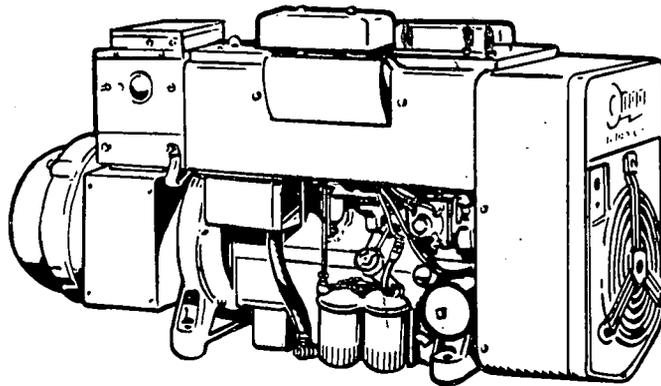


# **OPERATORS MANUAL AND PARTS CATALOG**

**FOR  
ELECTRIC GENERATING SETS**

**SERIES  
DJC**



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967-0341

1A-AA75  
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Printed in U.S.A.

## INTRODUCTION

THIS OPERATOR'S MANUAL CONTAINS INFORMATION PERTAINING TO THE OPERATION AND MAINTENANCE OF YOUR UNIT.

WE SUGGEST YOU KEEP THE MANUAL AND THE WIRING DIAGRAM WHICH ACCOMPANIES EVERY UNIT AND REFER TO IT WHEN MAKING EQUIPMENT ADJUSTMENTS OR ORDERING PARTS. ADDITIONAL COPIES ARE AVAILABLE FOR A NOMINAL CHARGE FROM YOUR DISTRIBUTOR.

WHEN ORDERING PARTS, REMEMBER TO INCLUDE THE MODEL, SPECIFICATION LETTER, AND SERIAL NUMBER LOCATED ON THE UNIT NAMEPLATE. THIS IS ESSENTIAL TO ENSURE THE CORRECT PART IS SHIPPED TO YOU.

FOR REPAIR SERVICE, CONTACT YOUR AUTHORIZED SERVICE REPRESENTATIVE.

### *WARNING*

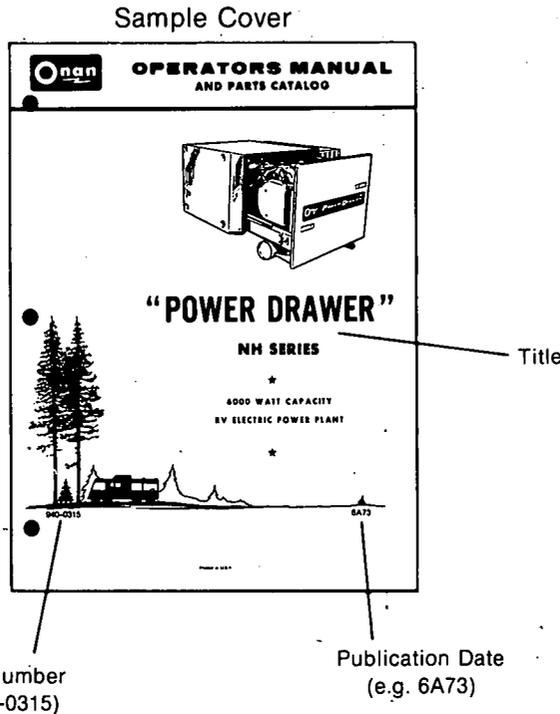
TO AVOID POSSIBLE PERSONAL INJURY OR EQUIPMENT DAMAGE, A QUALIFIED ELECTRICIAN OR AN AUTHORIZED SERVICE REPRESENTATIVE MUST PERFORM INSTALLATION AND ALL SERVICE.

907

0341

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*Thank You!*



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## COMMENTS ON MANUAL

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CONTENTS:     Excellent     Adequate     Inadequate (please explain) \_\_\_\_\_

\_\_\_\_\_  
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 \_\_\_\_\_

SUGGESTIONS (additions, deletions, changes . . . . . please refer pages) \_\_\_\_\_

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

UNIT HISTORY: Model Number \_\_\_\_\_  
 Type of Application \_\_\_\_\_  
 Unit Purchased From \_\_\_\_\_

### Optional Information

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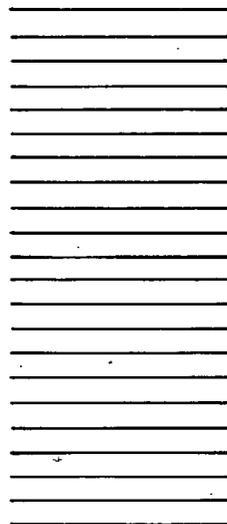
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# SAFETY PRECAUTIONS

The following symbols in this manual signal potentially dangerous conditions to the operator or equipment. Read this manual carefully. Know when these conditions can exist. Then, take necessary steps to protect personnel as well as equipment.

**WARNING** Onan uses this symbol throughout this manual to warn of possible serious personal injury.

**CAUTION** This symbol refers to possible equipment damage.

Fuels, electrical equipment, batteries, exhaust gases and moving parts present potential hazards that could result in serious, personal injury. Take care in following these recommended procedures.

- **Use Extreme Caution Near Gasoline, Gaseous Fuel And Diesel Fuel. A constant potential explosive or fire hazard exists.**

Do not fill fuel tank near unit with engine running. Do not smoke or use open flame near the unit or the fuel tank.

Be sure all fuel supplies have a positive shutoff valve.

Fuel lines must be of steel piping, adequately secured and free from leaks. Do not use copper piping on flexible lines as copper becomes hardened and brittle. Use black pipe on natural gas or gaseous fuels, not on gasoline or diesel fuels. Piping at the engine should be approved flexible line.

Have a fire extinguisher nearby. Be sure extinguisher is properly maintained and be familiar with its proper use. Extinguishers rated ABC by the NFPA are appropriate for all applications. Consult the local fire department for the correct type of extinguisher for various applications.

- **Guard Against Electric Shock**

Remove electric power before removing protective shields or touching electrical equipment. Use rubber insulative mats placed on dry wood platforms over floors that are metal or concrete when around electrical equipment. Do not wear damp clothing (particularly wet shoes) or allow skin

surfaces to be damp when handling electrical equipment.

Jewelry is a good conductor of electricity and should be removed when working on electrical equipment.

Use extreme caution when working on electrical components. High voltages cause injury or death.

Follow all state and local electrical codes. Have all electrical installations performed by a qualified licensed electrician.

- **Do Not Smoke While Servicing Batteries**

Lead acid batteries emit a highly explosive hydrogen gas that can be ignited by electrical arcing or by smoking.

- **Exhaust Gases Are Toxic**

Provide an adequate exhaust system to properly expel discharged gases. Check exhaust system regularly for leaks. Ensure that exhaust manifolds are secure and not warped.

Be sure the unit is well ventilated.

- **Keep The Unit And Surrounding Area Clean.**

Remove all oil deposits. Remove all unnecessary grease and oil from the unit. Accumulated grease and oil can cause overheating and subsequent engine damage and may present a potential fire hazard.

Dispose of oily rags. Keep the floor clean and dry.

- **Protect Against Moving Parts.**

Avoid moving parts of the unit. Loose jackets, shirts or sleeves should not be permitted because of the danger of becoming caught in moving parts.

Make sure all nuts and bolts are secure. Keep power shields and guards in position.

If adjustments *must* be made while the unit is running, use extreme caution around hot manifolds, moving parts, etc.

Do not work on this equipment when mentally or physically fatigued.

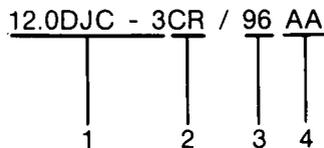
# GENERAL INFORMATION

## TABLE OF CONTENTS

### MODEL IDENTIFICATION

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

How to interpret MODEL and SPEC NO.



1. Factory code for general identification.
2. Specific Type:  
C - Indicates reconnectable.  
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).

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### MANUFACTURER'S GENERAL WARRANTY

Manufacturer extends to the original purchaser of Goods for use, the following warranties, subject to the qualifications indicated:

(a) Manufacturer warrants satisfactory performance for a period of one (1) year from the date each product is placed in service, so long as such product is installed, operated and serviced in accordance with Manufacturer's written instructions. THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING FITNESS FOR A PARTICULAR PURPOSE.

(b) Manufacturer's liability and purchaser's sole remedy for a failure of Goods to perform as warranted, and for any and all other claims arising out of the purchase and use of the Goods, including negligence on the part of Manufacturer, shall be limited to the repair or replacement of Goods returned to Manufacturer's factory or one of its Authorized Service Stations, transportation prepaid. The cost of any labor included shall be as specified in Manufacturer's written instructions. MANUFACTURER SHALL IN NO EVENT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.

(c) All claims shall be brought to Manufacturer's attention within Thirty (30) days after discovery that the Goods failed to perform as warranted, but in no event shall a claim be accepted after one (1) year from the date such product is placed in service.

No person is authorized to give any other warranty or to assume any other liability on Manufacturer's behalf unless made or assumed in writing by an Officer of Manufacturer, and no person is authorized to give any warranty or assume any liabilities on the Manufacturer's behalf unless made or assumed in writing by such Manufacturer.


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**IMPORTANT! RETURN WARRANTY CARD ATTACHED TO UNIT.**

# SPECIFICATIONS

*Average Fuel Consumption at Rated Load — 1.05 gal/hr*

	<b>MODEL SERIES</b>	
	<b>9.0DJC*</b>	<b>12.0DJC</b>
		<b>Metric</b>
<b>GENERAL</b>		
Nominal dimension of set (inches)		
Height .....	26	66.04 cm
Width .....	19	48.26 cm
Length .....	47	119.38 cm
<b>ENGINE DETAILS</b>		
Number cylinders (vertical inline) .....	4	—
Displacement (cubic inch) .....	120	1966.80 cc
Cylinder bore .....	3-1/4	82.55 mm
Piston stroke .....	3-5/8	92.08 mm
RPM (for 60 hertz) .....	1800	1800
RPM (for 50 hertz) .....	1500	1500
Compression ratio .....	19:1	19:1
<b>CAPACITIES AND REQUIREMENTS</b>		
Battery voltage (AC set) .....	12 volt	—
Battery size		
SAE group 1H .....	Two in Series	—
Amp/hr. SAE rating — 20 hr. (Nominal) .....	**120	432 kC
Starting by starting motor with solenoid shift and over-run clutch .....	Yes	—
Battery charge rate amperes .....	2-5	—
*Oil capacity in U.S. quarts — Refill .....	6	5.68 litre
Ventilation Required (cfm 1800 rpm)		
Engine (Pressure Cooling) .....	890	25.20 m <sup>3</sup> /min.
Generator .....	120	3.40 m <sup>3</sup> /min.
Combustion .....	64	1.81 m <sup>3</sup> /min.
<b>GENERATOR</b>		
Output rating at unity power factor load .....	1 phase	—
Output rated at 0.8 power factor load .....	3 phase	—
Rating (output in watts)		
*50 hertz AC General Utility .....	9,000	9.0 kW
60 hertz AC General Utility .....	12,000	12.0 kW
AC voltage regulation in % .....	3	—
AC frequency regulation in % .....	5	—
Revolving field type generator .....	Yes	—
120/240 volt single phase model reconnectible .....	Yes	—
Broad range 3-phase, 12 lead reconnectible (Begin Spec AA) .....	Yes	—
Static type exciter (Magneciter Prior to Spec AA) .....	Yes	—
Solid solid voltage regulator (Begin Spec AA) .....	Yes	—
Brushless Exciter (Spec AA) .....	Yes	—

\* 50 hertz model (9.0 kW).

\*\* Mobile or outdoor operation during ambient temperatures below 0° F, use 168 amp/hr rating.

\* Plus 1/2 quart (0.473 litre) for new filter.

**NOTE:** Hertz is a unit of frequency equal to one cycle per second.

# DIMENSIONS AND CLEARANCES

All clearances given at room temperature of 70° F.  
All dimensions in inches unless otherwise specified.

