KOHLER

Single Phase

Models 5RMY
5RMOY
7RMY
7.5R
7.5C
10RY
10RMOY
15RMY
15RMOY
17RY
17.5ROY

Service Manual

KOHLER
GENERATORS

TP-5110

Specifications

	5RMY	5RMOY	7RMY	7.5C	7.5R
Rated kW/kVA					
60Hz	5	5	7	7.5	7.5
50Hz	3.9	4.2	5.7	6.4	—
Rated Voltage	120V, 1Ø, 2W 120/240V, 1Ø, 3W	120V, 1Ø, 2W 120/240V, 1Ø, 3W	120V, 1Ø, 2W 120/240V, 1Ø, 3W	120V, 1Ø, 2W 120/240V, 1Ø, 3W	120V, 1Ø, 2W 120/240V, 1Ø, 3W
Rated Amperes					
120 Volt — 60 Hz	41.7	41.7	58.3	62.5	62.5
120/240 Volt — 60 Hz	20.8	20.8	29.2	31.2	31.2
120 Volt — 50 Hz	32.5	35.0	47.5	—	—
120/240 Volt — 50 Hz	16.3	17.5	23.8	—	—
110 Volt — 50 Hz	—	—	—	58	—
110/220 Volt — 50 Hz	—	—	—	29	—
Shaft rpm					
60 Hz	3600	1800	1800	1800	1800
50 Hz	3000	1500	1500	1500	—
Rotor Resistance	8-10 ohms	8-10 ohms	8-10 ohms	4-6 ohms	4-6 ohms
Stator Coil Resistance	All leads at .25 ohms	All leads at .25 ohms	All leads at .25 ohms	Leads 1-2, 3-4, 33-44 @ .25 ohms Leads 55-66 @ 1.0 ohms	Leads 1-2, 3-4, 33-44 @ .25 ohms Leads 55-66 @ 1.0 ohms
Battery-Charging Voltage	13.2	13.0	13.0	13.0	13.0
Coupling Type	Threaded	Tapered Shaft — Thru-Bolt	Tapered Shaft — Thru-Bolt	Tapered Shaft — Thru-Bolt	Tapered Shaft — Thru-Bolt
Thru-Bolt Torque	—	55 ft. lbs. (75 Nm)	55 ft. lbs. (75 Nm)	50 ft. lbs. (68 Nm)	50 ft. lbs. (68 Nm)
Over-Bolt Torque	70 in. lbs. (8.0 Nm)	260 in. lbs. (29 Nm)	70 in. lbs. (8.0 Nm)	70 in. lbs. (8.0 Nm)	70 in. lbs. (8.0 Nm)
Excitation Voltage	Static Brush-Type	Static Brush-Type	Static Brush-Type	Static Brush-Type	Static Brush-Type

10RY	10RMOY	15RMY	15RMOY	17RY	17.5ROY
10	10	15	15	17	17.5
—	—	—	—	—	—
120/240V, 1Ø, 3W	120V, 1Ø, 2W 120/240V, 1Ø, 3W	120V, 1Ø, 2W 120/240V, 1Ø, 3W	120V, 1Ø, 2W 120/240V, 1Ø, 3W	120/240V, 1Ø, 3W	120V, 1Ø, 2W 120/240V, 1Ø, 3W
75	83.4	125.0	125.0	141.6	145.8
37.5	41.7	62.5	62.5	71	72.9
—	—	—	—	—	—
—	—	—	—	—	—
—	—	—	—	—	—
—	—	—	—	—	—
1800	1800	1800	1800	1800	1800
—	—	—	—	—	—
3-5 ohms	2.5-4.5 ohms	2.5-4.5 ohms	2.5-4.5 ohms	2.5-4.5 ohms	2.5-4.5 ohms
Leads 1-2, 3-4, 33-44 @ .25 ohms Leads 55-66 @ 1.0 ohms	Leads 1-2, 3-4, 33-44 @ .25 ohms Leads 55-66 @ 1.0 ohms	Leads 1-2, 3-4, 33-44 @ .25 ohms Leads 55-66 @ 1.0 ohms	Leads 1-2, 3-4, 33-44 @ .25 ohms Leads 55-66 @ 1.0 ohms	Leads 1-2, 3-4, 33-44 @ .25 ohms Leads 55-66 @ 1.0 ohms	Leads 1-2, 3-4, 33-44 @ .25 ohms Leads 55-66 @ 1.0 ohms
13.0	13.0	13.0	13.0	13.0	13.0
Flexible Disc	Flexible Disc	Flexible Disc	Flexible Disc	Flexible Disc	Flexible Disc
—	—	—	—	—	—
70 in. lbs. (8.0 Nm)	260 in. lbs. (29 Nm)	260 in. lbs. (29 Nm)	260 in. lbs. (29 Nm)	260 in. lbs. (29 Nm)	260 in. lbs. (29 Nm)
Static Brush-Type	Static Brush-Type	Static Brush-Type	Static Brush-Type	Static Brush-Type	Static Brush-Type

Table of Contents

Introduction

This manual covers operation, troubleshooting and repair of Kohler Standby Single-Phase generators and controls. Differences between models are noted throughout the manual. Engine service and parts information are available separately for particular models and specs.

Service Assistance

Contact your Kohler Generator Distributor to obtain additional service information for particular models. See your local listing or contact Kohler Co. Give Model, Spec and Serial numbers from generator nameplate for complete engine service manual and generator set parts list.

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 way to prevent accidents is to be aware 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. Additional precautions must be taken when using the following fuels:

Gasoline - Store gasoline only in approved red containers clearly marked GASOLINE. Do not 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.

Natural Gas - Adequate ventilation is mandatory. Natural gas rises; install gas detectors high in room. Inspect detectors often.

⚠ WARNING

Storing gasoline and other volatile fuels in day or sub-base fuel tanks can cause an explosion. Store only diesel fuel in day or sub-base fuel tanks.

⚠ 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

Hazardous voltage can cause severe personal injury. When testing or servicing generator set and there is the presence of hazardous voltage, carefully follow instructions in the equipment manual.

⚠ WARNING

Hazardous "backfeed" voltage can cause death or severe injury. Install a transfer switch in standby power installations to prevent connection of standby 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.

⚠ CAUTION

Short circuits can cause 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

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

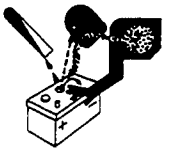
⚠ CAUTION

Hot parts can cause personal injury. Avoid touching generator field or exciter armature. Generator field and exciter armature will get hot if shorted.

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

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. 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

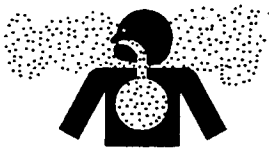
Sulfuric acid in batteries can cause permanent damage to eyes, burn skin, and eat holes in clothing. Always wear splash-proof safety goggles when working around the battery. If battery electrolyte is splashed in the eyes or on skin, immediately flush the affected area for 15 minutes with large quantities 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

Engine block heater can cause electrical shock. Remove engine block heater plug from electrical outlet before working on block heater electrical connections.

NOTE

Block heater will fail if not immersed in water. Always unplug block heater(s) before draining coolant and fill engine block with coolant prior to plugging in block heater(s). Block heater element MUST be immersed in engine coolant before being energized.

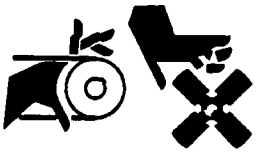


⚠ WARNING

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. Avoid breathing exhaust fumes when working on or near the generator set. Carbon monoxide is particularly dangerous in that it is an odorless, colorless, tasteless, nonirritating gas. Be aware that it can cause death if inhaled for even a short period of time. The exhaust system must be leakproof and routinely inspected.

⚠ 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.



⚠ 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.

⚠ 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 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.

⚠ WARNING

Hot exhaust components may ignite nearby combustible materials. Keep exhaust piping away from fuel lines, fuel tank, and combustible materials. A double-sleeved thimble (shield) must always be installed where exhaust piping passes through a combustible wall or roof.

⚠ WARNING

Accidental starting can cause death or serious personal injury. Turn Generator Master Switch to OFF position, disconnect power to battery charger, and remove 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 automatic transfer switch or remote start/stop switch unless these precautions are followed.

⚠ CAUTION

Electrical shock may occur if battery charger is not properly installed. Connect battery charger to a grounded, metal, permanent wiring system. As an alternative, run an equipment-grounding conductor with circuit conductors and connect to equipment-grounding terminal or lead on battery charger. Battery charger installation should be performed by a qualified electrician and must comply with all local codes and ordinances.

⚠ 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 that wherever electricity is present, there is the hazard of electrocution.

Hazardous voltage can cause death or severe injury. The AC pins and heat sink become "hot" when the power cord is plugged in during voltage regulator test and there is a hazard of electrocution.

Hazardous voltage can cause death or severe injury. Disconnect set from load by opening line circuit breaker or by disconnecting generator output leads from transfer switch and heavily taping ends of leads. If high voltage is transferred to load during test, personal injury and equipment damage may result. The GENERATOR SAFEGUARD BREAKER MUST NOT BE USED IN PLACE OF LINE CIRCUIT BREAKER!

Section 1
Operation

Prestart Checklist

The following items should be checked before each start-up of manually controlled generator sets and at regular intervals on sets equipped with automatic transfer switches.

⚠ WARNING

UNIT STARTS WITHOUT NOTICE! Units with Automatic Transfer Switches start automatically. Potential injury or electrocution can result. Turn Generator Master Switch on controller to OFF position, disconnect power to battery charger, and remove battery cables (remove negative lead first and reconnect it last) to disable generator set before working on any equipment connected to generator.

OIL LEVEL: Should be at or near FULL mark, not over.

FUEL LEVEL: Make sure there is an adequate supply; keep tanks full to allow operation for extended periods.

BATTERY: Check connections and level of battery electrolyte.

AIR CLEANER: Must be clean and properly installed to prevent unfiltered air from entering engine.

AIR INLETS: Must be clear and unobstructed.

AIR COOLING: Make sure the air intake and discharge openings are clean and clear.

LIQUID COOLING: Remove radiator cap to check coolant level. Add clean, fresh water or anti-freeze until level is just below overflow tube opening. A coolant solution of 50% ethylene glycol and 50% clean, soft water is recommended to inhibit corrosion and prevent freezing to -34°F (-37°C).

COMPARTMENT: Interior must be clean.

OPERATION AREA: Make sure there are no obstructions that could block the flow of cooling air. Make sure area is clean. Rags, tools, or debris must not be left on or near the generator set.

EXHAUST SYSTEM: Exhaust outlet must be clear; silencer and piping must be tight and in good condition.

Preheat Feature

The 17.5kW 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 (3°-4°C) and upon attempting to start the engine it turns over rapidly, exhausting white smoke but does not start, the use of a preheater is necessary. Depress preheat switch for 15-20 seconds, release and initiate starting procedure.

NOTE

Do not operate preheater on an unprimed engine. If no fuel is present at the preheat inlet and as a result no vaporization occurs, the excessive heat will permanently distort the bimetallic element, and destroy the preheater.

Controller

For identification of controller components, refer to Figure 1-1. Your controller may differ from that pictured. For an explanation of their functions, refer to the following.

1. **Frequency Meter** — measures frequency (Hz) of generator output voltage (optional).
2. **AC Voltmeter** — measures voltage across output leads indicated by selector switch (optional).
3. **AC Ammeter** — measures amperage from output leads indicated by selector switch (optional).
4. **Selector Switch** — indicates output leads being measured.
5. **Reset Lamp** — lights to indicate a fault condition.
6. **Generator Main Switch** — refer to "Testing, Starting, Resetting, and Stopping."
7. **Hourmeter** — records total generator set operating hours for reference in maintenance scheduling.
8. **Preheat Switch** — preheat feature, diesel models (optional).

   DC Ammeter — measures charge/discharge rate of the battery(ies).
9. **DC Voltmeter (17RY only)** — measures voltage of generator starting battery.
10. **Oil Pressure Gauge** — measures engine oil pressure (optional).
11. **Water Temperature Gauge** — measures engine coolant temperature (optional).

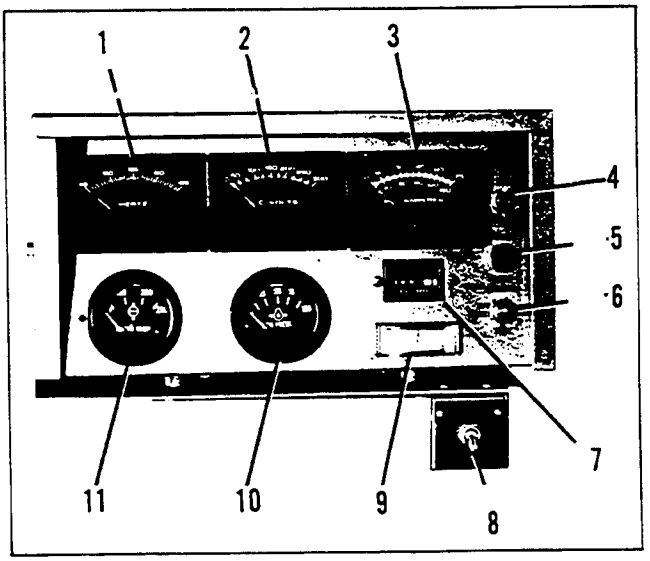


Figure 1-1. Controller Features

Testing

To test run the generator set at the controller move the Generator Main Switch to the TEST Position (if equipped).

Starting

Move Generator Main Switch to REMOTE position to allow start-up by automatic transfer switch or remote start-stop switch. If set is not connected to an automatic transfer or remote start-stop switch, move the Generator Main Switch to the TEST or START position for normal start-up.

Stopping

1. Run the generator set at no load for 5 minutes to allow engine cool-down.
2. Move Generator Main Switch or remote start-stop switch to OFF or STOP position.

Fault Shutdown

The generator set will shut down automatically and RESET lamp will light (if equipped) under the following fault conditions:

OVERCRANK: (Except 7.5C) Shutdown occurs if engine does not start after approximately 30 seconds of cranking.

HIGH TEMPERATURE: Shutdown occurs approximately 30 seconds after fault.

LOW OIL PRESSURE: Shutdown occurs approximately 30 seconds after fault.

The approximate oil pressure or engine temperature at which shutdown will occur is listed by model in the following chart.

Model	High Engine Temperature Shutdown @	Low Oil Pressure Shutdown @
5RMY	480° +/- 15°F (249°C)	—
5RMOY	275° +/- 10°F (135°C)	8 psi +/- 2psi (55 +/- 14kPa)
7RMY	480° +/- 15°F (249°C)	15psi +/- 3.5psi (103 +/- 24kPa)
7.5R	218° +/- 7°F (103°C)	8psi +/- 2.5psi (55 +/- 17kPa)
7.5C	218° +/- 7°F (103°C)	8psi +/- 2.5psi (55 +/- 17kPa)
10RY	218° +/- 7°F (103° C)	15psi +/- 3.5psi (103 +/- 24 kPa)
10RMOY	275° +/- 10°F (135°C)	8psi +/- 2psi (55 +/- 14kPa)
15RMY	375° +/- 15°F (190°C)	0.9psi (6.2kPa)
17RY	218° +/- 7°F (103°C)	15psi +/- 3.5psi (103 +/- 24kPa)

Resetting

To restart the generator set after a fault shutdown, refer to the following procedure.

1. Move Generator Main Switch to OFF/RESET or STOP position; reset lamp will go out (if equipped).
2. Disconnect generator set from load with the circuit breaker or automatic transfer switch (7.5 models — disconnect appliances).
3. Move Generator Main Switch to TEST position to restart generator set. Move switch to START on 7.5 models. Refer to Controller Troubleshooting, Section 2, to determine cause of fault shutdown.
4. Return Generator Main Switch to OFF/RESET or STOP position.
5. Correct cause of fault shutdown. See Safety Precautions.
6. Move Generator Main Switch to necessary position (REMOTE or START, TEST) for start-up.

Section 2
Controller Troubleshooting

The following is a sequence of operation your controller will go through when starting, running, stopping or emergency stopping. This section should serve as a good starting point in fault detection. Figures 2-1, 2-2, and 2-3 are sample schematics representative of most units. Later controller circuit boards are equipped with relay LED's which indicate when that particular relay is receiving power. The LED does not indicate whether the relay is energized. Refer to the appropriate sequence of operation below and proper schematic in Section 6 when troubleshooting.

All Models Except 7.5C

Starting

- Close the Generator Main Switch between LC and 3 (TEST position) or LC and 4 (REMOTE position).
- CR (LED 1 lights) and C relay energize. TDR relay begins timing.
- On units with cyclic cranking option, the 3CR relay will control energizing and deenergizing of the "C" cranking contactor.
- Normally open CR contacts close and energize the ignition circuit, terminal 70; meters and gauges are energized. Build-up terminal 1B is energized on units with 5-pin voltage regulator.
- Normally closed CR contacts open to remove ground from magneto. (Magneto-fired engines only.)
- Normally open C contacts close to energize starter solenoid or starter motor.
- Normally open R contacts will close to energize the injection solenoid (10-17.5kW Diesel).
- S contacts close to energize starter motor (10-17.5kW Diesel).
- On units with 6-pin voltage regulator, normally closed 4CR contacts provide rotor field flashing.

Running (7.5R w/5 pin regulator)

- When AC output is available, 1CR relay is energized.
- Normally-open 1CR contacts open to disconnect field flashing and de-energize C relay.
- C relay closed contacts open to disconnect cranking.

Running

- When AC output is available, 4CR relay is energized. 4CR normally-open contacts close. (On models with 6-pin voltage regulator, 4CR normally-open contacts close to disconnect field flashing.)
- 1CR relay is energized. Normally-closed 1CR contacts open to disconnect C relay (cranking) and field flashing.
- TDR relay stops timing (if equipped).

Stopping

- Move the Generator Main Switch to "OFF" position.
- CR relay will deenergize, grounding the magneto on gasoline models, deenergizing the fuel solenoid on the diesel models, or ignition coil on ignition fired gasoline models.

Low Oil Pressure (LOP) Shutdown

- Low oil pressure will cause LOP contacts in series with 2CR relay and TDR to close.
- TDR times out (30-60 seconds).
- 2CR contacts in series with the CR relay open to stop unit.
- 2CR relay contacts close to light fault lamp (if equipped).

High Temperature (HT) Shutdown

- On units supplied with high temperature cutouts, high temperature will cause temperature switch in series with 2CR relay and TDR to close.
- TDR times out (30-60 seconds).
- 2CR contacts in series with the CR relay open to stop unit.
- 2CR relay contacts close to light fault lamp (if equipped).

Overcrank

- During the cranking cycle, TDR timing module will be energized through closed 1CR relay contacts.
- If unit fails to start or unit starts and produces no AC output, TDR will time out (30-60 seconds) and energize 2CR relay (LED 3 lights).
- 2CR contacts in series with the CR relay open to stop cranking or stop unit if no AC output is produced.
- 2CR contacts in series with reset lamp will close to light fault lamp (if equipped).

Model 7.5C

Starting

- Move START/STOP switch to START position.
- "C" cranking contactor and 1CR (LED 2 lights) relay are energized, supplying voltage to terminal 70 (choke, fuel valve, hourmeter, etc.).
- Normally open C contacts close to energize starter and supply voltage through closed CR contacts to voltage regulator "B" terminal for field flashing.
- Normally closed 1CR contacts (in series with LOP switch) open to remove ground from magneto.

Running

- Once unit comes up to proper voltage, CR relay is energized (LED 1 lights).
- Normally closed CR contacts will open deenergizing 1CR relay at "C" cranking contactor.

Stopping

- Move START/STOP switch to STOP.
- Ground is placed on magneto, stopping engine.

Fault Shutdown

High Water Temperature (HWT)

- High water temperature in engine will cause HWT contacts to close.
- Closed HWT contacts place ground on magneto, stopping engine.

Low Oil Pressure (LOP)

- Low oil pressure in engine will cause LOP contacts to close.
- Closed LOP contacts place ground on magneto, stopping engine.

