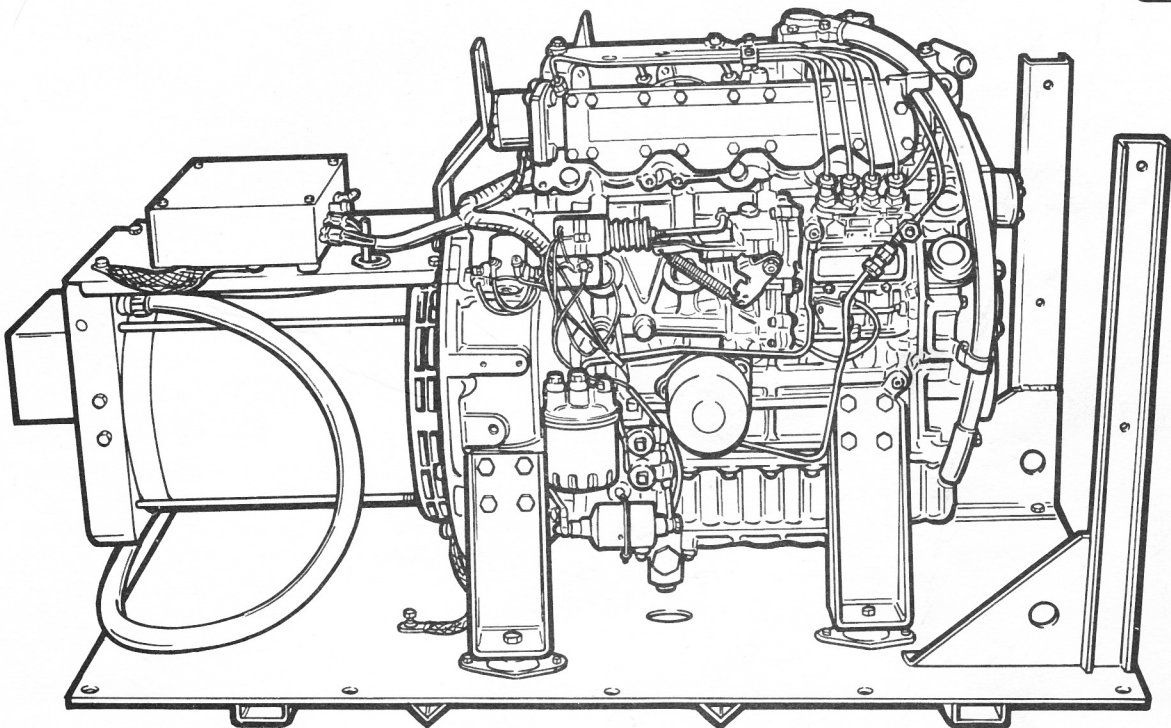


12.5 kW
“POWER BOOST”
RV GENERATOR SET
(YANMAR POWERED)
MODEL: 12.5CC067
TRAY MOUNTED MODELS



**Operation and
Installation
Manual**

KOHLER
GENERATORS

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SAFETY PRECAUTIONS

A Generator Set, like any other electro-mechanical device can pose potential dangers to life and limb if improperly maintained or imprudently operated. The best safeguards against accident are to be ever mindful of the potential dangers and to always use good common sense. In the interest of safety, some general precautions relating to operating of a Generator Set are presented below. Keep these in mind.

WARNING

LETHAL EXHAUST GAS! An engine discharges deadly carbon monoxide as part of the exhaust when operating. Carbon monoxide is particularly dangerous in that it is an odorless, tasteless, and non-irritating gas, but be ever mindful that it can cause death if inhaled for even a short period of time. Have only qualified specialists install and replace exhaust system components and have the system inspected frequently. Be careful when parking your coach to avoid obstructing the exhaust outlet. The exhaust gases must discharge freely, otherwise carbon monoxide may deflect under and into the vehicle or enter through open doors, windows, or vents. Also make sure that your exhaust cannot be discharged toward neighboring RV's, campers, or any occupied building. Be especially watchful for exhaust accumulation under calm, windless conditions.

WARNING

DANGEROUS FUELS! Use extreme caution when handling, storing, and using fuels — all fuels are highly explosive in a vapor state. Store fuel in a well-ventilated area away from spark producing equipment and out of the reach of children. Never add fuel to the tank while the engine is running to prevent spilled fuel from igniting on contact with hot parts or from ignition spark. Keep fuel lines and connections tight and in good condition — don't replace flexible fuel lines with rigid lines. Flexible sections are used to avoid breakage due to vibration. Should any fuel leakage, fuel accumulation, or electrical sparks be noted, DO NOT OPERATE GENERATOR SET. Have systems repaired by qualified specialists before resuming generator operation.

