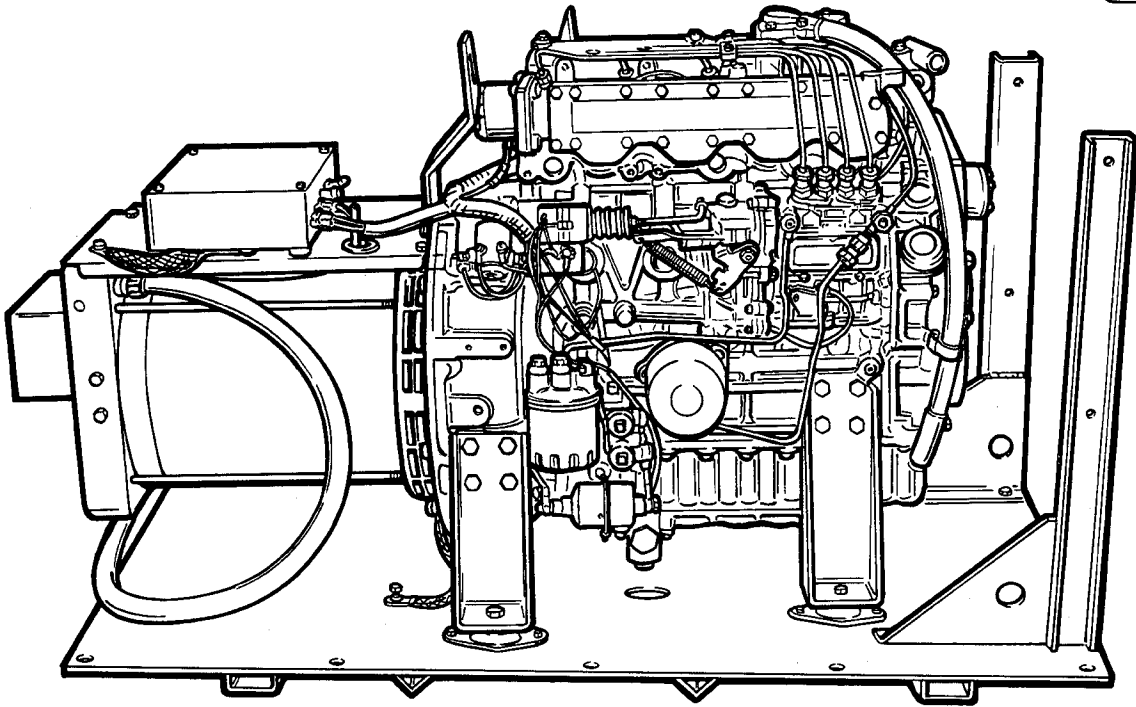


**12.5 kW
“POWER BOOST”
RV GENERATOR SET
(YANMAR POWERED)
MODEL: 12.5CC067
TRAY MOUNTED MODELS**



**Operation and
Installation
Manual**

KOHLER[®]
POWER SYSTEMS

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SAFETY PRECAUTIONS AND INSTRUCTIONS

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 follow. Keep these in mind. This manual contains several types of safety precautions which are explained below.

DANGER

Danger is used to indicate the presence of a hazard which *will* cause *severe* personal injury, death, or substantial property damage if the warning is ignored.

WARNING

Warning is used to indicate the presence of a hazard which *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 which *will* or *can* cause *minor* personal injury or property damage if the warning is ignored.

NOTE

Note is used to notify people of installation, operation, or maintenance information which is important but not hazard-related.

WARNING

All fuels are highly explosive in a vapor state. Use extreme care when handling, storing, and using fuels. 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 since spilled fuel may ignite on contact with hot parts or from ignition spark. Do not smoke or permit flame or spark to occur near potential sources of spilled fuel or fuel vapors. 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.

CAUTION

RV generator fuel system is susceptible to explosion when used in non-RV applications. Use generator sets specified for RV use in RV installations only.



WARNING

A flash fire can cause serious burns. Do not smoke or permit flame or spark to occur near fuel line, fuel filter, fuel pump, or other potential sources of spilled fuel or fuel vapors. When removing fuel line, use a proper container to catch all fuel.

Spilled fuel can ignite on contact with hot engine parts. Use a container to catch fuel when draining fuel system. Wipe up all spilled fuel after draining system.

WARNING

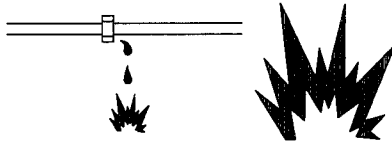
Hazardous voltage can cause death or severe injury. Perform electrical service only as prescribed in equipment manual. Be sure that generator is properly grounded. Never touch electrical leads or appliances with wet hands, when standing in water, or on wet ground as the chance of electrocution is especially prevalent under such conditions. Wiring should be inspected at the interval recommended in the service schedule—replace leads that are frayed or in poor condition. The function of a generator set is to produce electricity and wherever electricity is present, there is the hazard of electrocution.

Hazardous “backfeed” voltage can cause death or severe injury. The generator must not be used to “back-feed” by connecting it to building/campground electrical circuits. Install a transfer switch in RV generator installations to prevent connection of RV and other sources of power. Electrical backfeed into a utility electrical system can cause serious injury or death to utility personnel working on transmission lines.

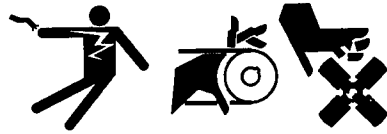
Hazardous voltage can cause death or severe injury. Follow instructions of test equipment manufacturer when performing high voltage test. Improper test procedure can damage equipment or lead to future generator failures.

CAUTION

Short circuits can cause bodily injury and/or equipment damage. Do not contact electrical connections with tools or jewelry while adjustments are made. Remove wristwatch, rings, and jewelry that can cause short circuits.

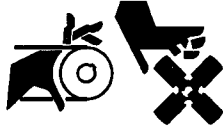


⚠ WARNING



Accidental starting can cause death or serious personal injury. Disconnect battery cables (remove negative lead first and reconnect it last) to disable generator set before working on any equipment connected to generator. The generator set can be started by remote start/stop switch unless this precaution is followed.

⚠ WARNING



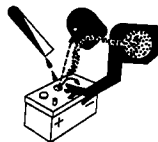
Exposed moving parts can cause severe injury. Keep hands, feet, hair, and clothing away from belts and pulleys when unit is running. Replace guards, covers, and screens before operating generator set. Do not open generator compartment door when unit is running.

⚠ WARNING



Battery gases can cause an explosion. 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. Never connect negative (-) battery cable to positive (+) connection terminal of starter solenoid. Do not test battery condition by shorting terminals together or sparks could ignite battery gases or fuel vapors. Any compartment containing batteries must be well ventilated to prevent accumulation of explosive gases. Do not mount battery in generator compartment. To avoid sparks, do not disturb battery charger connections while battery is being charged and always turn charger off before disconnecting battery connections. When disconnecting battery, remove negative lead first and reconnect it last.

⚠ WARNING



Sulfuric acid in batteries can cause permanent damage to eyes, burn skin, and eat holes in clothing. 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 hazardous spattering of electrolyte.

⚠ CAUTION



Hot exhaust system can ignite adjacent combustible materials. Do not locate electrical wiring, fuel lines, or combustible material above the exhaust muffler. Be careful when parking your RV to prevent grass fires started by exhaust system and hot exhaust gases.

⚠ CAUTION



Hot generator can ignite debris in compartment. Keep the compartment and generator set clean and free of debris and combustible materials to minimize chances of fire. Do not block fuel/oil drain opening in generator mounting tray. If sub-flooring is used, cut a corresponding hole in the sub-flooring for drain opening.

⚠ CAUTION



Hazardous noise can cause loss of hearing. Never operate generator without adequate hearing protection or muffler. Never operate generator with faulty exhaust system.

⚠ WARNING



Carbon monoxide can cause death, severe nausea or fainting. Never operate the generator set inside a building unless the exhaust gas is piped safely outside. Never operate in any area where exhaust gas could accumulate and seep back inside an occupied building or coach. Be careful when parking your coach to avoid obstructing the exhaust outlet. The exhaust gases must discharge freely, otherwise carbon monoxide may deflect into the vehicle. Avoid breathing exhaust fumes when working on or near the generator set. Carbon monoxide is particularly dangerous because it is an odorless, colorless, tasteless, nonirritating gas which can cause death if inhaled for even a short period of time. The exhaust system must be leakproof and routinely inspected.

⚠ WARNING



Carbon monoxide can cause death, severe nausea or fainting. Install exhaust system tail pipe so discharged exhaust gases will not be drawn into vehicle interior through windows, doors, air conditioners, etc. Do not use flexible tail piping since this type could crack and allow lethal exhaust fumes to enter the vehicle.

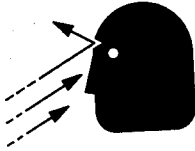
⚠ WARNING

Hot coolant can cause severe burns. Allow engine to cool and release pressure from cooling system before opening pressure cap. To release pressure, cover the pressure cap with a thick cloth then turn it slowly counter-clockwise to the first stop. After pressure has been completely released and the engine has cooled, remove cap. If generator set is equipped with a coolant recovery tank, check coolant level at tank.



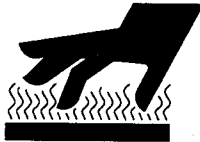
⚠ CAUTION

Flying projectiles can cause injury. Retorque all crankshaft and rotor hardware after servicing. When making adjustments or servicing generator set, do not loosen crankshaft hardware or rotor thru-bolt. If rotating crankshaft manually, direction should be clockwise only. Turning crankshaft or rotor thru-bolt counterclockwise can loosen hardware and result in serious personal injury from hardware or pulley flying off engine while unit is running.



⚠ CAUTION

Hot parts can cause personal injury. Do not touch hot engine parts. An engine gets hot while running and exhaust system components get extremely hot.



⚠ WARNING

A sudden backfire can cause serious burns. Do not operate with air cleaner removed.



⚠ CAUTION

Diesel fumes can rapidly destroy copper tubing in diesel exhaust systems. Do not use copper tubing in diesel exhaust systems. Exhaust sulphur will cause rapid deterioration and this could result in exhaust/water leakage.





NOTE



RV generator sets do not comply with United States Coast Guard (U.S.C.G.) requirements and must not be used for marine applications. Use only generator sets specified for marine use in marine installations. U.S.C.G. Regulation 33CFR183 requires a generator set to be "ignition protected" when used in a gasoline-fueled environment.


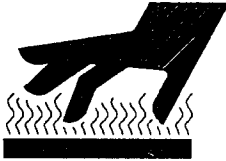
Warning Decals


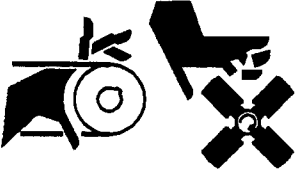
Warning decals are affixed to the generator set in prominent places to advise the operator or service technician of potentially hazardous situations. These decals are reproduced here to improve operator recognition and thereby increase decal effectiveness.


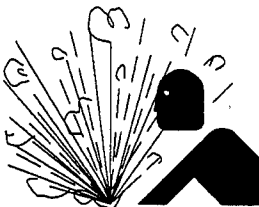
For a further explanation of decal warnings, reference preceding safety precautions. Before operating or servicing the generator set, be sure you understand the message of these decals. Replace decals if missing or damaged

| | |
|--|--|
|  WARNING | |
|  | <p>Hazardous voltage Backfeed to utility system can cause electrocution or property damage.</p> <p>Do not connect to any building electrical system without connecting through an approved device and after building main switch is open. See operator's manual.</p> <p style="text-align: right;">239771</p> |

| | |
|--|--|
|  WARNING | |
|  | <p>Fire or accident hazard. Can cause severe injury or death.</p> <p>Install unit only in accordance with manufacturer's detailed installation instructions.</p> <p style="text-align: right;">239773</p> |

| | |
|--|--|
|  CAUTION | |
|  | |
| <p>Hot engine and exhaust system. Can cause severe burns.</p> <p>Do not work on generator set until unit is allowed to cool.</p> <p style="text-align: right;">249809</p> | |

| | |
|---|--|
|  WARNING | |
|  | |
| <p>Rotating parts. Can cause severe injury.</p> <p>Do not operate generator set without all guards, screens or covers in place.</p> <p style="text-align: right;">249808</p> | |

| | |
|--|--|
|  WARNING | |
|  | <p>Hot coolant and steam. Can cause severe burns and personal injury.</p> <p>Before removing cap stop generator, allow to cool and loosen cap to relieve pressure. Fill system before starting unit.</p> <p style="text-align: right;">249810</p> |

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.

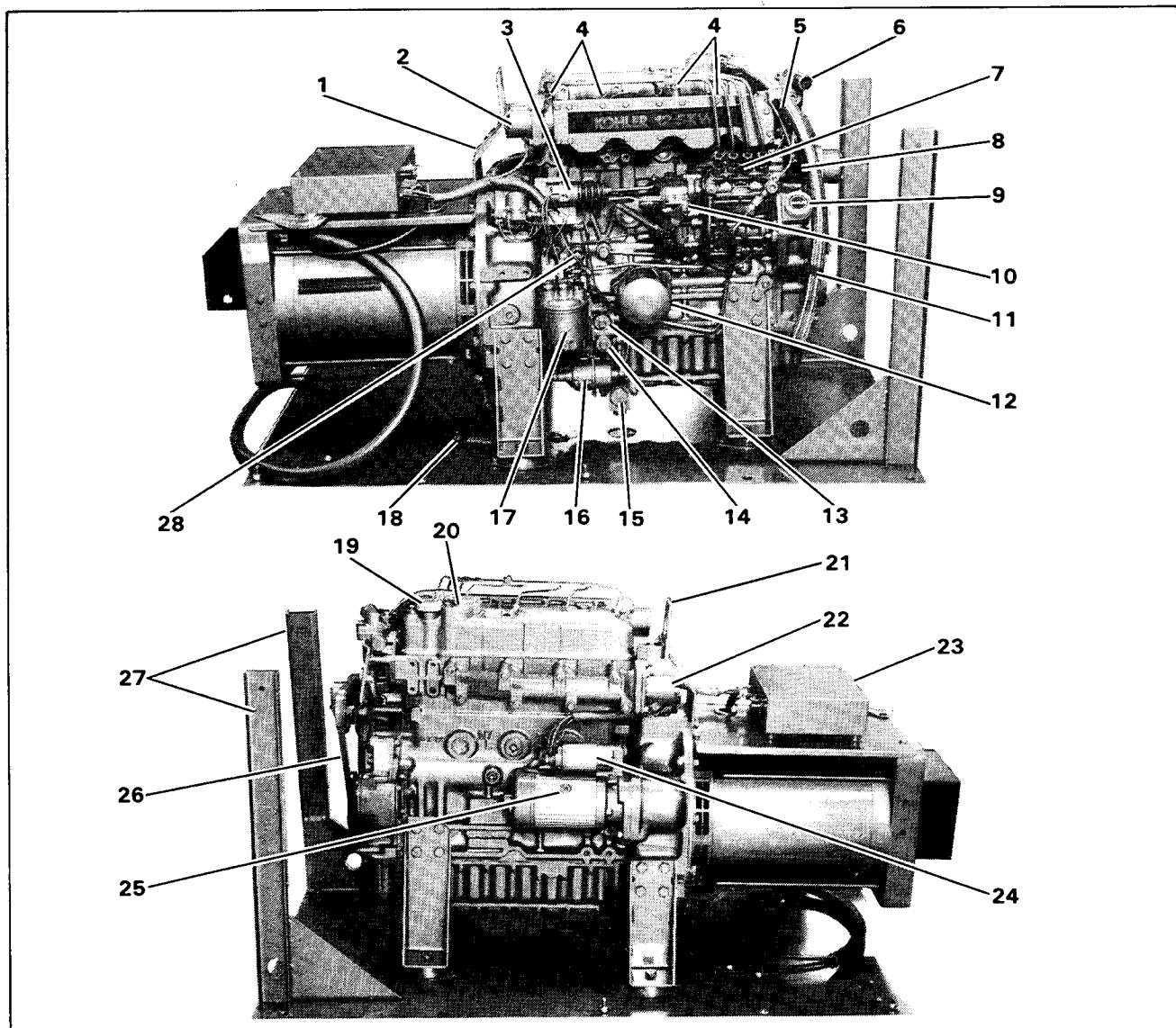


Figure 1-1. Service Views

- | | | |
|---|--------------------------------|--------------------------------------|
| 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

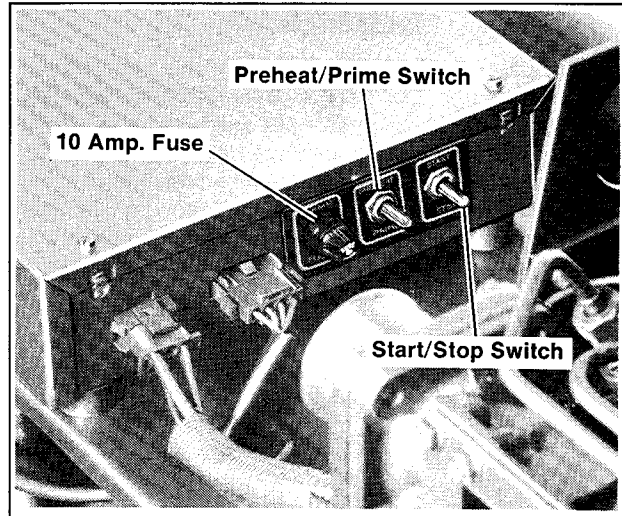


Figure 1-2a. Controller — Early Models

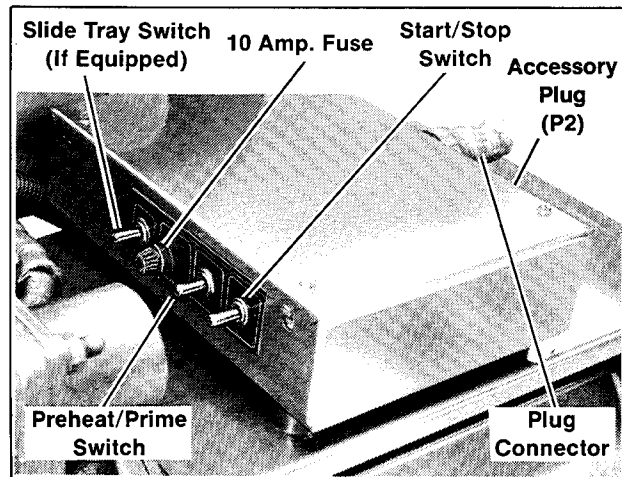


Figure 1-2b. Controller — Later Models

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 can cause severe burns. Allow engine to cool and release pressure from cooling system before opening pressure cap. To release, cover the pressure 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. If generator set is equipped with a coolant recovery tank, check coolant level at tank.

