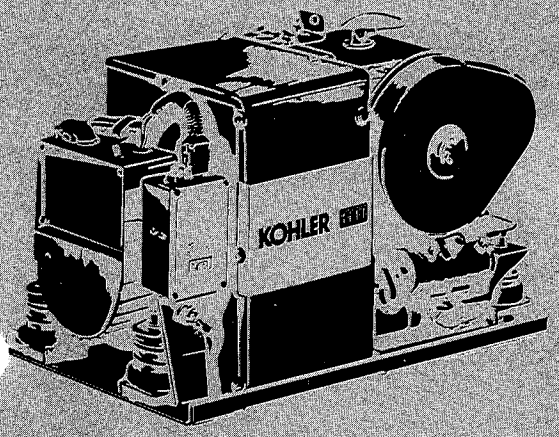
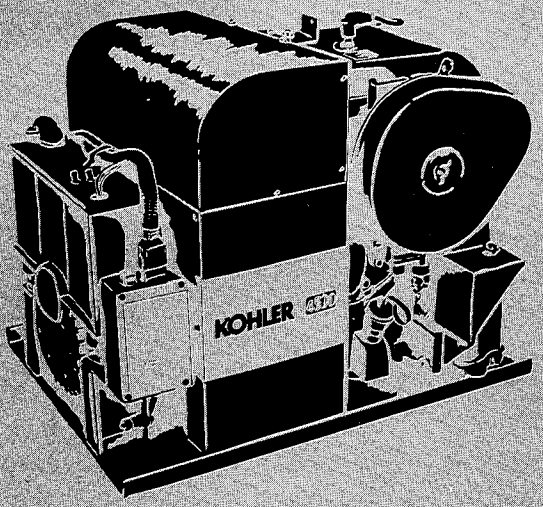
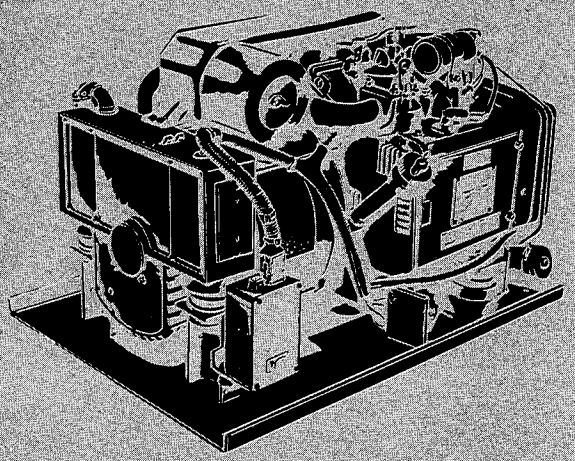
KOHLER GENERATORS

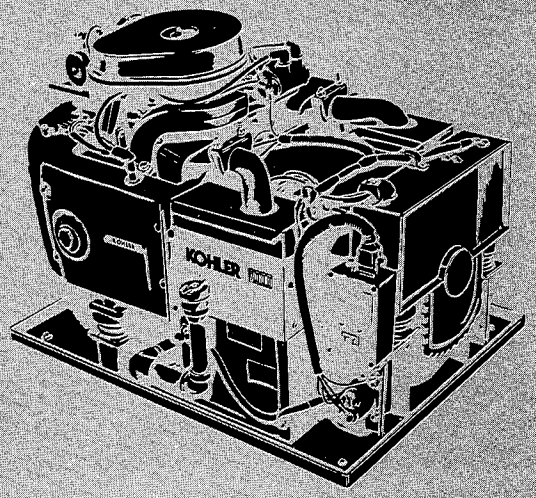
RV GENERATOR SETS

3.5RV
4.5RV
4.5RV
(Twin)
7RV









INSTALLATION MANUAL

Table of Contents

Safety Precautions

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

⚠ WARNING

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

⚠ WARNING

FLASH FIRE! A sudden flash fire can cause serious burns. To avoid the possibility of a flash fire, do not smoke or permit flame or spark to occur near carburetor, fuel line, fuel filter, fuel pump, or other potential sources of spilled fuel or fuel vapors.

⚠ WARNING

BACKFIRE! A sudden backfire can cause serious burns. Keep hands and face away from the carburetor when the air cleaner is removed.

⚠ WARNING

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

Propane (LP)—Adequate ventilation is mandatory. Propane is heavier than air; install gas detectors low in room. Inspect detectors often.

⚠ WARNING

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

⚠ WARNING

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

⚠ WARNING

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

⚠ WARNING

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

⚠ WARNING

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

⚠ WARNING

FIRE HAZARD! 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.

⚠ WARNING

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

⚠ WARNING

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

⚠ WARNING

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

⚠ WARNING

PRESSURIZATION! After all LP-Gas connections have been completed, the entire system shall be test pressurized to 6-8 ounces (10-14 inches water column).

⚠ WARNING

EXPLOSION! RV Generator Sets do not comply with United Stated Coast Guard requirements and must not be used for marine applications. USCG regulation 33CFR183 requires a generator set to be "ignition protected" when used in a gasoline-fueled environment.

⚠ WARNING

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

⚠ WARNING

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

⚠ WARNING

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

Introduction

The 60 Hz Kohler RV Generator Set models covered in this guidebook have been Underwriter's Laboratories (UL) listed. Generator sets certified by Canadian Standards Association (CSA) are indicated by an asterisk in the chart below. To continue to meet the prescribed standards, each generator set must be properly installed and maintained. Use this publication as a guide when installing a generator set in the recreational vehicle, then refer to the owner's manual for specific service instructions. Use this manual as a guide when installing your RV generator in your recreational vehicle. This installation must comply with CURRENT standards of (1) ANSI/RVIA EGS–1, (2) ANSI A 119.2/NFPA 501C and (3) applicable articles of ANSI/NFPA 70, National Electrical Code. Generator set installation must also comply with state and local requirements.

NOTE

Only 60 Hz models are UL listed.

⚠ WARNING

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

General Information

This publication covers the ten Kohler RV Generator Set Models listed below. Differences are pointed out wherever pertinent to installation throughout the manual. To determine which model is involved, check the details found on the nameplate attached to the frame of the generator being installed. Follow the instructions for that specific model to insure proper installation. The following models are covered in this manual.

Model No.	Engine No.	Volts	Hz	kW	Phase
3.5CM21-RV*	K181QS	120	60	3.5	1
3.5CFM61-RV	K181QS	120/240	50	3.5	1
4.5CM21-RV*	K341QS	120	60	4.5	1
4.5CFM61-RV	K341QS	120/240	50	4.5	1
4.5CKM21-RV*	KT17	120	60	4.5	1
4.5CKM61-RV*	KT17	120/240	60	4.5	1
4.5CFKM61-RV	KT17	120/240	50	4.5	1
7CM21-RV*	K582QS	120	60	7.0	1
7CM61-RV*	K582QS	120/240	60	7.0	1
7CFM61-RV	K582QS	120/240	50	7.0	1

*Indicates CSA Certified for Recreational Vehicles

Features

All feature Kohler designed and built 4-cycle air-cooled gasoline engines, rotating field Alternating Current generators and Relay Controllers. Each generator direct-connects to the Kohler "Quiet" engine for permanent alignment. Permanent magnet type starting motors are used to crank the engine during startup. Each Controller includes a START-STOP switch for test operating the set at the controller. The controller also has a keyed connector on top for connecting a wiring harness to a start-stop switch located remote from the set usually on the dashboard inside the vehicle. All Kohler RV Sets are mounted on a steel drip pan type mounting tray for quick installation to the frame of the vehicle. After the set is attached to the frame, all that's usually required to get it operational is to connect fuel line, remote switch, load leads, battery terminals, exhaust system, and add oil as needed to the crankcase to bring the level up to the Full mark. Following are some general specifications on all RV models.

Specifications	MODEL				
	3.5 kW	4.5 kW Single Cyl	4.5 kW Twin Cyl. KT17 Series I	4.5 kW Twin Cyl. KT17 Series II	7 kW
Weight (approximate)	146 lbs. (66.2 kg)	250 lbs. (113.4 kg)	240 lbs. (108.9 kg)	235 lbs. (106.6 kg)	350 lbs. (158.8 kg)
Length - Overall	22" (56 cm)	23-13/16" (60.5 cm)	28-5/16" (71.9 cm)	28-5/16" (71.9 cm)	27-1/2" (70 cm)
Width - Overall	13-3/4" (35 cm)	18-3/16" (46 cm)	20-3/4" (52.7 cm)	20-3/4" (51.8 cm)	21-1/2" (54.6 cm)
Height - Overall	15-3/4" (40 cm)	19-1/16" (48.3 cm)	17-9/16" (44.6 cm)	18-1/8" (44.6 cm)	20-3/8" (51 cm)
All Requirements - Total	376 CFM (1064 CMM)	396 CFM (1121 CMM)	417 CFM (1181 CMM)	417 CFM (1181 CMM)	675 CFM (1911 CMM)
Fuel Inlet Connection Size—Gasoline	1/4" I.D. (6.4 mm)	1/4" I.D. (6.4 mm)	1/4" I.D. (6.4 mm)	1/4" I.D. (6.4 mm)	1/4" I.D. (6.4 mm)
Fuel Consumption at Rated Load—Gasoline (gal. per hr.)	.74 (2.8 L)	.92 (3.5 L)	.80 (3.0 L)	.80 (3.0 L)	1.08 (4.1 L)
Battery Voltage	12V	12V	12V	12V	12V
Battery Amp Hr. Minimum	55	55	55	55	55
Battery Ground	Negative	Negative	Negative	Negative	Negative
Battery Cranking Current	40 Amps	76 Amps	76 Amps	76 Amps	97 Amps
Battery Charging Current	15 Amps	15 Amps	4 Amps	4 Amps	7 Amps

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 pre-planning the installation, the following factors must be considered.

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. **FUEL SYSTEM:** Is the system properly designed to prevent fuel starvation of either the main engine or generator set engine?
6. **EXHAUST SYSTEM:** Will the system meet all safety requirements after installation?
7. **ELECTRICAL CONNECTIONS:** Can all systems, battery, load, and remote switch be connected to be compatible with the vehicle systems?

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 startup. The "in-rush" or starting current may be 2-3 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 load 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 on page 4 - use this as a guide when selecting generator set capacity requirements involving motor loads. See the table below for general 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.

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 given in the chart below.

KILOWATT DERATING: The maximum kilowatt curve shows the performance of laboratory sets equipped with quiet-type muffler, corrected to sea level barometer and temperature of 60° Fahrenheit (16° Celsius). Kilowatt decreases 3-1/2% for each 1000 feet (305 meters) above sea level, and 1% for each 10°F (5.5°C) above 60°F (16°C).

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

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

Kohler Model	Wattage Capacity	Will Operate Air-Conditioner(s) of Size Indicated
3.5 kW	3,500	One 13,500 BTU
4.5 kW	4,500	One 13,500 BTU or Two 11,000 BTU
7. kW	7,000	Two 13,500 BTU

NOTE

Deration: The kilowatts of the generator set will decrease 3.5% for each 1,000 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 gas.

Compartment Size

When planning compartment size requirements, allow the minimum clearances for cooling of the generator set as shown in Minimum Clearance Table below.

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. Also, the clearance between the top of the spark plug and top of the compartment will permit easy removal of the spark plug on the single cylinder models.

Minimum Clearance Requirements

Front	1-1/2" (38.1 mm)
Side	1-1/2" (38.1 mm)
*Top	1-1/2" (38.1 mm)
Rear	1" (25.4 mm)

*Top minimum for spark plug removal 2" (50.8 mm).

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 1. Also keep in mind that the compartment door must have air intake openings having a free area of equal to or greater than that specified under "Air Requirements" following.

Make sure that the compartment is vapor tight and competely sealed off from the inside of the vehicle to prevent exhaust or other fumes from entering the vehicle. Line the compartment with a good sound deadening material. The material selected must be fireproof or highly resistant to fire. A recently introduced 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 or asbestos with heat barrier, have also been used successfully in mobile installations.

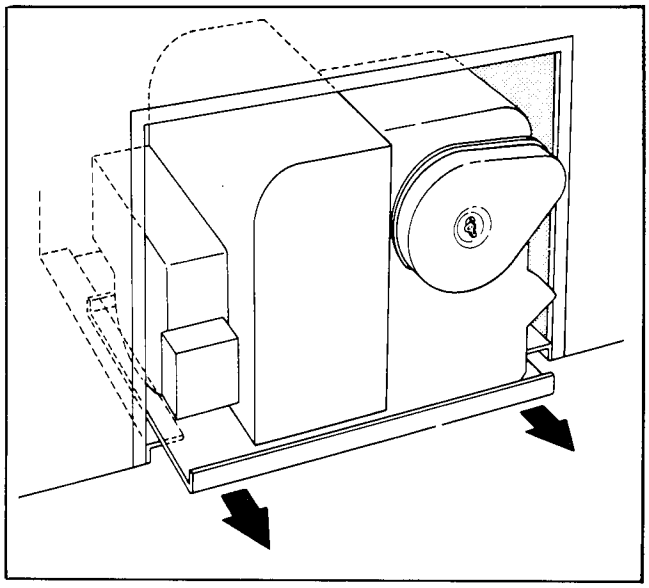


Figure 1. Slide Tray Feature for Complete Removal

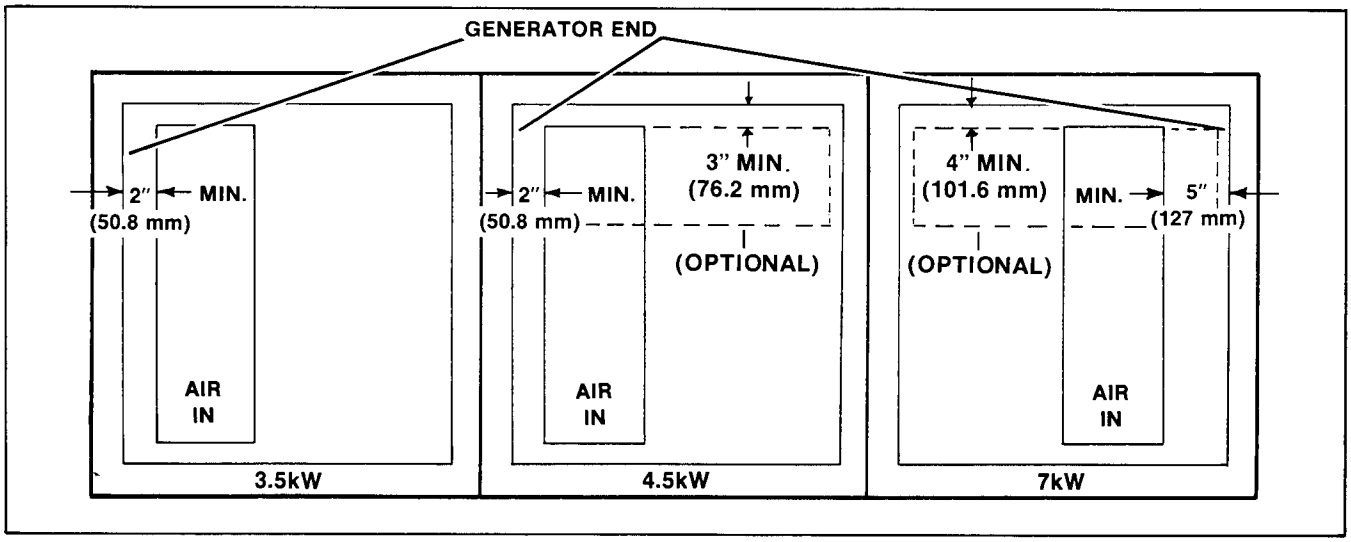


Figure 2. Screen Positions for Compartment Doors

Air Requirements

These generator sets feature direct air cooling systems. Fins on the flywheel of the engine pull cooling air into the compartment through the air intake screen at the front of the engine and force the air past cooling fins on cylinders and heads, and discharges the heated air downward, and out of the compartment through the discharge chute. A fan on the rotor of the generator circulates cooling air through the generator and into the discharge chute. Exhaust tubing from the engine is located inside this discharge chute. See Figure 3.

