

OPERATORS MANUAL AND PARTS CATALOG

FOR
ONAN
ELECTRIC GENERATING PLANTS

DJA
DJB
DJC
SERIES

SIMPSON MAXWELL
736 5431.

SER. #

MOD #

Price \$1.00



967-301

DIVISION of
STUDEBAKER CORPORATION.

2515 University Avenue S.E.,
Minneapolis 14, Minnesota



Minneapolis 14, Minnesota

MANUFACTURER'S WARRANTY

The Manufacturer warrants, to the original user, that each product of its manufacture is free from defects in material and factory workmanship if properly installed, serviced and operated under normal conditions according to the Manufacturer's instructions.

Manufacturer's obligation under this warranty is limited to correcting without charge at its factory any part or parts thereof which shall be returned to its factory or one of its Authorized Service Stations, transportation charges prepaid, within one year after being put into service by the original user, and which upon examination shall disclose to the Manufacturer's satisfaction to have been originally defective. Correction of such defects by repair to, or supplying of replacements for defective parts, shall constitute fulfillment of all obligations to original user.

This warranty shall not apply to any of the Manufacturer's products which must be replaced because of normal wear, which have been subject to misuse, negligence or accident or which shall have been repaired or altered outside of the Manufacturer's factory unless authorized by the Manufacturer.

Manufacturer shall not be liable for loss, damage or expense directly or indirectly from the use of its product or from any other cause.

The above warranty supersedes and is in lieu of all other warranties, expressed or implied, and of all other liabilities or obligations on part of Manufacturer. No person, agent or dealer is authorized to give any warranties on behalf of the Manufacturer nor to assume for the Manufacturer any other liability in connection with any of its products unless made in writing and signed by an officer of the Manufacturer.

IMPORTANT

RETURN WARRANTY CARD ATTACHED TO UNIT

GENERAL INFORMATION

THIS OPERATOR'S MANUAL PROVIDES INFORMATION FOR PROPER INSTALLATION, OPERATION, AND MAINTENANCE PROCEDURES.

WE SUGGEST THIS BOOK BE KEPT HANDY SO THAT IT CAN BE READILY REFERRED TO WHEN NECESSARY.

FOR MAJOR REPAIR INFORMATION, USE THE FORM PROVIDED BELOW. A SERVICE MANUAL WILL BE SENT UPON RECEIPT OF \$1.00. AN INDIVIDUAL WIRING DIAGRAM IS AVAILABLE AND WILL BE INCLUDED, WHEN REQUESTED.

PLEASE!

WHEN FILLING OUT THE FORM, BE SURE YOU HAVE INDICATED THE MODEL AND SPEC NO., AND THE SERIAL NO. EXACTLY AS SHOWN ON THE UNIT NAMEPLATE. THIS INFORMATION IS NECESSARY TO PROPERLY IDENTIFY THE UNIT AMONG THE MANY BASIC AND SPECIAL MODELS MANUFACTURED.

TRIM ALONG THIS LINE

ONAN

DIVISION of STUDEBAKER CORPORATION
2515 UNIVERSITY AVENUE S. E. MINNEAPOLIS 14, MINNESOTA

ENCLOSE \$1.00. PLEASE SEND ME A

MAJOR SERVICE MANUAL (Contains details for making all recommended repairs and general overhaul of unit)

IMPORTANT!

BE SURE TO INCLUDE COMPLETE MODEL, SPEC., AND SERIAL NUMBER OF UNIT (SEE ONAN NAMEPLATE)

MODEL AND SPEC. of my unit is _____

SERIAL NUMBER of my unit is _____

Name _____

St. or R.F.D. _____

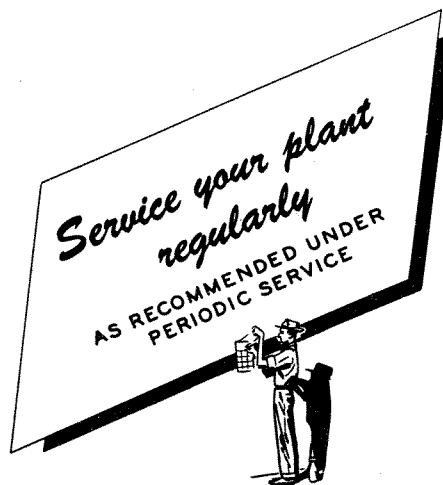
City _____ Zone _____ State _____

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NOTE

Operator's instructions on certain optional equipment may be included with the equipment and should be attached to this manual for future reference.



INTRODUCTION

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This manual applies to diesel fueled, air cooled Onan DJA, DJB, and DJC series generating plants.

The generating plant was run-in and adjusted at the factory.

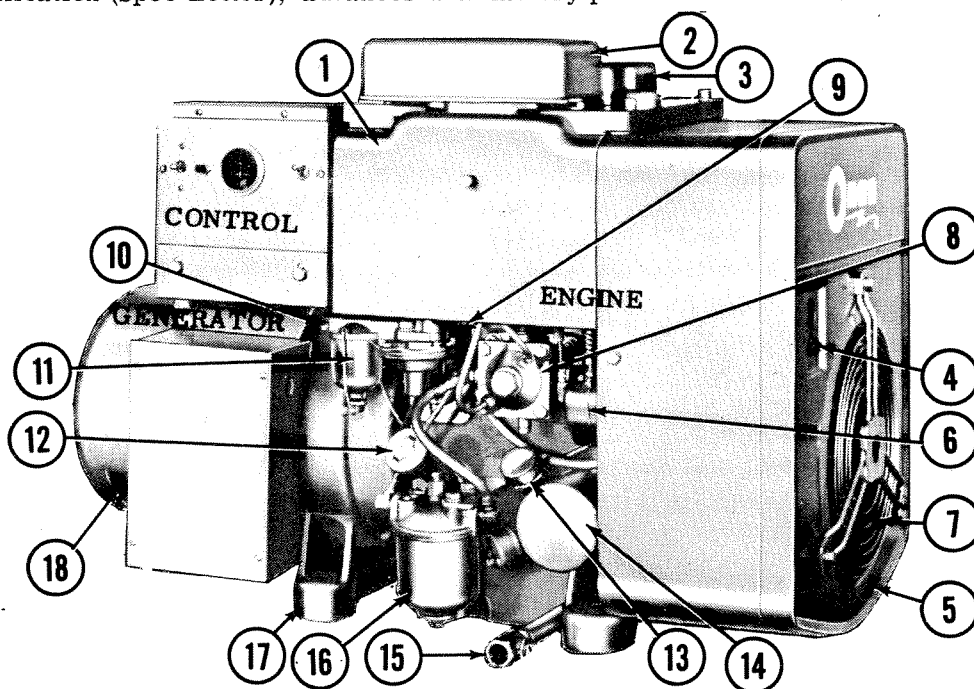
When instructions in this manual refer to a specific model of generating plant, the model in question can be identified by referring to the MODEL AND SPEC. (specification) NO. as shown on the plant nameplate. Electrical characteristics of the plant are shown on the nameplate lower portion.

TYPICAL MODEL AND SPEC NO.

3 DJA - 3R / 3399D

6DJB-3R/96H

- 1 - Factory code for general identification purposes. _____
- 2 - Factory code for specific optional equipment supplied. _____
- 3 - Specification (Spec Letter), advances with factory production modifications. _____



LEGEND

- | | | |
|--------------------------|-----------------------------------|----------------------------|
| 1 - Air housing door | 9 - Fuel return connection | 16 - Secondary fuel filter |
| 2 - Air Cleaner | 10 - Fuel Supply connection | 17 - Mounting feet |
| 3 - Valve rocker Box | 11 - Fuel pump and primary filter | 18 - Generator air inlet |
| 4 - Governor adjustment | 12 - Oil fill | <u>ON FARSIDE</u> |
| 5 - Flywheel air housing | 13 - Oil pressure gage | - Air outlet |
| 6 - Centrifugal switch | 14 - Lube oil filter | - Starting motor |
| 7 - Engine air inlet | 15 - Oil drain | - Battery connection |
| 8 - Injection pump | | |

TWO-CYLINDER DIESEL ELECTRIC GENERATING PLANT
(Left-side, Front-end View)

DATA AND DESCRIPTION TABLE I

	MODEL SERIES		
	DJA	DJB	DJC
Nominal dimensions of plant (inches)			
Height	25	25	25
Width	18	18	19
Length	32	38	53
Engine make	Onan	Onan	Onan
Number cylinder (vertical in-line)	1	2	4
Displacement (cubic inch)	30	60	120
Cylinder bore	3-1/4	3-1/4	3-1/4
Piston Stroke	3-5/8	3-5/8	3-5/8
RPM (for 60 cycle)	1800	1800	1800
RPM (for 50 cycle)	1500	1500	1500
RPM (for battery charger)	1750		
Compression ratio	19 to 1	19 to 1	19 to 1
Exhaust connection (pipe tapped)	1-1/4	1-1/4	1-1/2
Stellite faced exhaust and intake valves	yes	yes	yes
Valve rotators on intake and exhaust	yes	yes	yes
Connecting rod bearings are tri-metal replaceable ..	yes	yes	yes
Main bearings are leaded bronze; precision type for replacement (quantity used)	2	2	3
Battery voltage (ac plant except dual purpose)	12-v	12-v	12-v
Battery size (ac plant except dual purpose)			
SAE group 1H - two in series	yes	yes	yes
Amp/hr, SAE 20-hr (above freezing temp.)* ..	105	105	120
Starting by solenoid shift starting motor	no	yes★	yes★
Starting by exciter cranking	yes	no	no
Centrifugal Start-Disconnect Switch	no	yes	yes
Battery charge rate amperes (normal) AC plants ..	2 to 5	2 to 5	2 to 5
Charge ammeter	yes	yes	yes
Oil capacity in U.S. quarts - (REFILL*)	2.5	3	6
Engine cooling air (CFM at 1800 rpm)	400	590	900
Generator cooling air (CFM at 1800 rpm)	75	180	120
Combustion air (CFM at 1800 rpm)	9	17	35
Total cu. ft. per min. of air required	484	787	1055
Air cleaner (on basic models)	dry	dry	dry
Diesel fuel lift (maximum feet)	6	6	6
Oil filter (full flow type)	yes	yes	yes
Glow plugs and air heater to aid starting	yes	yes	yes
Injection pump (Am. Bosch type)	PLB	PSU	PSU
Primary and secondary fuel filters	yes	yes	yes
Generator make	Onan	Onan	Onan
Output is rated at unity power factor load on these models	all	1-phase	1-phase
Output is rated at 0.8 power factor load on these models	none	3-phase	3-phase
Rating (output in watts) -			
AC, 50-cycle plants, 24-volt battery charging plants	2500	4500	9000
AC, 60-cycle plants, 32-volt battery charging plants	3000		
120-volt AC/32-volt DC Dual Purpose Plant	2250AC 750DC		
AC, 60-cycle plants - intermittent service		6000	12000
- continuous service		5000	10000
AC voltage regulation in ±%	5	3	3
AC frequency regulation in %	5	5	5

★ - Pennsylvania approved models use continuously meshed gear starting motor.

* - Add 1/2 quart for oil filter.

** - Below freezing ambient temperatures - DJA, DJB use 120-amp/hr, DJC use 168-amp/hr.

TABLE I (Cont.)

MODEL SERIES

	DJA	DJB	DJC
Revolving armature type generator	yes	no	no
Revolving field type generator	no	yes	yes
120/240-volt single phase model reconnectible	no	yes	yes
Rotating type exciter	yes	no	no
Static type exciter (magneciter), Onan make	no	yes	yes
Fuel consumption at rated load (gal. per hour) .....	.36	.66	1.33
Net Weight (nominal in pounds)	348	480	774

OPTIONAL EQUIPMENT TABLE II

1. SEPARATE FUEL TANK. - Various sizes.
2. LOW OIL PRESSURE CUT-OFF (For diesel with starting motors). - Shuts down plants if oil pressure fails. Requires modified control on plant adding emergency relay, and different circuits.
3. HIGH AIR TEMPERATURE CUT-OFF. - Shuts down plant if engine discharged air temperature rises too high.
4. AIR SHUTTER. - Thermostatically controlled. Limits engine air flow when cold to aid engine warm up. Minimizes cold back drafts when engine is stopped.
5. HOUSING (2 & 4-cyl.). - Protects from weather. For outdoor installations.
6. SWITCHBOARD. - Instruments to read ac amperes, ac volts, and to break overloaded ac circuit. Desirable information for operator. For wall mounting.
7. AC RECEPTACLES. - Convenient for plugging in ac loads.
8. OIL BASE HEATER AND THERMOSTAT. - Electric heater aids cold starting.
9. OIL BATH TYPE AIR CLEANER. - More efficient than the standard equipment foam type air cleaner. The oil bath type air cleaner requires appropriate periodic servicing.
10. AUTOMATIC DEMAND CONTROL. - Starts and stops plant automatically.
11. LOAD TRANSFER CONTROL. - Controls running of plant and transfers load.
12. OTHER. - See your dealer.

INSTALLATION

GENERAL. - Proper installation is very important. Points to consider include: adequate engine and generator cooling air; discharge of circulated air; adequate fresh induction air; discharge of exhaust gases; electrical connections; fuel connection; accessible for operation and servicing; sturdy and flat floor; and protection from road dust and shocks during transit (mobile applications).

Each installation must be considered individually - use these instructions as a general guide. Meet regulations of local building code, fire ordinance, etc., which may affect installation details.

LOCATIONS. - Provide a location that is protected from the weather, dry, dust free, and preferably heated in cold weather. The air discharge side of the plant requires no service area. Provide at least 24 inches clearance from the other side and ends to the nearest wall for service convenience. Connections must be flexible to allow up to 2 inches of plant rocking on its mounts.

MOUNTING. - For permanent type installations, provide a sturdy, level mounting base of concrete, heavy wood or structural steel, and at least 12" high to aid oil changing and operating. When a wood base is used, the joists should be directly under the mounting feet of the plant. Minimum sizes of material for constructing a rigid wood base are: floor, 1" plywood; joists, 2 x 6" plank. For mobile applications, as in trucks or trailers, if compartment is too small for access, install slide-out rails or provide doors for access.

For plants with tubular type cushions, carefully assemble the mounting cushions washers and spacer bushing (fig. 1). The spacer bushing prevents excessive compression of the upper rubber cushion. Space the 3/8 inch diameter mounting bolts through the floor.

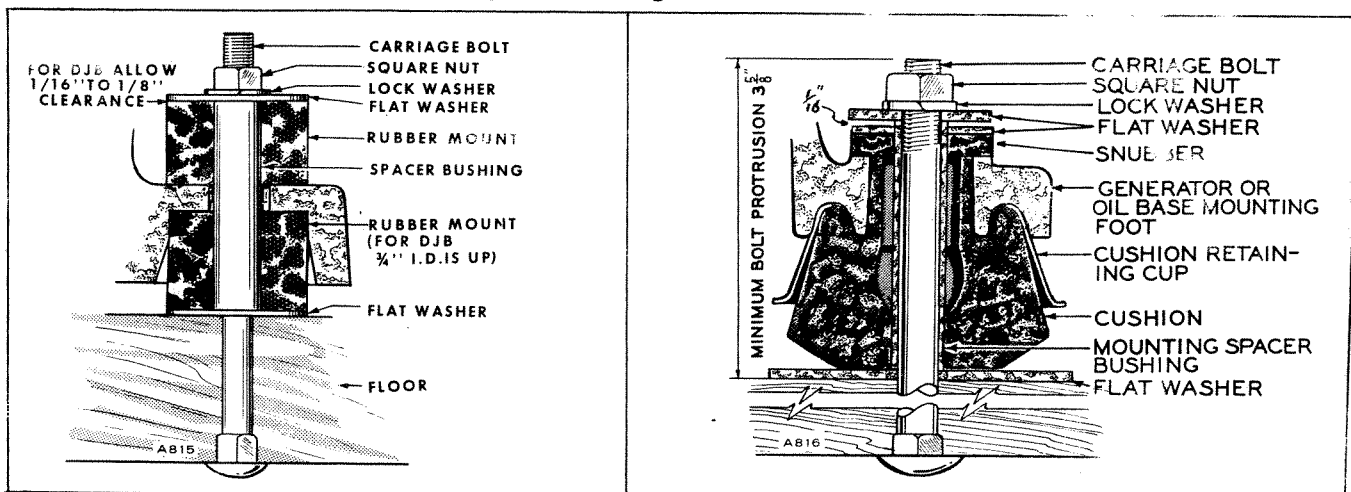


Fig. 1 Mounting Detail (Tubular Type Cushions)

Fig. 1a Mounting Detail (Cone Type Cushions)

For plants with cone type cushions (fig. 1a) a template is furnished for locating mounting bolts holes. Position the plant, place cushions under the oil base and generator support (for Model DJA also use the cushion retainer cups). Part number is shown on cushions, always use cushion with higher number on the generator (heavier) end.

Distance (inches) between hole centers is the same for tubular and cone type cushions and are:

MODEL	ENGINE END	GENERATOR END	ENGINE TO GENERATOR
DJA	13-1/4	9	8-1/16
DJB	11-1/2	11-1/2	12-1/8
DJC	11	11	21

VENTILATION AND COOLING. - The unit generates much heat that must be dissipated. Outdoor installations provide adequate cooling air. Indoor installations require sufficiently large air inlets near the engine and air outlets nearer the ceiling. Provide at least 2 sq. in. of free air inlet area for each cu. in. per minute of air flow.

*NOTE-IF REVOLVING FIELD TYPE PLANT IS INSTALLED IN 384 CU. FT. OR LESS COMPARTMENT DUCT GENERATOR HEATED AIR TO OUTSIDE.

DO NOT JOIN WITH DUCT FOR ENGINE HEATED AIR.

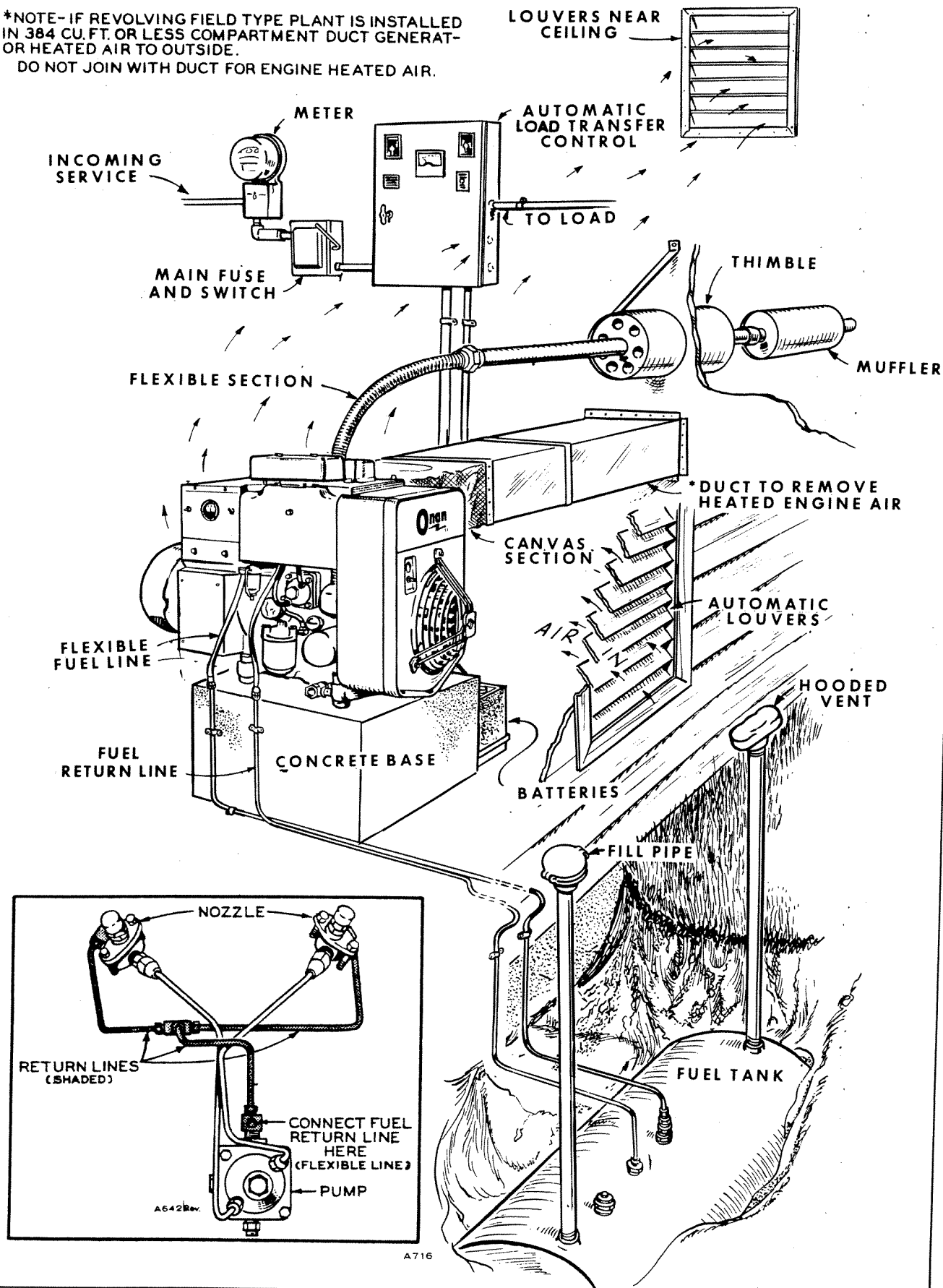


Fig. 2 Typical Installation

See DATA TABLE I for air requirement at 1800 rpm with rated load, and under normal conditions. Factors which affect ventilation requirements include: ambient temperature; size of room; amount of connected electrical load; continuous running time; and wind direction. Make allowances for any adverse conditions which limit cooling efficiency. For cold weather operation, discharged air shutter is available to control air circulated by a cold engine.

Never allow air recirculation within an enclosure except if air temperature stays under 120°F. Install hot air ducts from the air discharge opening of the engine (and of the revolving field type generator) to the outside atmosphere.

1. The engine air outlet can be fitted with an adapter or air shutter assembly. The air outlet is 8 x 20" on 4-cylinder, 8 x 10" on 2-cylinder, and 8 x 8" on 1-cylinder models. Make adequate allowance for the air flow restriction of an optional louver or screen. Consider positioning screen diagonally in duct to increase screen area. Limit bends and use radius type elbows where needed. Duct size must be as large as at the plant. Increase size for runs beyond 9 feet. Use a short canvas section to connect duct to the plant, to absorb vibration. If practical, pitch the duct level upward to permit heat to leave after stopping.
2. (Exception: The revolving armature generator discharges air into the room because a duct cannot be connected to the several outlets.) The generator air outlet is 5-5/8 x 3" inside measurement, on revolving field type generators only. Where the plant is installed in a small room (room too small for operator to walk in), install a duct to discharge air from the generator in the same manner as from the engine. This must be a separate duct - never joined with the engine duct. The generator duct is recommended but not mandatory on all other indoor installations.

Installation in a small room may require using an auxiliary fan of sufficient size to assure a proper volume of air. Connect fan to run only when plant is running. Always make an outlet near the ceiling to cool a small room.

For cold locations, room openings may be equipped with automatically operated louvers. An optional discharged air shutter, speeds warm-up by restricting flow of cold air.

EXHAUST. - Pipe POISONOUS exhaust gases outside any enclosure. Locate exhaust outlet far from air inlet to avoid gases re-entering enclosure. The engine exhaust on DJA and DJB models is tapped for 1-1/4" pipe and on DJC for 1-1/2" pipe. Use flexible tubing to connect between engine exhaust and any rigid pipe extension or the muffler. Shield the line if it passes through a combustible wall (fig. 3). If turns are necessary, use sweeping (long radius) type elbows. If pitched upward, install a condensation trap at point of rise. Increase one pipe size for each additional 10 feet in length. On DJC models, the exhaust manifold can be reversed for rear down exhaust instead of front up.

OIL DRAIN. - The oil drain may be extended to suit the installation. The oil base has a 1/2" pipe tapped hole.

FUEL TANK AND LINES. - Where a separate fuel tank is used, install so that the bottom of the tank is less than 6-feet below the fuel pump. Be sure that there are no air leaks in the suction line.

Where a fuel tank is shared, do not connect to an existing line at a point above the fuel supply level. This avoids starving the plant.

If fuel lift exceeds 6-ft. install an auxiliary electric fuel pump near the fuel supply. Wire it in parallel with the governor solenoid.

Use approved flexible fuel line next to the engine. The diesel engine requires a fuel supply line and a separate fuel return line. Install the fuel supply line from near the bottom of the supply tank to the 1/8" pipe tapped inlet of the fuel pump. Install the fuel return line from the 7/16-24 size opening in the overflow fitting located on the injection pump (where the nozzle fuel return line is also connected) to the top of the fuel supply tank, see figure 2.

Where the fuel line runs below the fuel level, making siphoning possible, a shut-off valve at the tank is recommended for servicing convenience.

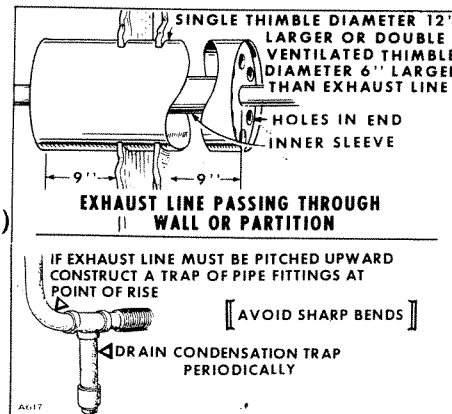


Fig. 3 Exhaust

GROUNDING. - To prevent shock hazard, ground the plant. For permanent installations, connect a #8 or larger wire between (1) a separate ground pipe or rod penetrating into moist earth, and (2) the solderless connector on the side of the generator or, on models not so equipped, the battery ground stud on the engine.

REMOTE START-STOP SWITCH (OPTIONAL). - For remote control of starting and stopping ("Remote" type AC plant) use four wires to connect two remote switches to the terminal block in the control box marked B+, 1, 2, 3, H as shown in fig. 5. One switch is for starting and stopping and the other for pre-heating the engine before starting. Use momentary contact, center-off type switches. One should be single pole, single throw (SPST). Remove the jumper wire between terminals 3 and H before installing the remote wires. Use the correct wire size as shown in fig. 5 according to the distance from the plant to the switches.

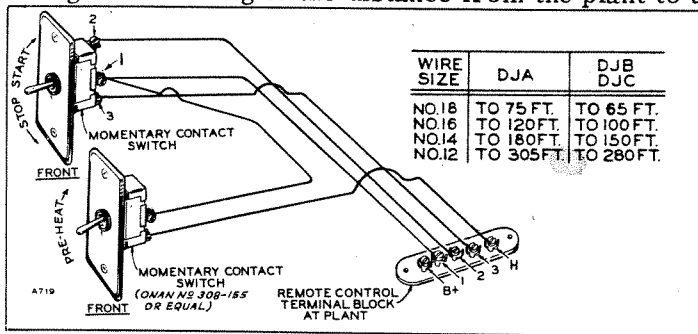


Fig. 5 Remote Start-Stop Switch and Wire Size

BATTERY CONNECTION (Plant with Starting Motor - Model DJB and DJC). - Refer to the wiring diagram and fig. 7. Battery polarity connection must agree with the connection of the rectifier located in the control box. If battery ground must be changed to agree with polarity of other equipment aboard a vessel, then loosen terminal screws and reverse the rectifier connection in the control, fig. 6.

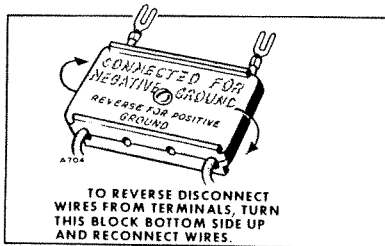


Fig. 6 Polarity Block

WARNING: If the battery is connected to the charging circuit with the wrong polarity, damage will occur after 3 minutes while stopped or in 5 seconds while running. Alternator windings will be damaged almost instantly if battery charging circuit is shorted before the resistor.

Refer to plant nameplate for battery voltage. For ac plants provide two 6-volt batteries connected in series (one battery's negative to other battery's positive) for 105-amp/hr, 12-volt source. For dual purpose plants use 32-volt set of batteries.

Connect the battery positive (+) to the starter engaging solenoid terminal post (fig. 7). Connect battery negative (-) to a good ground on the engine.

BATTERY CONNECTION (Exciter Cranked Plant - Model DJA with 12-volt system). - Refer to the wiring diagram and figure 8. If battery ground must be changed to agree with other equipment aboard a vessel, reverse the connections to the charge ammeter or re-mark the correct direction of charge. Crank electrically to flash field.

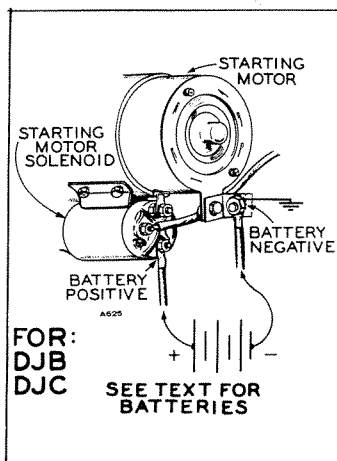


Fig. 7 Battery Connections

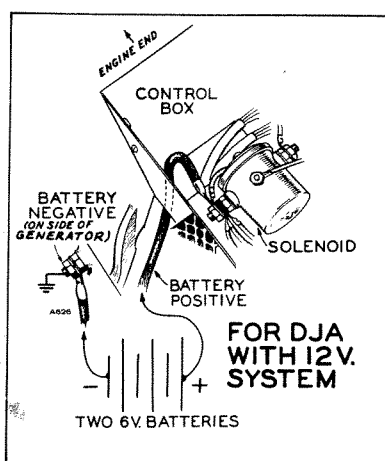


Fig. 8 Battery Connections

Provide TWO 6-volt batteries connected in series (one battery's negative to other battery's positive) for a 105 amp/hr, 12-volt source. Connect the remaining battery positive (+) to the start solenoid (located in the control box). Connect the battery negative (-) to a good ground on the generator frame.

BATTERY CONNECTION (Exciter Cranked Plant - Model DJA with 24-volt or 32-volt systems). - Refer to the wiring diagram and figure 9. The dual purpose plants and battery charging plants have GROUNDED system. Battery ground is negative, reversible in the field. Battery polarity must agree with polarity of other electrical equipment aboard a vessel. If the positive lead is grounded, reverse the

connections to the charge ammeter or remark the direction of charge.

Refer to plant nameplate for battery voltage and provide a proper set of batteries.

LOAD WIRE CONNECTIONS (AC Plants). -

The plant nameplate shows the electrical output rating of the plant in watts, volts and cycles. The plant wiring diagram shows the electrical circuits and connections necessary for the available output voltage. Also see fig. 12A-F.

Meet all applicable electrical code requirements. It is assumed the work will be done by a qualified electrician and the installation will be inspected and approved.

General - The control box (or junction box) on the plant has a knock out section for entering with load wires. Use flexible conduit and preferably stranded load wires near the plant to absorb vibrations. Use sufficiently large insulated wires. Strip insulation from wire ends as necessary for clean connections. Securely connect each load wire to the proper generator output lead inside the box on the plant. Insulate bare ends of ungrounded wires. Use a bolt through the control box to connect the generator lead and load wire to be grounded (\varnothing). Install a fused main switch or circuit breaker between the generating plant and load. If a test run indicates wrong rotation of 3-phase motors in the load circuit, reverse the connections at any two generator terminals.

Standby - If the installation is for standby service, always install a double-throw transfer switch (either manual or automatic type) so that the generator output cannot be fed into the normal power source lines, and so that both the normal source and the generator output cannot be connected at the same time to the load. Instructions for connecting an automatic line transfer switch are included with such equipment. See figure 11.

Balancing the load - Serious overloading can damage the generator windings! When two or more single phase circuits are available, divide the load between them as equally as practical. To determine the amount of current available on each single phase circuit, subtract the higher voltage load or 3-phase load (whichever applies) from the rated output and divide the remainder by the quantity of single phase circuits. **EXAMPLE:** On a 10,000-watt, 3-phase, 4-wire plant, if 4000-watts of 3-phase is used, a remainder of 6000-watts is available to be equally divided between the three single phase circuits. Thus only 2000-watts would be available on each of the three single phase circuits.

Output lead markings - Leads on revolving armature generators are marked M1, M2, etc. The comparable leads on the revolving field generators are marked T1, T2, etc. These identifying marks appear also on the wiring diagram.

Voltage selection on reconnectable generator - The revolving field single phase plants (DJB-3R and DJC-3R models) except when optionally equipped with meter panel, circuit breaker, etc. are reconnectable for use as either a 120/240-volt 3-wire, a 120-volt 2-wire, or a 240-volt 2-wire power source, figure 12C. Use the connection for 2 wire service when one load exceeds 1/2 the rated capacity. Balance the loads when connected for 3-wire service.

Loading DELTA connected generator - Any combination of single phase and three phase loading can be used at the same time as long as the current for any one output lead does not exceed the nameplate rating of the generator. Generator lead T0 is the generator center tap between T1 and T2. The T0 lead is normally not grounded but can be grounded if required.

Load connections - Refer to the figure which illustrates the load connection for the output shown on your plant's nameplate. See switchboard instructions here when a switchboard is used. See figure 12 A-F.

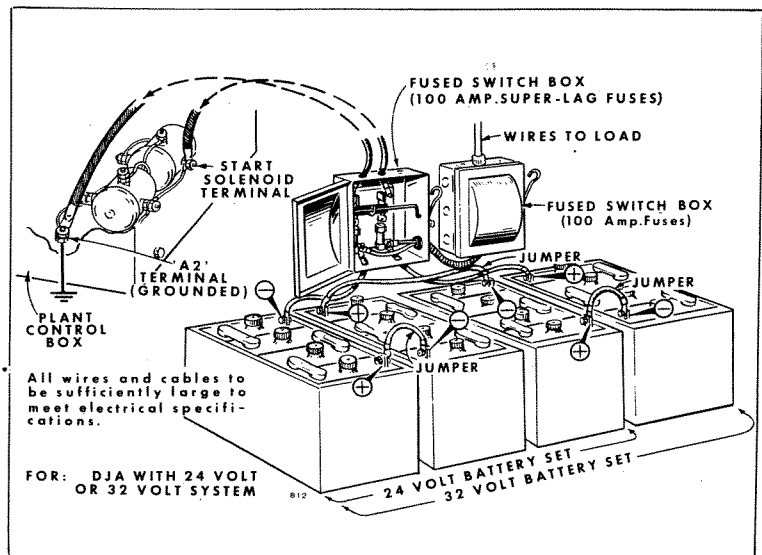


Fig. 9 Battery and DC Load Connections

Switchboard - When an optional wall mounted switchboard (containing ammeter(s), voltmeter, and circuit breaker(s) is used, these load wire connections apply: Connect to the unused terminal of each ammeter, one ungrounded ("hot") generator lead. Connect to the ground stud in the switchboard, generator lead(s) and load wire(s) which are to be grounded - if any. Connect to the unused terminal of each circuit breaker, one ungrounded ("hot") load wire. On plants which generate more than one voltage, the voltmeter reads the higher voltage shown on the nameplate. The lower voltage is correct when the higher is correct.

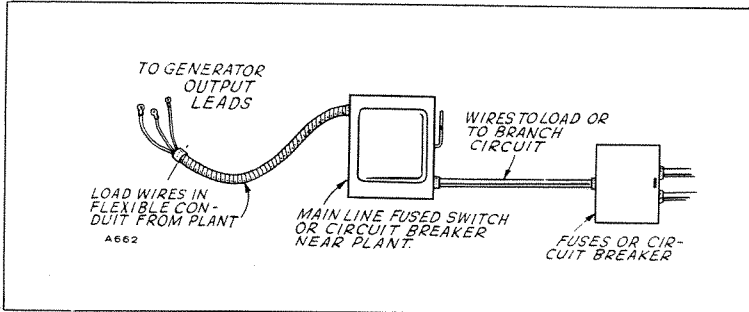


Fig. 10 Typical Wiring

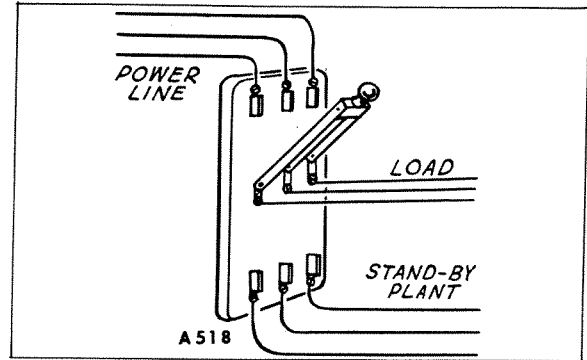


Fig. 11 Double Throw Transfer Switch

LOAD WIRE CONNECTION (Dual Purpose Plant, 120-V. AC/32-V. DC). - For connecting the 120-volt ac load, see figure 12A.

