KOHLER CO. KOHLER, WISCONSIN 53044
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KOHLER GENERATORS

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7000 WATT
RV GENERATOR SET
MODELS: 7CM21

OIL FILTER
FRAM PH28A
A.C. DELCO PF56

OWNERS MANUAL

Table of Contents

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NOTES

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NOTES

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- CANYON MOTOR HOME - HEATH
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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 SPECIFICATION, SERIAL and MODEL numbers as

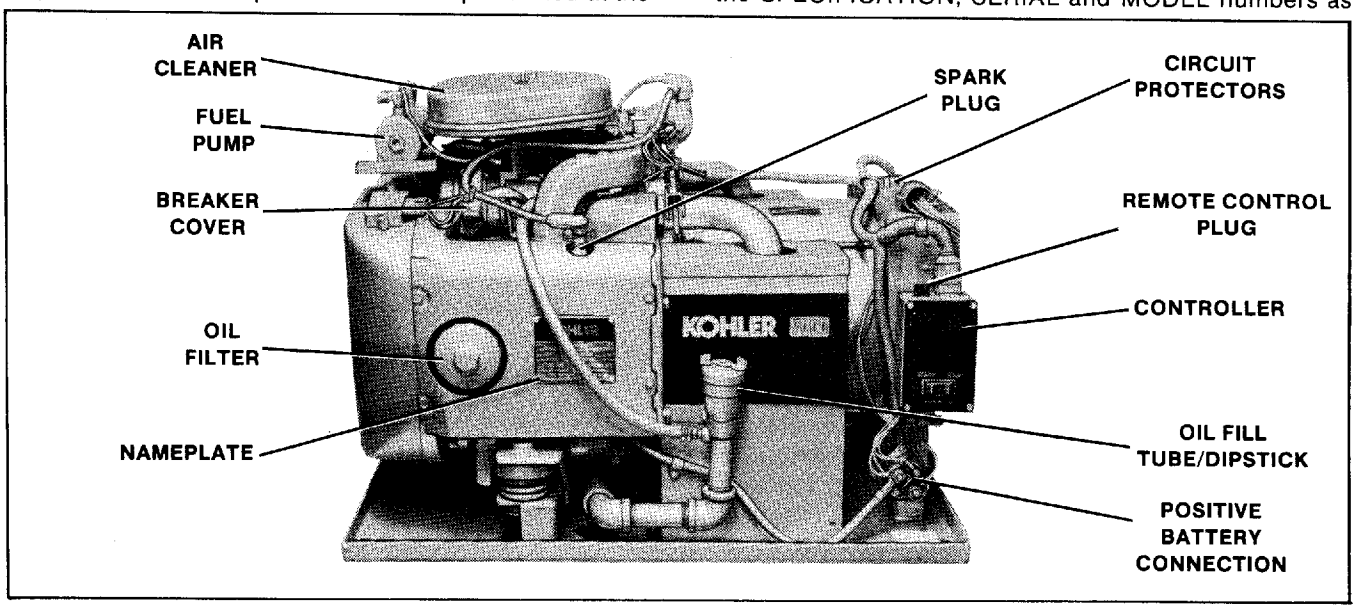

Figure 1a. Service Side View of a Kohler 7000 Watt Gasoline RV Generator Set

Operating Hour-Service Log

The following is provided to help you keep an accumulative record of operating hours on your generator set and the dates required services were performed. Enter hours to the nearest quarter hour.

DATE RUN	OPERATING HOURS		SERVICE RECORD	
	HOURS RUN	ACCUMULATIVE	DATE	SERVICE

DATE RUN	OPERATING HOURS		SERVICE RECORD	
	HOURS RUN	ACCUMULATIVE	DATE	SERVICE

Routine Service Parts

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

Part Description	Kohler Part No.
Air Intake	
Element, Air Cleaner	47 083 04
Cylinder Head	
Gasket, Head	48 052 01
Generator	
Brush	241624
Spring, Brush	238150
Holder, Brush	269367
Ignition System	
Breaker Points (Set)	4715001
Gasket, Breaker Cover	220174
Plug, Spark (RH10)	235041-S
Condenser	230722
Exhaust System	
Muffler	277726
Clamp, Spark Arrestor	237548
Spark Arrestor	277679
Clamp, Exhaust Tube	277707
Hanger	277725

Service Manual Procurement

A service manual for your generator set may be obtained through your RV dealer or Kohler Generator Distributor. State Model and Generator Specification number when ordering.

Model No. _____

Spec. No. _____

Serial No. _____

Engine Serial No. _____

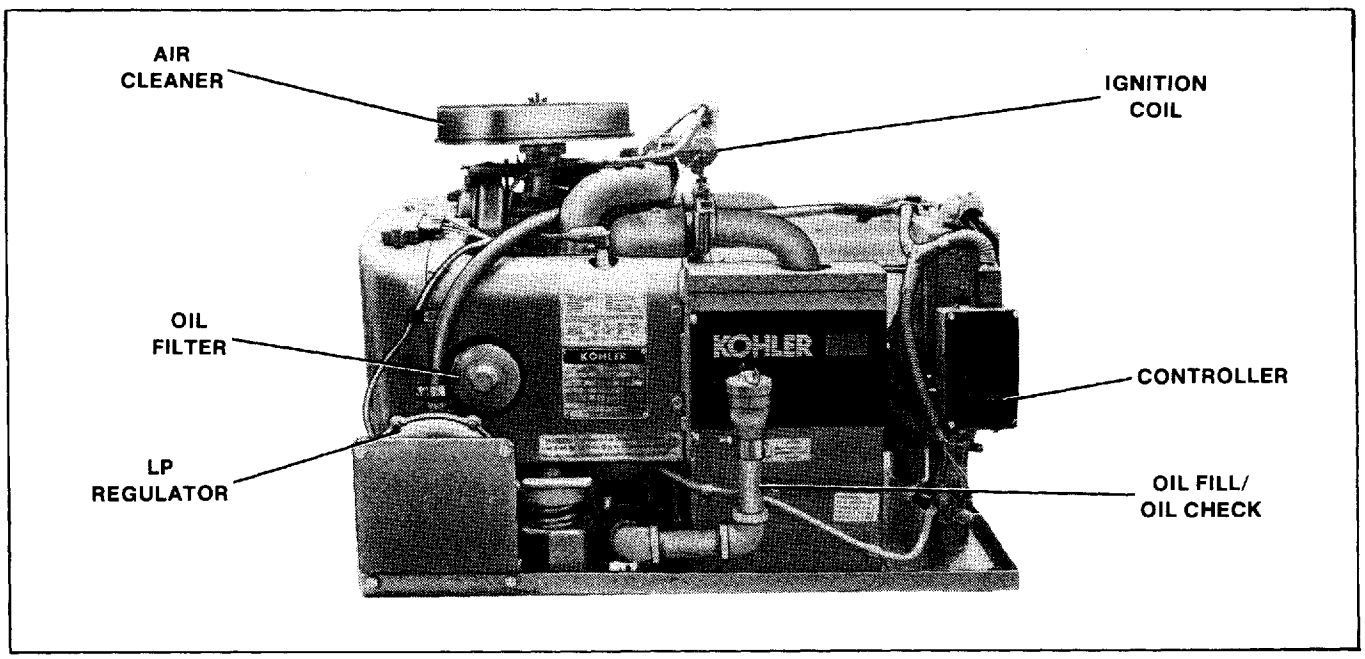

Figure 1b. Service View of 7000 Watt, LPG Powered RV Generator Set

found on the nameplate attached to the frame of the generator in the space provided on page 33. This information will enable your Kohler Generator Service Center to supply the correct part or data for your particular version. Keep this manual in your RV for future reference.