Each engine is equipped with a high temperature cutout which will automatically shut down the set in the event operating temperatures climb too high. To prevent automatic shutdown, make sure the compartment openings are large enough to allow adequate circulation of cooling air. The minimum *free air* openings in the compartment door are listed for each model below. Screen positions for compartment doors are shown in Figure 2. Remember, louvers, screens, and protective-decorative grill work definitely restrict the amount of air available. Even a simple, relatively open mesh screen as seen in Figure 4 will restrict air flow as much as 45%. The intake opening must be increased to compensate for such restrictions.

NOTE

If the generator set compartment is constructed with a floor below the set mounting tray, openings must be cut in the floor to allow cooling air discharge and oil drainage. Remaining floor should be closed off to prevent recirculation of hot air which could cause overheating of the generator sets. See Figures 5 through 8 for discharge opening dimensions for particular models.

Minimum Free Air Inlet Openings

Model	3.5kW	4.5kW Single Cyl.	4.5kW Twin Cyl.	7kW
Opening	80 sq. in. (516 sq. cm)	100 sq. in. (645 sq. cm)	100 sq. in. (645 sq. cm)	*120 sq. in. (774 sq. cm)

*NOTE: For horizontal opening, minimum opening required is 135 sq. in. (871 sq. cm).

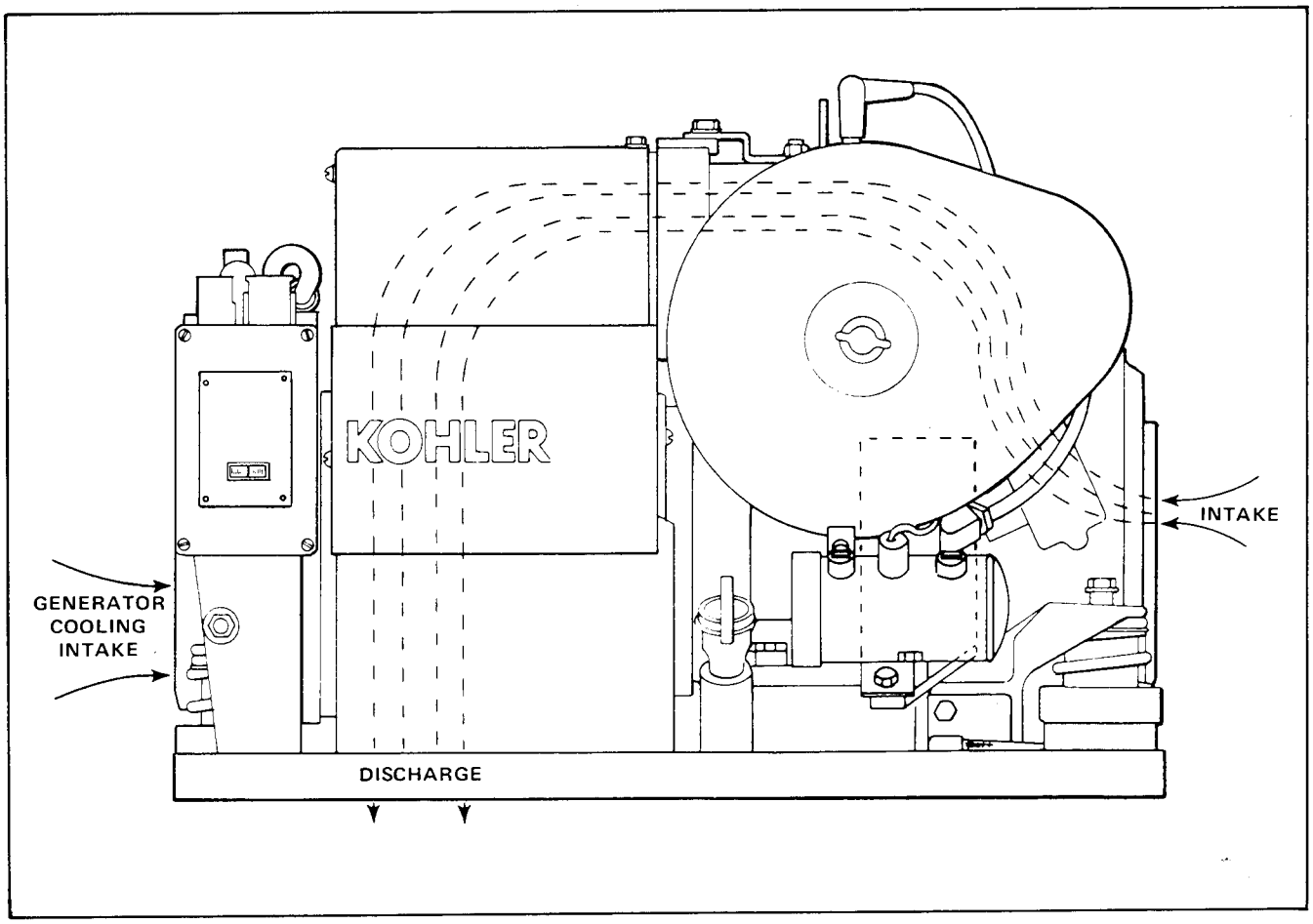


Figure 3. Cooling Air Circulation

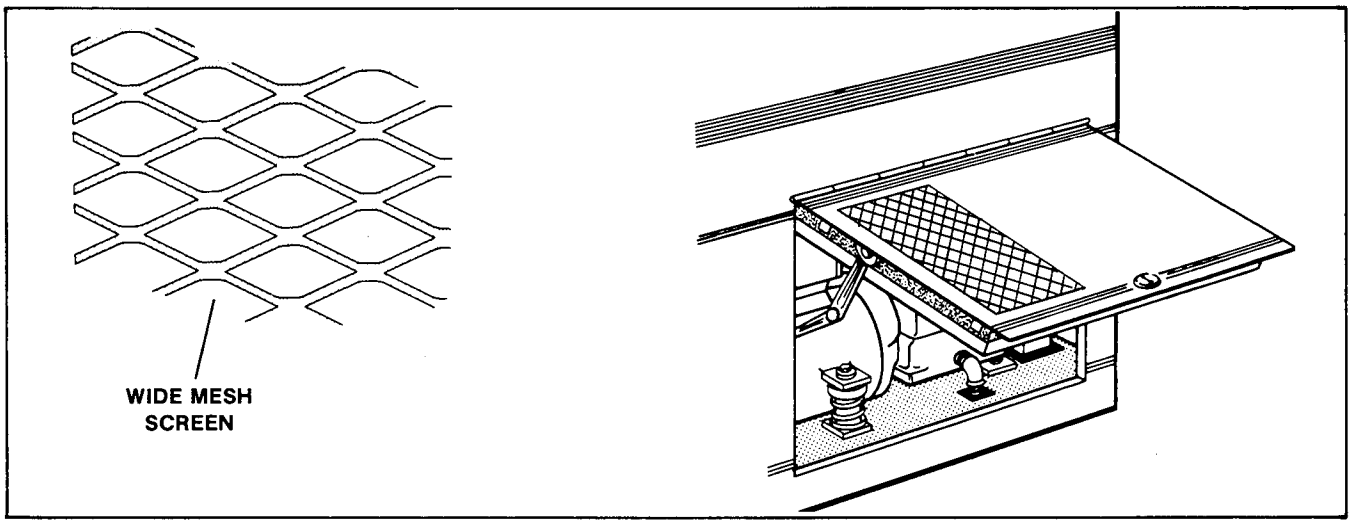


Figure 4. Inlet Screen and Louvers Restrict Air Flow

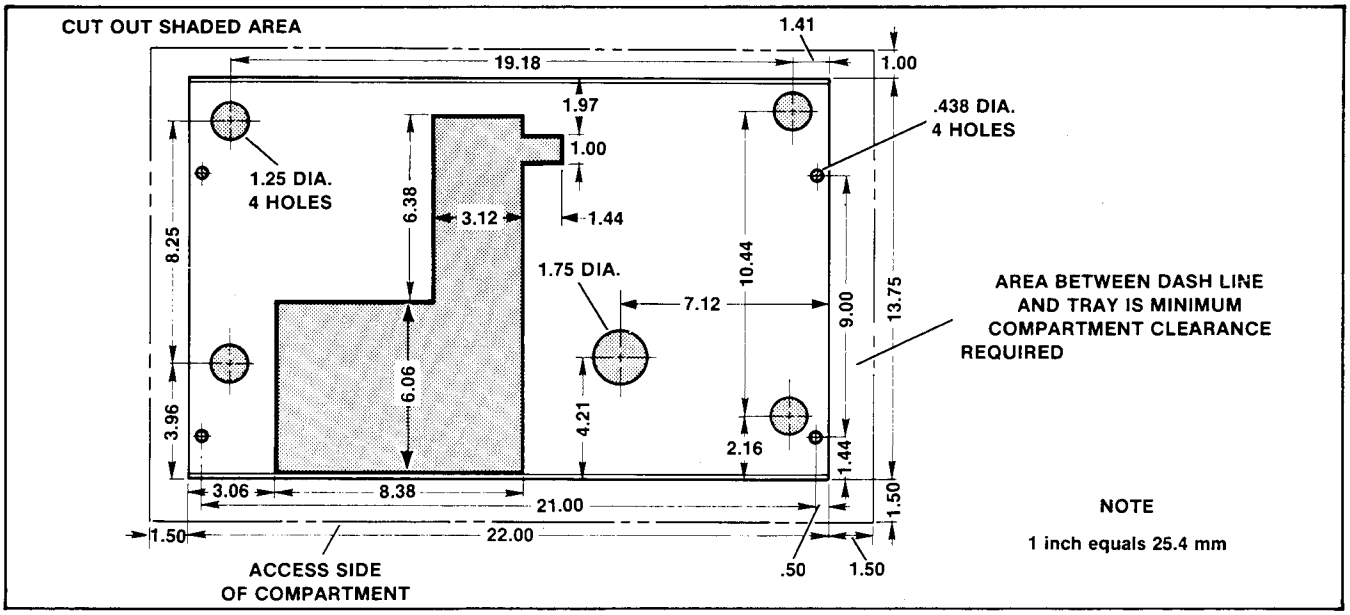


Figure 5. Floor Template 3.5kW-RV

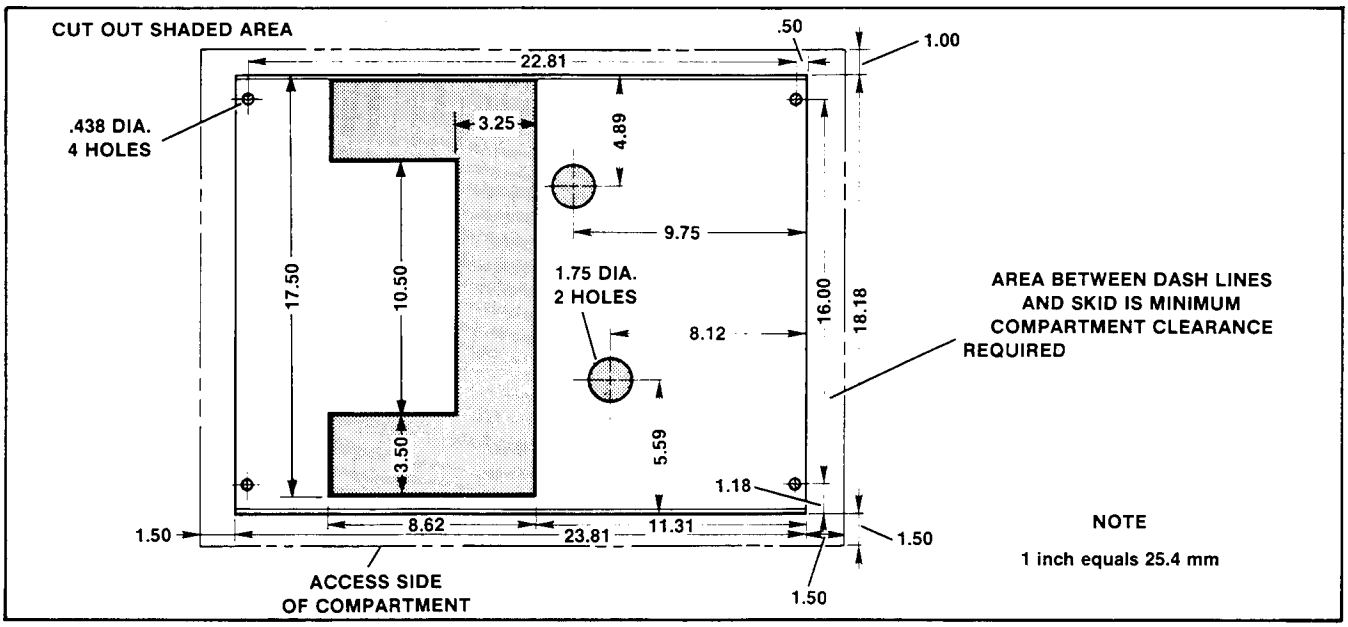


Figure 6. Floor Template 4.5kW-RV (Single Cylinder)

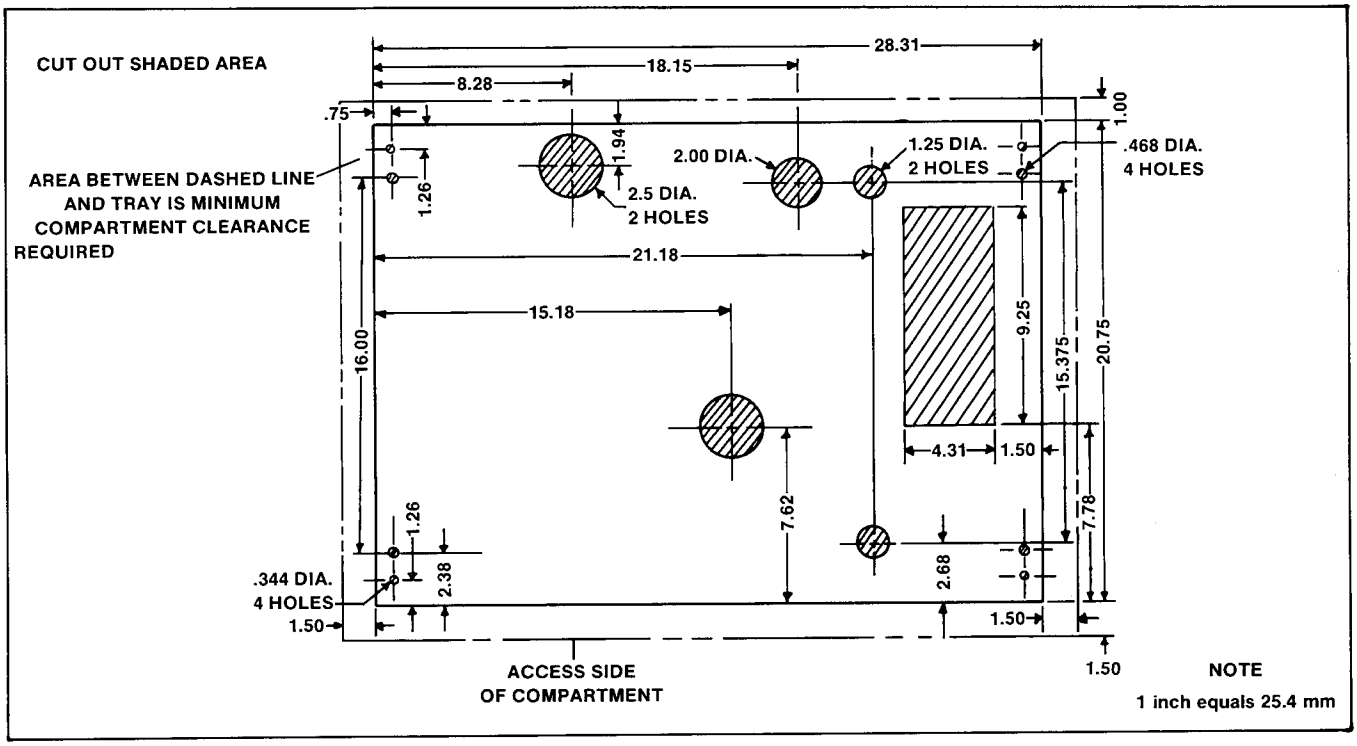


Figure 7a. Floor Template 4.5kW-RV (KT17 Series I engine)