For connecting the 32-volt dc load, refer to instructions as given for the 32-volt battery charging plant and figure 9.

CAUTION!

Remember that a total of up to 750-watts of direct current and 2250-watts of alternating current may be used at the same time or divided in any proportion within the rated output limits of the generator. Maximum dc output should not exceed 750-watts. Total current available is 3000-watts. If only alternating current is used, 3000-watts is available. Subtract the amount of direct current used from the total generator capacity to find the amount of alternating current available. Example: If 500-watts dc is used, only 2500-watts ac is available.

CONNECTING THE LOAD (Battery Charging Plants 24-V. and 32-V.). - The main line load circuit should be connected to the

batteries through a 100-ampere fused switch or circuit breaker. Lead wires from the battery fuse block to the main line fuse block should be sufficient to carry the full rated capacity of the generator plus the full rated capacity of the battery. Branch circuits should be properly fused. Smaller wire may be used for branch circuits but large enough to carry the amperage of the load on each circuit.

Make connections from the main line switch to the fused battery switch. Connect leads to the terminals on the battery side of both switches. Observe the same polarity used in connecting the battery. Refer to the Battery Connections figure 9.

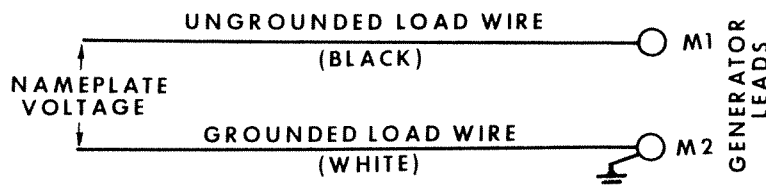


Fig. 12A 1 Phase, 2 Wire Revolving Armature Generator (60-cycle model has code -1 for 120 volt; or code -2 for 240 volt)

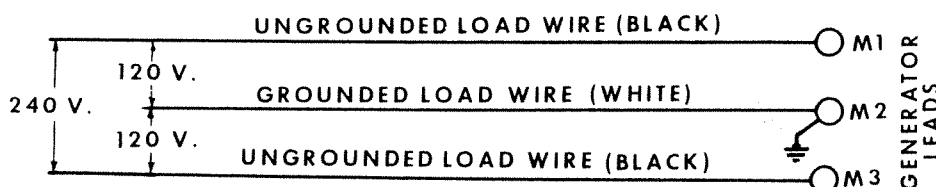
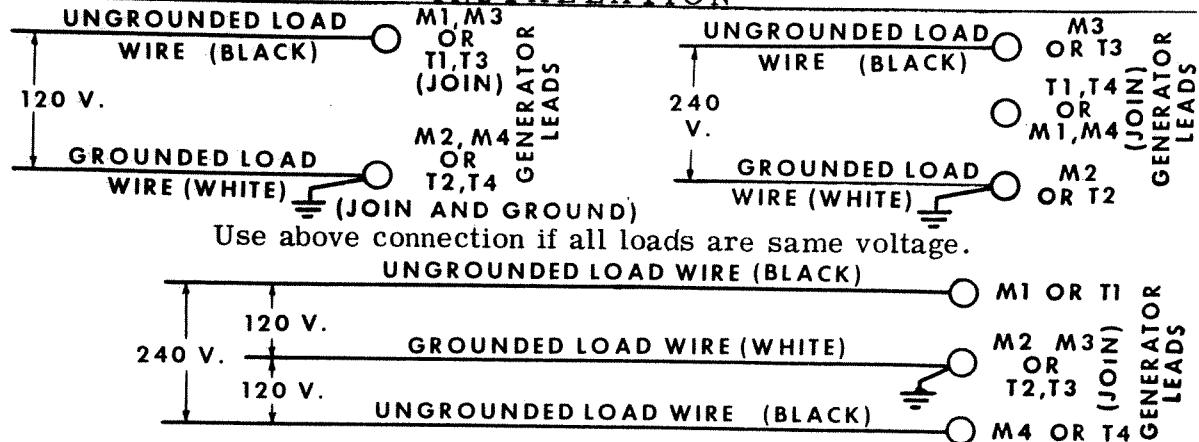


Fig. 12B 1 Phase, 3 Wire Revolving Armature Generator (60-cycle model has code -3 for 120/240 volt)

INSTALLATION



Only 1/2 plant capacity is available on each 120-volt circuit.

Fig. 12C 1 Phase, Reconnectable Generator (See text)
(60-cycle model has code -3 or -3C; gives 2-wire or 3-wire service)

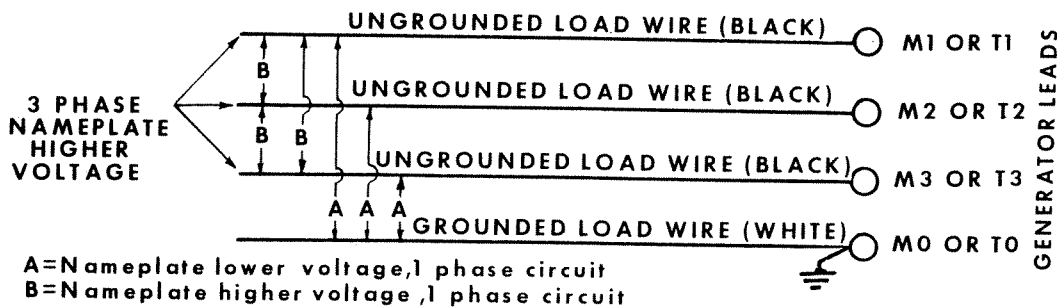


Fig. 12D 3 Phase, 4 Wire, Wye Connected Generator
(60-cycle model has code -4 for 120/208 volt; or code -7 for 220/380 volt; or code -4X for 277/480 volt)

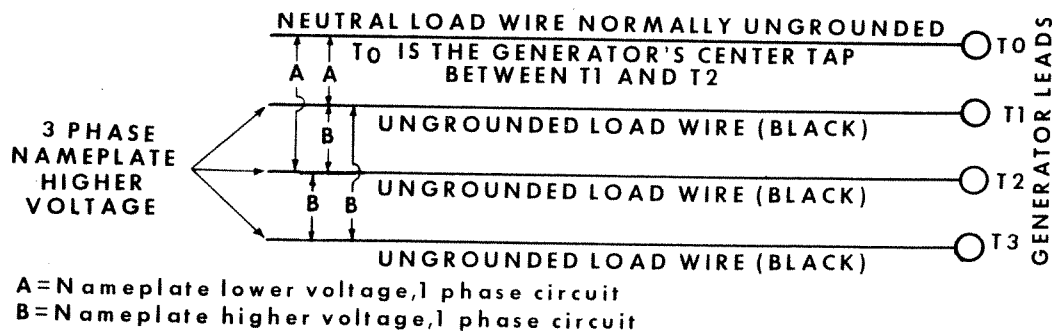


Fig. 12E 3 Phase, 4 Wire, Delta Connected Generator
(60-cycle model has code -5D for 120/240 volt; or code -6D for 240/480 volt)

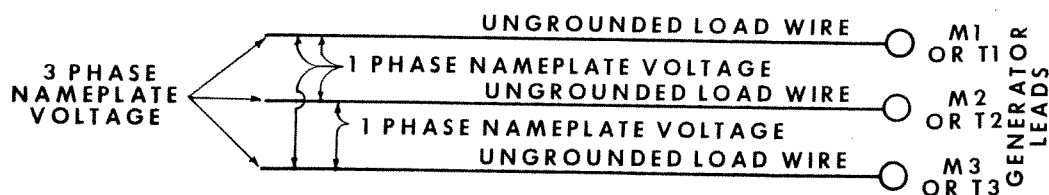


Fig. 12F 3 Phase, 3 Wire Generator
(60-cycle model has code -5 for 240 volt; or code -6 for 480 volt; or code -9 for 600 volt)

CRANKCASE OIL. - Table I gives the oil capacity. Be sure the plant is sitting level when filling. Fill to "F" (full) mark on the indicator (Fig. 13). Use an oil with the API designation DS that has passed the Series 3 Test and at least Sequence I of the Automotive Manufacturer's MS Sequence Tests. (DM oil which has passed the Automotive Manufacturer's MS Sequence Tests may also be used when ambient temperatures are lower than 30°F.) To reduce oil consumption to a normal level in the shortest time on a new or rebuilt "J" series diesel engine, use DG or DM oil (passing the MS Sequence Tests) for the first fill only (50 to 100-hours), then change to the recommended oil. Always reinstall indicator **AIR TIGHT**.

GOVERNOR LINKAGE. - Lubricate the linkage ball joints, figure 14, with powdered graphite (preferably), or light, non-gumming lubricating oil. Do not lubricate type with plastic socket.

OIL BATH AIR CLEANER (Optional). - Use the same grade of oil in the air cleaner as is used in the crankcase. The proper level is marked on the air cleaner.

TEMPERATURE	GRADE
Above 30°F	SAE 30
0°F to 30°F	SAE 10W or 5W-20
Below 0°F	SAE 5W-20

DS

DS

DS OR DA

RECOMMENDED FUEL depends on operating conditions. Use NO. 2 diesel fuel for best economy, except use NO. 1 diesel fuel (a) when ambient temperature is below 32°F., or (b) at all temperatures during long periods of light engine load, (c) if preferred by user. Use low sulfur content fuel having a pour point (ability to filter) of at least 10°F. below the lowest expected temperature. Keep fuel clean and protected from adverse weather. Leave some room for expansion when filling the tank.

BLEED AIR FROM FUEL SYSTEM. - Disconnect the fuel return line. See Figure 15. Operate the hand priming lever on diaphragm type fuel transfer pump until there are no air bubbles in fuel flowing from the fuel return line fitting. Then connect the fuel return line. NOTE: If the camshafts pump lobe is up, crank engine one revolution to permit hand priming. When finished, return priming lever inward (disengaged position) to permit normal pump operation.

On early 1 cylinder engines only, bleed also at the injection pump outlet, figure 15. Remove pump to nozzle fuel line and the delivery valve holder. Crank engine until air is removed, then reassemble.

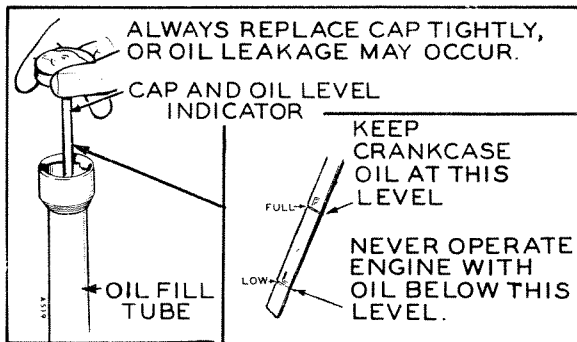


Fig. 13 Crankcase Oil Level

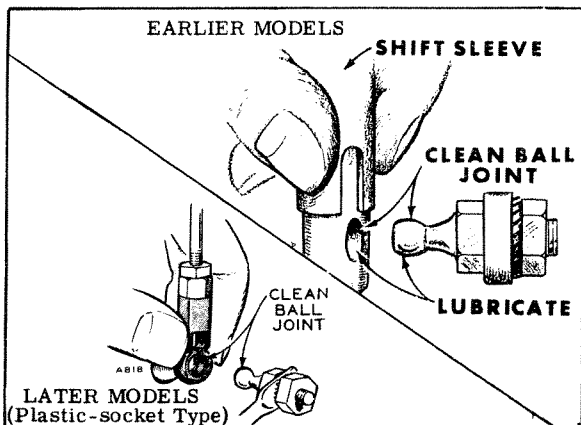


Fig. 14 Governor Linkage Lubrication

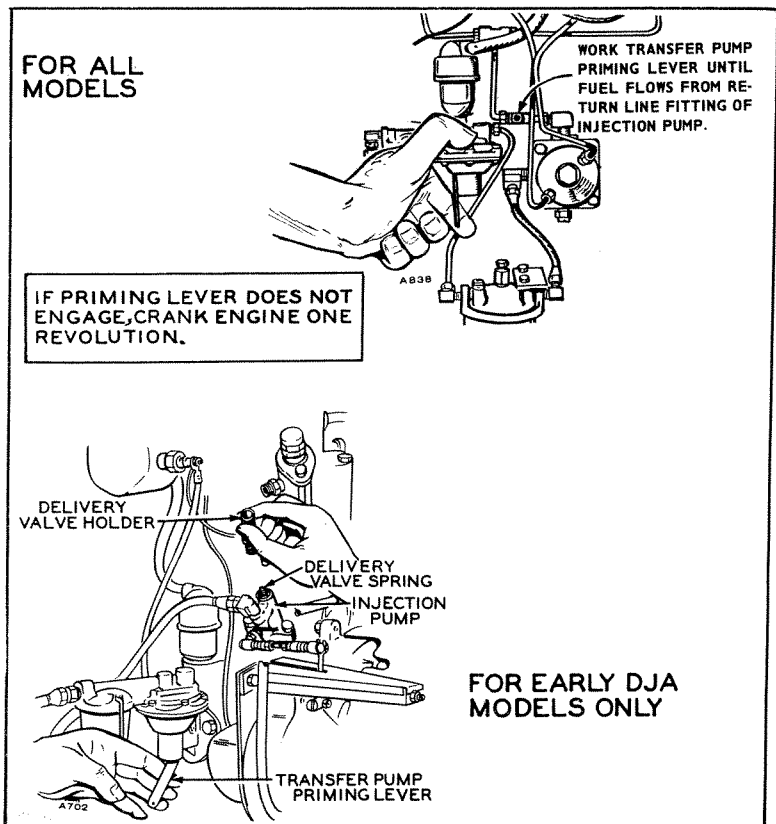


Fig. 15 Fuel System Priming and Air Bleeding

OPERATION

BE SURE THE INSTALLATION IS COMPLETE! HAVE THE ENGINE SERVICED WITH LUBRICATING OIL AND FUEL! HAVE COOLING AIR AVAILABLE! HAVE CYLINDER AIR HOUSING DOOR CLOSED!

INITIAL START. - Return the fuel pump hand lever to its inward position after priming a "dry fuel system".

IMPORTANT!!

This unit has been run and tested for about 3 to 4-hours at the factory. Additional break-in time is required and will vary depending upon load conditions, oil used etc. Load during break-in should be between 1/2 load and rated load, preferably near rated load for best results. This procedure results in faster break-in and lower oil consumption.

STARTING. - (1) For cold engine starting above 55°F, depress the manifold heater switch for one minute. (2) Push START-STOP switch to its START position. (3) Release switch after engine starts and reaches speed. (4) Oil pressure should read at least 20 psi. Pressure-relief valve in the oil system is factory adjusted. NOTE: On "contractor" model, depress preheat switch for one minute and then push start switch. Both switches must be engaged for starting.

For temperatures below 55°F, or under high humidity conditions, refer to the suggested aids in section Abnormal Operating Conditions.

Hand cranking is not practical - too difficult on diesel.

If the DJB or DJC plant control has a reset button, push it to reset this optional safety circuit only after a shutdown resulting from oil pressure failure. Remedy the cause, before running the engine.

On AC plants the adjustable resistor in the charging circuit is set to give approximately 2 amperes charging rate. For applications requiring frequent starts, check the battery charge condition (specific gravity) periodically and if necessary increase the charging rate slightly (slide resistor's tap nearer ungrounded lead) until it keeps the battery charged. Stop plant when readjusting to avoid accidental shorts! Avoid too high charging rate. The resistor is located in the generator air outlet of revolving field generators, or on rear of control box of revolving field generators.

On DJA dual purpose plants the battery charge rate is controlled by a HIGH-LOW charge switch located on the plant control box. The maximum charge rate in HIGH position is approximately 20 amp. in LOW position about 2 amp.

CAUTION!!

When switch is at HIGH position, the total AC load should not exceed 2250 watts. When switch is at LOW position, full capacity of 3000 watts can be used.

If the battery is in a discharged condition, place the switch in HIGH position and leave until battery nears a fully charged condition. Then return it to LOW position.

Battery charging plants have a rheostat in series with the shunt field circuit of the generator. The charge rate is controlled by turning the rheostat knob to raise or lower the charge rate. Set the charge rate as indicated by the ammeter, to rate of charge as recommended by battery manufacture.

When a separate automatic demand control for starting and stopping is used, adjust the charge rate for its maximum of approximately 4.5-amperes. This normally keeps batteries charged during starts occurring as often as each 15 minutes.

If a false start occurs with a plant having a starting motor, see that the centrifugal switch (fig. 18) closes with speed build-up.

STOPPING. - (1) Push START-STOP switch to its STOP position. (2) Release switch as soon as plant stops. NOTE: If stop circuit fails, close fuel valve.

CAUTION!!

Carbon in the exhaust system will occur in diesel engines operated consistently at light loads. Operate the plant at full load occasionally (or for about 5 minutes just before stopping) to clean out the exhaust system.

APPLYING LOAD. - Allow the plant to warm up before connecting a heavy electrical load. Overloading cold generators will cause high temperatures and serious damage to the windings can occur. Keep the load within the nameplate rating.

Connect the load in steps rather than full load at one time. Most installations use a line switch which must be closed to connect the load.

EXERCISE DURING STANDBY SERVICE. - Infrequent use can result in hard starting. Run the plant one 30-minute period each week.

AUTOMATIC STARTING AND STOPPING (AC Plants). - Separate controls may be used for automatic start and stop, but the controls must be designed to provide engine pre-heating. Without pre-heating, diesel starting isn't reliable at lower temperatures.

These controls have a time delay relay to pre-heat glow plugs and the manifold heater for about 20 seconds before cranking occurs. Remove the jumper in the plant's control box which connects terminal H (heater) to terminal 3 (start circuit) and connect separate-control pre-heat circuit to the plant H terminal when installing the control. The time delay relay also delays engagement of the starter when load is re-applied before the engine stops completely.

SAFETY DEVICE. - The plant may be optionally equipped with a cut-off switch which stops the plant in case of dangerously high air temperature.

When the revolving field generator is optionally equipped with a low oil pressure cut-off switch, a latching relay and a re-set button are used for positive stopping. After an emergency stop, investigate and correct the cause. Press re-set button before re-starting.

On revolving armature generators, the oil pressure switch is not intended as a safety device. It will not be adequate protection for gradually diminishing oil pressure or too low oil level.

PROTECTION FOR OUT-OF-SERVICE PLANTS:

1. Run plant until thoroughly warm.
2. Drain oil base while still warm. Attach a warning to refill before operation.
3. Service air cleaner.
4. Lubricate governor linkage. Protect from dirt by wrapping with clean cloth.
5. Plug exhaust outlet to prevent entrance of moisture or dirt.
6. Clean generator brushes, slip rings, etc. Do not use lubricant or preservative.
7. Clean entire unit. Coat parts likely to rust with light grease or oil.
8. Provide a suitable cover for the entire unit.
9. Disconnect battery and follow standard battery storage procedure.

EMERGENCY OPERATION IF BATTERY FAILS. - Revolving-armature plants (DJA) must have the battery connected while operating. High voltage will burn relays if battery is disconnected.

Revolving field plants (DJB, DJC) require a battery for running. If the plant battery fails completely and plant must be operated during an emergency, a battery can be shared with other equipment provided the plant charging circuit is disconnected as follows: Remove the ammeter wire connected to the battery polarity reconnection block and tape the bare end. The plant will not charge the battery with this lead wire disconnected.

ABNORMAL OPERATING CONDITIONS

HIGH TEMPERATURES

1. See that nothing obstructs air flow to and from the plant.
2. Be sure the room is properly ventilated.

LOW TEMPERATURES

1. Use the proper SAE oil for existing temperature conditions. Change oil only when warm from running. If an unexpected temperature drop causes an emergency, move the plant to a warm location, or apply heat externally until oil flows freely.
2. Protect fuel against condensation.
3. Keep batteries in a well charged condition.
4. Reduce room ventilation; however, use care to avoid overheating.
5. At low temperatures, if the plant won't start after cranking 1-minute, repeat the preheating.

DUST AND DIRT

1. Keep plant clean. Do not allow cooling fins to become coated or obstructed with debris.
2. Service air cleaner as frequently as necessary.
3. Change crankcase oil every 50 operating hours.
4. Keep oil and fuel supplies in dust-tight containers.
5. Keep governor linkage connections clean.
6. Keep generator brushes, slip rings and commutator (where used) clean.

HIGH ALTITUDE

Maximum power will be reduced approximately 4 percent for each 1000 ft. above sea level after the first 1000 ft.

PREVENTIVE MAINTENANCE

THE FOLLOWING MAINTENANCE IS RECOMMENDED TO KEEP THE PLANT IN GOOD OPERATING CONDITION. NEGLECT OF ROUTINE SERVICING MAY RESULT IN FAILURE OF THE PLANT AT A TIME WHEN IT IS URGENTLY NEEDED. THE CHART IS BASED ON UNITS OPERATING UNDER FAVORABLE CONDITIONS SUCH AS: PROPER INSTALLATION, RECOMMENDED FUEL AND OIL, NORMAL LOAD, ETC.

PERIODIC SERVICE CHART							
SERVICE THESE ITEMS	AFTER EACH CYCLE OF INDICATED HOURS						SEE SERVICE NOTES
	8	100	200	500	2000	5000	
Inspect Plant	x						A
Check Fuel Supply	x						B K
Check Oil Level	x						C
Lubricate Governor Linkage		x†					D
Service Air Cleaner:							
Oil bath type	†	x					E
Dry cartridge type (folded paper)	†	x					E
Moistened foam type (synthetic sponge)	†	x					E
Change Crankcase Oil	†	x					F
Clean Crankcase Breather					x		G
Check Breaker Points				x			H
Check Battery Electrolyte Level			x				J
Empty Fuel Sediment Bowl				x			K
Check Valve Clearance	●			x			N
Inspect Generator Brushes				x			L
Replace Air Cleaner Cart- ridge (or Foam Element if damaged)	(350 Hours)						E
Replace Oil Filter			x				M
Replace Secondary Fuel Filter					x		K
Clean Rocker Box Oil Line Holes					x		N
Check Valves, Clean Ports	(As Required)						N
Clean Generating Plant					x		N
Complete Reconditioning						x	N
Check Nozzle Opening Pressure Spray Pattern					x		N
Replace Anti-Flicker Points					x		H

† Service more often under extreme dust conditions.

● Tighten head bolts and adjust valve clearance after first 50 hours on a new or overhauled engine.

SERVICE NOTES. - These notes supplement the Periodic Service Chart.

A. - Inspect for leaks, loose connections, etc. KEEP PLANT CLEAN.

B. - FUEL SUPPLY. Check supply to avoid running out of fuel. Use clean fuel as recommended in Preparation section. Never fill completely, allow some space for expansion.

C. - OIL LEVEL. Fill to F (full) mark on indicator, figure 13.

D. - GOVERNOR LINKAGE. Use lubricating graphite on metal ball joints (figure 14). If graphite is not available, use a light non-gumming lubricating oil. Later models have plastic socket type ball joint and does not require lubrication.

E. - AIR CLEANER. See figure 16.

1. Models with "Dry" cartridge type air cleaner. NEVER WASH FOLDED PAPER CARTRIDGE. Each 100 hours or oftener, remove cartridge and shake out dirt. If cleaning with compressed air, hold the cartridge far enough from nozzle to avoid rupture. Replace cartridge each 500 hours or oftener. If cartridge type has foam wrapper, carefully remove and wash wrapper in clean fuel, then dry and reinstall.

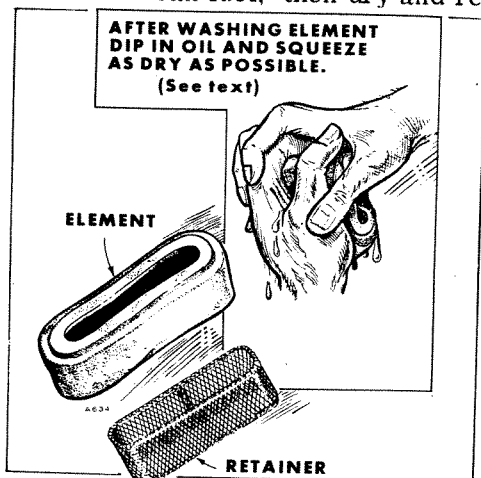


Fig. 16 Air Cleaner Service

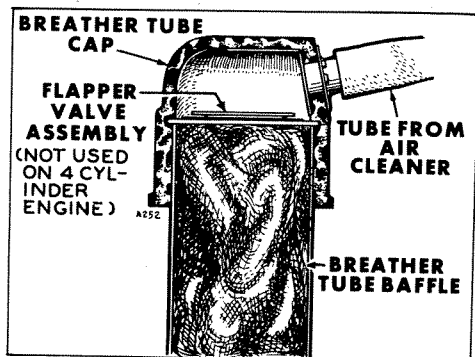


Fig. 17 Breather Valve and Baffle

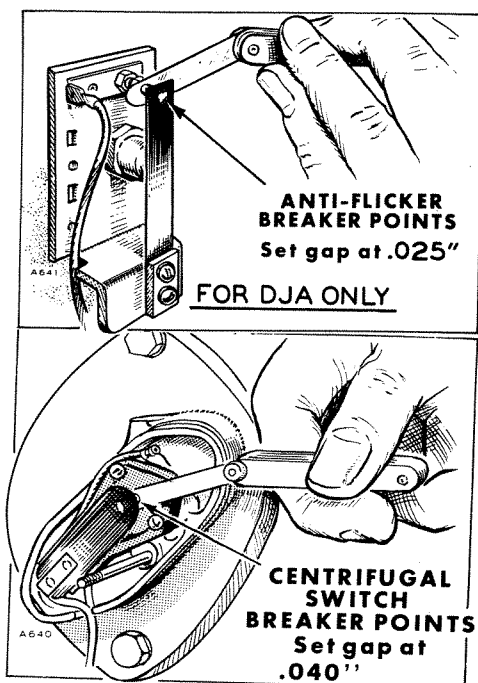


Fig. 18 Breaker Points

2. Models with all foam element type air cleaner. Each 100 hours wash element in fuel (gasoline or diesel). Moisten with clean crankcase grade oil (dip, then squeeze dry).
3. Models with oil bath type air cleaner. Maintain the oil level. When dirty, clean and refill the cup with fresh oil to the level indicated. Use same SAE number of oil as in the crankcase.
4. Models with pre-cleaner and air filter. Empty and clean pre-cleaner daily or as required. The dust level must not exceed the markings on the plastic case. Empty and clean dust cup on the air cleaner daily or as required. The dust level must not exceed 1/2 inch from slot in the dust cup baffle. Clean the air filter every 100 hours or as required. For dry or dusty deposits, clean filter with compressed air. Hold filter far enough from the air pressure nozzle to avoid damaging the filter. For oily or sooty deposits, wash the filter in lukewarm water using a non-sudsing household detergent. Rinse filter thoroughly with clean water and allow to air dry. Do not use heat while drying. Inspect filter after cleaning and drying for thin spots, pin holes, and small tears. Do not use a damaged filter. Replace the filter after 6 cleaning or at least every year.

F. - CRANKCASE OIL. Change oil only when hot. If oil is too cold to flow, move engine to a warm location or apply heat externally. The oil filter is a full-flow type. * - If engine is operating in extremely low temperature for short operating periods using high sulfur content fuel, or in extreme of dust and dirt, change oil every 50-hours instead of 100-hours.

G. - BREATHER VALVE. Lift off rubber breather cap (fig. 17). Carefully pry valve from cap. Otherwise press hard with both of your thumbs on top of cap to release valve from rubber cap. Wash the fabric flapper type check valve in fuel. Dry and reinstall positioning perforated disc toward engine. NOTE: None used on 4-cylinder engine.

Valve must maintain a partial vacuum in crankcase to help control oil. If faulty, install a new valve. If baffle (mesh) in breather tube is clogged, lift out and wash it.

H. - BREAKER POINTS. Refer to Table of Clearances for correct gap distances. Replace burned or faulty points. If only slightly burned, dress smooth with file or fine stone. Measure gap with thickness gage.

- (1) The centrifugal switch (fig. 18) is wide open when engine is stopped. Loosen and move stationary contact to correct the gap.

- (2) One-cylinder non-battery-charging units have breaker points (fig. 18) in the anti-flicker circuit.

The anti-flicker breaker points add a resistor to the generator field circuit only during each power stroke of the 1-cylinder engine. Crank engine to fully open points. Use hand crank or engage socket wrench on flywheel screw to crank the engine.

- J. - BATTERY. Check charge condition. Check electrolyte level. Add approved water to keep the electrolyte to its proper level. In freezing weather, run the plant immediately after adding water. Keep battery connections tight and clean.
- K. - FUEL SYSTEM. Water or foreign material in the fuel can ruin the injection system. If daily inspection shows water or excessive dirt in primary filter bowl, fuel handling and storing facilities should be checked and the situation corrected. Primary fuel filter must be cleaned and secondary fuel filter replaced following correction of fuel contamination problem. After servicing fuel filters, bleed air from system, Fig. 15.
- L. - GENERATOR. Clean slip rings (and commutator on revolving armature type generators) with a dry cloth. If heavily coated or rough, sand smooth with #00 (fine) sandpaper - never use emery or other conductive abrasives. Replace brushes when worn to 1/2 original length. Replace revolving field slip ring brushes when worn to 5/16" or less in length. Replace all other brushes when worn to 5/8" or less in length. Do not disturb the brush rig to install brushes. Use brushes specified in the parts list (never substitute). If sparking occurs, run plant at light load until brushes wear to a good seat.
- M. - OIL FILTER. The oil filter is a full-flow type (all oil is filtered enroute to bearings). A by-pass permits unfiltered oil to reach bearings if filter becomes clogged. Place a drip pan below filter. Unscrew oil filter counterclockwise using both hands or a filter wrench. Clean filter mounting area. Install new filter finger tight, then 1/4 to 1/2 turn additional using a filter wrench. Change oil filter oftener if oil becomes so black and dirty the marking on the level indicator can't be seen through the oil.
- N. - MAJOR ENGINE SERVICE. Adjust valve clearances when cold as given in the Adjustment Section. Flush rocker box cover oil line in fuel and clean small holes using a fine wire (do not enlarge holes). Clean entire generating plant to insure efficient cooling and operation. Perform other services as inspection or operation shows necessary. (A major Service Manual is available. See general information on page 1). All major service, especially fuel injection pump or injectors which require special test equipment, must be done by Onan qualified service agencies.
- O. - RELAY CONTACTS. The 02SX Magneciter (used on DJB Spec A and B) has a voltage build-up relay located inside near the generator air inlet. Carefully wipe the relay contacts with paper to remove any non-conductive film or dirt.

ADJUSTMENTS

GOVERNOR. - The governor is used to control the rated speed and voltage (see nameplate and Data Table I). Engine speed equals current frequency multiplied by 30, on a 4-pole generator. Thus, 1800-rpm gives 60-cycle frequency. Preferred speed does not vary more than 2-cycle from no-load to full-load operation. Be sure throttle, linkage, and governor mechanism operate smoothly.

Speed Adjustment - Change spring tension by holding the governor spring stud and turning the nut to adjust engine speed (fig.19). More spring tension (turning nut clockwise) increases rpm. Turn nut counterclockwise to decrease governed speed. Hold a tachometer against the stud in the axis of the generator. On revolving armature generator, adjust the engine speed to attain proper voltage with load connected and using a voltmeter.

Sensitivity Adjustment - Adjust for minimum speed drop without a hunting condition. If the speed drops too much when full load is applied, unscrew the governor adjusting stud (fig. 19) to use more coils of the spring. Hold the stud and turn the speed nut slightly for more spring tension to compensate for reduced rpm caused by making more coils operative. A too close sensitivity adjustment (approaching no speed drop when load is applied) will result in a hunting condition (continuous change of speed).

Throttle stop screws (DJB, DJC) - Set the maximum stop screw while gradually increasing the load to stop the throttle at smoke point. Set the minimum stop screw to just fully close the throttle (no fuel injected).

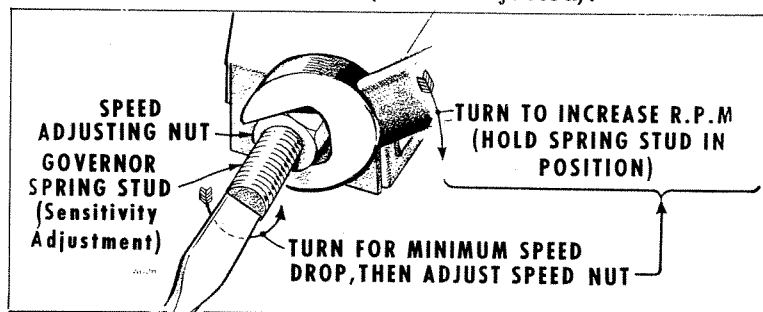


Fig. 19 Governor Adjustments

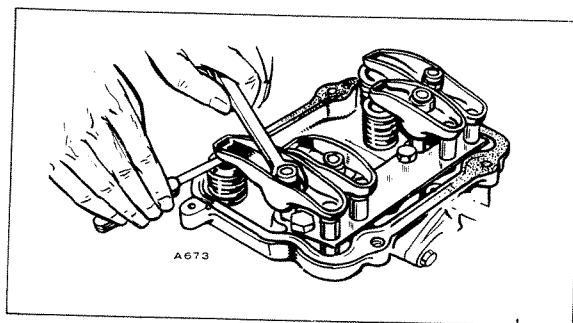


Fig. 20 Valve Adjustment

VALVE CLEARANCE. - Check valve clearance when engine is at room temperature (about 70°F).

Turn flywheel so piston in cylinder to be checked is between 10° and 45° ATC on the power stroke for that cylinder. Adjust the clearance (see fig. 20) to the values specified in the Table of Clearances. Whenever valves are adjusted on DJA models re-adjust the decompression release.

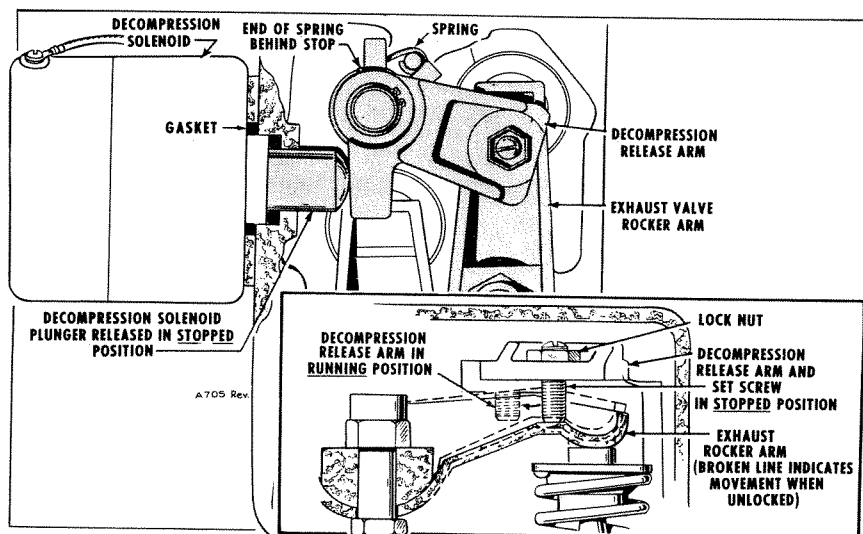


Fig. 21 Decompression Release (DJA)

DECOMPRESSION RELEASE (DJA). -

Before adjusting the decompression release, valves must be set for correct clearance. After checking valve clearance, leave the flywheel at 10° to 45° ATC with piston on power stroke so the exhaust valve will have its maximum clearance when adjusting the decompression release. See figure 21.

Set the arm in the decompression position (tension against release spring). Turn the set screw so the end just touches the exhaust rocker arm. Be sure the decompression release arm is up tight against the lock ring. Then turn the screw exactly one revolution clockwise.

NOTE: If the screw is tightened more than one turn, the exhaust valve could hit the piston.

Hold the set screw and tighten the lock nut $1/4$ to $1/2$ turn past finger tightness.

Release the mechanism to allow compression. Check the clearance between the screw and rocker arm. Take up valve clearance by inserting a feeler gage between the valve and rocker arm. If the set screw does not clear the rocker arm, loosen the lock nut and back off the screw until clearance is obtained.

When assembling the rocker box cover, remove the solenoid and re-mount it when the cover is on the engine.

