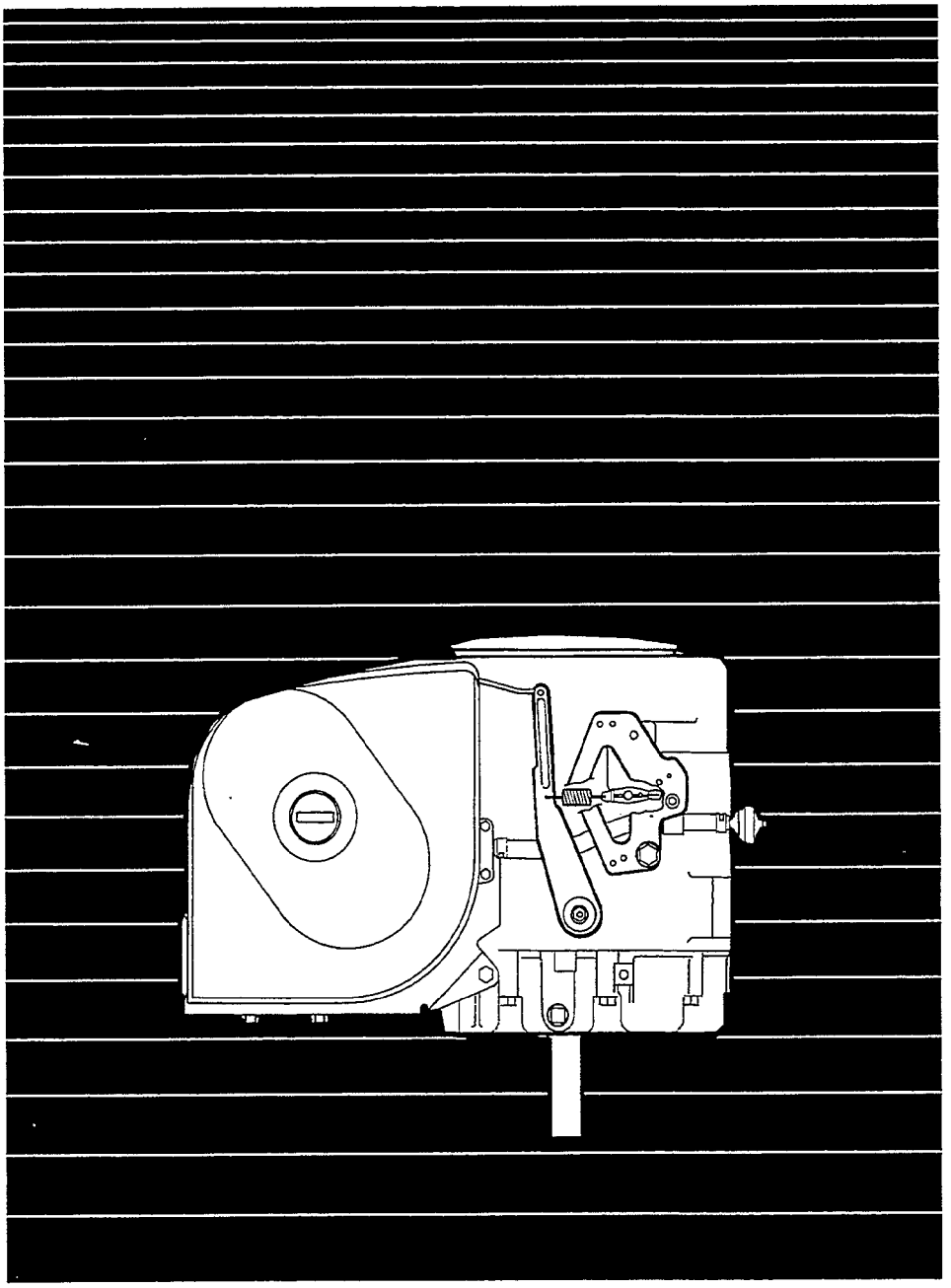
Onan

Engine

Operator's Manual

E125V, E140V

Elite Series



Printed in U.S.A.

965-0166
6-94 (Spec C)

Important Safety Precautions

Read and observe these safety precautions when using or working on electric generators, engines and related equipment. Also read and follow the literature provided with the equipment.

Proper operation and maintenance are critical to performance and safety. Electricity, fuel, exhaust, moving parts and batteries present hazards that can cause severe personal injury or death.

FUEL, ENGINE OIL, AND FUMES ARE FLAMMABLE AND TOXIC

Fire, explosion, and personal injury can result from improper practices.

- Used engine oil, and benzene and lead, found in some gasoline, have been identified by government agencies as causing cancer or reproductive toxicity. When checking, draining or adding fuel or oil, do not ingest, breathe the fumes, or contact gasoline or used oil.
- Do not fill tanks with engine running. Do not smoke around the area. Wipe up oil or fuel spills. Do not leave rags in engine compartment or on equipment. Keep this and surrounding area clean.
- Inspect fuel system before each operation and periodically while running.
- Equip fuel supply with a positive fuel shutoff.
- Do not store or transport equipment with fuel in tank.
- Keep an ABC–rated fire extinguisher available near equipment and adjacent areas for use on all types of fires except alcohol.
- Unless provided with equipment or noted otherwise in installation manual, fuel lines must be copper or steel, secured, free of leaks and separated or shielded from electrical wiring.
- Use approved, non-conductive flexible fuel hose for fuel connections. Do not use copper tubing as a flexible connection. It will work–harden and break.

EXHAUST GAS IS DEADLY

- Engine exhaust contains carbon monoxide (CO), an odorless, invisible, poisonous gas. Learn the symptoms of CO poisoning.
- Never sleep in a vessel, vehicle, or room with a genset or engine running unless the area is equipped with an operating CO detector with an audible alarm.
- Each time the engine or genset is started, or at least every day, thoroughly inspect the exhaust system. Shut down the unit and repair leaks immediately.
- Warning: Engine exhaust is known to the State of California to cause cancer, birth defects and other reproductive harm.

