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ONAN ELECTRIC GENERATING PLANTS DJA SERIES

967-311

1AD66

PERFORMANCE CERTIFIED

We certify that when properly installed and operated this Onan electric plant will deliver the full power and the voltage and frequency regulation promised by its nameplate and published specifications. This plant has undergone several hours of running-in and testing under realistic load conditions, in accordance with procedures certified by an independent testing laboratory.

ONAN

DIVISION of STUDEBAKER CORPORATION
Minneapolis 14, Minnesota

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, EITHER FOR ORDERING PARTS OR MAKING PLANT ADJUSTMENTS.

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

PLEASE!

WHEN FILLING OUT THE FORM, BE SURE YOU HAVE INDICATED THE MODEL AND SPEC NUMBER, AND THE SERIAL NUMBER 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

I 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 _____

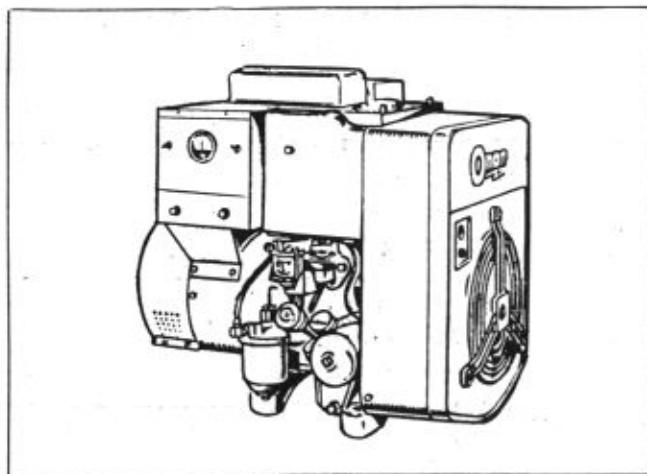
Name _____

St. or R.F.D. _____

City _____ Zone _____ State _____

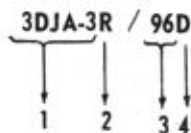
INTRODUCTION

Instructions in this manual may refer to a specific model of generating plant, identify the model by referring to the **MODEL AND SPEC. (specification) NO.** as shown on the plant nameplate. Electrical characteristics are shown on the lower portion of the plant nameplate.



TYPICAL MODEL DJA

How to read MODEL and SPEC. NO.



1. Factory code for general identification.
2. Specific Type:
E - ELECTRIC start type. Electric starting at the plant only.
R - REMOTE type. Electric starting. For permanent installation, can be connected to optional accessory equipment for remote or automatic control of starting and stopping.
3. Factory code for optional equipment.
4. Specification (Spec.) letter (advances when factory makes production modifications).

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 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.

DATED AUGUST 1, 1963

SPECIFICATIONS

205DJA*
3DJA

Nominal dimension of plant (inches)	
Height	26
Width	19
Length	27
Number cylinders (vertical inline)	1
Displacement (cubic inch)	30
Cylinder bore	3-1/4
Piston stroke	3-5/8
RPM (60-cycle)	1,800
RPM (50-cycle)	1,500
RPM (Battery Charger)	1,750
Compression ratio	19:1
Battery voltage (ac plant)	12-V
Battery size	
SAE group 1H	Two in Series
Amp/hr. SAE rating - 20-hr (Nominal)	**105
Starting by exciter cranking generator windings	Yes
Battery charge rate amperes	2-5
Ventilation required (cfm 1,800-rpm)	
Engine (Pressure Cooling)	440
Generator	75
Combustion	9
Output rated at unity power factor load	1-phase
Rating (output in watts)	
*50-cycle AC service	2,500
60-cycle AC service	3,000
24-30-V dc Battery Charger	2,500
32-40-V dc Battery Charger	3,000
AC voltage regulating in %	10
AC frequency regulation in %	5
Revolving armature type generator	Yes
Rotating type exciter	Yes

* 50-cycle model

** Mobile or outdoor operation during ambient temperatures below 0°F, use 120 amp/hr rating.

OPTIONAL EQUIPMENT

1. LOW OIL PRESSURE CUTOFF:

Stops plant if oil pressure fails or becomes excessively low. Requires modified control on plant by adding emergency relay with reset button and resistor.

2. HIGH AIR TEMPERATURE CUTOFF:

Stops plant if temperature of engine discharged air rises too high.

3. AIR SHUTTER:

Thermostatically controlled. Limits air flow when cold to accelerate warm-up. Minimizes cold back drafts when engine is stopped. Always includes high air temperature cut out.

4. DRIP PAN:

Especially suitable for marine applications.

5. SWITCHBOARD:

Contains instruments to measure ac amperes, ac volts, and to break over-loaded ac circuit. For wall mounting.

6. AC RECEPTACLES:

Convenient for plugging in ac loads if needed.

7. OIL BASE HEATER AND THERMOSTAT:

Electric heater aids cold starting.

8. OIL BATH TYPE AIR CLEANER:

This high efficiency air cleaner is recommended for use in extreme dusty dirt, or other severe conditions. Usually mounted separately from the plant for efficient operation and easy service.

9. AUTOMATIC DEMAND CONTROL:

Starts and stops plant automatically.

10. LOAD TRANSFER CONTROL:

Controls running of plant and transfers load.

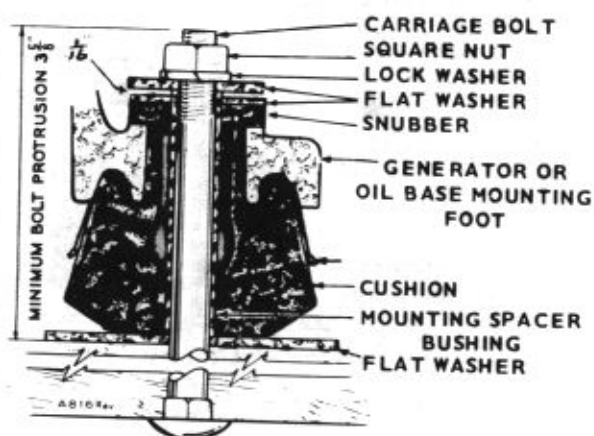
11. SEPARATE FUEL TANK:

Various sizes.

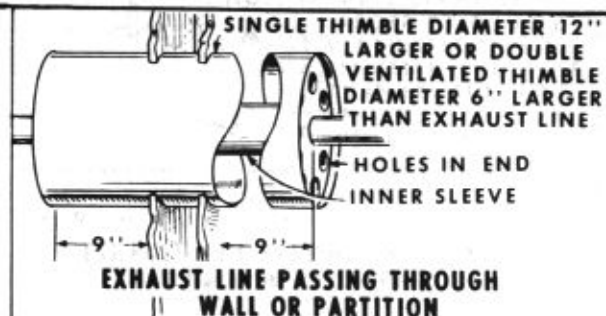
12. OTHER:

There is a series of other optional items that your dealer will discuss with you. Ask about them.

MEMORANDUM



MOUNTING CUSHIONS

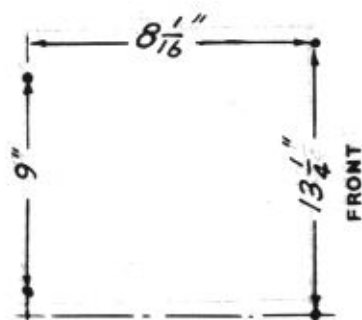


IF EXHAUST LINE MUST BE PITCHED UPWARD CONSTRUCT A TRAP OF PIPE FITTINGS AT POINT OF RISE

[AVOID SHARP BENDS]

← DRAIN CONDENSATION TRAP PERIODICALLY

A617



MOUNTING BOLT LOCATIONS

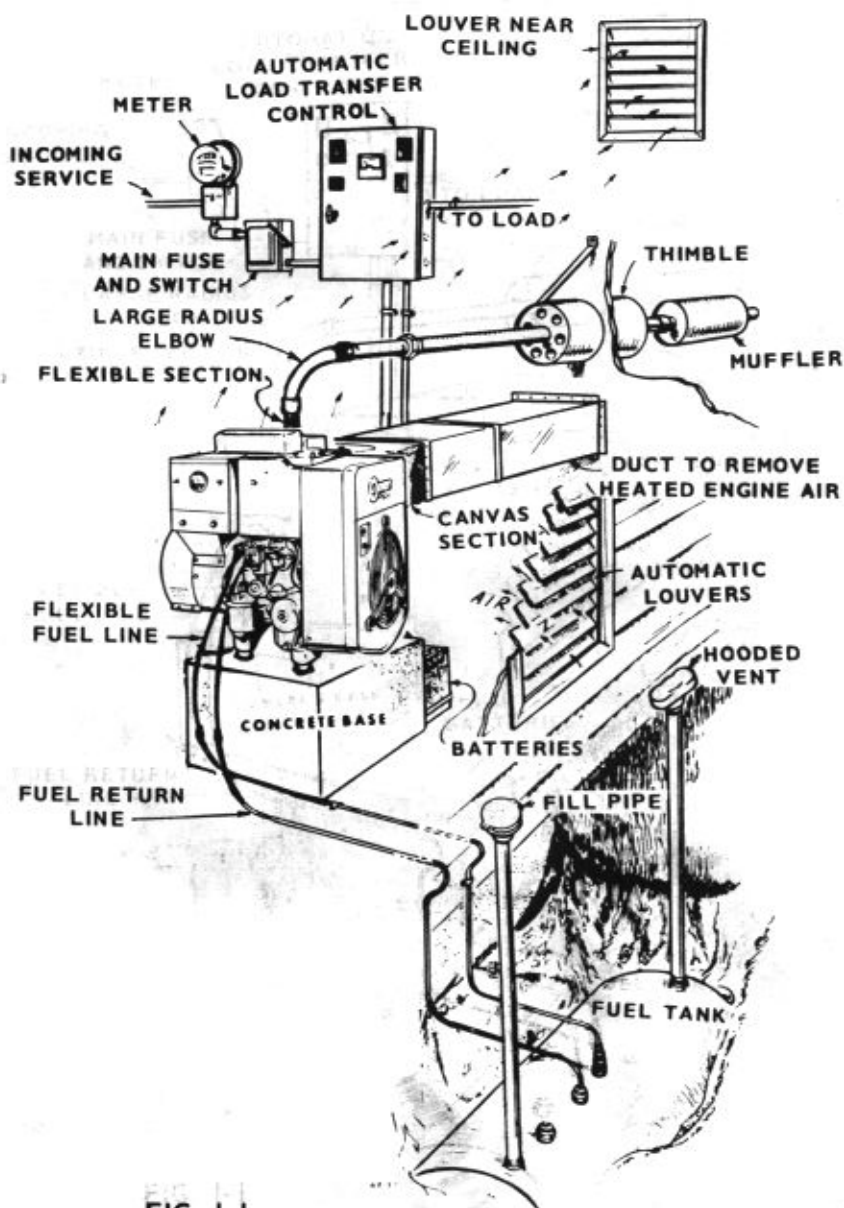


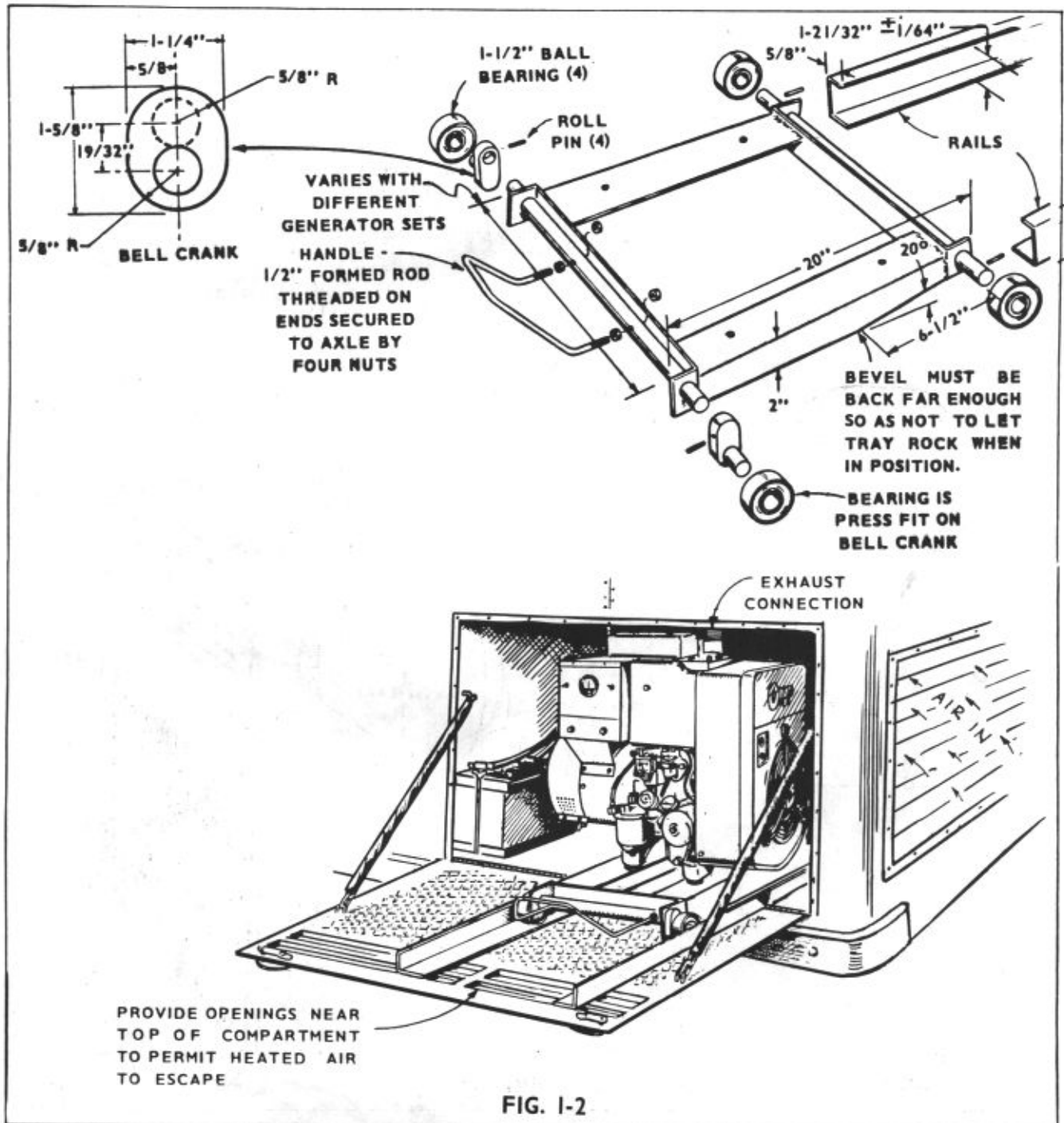
FIG. 1-1

INSTALLATION

GENERAL

Important installation points are: sufficient cooling, exhaust gas discharge, electrical and fuel connections, location and mounting, and protection from road dust and shocks during transit (mobile applications).

Each installation must be considered individually — use these instructions as a general guide. Always check local building codes, fire ordinances, etc., for compliance. Provide a location that is protected from the weather, dry, dust free, and preferably warm in cold weather. The air discharge



side of plant requires only 3" clearance from wall to permit plant to rock on its mounts. At least 24" clearance is required around all other sides for service accessibility.

MOUNTING (See Fig. 1-1)

A permanent type installation needs a sturdy, level, mounting base of concrete, a heavy wood or structural steel at least 12" high to aid oil changing and operating. For mobile applications (trucks or trailers) install slide-out rails or some other means (such as doors) to provide service space. (See Fig. 1-2)

Carefully assemble the mounting cushions, washers and spacer bushing (Fig. 1-1). The spacer bushing prevents compression of the snubber (upper rubber cushion). Space the 7/16" mounting bolts as shown in Fig. 1-1.

Caution: 1/2" clearance is required between oil filter and mounting bolt to avoid puncturing filter.

VENTILATION AND COOLING

Air circulation is needed to dissipate heat produced by the engine and generator in normal operation. *Outdoor* installations can rely on natural circulation, but *mobile, indoor or housed* installations need proper size and positioned vents for required air flow. See specifications for the air requirements at 1800 rpm.

Vent sizes depend on variable conditions: (1) size of enclosure, (2) ambient temperature, (3) electrical load, (4) running time, (5) restrictions imposed by screens, louvers, shutters, or filters, (6) prevailing wind direction.

Remember that a required volume of air must reach the unit, absorb the heat, and be discharged away from the installation.

Pressure cooled units need an inlet vent with an unrestricted opening of at least 3-1/2 sq. ft. for variables. For discharged air, install separate ducts from the engine and generator (see exception) as follows:

1. *The engine discharge duct must be the same size as the engine outlet, 8 x 8". If a screen is used in the duct, increase the duct size in proportion to the restriction. Consider installing the screen diagonally to limit the restriction and increase duct size for runs over 9-feet. If bends are necessary, use large radius elbows. Use a canvas section at the plant to absorb vibration (Fig. 1-1).*

Auxiliary fans can be used to increase air flow to units installed in small, poorly ventilated, rooms. The fan size and location should be such that the air inlet to the engine doesn't exceed 120°F when running at full rated load.

Thermostatically controlled shutters can be used to speed warm up after starting and keep cold air out during shut-down. When the discharged air reaches 120°F, shutters begin to open; at 140°F, the shutters are completely open. Air shutters are equipped with a high temperature cut-off switch that stops the plant if duct temperature reaches 375°F ± 10°. The unit cannot be re-started until the switch temperature drops to 350° ± 10°.

EXHAUST

Pipe *POISONOUS* exhaust gas outside enclosure. Locate exhaust outlet far from air inlet to avoid recirculation. The engine exhaust is tapped for 1-1/2" thread. Use flexible tubing to connect the engine exhaust to rigid pipe or muffler. Shield the line if it passes through a combustible wall (Fig. 1-1). If turns are necessary, use sweeping (large radius) elbows. If pitched upward, install a condensation trap at point of rise. Increase one pipe size for each additional 10-feet in length.

OIL DRAIN

Extend to suit installation. Oil base has a 1/2" pipe tapped hole.

FUEL TANK

If a separate fuel tank is used, install the tank so the bottom is less than 6-feet below the fuel pump. The tank top must be below fuel pump level to prevent siphoning. Install a shut-off valve at the tank. When the fuel tank is shared with another engine, use a separate fuel line for each to avoid starving the plant.

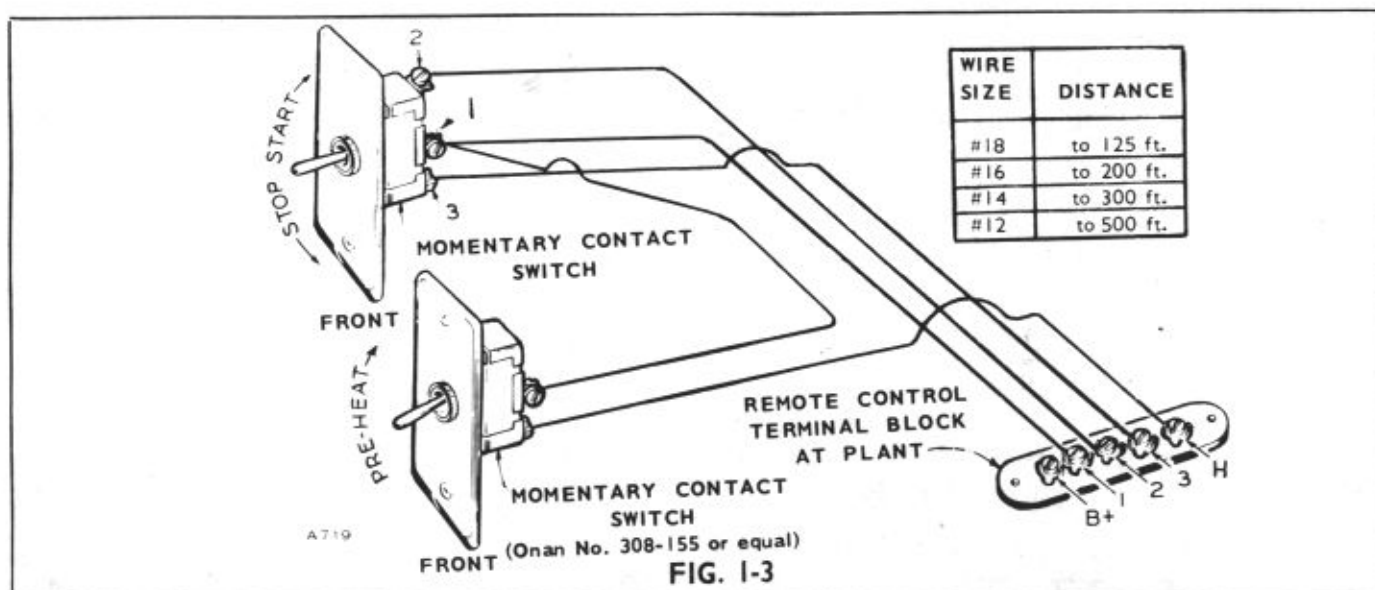
If fuel lift *must* exceed 6-feet, install an auxiliary electric fuel pump at the fuel supply.

FUEL CONNECTION

Connect the fuel line to the fuel pump inlet. Pump is threaded 1/8-27 NPTF (American Standard Internal Tapered Pipe Thread). **Important:** *Always use flexible tubing between engine and the fuel supply.*

The diesel engine requires a fuel supply line and a separate fuel return line. 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. (Fig. 1-1).

Do not use galvanized lines, fittings, or fuel tanks in the fuel system. Carefully clean all fuel system components before putting the plant into operation. Any dirt or contamination may cause major damage to the fuel injection system.



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,
- (2) and the solderless connector located on the generator (on models not so equipped, to the battery ground stud on the engine).