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

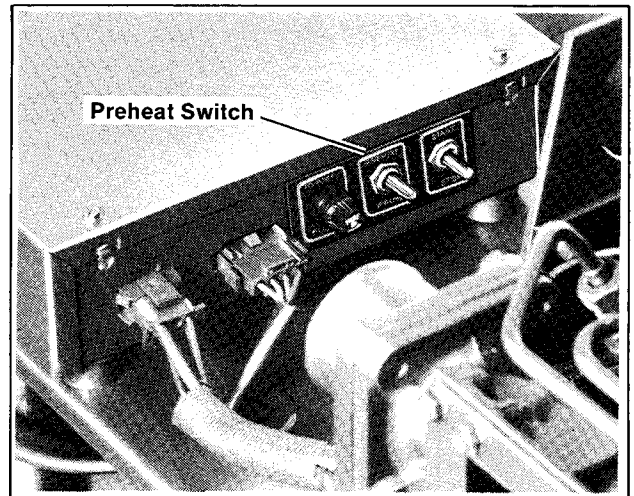


Figure 1-3a. Preheat Switch — Early Models

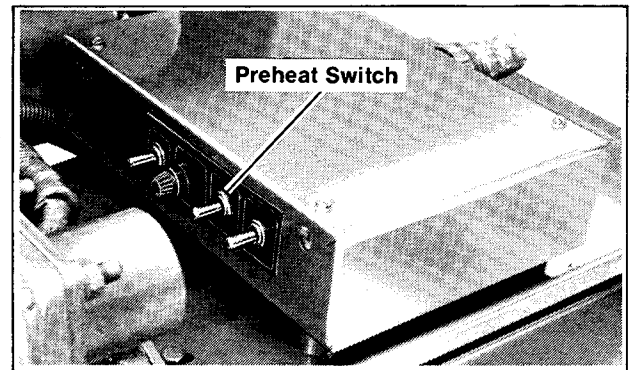


Figure 1-3b. Preheat Switch — Later Models

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.

NOTE

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. See Figure 1-4a. 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.

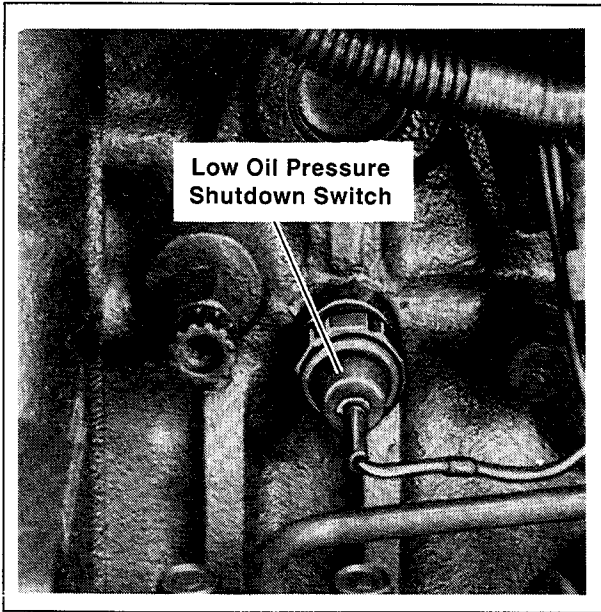


Figure 1-4a. Pressure Shutdown Switch

High Water Temperature Shutdown Switch

The generator set is also equipped with a high water temperature shutdown switch. See Figure 1-4b. 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.

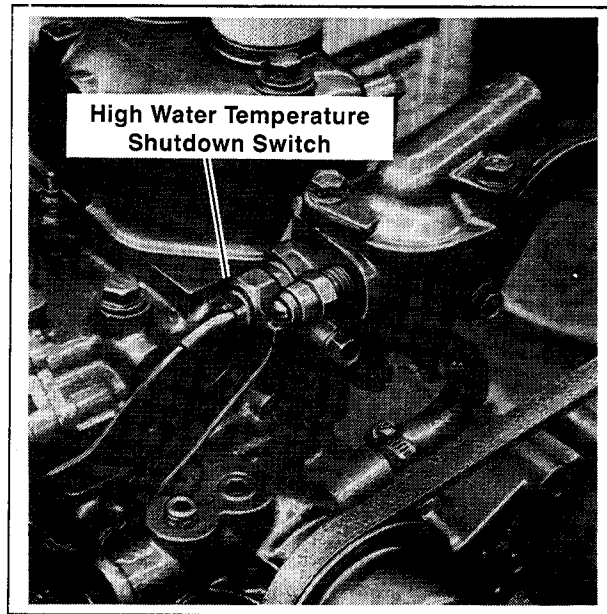
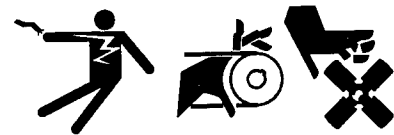


Figure 1-4b. High Water Temperature Shutdown Switch

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

Accidental starting can cause death or serious personal injury. Disconnect battery cables (remove negative lead first and reconnect it last) to disable generator set before working on any equipment connected to generator. The generator set can be started by remote start/stop switch unless this precaution is followed.

| | 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 | | |
| 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.

NOTE

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

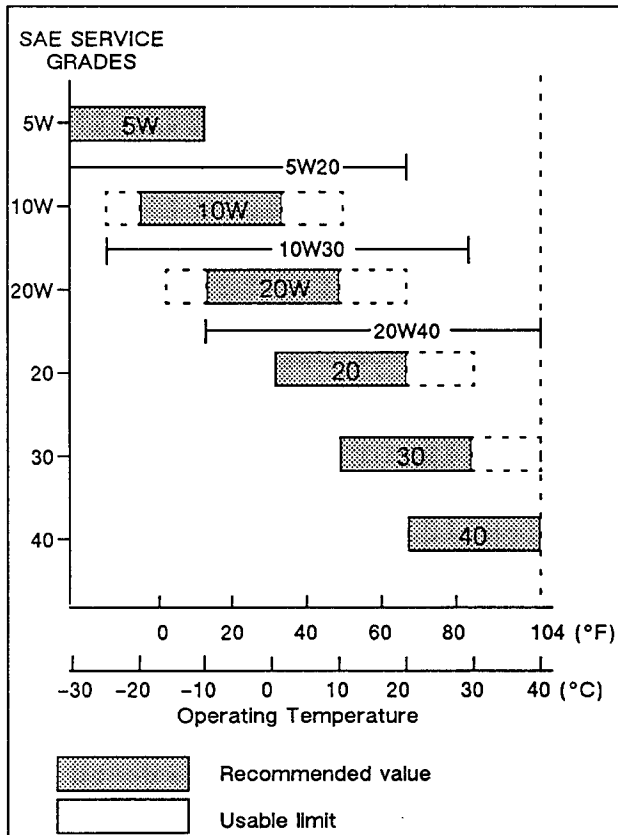


Table 1-1. Oil Selection Chart

NOTE

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 1-5a).

NOTE

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

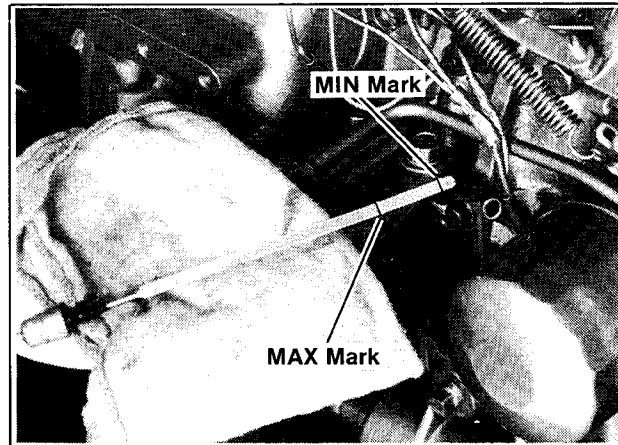


Figure 1-5a. Oil Level Check

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 1-5b.
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.

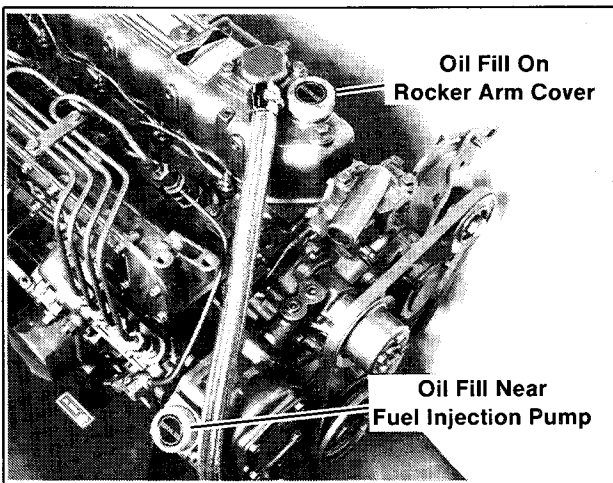


Figure 1-5b. Oil Fill Locations

NOTE

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.

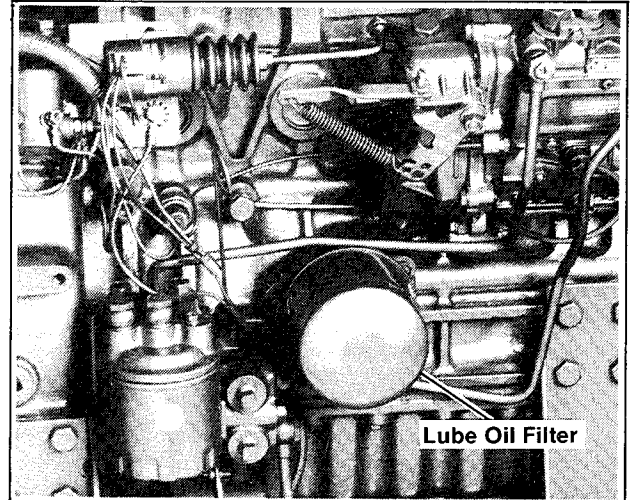


Figure 1-6. Oil Filter Location

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

NOTE

Never store diesel fuel in galvanized containers; diesel fuel and the galvanized coating react chemically to produce flaking which quickly clogs filters or causes failure of the fuel pump or injectors. Do not run the generator set out of fuel, air will be drawn into the fuel lines and the entire system will have to be bled before the unit can be restarted.

NOTE

Avoid storing fuel over long periods of time. Take special precautions to keep all dirt, water, and other contaminants out of the fuel. Storage tanks containing diesel fuel contaminated with water may cause the growth of "microbes." The presence of microbes will form a slime which will clog fuel filters and lines.

Fuel Filter

The fuel filter is paper and no attempt should be made to clean it. Its useful life will be determined largely by the quality and condition of the fuel used. Under normal conditions, the fuel filter element should be replaced for the first time after 50 hours or one month and then every 300 hours or six months. See Figure 1-7 for location and use the following procedure to service fuel filter.

1. Loosen fuel filter by turning in a counterclockwise direction. Use rags to clean up spilled fuel oil. Remove and discard.
2. Clean contact surface on fuel filter adapter.
3. Lightly lubricate the gasket surface of the new fuel filter with fresh fuel oil. Thread fuel filter to adapter until gasket makes contact, hand-tighten an additional one-half turn.
4. See "Bleeding" section following.

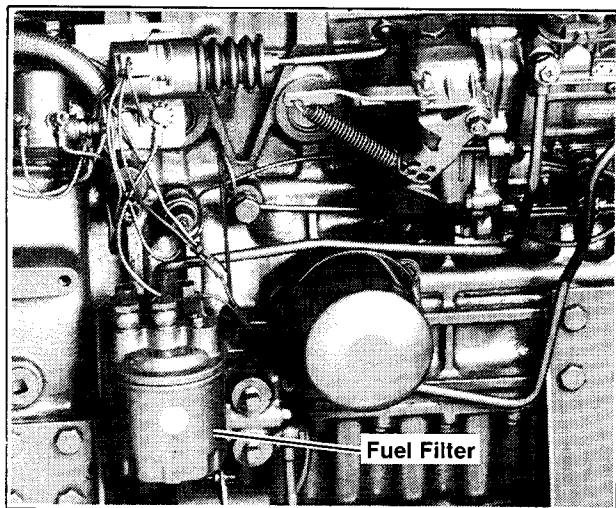


Figure 1-7. Fuel Filter Location

Bleeding

If the generator set engine runs out of fuel, if air leaks develop in the suction side of the fuel system, or if the fuel

filter is replaced, it will be necessary to bleed the entire system to prevent starting failures and/or erratic operation. See Figure 1-8 and refer to the following procedure.

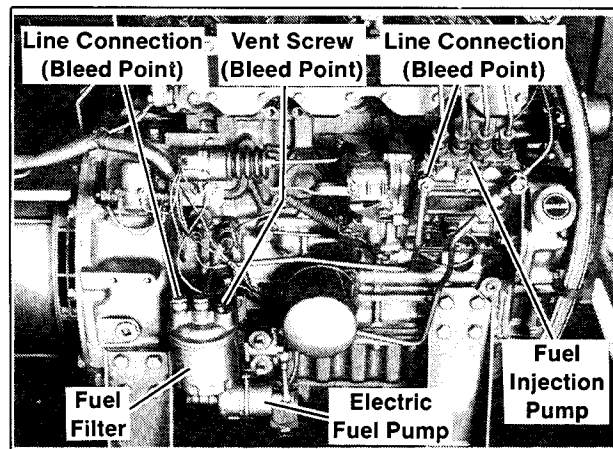


Figure 1-8. Bleeding Fuel System

1. Loosen line connection at fuel filter inlet.
2. Using priming switch (see Figure 1-2) on controller, operate fuel pump until fuel, free from air bubbles, flows from this point. Tighten line connection.
3. Loosen small vent screw (with Phillips head) on fuel filter.
4. Using priming switch on controller, operate fuel pump until fuel, free from air bubbles, flows from this point. Tighten vent screw.
5. Loosen line connection at fuel injection pump inlet.
6. Using priming switch on controller, operate fuel pump until fuel, free from air bubbles, flows from this point. Tighten line connection.

⚠ WARNING



A flash fire can cause serious burns. Do not smoke or permit flame or spark to occur near fuel line, fuel filter, fuel pump, or other potential sources of spilled fuel or fuel vapors. When removing fuel line, use a proper container to catch all fuel.

Spilled fuel can ignite on contact with hot engine parts. Use a container to catch fuel when draining fuel system. Wipe up all spilled fuel after draining system.

Air Cleaner Service

The paper element should be replaced at 300-hour/6-month intervals, change more frequently if operating under extremely dirty, dusty conditions. See Figure 1-9 and refer to the following procedure.

1. Loosen eye bolt and clamp enough to remove air cleaner cover.
2. Remove wing nut and slide air cleaner element from threaded rod.

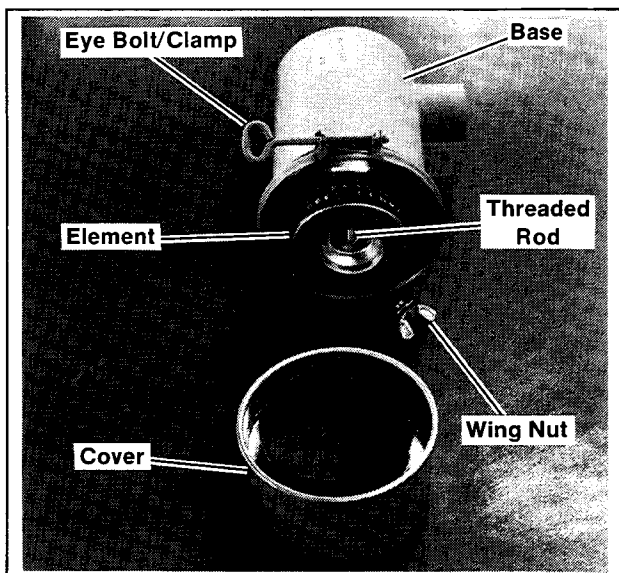


Figure 1-9. Air Cleaner Components

3. Clean dry element by tapping edges on a hard surface. Replace if damaged or very dirty.

NOTE

Do not attempt to clean dry type element in any liquid or with compressed air as this will damage paper filter material.

4. Wipe dirt or dust accumulation from cover and base. Check that all clamps are tight on inlet/outlet connections.
5. Install air cleaner element on threaded rod. Tighten wing nut making sure parts fit properly.
6. Position cover with arrow "up," place clamp over base and cover, and tighten eye bolt.

Governor

The centrifugal, mechanical-type governor serves to keep engine speed constant by automatically adjusting the amount of fuel supplied to the engine according to changes in the load. No regular service is required on the unit. The governor is adjusted during run-in at the factory, and further adjustment should not be needed unless greatly varying load conditions are encountered or if poor governor control develops after extended usage.

This set is designed to operate at 60-63 Hz, 1800 rpm under full load and 1890 rpm under no load. To check speed, use hand tachometer or frequency meter. Loosen locking nut on speed adjusting screw, turn screw in counterclockwise direction to increase speed (and frequency) or in clockwise direction to decrease speed. Tighten lock nut at new setting. See Figure 1-10.

NOTE

The governor spring is not used on later models.

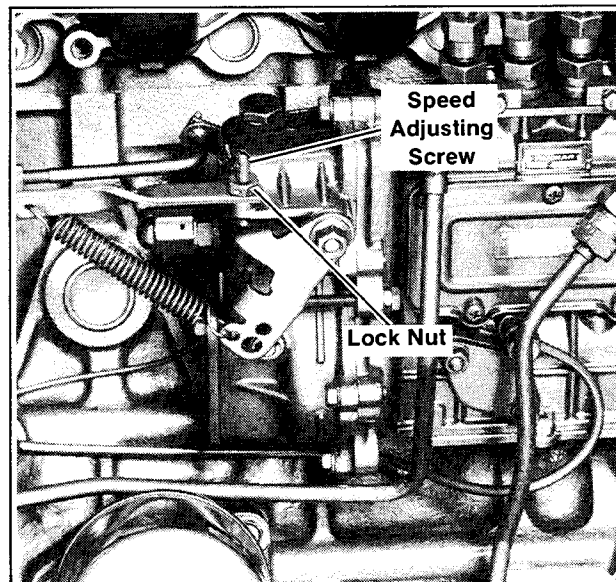


Figure 1-10. Governor

Valve Adjustment

With poppet-type valve mechanism, each valve is spring-held in the closed position until forced open by the action of the rocker arm in contact with the push rod which is moved by the tappet which rides on a lobe of the camshaft. Rocker arms have adjusting screws with lock nuts for adjusting the valve stem-to-rocker arm clearance. Check the intake/exhaust valve clearance every 300 hours or six months. Valve clearance on both intake and exhaust valves is 0.0079 in. (0.2 mm) with the engine cold.

NOTE

The engine firing order is based on the No. 1 piston being next to the flywheel, not the crankshaft pulley.

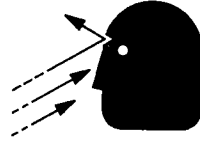
1. Remove rocker arm cover screws and breather hose at rocker arm cover connection. Carefully pry rocker arm cover from cylinder head. Wipe excess oil from components using a clean rag.

NOTE

Be careful not to damage gasket or mating surfaces.

2. Locate intake/exhaust valves of No. 1 cylinder. These are the first set of valves nearest to the flywheel. Remove belt guard, if used, and place two screws in threaded holes of pulley. Rotate using a bar until maximum clearance between intake/exhaust valves and rocker arms are present. This is the period between the closing of the intake valve and the opening of the exhaust valve. At this point the No. 1 piston is at Top Dead Center (TDC), and both intake and exhaust valves will be closed.

CAUTION



Flying projectiles can cause injury. Retorque all crankshaft and rotor hardware after servicing. When making adjustments or servicing generator set, do not loosen crankshaft hardware or rotor thru-bolt. If rotating crankshaft manually, direction should be clockwise only. Turning crankshaft or rotor thru-bolt counterclockwise can loosen hardware and result in serious personal injury from hardware or pulley flying off engine while unit is running.