Safety Warnings

A Generator Set, like any other electro-mechanical device, contains potential dangers to life and limb if improperly maintained or imprudently operated. The best safeguards against accidents 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 operation of an RV Generator Set are presented below. Keep these in mind.

WARNING

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

WARNING

DANGEROUS FUELS! Use extreme caution when handling, storing and using fuels — all fuels are highly explosive in a vapor state. Store fuel in a well-ventilated area away from spark producing equipment and out of the reach of children. Never add fuel to the tank while the engine is running to prevent spilled fuel from igniting on contact with hot parts or from ignition spark. Keep fuel lines and connections tight and in good condition — don't replace flexible fuel lines with rigid lines. Flexible sections are used to avoid breakage due to vibration. Additional precautions should be taken when using the following fuels:

GASOLINE: Store gasoline only in approved red containers clearly marked GASOLINE. Don't store gasoline in any occupied building.

LPG: LPG fuels are highly explosive. Proper ventilation is imperative. Be aware these gases are heavier than air and tend to settle into low areas where even the slightest spark can cause explosion.

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 the set before placing it in storage.

STEP 1: Drain the oil from the crankcase (while hot) then flush with clean light weight oil. Refill crankcase with regular weight oil.

STEP 2: Drain the fuel from the carburetor bowl. The bowl can be removed by removing the bolt on the bottom. This is done to prevent the gasoline from becoming "stale" which results in formation of gum. Replace the bowl after draining the fuel.

STEP 3: Remove the spark plugs, pour about 1 tablespoon of oil into each hole, crank the engine several times then reinstall the spark plug.

STEP 4: Clean exterior surfaces of the generator set then spread a light film of oil over any unpainted metallic surfaces which could corrode.

Service Ordering Instructions

In any communications regarding your generator set, please report the MODEL, SPECIFICATION, SERIAL, and ENGINE SERIAL numbers as found on the nameplate attached to the frame of the generator or engine block. This information will enable your Kohler Generator Service Center to supply the correct part or data for your particular version.

Part numbers, other than the routine service items listed below, do not appear in this manual due to variations in this series of generator set models. 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 Centers in your area.

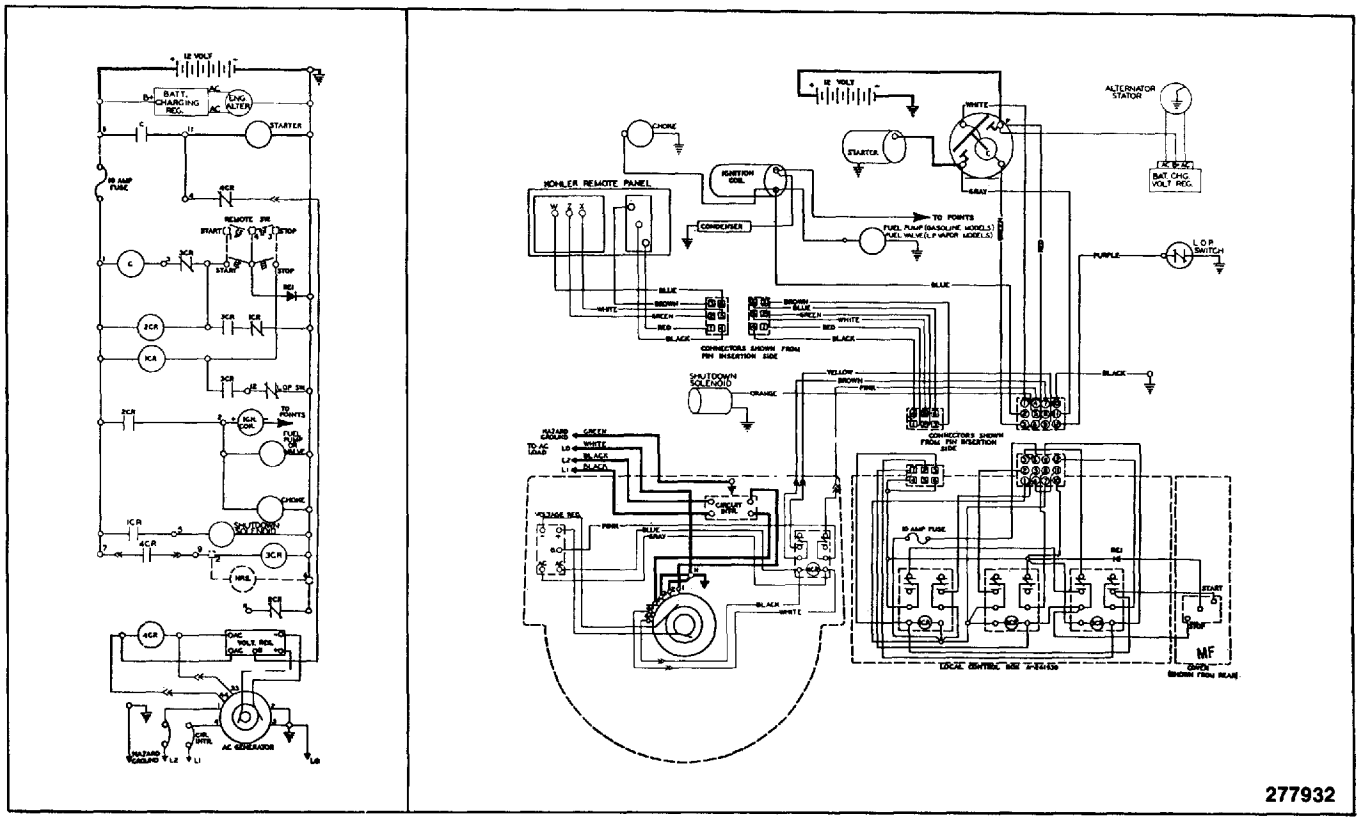

Figure 18. 120/240-Volt Wiring Diagram

WARNING

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

WARNING

DANGEROUS BATTERY GASES! The gases generated by a battery being charged are highly explosive. Do not smoke or permit flame or spark to occur near a battery at any time, particularly when it is being charged. Any compartment containing batteries should be well ventilated to prevent accumulation of explosive gases. To avoid sparks, do not disturb battery charger connections while battery is being charged and always turn charger off before disconnecting. Turn automotive test equipment off when connecting or removing battery clips. When removing or reconnecting battery cables, make sure ignition switch and all accessories are turned off.

General Precautions

CAUTION

Keep the compartment and generator set clean and free of debris to minimize chances of fire. Also remember that hot exhaust gases and exhaust system parts could start grass fires. Keep away from hot engine and generator parts to avoid burning yourself. Handle starting batteries carefully as they are filled with acid which can eat through clothing, burn skin and even cause blindness. Never operate the generator set without a battery in the system or damage to regulator and controller will result.

CAUTION

Welding on metal in common ground with the generator set may damage the Controller and battery charging regulator (if equipped). Before welding on any metal attached to the vehicle, disconnect the leads from the regulator and the harness plugs from the controller.

General Specifications

Engine

The 7000 watt RV generator set is powered by Kohler two cylinder model K582QS air-cooled, four-cycle gasoline engines. Some general specifications are listed below — refer to the appropriate service section in this manual for specific service details.

Lube Oil Capacity	4 U.S. quarts (3.8 lts.)*
Spark Plug Type	Champion RH10
Spark Plug Size	7/16" reach, 14 mm
Spark Plug Gap (Gasoline)	.025" (0.64 mm)
Spark Plug Gap (LPG)	.018" (0.45 mm)
Breaker Point Gap	.020" (0.51 mm)

*Additional 1/2 quart (0.47 lts.) required when oil filter is changed.