Make sure exhaust is properly ventilated.

- Vessel bilge must have an operating power exhaust.
- Vehicle exhaust system must extend beyond vehicle perimeter and not near windows, doors or vents.
- Do not use engine or genset cooling air to heat an area.
- Do not operate engine/genset in enclosed area without ample fresh air ventilation.
- Expel exhaust away from enclosed, sheltered, or occupied areas.
- Make sure exhaust system components are securely fastened and not warped.

MOVING PARTS CAN CAUSE SEVERE PERSONAL INJURY OR DEATH

- Do not remove any guards or covers with the equipment running.
- Keep hands, clothing, hair, and jewelry away from moving parts.
- Before performing any maintenance, disconnect battery (negative [–] cable first) to prevent accidental starting.
- Make sure fasteners and joints are secure. Tighten supports and clamps, keep guards in position over fans, drive belts, etc.
- If adjustments must be made while equipment is running, use extreme caution around hot manifolds and moving parts, etc. Wear safety glasses and protective clothing.

BATTERY GAS IS EXPLOSIVE

- Wear safety glasses and do not smoke while servicing batteries.
- Always disconnect battery negative (–) lead first and reconnect it last. Make sure you connect battery correctly. A direct short across battery terminals can cause an explosion. Do not smoke while servicing batteries. Hydrogen gas given off during charging is explosive.
- Do not disconnect or connect battery cables if fuel vapors are present. Ventilate the area thoroughly.

DO NOT OPERATE IN FLAMMABLE AND EXPLOSIVE ENVIRONMENTS

Flammable vapor can be ignited by equipment operation or cause a diesel engine to overspeed and become difficult to stop, resulting in possible fire, explosion, severe personal injury and death. **Do not operate diesel equipment where a flammable vapor environment can be created by fuel spill, leak, etc., unless equipped with an automatic safety device to block the air intake and stop the engine.**

HOT COOLANT CAN CAUSE SEVERE PERSONAL INJURY

- Hot coolant is under pressure. Do not loosen the coolant pressure cap while the engine is hot. Let the engine cool before opening the pressure cap.

ELECTRICAL SHOCK CAN CAUSE SEVERE PERSONAL INJURY OR DEATH

- Do not service control panel or engine with unit running. High voltages are present. Work that must be done while unit is running should be done only by qualified service personnel.
- Do not connect the generator set to the public utility or to any other electrical power system. Electrocution can occur at a remote site where line or equipment repairs are being made. An approved transfer switch must be used if more than one power source is connected.
- Disconnect starting battery (negative [–] cable first) before removing protective shields or touching electrical equipment. Use insulative mats placed on dry wood platforms. Do not wear jewelry, damp clothing or allow skin surface to be damp when handling electrical equipment.
- Use insulated tools. Do not tamper with interlocks.
- Follow all applicable state and local electrical codes. Have all electrical installations performed by a qualified licensed electrician. Tag open switches to avoid accidental closure.
- With transfer switches, keep cabinet closed and locked. Only authorized personnel should have cabinet or operational keys. Due to serious shock hazard from high voltages within cabinet, all service and adjustments must be performed by an electrician or authorized service representative.

If the cabinet must be opened for any reason:

1. Move genset operation switch or Stop/Aut~/ Handcrank switch (whichever applies) to Stc
2. Disconnect genset batteries (negative [–] lead first).
3. Remove AC power to automatic transfer switch. If instructions require otherwise, use extreme caution due to shock hazard.

MEDIUM VOLTAGE GENERATOR SETS (601V TO 15kV)

- Medium voltage acts differently than low voltage. Special equipment and training are required to work on or around medium voltage equipment. Operation and maintenance must be done only by persons trained and qualified to work on such devices. Improper use or procedures will result in severe personal injury or death.
- Do not work on energized equipment. Unauthorized personnel must not be permitted near energized equipment. Induced voltage remains even after equipment is disconnected from the power source. Plan maintenance with authorized personnel so equipment can be de-energized and safely grounded.

GENERAL SAFETY PRECAUTIONS

- Do not work on equipment when mentally or phys cally fatigued or after consuming alcohol or drugs
- Carefully follow all applicable local, state and federal codes.
- Never step on equipment (as when entering or leaving the engine compartment). It can stress and break unit components, possibly resulting in dangerous operating conditions from leaking fuel, leaking exhaust fumes, etc.
- Keep equipment and area clean. Oil, grease, dirt, or stowed gear can cause fire or damage equipment by restricting airflow.
- Equipment owners and operators are solely responsible for operating equipment safely. Contact your authorized Onan/Cummins dealer or distributor for more information.

KEEP THIS DOCUMENT NEAR EQUIPMENT FOR EASY REFERENCE.

Table of Contents

⚠WARNING

INCORRECT SERVICE OR REPLACEMENT OF PARTS CAN RESULT IN SEVERE PERSONAL INJURY AND/OR EQUIPMENT DAMAGE. SERVICE PERSONNEL MUST BE QUALIFIED TO PERFORM ELECTRICAL AND/OR MECHANICAL SERVICE.

Introduction

KNOW YOUR ENGINE

Study this manual carefully and comply with each of the warnings and cautions. Maintain the engine according to the maintenance schedule. Operating the engine properly and performing regular maintenance can result in longer engine life, better performance and safer operation. Regularly scheduled maintenance lowers operating costs.

Figure 1 shows the locations of the components referred to in this manual.

ENGINE MODEL REFERENCE

Identify your model by referring to the *MODEL* and *SPECIFICATION* number as shown on the engine nameplate (Figure 1).

Always use this number and the engine serial number when making reference to your engine.

If a major repair or an overhaul is necessary, Onan recommends the work be done by a competent mechanic to see that all dimensions, clearances, and torque values are within the specified tolerances.