3. Insert feeler gauge between rocker arm and exhaust valve. If necessary, loosen lock nut and move adjusting screw so that very slight drag is felt on the feeler gauge as it is withdrawn. Tighten lock nut on adjusting screw. See Figure 1-11. Repeat step for intake valve.

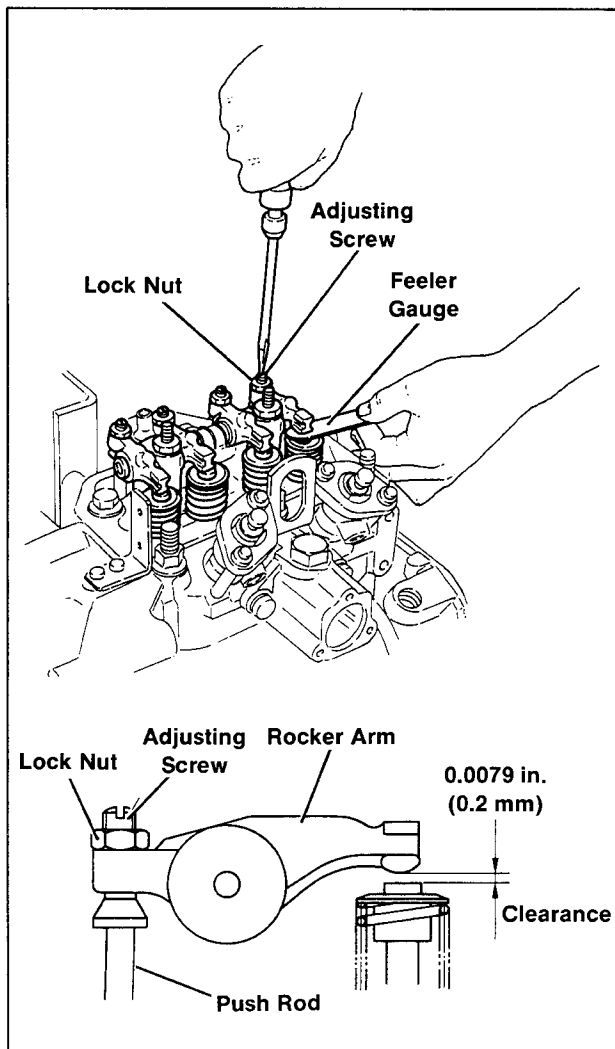


Figure 1-11. Valve Adjustment

4. Repeat procedure for each additional cylinder to be checked and/or adjusted.
5. With mating surfaces clean and gasket properly aligned, install rocker arm cover and screws. Be careful that O-ring is properly seated in recessed hole.
6. Remove screws from pulley and replace belt guard, if used.

Cooling System

To prevent the inconvenience of having the generator set shut down or become damaged due to overheating, keep the cooling air inlets to the component clean and unobstructed at all times.

Consult **coach manufacturer** for cooling system capacity. Coolant capacity of Kohler supplied radiator is 4 gal. (15.1L). A drain petcock is provided on the underside of the radiator and the engine block to drain the system. When draining the coolant, remove the radiator cap and open the block drain located near the flywheel housing; this will allow the entire system to drain and prevent air pockets from forming and restricting coolant passage in the block. When operating in climates subject to freezing temperatures, make sure a sufficient amount of antifreeze solution is added to prevent freeze-up of the system. A solution of 50% ethylene glycol and 50% clean, softened water is recommended to inhibit rust/corrosion. A coolant solution of 50% ethylene glycol will provide freezing protection to -34°F (-37°C) and overheating protection to 265°F (129°C). A coolant solution with less than 50% ethylene glycol may not provide adequate freezing and overheating protection. A coolant solution with more than 50% ethylene glycol can cause damage to engine and components. Do not use alcohol or methanol antifreeze or mix them with the coolant.

Check coolant level frequently and add water or anti-freeze as needed to maintain level just below the overflow tube.

NOTE

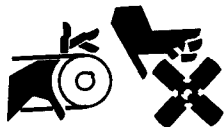
Special attention should be given when checking for proper coolant level. After a radiator has been drained, it normally requires some time before complete refill of all air cavities takes place.

Belt Tension

The belt tension should be adjusted so that it can be depressed about 0.38 in. (10 mm) with about 22 lbs. (10 kg) of force, see Figure 1-12. Use the following procedure to adjust belt.

1. Remove belt guard (if equipped).
2. Loosen pivot and adjusting screws.
3. While prying idler pulley outward, tighten adjusting screw.
4. Tighten pivot screw.
5. Recheck and adjust as necessary.
6. Replace belt guard (if equipped).

⚠ WARNING



Exposed moving parts can cause severe injury. Keep hands, feet, hair, and clothing away from belts and pulleys when unit is running. Replace guards, covers, and screens before operating generator set. Do not open generator compartment door when unit is running.

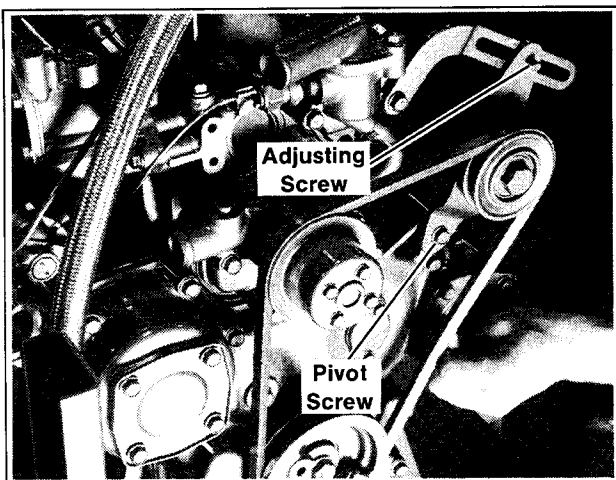


Figure 1-12. Belt Tension

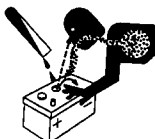
Battery

Use a 12 Volt battery with a rating of at least 500 Cold Cranking Amps./100 Amp. Hr. When using a "Maintenance Free" battery, it is not necessary to check the specific gravity or electrolyte level. Otherwise these procedures should be done at the intervals specified in the "Service Schedule." A negative ground system is used. Battery connections are shown on the wiring diagram. Make sure battery is properly connected and terminals are tight.

NOTE

The generator set will not start if the battery connections are made in reverse.

⚠ WARNING



Sulfuric acid in batteries can cause permanent damage to eyes, burn skin, and eat holes in clothing. 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 hazardous spattering of electrolyte.

⚠ WARNING



Battery gases can cause an explosion. 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 wrist-watch, rings, and any other jewelry before handling battery. Never connect negative (-) battery cable to positive (+) connection terminal of starter solenoid. Do not test battery condition by shorting terminals together or sparks could ignite battery gases or fuel vapors. Any compartment containing batteries must be well ventilated to prevent accumulation of explosive gases. Do not mount battery in generator compartment. To avoid sparks, do not disturb battery charger connections while battery is being charged and always turn charger off before disconnecting battery connections. When disconnecting battery, remove negative lead first and reconnect it last.

Cleaning

Keep battery clean by wiping it with a damp cloth. Keep all electrical connections dry and tight. If corrosion is present, disconnect cables from battery and remove corrosion with a wire brush. Clean battery and cables with a solution of baking soda and water. Be careful that cleaning solution does not enter battery cells. When cleaning is complete, flush battery and cables with clean water and wipe with a dry cloth. After the battery cables are reconnected, coat terminals with petroleum jelly or other non-conductive grease.

Checking Electrolyte Level

Check the level of electrolyte before each start-up. Remove filler caps and check to see that electrolyte level is up to bottoms of filler holes. Refill as necessary with distilled water or clean tap water. **DO NOT** add fresh electrolyte! Be sure filler caps are tight.

Checking Specific Gravity

Use a battery hydrometer to check the specific gravity of the electrolyte in each battery cell. While holding the hydrometer vertical, read the number on the glass bulb at the top of the electrolyte level. If the hydrometer used does not have a correction table, use the one in Figure 1-13. Determine specific gravity and electrolyte temperature of battery cells. Locate temperature in Figure 1-13 and adjust specific gravity by amount shown. The battery is fully charged if the specific gravity is 1.260 at an electrolyte temperature of 80° F (26.7° C). The difference between specific gravities of each cell should not exceed ± 0.01 . The battery should be charged if the specific gravity is below 1.215 at an electrolyte temperature of 80° F (26.7° C).

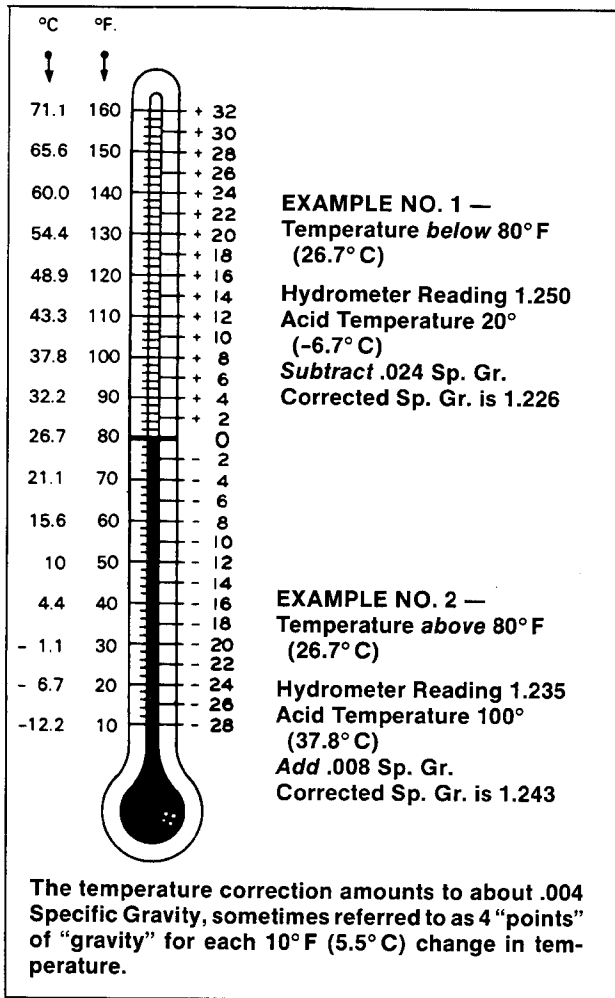
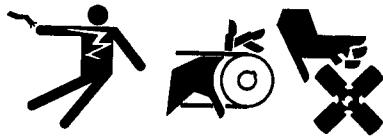


Figure 1-13. Specific Gravity Temperature Correction

Fuse Replacement



WARNING

Accidental starting can cause death or serious personal injury. Disconnect battery cables (remove negative lead first and reconnect it last) to disable generator set before working on any equipment connected to generator. The generator set can be started by remote start/stop switch unless this precaution is followed.

There is one 10 Amp. fuse located on the relay controller. This fuse protects the controller against damage in the event a short develops in the engine wiring system or the wiring harness to the remote start/stop switch. See Figure 1-14a or 1-14b. If this fuse "blows," the set will stop.

An 8 Amp. fuse is located in the end bracket assembly. This fuse protects the voltage regulator circuit in the event of an overload in the circuit. If there is no AC output, check the fuse; if blown, replace the fuse, then restart the genera-

tor set. If the fuse blows again, contact an Authorized Service Dealer.

NOTE

If the 8 Amp. fuse (in the end bracket) is blown, the engine will crank but not start. If the 10 Amp. fuse (on the controller) is blown, the engine will not crank. If either fuse blows while the generator set is running, the set will stop.

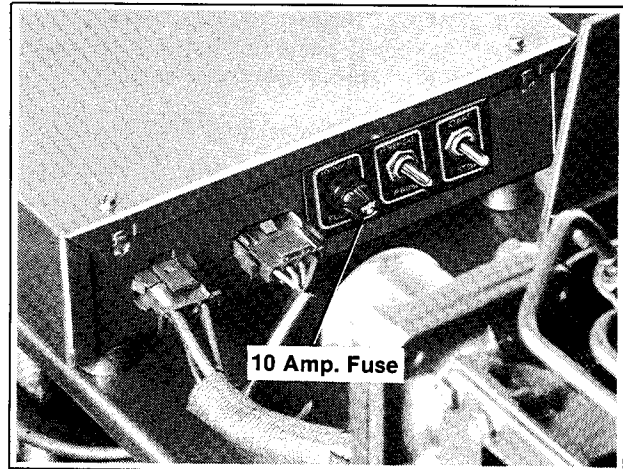


Figure 1-14a. Fuse Replacement — Early Models

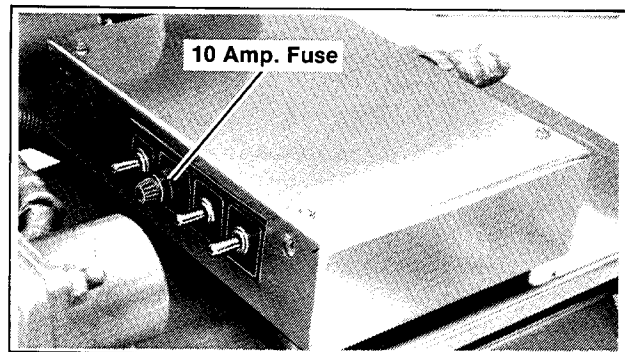


Figure 1-14b. Fuse Replacement — Later Models

Fuel Solenoid

The fuel solenoid serves to stop fuel flow through the fuel injection pump when the start/stop switch is placed in the stop position. If the fuel solenoid is removed or the setting is suspected to be incorrect, use the following procedure and see Figure 1-15a or 1-15b.

1. Loosen lock nut on fuel solenoid linkage (early models only).
2. With fuel solenoid mounted to engine block, compress plunger and adjust fuel solenoid linkage so that linkage connects to fuel control lever 1/16 in. (1.6 mm) before lever contacts internal full stop.
3. Attach cotter pin to fuel solenoid linkage.
4. Tighten fuel solenoid linkage lock nut against plunger body (early models only).

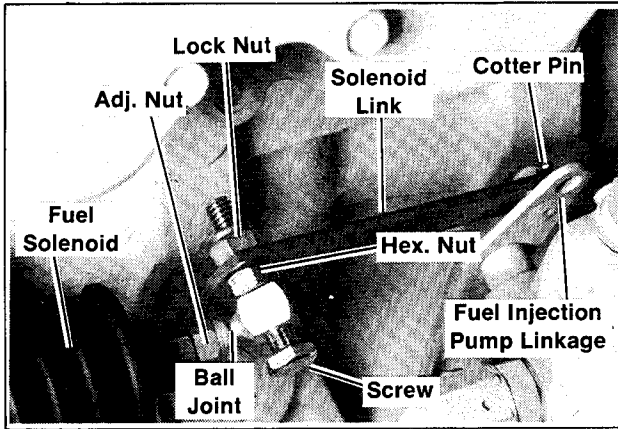


Figure 1-15a. Fuel Solenoid — Early Models

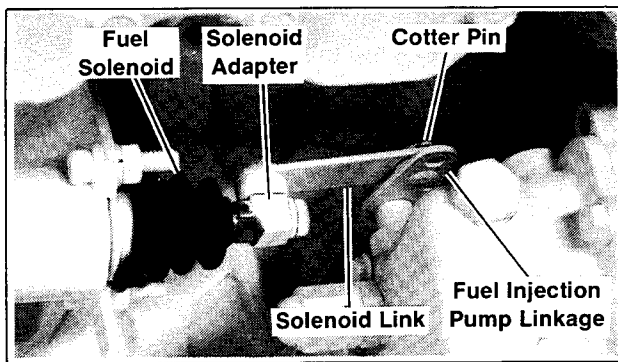


Figure 1-15b. Fuel Solenoid — Later Models

Cylinder Head Retightening

Loosen and retorque cylinder head bolts every 600 hours of operation or yearly. Torque to 29 ft. lbs. (39 Nm) initially and then final torque to 58 ft. lbs. (78 Nm) using the sequence shown in Figure 1-16.

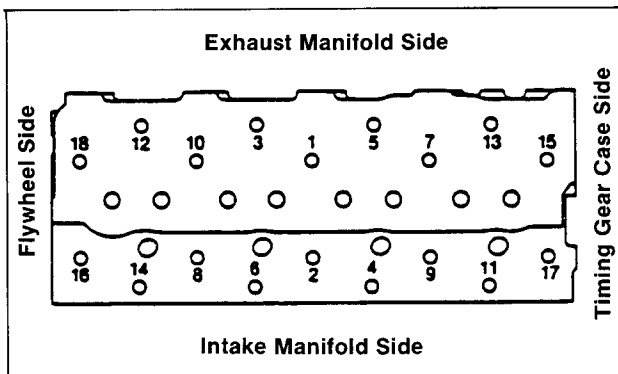


Figure 1-16. Cylinder Head Tightening Sequence

Wattage Requirements

Line circuit breakers should be used to prevent damage to the generator set should the rated capacity of the generator set be exceeded. This could be caused by a short in the

AC circuit in your RV or simply by having too many appliances on at the same time resulting in an overload condition. If the circuit breaker(s) trip, the set may continue running but there will be no AC output to the protected circuit. Before resetting the circuit breaker(s), turn off some of the appliances and lights inside the RV to bring the load down within the rated limits of the set. If this done and the circuit breaker trips again after being reset, a short circuit is indicated. In this event, turn off the set and have a qualified electrician locate and correct the cause of the short circuit.

The average wattage requirements of some common RV appliances and motor loads are listed in the following chart. Use these figures to calculate the total load on your set to avoid the inconvenience of having the circuit breaker trip due to overload. Your generator set will operate three 13,500 Btu air conditioners. The lighting load is easily determined by adding the wattage rating of each bulb in the circuit. Check the nameplate rating on motors and appliances in your RV for exact wattage requirements.

| Electrical Appliance | Rating (Watts) |
|----------------------|----------------|
| Blanket | 50-250 |
| Blender | 600 |
| Broiler | 1350 |
| Fan, Air Circulating | 25-100 |
| Fan, Furnace | 270 |
| Heater, Space | 750-1500 |
| Heater, Water | 1500 |
| Pan, Frying | 1200 |
| Percolator, Coffee | 650 |
| Radio | 50-100 |
| Television | 300-750 |
| Toaster | 750-1200 |

Generator Service

Under normal conditions, generator service will not be required on a regular basis. If operating under extremely dusty and dirty conditions, use dry compressed air to blow dust out of the generator at frequent intervals. Do this with the generator set operating and direct the stream of air through the cooling slots at the end of the generator. Because of the design of this Kohler generator, brush service should be practically non-existent. The brushes operate at very low amperage and should last indefinitely. Abrasive dust on the controller rings could, however, shorten the life of the brushes. If brush replacement becomes necessary, due to poor or no AC output, return set to a Kohler Generator Service Dealer to have this done.

Storage Procedure

If your generator set is to be out of service for a considerable length of time, the following steps should be taken to preserve it.

1. Drain oil from crankcase while engine is still warm. Refill crankcase with specified weight oil.
2. If generator set has a separate fuel tank, drain fuel completely from tank, otherwise moisture from the fuel system will mix with the fuel.
3. Clean exterior of generator set and spread a light film of oil or silicon spray over any exposed surfaces which may be subject to rust or corrosion.
4. Disconnect and remove battery. Battery should be placed in a warm, dry location for period of storage. Recharge once a month to maintain full charge.