WARNING

MOVING PARTS! Do not open generator set compartment door when unit is running, except for servicing by qualified specialists. Keep hands, feet, and clothing away from belts, and related pulleys when unit is running. Replace guards, covers, and screens (if used) before operating generator set.

WARNING

ELECTRICAL SHOCK! Battery can cause electrical burns and shocks. Exercise reasonable care when working near the battery to avoid electrical connections through tools. Remove wristwatch, rings, and any other jewelry.

WARNING

HIGH VOLTAGE! Remember that the function of a generator set is to produce electricity and that wherever electricity is present, there is the potential danger of electrocution. Take the same precautions with electrical appliances in your coach that you would observe in your home. Keep away from electrical circuits and wiring while the set is running and have electrical service performed only by qualified electricians. Make sure unqualified persons, especially children, cannot gain access to your set — keep the compartment door locked or securely latched at all times. Be sure that generator is properly grounded. Never touch electrical leads or appliances with wet hands, when standing in water, or on wet ground as the chance of electrocution is especially prevalent under such conditions.

WARNING

UNIT STARTS WITHOUT NOTICE! To prevent accidental starting on units with a remote start/stop switch, always disconnect battery (remove negative lead first and reconnect it last) to disable generator set before working on any equipment connected to generator.

WARNING

DANGEROUS ACID! Avoid contact with battery electrolyte. It contains acid which can eat holes in clothing, burn skin, and cause permanent damage to eyes. Always wear splash-proof safety goggles when working around the battery. If battery electrolyte is splashed in the eyes or on skin, immediately flush the affected area for 15 minutes with large quantities of clean water. In the case of eye contact, seek immediate medical aid. Never add acid to a battery once the battery has been placed in service. Doing so may result in dangerous spattering of electrolyte.

WARNING

EXPLOSIVE BATTERY GASES! The gases generated by a battery being charged are highly explosive. Do not smoke or permit flame or spark to occur near a battery at any time, particularly when it is being charged. Avoid contacting terminals with tools, etc., to prevent burns and to prevent sparks that could cause an explosion. Remove wristwatch, rings, and any other jewelry before handling battery. Any compartment containing batteries should be well ventilated to prevent accumulation of explosive gases. To avoid sparks, do not disturb battery charger connections while battery is being charged and always turn charger off before disconnecting battery connections. Turn automotive test equipment off when connecting or removing battery clips. When removing or reconnecting battery cables, make sure ignition switch and all accessories are turned off.

 **WARNING**

LOOSE COMPONENTS! When adjusting valves, do not use a ratchet wrench on crankshaft nut. Doing so can loosen nut and result in serious personal injury from nut or pulley flying off engine while unit is running.

 **WARNING**

EXCESSIVE NOISE! Never operate without adequate muffler or faulty exhaust system — exposure to excessive noise is not only tiring but can lead to impairment of hearing.

 **WARNING**

FIRE HAZARD! Be careful when parking your RV to prevent grass fires started by hot exhaust gases and exhaust system. Keep away from hot engine and generator parts to avoid burning yourself.

 **WARNING**

HOT PIPING! An engine gets hot while running and exhaust system components get extremely hot. Do not work on generator set until unit is allowed to cool.

 **WARNING**

HOT COOLANT! Allow engine to cool and release pressure from cooling system before opening radiator pressure cap. To release pressure, cover the radiator cap with a thick cloth, then turn it slowly counterclockwise to the first stop. After pressure has been completely released and the engine has cooled, remove cap.

 **WARNING**

LETHAL EXHAUST GAS! Do not use flexible tail piping as this type could crack or break and allow lethal fumes to enter the vehicle.

 **WARNING**

ELECTROCUTION! Your RV generator set must not be used to “backfeed” by connecting it to building/campground electrical circuits. Doing so can cause serious injury or death to utility personnel working on utility transmission lines and may also seriously injure persons in your household. Unauthorized connection may be unlawful in some states and/or localities. A transfer switch must be installed in the RV to prevent interconnection of generator and outside source of power.

 **WARNING**

FIRE HAZARD! Spilled fuel may ignite on contact with hot engine parts. Wipe up all spilled fuel after bleeding system.

 **WARNING**

EXPLOSIVE BATTERY GASES! The gases generated by a battery being charged are highly explosive. Do not smoke or permit flame or spark to occur near a battery at any time, particularly when it is being charged. Any compartment containing batteries should be well ventilated to prevent accumulation of explosive gases. Do not mount battery in generator compartment.