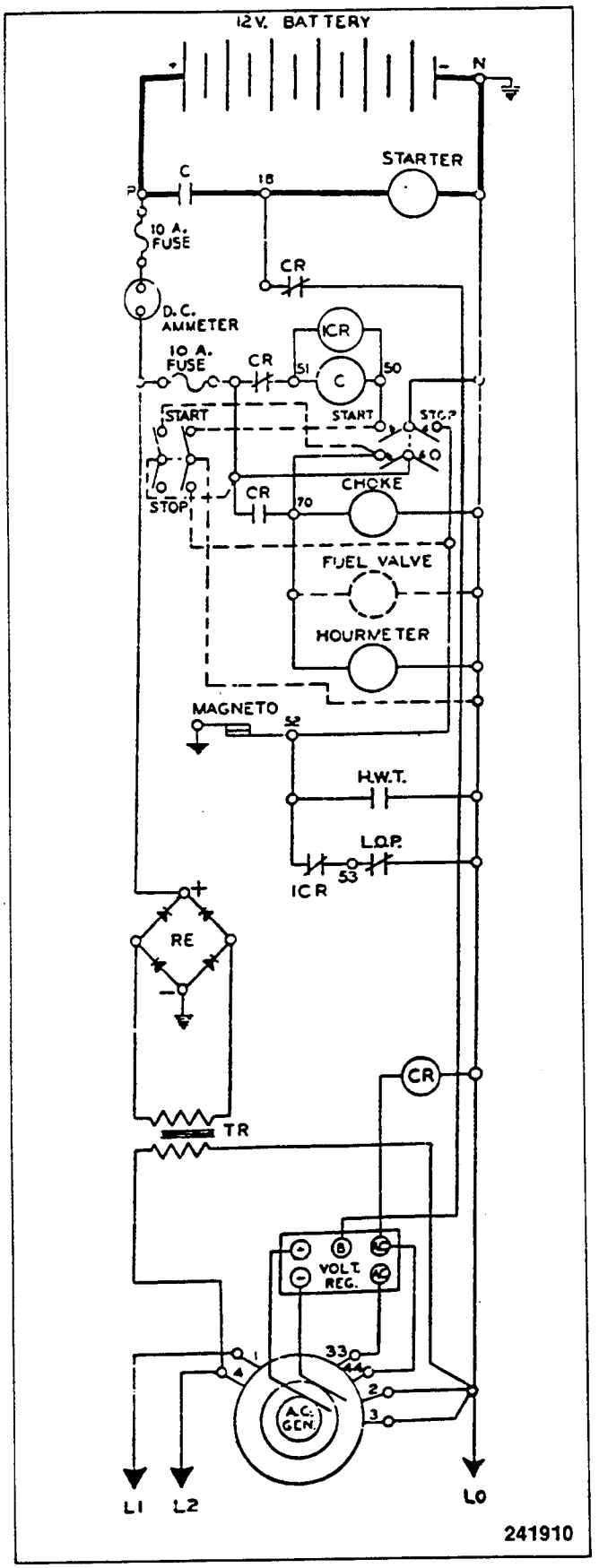


Figure 2-1. Sample Sequence of Operation (Sets w/5-Pin Voltage Regulator)

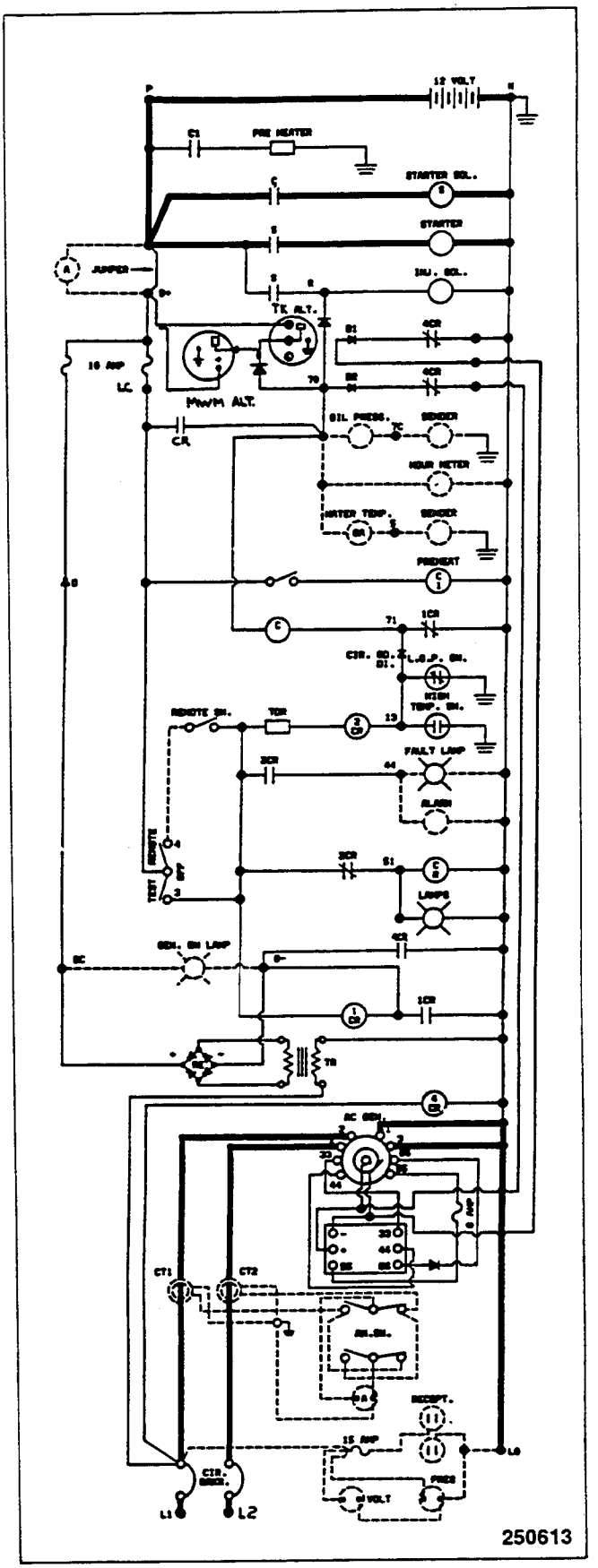


Figure 2-2. Sample Sequence of Operation (Sets w/6-Pin Voltage Regulator)

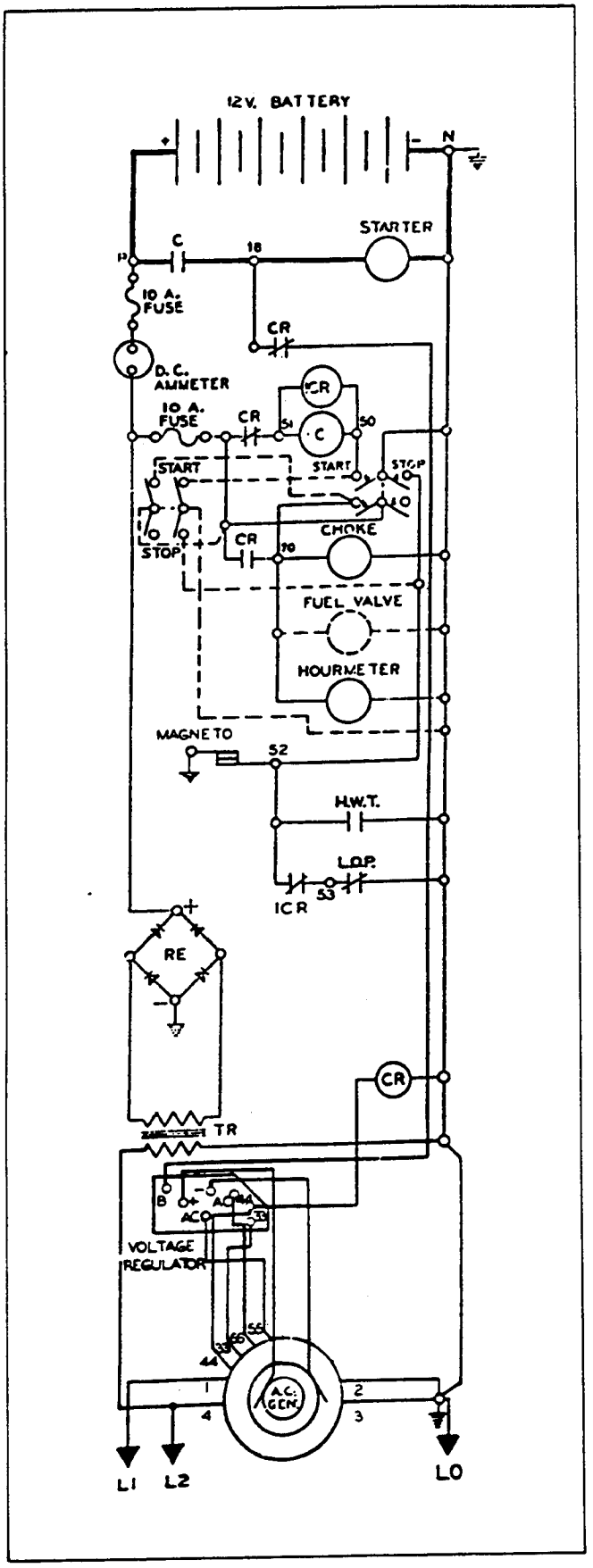


Figure 2-3. Sample Sequence of Operation (Sets w/7-Pin Voltage Regulator)

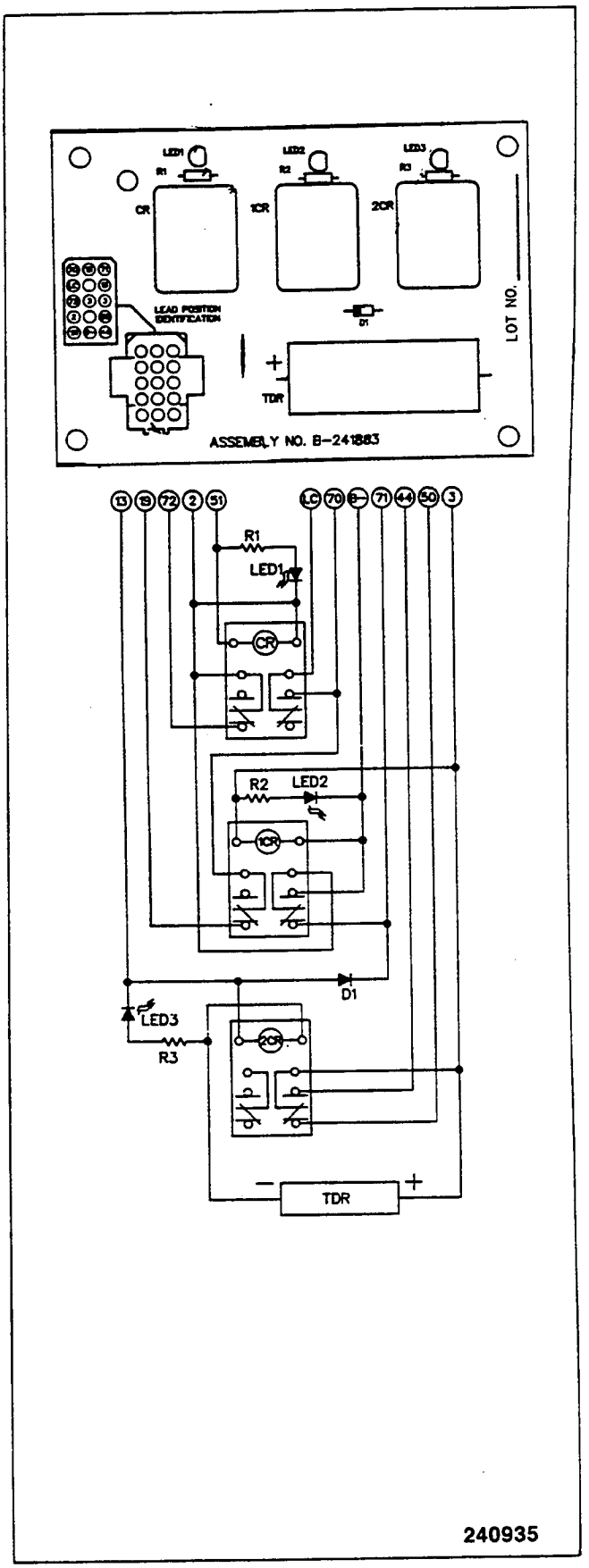


Figure 2-4. Controller Circuit Board B-241883

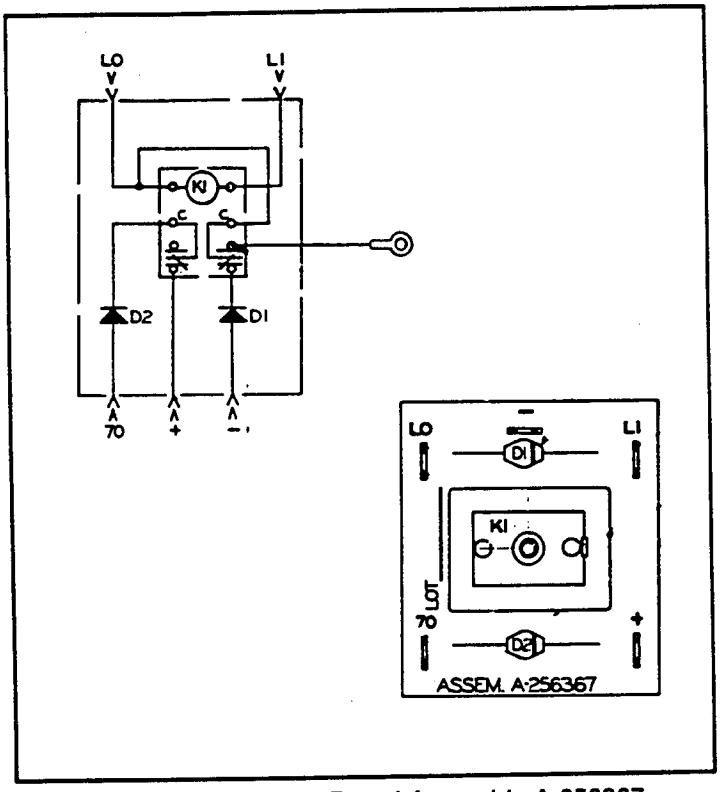
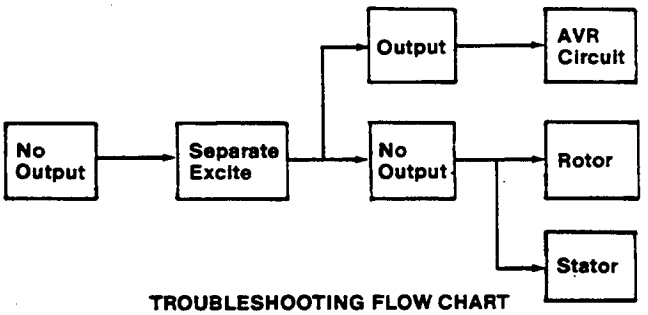


Figure 2-5. Flashing Board Assembly A-256367

Section 3
Generator Troubleshooting

The flow chart below is a guide to troubleshoot your generator set. Before beginning the troubleshooting procedures, read all safety precautions at the beginning of this manual. Additional safety precautions are included with the tests; do not neglect these precautions.



TROUBLESHOOTING FLOW CHART

Table 3-1. Generator Troubleshooting

Separate Excite

To determine the cause of no or low AC output, separately excite the generator. The generator field (rotor) may be excited (magnetized) using an outside power source and the following procedures. Follow the instructions for your voltage regulator type. Refer to Figures 3-1, 3-2 and 3-3 to identify the correct voltage regulator.

⚠ 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. 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.

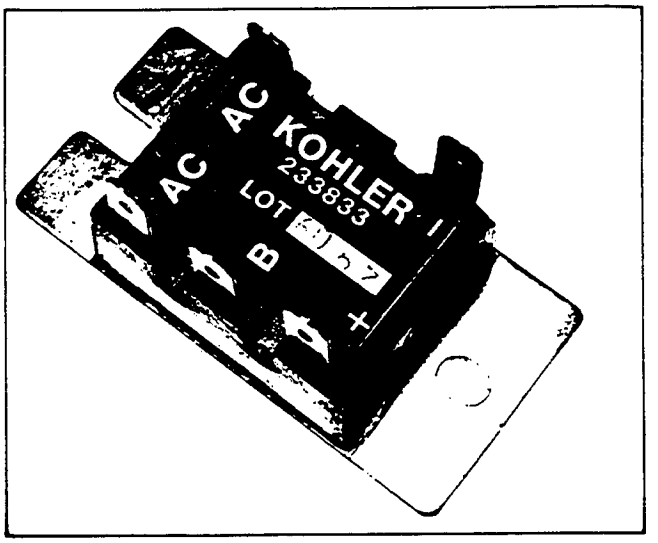


Figure 3-1. 5-Pin Voltage Regulator

5- and 7-Pin Voltage Regulator

1. Disconnect all leads from voltage regulator.
2. Connect an ammeter and a 12-volt automotive battery with the positive (+) and negative (-) brush leads. Refer to Figure 3-4. Note and record ammeter reading.
3. The ammeter reading should approximate battery voltage divided by specified rotor resistance.

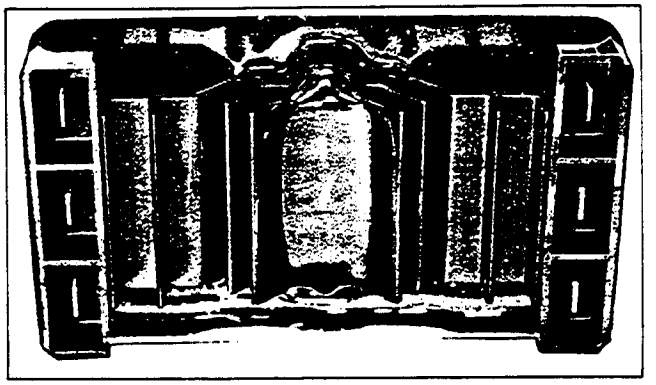


Figure 3-2. 6-Pin Voltage Regulator

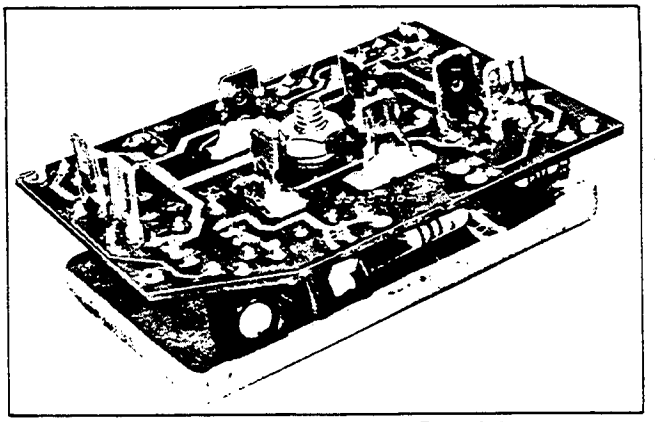


Figure 3-3. 7-Pin Voltage Regulator

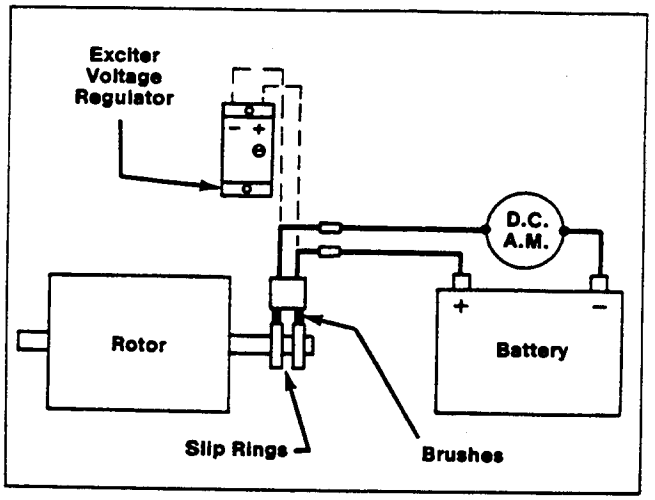


Figure 3-4. Separate Excitation Connections

4. Start engine and check that the ammeter remains stable. If unstable, this indicates a faulty rotor. Refer to Component Testing, Section 4. If ammeter is stable, proceed to Step 5.

5. Check for AC output across leads 1-2, 3-4, 33-44 and 55-66 (if applicable). Output should be approximately 100 volts on the two-pole rotor and approximately 55 volts with the four-pole rotor. If reading is incorrect, this indicates a faulty stator. Refer to Component Testing, Section 4.

6. If rotor and stator checks are positive, this indicates a faulty voltage regulator. Refer to Component Testing, Section 4.

6-Pin Voltage Regulator

1. Disconnect all leads from voltage regulator.

2. Connect an ammeter and a 12-volt automotive battery with the positive (+) and negative (-) brush leads. Refer to Figure 3-4. Note and record the ammeter reading.

3. The ammeter reading should approximate battery voltage divided by specified rotor resistance.

4. Start engine and check that the ammeter remains stable. If unstable, this indicates a faulty rotor, refer to Component Testing, Section 4. If ammeter is stable, proceed to Step 5.

5. Check for AC output across leads 1-2, 3-4, 33-44 and 55-66. Output should be approximately 40-75 volts. If reading is incorrect, this indicates a faulty stator. Refer to Component Testing, Section 4.

6. If rotor and stator are positive, this indicates a faulty voltage regulator. Refer to Component Testing, Section 4.

Section 4
Component Testing

This section guides you in checking your generator components for proper operation. Follow the safety precautions in front of this manual. Additional safety precautions are included with the tests; do not neglect these precautions.

5-Pin Voltage Regulator Test

This test is designed to check regulator output when cold; this test does not check voltage build-up.

NOTE

Although the physical appearance of your voltage regulator may differ from the one pictured in Figure 4-1, its function is identical.

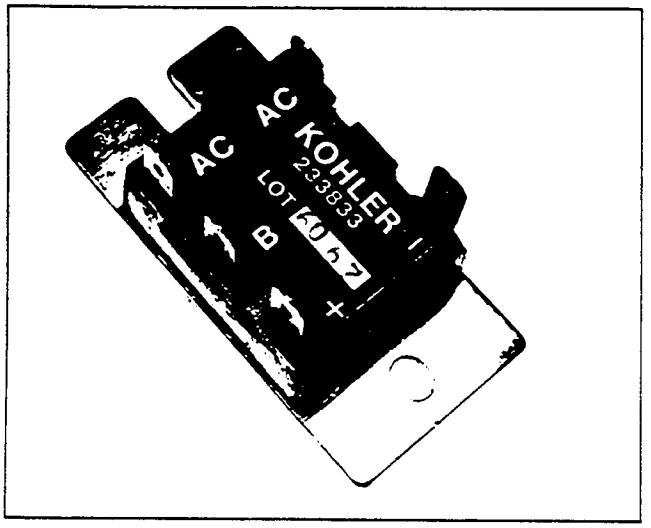


Figure 4-1. Exciter Voltage Regulator

To test, you will need the following components:

- Two 120 Volt/100 watt bulbs and sockets
- 0-140 Volt variable transformer
- Switch (DPST) 120 Volt, 10 Amp. minimum
- Fuse, 2 Amp. (in holder)
- Jumpers
- Multimeter

⚠ 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 that wherever electricity is present, there is the hazard of electrocution.

Hazardous voltage can cause death or severe injury. The AC pins and heat sink become "hot" when the power cord is plugged in during voltage regulator test and there is a hazard of electrocution.

Figure 4-2 shows the typical voltage regulator terminal identifications.

1. Connect two 100W light bulbs across "+" and "–" terminals of regulator. See Figure 4-2. Terminals are identified in Figure 4-3.
2. Set multimeter range to 100 Volts DC. Connect meter across light bulbs. Check for correct polarity (refer to Figure 4-2).

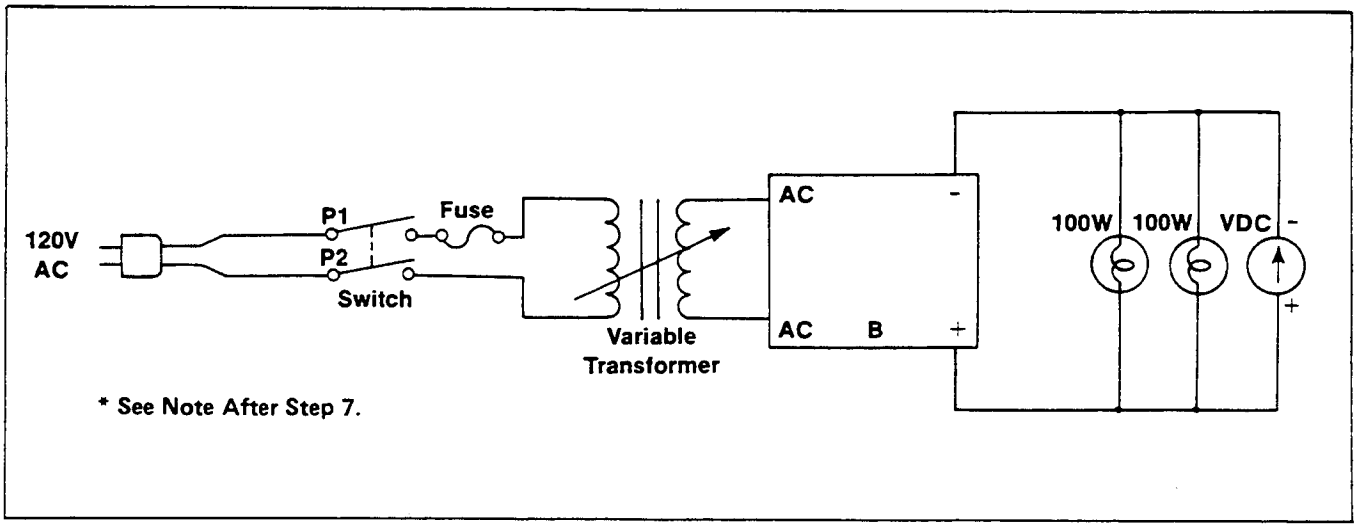


Figure 4-2. Wiring Diagram — Voltage Regulator Field Test (5-Pin)

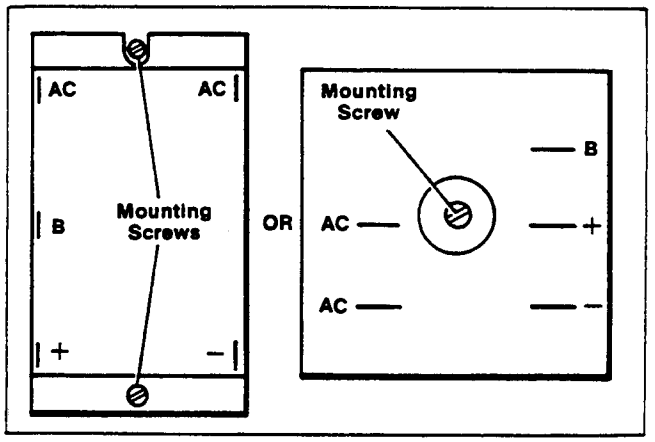


Figure 4-3. Voltage Regulator Terminal Identification

3. Connect the regulator AC terminals to the output leads of the variable transformer. Connect the switch (DPST) and 2 Amp. fuse to the AC cord as shown in Figure 4-2 (if not included in variable transformer assembly).
4. Turn the variable transformer to minimum position and connect to the AC supply.
5. Slowly increase transformer output voltage. The bulbs should increase in brightness. When the regulator input voltage (AC terminals) is approximately 120 Volts, the bulbs will be at maximum brightness. As the input voltage is increased the bulbs should go out. The bulbs should not light at input voltages over 130 Volts AC.
6. Test field build-up circuit by connecting one end of jumper to either "AC" terminal. Touch the other end of jumper to "B" terminal. Bulbs should glow brighter. Voltmeter should indicate 50-75 Volts DC. **Completely disconnect jumper.**
7. **Turn switch off and unplug AC cords.**

The voltage regulator is defective if:

- The bulbs do not light at any input voltage level.
- The bulbs do not go out when the AC input is above 130 Volts AC.
- The bulbs flicker excessively.