REMOTE START-STOP SWITCH (OPTIONAL)

For remote control starting and stopping, use 3-wires to connect the remote switch (SPDT, momentary contact, center-

off type) to the terminal block marked B+, 1, 2, 3, in the plant control box using wire sizes as listed in Fig. 1-3. Preheat circuit requires an extra wire to terminal H and momentary contact switch (SPST) connection. Remove jumper between terminals 3 and H before installing remote wiring.

BATTERY CONNECTION

Exciter Cranked Plant: Refer to wiring diagram and Fig. 1-4. If battery ground must be changed, reverse the connections to the charge ammeter or re-mark the correct direction of charge. Crank electrically to flash field.

Provide two 6-volt batteries connected in series (one battery's negative to other battery's positive) for a 12-volt source. See Specifications for minimum battery requirements. 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.

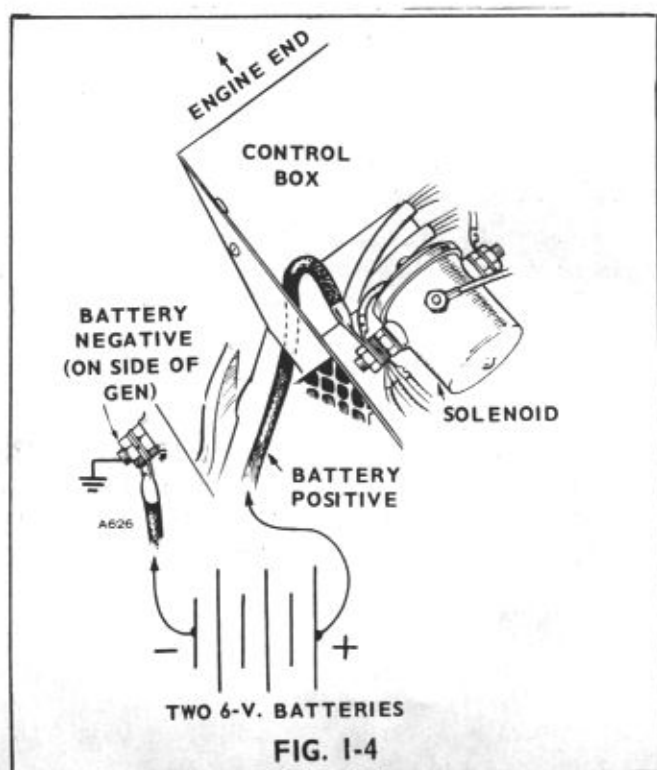
Plants may be equipped for 24-volt cranking and battery charging circuit. Battery connections are similar to 12-volt connections. Provide two 12-volt batteries connected in series (one battery negative to the other battery positive). Be sure all battery connections are secure. Observe correct battery connection polarity (Fig. 1-4).

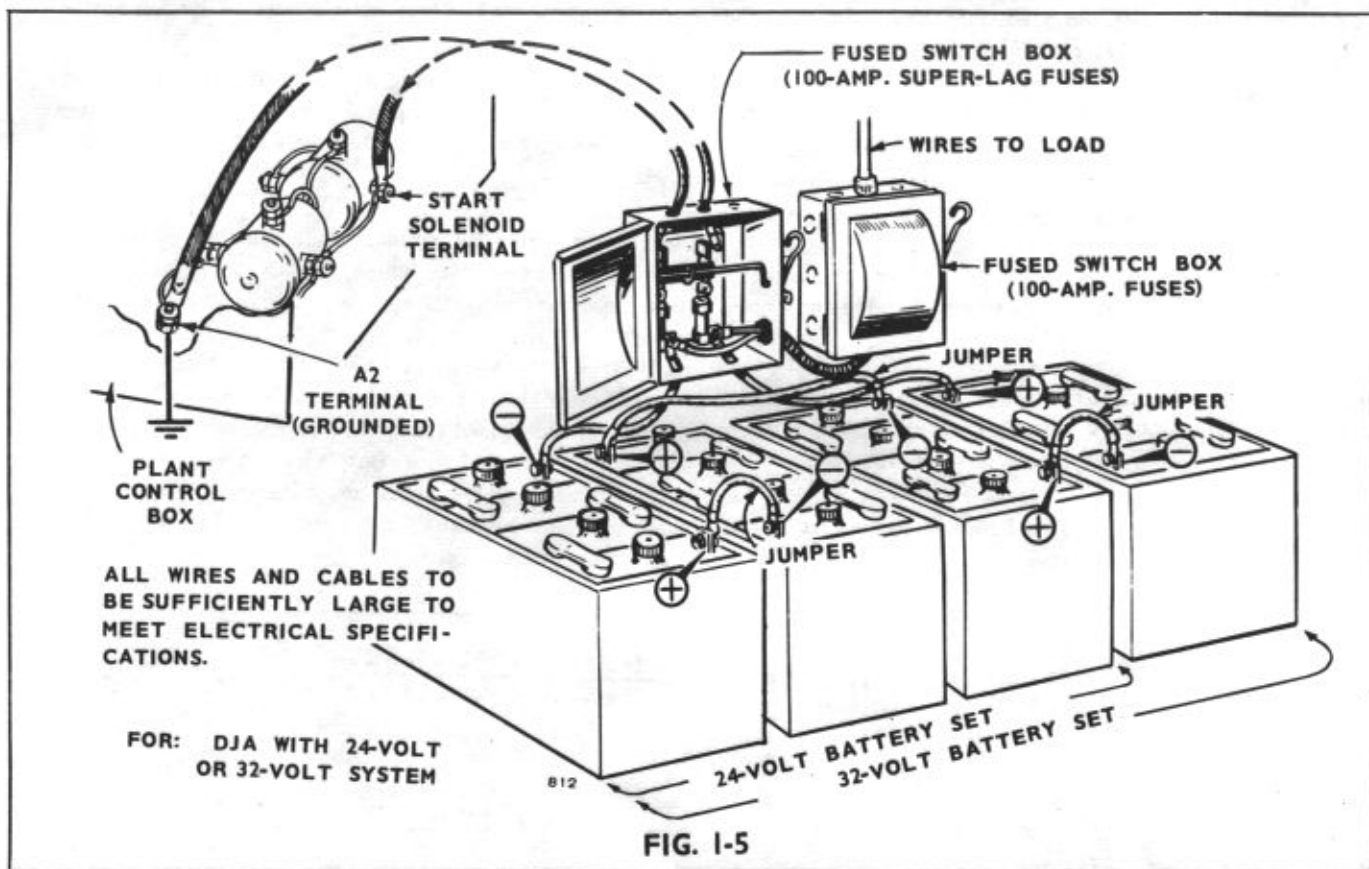
24-volt or 32-volt systems: Refer to wiring diagram and figure 1-5. Dual purpose plants and battery charging plants have a GROUNDED system. Battery ground is negative, reversible in the field. Battery polarity must agree with polarity of other electrical equipment aboard a vessel. If the positive lead 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

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. 1-6 thru 1-8.

Meet all applicable electrical code requirements. Work should be done by a qualified serviceman or electrician because the installation will be inspected and approved.

The plant control box (junction box) has knock out sections to accommodate load wires. Use flexible conduit and stranded load wires near the plant to absorb vibration. Use sufficiently large insulated wires. Strip insulation from wire ends as necessary for clean connections. Connect each load wire to the proper generator output lead inside the plant box. Insulate bare ends of ungrounded wires. Use a bolt (through the control box) to connect the grounded ($\frac{1}{2}$) generator lead and load wire. 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, switch the connections at any two generator terminals.

Standby: If the installation is for standby service, install a double-throw transfer switch (either manual or automatic type) to prevent feeding generator output into the normal power source lines and to also prevent commercial power and generator output from being connected *at the same time to the load*. Instructions for connecting an automatic load transfer switch is included with such equipment. See Fig. 1-1.

Dual Purpose Plant, 120-V. AC/32-V. DC: For connecting the 120-volt ac load, see figure 1-6. For connecting the 32-volt dc load, refer to instructions as given for the 32-volt battery charging plant and figure 1-5.

CAUTION!

A total of 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. 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.

Battery Charging Plants 24-V. and 32-VDC: Connect the main line load circuit 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 must be 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 figure 1-5.

Balancing the Load: Current for any one output lead must not exceed nameplate rating. Serious overloading can damage the generator windings. When two or more single phase circuits are available, divide the load equally between them. 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 3,000-watt, 3-phase, 4-wire plant, if 2,000-watts of 3-phase is used...a remainder of 1,000-watts is available to be equally divided between the three single phase circuits. Thus, only 330-watts would be available on each of the three single phase circuits.

Output Lead Markings: Revolving armature generator leads are marked M1, M2, etc. These identifying marks also appear on the wiring diagram.

Voltage Selection on Reconnectable Single Phase Generators: Models such as DJA-3 (except when optionally equipped with meter panel, circuit breaker, etc.) are reconnectable for use as 120/240-volt 3-wire, 120-volt 2-wire, or 240-volt 2-wire power source (Fig. 1-8). Use the connection for two wire service when one load exceeds 1/2 the rated

capacity. Balance the load when connected for three-wire service.

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.

Switchboard: When an optional wall mounted switchboard containing ammeters, voltmeters, circuit breakers, 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 leads and load wires 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 voltage is correct.

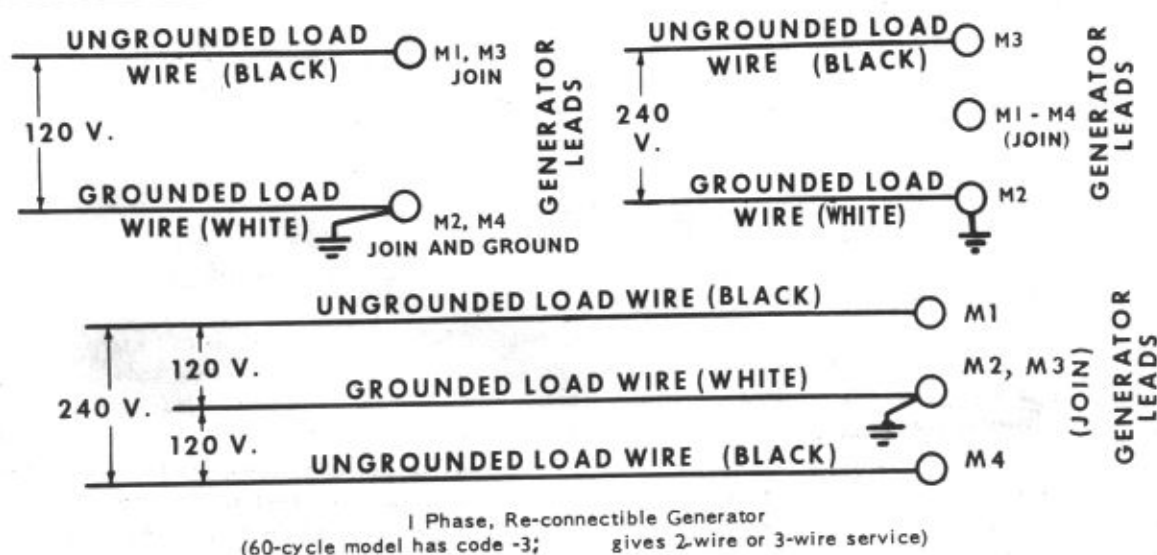
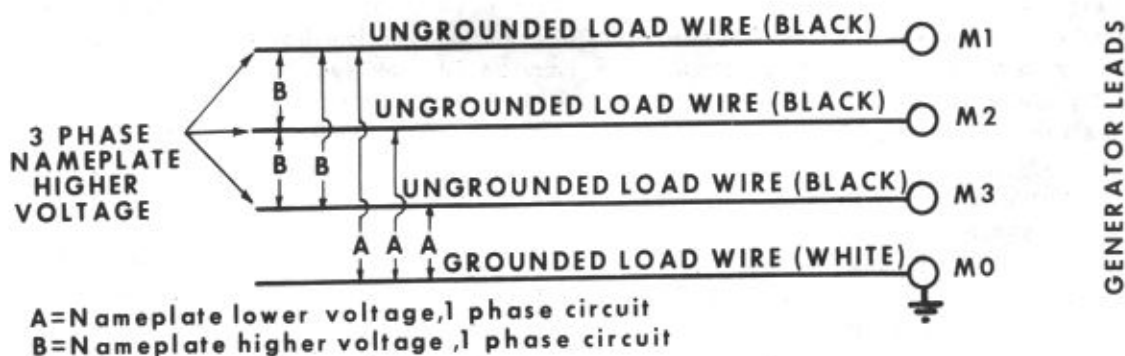


FIG. 1-6



(60-cycle 120/208-volt model has code -4)

Y-Connected

FIG. 1-7

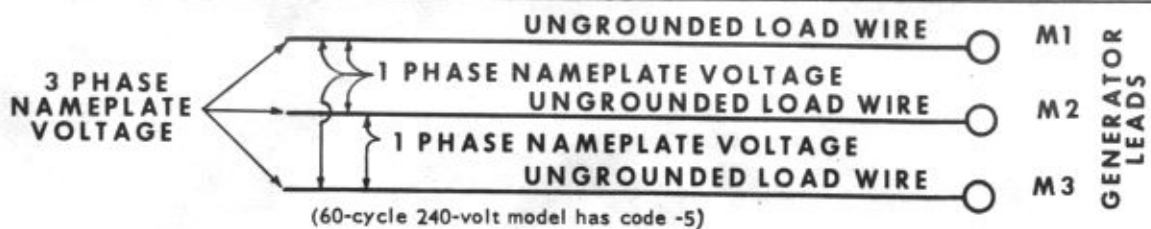


FIG. I-8

OPERATION

CRANKCASE OIL

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.

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

Do not mix brands or grades. Refer to Maintenance Section for recommended oil changes.

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.

INITIAL START

Check the engine to make sure it has been filled with oil and fuel. Cylinder air housing door should be closed.

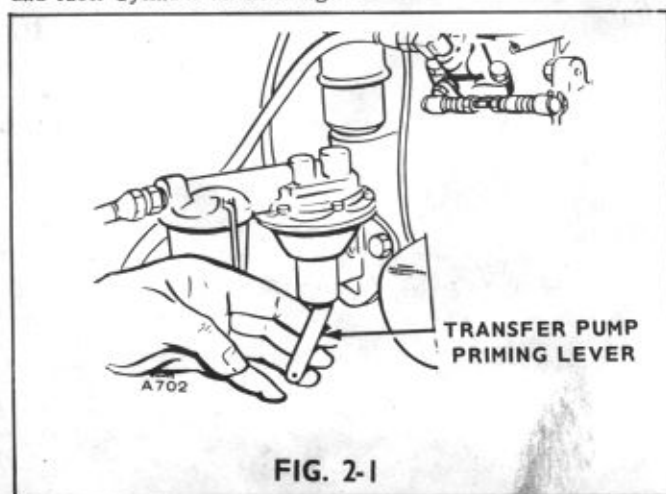


FIG. 2-1

Bleed air from fuel system as follows: Disconnect the fuel return line. See Fig. 2-1. 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.

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.

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 is not adjustable). IMPORTANT: On "contractor" model, depress preheat switch for one minute and then push start switch. Both switches must be engaged for starting.

If the plant control has a re-set button, push it to re-set only after a shutdown resulting from oil pressure failure occurs. Find the cause before re-starting the engine.

The adjustable resistor slide tap (in the charging circuit) is set to give approximately 2-ampere charging rate. For applications requiring frequent starts, check battery specific gravity periodically and, if necessary, increase the charging rate slightly (move slide tap nearer ungrounded lead) until it keeps the battery charged. Adjust only when plant is stopped. Avoid overcharging.

If a separate automatic demand control for starting and stopping is used, adjust the charge rate for its maximum 4.5 amperes. This normally keeps battery charged even if starts occur as often as 15-minutes apart.

Extremes in starting temperatures may require additional preheating. If engine fails to start quickly, rest engine several seconds before successive attempts, apply preheat for a longer interval.

AUTOMATIC STARTING AND STOPPING

Separate controls may be used for automatic start and stop,

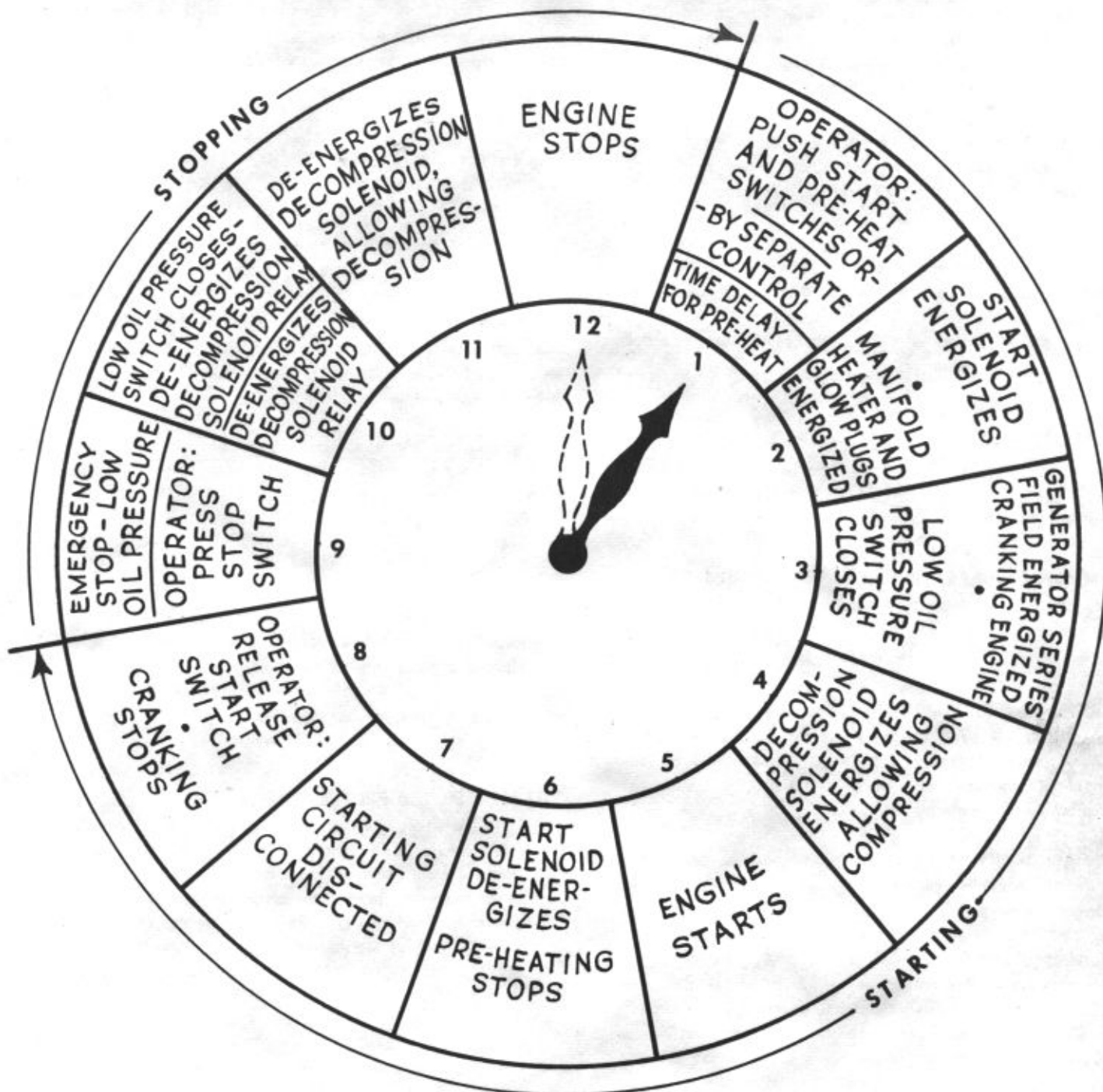


FIG. 2-2

but must provide engine pre-heating.

The automatic control has 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.

STOPPING

- (1) Push *start-stop* switch to *stop* position.
- (2) Release switch when plant stops. If stop circuit fails, close fuel valve.

APPLYING LOAD

If practicable, allow plant to warm up before connecting a heavy load. Continuous generator overloading may cause high operating temperatures that can damage the windings. The generator can safely handle an overload temporarily, but for normal operation, keep the load within nameplate rating. The exhaust system may form carbon deposits during operation at light loads, apply full load occasionally before shut-down to prevent excessive carbon accumulations.

Try to connect the load in steps instead of full load at one time. Most installations use a line switch that must be closed to connect a portion of the load.

Dual Purpose Plants: The battery charge rate is controlled by a HIGH-LOW charge switch located on the plant control box. Maximum charge rate in HIGH position is approximately 20 amp., in LOW position about 2 amp.

Caution: When switch is at HIGH position, total AC load should not exceed 2,250-watts. When switch is at LOW position, full capacity of 3,000-watts can be used.

Battery Charging Plants: A rheostat in series with the shunt field circuit of the generator controls the charge rate. Turn the rheostat knob to raise or lower the charge rate. Set the charge rate (indicated on the ammeter) to rate recommended by battery manufacturer.

EXERCISE STANDBY PLANTS

Infrequent use results in hard starting. Operate standby plants one 30-minute period each week. Run longer if battery needs charging.

EMERGENCY OPERATION IF BATTERY FAILS

The remote-type revolving-armature plant must always have the battery connected while operating. High voltage will burn relays if battery is disconnected.

BREAK-IN PROCEDURE

No matter how carefully engine parts are manufactured or expertly assembled, there are always microscopic variations in fit between metal parts such as pistons, rings, main and connecting rod bearings.

Break-in or ideal fitting of all internal moving metal parts can best be achieved by maintaining proper cooling and correct lubrication during the running-in period. *Break-in* can take as little as ten operating hours or it may take many hundreds of hours. Extended periods of very heavy engine loading (above rated horsepower or electrical output) during this initial service period can cause severe cylinder scoring or bearing galling. On the other hand extended periods of very light loading during initial break-in may cause cylinder wall glazing and/or poor piston ring seating. Engine parts damage can also be caused by using the wrong type and viscosity oil and high engine operating temperatures during break-in.