An engine service manual is available at additional cost. Contact your nearest authorized dealer or Onan Parts and Service Center.

This manual contains the SI metric equivalents shown in parentheses immediately after the U.S. customary units of measure.

TABLE 1. SPECIFICATIONS

SPECIFICATION	Unit of Measure	Series E125V	Series E140V
Numbers of Cylinders		1	1
Bore	in (mm)	3.31 (84.2)	3.31 (84.2)
Stroke	in (mm)	2.76 (70.0)	2.76 (70.0)
Displacement	cu in (cm^3)	23.7 (389)	23.7 (389)
Compression Ratio		8.5 to 1	8.5 to 1
Power at Rated Speed (3600 rpm)	BHP (kW)	12.5 (9.3)	14.0 (10.4)
Oil Capacity With Filter	Qts (liter)	1.75 (1.7)	1.75 (1.7)
Valve Clearance (Cold) Intake	in (mm)	0.006 (0.15)	0.006 (0.15)
Exhaust	in (mm)	0.006 (0.15)	0.006 (0.15)
Spark Plug Gap	in (mm)	0.035 (0.89)	0.035 (0.89)
Ignition Timing	BTDC	23°	23°

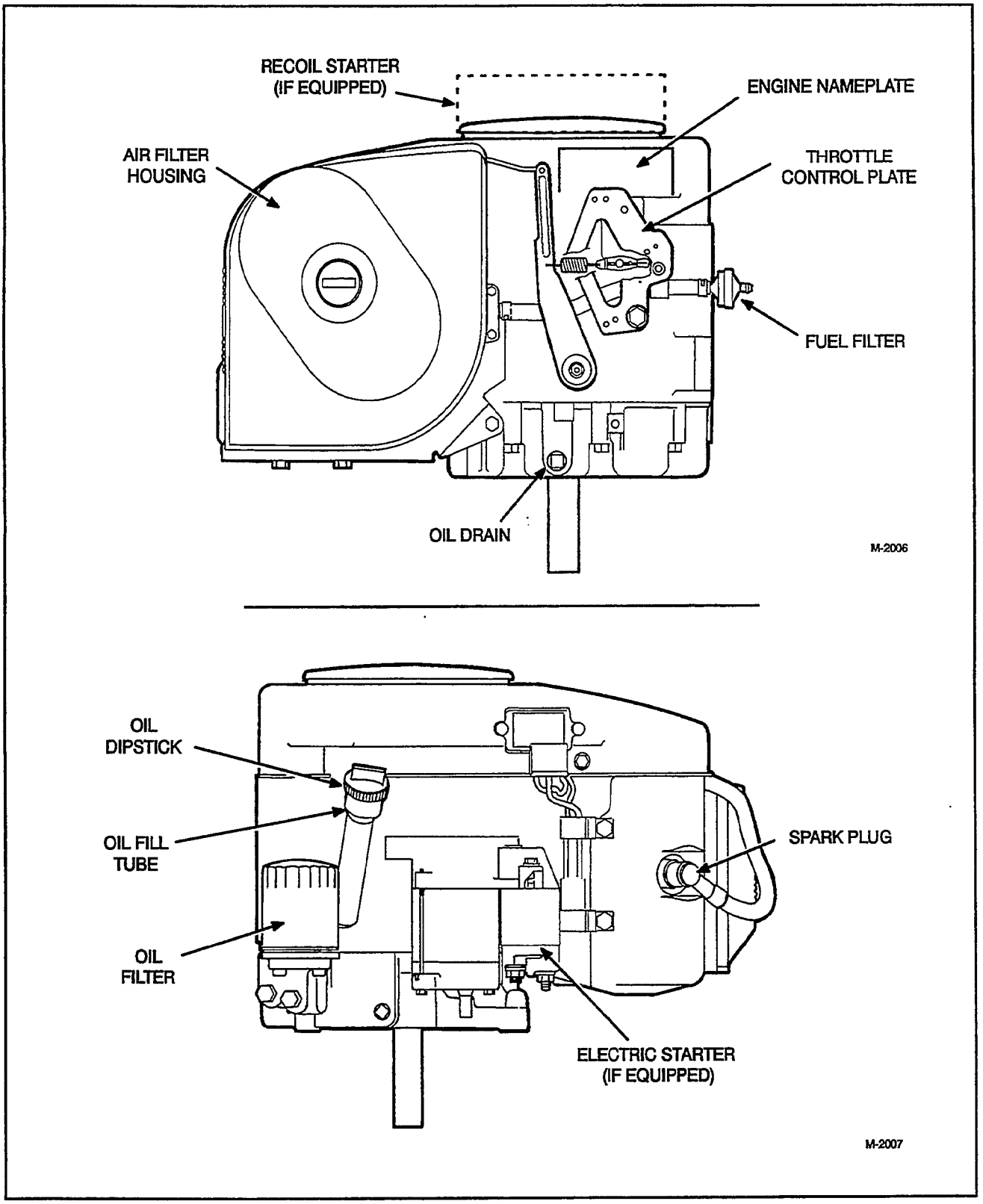


FIGURE 1. ENGINE COMPONENT LOCATIONS

Engine Set-Up

PRE-START CHECKS

Inspect the engine visually. Check for loose or missing parts and any damage that may have occurred in shipment.

⚠ CAUTION ***Starting the engine without oil will result in severe engine damage. Add oil prior to starting the engine.***

BATTERY (If Equipped)

The battery and battery cables used for starting the engine should be of sufficient size to provide prompt starting. Use of an undersized battery will result in poor starter operation and a very short starter service life.

⚠ WARNING ***Ignition of explosive battery gases can result in severe personal injury. Do not smoke or allow any ignition source near the battery.***

⚠ CAUTION ***Reversing positive and negative battery connections or allowing the engine to run without being connected to the alternator will result in engine electrical system damage. Do not switch battery connections or allow the engine to run without being connected to the alternator.***

CRANKCASE OIL RECOMMENDATIONS

Use premium quality motor oil with the API (American Petroleum Institute) designation SG on the container. Figure 2 shows the recommended oil weight for the temperature range that the engine will be operated in. Make sure the engine oil weight is correct for the expected temperature range.