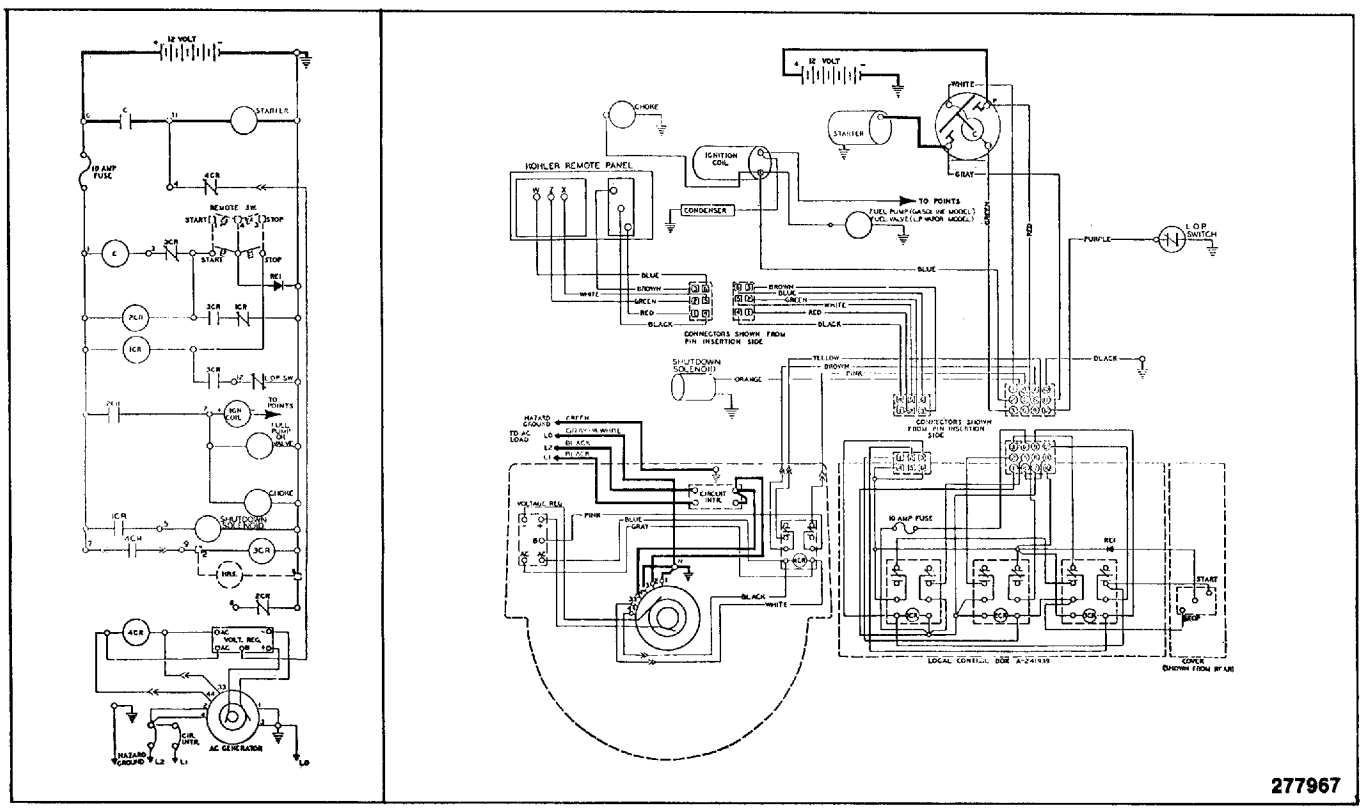

Figure 17. 120-Volt Wiring Diagram, Less Battery Charging

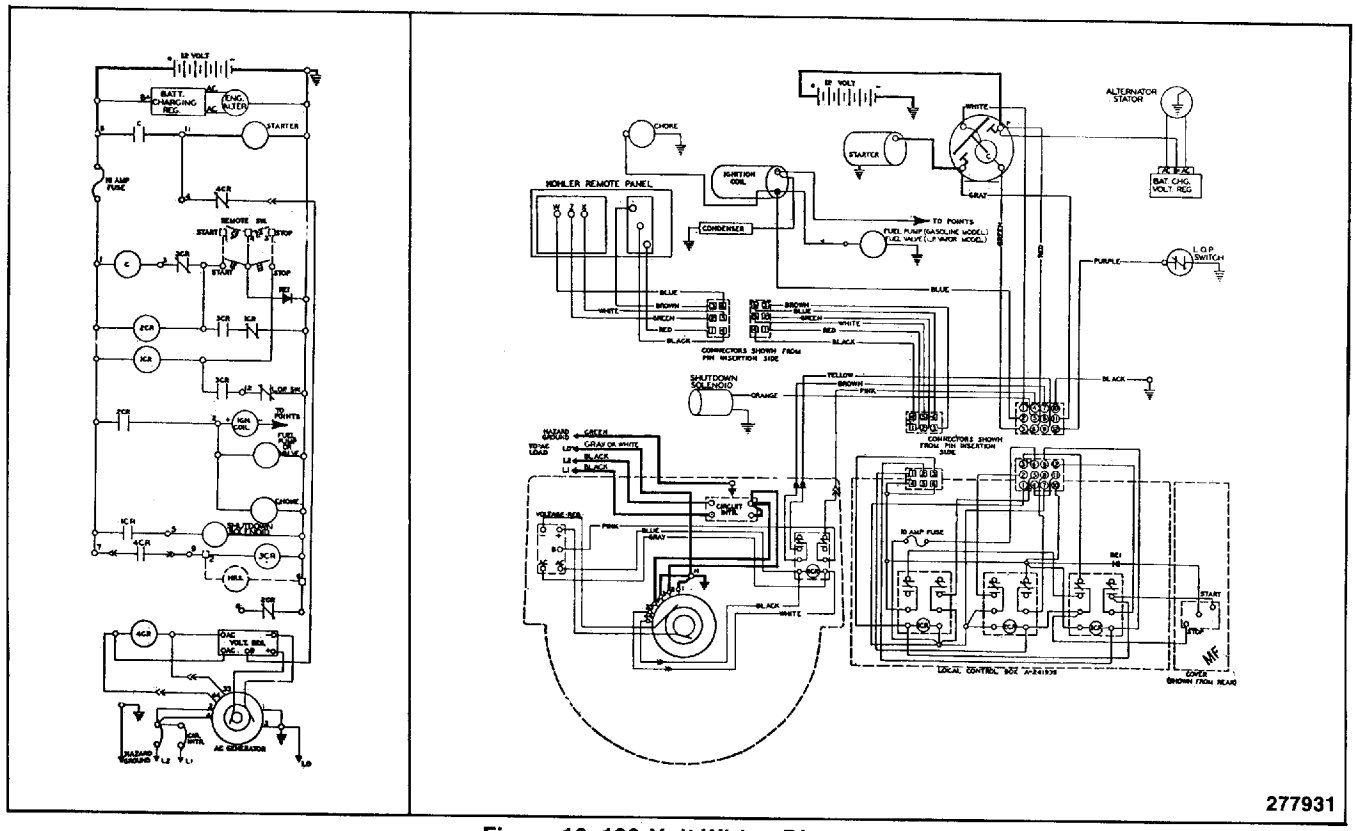

Figure 16. 120-Volt Wiring Diagram

Generator

Kohler designed and built rotating field 60 Hertz generators are direct connected to engine for permanent alignment. Generator features safeguard circuit protectors to protect generator against damage due to overload. The 7CM21-RV models, 7000 Watt, 120 Volt, 58 Amp Alternating current is produced.