 **WARNING**

LETHAL EXHAUST GAS! When installing exhaust system, position tail pipe end so that discharged exhaust gases may not be drawn into vehicle interior through windows, doors, air conditioners, etc.

 **WARNING**

MARINE APPLICATION! RV generator sets do not comply with United States Coast Guard (USCG) requirements and must not be used for marine applications. Use only generator sets specified for marine use in marine installations. USCG regulation 33CFR183 requires a generator set to be “ignition protected” when used in a gasoline-fueled environment.

 **WARNING**

FIRE HAZARD! Keep the compartment and generator set clean and free of debris and combustible materials to minimize chances of fire. An opening is provided in the mounting tray of each set as a safety feature to allow any fuel or oil that might possibly leak out of the system to drain out of the compartment — make sure this opening is not blocked in any way when the set is installed. If sub-flooring is used, cut a corresponding hole in the sub-flooring for this drain opening.

 **WARNING**

EXPLOSION! Use generator sets specified for RV use in RV installations only.

OPERATION

Introduction

Your recreational vehicle is equipped with a dependable Kohler Alternating Current RV Generator Set. Service requirements of the generator set are minimal but it is important that the required services be performed at the prescribed intervals. Please take a few moments to read through this manual, then carefully follow all service recommendations to keep your set in top condition.

Record the MODEL, SPECIFICATION, SERIAL, and ENGINE SPECIFICATION numbers as found on the nameplate attached to the frame of the generator or engine block in the space provided, see "Service Ordering Instructions." This information will enable your Kohler Generator Service Dealer to supply the correct part or data for your particular version. Keep this manual in your RV for future reference.

