Instructions

WARNING

- Before working on the line or equipment, disable the engine as follows: 1)
- Disconnect the spark plug lead(s). 2)
- Disconnect the negative (–) battery cable from the battery.
- Accidental Starts can cause severe injury or death.
- Disconnect and ground the spark plug lead(s) before servicing.
- 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 dealer found at KohlerEngines.com or 1-[800-544-2444](tel:800-544-2444) (U.S. and Canada).

Maintenance Schedule

After the first 3-5 Hours

- Change oil.

Every 25 Hours or Annually¹

- Service/replace the precleaner.
- Check the air cleaner for dirty, loose, or damaged parts.

Every 50 Hours or Annually

- Change oil.
- Replace fuel filter (if equipped).

Every 50 Hours or Annually¹

- Replace the air cleaner element.

Every 100 Hours or Annually¹

- Clean spark arrestor (if equipped).

Every 100 Hours or Annually²

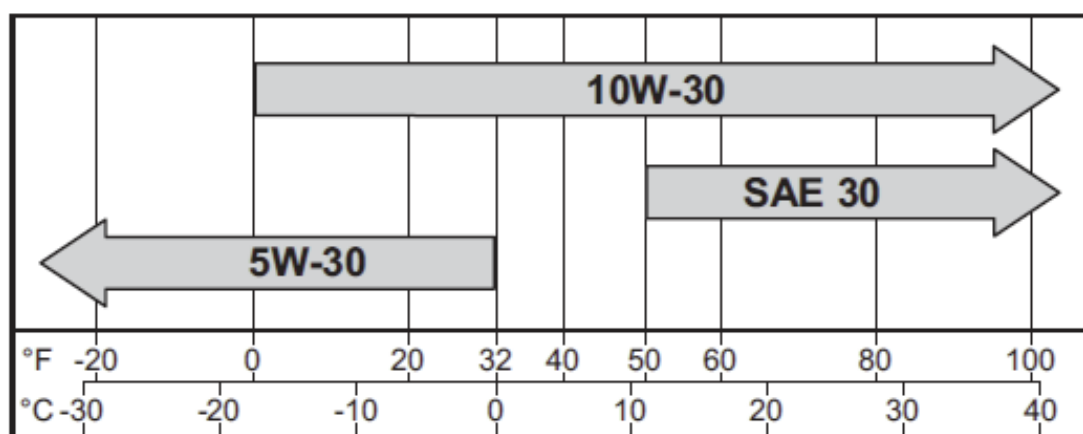
- Have the combustion chamber decarbonized.

Every 125 Hours or Annually¹

- Replace the spark plug and set the gap.
 1. Perform these procedures more frequently under severe, dusty, and dirty conditions.
 2. Have a Kohler authorized dealer perform this service.

Oil Recommendations

We recommend the use of Kohler oils for best performance. Other high-quality detergent oils (including synthetic) of API (American Petroleum Institute) Service class SJ or higher are acceptable. Select viscosity based on air temperature at time of operation as shown in the table below.



Check Oil Level

NOTE: To prevent extensive engine wear or damage, never run the engine with the oil level below or above the operating range indicator on the dipstick. Ensure the engine is cool. Clean oil fill cap/dipstick areas of any debris.

1. Remove dipstick; wipe oil off
 - a. 1/4 turn cap: reinsert dipstick into tube; Press completely down and turn 1/4 turn.

- b. Threaded cap: reinsert dipstick into tube; rest cap on tube, do not thread cap onto tube.
2. Remove dipstick; check oil level. The level should be at the top of the indicator on the dipstick.
 3. If oil is low on the indicator, add oil up to the top of the indicator mark.
 4. Reinstall and secure the dipstick.

Change Oil

Change oil while the engine is warm.

Dipstick tube

1. Clean the area around the oil fill cap/dipstick.
2. Remove oil fill cap/dipstick. Tilt the engine on its side with the air cleaner facing up.
Drain oil into an appropriate container.
3. After the crankcase is drained completely, tilt the engine upright.
4. Fill the crankcase with new oil. The level should be at the top of the indicator on the dipstick.
5. Reinstall the oil fill cap/dipstick and tighten securely.
6. Dispose of used oil by local ordinances.

Crankcase plug

1. Disable the engine by disconnecting the spark plug.
2. Clean the area around the oil fill cap/dipstick.
3. Remove oil fill cap/dipstick.
4. Remove the crankcase plug on the bottom of the engine; drain oil into the appropriate container.
5. Apply thread sealant around three full threads of the drain plug; reinstall the drain plug.
6. Torque to 120 in. lb. (13.6 N·m).
7. Fill the crankcase with new oil. The level should be at the top of the indicator on the dipstick.
8. Reinstall the oil fill cap/dipstick and tighten securely.
9. Dispose of used oil by local ordinances.

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.
- Spilled fuel could ignite if it comes in contact with hot parts or sparks from ignition. Never use gasoline as a cleaning agent.
- **NOTE:** E15, E20 and E85 are NOT approved and should NOT be used; effects of Old, stale, or contaminated fuel is not warrantable.