Deration: The kilowatts of the generator set will decrease 3.5% for each 1000 feet (305 meters) above sea level, 1% for each 10° F (5.5° C) above 60° F (16° C) and 11.1% when converted to LP fuel.

Controller

The Kohler relay controller has a rocker type momentary contact START-STOP switch for test operating the set at the controller. Also included is a keyed connector for starting and stopping set at a remote switch located inside the vehicle. See Figure 1. The green GENERATOR ON lamp at the remote control panel will light whenever AC output is available from the generator. If the generator set has automatically stopped due to low oil pressure, the cause must be eliminated, before the set can be restarted.

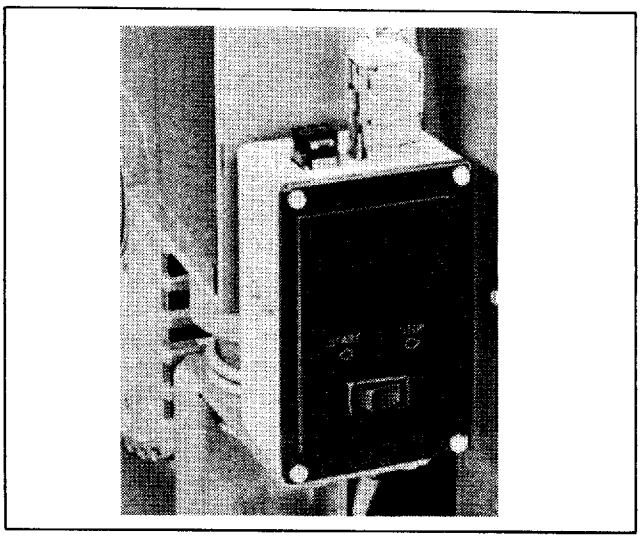

Figure 2. Controller

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).

AIR INLETS: Must be clear and unobstructed.

COMPARTMENT: Interior must be clean.

AIR CLEANER: Must be clean and properly installed.

AIR SHROUDING: Must be tight and in proper position.

EXHAUST: Tail pipe must be clear, muffler and piping tight and in good condition.

ELECTRICAL: All connections including battery must be tight.

Start-Stop Procedure

Move the START-STOP switch into the START position and hold in this position until the engine is running, then 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. If the flywheel ring gear is still rotating when the starter pinion gear is engaged, the pinion gear and ring gear will clash which may damage the ring gear teeth. Whenever possible, allow a brief cooling period by running the set at low or no load for a few minutes just prior to shut-down. 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.

Generator

PROBLEM	INDICATOR	POSSIBLE CAUSE — CORRECTIVE ACTION
No AC Output	● Green "ON" ● Green "ON" ● Green "ON"	● Circuit Protector in OFF position — reset to ON position. ● Circuit Protector tripping due to overload on generator set — reduce load (see Wattage Requirements) ● Short Circuit in RV circuit causing RV circuit protector to trip — Reset — if it trips repeatedly, stop set and contact RV service center.
No AC Output	● Green "OFF"	● General Malfunction such as sticking brushes, broken brush leads or other internal fault — contact generator service center for repairs.
Low Output or excessive drop in voltage		● Contact Service Center.
Set Stops Suddenly		● Out of Fuel: replenish fuel supply. ● Engine Malfunction: see Troubleshooting — Engine. ● Fuse blown due to short or failure in engine wiring — contact Service Center.

Engine - cont'd

PROBLEM	POSSIBLE CAUSE – CORRECTIVE ACTION
Stops Suddenly	• Out of fuel — replenish. • Air cleaner clogged — clean or replace element. • Faulty spark plug — clean and regap or replace. • Breaker points stuck — clean or replace.
Lacks Power	• Air cleaner clogged — clean or replace element. • Improper cooling — inspect cooling system. • Engine overloaded — reduce load. • Improper fuel — replace. • Battery weak — recharge or replace. • Faulty spark plug or points – clean or replace. • Carburetor adjustment wrong — adjust.
Operates Erratically	• Air cleaner clogged — clean or replace element. • Improper fuel — replace. • Faulty spark plug or breaker points — clean or replace. • Carburetor adjustment wrong — adjust.
Overheats	• Improper cooling — check intake and outlet openings. • Air cleaner clogged — clean or replace element. • Carburetor adjustment too rich — adjust. • Engine ignition timing — adjust.

Service

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 Center 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.

Service Schedule

DAILY (OR BEFORE EACH STARTUP)

Check oil level.

Check fuel supply.

Keep cooling air inlets and outlets clean.

Remove loose dirt from compartment.

EVERY 50 HOURS (OR 6 MONTHS, WHICHEVER OCCURS FIRST)

Change lube oil. See "Break-In Period Oil Recommendation" following.

Service air cleaner.

Service electric fuel pump filter.

Check electrolyte level in battery.

EVERY 100 HOURS (OR 8 MONTHS, WHICHEVER OCCURS FIRST)

Service spark plugs.

Replace lube oil filter.

Check and tighten electrical connections.

Check and tighten mounting bolts and vibro mounts.

Check generator brushes.

Replace air cleaner element.

Check breaker points.

EVERY 200 HOURS OR EVERY YEAR

"Tune up" at authorized service center.

Air Cleaner Service

The engine is equipped with a dry type air cleaner. Every 50 hours remove element and service by tapping element lightly against flat surface to dislodge loose surface dirt - do not clean in any liquid or blow out with compressed air as this will ruin filter material in element. Replace (with genuine Kohler replacement element only) after each 100 hours or, if good clean operating conditions are encountered, this can be extended up to 200 hours. See Figure 3.

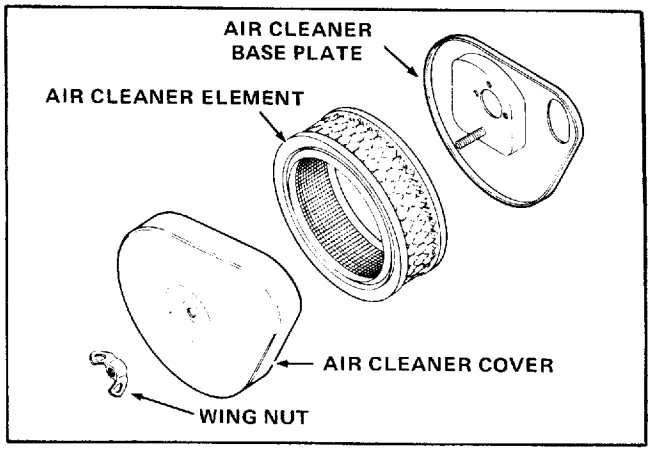

Figure 3. Air Cleaner Components

Lubrication

Your engine has a positive pressure lubrication system and low-oil pressure shut-down.

CAUTION

The low-oil pressure shut-down feature protects the engine against internal damage in the event the oil pressure drops too low due to oil pump fault or other malfunction - it does not protect against damage due to operating with the oil level below the safe range - it is not a low oil level shut-down. The only protection against running out of oil is to check the level regularly and to add oil as needed.

Troubleshooting

Engine

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 center. Tell the service center personnel exactly what happened when the problem occurred and any adjustments made to the set.