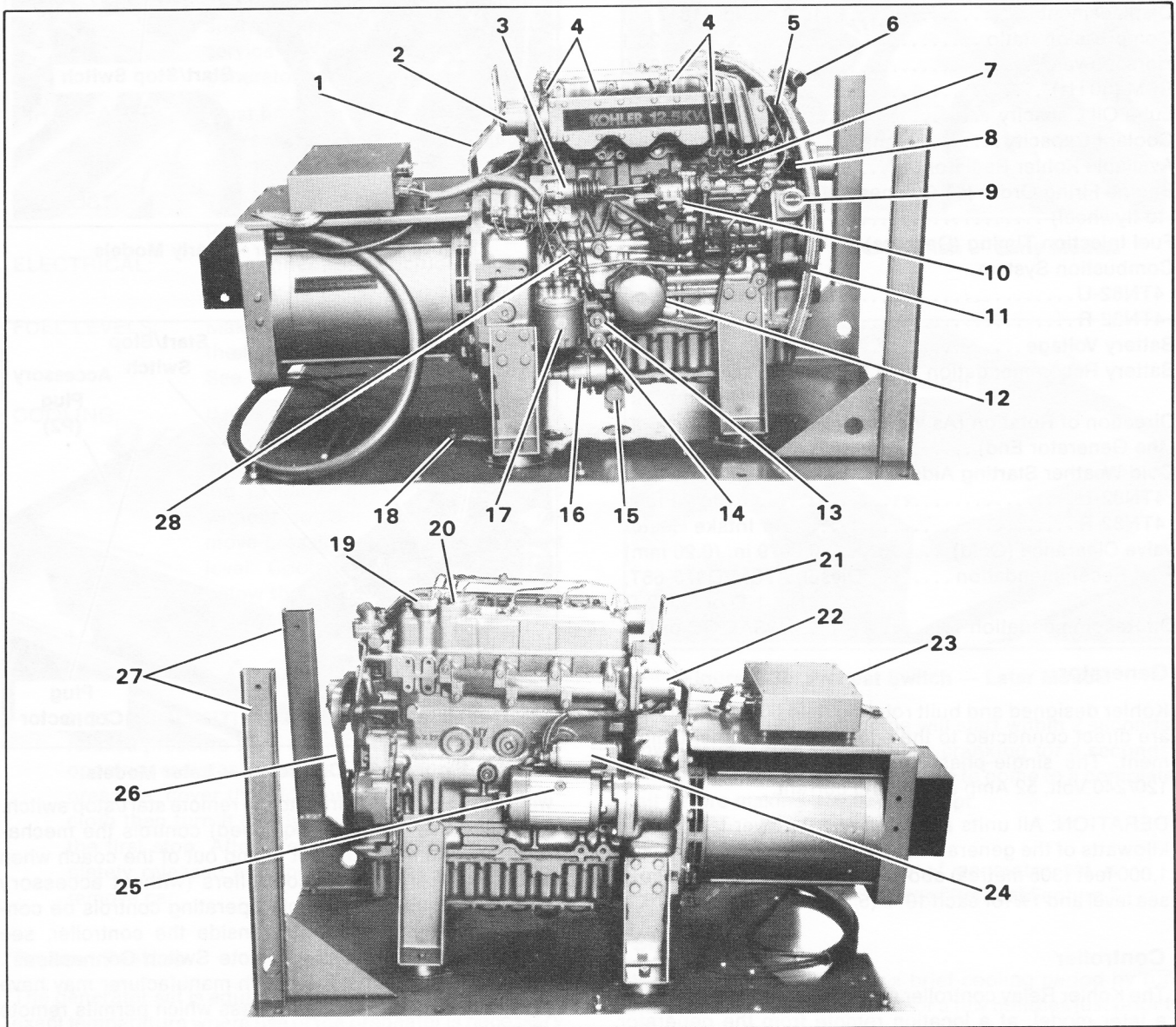


Figure 1-1. Service Views

- | | | |
|---|--------------------------------|--------------------------------------|
| 1. Nameplate | 11. Breather Hose | 21. Hoisting Eye |
| 2. Air Intake Connection | 12. Lube Oil Filter | 22. Exhaust Outlet |
| 3. Fuel Solenoid | 13. Fuel Return Line Connector | 23. Controller |
| 4. Injectors | 14. Fuel Inlet Connector | 24. Starter Solenoid |
| 5. High Water Temperature Shutdown Switch | 15. Oil Drain | 25. Starter |
| 6. Water Outlet | 16. Fuel Pump | 26. V-Belt |
| 7. Fuel Injection Pump | 17. Fuel Filter | 27. Radiator Brackets |
| 8. Water Inlet | 18. Ground Lug | 28. Low Oil Pressure Shutdown Switch |
| 9. Lube Oil Fill | 19. Lube Oil Fill | |
| 10. Governor | 20. Breather Cap | |

Specifications

Engine

Your Kohler generator set is powered by a Yanmar, four-cylinder model 4TN82-U or 4TN82-R water-cooled diesel engine. General specifications are as follows:

No. of Cylinders	4
Bore x Stroke (in.)	3.228 in. x 3.386 in.
Bore x Stroke (mm)	(82 mm x 86 mm)
Displacement	110.8 cu. In. (1817 cc)
Compression Ratio	23:1
Horsepower	22.0
RPM (60 Hz)	1800
Lube Oil Capacity	6.1 U.S. qts. (5.8L)
Coolant Capacity	(Consult Coach Manufacturer)
Available Kohler Radiator	4 gal. (15.1L)
Engine Firing Order (#1 Cyl. nearest to flywheel)	1-3-4-2-1
Fuel Injection Timing (Degrees)	12 ^o ±1 ^o BTDC
Combustion System	
4TN82-U	Indirect Injection
4TN82-R	Direct Injection
Battery Voltage	12 Volts
Battery Recommendation (min.)	500 Cold Cranking Amps., 100 Amp. Hr.
Direction of Rotation (As Viewed from the Generator End)	Counterclockwise
Cold Weather Starting Aids	
4TN82-U	Glow Plugs
4TN82-R	Air Intake Heater
Valve Clearance (Cold)	0.0079 in. (0.20 mm)
Fuel Recommendation	Diesel, ATSM/D975-66T, No. 1-D or No. 2-D
Oil Recommendation	SAE CC or CD

Generator

Kohler designed and built rotating field 60 Hz generators are direct connected to the engine for permanent alignment. The single-phase generator produces 12.5 kW, 120/240 Volt, 52 Amp alternating current.

DERATION: All units are rated at 1.0 power factor. The kilowatts of the generator set will decrease 3.5% for each 1,000 feet (305 metres) above 500 feet (152 metres) above sea level and 1% for each 10° F (5.5° C) above 85° F (30° C).

Controller

The Kohler Relay controller may be located at the set or, if a later model, at a location remote from the generator. (Remote harnesses for the controller are available in 7.5 and 15 foot lengths.) All connections are made through the plug connector(s) on the controller. The relay controller has a toggle type momentary-contact start/stop switch for test operating the set at the controller. See Figure 1-2a or 1-2b. Also included is a combination preheat/prime switch. When toggled to the "preheat" position, the preheat/prime switch aids in cold weather starting. When moved to the "prime" position, the switch activates the fuel pump to help bleed air from the fuel system (see "Fuel System—Bleeding"). The 10 Amp. fuse protects the controller against damage if a short develops in the engine