NOTE

If voltage readings coincide with above recommended test results, regulator may be used in generator set.

6-Pin Voltage Regulator

This test is designed to check regulator output. To test, you will need the following components:

- Variable transformer, 0-140 Volts (.5 Amp. min.)
- 1 to 1 isolation transformer (.6 Amp. min.)
- 120 Volt AC plug (60 Hz)
- Double pole, single throw switch (DPST)
- One 120 Volt, 100 watt lamp
- One fuse, 2 Amp. (in holder)
- AC Voltmeter
- Recommended #14 AWG copper wire (minimum)

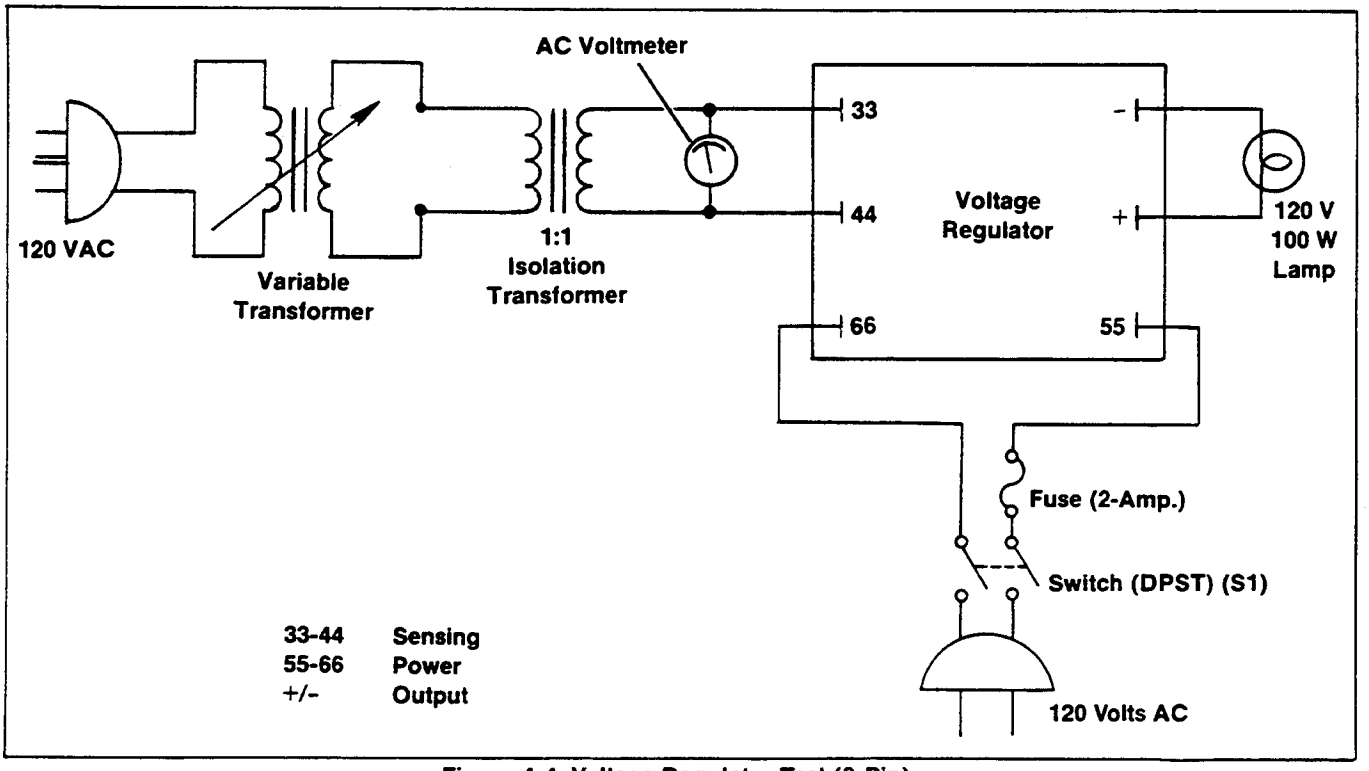


Figure 4-4. Voltage Regulator Test (6-Pin)

⚠ 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 that wherever electricity is present, there is the hazard of electrocution.

Hazardous voltage can cause death or severe injury. The AC pins and heat sink become "hot" when the power cord is plugged in during voltage regulator test and there is a hazard of electrocution.

1. Connect components as shown in Figure 4-4.
2. Plug in both variable transformer and AC plug (55-66).
3. Turn switch S1 on. Lamp should be on. If lamp does not go on this indicates a faulty voltage regulator; replace.
4. Turn variable transformer on. Slowly increase variable transformer output. The lamp should go out at approximately 120 Volts and remain out as voltage is increased.
5. If the lamp does not go out or stays at a dull glow, this indicates a faulty regulator which should be replaced.
6. **Turn switch off and unplug AC cords.**

7-Pin Voltage Regulator Test and Adjustment

Equipment Required

- Two 100 watt bulbs mounted and connected in parallel
- 0-140 Volt variable transformer
- One 2 Amp. fuse
- Switch (DPST), 120 Volt, 10 Amp. minimum
- Two jumper wires (18 AWG minimum)

⚠ 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 that wherever electricity is present, there is the hazard of electrocution.

Hazardous voltage can cause death or severe injury. The AC pins and heat sink become "hot" when the power cord is plugged in during voltage regulator test and there is a hazard of electrocution.

1. If regulator adjusting Pot. (see Figure 4-5) has not been factory sealed, set Pot. to its mid-position.

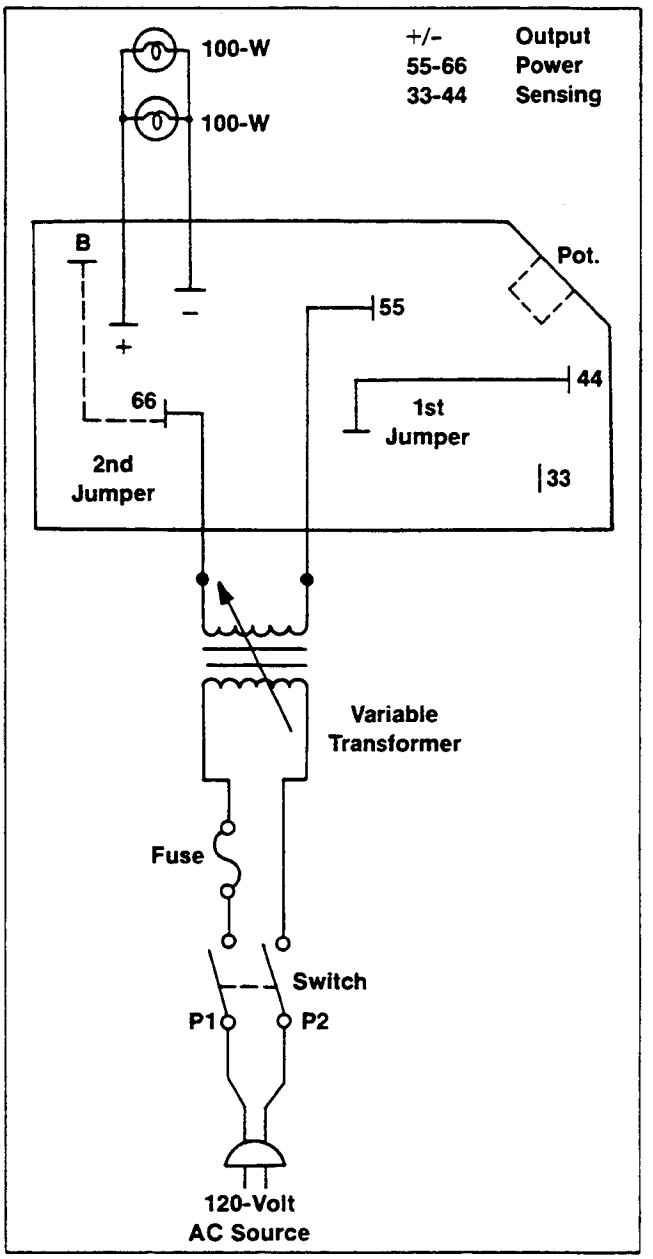


Figure 4-5. Voltage Regulator Test (7-Pin)

2. Connect the components as shown in Figure 4-5. The two 100 watt bulbs are connected across the positive (+) and negative (-) regulator terminals. The first jumper is connected across regulator terminal 44 and the unmarked terminal. The output of the variable transformer is connected to terminals 55 and 66 of the regulator. Connect a double pole switch and a 2 Amp. fuse in series with the AC power cord and transformer (if not incorporated in the transformer assembly).

3. Turn transformer to minimum voltage position. Energize transformer and slowly increase voltage. Lamp should increase in brightness. When the voltage is approximately 120 Volts (regulating voltage) the load lamps should go out. The lamps should remain out as the voltage is further increased. To readjust voltage regulator, follow Steps 4-6.

⚠ WARNING

Hazardous voltage can cause severe personal injury. When testing or servicing generator set and there is the presence of hazardous voltage, carefully follow instructions in the equipment manual.

4. Turn switch to off and unplug cord from outlet. If regulator Pot. has been factory sealed, carefully remove sealer and turn Pot. slider so slider works freely. Set Pot. to mid-position.

5. Reconnect power to regulator and adjust transformer output to the desired voltage level (usually 120 Volts AC). Turn regulator adjustment Pot. to full clockwise position — lamps should light or remain lit.

6. Turn Pot. slowly counterclockwise until bulbs go out (preadjustment setting). **Turn switch off and unplug power cord from outlet.**

7. To check field flash circuit, plug power cord into outlet, turn switch on and momentarily contact second jumper wire across regulator terminals B and 66. Bulbs should light and go out. **Turn switch off and unplug power cord from outlet.**

NOTE

If regulator tests test positive as described in Steps 3 through 7, regulator may be used in generator.

8. Install regulator in generator and connect as shown in proper wiring diagram. Disconnect generator from load. Connect voltmeter across L0 and L1. Start engine. Adjust regulator Pot. so meter shows proper output voltage. Stop engine. Remove voltmeter and seal Pot. with RTV or suitable substitute.

To Install Voltage Regulator

When installing 5 and 7 pin voltage regulators, apply a thin coating of thermal compound to back surface of regulator before mounting. Mounting surfaces should be flat and free of burrs and debris. Thermal compound application is unnecessary for 6-pin voltage regulator installation. Tighten regulator mounting screws only as necessary to compress lockwashers. For regulator with two mounting screws, tighten screws to 20 in. lbs. (0.23 Kgm) maximum. For center mount type regulators, tighten screw to 10 in. lbs. (0.17 Kgm) maximum.

NOTE

Failure to apply thermal compound or overtightening regulator mounting screws may cause regulator failure.

Rotor

The rotor creates the magnetic field needed to raise alternating current in the stator windings. The 5RMY model uses a two-pole rotor and the 5RMOY through 17.5ROY models use a four-pole rotor.

Prior to testing, inspect the rotor for visible damage to pole shoes, insulation, exposed coil windings, and slip ring surfaces. Check bearing for wear, noise when rotated or heat discoloration.

Check the rotor for continuity and resistance. Measure the rotor resistance (ohms) between the two slip rings (Figure 4-6). See Table 4-1 for the correct readings.

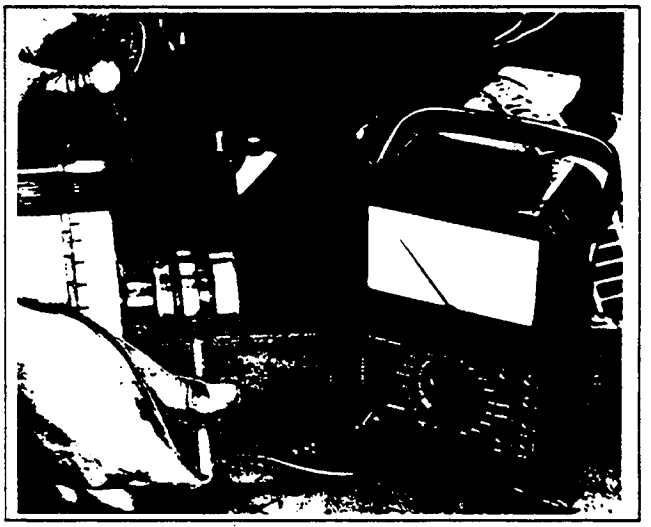


Figure 4-6. Rotor Resistance Check

Slip rings acquire a glossy brown finish in normal operation. Do not attempt to maintain a bright, newly machined appearance. Ordinary cleaning with a dry, lint-free cloth is usually sufficient. Very fine sandpaper (#00) may be used to remove roughness. Use light pressure on the sandpaper. Do not use emery or carborundum paper or cloth. Clean out all carbon dust from the generator. If the rings are black or pitted, remove the rotor and remove some of the surface material by using a lathe.

Model	Resistance	
	6-Pin Regulator (Powerboost)	5- and 7-Pin Regulator
5RMY	4-6 ohms	7-9 ohms
5RMOY	4-6 ohms	7-9 ohms
7RMY	4-6 ohms	7-9 ohms
7.5R	4-6 ohms	7-9 ohms
7.5C	4-6 ohms	7-9 ohms
10RY	3-5 ohms	—
10RMOY	2.5-4.5 ohms	—
15RMY	2.5-4.5 ohms	—
15RMOY	2.5-4.5 ohms	—
17.5ROY	2.5-4.5 ohms	—
17RY	2.5-4.5 ohms	—

Table 4-1. Rotor Resistance

To check for rotor continuity, adjust ohmmeter to zero ohms. Touch one ohmmeter lead to either slip ring and other lead to rotor poles or shaft. Meter should register no continuity.

Should any fault be found with the rotor in any of the above tests, the rotor must be repaired or replaced.

Stator

The stator consists of a series of coils of wire laid in a laminated steel frame. The stator leads supply voltage to the AC load and exciter regulator.

Prior to testing, inspect stator for visible damage to lead wires, exposed coil windings, exposed and varnished areas of frame laminations and housing, and make sure stator is securely riveted in housing.

Checking Stator Continuity and Resistance

1. To check stator continuity, set ohmmeter on R x 1 scale (Figure 4-7). Contact red and black meter leads; adjust meter to zero ohms. Check stator continuity, contacting meter leads to stator leads (Figure 4-8). Leads 1, 2, 3, and 4 are the generator output leads. Leads 33, 44, 55, and 66 are voltage regulator supply and sensing leads.
   - There must be continuity between leads 1 and 2.
   - There must be continuity between leads 3, 4, 33, and 44.
   - There must be continuity between leads 55 and 66 (if equipped).
   - There should be no continuity between lead 1 and leads 3, 4, 33, and 44.
   - There should be no continuity between lead 1 and leads 55 and 66 (if equipped).
   - There should be no continuity between lead 4 and leads 55 and 66 (if equipped).
   - There should be no continuity between any stator lead and ground on the stator housing or frame laminations.
2. Contact red and black meter leads and readjust ohmmeter to zero ohms. Check cold resistance of stator windings, contacting meter leads to stator leads 1 and 2, leads 3 and 4, leads 33 and 44, and leads 55 and 66 (if equipped). Readings should be as shown in Table 4-2. (NOTE: These readings were taken with an analog meter.)

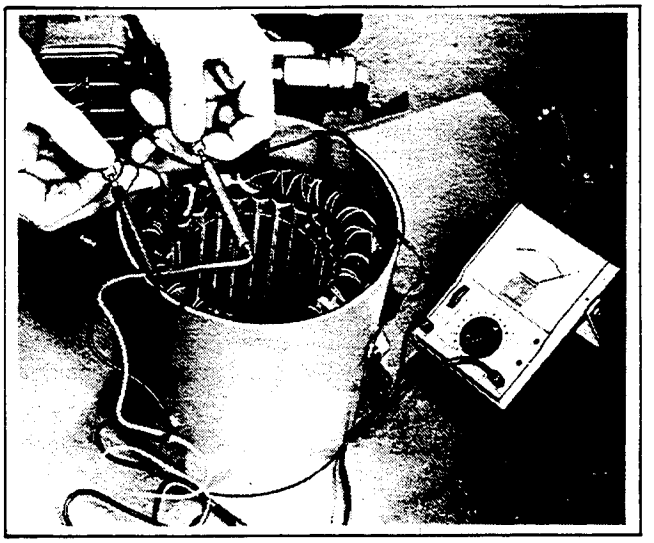


Figure 4-7. Checking Stator Continuity

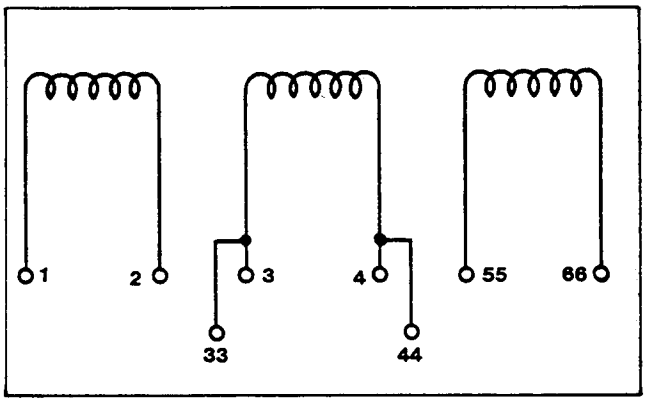


Figure 4-8. Generator Stator Leads

Leads	Readings
1 and 2	0.25 ohms
3 and 4	0.25 ohms
33 and 44	0.25 ohms
55 and 66	1.0 ohms

Table 4-2. Stator Winding Cold Resistance Readings

Should any fault be found with the stator in any of the above tests, the stator must be repaired or replaced.

Brushes

The brushes transfer current from the voltage regulator to slip rings. The brushes carry a very low current (approxi-

mately 2 Amps.) and should last the life of the generator set. Abrasive dust on the slip rings could, however, shorten the life of the brushes. Excessive arcing at the brushes could damage the voltage regulator. Arcing could be caused by weak springs, damaged slip rings, sticking brushes, loose holder or poor brush contact.

The brushes must be free to move within the holder and held in proper contact by the springs. When properly positioned, spring pressure on the brush surface will cause the brush to wear evenly. Brushes must ride 100% on rings or arcing will occur, resulting in burned rings or failure of the voltage regulator. Figure 4-9 shows the correct positioning of the brushes.

Replace the brushes if worn excessively or unevenly. Replace the springs if damaged or discolored.

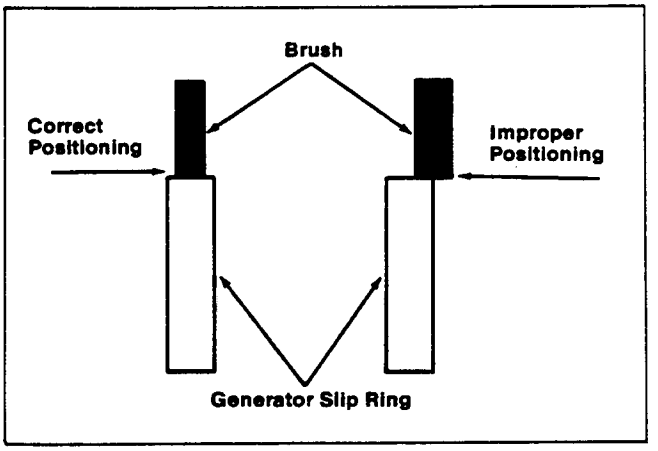


Figure 4-9. Brush Positioning

Section 5
Generator Disassembly/Reassembly

When disassembling or reassembling your generator set, follow all the safety precautions listed in the beginning of this manual. Your model may differ slightly from those shown.

Disassembly

1. Remove end panel from generator end of unit.
2. Remove cover from controller box. Disconnect the generator and engine leads from the internal controller terminal strip. Disconnect ground and LO leads. Remove leads from 4CR relay. Disconnect wire #70 going to the 10-Amp. fuse in the generator end bracket.
3. Remove controller mounting bolts from generator set. Figure 5-1. Pull leads through the opening in controller box when removing from generator.

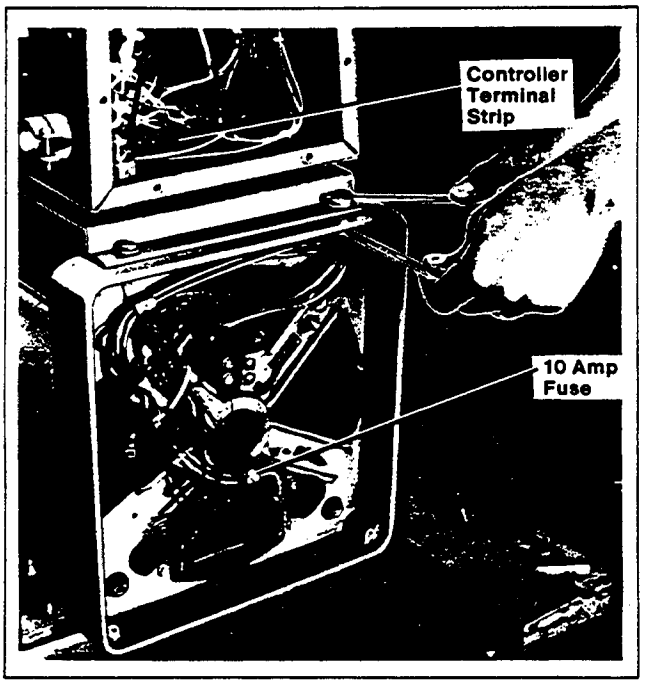


Figure 5-1. Controller Removal

NOTE

On some models, controller can be moved to the side during disassembly without disconnecting controller wiring.