	Minimum	Maximum
<b>CAMSHAFT</b>		
Bearing Journal Diameter, Front.....	2.500 (63.50 mm)	2.505 (63.63 mm)
Bearing Journal Diameter, Rear .....	1.1875 (30.16 mm)	1.1880 (16.30 mm)
Bearing Journal Diameter, Center .....	1.2580 (31.95 mm)	1.2582 (31.96 mm)
Bearing Clearance Limit .....	.0012 (0.03 mm)	.0037 (0.99 mm)
End Play, Camshaft.....	.007 (0.180 mm)	.039 (0.99 mm)
	Spec A Through N	
Cam Tappet Diameter .....	.7475 (18.99 mm)	.7480 (19.00 mm)
Cam Tappet Hole Diameter .....	.7505 (19.06 mm)	.7515 (19.09 mm)
	Begin Spec P	
Cam Tappet Diameter .....	.8725 (22.16 mm)	.8730 (22.17 mm)
Cam Tappet Hole Diameter .....	.8755 (22.24 mm)	.8765 (22.26 mm)
<b>CONNECTING RODS</b>		
Large Bore Diameter.....	2.1871 (55.55 mm)	2.1876 (55.57 mm)
Small Bore Diameter.....	1.044 (26.52 mm)	1.045 (26.54 mm)
Clearance, Bearing-to-Crankshaft .....	.001 (0.03 mm)	.003 (0.08 mm)
<b>CYLINDER</b>		
Cylinder Bore .....	3.250 (82.55 mm)	
<b>CRANKSHAFT</b>		
Main Bearing Journal Diameter.....	2.2427 (56.99 mm)	2.2435 (57.01 mm)
Main Bearing Clearance .....	.0024 (0.06 mm)	.0062 (0.157 mm)
Connecting Rod Journal Diameter.....	2.0600 (52.32 mm)	2.0605 (52.34 mm)
Rod Bearing Clearance .....	.0010 (0.0254 mm)	.0033 (0.0838 mm)
End Play, Crankshaft .....	.010 (0.25 mm)	.015 (0.38 mm)
<b>PISTON</b>		
Piston Clearance to Cylinder Wall (Measure 90° to Pin, Just Below Oil Ring Groove) .....	.0055 (0.14 mm)	.0075 (0.19 mm)
<b>PISTON PIN</b>		
Piston Clearance .....	Thumb Push Fit	
Connecting Rod Bushing Clearance .....	.0002 (0.01 mm)	.0007 (0.2 mm)
<b>PISTON RINGS</b>		
Ring Gap .....	.010 (0.25 mm)	.020 (0.51 mm)
Ring Width, Top .....	.0925 (2.35 mm)	.0935 (2.37 mm)
2nd .....	.0925 (0.25 mm)	.0935 (2.37 mm)
3rd .....	.0925 (0.25 mm)	.0925 (2.37 mm)
<b>VALVE, INTAKE</b>		
Stem Diameter .....	.3405 (8.65 mm)	.3415 (8.67 mm)
Guide Clearance .....	.0015 (0.04 mm)	.0030 (0.08 mm)
Valve Face .....	42°	
Valve Clearance .....	.009 (0.22 mm)	
<b>VALVE, EXHAUST</b>		
Stem Diameter .....	.3405 (8.65 mm)	.3415 (8.67 mm)
Guide Clearance .....	.0030 (0.08 mm)	.0050 (0.13 mm)
Valve Face .....	45°	
Valve Clearance .....	.007 (0.18 mm)	

**VALVE GUIDE**

Length .....	1.25/32 (42.24 mm)	
Outside Diameter .....	.4690 (11.91 mm)	.4695 (11.93 mm)
Inside Diameter (After Reaming) Exhaust .....	.344 (8.74 mm)	.345 (8.76 mm)
Intake .....	.342 (8.69 mm)	.343 (8.71 mm)
Cylinder Block Bore Diameter .....	.467 (11.86 mm)	.468 (11.89 mm)

**VALVE SEATS (Stellite)**

Valve Seat Bore		
Diameter .....	1.361 (34.57 mm)	1.362 (34.59 mm)
Depth (From Cylinder Head Face) .....	.433 (11.00 mm)	.439 (11.15 mm)
Seat Insert Outside Diameter .....	1.364 (34.65 mm)	1.365 (34.67 mm)
Seat Width .....	3/64 (30.25 mm)	1/16 (40.34 mm)
Seat Angle .....	45°	
Available Oversizes .....	.002 (0.05 mm), .005 (0.13 mm), .010 (0.25 mm), .025 (0.64 mm)	

**VALVE SPRINGS**

Load, Valve Closed .....	45-49 lb. (20.41-22.23 kg) Spec A Through N
Load, Valve Open .....	83-93 lb. (37.65-42.18 kg) Begin Spec P
Load, Valve Open .....	87.2-97.2 lb. (39.55-44.09 kg)

**TORQUE VALUES**

Cylinder Head .....	44-46 ft. lb. (59.66-62.37 Nm)
---------------------	--------------------------------

# DESCRIPTION

## GENERAL

An Onan DJC Series electric generating set consists of a four-cylinder, in-line diesel engine and a 12.0kW (9.0kW for 50 hertz) alternating current generator with standard or optional equipment as ordered.

## ENGINE

The DJC engine has 120 cubic inch piston displacement, 19 to 1 compression ratio, and is air-cooled. Basic measurements and other details are listed under Specifications.

## AC GENERATOR

The YD generators beginning with Spec AA (Figure 1) are four-pole, revolving field, brushless exciter models of drip-proof construction. Generator design includes both single and three-phase, 60 and 50 hertz type generators. The generator rotor connects directly to the engine crankshaft with a tapered shaft and key. The generator is fastened to the engine by the rotor-through-stud which passes through the rotor shaft; it has a nut on the outside of the end bell. A

centrifugal blower, on the front end of the rotor shaft, circulates the generator cooling air which is drawn in through the end bell cover, over the rotor, and discharged through an outlet at the blower end.

A ball bearing in the end bell supports the outer end of the rotor shaft. The end bell and generator stator housing are attached by four-through-studs which pass through the stator assembly to the engine-generator adapter. The brushless exciter stator mounts in the end bell while the exciter rotor and its rotating rectifier assemblies mount on the generator rotor shaft.

The basic operation of the generator and voltage regulator involves the stator, voltage regulator, exciter field and armature, a full wave bridge rectifier, and the generator rotor. Residual magnetism in the generator rotor and a permanent magnet embedded in one exciter field pole begin the voltage build-up process as the generator set starts running. Single-phase AC voltage, taken from one of the stator

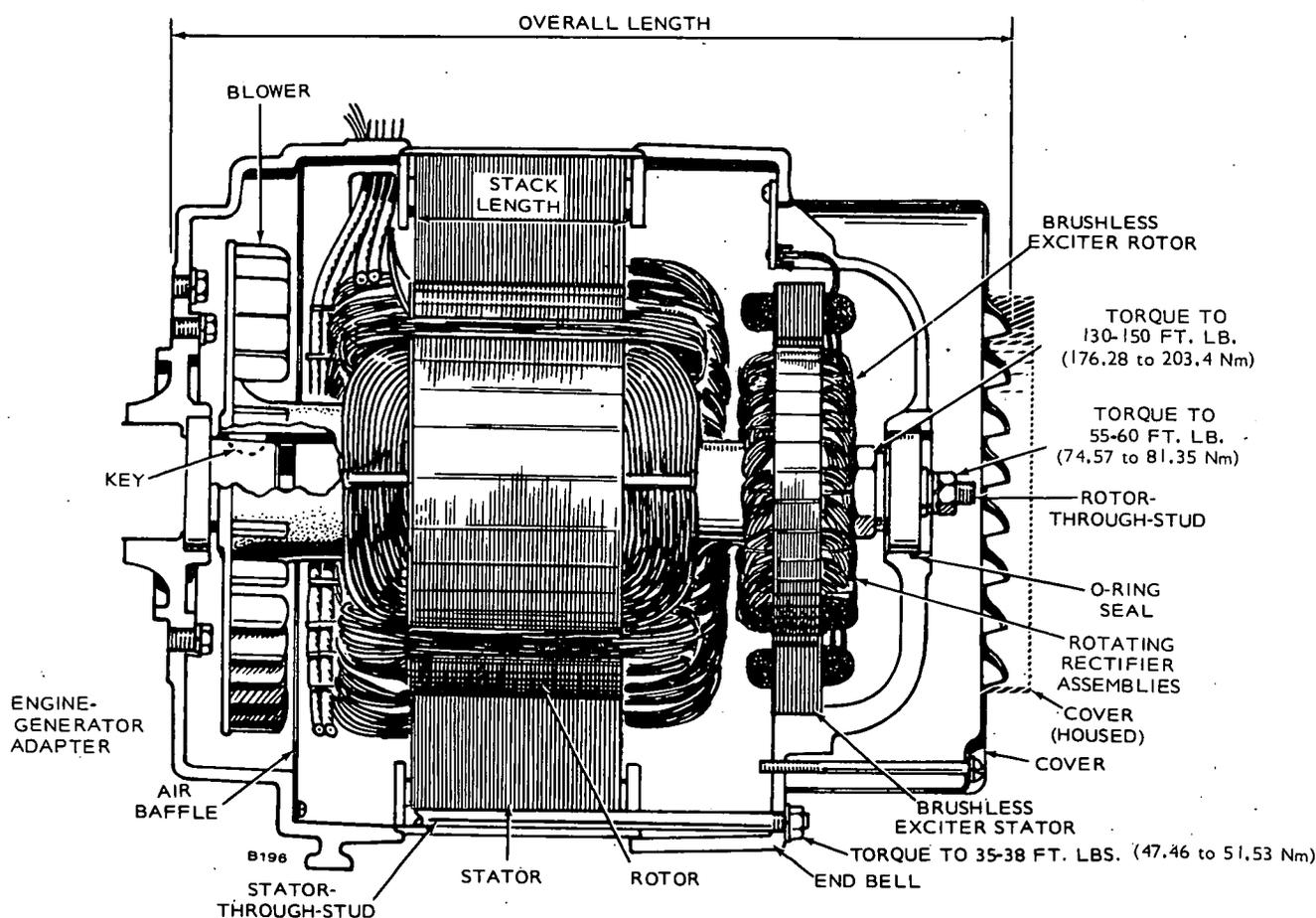


FIGURE 1. GENERATOR (CUTAWAY VIEW)

windings, is fed to the voltage regulator as a reference voltage for maintaining the generator output voltage. The AC reference voltage is converted to DC by a silicon controlled rectifier bridge on the voltage regulator printed circuit board and fed into the exciter field windings. The exciter armature produces three-phase AC voltage that is converted to DC by the rotating rectifier assembly. The resultant DC voltage excites the generator rotor winding to produce the stator output voltage for the AC load.

The generator rotor also produces AC voltage in the charging winding of the stator which is converted to direct current for battery charging.

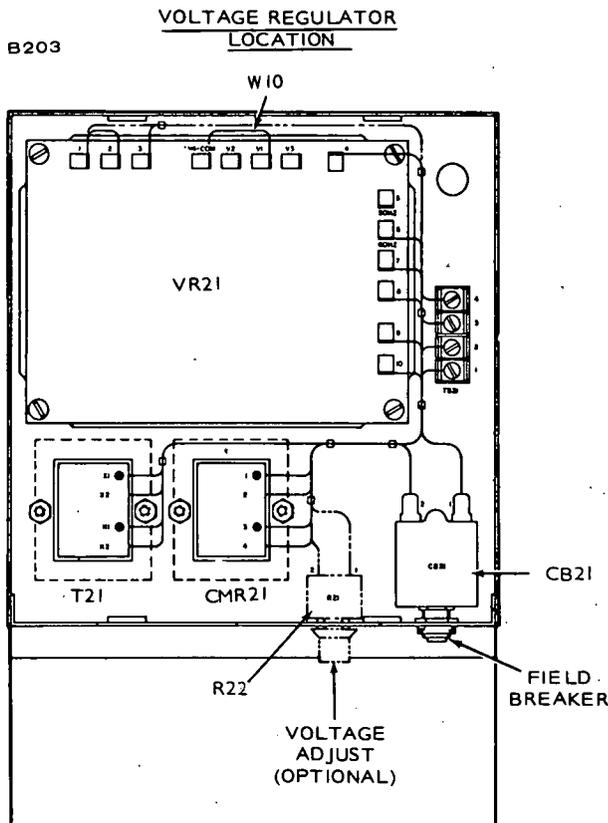
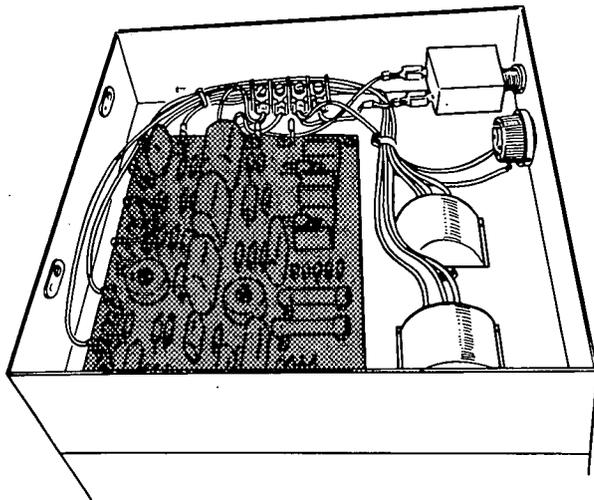


FIGURE 2. VOLTAGE REGULATOR ASSEMBLY

## VOLTAGE REGULATOR (Spec AA)

The line-voltage regulator on the J-series generator sets is an all solid state device; that is, no relays or tubes are needed. Basic components of the voltage regulator are:

- Printed circuit board VR21
- Voltage reference transformer T21
- Commutating reactor CMR21
- Field circuit breaker CB21
- Voltage adjust rheostat R22 (Optional)

Figure 2 shows the above components in a typical control box, on standard air-cooled electric generating sets.