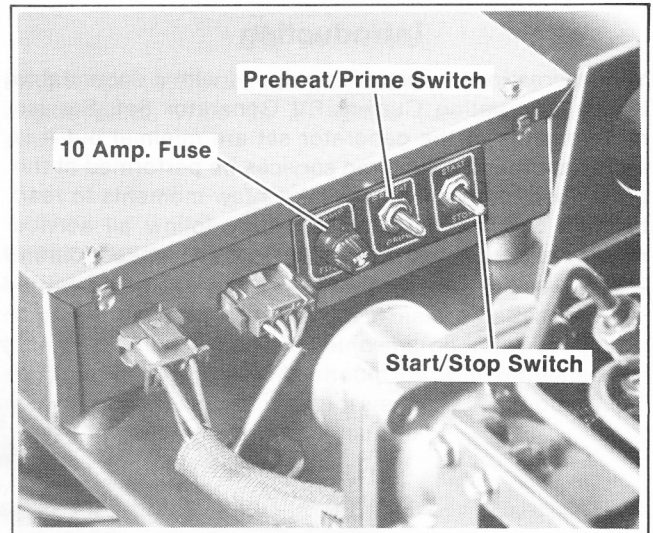


Figure 1-2a. Controller — Early Models

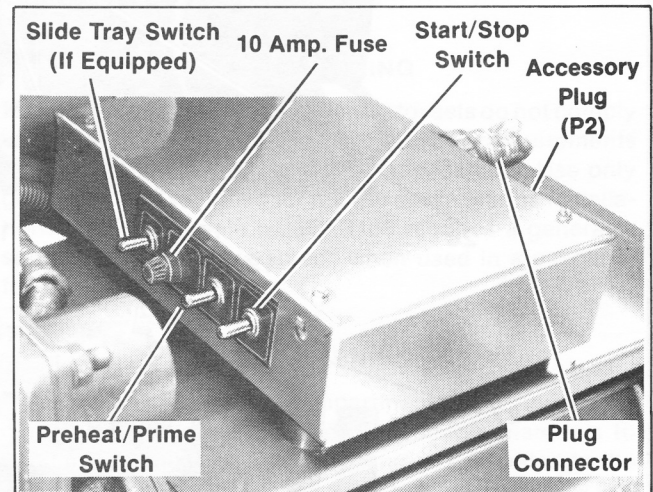


Figure 1-2b. Controller — Later Models

wiring system or the wiring to the remote start/stop switch. The slide tray switch (if equipped) controls the mechanism used to move the set in and out of the coach when servicing. Early model controllers (without accessory plug P2) require that remote operating controls be connected to the terminal strip inside the controller, see "Electrical Connections—Remote Switch Connections". In some installations, the coach manufacturer may have provided a special wiring harness which permits remote connections without accessing the controller terminal strip. Later model controllers include an accessory plug (P2) for connecting the remote switch, preheat switch, and generator "ON" lamp wiring harness (available separately). If the generator set has automatically stopped due to high water temperature (230°F/110°C) or low oil pressure (7.1 psi/49 kPa or less), the cause must be corrected before the set can be restarted. See "Fault Shutdown".

Operating Instructions

To insure continued satisfactory operation. The following items should be checked before each start-up.

Prestart Checklist

- OIL LEVEL:** Should be at or near full mark (not over). See "Engine Lubrication."
- AIR INLETS:** Must be clear and unobstructed.
- COMPARTMENT:** Interior must be clean. Check the condition of fuel system, exhaust piping, hoses, and muffler. If fuel leaks, fumes, exhaust gases, or electrical sparks are noted, contact a qualified service technician before operating generator set.
- AIR CLEANER:** Must be clean and properly installed to prevent unfiltered air from entering engine. See "Air Cleaner Service."
- EXHAUST:** Tail pipe must be clear, muffler and piping tight and in good condition.
- ELECTRICAL:** All connections including battery must be tight.
- FUEL LEVELS:** Make sure the fuel tank(s) are full and the fuel system primed for operation. See "Fuel System."
- COOLING:** If the cooling system is equipped with a coolant recovery tank, check coolant level at tank. Maintain level according to markings on tank. On units without coolant recovery tanks, remove pressure cap to check coolant level. Coolant level should be just below the overflow tube. See "Cooling System."

WARNING

HOT COOLANT! Allow engine to cool and release pressure from cooling system before opening radiator pressure cap. To release pressure, cover the radiator cap with a thick cloth then turn it slowly counterclockwise to the first stop. After pressure has been completely released and the engine has cooled, remove cap.