4. Remove bolts from vibro-mounts. Figure 5-2.

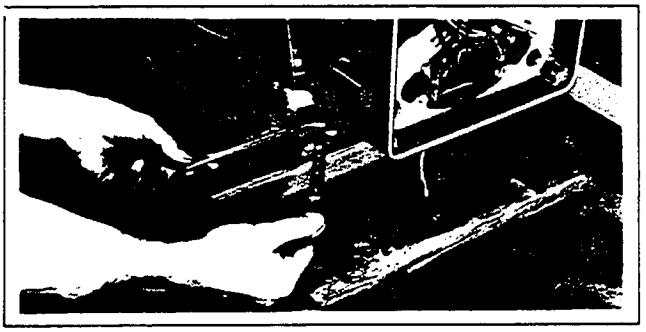


Figure 5-2. Removing Vibro-Mount Bolts

5. Cradle stator with lifting straps and raise with a hoist to lift generator off of vibro-mounts. Figure 5-3.

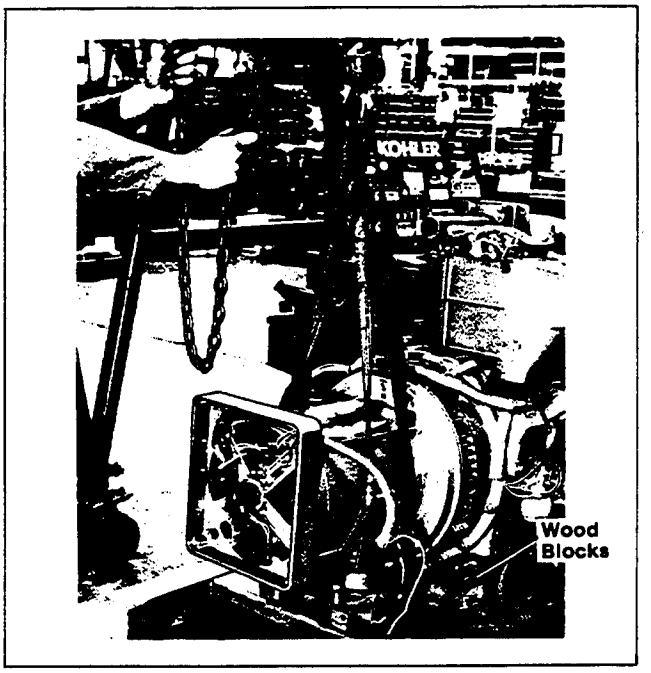


Figure 5-3. Generator Hoisting

6. Place wood blocks under the flywheel housing to support engine, Figure 5-3. Lower generator allowing flywheel housing to rest on blocks.
7. Remove brush cover (if equipped). Raise brushes in holder, pushing leads upward in the slots. Retain brushes by inserting a length of wire or a paper clip. Figure 5-4.

Figure 5-4. Retaining Brushes

8. Disconnect all leads from end bracket. Pull stator leads through harness casing.
9. Remove four over-bolts. Figure 5-5.

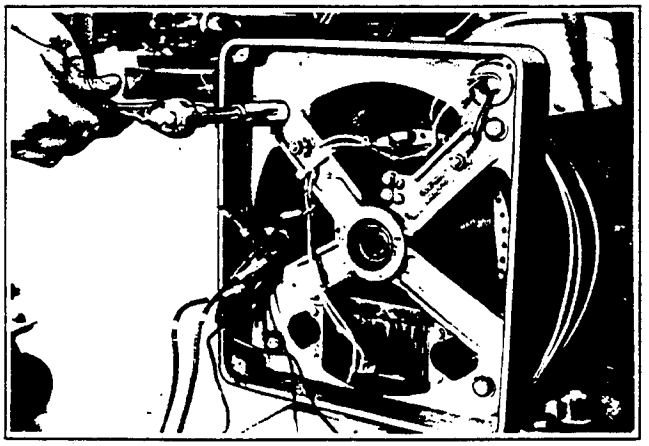


Figure 5-5. Removing Over-Bolts

10. Bump end bracket with a soft, rubber mallet. Figure 5-6.

Figure 5-6. End Bracket Removal

11. Remove stator, being careful not to damage rotor while removing. Figure 5-7.

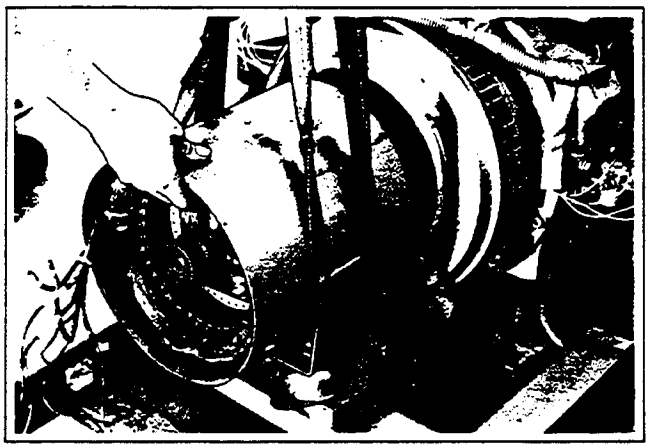


Figure 5-7. Stator Removal

12. Remove generator fan guard (on those equipped).

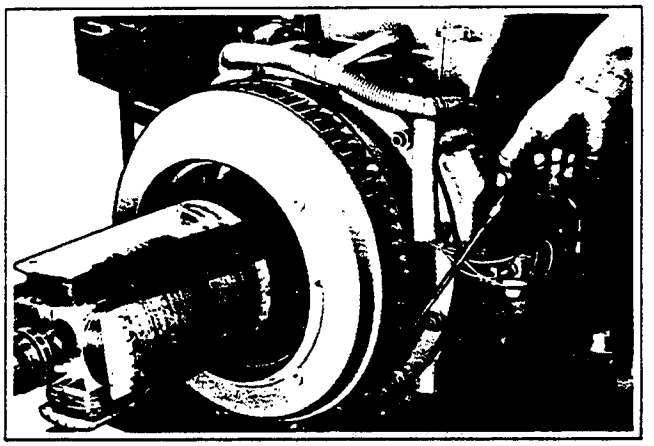


Figure 5-8. Fan Guard Removal

13. On the 10RMOY models, to remove the adapter assembly, remove the adapter mounting nuts. Figure 5-9. Then remove the fan mounting bolts. Figure 5-10. On the 10RY, 15RMY, 15RMOY, 17RY, and 17.5ROY models, remove adapter mounting bolts. Figure 5-11.

    The 7.5C and 7.5R models require removal of the rotor and fan before removing adapter.

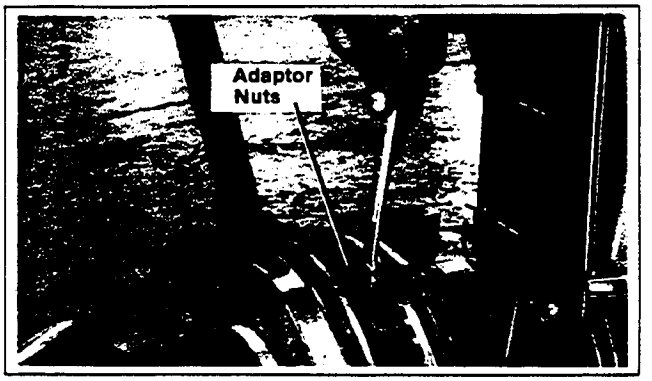


Figure 5-9. 10RMOY Adaptor Removal

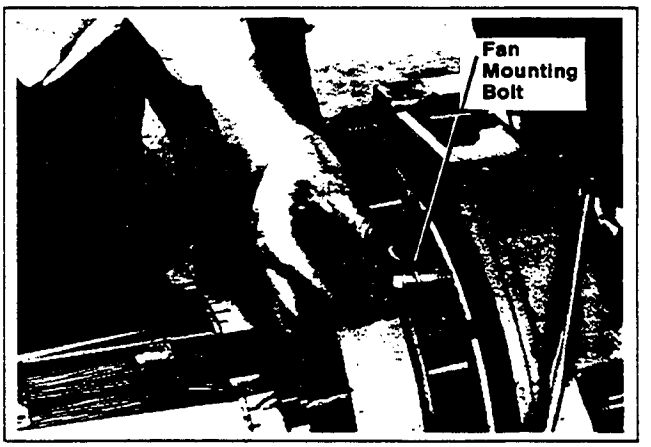


Figure 5-10. 10RMOY Fan Mounting Bolts

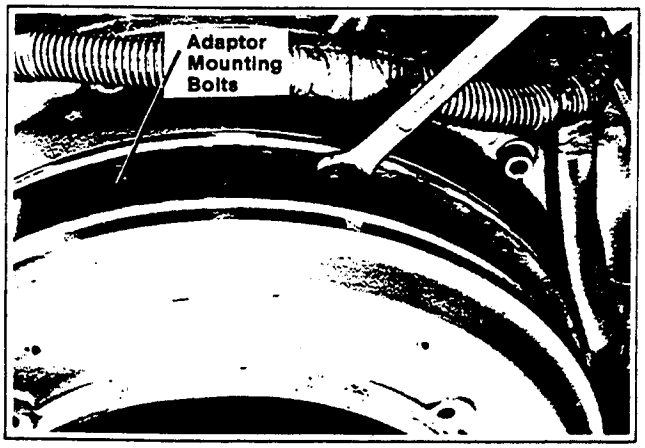


Figure 5-11.
15RMY, 15RMOY & 17.5ROY Adaptor Removal

14. On 10RY and 17RY models, remove fan from adapter plate by removing retaining nuts. Remove nuts, washers, and spacers securing adapter plate and drive discs to flywheel.

15. To remove the rotor assembly, refer to the procedure for your specific model.

5RMY

The rotor is held to the engine crankshaft by right-hand threads on the crankshaft and in the rotor shaft. To remove the rotor, place a wood block on a trailing edge of one rotor pole. One or two sharp, medium-

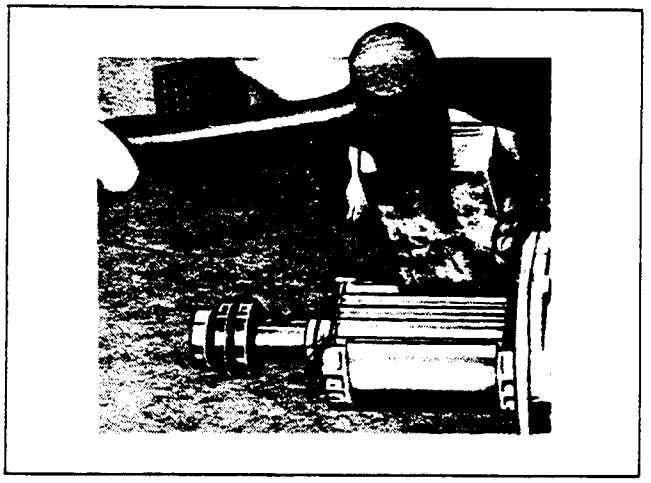


Figure 5-12. Removing Rotor — 2 Pole

force hammer blows to the wood block's end will free the rotor, allowing it to be turned off by hand. Figure 5-12.

CAUTION

Do not attempt to remove rotor by blocking engine cooling fan and turning rotor with any kind of wrench, or damage to fan blades and rotor will result.

5RMOY, 7RMY

To remove the four-pole rotor, loosen thru bolt as shown in Figure 5-13. To break the rotor loose from the taper, strike the bolt head with a heavy lead mallet. If after striking bolt head, the rotor can be rocked slightly back and forth in place, remove thru bolt and pull rotor away from engine. If rotor is not loose, repeat procedure. The generator fan will be removed with rotor.

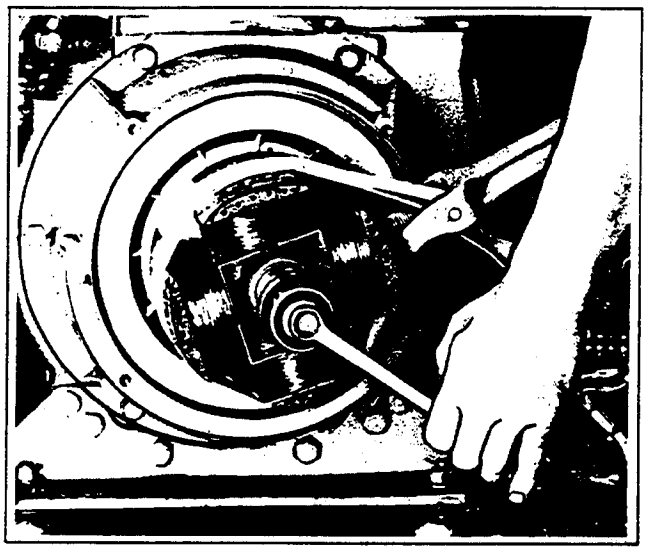


Figure 5-13. Removing Rotor — 5RMOY, 7RMY, 7.5C & 7.5R

7.5C & 7.5R

Remove rotor by loosening thru bolt as shown in Figure 5-13. Break rotor loose from taper by striking bolt head with a mallet. If the rotor can be rocked back and forth in place after striking bolt head, remove thru bolt and pull rotor from engine. Remove stub shaft mounting bolts and separate stub shaft from flywheel. If the rotor seems loose but cannot be removed, the flywheel has become free of the crankshaft taper. To separate rotor from flywheel, adapter, and stub shaft proceed as follows:

a. Remove eight bolts fastening generator adapter to bell housing.

b. Pull rotor, adapter, and flywheel away from engine.

c. Slide adapter over generator fan as far as possible.

d. Remove four bolts fastening stub shaft to flywheel. The flywheel and adapter can now be removed.

e. Strike downward on corner of stub shaft with a mallet to separate stub shaft from flywheel. See Figure 5-14.

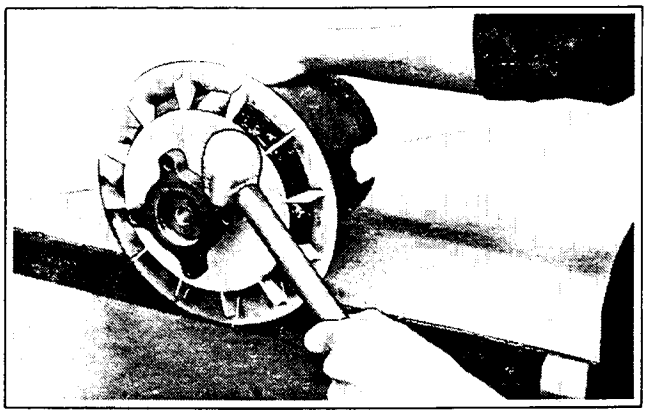


Figure 5-14. Removing Stub Shaft — 7.5C & 7.5R

10RMOY
Remove the drive disc mounting bolts, Figure 5-15. Pull rotor assembly away from adapter.

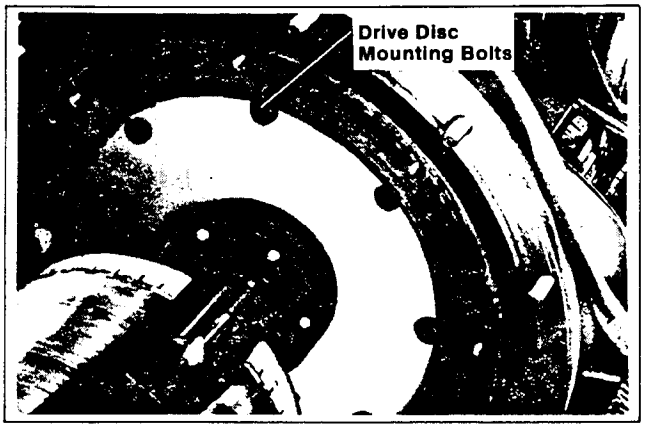


Figure 5-15. 10RMOY Rotor Removal

15RMY, 15RMOY, and 17.5ROY
Remove the fan/drive disc mounting nuts from the flywheel studs. Pull rotor assembly away from adapter. Figure 5-16.

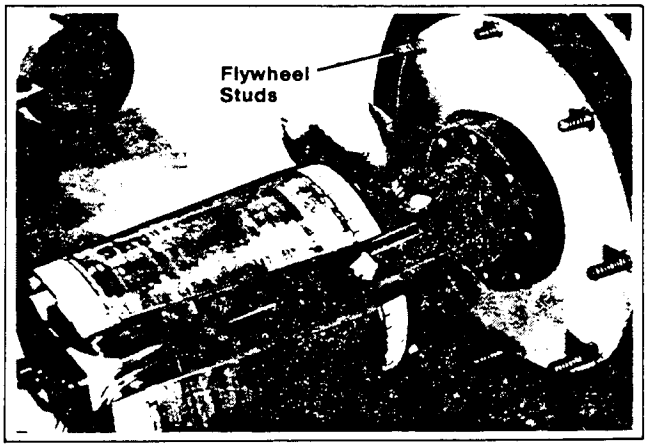


Figure 5-16. 15RMY, 15RMOY & 17.5ROY Rotor Removal

10RY, 17RY
The rotor can be removed after completing step 14 earlier. Remove bolts and washers to separate rotor stub from drive discs (if desired).

Reassembly

1. To remount the rotor assembly, refer to the procedure for your specific model.

   5RMY
   Clean rotor shaft and crankshaft threads with compressed air. Coat crankshaft threads with anti-seize compound and thread onto crankshaft, turning it hand-tight. Finally tighten rotor by placing a wood block against the leading edge of one of the rotor poles and using one or two moderately sharp hammer blows to the block's end. Figure 5-12.

   5RMOY, 7RMY
   Clean stub shaft taper and paint with copper-graphite or some other type of anti-seize compound. Lift rotor assembly onto taper and replace thru-bolt. Torque thru bolt to 55 ft. lbs. (75 Nm).

   7.5C & 7.5R
   If it was necessary to disassemble flywheel, adapter, and stub shaft to remove rotor, reassemble as follows:

   a. Replace four bolts fastening stub shaft to flywheel.

   b. Lift flywheel onto (clean) keyed taper of the crankshaft.

   c. Replace eight bolts fastening generator adapter to bell housing.

   d. Clean stub shaft taper and coat with anti-seize compound.

   e. Place rotor assembly (with fan) on stub shaft and replace thru bolt. Torque to 50 ft. lbs. (68 Nm).

   15RMY, 15RMOY, and 17.5ROY
   Mount the rotor assembly to the engine. Attach the rotor with the flywheel/drive disc mounting nuts. Figure 5-15.

   10RMOY
   Mount the rotor assembly to the engine with the drive disc mounting bolts. Figure 5-14.

   10RY, 17RY
   Attach rotor to flywheel studs with nuts, washers, and spacers. Be sure adapter plate is positioned between washers and spacers. On 17RY, use retainer clips to hold fan mounting bolts in adapter plate. Attach fan to adapter plate with nuts and washers (8).

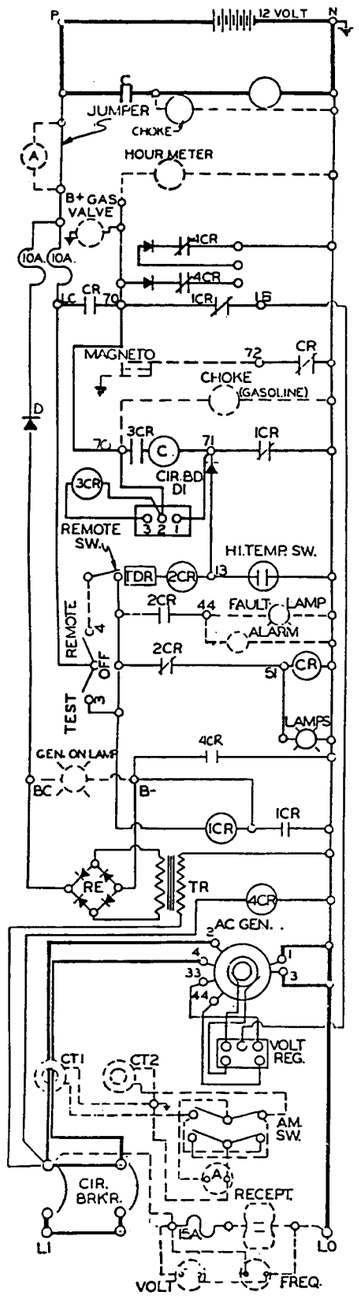
2. Reverse the disassembly procedure after the rotor has been correctly mounted. When sliding stator into position, make sure stator is tightly against adapter.

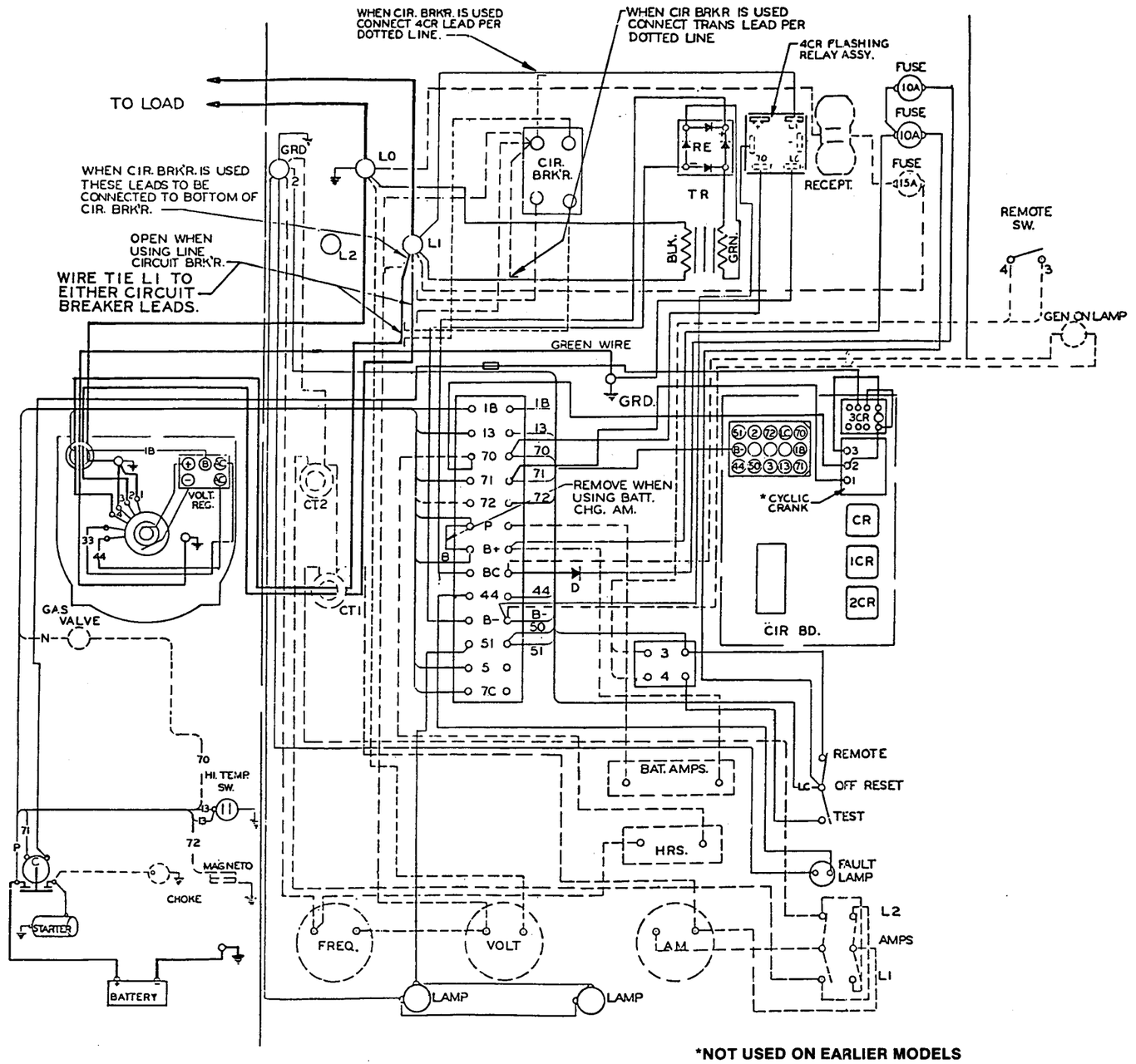
3. Taking caution not to pinch any wires, position end bracket on stator. Bump snugly into place using a rubber mallet. Replace hardened washers and four over-bolts. Torque over-bolts according to Table 5-1.