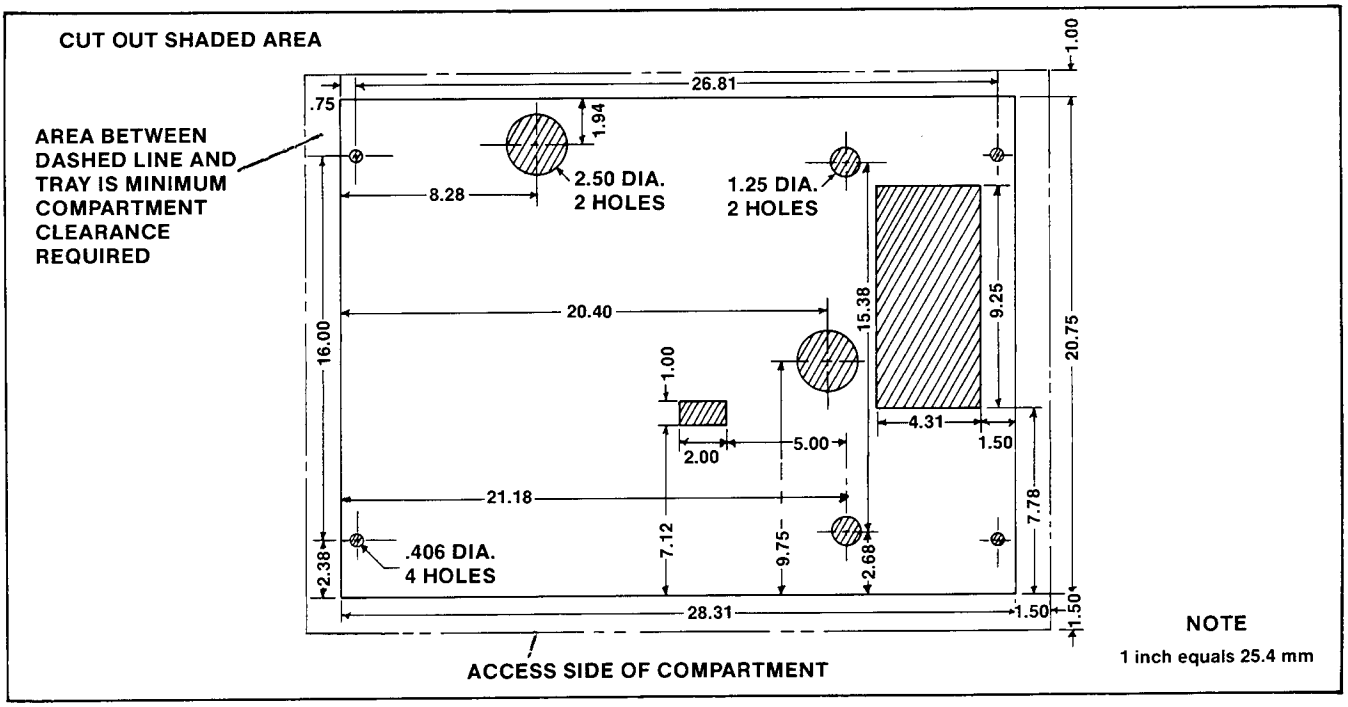


Figure 7b. Floor Template 4.5kW-RV (KT17 Series II engine)/CSA

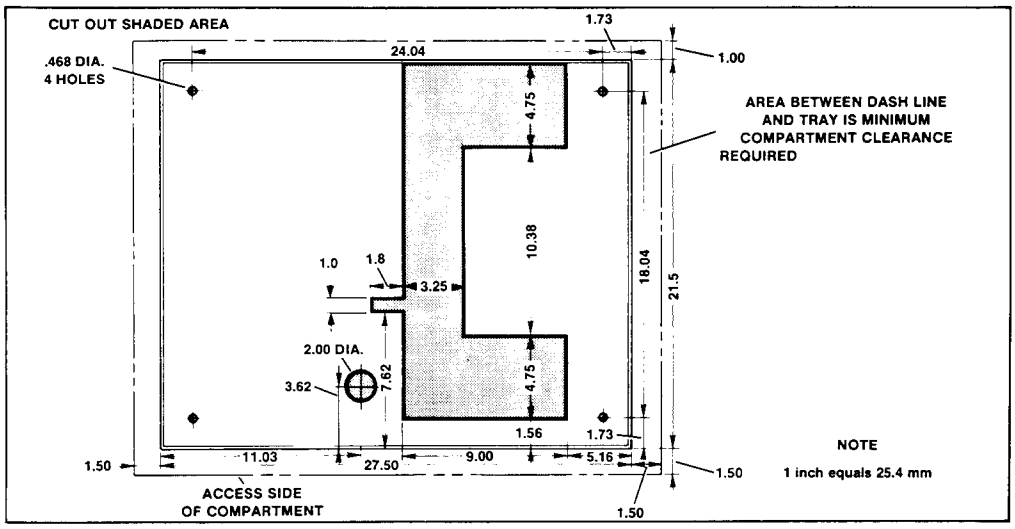


Figure 8. Floor Template 7kW-RV

Fuel System

Gasoline

Use a good quality grade of low lead or nonleaded gasoline with a pump sticker rating of at least 85 octane (90 octane research method).

The GASOLINE 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 two dip tube arrangement as shown in Figure 9. This prevents the smaller engine from being starved of fuel by the larger engine. The generator set diptube 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 and even the carburetor fuel bowl 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. 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" (3.18 mm) I.P. (minimum) with an 8" (203.2 mm (minimum) flexible section to allow free movement of the generator set.

LP Gas

Use a flexible hose designated for use with LP Gas between the generator set and main tank. Care must be taken when routing the fuel line. A two inch minimum clearance is required between the fuel line and any bare exhaust components. Electrical wiring can not be tied to any fuel lines and should be routed so that it will not inadvertently contact fuel lines. If the flexible hose passes through sheet metal, install grommets or clamps to prevent hose abrasion.

For LP gas systems, use pipe joint sealing compound to prevent dangerous fuel leaks. Use a sealing compound approved by Underwriter's Laboratories, Inc. Apply sealing compound at all fuel line pipe joints.

After all the LP connections have been completed, the entire system shall be test pressurized to 6-8 ounces (10-14 inches water column). Test connections for leakage with soapy water or bubble solution. Do not use solutions that contain ammonia or chlorine for soap will not bubble for an accurate leakage test.

The gas and supply pressure should not exceed six ounces. To check inlet pressure, remove plug on fuel inlet of gas regulator. Insert manometer or ounce pressure gauge. Adjust operating pressure to 4-6 ounces (7-11" water column); inlet pressure is adjusted on primary regulator.

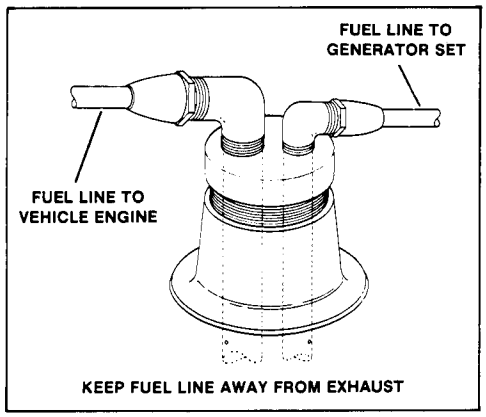


Figure 9. Two Dip Tubes in Fuel Tank

⚠ WARNING

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

Exhaust Systems

Two exhaust kit versions are available for the 3.5kW, 4.5kW (Single Cylinder), and 7kW RV models. Both versions include spark arrestor, muffler and mounting hardware. The 4.5kW (Twin Cylinder) RV model has four exhaust kits. Two versions include spark arrestor, muffler and mounting hardware. The other two versions are CSA approved and include muffler and mounting hardware. See Figures 10 through 14. For each RV model, one version is designed for installation on vehicles with the compartment located on the right or curb side while the other version is for left or street side compartments.

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 gradual bend (not 90°) to avoid excessive back pressure and face tail pipe away from normal air stream. Position tail pipe end so that discharged exhaust gases may not be drawn into vehicle interior through windows, doors, air conditioners, etc.

CAUTION

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.

⚠ WARNING

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

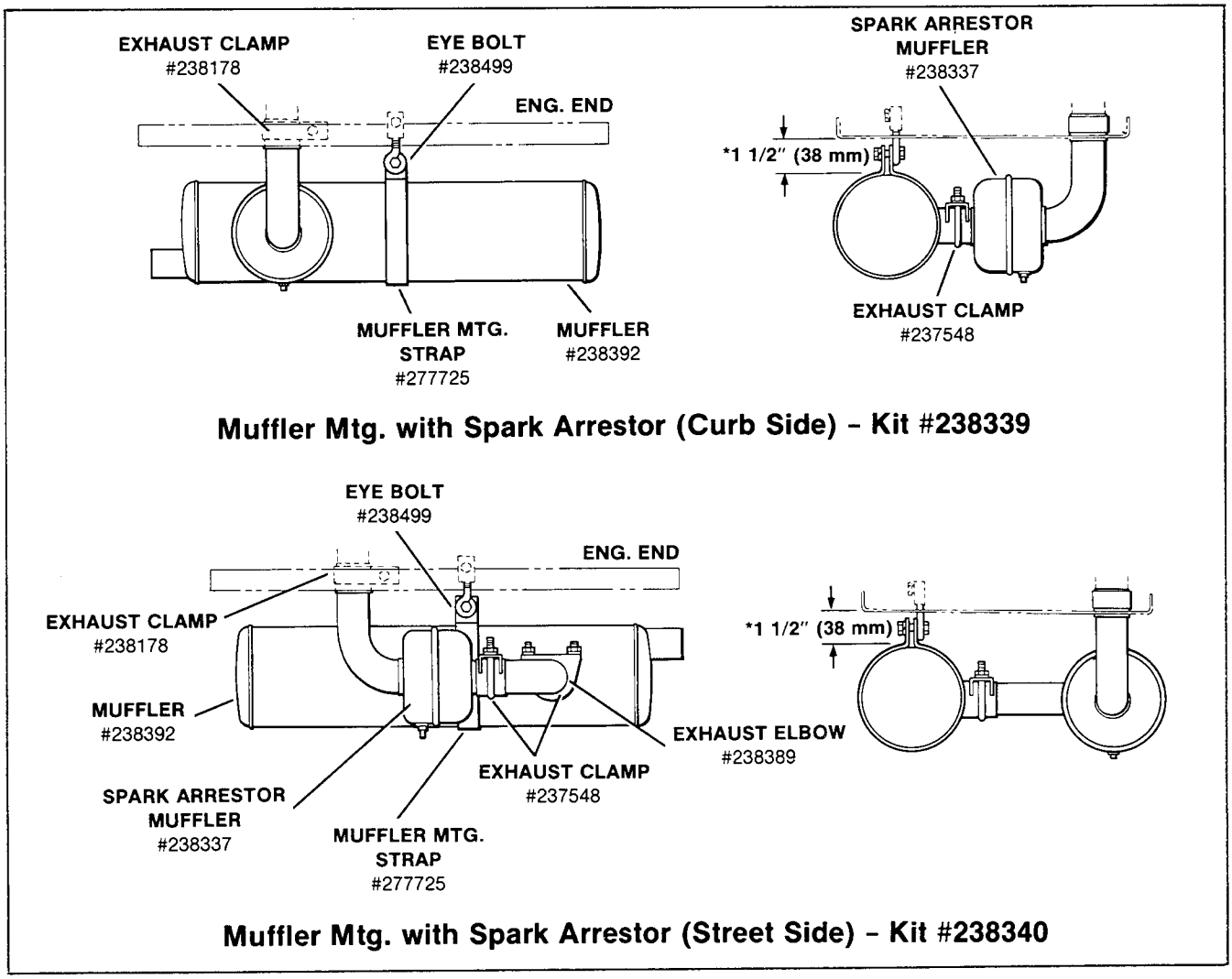


Figure 10. Exhaust Kit for 3.5kW-RV

***NOTE:** Minimum distance between tray and muffler.

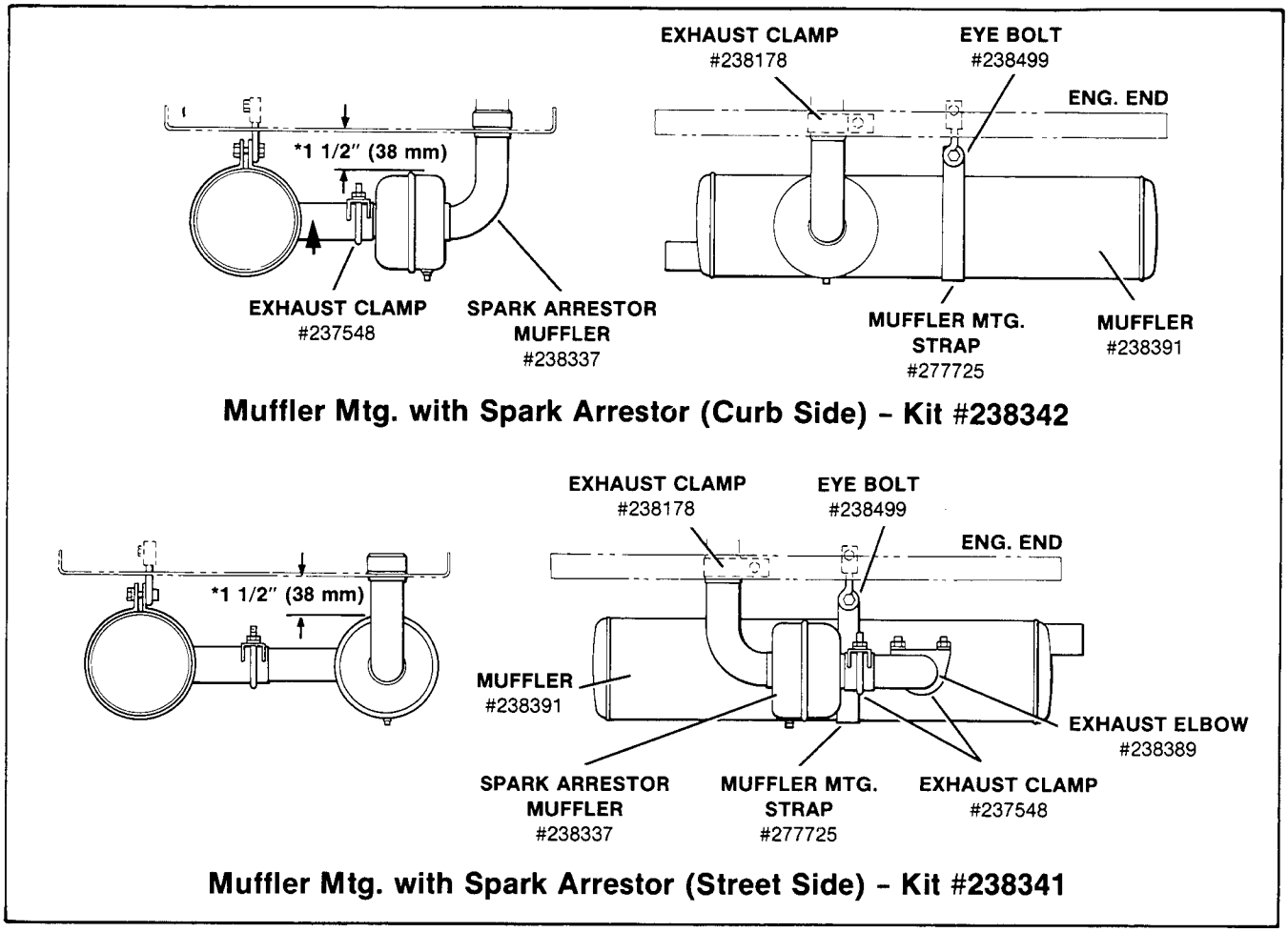


Figure 11. Exhaust Kit for 4.5kW-RV (Single Cylinder)