Troubleshooting

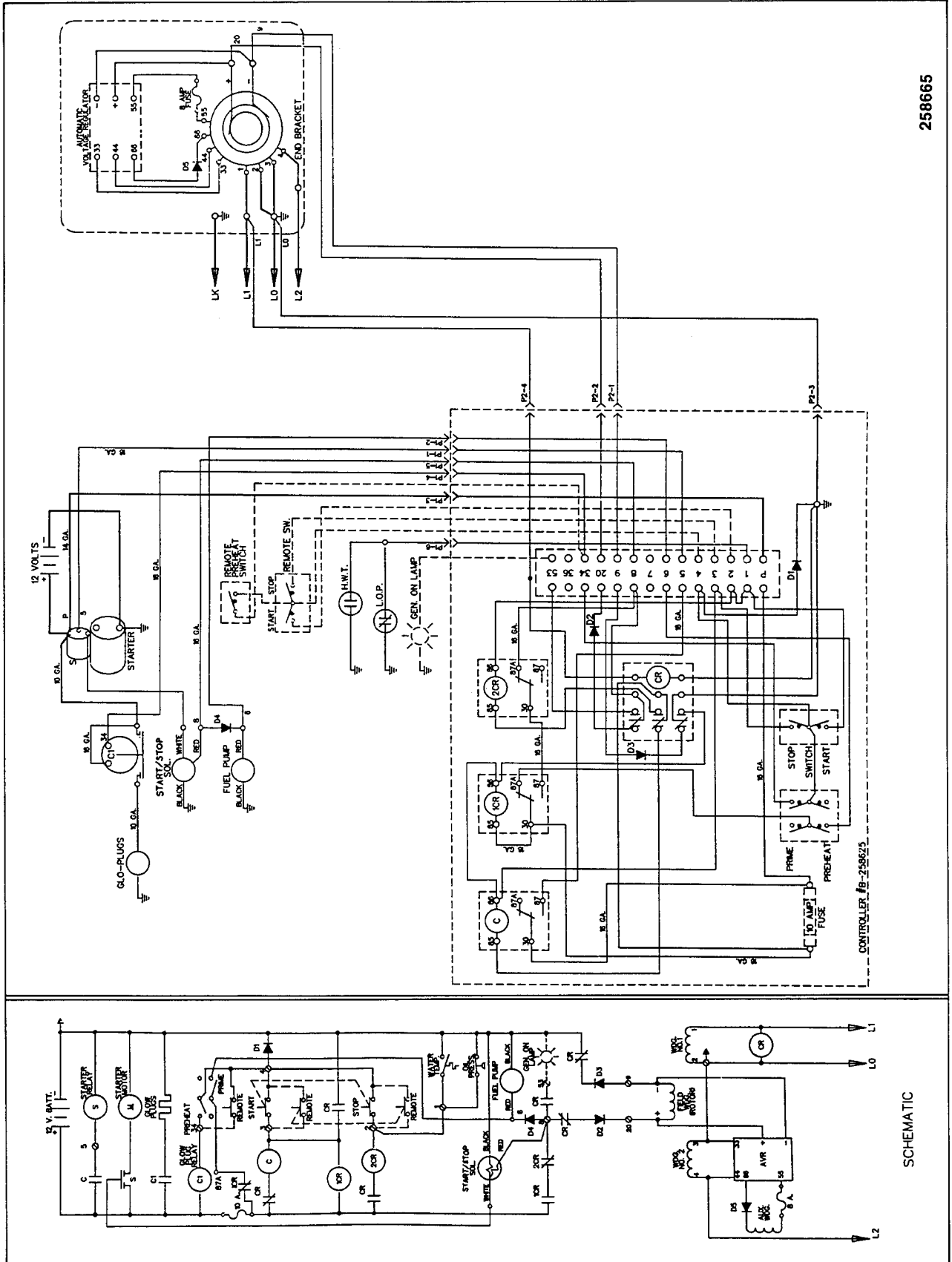
When troubles occur, don't overlook simple causes. A starting problem could be caused, for example, by improper fuel or an empty fuel tank. Make sure all electrical connections are secure. Remember the battery negative must have a good ground. The following charts list some common problems. If procedures in this manual do not correct the problem, take the generator set to a Service Dealer. Tell the Service Dealer personnel exactly what happened when the problem occurred and any adjustments made to the set.

| Problem | Possible Cause | Corrective Action |
|---|--|--|
| Engine Engine hard to start or will not start | Weak or dead battery Battery connections made in reverse Faulty ground Fuse blown Out of fuel Fault shutdown Clogged fuel filter Air cleaner clogged Defective fuel feed pump Air in fuel system Water, dirt in fuel system Dirty or faulty injectors Improper compression Improper type of fuel Improper type of crankcase lube oil | Recharge or replace Check connections Clean and retighten Replace Replenish Check low oil pressure and high water temperature shutdown switches Replace filter element Clean or replace element Replace fuel feed pump Bleed air Drain, flush fuel system See Authorized Service Dealer See Authorized Service Dealer Use proper type of fuel; consult fuel supplier Use proper lube oil |
| Engine knocks | Improper type of fuel Incorrect fuel injection timing Improper cylinder top clearance Defective piston or piston ring Defective crankshaft bearing or piston pin bearing Improper valve clearance Air in injectors | Use proper type of fuel; consult fuel supplier Check injection timing See Authorized Service Dealer See Authorized Service Dealer See Authorized Service Dealer Adjust proper valve clearance Bleed air |
| Engine runs irregularly or stalls frequently | Vent in fuel tank cap obstructed Clogged fuel filter Water, dirt, or air in fuel system | Clean cap in solvent, blow dry Replace fuel filter element Drain, flush, fill, and bleed air in the system |

| Problem | Possible Cause | Corrective Action |
|--|---|---|
| Engine runs irregularly or stalls frequently | Dirty or faulty injectors Faulty governor linkage Defective fuel feed pump Improper valve clearance Defective valve spring Improper compression | See Authorized Service Dealer See Authorized Service Dealer Replace fuel feed pump Adjust proper valve clearance Replace valve spring See Authorized Service Dealer |
| Lack of engine power | Engine overloaded Air intake restriction Clogged fuel filter Improper type of fuel Improper valve clearance Dirty or faulty injectors Incorrect fuel injection Improper engine compression Vent in fuel tank cover obstructed | Reduce load Service air cleaner Replace filler element Use proper fuel Adjust proper valve clearance See Authorized Service Dealer Check fuel injection timing See Authorized Service Dealer Clean cap in solvent; blow dry |
| Engine overheats | Engine overloaded Defective cooling system Loose or defective water pump V-belt Cooling system needs flushing Defective thermostat Defective high water temperature switch Cooling water leaks from water passages Radiator clogged with dirt or oil | Reduce load Check water pump Adjust belt tension or replace belt Flush cooling system Replace thermostat Replace switch Check water passages Clean with water soluble grease remover and flush cooling system |
| Engine emits black or gray exhaust smoke | Improper type of fuel Clogged or dirty air cleaner Defective injection pump Faulty injectors Incorrect fuel injection timing Improper valve clearance Lube oil level too high Improper/lube oil | Use proper fuel Service air cleaner element See Authorized Service Dealer See Authorized Service Dealer Check the injection timing Adjust valve clearance Drain out surplus Use proper viscosity oil |
| Low lube oil pressure | Low lube oil level Improper lube oil viscosity Defective lube oil pump Defective oil pressure switch | Add lube oil Drain, fill with proper viscosity oil See Authorized Service Dealer Replace switch |
| High lube oil consumption | Too light viscosity oil Oil leaks | Use proper viscosity oil Check for leaks in lines, around gasket, and drain plug |

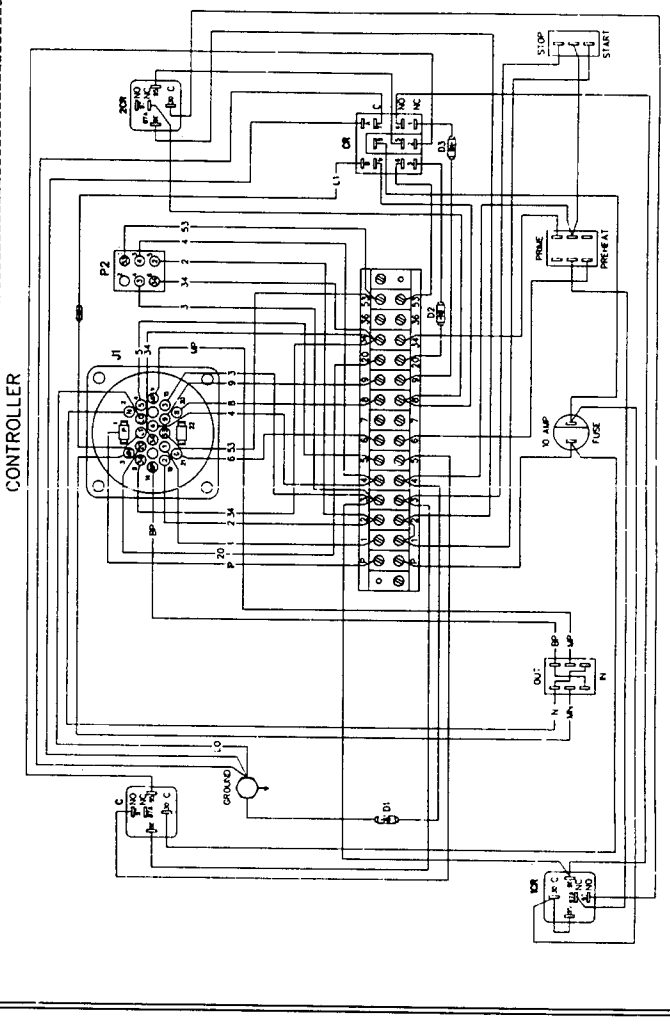
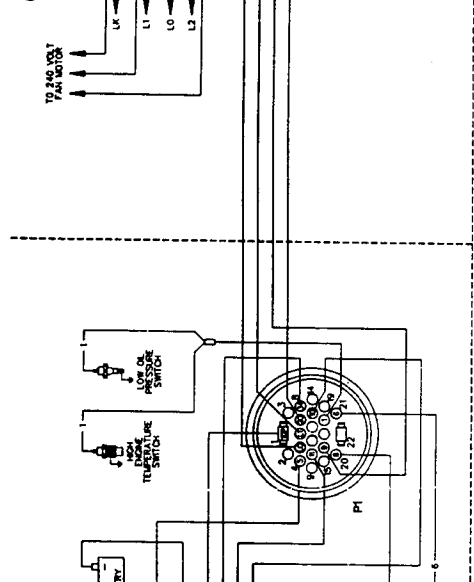
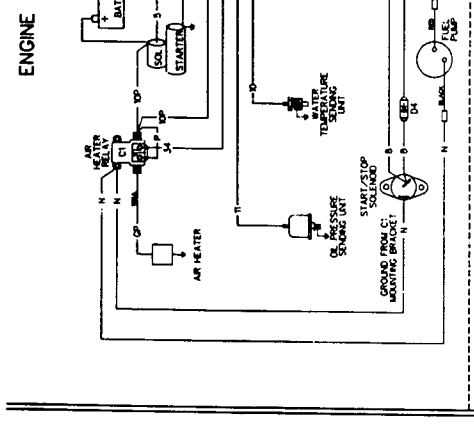
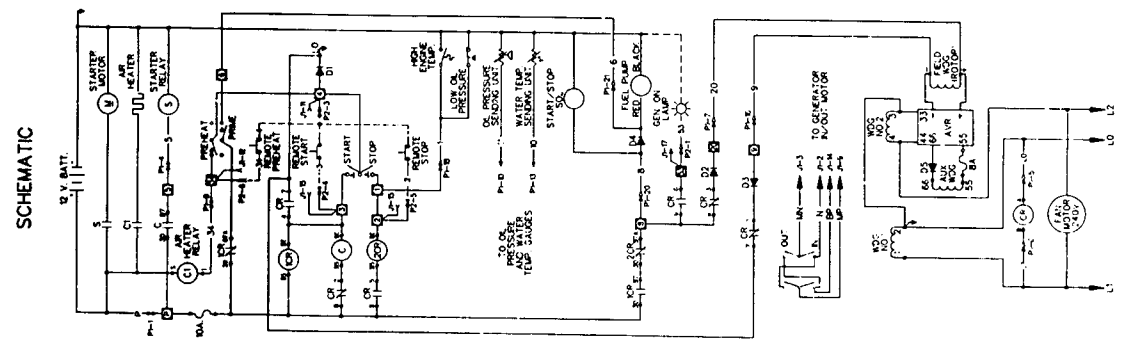
| Problem | Possible Cause | Corrective Action |
|--------------------------------|---|---|
| High lube oil consumption | Improper type of oil Clogged breather system Defective piston ring, piston cylinder liner, valve guide, or valve seat | Use oil of proper viscosity Clean breather system See Authorized Service Dealer |
| High fuel consumption | Improper type of fuel Clogged or dirty air cleaner element Engine overloaded Improper valve clearance Incorrect fuel injection timing Low engine temperature Improper compression Fuel leakage | Use proper fuel Service air cleaner element Reduce load Adjust valve clearance Check injection timing Check thermostat See Authorized Service Dealer Check for leaks at fuel tank, lines, and engine fuel system |
| Electrical System | | |
| Battery will not charge | Loose or corroded connections Sulfated or worn-out battery Defective vehicle alternator Loose or defective vehicle alternator belt | Clean and tighten connection Check electrolyte level and specific gravity (batteries with filler caps only) Replace vehicle alternator Adjust belt tension or replace belt |
| Starter does not work properly | Loose or corroded connections Low battery output Defective starter solenoid Defective starter switch Defective wiring | Clean and tighten connection Check electrolyte level and specific gravity (batteries with filler caps only) Replace starter solenoid Replace starter switch Check wiring |
| Starter cranks slowly | Low battery output Too heavy viscosity lube oil Loose or corroded wiring High starter current draw | Check electrolyte level and specific gravity (batteries with filler caps only) Use proper viscosity oil Clean and tighten loose connections Rebuild or replace starter |
| Generator | | |
| No AC output | AC circuit breaker(s) in OFF position No DC power to controller Fuse blown in end bracket Generator malfunction such as sticking brushes, broken brush leads, or other internal fault | Return to ON position Check battery connections Replace fuse See Authorized Service Dealer |
| Low output | Engine speed too low Set overloaded Engine in poor condition | Check governor operation Make sure set capacity is not being exceeded. See "Wattage Requirements." If routine services are performed and condition persists, see Authorized Service Dealer |

Wiring Diagrams



258665

Wiring Diagram—12.5 kW Tray Mounted Model Generator Mounted Controller



258761

Wiring Diagram—12.5 kW Tray Mounted Model Remote Mounted Controller (with accessory plug P2)

Generator Reconnection

The generator may be reconnected to supply a different output voltage than listed on the generator nameplate. Refer to the reconnection procedure that applies to your generator set. Observe the following safety precautions during the reconnection procedure.



WARNING
Accidental starting can cause death or serious personal injury. Disconnect battery cables (remove negative lead first and reconnect it last) to disable generator set before working on any equipment connected to generator. The generator set can be started by remote start/stop switch unless this precaution is followed.



WARNING
Hazardous voltage can cause death or severe injury. Perform electrical service only as prescribed in equipment manual. 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. Wiring should be inspected at the interval recommended in the service schedule -- replace leads that are frayed or in poor condition. The function of a generator set is to produce electricity and wherever electricity is present, there is the hazard of electrocution.

4-Lead Reconnectable Generator Sets

Single-phase generators with four-lead stators can be reconnected to 120-Volt or 120/240-Volt systems at 60 Hz. Contact the factory for information on reconnecting the set at 50 Hz voltages.

NOTE

If generator is reconnected to a voltage different than nameplate rating, new voltage should be recorded on generator. Voltage change decals for this purpose are available from Kohler Service Parts.

120-Volt Connection

The jumper lead should be placed on the line side of the circuit breaker. See Figure 1-17. Leads L1 and L2 can either be left as separate leads or can be connected (depending upon application). Regardless of the number of output leads used in the application, both circuit breakers must have leads attached to the load side. It is recommended that the jumper lead be used for all straight 120-volt systems to help balance the generator set load.

| | |
|--------------|-------------|
| Leads | 60Hz |
| L0-L1 | 120-Volt |
| L0-L2 | 120-Volt |

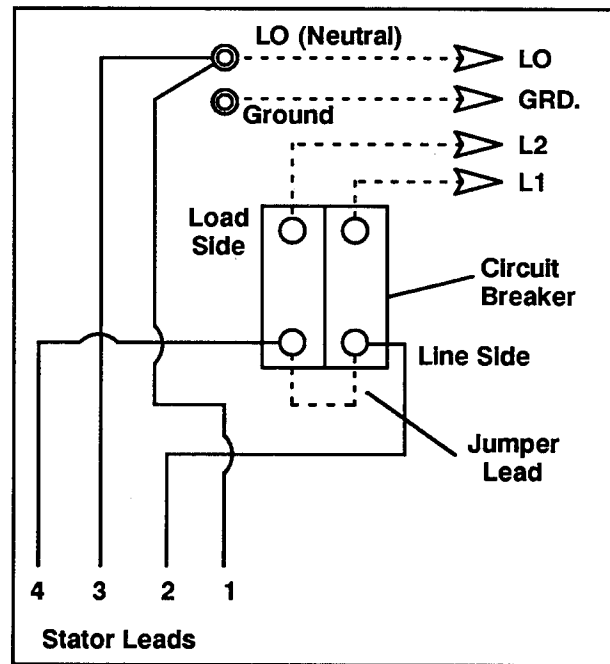


Figure 1-17. 120-Volt Connection

120/240-Volt Connection

In 120/240-Volt systems, the jumper lead is not used. If the unit was originally wired for straight 120-Volt (60 Hz), be sure jumper lead is removed from circuit breaker line side. Leads L1 and L2 are different phases and must never be connected together. See Figure 1-18 for 120/240-Volt connection.

Leads

L0-L1
L0-L2
L1-L2

Voltage at 60 Hz

120-Volt
120-Volt
240-Volt

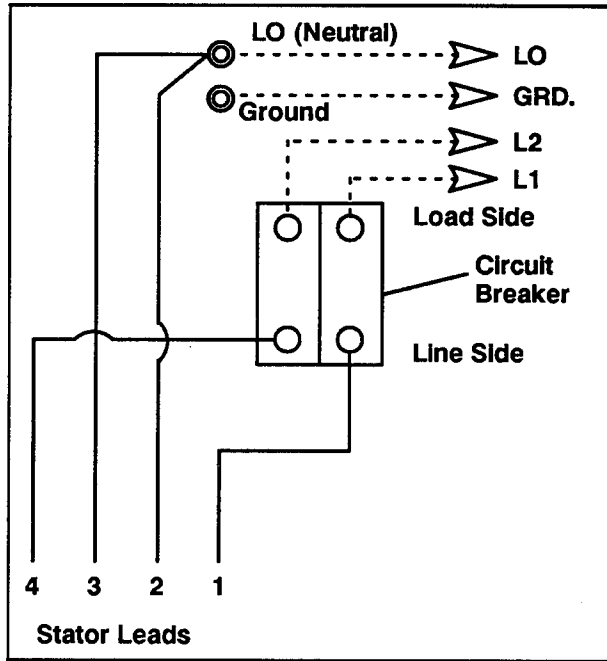


Figure 1-18. 120/240-Volt Connection

INSTALLATION

Introduction

Use this section as a guide when installing a generator set in the recreational vehicle, then refer to the Operation Manual section for specific service instructions. When installing an RV generator set, the installation must comply with CURRENT standards of (1) ANSI/RVIA EGS-1, (2) ANSI A 119.2/NFPA 501 C and (3) applicable articles of ANSI/NFPA 70, National Electrical Code. Generator set installation must also comply with state and local requirements.