All engines use more oil than normal during the first hours of operation. As internal moving parts are run-in by controlled operation, oil consumption should gradually decrease until the rate of consumption is stabilized. It is extremely rare that oil consumption drops to zero. All engines use some oil even when in perfect condition and properly broken-in. Oil consumption varies according to engine design, engine (piston) speed, size of engine, type of oil, oil viscosity, length of operating periods, operating temperatures, engine loading, etc. As engine operation is continued, clearance between moving parts increase slightly due to normal wear of piston rings, cylinder walls, valve guides,

oil seals, etc. These clearances increase until oil consumption is excessive and engine parts have to be replaced and/or refitted. This usually takes thousands of hours.

Each Onan engine is *run-in* at the Onan factory for a minimum of three hours. This is not enough running time to completely *break-in* the engine. Proper completion of the *break-in* period is up to the customer.

Generator sets manufactured by Onan can be loaded to full nameplate rated output (not until they *bog down*) as soon as they are put into operation. It is recommended during these first few hours of operation that generator sets be loaded as close to full rated capacity as possible. Initial heavy loading helps seat piston rings and brings oil consumption down to a normal level in the shortest time.

During *break-in* check oil level at least every eight (8) operational hours. Add oil if the level is at *low* on the dipstick. Never over-fill. This may cause oil to foam and enter the breather system.

Drain the initial oil fill after 50-hours of operation while the engine is hot.

Controlled *break-in* with consistent use of proper oil from a reputable supplier and a conscientiously applied maintenance program will help assure satisfactory service for thousands of hours from your Onan electric plant.

OUT-OF-SERVICE PROTECTION

Protect a plant that is to be out-of-service for more than 30 days as follows:

1. Run plant until thoroughly warm.
2. Turn off fuel supply and run until plant stops.
3. Drain oil from oil base while still warm. Refill and attach a warning tag stating oil viscosity used.
4. Remove each injector. Pour 1 oz. (two tablespoons) of rust inhibitor (or SAE #50 oil) into each cylinder. Crank engine slowly (by hand) several times. Install injector.
5. Service air cleaner.
6. Clean governor linkage and protect by wrapping with a clean cloth.
7. Plug exhaust outlet to prevent entrance of moisture, dirt, bugs, etc.
8. Wipe generator brushes, slip rings, etc. Do not apply lubricant or preservative.
9. Wipe entire unit. Coat rustable parts with a light film of grease or oil.
10. Provide a suitable cover for the entire unit.
11. If battery is used, disconnect and follow standard battery storage procedure.

HIGH TEMPERATURES

1. See that nothing obstructs air flow to-and-from the plant.
2. Keep cooling fins clean. Air housing should be properly installed and undamaged.

LOW TEMPERATURES

1. Use correct SAE No. oil for temperature conditions. Change oil only when engine is warm. If an unexpected temperature drop causes an emergency, move the plant to a warm location or apply heat externally until oil flows freely.
2. Use fresh fuel. Protect against moisture condensation.
3. Keep fuel system clean, and batteries in a well charged condition.
4. Partially restrict cool air flow but use care to avoid overheating.
5. Use additional preheating during cold starts.

DUST AND DIRT

1. Keep plant clean. Keep cooling fins free of dirt, etc.
2. Service air cleaner as frequently as necessary.
3. Change crankcase oil every 50 operating hours.
4. Keep oil and fuel in dust-tight containers.
5. Keep governor linkage clean.
6. Clean generator brushes, slip rings.

HIGH ALTITUDE

Maximum power will be reduced approximately 4% for each 1000-feet above sea level, after the first 1000-feet.

ADJUSTMENTS

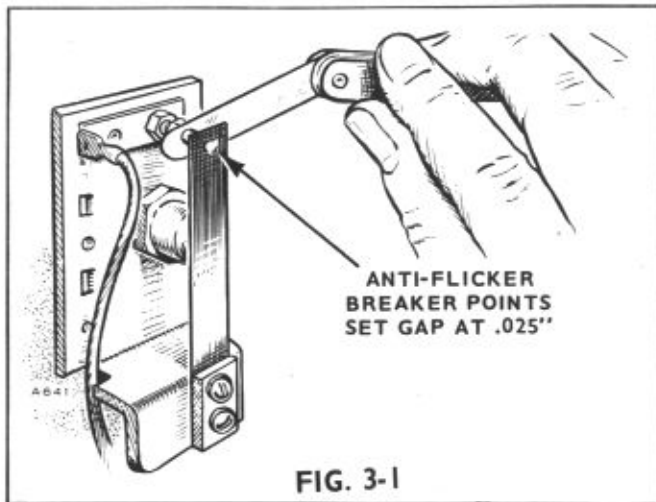


FIG. 3-1

CHECK BREAKER POINTS

Refer to Maintenance Schedule for correct gap distances. Replace burned or faulty points. If only slightly burned, dress smooth with file or fine stone. Measure gap with thickness gauge.

The anti-flicker breaker points (Fig. 3-1) are adjusted while wide open. Loosen and move stationary contact to correct gap.

GOVERNOR

The governor controls engine speed. Rated speed and voltage appear on the nameplate (see also Specifications). Engine speed equals frequency multiplied by 30, on a 4-pole generator, thus 1800 rpm give 60-cycle frequency. Preferred speed does not vary more than 2-1/2-cycles from no-load to full-load operation. Be sure throttle, linkage, and governor mechanism operate smoothly.

Changing spring tension (by holding the governor spring stud and turning the nut) changes engine speed (Fig. 3-2).

More spring tension (turning nut clockwise) gives more rpm. Turn nut counterclockwise to reduce governed speed. Hold a tachometer against the stud in the generator axis. On revolving armature generators, adjust engine speed to attain proper voltage with load connected and using a voltmeter.

Sensitivity (no load to full load speed droop) is adjusted by turning the governor spring stud. If speed drops too much when full load is applied, turn the governor adjusting stud (Fig. 3-2) counterclockwise to use more coils of the spring. Hold the stud and turn the 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 (increase and decrease in speed). **Important:** Excessive droop may be caused by engine mis-firing. Correct this condition before adjusting governor.

CHARGE RATE

See *Starting* in Operation Section.

VALVE CLEARANCE

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

1. Turn the flywheel until the cylinder is on its compression stroke. On engines without a hand crank use a socket wrench on the flywheel screw hex head.

To determine if the cylinder is in its compression stroke, observe the action of the push rods as the engine is rotated in a clockwise direction. The exhaust valve push rod will be in its lowest position and the intake valve push rod will be moving downward. As the piston reaches top dead center, the flywheel timing mark should be aligned with the timing pointer and the valve push rods stationary.

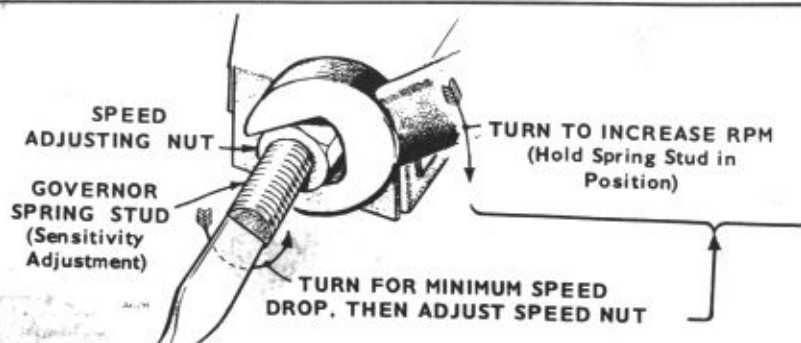
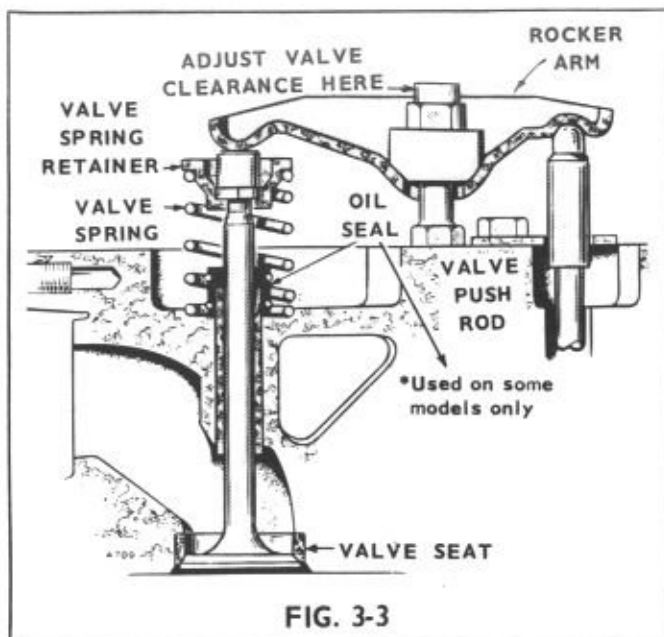
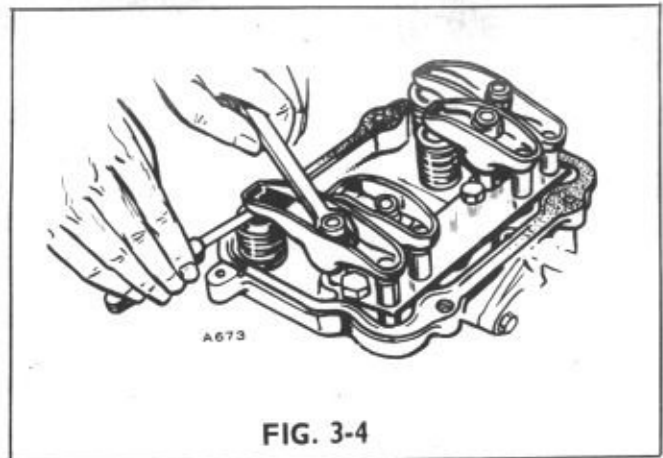


FIG. 3-2



2. Now turn the flywheel clockwise for an additional 10- to 45-degrees. There is no timing mark for this position so it must be estimated. With the piston located in this position, it will be in its power stroke with both valves completely closed.
3. Check cylinder head-bolt torque prior to valve clearance adjustment. Torque should be 44 to 46 foot-pounds. To change the setting of valve clearance, adjust the locknut which secures the rocker arm to the cylinder head (see Fig. 3-3). Loosen the locknut to increase clearance and tighten it to reduce clearance.
4. Using a feeler gage, check the clearance between the rocker arm and the valve (see Fig. 3-4). Increase or reduce the clearance until the proper gap is established. Valve clearances are given in the Maintenance Section.



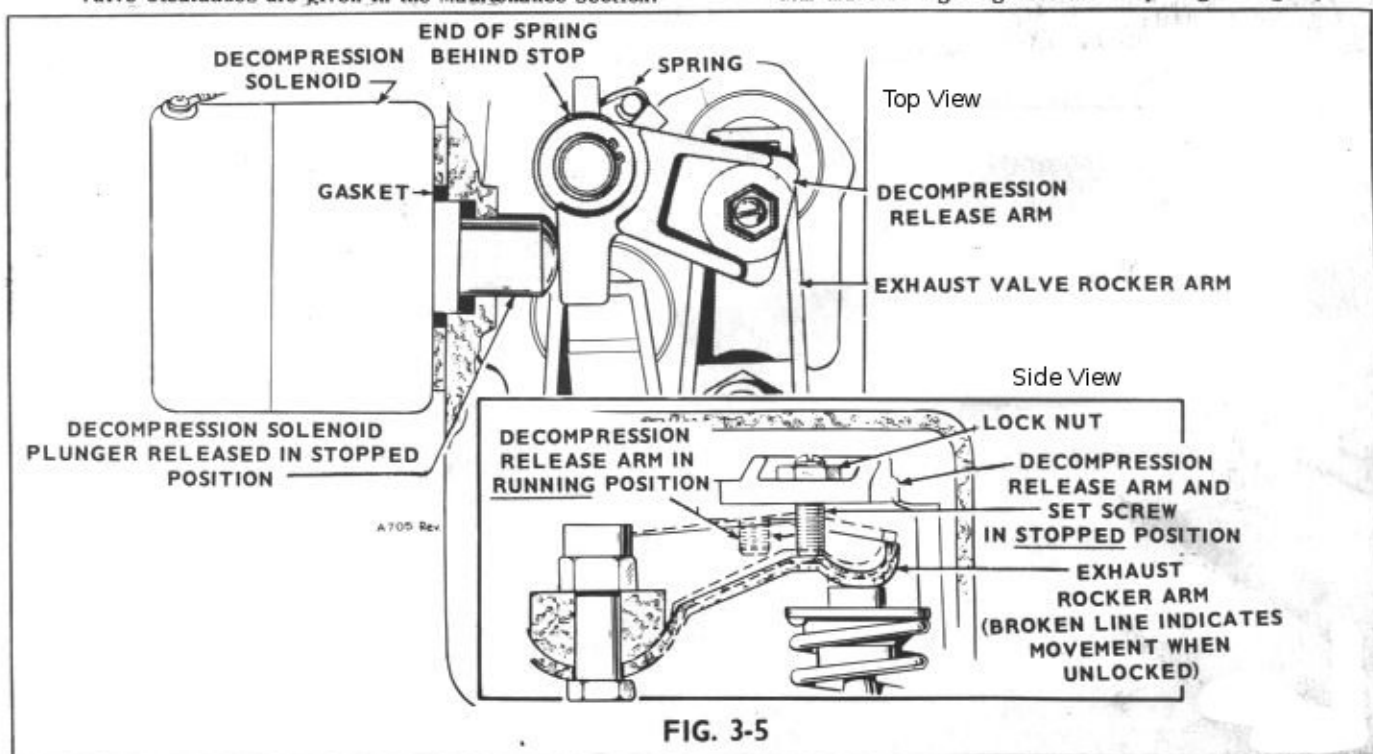
5. After allowing engine to cool the #1 cylinder and adjust the valve clearance according to steps 2 and 3. Refer to Maintenance Section for correct valve clearance.

DECOMPRESSION RELEASE

The decompression release mounts on the cylinder head with a solenoid on the rocker box cover. It holds the exhaust valve open to allow the engine to build up speed during starting before compression occurs, and to stop the plant. The mechanism holds the exhaust valve open when the solenoid is de-energized. If the release is defective, replace any worn parts, otherwise adjust as follows:

NOTE: Before adjusting the decompression mechanism, the valves must be set for the correct clearance.

1. With the piston 10° to 45° past TDC on the power stroke, hold the arm in the decompression position (tension against spring). Turn the set screw so it just touches the exhaust rocker arm (Fig. 3-5). The release arm must be tight against the snap ring during adjust-



ment. Then turn the screw exactly 1 revolution clockwise. Original factory setting marked with white or yellow paint.

NOTE: If the screw is tightened more than 1 turn, the exhaust valve could hit the piston.

Hold the set screw and lock it into position with the attached nut. Turn the nut hand tight plus $1/4$ to $1/2$ turn to lock the mechanism.

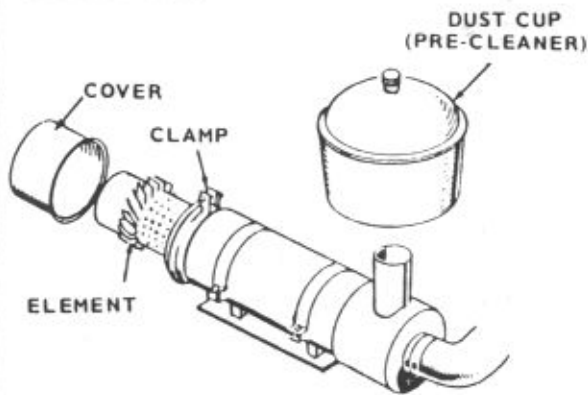
2. Release the mechanism to allow compression and check

the clearance between the screw and rocker arm. Insert a feeler gauge between valve and rocker arm to take up valve clearance for this check. If there is no clearance, back off the set screw until it just clears the rocker arm.

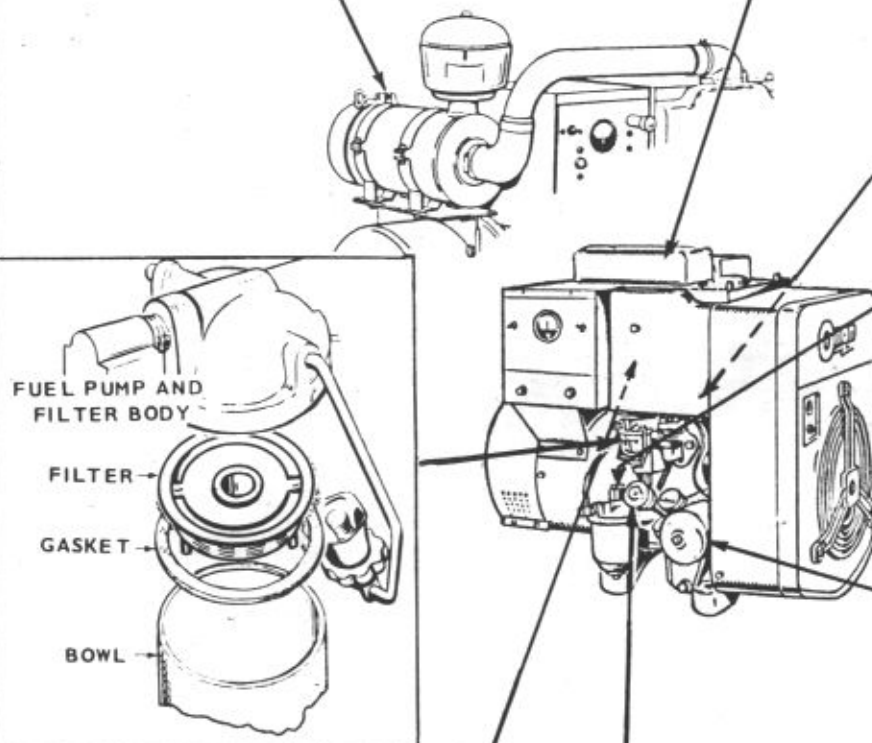
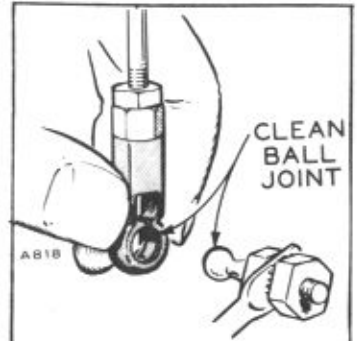
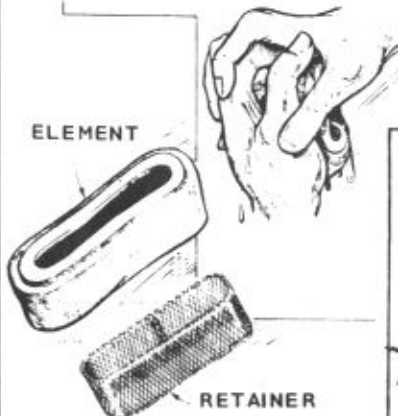
When reassembling the rocker cover, remove the solenoid, dip the plunger "O" ring in oil and reinstall when cover is on the engine. Align solenoid so terminal "SW" is above terminal "IGN".

MAINTENANCE

AIR CLEANER



AFTER WASHING ELEMENT DIP IN ENGINE OIL AND SQUEEZE AS DRY AS POSSIBLE.

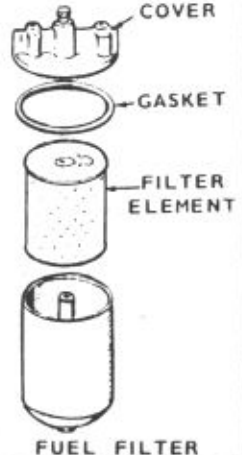


FUEL PUMP AND FILTER BODY

FILTER

GASKET

BOWL



OIL FILTER CHANGE (See Schedule)

Place pan under old filter and remove by screwing counter-clockwise. Clean filter mounting area. Install new filter; oil filter gasket and screw filter on clockwise until gasket touches mounting base, then tighten 1/2 turn.

BREATHING TUBE CAP

FLAPPER VALVE ASSEMBLY

TUBE FROM AIR CLEANER

BREATHING TUBE Baffle

A752

CRANKCASE BREATHING

Remove breather cap. Remove valve from cap. Wash valve in fuel. Dry and install with perforated disc toward engine. If faulty, install new valve.

CAP AND OIL LEVEL INDICATOR

KEEP OIL AT THIS LEVEL

NEVER OPERATE ENGINE WITH OIL BELOW THIS LEVEL

ABOVE 30°F
0°F to 30°F
BELOW 0°F

SAE 30
SAE 10W or 5W-20
SAE 5W-20

ALWAYS REPLACE CAP TIGHTLY, OR OIL LEAKAGE MAY OCCUR.

FIG. 4-1

ROUTINE CHECK CHART

Before generator set is put in operation, check all components for mechanical security. If any abnormal condition, defective part, or operating difficulty is detected, repair or

service as required. The generator set should be kept free of dust, dirt, and spilled oil or fuel. Be sure proper operating procedure is followed.

GENERATOR SET ROUTINE CHECK CHART

WHAT TO CHECK	HOW TO CHECK	PRECAUTIONS
Engine oil	Check level (should be at full mark of oil indicator)	Add oil as necessary to bring level to full mark.
Engine Fuel	Check level in tank.	See that fuel line is properly connected.
Engine ventilation	Check ventilating openings.	Remove any obstructions.
Connecting cables	Check for proper connections. Check for physical damage.	Tighten connections. Replace damage connectors.
Battery	Check electrolyte level.	Keep level above plates. Add only approved water as necessary.

MAINTENANCE SCHEDULE

Use this factory recommended maintenance (based on favorable operating conditions) to serve as a guide to get long and efficient plant life. Neglecting routine maintenance can result in failure or permanent damage to the plant.