TORQUE SPECIFICATIONS

	<u>LB. FT.</u>		<u>LB. FT.</u>
Rocker Arm Nut (thd friction)	4-10	Injection Pump Mtg. Screw	
Center Main Bolt (4-cylinder)	97-102	DJA	18-21
Connecting Rod Bolt	27-29	DJB, DJC	15-16
Cylinder Head Bolt	44-46	Oil Base Mtg. (1 cylinder)	32-38
Flywheel Mounting Screw	65-70	Rear Bearing Plate	40-45
Hub to Flywheel Screws (DJC)	17-21	Exhaust Manifold	
Fuel Pump Mounting Screw	15-20	Nuts -	*13-15
Gear Cover Mounting Screw	15-20	Rocker Arm Stud	35-40
Oil Pump Mounting Screw	15-20	Rocker Cover	8-10
Oil Base Mounting Screw (2 and 4 cylinder)	45-50	Intake Manifold (4 cylinder)	13-15
Glow Plug	10-15	Generator Through Stud Nut	
Injection Nozzle Mtg. Screw	20-21	Revolving Armature	30-40
		Revolving Field	55-60

* - Exhaust manifold nuts must be tightened evenly.

KEEP FUEL

Clean!

DIRTY FUEL IS ONE OF THE
MAJOR CAUSES OF PLANT
FAILURE.

REMEMBER-EVEN A TINY PARTICLE
OF DIRT IN THE INJECTION SYSTEM
MAY STOP YOUR PLANT!

TABLE OF CLEARANCES

Engine should be checked and repaired by a trained mechanic. Major generator or control repairs should be made by a competent electrician. Maintain factory limits and clearances as given in the Table of Clearances. Avoid accidental shorts by disconnecting the battery when servicing control parts. Refer to SERVICE DIAGNOSIS Section for aid in locating and correcting troubles.

FOR SERVICE INSTRUCTIONS NOT COVERED IN THIS BOOK, A MAJOR SERVICE MANUAL IS AVAILABLE. (See General Information on Page 1).

NEW PARTS, 70°F.	MINIMUM	MAXIMUM
INTAKE Valve Clearance (cold) -		
For DJA .....	.011"	
For DJB (Prior to Spec D - .004") .....	.009"	
For DJC .....	.009"	
EXHAUST Valve Clearance (cold) -		
For DJA .....	.008"	
For DJB (Prior to Spec D - .004") .....	.007"	
For DJC .....	.007"	
Valve Stem to Guide (intake) .....	.001"	.003"
Valve Stem to Guide (exhaust) .....	.0025"	.0045"
Intake Valve Face Angle	42°	
Exhaust Valve Face Angle	45°	
Valve Seat Angle	45°	
Valve Seat Width	3/64"	1/16"
Valve Spring Tension (valve open)	83 lbs.	93 lbs.
Valve Spring Tension (valve closed)	45 lbs.	49 lbs.
Crankshaft Main Bearing Journal (std. size)		
For DJA (1 cylinder) and DJB 2 cylinder)	2.2440"	2.2445"
For DJC (4 cylinder)	2.2430"	2.2435"
Crankshaft Main Bearings -		
For DJA (1 cylinder) and DJB (2 cylinder) .....	.002"	.003"
For DJC (4 cylinder) .....	.003"	.004"
Crankshaft Rod Bearing Journal (std. size)	2.0600"	2.0605"
Connecting Rod Bearing .....	.001"	.003"
Crankshaft End Play .....	.010"	.015"
Camshaft End Play (crankshaft fully back) .....	.007"	.039"
Camshaft Bearing .....	.0015"	.0030"
Cylinder Bore	3.2495"	3.2505"
Piston to Cylinder:		
Vanasil Piston (90° to pin, immediately below oil ring groove) .....	.0050"	.0070"
Piston Pin in Piston		
Piston Pin in Rod .....	.0002"	.0007"
Piston Ring Gap .....	.010"	.020"
Injection Timing - PC (Port Closing) - DJA	17° BTC	
Injection Timing - PC (Port Closing) - DJB, DJC	21° BTC	
Anti-Flicker Breaker Point Gap .....	.025"	
Start-Disconnect Centrifugal Switch (diesel) .....	.040"	
Firing Order (4 cylinder)	1-2-4-3	
Tappet Diameter (standard) .....	.7475"	.7480"
Tappet Hole Diameter .....	.7505"	.7515"

Thumb Push Fit

TROUBLE	POSSIBLE CAUSE	REMEDY
ENGINE WILL NOT CRANK	<p>Battery discharged.</p> <p>Loose connections</p> <p>Defective starting circuit</p> <p>Defective starting motor on revolving field generator plants</p> <p>Defective switch</p> <p>Poor generator brush contact on revolving armature generator</p>	<p>Recharge.</p> <p>Tighten connections</p> <p>Repair or replace as necessary</p> <p>Repair or replace as necessary</p> <p>Replace</p> <p>Replace brush. Refinish surface</p>
ENGINE CRANKS TOO STIFFLY	<p>Too heavy oil in crankcase</p> <p>Engine seized</p> <p>Load connected</p> <p>Decompression release (on 1 cylinder diesel) at running position</p>	<p>Drain, refill with light oil</p> <p>Dis-assemble and repair</p> <p>Disconnect</p> <p>Place at start position</p>
ENGINE WILL NOT START WHEN CRANKED	<p>Air in fuel system</p> <p>Lack of fuel or faulty injection caused by dirty fuel</p> <p>Clogged fuel filter</p> <p>Poor compression</p> <p>Wrong timing</p> <p>Defective glow plugs or leads</p>	<p>Bleed the fuel system</p> <p>Refill the tank. Check the fuel system. Clean, adjust, or replace parts necessary</p> <p>Clean strainer (primary) Install new cartridge (secondary)</p> <p>Tighten cylinder head. Replace head gasket. If still not corrected, grind the valves. Replace piston rings, if necessary.</p> <p>Check injection pump timing</p> <p>Repair or replace</p>
ENGINE STOPS WHEN START SWITCH IS RELEASED	<p>Centrifugal switch remained open (units with revolving field generator)</p>	<p>Clean and adjust</p>
ENGINE RUNS BUT VOLTAGE DOES NOT BUILD UP	<p>Poor brush contact</p> <p>Open circuit, short circuit, or ground in generator</p> <p>Residual magnetism lost</p>	<p>See that brushes seat well, are free in their holders, are not worn too short, and have good spring tension.</p> <p>Replace parts necessary</p> <p>Consult your dealer</p>

SERVICE DIAGNOSIS

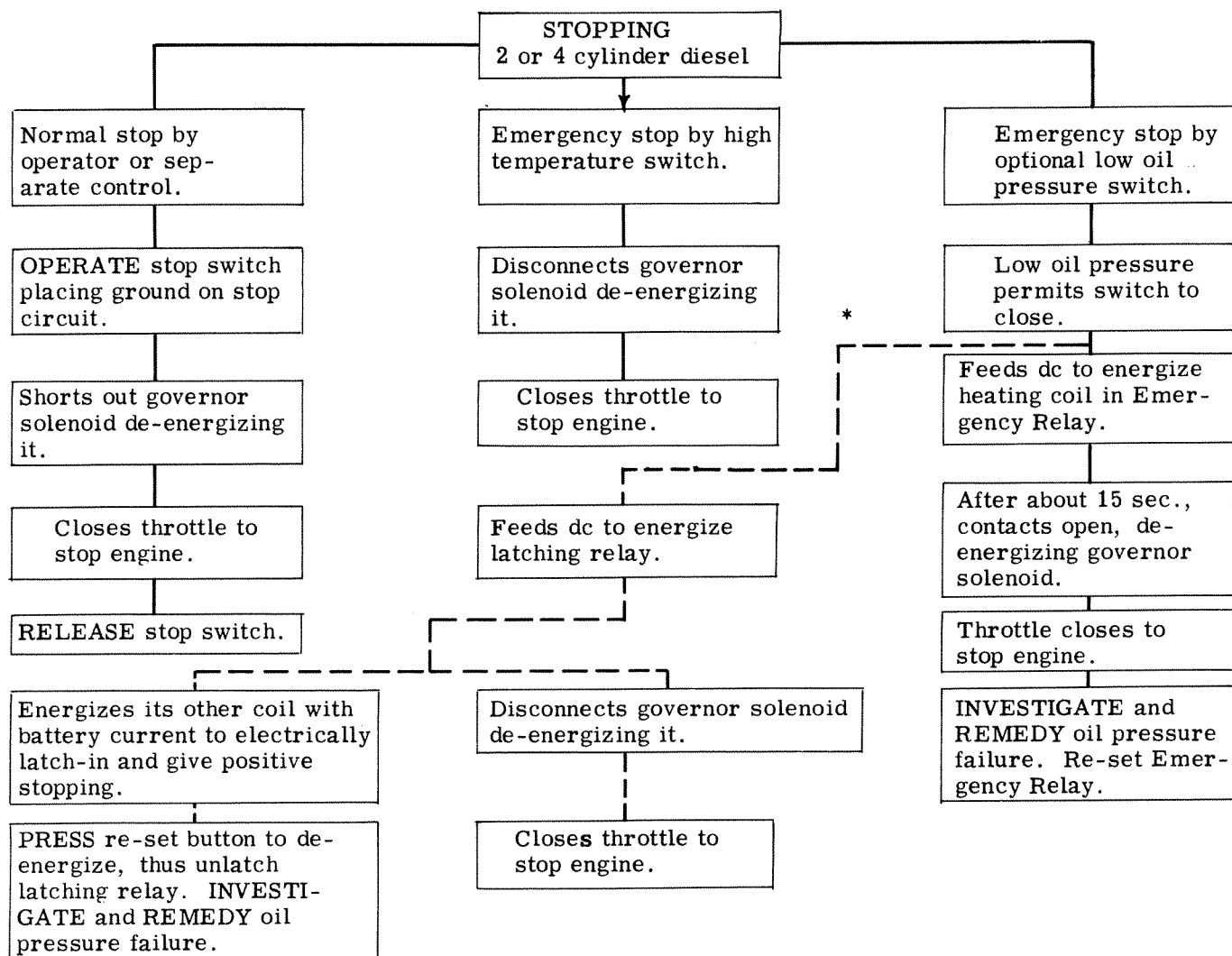
TROUBLE	POSSIBLE CAUSE	REMEDY
ENGINE RUNS BUT VOLTAGE DOES NOT BUILD UP (Cont.)	Faulty Magneciter.	Trouble-shoot Magneciter
EXCESSIVE OIL CONSUMPTION, LIGHT BLUE SMOKY EXHAUST	Poor compression; worn piston, rings or cylinder. Rings not seated on new engine Oil leaks from oil base or connections. This does not cause smoky exhaust. Oil too light or diluted Worn engine Worn intake valve guide or valve stem Engine misfiring Too much oil Intake valve stem-to-guide oil seal leaking	Refinish cylinder. Install oversize piston and rings Break-in time necessary Replace gaskets. Tighten screws and connection. Check breather valve. Drain, refill with correct oil Repair as necessary Replace Refer to symptoms of engine misfiring Drain excess oil Reposition over guide. Install new if faulty.
BLACK, SMOKY EXHAUST, EXCESSIVE FUEL CONSUMPTION, POSSIBLE LOW POWER UNDER HEAVY LOAD	Generator overloaded. Black smoky exhaust normal condition with overload Poor compression Poor grade or dirty fuel Injection pump or nozzle not operating properly Faulty injection timing. Dirty air cleaner	Reduce load to within rated capacity. If smoky condition continues, stop unit and investigate Tighten cylinder head, grind or replace valves, replace piston rings as needed. Use only, clean, recommended fuel. Clean nozzle. If necessary, install new nozzle or injection pump. Check injection pump timing Clean
ENGINE STOPS UNEXPECTEDLY	Fuel tank empty Transfer Pump failure Safety switch operated (where used)	Refill Repair or replace Correct the overheating or the lubrication failure. Press reset switch
DULL METALLIC THUD. IF NOT BAD, MAY DISAPPEAR AFTER FEW MINUTES OPERATION. IF BAD, INCREASES WITH LOAD	Loose crankshaft bearing	Replace unless one of the next two remedies permanently corrects the trouble.

TROUBLE	POSSIBLE CAUSE	REMEDY
SHARP METALLIC THUD, ESPECIALLY WHEN COLD ENGINE FIRST STARTED	Low oil supply Oil badly diluted	Add oil Change oil
TAPPING SOUND	Valve clearance too great Broken valve spring	Adjust. Replace faulty valve system Install new spring
HOLLOW CLICKING SOUND WITH COOL ENGINE UNDER LOAD	Loose piston	If noise only slight and dis- appears when engine warms up, no immediate attention needed. Otherwise replace worn parts
LIGHT POUNDING KNOCK (KNOCK FROM FIRING OF FUEL IS NORMAL)	Loose connecting rod bearing Low oil supply Oil badly diluted	Adjust or replace Add oil Change oil. Investigate cause.
ENGINE RACES	Too much fuel injected. STOP UNIT AT ONCE!	Check governor performance and linkage condition
ENGINE MISFIRES	Faulty injection Low compression	Clean fuel system. Use clean recommended fuel Tighten cylinder head. Ser- vice valves and piston rings as needed
LOW OIL PRESSURE	Defective gage Oil too light or diluted from leaking fuel pump diaphragm Oil too low Oil relief valve not seating Badly worn bearings Sludge on oil cup screen Badly worn oil pump	Replace Drain. Refill with proper oil. Repair or replace trans- fer pump Add oil Clean. Replace if needed Replace Clean screen and oil sump Replace
HIGH OIL PRESSURE	Defective gage Oil too thick Clogged oil passages Oil relief valve stuck	Replace Drain. Refill Clean all lines and passages Clean by-pass. Replace if needed
ENGINE OVERHEATING	Poor coolant circulation Improper lubrication Improper ventilation	Maintain supply See Low Oil Pressure Provide for better air change

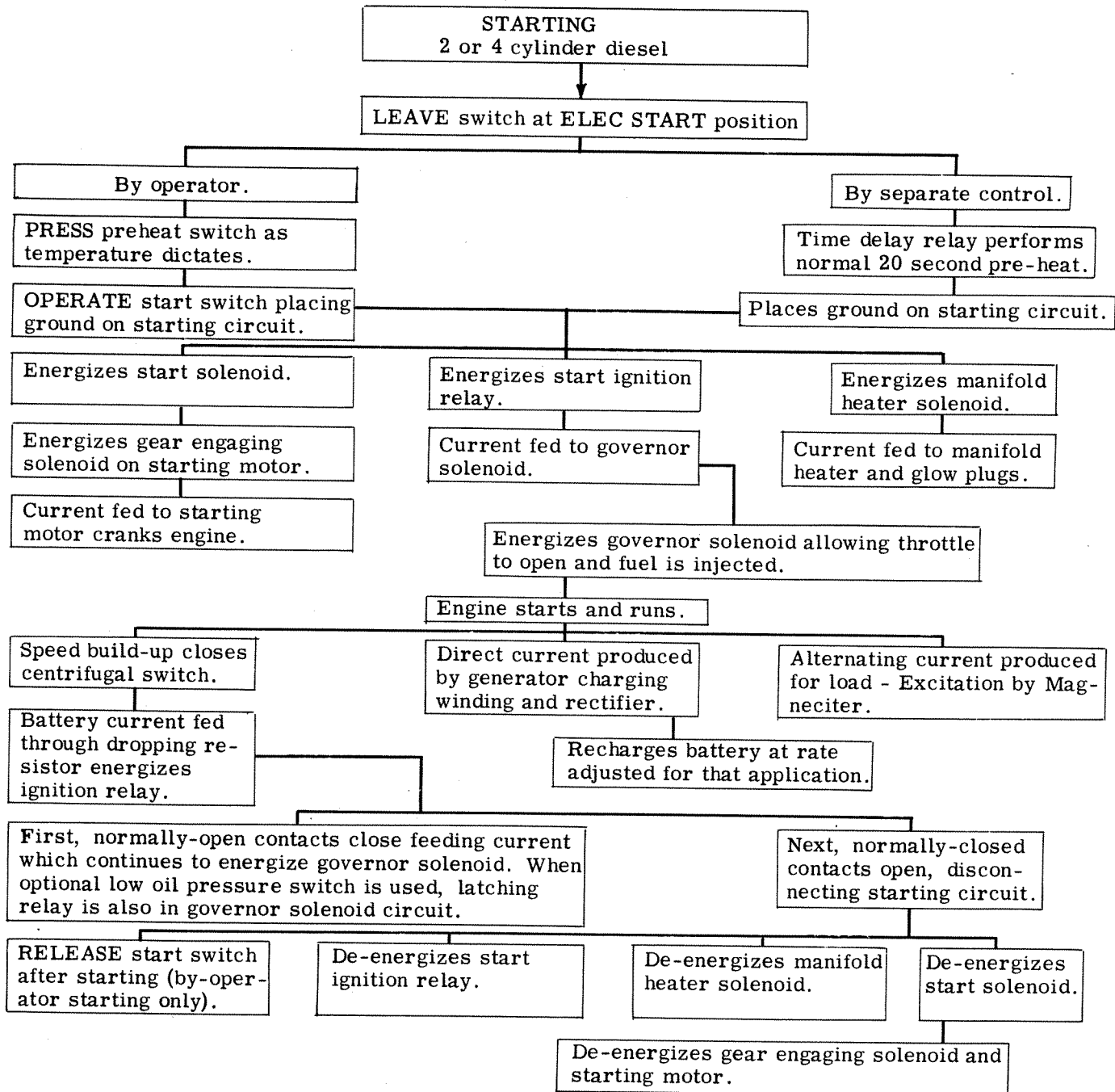
TROUBLE	POSSIBLE CAUSE	REMEDY
ENGINE OVERHEATING (Cont.)	Wrong injection timing Generator overloaded	Retime Reduce load
VOLTAGE LOW AT FAR END OF LINE BUT NORMAL NEAR POWER PLANT	Too small line wire for load and distance	Install larger or extra wires or reduce load
ELECTRIC MOTOR RUNS TOO SLOWLY AND OVER- HEATS AT FAR END OF LINE BUT OK IF USED NEAR POWER UNIT	Too small line wire for load and distance	Install larger or extra wires or reduce load
VOLTAGE UNSTEADY BUT ENGINE NOT MISFIRING	Speed too low Poor brush contact (or poor commutation on revolving armature models). Loose connections Fluctuating load	Adjust governor to correct speed See that brushes seat well on commutator, are free in their holders, are not worn too short, and have good spring tension Tighten connections Correct any abnormal load condition causing trouble
NOISY AND EXCESSIVE ARCING OF BRUSHES (REVOLVING ARMATURE MODEL)	Rough commutator Dirty commutator. Brushes not seating properly Open circuit in armature Brush rig out of position	Turn down. Undercut mica between bars Clean Sand to a good seat Replace Line up properly
GENERATOR OVERHEATING (Approximately 160°F. higher than ambient)	Brush rig out of position (Revolving Armature Gen- erator) Overloaded	Adjust Reduce load
VOLTAGE DROPS UNDER HEAVY LOAD	Engine lacks power Poor compression Faulty injection Dirty air cleaner Restricted exhaust line	See remedies for engine misfires Tighten cylinder head and glow plug. If still not cor- rected, grind the valves. Replace piston rings, if necessary. Check the fuel system. Clean, adjust or replace parts neces- sary Clean Clean or increase the size

CONTROL FUNCTIONS

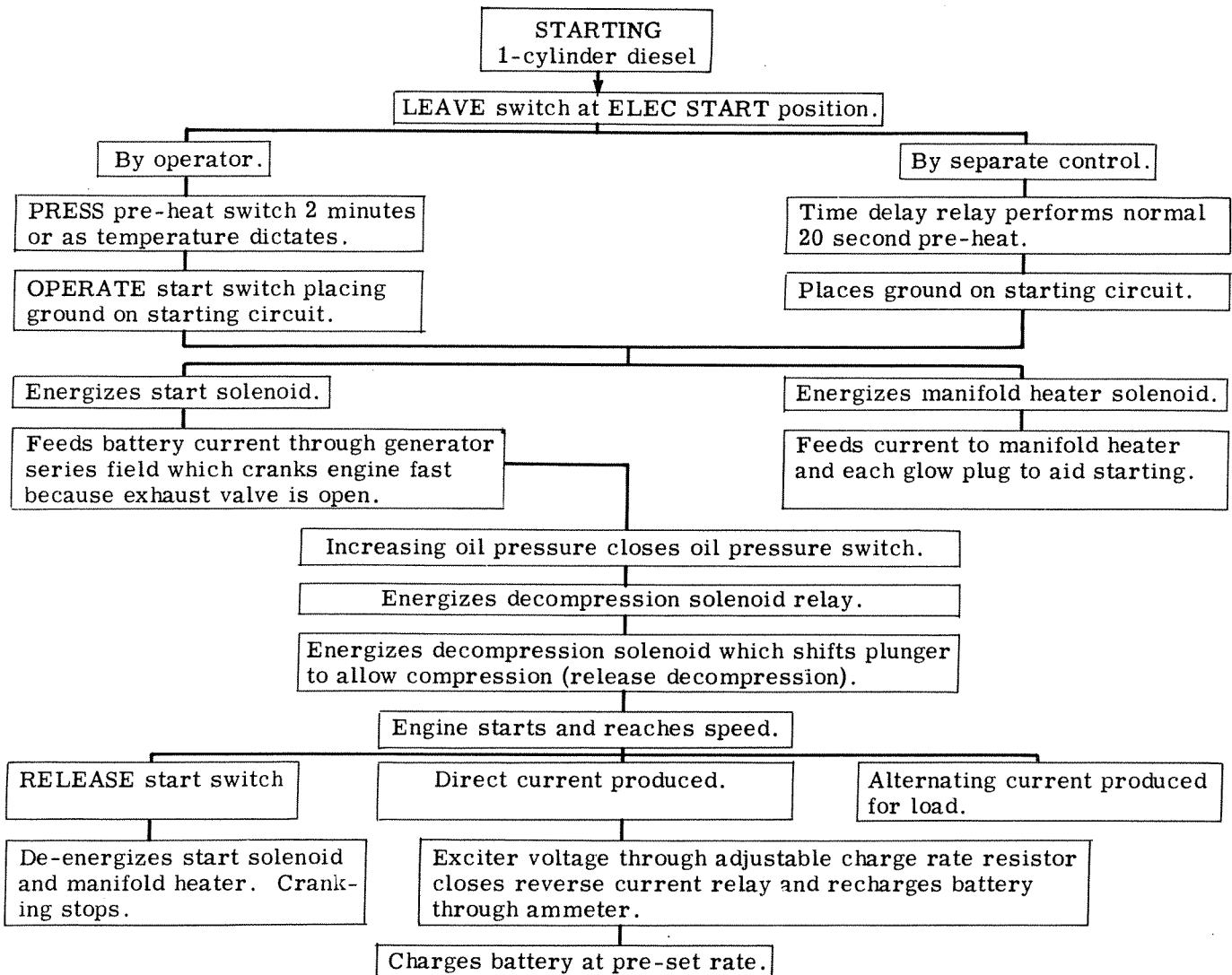
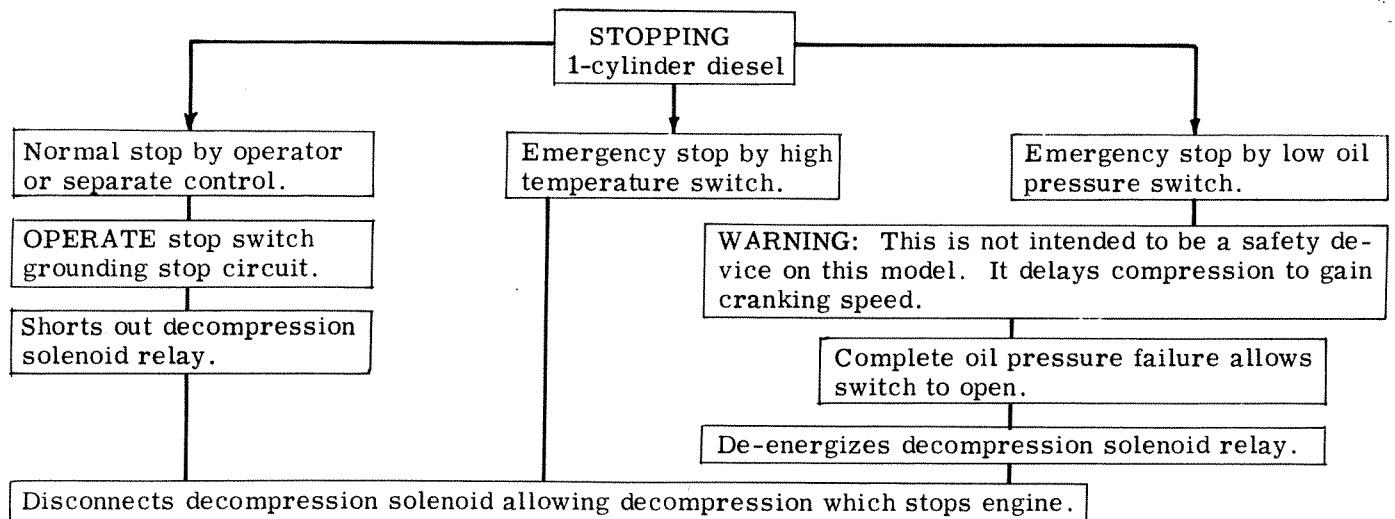
This sequence of control actions aid in locating and correcting troubles that might occur. Trace the circuits on the wiring diagram while reading. For safety, have the battery disconnected while servicing controls.



* - Use broken lines for DJB prior to Spec F.



3. UNLESS OTHERWISE NOTED, ALL COMPONENTS ARE SHOWN IN THE DE-ENERGIZED POSITION.



TYPICAL WIRING DIAGRAMS

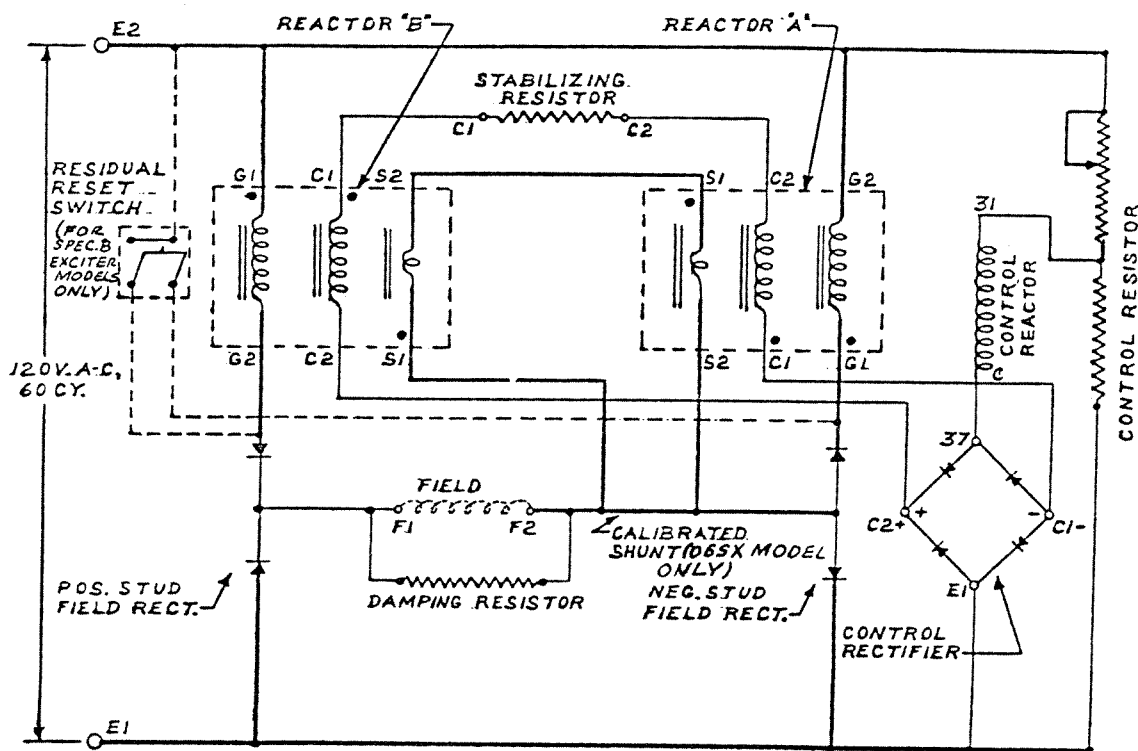
The wiring diagrams on the following pages are typical and apply to standard models. If you need a wiring diagram for your particular model and the diagrams shown here are not sufficient, request a wiring diagram from the factory. Be sure to give the generator's Model, Spec No. and Serial No. from the nameplate.

On revolving field plants, select the generator wiring diagram according to the model, phase and number of output wires. Select the Magneciter wiring diagram from the Magneciter model number on the plant nameplate.

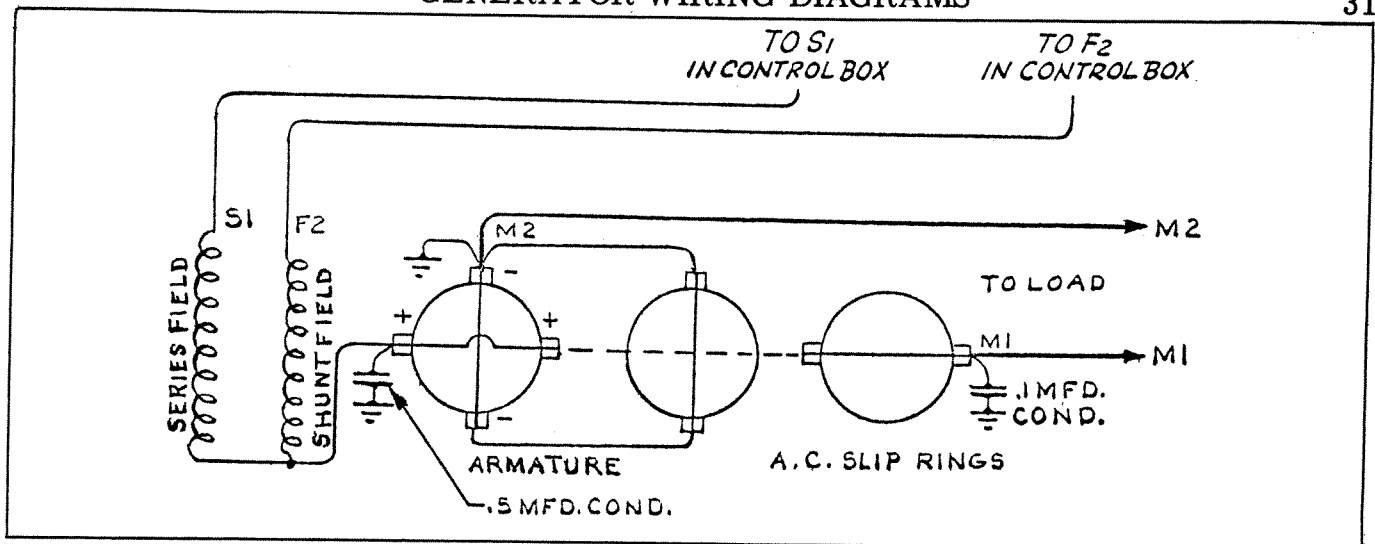
For revolving armature plants DJA, select the generator wiring diagram with proper number of wires and phase.

Select the proper control wiring diagram depending on the model and voltage or type of plant.

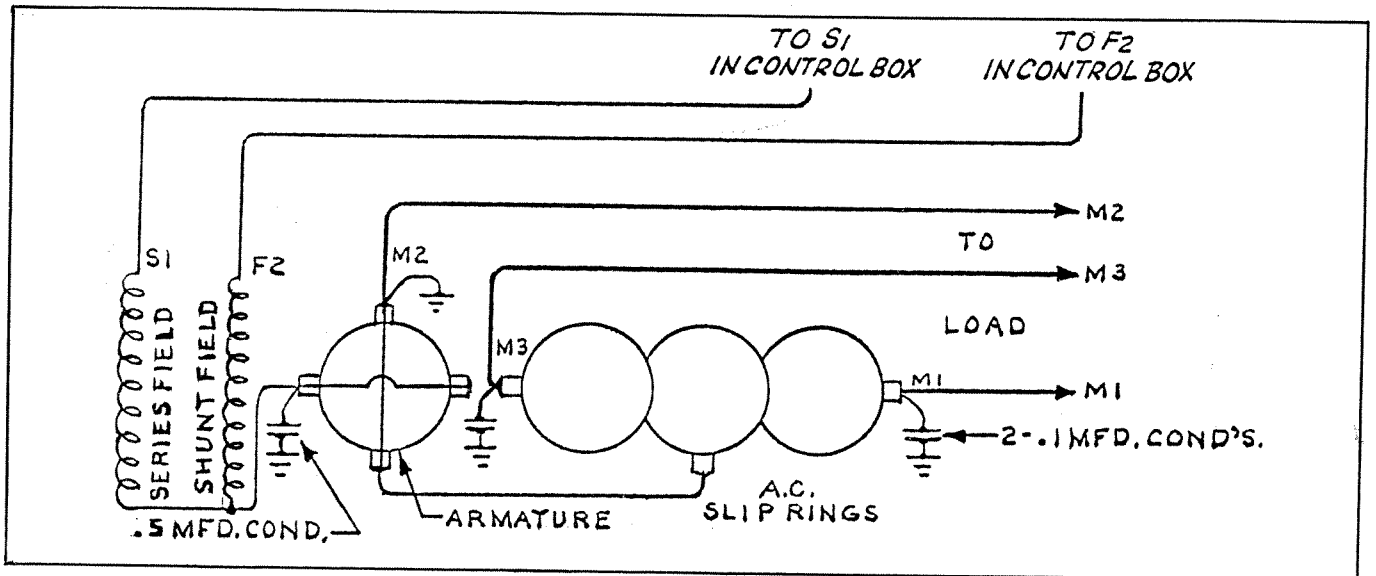
MAGNECITER SCHEMATIC WIRING DIAGRAM



04SX, 06SX
Exciter Specs A and B

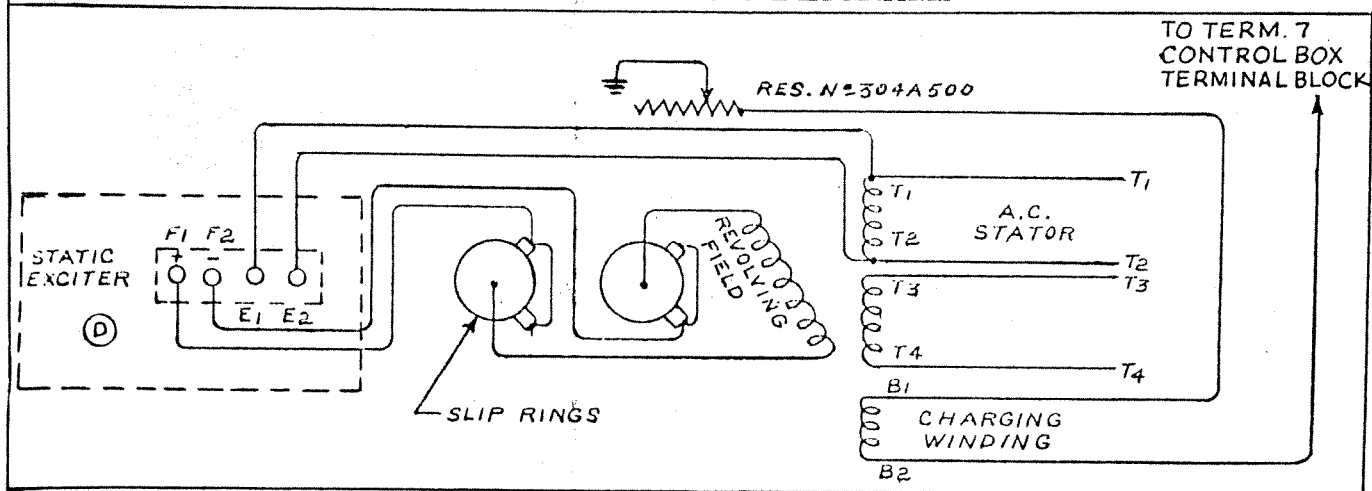


DJA Revolving Armature 2-Wire, Single Phase

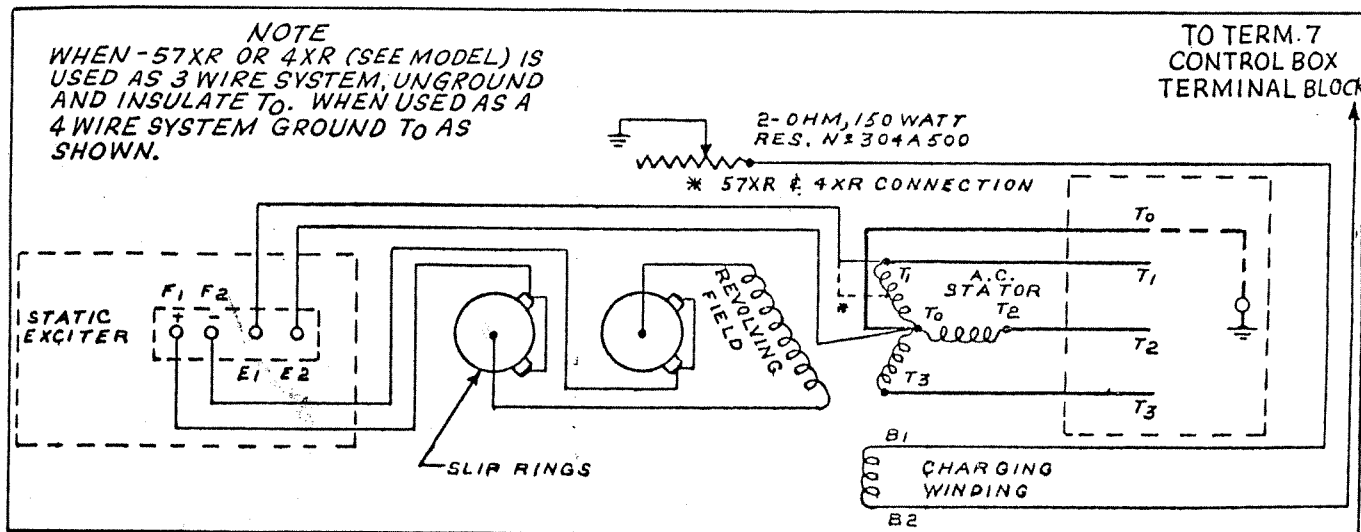
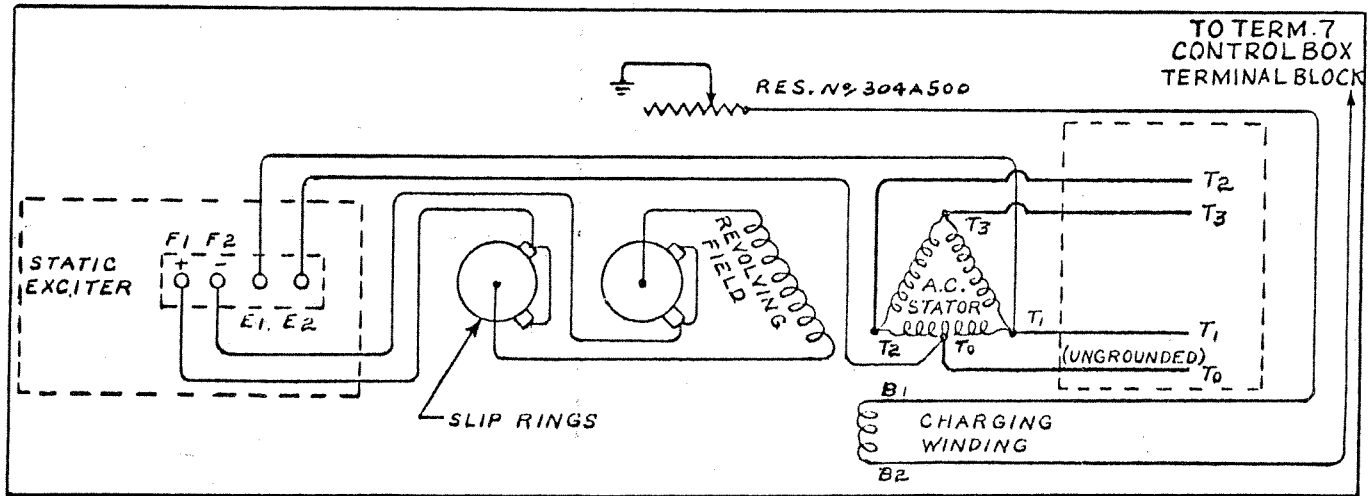