NOTE

RV generator sets do not comply with United States Coast Guard (U.S.C.G.) requirements and must not be used for marine applications. Use only generator sets specified for marine use in marine installations. U.S.C.G. Regulation 33CFR183 requires a generator set to be "ignition protected" when used in a gasoline-fueled environment.

General Information

This information section covers the Kohler RV generator set models listed below. To determine which model is involved, check the model number found on the nameplate attached to the frame of the generator being installed. Follow all instructions to insure proper installation.

| Model No. | Engine No. | Volts | Hz | kW | Phase |
|-----------|--|---------|----|------|-------|
| 12.5CC067 | Yanmar 4TN82-U (early models) 4TN82-R (later models) | 120/240 | 60 | 12.5 | 1 |

Features

Generator sets feature Yanmar 4TN82-U or 4TN82-R diesel engines, rotating field alternating current generator, and relay controllers. Each generator is directly connected to the engine for permanent alignment. Each controller includes a START/STOP switch for test operating the set at the controller. Early model controllers (without accessory plug P2) require that remote operating controls be connected to the terminal strip inside the controller. Later model controllers include an accessory plug (P2) for connecting the remote switch, preheat switch, and generator "ON" lamp wiring harness. All Kohler RV sets are mounted on a steel mounting tray for quick installation to the frame of the vehicle. After the set is attached to the frame, and the coach supplied radiator and hose connections are installed, all that is usually required to make it operational is to connect fuel line, remote switch, load leads, battery terminals, exhaust system, add coolant, and add oil as needed to the crankcase to bring the level up to the full mark. Consult the Specification Chart below to aid in the installation.

NOTE

When selecting and installing radiator, consult Kohler Co., Generator Division, Product Applications Dept., Kohler, WI, 53044, Telephone (414) 565-3381 for recommendations and instructions.

Installation Factors

Each generator set is received as a unit except for the optional exhaust system components which are shipped loose for assembly after the set is installed in the vehicle. When preplanning the installation, the following factors must be considered:

Specifications

| Specifications | Model 12.5CC067-RV |
|-------------------------------------|---|
| Radiator Type | Remote |
| Weight (Dry) | 742 lbs. (336.6 kg) |
| Length — Overall | 49 In. (1245 mm) |
| Width — Overall | 26-5/8 In. (676 mm) |
| Height — Overall | 27-3/4 In. (705 mm) |
| Air Requirements — Total | 2000 CFM (56628 L/min.) |
| Fuel Inlet Connection Size | 1/4 In. (6.4 mm) |
| Battery Voltage | 12 Volts |
| Battery Recommendation (Minimum) | 500 Cold Crankings Amps., 100 Amp. Hr. |
| Battery Cranking Current | 170 Amps. |
| Battery Ground | Negative |
| Fuel Consumption (% Load) gph (Lph) | |
| 25% | 0.52 gph (1.97 Lph) |
| 50% | 0.69 gph (2.61 Lph) |
| 75% | 0.88 gph (3.33 Lph) |
| 100% | 1.13 gph (4.28 Lph) |
| Fuel Recommendation | ASTM/D975 No. 1-D or No. 2-D Diesel Oil |

1. **ELECTRICAL LOAD:** Does the set selected have adequate capacity to handle the load?
2. **COMPARTMENT SIZE:** Will there be sufficient room around the set to maintain minimum clearances?
3. **AIR REQUIREMENTS:** Are the compartment air inlets and outlets sized to allow adequate circulation of air for cooling and combustion?
4. **COMPARTMENT FLOOR:** Is the compartment floor strong enough to support the weight of the generator set?
5. **COOLING SYSTEM:** Is the cooling system large enough to cool the generator?
6. **FUEL SYSTEM:** Is the system properly designed to prevent fuel starvation of either the main engine or generator set engine?
7. **EXHAUST SYSTEM:** Will the system meet all safety requirements after installation?
8. **ELECTRICAL CONNECTIONS:** Will all systems, (battery, load, and remote switch) when connected, be compatible with vehicle system?

Each of these installation considerations are covered in detail on the following pages.

Electrical Load

While the electrical load of the vehicle should have been calculated prior to purchase of the generator set, you may want to recheck the load before installing the set to make sure that the capacity is ample to meet demands without possible overloading.

Lighting Load

The lighting load is usually easiest to calculate. In most cases, simply add the wattage of each lamp to be operated off the generator set. Note that in many applications, not all of the lights or lamps are in the generator set AC circuit — some are DC powered by the 12-Volt battery in the vehicle. Make sure the total includes only lights actually on the generator set AC circuit.

The lighting load is usually not too heavy in mobile installations; however, it must be accurately calculated to prevent overloading which could occur, for example, if all

lights happened to be on when the air conditioner or other motor loads start up.

Motor Loads

When figuring generator set capacity requirements for installation involving motor loads, do not overlook the high current demanded by the motor during start-up. The “in-rush” or starting current may be 2 to 5 times higher than that required when the motor reaches normal operating speed. Reserve capacity must be allowed for in-rush demands plus other loads which could be on the line as the motor starts.

Air conditioning units are perhaps the most common type of motor loads for generator sets in recreational vehicles. The starting characteristics of the different makes of air conditioners vary greatly — one particular 12,000 Btu unit has, for example, lower starting requirements than a 10,000 Btu unit of another make. When only one unit is involved, there is usually no starting problem provided, of course, the lighting and appliance load is not too high when the unit is started.

The trend seems to be toward larger capacity air conditioners and the use of more than one unit in larger vehicles. Simultaneous starting of two units can present problems if the capacity is marginal. Because of the variation in starting characteristics of the various makes of air conditioners, no definite statements are made in this publication regarding multiple-motor starting capabilities of the mobile generator sets covered. Delayed starting or use of “easy starting” devices on air conditioner units should be considered whenever simultaneous starting of more than one motor is involved. The starting and running requirements of some motor loads common to mobile applications are listed in Table 2-1. Use this as a guide when selecting generator set capacity requirements involving motor loads. See Table 2-2 for generator set capabilities regarding air conditioners. Capabilities will vary according to “Kilowatt Derating” following. For specific information regarding simultaneous starting of two or more motors, contact Kohler Co., Generator Division, Product Applications Dept., Kohler, WI 53044, Telephone (414) 565-3381.

| Motor Requirements | 1/4 hp | 1/3 hp | 1/2 hp | 3/4 hp | 1 hp | 2 hp | 3 hp |
|--------------------|--------|--------|--------|--------|------|------|------|
| Starting (In-Rush) | 750 | 1000 | 1500 | 2000 | 3300 | 4000 | 5000 |
| Running Watts | 350 | 400 | 600 | 750 | 1100 | 2000 | 3000 |

Table 2-1. Motor Requirements

| Model | Radiator Type | Wattage | Will Operate Air Conditioner of Size Indicated | “Power to Spare” for Lighting Appliances, Tools |
|-----------|---------------|---------|--|---|
| 12.5CCO67 | Remote | 12,500 | Three 13,500 Btu | 6000 Watts |

Table 2-2. Air Conditioner Ratings

Appliance Loads

Generator sets in recreational vehicles are often used to furnish AC for appliances such as TV, stereo, electric water heaters, etc. With the exception of the resistance-type loads such as the water heater, requirements for appliances are usually low. Such loads must not, however, be overlooked when figuring total requirements. Reserve capacity should be available for anticipated appliance loads to avoid overloading of a set. The average power requirements of some common electrical appliances are listed in Table 2-3.

| Electrical Appliance | Rating (Watts) |
|----------------------|----------------|
| Blanket | 50-250 |
| Blender | 600 |
| Dryer, Hair | 500-1200 |
| Fan, Air Circulating | 25-100 |
| Fan, Furnace | 270 |
| Heater, Space | 750-1500 |
| Heater, Water | 1500 |
| Pan, Frying | 1200 |
| Percolator, Coffee | 650 |
| Radio | 50-100 |
| Television | 300-750 |
| Toaster | 750-1200 |

Table 2-3. Appliance Ratings

Kilowatt Derating

All units are rated at 1.0 power factor. The kilowatts of the generator set will decrease 3.5% per 1,000 ft. (305 m) above 500 ft. (152 m) above sea level. Derate 1% for every 10° F (5.5° C) above 85° F (30° C).

Compartment Size

When planning compartment size requirements, allow the minimum clearances for cooling of the generator set as shown in Table 2-4.

NOTE

Since the sets are flexibly mounted, the minimum clearances will assure that the sides of the compartment and the set will not rub while the set is in operation or while the vehicle is in transit.

| | |
|-------|----------------|
| Front | 1-1/2" (38 mm) |
| Side | 1-1/2" (38 mm) |
| Top | 1-1/2" (38 mm) |
| Rear | 1-1/2" (38 mm) |

Table 2-4. Minimum Clearance Requirements

The thickness of insulating and sound deadening material used to line the compartment must be taken into consideration when planning clearances. If necessary, enlarge

the compartment so minimum clearance requirements are maintained. The generator set must be securely fastened to avoid unwanted movement from vibration and road shock. On a typical installation, the mounting tray is supported on the ends by angle iron and has a full door for service access. The same number of bolts as mounting holes in the tray must be used to secure the tray to the support structure.

When designing the compartment, allow sufficient room for the set to be easily removed when major service is required. See Figure 2-1. Also keep in mind that the compartment door must have air intake openings having a full area of equal to or greater than that specified under "Air Requirements" following.

Make sure that the compartment is vapor tight and completely sealed off from the inside of the vehicle to prevent exhaust or other items from entering the vehicle.

Line the compartment with a good sound deadening material. The material selected must be fireproof or highly resistant to fire. An available type of 3-layer foam material does a very efficient job of absorbing sound. This type material is easily cut to size with scissors and can be quickly installed using special fire retardant adhesive which bonds the material to almost any surface that is clean and dry. Other materials, such as fiberglass insulation with heat barrier, have also been used successfully in mobile installations.

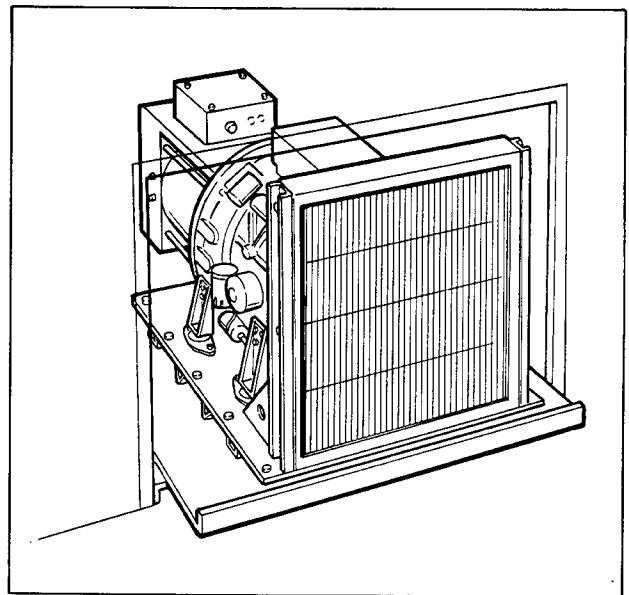


Figure 2-1. Slide Tray Feature for Complete Removal

Air Requirements

Each engine is equipped with a high water temperature shutdown switch which will automatically shut down the set in the event operating temperatures climb too high. To prevent the generator set from shutdown, make sure the compartment openings are large enough to allow ade-

quate circulation of cooling air. The minimum **free air** opening in the compartment door is shown in Table 2-5. Remember, louvers, screens, and protective decorative grill work definitely restrict the effective air flow. Even a simple, relatively open mesh screen, as shown in Figure 2-2 will restrict air flow as much as 45%. The intake opening must be increased to compensate for such restrictions.

| Minimum Air Openings | | |
|-----------------------------------|-------------------------------|-------------------------------|
| Model | Inlet | Outlet |
| 12.5CCO67-RV (Remote Radiator) | 350 Sq. In. (2258 Sq. Cm.) | 700 Sq. In. (4516 Sq. Cm.) |

Table 2-5. Compartment Door Air Opening

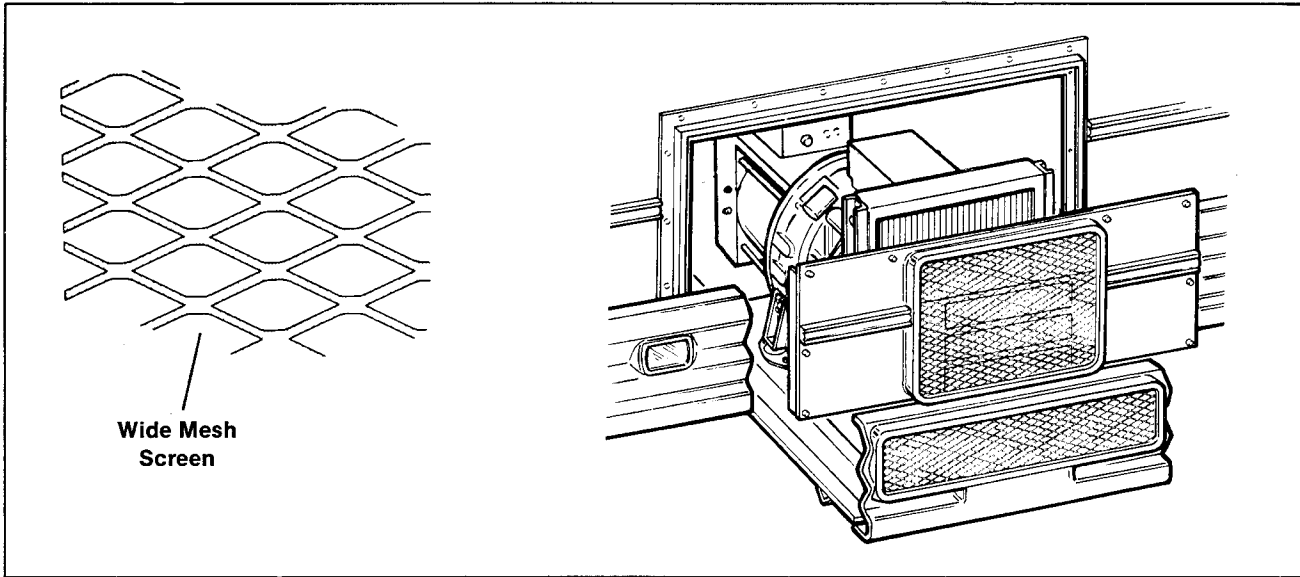


Figure 2-2. Inlet Screen and Louvers Restrict Air Flow

Cooling System

Use the following data in designing and installing the generator set cooling system. To insure a safe, effective installation, be sure the cooling system selected follows these parameters. Kohler Generator offers three radiator assemblies which meet these requirements and adequately cool the generator. Select the radiator assembly appropriate for the generator installation.

Due to the multitude of coach manufacturers and variety of generator installations, only general guidelines are provided. Adapt these recommendations to the installation. In a typical installation, the radiator assembly is installed in the same compartment as the generator. If the blower fan radiator assembly is used, cooling air is drawn across the generator and engine and then through the radiator. If the suction fan radiator assembly is used, the suction fan pulls cooling air through the radiator and then past the generator set. If the radiator assembly alone is used, the installer must supply an electric blower or suction fan to circulate the cooling air. See Figure 2-3a. Depending on space limitations, the radiator can be located in front of, adjacent to, or in a ventilated location remote from the engine (maximum distance from generator is 10 ft.). To prevent recirculation of heated air, be sure to maintain a tight seal between the radiator and the discharge chute. Generally, the discharge chute opening should be approximately one and one-half times the size of the radiator core.

NOTE

If the radiator is to be located in a compartment separate from the engine, remember the engine combustion air and heat rejection requirements of the alternator and engine block when designing the cooling system. A supplemental cooling fan capable of 1000 cfm (28.32 m³/min) should be installed to supply air to the generator compartment for these requirements.

Connect radiator fan motor to generator output leads L1 and L2 as shown in Figure 2-3b. If a non-Kohler radiator assembly is installed, be sure the radiator fan motor rotates in the correct direction and is of the proper voltage. To protect against overload and short circuits, it is recommended that fuses (adequate for the motor used) be installed between the fan motor and the L1/L2 connections.

NOTE

The cooling system fill (radiator or expansion tank) must be the highest point in the cooling system. (See Figure 2-3c). If the cooling system fill is not located as directed, cooling water will not completely fill the engine and result in overheating of the engine and disablement of the high water temperature shutdown switch.

NOTE

The RV radiator with blower fan is not equipped with a radiator fill cap. An overflow/expansion tank is required with this model to add/maintain coolant (level).

A close relationship exists between cooling system design and generator compartment size. Availability of space is often the determining factor in cooling system design. See "Compartment Size" section of this manual prior to designing and installing generator cooling system.