Refer to Table 1 (*Specifications*) for the crankcase oil capacity.

Single-grade oil is preferable when temperatures are consistently over 30°F (0°C). Multigrade oils are best when wide temperature variations are anticipated.

⚠ WARNING ***Crankcase pressure can blow out hot oil that can cause severe personal injury. Do not check the oil level while the engine is running.***

⚠ CAUTION ***Excess oil can cause high oil consumption, high operating temperatures, and oil foaming. Do not overfill the crankcase.***

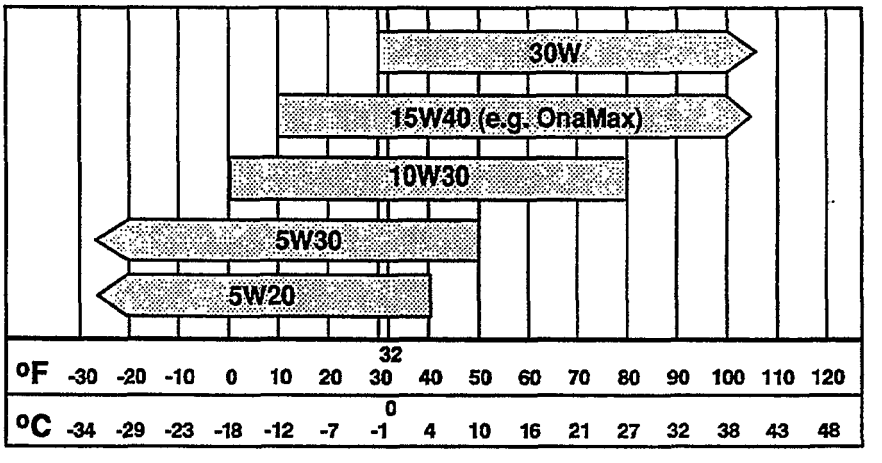


FIGURE 2. OIL VISCOSITY VS. TEMPERATURE

Oil Level

Check the oil level at the intervals recommended in the *Periodic Maintenance Schedule.* Check more frequently on a new or reconditioned engine as oil consumption is normally higher until the piston rings seat properly. Make sure equipment is on a level surface and screw the oil fill cap into the dipstick tube until it stops. Refer to the *Maintenance* section for recommended oil change intervals and procedures.

When adding oil between oil changes, it is preferable to use the same brand, because different oil brands may not be compatible. Figure 3 shows the oil level dipstick and the FULL mark.

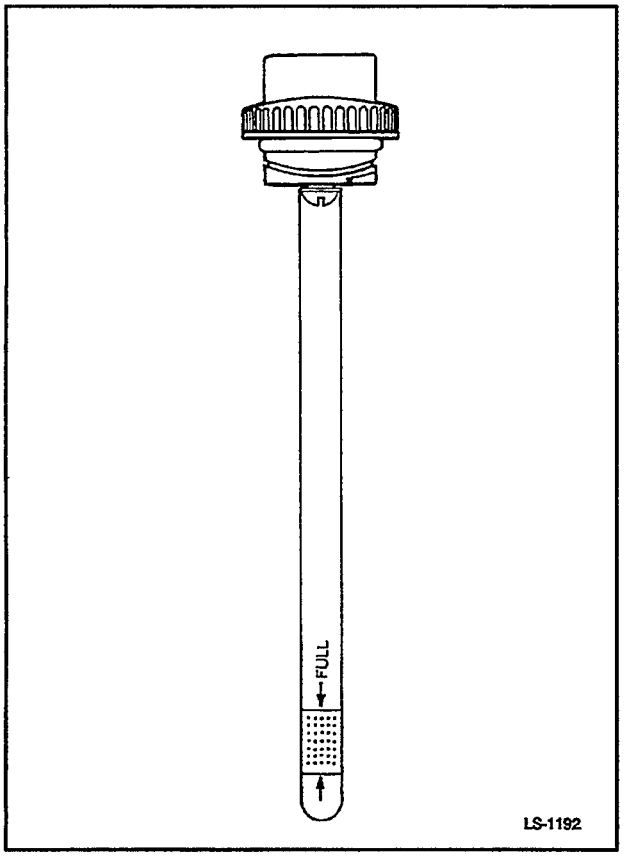


FIGURE 3. OIL LEVEL DIPSTICK

FUEL RECOMMENDATIONS

⚠WARNING ***Ignition of fuel can result in severe personal injury or death. Do not smoke or allow any spark, pilot light, or arcing equipment near the fuel system.***

Use clean, fresh, unleaded gasoline. Use of unleaded gasoline results in less maintenance.

⚠ CAUTION ***Gasoline de-icers and fuel containing alcohol can cause poor engine performance and engine damage. Do not use fuel system de-icers. Do not use gasoline containing alcohol concentrations greater than ten percent.***

⚠WARNING ***Ignition of fuel can result in severe personal injury or death. Thoroughly clean up any spilled fuel.***

EXHAUST SYSTEM

Exhaust products of any internal combustion engine are toxic and can cause injury or death if inhaled. All engine applications, especially those within a confined area, must be equipped with an exhaust system to discharge gases to the outside atmosphere and away from windows doors and vents.

⚠WARNING ***Exhaust gas is deadly. Breathing exhaust gases can result in severe personal injury or death. Use extreme care during installation to ensure a leak-free exhaust system.***

Operation

⚠WARNING

EXHAUST GAS IS DEADLY!