DJA Revolving Armature 3-Wire, Single Phase

GENERATOR WIRING DIAGRAMS



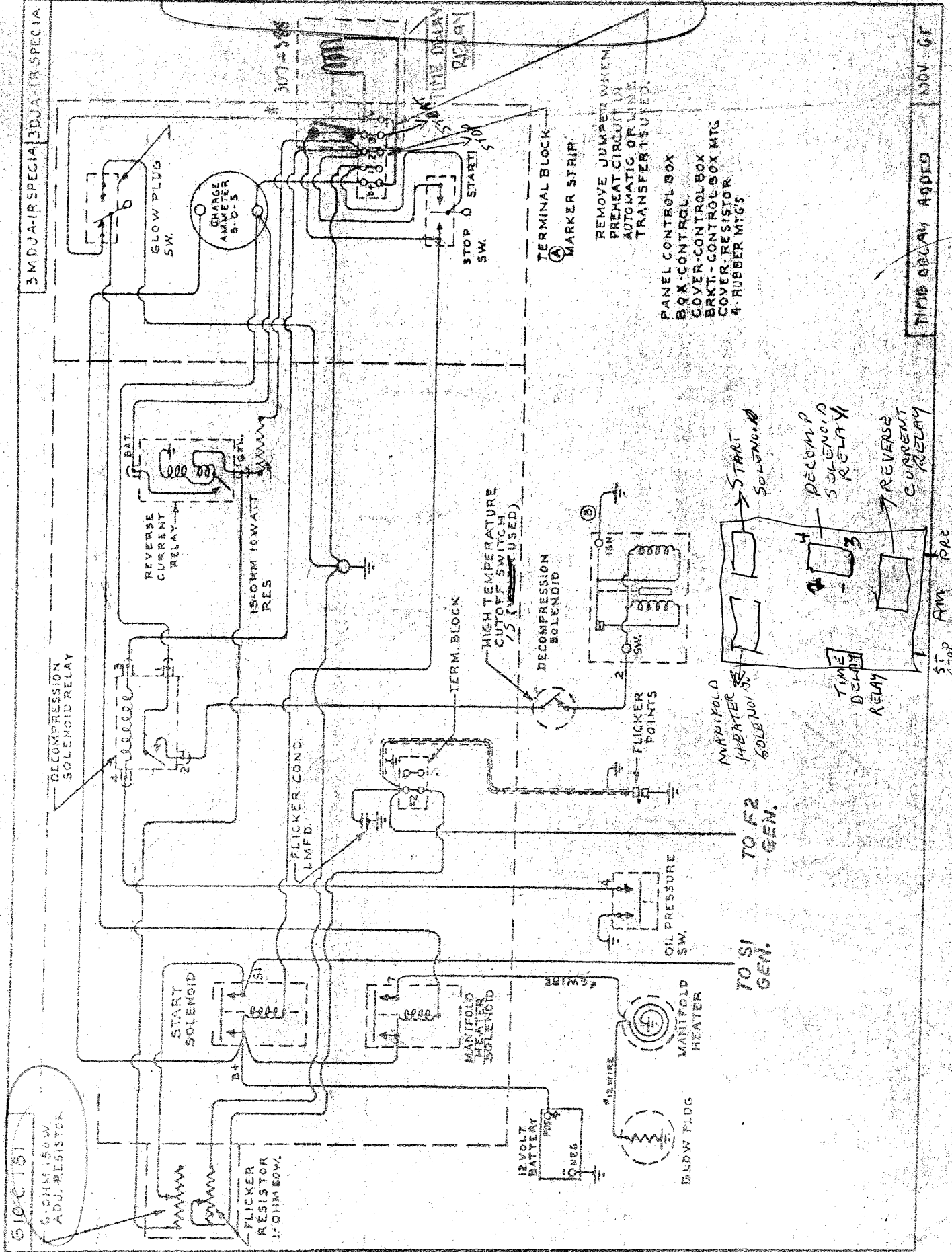
Revolving Field (3R) Reconnectable for 120, 240 or 120-240 Volt, Single Phase

Revolving Field, Wye Wound, 4-Wire, 3-Phase
-4R (120-208 Volt), -4XR (277-480 Volt), 7R (220-380 Volt)

Revolving Field (5DR) 120-240 Volts, Delta Wound, 4-wire, 3 Phase

DJA CONTROL WIRING DIAGRAM

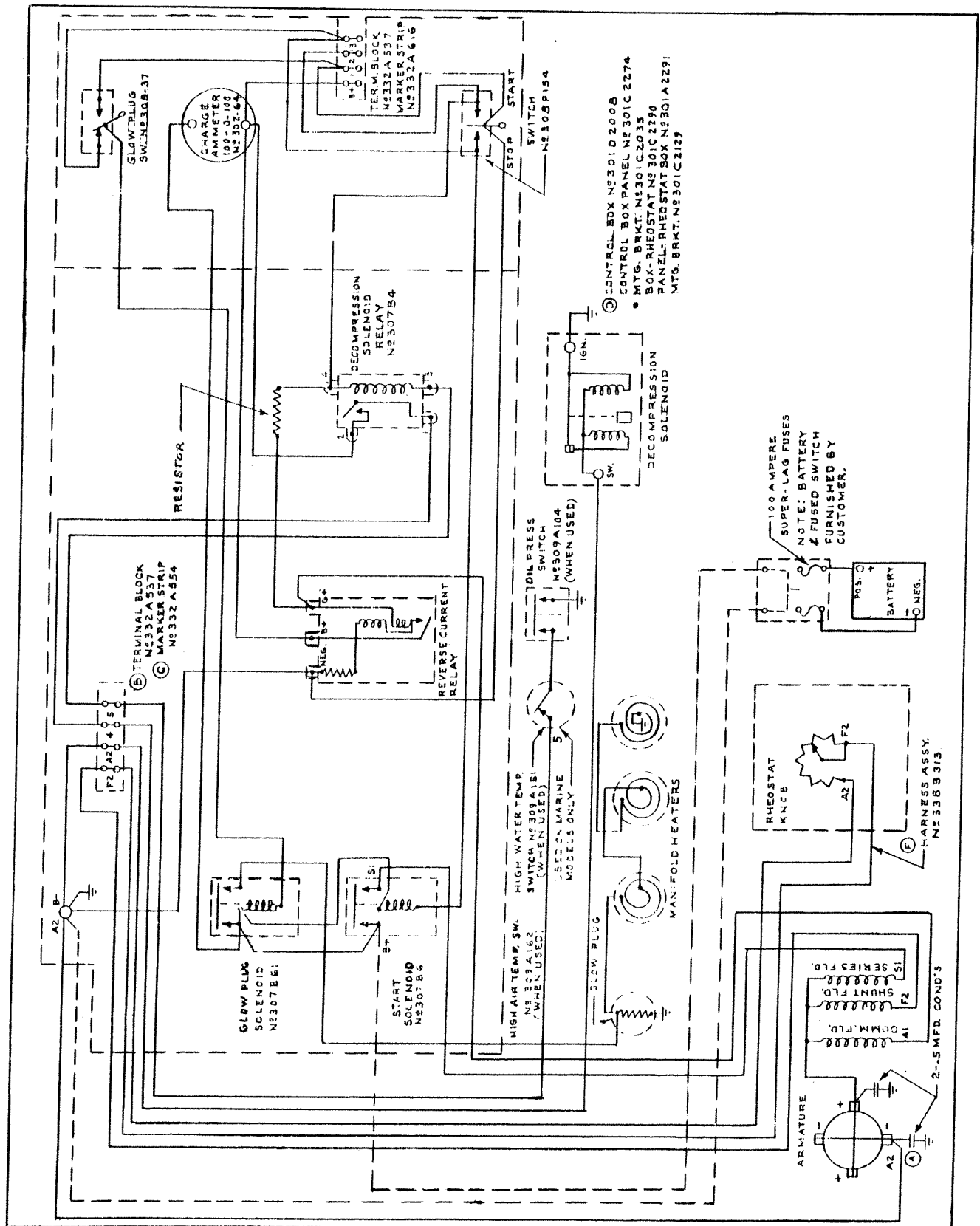
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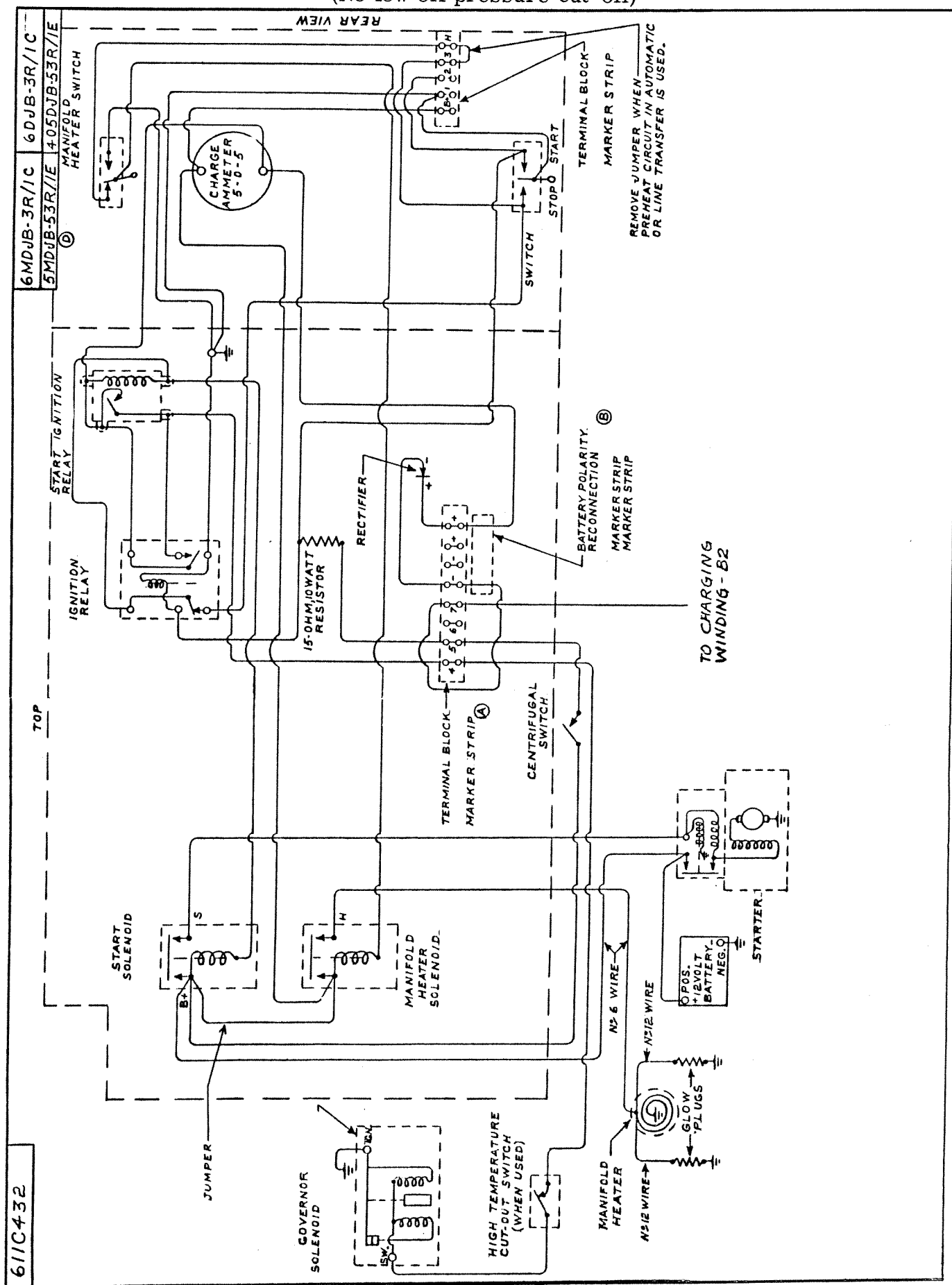
TIME DELAY ADDED

NOV 67

DJA WIRING DIAGRAM 24-VOLT AND 32-VOLT BATTERY CHARGER

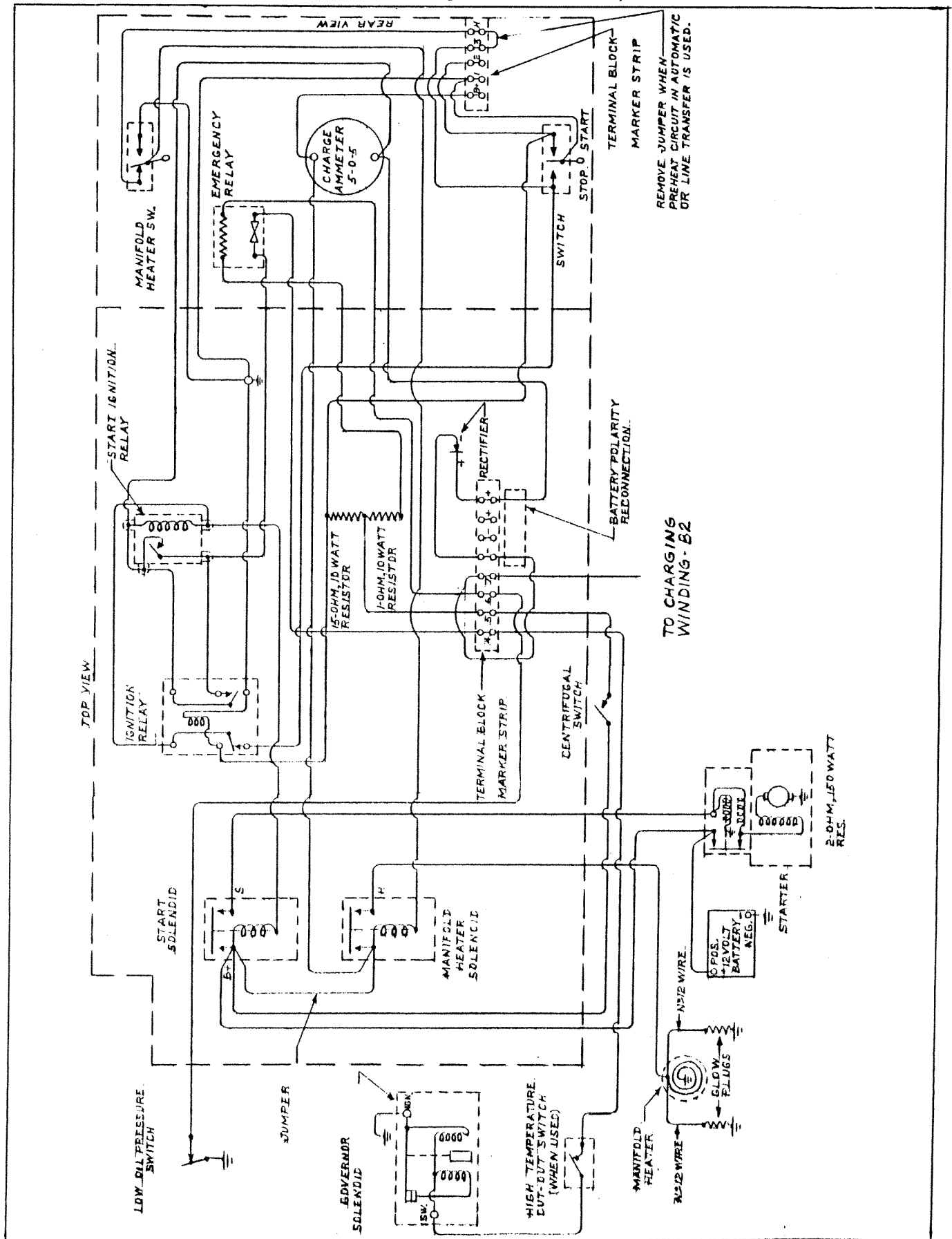


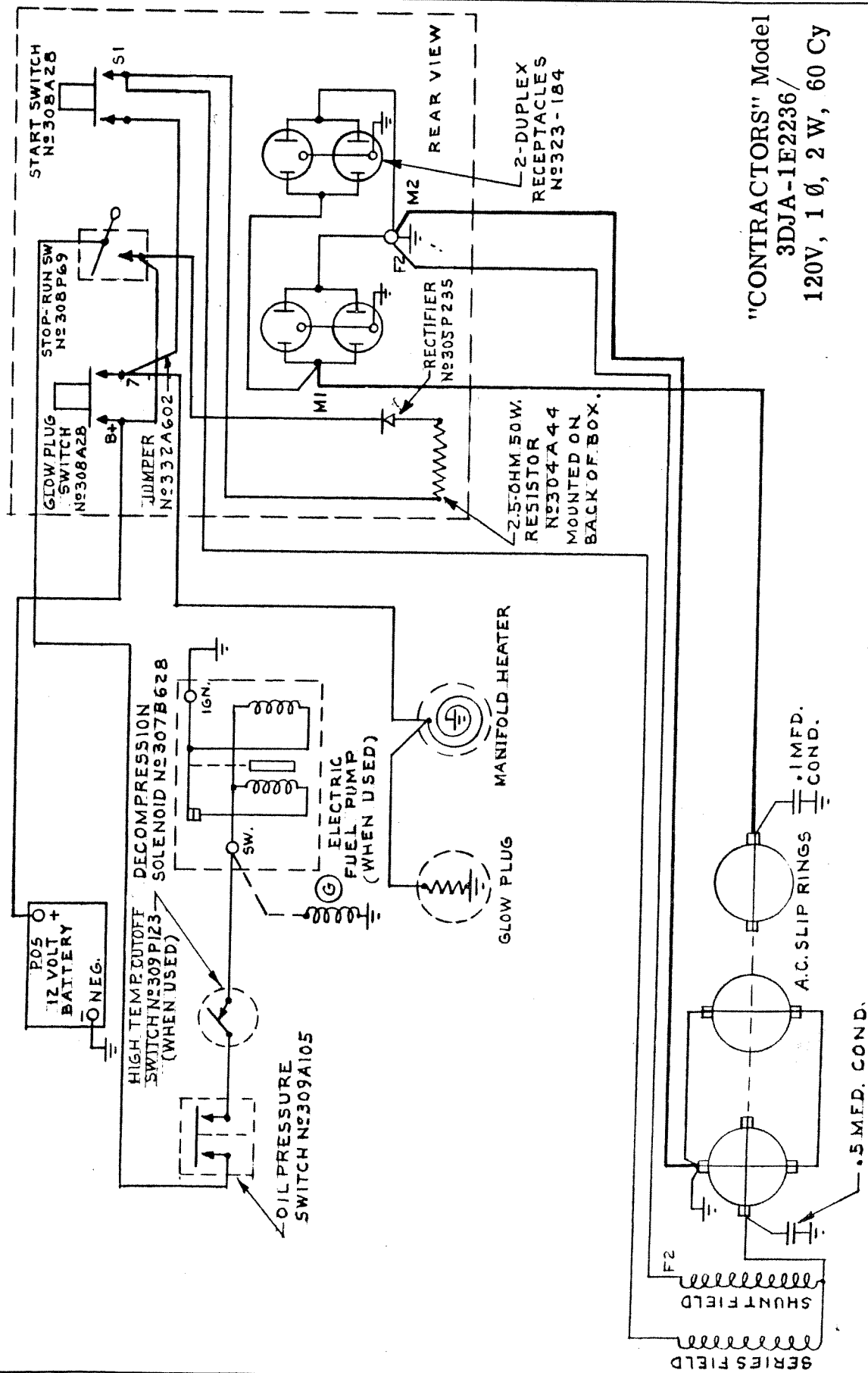
DJB, DJC WIRING DIAGRAM (No low oil pressure cut-off)



DJB, DJC CONTROL WIRING DIAGRAM (Except DJB prior to Spec F)
(With low oil pressure cut-off)

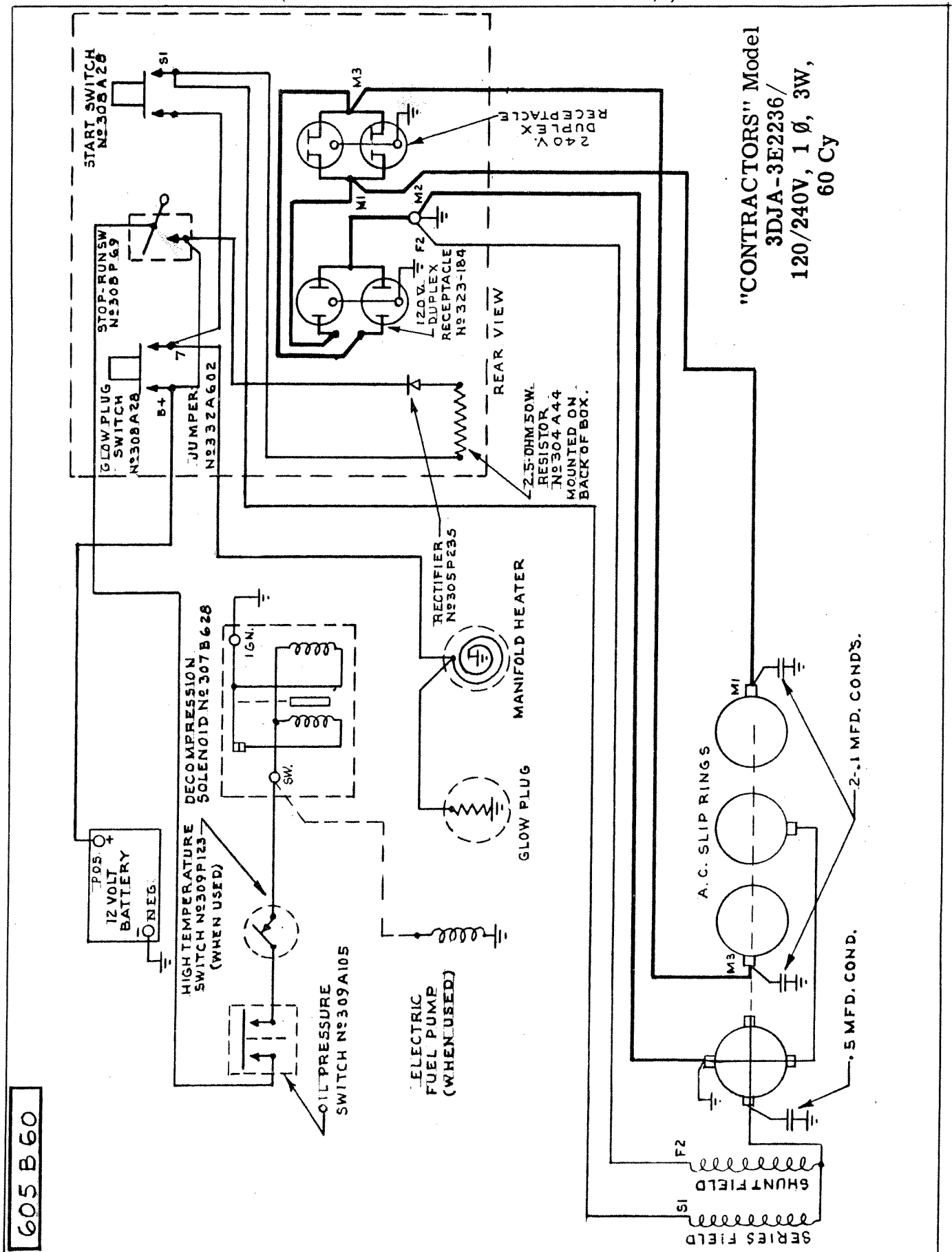
37

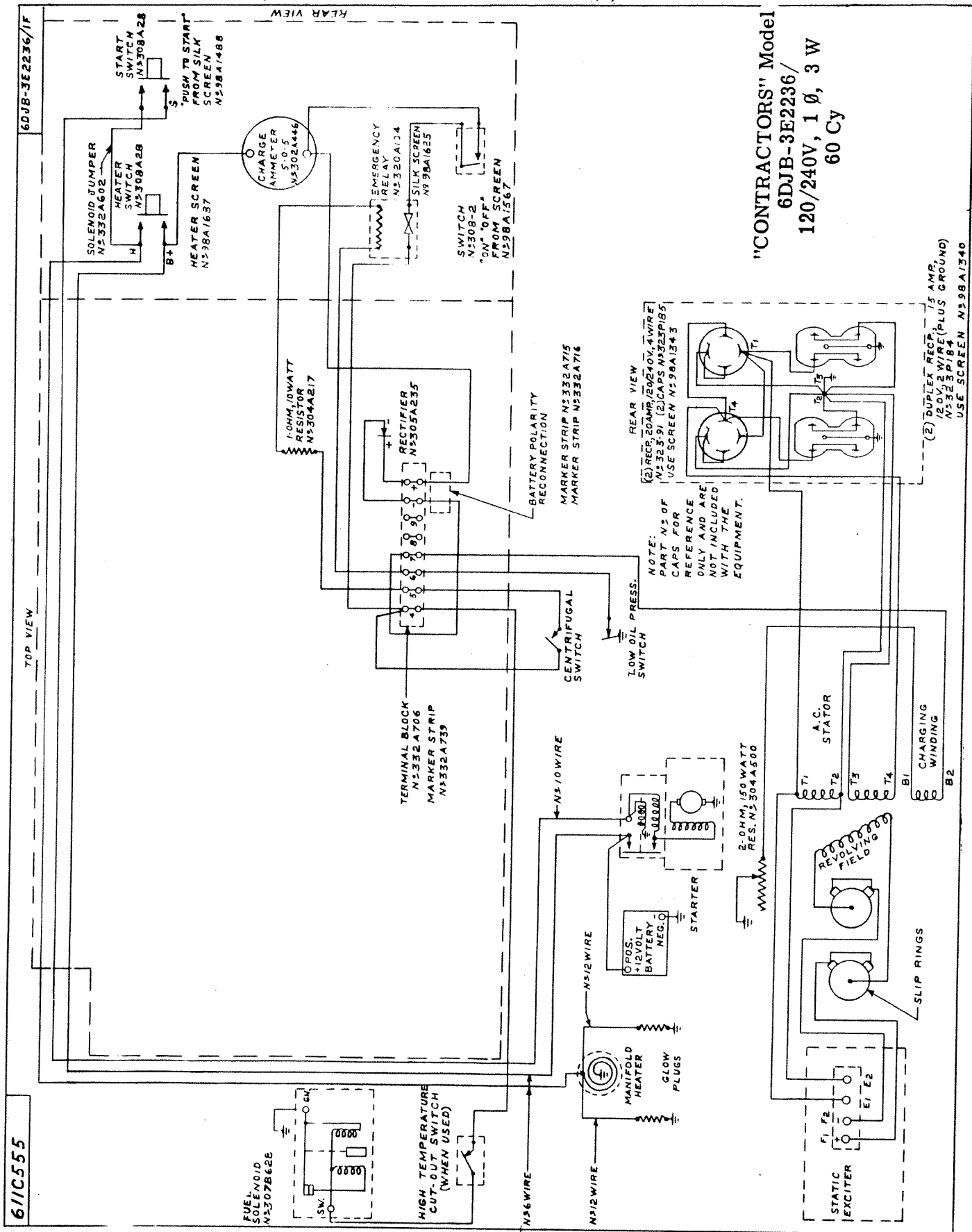




DJA WIRING DIAGRAM (Contractors Model 3DJA-3E2236/)

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PARTS CATALOG

41

This parts catalog applies to the standard DJ SERIES Generating Plants as listed in the Plant Data Table.

Parts are arranged in groups of related items. Each illustrated part is identified by a reference number corresponding to the same reference number in the Parts List for the group. Parts illustrations represent typical items and do not necessarily portray a particular part number.

Compare your plant nameplate MODEL and SPEC NO. with the Plant Data Table. Select the Parts Key No. (1, 2, etc. in the last column) that applies to your plant Model and Spec No. This Parts Key No. appears in the description of parts that differ between models. Unless otherwise mentioned in the parts description, parts are interchangeable between the various models on which they are used as indicated by the Quantity Used Columns.

Many parts are interchangeable between the 1 cylinder, 2 cylinder and 4 cylinder plants. The quantity used per engine varies, therefore the Quantity Used Column is sub-divided. Use Column A for quantity used on 1 cylinder models, Column B for quantity used on 2 cylinder models and Column C for quantity used on 4 cylinder models.

Right and left sides of the plant are determined by FACING the engine end (front) of the complete plant.

Plant Data Table

MODEL & SPEC	NO. CYL.	ELECTRICAL DATA					QTY. COL.	PARTS KEY NO.
		WATTS	VOLTS	CYCLE	WIRE	PHASE		
205DJA-51R/*	1	2500	120	50	2	1	A	1
205DJA-52R/*	1	2500	240	50	2	1	A	1
205DJA-53R/*	1	2500	120/240	50	3	1	A	1
3DJA-1R/*	1	3000	120	60	2	1	A	1
3DJA-2R/*	1	3000	240	60	2	1	A	1
3DJA-3R/*	1	3000	120/240	60	3	1	A	1
205DJA-51R4/*	1	2500	{ 120AC 32DC	50	2	1	A	2
3DJA-1R4/*	1	3000		60	2	1	A	2
205DJA-224R/*	1	2500	24DC	DC			A	4
3DJA-232R/*	1	3000	32DC	DC			A	5
405DJB-53R/*	2	4500	120/240	50	★	1	B	6
405DJB-54R/*	2	4500	120/208	50	4	3	B	6
405DJB-54XR/*	2	4500	277/480	50	4	3	B	6
405DJB-55DR/* §	2	4500	120/240	50	4	3	B	6
405DJB-57R/*	2	4500	220/380	50	4	3	B	6
405DJB-59R/*	2	4500	600	50	3	3	B	6
6DJB-3R/*	2	6000	120/240	60	★	1	B	6
6DJB-4R/*	2	6000	120/208	60	4	3	B	6
6DJB-4XR/*	2	6000	277/480	60	4	3	B	6
6DJB-5DR/*	2	6000	120/240	60	4	3	B	6
6DJB-7R/*	2	6000	220/380	60	4	3	B	6
6DJB-9R/*	2	6000	600	60	3	3	B	6
9DJC-53R/*	4	9000	120/240	50	★	1	C	7
9DJC-54R/*	4	9000	120/208	50	4	3	C	7
9DJC-54XR/*	4	9000	277/480	50	4	3	C	7
9DJC-55DR/*	4	9000	120/240	50	4	3	C	7
9DJC-57R/*	4	9000	220/380	50	4	3	C	7
9DJC-59R/*	4	9000	600	50	3	3	C	7
12DJC-3R/*	4	12000	120/240	60	★	1	C	7
12DJC-4R/*	4	12000	120/208	60	4	3	C	7
12DJC-4XR/*	4	12000	277/480	60	4	3	C	7
12DJC-5DR/*	4	12000	120/240	60	4	3	C	7
12DJC-7R/*	4	12000	220/380	60	4	3	C	7
12DJC-9R/*	4	12000	600	60	3	3	C	7
3DJA-1E2236/*	1	Contractor Models - SEE SPECIAL PARTS LIST Following Standard Parts List on page 71.						
3DJA-3E2236/*	1							
6DJB-3E2236/*	2							

* - The Specification Letter advances (A to B, B to C, etc.) with manufacturing changes. A Spec Number, other than 1, designates customer option(s).

★ - These generators have 4 load wires which are reconnectable for 120-volt 2-wire service, or 240-volt 2-wire service, or 120/240-volt 3-wire service.

INSTRUCTIONS FOR ORDERING REPAIR PARTS

FOR PARTS OR SERVICE, CONTACT THE DEALER FROM WHOM
YOU PURCHASED THIS EQUIPMENT OR REFER TO YOUR NEAR-
EST AUTHORIZED SERVICE STATION.

TO AVOID ERRORS OR DELAY IN FILLING YOUR PARTS ORDER, PLEASE
FURNISH ALL INFORMATION REQUESTED.

REFER TO THE NAMEPLATE ON YOUR PLANT

1. Always give the MODEL & SPEC. NO. and SERIAL NO.

ELECTRIC Onan PLAN

MODEL AND SPECIFICATION NO. SERIAL NO.

IMPORTANT MENTION ABOVE NUMBERS AND GEN. DATA NO. WHEN ORDERING
PARTS OR WRITING ABOUT THIS PLANT.

RATINGS AT SEA LEVEL BASED ON FUEL CHECKED BELOW:

GASOLINE 	DIESEL FUEL
STAND BY KW KVA AMPS 	CONTINUOUS KW KVA AMPS
A.C. VOLTS CYCLES PHASE P.F. 	EXCITER GEN. DATA
R.P.M. USE VOLT BATTERY-NEGATIVE GROUND	

MANUFACTURED BY
ONAN
MINNEAPOLIS 14, MINNESOTA
MADE IN U.S.A.

For handy reference, copy **YOUR** plant
nameplate information in the spaces above.

2. Do not order by reference number or group number, use part number and description.
3. Give the part number, description and quantity needed of each item. If an old part cannot be identified, return the part prepaid to your dealer or nearest AUTHORIZED SERVICE STATION. Print your name and address plainly on the package. Write a letter to the same address stating the reason for returning the part.
4. State definite shipping instructions.

Any claim for loss or damage to your unit in transit should be filed promptly against the transportation company making the delivery. Shipments are complete unless the packing list indicates items are back ordered.

"Prices are purposely omitted from this Parts Catalog due to the confusion resulting from fluctuating costs, import duties, sales taxes, exchange rates, etc.

For Current parts prices, consult your Onan Dealer, Distributor or Parts and Service Center."

"En esta lista de partes los precios se omiten de proposito, ya que bastante confusion resultado de fluctuaciones de los precios, derechos aduanales, impuestos de venta, cambios extranjeros etc.