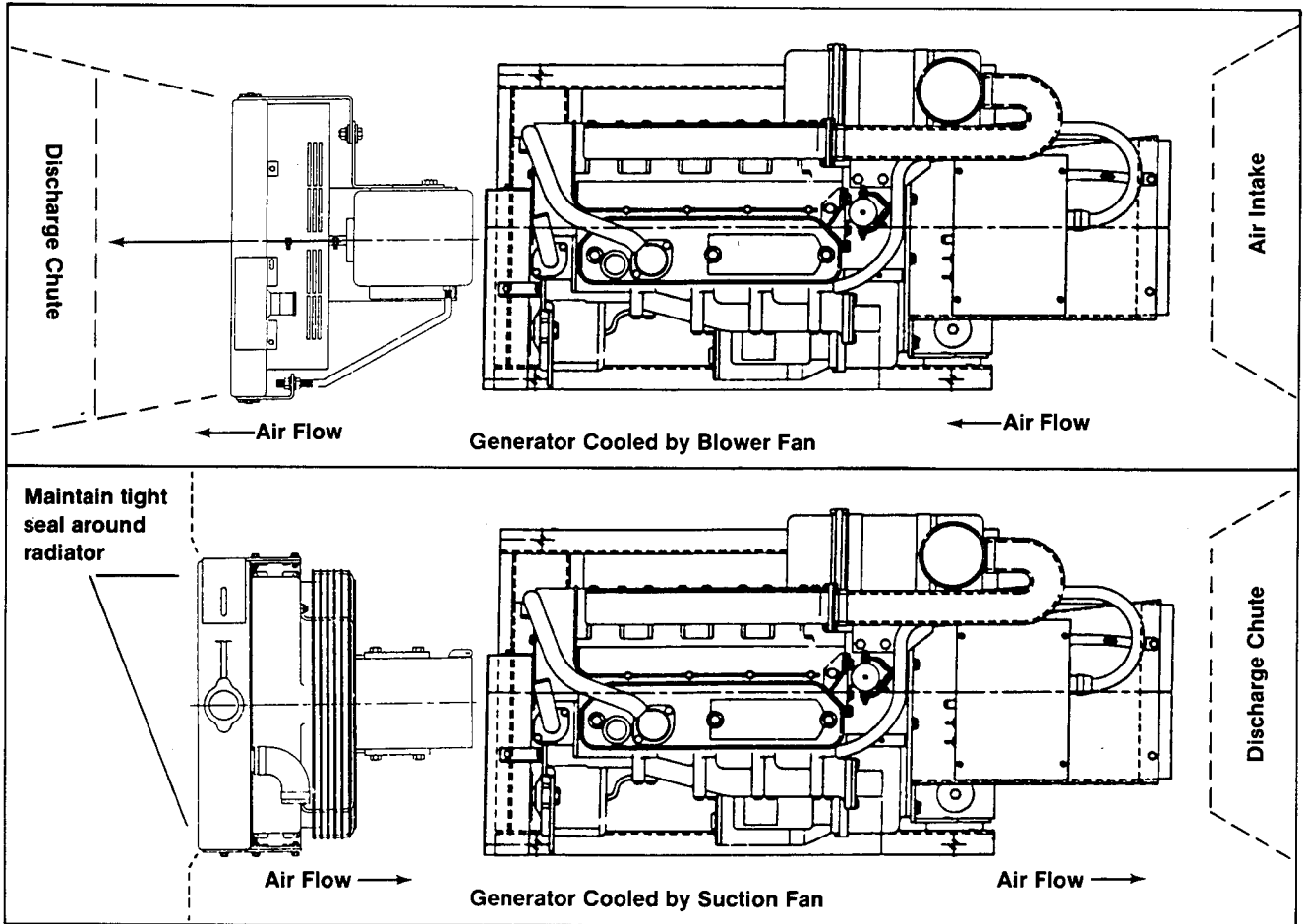


Figure 2-3a. Typical Cooling System Installations

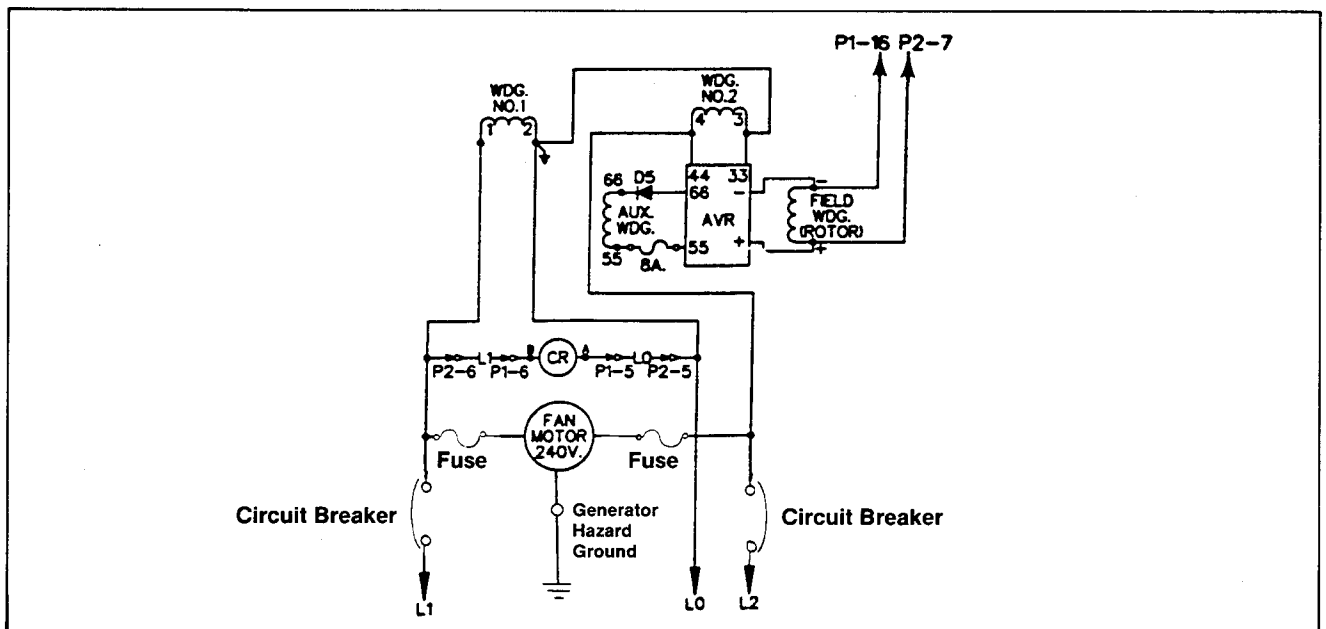


Figure 2-3b. Radiator Fan Electrical Connections

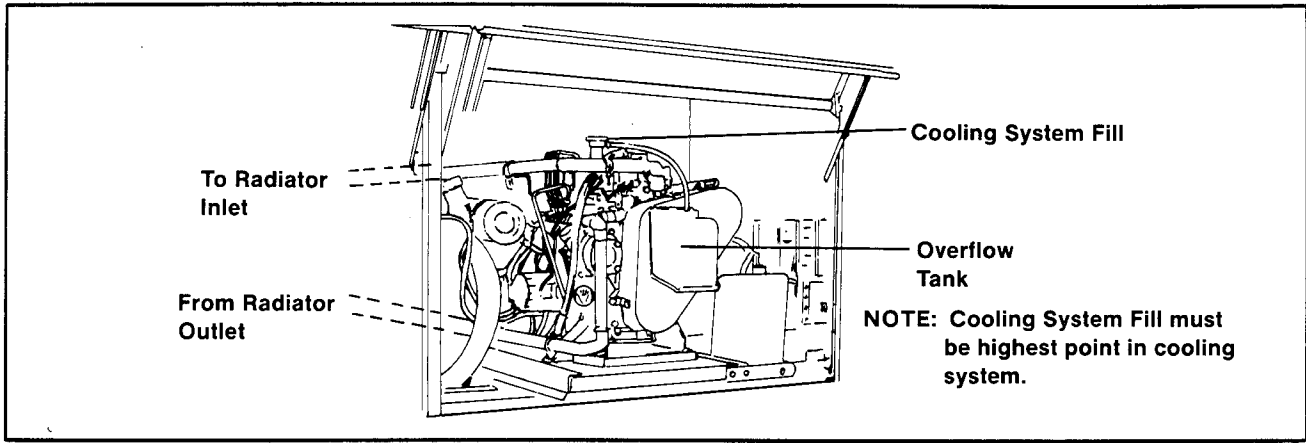


Figure 2-3c. Cooling System Fill

Cooling System Components

| | |
|--|----------------------------------|
| Radiator with Motor-Driven Blower Fan (Does not include radiator fill cap; installer to provide fill/expansion tank. Includes mounting brackets). | Kohler Part No. PAA-258570 |
| Radiator with Motor-Driven Suction Fan (Includes mounting brackets) | Kohler Part No. PAB-258598 |
| Radiator Assembly (alone) | Kohler Part No. A-258591 |
| Radiator Hose Adapter *, 1.25 in. hose (I.D.) to 1.5 in. hose (I.D.) | Kohler Part No. 259491 |
| Radiator Hose Adapter *, 1.25 in. hose (I.D.) to 1.75 in. hose (I.D.) | Kohler Part No. 259492 |

* One required for installation of listed radiator assemblies

**Radiator Specifications
(radiators designed to meet these criteria)**

| | |
|------------------------|--|
| Water Flow | 12 gpm (46 Lpm) |
| Heat Rejection | 1150 Btu/min. |
| Air Flow | 3000 cfm (85 m ³ /min.) |
| Radiator Pressure Drop | 04 psi (.275 kPa) |
| Air to Boil (ATB) | 125°F (51.6°C) |
| Radiator Cap Pressure | 7 psi (48.2 kPa) |
| Coolant Capacity | 4 gal. (15.1 L)** |
| Dimensions | See Installation Drawings |

** Radiator capacity only. Cooling system capacity also affected by radiator hose length.

**Cooling System Specifications
(Design cooling system and compartment so generator set meets these specifications)**

| | |
|---|--|
| Engine Inlet Water Temperature (maximum) | 186°F (85.5°C) |
| Engine Outlet Water Temperature (maximum) | 196°F (91.1°C) |
| Engine Oil Temperature (maximum) | 250°F (121.1°C) |
| Combustion Air Temperature | 120°F (48.8°C) or 15°F (-9.4°C) Over Ambient |

NOTE

Ambient temperature is defined as the temperature of the generator operating environment. In RV applications, ambient temperature is the temperature inside the generator compartment.

Other Pertinent Information

| | |
|--|---------------------------------|
| Thermostat Rating (Yanmar Engine) | |
| Start to Open | 157°F (69.5°C) |
| High Water Temperature Switch Rating (Yanmar Engine) | 230°F (110°C) |
| Maximum Distance Radiator to Generator Set | 10 ft. (9 m) |
| Generator Set Dimensions | See Installation Drawings |

Fuel System

The diesel fuel system for the generator set must be designed to operate independently of the system for vehicle engine if both engines are to be operated at the same time. The best way to do this is to have separate fuel tanks; however, this is usually impractical because of space restrictions. In most installations, both engines operate off a common tank with a separate dip tube arrangement as shown in Figure 2-3c. This prevents the smaller engine from being starved of fuel by the larger engine. The generator set dip tube is generally shorter than the vehicle dip tube. With this arrangement, fuel may not be available to the generator set when fuel supply is low.

A simple tee fitting is sometimes used to provide fuel for both engines off a common tank; however, this usually prohibits simultaneous operation. There is also the possibility that operation of either engine could completely drain the fuel line of the other engine, thus making starting difficult if not impossible. The tee arrangement should be avoided or used only as a last resort.

Care must be taken when routing the fuel line from the main tank to the generator set. Keep fuel lines as short as possible but maintain adequate clearance from exhaust system. Fuel lines must be run along the frame or under carriage — never run fuel lines inside the coach. Locate fuel lines below the generator set compartment with entry point near fuel pump. The fuel line must be of adequate size to handle the flow of fuel and withstand road shock and year-round climate conditions. If steel tubing is used, it should be 1/8" (3.2 mm) I.P. (minimum) with an 8" (203 mm) (minimum) flexible section to allow free movement of the generator set.

⚠ WARNING

All fuels are highly explosive in a vapor state. Use extreme care when handling, storing, and using fuels. 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 since spilled fuel may ignite on contact with hot parts or from ignition spark. Do not smoke or permit flame or spark to occur near potential sources of spilled fuel or fuel vapors. 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.

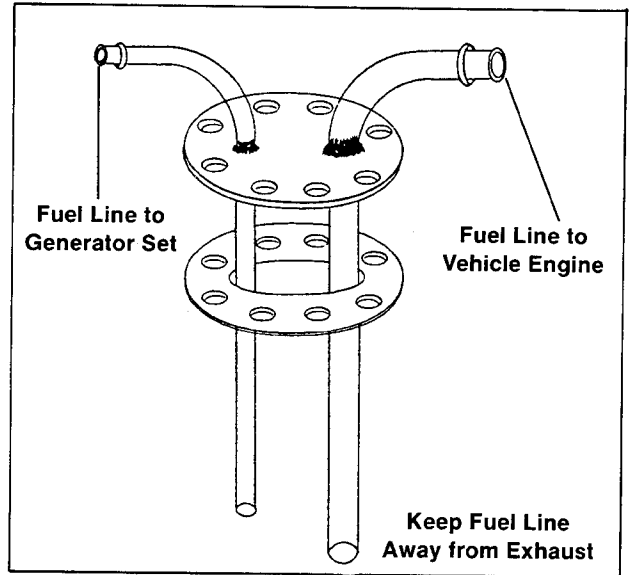
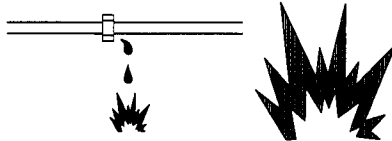


Figure 2-3c. Two Dip Tubes in Fuel Tank

⚠ CAUTION

Hot generator can ignite debris in compartment. Keep the compartment and generator set clean and free of debris and combustible materials to minimize chances of fire. Do not block fuel/oil drain opening in generator mounting tray. If sub-flooring is used, cut a corresponding hole in the sub-flooring for drain opening.

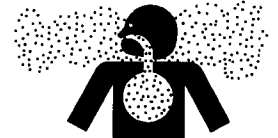


Exhaust Systems

Because the length varies with most installations, a tail pipe is not furnished with the kits. A tail pipe must, however, be installed to direct the exhaust gases beyond the perimeter of the vehicle. Use a tail pipe with as few gradual bends as possible to avoid excessive back pressure and face tail pipe away from normal air stream.

⚠ WARNING

Carbon monoxide can cause death, severe nausea or fainting. Install exhaust system tail pipe so discharged exhaust gases will not be drawn into vehicle interior through windows, doors, air conditioners, etc. Do not use flexible tail piping since this type could crack and allow lethal exhaust fumes to enter the vehicle.



NOTE

Make sure exhaust system components are positioned well away from the drain opening in the bottom of the mounting tray. Also make sure the components are not blocking access to the oil drain plug.

least 2" (51 mm) clearance must be provided between electrical wiring and hot exhaust parts. Also, wiring must not be located directly below or in close proximity to fuel system parts or oil fill locations. Some other points to consider when making AC load connections are covered in the following.

Electrical Connections

Battery, load lead, and remote switch panel connections are needed to complete the installation. Make final connections to the battery only after all other connections have been made as this will prevent unintentional starting. Some specific details on each connection are stated in the following paragraphs. Refer to the wiring diagram for specific details — connections should be made only by qualified electricians. All wiring to the generator set shall be securely supported or harnessed to prevent abrasion. Additional support is required to prevent exposure to the exhaust system and drippage of fuel, oil, or grease — at

NOTE

Wiring connections made at the time of installation should be accessible for inspection and servicing.

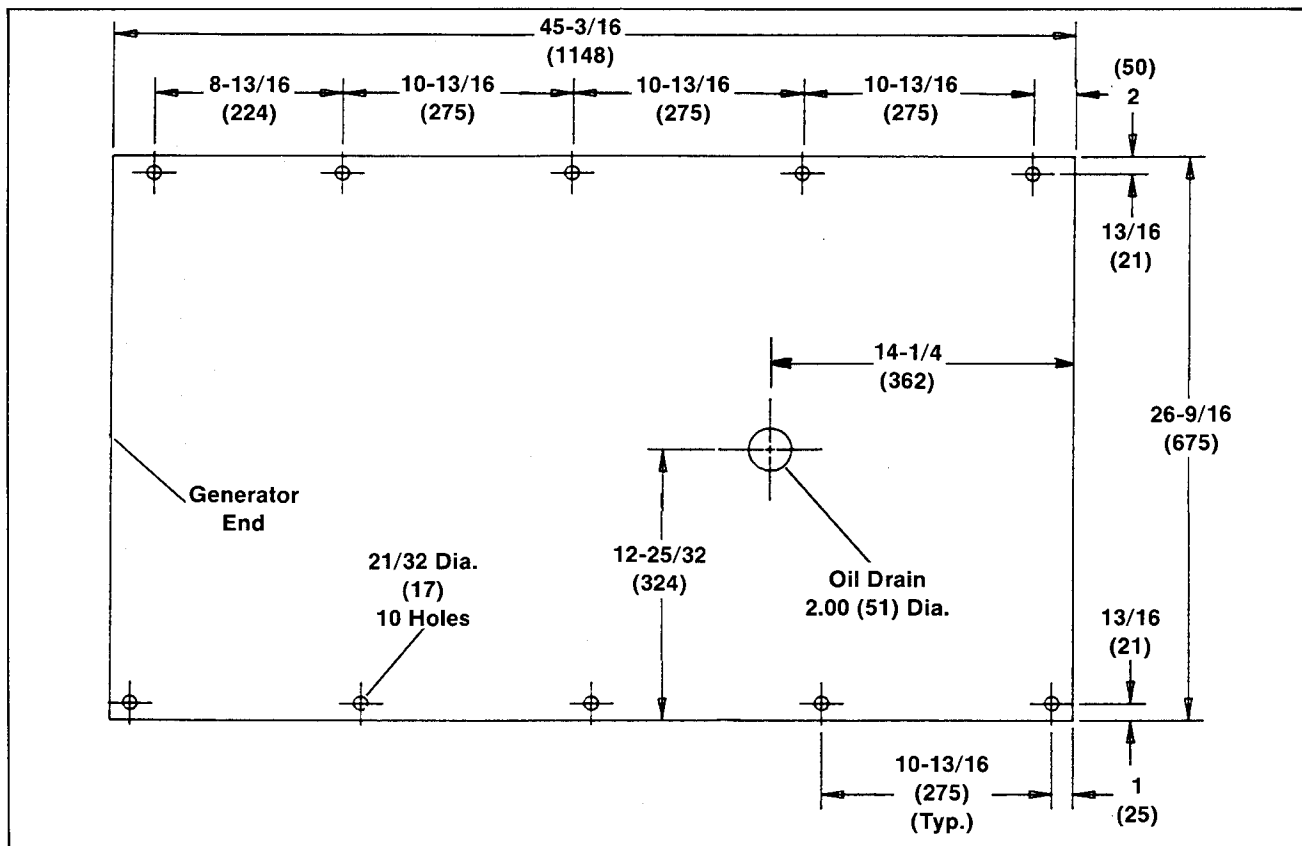


Figure 2-4. Floor Template

Battery and Connections

A separate 12-Volt battery is recommended for the generator set. With a separate battery, cables can be kept short which eliminates the problem of excessive voltage drop through long cables. See Table 2-6 for lengths and sizes. Refer to Figure 2-5 (View A) for cable connections — note that a grounding strap must be connected between the ground lug on the generator set and frame of the vehicle with this arrangement. When using a separate battery, provision must be made for charging battery.