Exhaust gases from all fuels (including diesel, gasoline, liquid propane, natural gas) contain carbon monoxide, an odorless and colorless gas. Carbon monoxide is poisonous and can cause unconsciousness and death. Symptoms of carbon monoxide poisoning can include:

- ***Dizziness***
- ***Nausea***
- ***Headache***
- ***Weakness and Sleepiness***
- ***Throbbing in Temples***
- ***Muscular Twitching***
- ***Vomiting***
- ***Inability to Think Coherently***

IF YOU OR ANYONE ELSE EXPERIENCE ANY OF THESE SYMPTOMS, GET OUT INTO THE FRESH AIR IMMEDIATELY. If symptoms persist, seek medical attention. Shut down the unit and do not operate until it has been inspected and repaired.

Protection against carbon monoxide inhalation includes proper installation, ventilation and regular, frequent visual and audible inspections of the complete exhaust system.

STARTING

1. Move the speed control to the choke position.
2. Engage the electric starter for up to 30 seconds or pull the recoil starter until the engine starts.
3. When the engine starts, move the speed control from the choke position to the fast or high position as the engine warms up, usually within 10 seconds.
4. If the engine does not start, wait 30 seconds and repeat steps 2 and 3.

In very cold temperatures it may be necessary to partially open the choke when the engine begins to fire.

BREAK-IN PROCEDURE

Controlled break-in is the ideal fitting of all internal moving metal parts. Using the proper oil and applying a conscientious maintenance program during this period helps to obtain satisfactory service from the Onan engine.

Maintain the proper cooling and lubrication during break-in. Run the engine at half load for the first 1-1/2 hours with intermittent periods of full load to control engine break-in.

⚠CAUTION ***Using the wrong grade and weight of oil with high engine operating temperatures during break-in can cause engine damage. Use the correct oil grade and weight and provide adequate engine cooling during engine break-in.***

Check the oil level at least every five operating hours during break-in. Add oil to keep it at the proper level, but never overfill, because overfilling may cause the oil to foam and enter the breather system, resulting in high oil consumption and oil accumulation in the air cleaner housing.

OPERATION

Always be careful when operating power equipment. Follow the operating procedures and observe all warnings and cautions.

⚠WARNING ***Contact with rotating machinery and hot parts can result in severe personal injury or death. Stay clear of rotating components and hot parts. Make sure that protective shields and guards are secured in place before operating power equipment.***

Hot Weather Operation

When operating the engine in temperatures above 100°F (38°C), pay particular attention to the following items to prevent equipment damage:

1. Keep the engine cooling fins clean and free of obstruction.

   ⚠ CAUTION ***Plugged or clogged cooling fins or a dirty flywheel intake filter can cause overheating and engine damage. Make sure the cooling fins and intake filter are kept clean.***

2. See that nothing obstructs the air flow to and from the engine.
3. Make sure the crankcase is full of the proper oil weight for the ambient temperatures. Check the oil level each time you fill the fuel tank.
4. Change the crankcase oil and oil filter more frequently than scheduled.

Cold Weather Operation

When the engine is being used in temperatures below 32°F (0°C), check the following items to prevent equipment damage:

1. Make sure the crankcase is full of the proper oil weight for the ambient temperatures. Warm the engine up before changing the oil. If an unexpected temperature drop occurs when the engine is filled with summer weight oil, move the equipment to a warm location before starting the engine so the oil will flow freely.
2. Use fresh fuel. Fill the fuel tank after each day's use to protect against moisture condensation.
3. Keep the battery in a well-charged condition.
4. After each use, place the speed control in the low speed position. This will prevent engine overspeed if ice forms on the linkage during storage.

Operation in Dusty Conditions

1. Keep the cooling system and the equipment clean.
2. Service the air cleaner more frequently than listed in the *Maintenance schedule.*
3. Change the crankcase oil and oil filter more frequently than listed in the *Maintenance schedule.*

OUT-OF-SERVICE PROTECTION

Protect an engine that will be out-of-service for more than 30 days as follows:

1. Run the engine until it reaches normal operating temperature.
2. Turn off the fuel supply and run the engine until it stops.
3. Drain the oil from the oil base while the engine is still warm. Refill with fresh oil and attach a tag stating the oil viscosity used.
4. Remove the spark plug. Squirt 1 ounce (2 tablespoons or 28 grams) of rust inhibitor or SAE 50 oil into the cylinder. Crank the engine over a few times. Reinstall the spark plug.
5. Service the air cleaner as outlined in the *Maintenance* section.
6. Clean the governor linkage and protect it by wrapping it with a clean cloth.
7. Plug the exhaust outlet to prevent the entrance of moisture, dirt, bugs, etc.
8. Wipe the entire unit clean. Coat bare metal parts with a light film of grease or oil.
9. Provide a suitable cover for the entire unit.
10. If the equipment is equipped with a battery, disconnect it and follow the manufacturer's battery storage procedure.

RETURNING ENGINE TO SERVICE

1. Remove the cover and all protective wrapping. Remove the plug from exhaust outlet.
2. Check the tag on the oil base and verify that oil weight is still correct for the existing ambient temperatures.
3. Clean and check the battery (if equipped).
4. Check the fuel filter and lines to make sure they are secure and have no cracks or leaks.
5. Check that the carburetor throttle lever and governor linkage move freely.
6. Connect the battery cables, positive (+) cable first.
7. Start the engine. Exhaust smoke is normal when the engine is started, due to the rust inhibitor oil.

Maintenance Schedule

PERIODIC MAINTENANCE SCHEDULE

Following the maintenance schedule and using the engine properly will result in longer engine life, better performance and safer operation. Perform each maintenance procedure after the number of operating hours indicated. These service intervals are recommended for normal operating conditions. For operation in hot or dusty conditions, service the engine more frequently. Neglecting routine maintenance can result in premature engine failure.

For any abnormalities in operation, unusual noises from the engine or accessories, loss of power, overheating, etc., contact your nearest Onan Service Center.

Refer to the following *Maintenance Procedures* section for routine maintenance procedures.