Maintenance is divided into two categories: (1) OPERATOR MAINTENANCE – performed by the operator, and (2) CRITICAL MAINTENANCE – performed by qualified service personnel.

OPERATOR MAINTENANCE SCHEDULE

MAINTENANCE ITEMS	OPERATIONAL HOURS			
	8	50	100	200
Inspect Plant	x			
Check Fuel	x			
Check Oil Level	x			
Check Air Cleaner		x1		
Clean Governor Linkage		x1		
Clean Fuel System Filters			x	
Change Crankcase Oil			x1	
Clean Crankcase Breather				x
Clean Fuel System				x
Check Battery				x
Replace Oil Filter				x1

BOLT TORQUES

	FT-LB
Rocker Arm Nut	4-10
Cylinder Head Bolt	44-46
Flywheel Mounting Screw	65-70
Fuel Pump Mounting Screw	15-20
Gear Cover Mounting Screw	15-20
Oil Base Mounting Screw	32-38
Glow Plug	10-15
Injection Nozzle Mtg. Screw	20-21
Injection Pump Mtg. Screw	18-21
Rear Bearing Plate	40-45
Manifold Nuts	13-15
Rocker Cover	8-10
Generator Through Stud Nut	30-40
Tappets Intake .011" Exhaust .008"	
Anti-Flicker .025"	

CRITICAL MAINTENANCE SCHEDULE

MAINTENANCE ITEMS	OPERATIONAL HOURS			
	200	500	1000	5000
Check Breaker Points	x			
Check Slip Rings	x1			
Check Brushes	x2			
Check Commutator	x2			
Check Valve Clearance	*	x		
Clean Generator			x	
Remove & Clean Oil Base			x	
Grind Valves (If Required)			x	
Replace Secondary Fuel Filter			x	
Clean Rocker Box Oil Line Holes			x	
General Overhaul				x
Check Nozzle Opening Pressure, Spray Pattern			x	

x1 - Perform more often in extremely dusty conditions.

x2 - Replace collector ring brushes when worn to 5/16", replace commutator brushes when worn to 5/8".

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

MAINTENANCE DIAGNOSIS

POSSIBLE CAUSE	REMEDY	POSSIBLE CAUSE	REMEDY
ENGINE WILL NOT CRANK		SHARP METALLIC THUD, ESPECIALLY WHEN COLD ENGINE FIRST STARTED	
Battery discharged.	Recharge.	Low oil supply.	Add oil.
Loose connections.	Tighten connections.	Oil badly diluted.	Change oil.
Defective switch.	Replace.	LIGHT POUNDING KNOCK	
ENGINE CRANKS TOO STIFFLY		Low oil supply.	Add oil.
Too heavy oil in crankcase.	Drain, refill with lighter oil.	Oil badly diluted.	Change oil.
Defective decompression release.	Check and adjust.	ENGINE MISFIRES AT LIGHT LOAD	
ENGINE WILL NOT START WHEN CRANKED		Faulty injection.	Clean fuel system, adjust and replace injector.
Lack of fuel or faulty injection.	Refill tank. Check fuel system. Clean, adjust, as necessary.	Low compression.	Inspect and repair as necessary.
Clogged fuel filter.	Clean.	ENGINE MISFIRES AT HEAVY LOAD	
Defective glow plug or preheater.	Repair or replace.	Clogged injector.	Clean fuel system, repair injector.
Poor quality fuel	Drain, fill with fresh fuel.	Clogged fuel screen.	Clean.
Poor compression.	Inspect plant, repair as necessary.	ENGINE RACES	
ENGINE STOPS WHEN SWITCH IS RELEASED		Governor not controlling.	Check governor performance and linkage condition.
Centrifugal switch remained open.	Clean and adjust.	STOP ENGINE IMMEDIATELY LOW OIL PRESSURE	
EXCESSIVE OIL CONSUMPTION		Defective gage.	Replace.
Oil leaks from oil base or connections.	Replace gaskets. Tighten screws and connection. Check breather valve.	Oil too light or diluted from leaking fuel pump diaphragm.	Drain. Refill with proper oil. Repair or replace fuel pump.
Oil too light or diluted.	Drain, refill with correct oil.	Oil too low.	Add oil.
Worn piston rings.	Replace rings.	Sludge on oil cup screen.	Clean screen and oil pump.
Too much oil.	Drain excess oil.	Badly worn oil pump.	Replace.
BLACK, SMOKY EXHAUST, EXCESSIVE FUEL CONSUMPTION, POSSIBLE LACK OF POWER UNDER HEAVY LOAD		HIGH OIL PRESSURE	
Poor quality fuel.	Use recommended fuel.	Defective gage.	Replace.
Dirty air cleaner.	Clean.	Oil too heavy grade.	Drain. Refill.
Overloaded.	Reduce load.	Clogged oil passages.	Clean all lines and passages.
ENGINE STOPS UNEXPECTEDLY		Oil relief valve stuck.	Clean by-pass. Replace if needed.
Fuel tank empty.	Fill with fresh fuel.	ENGINE OVER-HEATING	
Emergency relay actuated.	Correct cause of over-heating or lubrication failure.	Poor air circulation.	Clean cooling surfaces, remove restrictions.
		Improper lubrication.	See Low Oil Pressure.
		Generator overloaded	Reduce load.

POSSIBLE CAUSE	REMEDY	POSSIBLE CAUSE	REMEDY
VOLTAGE LOW AT FAR END OF LINE BUT NORMAL NEAR POWER PLANT		GENERATOR OVERHEATING (Approximately 160°F higher than ambient)	
Too small line wire for load distance.	Install larger or extra wires or reduce load.	Overloaded.	Reduce load.
ELECTRIC MOTOR RUNS TOO SLOWLY AND OVER- HEATS AT FAR END OF LINE BUT OK IF USED NEAR POWER UNIT		VOLTAGE DROPS UNDER HEAVY LOAD	
Too small line wire for load and distance.	Install larger or extra wires or reduce load.	Engine lacks power.	See remedies for engine misfires under heavy load. Inspect, repair as necessary.
VOLTAGE UNSTEADY BUT ENGINE NOT MISFIRING		Faulty injection.	Clean the fuel system. Clean, adjust or replace parts necessary.
Speed too low.	Adjust governor to correct speed.	Dirty air cleaner.	Clean.
Loose connections.	Tighten connections.	Restricted exhaust line.	Clean or increase the size.
Fluctuating load.	Correct any abnormal load condition causing trouble.		

INSTRUCTIONS FOR ORDERING REPAIR PARTS

For parts or service, contact the dealer from whom you purchased this equipment or refer to your Nearest Authorized Parts & Service Center.

To avoid errors or delay in filling your parts order, please furnish all information requested.

Always refer to the nameplate on your plant:

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

ELECTRIC **Onan** PLANT

MODEL & SPEC. NO. SERIAL NO.

IMPORTANT

RATINGS AT SEA LEVEL BASED ON FUEL CHECKED BELOW

GASOLINE	<input type="text"/>	DIESEL FUEL	<input type="text"/>
STAND BY	KW <input type="text"/>	KVA <input type="text"/>	AMPS <input type="text"/>
CONTINUOUS	KW <input type="text"/>	KVA <input type="text"/>	AMPS <input type="text"/>
A.C. VOLTS	<input type="text"/>	CYCLES	PHASE <input type="text"/> P.F. <input type="text"/>
EXCITER	GEN DATA <input type="text"/>		
R.P.M.	<input type="text"/>	USE <input type="text"/>	VOLT BATTERY NEGATIVE GROUND

MANUFACTURED BY
ONAN
DIVISION OF STUDEBAKER
MINNEAPOLIS, MINN. U.S.A.

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

2. Do not order by reference number or group number, always use part number and description.
3. Give the part number, description and quantity needed of each item. If an older 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 resulto de fluctuaciones de los precios, derechos aduanales, impuestos de venta, cambios extranjeros etc.

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

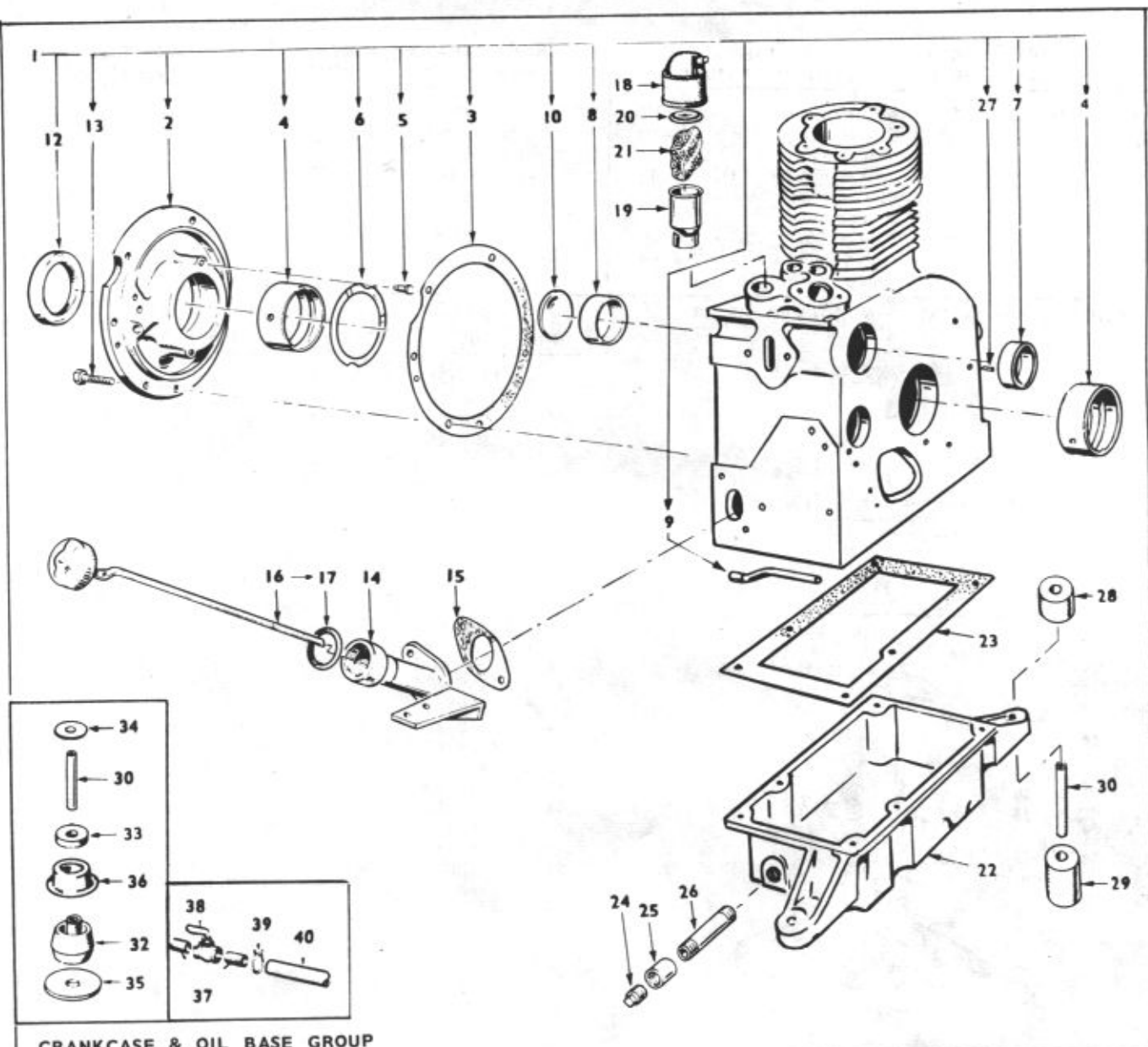
PARTS CATALOG

This catalog applies to the standard DJA Plants as listed below. Parts are arranged in groups of related items. Each illustrated part is identified by a reference number corresponding to the same reference number below the illustration. Parts illustrations are typical. Using the *Model and Spec. No.* from the plant nameplate, 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. represents parts that differ between models. Unless otherwise mentioned in the description, parts are interchangeable between models. Right and left plant sides are determined by *facing* the engine end (front) of the plant.

PLANT DATA TABLE

* MODEL & SPEC.	ELECTRICAL DATA					PARTS KEY NO.
	WATTS	VOLTS	CYCLES	WIRE	PHASE	
205DJA-51R/*	2,500	120	50	2	1	1
205DJA-52R/*	2,500	240	50	2	1	1
205DJA-53R/*	2,500	120/240	50	3	1	1
205DJA-55R/*	2,500	240	50	3	3	1
3DJA-1R/*	3,000	120	60	2	1	1
3DJA-2R/*	3,000	240	60	2	1	1
3DJA-3R*	3,000	120/240	60	3	1	1
3DJA-5R/*	3,000	240	60	3	3	1
205DJA-51R4/*	2,500	120 AC	50	2	1	2
3DJA-1R4/*	3,000	32 DC	60	2	1	2
205DJA-224R/*	2,500	24 DC	DC			3
3DJA-232R/*	3,000	32 DC	DC			4
3DJA-1E2236/* 3DJA-3E2236/*	Contractor Models - SEE SPECIAL PARTS LIST Following Standard Parts List					

* - The Specification Letter Advances (A to B, B to C, etc.) with manufacturing changes.



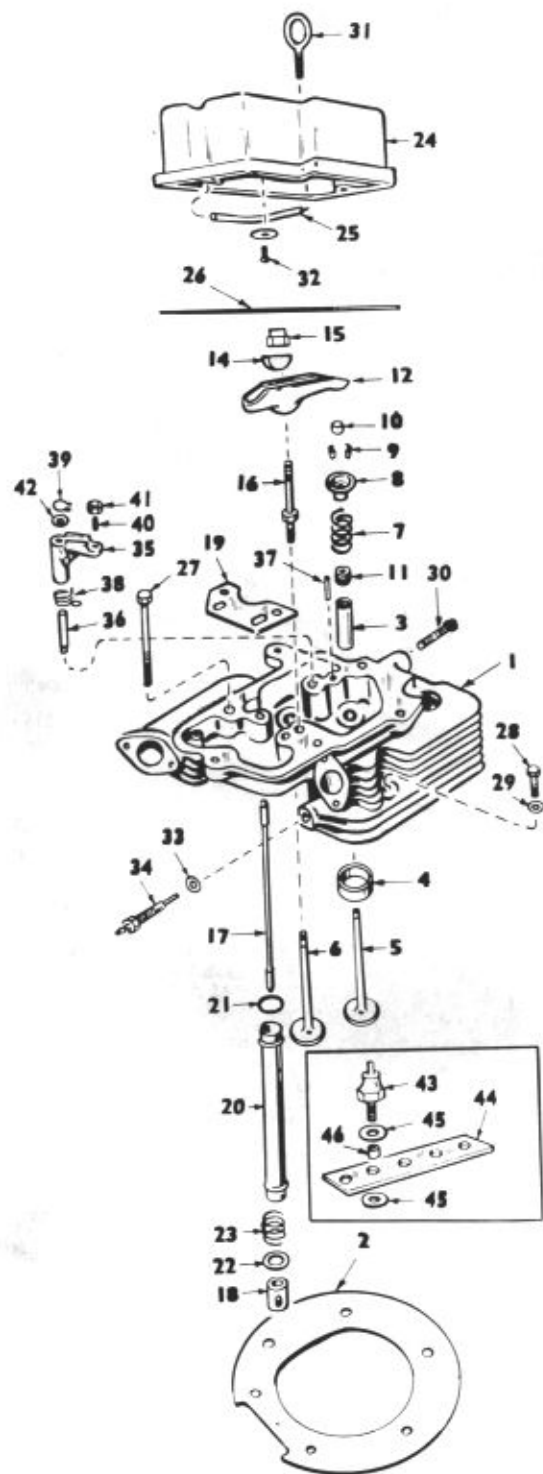
CRANKCASE & OIL BASE GROUP

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTIONS	REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	110A1335	1	Block Assy., Cyl. Incl. Brgs.	19	123A645	1	Tube, Breather
2	101D337	1	Plate, Brg., (Less Brg. & Pins)	20	123A315	1	Valve, Breather
3	101K386	1	Gasket Kit, Brg. Plate (Incl. Steel Shims)	21	123A865	1	Baffle, Breather
4	101B359	2	Bearing, Prec. Frt. or Rr., Specify: Std., or .002", .010", .030" Under.	22	BASE, OIL		
5	516A72	4	Pin, Thrust Washer		102D488	1	To Spec. C
6	104B420	2	Washer, Crankshaft Thrust		102D541	1	Begin Spec. C
7	101B363	1	Bearing, Prec. Cam Frt., Std. Only	23	102B459	1	Gasket, Base
8	101B365	1	Bearing, Prec. Cam Rear, Std. Only	24	505-56	1	Plug (1/2")
9	120A572	1	Tube, Crankcase Oil	25	505-14	1	Coupling (1/2")
10	517-53	1	Plug, Camshaft Opening	26	505-2	1	Nipple (1/2" x 3")
12	509-86	1	Seal, Crankshaft Rear	27	516A141	2	Pin, Dowel, Gear Cover Locating
13	805-19	6	Bolt, Place, Plt., 3/8-16 x 1-1/4"	28	402A36	4	Mount, Vibration, Cylindrical Shaped, Upper, To Spec. C
14	123A724	1	Tube, Oil Fill	29	402A38	4	Mount, Vibration, Cylindrical Shaped, Lower, To Spec. C
15	123A667	1	Gasket, Oil Fill Tube	30	BUSHING, SPACER - VIBRATION MOUNT		
16	123A716	1	Cap & Indicator		402A46	4	To Spec. C
17	123A191	1	Gasket, Cap		402A328	4	Begin Spec. C
18	CAP, BREATHER			32	CUSHION, VIBRATION, CONE SHAPED, BEGIN SPEC. C		
	123A458	1	To Spec. B		402B284	2	Eng. End
	123A787	1	Begin Spec. B		402B285	2	Gen. End
				33	402A282	4	Snubber, Shock Mtg., Begin Spec. C

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTIONS
34	526-14	4	Washer (29/64" I.D. x 1-1/2" O.D. x 1/8") Only with Cone Shaped Cushion
35	526A195	4	Washer (29/64" I.D. x 3-1/4" O.D. x 1/8") Only with Cone Shaped Cushion
35	526A198	As Req.	Washer (5/8" I.D. x 1-1/2" O.D. x 1/16") Only with Cone Shaped Cushion

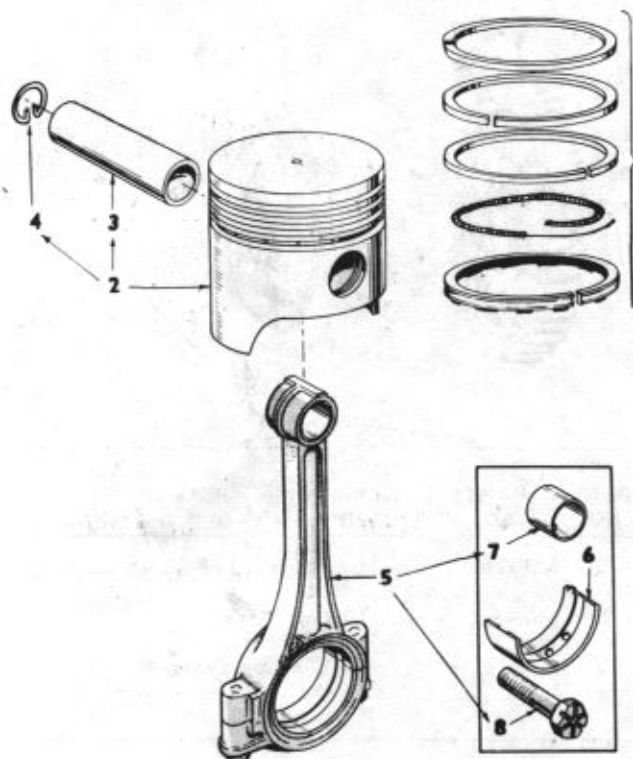
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTIONS
36	402A300	4	Cup, Cushion Retaining
37	505-100	2	Nipple, Oil Drain (Hsd. Plts.)
38	504-11	1	Valve, Oil Drain (Hsd. Plts.)
39	503-197	1	Clamp, Oil Drain (Hsd. Plts.)
40	503-316	1	Hose, Oil Drain (Hsd. Plts.)