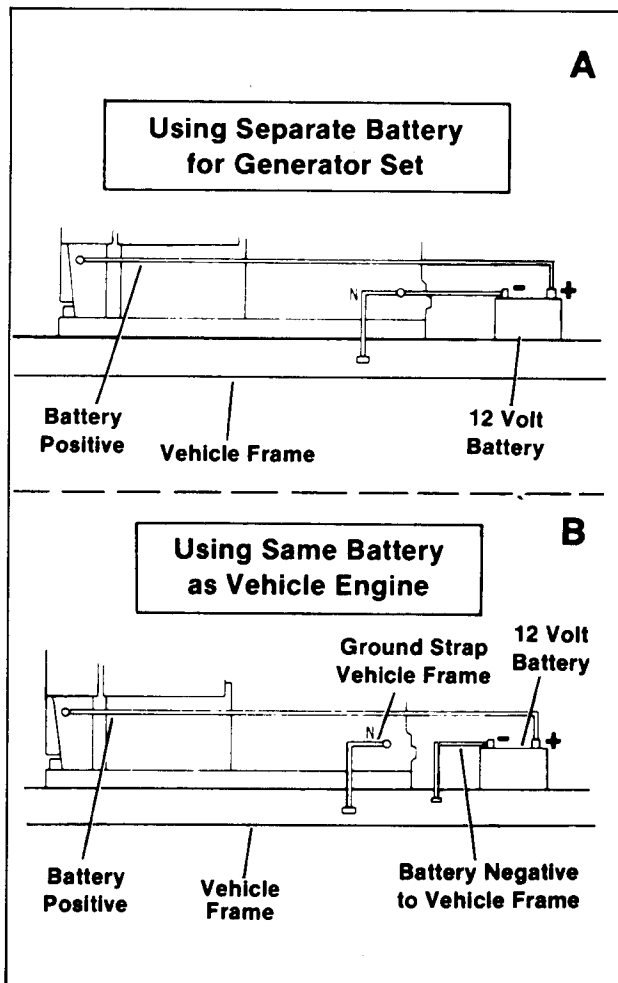


Figure 2-5. Battery Connection Details

If the starting battery for the vehicle engine must also be used for starting the generator engine, the negative battery terminal must be grounded to the vehicle frame and heavy gauge (#4) ground strap must connect the ground lug on the generator set to the vehicle frame as illustrated in Figure 2-5 (View B).

| Distance Between Generator Set & Battery | Cable Size (AWG) | | |
|--|------------------|---------------|------------------|
| | At 0° F (-18° C) | At 32° F (0°) | At 75° F (24° C) |
| 40 Feet (12.2 m) | 00 | 0 | 1 |
| 30 Feet (9.2 m) | 0 | 1 | 2 |
| 25 Feet (7.6 m) | 1 | 2 | 4 |
| 20 Feet (6.1 m) | 2 | 2 | 6 |
| 15 Feet (4.6 m) | 2 | 4 | 6 |
| 10 Feet (3.0 m) | 4 | 6 | 8 |
| 5 Feet (1.5 m) | 6 | 6 | 8 |
| 2.5 Feet (0.8 m) | 8 | 8 | 8 |

Table 2-6. Battery Cable Size

⚠ WARNING



Battery gases can cause an explosion. 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. Never connect negative (-) battery cable to positive (+) connection terminal of starter solenoid. Do not test battery condition by shorting terminals together or sparks could ignite battery gases or fuel vapors. Any compartment containing batteries must be well ventilated to prevent accumulation of explosive gases. Do not mount battery in generator compartment. To avoid sparks, do not disturb battery charger connections while battery is being charged and always turn charger off before disconnecting battery connections. When disconnecting battery, remove negative lead first and reconnect it last.

AC Load Lead Connections

Each set has four color-coded load leads and a connector for attaching flexible conduit from the generator end bracket to the load terminal junction box typically installed in the compartment. The black leads (L1 and L2) are hot, the white lead (L0) is neutral, and the green lead is the hazard ground.

NOTE

Route load leads through flexible conduit and keep circuit away from the generator set, specifically fuel and exhaust system components.

Figure 2-6 represents position and dimensions for typical junction box installation. Junction box should be installed to make it accessible for inspection and service.

AC load lead L0 (white or gray) is always the neutral lead on Kohler generator sets — make sure the neutral of the AC circuit in the vehicle is connected to the lead L0 (white or gray). If equipment ground-type plugs and receptacles (3-pronged) are used in the vehicle, the green wire must be connected to the "U" shaped pin. On vehicles which also have provisions for using an outside AC power

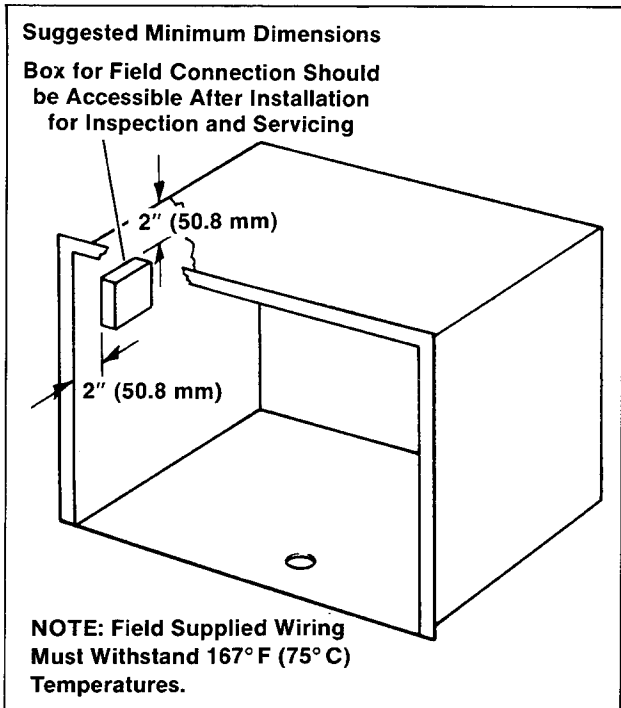


Figure 2-6. RV Junction Box

source, the neutral as well as the "hot" leads (or black) must be completely isolated from the generator set when power is switched to the outside source. See Figure 2-7.

CAUTION

A triple pole-double throw transfer switch, rated for the calculated load of the RV, must be used to transfer the load from one source to the other. A ground-fault circuit interrupter should be installed in the wiring system to protect all branch circuits.

CAUTION

The AC load circuit of the generator set must be protected by a circuit breaker(s) in the event of an overload or short circuit.

Remote Switch Connection

Early Controllers (without accessory plug P2)

Refer to the wiring diagram for proper connection of customer supplied start/stop switch, preheat switch, and generator "ON" lamp. If an hourmeter is to be connected, use the same terminal as the generator "ON" lamp. Run leads through the supplied controller grommet and connect to the terminal strip using spade or eyelet terminals.

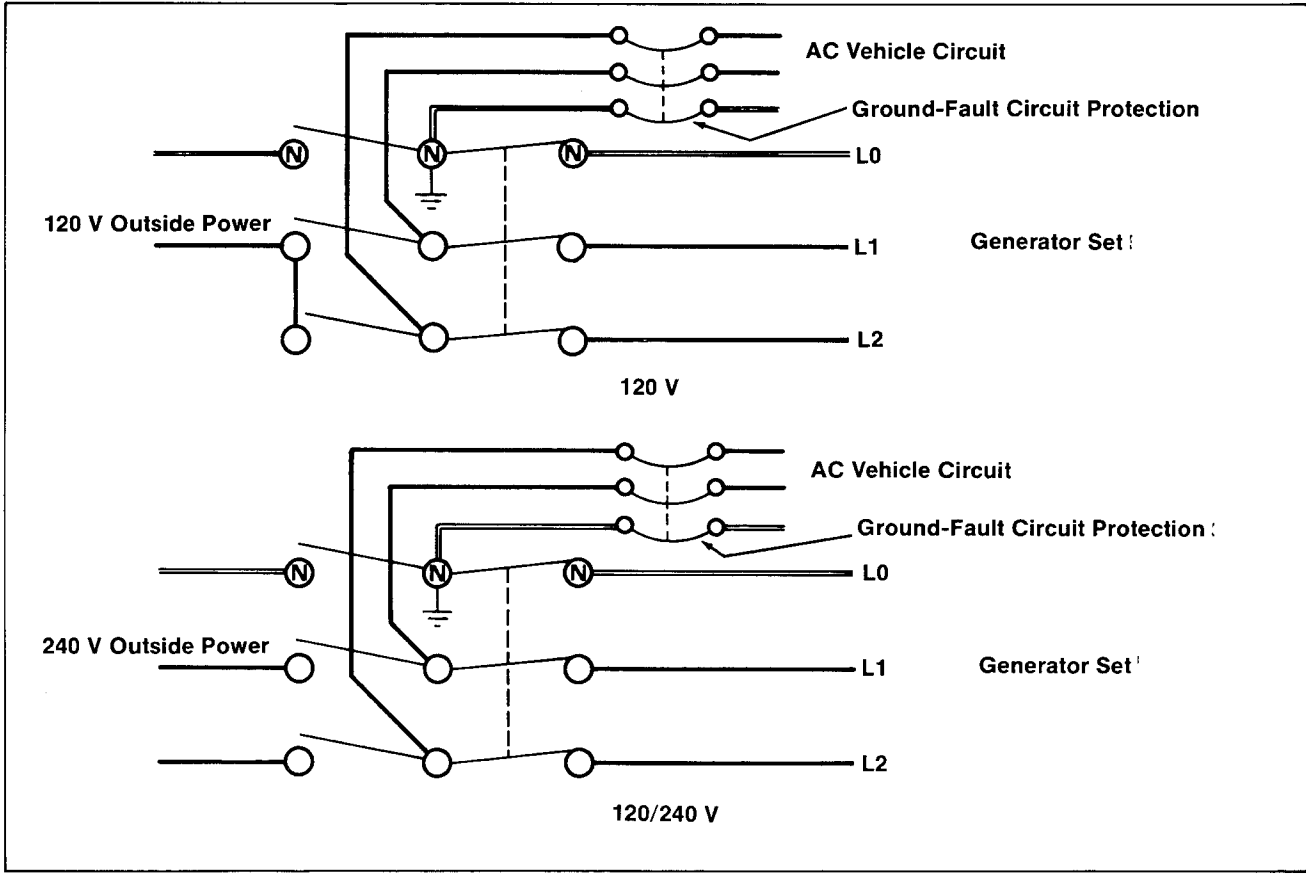


Figure 2-7. Transfer Switch Connection, 3-Wire AC Circuit

Later Controllers (with accessory plug P2)

Later model controllers include an accessory plug (P2) for easy connection of the remote switch, preheat switch, and generator "ON" lamp wiring harness (available separately). One end of the 12 in. (30.5 cm) P2 wiring harness plugs directly into the controller. The "pigtail" leads on the remaining end of the harness are connected to the appropriate remote panel terminals via customer supplied wiring. Be sure to connect the remote operating controls to the correct P2 wire harness lead. See figure 2-8 for identification of P2 harness leads.

| Pin No. | Lead No. | Function |
|---------|----------|---------------|
| 1 | 53 | Gen "ON" lamp |
| 2 | — | Not Used |
| 3 | 4 | Ground |
| 4 | 3 | Start |
| 5 | 2 | Stop |
| 6 | 34 | Preheat |

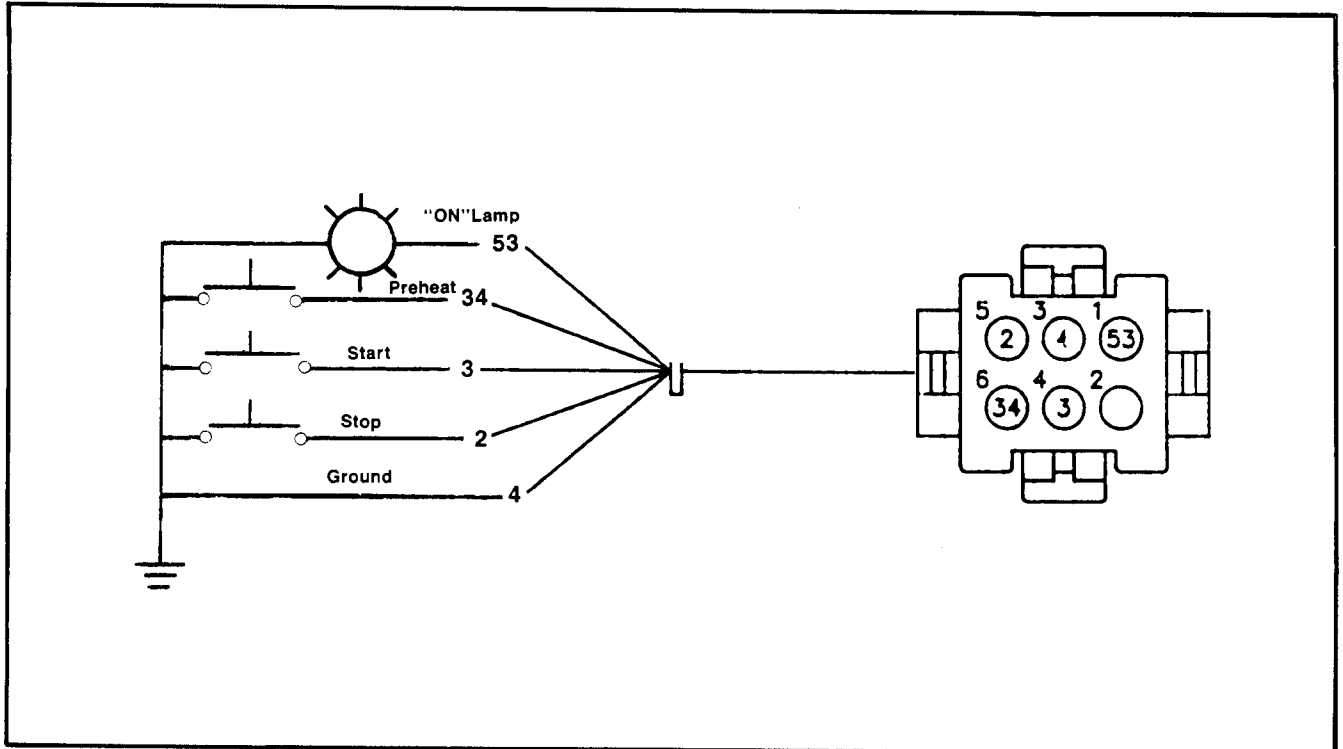


Figure 2-8. Remote Panel Wiring (P2 Wiring Harness)

Gauge Connections

Some models are equipped with sending devices for connection to oil pressure and water temperature gauges (not provided). Location of the oil pressure and water temperature senders is shown in Figure 2-9. Follow the recommendations of the gauge manufacturer in selecting a gauge compatible with each sender. The resistance and range of the gauge must match the resistance and range

of the sending device (reference the sender ratings below). RV Coach manufacturers have successfully used the following gauges with the oil pressure and water temperature senders on 12.5/14.5CCO generator sets:

Water Temperature Gauge - Teleflex No. 53215

Oil Pressure Gauge - Teleflex No. 53214

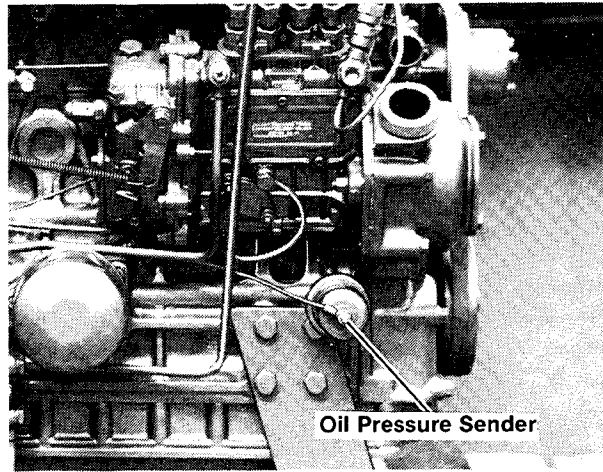
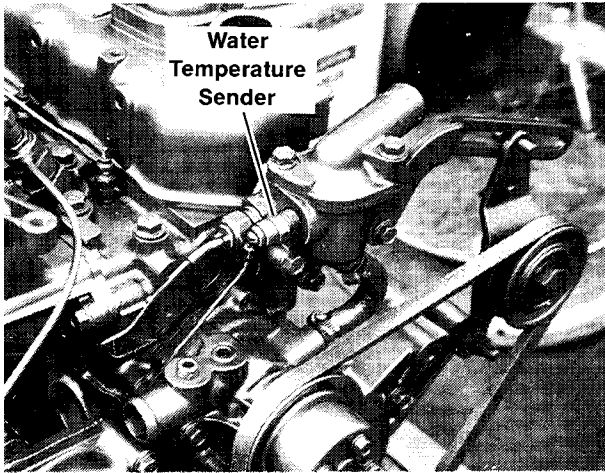


Figure 2-9. Engine Temperature and Oil Pressure Senders

Oil Pressure & Water Temperature Sender Ratings

| Description | Kohler Part No. | Range | Resistance (approx.) |
|--------------------------|-----------------|---------------------|--|
| Water Temperature Sender | 258694 | 100-360° F | 218.5-251.5 ohms @ 200° F (93° C) (34-182° C) |
| Oil Pressure Sender | 258693 | 0-125 psi (862 kPa) | 1 ohm @ 0 psi (0 kPa) 44 ohms @ 62.5 psi (431 kPa) 88 ohms @ 125 psi (862 kPa) |

NOTE

Generator set operating oil pressure is 21.3 - 56.9 psi (147 - 392 kPa).

To connect the sending units to the gauges, use spade connectors and 16 or 18 gauge wire. Since lead 10 (from water temperature sender) and lead 11 (from oil pressure sender) may not appear at controller plug J1 or P1, it may be necessary to access these leads in the engine harness or remote harness (if used). Leads 10 and 11 do not run the

full length of the remote harness. Retrieve the ends of these leads from the harness for connection to the oil pressure and water temperature gauges. The installer may also elect to run separate leads from each sender directly to the gauges and bypass the harnesses entirely. Each of these options is illustrated in Figure 2-10 below. Use insulink or similar connectors at all spliced connections to insure reliable operation of the senders and gauges.