TABLE 2. PERIODIC MAINTENANCE SCHEDULE

SERVICE THESE ITEMS	AFTER EACH CYCLE OF INDICATED HOURS				
	8	25	50	100	200
Inspect the Engine	X[1]				
Check Oil Level	X				
Service Air Cleaner Foam Wrapper			X[2]		
Change Crankcase Oil and Oil Filter		X[3]		X[2]	
Clean Cooling Fins			X[2]		
Replace Air Cleaner Paper Element					X[2]
Replace Fuel Filter					X
Check or Replace Spark Plug					X
Check Valve Clearance		X[3]			X[4]

1- Check for fuel leaks. With engine running, visually and audibly check exhaust system for leaks. Shut down the engine and repair any leaks immediately.
2- Perform more often when running under severe operating conditions.
3- Required for initial break-in only.
4- For detailed maintenance, contact an Onan Service Center or refer to the Service Manual.

TABLE 3. MAINTENANCE PARTS

ENGINE MAINTENANCE PARTS	
Item	**Part No.**
Oil Filter	122-0737
Fuel Filter	149-2356
Air Cleaner Paper Element	140-2672
Air Cleaner Foam Wrapper	140-2748
Spark Plug	167-0263-02

WARNING Breathing exhaust gases can result in severe personal injury or death. Do not use air cleaner, exhaust elbow, or connecting parts as a supporting step. Damage to these and connecting parts can cause an exhaust leak.

Maintenance Procedures

⚠WARNING ***Accidental starting of the engine can result in severe personal injury or death. Disconnect the negative (–) battery cable and the spark plug wire while servicing the engine, controls, or associated equipment.***

CHECK DAILY OR EVERY 8 HOURS

The operator should make a complete visual and audible inspection of the engine daily. Check the following before starting the engine for the first time each day:

1. Check all fuel lines and fittings for possible leakage. Repair all leaks immediately.
2. Inspect exhaust system for possible leakage and cracks. Locate leaks in muffler and piping while the engine is operating. Repair all leaks immediately.
3. Inspect the air cleaner system for leaks. Make certain all clamps and fittings are tight and free of potential leaks.
4. Check crankcase oil level with the engine off and the equipment on a level surface. If the engine has been run, allow a minimum of 10 minutes for the oil to drain down before checking.

   To check the oil level, screw the oil fill cap into the dipstick tube until it stops. If the oil level is below the FULL mark on dipstick, add sufficient oil of the proper viscosity as specified in *Engine Set-Up* section. Maintain the oil level at the FULL mark. Do not operate the engine with oil level above the FULL mark.
5. Check the engine cooling system to make sure the cooling fins and ducting are clean. Remove dust, dirt or oil from the cooling surfaces.

CRANKCASE OIL AND FILTER CHANGE

⚠WARNING ***Hot crankcase oil can cause burns if it contacts the skin. Wear protective clothing and keep hands clear when draining oil.***

Refer to the *Periodic Maintenance Schedule* for oil change intervals. Refer to Figure 1 for oil filter and oil drain locations.

1. Run the engine until it is warm. Stop the engine and place a pan under the oil drain outlet.
2. Remove the oil drain plug. After the oil is completely drained, securely install the drain plug.
3. Spin off the oil filter element. Drain the oil and discard the filter.
4. Thoroughly clean the filter mounting surface.
5. Make sure the new gasket is inserted in the element. Apply a thin film of oil to the gasket.
6. Spin the new element on by hand until the gasket just touches the mounting pad, then turn it down an additional 1/2 to 3/4 turn. Do not overtighten.
7. Refill with oil of the correct API classification and the appropriate SAE viscosity grade for the temperature conditions (refer to Figure 2). Refer to Table 1 (*Specifications*) for the oil capacity.
8. Start the engine and run it for a short time to check for oil leaks around the drain plug and oil filter. Retighten only as much as necessary to eliminate leaks. Do not overtighten.

Used oil is harmful to the environment. Pour used oil into a sealed container and deliver it to the nearest recycling center or automotive service station.

AIR CLEANER

Refer to the *Periodic Maintenance Schedule* for air cleaner element wrapper and air filter service and replacement intervals. Service or replace more often when operating the engine under severe operating conditions.

Air Cleaner Foam Element Wrapper

With the engine stopped, remove the outer air cleaner nut and plastic outer cover. When servicing the foam wrapper *only, do not remove the inner air* cleaner nut and cover.

Remove and wash the foam wrapper in water and detergent and squeeze it dry like a sponge. Rinse with clean water and allow it to dry. Coat the wrapper evenly with one tablespoon (14 grams) of SAE 30 engine oil. Knead the oil into the wrapper and wring out the excess oil.

Failure to adequately wring out excess oil from the wrapper may cause a drop in engine power due to a restriction of inlet air.

Install the foam wrapper over the paper air cleaner element by stretching it over the inner cover. Completely cover all exposed paper pleats on the air cleaner paper element. If the foam wrapper has stretched or become torn, replace the foam wrapper.

Air Cleaner Element

With the engine stopped, remove the outer air cleaner nut and plastic outer cover. Wipe away loose dirt and chaff from the air cleaner assembly and remove the inner air cleaner nut and inner air cleaner cover. Remove the air filter paper element and foam wrapper from the engine. Wipe off excess dirt from the air cleaner base.

Install the new paper element and secure with the inner cover and inner mounting nut. Tighten the inner nut one and a half turns after seating on the inner cover. Service the foam wrapper per the instructions given. Assemble the outer air cleaner cover and nut.