Preheat Feature

The generator set is equipped with a preheat feature. The exact temperature where use of the preheater is necessary varies from engine to engine and according to many other variables. Generally, if the temperature is below 40° F (4° C) and the engine turns over rapidly and exhausts white smoke during an unsuccessful starting attempt, the use of a preheater is necessary. Depress preheat switch for 15 to 20 seconds, release and initiate starting procedure. See Figure 1-3a or 1-3b.

Starting

Move the START/STOP switch into the START position and hold in this position until the engine is running, then

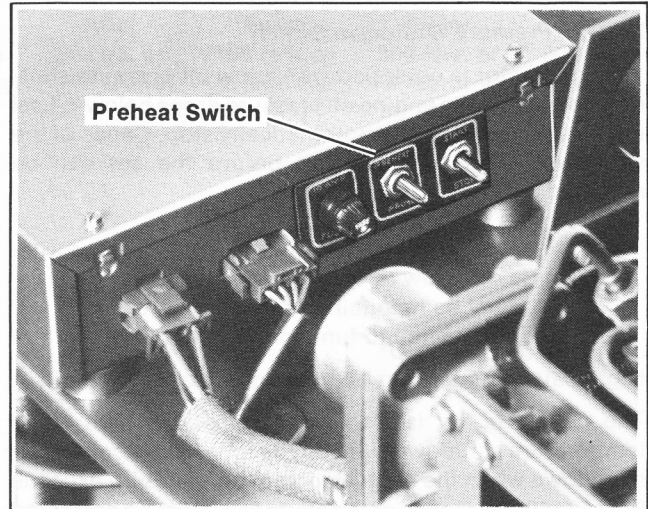


Figure 1-3a. Preheat Switch — Early Models

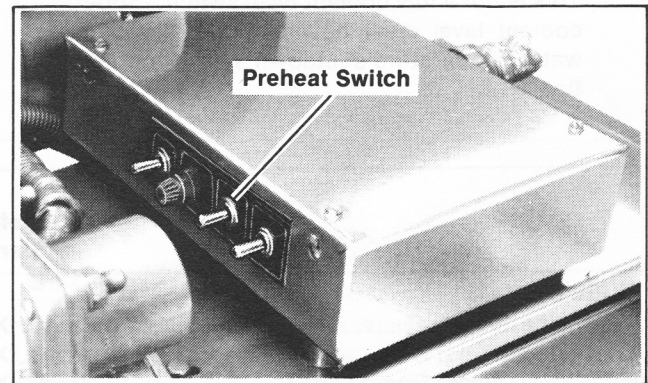


Figure 1-3b. Preheat Switch — Later Models

release. Normally, the engine will start within 2 seconds. However, if it fails to start after cranking for 5 seconds, release the switch. Wait for engine to come to a complete halt before making a restart attempt.

NOTE

If ambient temperature of generator set is below 40° F (3° C-4° C), see "Preheat Feature."

Stopping

Whenever possible, allow a brief cooling period by running the set at low or no load for a few minutes just prior to shutdown. To stop, move the switch into the STOP position and hold until the set comes to a complete halt.

If the generator set shuts down automatically, identify and correct the problem before attempting to restart.

CAUTION

If the engine starts and then stops, allow the engine to come to a complete halt before making a restart attempt. If flywheel ring gear is still rotating when the starter pinion gear is engaged, the pinion gear will clash which may damage the ring gear teeth.

Fault Shutdowns

Low Oil Pressure Shutdown Switch

Your generator is equipped with a low oil pressure shutdown switch. If the engine oil pressure drops below 7.1 psi (49 kPa), the engine will automatically stop. Cause of the shutdown must be corrected before the set can be restarted.

NOTE

This is not a low oil level shutdown. Proper oil level must be maintained for low oil pressure shutdown switch to function.

High Water Temperature Shutdown Switch

The generator set is also equipped with a high water temperature shutdown switch. The unit will automatically shut down when the engine coolant temperature exceeds 230° F (110° C). Cause of the shutdown must be corrected before the generator can be restarted.

NOTE

This is not a low coolant level switch. Proper coolant level must be maintained for high water temperature shutdown switch to function.

Service Schedule

Use the service schedule following and the optional remote panel hourmeter to schedule routine maintenance.

In addition to the routine services listed in this manual, there are other important steps that should be taken to keep a generator set in top condition. Usually tools and instruments required for these additional steps are not available to the generator set owner. For this reason, the set should be returned periodically to an authorized Service Dealer for complete servicing and tune-up. The benefits of such service will be improved performance and continuous satisfactory operation during a long trouble free service life. Use the "Operating Hour Service Log" in the back of this manual to document services performed.