Model	Torque Value
5RMY, 7RMY, 7.5C, 7.5R, 10RY	70 in. lbs. (8.0 Nm)
5RMOY	260 in. lbs. (29 Nm)
10RMOY, 15RMY, 15RMOY, 17RY, 17.5 ROY	260 in. lbs. (29 Nm)

Table 5-1. Over-Bolt Torque

4. Cradle generator end with lifting straps and raise with a hoist. Remove wood block(s) and return generator to normal position. Replace vibro-mount bolts.
5. Remove retainer wire from brush holder. Make sure brushes are centered on the slip rings. Improper positioning will cause brushes to wear.
6. Remount the controller. Refer to Section 6, Wiring Diagrams for the proper wiring of your generator set.
7. Remount the end panel.

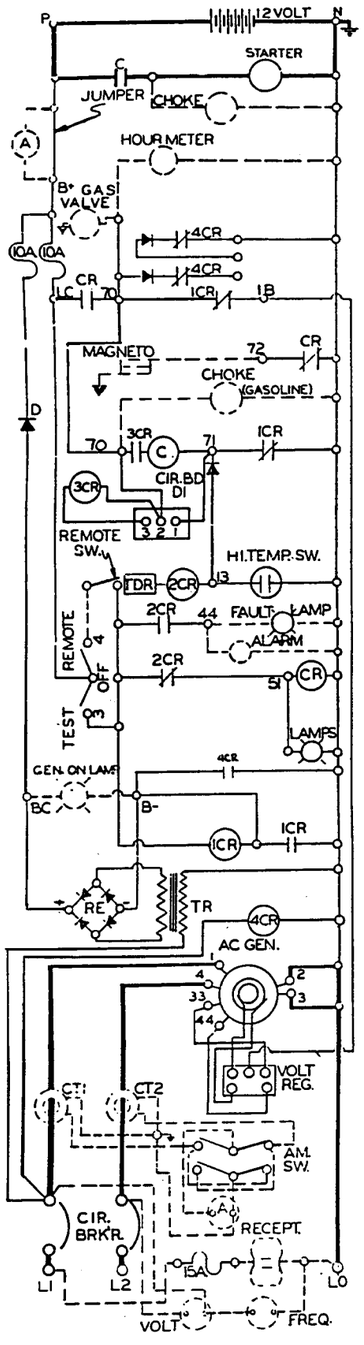


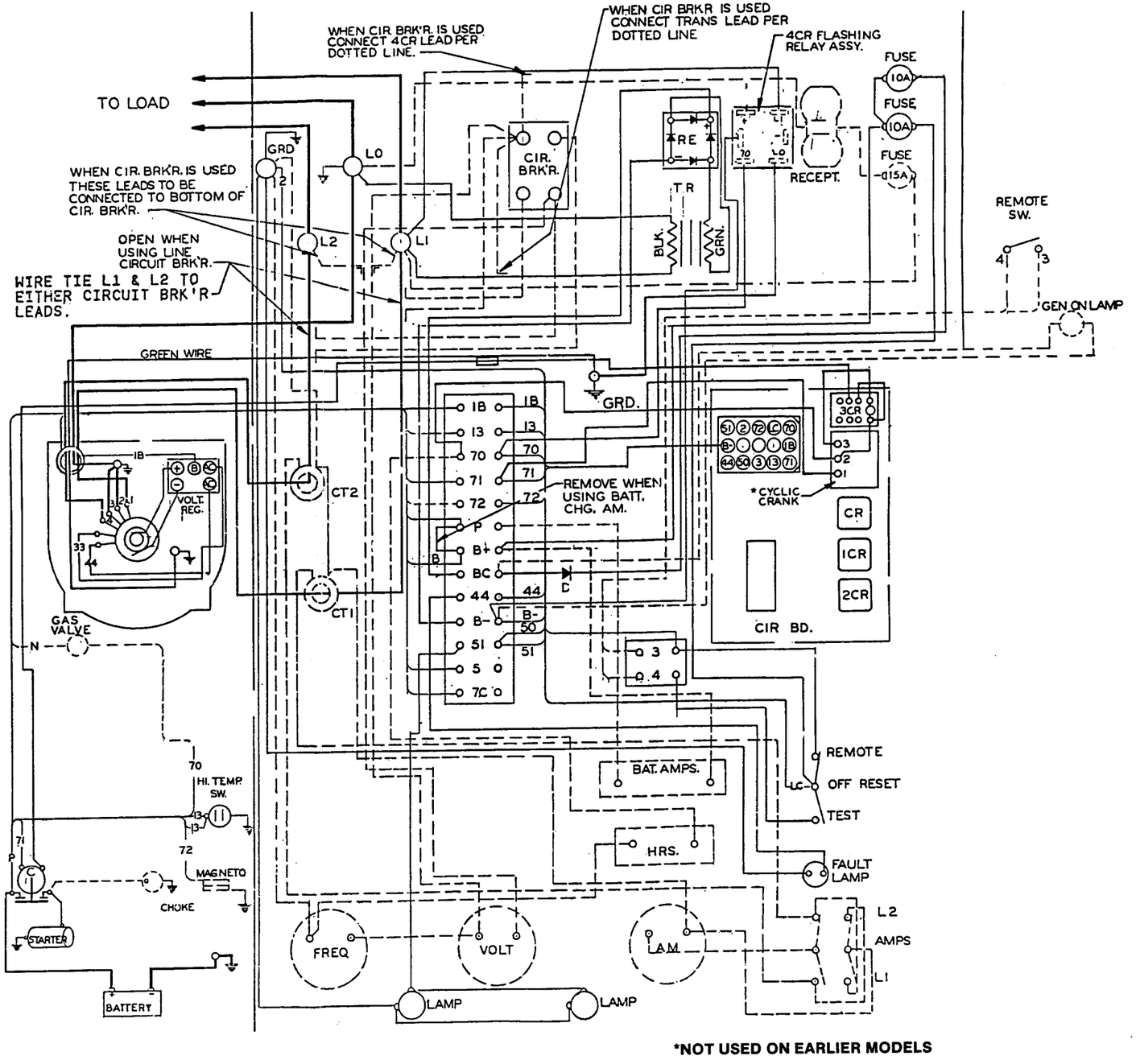


***NOT USED ON EARLIER MODELS**

278091

5RMY — 10, 2W 120-Volt (5-Pin Voltage Regulator)

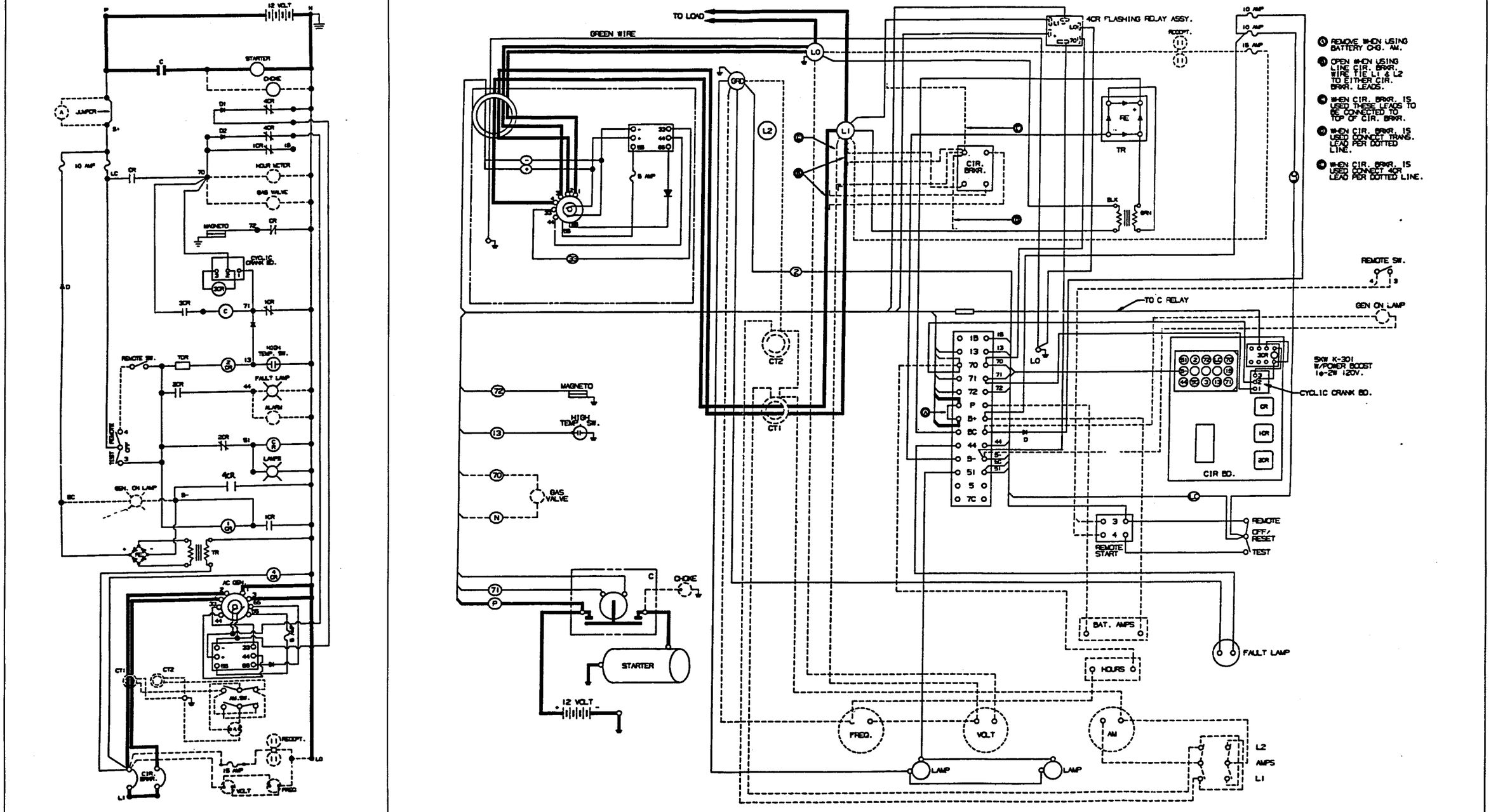




*NOT USED ON EARLIER MODELS

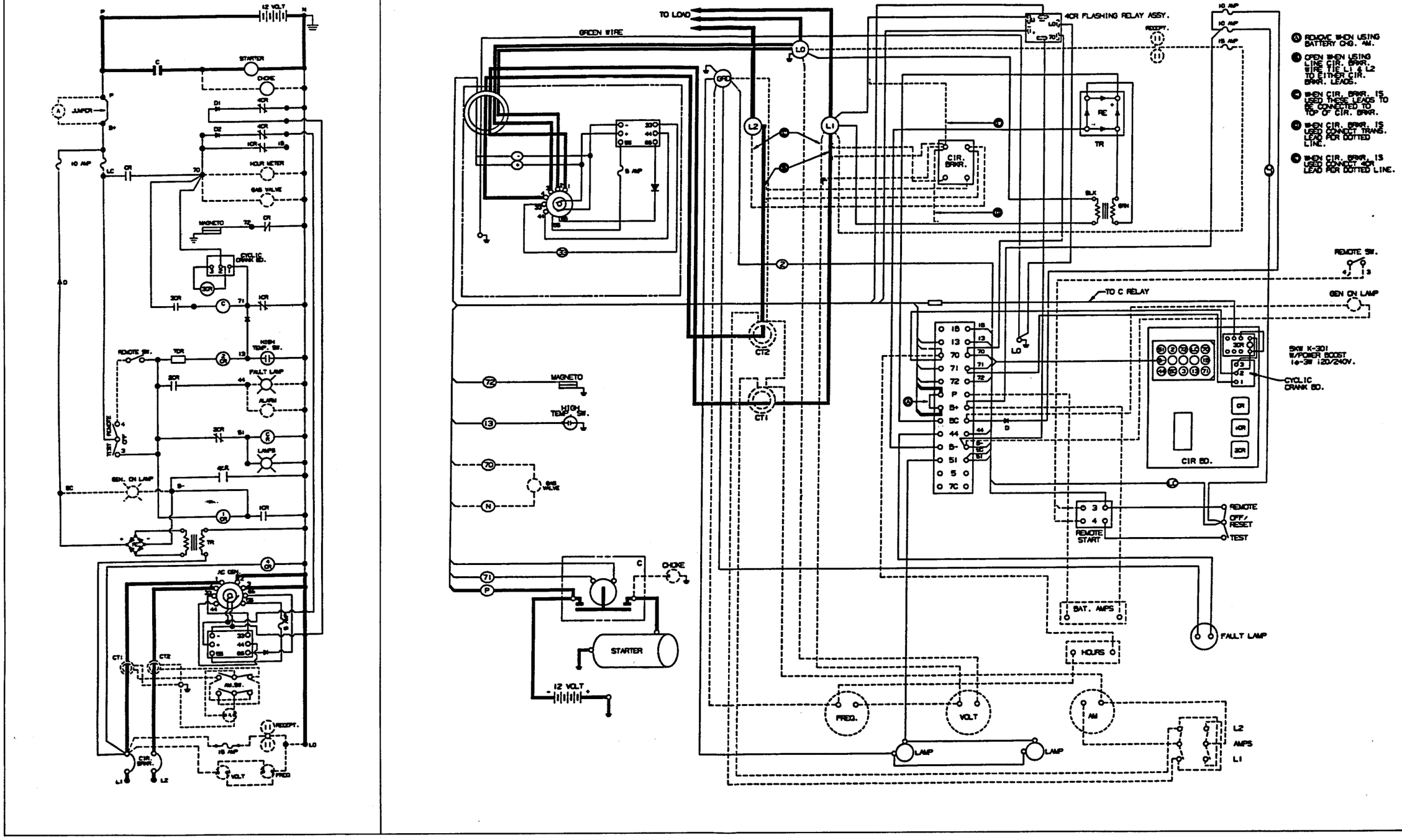
278092

5RMY — 10, 3W 120/240-Volt (5-Pin Voltage Regulator)



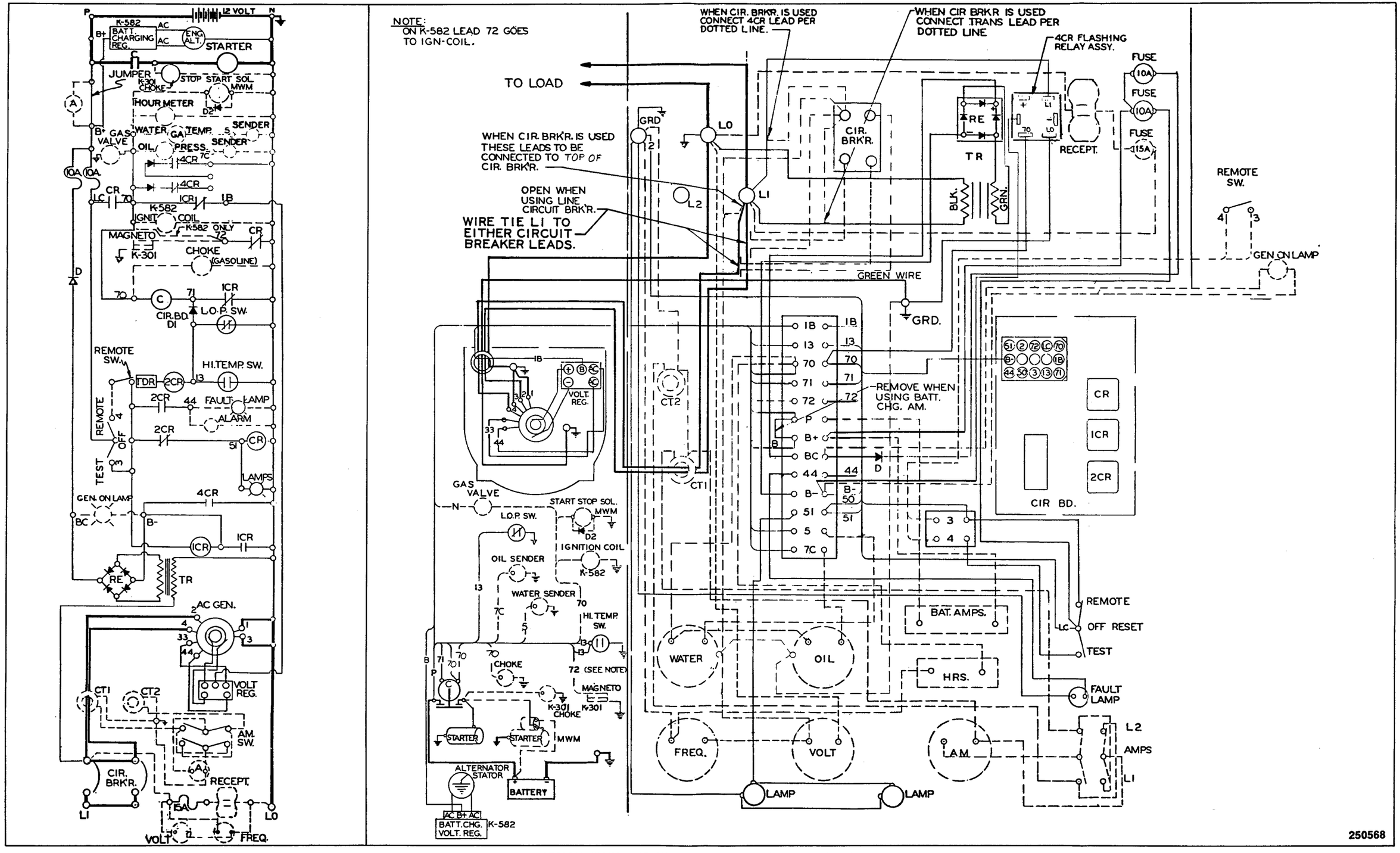
239460

5RMY — 1ø, 2W 120-Volt (6-Pin Voltage Regulator)



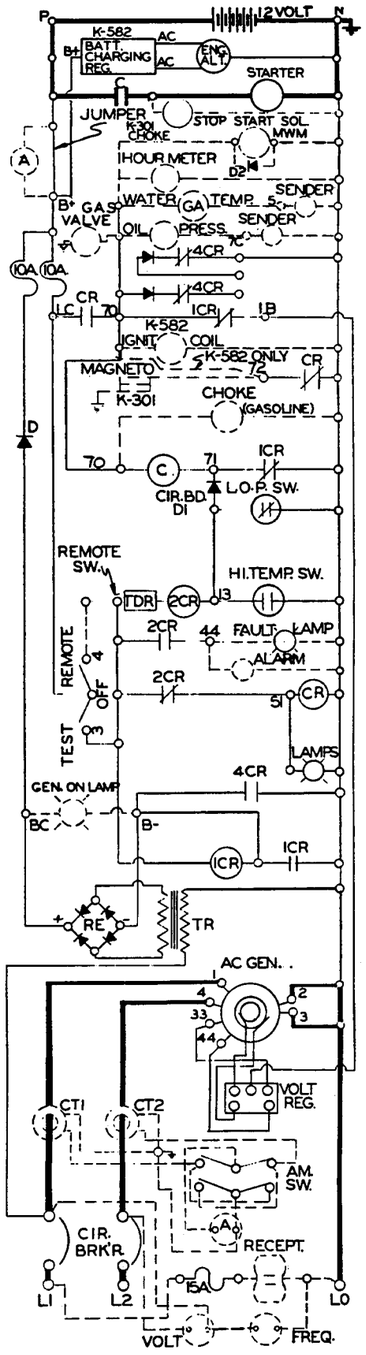
239459

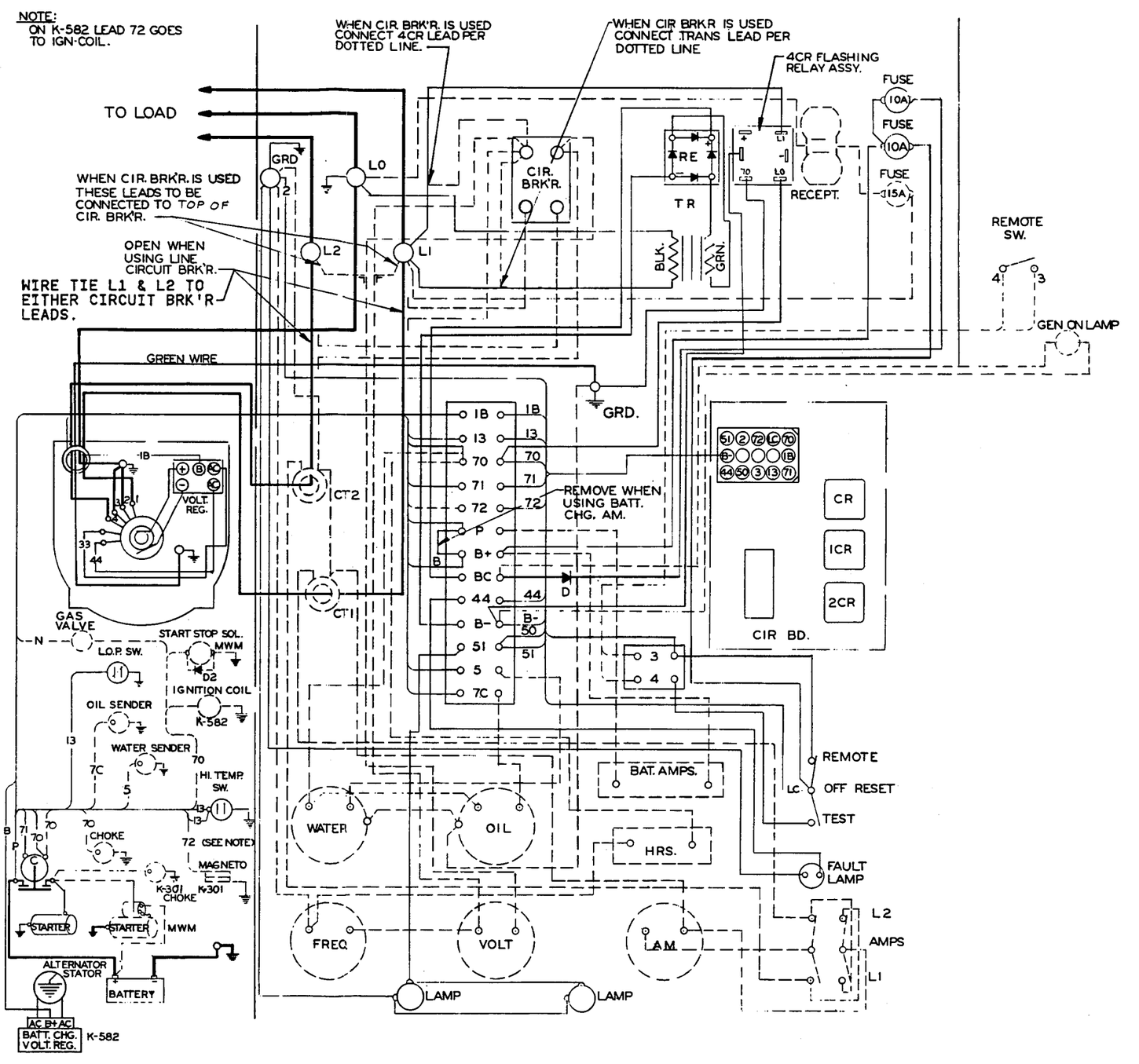
5RMY — 1ø, 3W 120/240-Volt (6-Pin Voltage Regulator)