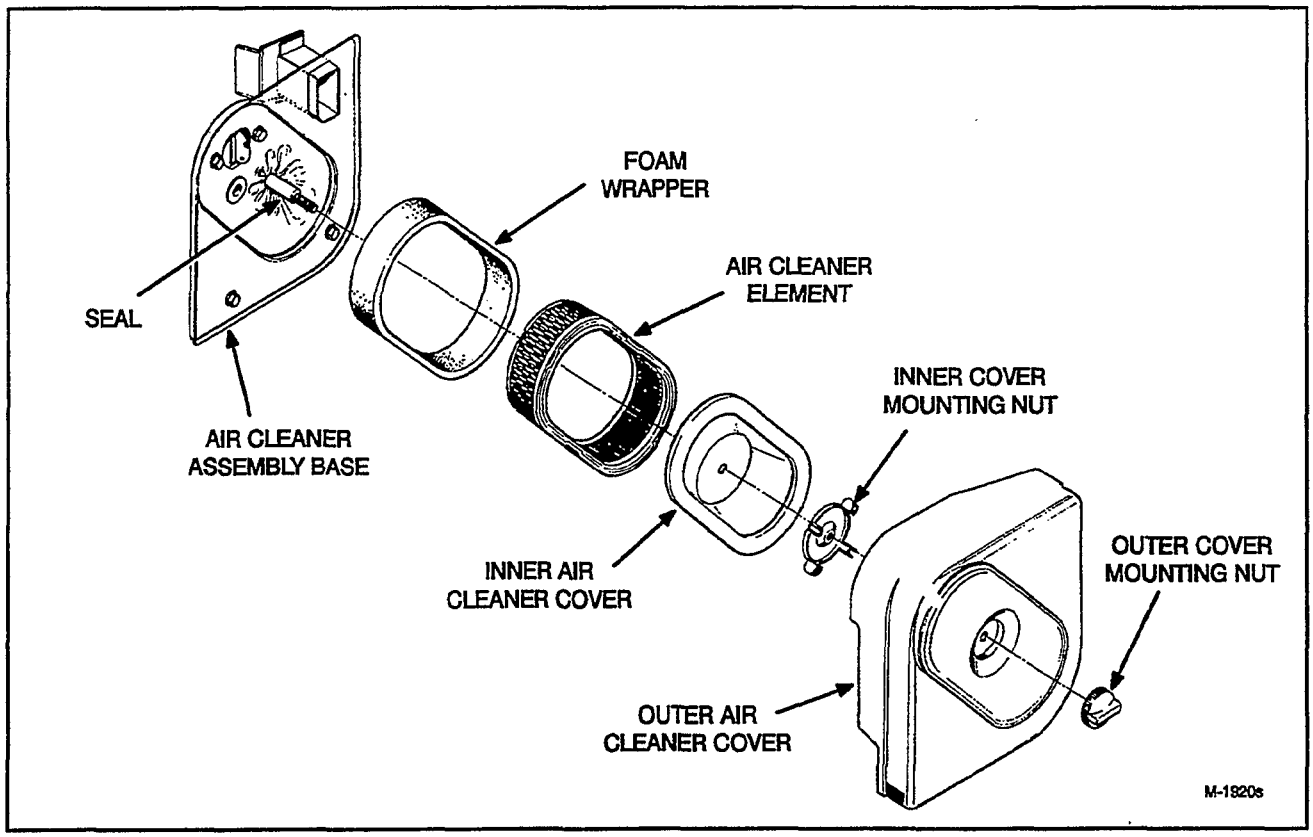


FIGURE 4. AIR CLEANER ASSEMBLY

IGNITION

Spark Plug

Refer to the *Periodic Maintenance Schedule* for the spark plug service interval. Replace the spark plug if it shows signs of fouling or electrode erosion. Refer to *Specifications* (Table 1) for the spark plug gap.

Solid State Ignition

Ignition timing is set at the factory, and it is not adjustable. The solid state ignition components do not require any routine maintenance.

COOLING SYSTEM

Refer to the *Periodic Maintenance Schedule* for the cooling system service interval. Clean the cooling fins sooner if required. Remove dust, dirt or oil from the cooling surfaces.

⚠CAUTION ***Plugged or clogged inlet screens and recoil starter can cause overheating and engine damage. Remove chaff and debris from air inlets.***

EXHAUST SYSTEM

⚠WARNING ***A hot exhaust system can cause severe burns. Allow the engine time to cool down before inspecting or servicing the exhaust system.***

Make regular visual and audible inspections of the exhaust system. Locate leaks in the muffler and piping while the engine is operating. Repair all leaks immediately after they are detected for personal safety. Keep the area around the muffler and exhaust manifold clear of chaff and debris.

⚠WARNING ***Breathing exhaust gas can result in severe personal injury or death. Inspect the exhaust system audibly and visually for leaks daily, and repair leaks immediately.***

⚠WARNING ***Accumulation of chaff and debris around the muffler can result in a potential fire hazard. Remove chaff and debris from around exhaust system.***

Adjustments

ENGINE SPEED ADJUSTMENT PROCEDURE

The carburetor mixture adjustments are preset at the factory for maximum efficiency. No mixture adjustments are required. The engine speed specified by your equipment manufacturer is preset and should only be adjusted by a competent mechanic. The service manual outlines the speed and choke adjustment procedure for this engine.

The speed control cable must be properly installed for proper engine performance. Poor starting, fouled spark plugs and poor equipment performance may be symptoms of an improperly adjusted speed control cable. Adjust the speed control cable as follows:

1. The engine must not be running during this speed control cable adjustment.
2. Loosen the speed control cable clamp located on your engine's throttle control plate. (See Figure 5.)
3. Place the speed control lever on the equipment to the high speed position. On equipment without a separate choke control, be sure the speed control lever is not in the start or choke position.
4. Move the throttle control lever so a pin can be inserted through the 3.5 mm hole in the throttle control plate and the throttle control lever.
5. Remove the slack from the speed control cable and tighten the speed control cable clamp. Remove the pin from the 3.5 mm hole.
6. Start the engine per the equipment manufacturers instructions and observe all safety precautions. If the engine performance problem is not corrected, take the equipment to a competent mechanic for proper adjustment of the governor, high idle speed, low idle speed, and choke.

See your equipment manufacturer's owners manual for high idle speed and low idle speed settings for optimum performance from your equipment.