CYLINDER HEAD, VALVE & ROCKER GROUP

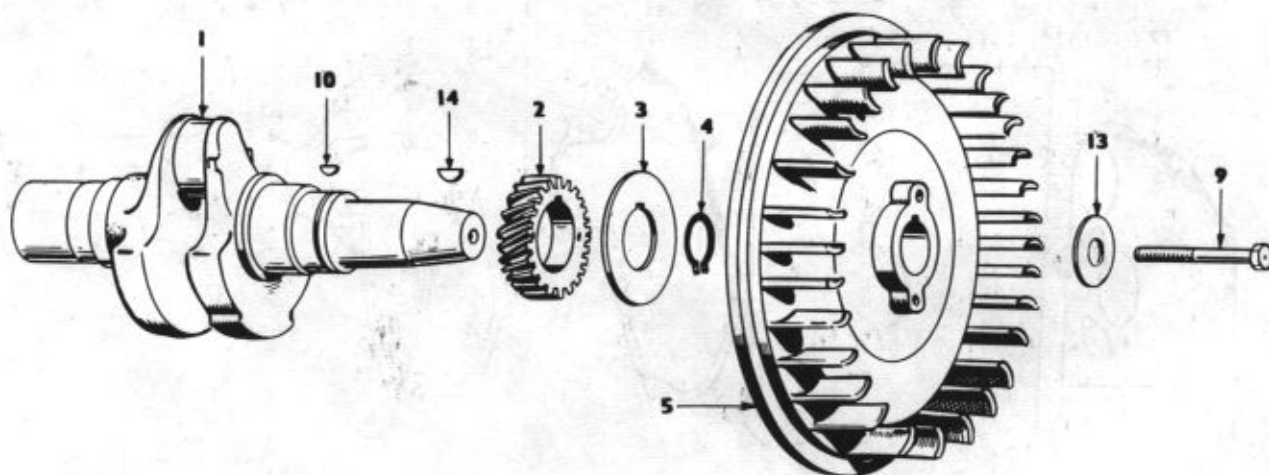


REF. NO.	PART NO.	QTY. USED	PART DESCRIPTIONS
1	110B1270	1	Head, Cylinder
2	110B1267	1	Gasket, Head
3	110A1501	2	Guide, Valve (Repl. 110A1216)
4	110A1268	2	Insert, Valve Seat, Specify: Std. or .002", .005", .010", .025" Over.
5	110B1320	1	Valve, Intake
6	110B1278	1	Valve, Exhaust, Stellite
7	110A1221	2	Spring, Valve
8	110B1220	2	Retainer, Valve Spring
9	110A858	4	Lock, Valve Spring Retainer
10	110A859	2	Cap, Valve Stem
11	509A90	1	Seal, Oil, Intake Valve, Incl. Ret. Rgs.
12	ARM ROCKER		
	115B128	1	Exhaust
	115B129	1	Intake
14	115B127	2	Ball, Rocker Arm
15	115B150	2	Lock Nut, Rocker Arm
16	115B152	2	Stud, Rocker Arm
17	115B149	2	Rod, Valve Push (Steel)
18	115A132	2	Tappet, Valve
19	115A147	1	Guide, Push Rod
20	115A151	2	Shield, Push Rod
21	509-84	4	Seal, Push Rod Shield
22	115A155	2	Washer, Spring Retaining
23	115A146	2	Spring, Shield Retainer
24	115B163	1	Cover, Rocker (115C162 Listed in Error)
25	120A595	1	Line, Oil, Rocker Cover
26	115B160	1	Gasket, Rocker Cover
27	110A1264	2	Screw (3/8-16 x 4-1/4") Cyl. Head
28	110A814	4	Screw (3/8-16 x 1-1/2" Cyl. Head
29	526-174	4	Washer, Cylinder Head
30	800-31	2	Screw (5/16-18 x 1-1/2") Exh. Man.
31	403P671	1	Bolt, Lifting
32	809-42	1	Screw, Oil Line, Rocker Cover
33	110A546	1	Gasket, Glow Plug
34	PLUG, GLOW (Incl. Gskt.)		
	333K106	1	Key 1, 12-V (Repl. 333A37)
	333K107	1	Key 3, 24-V
	333K112	1	Key 2, 4, 32-V (Repl. 333A83)
35	110B1512	1	Arm, Decomp. Release
36	110A1351	1	Pin, Decomp. Release
37	516-90	1	Pin, Roll (3/8 x 1-3/8")
38	110A1356	1	Spring, Decomp. Release
39	518-207	1	Ring, Ret., Decomp. Release
40	815-252	1	Set Screw, Decomp. Release
41	870-134	1	Palnut, Decomp. Release
42	110A1511	1	Washer, Decomp. Release (Not used on early mdls. with cast iron arm.)
43	309P196	1	Switch, High Air Temperature (Optional)
44	309A195	1	Bracket, High Air Temp. Switch (Optional)
45	508A126	2	Washer, Insulator, Switch Mtg. (Optional)
46	508A127	1	Insulator, Sleeve, Air Temp. Switch (Optional)

PISTON & CONNECTING ROD GROUP



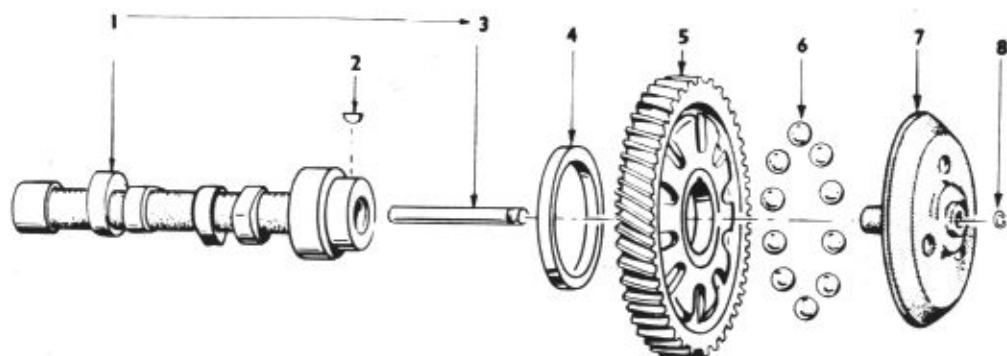
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTIONS
1	113A130	1	Ring Set, Specify: Std. or .010", .020", .030" Over.
2	112-103	1	Piston & Pin, Incls. Pin Retaining Rings, Specify: Std. or .010", .020", .030" Over.
3	112A93	1	Pin, Specify: Std. or .002" Over
4	112A85	2	Ring, Retaining, Pin
5	114A168	1	Rod Assy., Connecting (Forged)
6	114B164	2	Bearing Half, Connecting Rod, Specify: Std. or .002", .010", .020", .030" Under.
7	114A170	1	Bushing, Piston Pin, Con. Rod, Semi-Finished
8	805A12	2	Bolt (5/16-24 x 1-13/16")



CRANKSHAFT & FLYWHEEL GROUP

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTIONS
1	104B462	1	Crankshaft
2	104B418	1	Gear
3	104A416	1	Washer, Retainer
4	518-188	1	Ring, Lock
5	104D529	1	Flywheel

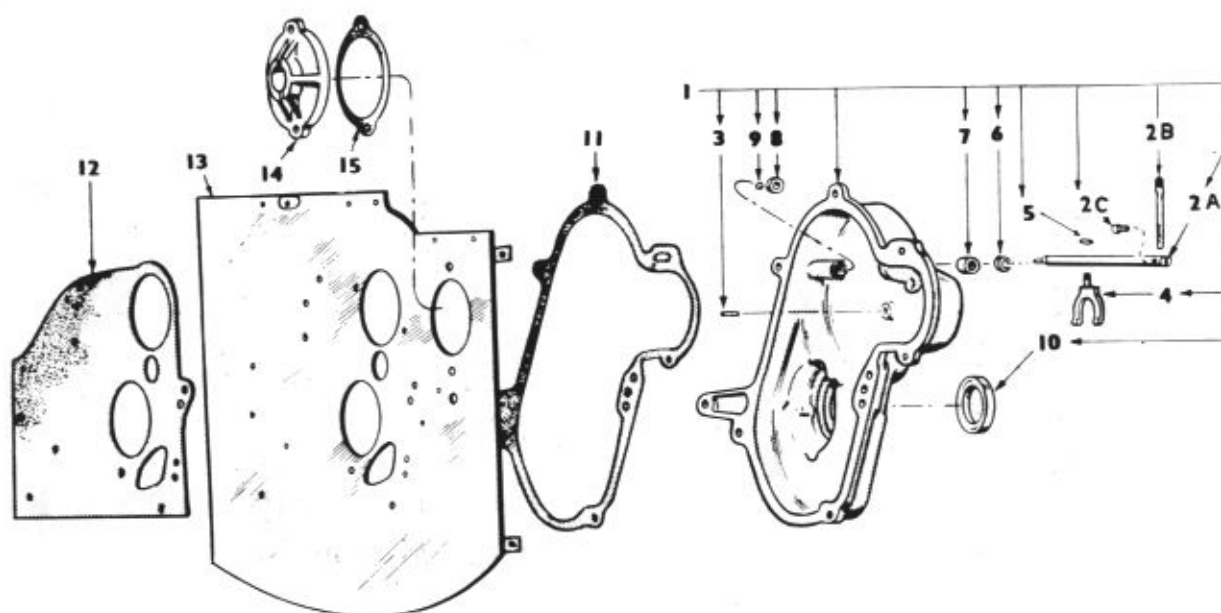
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTIONS
9	800-500	1	Screw, 7/16-14 x 5-1/2", Flywheel
10	515-1	1	Key, Gear
13	526A185	1	Washer, Flywheel
14	515-153	1	Key, Flywheel to Crankshaft



CAMSHAFT GROUP

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	105A248	1	Camshaft - Includes Center Pin
2	515-1	1	Key, Cam. Gear or Dist. Gear
3	150A75	1	Pin, Center
4	105A205	1	Washer, Thrust

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTIONS
5	105B218	1	Gear, Includes Flyball Spacer & Plate
6	510-46	10	Flyball, Governor
7	150C775	1	Cup, Governor
8	150A78	1	Ring, Snap, Center Pin

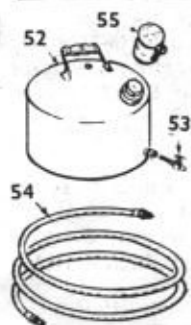
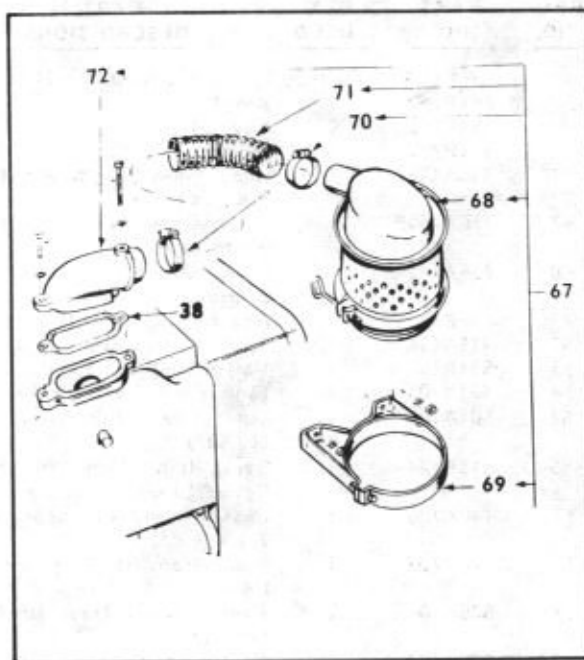


GEAR COVER GROUP

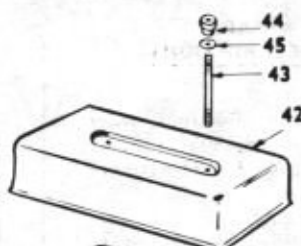
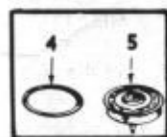
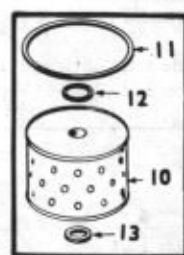
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTIONS
1	103C277	1	Cover Assy., Gear, Complete, Incl. Parts Marked *
2A	150B838	1	*Shaft, Governor
2B	150A856	1	Arm, Governor
2C	815-176	1	*Screw, #8-32 x 1/2"
3	516-111	1	*Pin, Roll, Gov. Cup Stop
4	150A777	1	*Yoke, Governor
5	518-129	1	*Ring, Yoke
6	509-88	1	*Seal, Oil
7	510P48	1	*Bearing, 1/2", Gov. Shaft
8	510P82	1	*Bearing, 1/4", Gov. Shaft

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTIONS
9	510-43	1	*Ball Bearing - Gov. Shaft Thrust
10	509-87	1	*Seal, Oil
11	103B251	1	Gasket, Gear Cover
12	103C218	1	Gasket, Backplate
13	103D226	1	Backplate
14	103D221	1	Cover, Gear Cover Backplate Opening
15	160A721	1	Gasket, Backplate Opening Cover

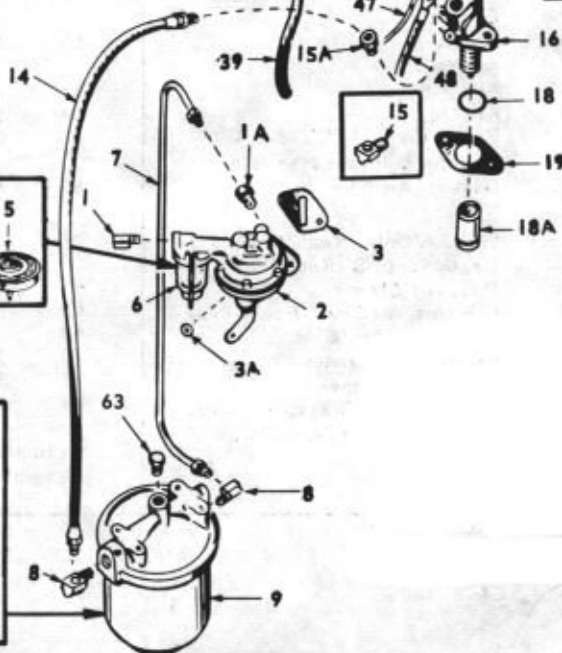
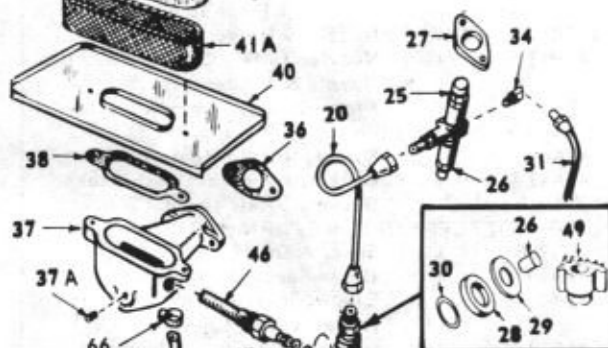
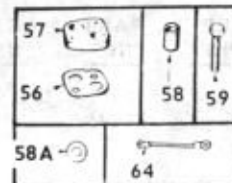
* - Included in Gear Cover Assy.



Fuel Filter (#10)
Onan 149P428
Wix 33110
NAPA 3110
Fram C1110PL
Purolator F50089



Onan Air Filter
Old # 140-0636
New # 140-1907



FUEL SYSTEM GROUP

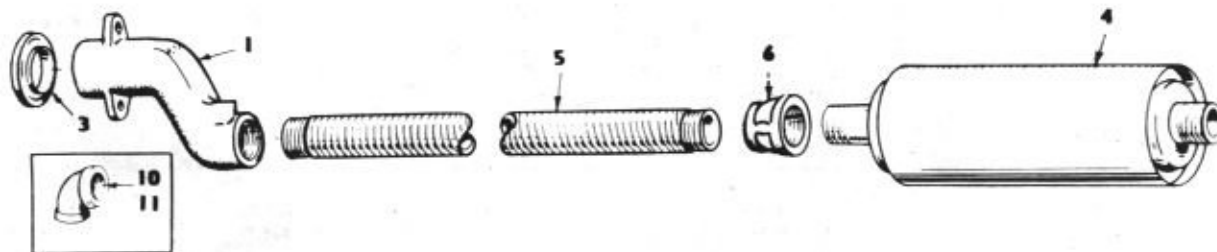
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTIONS
	149K875	1	Repair Kit, Fuel Pump (Incl. Diaphragm & Gaskets)
1	502-2	1	Elbow, Inv. Male, Fuel Pump Inlet
1A	502-3	1	Connector, Inv. Male, Fuel Pump Out.
2	149C852	1	Pump, Fuel Transfer
3	149A792	1	Gasket, Pump Mtg.
3A	526-65	2	Washer, Copper, Pump Mtg.
4	149P517	1	Gasket, Fuel Pump Bowl
5	149P438	1	Filter, Assy. Fuel Pump (Brass Disc Type)
6	149-116	1	Bowl, Pump (Glass)
7	501A32	1	Line, Pump to Sec. Filter, (Repl. 149A895)
8	502-41	1	Elbow, Inv. Male, Sec. Filter Inlet

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTIONS
8	502-54	1	Elbow, St., Sec. Filter Out.
9	149C408	1	Filter, Sec., Incl. Cart. (Note: Bleed Plug 149-769 is also available)
10	149P428	1	Cartridge, Sec. Fuel Filter
11	149P456	1	Gasket, Sec. Filter, Bowl to Cover
12	149P455	1	Gasket, Sec. Filter, Cart. to Head
13	149P493	1	Gasket, Sec. Filter, Cart. to Retainer
14	501A103	1	Line, Fuel, Sec. Filter to Inj. Pump
15	502-41	1	Elbow, Inj. Pump In., Spec. A Only
15A	502-33	1	Connector, Inj. Pump Inlet, Begin Spec. B

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTIONS
16	PUMP, INJECTION 147C167	1	Spec. A Only, For repl. order 147C180 Pump, 502-33 Con., 149B947 Line & Instructional Sheet E154
	147C180	1	Begin Spec. B
18	509P101	1	Seal, O-Ring, Inj. Pump to Crankcase
18A	115A166	1	Tappet, Inj. Pump
19	147K172	1	Shim Kit, Inj. Pump Mtg.
20	149B925	1	Line, Inj. Pump to Nozzle
25	147B136	1	Nozzle & Holder Assy.
26	147P134	1	Nozzle Only, Component of Nozzle & Holder Assy.
27	147A141	1	Flange, Inj. Nozzle Hold- down
28	147A44	1	Shield, Nozzle Heat (Steel)
29	147A43	1	Gasket, Ht. Shield (Asbestos)
30	110A419	1	Gasket, Shield to Hd. (Copper)
31	LINE, NOZZLE FUEL RETURN 149B958	1	Spec. A Only
	149B947	1	Begin Spec. B
34	502-65	1	Elbow, Inverted, 45°, Nozzle (Fuel Return Line)
36	141A281	1	Gasket, Air Clnr. Adapter to Engine
37	ADAPTER, AIR CLEANER 140C576	1	Key 1
	140D704	1	Key 2,4
	140D734	1	Key 3
37A	505-180	1	Plug, Pipe, 1/4", Air Clnr. Adapter & Intake Manifold
38	140A584	1	Gasket, Air Clnr.
39	HOSE, BREATHER 123A769	1	Spec. A Only (Repl. 503A391)
	503A479	1	Begin Spec. B (Repl. 123A786)
40	140C595	1	Pan, Air Cleaner
41	140B640	1	Element, Air Clnr., Foam Type
41A	140B641	1	Retainer, Air Clnr. Element
42	140C594	1	Cover, Air Cleaner
43	520A621	2	Stud, Air Cleaner
44	871-70	2	Nut, Knurled, Brass, Air Clnr.
45	140A602	2	Washer, Rubber, Air Clnr.

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTIONS
46	HEATER, MANIFOLD, INCL. GASKET (12-V) 154P712	1	Key 1
	154P712	3	Key 2,4
	154P712	2	Key 3
47	336A1380	1	Lead, Glow Plug to Air Htr., Rd. Type Term.
47	336A1505	1	Lead, Glow Plug to Air Htr., Blade Type Term.
48	336A1418	1	Lead, Air Htr. to Sol. in Control
49	147B133	1	Adapter, Injection Nozzle
52	415A126	1	Tank, Fuel, 5-Gal.
53	504A16	1	Valve, Shut-Off, Fuel
54	501A10	1	Line, Fuel (Repl. 501A9)
54	501A104	1	Line, Fuel Return (Replaces 501A27)
55	415B124	1	Cap, Rain (Prov. for Fuel Return Line)
56	140A706	1	Gasket, Man. Htr. Insul., Key 2,3,4
57	140A705	1	Plate, Man. Htr. Mtg., Key 2, 3,4
58	508A103	2	Sleeve, Insul., Man. Htr. Mtg. Key 2,3,4
58A	508A102	2	Washer, Insul., Man. Htr. Mtg., Key 2,3,4
59	114A23	2	Screw, Cap (1/4-20 x 1-1/4"), Man. Htr. Mtg., Key 2,3,4
63	149-769	1	Plug, Air Bleed, Sec. Filter
64	LEAD, JUMPER, AIR HEATER 336A1051	1	Key 2,4
	336A1408	1	Key 3
66	503A171	2	Clamp, Brthr. Hose (Repl. 503A446)
67	140K677	1	Conversion Kit, Oil Bath Air Clnr. (Opt., Incl. Parts Marked * Plus Hdw.
68	140B500	1	*Clnr., Air, Oil Bath
69	140B519	1	*Band, Air Cleaner
70	503P365	2	*Clamp, Air Clnr. Hose
71	503A444	1	*Hose, Air Clnr. to Adapter
72	140C645	1	*Adapter, Oil Bath Air Clnr.

* - Included in optional 140K677 Oil Bath Air Cleaner Conversion Kit.