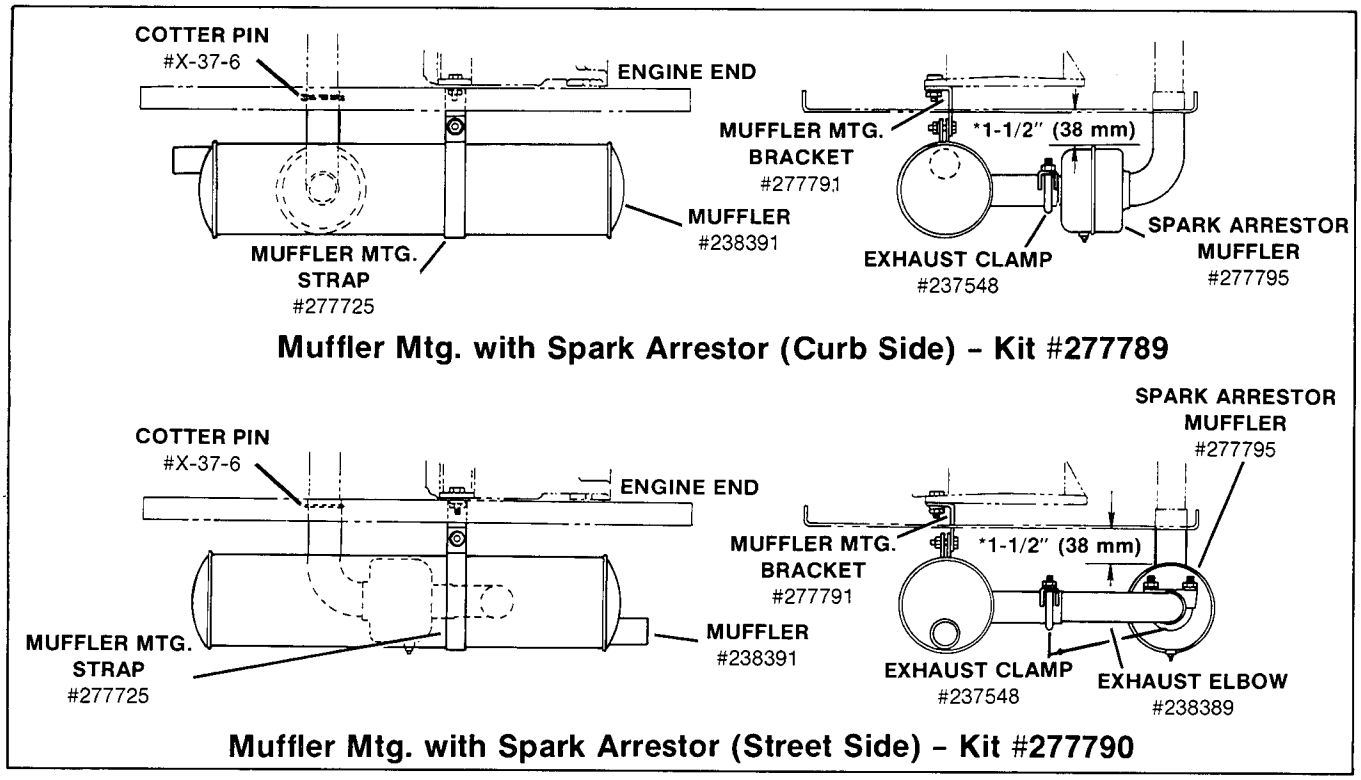


Figure 12. Exhaust Kit for 4.5kW-RV (Twin Cylinder)

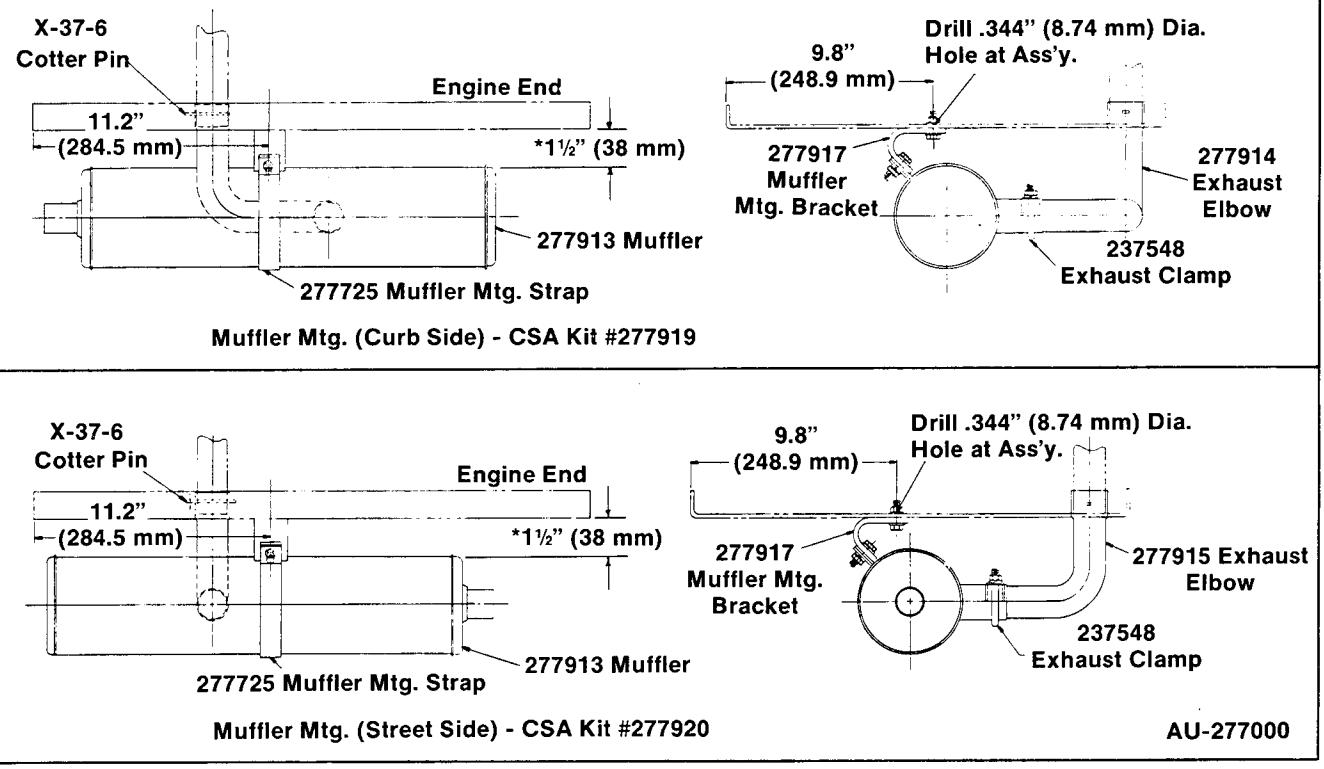
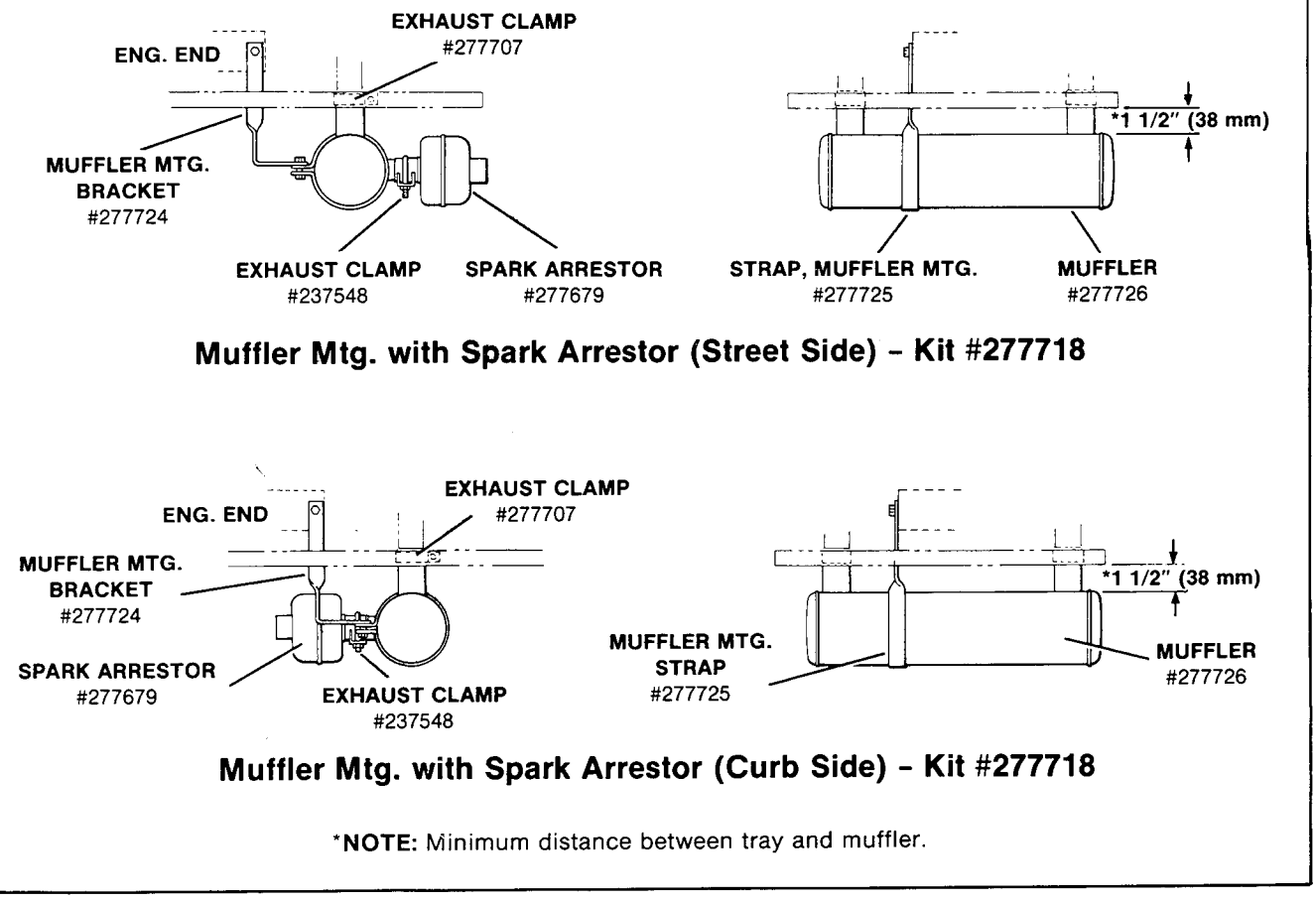


Figure 13. Exhaust Kit for 4.5kW-RV (Twin Cylinder)/CSA



*NOTE: Minimum distance between tray and muffler.

Figure 14. Exhaust Kit for 7kW-RV

Electrical Connections

Battery, load lead and remote switch panel connections are needed to complete the installation. Make final connections to the battery only after the other connections have been made as this will prevent unintentional starting. Some specific details on each connection are stated in the following. 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 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 tube. Some other points to consider when making AC load connections are covered in the following.

NOTE

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

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 Battery Cable chart for lengths and sizes. Battery charging is provided by a charging circuit built into each Kohler generator set. Refer to Figure 15. View A for cable connections - note that a grounding strap must be connected between the ground lug on rear mount and frame of the vehicle with this arrangement.

Battery Cable Size Chart

Distance Between Generator Set and Battery	At 0° F (-18° C)	Cable Size (AWG) At 32° F (0° C)	At 75° F (24° C)
40 Feet (12.2 m)	00	0	1
30 Feet (9.1 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

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 to the vehicle frame as illustrated in View B, Figure 15. When using the vehicle battery, the battery charging circuit of the generator set must be disconnected. To disconnect the charging circuit, disconnect the plug from the battery charging regulator.

⚠ WARNING

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

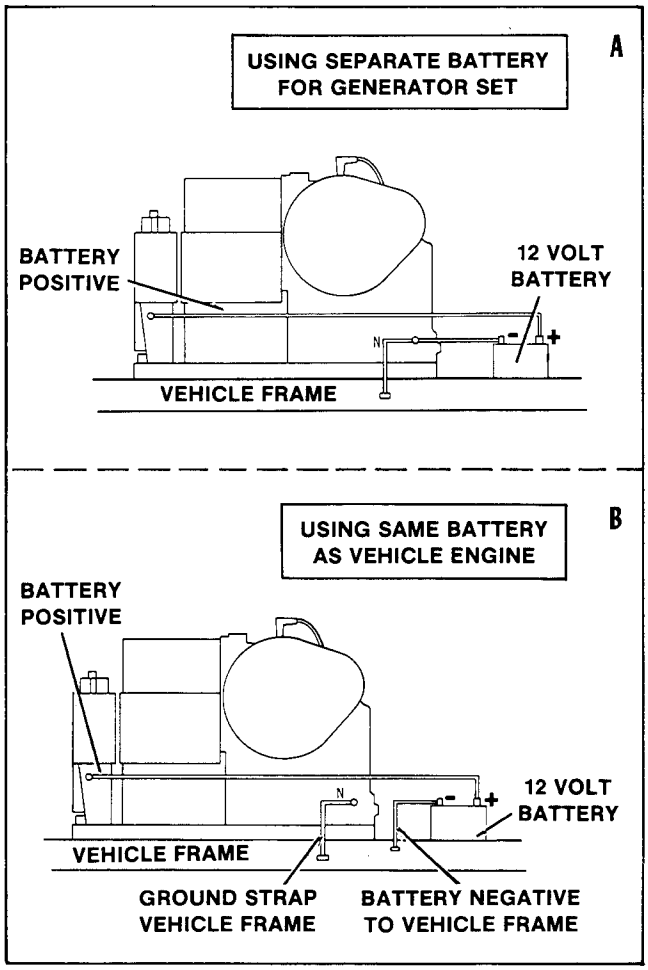


Figure 15. Battery Connection Details

AC Load Lead Connections

Each set is provided with color coded load leads and a connector for attaching a flexible conduit to the load terminal box provided in the compartment. The 3.5 and 4.5 kW models have 3 leads. The black lead is the hot lead, the

white (or gray) lead is the neutral and the green is the hazard ground lead. Connect these to proper terminals in the RV junction box. Four leads are provided on 7 kW sets -the green lead and the white (or gray) lead are the same but two 120 Volt black leads are provided.

NOTE

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

Figure 16 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 LO (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 lead LO (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 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 17 or 18.

CAUTION

If transfer switch is used between an outside power source and the generator set, the transfer switch must be wired so it breaks neutral as well as the hot leads.

NOTE

The generator and field conductors to the junction box for connection to the load are protected by an appropriate rated overcurrent protective device.

Remote Switch Connection

Kohler offers a remote switch panel for mounting on the dashboard or elsewhere in the vehicle. It measures 2" x 4" (51 mm x 103 mm) and requires a cutout of 1-3/4" x 3-1/8" (44 mm x 79 mm). The panel includes start-stop switch, generator ON light, and a digital hourmeter. Kohler also offers wiring harnesses of 4 different lengths with keyed plugs for quick connection between the controller on the set (Figure 19) and the remote switch panel in the vehicle. Part numbers of these are listed below. A wiring diagram is shown in Figure 20 if the installer elects to use just a start-stop switch or separate lights and hourmeter.