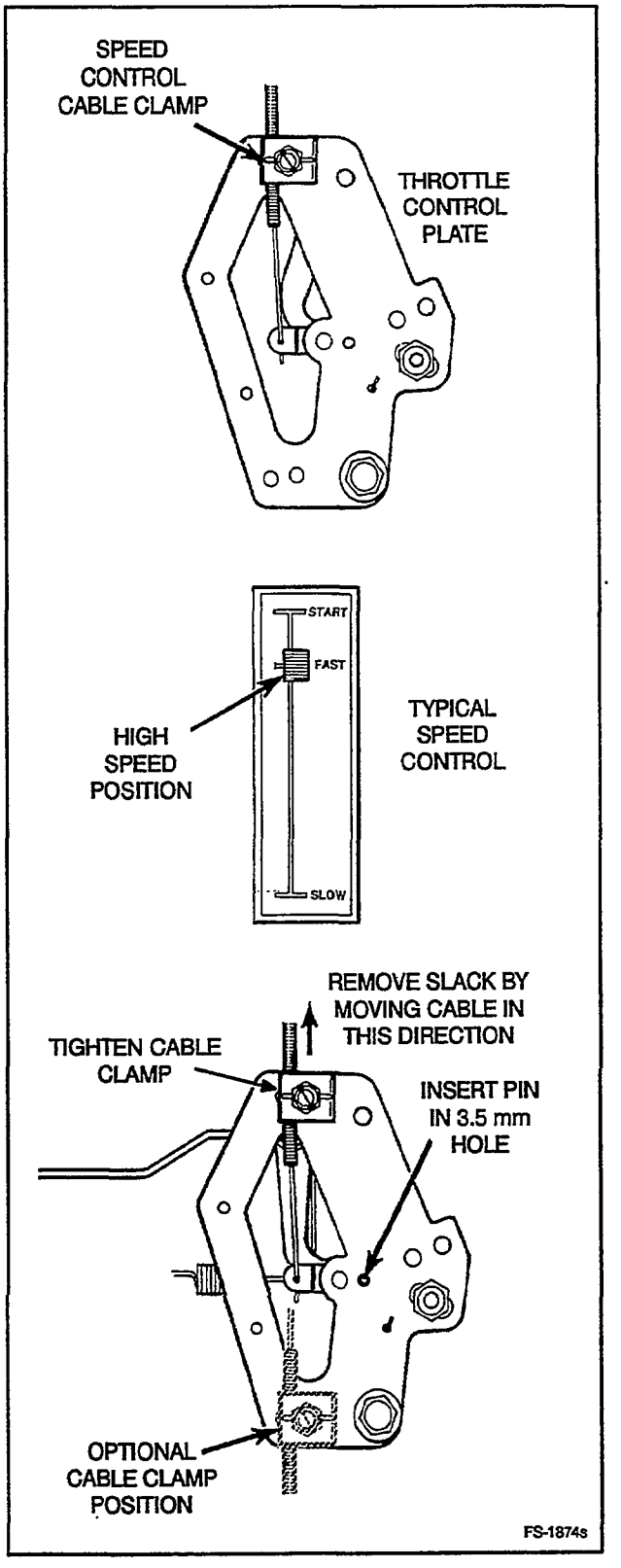


FIGURE 5. SPEED ADJUSTMENT

Troubleshooting

The following chart is a basic troubleshooting guide. If these recommendations fail to resolve the problem, contact an authorized Onan service center.

⚠WARNING ***Many troubleshooting procedures present hazards that can result in severe personal injury or death. Only qualified service personnel with knowledge of fuels, electricity, and machinery hazards should perform service procedures. Review the safety precautions on the inside cover page.***

⚠WARNING ***A hot engine can cause severe burns. Always allow the engine time to cool down before performing any maintenance or service procedures.***

TABLE 4. TROUBLESHOOTING GUIDE

Problem	Probable Cause	Solution
FAILS TO CRANK	1. Bad battery cable connection. 2. Low battery. 3. Defective start switch. 4. Defective starter or start solenoid.	1. Check battery cable connections. 2. Check electrolyte level. 3. Contact an Onan service center. 4. Contact an Onan service center.
CRANKS SLOWLY OR HARD TO PULL RECOIL STARTER	1. Bad battery cable connection. 2. Oil is too heavy.	1. Clean and tighten all battery cable connections. 2. Change to proper weight oil.
CRANKS BUT WON'T START	1. Fuel supply valve closed. 2. Carbon deposits on spark plug. 3. Low oil level. 4. Dirty air cleaner. 5. Dirty fuel filter. 6. Fuel or ignition system problem.	1. Fully open fuel supply valve. 2. Clean or replace spark plug. 3. Add oil if low. 4. Clean the air filter. 5. Replace fuel filter. 6. Contact an Onan service center.
UNIT RUNS THEN STOPS	1. Low on fuel. 2. Low oil level. 3. Excess oil.	1. Refill fuel tank. 2. Add oil if necessary. 3. Reduce engine oil level.
EXHAUSTING BLACK SMOKE	1. Dirty air cleaner. 2. Choke stuck or misadjusted. 3. Rich fuel mixture.	1. Clean the air filter. 2. Contact an Onan service center. 3. Contact an Onan service center.
UNIT RUNS, THEN SURGES	1. Loose or worn spark plug lead. 2. Faulty spark plug. 3. Ignition coil, wiring, or control components defective. 4. Governor out of adjustment. 5. Fuel mixture out of adjustment.	1. Check security of spark plug lead at spark plug and ignition coil. 2. Remove and clean or replace. 3. Contact an Onan service center. 4. Contact an Onan service center. 5. Contact an Onan service center.

Onan

Onan Corporation
1400 73rd Avenue N.E.
Minneapolis, MN 55432
1-800-888-ONAN
612-574-5000 International Use
Telex: 275477
Fax: 612-574-8087