Consiga los precios vigentes de su distribuidor de productos "ONAN".

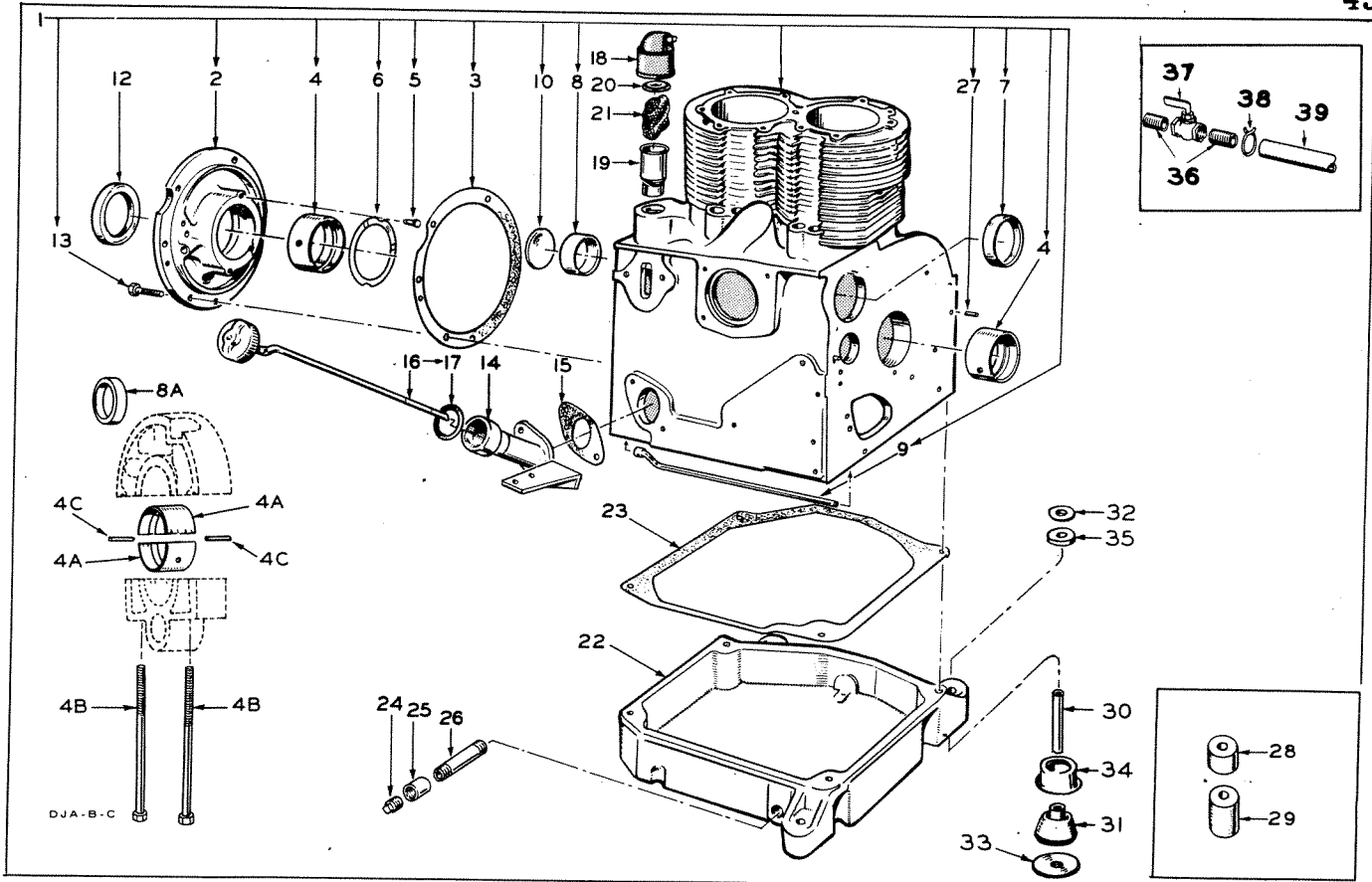


FIG.A-CRANKCASE AND OIL BASE GROUP

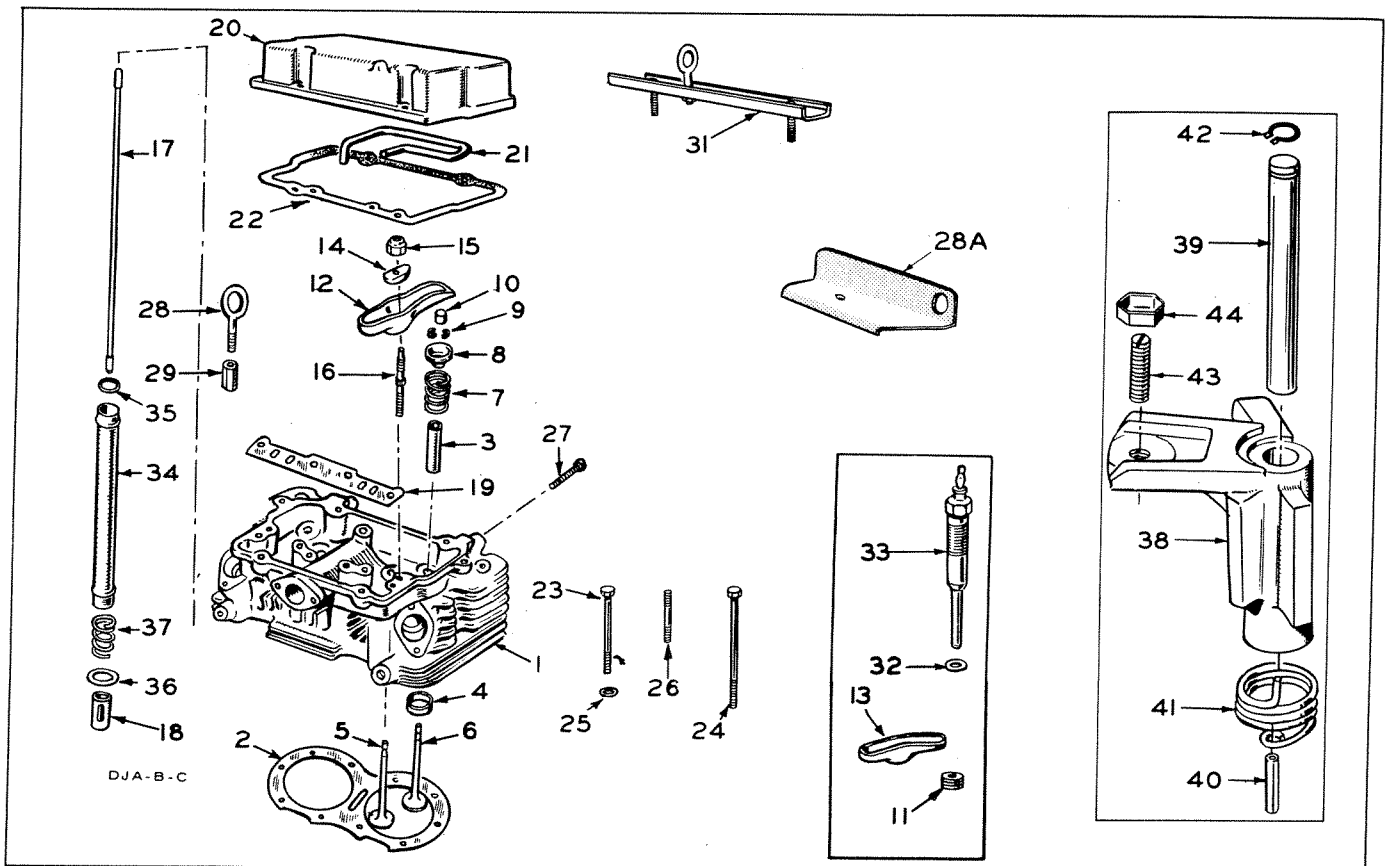


FIG.B-CYLINDER HEAD, VALVE AND ROCKER GROUP

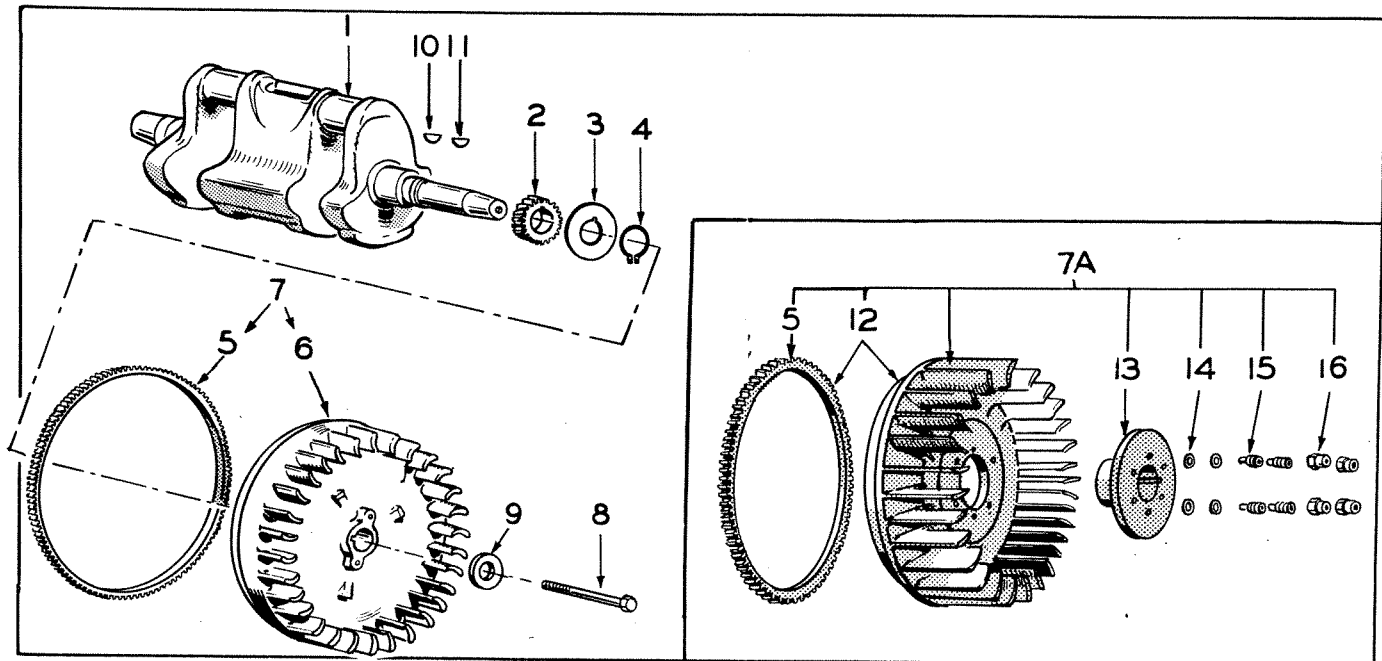


FIG.C-CRANKSHAFT AND FLYWHEEL GROUP

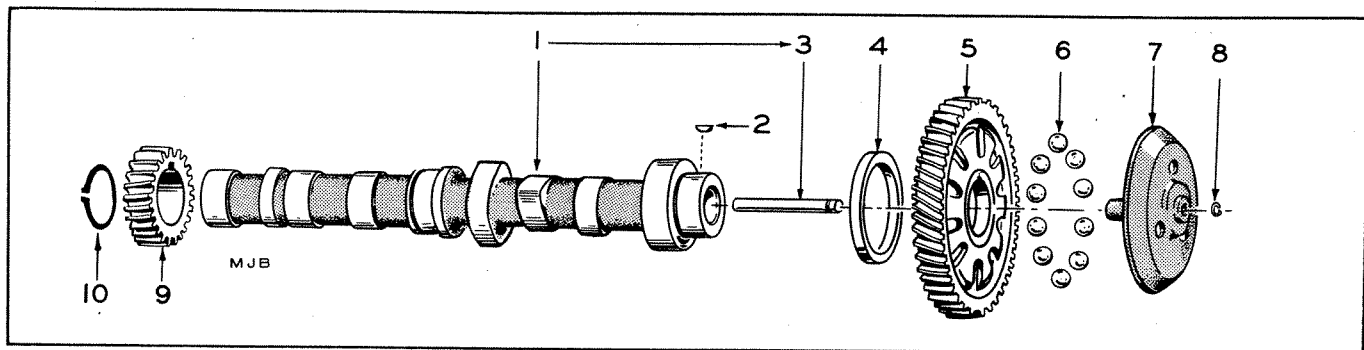


FIG.D-CAMSHAFT GROUP

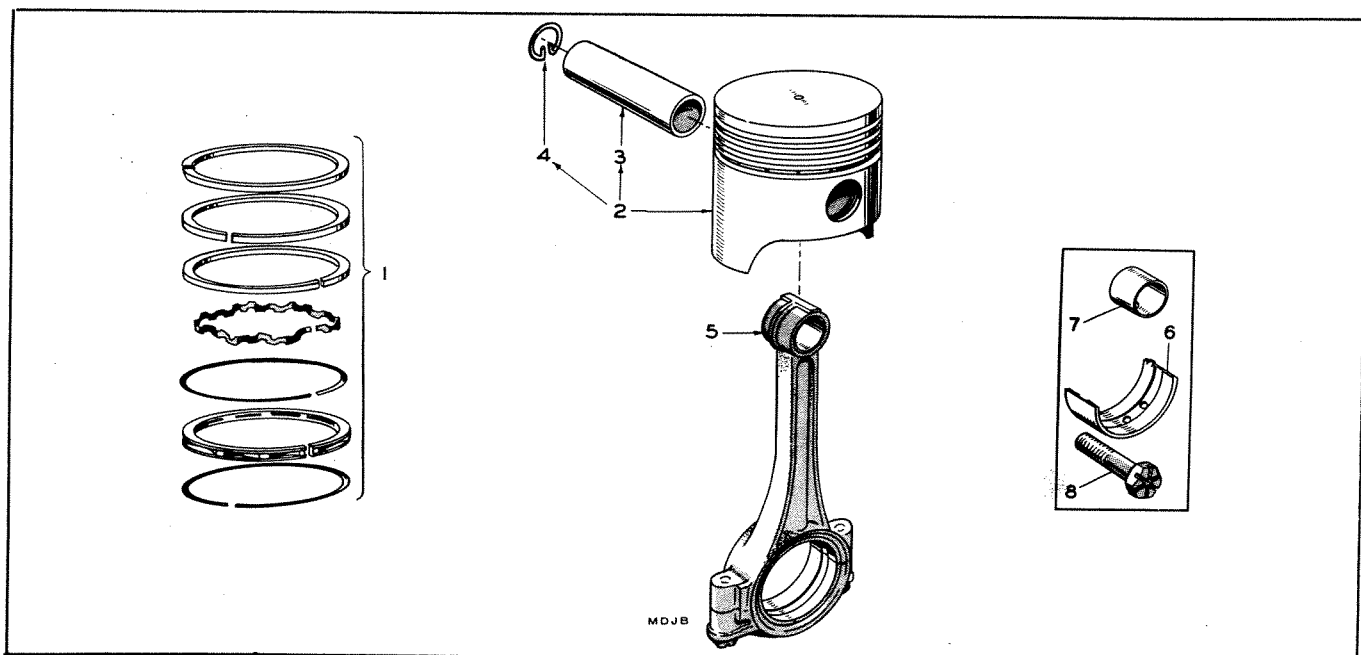
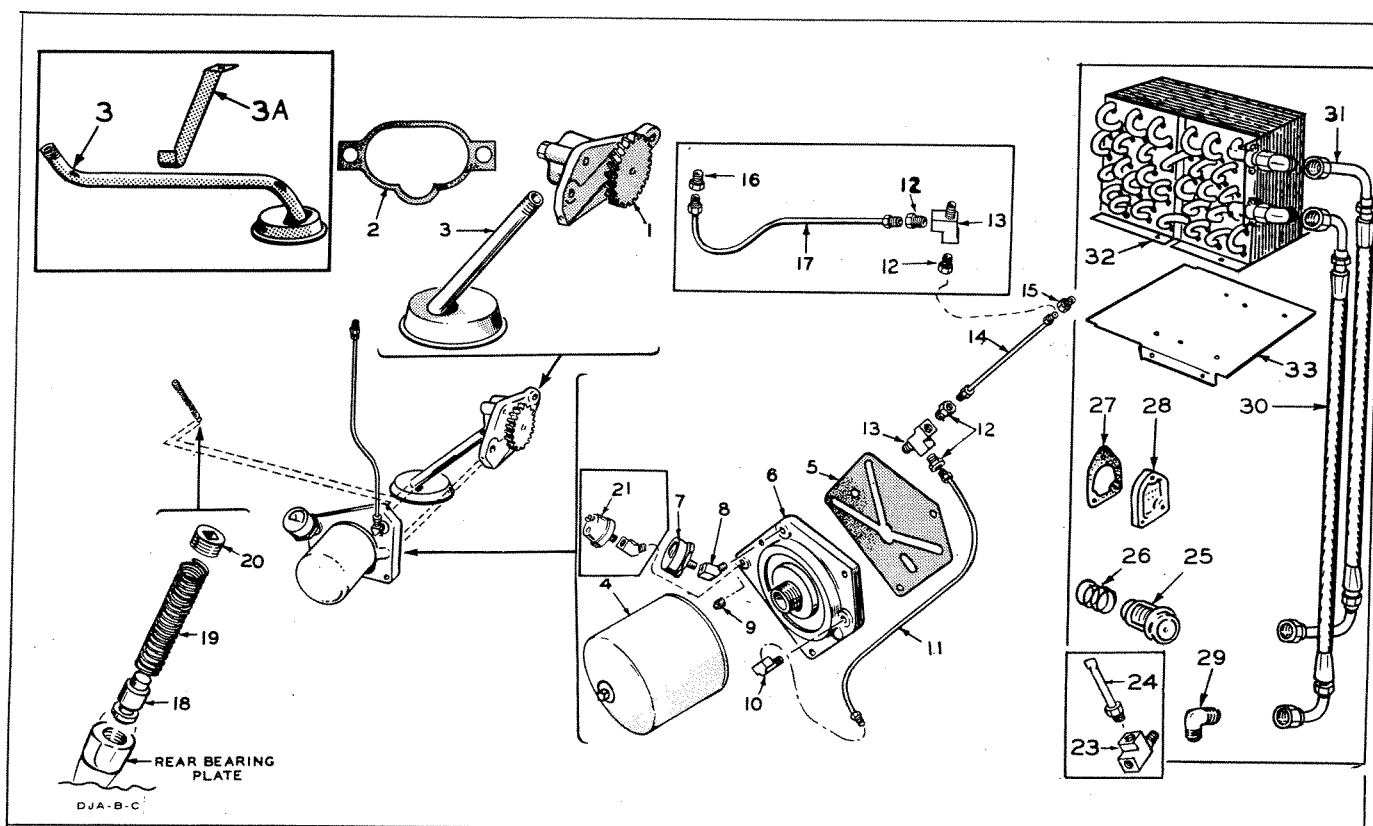
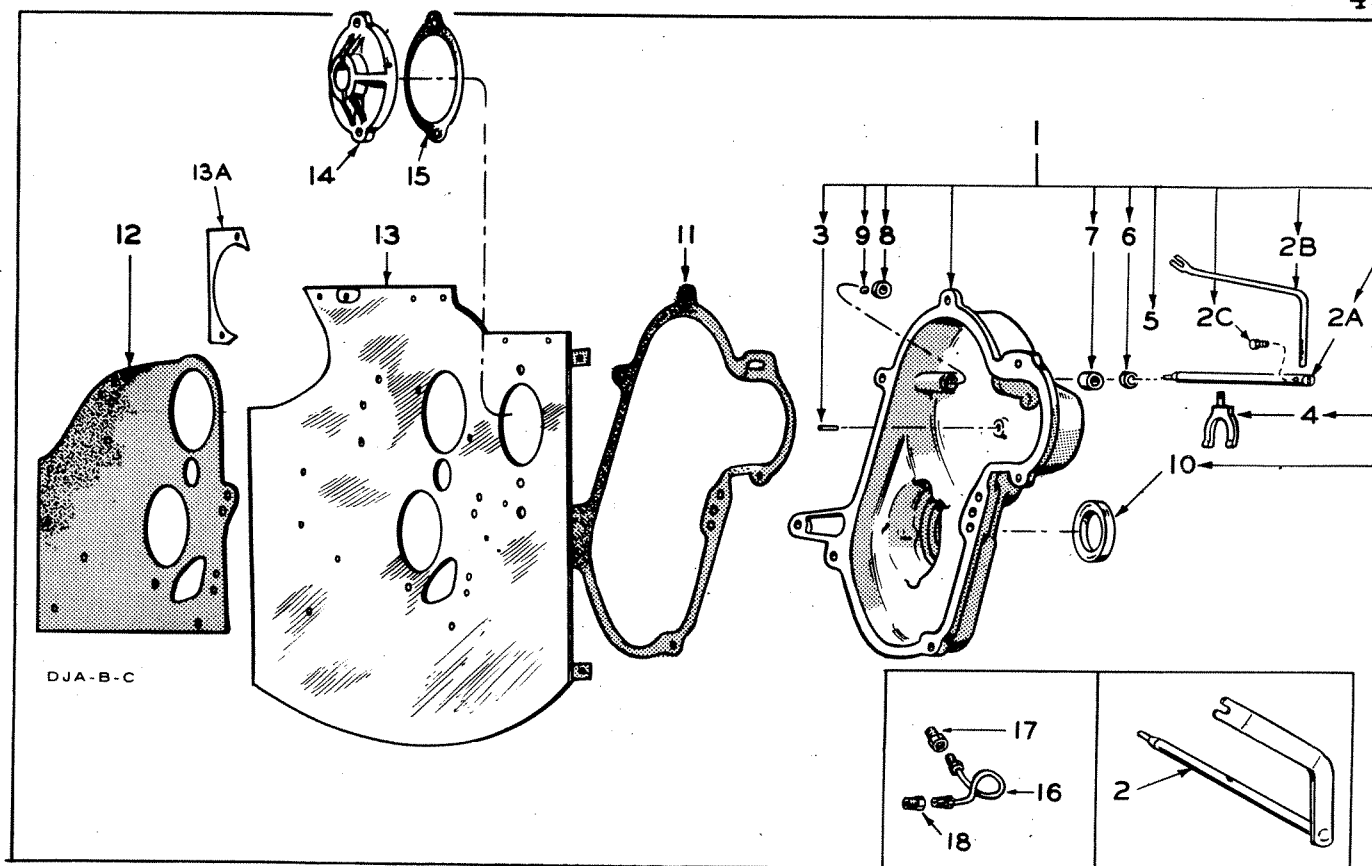


FIG.E-PISTON AND CONNECTING ROD GROUP



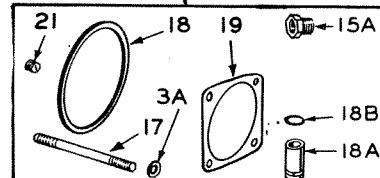
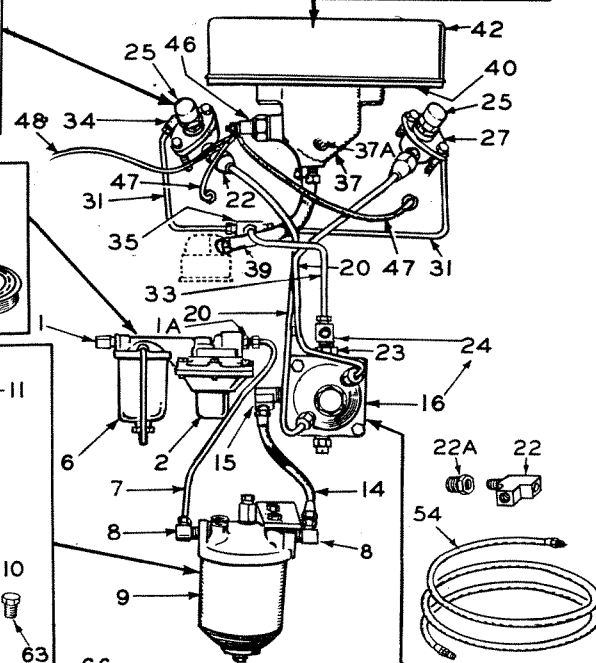
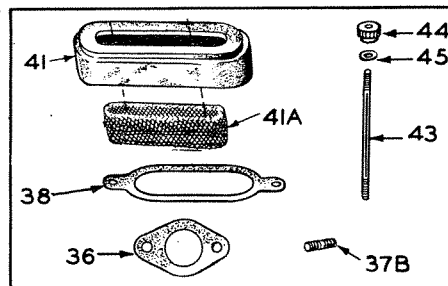
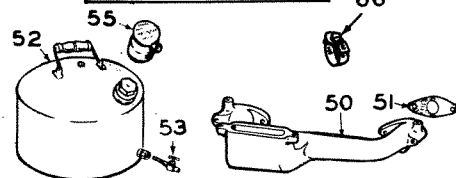
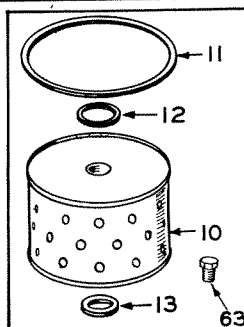
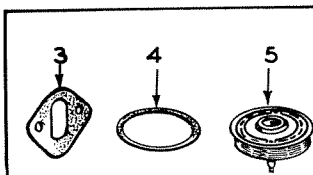
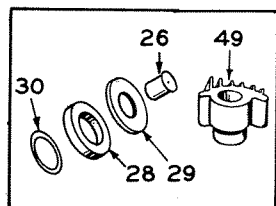


FIG.J-FUEL SYSTEM GROUP

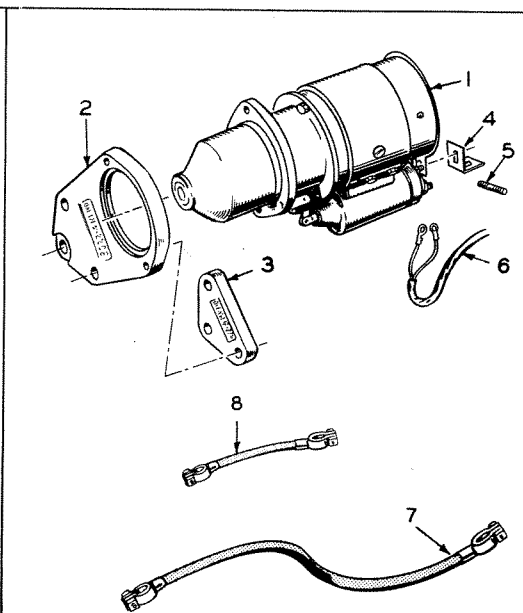
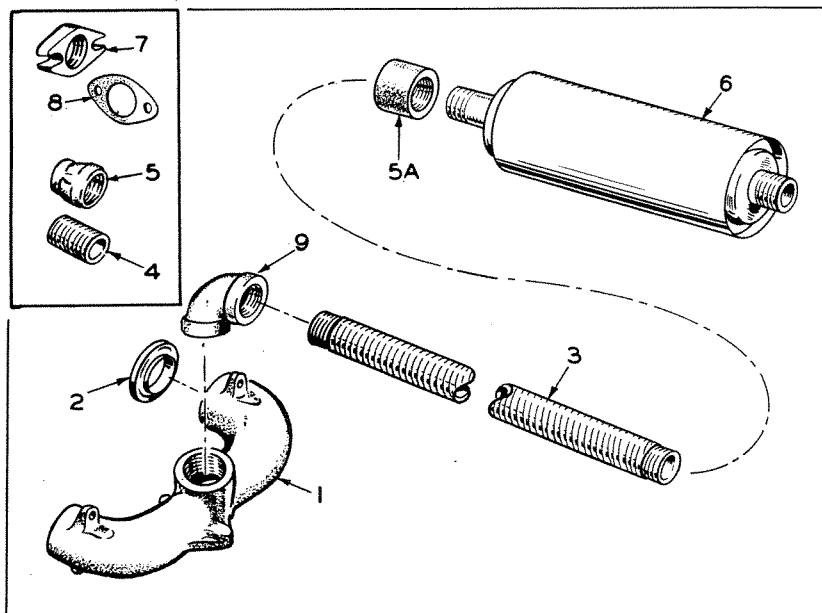


FIG.1-AUTOMOTIVE STARTER GROUP

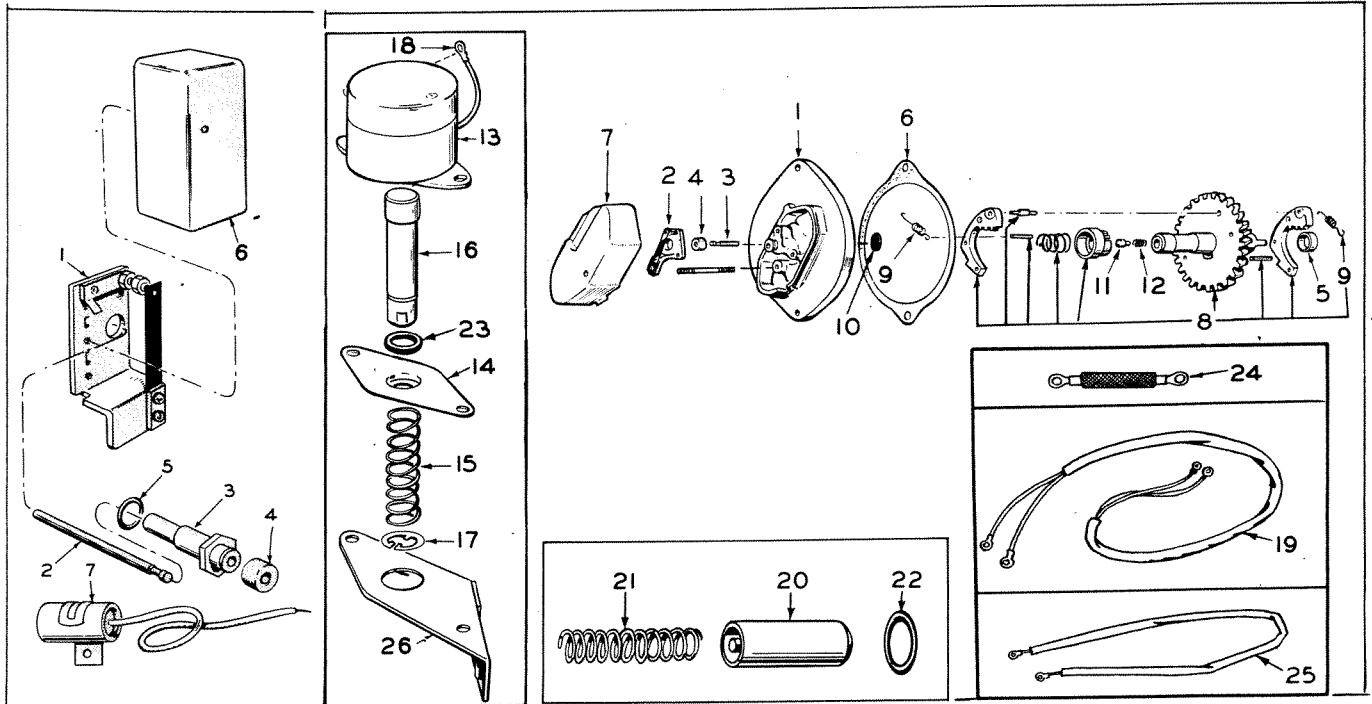


FIG. M-ANTI-FLICKER GROUP

FIG. N-START-DISCONNECT PLATE AND STOP SOLENOID GROUP

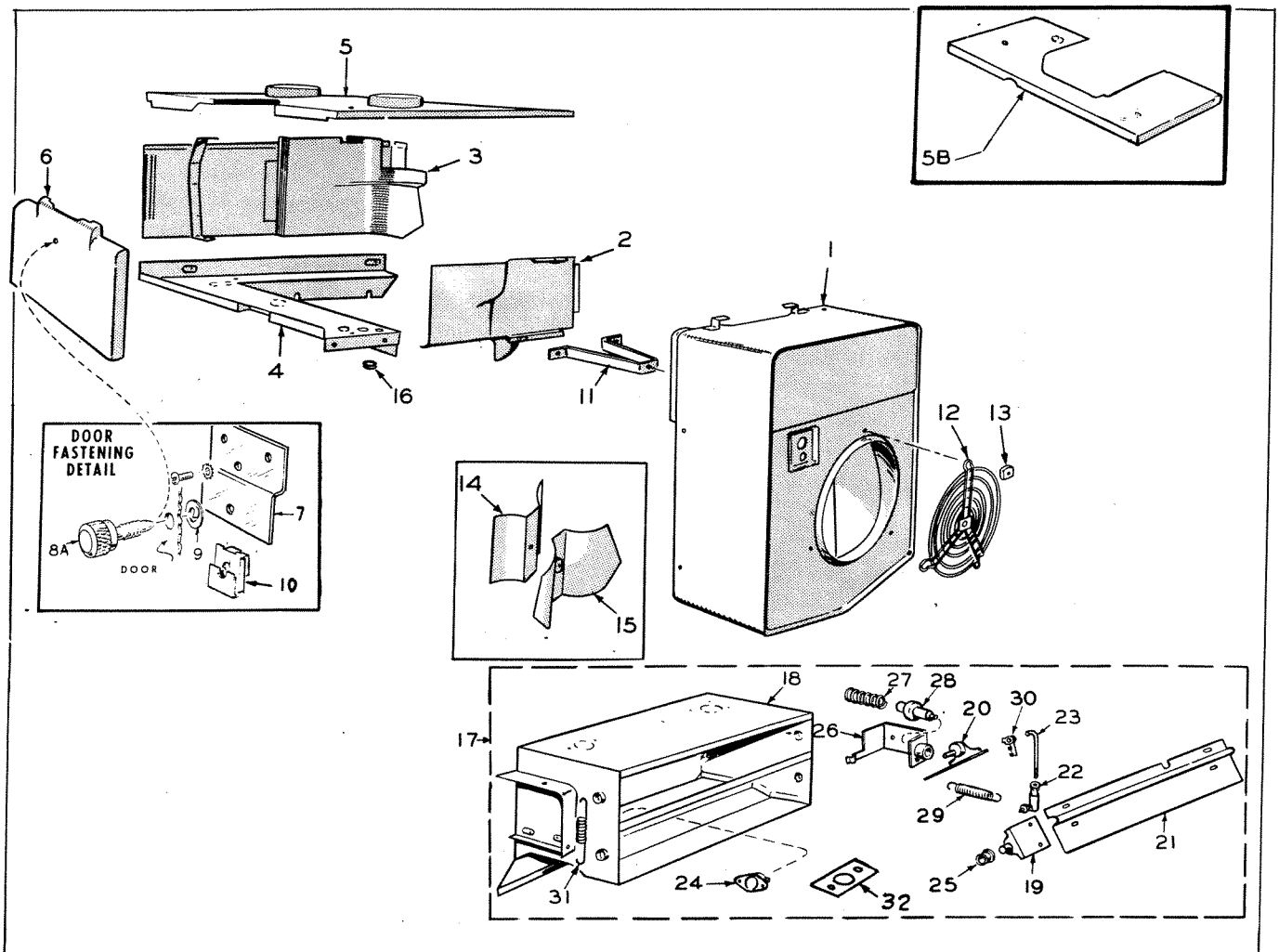
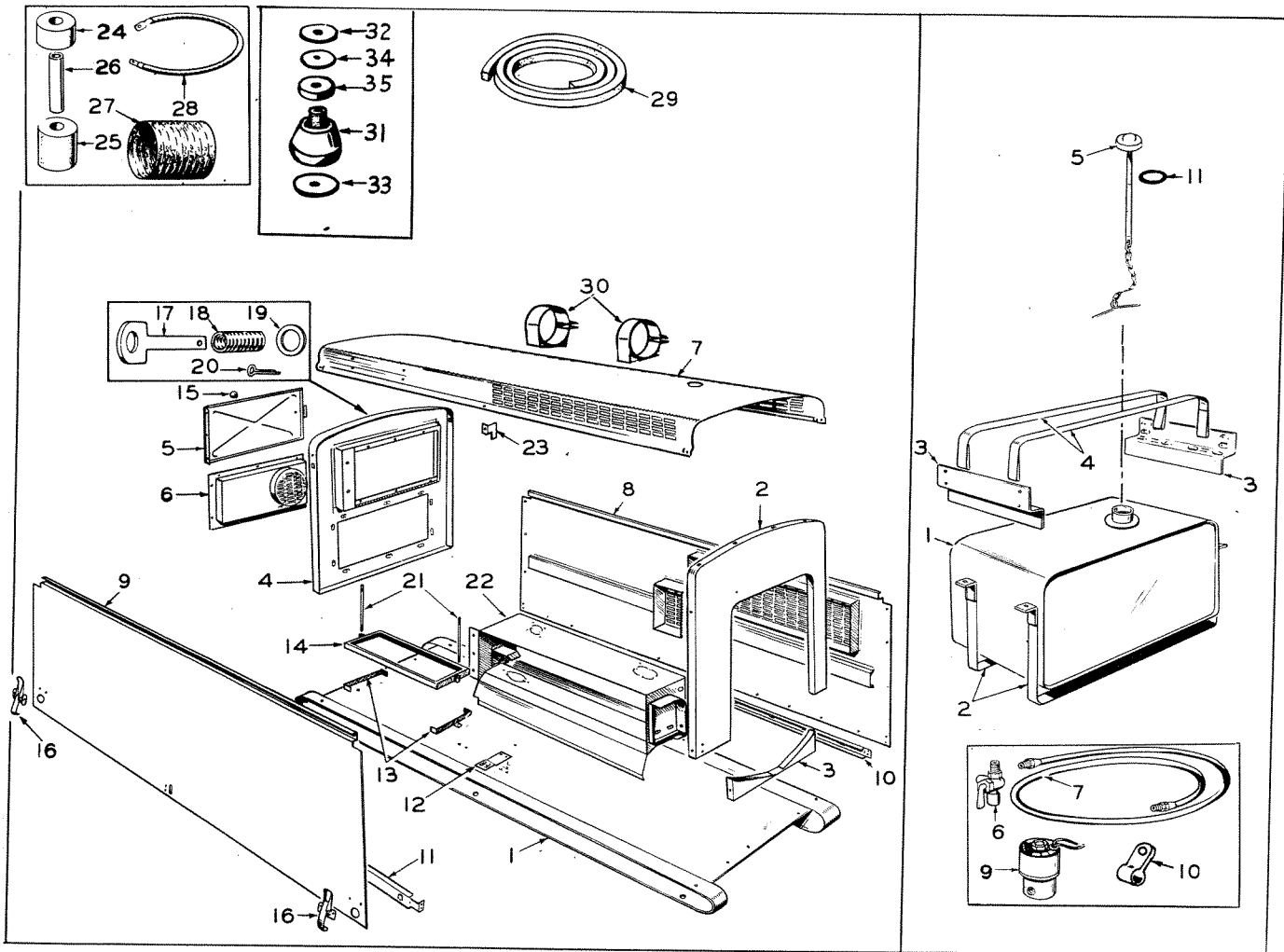