Remote Switch Assembly

Digital Hourmeter
A-269299

Remote Switch Harness

Part No.	Length	Part No.	Length
PA-269966	12" (305 mm)	PA-269963	30' (9.1 m)
PA-269965	15' (4.6 m)	PA-269964	40' (12.2 m)

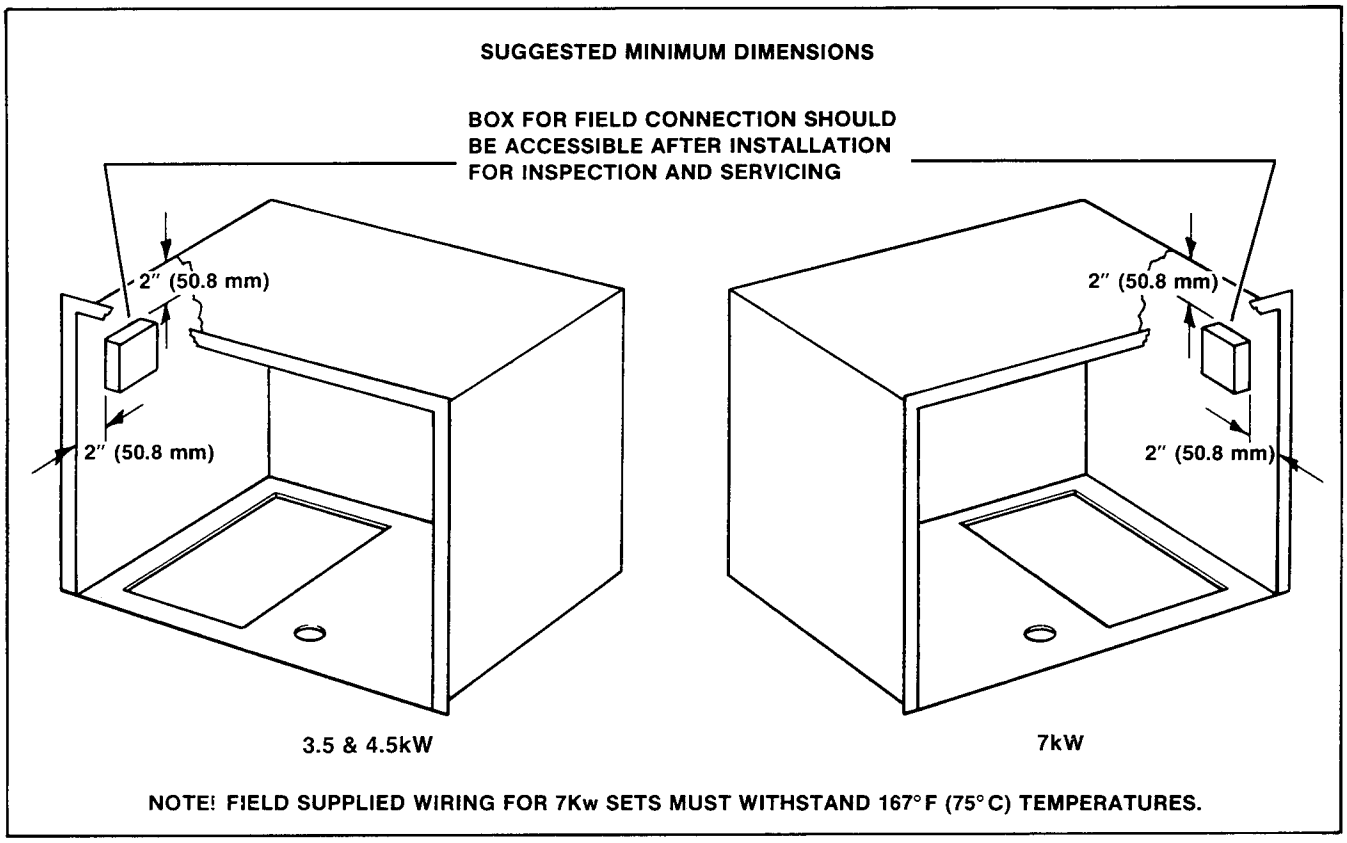


Figure 16. RV Junction Box

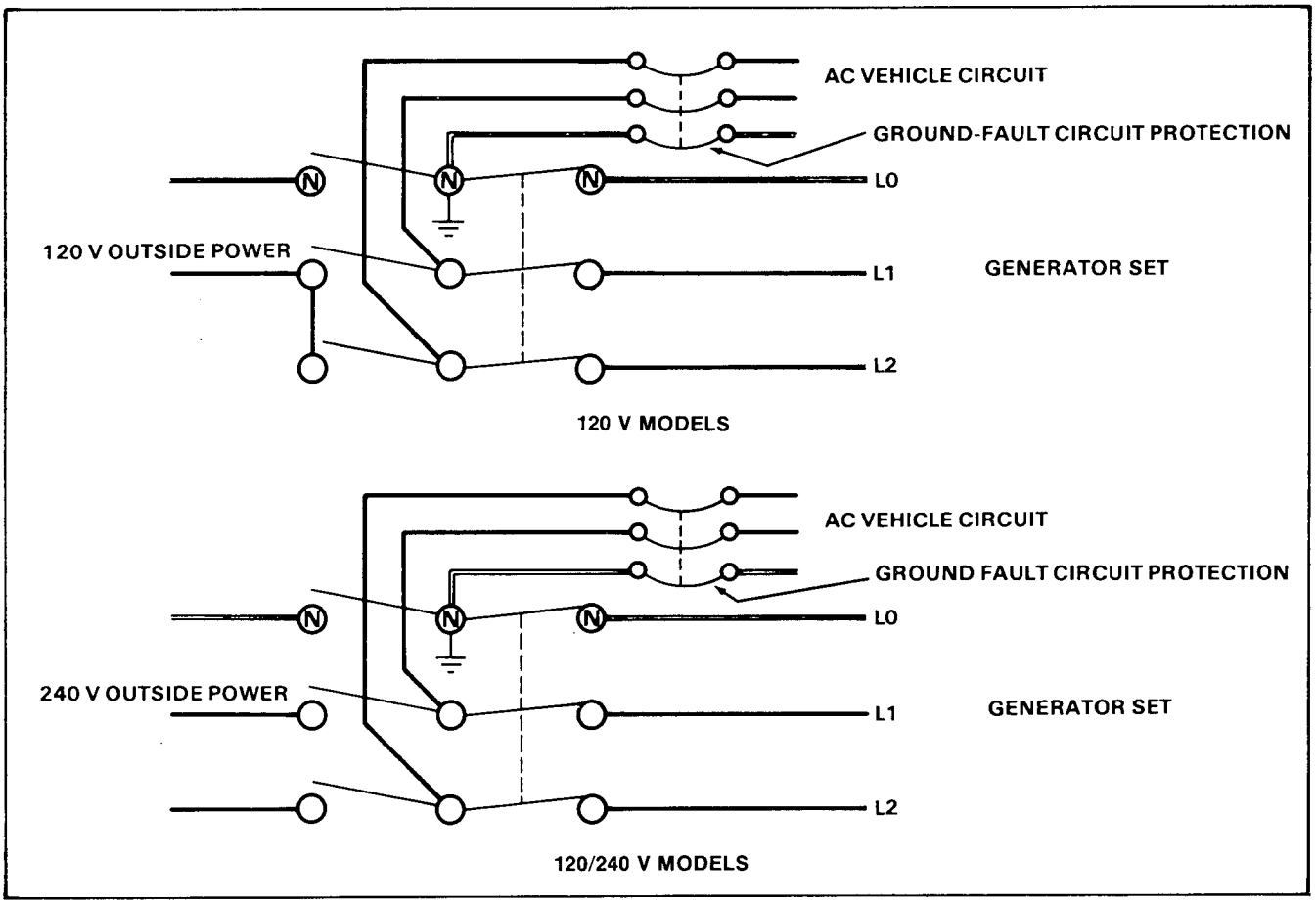


Figure 17. Transfer Switch Connection, 3-Wire AC Circuit

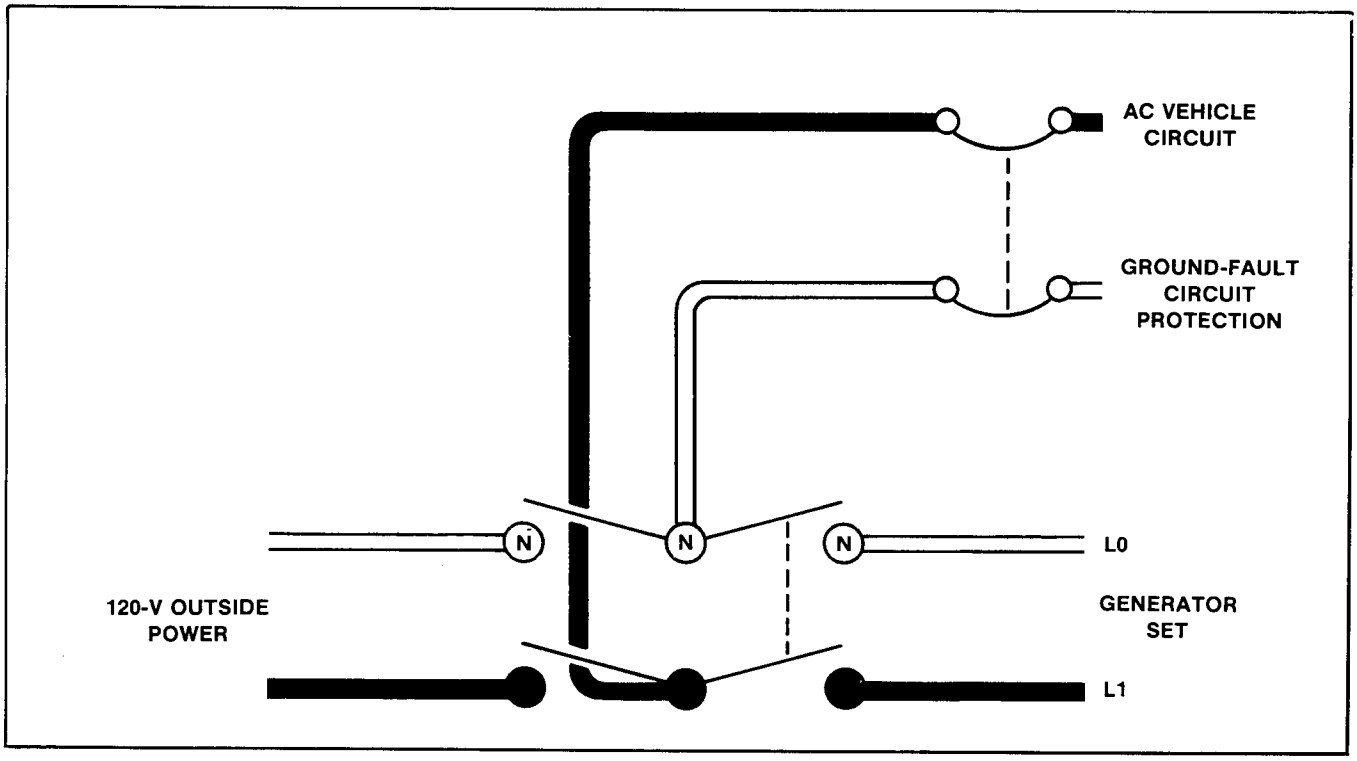


Figure 18. Transfer Switch Connection, 2-Wire AC Circuit

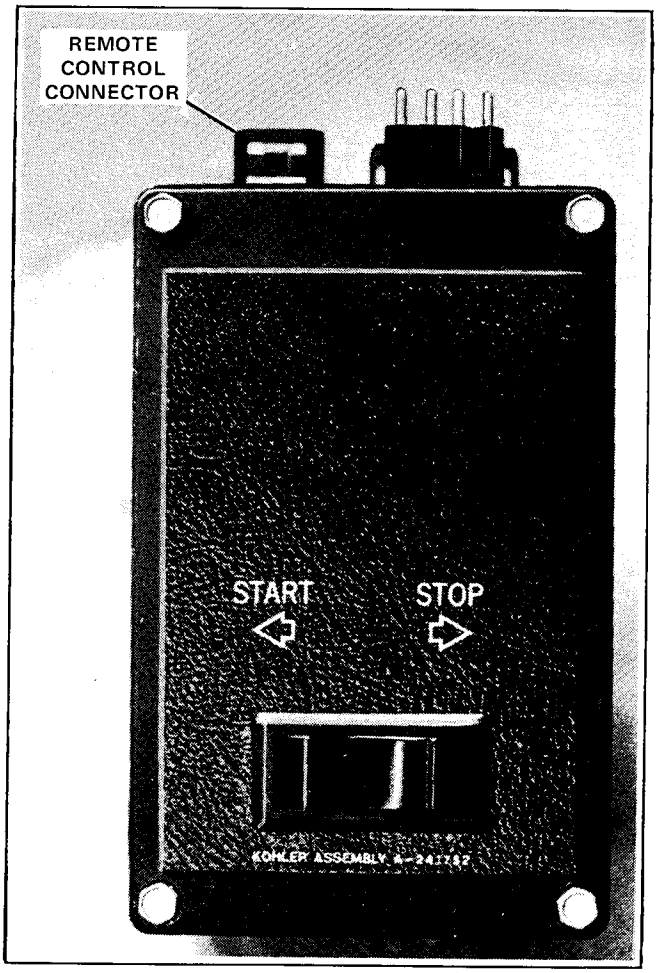
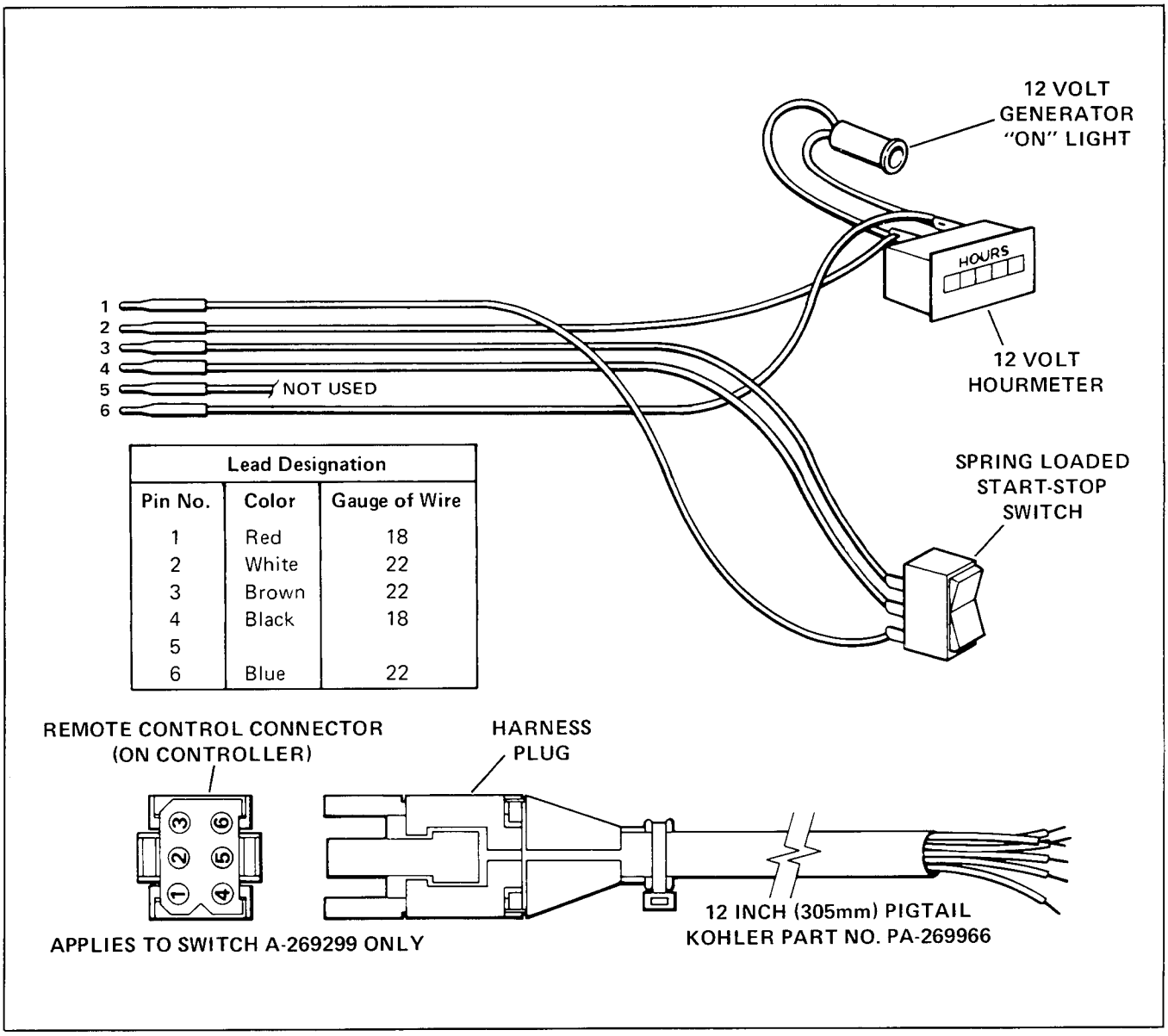