## CONTROLS

The standard control box has a battery charge rate ammeter, pre-heat switch, and a START-STOP switch and field circuit breaker on the control panel, Figure 3. Optional controls that may be added on the standard panel include a fault lamp, a frequency meter, a running time meter, an overspeed indicator, a high temperature indicator, a volt adjust knob, a phase selector, and AC voltmeters.

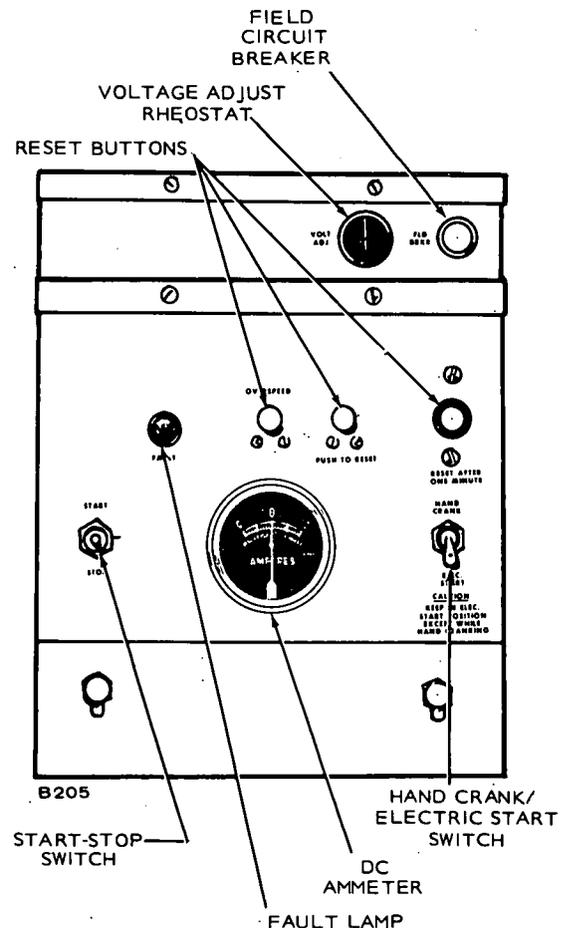


FIGURE 3. TYPICAL CONTROL PANEL

The following is a brief description of typical controls and instruments on the face of the panels; these may vary according to the customer purchase order.

**Standard:**

- Start-Stop Switch:** Starts and stops the unit locally.
- Battery Charge Rate DC Ammeter:** Indicates the battery charging current.
- Field Circuit Breaker:** Provides generator exciter and regulator protection from overheating in the event of certain failure modes of the generator, exciter, and voltage regulator.
- Pre-Heater Switch:** Provides pre-heat control for manifold heater and glow plugs for cold diesel engine starting.

**Optional:**

- Oil Pressure Gauge:** Indicates pressure of lubricating oil in engine (wired to a sensor unit located on the engine).
- AC Voltmeter:** Indicates AC generator output voltage.
- Voltmeter Phase Selector Switch:** Selects the phases of the generator output to be measured by the AC voltmeter.
- Voltage Adjust Rheostat:** Provides approximately plus or minus 5 percent adjustment of the rated output voltage.
- Running Time Meter:** Registers the total number of hours, to 1/10th that the unit has run. Use it to keep a record for periodic servicing. Time is accumulative, meter cannot be reset.
- Frequency Meter:** Indicates the frequency of the generator output in hertz. It can be used to check engine speed. (Each hertz equals 30 rpm.)

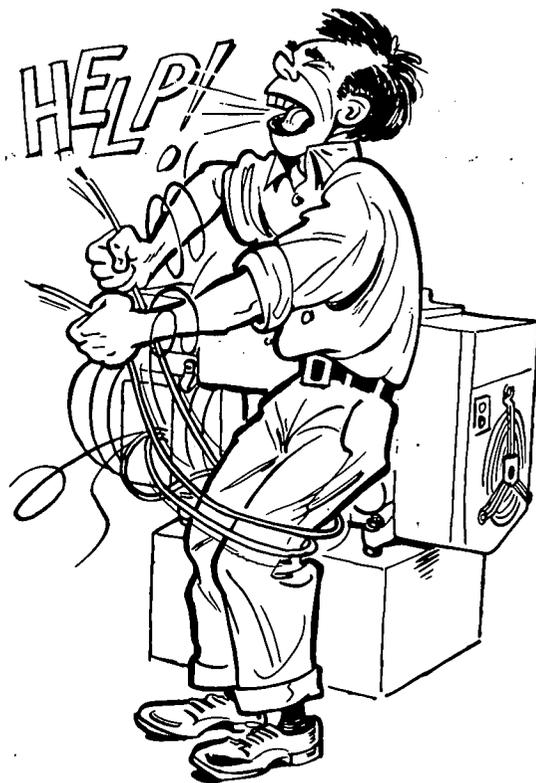
**Warning Lights:** Three red indicator lights give warning of:

- Overspeed
- Low oil pressure
- High engine temperature

Three reset pushbuttons permit restarting after trouble is corrected.

**Line Circuit Breaker:** Protects generator from line overloads.

**Cranking Limiter:** Thermally actuated device limits cranking time to between 45 and 90 seconds depending on the ambient temperature. Red pushbutton pops out and cannot be reset until one minute has elapsed.



### VOLTAGE RECONNECTION WITH OPTIONAL INSTRUMENTS

The optional AC instruments on the control panel (such as voltmeters, and running time meters) are installed for use with specific nameplate voltages. Control components may have to be changed to match new current ratings when field reconnection for other voltages are made.

**CAUTION** To prevent instrument damage, contact your Onan Service Center for required instrument changes, new wiring diagrams, proper specification number, and voltages before attempting to reconnect a generator with instruments on the control panel.

# INSTALLATION

## GENERAL

Installations must be considered individually, however, the following installation guidelines should be followed. Installations must conform to local building codes, fire ordinances, and other local, state, and federal regulations. See Figure 4.

Installation points to consider include:

1. Level mounting surface.
2. Adequate cooling air.
3. Adequate fresh induction air.
4. Discharge of circulated air.
5. Discharge of exhaust gases.
6. Electrical connections.
7. Fuel connections.
8. Accessibility for operation and servicing.
9. Vibration isolation.
10. Noise levels.

## LOCATION

Provide a location that is protected from the weather and is dry, clean, dust free and well ventilated. If practical, install inside a heated building for protection from extremes in weather conditions.

The air discharge side of set requires 3 inches (76 mm) clearance from wall to permit set to rock on its mounts; at least 24 inches (610 mm) clearance is required around all other sides for service accessibility.

## MOUNTING

A permanent type installation (Figure 4) needs a sturdy, level, mounting base of concrete, a heavy wood or structural steel at least 12 inches (305 mm) high to aid oil changing and operating. Place the 7/16 inch mounting bolts as shown in Figure 4.

Carefully assemble the mounting cushions, washers and spacer bushing on the mounting bolts. The spacer bushing prevents compression of the snubber (upper rubber cushion).

### CAUTION

One half inch 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 (Figure 5) can rely on natural circulation, but *mobile, indoor or housed* installations need proper size and positioned vents for required air flow, Figure 4. 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, and (6) prevailing wind direction.

**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 5 square feet (4.6 cm<sup>2</sup>) 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 20 inches (203 x 508 mm). 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 (228 mm). If bends are necessary, use large radius elbows. Use a canvas section at the set to absorb vibration and noise.
2. *Generator outlet ducts* must be used when units are installed in compartments too small for operator to walk. Ducts are recommended for all other indoor installations. The air outlet is 5-5/8 x 3 inches (143 mm x 76 mm). Follow the same principles of duct design and installation as used for the engine duct. Engine and generator require separate ducts.

*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 (49.28° C) when running at full rated load.

*Thermostatically controlled shutters* can be used to aid warm up after starting and keep cold air out during shutdown. When the discharged air reaches 120° F (49.28° C), shutters begin to open; at 140° F (60.48° C), the shutters are completely open.

### WARNING

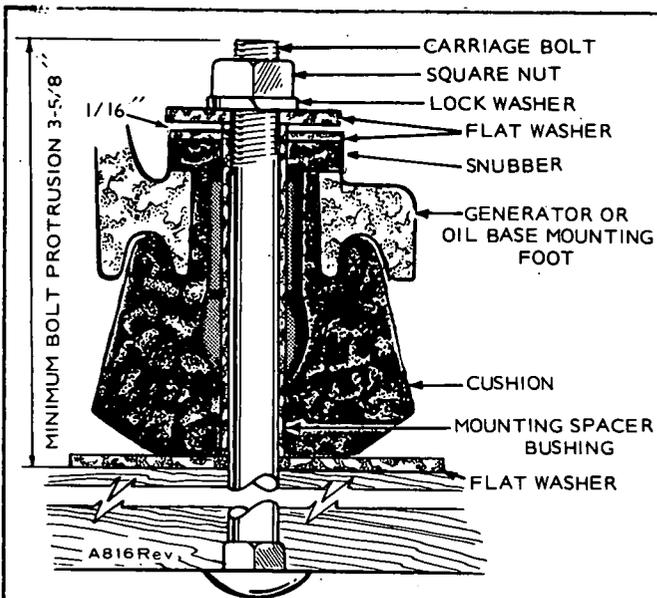
Utilizing exhaust heat to warm a room or compartment occupied by people is not recommended due to possible leakage of harmful exhaust gases.

## EXHAUST

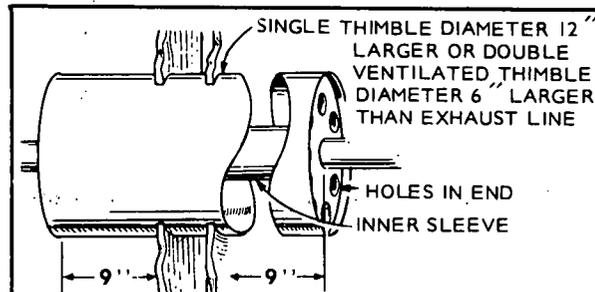
### WARNING

**EXHAUST GASES ARE DEADLY POISONOUS!**

Vent exhaust gases outside. Use flexible tubing between the engine exhaust outlet and rigid piping.