WARNING

UNIT STARTS WITHOUT NOTICE! To prevent accidental starting on units with a remote start/stop switch, always disconnect battery (remove negative lead first and reconnect it last) to disable generator set before working on any equipment connected to generator.

	Before Starting	After 50 Hrs. or One Month	Every 150 Hrs. or 3 Months	Every 300 Hrs. or 6 Months	Every 600 Hrs. or Yearly
FUEL SYSTEM					
Check the fuel level	X				
Fill fuel tank	X				
Remove sediment from fuel tank	X				
Replace the fuel filter element		X		X	
			(Break-In Period)		
Check the injection timing					X
Check governor operation and adjust as necessary					X
Check the injection spray condition					X
LUBRICATION SYSTEM					
Check the oil level — crankcase	X				
Replace the oil — crankcase		X	X		
			(Break-In Period)		
Replace the lube oil filter element		X		X	
			(Break-In Period)		
COOLING SYSTEM					
Check coolant level	X				
Adjust the tension of water pump V-belt		X	X		
			(Break-In-Period)		
Check the thermostat function					X
Change coolant					X
Clean radiator fins			X		
AIR CLEANER, ETC.					
Replace the air cleaner element					X
Clean the breather pipe			X		

	Before Starting	After 50 Hrs. or One Month	Every 150 Hrs. or 3 Months	Every 300 Hrs. or 6 Months	Every 600 Hrs. or Yearly
ELECTRICAL SYSTEM					
Check the electrolyte level in the battery	X				
Check the electrical connections		X			
Check the battery specific gravity			X		
CYLINDER HEAD, ETC.					
Check for leakage of water and oil	X	X			
Retighten all major nuts and bolts		X			X
		(Break-In-Period)			
Check mounting bolts and vibro mounts for tightness				X	
Retighten the cylinder head bolts					X
Adjust intake/exhaust valve clearance				X	
REMOTE CONTROL SYSTEM, ETC.					
Check the remote control operation		X		X	
Check compartment condition (fuel or oil leaks, exhaust gases, etc.)		X			
		(Break-In-Period)			
GENERATOR					
Blow dust out of generator					X
Clean slip rings and inspect brushes					X

Engine Lubrication

Oil Selection

The selection of engine oil is very important to a diesel engine. If an unsuitable oil is used or an oil change is neglected, it may result in damage and a shorter engine life. Oil must meet the American Petroleum Institute (API) classification of CC or CD. Recommended SAE viscosity designation for given temperature ranges are listed in Table 1-1.

Air Temperature	Oil Viscosity
Below -4° F (-20° C)	5W20
-4° to 50° F (-20° to 10° C)	10W20
-4° to 68° F (-20° to 20° C)	10W30
5° to 68° F (-15° to 20° C)	15W30
5° to 86° F (-15° to 30° C)	15W40
14° to 68° F (-10° to 20° C)	20W30
14° to 86° F (-10° to 30° C)	20W40

Table 1-1. Engine Oil Selection

CAUTION

Failure to observe these standards may cause inadequate oil pressure and cold-starting difficulties.

Oil Check

Check the oil level in the crankcase daily or before each start-up to insure that the level is in the "safe range." To check oil level, remove dipstick and wipe the end clean, reinsert as far as possible, and remove. Level should be between MIN and MAX marks on the dipstick (see Figure 1-4).

CAUTION

Do not operate the set if the level is below the MIN mark or above the MAX mark.

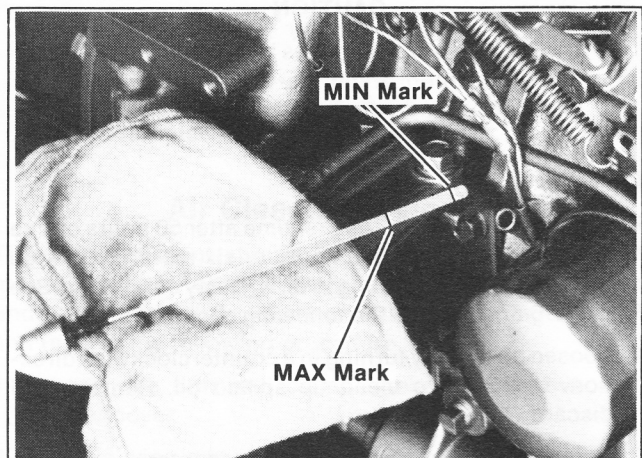


Figure 1-4. Oil Level Check

Oil Change

Change oil for the first time after 50 hours or one month and then every 150 hours or three months. Change oil more frequently under dirty, dusty conditions. Change oil while the engine is still warm.