FIG. O-AIR HOUSING AND OPTIONAL AIR SHUTTER GROUP



**FIG. P-HOUSING GROUP- HOUSED AC PLANTS
(Optional Equipment)**

**FIG. Q-MOUNTED FUEL
TANK GROUP-
HOUSED MODELS ONLY
(Optional Equipment)**

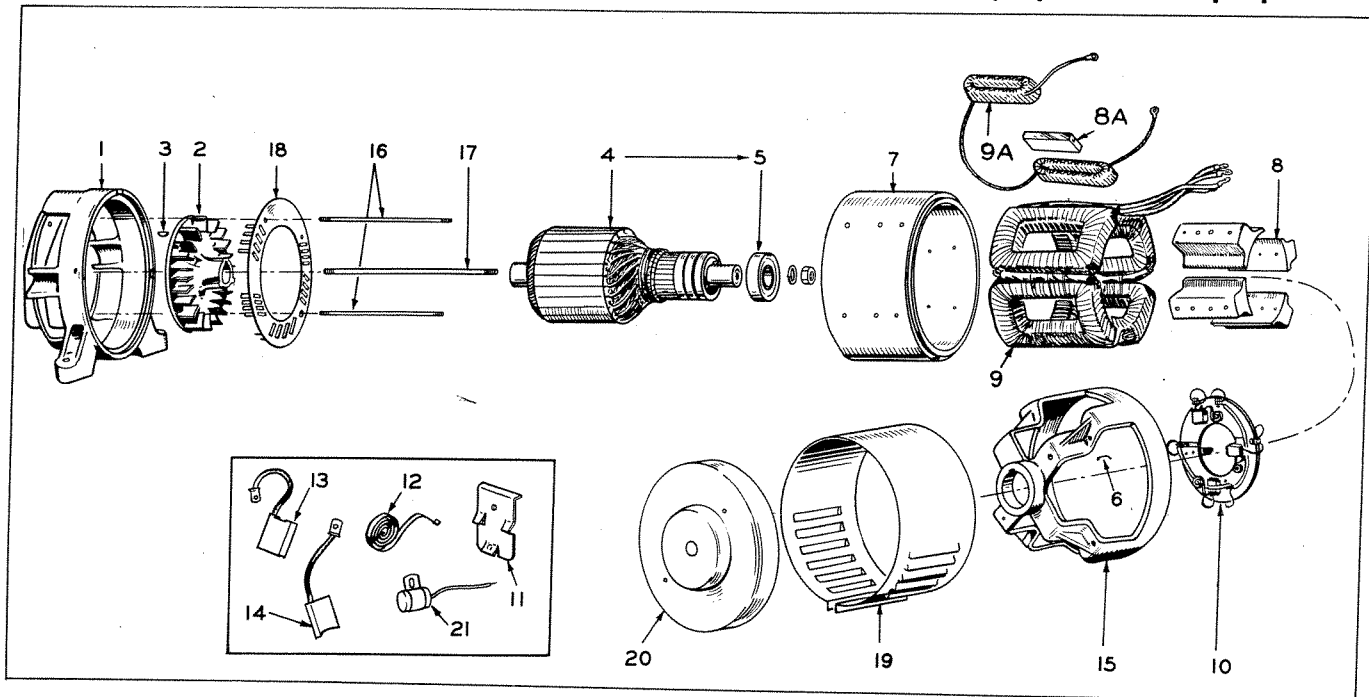
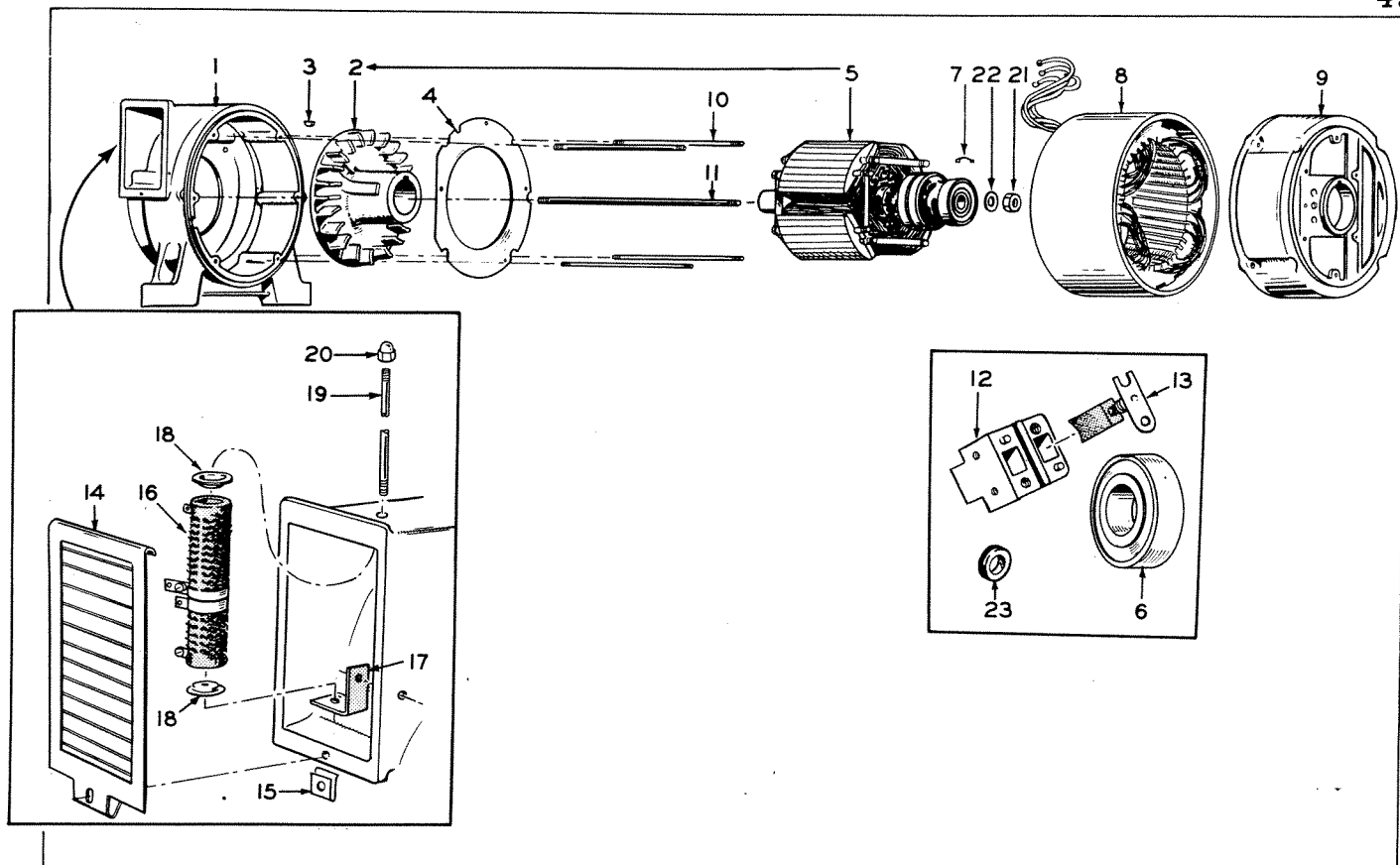
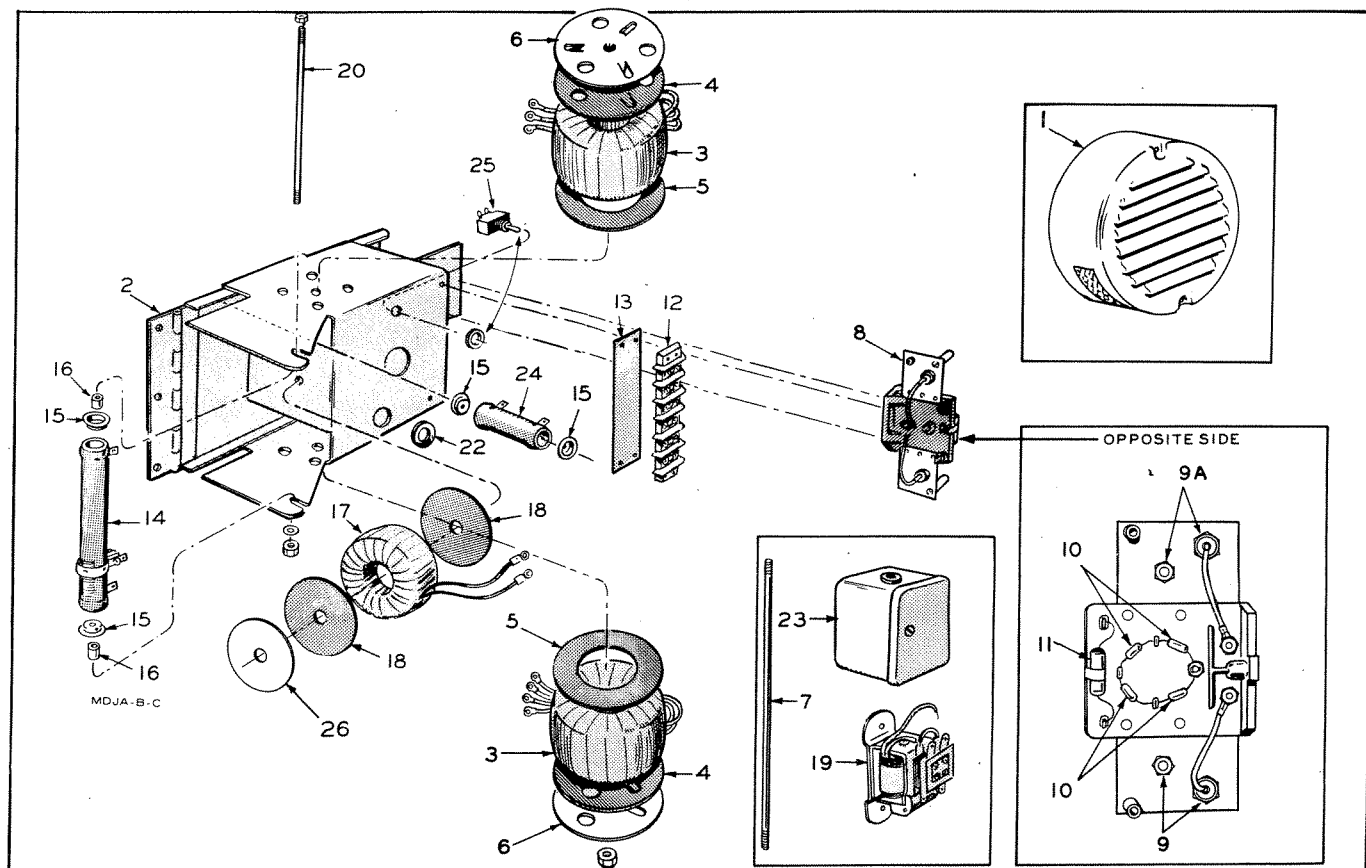


FIG. R-GENERATOR GROUP (Revolving Armature Type)



**FIG.S-GENERATOR GROUP- ALTERNATOR PORTION
(Revolving Field Type)**



**FIG.T-GENERATOR GROUP- EXCITER PORTION
(Revolving Field Type)**

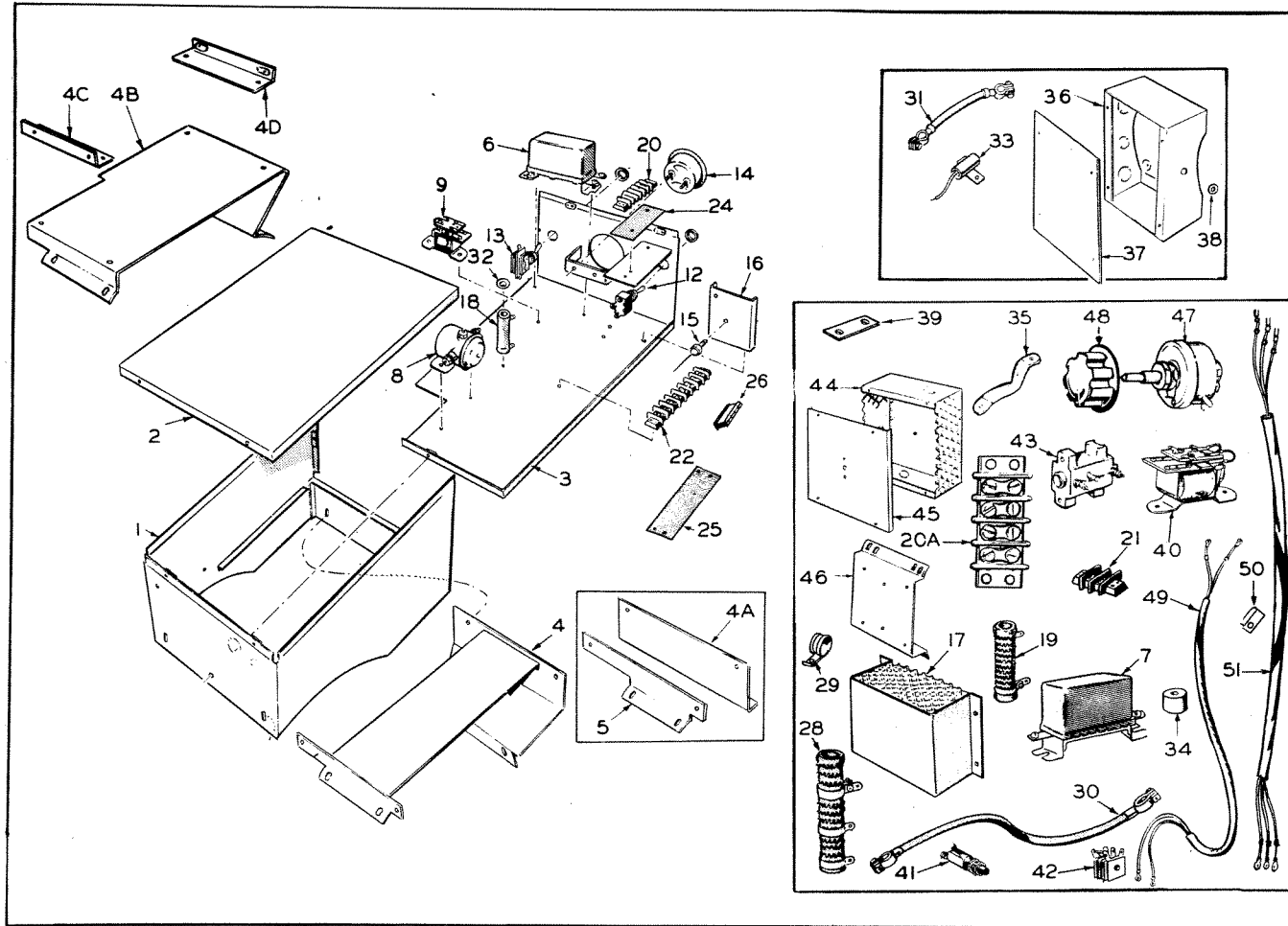
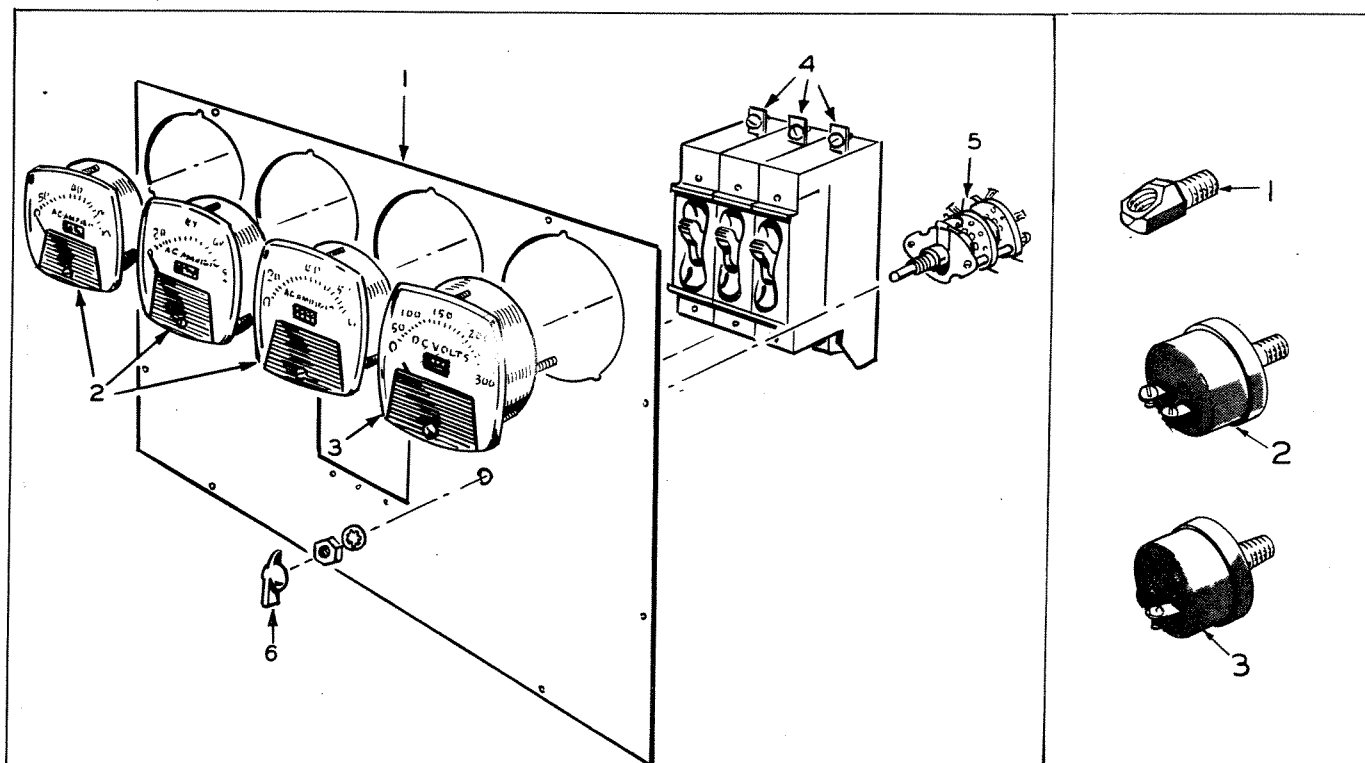


FIG.U-CONTROL GROUP

FIG.V-AC METER PANEL GROUP (Housed Models)
(Optional Equipment)FIG.GG—OIL
SYSTEM GROUP

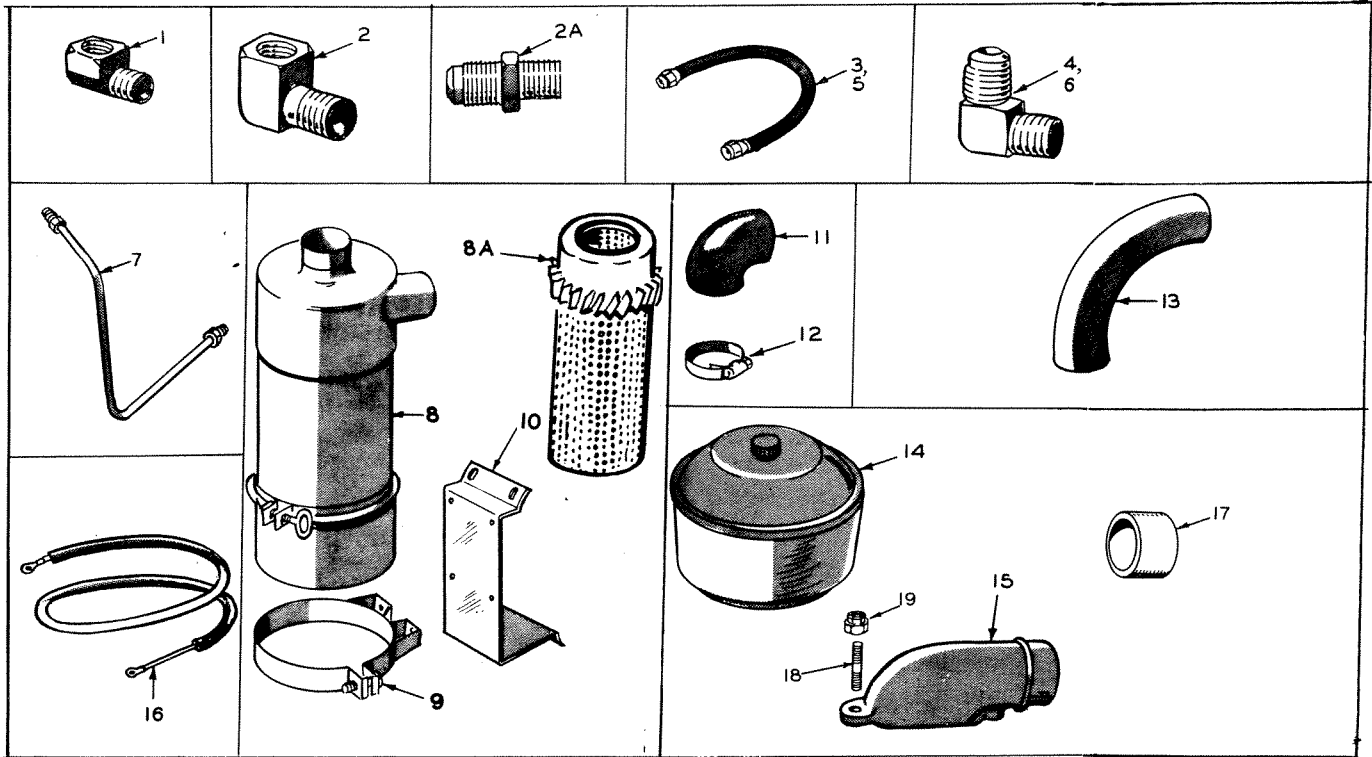
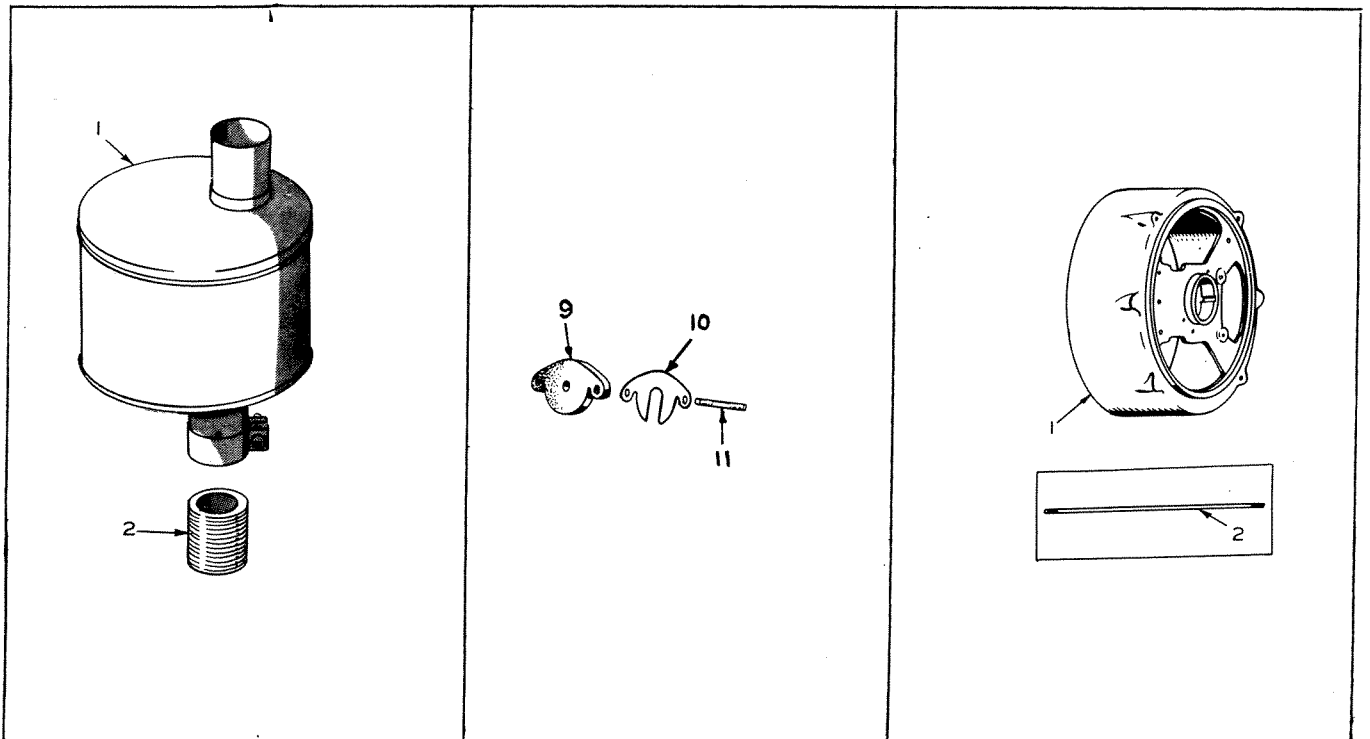


FIG.JJ-FUEL SYSTEM GROUP

FIG.KK- MANIFOLD
AND EXHAUST
GROUPFIG. LL - AUTOMOTIVE
STARTER GROUPFIG.SS-GENERATOR
GROUP- ALTERNATOR
PORTION (Revolving
Field Type)

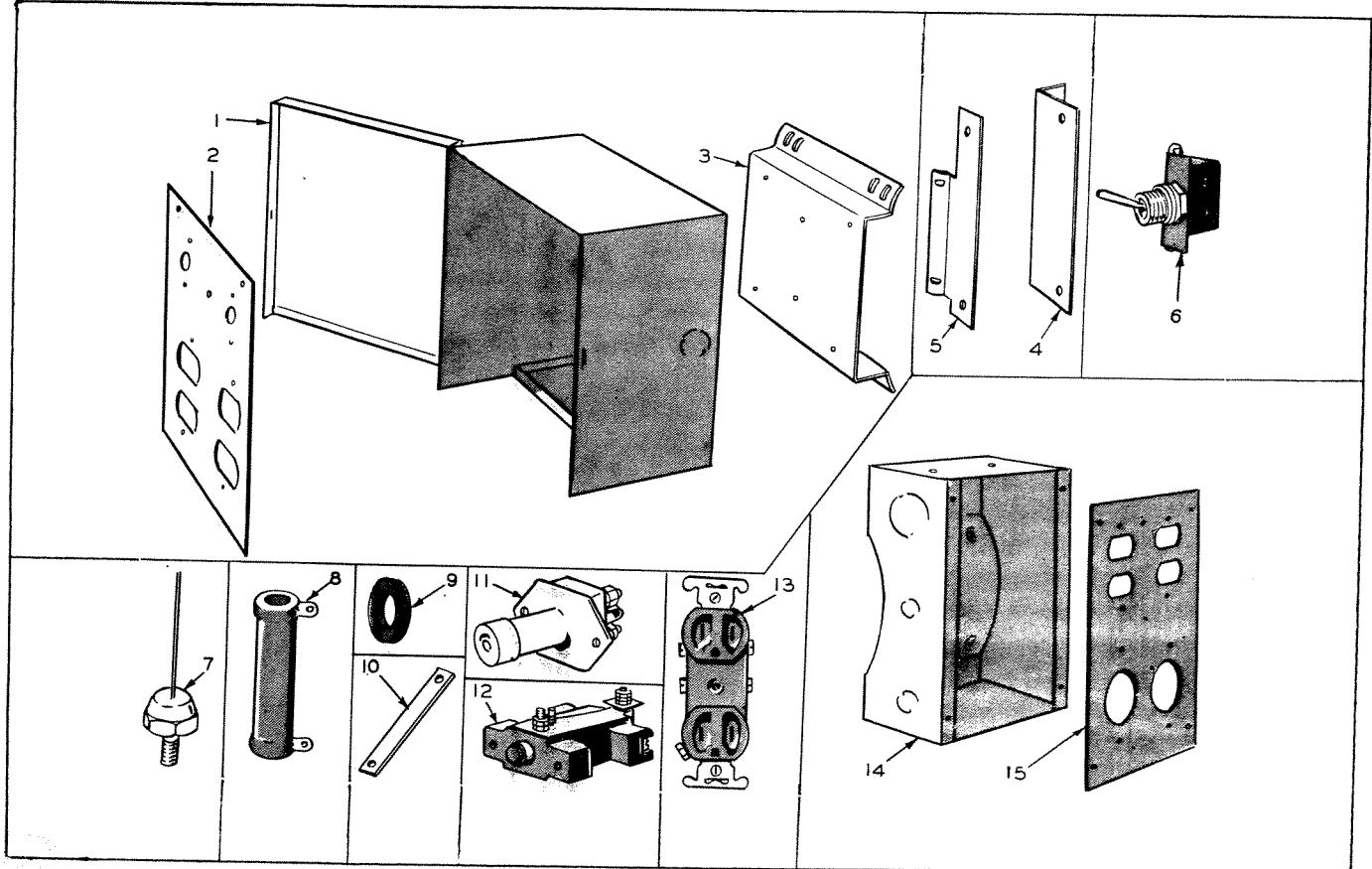


FIG.UU-CONTROL GROUP

PARTS LIST

53

REF. NO.	PART NO.	QUANT. USED			DESCRIPTION
		A	B	C	
					FIG. A - CRANKCASE AND OIL BASE GROUP
1	110A1335	1			Block Assembly, Cylinder - Includes Bearings
1	110A1330		1		Block Assembly, Cylinder - Includes Bearings
1	110A1332			1	Block Assembly, Cylinder - Includes Bearings
2	101D337	1	1	1	Plate, Rear Bearing - Less Bearing and Lock Pins
3	101K386	1	1	1	Gasket Kit, Rear Bearing Plate (Includes Steel Shims)
4	101K359	2	2	2	Bearing, Precision Main - Front or Rear - Specify: Standard or .002", .010", .020" or .030" Undersize
4A	101B361			2	Bearing Half, Precision Main - Center - Specify: Standard or .002", .010", .020" or .030" Undersize
4B	101A342			2	Bolt, Center Main Bearing Housing
4C	516A149			2	Pin, Dowel - Center Main Bearing Housing
5	516A72	4	4	4	Pin, Lock - Crankshaft Thrust Washer
6	104B420	2	2	2	Washer, Crankshaft Thrust
7	101B363	1	1	1	Bearing, Precision Camshaft - Front - Standard Size Only
8	101B365	1	1	1	Bearing, Precision Camshaft - Rear - Standard Size Only
8A	101B364			1	Bearing, Precision Camshaft - Center - Standard Size Only
9	120A572	1			Tube, Crankcase Oil
9	120A553		1		Tube, Crankcase Oil
9	120A586			1	Tube, Crankcase Oil - Front
9	120A585			1	Tube, Crankcase Oil - Rear
10	517-53	1	1	1	Plug, Expansion - Rear Camshaft Opening
12	509-86	1	1	1	Seal, Oil - Crankshaft Rear
13	805-19	6	6	6	Bolt, Place - Rear Bearing Plate - 3/8 x 1-1/4"
14	123A724	1			Tube, Oil Fill
14	123A681		1	1	Tube, Oil Fill
15	123A667	1	1	1	Gasket, Oil Fill Tube Mounting
16	123A716	1			Cap and Indicator, Oil Fill
16	123A651		1		Cap and Indicator, Oil Fill
16	123A698			1	Cap and Indicator, Oil Fill
17	123A191	1	1	1	Gasket, Oil Fill Cap
18					Cap, Breather Tube
	123A458	1			Spec A Only
	123A787	1			Begin Spec B
	123A458		1		Prior to Spec G
	123A787		1		Begin Spec G
	123A787			1	All
19	123A645	1	1	1	Tube, Breather
20	123A315	1	1		Valve, Breather
21	123A865	1	1	1	Baffle, Breather Tube - (Replaces 123-452)
22					Base, Oil
	102D488	1			Prior to Spec C
	102D541	1			Begin Spec C
	102D450		1		Prior to Spec H
	102D540		1		Begin Spec H
	102E476			1	Spec A Only
	102E539			1	Begin Spec B
23	102B459	1			Gasket, Oil Base
23	102B451		1		Gasket, Oil Base
23	102B475			1	Gasket, Oil Base
24	505-56	1	1	1	Plug, Pipe - 1/2" - Oil Drain
25	505-14	1	1		Coupling, Pipe - 1/2" - Oil Drain
26	505-2	1	1		Nipple, Pipe - 1/2" x 3" - Oil Drain
27	516A141	2	2	2	Pin, Dowel - Gear Cover Locating
28					Cushion, Vibration - Tubular Type - Upper
	402A36	4			Prior to Spec C
	402A36		4		Prior to Spec H
	402A36			4	Spec A Only
29					Cushion, Vibration - Tubular Type - Lower
	402A38	4			Prior to Spec C
	402A276		4		Prior to Spec H (Replaces #402A38)
	402A38			2	Engine End - Spec A Only
	402A251			2	Generator End - Spec A Only
30					Bushing, Spacer - Vibration Cushion
	402A46	4			Prior to Spec C
	402A328	4			Begin Spec C
	402A46		4		Prior to Spec H