250568

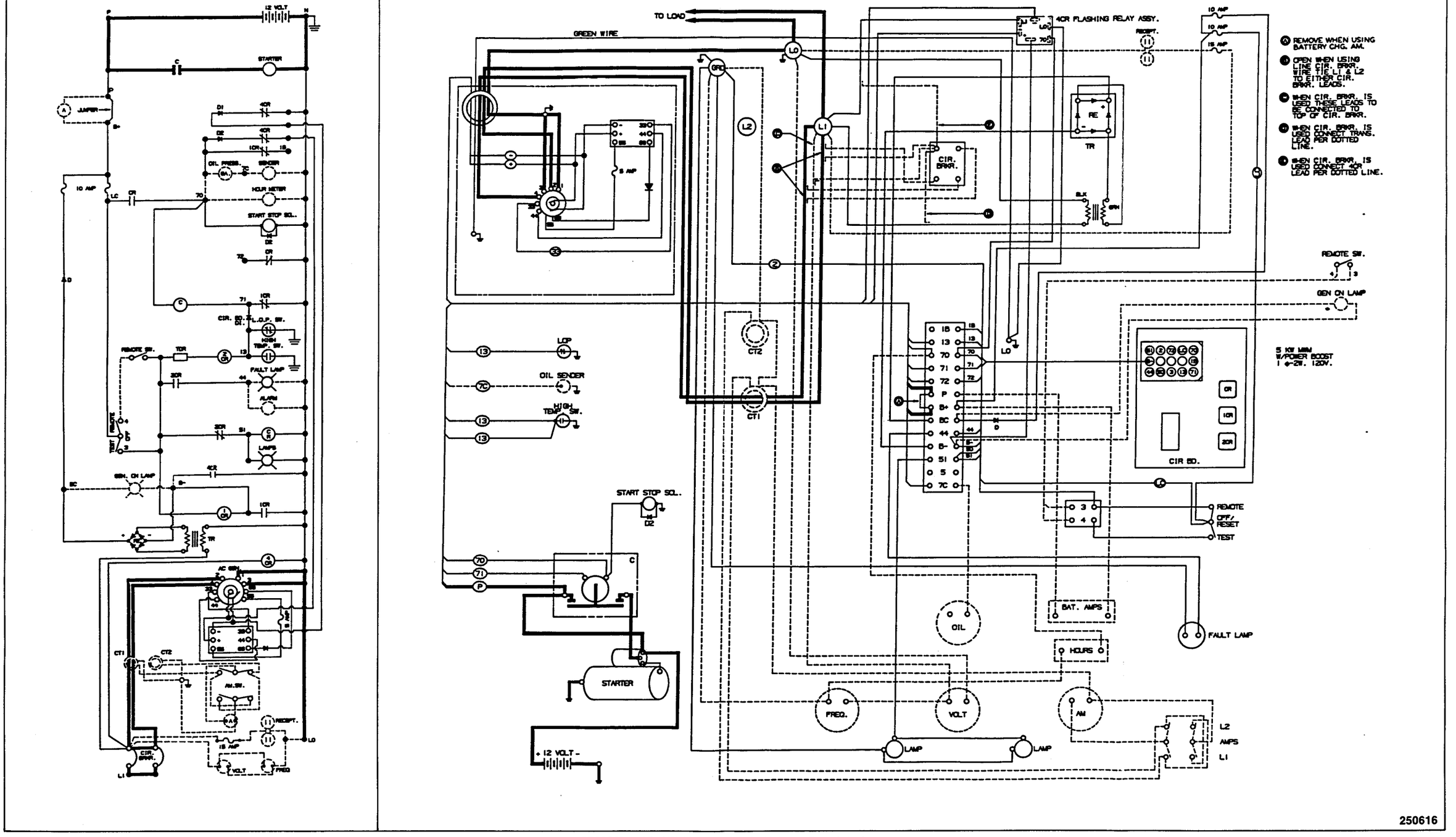
5RMOY, 7RMY — 1Ø, 2W 120-Volt (5-Pin Voltage Regulator)





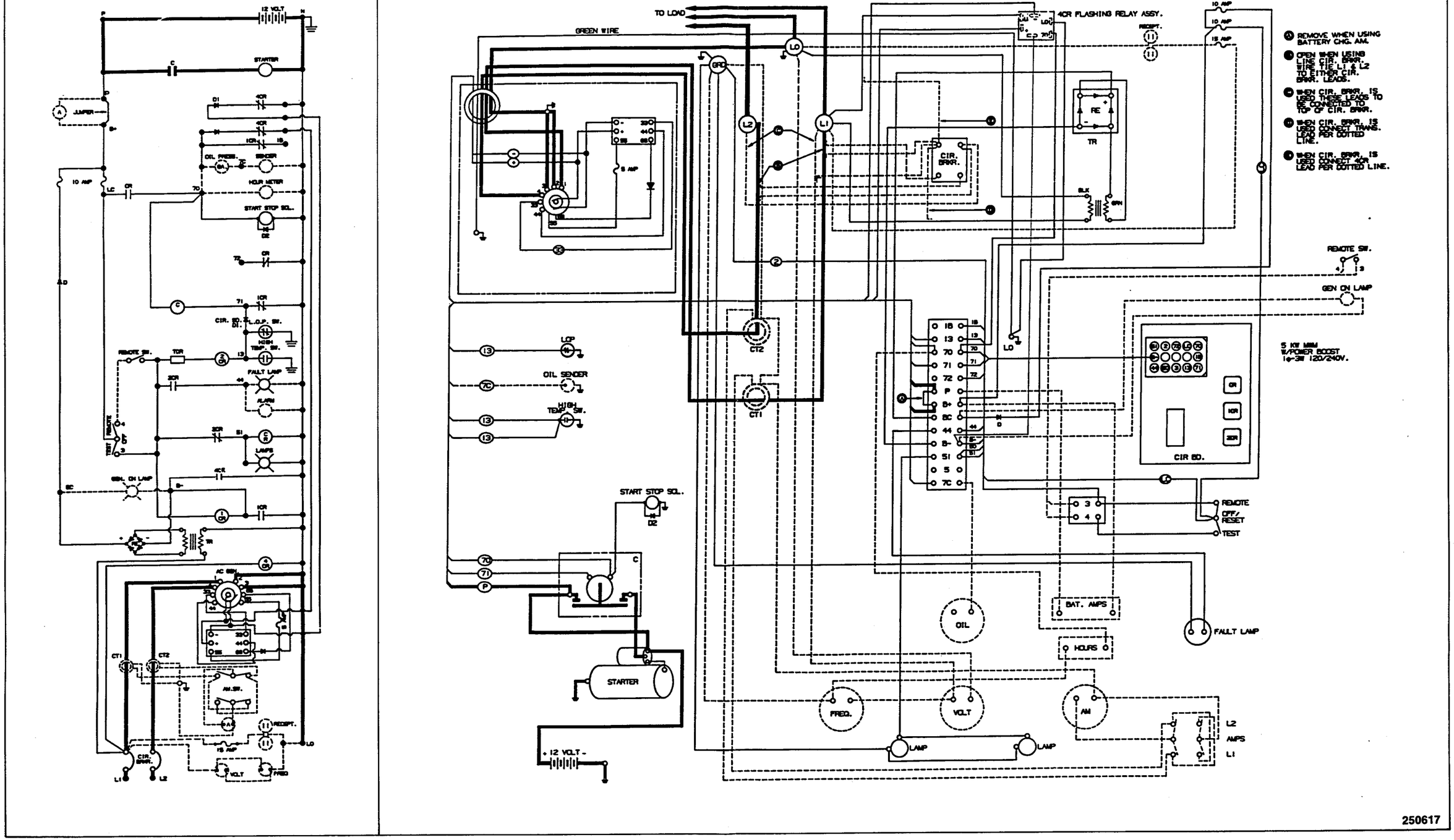
250567

5RMOY, 7RMY — 1Ø, 3W 120/240-Volt (5-Pin Voltage Regulator)



250616

5RMOY — 10, 2W 120-Volt (6-Pin Voltage Regulator)



A REMOVE WHEN USING BATTERY CHG. AM.

B OPEN WHEN USING LINE CIR. BRKR. WIRE TIE L1 & L2 TO EITHER CIR. BRKR. LEADS.

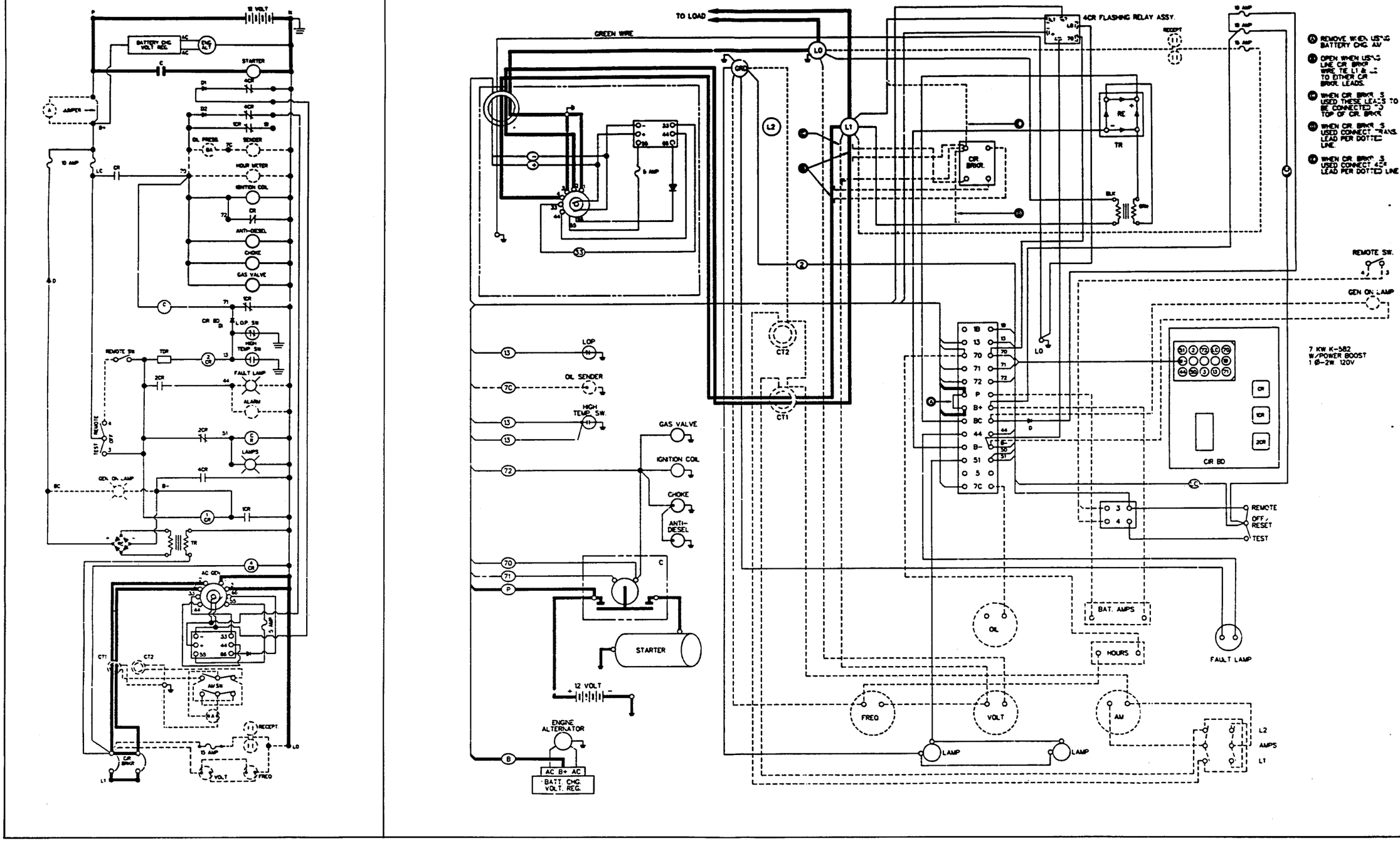
C WHEN CIR. BRKR. IS USED THESE LEADS TO BE CONNECTED TO TOP OF CIR. BRKR.

D WHEN CIR. BRKR. IS USED CONNECT TRANS. LEAD PER DOTTED LINE.

E WHEN CIR. BRKR. IS USED CONNECT 4CR LEAD PER DOTTED LINE.

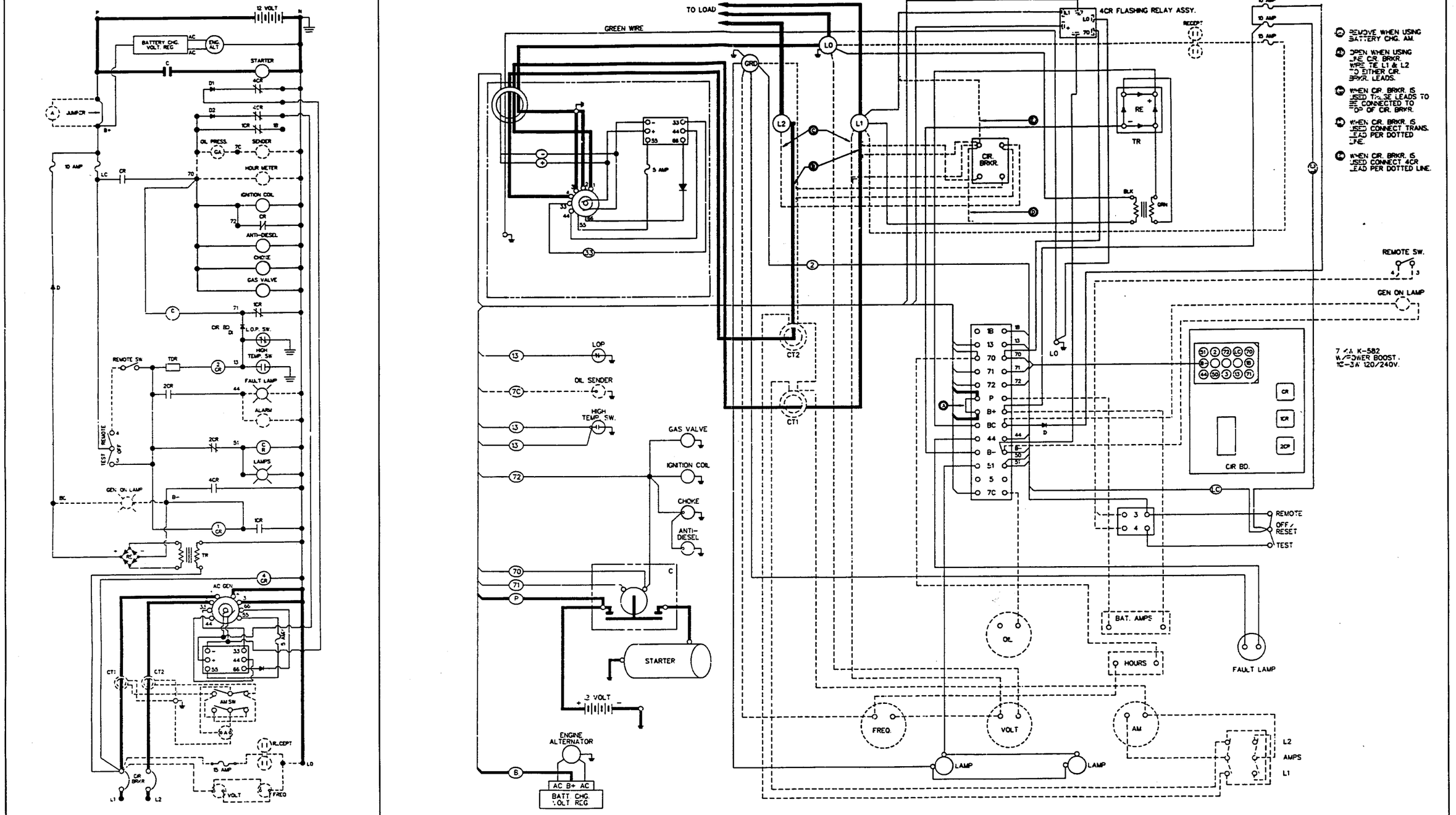
250617

5RMOY — 1Ø, 3W 120/240-Volt (6-Pin Voltage Regulator)



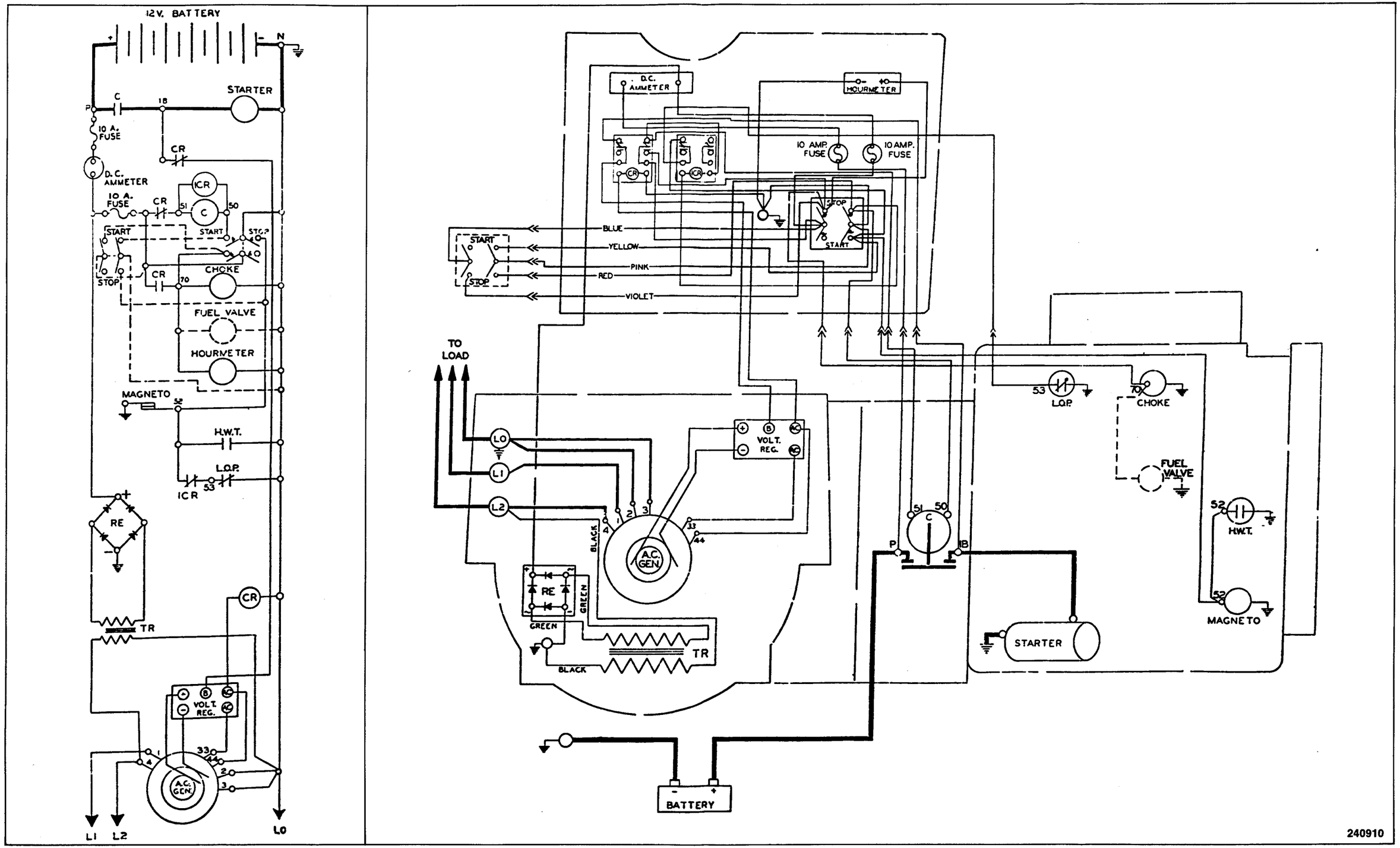
278128

7RMY — 1Ø, 2W 120-Volt (6-Pin Voltage Regulator)

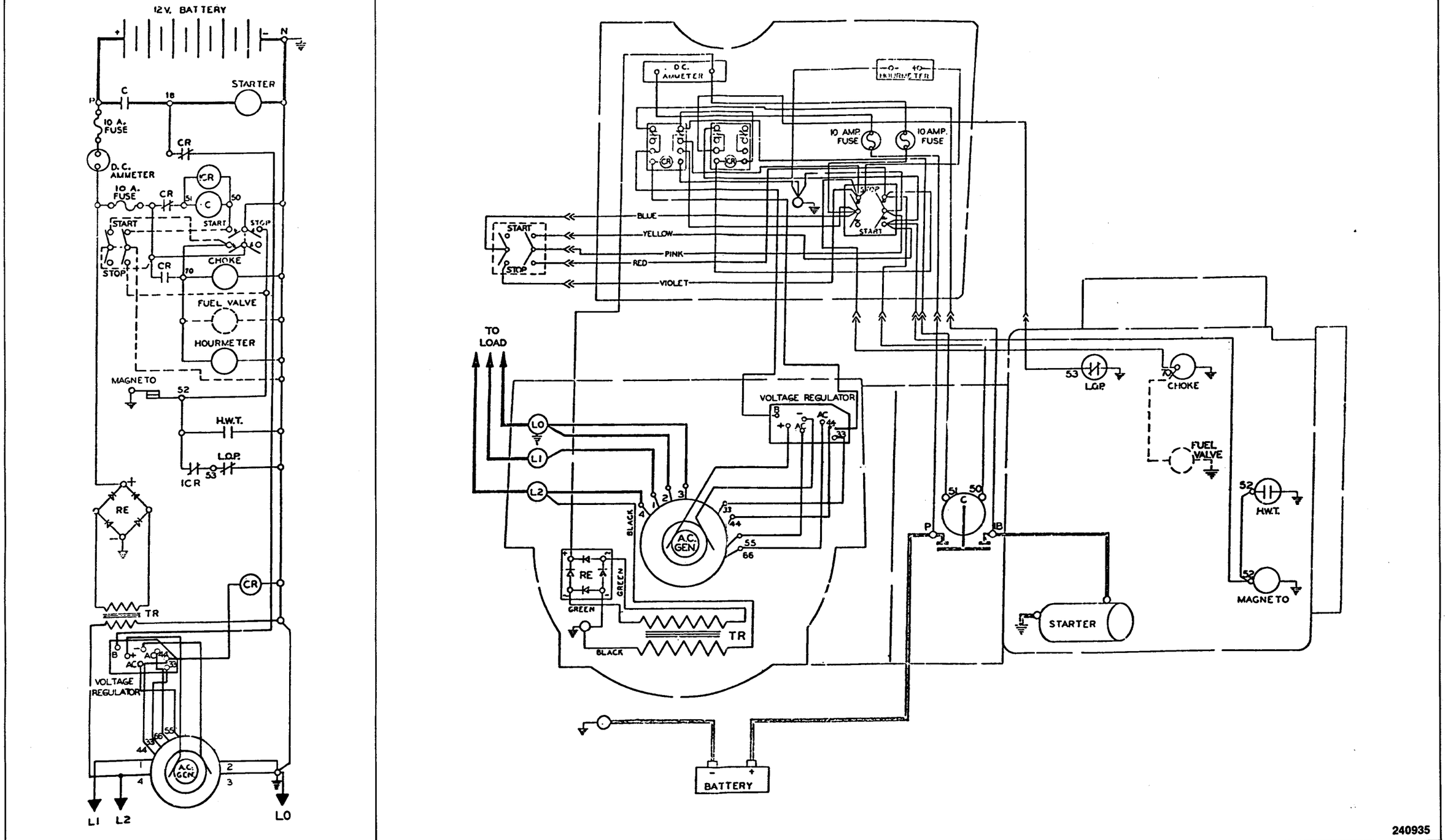


278127

7RMY — 1Ø, 3W 120/240-Volt (6-Pin Voltage Regulator)