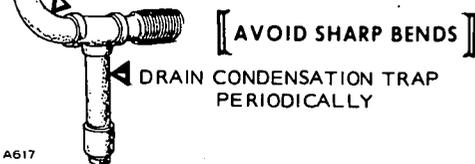


**MOUNTING CUSHIONS**

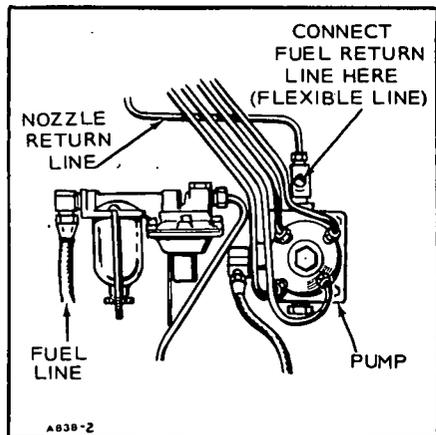


**EXHAUST LINE PASSING THROUGH WALL OR PARTITION**

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



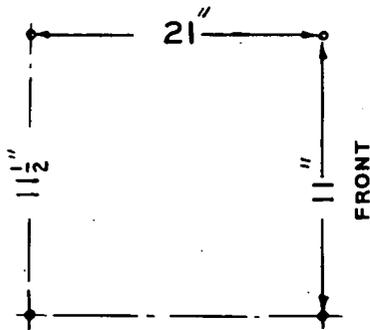
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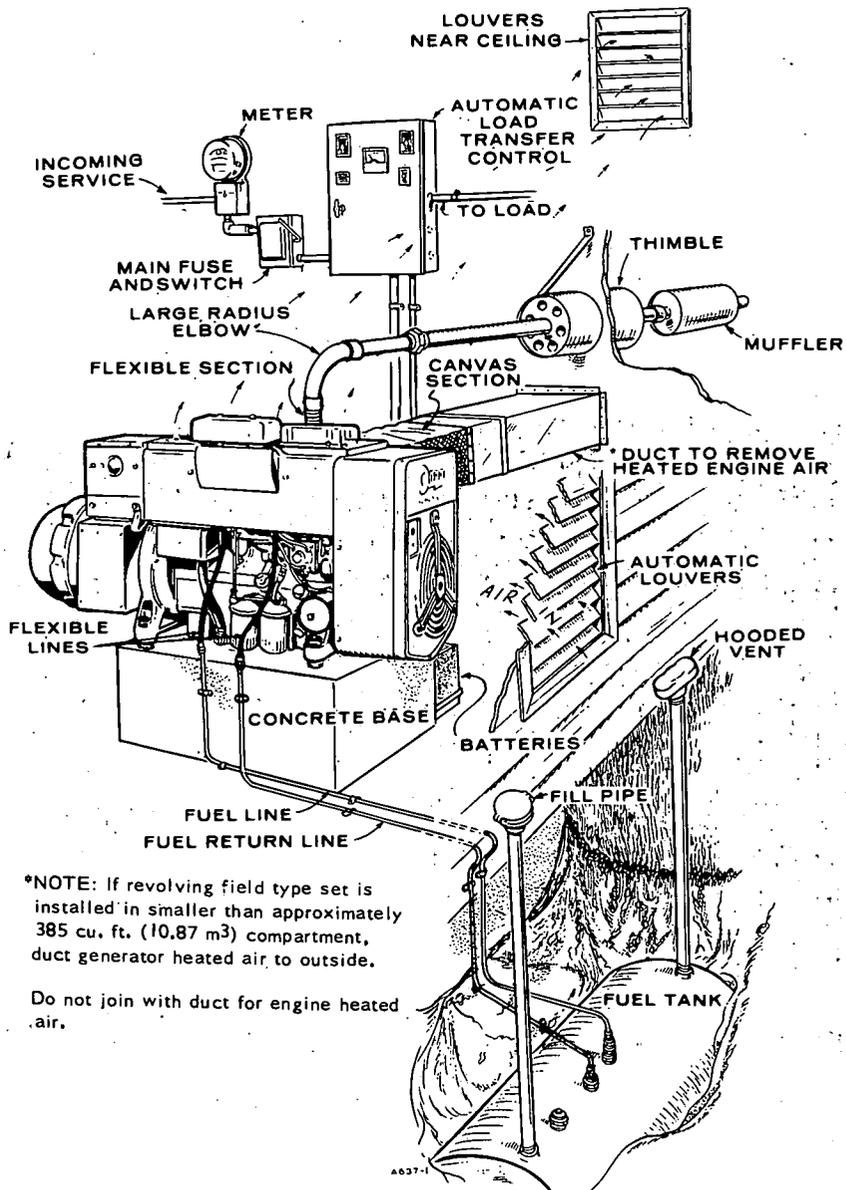
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**INCHES TO MILLIMETERS CONVERSION**

1/16"	1.588 mm
3-5/8"	92.075 mm
9"	228.6 mm
11"	279.4 mm
11-1/2"	292.1 mm
12"	304.8 mm
21"	533.4 mm



**MOUNTING BOLT LOCATIONS**



A627-1

**FIGURE 4. TYPICAL INSTALLATION**

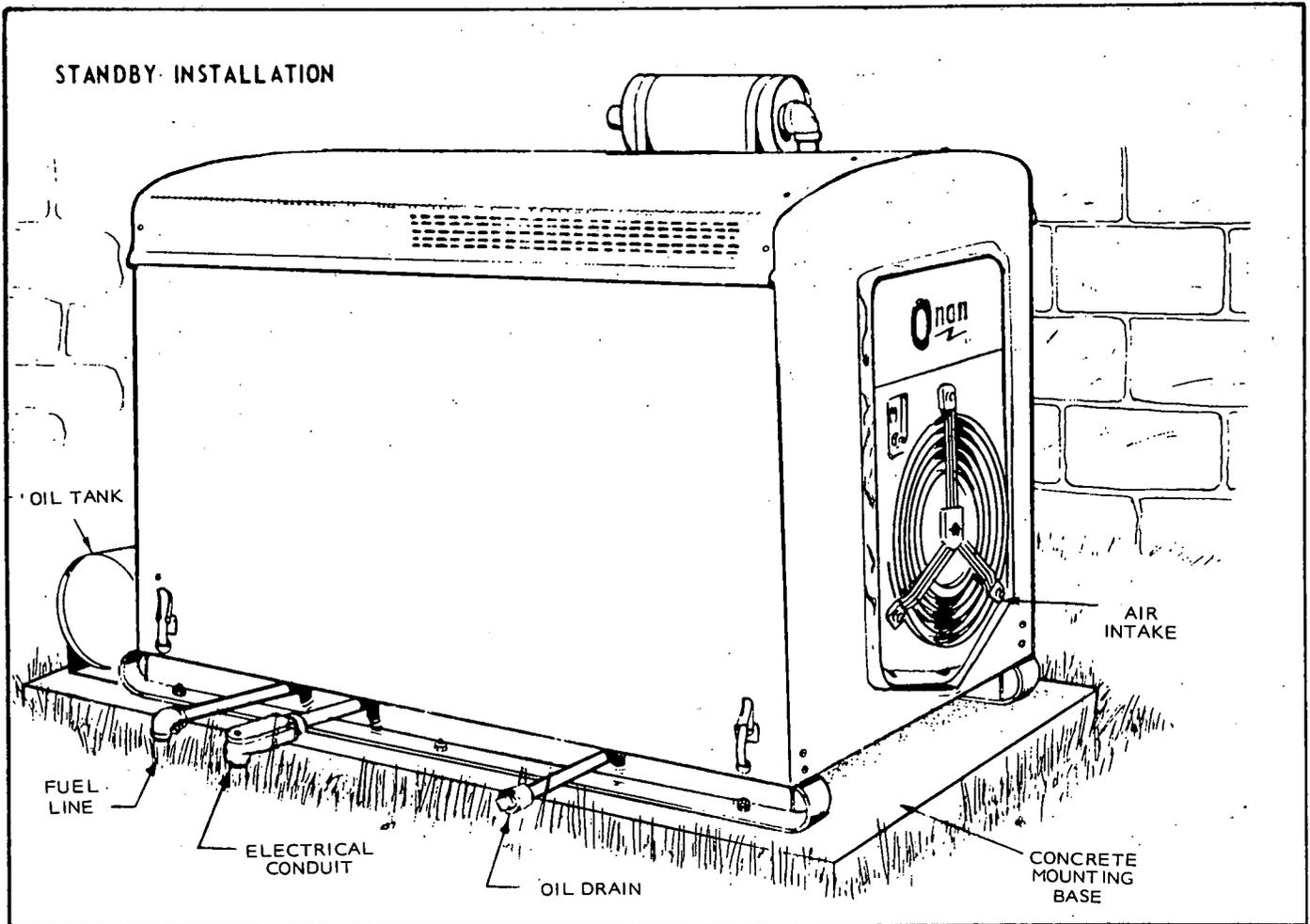


FIGURE 5. TYPICAL OUTDOOR INSTALLATION

Shield the line if it passes through a combustible wall or partition. If turns are necessary, use long sweeping type elbows. Use one pipe size larger for each ten feet in length. Position the exhaust outlet away from the engine air intake.

### OIL DRAIN

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

### FUEL TANK

If a separate fuel tank is used, install the tank so the bottom is less than 6 feet (1.86 m) 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 set.

If fuel lift must exceed 6 feet (1.86 m), 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).

### WARNING

Always use flexible tubing between engine and the fuel supply to avoid line failure due to vibration.

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 (Figure 4).

### WARNING

Do not use galvanized lines, fittings, or fuel tanks in underground portions of the fuel system. Hazardous fuel leaks may be caused by electrolytic corrosion from moisture and chemicals in the soil (galvanism). Some safety ordinances prohibit the use of galvanized materials in fuel systems and the use of threaded cast iron fittings as well.

### ELECTRICAL CONNECTIONS

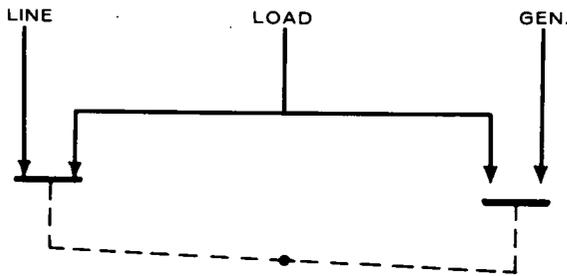
The nameplate on the generator set shows the electrical output rating of the generator in watts, volts, and hertz. The wiring diagram, shipped with the generator set, shows the electrical circuits and connections needed during installation.

All electrical connections should be done by a qualified serviceman or electrician to meet the electrical code requirements in your area.

## LOAD WIRES

The control box (junction box) has knock out sections to accommodate load wires. Use flexible conduit and stranded load wires near the set 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 set box. Insulate bare ends of ungrounded wires. Use bolt provided on the control box to connect the generator ground lead and load wire. Install a fused main switch (or circuit breaker) between the generator 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 to the load at the same time. Instructions for connecting an automatic load transfer switch is included with such equipment. See Figure 6.



NOTE: SHOWN WITH LINE CONNECTED TO LOAD.

FIGURE 6. LOAD TRANSFER SWITCH

**Balance All Loads:** Divide the loads equally between output leads. Current loads for any one output lead must not exceed nameplate rating. Overloading can damage the generator windings.

**Single Phase Loads on Three Phase Generators:** Any combination of single phase and three phase loading can be used at the same time as long as the current for any output lead does not exceed the generator nameplate rating.

**Output Lead Markings:** Leads on revolving field generators are marked T<sup>1</sup>, T<sup>2</sup>, etc. These identifying marks also appear on the wiring diagram.

## SWITCHBOARD

A wall mounted switchboard containing ammeters, a voltmeter, and circuit breakers is optional. When

used, the following connections apply:

1. Connect one ungrounded (hot) generator lead to the unused terminal on each ammeter.
2. Connect the generator lead and load wires which are to be grounded to the ground stud on the switchboard.
3. Connect one ungrounded (hot) load wire to the unused terminal on each circuit breaker.
4. On sets that generate more than one voltage (example: 120/240), the voltmeter should be wired to indicate the higher of the two voltages.

## RECONNECTIBLE GENERATORS, BEGIN SPEC AA

The factory ships all special order sets with instruments on the control panels completely wired for the voltage code or voltage specified on the customers purchase order. Standard sets without instruments are shipped with the T<sup>1</sup>-T<sup>4</sup> or T<sup>1</sup>-T<sup>12</sup> output leads separated in the output box. These single phase and broad range generators are connectible or later reconnectible to provide any of the output voltages shown in Figure 7.

**Code 3C or 53C Reconnectible Generators:** The single phase, 60 and 50 Hertz generators have output leads T<sup>1</sup>, T<sup>2</sup>, T<sup>3</sup>, and T<sup>4</sup> available for making the single phase voltage and load connections shown in Figure 7 at the installation site. Grounding procedure should comply with local codes.

**Code 18R or 518R Reconnectible Generators:** The three phase, broad range, 60 and 50 Hertz 12 lead generators have output leads T<sup>1</sup> through T<sup>12</sup> available for making several single and three phase voltage load connections shown in Figure 7. Grounding procedure should comply with local codes.

When connecting the output leads, be sure to connect jumper W10 on the voltage regulator printed circuit board between terminal V<sup>4</sup> (common) and V<sup>1</sup>, V<sup>2</sup>, or V<sup>3</sup> as listed on the reconnection diagram in Figure 7.

A broad range generator is capable of generating numerous different output voltages as indicated by the reconnection diagram.

**Code 9X Generators:** These special order three phase, 60 Hertz, 4 wire, generators are prewired at the factory to provide 347/600 VAC. Output leads T<sup>1</sup>, T<sup>2</sup>, T<sup>3</sup>, and T<sup>0</sup> are available for connection to the load wires. See connection diagram. Grounding procedure should comply with local electrical codes.