Figure 19. Controller



Lead Designation		
Pin No.	Color	Gauge of Wire
1	Red	18
2	White	22
3	Brown	22
4	Black	18
5		
6	Blue	22

Figure 20. Remote Control Panel Wiring

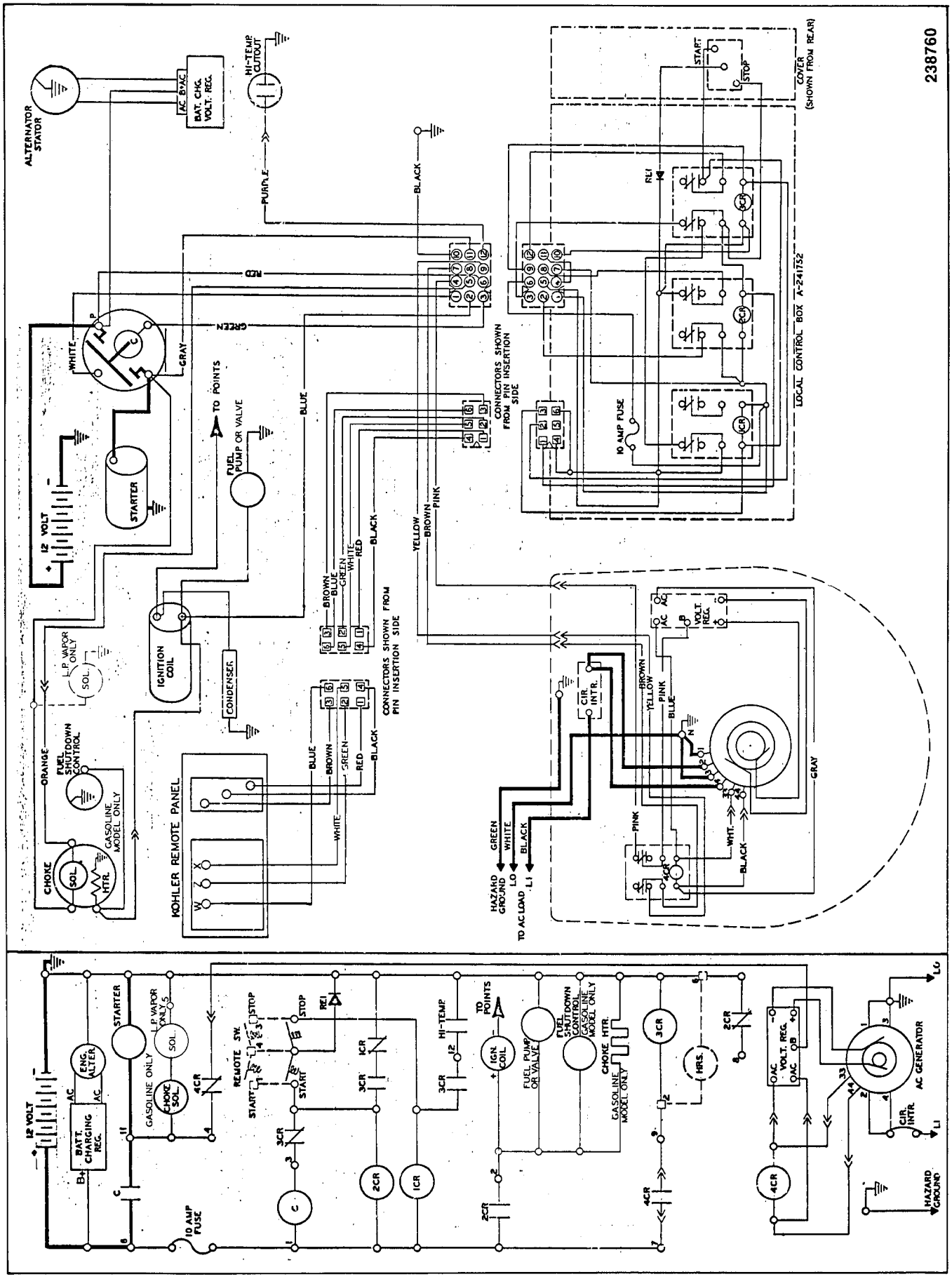


Figure 21. Wiring Diagram - 3.5CM21 120-Volt

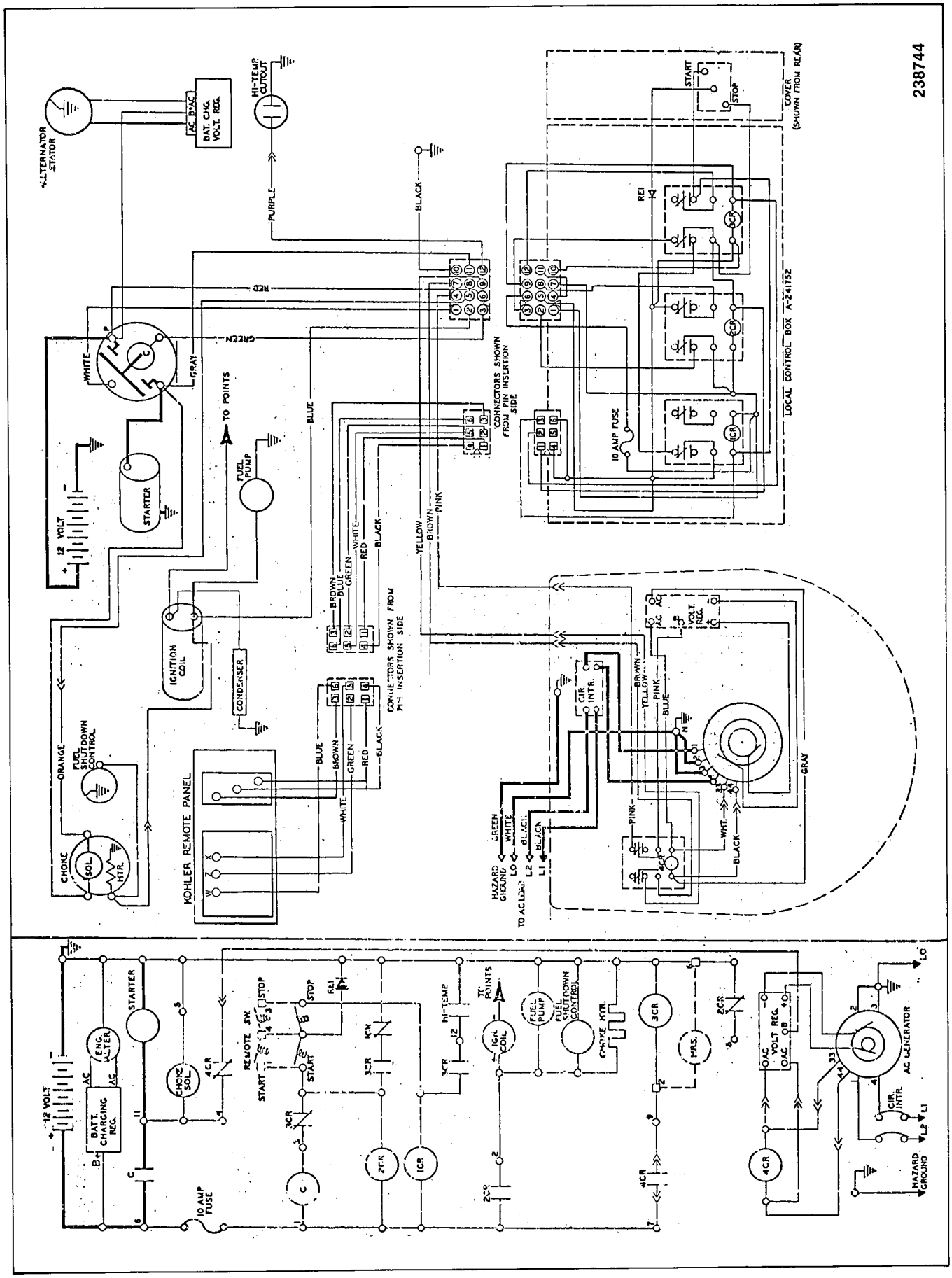


Figure 22. Wiring Diagram - 3.5CFM61 120/240-Volt

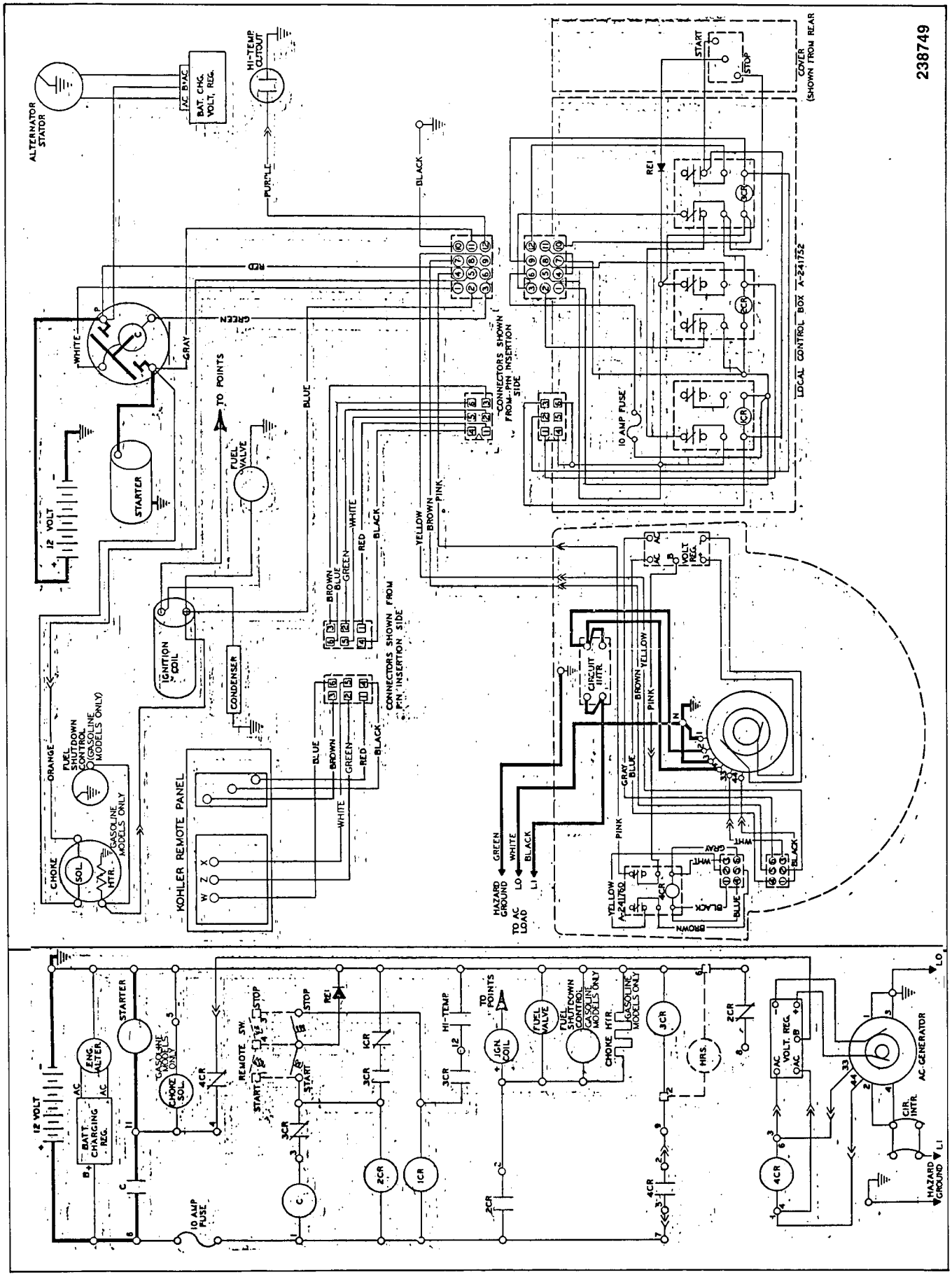


Figure 23. Wiring Diagram - 4.5CM21 (Single Cylinder) 120-Volt

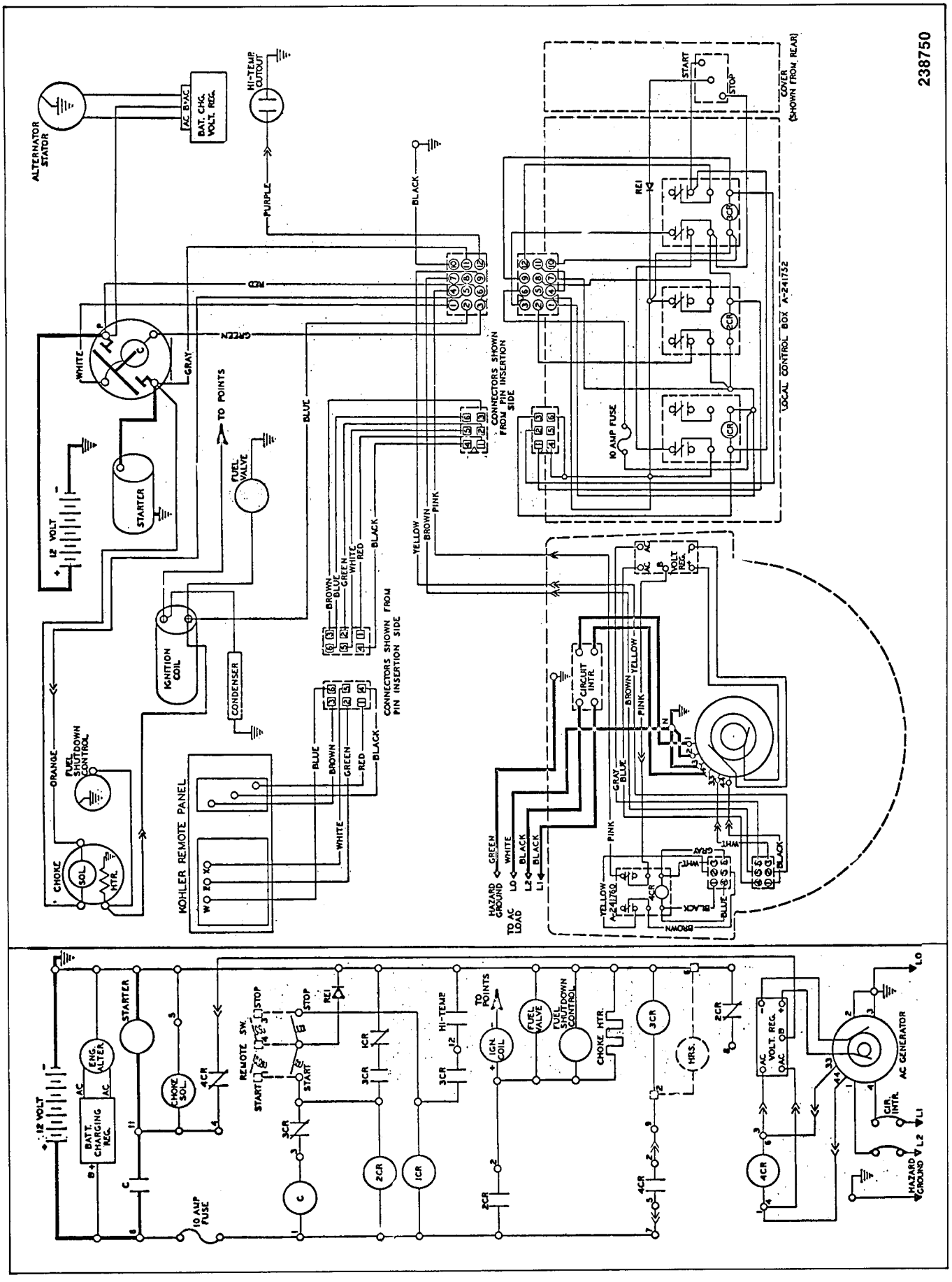