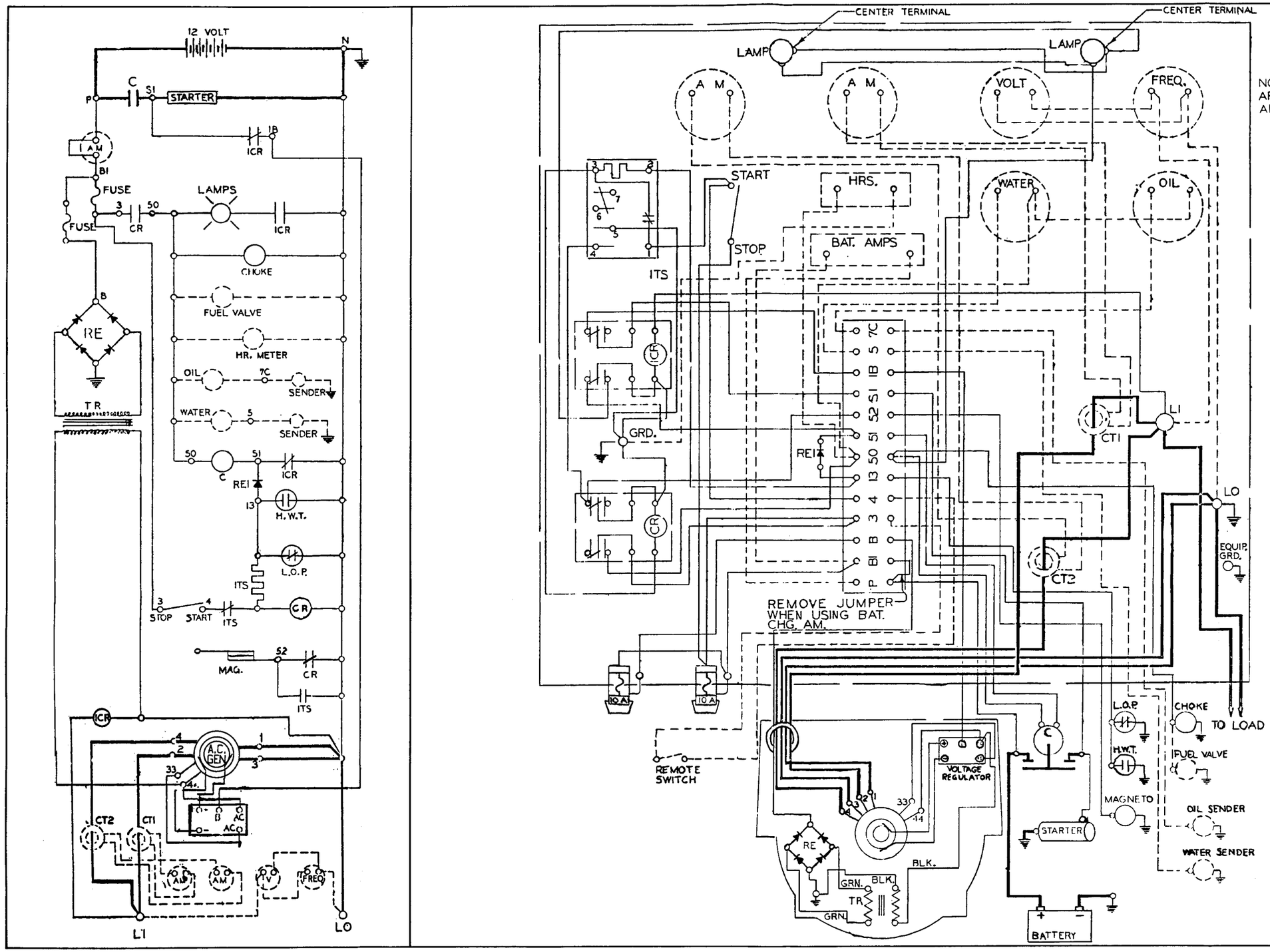


7.5C — 10, 3W 120/240-Volt (5-Pin Voltage Regulator)



240935

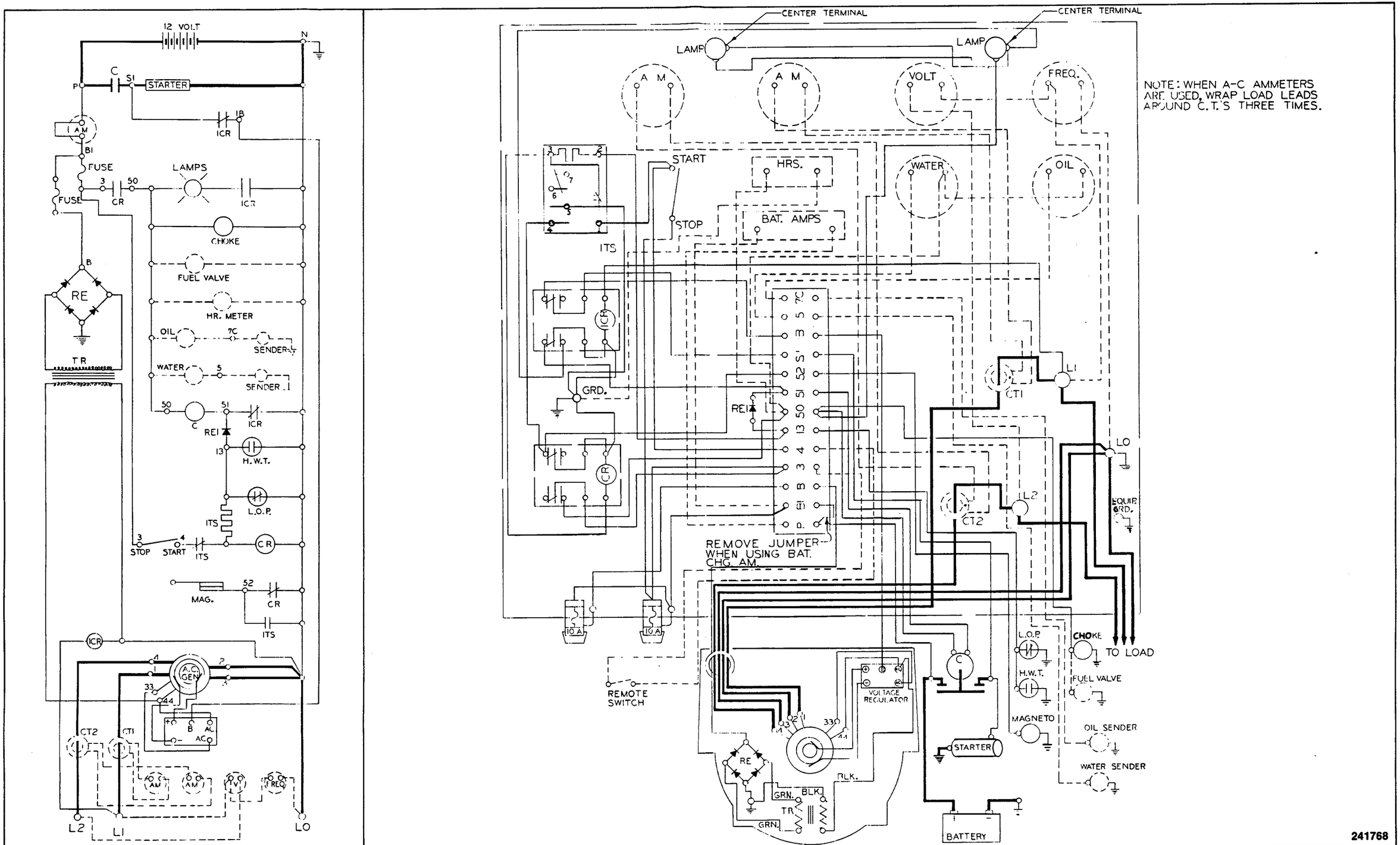
7.5C — 10, 3W 120/240-Volt (7-Pin Voltage Regulator)



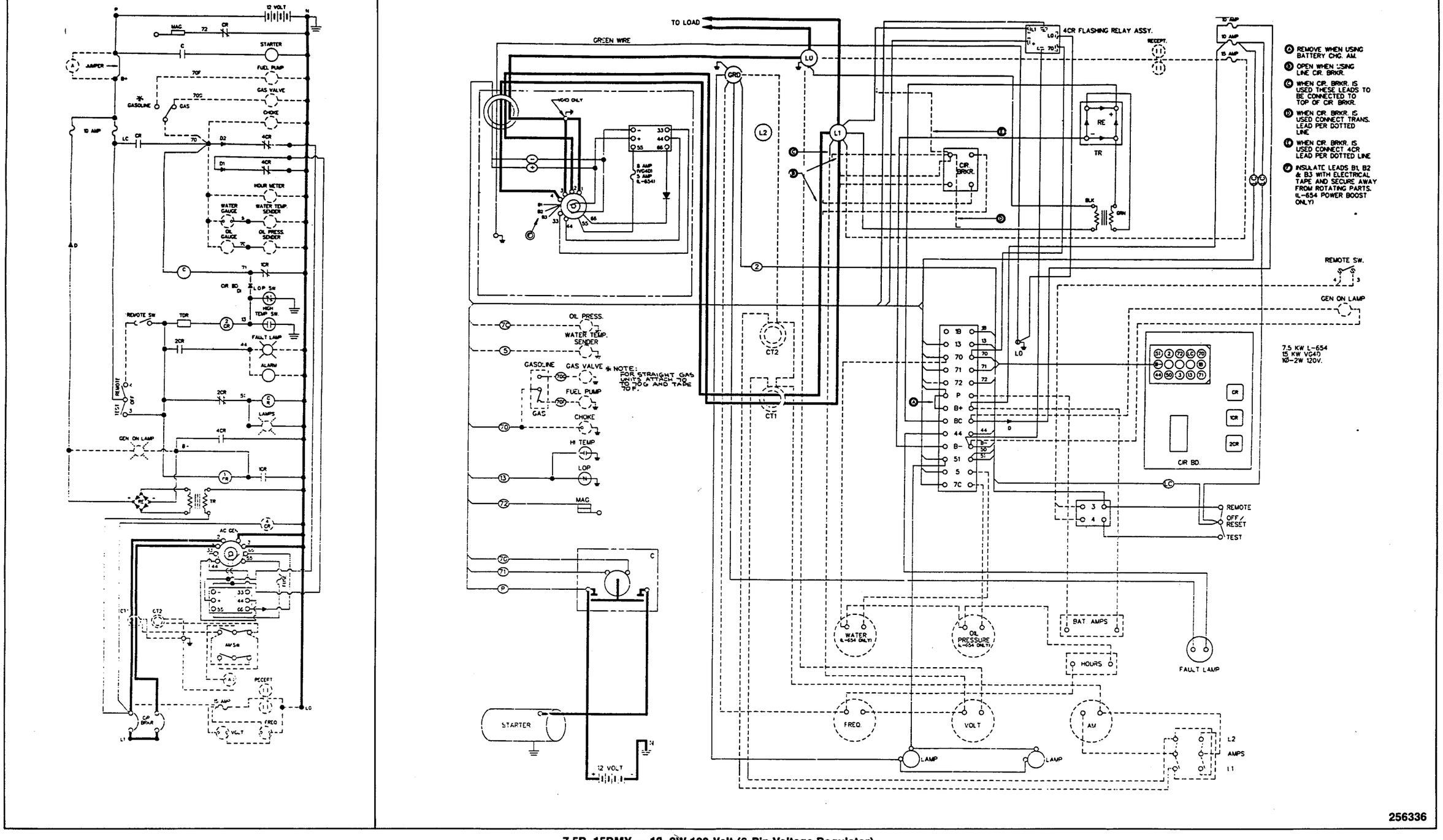
NOTE: WHEN A-C AMMETERS ARE USED, WRAP LOAD LEADS AROUND C.T.'S THREE TIMES.

241767

7.5R — 1Ø, 2W 120-Volt (5-Pin Voltage Regulator)

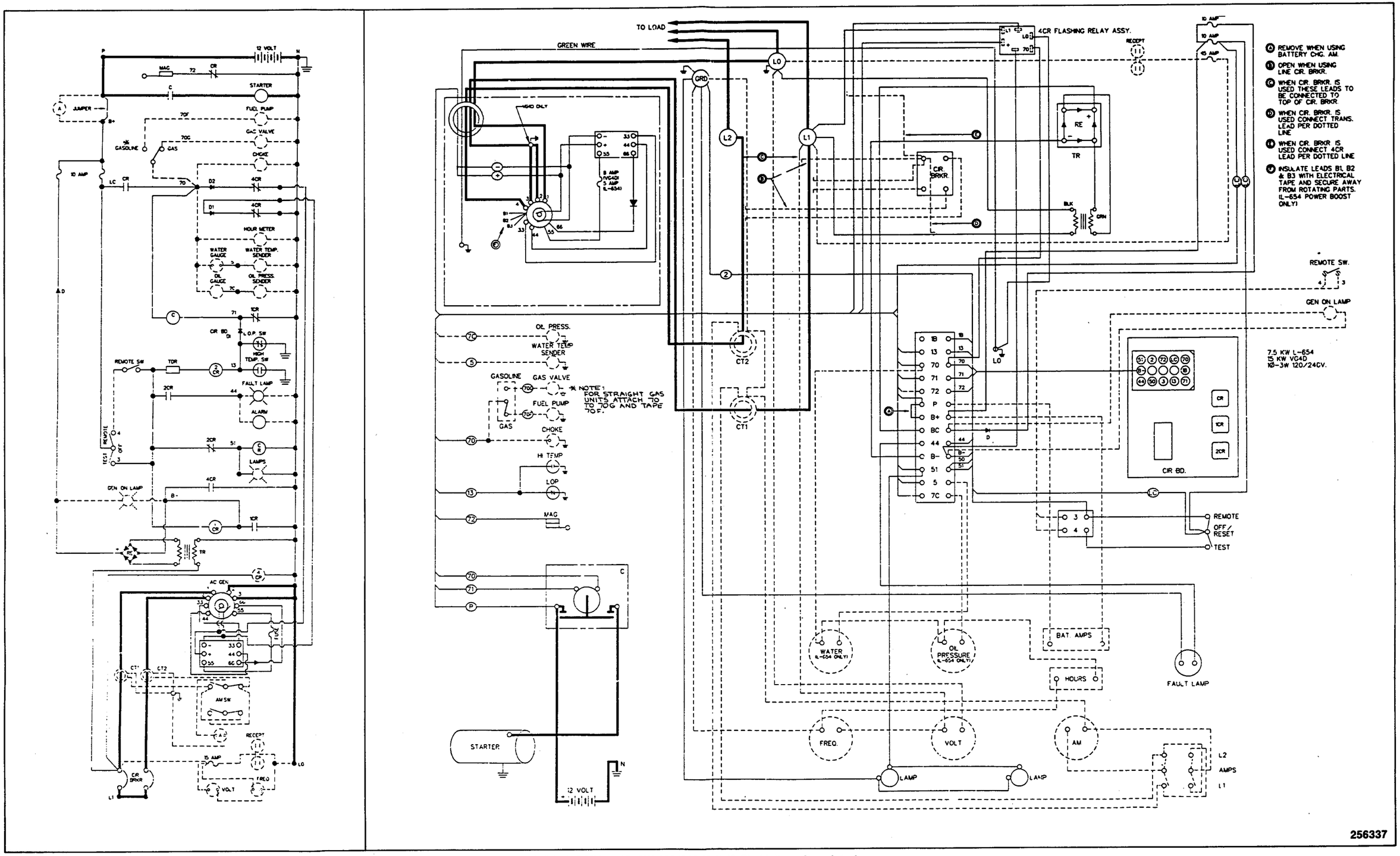


7.5R — 10, 3W 120/240-Volt (5-Pin Voltage Regulator)

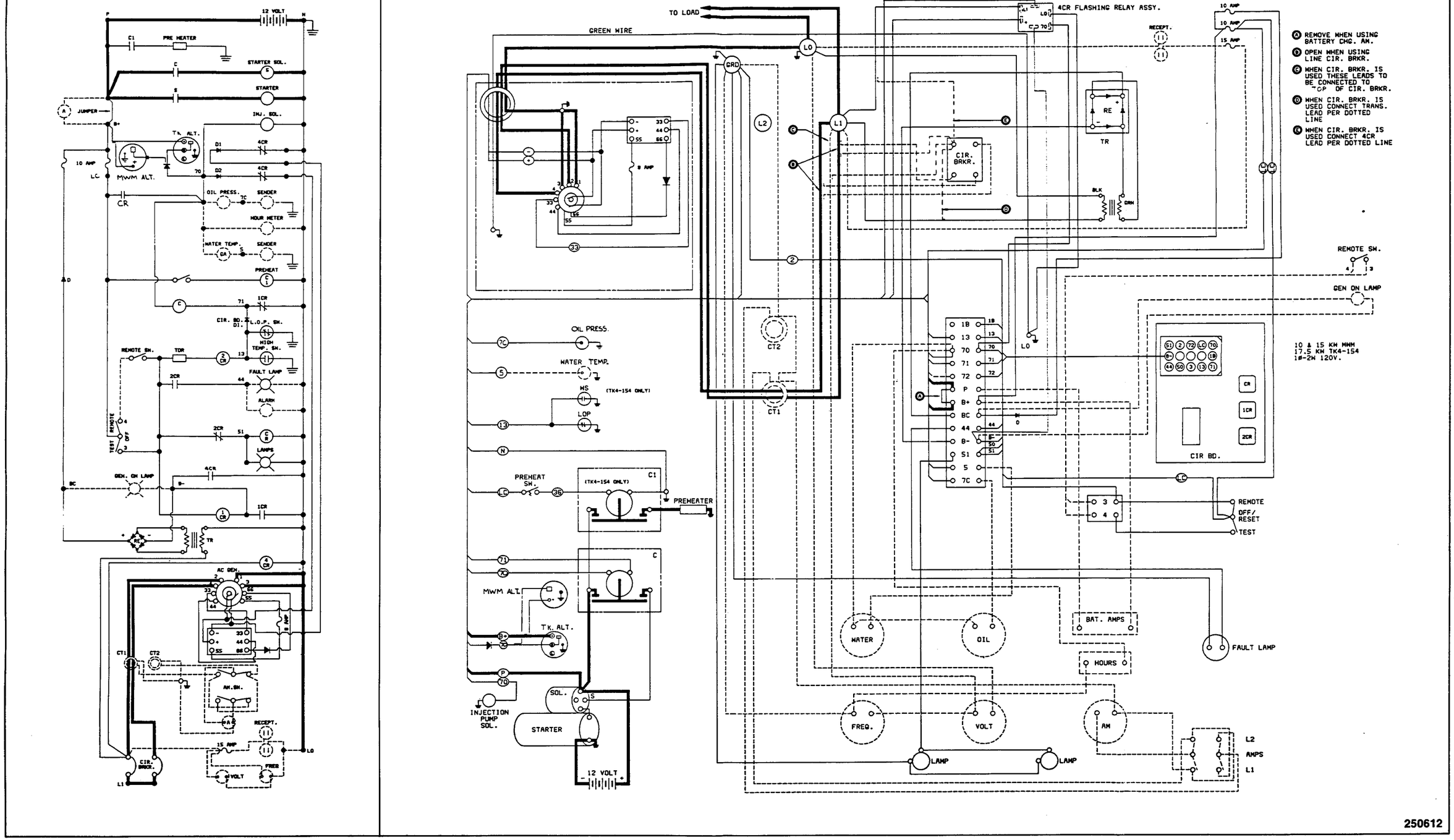


256336

7.5R, 15RMY — 10, 2W 120-Volt (6-Pin Voltage Regulator)