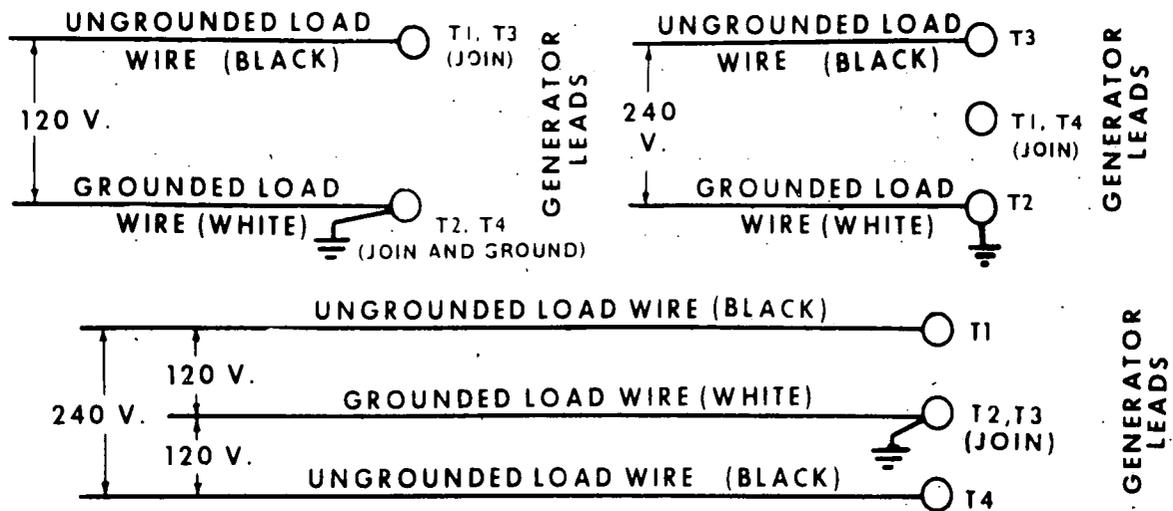
## GENERATORS PRIOR TO SPEC AA

Revolving field generators, used with the DJC series prior to Spec AA, have four leads. Connections for these generators are shown in Figure 8.

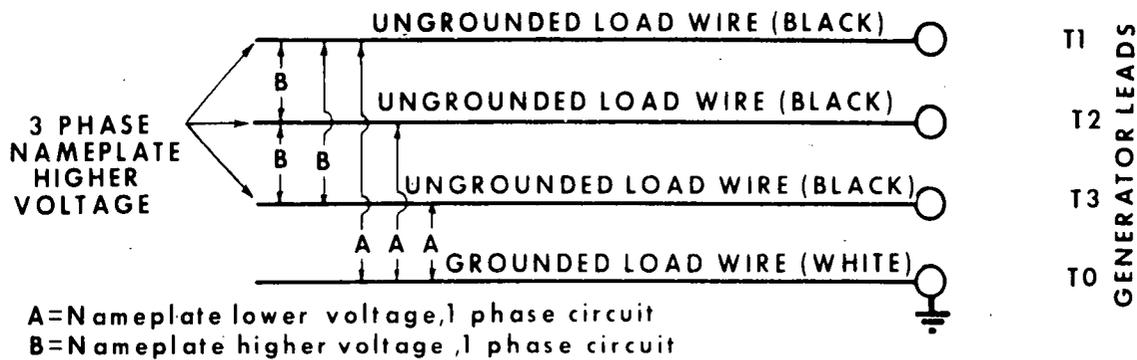
**Reconnectible Single Phase Generators:** Code 3C models, such as DJC-3C are reconnectible for use as 120/240 volt 3 wire; 120 volt two wire; or 240 volt 2 wire

NAMEPLATE VOLTAGE CODE	VOLTAGE	PHASE	FREQUENCY	CONNECT W/O JUMPER WIRE FROM V <sub>4</sub> TO:	GENERATOR CONNECTION	GENERATOR CONNECTION SCHEMATIC DIAGRAM	LOAD TO GENERATOR CONNECTION WIRING DIAGRAM
3C	120/240	1	60	V1		A-120 	A-120 
53C	120/240	1	50	V1		B-240 	B-240 
	115/230	1	50	V2		C-120/240 	C-120/240 
	110/220	1	50	V3			
18	120/208 127/220 139/240	3	60	V1 V2 V4	PARALLEL WYE		
518	110/190 115/200 120/208 127/220	3	50	V1 V2 V3 V4			
18	240/416 254/440 277/480	3	60	V1 V2 V4	SERIES WYE		
518	220/380 230/400 240/416 254/440	3	50	V1 V2 V3 V4			
18	120/240	3	60	V1	SERIES DELTA		
518	110/220 115/230 120/240	3	V1 V2 V3				
18	120/240	1	60	V1			
518	110/220 115/230 120/240	1	50	V1 V2 V3	DOUBLE DELTA		
18	120	1	60	V1	PARALLEL DELTA		
518	110 115 120	1	V1 V2 V3				
9X	347/600	3	60	V4			

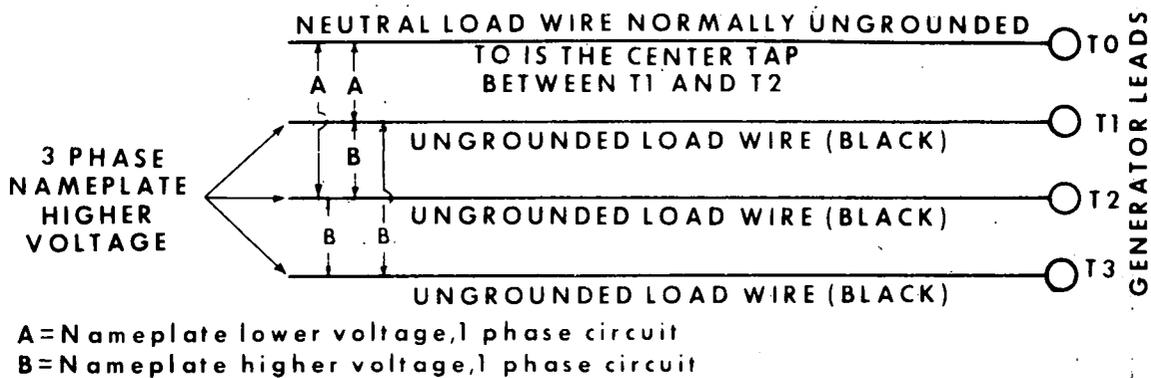
FIGURE 7. GENERATOR WIRING AND CONNECTION DIAGRAMS



1 Phase, Reconnectable Generator  
(60 hertz model has code 3C, gives 2 wire or 3 wire service)



(60 hertz 120/208 volt model has code -4; code -7 for 220/380 volt; code -4X for 277/480 volt)



**Delta Connected**

(60 hertz 120/240 volt model has code -5D; for 240/480 volt)

**FIGURE 8. LOAD WIRE CONNECTIONS**

units (Figure 8) except when optionally equipped with a meter panel.

**Delta Generators:** On these generators, T<sup>0</sup> is the center tap between T<sup>1</sup> and T<sup>2</sup>; T<sup>0</sup> is normally not grounded but may be grounded if required.

**Grounding:** A number 8 or larger wire should be used to connect the generator housing to a rod or pipe that penetrates into moist earth. If a solderless connector is not provided on the generator, connect the ground wire at the battery ground stud on the engine.

### BATTERY CONNECTIONS

The battery is connected for negative (-) ground, Figure 9. Be sure all battery connections are secure.

Battery polarity must agree with the rectifier located in the control box. If battery ground must be changed, reverse the rectifier connection in the control box.

**CAUTION**

If battery polarity is reversed, damage will occur within 3 minutes while stopped or 5 seconds while running. Alternator windings will be damaged almost instantly if battery charging circuit is shorted between resistor R21 and the B1 end of the charging winding.

See Specifications for minimum 12 volt battery requirements. Connect battery positive (+) to starter engaging solenoid terminal post, Figure 9. Connect battery negative (-) to a good ground on the engine.

Sets 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).

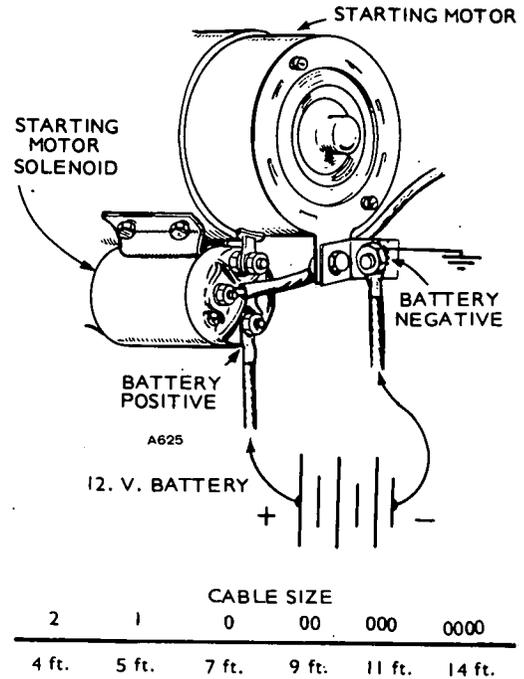


FIGURE 9. BATTERY CONNECTION

### REMOTE START-STOP SWITCH (OPTIONAL)

For remote control starting and stopping, use 3-wires to connect the remote switch (single pole, double throw, momentary contact, center-off type) to the terminal block marked B+, 1, 2, 3, in the set control box using wire sizes as listed in Figure 10. 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.

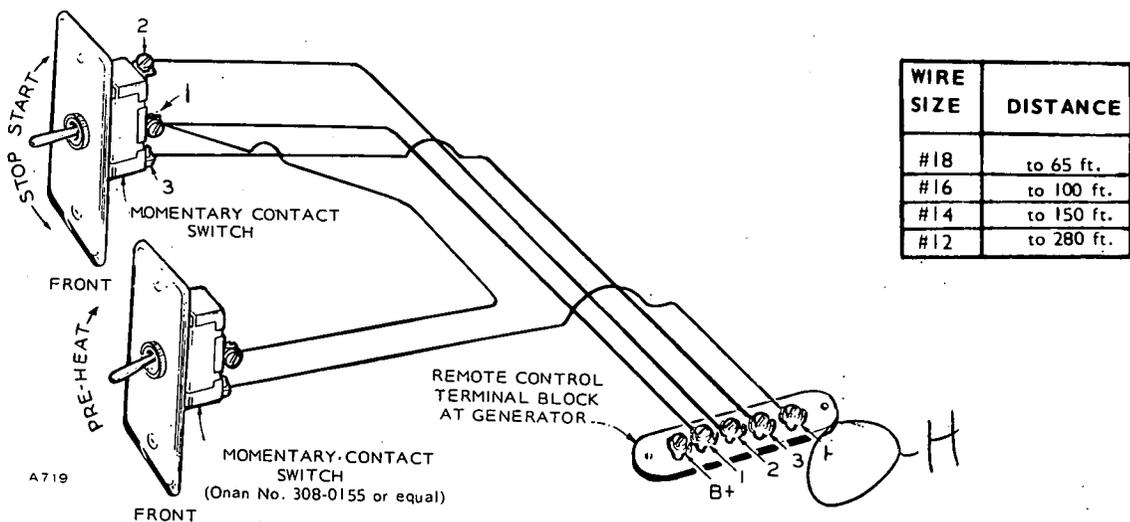


FIGURE 10. REMOTE CONTROL

# OPERATION

## PRE-STARTING

Preparations for the initial and each additional starting operation should include careful checks of the oil, fuel, cooling, and electrical systems. The cylinder air housing door should be closed with all air shrouds in place.

Before generator set is put in operation, check all components for mechanical security. If an 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.

**Crankcase Oil:** Use an oil with the API designation CD/SD or CD/SE. However, to reduce oil consumption to a normal level in the shortest time possible on a new or rebuilt engine, use CC oil for the first fill only (50 hours). Then use the recommended oil only. Select the correct SAE grade oil by referring to the following:

Above 30° F (1° C)	SAE 30
0° F to 30° F (1° C)	SAE 10W or 5W-30
Below 0° F (-18° C)	SAE 5W-30

Multigrade oils are recommended for temperatures of 30°F and below, but they are not recommended for temperatures above 30°F. When adding oil between oil changes, it is preferable to use the same brand as various brands of oil may not be compatible when mixed together.

**Recommended Fuel:** Although number 2 diesel fuel gives the best economy for most operating conditions, number 1 diesel fuel can be used:

1. When ambient temperatures are below 32° F (0° C).
2. During long periods of light engine load; or,
3. If preferred by user.

Use low sulfur content fuel having a pour point (ability to filter) of at least 10° F (-23° C) below the lowest expected temperature. Keep the fuel clean and protected from adverse weather. Leave some room for expansion when filling the fuel tank.

**CAUTION** Due to the precise tolerances of diesel injection systems, it is extremely important the fuel be kept clean. Dirt in the system can cause severe damage to both the injection pump and the injection nozzles.

Bleed air from fuel system as follows: Disconnect the fuel return line. See Figure 11. 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.