Figure 24. Wiring Diagram - 4.5CFM61 (Single Cylinder) 120/240-Volt

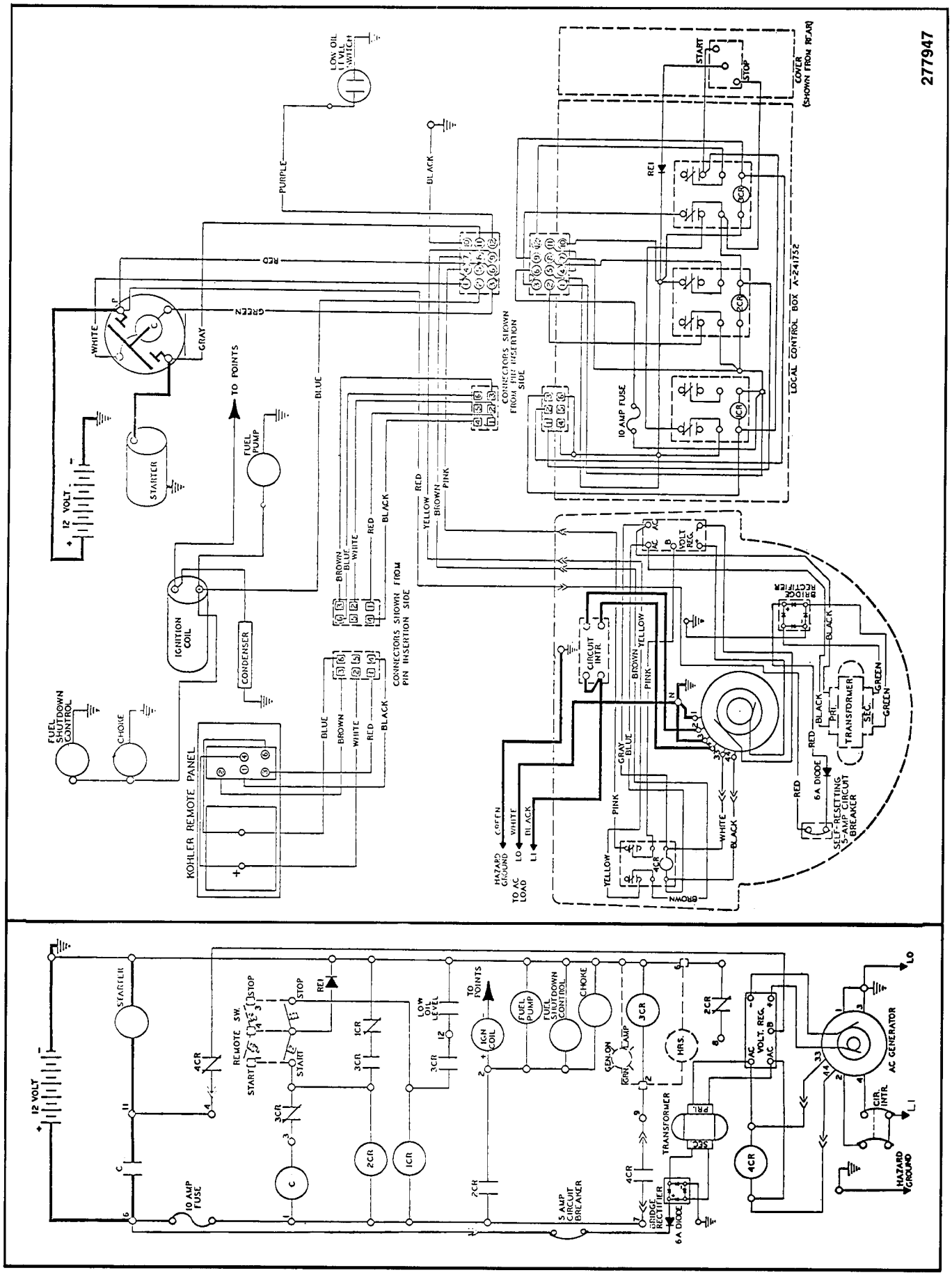


Figure 25. Wiring Diagram - 4.5CKM21 (KT17 Series I engine) 120-Volt/CSA

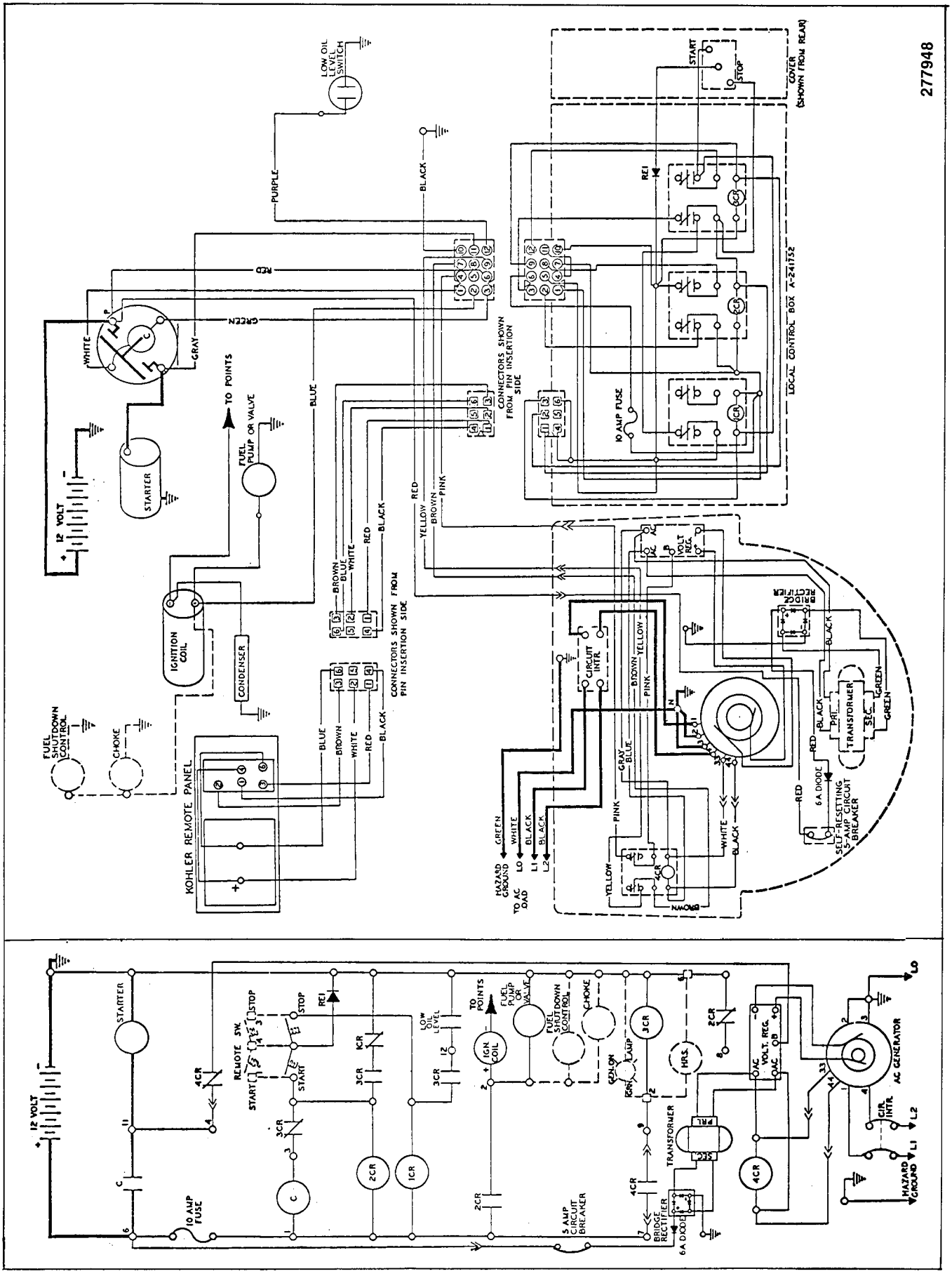


Figure 26. Wiring Diagram - 4.5CKM61 (KT17 Series I engine) 120/240-Volt/CSA

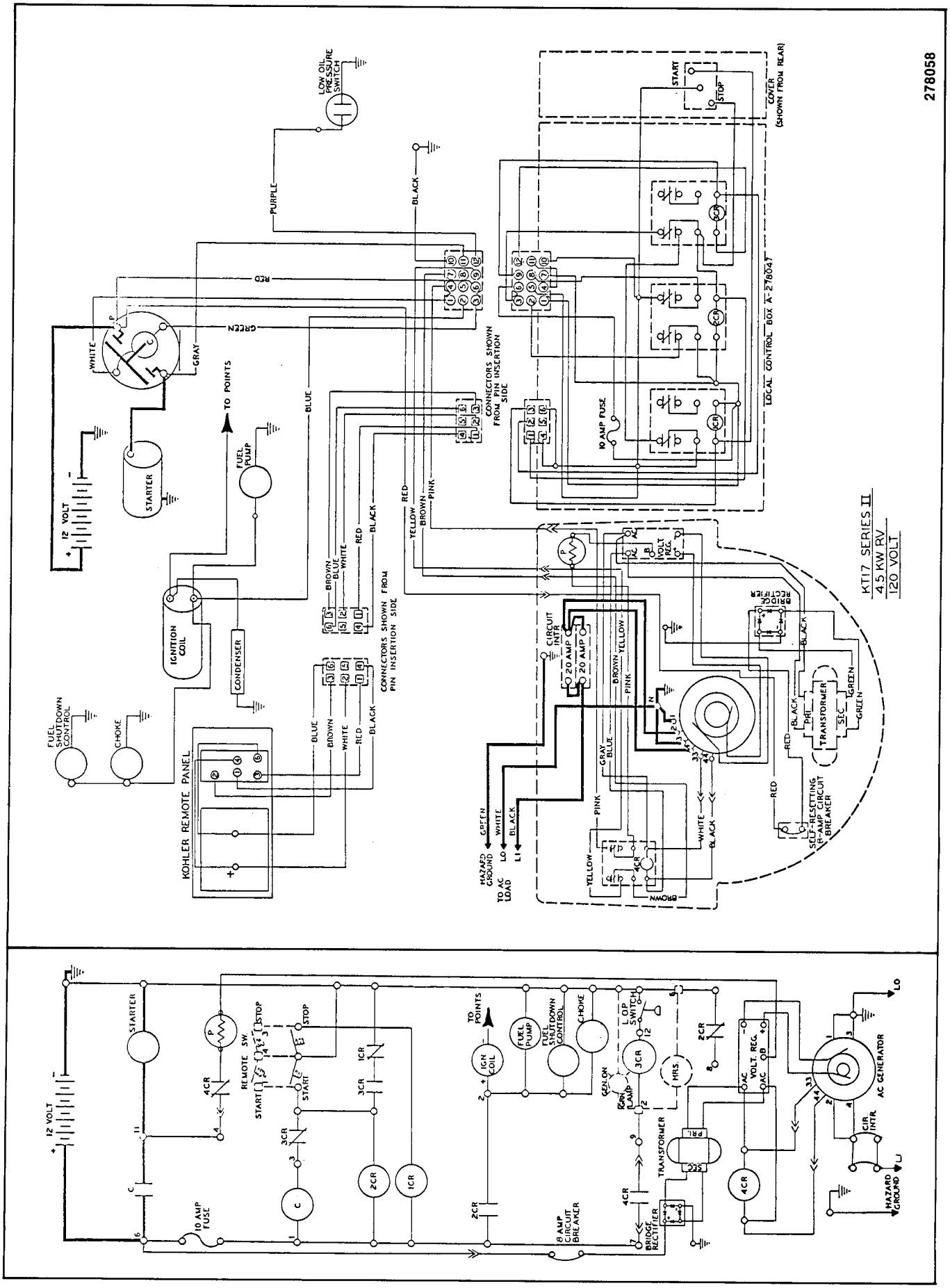


Figure 27. Wiring Diagram — 4.5CKM21 (KT17 Series II engine) 120 Volt

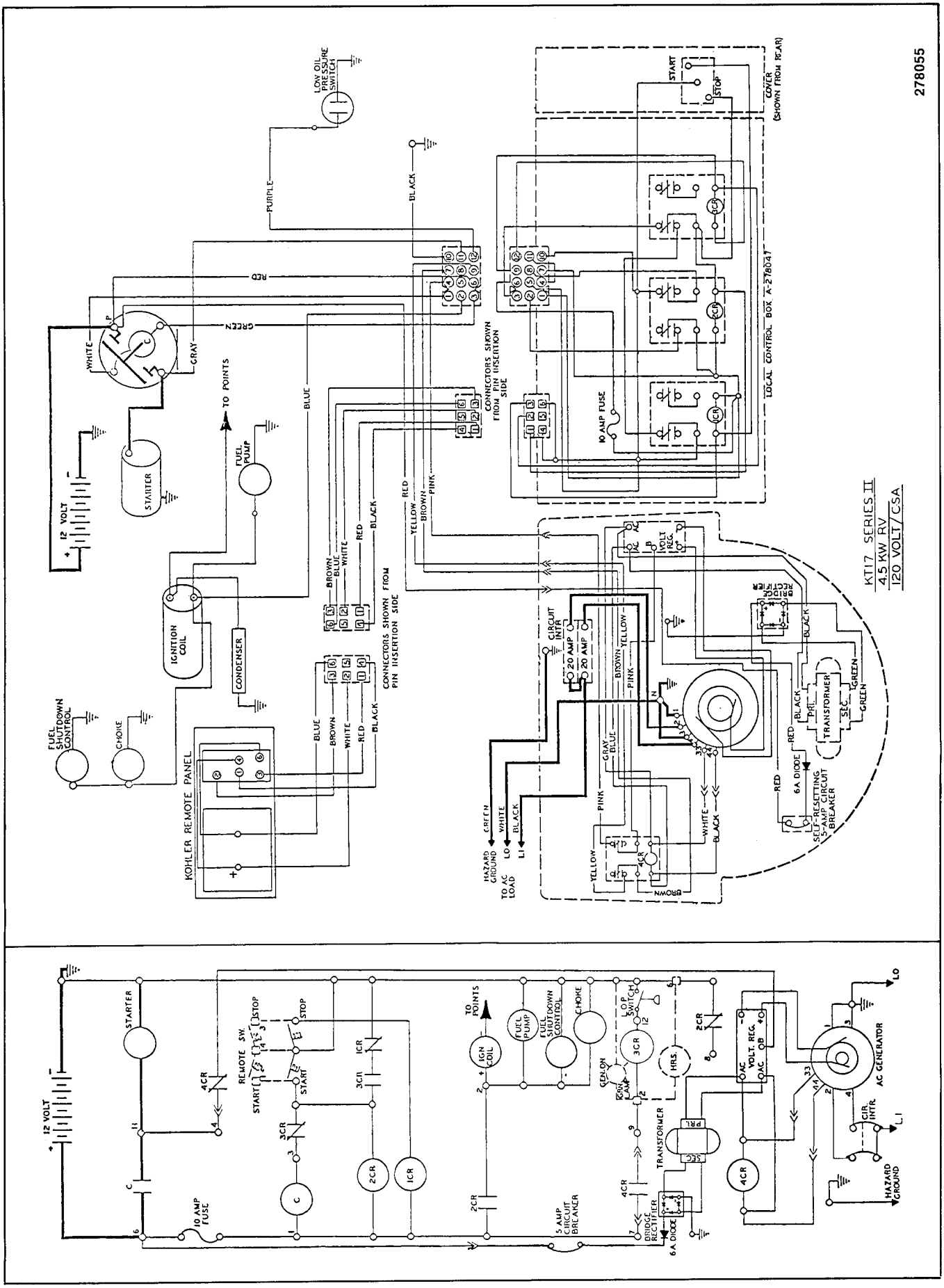


Figure 28. Wiring Diagram — 4.5CKM21 (KT17 Series II engine) 120 Volt/CSA