PROBLEM	POSSIBLE CAUSE – CORRECTIVE ACTION
Will Not Start	• In-line fuse blown — replace. • Out of fuel — replenish. • Clogged fuel filter — clean. • Air cleaner clogged — clean or replace element. • Stuck shut-down control plunger — correct.
Will Not Start (Continued)	• Battery improperly connected — check connections. • Faulty spark plug — clean and regap or replace. • Wrong spark plug — use resister type plug. • Breaker points stuck — clean or replace. • Choke adjustment wrong — adjust.
Hard Starting	• Improper fuel — replace. • Air cleaner clogged — clean or replace element. • Improper cooling — inspect cooling system. • Carburetor adjustment wrong — adjust. • Choke adjustment wrong — adjust. • Faulty spark plug — clean and regap or replace.

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 protector trip due to overload. A 7000 watt generator set will operate two 13,500 BTU air conditioners. The lighting load is easily determined by adding the watt 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 in 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 collector 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 Center to have this done.

Oil Check

To be on the safe side, check oil in engine crankcase daily or before each start to insure that the level is in the safe range between the L and F marks on dipstick. Do not operate set if level exceeds "F" mark or if below "L" mark. See Figure 4.

CAUTION

Do not check the oil level when the set is in operation - Engine must be stopped!

Break-In Period Oil Recommendation

Generator set engines are shipped "dry", the oil used in factory testing having been drained. Before operating a new set, the engine crankcase should be filled to specified capacity with a straight-weight, non-detergent oil having a viscosity appropriate for your particular climate. This oil should be drained immediately after the first five hours of operation, and replaced with the oil recommended for normal use. See "OIL TYPE".

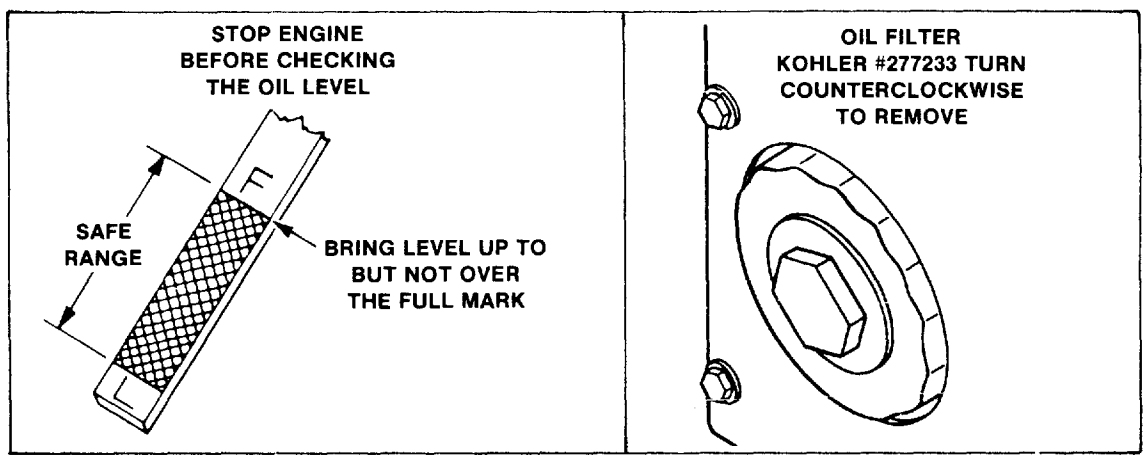

Figure 4. Lube Oil Level and Oil Filter Location

Oil Change

On a new engine change the oil after the first 5 hours of operation and thereafter at 50 hour intervals or every 6 months, whichever occurs first. Replace the oil filter at every oil change. Whenever possible, drain the oil while it is still warm. To drain, place a container below the unit, open the oil drain and allow sufficient time for the old oil to drain completely. If the filter is being replaced, use a 1" hex wrench and turn filter in counterclockwise direction to remove. After draining, close drain plug then install replacement filter if applicable. Before reinstalling replacement filter, apply a light coating of oil on the rubber seal at the base of the filter. Add new oil of proper weight and grade as specified under "OIL TYPE" following. After restarting, check the area around the filter for evidence of leakage - tighten filter if needed to stop leakage.

OIL REFILL CAPACITY:

4 U.S. Quarts (3.8 lts.)*

*Additional 1/2 quart (0.47 lts.) required when filter is replaced.

OIL TYPE:

Oils meeting the requirements of SAE service class SC, SD, SE and SF are recommended for use on the K582QS engine. Do not use synthetic oils during the first five hours of operation or the rings may not seat properly. Select oil viscosity based on the air temperature at the time of operation. Refer to the following chart. Oil capacity is 4 quarts (3.8 lts).

OIL SELECTION CHART

Air Temperature	Oil Viscosity
Above 32° F (0° C)	SAE 30
Below 32° F (0° C)	SAE 5W20 or 5W30

In-Line Fuse

A 10 amp fuse is mounted in-line between the controller and ignition coil. See the wiring diagram. It protects the controller in the event of a shorted or failed ignition coil, fuel pump, choke-heater, shut-down control or engine wiring.

NOTE

If the 10 amp in-line fuse is blown the engine will crank but not start. If the 10 amp fuse inside the controller is blown the engine will not crank. If either fuse blows while the engine is running, the set will stop.

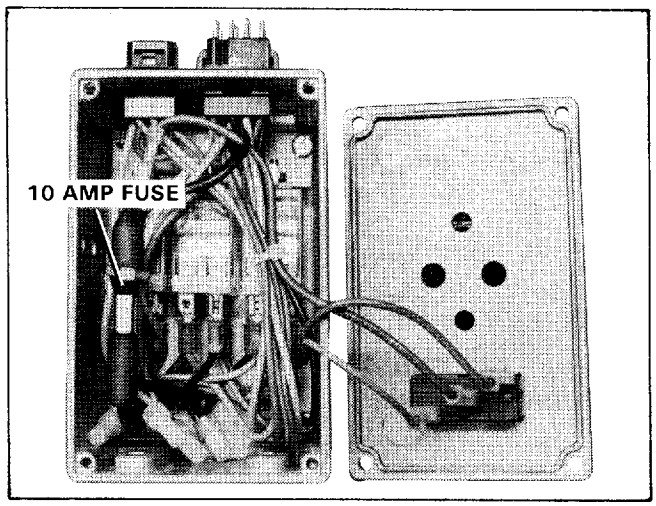

Figure 15. Fuse Location

Wattage Requirements

If the rated capacity of your generator is exceeded, the circuit protector (s) located on top of the generator end cover will trip to protect the generator against damage. See Figure 1. 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 protector(s) trip, the set will continue running but there will be no AC output to the protected circuit. Before resetting the protector(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 is done and the protector 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.

Valve Service

After each 500 (or sooner if a loose valve is detected), check clearance between the valve stems and tappets. The engine must be stopped and cooled to normal ambient temperatures to accurately gauge and adjust valve clearances. Use the following procedure to adjust.

1. Turn engine over until piston in #1 cylinder (closest to flywheel) is at Top Dead Center on compression - in this position, both valves WILL BE CLOSED and cam will have no effect on tappet.
2. Measure clearance between valve stem and tappet with a feeler gauge. To adjust, turn adjusting screw on tappet in or out until proper clearance is attained.

COLD CLEARANCE

INTAKE .008-.010" (0.203 mm-0.254 mm)

EXHAUST .017-.020" (0.432 mm-0.508 mm)

3. After adjusting valve tappet clearance on #1 cylinder, turn engine over until #2 cylinder is at TDC on compression and repeat adjustment on this cylinder.

Fuse Replacement

WARNING

Disconnect the battery before removing the cover of the controller.

Controller

There is one 10 amp fuse inside the relay controller. This fuse protects the controller against damage in the event a short develops in the wiring harness to the remote start-stop switch. See Figure 15. If this fuse "blows" the set will stop.