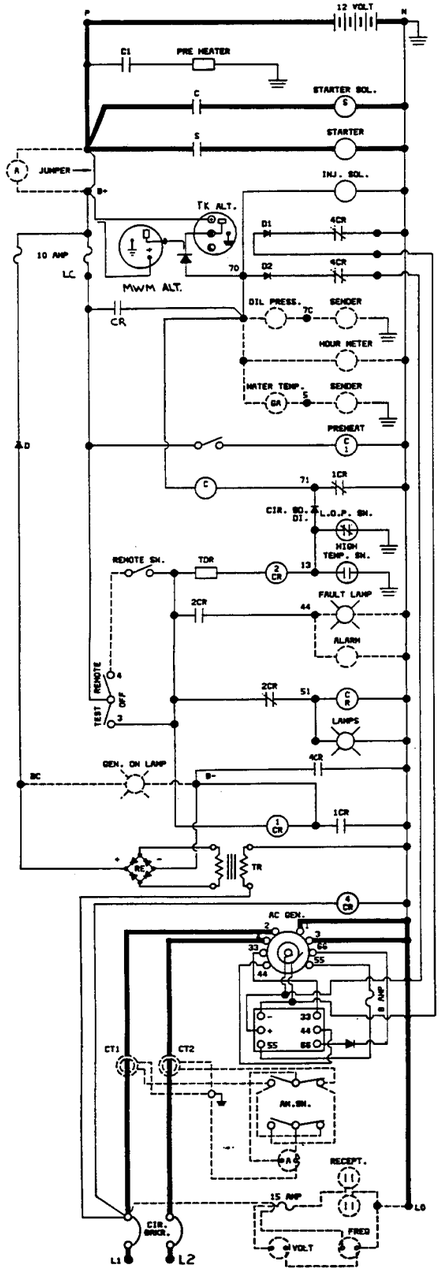


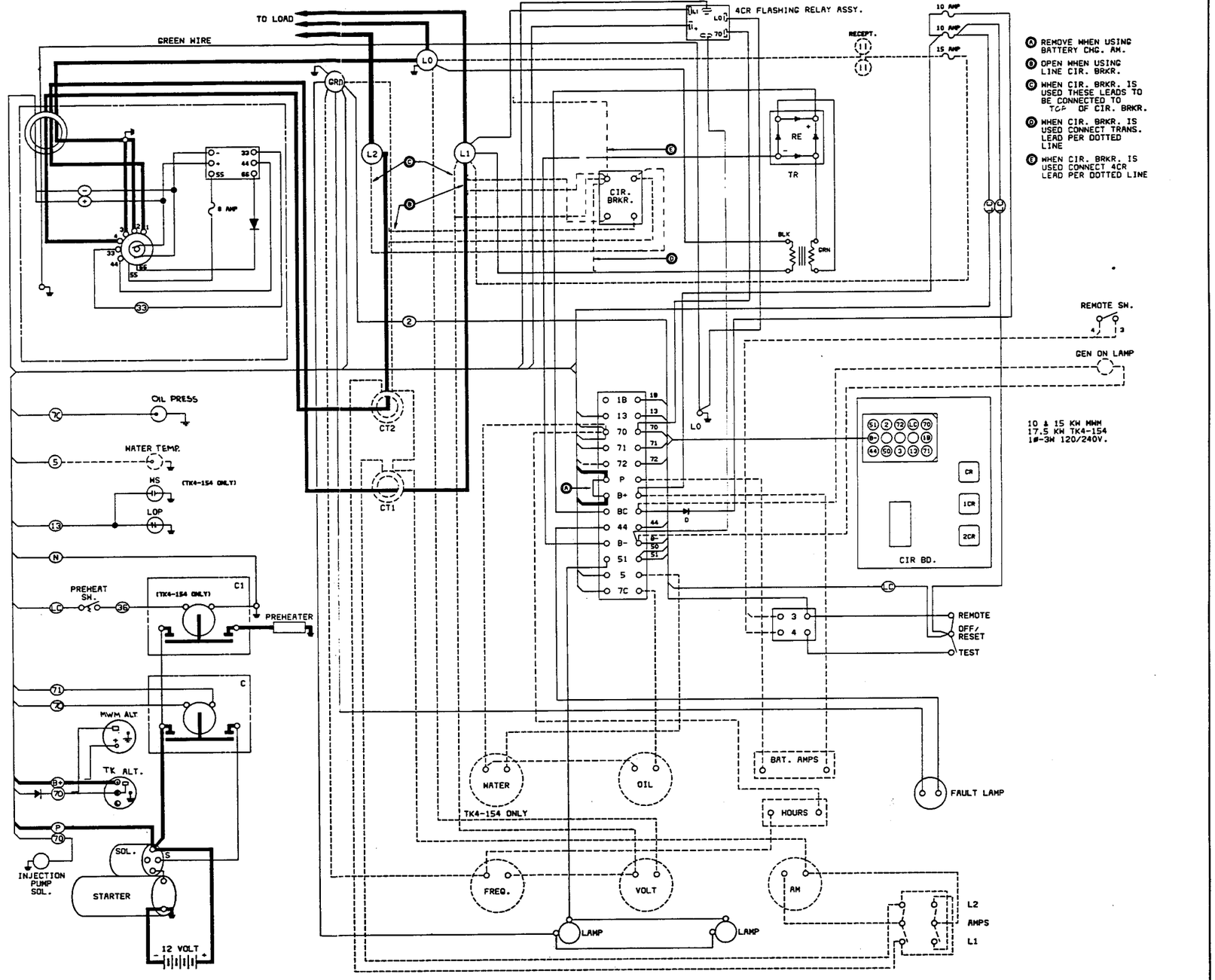
7.5R, 15RMY — 1Ø, 3W 120/240-Volt (6-Pin Voltage Regulator)



250612

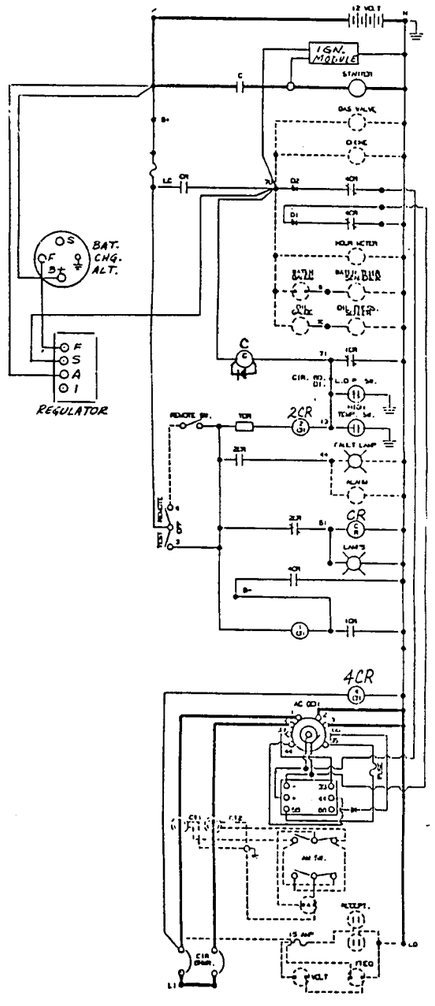
10RMOY, 15RMOY, 17.5ROY — 1Ø, 2W 120-Volt (6-Pin Voltage Regulator)

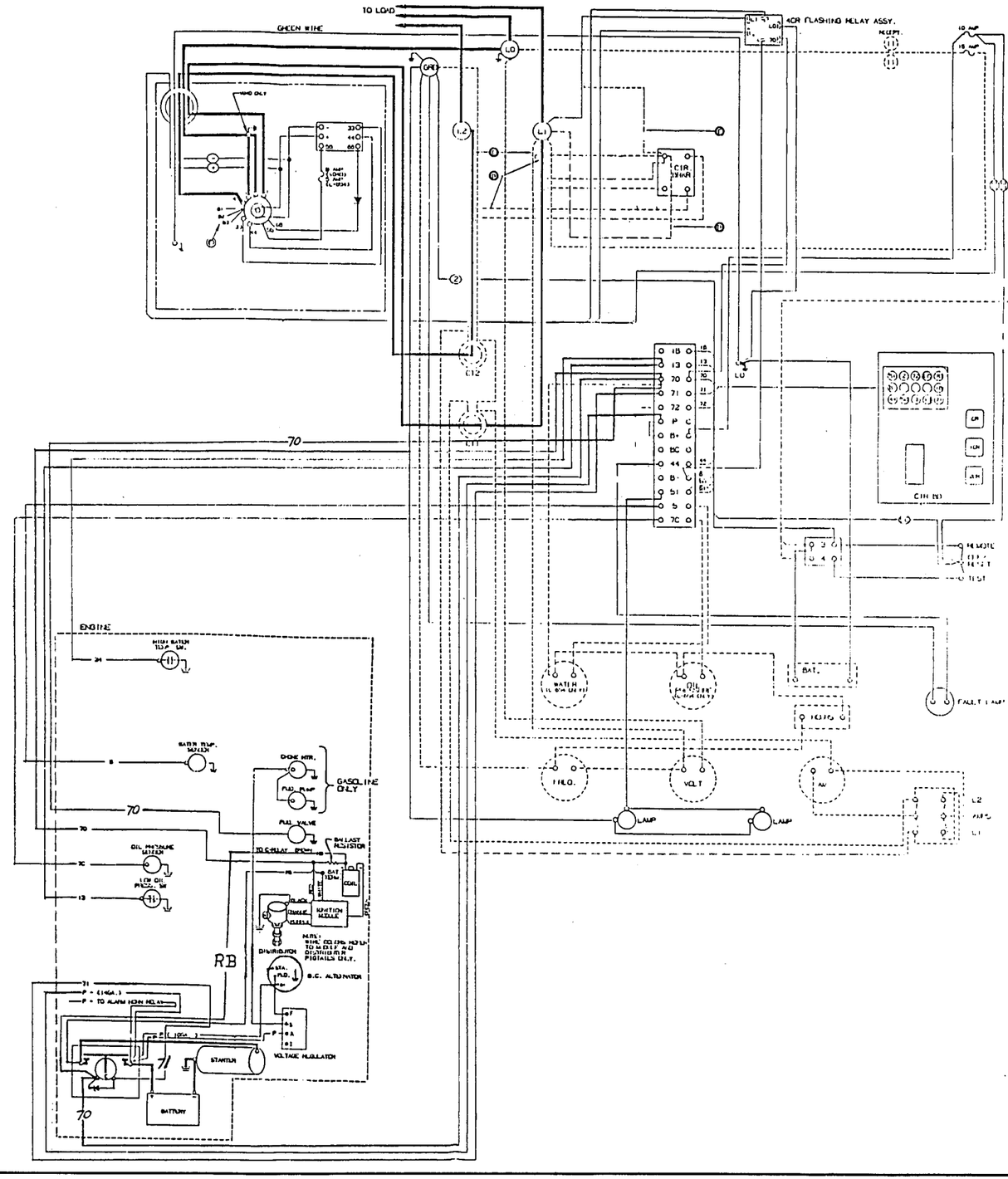




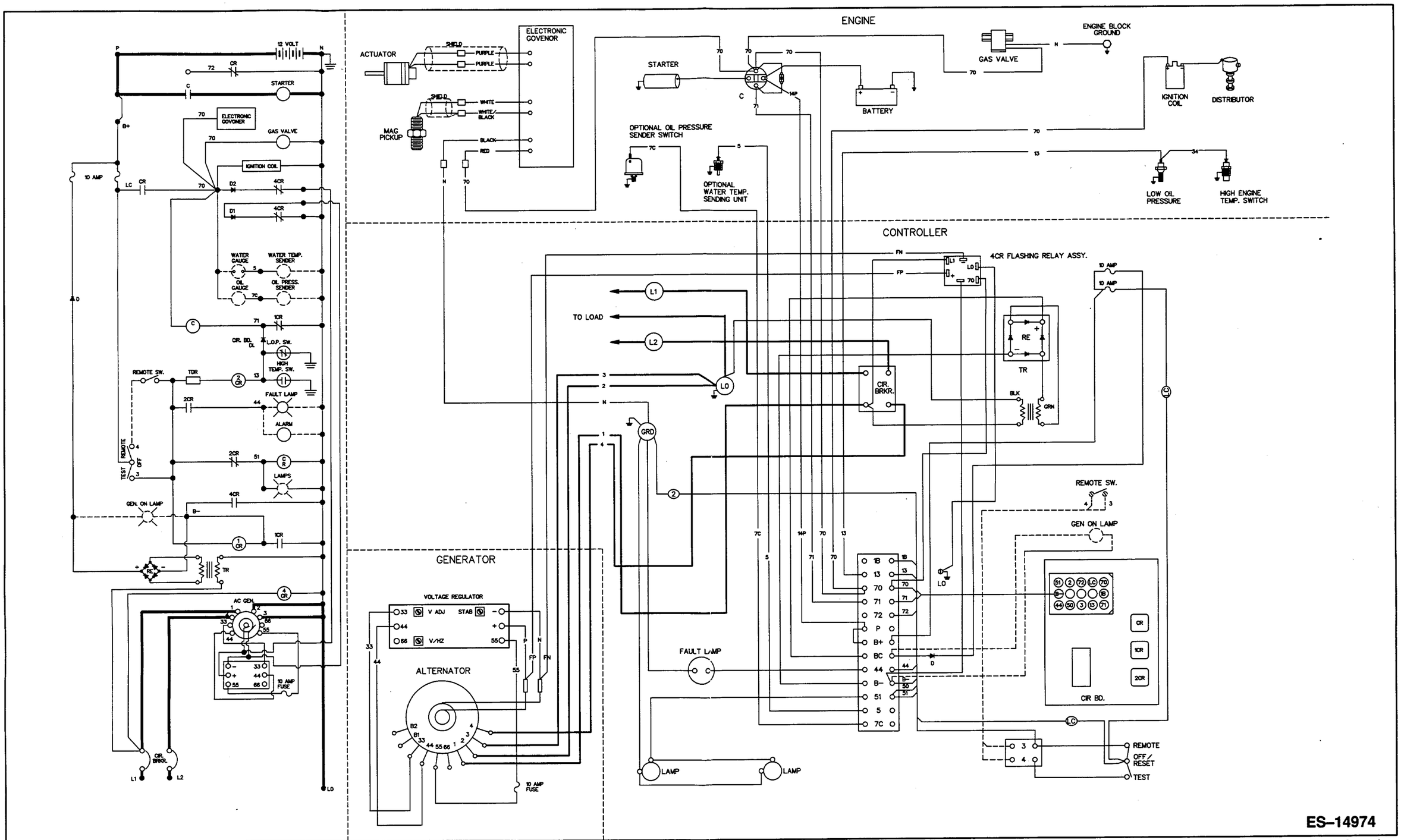
250613

10RMOY, 15RMOY, 17.5ROY — 1Ø, 3W 120/240-Volt (6-Pin Voltage Regulator)





17RY — 10, 3W, 120/240-Volt (6-Pin Voltage Regulator)



ES–14974

10RY, 1–Phase, 3W, 120/240–Volt (6–Pin Voltage Regulator)

APPENDIX

Cyclic Cranking Kit #PA-278099
For 5RMY

The cyclic cranking kit has two adjustment pots. (one for "on" time and one for "off" time), see Figure 1. The factory setting is 6-8 seconds "on" time and 1-2 seconds "off" time. The on-off cycles can be adjusted from 1-60 seconds. The cyclic cranking kit will not operate when both pots are in the full counterclockwise position. If the cranking cycle seems too short, check the condition of the battery before readjusting the cycler — timing will decrease if the battery charge drops too low. See Figure 1 and part listing for description and location of components.

WARNING

UNIT STARTS WITHOUT NOTICE! Units with Automatic Transfer Switches start automatically. Turn Generator Main Switch on controller to OFF position, and remove battery cables (remove negative lead first and reconnect it last) to disable generator set before working on any equipment connected to generator.

MOUNTING AND CONNECTION

1. Place controller main switch to OFF position. Disconnect battery of generator set, negative lead first.
2. Remove controller cover.
3. Assemble cyclic cranking kit.
   a. Install P.C. board holders on bracket.

NOTE

When installing holders, place large cut corner of bracket to the left side. See Figure 1.

   b. Remove 3/16" x 3/16" (5 mm x 5 mm) from top two corners of circuit board assembly. Slide circuit board assembly onto P.C. board holders.
   c. Install relay to bracket using lock washer and nut.

NOTE

Mount relay with terminals 1 and 2 nearest to circuit board assembly.

   d. Install tab adapter to relay terminal 7.
   e. Connect 3" lead to tab adapter and relay terminal 6.
   f. Connect lead with insulink to relay terminal 4.
   g. Crimp-on eyelet terminal to lead 71 and connect to terminal 1 of circuit board assembly.

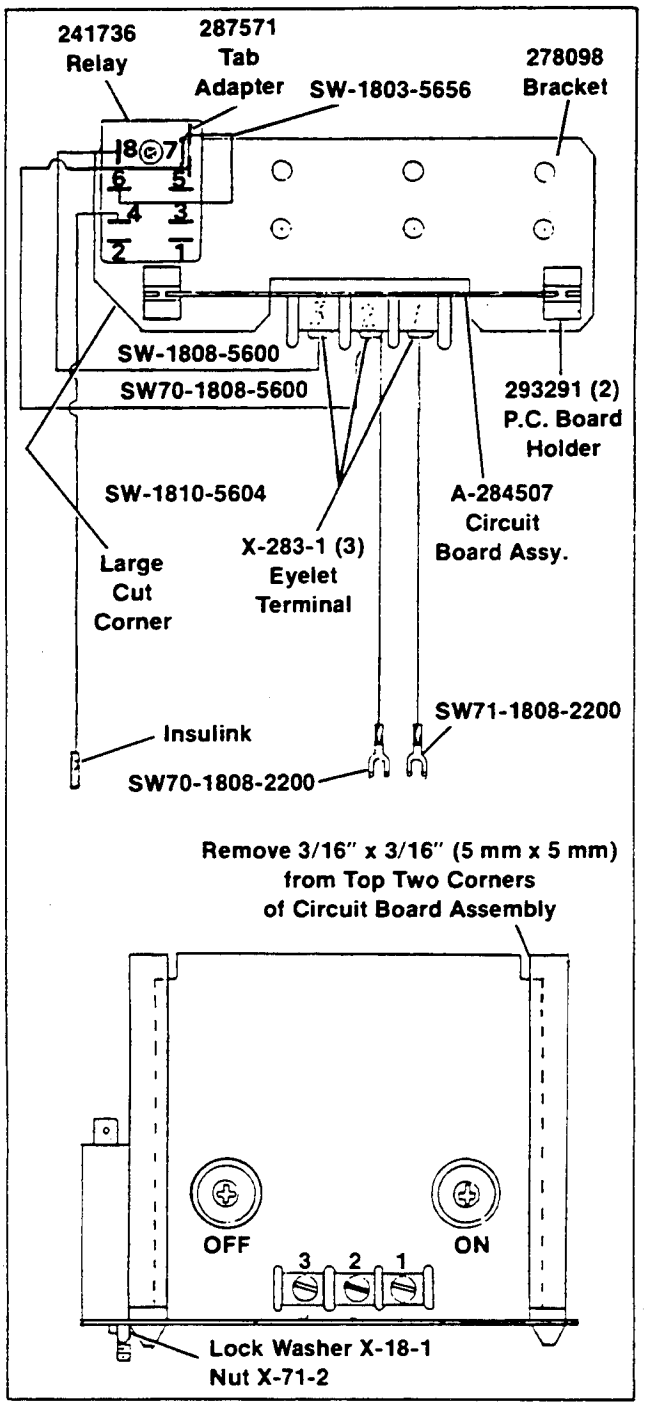


Figure 1. Cyclic Cranking Kit

h. Twist stripped ends of leads 70 together and crimp-on eyelet terminal. Connect eyelet terminal to terminal 2 of circuit board assembly. Connect push-on terminal to tab adapter.

i. Crimp-on eyelet terminal to 8" lead (with no markings), and connect to terminal 3 of circuit board assembly and relay terminal 8.

4. Remove nuts and lock washers from CR, 1CR and 2CR relays.
5. Mount cyclic cranking kit to top of relays using existing lock washers and nuts.
6. Connect lead from terminal 1 of cyclic cranking kit to 71 on controller terminal strip. See Figure 2.
7. Locate starter solenoid (mounted near starter) and determine which lead (70 or 51) from controller is connected to starter solenoid terminal. Remove the other end of this lead from the controller terminal strip. Cut terminal from lead, strip end and connect to lead (with insulink) from cyclic cranking relay terminal 4.
8. Connect lead from terminal 2 of cyclic cranking kit to 70 on controller terminal strip.
9. Adjust pots. if required.

PART LISTING

Part No.	Description	Qty.
A-284507	Board Assembly, Circuit	1
X-18-1	Washer, #6 Lock	1
X-71-2	Nut, 6-32	1
X-283-1	Terminal, Eyelet	3
241736	Relay	1
278098	Bracket	1
287571	Adapter, Tab	1
293291	Holder, P.C. Board	2
SW-1803-5656	Lead, 3"	1
SW-1808-5600	Lead, 8"	1
SW-1810-5604	Lead, 10" w/Insulink	1
SW70-1808-2200	Lead, #70 w/Spade	1
SW70-1808-5600	Lead, #70 w/Push-on	1
SW71-1808-2200	Lead, #71	1

NOTE

To increase the time period, turn pot. clockwise.

10. Replace the controller cover.
11. Check that the controller main switch is in the OFF position. Reconnect battery, negative lead last.

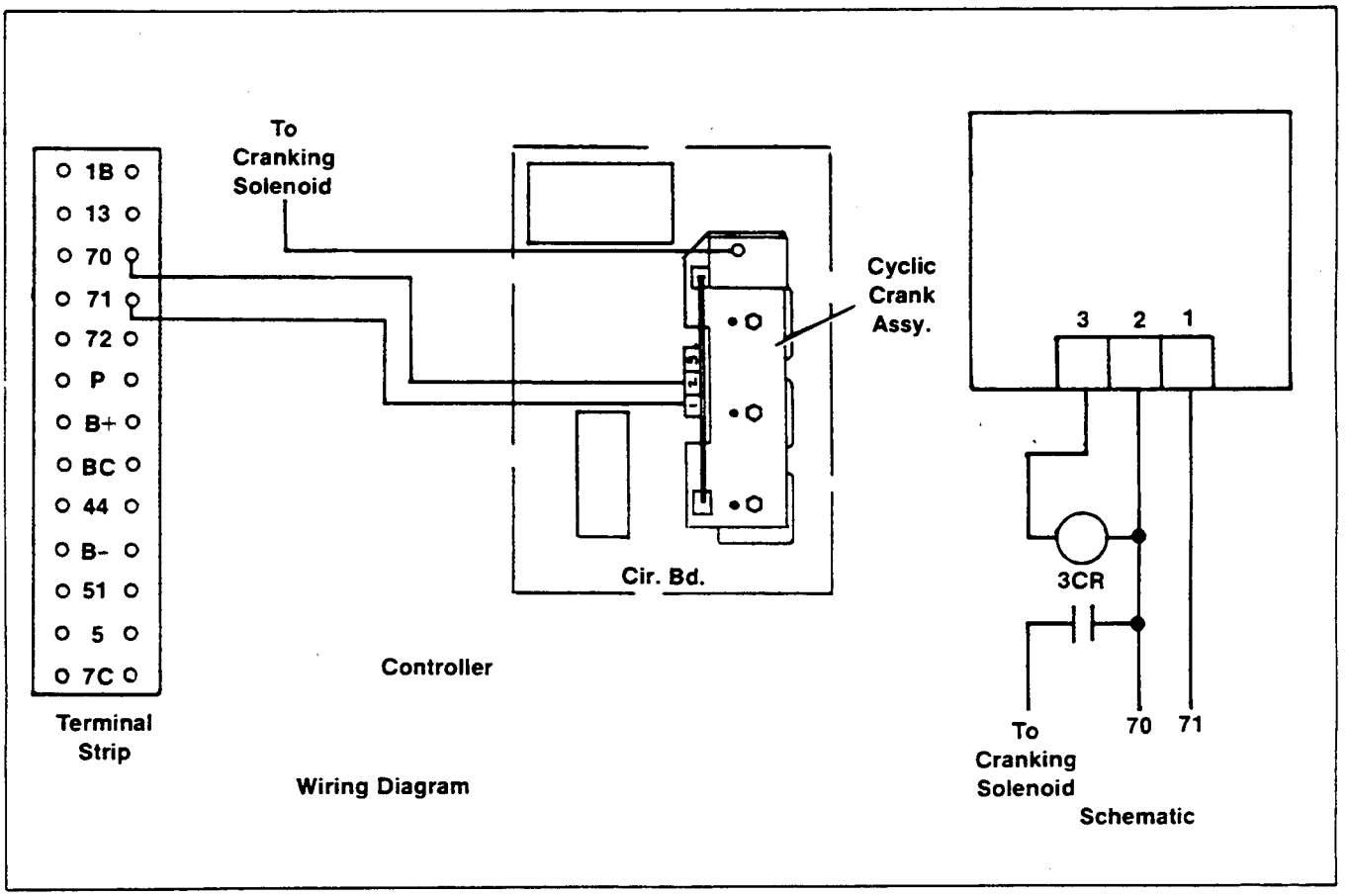


Figure 2. Wiring Diagram

TP-5110 2/90
Printed in U.S.A.

KOHLER
GENERATORS

KOHLER CO., KOHLER, WISCONSIN 53044