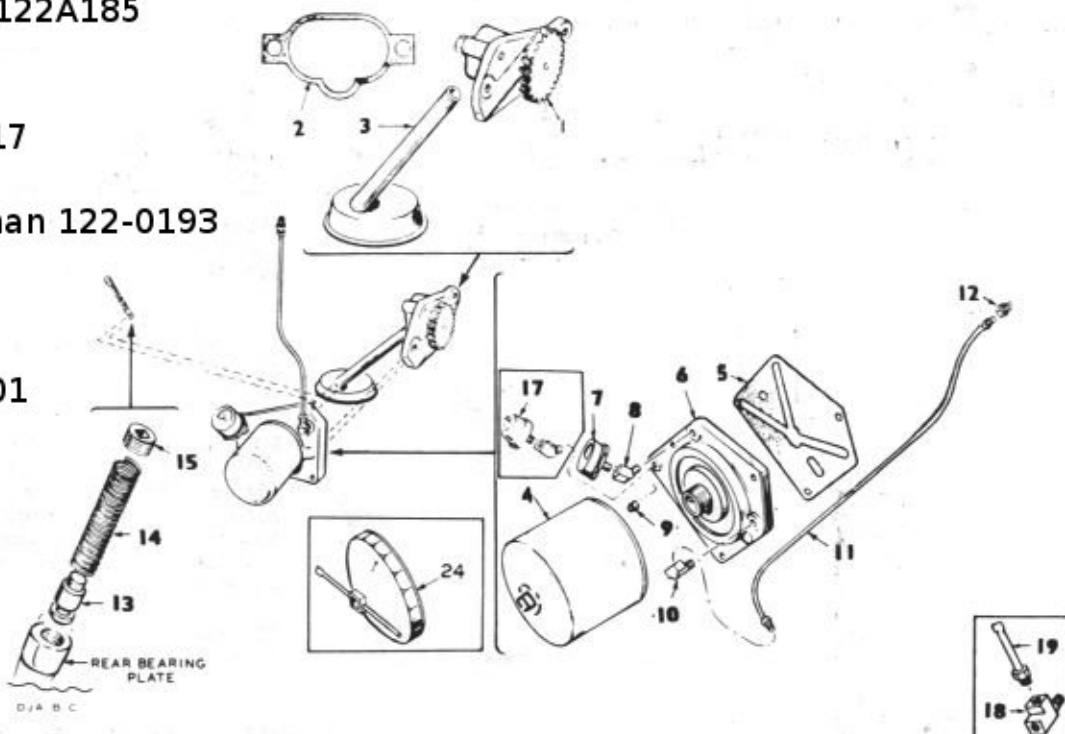


MANIFOLD & EXHAUST GROUP

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTIONS	REF. NO.	PART NO.	QTY. USED	PART DESCRIPTIONS
1	MANIFOLD, EXHAUST 154C704	1	To Spec. C	5	155B492	1	Tube, Exh. Flex. 1-1/4" Thread
	154C725	1	Begin Spec. C (Note: Use 154C704 on Contractors Mdl. and Mdl. with shutters or air duct)	5	155B849	1	Tube, Exh., Flex. (Hsd. Plts. Only) 10-1/4", 1-1/4" Thread
3	154A463	1	Gasket	6	505-36	1	Coupling, Reducer (1-1/2" to 1-1/4")
4	155B330	1	Muffler, 1-1/4" Inlet	10	505-183	1	Elbow, Pipe Reducer (1-1/2" to 1-1/4")
4	155B456	1	Muffler (Hsd. Plts. Only) 1-1/2" Inlet	11	505-43	1	Elbow (1-1/2") Hsd. "Plts. Only

Oil Filter Onan 122A185
 Fram PH16
 Wix 51084
 Purolator L10017

HD Oil Filter Onan 122-0193
 5 3/4" long
 Fram PH8A
 Wix 51452
 Purolator L30001
 AC Delco PF2

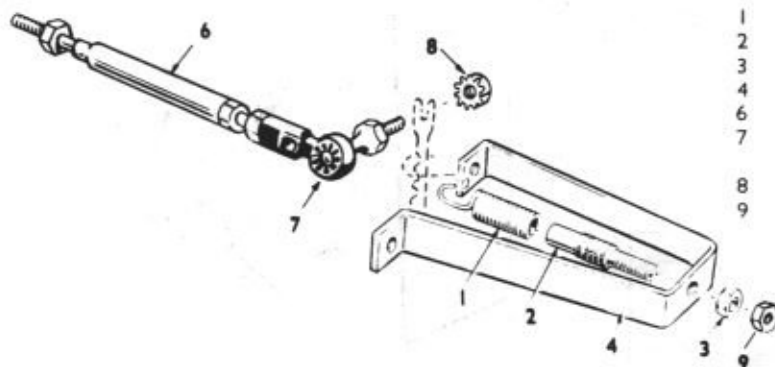


OIL SYSTEM GROUP

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTIONS
1	120A547	1	Pump Assembly, Oil
2	120K580	1	Gasket Kit, Pump
3	120A551	1	Cup, Oil Intake
4	122A185	1	Filter
5	122A188	1	Gasket, Adapter
6	122A182	1	Adapter, Oil Filter
7	193P122	1	Gage, Oil Pressure
8	502A53	1	Elbow, Street 45° Oil Gage (Also (1) Optional Low Oil Pressure Switch)
9	505-57	1	Plug, 1/8", Adapter

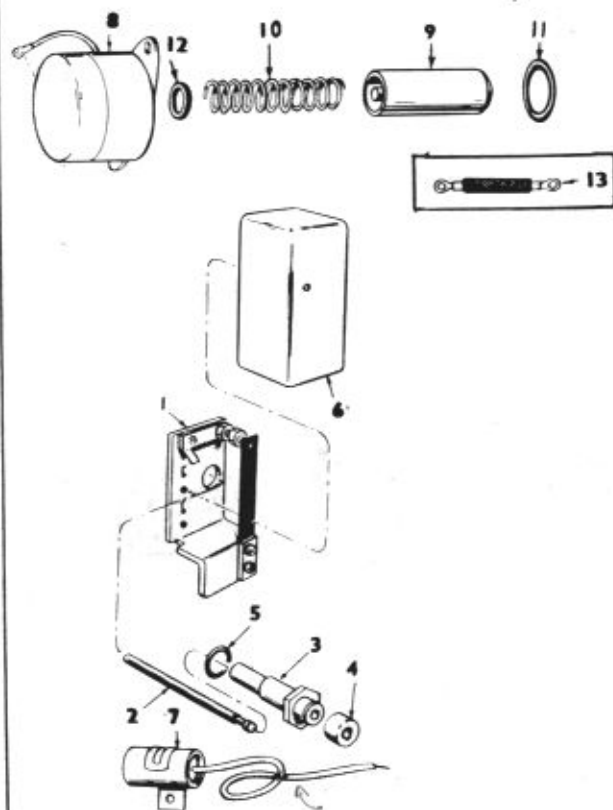
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTIONS
10	502-19	1	Elbow, Oil Line to Filter Adapter
11	120A562	1	Line, Adapter to Cyl. Hd.
12	502A235	1	Connector, Restricted Cyl., Hd.
13	120A539	1	Valve, Oil By-Pass
14	120A555	1	Spring, By-Pass Valve
15	505-274	1	Plug, 1/8" Oil By-Pass
17	309A104	1	Switch, Oil Pressure
18	502A255	1	Tee, Rest., Air Trap Tube
19	120A598	1	Tube, Air Trap, Switch

GOVERNOR GROUP



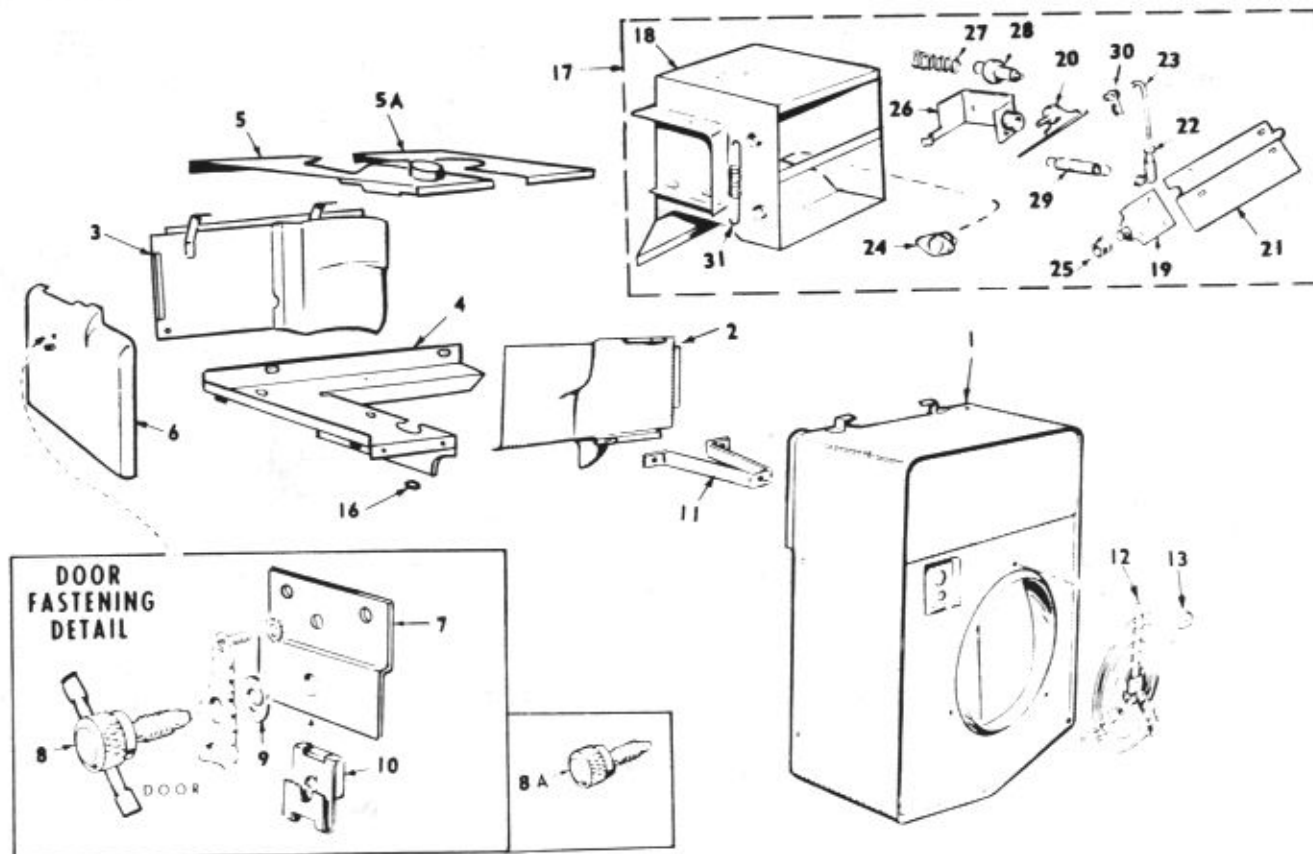
REF. NO.	PARTS NO.	QTY. USED	PART DESCRIPTIONS
1	150A821	1	Spring
2	150A822	1	Stud, Adjusting
3	104A91	1	Nut, Adjusting Stud
4	150A812	1	Bracket Assembly
6	150A831	1	Linkage Assembly
7	150A974	2	Joint, Ball (Early Plts. Only)
8	870-131	1	Nut, Keps, Joint Arm
9	870-130	1	Nut, Lock

ANTI-FLICKER & STOP SOLENOID GROUP



REF. NO.	PART NO.	QTY. USED	PART DESCRIPTIONS
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. (Mts. in Control Box, Also in Control Group) 200VDC
8	SOLENOID, DECOMPRESSION RELEASE		
	307B628	1	Parts Key No. 1 (12-V)
	307B680	1	Parts Key Nos. 2,4 (32-V)
	307B668	1	Parts Key No. 3 (24-V)
9	306A167	1	Plunger, Sol., Incl. Pin
10	306A166	1	Spring, Sol. Plunger
11	509P103	1	Seal, O-Ring, Stop Sol. (Repl. 509P18)
12	307A736	1	Gasket, Sol. Mtg.
13	337A51	1	Strap, Grd., Sol. to Eng.

Note: Used on plants with Key 1 & 2.

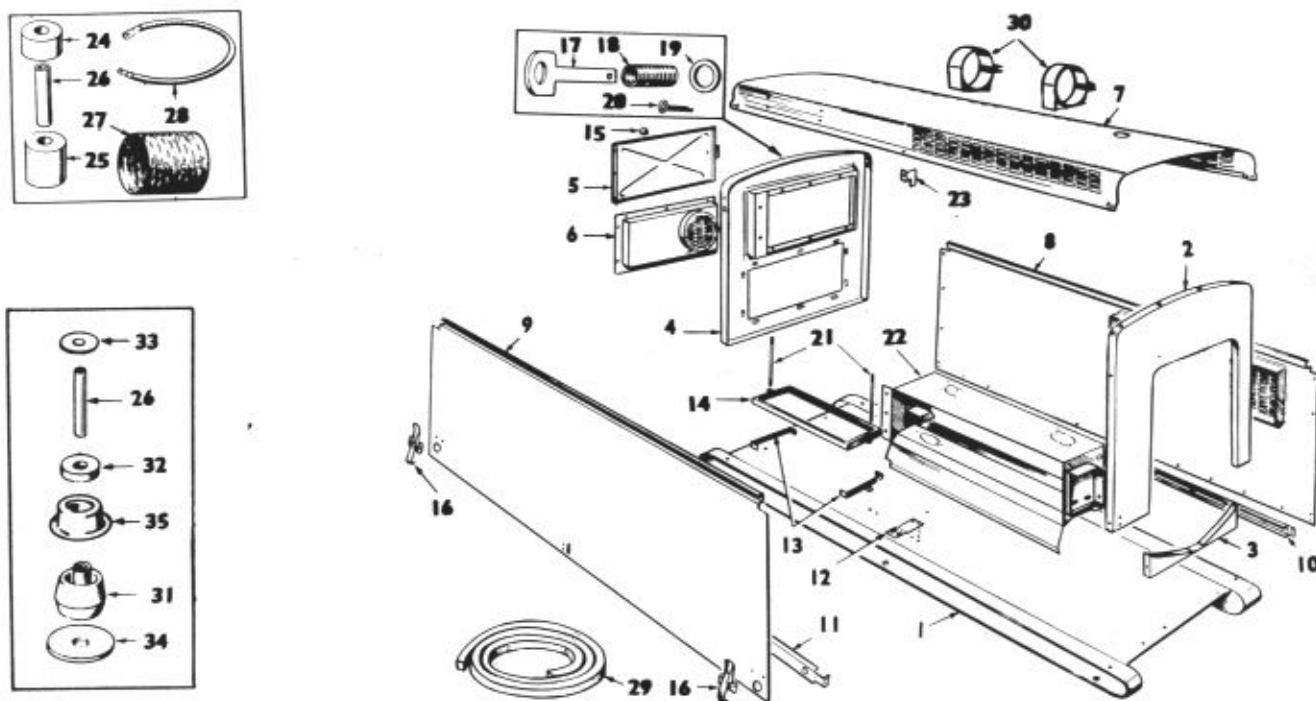


AIR HOUSING & OPTIONAL SHUTTER GROUP

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTIONS
1	134D1050	1	Housing, Blower
2	134D1048	1	Housing, Cyl. Air - Frt.
3	134C1127	1	Housing, Cyl. Air - Rear
4	134D1102	1	Panel, Cyl. Air Hsg. (Bottom)
5	134C1130	1	Cover, Nozzle & Hsg.
5A	134B1131	1	Cover, Housing, Plain
6	134D1117	1	Panel, Air Hsg. Door
7	134A1554	1	Bracket, Air Hsg. Door Panel
8	134A1373	1	Screw, Door
8A	134A1179	4	Screw, Top Cover, Use Cap Screw
9	134A1180	2	Washer, Door (Early Models 8 for Top Cover)
10	870-194	5	U-Clip, Door Panel & Cover
11	134B1085	1	Support, Blower Hsg. & Grille
12	134D1178	1	Grille and Plate
13	134A1092	3	Retainer, Grille
16	GROMMET, RUBBER - HOUSING		
	508A5	1	For 9/16" Hole
	508P21	3	For 3/4" Hole

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTIONS
17	134D1253	1	Shutter Assy., (Optional)
18	134D1254	1	*Duct Assy., Air Outlet
19	134A1242	3	*Bracket & Pivot Shutter
20	134D1238	1	*Bracket Shaft & Pin Shutter
21	134B1256	2	*Shutter, Air Outlet
22	150A998	1	*Joint, Ball (Repl. 150A639)
23	134A1247	1	*Rod, Shutter Control
24	309P162	1	*Switch, Hi-Temperature
25	134P1248	4	*Bearing, Shutter
26	134A1244	1	*Bracket & Guide, Vernatherm
27	134A656	1	*Spring, Vernatherm Element
28	309A85	1	*Element, Vernatherm
29	134A658	1	*Spring, Shutter Return
30	518-4	1	*Clip, Rod
31	134A1437	2	*Spring, Shutter Pivot

* - Included in Optional - Air Discharge Shutter.



HOUSING GROUP, HOUSED AC PLANTS (Optional Equipment)

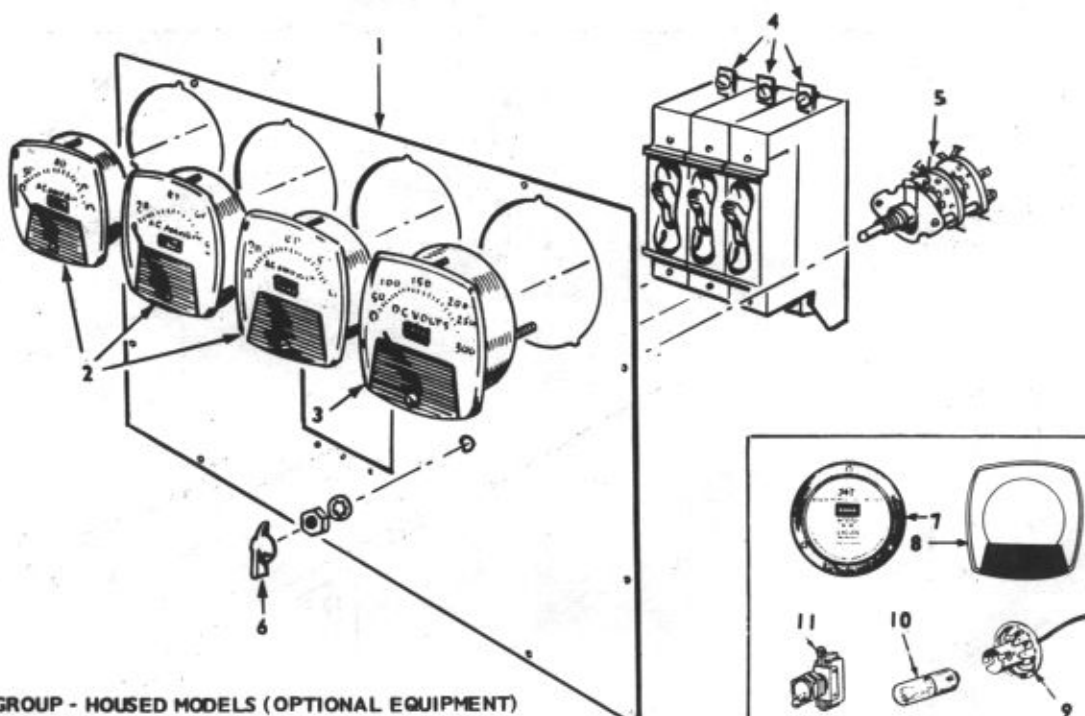
Note: 4 possible options exist: (1) Housing, (2) Housing plus Meter Panel, (3) Housing plus Shutters, (4) Housing plus Meter Panel and Shutters.

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTIONS
1	403A679	1	Base
2	405B1323	1	Panel, Upper (Eng. End)
3	405B1333	1	Panel, Lower (Eng. End)
4	PANEL (GENERATOR END) REAR		
	405B1322	1	Plants without Meter Panel
	405C1331	1	Plants with Meter Panel
5	PANEL, DOOR - REAR END		
	405B1329	1	Plants without Meter Panel
	405B1332	1	Plants with Meter Panel
6	405B1330	1	Panel, Generator Access
7	405B1348	1	Panel, Top
8	405B1386	1	Panel, R Side (Plts. without Shutters)
8	405B1391	1	Panel, R Side (Plts. with Shutters)

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTIONS
9	405B1346	1	Panel, Left Side
10	405B1344	1	Rail, Stiffener Right Side
11	405B1345	1	Rail, Stiffener Left Side
12	405A1341	2	Bracket, Stiffener Rail
13	416A501	2	Bracket, Battery
14	416B502	1	Frame, Battery, Hold-down
15	406-2	1	Knob, Rear Door Panel
16	406A105	2	Fastener, Housing
17	405A1138	2	Pin, Shoulder, Rear Panel
18	405B1139	2	Spring, Shoulder Pin, Rr. Panel
19	526-115	2	Washer, Shoulder Pin, Rr. Panel (Repl. 526-22)
20	516-39	2	Pin, Shoulder Pin
21	520A490	2	Stud, Battery Hold-down

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTIONS
22	DUCT, EXHAUST MANIFOLD		
	134D1254	1	Plants without Shutters
	134D1253	1	Plants with Shutters
23	405A1181	2	Stop, Door
24	402A36	4	Mount, Cylindrical Shaped, Upper, To Spec. C
25	402A38	4	Mount, Cylindrical Shaped, Lower, To Spec. C
26	BUSHING, SPACER, VIBRATION MOUNT		
	402A46	4	To Spec. C
	402A328	4	Begin Spec. C
27	503A423	1	Hose, Flex., Gen. Air Duct
28	336A476	1	Strap, Ground, Eng. to Frame
29	895P104	1	Stripping, Foam Weather (76" Req. for Hsg.) Cement in Pl.
30	140B631	2	Band, Muffler

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTIONS
31	CUSHION, VIBRATION, CONE SHAPED (TAPERED)		
	402B284	2	Eng. End, Begin Spec. C
	402B285	2	Gen. End, Begin Spec. C
32	402B282	4	Snubber, Shock Mtg., Begin Spec. C
33	526-14	4	Washer (29/64" I.D. x 1-1/2" O.D. x 1/8") Only with Cone Shaped Cushions
34	526A195	4	Washer (29/64" I.D. x 3-1/4" O.D. x 1/8") Only with Cone Shaped Cushions
34	526-198	As Req.	Washer (5/8" I.D. x 1-1/2" O.D. x 1/16") Only with Cone Shaped Cushions
35	402A300	4	Cup, Cushion Retaining, Begin Spec. C



AC METER PANEL GROUP - HOUSED MODELS (OPTIONAL EQUIPMENT)

REF. NO.	PART NO.	QTY. USED	PARTS DESCRIPTION
1	*	1	Panel
2	AMMETER, AC (Check Scale, Select According to Rating)		
	302P418		Scale Reads 0-30
	302P444	As	Scale Reads 0-35
	302P419	Req.	Scale Reads 0-50
	302P458		Scale Reads 0-80
3	VOLTMETER, AC (Check Scale, Select According to Rating)		
	302P421	1	Scale Reads 0-300
	302P422	1	Scale Reads 0-600
4	BREAKER, CIRCUIT (Check Orig. Part, Select According to Amp. and Voltage, 120-V is 1" Wide, 480-V is 1-1/2" Wide)		
	320B150	20-Amp, 480-V	
	320B151	25-Amp, 480-V	