If the set has stopped due to causes other than lack of fuel, engine malfunction, or low oil pressure, remove the cover of the controller and check the fuse. If blown, replace the fuse then restart the generator set. If the fuse blows again, contact a Kohler Generator Service Center for assistance in locating and correcting the cause.

Cooling System Service

To prevent the inconvenience of having the generator set shut down due to overheating, keep the cooling air inlets to the compartment clean and unobstructed at all times (Figure 5).

Your generator set has a direct air cooling system. With this system, fins on the flywheel of the engine pull cooling air into the compartment through the air intake screen then forces it past the cooling fins on the engine and discharges the heated air downward and out of the compartment through the discharge duct. A fan on the rotor of the generator circulates cooling air through the generator.

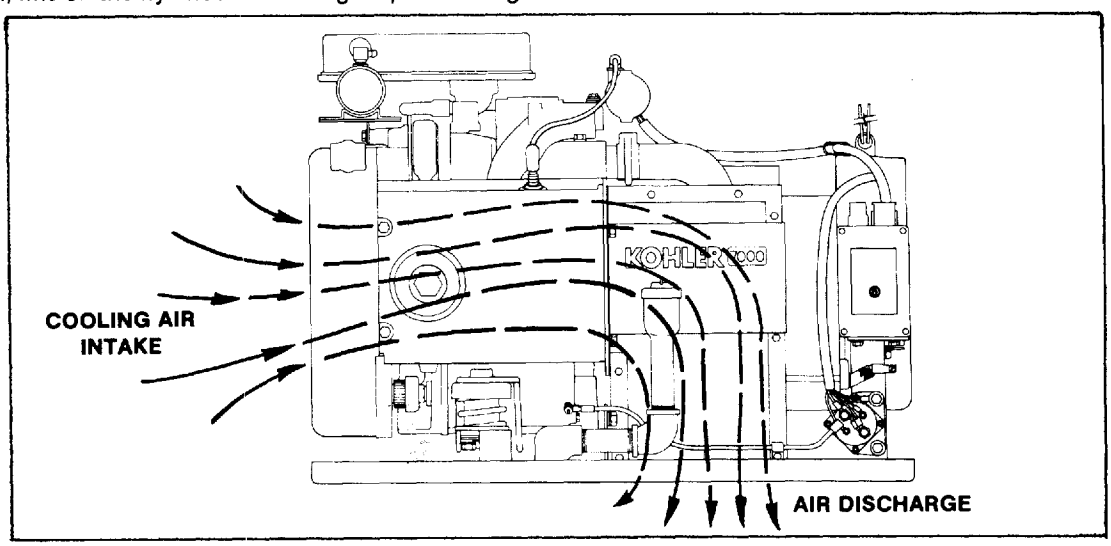

Figure 5. Cooling Air Circulation

Ignition System Service

Spark Plugs

Every 100 hours remove both spark plugs and check condition. Reset gap or replace plug if needed. Good operating conditions are indicated if plug has light coating of gray or tan deposit. A dead white, blistered coating could indicate overheating. A black (carbon) coating may indicate an "overrich" fuel mixture caused by clogged air cleaner or improper carburetor adjustment.

NOTE

Use straight weight oils as specified. Do not use multi-viscosity oils above 32° F as considerable increases in oil consumption and combustion deposits will result.

NOTE

Use only resistor type spark plugs. Set gap at 0.025" (0.64 mm) for gasoline powered and 0.018" (0.457 mm) for LP powered. Tighten plug to 18-22 ft. lbs. (2.5-3.0 kgm) when installing.

Breaker Points

WARNING

Disconnect the spark plugs before making adjustments to prevent unintentional starting.

Every 100 hours the breaker points should be inspected and serviced. If oxidized, dirty or oily, clean with coarse cloth - do not use emery cloth or sandpaper. Slightly pitted points can be dressed with a point file - replace badly pitted or burned points. The gap must be adjusted after points are serviced or replaced since this setting establishes ignition timing. Read the following procedure before beginning the adjustment.

1. Remove the spark plug leads to prevent unintentional starting.

2. Remove the breaker point cover. See Figure 1.

3. Flick the starter button to slowly turn the engine over while observing the breaker points. Rotate the engine until the points reach maximum opening. See Figure 6.

4. Measure the gap with a feeler gauge. The gap at full open should be 0.020 inch (0.51 mm). If not, loosen the point gap adjustment screw with an offset screwdriver. Adjust the gap to 0.020 inch by inserting a screwdriver blade in the adjusting notch and shifting the movable plate. See Figure 6. Securely tighten the adjusting screw after setting the gap.

Battery Service

Check the electrolyte level in the battery at frequent intervals and add distilled water as needed. To avoid unintentional starting while you are working on the set, disconnect the battery. Use a 12 volt battery with an amp hour rating of at least 55. A negative ground system is used. Battery connections are shown in Figure 1, and on the wiring diagram shown on page 29. Make sure battery is properly connected and terminals are tight.

Cylinder Head Service

After each 500 hours of operation, the cylinder heads should be taken off the engine and serviced. Remove carbon deposits from combustion chamber in head. Scrape and remove carbon with a sharp piece of wood - wood or similar material is suggested to avoid scratching aluminum surfaces of head. Always use new cylinder head gaskets, make sure head bolts are tightened in the proper sequence and to the torque value specified. See Figure 14.

NOTE

Under certain operating conditions, such as continued light load or relatively constant speed, carbon may build up much more rapidly. If there are early indications of this, such as heavy deposits of carbon on spark plug electrodes, service the heads much more frequently. 250 hour intervals are suggested under these conditions.

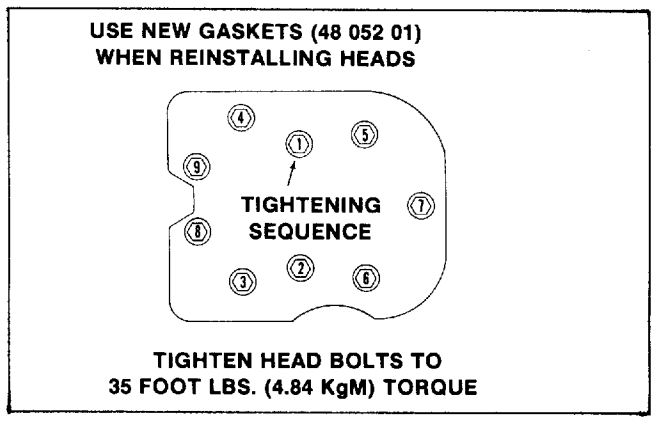

Figure 14. Cylinder Head Tightening

Governor Adjustments

Speed

With the Constant Speed type governor, the throttle shaft is fixed at a definite length to establish a specific full load speed of 1800 RPM. Any variation in speed causes frequency changes in output of the generator - for this reason, only slight readjustment of speed is possible. To increase speed, loosen the inside speed adjusting locking nut and tighten the outside nut to draw the eyebolt closer to the bracket - to decrease speed, loosen the outside nut and tighten the inside nut. After speed is correct, tighten the nut that was loosened to lock the eyebolt at the new setting.

Sensitivity

If the governor is too sensitive, speed surging will occur with change in load. If a big drop in speed occurs when normal load is applied, the governor should be set for greater sensitivity. Sensitivity is changed by repositioning the sensitivity adjusting eyebolt as shown in Figures 8, 9 and 13. To make governor control more sensitive, loosen the upper nut and tighten the lower nut to force the eyebolt downward. To make control less sensitive, draw the eyebolt upward by loosening the lower nut and tightening the upper nut. Recheck speed after making sensitivity adjustment. Retighten nut that was loosened to lock eyebolt at the new setting.