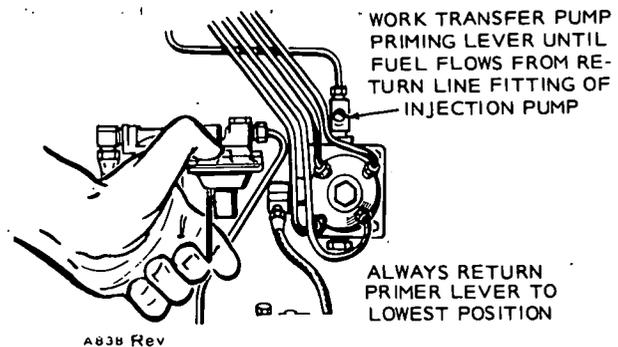


FIGURE 11. FUEL SYSTEM

## STARTING SEQUENCE

The starting and stopping (Figure 12) sequence shows the manual, mechanical, and electrical events required for satisfactory start, run, and stop cycles.

If the camshaft's 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.

## PRE-HEATING AND STARTING

Extremes in starting temperatures may require additional preheating. If engine fails to start quickly, rest engine several seconds and repeat starting sequence applying preheat for a longer interval using heater switch.

1. For cold engine starting below 55° F (12° C), 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).

On "contractor" model, depress preheat switch for one minute and then push start switch. Both switches must be engaged for starting.

When engine comes up to speed, cranking will automatically stop through the centrifugal switch and start-disconnect relay. If the engine fails to start in from 45 to 120 seconds, the cranking limiter will trip and cranking will stop. If this occurs, wait one minute before resetting the cranking limiter and reattempting to start.

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

To prevent false starts, hold on start switch until the centrifugal switch automatically disengages starter motor.

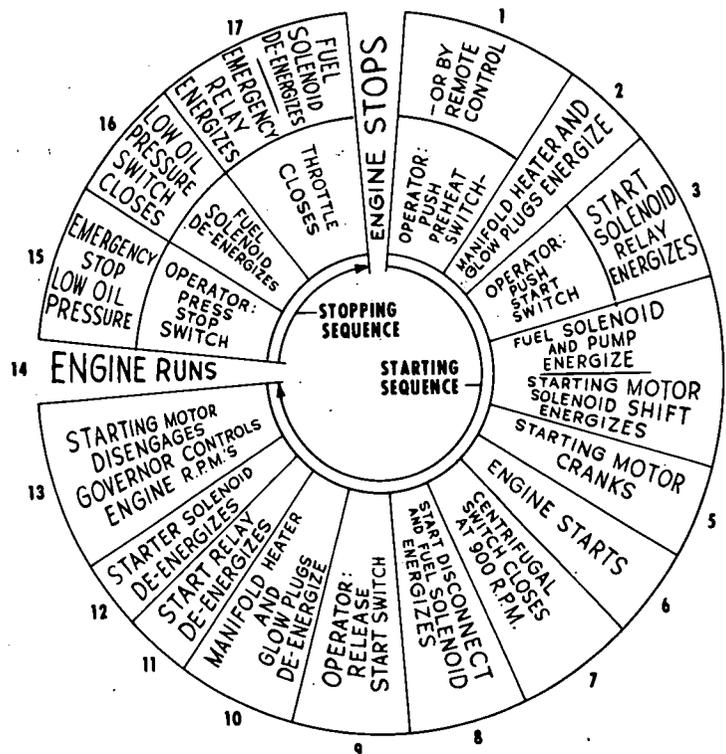


FIGURE 12. STARTING AND STOPPING SEQUENCE

**CAUTION** Do not apply overvoltage to the starting circuit at any time. Overvoltage will destroy the glow plugs and air heater in 2 to 3 seconds. If it becomes necessary to use an additional source of power to start the set — use a 12 volt battery connected in parallel.

### AUTOMATIC STARTING AND STOPPING

Separate controls may be used for automatic start and stop, but must provide engine preheating.

The automatic control has a time delay relay to preheat glow plugs and the manifold heater for about 20 seconds before cranking occurs. The time delay relay prevents immediate engagement of the starter in case the load is reapplied before the engine stops.

### STOPPING

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

### APPLYING LOAD

If practicable, allow set 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.

### EXERCISE STANDBY PLANTS

Infrequent use results in hard starting. Operate standby sets at least 30 minutes each week. Run longer if battery needs charging.

### EMERGENCY OPERATION IF BATTERY FAILS

If the battery fails completely and the set must be operated during an emergency, a battery can be shared with other equipment providing the set charging circuit is disconnected as follows: (Prior to Spec P) Remove the wire which connects to the battery reconnection block from the ammeter and tape the bare end. (Begin Spec P) Remove the wire which connects to term #8 in the control panel from the ammeter and tape the bare end. With these leads disconnected the set will not charge the battery.

### BREAK-IN PROCEDURE

The unit should be run in the following sequence:

1. One half hour at 1/2 load.
2. One half hour at 3/4 load.
3. Full load.

Continuous running under one half load during the first few hundred hours usually results in poor piston

ring seating, causing higher than normal oil consumption and blowby.

Drain and replace the crankcase oil after 50 hours of operation; drain while the engine is still hot.

## OUT-OF-SERVICE PROTECTION

The natural lubricating qualities of No. 2 diesel fuel should protect a diesel engine for at least 30-days when unit is not in service. To protect a set that will be out of service for more than 30 days, proceed as follows:

1. Run set until thoroughly warm; generator under at least 50 percent load.
2. Stop engine and drain oil while still warm. Add new oil and run engine enough to circulate oil to upper lube passages.
3. Remove glow plugs. Inject a couple squirts of rust inhibitor (or SAE #10 oil) into each cylinder. Crank engine over several times. Install glow plugs.
4. Service air cleaner.
5. Clean throttle and governor linkage and protect by wrapping with a clean cloth.
6. Plug exhaust outlets to prevent entrance of moisture, bugs, dirt, etc.
7. Clean and wipe entire unit. Coat parts susceptible to rust with a light coat of grease or oil.
8. Disconnect battery and follow standard battery storage procedure.
9. Provide a suitable cover for the entire unit.

### Returning a Unit to Service.

1. Remove cover and all protective wrapping. Remove plug from exhaust outlet.
2. Check warning tag on oil base and verify that oil viscosity is still correct for existing ambient temperature.
3. Clean and check battery. Measure specific gravity (1.260 at 77°F [25°C]) and verify level to be at split ring. If specific gravity is low, charge until correct value is obtained. If level is low, add distilled water and charge until specific gravity is correct. **DO NOT OVERCHARGE.**

#### **WARNING**

Do not smoke while servicing batteries. Explosive gases are emitted from batteries in operation. Ignition of these gases can cause severe personal injury.

4. Check that fuel injectors and fuel lines are secure, correctly torqued.

5. Check coolant level, adjust if necessary.
6. Connect batteries.
7. Verify that no loads are connected to generator.
8. Start engine.
9. After start, apply load to at least 50 percent of rated capacity.
10. Check all gauges to be reading correctly. Unit is ready for service.

After engine has started, excessive blue smoke will be exhausted until the rust inhibitor or oil has burned away.

## HIGH TEMPERATURES

1. See that nothing obstructs air flow to and from the set.
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 set to a warm location or apply heated air (never use open flame) 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 set 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.

## HIGH ALTITUDE

Maximum power will be reduced approximately 4 percent for each 1000 feet above sea level, after the first 1000 feet (310 m).

# ADJUSTMENTS

## CENTRIFUGAL SWITCH

The start-disconnect centrifugal switch (Figure 13) is located on the gear cover on the side of the engine above the oil filter. The switch opens when the engine stops and closes when engine speed reaches about 900 rpm. If necessary, loosen the stationary contact and adjust the point gap at 0.040 inch. Replace burned or faulty points.

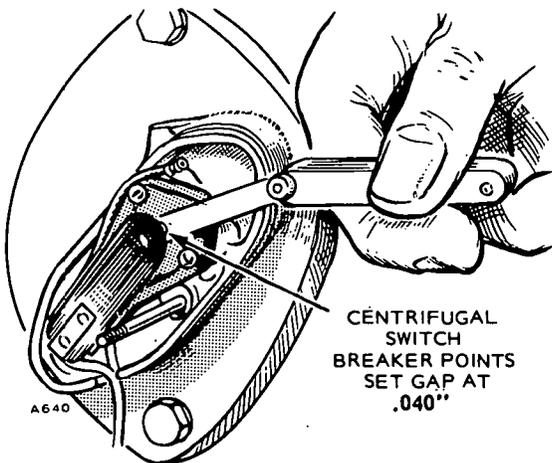


FIGURE 13. BREAKER POINT ADJUSTMENT

## 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 hertz frequency. Preferred speed does not vary more than 3 hertz from no-load to full-load operation. Be sure throttle, linkage, and governor mechanism operate smoothly.

**Speed Adjustment:** To change the governor speed, change the spring tension by turning the governor spring nut (Figure 14). Turn the nut clockwise (more spring tension) to increase RPM and counterclockwise to reduce governed speed. Hold a tachometer against flywheel cap screw.

**Sensitivity Adjustment:** To adjust governor sensitivity (no load to full load speed droop) turn the sensitivity adjusting ratchet accessible through a covered access hole on the side of the blower housing. Counterclockwise gives more sensitivity (less speed drop when full load is applied), clockwise gives less sensitivity (more speed drop). If the governor is too sensitive, a rapid hunting condition occurs (alternate increasing and decreasing speed). Adjust for maximum

sensitivity without hunting. After sensitivity adjustment, the speed will require readjustment. After adjusting the governor, replace the knockout plug in the blower housing and secure speed stud lock nut.

**Excessive droop may be caused by engine misfiring. Correct this condition before adjusting governor.**

## CHARGE RATE ADJUSTMENT

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. The resistor is located in the generator air outlet.

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.

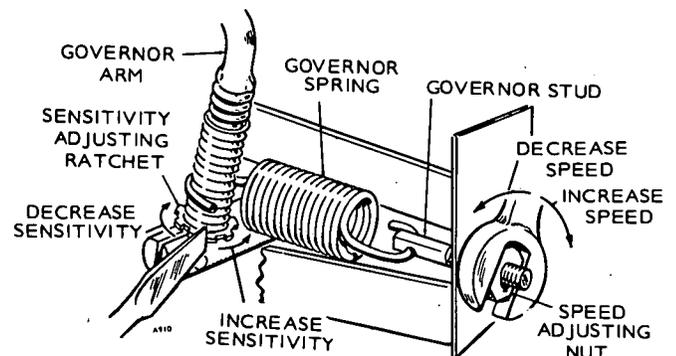
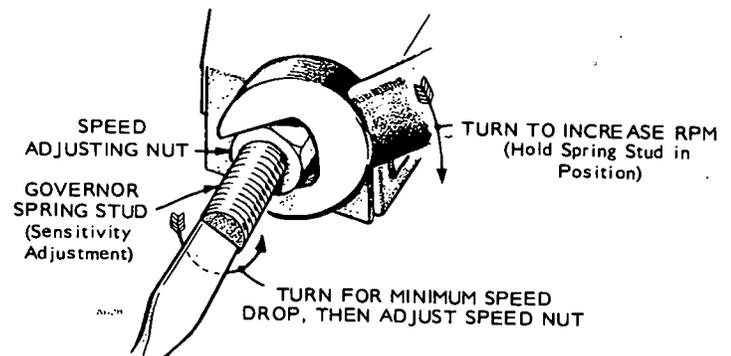


FIGURE 14. GOVERNOR ADJUSTMENT

# GENERAL MAINTENANCE

## GENERAL

Follow a regular schedule of inspection and servicing, based on operating hours (Table 1). Keep an accurate logbook of maintenance, servicing, and operating time. Use the running time meter (optional equipment) to keep a record of operation and servicing. Regular service periods are recommended for normal service and operating conditions. For continuous duty extreme temperature, etc., service more frequently. For infrequent use, light duty, etc., service periods can be lengthened accordingly. Refer to Figures 15 and 16 for engine maintenance information.

**WARNING** Before commencing any maintenance work on the engine, generator, control panel, automatic transfer switch or associated wiring, disconnect batteries. Failure to do so could result in damage to the unit or serious personal injury in the event of inadvertent starting.

Operator should periodically make a complete visual inspection with set running at rated load. Some of the things to check for are as follows:

1. Check all fuel and oil lines for possible leakage.
2. Inspect exhaust lines and mufflers for possible leakage and cracks.
3. Periodically or daily, drain moisture from condensation traps.
4. Inspect air shrouds for leaks and security. Be sure cooling fins are clean.
5. Inspect electrical wires and connections for security and fray damage.

If generator requires major repair or servicing, contact an authorized Onan dealer or distributor.

## AC GENERATOR

Periodic inspections that coincide with engine oil changes will ensure good performance.

## BEGIN SPEC AA.

When inspecting the rotating rectifier assembly, make sure diodes are free of dust, dirt and grease. Excessive foreign matter on these diodes and heat sinks will cause the diodes to overheat and will result in their failure. Blow out the assembly periodically, with filtered, low pressure air. Also check to see that diodes and leadwires are properly torqued. The diodes should be torqued to 25 in. lb. (2.83 N•m) or finger tight plus a quarter turn. See Figure 1.