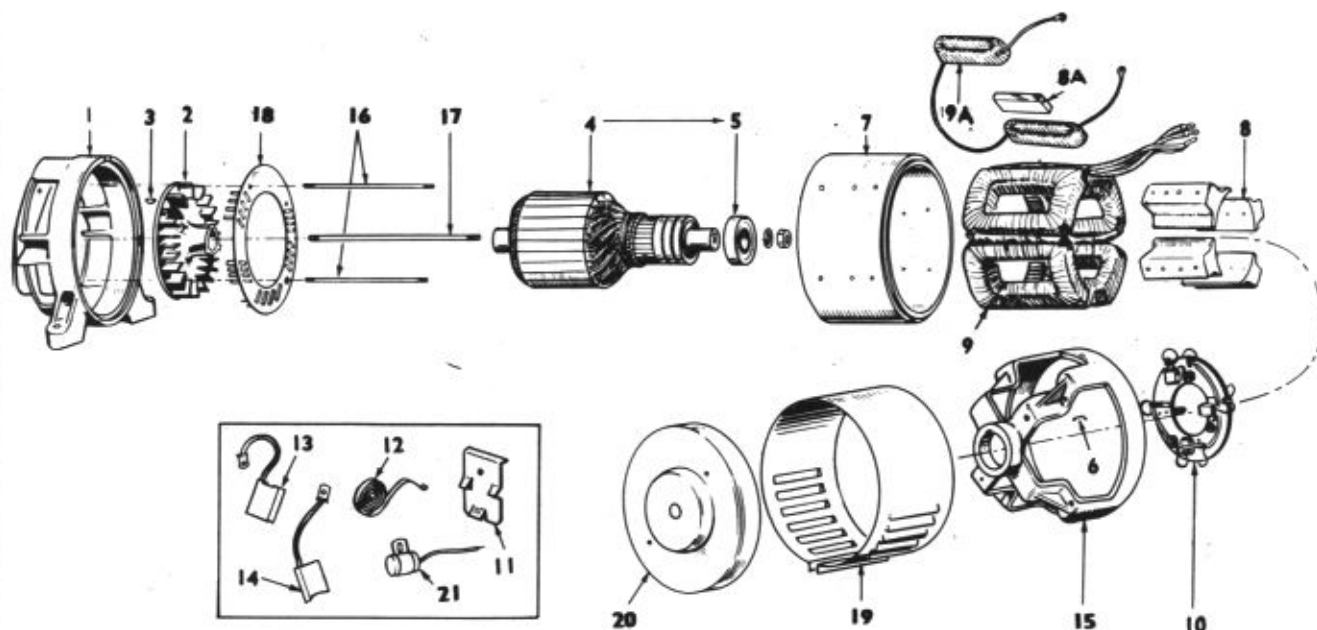
REF. NO.	PART NO.	QTY. USED	PARTS DESCRIPTION
	320B20		35-Amp, 120/240-Volt
	320B153		40-Amp, 120/240-Volt
	320B198		45-Amp, 120/240-Volt
	320B52		50-Amp, 120/240-Volt
	320B195		55-Amp, 120/240-Volt
	320B148		70-Amp, 120/240-Volt
5	308-12	1	Switch, Voltmeter Sel., 3-Ph. Only
6	303-76	1	Knob, Sel. Switch, 3-Ph. Only
7	METER, FREQUENCY		
	302-213	1	60-Cycle
	302-234	1	50-Cycle
8	302B448	1	Plate, Meter Face
9	322P72	2	Receptacle, Panel Lights
10	322-4	2	Bulb, Panel Light
11	308-2	1	Switch, Panel Lights

* - Order by description, giving complete Model and Serial Number (ONAN Nameplate).

CONTROL GROUP

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTIONS
1	301D2008	1	Box, Control
2	301B1963	1	Cover, Control Box
3	PANEL, CONTROL BOX		
	301C2009	1	Key 1
	301C2295	1	Key 2
	301C2274	1	Key 3,4
4		1	Bracket, Cont. Box Mtg., One Piece (Order 301C2424, 301A2425 & 301A2426)
4A	301C2424	1	Bracket, Cont. Box Mtg.
4B	301A2425	1	Bracket, Cont. Box Mtg., L.H.
5	301A2426	1	Bracket, Cont. Box Mtg., R.H.
6	307B4	1	Relay, Decomp. Sol. Relay
7	RELAY, REVERSE CURRENT		
	307B180	1	Key 1
	307B496	1	Key 2
	307B7	1	Key 3
	307B361	1	Key 4
8	SOLENOID, MANIFOLD HEATER & START		
	307B40	2	Key 1
	307B61	2	Key 2,3,4
12	308P154	1	Switch, Start Stop
13	308P37	1	Switch, Manifold Heater
13	308-7	1	Switch, Hi-Low Charge, Key 2
14	AMMETER, CHARGE		
	302A446	1	Key 1 (5-0-5)
	302-61	1	Key 2 (30-0-30)
	302-64	1	Key 3,4 (100-0-100)
17	301B2012	1	Cover, Resistor, Key 1
18	RESISTOR, FIXED		
	304A32	1	15-Ohm, 10-Watt, Key 1
	304A257	1	75-Ohm, 25-Watt, Key 2
	304A11	1	50-Ohm, 25-Watt, Key 3
	304A256	1	75-Ohm, 25-Watt, Key 4

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTIONS
19	RESISTOR, ADJUSTABLE		
	304A506	1	6-Ohm, 150-Watt, Key 1,2
	304A175	1	1-Ohm, 50-Watt, Flicker, Key 1
	304A16	1	2.5-Ohm, 50-Watt, Flicker, Key 2
20	332A604	1	Block, Term., 5-Pl., Remote Con., Key 1,2
20	332A537	1	Block, Term., 4-Pl., Remote Con., Key 2
20	332A537	2	Block, Term., 4-Pl., (1) Remote Con., (1) Term. Load, Key 3,4
21	332A609	1	Block, Term., 2-Pl., Term. Load, Key 1
24	332A616	1	Strip, Blk. Marker (B+,1,2,3, H)
24	332A554	1	Strip, Blk. Marker (F2,4,5,6), Key 2,3,4
30	416A77	2	Cable, Battery, Key 1,2
31	416A4	1	Cable, Battery Jumper, Key 1,2
32	304A6	2	Washer, Resistor Centering
33	312A57	1	Condenser, 1. Mfd., Anti-Flicker, Key 1,2
34	402-78	4	Mount, Rubber, Cont. Box
35	301C2290	1	Box, Rheo, Mtg., Key 3,4
36	301A2291	1	Panel, Rheo, Box, Key 3,4
37	301C2129	1	Bracket, Rheo. Box Mtg., Key 3,4
38	RHEOSTAT		
	303-46	1	Key 3 (10-Ohm, Model P)
	303-10	1	Key 4 (8-Ohm, Model P)
39	303-47	1	Knob, Rheo. Key 3,4
40	338B313	1	Harness Wiring, Rheo, Key 3,4



GENERATOR GROUP

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTIONS
1	ADAPTER		
	231E100	1	To Spec. C
	231E113	1	Begin Spec. C
2	205C65	1	Blower, Generator
3	515-6	1	Key, Blower
4	ARMATURE ASSY., INCL. BRG. & BLOWER		
			Key 1
	201-1202	1	120-V, 50-Cycle
	201A1159	1	240-V, 50-Cycle, 1-Ph.
	201-1214	1	120/240-V, 50-Cycle
	201A1160	1	240-V, 50-Cycle, 3-Ph.
	201A1116	1	120-V, 60-Cycle
	201A1207	1	240-V, 60-Cycle, 1-Ph.
	201-1178	1	120/240-V, 60-Cycle
	201-1379	1	240-V, 60-Cycle, 3-Ph.
			Key 2
	201-1223	1	50-Cycle
	201A1206	1	60-Cycle
	201-1192	1	Key 3
	201-1216	1	Key 4
5	510A47	1	Bearing, Ball, Armature
6	232A596	1	Clip, Bearing Stop
7	FRAME ONLY, LESS COILS & POLE SHOES		
	210D348	1	Key 1,2
	210D362	1	Key 3,4
8	SHOE, POLE, FIELD		
	221A91	4	Key 1,2
	221B126	4	Key 3,4
8A	221A129	2	Shoe, Pole, Interpole, Key 3,4
9	COIL ASSY., FIELD, SET OF 4 COILS		
	222A1593	1	Key 1
	222-1610	1	Key 2
	222-1608	1	Key 3
	222-1613	1	Key 4
9A	COIL ASSY., INTERPOLE, SET OF 2 COILS		
	222-1607	1	Key 3
	222-1614	1	Key 4
10	RIG ASSEMBLY, BRUSH		
			Key 1
	212C294	1	120-V & 240-V, 1-Ph. (Repl. 212C225)
	212C296	1	120/240-V (Repl. 212C283)

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTIONS
	212C297	1	240-V, 3-Ph. (Repl. 212C235)
	212C301	1	Key 2 (Repl. 212C269)
	212C116	1	Key 3
	212C244	1	Key 4
	SPRING, BRUSH		
11	212B1105	8	120-V, 240-V (1-Ph.) & 120AC/32DC-V, Key 1,2 - AC & DC
11	212B1106	4	Key 4, Commutator (DC)
11	212B1105	7	120/240-V, 1-Ph. & 240-V 3-Ph., AC & DC, Key 1 Begin Spec. D
12	212A1003	4	120/240-V, 1-Ph. & 240-V 3-Ph., DC, Key 1, To Spec. D
12	212A1004	3	120/240-V, 1-Ph. & 240-V 3-Ph., AC, Key 1, To Spec. D
12	212A1011	4	Key 3, Commutator (DC)
13	BRUSH, COMMUTATOR (DC)		
			Key 1
	214A61	4	120-V & 240-V, 1-Ph. (Repl. 214A80)
	214A81	4	120/240-V, 1-Ph. (Repl. 214A30) To Spec. D
	214A61	4	120/240-V, 1-Ph., Begin Spec. D
	214A30	4	240-V, 3-Ph., To Spec. D
	214A61	4	240-V, 3-Ph., Begin Spec. D
	214A9	4	Key 2, To Spec. D
	214A83	4	Key 2, Begin Spec. D
	214A18	4	Key 3
	214A68	4	Key 4
14	BRUSH, COLLECTOR RING (AC)		
			Key 1
	214A50	4	120-V & 240-V, 1-Ph
	214A79	3	120/240-V, 1-Ph., To Spec. D
	214A50	3	120/240-V, 1-Ph., Begin Spec. D
	214A32	3	240-V, 3-Ph., To Spec. D
	214A50	3	240-V, 3-Ph., Begin Spec. D
	214A50	4	Key 2

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTIONS	REF. NO.	PART NO.	QTY. USED	PART DESCRIPTIONS
15	BELL, END			20	COVER, END BELL		
	211D97	1	Key 1		211C99	1	Unhoused Plants
	211D98	1	120-V & 240-V, 1-Ph.		234B229	1	Housed Plants
			120/240-V, 1-Ph., & 240-V, 3-Ph.	21	CONDENSER		
	211D97	1	Key 2,3,4		312A58	1	Key 1
16	520A502	2	Stud, Generator Through				AC, .1 Mfd., 120-V & 240-V, 1-Ph.
17	STUD, ARMATURE THROUGH				312A58	2	AC, .1 Mfd., 120/240-V, 1-Ph.
			Key 1		312A58	3	AC, .1 Mfd., 240-V, 3-Ph.
	520A491	1	120-V & 240-V, 1-Ph.		312A27	1	DC, .5 Mfd., 120-V, 240-V & 120/240-V, 1-Ph.
	520A525	1	120/240-V, 1-Ph. & 240-V, 3-Ph.		312A17	1	DC, .5 Mfd., 240-V, 3-Ph.
	520A491	1	Key 2,3,4				Key 2
18	232C1256	1	Scroll, Generator Air		312A58	1	AC, .1 Mfd.
19	BAND, END BELL				312A27	1	DC, .5 Mfd.
			Key 1				Key 3
	234B2	1	120-V & 240-V, 1-Ph.		312A17	2	DC, .5 Mfd.
	234B5	1	120/240-V, 1-Ph. & 240-V, 3-Ph.				Key 4
	234B2	1	Key 2,3,4		312A17	1	DC, .5 Mfd.
	234B228	1	Housed Plants		312A27	1	DC, .5 Mfd.

SERVICE KITS & MISCELLANEOUS

NOTE: For other kits, refer to the group for the part in question.

REF. NO.	PART NO.	QTY. USED	PARTS DESCRIPTION
	168K85	1	Gasket Kit, Plant
	522K200	1	Overhaul Kit, Plant
	525P137	1	Paint, Touch-up Enamel (Green) 16-Ounce Pressurized Can

SPECIAL PARTS SECTION

**FOR 3DJA-1E2236/ & 3DJA-3E2236/
CONTRACTORS MODELS**

Parts not listed in this section, refer to the standard parts groups. Exception: Overhaul Kits do not apply.

OIL SYSTEM GROUP (Special List)

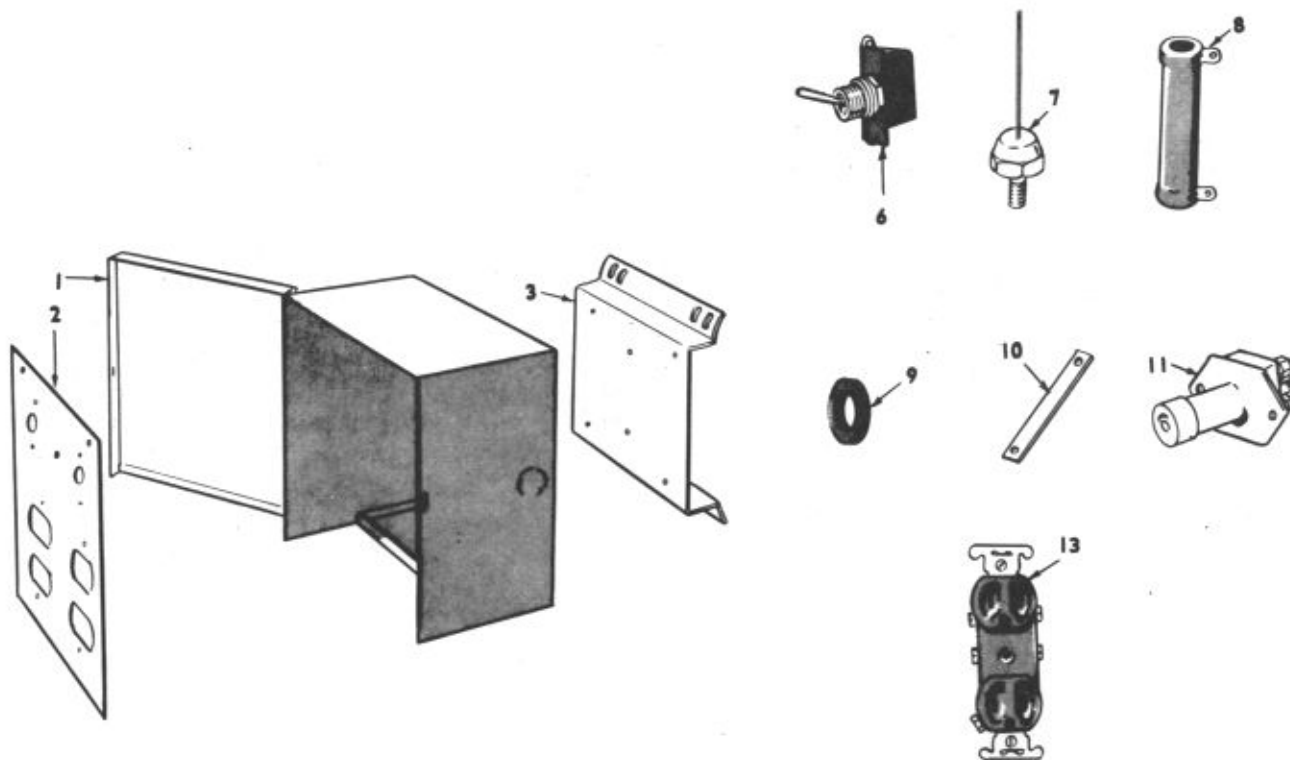


REF. NO.	PART NO.	QTY. USED	PART DESCRIPTIONS
2	309A105	1	Switch, Oil Press., Decom. Release Sol. Cut-in

MANIFOLD & EXHAUST GROUP (Special List)



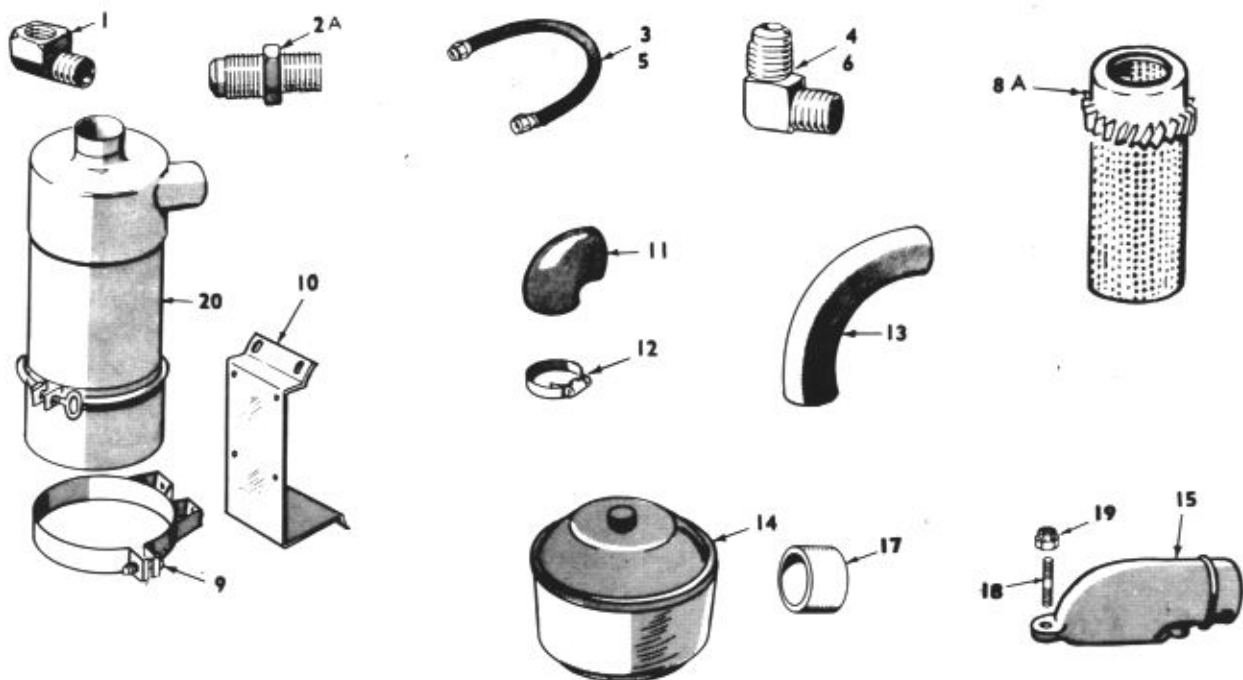
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTIONS
1	155B824	1	Muffler, Exhaust
2	505-177	1	Nipple, Pipe Close, Exh.



CONTROL GROUP (Special List)

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTIONS
1	301C2302	1	Box, Control
2	301B2293	1	Panel, Control Box
3	301B2129	1	Bracket, Cont. Box Mtg.
6	308P69	1	Switch, Stop-Run
7	305A235	1	Rectifier, 10-Amp, 100-V Peak
8	304A44	1	Resistor, Fixed (2.5-Ohm, 50-Watt) 4 x 3/4"
9	GROMMET, RUBBER		
508-8		1	For 7/8" Hole

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTIONS
	508-9	1	For 1-5/16" Hole
	508-26	1	For 13/32" Hole
10	332A602	1	Jumper, Htr. Switch to Start Switch
11	308A28	2	Switch, (1) Start (1) Heater
13	RECEPTACLE, DUPLEX		
	323-184	2	120-V, 1-Ph., 2-Wire Model
	323-184	1	120/240-V, 1-Ph., 3-Wire Mdl.
	323-213	1	120/240-V, 1-Ph., 3-Wire Mdl.