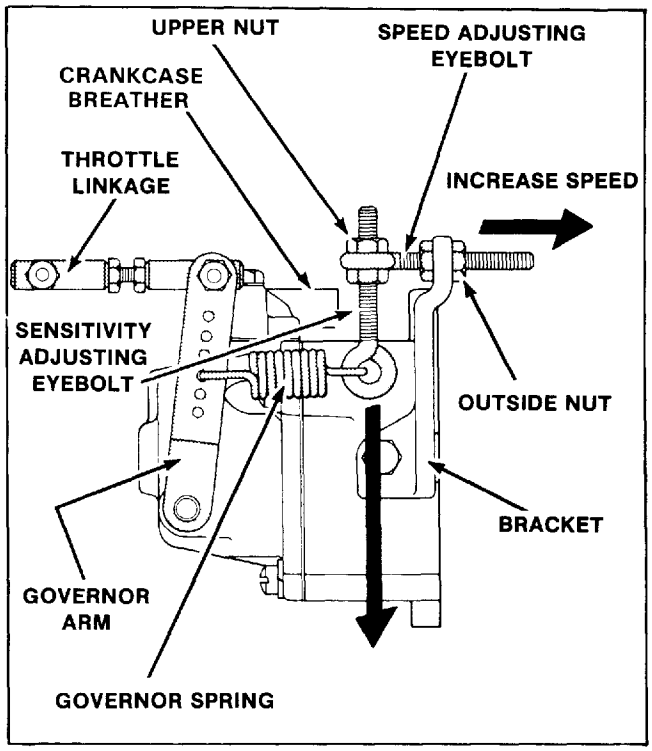

Figure 13. Governor Components and Adjustments

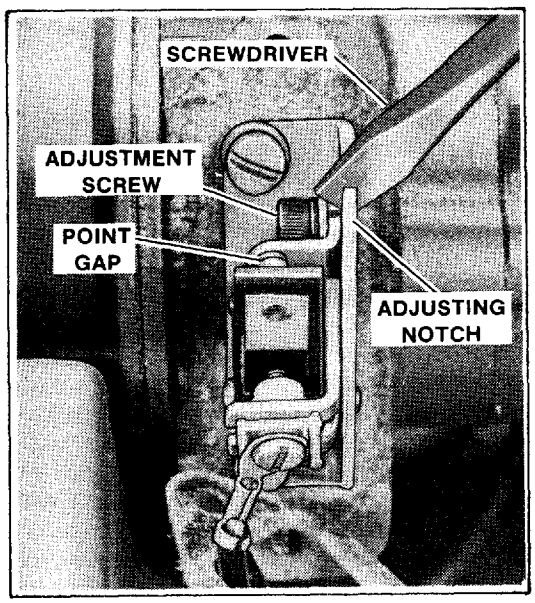

Figure 6. Breaker Point Gap Adjustment

5. Replace the breaker point cover.
6. Reconnect the spark plug leads.
7. Follow up with the final or precision adjustment using a timing light.

Ignition Timing

The governor includes an automatic spark advance retard mechanism. Retard is 8° BTDC while the advance point is 27° BTDC. Timing is changed by shifting position of the governor. FINAL TIMING IS MADE WITH A TIMING LIGHT AND SHOULD BE DONE BY QUALIFIED SERVICE SPECIALIST ONLY - THE FOLLOWING IS OFFERED AS A GUIDE TO THE SPECIALIST. Set breaker point gap per the foregoing then connect timing light leads per instructions included with light - timing is made on the #1 cylinder. Before starting, rotate engine until "SP" mark is observed in timing sight hole - chalk mark the line for easy reading. Start engine and operate at 1800 RPM. Aim timing light into sight hole - light should flash just as "SP" mark is centered in sight hole. If light flashes before mark is centered, timing is overadvanced. If light flashes after mark is centered, timing is retarded. To adjust, loosen (do not remove) governor flange mounting capscrews and shift or rotate until timing mark is exactly centered as light flashes. Retighten flange mounting screws after exact timing is achieved.

Gasoline Fuel Specifications and Service

Gasoline Fuel Specifications

Use a good quality regular grade of gasoline with a pump sticker rating of at least 85 octane (90 octane-research method). Low lead or nonleaded gasoline is recommended as this helps keep combustion chamber deposits at a minimum. Do not use gasohol or valve and carburetor damage will occur. Oil must not be mixed with the fuel. Avoid using gasoline that is not fresh as stale fuel will cause gum deposits to form in the carburetor. Add fuel stabilizers if the gasoline will remain in the tank for several months, such additives are only a help, gasoline should never be stored for more than six months.

Gasoline Fuel Filter Service

The electric fuel pump (Figure 7) has a built-in filter which should be cleaned every 50 hours of operation. Remove the pump cover to remove the filter. Swish the filter in cleaning solvent or in fresh clean gasoline. If a filter is attached in the fuel line, clean the element every 50 hours.

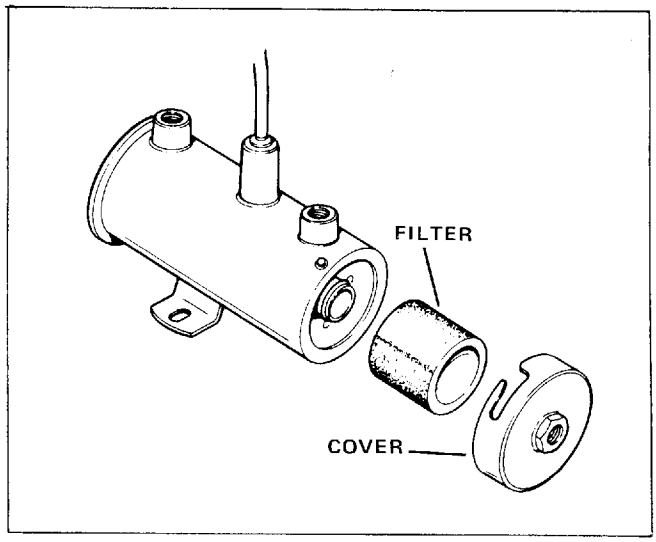

Figure 7. Electric Fuel Pump

LP Carburetor Adjustments

The LP fuel system consists of a fuel valve, regulator and carburetor. To locate adjustment screws, refer to Figure 12.

Main Fuel Adjustment

Turn the main fuel adjustment screw in until it bottoms lightly. From the closed position back the screw out 2-1/4 turns. Minor adjustments may have to be made to achieve full power.

Idle Fuel Adjustment

The idle adjustment screw is closed at all times.

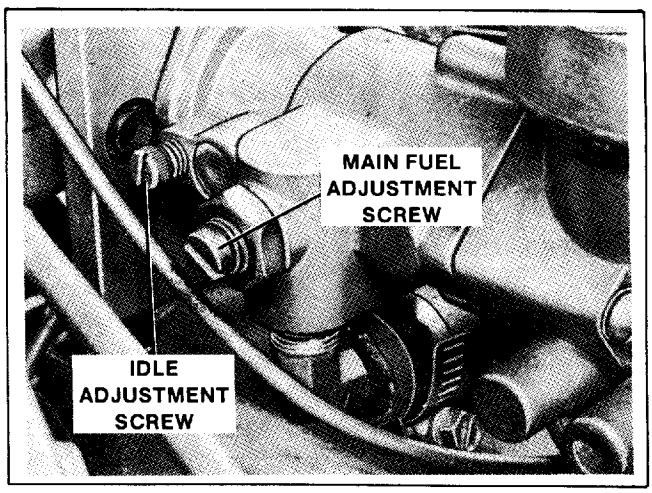

Figure 12. LPG Carburetor Adjustments

Choke Adjustment

A Kohler Thermo-electric automatic choke is used to enrich the fuel mixture during starting. Whenever the start-stop switch is moved into the start position, battery current flows to coils inside the choke which draws the choke plate into the closed position. As the engine warms, the coils allow the choke plate to open. If readjustment is needed, loosen the two screws securing the choke bracket to the carburetor and shift the position of the choke assembly (see Figure 11). When properly set, the choke plate will be within 5 to 10 degrees of full open at approximately 70° F (21° C).