PARTS LIST

REF. NO.	PART NO.	QUANT. USED			DESCRIPTION
		A	B	C	
FIG. A - CRANKCASE AND OIL BASE GROUP (Cont.)					
30	402A290		4		Bushing, Spacer - Vibration Cushion (Cont.)
	402A46			4	Begin Spec H
	402A290			4	Spec A Only
31					Begin Spec B
	402B284	2			Cushion, Vibration - Cone Shaped (Tapered)
	402B285	2			Engine End - Begin Spec C
	402B284		2		Generator End - Begin Spec C
	402B285		2		Engine End - Begin Spec H
	402B285			2	Generator End - Begin Spec H
	402B287			2	Engine End - Begin Spec B
	402B287			2	Generator End - Begin Spec B
32	526-14	4	4	4	Washer, Flat (29/64" I.D. x 1-1/2" O.D. x 1/8") - Used only with Cone Shaped Cushions
33	526A195	4	4	4	Washer, Flat (29/64" I.D. x 3-1/4" O.D. x 1/8") - Used only with Cone Shaped Cushions
33A	526-198	As Req.			Washer, Flat (5/8" I.D. x 1-1/2" O.D. x 1/16") - Used only with Cone Shaped Cushions
34	402A300	4			Cup, Cushion Retaining - Begin Spec C
35					Snubber, Shock Mounting
	402A282	4			Begin Spec C
	402A282		4		Begin Spec H
	402A282			4	Begin Spec B
36	505-100		2	2	Nipple, Pipe Close - Housed Plants
37	504-11		1	1	Valve, Oil Drain - Housed Plants
38	503-197		1	1	Clamp, Oil Drain Hose - Housed Plants
39	503-316		1	1	Hose, Oil Drain - Housed Plants
FIG. B - CYLINDER HEAD, VALVE & ROCKER GROUP					
1	110B1270	1			Head, Cylinder
1	110B1269		1	2	Head, Cylinder
2	110B1267	1			Gasket, Cylinder Head
2	110B1223		1	2	Gasket, Cylinder Head
3	110A1501	2	4	8	Guide, Valve - Replaces 110A1216.
4	110A1268	2	4	8	Insert, Valve Seat - Intake and Exhaust - Stellite - Specify: Standard or .002", .005", .010" or .025" Oversize
5	110B1320	1	2	4	Valve, Intake
6	110B1278	1	2	4	Valve, Exhaust - Stellite
7	110A1221	2	4	8	Spring, Valve
8	110A1220	2	4	8	Retainer, Valve Spring
9	110A858	4	8	16	Lock, Valve Spring Retainer
10	110A859	2	4	8	Cap, Valve Stem
11	509A90	1	2	4	Seal, Oil - Intake Valve - Includes Retainer Rings
12	115B129	1	2	4	Arm, Rocker - Intake
13	115B128	1	2	4	Arm, Rocker - Exhaust
14	115B127	2	4	8	Ball, Rocker Arm
15	115B150	2	4	8	Locknut, Hex - Rocker Arm
16	115A152	2	4	8	Stud, Rocker Arm
17	115B149	2	4	8	Rod, Valve Push (Steel)
18	115A132	2	4	8	Tappet, Valve
19	115A147	1			Guide, Push Rod
19	115B142		1	2	Guide, Push Rod
20	115C162	1			Cover, Rocker
20	115D164		1	2	Cover, Rocker (Replaces #115D141)
21	120A595	1			Line, Oil - Rocker Cover
21	120B628		1	2	Line, Oil - Rocker Cover (Replaces #120B561)
22	115B160	1			Gasket, Rocker Cover
22	115B130		1	2	Gasket, Rocker Cover
23	110A814	4			Screw, Hex Cap - 3/8-16 x 1/2" - Cylinder Head Mounting
23	800A503		6	12	Screw, Hex Cap - 3/8-16 x 1-3/4" - Cylinder Head Mounting (also used on later models to mount lifting bracket)
24	110A1264	2	5	10	Screw, Hex Cap - 3/8-16 x 4-1/4" - Cylinder Head Mounting
25	526-174	4	5	10	Washer, Cylinder Head Mounting

PARTS LIST

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REF. NO.	PART NO.	QUANT. USED			DESCRIPTION
		A	B	C	
FIG. B - CYLINDER HEAD, VALVE & ROCKER GROUP (Cont.)					
26	520A626		1	2	Stud, Cylinder Head - (Used only on early models having lifting eye bolt and extension nut)
27	800-31	2			Capscrew, Hex Head - 5/16-18 x 1-1/2" - Exhaust Manifold (Replaces #520A608 Stud)
28	403P671	1			Bolt, Eye Lifting
28			1		Bolt, Eye Lifting - Order 403K707
28A	403K707		1		Bracket, Lifting - Kit includes Mounting Hardware (Replace #402A622, 110A1305 and 520A626)
28A	403B690			1	Bracket, Lifting - Begin Spec B
29					Nut, Extension
	110A1305		1		Used Only on Plants having Lifting Eye
	403A620			2	Spec A Only - Lifting Bar
31					Eye Assembly, Lifting Bar - Spec A Only - For Replacement Order #403B690 Bracket (2) #800-91 Screw and (2) #850-60 Washer
32	110A546	1	2	4	Gasket, Glow Plug
33					Plug, Glow - Includes Gasket
	33K106	1			Parts Key No. 1 - 12-Volt (Replaces 333A37)
	333K107	1			Parts Key No. 4 - 24-Volt
	333K112	1			Parts Key No. 2, 5 - 32-Volt (Replaces 333A83)
	336K106		2	4	All - 12-Volt (Replaces 333A37)
34	115A151	2	4	8	Shield, Push Rod
35	509-84	4	8	16	Seal, "O" Ring - Push Rod Shield
36	115A155	2	4	8	Washer, Spring Retaining - Push Rod Shield
37	115A146	2	4	8	Spring, Retainer - Push Rod Shield
38	110B1353	1			Arm, Decompression Release
39	110A1351	1			Pin, Decompression Release
40	516-90	1			Pin, Roll - 3/16 x 1-3/8"
41	110A1356	1			Spring, Decompression Release
42	518-207	1			Ring, Retaining - Decompression Release - (Replaces 518-133)
43	815-252	1			Setscrew, Slotted - 1/4-20 - Decompression Release
44	870-134	1			Palnut - 1/4-20 - Decompression Release
FIG. C - CRANKSHAFT & FLYWHEEL GROUP					
1	104B462	1			Crankshaft
1	104B451		1		Crankshaft
1	104B464			1	Crankshaft
2	104B418	1	1	1	Gear, Crankshaft
3	104A416	1	1	1	Washer, Crankshaft Gear Retainer
4	518-188	1	1	1	Ring, Lock - Crankshaft Gear Washer
5	104B423		1	1	Gear, Flywheel Ring
6	104D529	1			Flywheel
7	104B470		1		Flywheel - Includes Ring Gear
7A	134B1406			1	Flywheel - Includes Ring Gear and Hub Assembly
8	800-500	1	1	1	Screw, Hex Cap - 7/16-14 x 5-1/2" - Flywheel Mounting
9	526A185	1	1	1	Washer, Flywheel
10	515-1	1	1	1	Key, Crankshaft Gear
11	515-153	1	1	1	Key, Flywheel to Crankshaft
12	134B1404			1	Flywheel, Includes Ring Gear - Less Hub
13	134B1401			1	Hub, Flywheel
14	526A187			4	Washer, Flat - Special - Hub to Flywheel
15	104A543			4	Spacer and Washer Assembly - Hub to Flywheel
16	115B150			4	Nut, Stover (3/8-24) - Hub to Flywheel
FIG. D - CAMSHAFT GROUP					
1	105A248	1			Camshaft - Includes Center Pin
1	105A221		1		Camshaft - Includes Center Pin
1	105A240			1	Camshaft - Includes Center Pin
2	515-1	1	2	2	Key, Camshaft Gear or Injection Pump Drive Gear
3	150A75	1	1	1	Pin, Camshaft Center
4	105A205	1	1	1	Washer, Camshaft Thrust
5	105B218	1	1	1	Gear, Camshaft - Includes Flyball Spacer and Plate
6	510-46	10	10	10	Flyball, Governor

PARTS LIST

REF. NO.	PART NO.	QUANT. USED			DESCRIPTION
		A	B	C	
FIG. D - CAMSHAFT GROUP (Cont.)					
7	150C775	1	1	1	Cup, Governor
8	150A78	1	1	1	Ring, Snap - Center Pin
9	147B142		1	1	Gear, Injection Pump Drive
10	518-195		1	1	Ring, Snap - Injection Pump Drive Gear
FIG. E - PISTON & CONNECTING ROD GROUP					
1	113A101	1	2		Ring Set, Piston - For One Piston - Specify: Standard or .010", .020", .030", or .040" Oversize
1	113A123			4	Ring Set, Piston - For One Piston - Specify: Standard or .010", .020", .030" or .040" Oversize
2	112-103	1	2	4	Piston & Pin - Includes Pin Retaining Rings - Specify: Standard or .010", .020", .030" or .040" Oversize (Replaces #112-95 and #112-98)
3	112A93	1	2	4	Pin, Piston - Specify: Standard or .002" Oversize
4	112A85	2	4	8	Ring, Piston Pin Retaining
5	114A169	1	2	4	Rod Assembly, Connecting (Forged) - Complete
6	114B164	2	4	8	Bearing Half - Connecting Rod - Specify: Standard or .002", .010", .020", .030" Undersize
7	114A170	1	2	4	Bushing, Piston Pin - Connecting Rod (Semi-Finished)
8	805-12	2	4	8	Bolt, Place - Connecting Rod - 5/16-24 x 1-13/16"
FIG. F - GEAR GROUP					
1	103C262	1			Cover Assembly, Gear - Complete - Includes parts marked ▲
1	103C262		1		Cover Assembly, Gear - Complete - Includes parts marked ▲ - NOTE: For plants prior to Serial #692459 - (During Spec E) also order #150B847 Governor Arm, and 103C251 Gasket to replace 103C236 Gear Cover previously used.
1	103C262			1	Cover Assembly, Gear - Complete - Includes parts marked ▲
2	150B825		1		Arm and Shaft, Governor - Used Prior to Serial #692459 - (During Spec E) - NOTE: For replacement order #150B838 Shaft and #150B847 Arm
2A	150B838		1		▲Shaft, Governor - Gear Cover - Used begin Serial #692459 - (During Spec E)
2A	150B838	1		1	▲Shaft, Governor - Gear Cover
2B	150A856	1			Arm, Governor - Governor Shaft to Carburetor
2B	150B847		1		Arm, Governor - Governor Shaft to Carburetor - Used Begin Serial #692459 - (During Spec E)
2B	150B847			1	Arm, Governor - Governor Shaft to Carburetor
2C	815-176		1		▲Screw, Hex Machine - #8-32 x 1/2" - Used Begin Serial #692459 - (During Spec E)
2C	815-176	1		1	▲Screw, Hex Machine - #8-32 x 1/2"
3	516-111	1	1	1	Pin, Roll - Governor Cup Stop (Located in Gear Cover) - Replaces 516-117
4	150A777	1	1	1	▲Yoke, Governor
5	518-129	1	1	1	▲Ring, Yoke Retaining - "E" Shaped
6	509-88	1	1	1	▲Seal, Oil - Governor Shaft
7	510P48	1	1	1	▲Bearing, Needle - Governor Shaft - For 1/2" Shaft
8	510P82	1	1	1	▲Bearing, Needle - Governor Shaft - For 1/4" Shaft - Replaces 510P49
9	510-43	1		1	▲Bearing, Ball - Governor Shaft Thrust - 5/16"
9	510-14		1		▲Bearing, Ball - Governor Shaft Thrust - 3/16" - Prior to Serial #692459 (During Spec E)
9	510-43		1		▲Bearing, Ball - Governor Shaft Thrust - 5/16" - Begin Serial #692459 (During Spec E)
10	509-87	1	1	1	▲Seal, Oil - Gear Cover
11	103C251	1		1	Gasket, Gear Cover - Previously listed 103C219 was never used.
11	103C219		1		Gasket, Gear Cover - (For Cast Iron Gear Cover) - Prior to Serial #692459 (During Spec E)
11	103C251		1		Gasket, Gear Cover - (For Die Cast Gear Cover) - Begin Serial #692459 (During Spec E)
12	103C218	1	1	1	Gasket, Gear Cover Backplate
13	103D226	1			Backplate, Gear Cover
13	103D271		1		Backplate, Gear Cover (To Replace 103D220 used on early models also order #134B1532 Baffle)
13	103D272			1	Backplate, Gear Cover (To Replace 103D266 used on early models also order #134B1532 Baffle)
13A	134B1532		1	1	Baffle Plate, Gear Cover Backplate - Starter Mtg (Not used on early models)
14	103D221	1			Cover, Gear Cover Backplate Opening
15	160A721	1	1	1	Gasket, Start Disconnect Plate or Backplate Opening Cover
16	120A581		1		Line, Oil - Gear Cover (Used on Early Models Only)
17	502A235		1		Connector, Restricted - Oil Line (Used on Early Models Only)
18	502-30		1		Connector, Inverted Male - Oil Line (Used on Early Models Only)

▲ - Parts Included in Gear Cover Assembly.

PARTS LIST

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REF. NO.	PART NO.	QUANT. USED			DESCRIPTION
		A	B	C	
FIG. G - OIL SYSTEM GROUP					
1	120A547	1	1	1	Pump Assembly, Oil
2	120K580	1	1	1	Gasket Kit, Oil Pump
3	120A551	1	1		Cup Assembly, Oil Pump Intake
3	120B601			1	Cup Assembly, Oil Pump Intake
3A	120A602			1	Bracket, Oil Pump Intake Cup
4	122A185	1	1	1	Filter, Oil
5	122A188	1	1		Gasket, Oil Filter Adapter
5	122A246			1	Gasket, Oil Filter Adapter
6	122A182	1	1		Adapter Assembly, Oil Filter
6	122A245			1	Adapter Assembly, Oil Filter (Includes provision for Oil Cooler Thermo- stat)
7	193P122	1	1	1	Gage, Oil Pressure
8	502A53	1	1	1	Elbow, Street - 45° - Oil Gage (Also (1) Used to Mount Optional Low Oil Pressure Switch)
9	505-57		1	1	Plug, Pipe - 1/8" Filter Adapter
10	502-19	1	1	1	Elbow, Inverted Male - Oil Line to Filter Adapter
11	120A562	1			Line, Oil - Filter Adapter to Cylinder Head
11	120A584		1	1	Line, Oil - Filter Adapter to Injection Pump Tee
12	502-30		2	2	Connector, Inverted Male - Injection Pump Lubricating Tee
12	502-30			1	Connector, Inverted Male - Injection Pump Oil Line to Cylinder Head Tee
13	502A242		1	1	Tee, Restricted - Injection Pump Lubricating
13	502A242			1	Tee, Restricted - Cylinder Head Oil Lines
14	120A583		1	1	Line, Oil - Injection Pump Tee to Cylinder Head
15	502A235	1	1		Connector, Restricted - Oil Line to Cylinder Head
16	502-97			2	Connector, Inverted Male - Rear Cylinder Head Oil Line
17	120B575			1	Line, Oil - Rear Cylinder Head
18	120A539	1	1	1	Valve, Oil By-Pass
19	120A555	1	1	1	Spring, By-Pass Valve
20	505-274	1	1	1	Plug, Pipe - Countersunk - Oil By-Pass
21	309A104	1			Switch, Oil Pressure - Decompression Release Solenoid Cut-In
21	309-64		1		Switch, Low Oil Pressure Cut-Off (Optional Equipment) - Prior to Spec F
21	309A169		1		Switch, Low Oil Pressure Cut-Off (Optional Equipment) - Begin Spec F
21	309A169			1	Switch, Low Oil Pressure Cut-Off (Optional Equipment)
23	502A255	1			Tee, Inverted - Restricted - Air Trap Tube
24	120A598	1			Tube, Air Trap - Oil Pressure Switch
25	309B130			1	Thermostat, Oil Cooler By-Pass
26	122A242			1	Spring, By-Pass Thermostat Retaining
27	122A243			1	Gasket, By-Pass Thermostat Cover Plate
28	122A244			1	Plate, By-Pass Thermostat Cover
29	502P277			2	Elbow, Male - 90° - Oil Cooler Lines to Adapter
30	501B109			1	Line, Flexible Oil Cooler (Short Elbow)
31	501B110			1	Line, Flexible Oil Cooler (Long Elbow)
32	102C520			1	Cooler, Oil
33	102B518			1	Bracket, Oil Cooler Mounting
FIG. H - GOVERNOR GROUP					
1	150A821	1			Spring, Governor
1	150A846		1	1	Spring, Governor
2	150A822	1	1	1	Stud, Governor Adjusting
3	104A91	1	1	1	Nut, Governor Adjusting Stud
4	150A812	1			Bracket Assembly, Governor Spring
4	150B814		1	1	Bracket Assembly, Governor Spring
5	150A883	1			Link, Governor
6	150A831		1	1	Linkage Assembly, Governor (Includes One Ball Joint)
7	150A974	2	2	2	Joint, Ball (Replaces #150A639)
8	870-131	2	2	2	Nut, Keps - Ball Joint
9	870-130	1	1	1	Nut, Lock - Governor Adjusting Stud
FIG. J - FUEL SYSTEM GROUP					
	149P1046	1	1	1	Repair Kit, Fuel Pump (Includes Diaphragm and Gaskets) Does not apply for AC pumps
1	502-2	1	2	2	Elbow, Inverted Male - Fuel Pump Inlet or Outlet
1A	502-3	1			Connector, Inverted Male - Fuel Pump Outlet

PARTS LIST

REF. NO.	PART NO.	QUANT. USED			DESCRIPTION
		A	B	C	
FIG. J - FUEL SYSTEM GROUP					
2	149C852	1			Pump, Fuel Transfer
2	149C1020		1	1	Pump, Fuel Transfer - Replaces 149C804
3	149A792	1	1	1	Gasket, Fuel Transfer Pump Mounting
3A	526-65	2	2	2	Washer, Copper - Fuel Pump Mounting
4	149P517	1	1	1	Gasket, Fuel Pump Bowl
5	149P438	1			Filter, Assembly, Fuel Pump - Brass Disc Type
6	149-116	1	1	1	Bowl, Fuel Pump - Glass
7	501A32	1			Line, Fuel Pump to Secondary Filter - (Replaces 149A895)
7	149B806		1	1	Line, Fuel Pump to Secondary Filter
8	502-41	1			Elbow, Inverted Male - Secondary Filter Inlet
8	502-54	1			Elbow, Street - Secondary Filter Outlet
8	502-41		2	2	Elbow, Inverted Male - Secondary Filter Inlet and Outlet
9	149C408	1	1	1	Filter, Secondary Fuel - Includes Cartridge - Note: Bleed Plug 149-769 is available separately also.
10	149P428	1	1	1	Cartridge, Secondary Fuel Filter
11	149P456	1	1	1	Gasket, Secondary Filter - Bowl to Cover
12	149P455	1	1	1	Gasket, Secondary Filter - Cartridge to Head
13	149P493	1	1	1	Gasket, Secondary Filter - Cartridge to Retainer
14	501A103	1			Line, Fuel - Secondary Filter to Injection Pump
14	501A91		1	1	Line, Fuel - Secondary Filter to Injection Pump
15					Elbow
	502-54		1	1	Injection Pump Inlet (Street)
	502-41	1			Elbow, Injection Pump Inlet - Spec A Only (Inverted Male)
15A	502-33	1			Connector, Injection Pump Inlet - Begin Spec B
16					Pump, Injection
	147C167	1			Spec A Only - For replacement order #147C180 Pump, #502-33
					Connector, #149B947 Line and Instructional Sheet E154
	147C180	1			Begin Spec B
	147C185		1		All - (Replaces #147C130)
	147C184			1	All
					When Ordering, always give port closing dimensions and button code letter from old pump flange.
17	520A129		4	4	Stud, Injection Pump Mounting (Replaces #520A114)
18	509P101	1			Seal, "O" Ring - Injection Pump to Crankcase
18	509P94		1	1	Seal, "O" Ring - Injection Pump to Crankcase
18A	115A166	1			Tappet, Injection Pump
18A	147A182		1	1	Tappet, Injection Pump
18B	147-196		1	1	Gasket, "O" Ring - Injection Pump Tappet
19	147K172	1			Shim Kit, Injection Pump Mounting
19	147K145		1	1	Shim Kit, Injection Pump Mounting
20	149B925	1			Line, Injection Pump to Nozzle - Includes Fittings
20	149C961		1		Line, Injection Pump to Nozzle - Includes Fittings - No. 1 Cylinder (Replaces #149B877)
20	149C962		1		Line, Injection Pump to Nozzle - Includes Fittings - No. 2 Cylinder (Replaces #149B872)
20	149C963			1	Line, Injection Pump to Nozzle - Includes Fittings - No. 1 Cylinder
20	149C964			1	Line, Injection Pump to Nozzle - Includes Fittings - No. 2 Cylinder
20	149D965			1	Line, Injection Pump to Nozzle - Includes Fittings - No. 3 Cylinder
20	149D966			1	Line, Injection Pump to Nozzle - Includes Fittings - No. 4 Cylinder
21	147A147	1	1		Button, Injection Pump Plunger - .119 - Marked A
21	147A148	1	1		Button, Injection Pump Plunger - .116 - Marked B
21	147A149	1	1		Button, Injection Pump Plunger - .113 - Marked C
21	147A150	1	1		Button, Injection Pump Plunger - .110 - Marked D
21	147A151	1	1		Button, Injection Pump Plunger - .107 - Marked E
21	147A161	1	1		Button, Injection Pump Plunger - .104 - Standard - No Marking
21	147A152	1	1		Button, Injection Pump Plunger - .101 - Marked F
21	147A153	1	1		Button, Injection Pump Plunger - .098 - Marked H
21	147A154	1	1		Button, Injection Pump Plunger - .095 - Marked J
21	147A155	1	1		Button, Injection Pump Plunger - .092 - Marked K
21	147A156	1	1		Button, Injection Pump Plunger - .089 - Marked L
21	147A190	1	1		Button, Injection Pump Plunger - .122 - Marked M
21	147A189	1	1		Button, Injection Pump Plunger - .125 - Marked N
21	147A188	1	1		Button, Injection Pump Plunger - .128 - Marked P
21	147A187	1	1		Button, Injection Pump Plunger - .131 - Marked R

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REF. NO.	PART NO.	QUANT. USED			DESCRIPTION
		A	B	C	
					FIG. J - FUEL SYSTEM GROUP (Cont.)
21	147A186		1	1	Button, Injection Pump Plunger - .133 - Marked S
22	502-48		1	1	Tee, Return Line (with provision for return line to tank)-Early Models Only
22A	502-29		1	1	Bushing, Pipe - Return Line Tee to Pump Bleeder Valve-Early Models Only
23	502-176		1	1	Adapter, Pipe - Bleeder Valve to Pump - Early Models Only
24	147P183		1	1	Valve, Bleeder - Injection Pump (Replaces #147P162)
25	147B136	1	2	4	Nozzle and Holder Assembly
26	147P134	1	2	4	Nozzle Only - Component of Nozzle and Holder Assembly
27	147A141	1	2	4	Flange, Injection Nozzle Hold-down
28	147A44	1	2	4	Shield, Nozzle Heat - Steel
29	147A43	1	2	4	Gasket, Nozzle Heat Shield - Asbestos
30	110A419	1	2	4	Gasket, Shield to Head - Copper
31					Line, Nozzle Fuel Return
	149B958	1			Spec A Only
	149B947	1			Begin Spec B
	149B863		1		No. 1 Cylinder (14-3/8")
	149B864		1		No. 2 Cylinder (10-1/8")
	149B909			1	No. 1 Cylinder (16-7/16")
	149B908			2	No. 2 and 3 Cylinder (12-5/8")
	149B910			1	No. 4 Cylinder (16-7/16")
33	149A950		1		Line, Injection Pump to Fuel Return Lines Tee (Replaces #149A865)
33	149A949			1	Line, Injection Pump to Fuel Return Lines Tee (Replaces #149A907)
34	502-65	1	2		Elbow, Inverted - 45° - Nozzle (Fuel Return Line)
34	502-65			2	Elbow, Inverted - 45° - Nozzle (Fuel Return Line) - Cylinder Nos. 1 and 4
34	502-2			2	Elbow, Inverted - 90° - Nozzle (Fuel Return Line) - Cylinder Nos. 2 and 3
35	502-102		1		Tee, Return Lines
35	502A245			1	Adapter, Return Lines
36	141A281	1	1		Gasket, Air Cleaner Adapter to Engine
37					Adapter, Air Cleaner
	140C576	1			Parts Key No. 1
	140D704	1			Parts Key No. 2, 5
	140D734	1			Parts Key No. 4
	140C576		1		All
37A	505-180	1			Plug, Pipe - 1/4" - Air Cleaner Adapter and Intake Manifold
37A	505-54		1	1	Plug, Pipe - 1/4" - Air Cleaner Adapter and Intake Manifold
37B	520A526			2	Stud, Air Cleaner Adapter Mounting
38	140A584	1	1	1	Gasket, Air Cleaner
39					Hose, Breather
	123A769	1			Spec A Only (Replaces #503A391)
	503A479	1			Begin Spec B (Replaces 123A786)
	503A384		1		Prior to Spec G
	503A462		1		Begin Spec G
	503A328			1	All
40	140C595	1	1	1	Pan, Air Cleaner
41	140B640	1	1	1	Element, Air Cleaner - Foam Type (NOTE: Order also 140B641 Retainer to replace folded paper type used on early models)
41A	140B641	1	1	1	Retainer, Air Cleaner Element (Used with Foam Type Element Only)
42	140C594	1	1	1	Cover, Air Cleaner
43	520A621	2	2	2	Stud, Air Cleaner
44	871-70	2	2	2	Nut, Knurled - Brass - Air Cleaner
45	140A602	2	2	2	Washer, Rubber - Air Cleaner
46					Heater, Manifold - Includes Gasket (12-Volt)
	154P712	1			Parts Key No. 1
	154P712	3			Parts Key No. 2, 5
	154P712	2			Parts Key No. 4
	154P712		1	2	All
47	336A1380	1			Lead, Glow Plug to Air Heater - Round Type Terminal
47	336A1505	1			Lead, Glow Plug to Air Heater - Blade Type Terminal
47	336A1314		1		Lead, Glow Plug to Air Heater - No. 1 Cylinder (10-1/4") - Round Type Terminal
47	336A1504		1		Lead, Glow Plug to Air Heater - No. 1 Cylinder (12-1/4") - Blade Type Terminal
47	336A1313		1		Lead, Glow Plug to Air Heater - No. 2 Cylinder (5-1/4") - Round Type Terminal
47	336A1505		1		Lead, Glow Plug to Air Heater - No. 2 Cylinder (5-1/4") - Blade Type Terminal

PARTS LIST

REF. NO.	PART NO.	QUANT. USED			DESCRIPTION
		A	B	C	
FIG. J - FUEL SYSTEM GROUP (Cont.)					
47	336A1314			1	Lead, Glow Plug to Air Heater - No. 1 Cylinder (10-1/4") - Round Type Terminal
47	336A1313			2	Lead, Glow Plug to Air Heater - No. 2 and 3 Cylinder (5-1/4") - Round Type Terminal
47	336A1505			2	Lead, Glow Plug to Air Heater - No. 2 and 3 Cylinder (5-1/4") - Blade Type Terminal
47	336A1333			1	Lead, Glow Plug to Air Heater - No. 4 Cylinder (18") Round Type Terminal
47	336A1504			2	Lead, Glow Plug to Air Heater - No. 1 and 4 Cylinder (12-1/4") - Blade Type Terminal
48	336A1418	1			Lead, Air Heater to Solenoid in Control
48	336A1346		1		Lead, Air Heater to Solenoid in Control
48	336A1331			1	Lead, Air Heater to Solenoid in Control
49	147B133	1			Adapter, Injection Nozzle
49	147B133		1		Adapter, Injection Nozzle - No. 1 Cylinder
49	147B133			2	Adapter, Injection Nozzle - No. 1 and 3 Cylinders
49	147B132		1		Adapter, Injection Nozzle - No. 2 Cylinder
49	147B132			2	Adapter, Injection Nozzle - No. 2 and 4 Cylinders
50	154D840			1	Manifold, Intake
51	154A733			2	Gasket, Intake Manifold
52	415A126	1	1		Tank, Fuel - 5-Gallon
53	504A16	1	1		Valve, Shut-Off - Fuel Tank
54	501A10	1	1		Line, Fuel - Tank to Pump - Replaces 501A9
54	501A104	1	1		Line, Fuel Tank Return - Replaces 501A27
55	415B124	1	1		Cap, Rain (with provision for fuel return line)
56	140A706	1		1	Gasket, Manifold Heater Insulating - Parts Key Nos. 2, 4, 5, 7
57	140A705	1		1	Plate, Manifold Heater Mounting - Parts Key Nos. 2, 4, 5, 7
58	508A103	2		2	Sleeve, Insulating - Manifold Heater Mounting - Parts Key Nos. 2, 4, 5, 7
58A	508A102	2			Washer, Insulating Mica - Manifold Heater Mtg. - Parts Key Nos. 2, 4, 5, 7
59	114A23	2		2	Screw, Cap - 1/4-20 x 1-1/4" - Manifold Heater Mtg. - Parts Key Nos. 2, 4, 5, 7
60	123A732			1	Tube, Nylon - Breather Hose to Manifold
61	505-180			1	Plug, Intake Manifold
63	149-769	1	1	1	Plug, Air Bleed - Secondary Filter
64					Lead, Jumper - Air Heater
	336A1051	1			Parts Key No. 2, 5
	336A1408	1			Parts Key No. 4
65	332A829			1	Strap, Jumper - Air Heater
66	503A171	2	2	2	Clamp, Breather Hose (Replaces 503A446)
67	140K677	1	1	1	*Conversion Kit, Oil Bath Air Cleaner (Optional - Includes Parts Marked ▲ Plus Hardware
68	140B500	1	1	1	▲Cleaner, Air - Oil Bath
69	140B519	1	1	1	▲Band, Air Cleaner
70	503P365	2	2	2	▲Clamp, Air Cleaner Hose
71	503A444	1	1	1	▲Hose, Air Cleaner to Adapter
72	140C645	1	1	1	▲Adapter, Oil Bath Air Cleaner
▲ - Included in OPTIONAL #140K677 Oil Bath Air Cleaner Conversion Kit. * - Not applicable to 4-cylinder (DJC) Housed Plants.					
FIG. K - MANIFOLD AND EXHAUST GROUP					
1	154C704	1			Manifold, Exhaust - Prior to Spec C
1	154C725	1			Manifold, Exhaust - Begin Spec C (Note: Use 154C704 on Contractors Model and models with shutters or air duct)
1	154C633	1			Manifold, Exhaust
1	154D714			1	Manifold, Exhaust
2	154A463	1	2	4	Gasket, Exhaust Manifold
3	155B492	1	1		Tube, Exhaust - Flexible - 36" - With 1-1/4" Pipe Thread
3	155B849		1		Tube, Exhaust - Flexible (Housed Plants Only) - 10-1/4" with 1-1/4" Pipe Thread
3	155B493			1	Tube, Exhaust - Flexible
3	155A841			1	Tube, Exhaust - Flexible (Housed Plants Only) - 9-3/4" with 1-1/2" Pipe Thread
4	505-177	1			Nipple, Pipe Close - Exhaust
5	505-36	1	1		Coupling, Pipe Reducer (1-1/2" x 1-1/4") - Exhaust
5A	505-32			1	Coupling, Pipe (1-1/2") - Exhaust

PARTS LIST

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REF. NO.	PART NO.	QUANT. USED			DESCRIPTION
		A	B	C	
FIG. K - MANIFOLD AND EXHAUST GROUP (Cont.)					
6	155B330	1	1		Muffler, Exhaust - 1-1/4" Pipe Inlet
6	155B456		1		Muffler, Exhaust (Housed Plants Only) - 1-1/2" Pipe Inlet
6	155B456			1	Muffler, Exhaust - 1-1/2" Pipe Inlet
7	155A782			1	Flange, Exhaust
8	154A738			1	Gasket, Exhaust Outlet
9	505-43		1	2	Elbow, Pipe (1-1/2") - Exhaust (Housed Plants Only)
9	505-183		1		Elbow, Pipe Reducer (1-1/2" to 1-1/4") - Exhaust (Housed Plants Only)
FIG. L - AUTOMOTIVE STARTER GROUP					
NOTE: Used on plants with Parts Key Nos. 6 and 7.					
1	191C324		1	1	*Motor, Starter - 12-Volt
2	191C512		1	1	Flange, Starter Mounting (Replaces 191C310)
3	191A311		1	1	Spacer, Starter Flange
4	191A365		1	1	Bracket, Starter Support
5	800-24		1		Capscrew Battery Cable Ground (Replaces 520A624)
5	520A624			1	Stud, Battery Cable Ground
6	338B255		1		Harness, Wiring - Starter to Control
6	338B265			1	Harness, Wiring - Starter to Control
7	416A77		2		Cable, Battery - Unhoused Plants (Replaces 416A21)
7	416A27			2	Cable, Battery - Unhoused Plants
7	416A50		2		Cable, Battery - Housed Plants
7	416A37			2	Cable, Battery - Housed Plants
8	416A4		1	1	Cable, Battery Jumper
	191-432		1	1	Clutch, Starter
	191-433		1	1	Switch, Start Solenoid
	191-434		1	1	Brush Set, Starter
*- Check Starter nameplate and order components not listed from your nearest dealer.					
FIG. M - ANTI-FLICKER GROUP					
NOTE: Used on plants with Parts Key Nos. 1 and 2.					
1	166B316	1			Point Set, Anti-Flicker
2	160A800	1			Plunger, Breaker
3	160A799	1			Guide, Breaker Plunger
4	160A263	1			Diaphragm, Breaker Plunger
5	509-91	1			Seal, "O" Ring
6	160B796	1			Cover, Anti-Flicker
7	312A57	1			Condenser - 1. Mfd. (mounts in control box, also listed in Control Group)
FIG. N- START-DISCONNECT PLANT & STOP SOLENOID GROUP					
1	191A496		1	1	Plate - Start-Disconnect Switch
2	309A134		1	1	Switch Assembly, Start-Disconnect
3	309A152		1	1	Plunger, Switch
4	160A263		1	1	Diaphragm, Switch Plunger
5	160A720		1	1	Spacer, Start-Disconnect Switch plate
6	160A721		1	1	Gasket, Start-Disconnect Plate
7	191B392		1	1	Cover, Start-Disconnect Switch Plate
8	191B388		1	1	Control Assembly, Start-Disconnect Switch
9	160A711		2	2	Spring, Weight - Included in Switch Control Assembly
10	160A806		1	1	Disc, Thrust Plunger
11	160A774		1	1	Plunger, Thrust
12	160A773		1	1	Spring, Thrust Plunger
13					Solenoid, Stopping and Decompression Release
	307B628	1			Parts Key Nos. 1 (12-Volt)
	307B680	1			Parts Key Nos. 2, 5 (32-Volt)
	307B668	1			Parts Key No. 4 (24-Volt)
	307B628		1	1	All
14	306A162		1	1	Retainer, Solenoid Plunger
15	306A161		1	1	Spring, Solenoid Plunger
16	306A159		1	1	Plunger, Solenoid
17	518-203		1	1	Ring, Snap - Spring Retaining
18	336A706		1	1	Lead, Solenoid Ground
19	338B258		1		Harness, Wiring - Switch Plate to Control
19	338B264			1	Harness, Wiring - Switch Plate to Control
20	306A167	1			Plunger, Solenoid - Includes Pin

PARTS LIST

REF. NO.	PART NO.	QUANT. USED			DESCRIPTION
		A	B	C	
FIG. N - START-DISCONNECT PLATE & STOP SOLENOID GROUP (Cont.)					
21	306A166	1			Spring, Solenoid Plunger
22	509P103	1			Seal, "O" Ring - Stop Solenoid (Replaces #509P18)
23	307A736	1			Gasket, Solenoid Mounting
24	337A51	1			Strap, Ground - Solenoid to Engine
25	336A1347		1		Lead, Solenoid to Control
26	306B158			1	Bracket, Solenoid
FIG. O - AIR HOUSING AND OPTIONAL AIR SHUTTER GROUP					
1	134D1050	1			Housing, Blower
1	134D1087		1		Housing, Blower
1	134D1447			1	Housing, Blower
2	134D1048	1	1		Housing, Cylinder Air - Front (Flywheel End)
2	134C1449			1	Housing, Cylinder Air - Front (Flywheel End)
3	134C1127	1			Housing, Cylinder Air - Rear
3	134C1051		1	1	Housing, Cylinder Air - Rear
4	134D1102	1			Pan, Cylinder Air, Housing (Bottom)
4	134D1419		1		Pan, Cylinder Air Housing (Bottom) (Replaces #134D1037)
4	134D1418			1	Pan, Cylinder Air Housing (Bottom)
5	134C1130	1			Cover, Nozzle and Housing
5	134C1125		1		Cover, Nozzle and Housing
5	134D1200			1	Cover, Nozzle and Housing
5B	134B1131	1			Cover, Housing - Plain
6	134D1117	1			Panel, Air Housing Door
6	134D1039		1		Panel, Air Housing Door
6	134D1202			1	Panel, Air Housing Door
7	134A1554	1	1		Bracket, Air Housing Door Panel (Replaces 134A1082)
7	134A1089			2	Bracket, Air Housing Door Panel
8	800-4	4	4	4	Screw, Hex Cap - Top Cover - Replaces #134A1179 Knurled Screw used on early models)
8	134A1373	1	1	2	Screw, Fastener - Door Panel (Replaces 134A1179)
9	134A1180	2	2	4	Washer, Fastener Screw Retainer - Door Panel (Also 8 used on top cover on earlier models)
10	870P194	5	5	6	Nut,Tinnerman.- Fastener Screw - Door Panel and Cover
11	134B1085	1			Support, Blower Housing and Grille
11	134B1088		1	1	Support, Blower Housing and Grille
12	134D1178	1	1	1	Grille and Plate
13	134A1092	3	3	3	Retainer, Grille
14	134B1097			1	Baffle, Center Cylinder - (Injection Pump Side)
15	134B1098			1	Baffle, Center Cylinder - (Opposite Pump Side)
16					Grommet, Rubber - Housing -
	508A5	1	2	2	For 9/16" Hole
	508P21	3			For 3/4" Hole
17	134D1253	1			Shutter Assembly - Air Discharge (OPTIONAL) - Includes parts marked †
17	134D1249		1		Shutter Assembly - Air Discharge (OPTIONAL) - Includes parts marked †
17	134D1234			1	Shutter Assembly - Air Discharge (OPTIONAL) - Includes parts marked †
18	134D1254	1			†Duct Assembly, Air Outlet
18	134D1250		1		†Duct Assembly, Air Outlet
18	134D1235			1	†Duct Assembly, Air Outlet
19	134A1242	3	3	3	†Bracket and Pivot Assembly, Shutter
20	134B1238	1	1	1	†Bracket Shaft and Pin Assembly, Shutter
21	134B1256	2			†Shutter, Air Outlet
21	134B1252		2		Shutter, Air Outlet
21	134B1237			2	Shutter, Air Outlet
22	150A998	1	1	1	†Joint, Ball (Replaces 150A998)
23	134A1247	1	1	1	†Rod, Shutter Control
24	309P162	1	1	1	†Switch, Hi-Temperature Cut-Off
25	134P1248	4	4	4	†Bearing, Air Shutter
26	134A1244	1	1	1	†Bracket and Guide Assembly, Vernatherm
27	134A656	1	1	1	†Spring, Vernatherm Element
28	309A85	1	1	1	†Element, Vernatherm
29	134A658	1	1	1	†Spring, Shutter Return
30	518-4	1	1	1	†Clip, Rod End (Replaces 518-6)
31	134A1437	2	2	2	†Spring, Shutter Pivot
32	134A1375			1	†Plate, Exhaust Outlet Cover

† - Parts Included in OPTIONAL Discharge Shutter Assembly.