FUEL SYSTEM GROUP (Special List)

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTIONS
1	502-2	1	Elbow, Inv. Male, Fl. Pump In.
2A	502-137	1	Connector, Male, Fl. Pp. Out.
3	501A98	1	Line, Pump to Sec. Filter
4	502-148	1	Elbow, Male, Sec. Filter In.
4	502-148	1	Elbow, Male, Sec. Filter Out.
5	501A96	1	Line, Sec. Filter to Inj. Pp.
6	502-148	1	Elbow, Male, Inj. Pump In.
8A	140P765	1	Element Only, Air Clnr.
9	140P722	2	Band, Air Clnr. Mtg.
10	140P728	1	Bracket, Air Cleaner

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTIONS
11	503P419	1	Elbow, Air Clnr., Rubber
12	503P365	4	Clamp, Hose, Air Clnr.
13	140A742	1	Tube, Air Induction
14	140P723	1	Pre-Clnr., Air Clnr. (Plastic)
15	140C645	1	Adapter, Air Clnr. Hose to Air Cleaner Adapter
17	503A330	1	Hose, Air Clnr. Connector
18	520A11	2	Stud, Air Clnr. Adapter Mtg.
19	870-137	2	Nut, Air Clnr. Adapter Stud
20	140P721	1	Cleaner, Air, Incl. Element

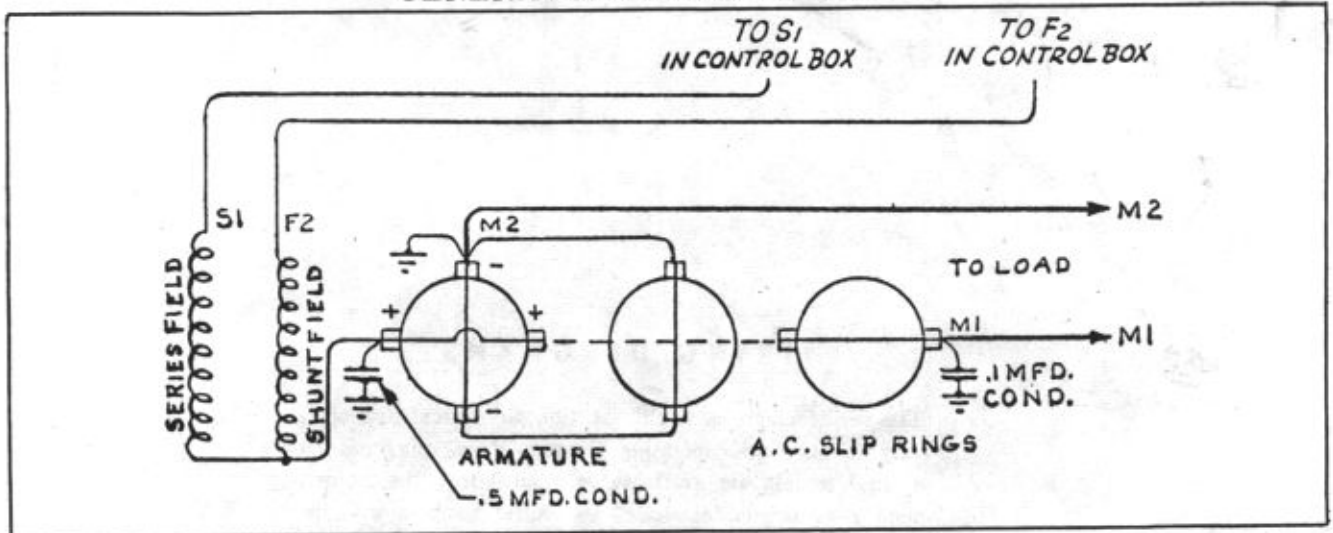
WIRING DIAGRAMS

The wiring diagrams in this section are typical and apply only to standard generating plants. Wiring diagrams for special models are available on request from the factory; send generator model, spec, and serial numbers with the request.

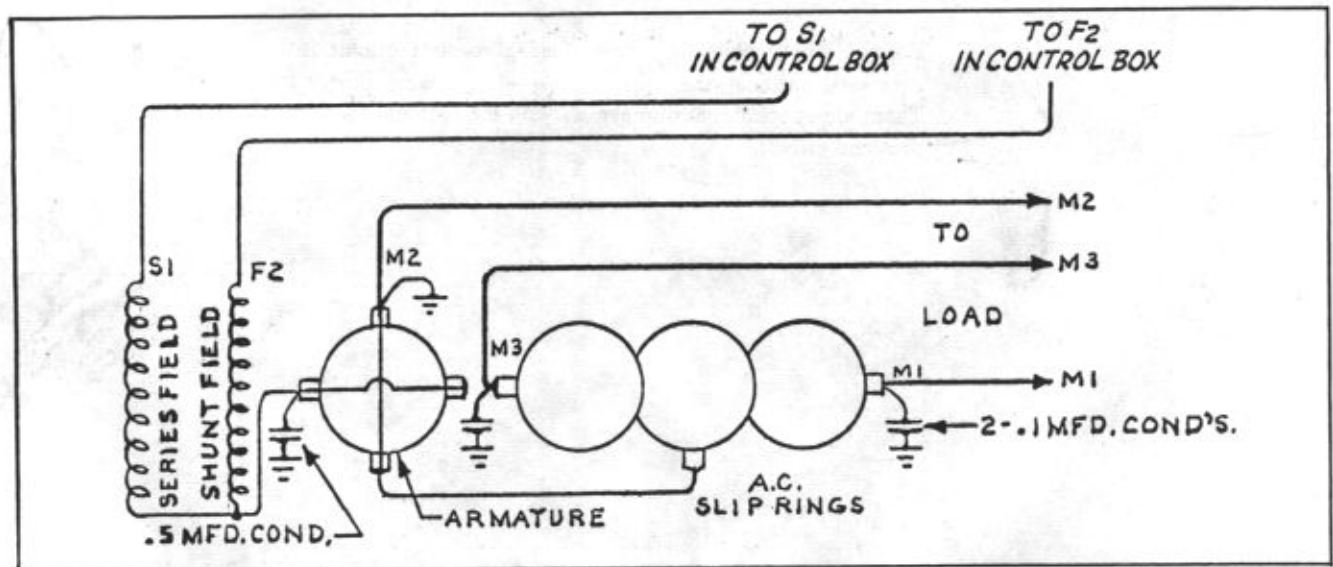
For revolving armature plants, select the generator wiring diagram with the proper phase and number of output wires.

Control wiring diagrams show standard control circuit in schematic without the optional low oil pressure circuit. There are special control diagrams with the optional low oil pressure circuit.

GENERATOR WIRING DIAGRAMS



DJA Revolving Armature 2-Wire, Single Phase

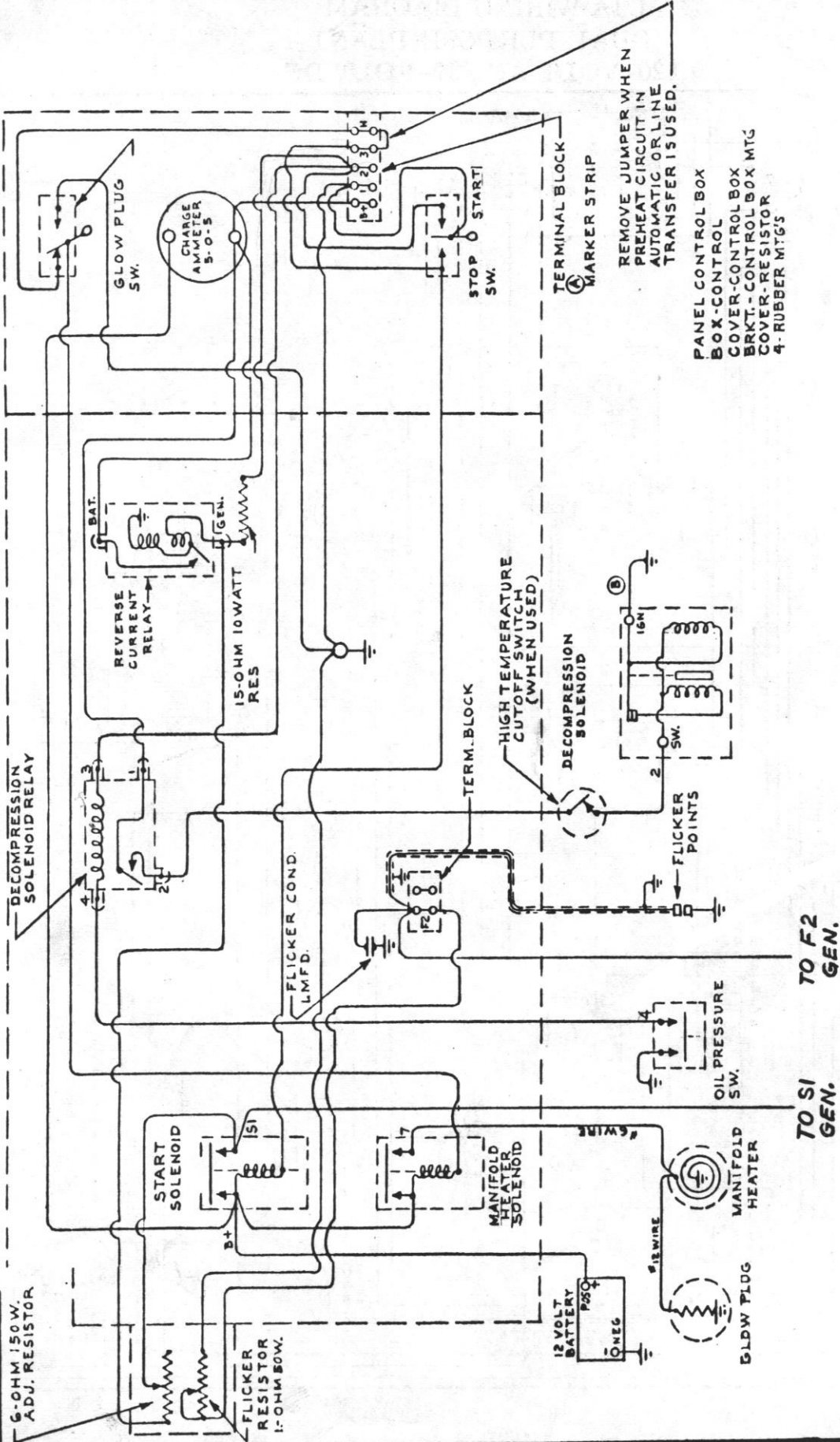


DJA Revolving Armature 3-Wire, Single Phase

DJA CONTROL WIRING DIAGRAM

3MDJA-1R SPECIA 3DJA-1R SPECIA

610 C 181



PANEL CONTROL BOX
BOX-CONTROL
COVER-CONTROL BOX
BRKT.-CONTROL BOX MTG
COVER-RESISTOR
4-RUBBER MTGS

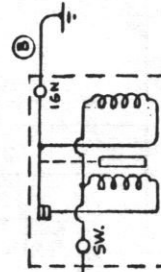
REMOVE JUMPER WHEN
PREHEAT CIRCUIT IN
AUTOMATIC OR LINE
TRANSFER IS USED.

TERMINAL BLOCK
A MARKER STRIP

TERM. BLOCK

HIGH TEMPERATURE
CUTOFF SWITCH
(WHEN USED)

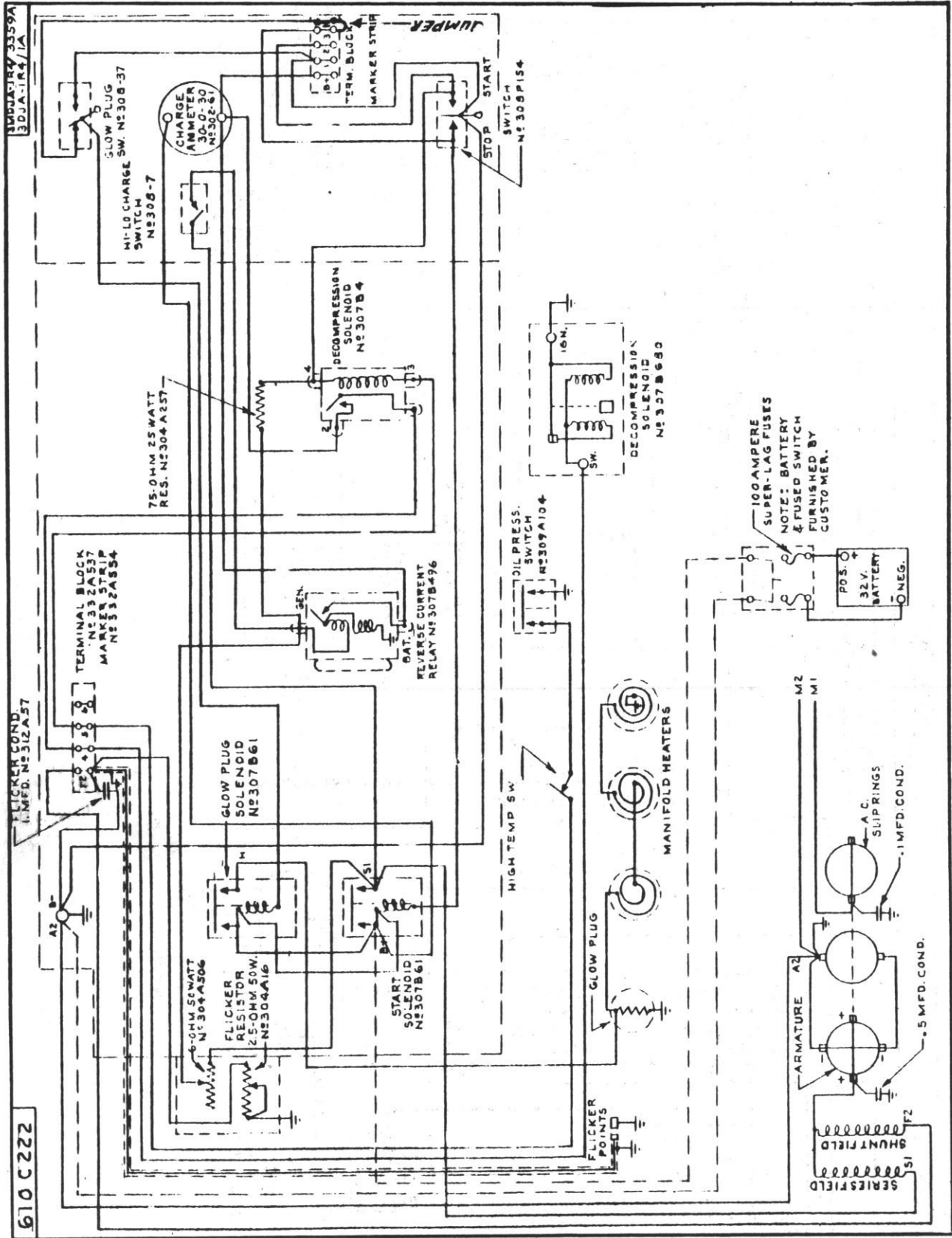
DECOMPRESSION
SOLENOID



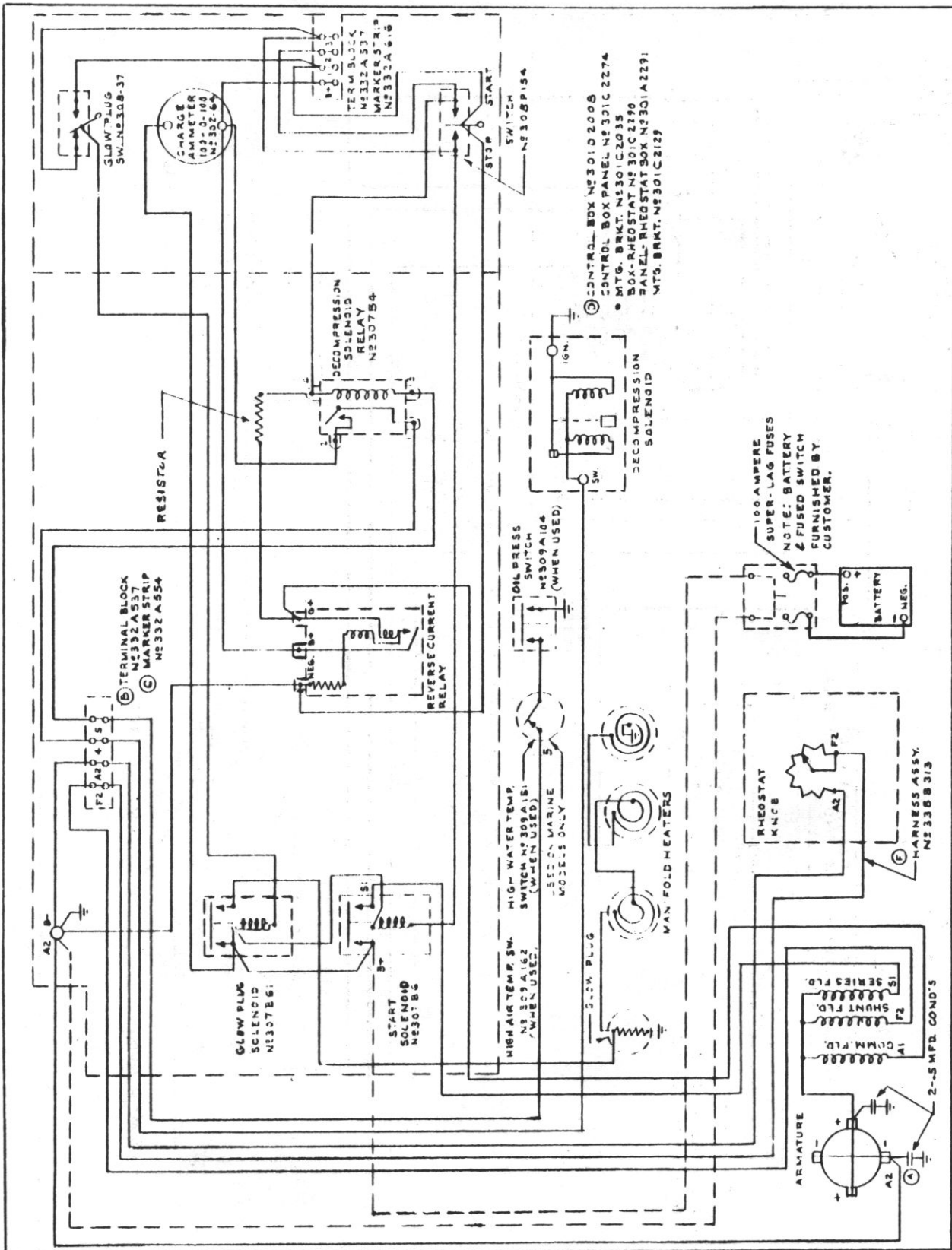
TO F2
GEN.

TO S1
GEN.

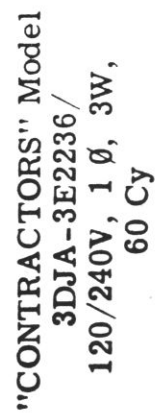
DJA WIRING DIAGRAM DUAL PURPOSE PLANT 120-VOLT AC /32-VOLT DC



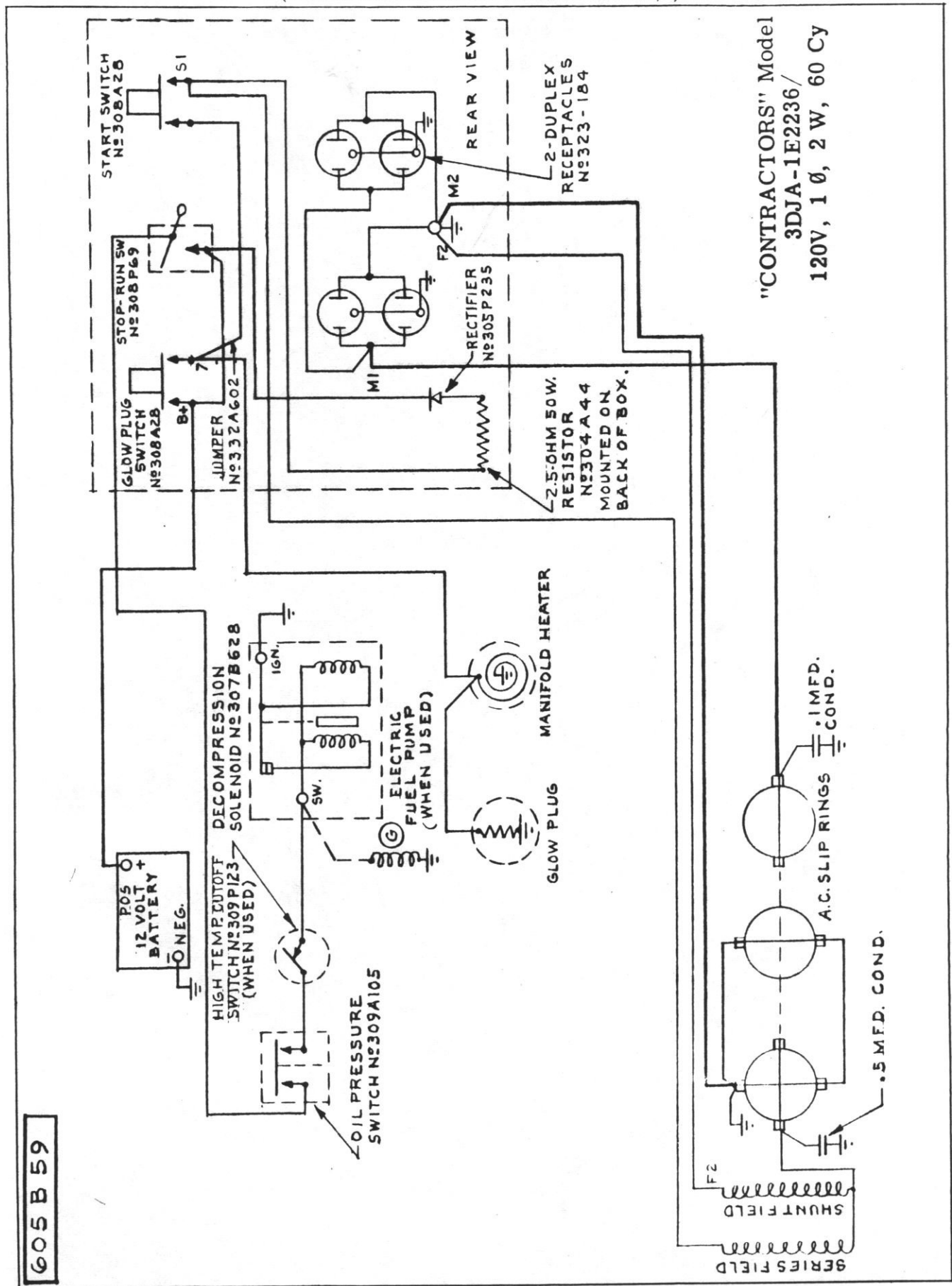
DJA WIRING DIAGRAM 24-VOLT AND 32-VOLT BATTERY CHARGER



605 B 60



DJA WIRING DIAGRAM (Contractors Model 3DJA-1E2236/)



605 B 59