## BATTERIES

Check the condition of the starting batteries at least every two weeks. See that connections are clean and tight. A light coating of non-conductive grease will retard corrosion at terminals. Keep the electrolyte at the proper level above the plates by adding distilled water. Check specific gravity; recharge if below 1.280.

## MAINTENANCE SCHEDULE

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

TABLE 1  
OPERATOR AND SERVICE MAINTENANCE SCHEDULE

HOURS OF OPERATION	MAINTENANCE TASK
8	<ul style="list-style-type: none"> <li>• Inspect generator set</li> <li>• Check fuel supply, see Note 1</li> <li>• Check oil level, See Figure 16</li> </ul>
50 (more often in dusty conditions)	<ul style="list-style-type: none"> <li>• Check air cleaner, See Figure 15</li> </ul>
100	<ul style="list-style-type: none"> <li>• Clean governor linkage, See Figure 16</li> <li>• Change crankcase oil</li> <li>• Drain fuel condensation traps in lines and filters, see Note 1</li> </ul>
200	<ul style="list-style-type: none"> <li>• Clean crankcase breather, See Figure 16</li> <li>• Replace oil filter</li> <li>• Check battery condition</li> </ul>
500 Call Onan serviceman	<ul style="list-style-type: none"> <li>• Check start-disconnect circuit</li> <li>• Check generator slip rings and brushes (prior to Spec AA) on older sets; replace if worn to 5/16"</li> <li>• Check valve clearances</li> </ul>
600	<ul style="list-style-type: none"> <li>• Change primary filter</li> </ul>
2000 Call Onan serviceman	<ul style="list-style-type: none"> <li>• Grind valves (if required)</li> <li>• Clean holes in rocker box oil line</li> <li>• Check nozzle spray pattern, see Note 2</li> <li>• Clean generator</li> </ul>
3000	<ul style="list-style-type: none"> <li>• Change secondary fuel filter</li> </ul>
5000 Call Onan serviceman	<ul style="list-style-type: none"> <li>• General overhaul (if required) see Note 3</li> </ul>

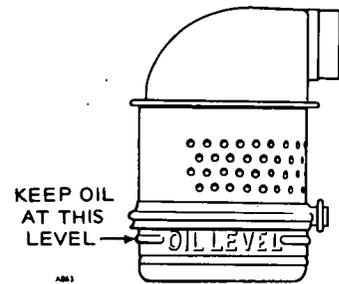
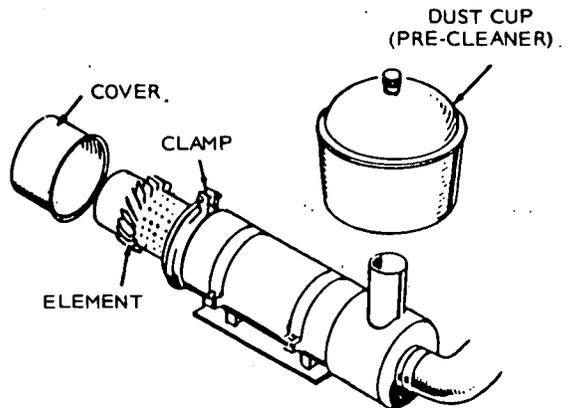
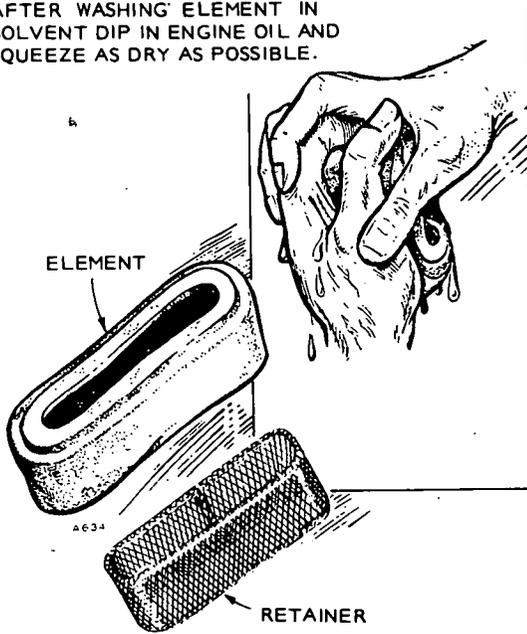
**NOTE 1.** Water or foreign material in fuel can ruin the injection system. If daily inspection shows water or excessive dirt in sediment bowl fuel, handling and storing facilities should be checked and situation corrected. Primary and secondary fuel filters must be replaced following correction of fuel contamination problem.

2. This service must be conducted by trained diesel injection equipment personnel with suitable test facilities. Omit this service until these conditions can be met.
3. Tighten head bolts and adjust valve clearance after first 50 hours on an overhauled engine.

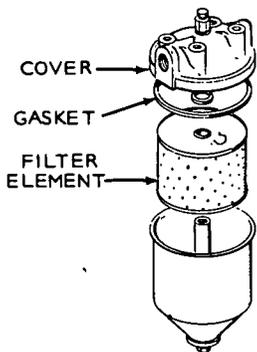
## OIL FILTER CHANGE

Place pan under old filter and remove by screwing counterclockwise. 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.

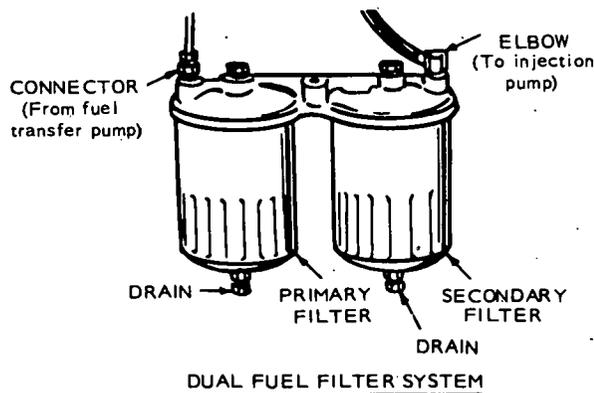
AFTER WASHING ELEMENT IN SOLVENT DIP IN ENGINE OIL AND SQUEEZE AS DRY AS POSSIBLE.



### AIR CLEANERS



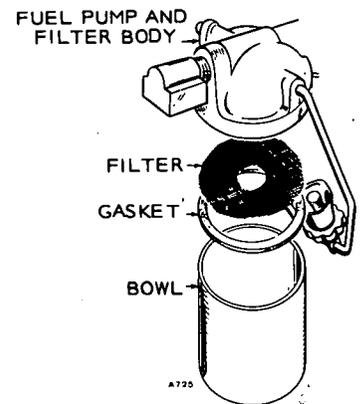
PRIOR TO SPEC. S



**CAUTION** Drain plug on fuel filters can tolerate only a limited amount of torque. Use two wrenches in combination for breaking plug loose and for final tightening.

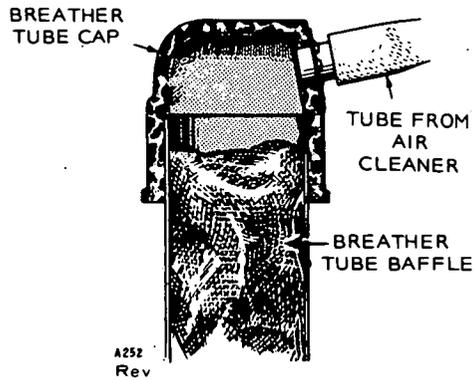
B208

BEGIN SPEC. S

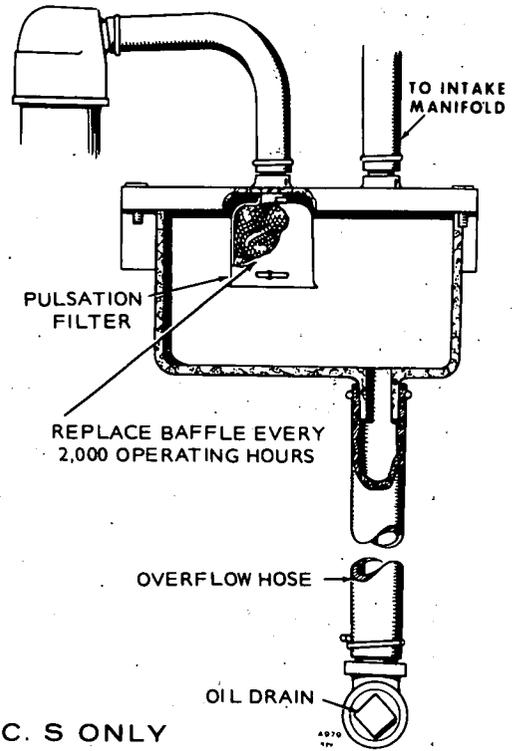


### FUEL FILTERS

FIGURE 15. AIR CLEANER AND FUEL FILTER MAINTENANCE



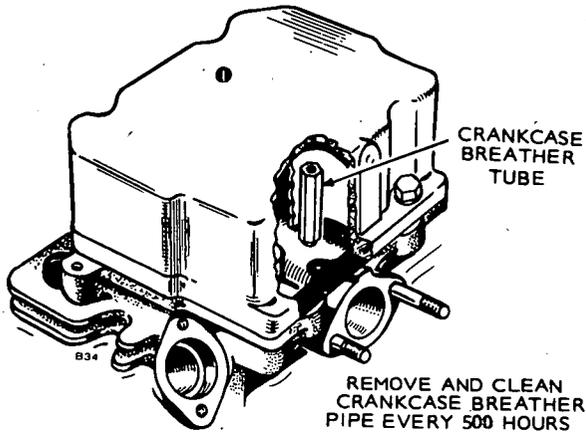
**CRANKCASE BREATHER**



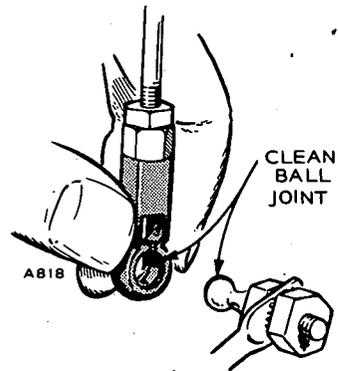
**SPEC. S ONLY**

**BREATHER PULSATION DAMPENER**

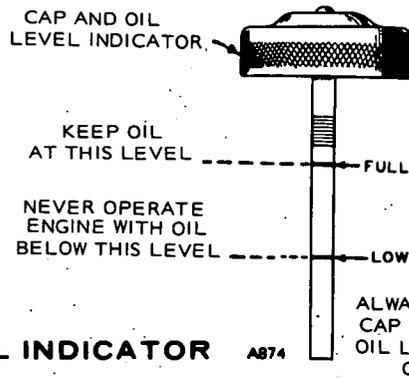
**BEGIN SPEC. T**



**BREATHER SYSTEM**



**BALL JOINT**



**OIL LEVEL INDICATOR**

**ALWAYS REPLACE CAP TIGHTLY, OR OIL LEAKAGE MAY OCCUR.**

**FIGURE 16. OIL LEVEL, GOVERNOR, AND CRANKCASE BREATHER MAINTENANCE**



# PARTS CATALOG

## INSTRUCTIONS FOR ORDERING REPAIR PARTS

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

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

Always refer to the nameplate on your unit:

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

<b>Onan</b> <sup>®</sup>	
<b>ELECTRIC GEN SET</b>	
MODEL AND SPEC NO.	
[ ]	
SERIAL NO. [ ]	
<b>IMPORTANT—ALWAYS GIVE ABOVE NOS WHEN ORDERING PARTS</b>	
A.C. VOLTS [ ]	PH. [ ]
K.V.A. [ ]	KW [ ]
P.F. [ ]	AMPS [ ] Hz [ ]
D.C. VOLTS [ ]	AMPS [ ]
WATTS [ ]	
R.P.M. [ ]	BAT. [ ]
MANUFACTURED BY ONAN DIVISION OF ONAN CORPORATION MINNEAPOLIS, MINNESOTA U.S.A. FOR ELECT EQUIPMENT ONLY SA 99-0444	

For handy reference, insert "YOUR" 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".

This catalog applies to the standard DJC Sets 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 set nameplate, select the parts that apply to your set. Unless otherwise mentioned in the description, parts are interchangeable between models. Right and left set sides are determined by facing the engine end (front) of the set.