PARTS LIST

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REF. NO.	PART NO.	QUANT. USED			DESCRIPTION
		A	B	C	
					FIG. P - HOUSING GROUP - HOUSED AC PLANTS (Optional Equip.)
					NOTE: 4 possible options exist: (1) Housing, (2) Housing plus Meter Panel (3) Housing plus Shutters, (4) Housing plus Meter Panel and Shutters.
1	403B661			1	Base, Skid
1	403A679	1			Base, Skid
2	405B1323	1	1		Panel, Front - Upper (Engine End)
3	405B1333	1	1		Panel, Front - Lower (Engine End)
4					Panel, Rear (Generator End) -
	405B1322	1	1		Plants WITHOUT Meter Panel
	405C1331	1	1		Plants WITH Meter Panel
5					Panel, Door - Rear End -
	405B1329	1	1		Plants WITHOUT Meter Panel
	405B1332	1	1		Plants WITH Meter Panel
6	405B1330	1	1		Panel, Generator Access
7	405B1326			1	Panel, Top
7	405B1348	1			Panel, Top
8	405B1342			1	Panel, Side - Right Hand - (Plants Without Shutters)
8	405B1347	1			Panel, Side - Right Hand - (Plants Without Shutters)
8	405B1352			1	Panel, Side - Right Hand - (Plants With Shutters)
8	405B1355	1			Panel, Side - Right Hand - (Plants With Shutters)
9	405B1325			1	Panel, Side - Left Hand (Fuel Pump) Side
9	405B1346	1			Panel, Side - Left Hand (Fuel Pump) Side
10	405B1327			1	Rail, Stiffener - Right Hand Side
10	405B1344	1			Rail, Stiffener - Right Hand Side
11	405B1328			1	Rail, Stiffener - Left Hand (Fuel Pump) Side
11	405B1345	1			Rail, Stiffener - Left Hand (Fuel Pump) Side
12	405A1341	2	2		Bracket, Stiffener Rail
13	416A501	2	2		Bracket, Battery Support
14	416B502	1	1		Frame, Battery Hold-down
15	406-2	1	1		Knob, Rear End Door Panel
16	406A105	2	2		Fastener, Housing Hold-down
17	405A1138	2	2		Pin, Shoulder - Rear End Panel
18	405B1139	2	2		Spring, Shoulder Pin - Rear End Panel
19	526-115	2	2		Washer, Shoulder Pin - Rear End Panel (Replaces 526-22)
20	516-39	2	2		Pin, Cotter - Shoulder Pin
21	520A490	2	2		Stud, Battery Hold-down
22	134D1235			1	Duct, Exhaust Manifold (Plants Without Shutters)
22	134D1250	1			Duct, Exhaust Manifold (Plants Without Shutters)
22	134D1234			1	Duct, Exhaust Manifold (Plants With Shutters)
22	134D1249	1			Duct, Exhaust Manifold (Plants With Shutters)
23	405A1181	2	2		Stop, Door
24					Cushion, Vibration - Tubular Type - Upper
	402A36	4			Prior to Spec H
	402A36			4	Spec A Only
25					Cushion, Vibration - Tubular Type - Lower
	402A278	2			Engine End - Prior to Spec H
	402A38			2	Engine End - Spec A Only
	402A276	2			Generator End - Prior to Spec H
	402A251			2	Generator End - Spec A Only
26					Bushing, Spacer - Vibration Cushion
	402A46	4			Prior to Spec H
	402A290	4			Begin Spec H
	402A46			4	Spec A Only
	402A290			4	Begin Spec B
27	503A423	1	1		Hose, Flexible - Generator Air Duct
28	336A476	1	1		Strap, Ground - Engine to Frame
29	895P104	1	1		Stripping, Foam Weather (76" amount required for housing) - Must be cemented in place.
30	140B631	2	2		Band, Muffler Mounting
31					Cushion, Vibration - Cone Shaped (Tapered)
	402A284	2			Engine End - Begin Spec H
	402A285	2			Generator End - Begin Spec H
	402A285			2	Engine End - Begin Spec B
	402A287			2	Generator End - Begin Spec B
32	526-14	4	4		Washer, Flat (29/64" I.D. x 1-1/2" O.D. x 1/8") - Used only with Cone Shaped Cushions
33	526A195	4	4		Washer, Flat (29/64" I.D. x 3-1/4" O.D. x 1/8") - Used only with Cone Shaped Cushions

PARTS LIST

REF. NO.	PART NO.	QUANT. USED			DESCRIPTION
		A	B	C	
					FIG. P - HOUSING GROUP - HOUSED AC PLANTS (Optional Equip) (Cont.)
34	526-198		As Req		Washer, Flat (5/8" I.D. x 1-1/2" O.D. x 1/16) - Used only with Cone Shaped Cushions
35	402A282		4		Snubber, Shock Mounting
	402A282			4	Prior to Spec H Begin Spec B
					FIG. Q - MOUNTED FUEL TANK GROUP - HOUSED MODELS ONLY (Optional Equipment)
					NOTE: For DJC Plants Only Parts Key No. 7.
1	159D788			1	Tank, Fuel - 15 Gallon
2	159A786			2	Strap, Fuel Tank Mounting
3	159B789			2	Bracket, Fuel Tank Support
4	159A787			2	Strap, Fuel Tank Hold-down
5	159B512			1	Cap and Indicator, Fuel
6	504P4			1	Valve, Fuel Shut-Off
7	501A5			1	Line, Flex Fuel - 18-1/2"
7	501B10			1	Line, Flex Fuel - 42"
9	307P565			1	Valve, Fuel Solenoid - 12-Volt
10	332-50			2	Clip, Tinnerman - Fuel Line
11	159-751			1	Gasket, Fuel Tank Cap
					FIG. R - GENERATOR GROUP (Revolving Armature Type)
1	231E100	1			Adapter, Generator to Engine -
	231E113	1			Prior to Spec C Begin Spec C
2	205C65	1			Blower, Generator
3	515-6	1			Key, Blower to Crankshaft
4					Armature Assembly - Includes Bearing and Blower - Parts Key No. 1
	201-1202	1			For 120-Volt, 50-Cycle
	201A1159	1			For 240-Volt, 50-Cycle, 1-Phase
	201-1214	1			For 120/240-Volt, 50-Cycle
	201A1160	1			For 240-Volt, 50-Cycle, 3-Phase
	201A1116	1			For 120-Volt, 60-Cycle
	201A1207	1			For 240-Volt, 60-Cycle, 1-Phase
	201-1178	1			For 120/240-Volt, 60-Cycle
	★	1			For 240-Volt, 60-Cycle, 3-Phase
	201-1223	1			Parts Key No. 2
	201A1206	1			For 50-Cycle
	201-1192	1			For 60-Cycle
	201-1216	1			Parts Key No. 4
5	510A47	1			Parts Key No. 5
6	232A596	1			Bearing, Ball - Armature
7					Clip, Bearing Stop
	210D348	1			Frame Only - Less Coils and Poleshoes -
	210D362	1			Parts Key Nos. 1, 2
8					Parts Key Nos. 4, 5
	221A91	4			Shoe, Pole - Field -
	221B126	4			Parts Key Nos. 1, 2
8A	221A129	2			Parts Key Nos. 4, 5
9					Shoe, Pole - Interpole - Parts Key Nos. 4, 5
	222A1593	1			Coil Assembly, Field - Set of 4 Coils -
	222-1610	1			Parts Key No. 1
	222-1608	1			Parts Key No. 2
	222-1613	1			Parts Key No. 4
9A					Parts Key No. 5
	222-1607				Coil Assembly, Interpole - Set of 2 Coils -
	222-1614				Parts Key No. 4
10					Parts Key No. 5
					Rig Assembly, Brush -
	212C294	1			Parts Key No. 1
	212C296	1			120-Volt and 240-Volt, 1-Phase (Replaces 212C225)
					120/240-Volt (Replaces 212C283)

★ - Order by description giving complete Model and Serial Number.

PARTS LIST

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REF. NO.	PART NO.	QUANT. USED			DESCRIPTION
		A	B	C	
					FIG. R - GENERATOR GROUP (Revolving Armature Type) Cont.
10					Rig Assembly, Brush - (Cont.)
	212C297	1			Parts Key No. 1
	212C301	1			240-Volt, 3-Phase (Replaces 212C235)
	212C116	1			Parts Key No. 2 (Replaces 212C269)
	212C244	1			Parts Key No. 4
					Parts Key No. 5
11	212B1105	8			Spring, Brush -
11	212B1106	4			120-Volt, 240-V (1-Ph.) & 120AC/32DC-V - Key Nos. 1, 2 - AC & DC
11	212B1105	7			Parts Key No. 5 - Commutator (DC)
12	212A1003	4			120/240-V (1-Ph.) & 240-V (3-Ph.) AC & DC - Key # 1 - Begin Spec D
12	212A1004	3			120/240-V (1-Ph.) & 240-V (3-Ph.) - DC - Key # 1 - Prior to Spec D
12	212A1011	4			120/240-V (1-Ph.) & 240-V (3-Ph.) - AC - Key # 1 - Prior to Spec D
13					Parts Key No. 4 - Commutator (DC)
					Brush, Commutator (DC) -
	214A61	4			Parts Key No. 1
	214A81	4			120-Volt and 240-Volt, 1-Phase (Replaces #214A80)
	214A61	4			120/240-Volt, 1-Phase (Replaces #214A30) - Prior to Spec D
	214A30	4			120/240-Volt, 1-Phase - Begin Spec D
	214A61	4			240-Volt (3-Phase) - Prior to Spec D
	214A9	4			240-Volt (3-Phase) - Begin Spec D
	214A83	4			Parts Key No. 2 - Prior to Spec D
	214A18	4			Parts Key No. 2 - Begin Spec D
	214A68	4			Parts Key No. 4
14					Parts Key No. 5
					Brush, Collector Ring (AC) -
	214A50	4			Parts Key No. 1
	214A79	3			120-Volt and 240-Volt (1-Phase)
	214A50	3			120/240-Volt (1-Phase) - Prior to Spec D
	214A32	3			120/240-Volt (1-Phase) - Begin Spec D
	214A50	3			240-Volt (3-Phase) - Prior to Spec D
	214A50	4			240-Volt (3-Phase) - Begin Spec D
15					Parts Key No. 2
					Bell, End
	211D97	1			Parts Key No. 1
	211D98	1			For 120-Volt and 240-Volt (1-Phase)
	211D97	1			For 120/240-Volt (1-Phase) and 240-Volt (3-Phase)
16	520A502	2			Parts Key Nos. 2, 4, 5
17					Stud, Generator Through
					Stud, Armature Through
	520A491	1			Parts Key No. 1
	520A525	1			For 120-Volt and 240-Volt (1-Phase)
	520A491	1			For 120/240-Volt (1-Phase) and 240-Volt (3-Phase)
18	232C1256	1			Parts Key No. 2, 4, 5
19					Baffle, Generator Air
					Band, End Bell
	234B2	1			Parts Key No. 1
	234B5	1			For 120-Volt and 240-Volt (1-Phase)
	234B2	1			For 120/240 - Volt (1-Phase) and 240-Volt (3-Phase)
20	211C99	1			Parts Key No. 2, 4, 5
21					Cover, End Bell
					Condenser
	312A58	1			Parts Key No. 1 (AC)
	312A58	2			AC - .1 Mfd - For 120-Volt and 240-Volt (1-Phase)
	312A58	3			AC - .1 Mfd - For 120/240-Volt (1-Phase)
	312A27	1			AC - .1 Mfd - For 240-Volt (3-Phase)
	312A17	1			DC - .5 Mfd - For 120-Volt, 240-Volt and 120/240-Volt (1-Phase)
					DC - .5 Mfd - For 240-Volt (3-Phase)
	312A58	1			Parts Key No. 2
	312A27	1			AC - .1 Mfd
					DC - .5 Mfd
	312A17	2			Parts Key No. 4
					DC - .5 Mfd
	312A17	1			Parts Key No. 5
	312A27	1			DC - .5 Mfd
					DC - .5 Mfd

PARTS LIST

REF. NO.	PART NO.	QUANT. USED			DESCRIPTION
		A	B	C	
FIG. S - GENERATOR GROUP - ALTERNATOR PORTION (Revolving Field Type)					
1	231E99	1			Adapter, Generator to Engine
	231E111	1			Prior to Spec H
	231E99		1		Begin Spec H
	231E111		1		Spec A Only
	231E111		1		Begin Spec B
2	205C64	1	1		Blower, Generator
3	515 6	1	1		Key, Blower to Crankshaft
4	234B162	1	1		Baffle, Generator Air
5					Rotor Assembly, Wound - Includes Bearing and Blower - Parts Key No. 6
	201A1086	1			Prior to Spec C
	201A1123	1			Begin Spec C
	201A1124		1		Parts Key No. 7
6	510A47	1	1		Bearing, Ball - Rotor
7	232A596	1	1		Clip, Bearing Stop
8	★				Stator Assembly, Wound
9					Bell, End - Alternator to Exciter
	211E146	1			Parts Key No. 6
					For 50-Cycle
					For 60-Cycle
	211E138	1			Unhoused Plants - EXCEPT Plants with Overspeed Switch
	211E146	1			Housed Plants (Also used on Unhoused Plants with Over- speed Switch)
	211E146		1		Parts Key No. 7
10					Stud, Generator Through
	520A637	4			Parts Key No. 6
					For 50-Cycle
					For 60-Cycle
	520A605	4			Unhoused Plants - EXCEPT Plants with Overspeed Switch
	520A637	4			Housed Plants (Also used on Unhoused Plants with Over- speed Switch)
	520A639		4		Parts Key No. 7
11					Stud, Rotor Through
	520A611	1			Parts Key No. 6
	520A614		1		Parts Key No. 7
12	212A1064	2	2		Block, Guide - Collector Ring Brush
13	214A59	4	4		Brush, Collector Ring
14	234B172	1	1		Cover, Air Outlet
15	870-177	1	1		Clip, Fastening - Air Outlet Cover
16	304A500	1	1		Resistor, Topped Adjustable - Mounts in Generator Air Outlet (Also listed in Control Group)
17	232A1565	1	1		Bracket, Resistor Mounting
18	304A6	2	2		Washer, Resistor Centering
19	520A620	1	1		Stud, Resistor Mounting
20	866-1	1	1		Nut, Acorn - Resistor Mounting
21	110A67	1	1		Nut, Rotor Through Stud
22	232-200	1	1		Washer, Rotor Through Stud
23	508-95	1	1		Grommet, Rubber - Air Baffle
FIG. T - GENERATOR GROUP - EXCITER PORTION (Revolving Field Type)					
NOTE: Magneclter Number is given on the Plant Nameplate.					
1					Cover, Exciter
	234C185	1			Parts Key No. 6
					For 50-Cycle
					For 60-Cycle
	234C154	1			*For 04SX1N1A Magneclter
	234C185	1			**For 04SX1N1B Magneclter
	234C185		1		Parts Key No. 7
	234B223	1	1		Housed Plants Only

* - 04SX1N1A used Prior to Spec H on (1) Unhoused Plants, (2) Plants without Overspeed Switch, (3) Except see **.

** - 04SX1N1B used on (1) All Housed Plants, (2) All Plants with Overspeed Switch, (3) All Contractor Models,
(4) Unhoused and Plants without Overspeed Switch Begin Spec H.

PARTS LIST

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REF. NO.	PART NO.	QUANT. USED			DESCRIPTION
		A	B	C	
					FIG. T - GENERATOR GROUP - EXCITER PORTION (Revolving Field Type) (Cont.)
2					Panel Only, Exciter Parts Key No. 6 For 50-Cycle For 60-Cycle
	234C188	1			
	234B153	1			*For 04SX1N1A Magneciter
	234C188	1			**For 04SX1N1B Magneciter
	234C188		1		Parts Key No. 7
3					Reactor, Gate For 50-Cycle For 60-Cycle
	315B104	2	2		
	315A84	2			Prior to Spec C
	315A99	2			Begin Spec C
	315A102		2		For 60-Cycle
4	232A1553	2	2		Gasket, Gate Reactor Mounting - Outer
5	232A1551	2	2		Gasket, Gate Reactor Mounting - Inner
6	232A1552	2	2		Retainer, Gate Reactor
7	520A611	1			*Stud, Gate Reactor Mounting - For 60-Cycle
8					Rectifier Assembly, Resistor and - (Complete) - Parts Key No. 6 For 50-Cycle For 60-Cycle
	305C264	1			
	305C242	1			Prior to Spec C
	305C259	1			Begin Spec C
	305C264		1		Parts Key No. 7
9	305P238	2	2		Rectifier Only Power Field - Negative Stud (Red Lead)
9A	305P239	2	2		Power Field - Positive Stud (Black Lead)
10	305P240	4	4		Voltage Control
11					Resistor For 50-Cycle (150-Ohm, 50-Watt) For 60-Cycle
	304A512	1	1		
	304P476	1			For 60-Cycle (150-Ohm, 50-Watt)
	304A512		1		
12					Block, Terminal Parts Key No. 6 For 50-Cycle For 60-Cycle
	332A745	1			
	332A699	1			*For 04SX1N1A Magneciter (6-Place)
	332A745	1			**For 04SX1N1B Magneciter (7-Place)
	332A745		1		Parts Key No. 7 (7-Place)
13					Strip, Block Marker Parts Key No. 6 For 50-Cycle For 60-Cycle
	332A746	1			
	332A700	1			Prior to Spec C (Marked F2, E1, E2, C1, C2, C3) Begin Spec C
	332A738	1			*For 04SX1N1A Magneciter (Marked F2, E1, E2, 31, 32, 33)
	332A746	1			**For 04SX1N1B Magneciter (Marked F1, F2, E1, E2, 31, 32, 33)
	332A746		1		Parts Key No. 7
14					Resistor Parts Key No. 6 For 50-Cycle - Tapped - 500 Ohm (425 Fixed, 75 Adjustable) 3/4 x 4-1/2"
	304A527	1			
	304A489	1			For 60-Cycle Prior to Spec C - Fixed (200-Ohm, 50-Watt) - 3/4 x 3-1/2"
	304A511	1			Begin Spec C *For 04SX1N1A Magneciter - Tapped - 500-Ohm (425 Fixed, 75 Adjustable) 3/4 x 3-1/2"
	304A527	1			**For 04SX1N1B Magneciter - Tapped - 500 Ohm (425 Fixed, 75 Adjustable) 3/4 x 4-1/2"
	304A527		1		Parts Key No. 7 - Tapped - 500-Ohm (425 Fixed, 75 Adj.) 3/4 x 4-1/2"

* - 04SX1N1A used Prior to Spec H on (1) Unhoused Plants, (2) Plants without Overspeed Switch, (3) Except see **.

** - 04SX1N1B used on (1) All Housed Plants, (2) All Plants with Overspeed Switch, (3) All Contractor Models,
(4) Unhoused and Plants without Overspeed Switch Begin Spec H.

PARTS LIST

REF. NO.	PART NO.	QUANT. USED			DESCRIPTION
		A	B	C	
					FIG. T - GENERATOR GROUP - EXCITER PORTION (Revolving Field Type) (Cont.)
15	304A15	4	4		Washer, Resistor Centering - NOTE: 2 Only used Column B Prior to Spec C
16					Spacer, Resistor Mounting
	232A1474	2			Parts Key No. 6
					For 50-Cycle
	232A1550	2			For 60-Cycle
	232A1474	2			*For 04SX1N1A Magneciter
	232A1474		2		**For 04SX1N1B Magneciter
17					Parts Key No. 7
	315A105	1	1		Reactor, Voltage Control
					For 50-Cycle
	315A85	1			For 60-Cycle
	315A100	1			Prior to Spec C
	315A100		1		Begin Spec C
18	232A1548	2	2		For 60-Cycle
19	307A584	1			Gasket, Voltage Control Reactor Mounting
20					Relay, Field Build-up - For 60-Cycle Prior to Spec C
	520A641	1			Stud or Screw - Resistor Mounting
					For 50-Cycle
	812-116	1			For 60-Cycle
	520A641	1			*For 04SX1N1A Magneciter
	520A641		1		**For 04SX1N1B Magneciter
22	508P8	1	1		For 60-Cycle
23	307A643	1			Grommet, Rubber - For 7/8" Hole
24					Cover, Field Build-up Relay - For 60-Cycle Prior to Spec C
	304A510	1	1		Resistor - Fixed (250-Ohm, 25-Watt) 3/4 x 2"
	304A510	1			For 50-Cycle
	304A510		1		For 60-Cycle Begin Spec C
25					For 60-Cycle
	308A175	1	1		Switch, Residual Reset
					For 50-Cycle
	308A175	1			For 60-Cycle
	308A175		1		**For 04SX1N1B Magneciter
26	526-173	1	1		For 60-Cycle
					Washer, Retainer - Voltage Control Reactor

* - 04SX1N1A used Prior to Spec H on (1) Unhoused Plants, (2) Plants without Overspeed Switch, (3) Except see **.

** - 04SX1N1B used on (1) All Housed Plants, (2) All Plants with Overspeed Switch, (3) All Contractor Models,
(4) Unhoused and Plants without Overspeed Switch Begin Spec H.

FIG. U - CONTROL GROUP					
1	301D2008	1			Box, Control
1	301C1962		1	1	Box, Control
2	301B1963	1	1	1	Cover, Control Box
3					Panel, Control Box -
	301C2009	1			For Parts Key No. 1
	301C2295	1			For Parts Key No. 2
	301C2274	1			For Parts Key No. 4 and 5
	301C1961		1	1	For Parts Key Nos. 6 and 7
4		1			Bracket, Control Box Mounting - One Piece (Order 301C2424, 301A2425, and 301A2426)
4	301C1968		1		Bracket, Control Box Mounting
4A	301B2208			1	Bracket, Control Box Mounting - R.H.
4B	301C2424	1			Bracket, Control Box Mounting
4C	301A2425	1			Bracket, Control Box Mounting - L.H.
4D	301A2426	1			Bracket, Control Box Mounting - R.H.
5	301B1980			1	Bracket, Control Box Mounting - L.H.
6	307B4	1			Relay, Decompression Solenoid Relay
6	307B597		1	1	Relay, Ignition Start
7					Relay, Reverse Current -
	307B180	1			For Parts Key No. 1
	307B496	1			For Parts Key No. 2
	307B7	1			For Parts Key No. 4
	307B361	1			For Parts Key No. 5
8					Solenoid, Manifold Heater and Start -
	307B40	2	2	2	For Parts Key Nos. 1, 6 and 7
	307B61	2	2	2	For Parts Key Nos. 2, 4 and 5

PARTS LIST

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REF. NO.	PART NO.	QUANT. USED			DESCRIPTION
		A	B	C	
					FIG. U - CONTROL GROUP (Cont.)
9	307B623		1	1	Relay, Ignition
12	308P154	1	1	1	Switch, Start Stop
13	308P37	1	1	1	Switch, Manifold Heater
13	308-7	1			Switch, Hi-Low Charge - Parts Key No. 2
14					Ammeter, Charge -
	302A446	1	1	1	Parts Key Nos. 1, 6 and 7 - (5-0-5)
	302-61	1			Parts Key No. 2 - (30-0-30)
	302-64	1			Parts Key No. 4 and 5 (100-0-100)
15	305A235		1	1	Rectifier - 10 Amp - 100 Volt Peak
16	305A254		1	1	Bracket, Rectifier
17	301B2012	1			Cover, Resistor - Parts Key No. 1
18	304A32	1			Resistor, Fixed (15-Ohm, 10-Watt) - Parts Key No. 1
18	304A257	1			Resistor, Fixed (75-Ohm, 25-Watt) - Parts Key No. 2
18	304A11	1			Resistor, Fixed (50-Ohm, 25-Watt) - Parts Key No. 4
18	304A256	1			Resistor, Fixed (75-Ohm, 25-Watt) - Parts Key No. 5
18	304A32		1	1	Resistor, Fixed (15-Ohm, 10-Watt)
18	304A217		1		Resistor, Fixed (1-Ohm, 10-Watt) - Plants WITH Low Oil Pressure Cut-Off Switch - Begin Spec F
18	304A217			1	Resistor, Fixed (1-Ohm, 10-Watt) - Plants WITH Low Oil Pressure Cut-Off Switch
19	304A506	1			Resistor, Adjustable (6-Ohm, 150-Watt) - Parts Key Nos. 1 and 2
19	304A175	1			Resistor, Adjustable (1-Ohm, 50-Watt) - Flicker - Parts Key No. 1
19	304A16	1			Resistor, Adjustable (2.5-Ohm, 50-Watt) - Flicker - Parts Key No. 2
20	332A604	1	1	1	Block, Terminal - 5 Place - Remote Connection - Parts Key Nos. 1, 2, 6 and 7
20A	332A537	1			Block, Terminal - 4 Place - Remote Connection - Parts Key No. 2
20A	332A537	2			Block, Terminal - 4 Place - (1) Remote Connections - (1) Terminal Load - Parts Key Nos. 4 and 5
21	332A609	1			Block, Terminal - 2 Place - Terminal Load - Parts Key No. 1
22	332A706		1	1	Block, Terminal - 8 Place
24	332A616	1	1	1	Strip, Block Marker (Marked B+, 1, 2, 3, H).
25	332A739		1	1	Strip, Block Marker (Marked 4, 5, 6, 7, 8, 9)
25	332A554	1			Strip, Block Marker (Marked F2, 4, 5, 6) - Parts Key Nos. 2, 4 and 5
26	332K750		1	1	Kit, Polarity Marker Strip
28	304A500		1	1	Resistor, Tapped Adjustable (Mounted in Generator Air Outlet)
29	332P52		2		Clip, Tinnerman
30	416A77	2			Cable, Battery - Parts Key Nos. 1 and 2
31	416A4	1			Cable, Battery Jumper
32	304A6	2	2		Washer, Resistor Centering
33	312A57	1			Condenser - 1. Mfd - Anti-Flicker (Also Listed in Anti-Flicker Group) - Parts Key Nos. 1 and 2
34	402-78	4	4	4	Mount, Rubber - Control Box
35	337A52		1	1	Strap, Ground - Control Box to Generator
36	301D1978			1	Box, Output
37	301B856			1	Cover, Output Box
38					Grommet, Rubber -
	508-1	1	1		For 1-1/16" Hole
38	508-9	1	1		For 1-5/16" Hole
39	332A602	1	1		Jumper, Heater Solenoid to Start Solenoid
40	307B614	1			Relay, Latching - Plants WITH Low Oil Pressure Cut-Off Switch Only - Prior to Spec F
41	308-91	1			Switch, Reset - Plants WITH Low Oil Pressure Cut-Off Switch Only - Prior to Spec F
42	305P197	1			Rectifier, Full Wave - Eyelet Connections - Plants WITH Low Oil Pressure Cut-Off Switch Only - Begin Spec F - 120/240-Volt, 120/208-Volt and 220/380-Volt Plants
42	305A235	1			Rectifier, Full Wave - Plants WITH Low Oil Pressure Cut-Off Switch Only 277/480-Volt Plants
42	305P197		1		Rectifier, Full Wave - Eyelet Connections - Plants WITH Low Oil Pressure Cut-Off Switch Only
43	320A104	1			Relay, Emergency - Plants WITH Low Oil Pressure Cut-Off Switch Only - Begin Spec F
43	320A104			1	Relay, Emergency - Plants WITH Low Oil Pressure Cut-Off Switch Only
44	301C2290	1			Box, Rheostat Mounting - Parts Key No. 4 and 5

PARTS LIST

REF. NO.	PART NO.	QUANT. USED			DESCRIPTION
		A	B	C	
					FIG. U - CONTROL GROUP (Cont.)
45	301A2291	1			Panel, Rheostat Box - Parts Key No. 4 and 5
46	301C2129	1			Bracket, Rheostat Box Mounting - Parts Key No. 4 and 5
47					Rheostat
	303-46	1			Parts Key No. 4 (10-Ohm, Model P)
	303-10	1			Parts Key No. 5 (8-Ohm, Model P)
48	303-47	1			Knob, Rheostat - Parts Key Nos. 4 and 5
49	338B313	1			Harness Wiring - Rheostat- Parts Key Nos. 4 and 5
50	416A96			1	Clip, Harness Support
51	338A305		1	1	Harness, Wiring - Plant Control to Start-Stop Switch on Housing End Panel - Housed Plants Only.
					FIG. V - AC METER PANEL GROUP (Housed Models) (Optional Equip.)
1	★			1	Panel, AC Meter
2					Ammeter, AC (Check Ammeter Scale - Select According to Rating) -
	302P418	As Req.			Ammeter Scale Reads 0-30
	302P444	As Req.			Ammeter Scale Reads 0-35
	302P419	As Req.			Ammeter Scale Reads 0-50
	302P458	As Req.			Ammeter Scale Reads 0-80
3					Voltmeter, AC (Check Voltmeter Scale - Select According to Rating) -
	302P421		1		Voltmeter Scale Reads 0-300
	302P422		1		Voltmeter Scale Reads 0-600
4					Breaker, Circuit (Check Original Part - Select According to Amperage and Voltage - 120-Volts is 1 Inch Wide, 480-Volt is 1-1/2 Inch Wide) -
	320B150	As Req.			20 Ampere, 480-Volt
	320B151	As Req.			25 Ampere, 480-Volt
	320B20	As Req.			35 Ampere, 120-Volt
	320B153	As Req.			40 Ampere, 120-Volt
	320B198	As Req.			45 Ampere, 120-Volt
	320B52	As Req.			50 Ampere, 120-Volt
	320B195	As Req.			55 Ampere, 120-Volt
	320B148	As Req.			70 Ampere, 120-Volt
5	308-12			1	Switch, Voltmeter Selector - 3-Phase Models Only
6	303-76			1	Knob, Selector Switch - 3-Phase Models Only
					SERVICE KITS AND MISCELLANEOUS
					NOTE: For other kits, refer to the group for the part in question
	168K85	1			Gasket Kit, Plant
	168K86		1		Gasket Kit, Plant
	168K87			1	Gasket Kit, Plant
	522K200	1			Overhaul Kit
	522K201		1		Overhaul Kit
	522K202			1	Overhaul Kit
	525P137	As Required			Paint, Touch-up Enamel - Green - 16 Ounce Pressurized Can

SPECIAL PARTS SECTION

PARTS LIST

REF. NO.	PART NO.	QUANT. USED			DESCRIPTION
		A	B	C	
					SPECIAL PARTS LIST (Contractors Models)
					3DJA-1E2236/ ... Use Column A
					SPECIAL PARTS SECTION 3DJA-3E2236/ ... Use Column A
					6DJB-3E2236/ ... Use Column B
					NOTE: For parts not listed in this section, refer to the standard parts groups and use Column A, parts key no. 1 for 3DJA-1E2236/ and 3DJA-3E2236/, use Column B, parts key no. 6 for 6DJB-3E2236/. Exception: Overhaul Kits do not apply!
					FIG. GG - OIL SYSTEM GROUP
1	502A53		2		Elbow, Street - 45° - Oil Gage or Oil Pressure Switch Mounting
2	309A105	1			Switch, Oil Pressure - Decompression Release Solenoid Cut-In
3	309A169		1		Switch, Low Oil Pressure Cut-Off
					FIG. JJ - FUEL SYSTEM GROUP
1	502-2	1	1		Elbow, Inverted Male - Fuel Pump Inlet
2	502-20		1		Elbow, Street - Fuel Pump Outlet
2A	502-137	1			Connector, Male - Fuel Pump Outlet
3	501A98	1	1		Line, Fuel Pump to Secondary Filter
4	502-138		1		Elbow, Male - Fuel Pump Outlet
4	502-148	1	1		Elbow, Male - Secondary Filter Inlet
4	502-148	1			Elbow, Male - Secondary Filter Outlet
4	502-41		1		Elbow, Inverted Male - Secondary Filter Outlet
5	501A96	1			Line, Secondary Filter to Injection Pump
5	501A98		1		Line, Secondary Filter to Injection Pump
6	502-148	1	1		Elbow, Male - Injection Pump Inlet
7	149A950		1		Line, Injection Pump to Fuel Return Lines Tee
8A	140P765	1	1		Element Only, Air Cleaner
9	140P722	2	2		Band, Air Cleaner Mounting
10	140P728	1			Bracket, Air Cleaner
10	140B720		1		Bracket, Air Cleaner
11	503P419	1	1		Elbow, Air Cleaner - Rubber
12	503P365	4	4		Clamp, Hose - Air Cleaner
13	140A742	1			Tube, Air Induction
13	140B741		1		Tube, Air Induction
14	140P723	1	1		Pre-Cleaner, Air Cleaner - Plastic
15	140C645	1	1		Adapter, Air Cleaner Hose to Air Cleaner Adapter
16	336A1418		1		Lead, Air Heater to Control
17	503A330	1	1		Hose, Air Cleaner Connector
18	520A11	2	2		Stud, Air Cleaner Adapter Mounting
19	870-137	2	2		Nut, Air Cleaner Adapter Stud Nut
					FIG. KK - MANIFOLD & EXHAUST GROUP
1	155B824	1	1		Muffler, Exhaust
2	505-177	1	1		Nipple, Pipe Close - Exhaust
					FIG. LL - AUTOMOTIVE STARTER GROUP
9	191A506		1		Seal, Dirt (Starter)
10	191A505		1		Cover Plate, Dirt Seal
11	520A662		1		Stud, Starter Mounting

PARTS LIST

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REF. NO.	PART NO.	QUANT. USED			DESCRIPTION
		A	B	C	
					FIG. SS - GENERATOR GROUP - ALTERNATOR PORTION (Revolving Field Type)
1	211E146		1		Bell, End - Alternator to Exciter
2	520A637		4		Stud, Generator Through
					FIG. UU - CONTROL GROUP
1	301C2302	1			Box, Control
2	301B2293	1			Panel, Control Box
2	301C2297		1		Panel, Control Box
3	301B2129	1			Bracket, Control Box Mounting
4	301B2208		1		Bracket, Control Box Mounting - R.H.
5	301B1980		1		Bracket, Control Box Mounting - L.H.
6	308P69	1			Switch, Stop-Run
6	308-2		1		Switch, Ignition
7	305A235	1			Rectifier - 10 Amp - 100 Volt Peak
8	304A44	1			Resistor, Fixed (2.5-Ohm, 50-Watt) 4 x 3/4"
8	304A217		1		Resistor, Fixed (1-Ohm, 10-Watt) 5/16 x 1-3/4"
9					Grommet, Rubber -
	508-8	1			For 7/8" Hole
	508-9	1	1		For 1-5/16" Hole
	508-26	1			For 13/32" Hole
10	332A602	1	1		Jumper, Heater Switch to Start Switch
11	308A28	2	2		Switch, (1) Start (1) Heater
12	320A104		1		Relay, Emergency - Low Oil Pressure Cut-Off Circuit
13					Receptacle, Duplex
	323-184	2			120-Volt, 1-Phase, 2-Wire Model
	323-184	1			120/240-Volt, 1-Phase, 3-Wire Model
	323-213	1			120/240-Volt, 1-Phase, 3-Wire Model
	323-184		2		120/240-Volt, 1-Phase, 4-Wire Reconnectible Model
	323-91		2		Receptacle, Single - 120/240-Volt, 1-Phase, 3-Wire Model
14	301D1978		1		Box, Receptacle
15	301B1170		1		Cover, Receptacle Box