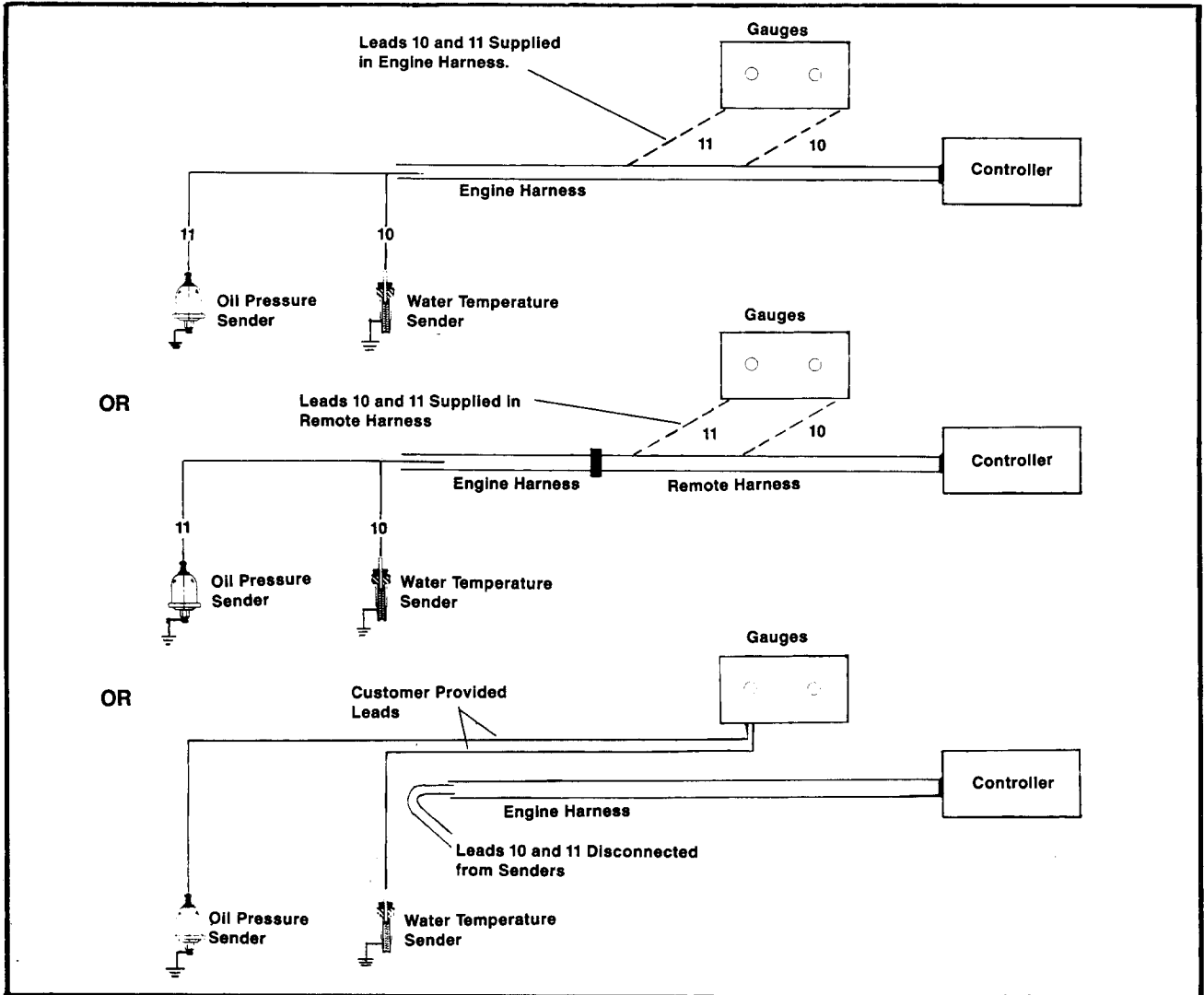
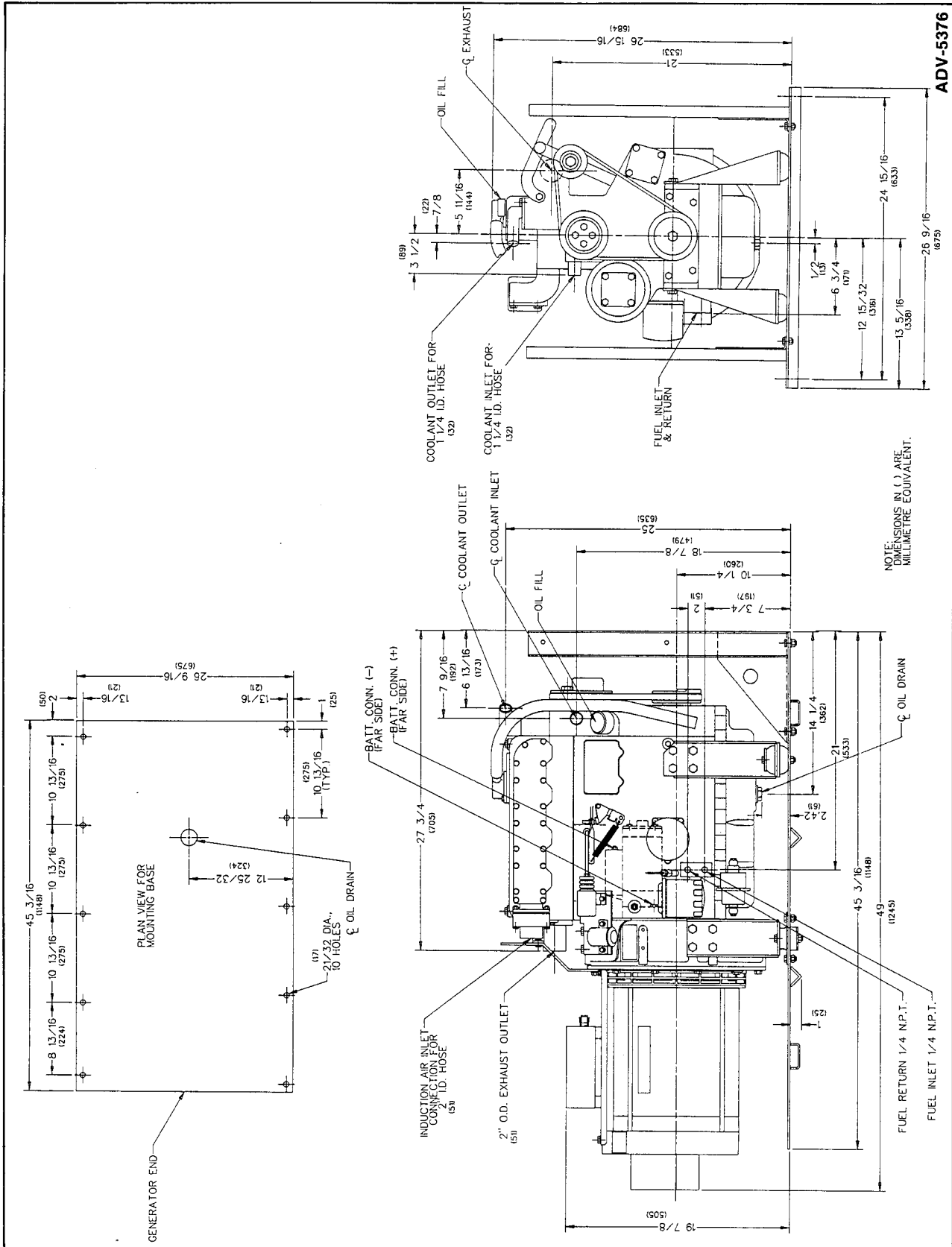
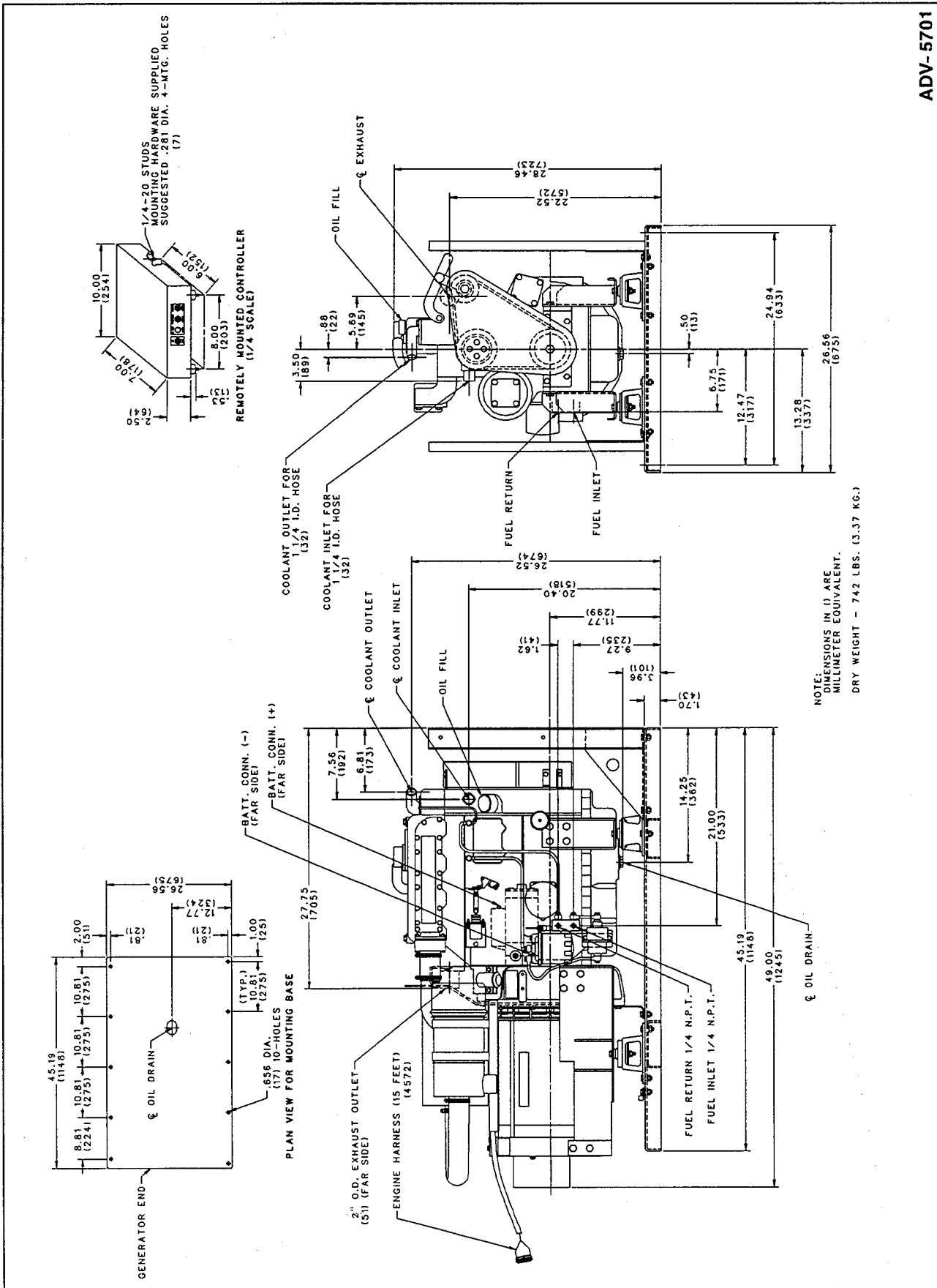


Figure 2-10. Oil Pressure/Water Temperature Sender Connections

Installation Drawings



12.5 kW (Blue Bird) — Tray Mounted Model — Yanmar-Powered (Specification 135010)

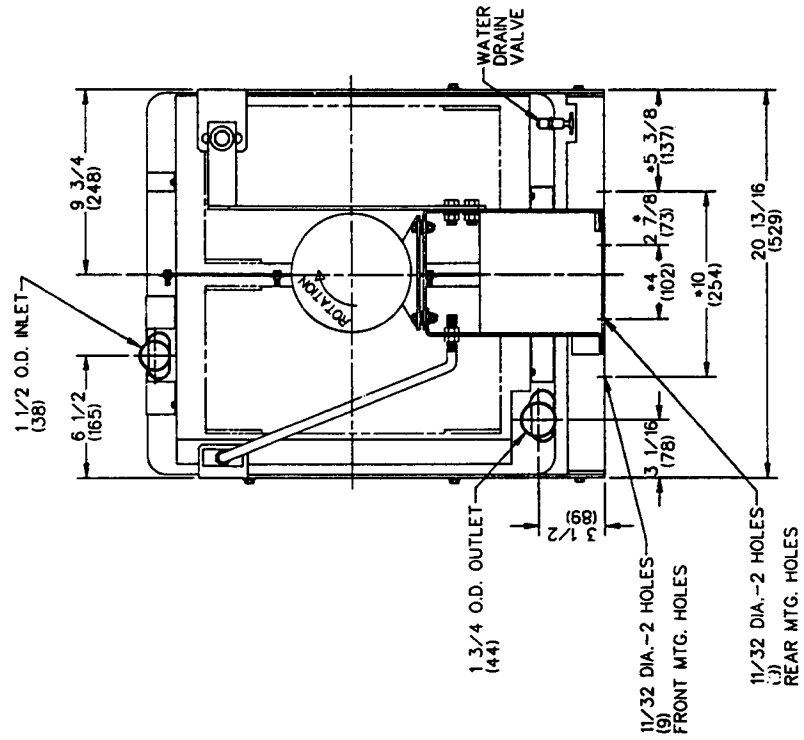
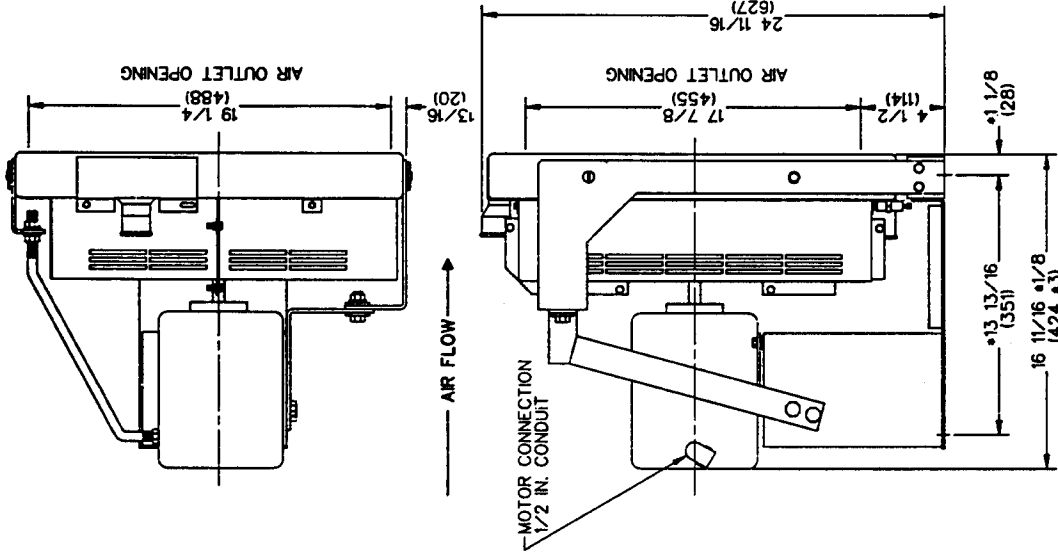


ADV-5701

12.5 kW (Blue Bird) - Tray Mounted Model (Centerline Mounting) - Yanmar-Powered - Specification 135023

NOTE

The RV radiator with blower fan is not equipped with a radiator fill cap. An overflow/expansion tank is required with this model to add/maintain coolant (level).

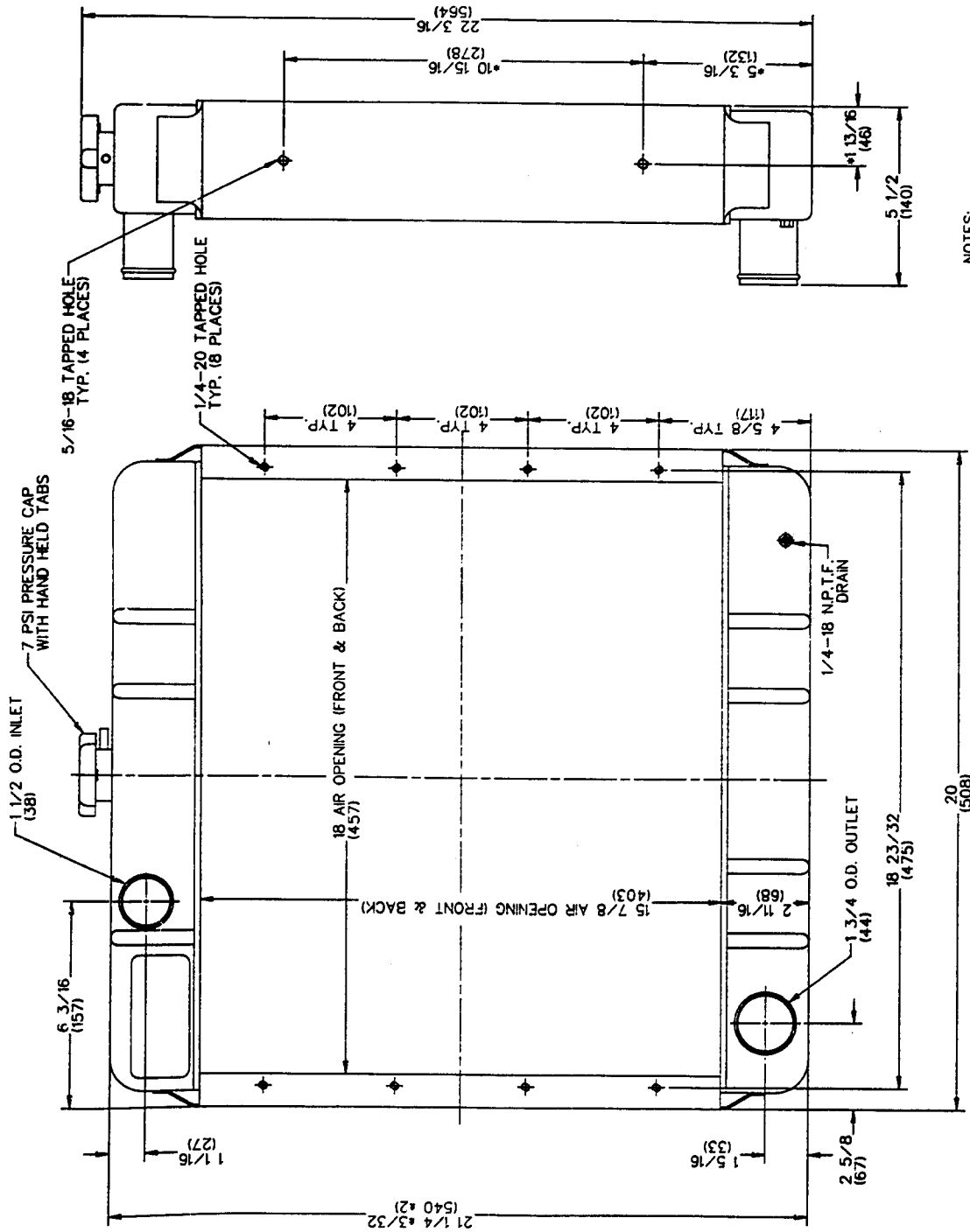


NOTES:
 MOTOR RATINGS 1 HP 1725 RPM 120/240 VOLT
 REQUIRED FOR 240 VAC CLOCKWISE ROTATION.
 * DENOTES MOUNTING BASE DIMENSIONS.

DIMENSIONS IN () ARE IN MILLIMETERS.

ADV-5522

12.5kW RV Radiator with Motor-Driven Blower Fan



NOTES:
 DESIGNED FOR 12 G.P.M. FLOW &
 1150 BTU/HR HEAT REFLECTION AT
 3000 C.F.M. & 0.4 P.S.I.G. OF
 S.P. TO ATTAIN AN A.T.B. OF 125° F.
 * DENOTES MOUNTING DIMENSIONS

DIMENSIONS IN Ø ARE IN MILLIMETERS.

12.5kW RV Radiator

SERVICING ORDERING INSTRUCTIONS

In any communications regarding your generator set, please include the MODEL, SPECIFICATION, SERIAL, and ENGINE SPEC numbers as found on the nameplate attached to the frame of the generator or engine block. Your Authorized Service Dealer will need these numbers to provide the correct parts and information for your generator set. Do not attempt to replace major items or any item that calls for special tools or procedures — have this done only by qualified Kohler Generator Specialists. Check the yellow pages of your telephone directory under the heading GENERATORS-ELECTRIC for Kohler Generator Service Dealers in your area.

Routine Service Parts

Your Kohler Generator Dealer has a complete listing of parts for your generator set. Contact them for service.

| Part Description | Kohler Part No. |
|----------------------|-----------------|
| Engine | |
| Element, Air Cleaner | 258646* |
| Filter, Lube Oil | 252834 |
| Filter, Fuel | 252765 |
| V-Belt | 252758 |
| Generator | |
| Brush | 239282 |
| Holder, Brush | 239247 |
| Spring, Brush | 238150 |
| Fuse, 8-A | 258405 |
| Controller | |
| Fuse, 10-A | 223316 |

*If Kohler supplied air cleaner

Service Manual Procurement

A service manual or parts catalog for your generator set may be obtained through your RV dealer or Kohler Generator Distributor. Record Model, Spec, Serial, and Engine Specification numbers (from generator set nameplate) in the spaces below.

Model No. _____

Spec. No. _____

Serial No. _____

Engine Spec No. _____

KOHLER CO., Kohler, Wisconsin 53044 U.S.A.
Phone 920-565-3381, Web site www.kohlergenerators.com
Fax 920-459-1646 (U.S.A. Sales), Fax 920-459-1614 (International)
For the nearest sales and service outlet in U.S.A. and Canada
Phone 1-800-544-2444

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POWER SYSTEMS

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PHONE 414-565-3381, TELEX 26888, FAX 414-565-3648

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