1. Place a container below the oil drain hole and remove oil drain plug. Allow sufficient time for the old oil to drain completely. Replace oil drain plug.
2. Remove oil fill cap. One is located on the rocker arm cover and one is located near the fuel injection pump. See Figure 1-5.
3. Fill crankcase with proper amount and type of oil, see "Specifications-Engine" and "Oil Selection."
4. If engine oil filter is to be replaced, see "Oil Filter" following.
5. Start generator set and check for oil leaks.
6. Stop generator set. Remove dipstick and wipe clean, reinsert as far as possible, and remove to check oil level. Add oil, as necessary, to bring level up to MAX mark.

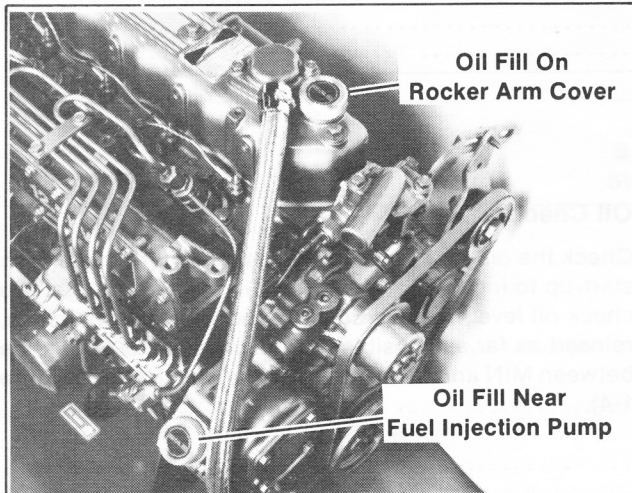


Figure 1-5. Oil Fill Locations

CAUTION

Too high an oil level causes high oil consumption and carbonizing of the engine. Too low a level will damage the engine.

Oil Filter

Replace the oil filter for the first time after 50 hours or one month and then every 300 hours or six months. Change more frequently if operating in dirty, dusty conditions. See Figure 1-6 and refer to the following procedure.

1. Loosen oil filter by turning in a counterclockwise direction. Use rags to clean up spilled oil. Remove and discard.
2. Clean contact surface on oil filter adapter.

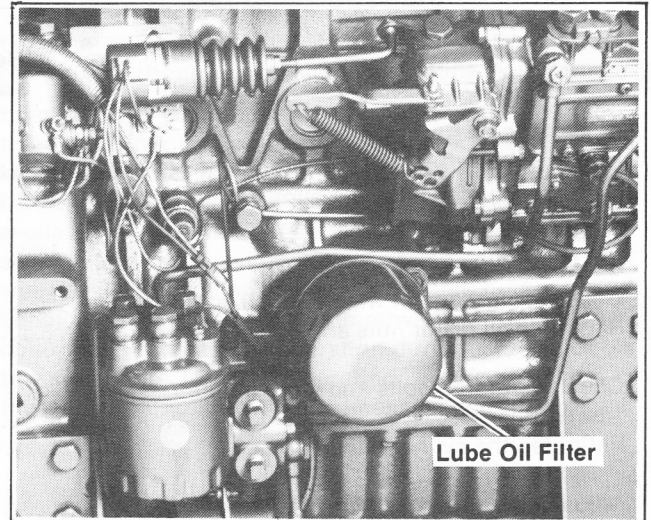


Figure 1-6. Oil Filter Location

3. Lightly lubricate the gasket surface of the new oil filter with the fresh engine oil. Thread oil filter to adapter until gasket makes contact, hand-tighten an additional one-half turn.
4. Start generator set and check for oil leaks.
5. Stop generator set. Remove dipstick and wipe clean, reinsert as far as possible, and remove to check oil level. Add oil, as necessary, to bring level up to MAX level.

Fuel System

Specifications

Use a clean, good quality No. 2-D (DIN 51 601) diesel fuel oil. The fuel must meet the requirements of the American Society of Testing and Materials (ASTM) diesel fuel classification D975 (Federal Specification W-F-800a). Cleanliness of the fuel is especially important on diesel engines which have easily clogged, precision fuel injectors and pumps. See chart below.

United States	ASTM/D975	No. 1-D or No. 2-D Diesel Oil
United Kingdom	BS2869	Class A1 or Class A2

Air Temperature	Diesel/Fuel (ASTM/D975)
Below 40°F (5°C)	1-D
Above 40°F (5°C)	2-D

Other Considerations:

Sulfur Content Less than 0.5%
 Sediment and Water Content Not to exceed 0.1%
 Cetane Number 40 minimum
 Pour Point At least 10°F (5.6°C) below the lowest outside air temperature