Fuel must meet these requirements.

- Clean, fresh, unleaded gasoline.
- Octane rating of 87 (R+M)/2 or higher.
- Research Octane Number (RON) 90 octane minimum.
- Gasoline up to 10% ethyl alcohol, 90% unleaded is acceptable.
- Methyl Tertiary Butyl Ether (MTBE) and unleaded gasoline blend (max 15% MTBE by volume) are approved.
- Do not add oil to gasoline.
- Do not overfill fuel tank.
- Do not use gasoline older than 30 days.

Add Fuel

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.

- Spilled fuel could ignite if it comes in contact with hot parts or sparks from ignition. Never use gasoline as a cleaning agent. Ensure the engine is cool.

1. Clean the area around the fuel cap.
2. Remove fuel cap. Fill to the base of filler neck.
3. Do not overfill fuel tank. Leave room for fuel to expand.
4. Reinstall the fuel cap and tighten securely.

Fuel Line

Low-permeation fuel lines must be installed on carbureted Kohler Co. engines to maintain the EPA and CARB regulatory compliance.

Spark Plugs

CAUTION

- Electrical Shock can cause injury.
 - Do not touch wires while the engine is running.
 - Clean out the spark plug recess. Remove the plug and replace it.
1. Check the gap using a wire feeler gauge.
 2. Adjust the gap; see the specification table for adjustment.
 3. Install the plug into the cylinder head.
 4. Torque plug to 20 ft. lb. (27 N·m).

Air Cleaner

NOTE: Operating the engine with loose or damaged air cleaner components could cause premature wear and failure. Replace all bent or damaged components.

NOTE: The Paper element cannot be blown out with compressed air. Loosen knob and remove air cleaner cover.

Precleaner (if equipped)

1. Remove precleaner.
2. Replace or wash the precleaner in warm water with detergent.

3. Rinse and allow to air dry.
4. Reinstall precleaner into cover, aligning hole in precleaner with upper cover knob.

Paper Element

1. Remove the paper element from the base and replace it.
2. Install the element with the pleated side out and seat the Rubber seal onto the edges of the base.

Foam Element

1. Remove the foam element from the base and replace it.
2. Install the element with the foam side out and the seat rubber seal onto the edges of the base.
3. Reinstall the air cleaner cover and secure it with knob.

Breather Tube

Ensure both ends of the breather tube are properly connected.

Air Cooling

WARNING

- Hot Parts can cause severe burns.
- Do not touch the engine while operating or just after stopping.
- Never operate the engine with heat shields or guards removed.
- Proper cooling is essential.
- To prevent overheating, clean the screens, cooling fins, and other external surfaces of the engine.
- Avoid spraying water at the wiring harness or any electrical components. See Maintenance Schedule.

Repairs/Service Parts

We recommend that you use a Kohler authorized dealer for all maintenance, service, and replacement parts for the engine. To find a Kohler authorized dealer, visit KohlerEngines.com or call 1-800-544-2444 (U.S. and Canada).

Storage

If the engine is out of service for 2 months or more, follow the procedure below.

1. Add Kohler PRO Series fuel treatment or equivalent to a fuel tank. Run engine 2-3 minutes to get stabilized fuel into the fuel system (failures due to untreated fuel are not warrantable).
2. Change oil while the engine is still warm from operation. Remove spark plug(s) and pour about 1 oz. of engine oil into the cylinder(s). Replace spark plug(s) and crank the engine Slowly distribute oil.
3. Disconnect the negative (-) battery cable.
4. Store the engine in a clean, dry place.

Troubleshooting

Do not attempt to service or replace major engine components or any items that require special timing or adjustment procedures. This work should be performed by a Kohler authorized dealer.

Problem	Possible Cause							
	No Fuel	Improper Fuel	Dirt In Fuel Line	Dirty Debris 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						•	•	•

Engine Specifications

Model	Bore	Stroke	Displacement	Oil Capacity (Refill)	Spark Plug Gap	Maximum Angle of Operation (@ full oil level)*
XT650, XT675	2.56 in. (65 mm)	1.80 in. (45 mm)	9.1 cu. in. (149 cc)	20 oz. (0.60 L)	0.030 in. (0.76 mm)	20°
XT775	2.75 in. (70 mm)		10.6 cu. in. (173 cc)			

Exceeding the maximum angle of operation may cause engine damage from insufficient lubrication. Additional specification information can be found in the service manual at [KohlerEngines.com](https://www.kohlerengines.com). Any horsepower (hp) references by Kohler are Certified Power Ratings and per SAE J1940 & J1995 hp standards. Details on Certified Power Ratings can be found at [KohlerEngines.com](https://www.kohlerengines.com).

Emission Control System

Exhaust Emission Control System for models XT650, XT675, and XT775 is EM for U.S. EPA, California, and Europe.

NOTE: Tampering with the engine and its emission control system voids the EPA Certificate of Conformity, ARB Executive Order, and EU type-approval.

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References

- [User Manual](#)

Engines, Kohler, Small Gasoline, user manual, XT650, XT650 Small Gasoline, XT675,

Kohler XT775

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