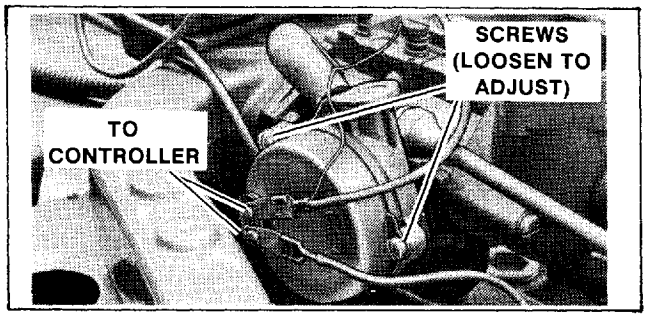

Figure 11. Automatic Choke

Gasoline Carburetor Adjustments

WARNING

When making carburetor adjustments with the air cleaner removed, keep face and hands well away from carburetor air intake opening. Engine backfire could inflict serious burns.

Lack of power and black sooty exhaust smoke usually indicate that the fuel mixture is too rich. An overrich mixture may be caused by a clogged air cleaner or improperly adjusted choke. Always check the air cleaner before readjusting the choke or carburetor. If the engine skips (misses) or backfires, the fuel mixture may be too lean. To locate adjustment screws refer to Figures 8 and 9.

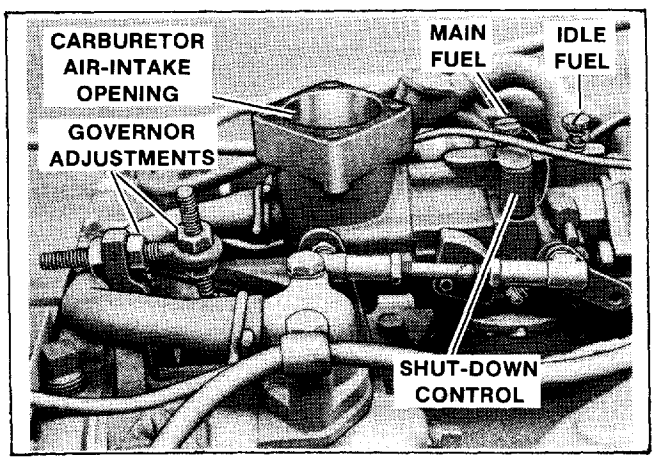

Figure 8. Carburetor and Governor Adjustments with Fuel Shut-Down Solenoid

Main Fuel Mixture

For preliminary setting turn the MAIN FUEL screw in clockwise direction until it bottoms lightly (do not force) then back out two turns. With the engine thoroughly

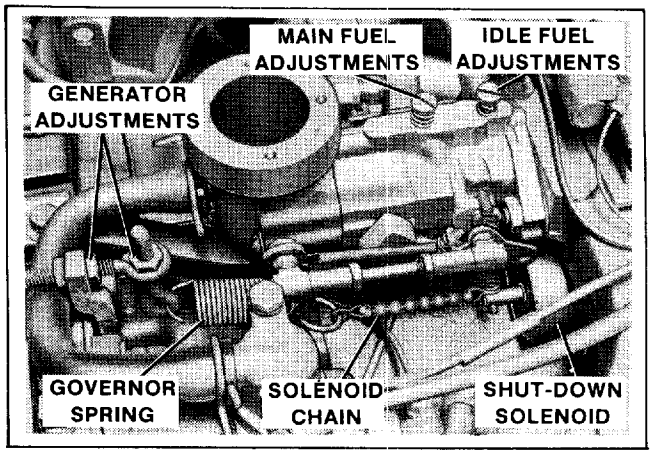

Figure 9. Carburetor and Governor Adjustments with Air Shut-down Solenoid

warmed up and running at rated RPM under full load, turn MAIN FUEL screw in until the engine slows down (lean setting) then turn screw out until the engine regains speed and then starts to slow down (overrich setting). Turn the screw back in until it is positioned halfway between lean and overrich settings. When properly adjusted, the engine will operate with steady governor action.

Idle Fuel Mixture

The idle fuel adjustment screw is set 1-1/4 turns out.

Shut-Down Control

Air Shut-Off Solenoid

The shut-down control pictured in Figure 9 is an anti-dieseling system. This system involves a newly designed carburetor, governor, and shut-down solenoid. When the controller switch is moved to the stop position, the shut-down solenoid is immediately activated, closing the carburetor butterfly valve shutting off the air flow. If any adjustments are necessary, contact your local Kohler Dealer or Distributor.

Fuel Shut-Down Solenoid

After running with a heavy load, engines tend to continue running (diesel) after the switch is moved to the stop position. To prevent this, the carburetor on your engine is equipped with a shut-down control (Figure 8) which stops all flow of fuel when the switch is moved to the stop position. When the engine is running, battery current through the solenoid attracts and holds a plunger (Figure 10). When the switch is moved to the stop position, the solenoid de-energizes and releases the plunger into a porting in the carburetor to equalize pressure and stop all flow of fuel. Should the solenoid fail, fuel cannot flow and the set will not run. As a temporary fix, the plunger can be removed until the solenoid is replaced. To remove, turn the main fuel screw out far enough to shift the solenoid retaining bracket. Lift the solenoid and remove the plunger. Reinstall the solenoid and retaining bracket. The retaining bracket is the ground connection for the solenoid, therefore it is important that a good metal to metal contact exists between the bracket and the carburetor. Turn the main fuel screw in until it bottoms lightly (do not force) then back out two full turns.

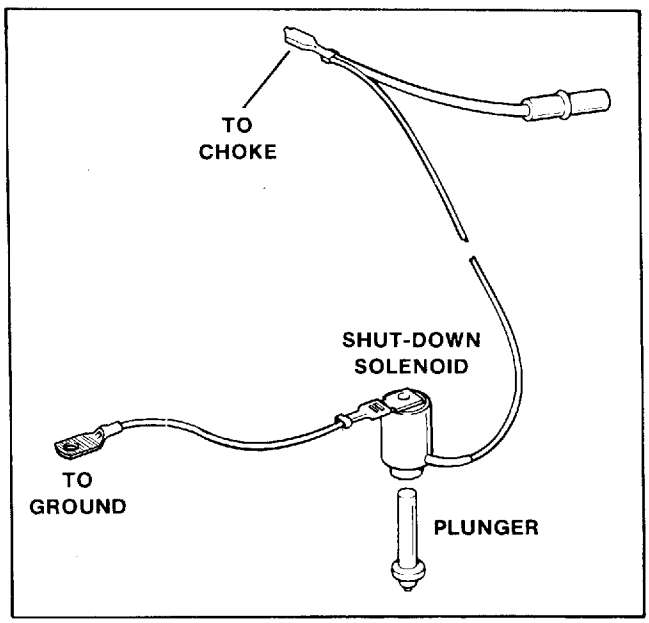

Figure 10. Shut-Down Control