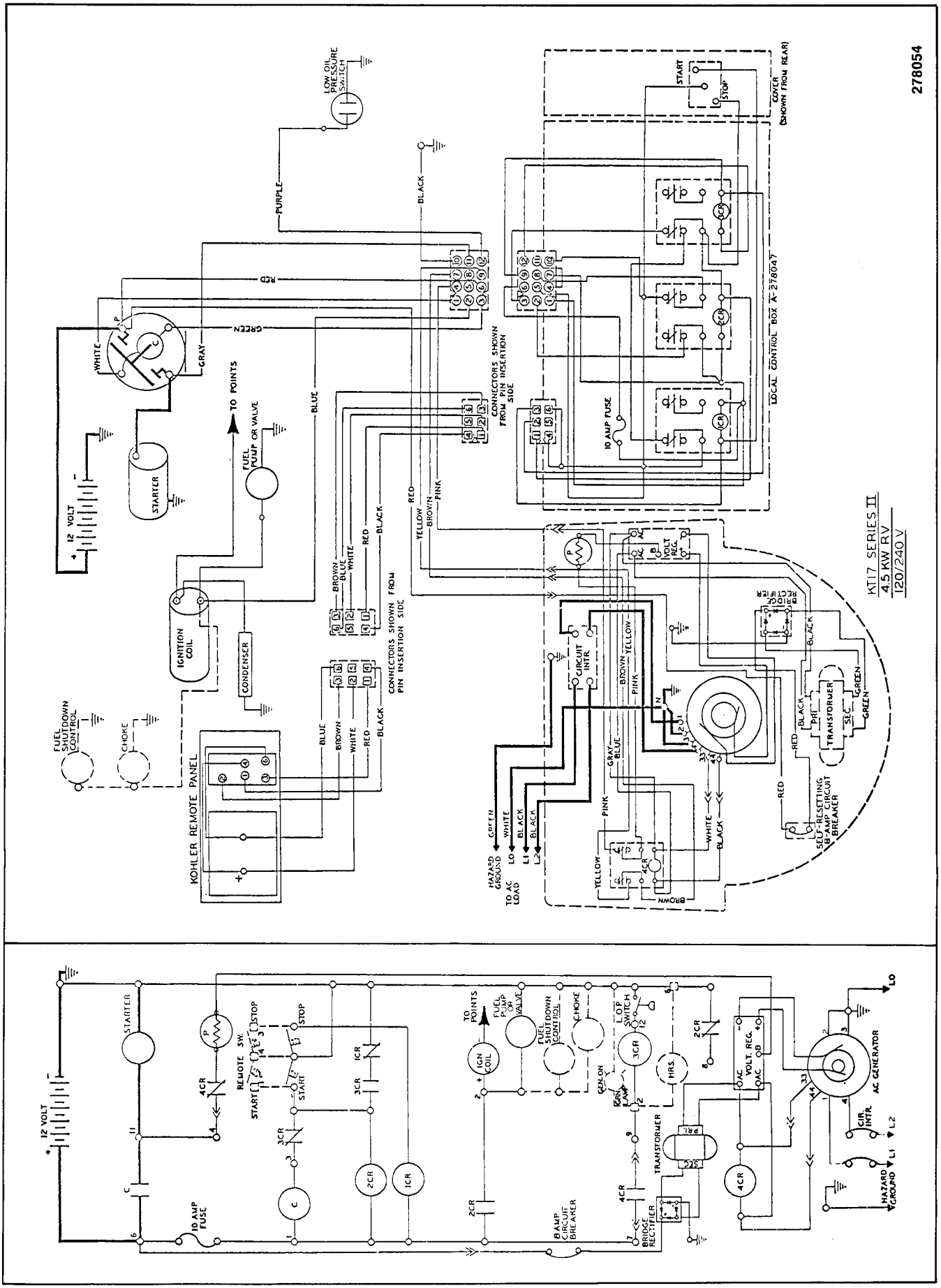


Figure 29. Wiring Diagram — 4.5CKM61 (KT17 Series II engine) 120/240 Volt

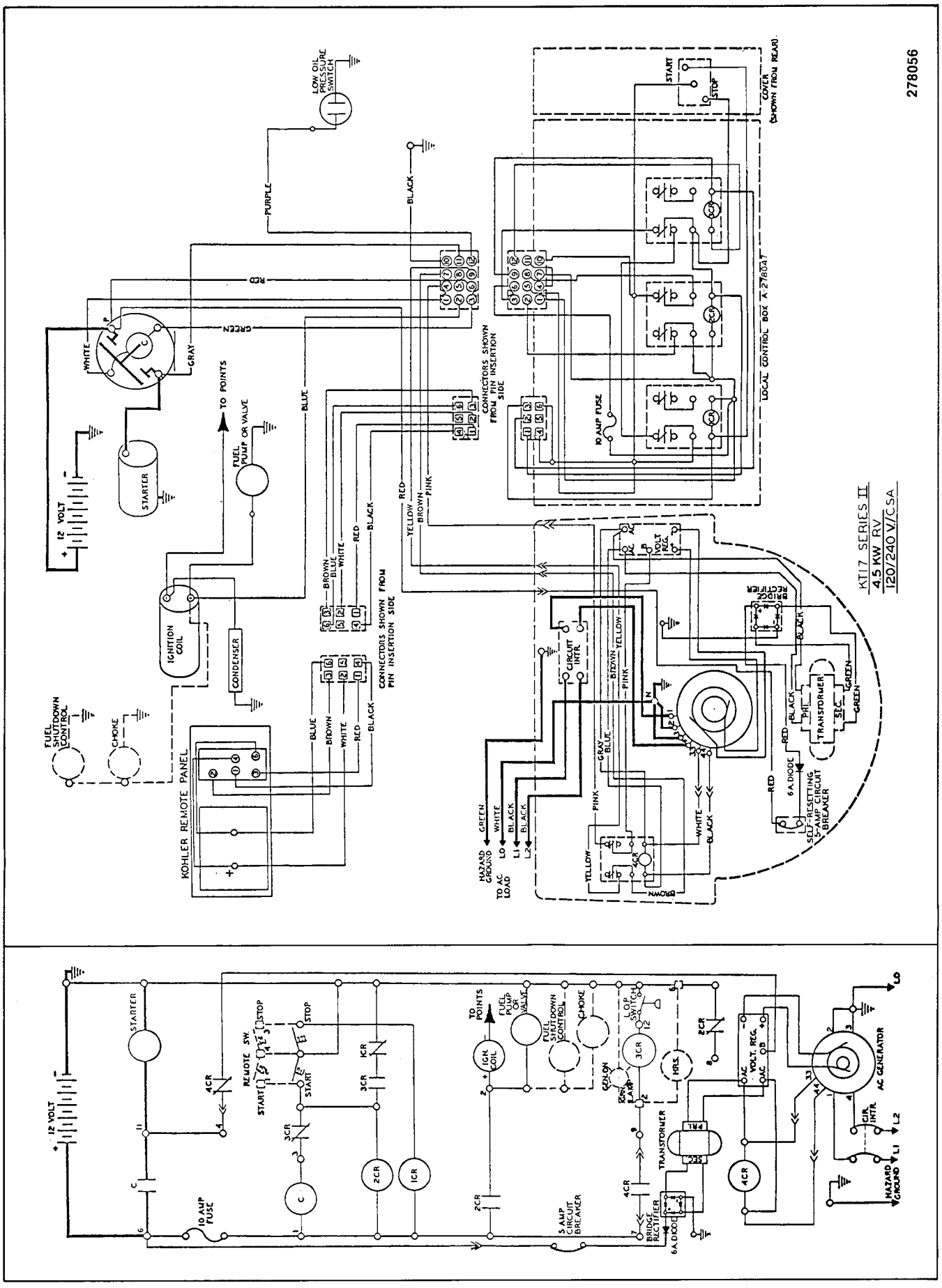


Figure 30. Wiring Diagram — 4.5CKM61 (KT17 Series II engine) 120/240 Volt/CSA

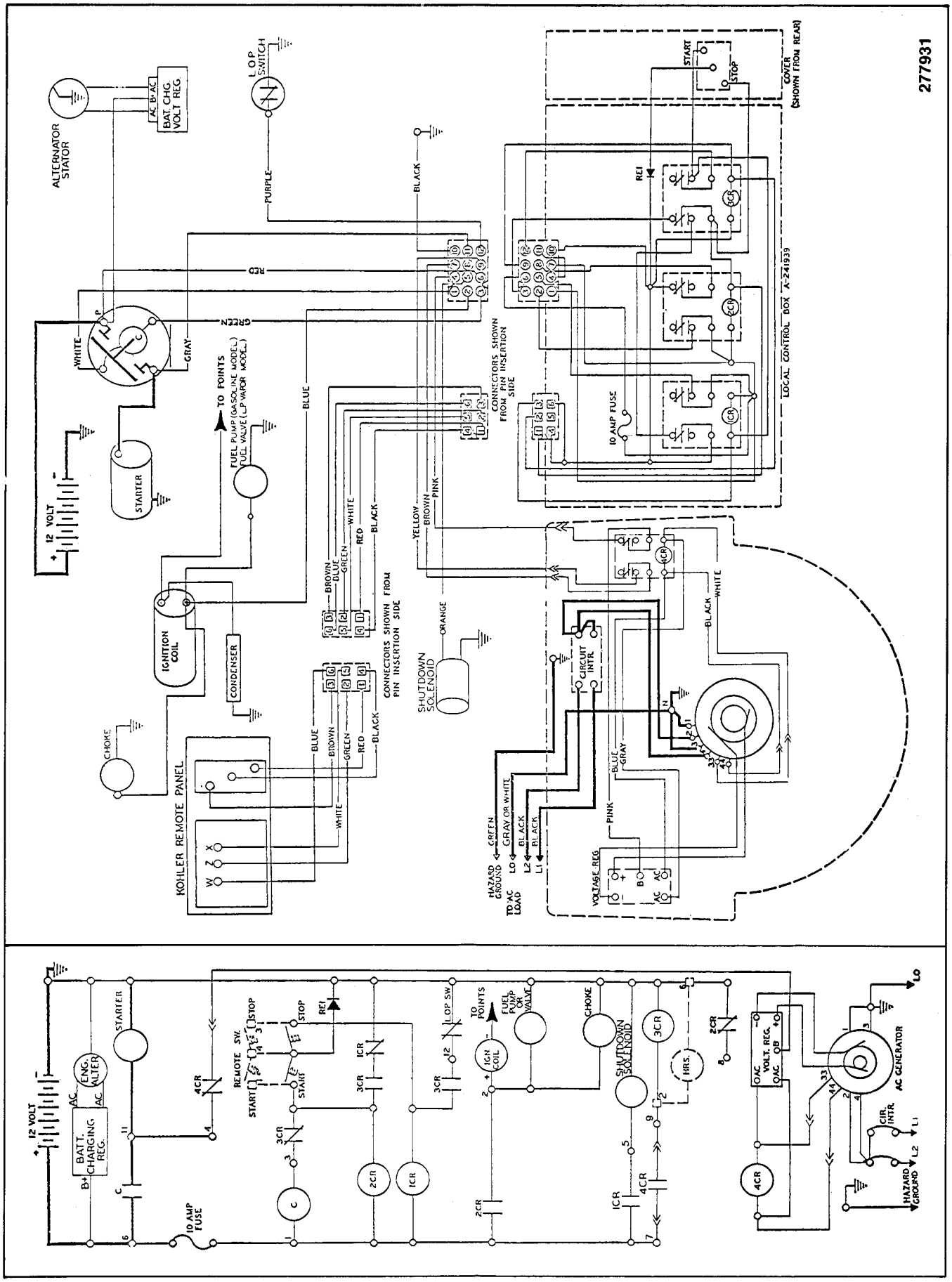


Figure 31. Wiring Diagram - 7CM21 120-Volt

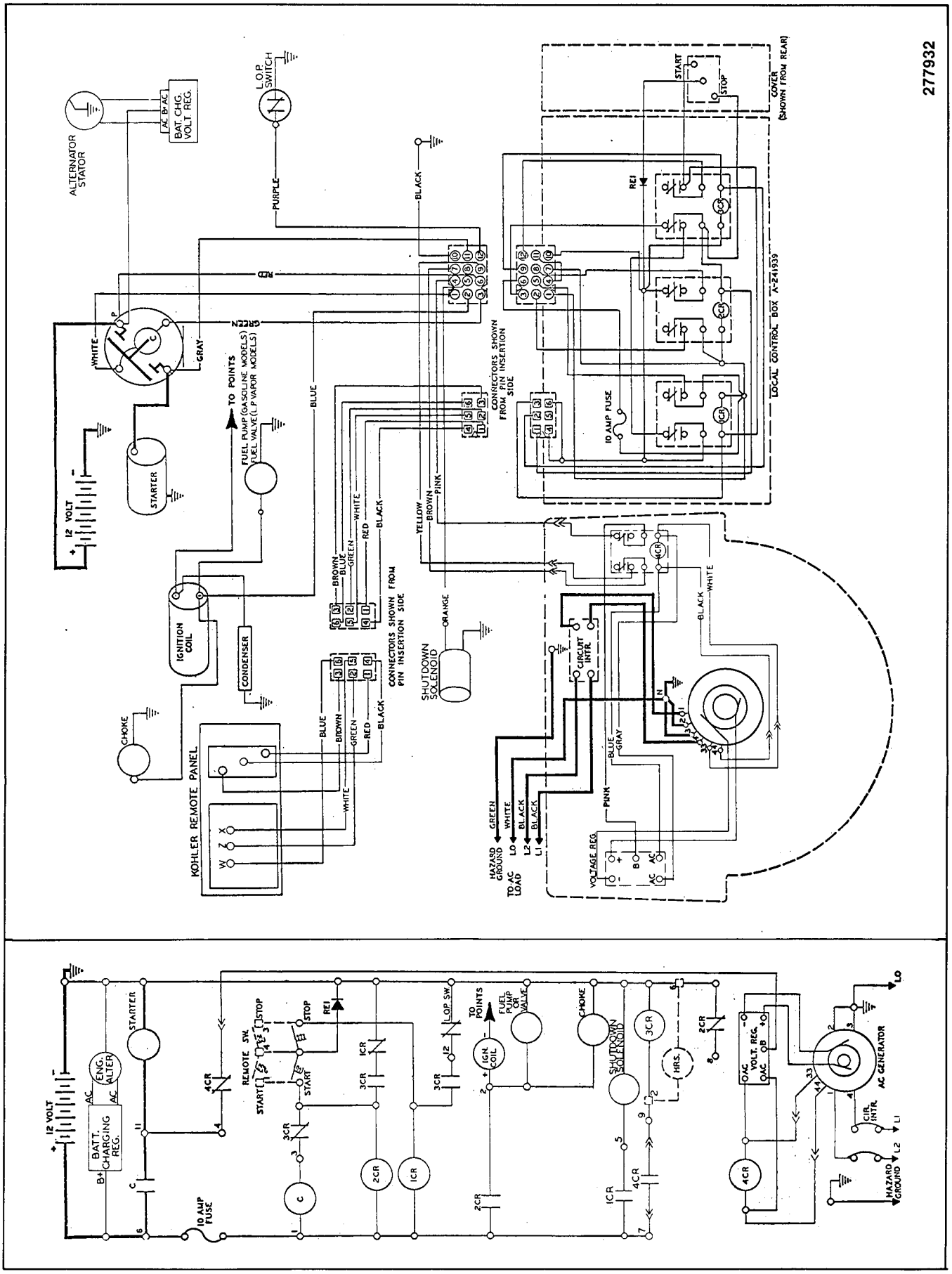


Figure 32. Wiring Diagram - 7CM61 120/240-Volt

TP-5005 10/86
PRINTED IN USA

KOHLER
GENERATORS

KOHLER CO. KOHLER, WISCONSIN 53044