### SET DATA TABLE

£ MODEL AND SPEC NO.	ELECTRICAL DATA				
	WATTS	VOLTS	HERTZ	WIRE	PHASE
9.0DJC-53CR/*	9,000	120/240	50	**	1
9.0DJC-54R/*	9,000	120/208	50	4	3
9.0DJC-54XR/*	9,000	277/480	50	4	3
9.0DJC-55DR/*	9,000	120/240	50	4	3
9.0DJC-57R/*	9,000	220/380	50	4	3
9.0DJC-59R/*	9,000	600	50	3	3
9.0DJC-518R/*	9,000	★	50	12	3
12.0DJC-3CR/*	12,000	120/240	60	**	1
12.0DJC-4R/*	12,000	120/208	60	4	3
12.0DJC-4XR/*	12,000	277/480	60	4	3
12.0DJC-5DR/*	12,000	120/240	60	4	3
12.0DJC-9R/*	12,000	600	60	3	3
12.0DJC-18R/*	12,000	★	60	12	3
12.0DJC-3CE/* (Formerly 12DJC-3E2236/)	Contractor Models - See Special Parts List following the Standard Parts List.				

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

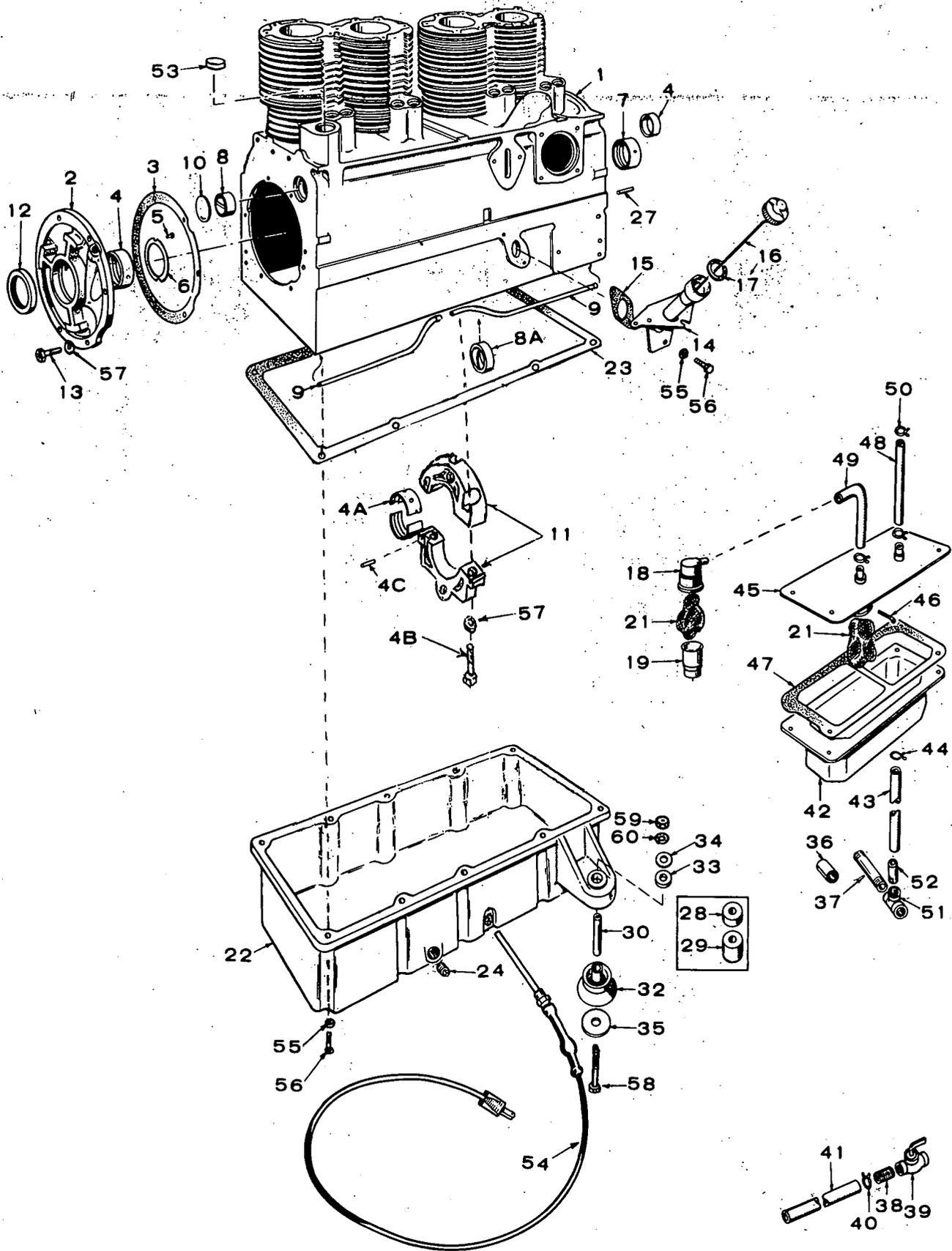
\*\* - These generators have four load wires which are reconnectable for 120 volt 2 wire service, or 240 volt 2 wire service, or 120/240 volt 3 wire service. **NOTE:** Previously the C designation was not in the model.

£ - New model designation shown, begin during 1969. Previous designation did not use a decimal in the KW rating. EXAMPLE: 9.0DJC was formerly 9DJC and 12.0DJC was formerly 12DJC.

★ - These sets are reconnectable, refer to Specifications (Generator Details).

**NOTE:** Hertz is a unit of frequency equal to one cycle per second.

# CYLINDER BLOCK AND OIL BASE GROUP



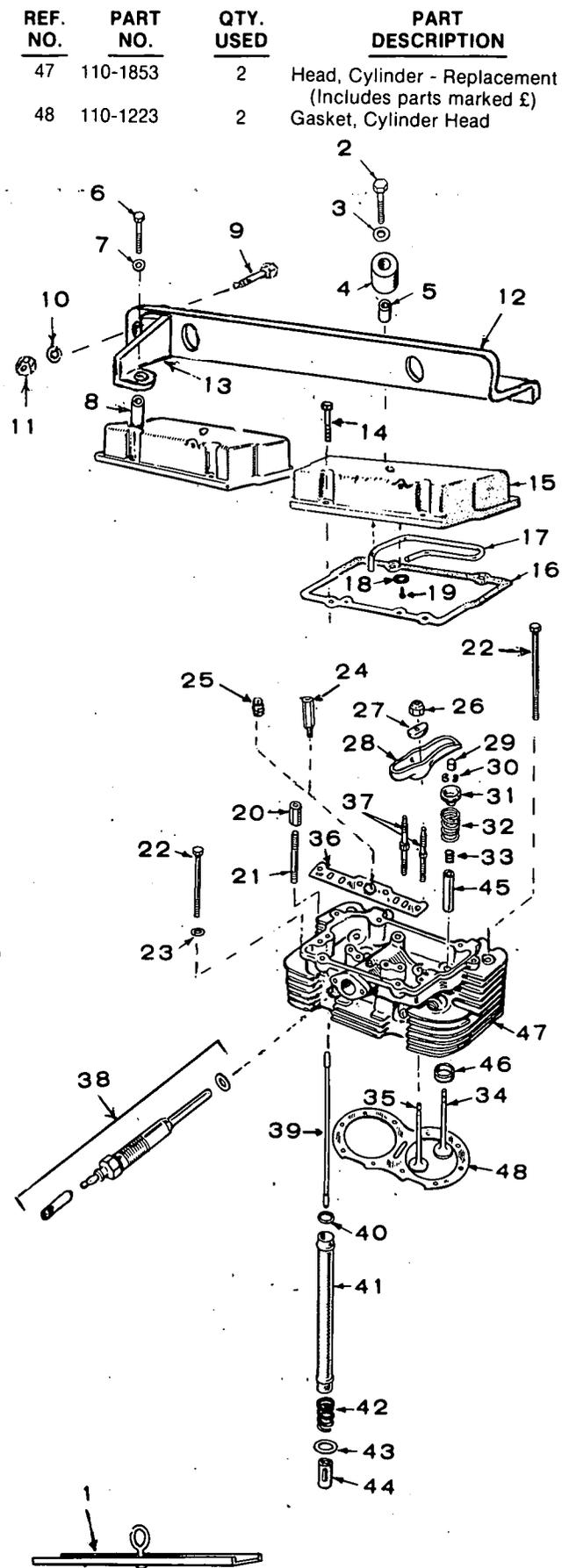
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	110-1332	1	Block Assembly, Cylinder (Includes Parts Marked *)
2	101-0337	1	*Plate, Rear Bearing (Less Bearing and Pins)
3	101-0386	1	*Shim and Gasket Kit, Rear Bearing Plate
4	*BEARING, PRECISION MAIN — FRONT OR REAR		
	101-0359	2	Standard
	101-0359-02	2	.002" Undersize
	101-0359-10	2	.010" Undersize
	101-0359-20	2	.020" Undersize
	101-0359-30	2	.030" Undersize
4A	*BEARING, HALF, PRECISION — CENTER MAIN		
	101-0361	2	Standard
	101-0361-02	2	.002" Undersize
	101-0361-10	2	.010" Undersize
	101-0361-20	2	.020" Undersize
	101-0361-30	2	.030" Undersize
4B	101-0342	2	*Bolt, Center Bearing Housing
4C	516-0149	2	*Pin, Center Bearing Housing
5	516-0072	4	*Pin, Thrust Washer
6	104-0420	2	*Washer, Crankshaft Thrust
7	101-0363	1	*Bearing, Precision Cam Front (Standard Only)
8	101-0365	1	*Bearing, Precision Cam Rear (Standard Only)
8A	101-0364	1	*Bearing, Precision Cam Center (Standard Only)
9	*TUBE, CRANKCASE OIL		
	120-0586	1	Front
	120-0585	1	Rear
10	517-0053	1	*Plug, Expansion - Rear Cam Opening
11	101-0356	1	Housing, Center Main Bearing
12	509-0086	1	*Seal, Crankshaft Rear
13	805-0019	6	*Bolt, Rear Bearing Plate (3/8-16 x 1-1/4")
14	TUBE, OIL FILL		
	123-0681	1	Spec A through R
	123-1086	1	Begin Spec S
15	123-0667	1	Gasket, Oil Fill
16	CAP AND INDICATOR		
	123-0698	1	Spec A through R
	123-1056	1	Begin Spec S
17	123-0191	1	Gasket, Cap
18	123-0787	1	Cap, Breather Tube - Spec A through S
19	123-0645	1	Tube, Breather - Spec A through S
21	BAFFLE, BREATHER		
	123-0865	1	Spec A through R
	123-0865	2	Spec S Only
22	BASE, OIL		
	102-0476	1	Spec A Only
	102-0539	1	Begin Spec B
	102-0549	1	For Oil Base Heater
23	102-0475	1	Gasket, Oil Base
24	505-0056	1	Plug (1/2")
27	516-0141	2	*Pin, Gear Cover Locating
28	402-0036	4	Mount, Vibration, Cylindrical Shaped, Upper, Spec A Only
29	MOUNT, VIBRATION, CYLINDRICAL SHAPED, LOWER, SPEC A ONLY		
	402-0038	2	Engine End
	402-0251	2	Generator End
30	BUSHING, SPACER, VIBRATION MOUNT		
	402-0046	4	Spec A Only
	402-0290	4	+Begin Spec B
32	CUSHION, VIBRATION, CONE SHAPED		
	402-0285	2	Engine End - Begin Spec B
	402-0287	2	Generator End - Spec B through Z
	402-0286	2	Generator End - Begin Spec AA

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
33	402-0282	4	+Snubber, Shock Mounting, Begin Spec B
34	526-0014	4	+Washer (29/64" I.D. x 1-1/2" O.D. x 1/8") Only with Cone Shaped Cushions
35	+WASHER (ONLY WITH CONE SHAPED CUSHIONS)		
	526-0195	4	29/64" I.D. x 3-1/4" O.D. x 1/8"
	526-0198	As Req.	5/8" I.D. x 1-1/2" O.D. x 1/16"
36	505-0014	1	Coupling, Oil Drain (1/2") (Optional)
37	NIPPLE, OIL DRAIN		
	505-0002	1	Spec A through R (1/2 x 3") (Optional)
	505-0681	1	Spec S Only
38	505-0100	2	Nipple, Oil Drain (Housed Units)
39	504-0011	1	Valve, Oil Drain (Housed Units)
40	503-0197	1	Clamp, Hose (Housed Units)
41	503-0316	1	Hose, Oil Drain (Housed Units)
42	123-1061	1	Damper, Breather Pulsation - Spec S Only
43	503-0564	1	Hose, Overflow - Pulsation Damper - Spec S Only
44	503-0197	2	Clamp, Overflow Hose - Spec S Only
45	123-1047	1	Cover, Breather Pulsation Damper - Spec S Only
46	516-0177	1	Pin, Cotter - Baffle Retainer - Spec S Only
47	123-1049	1	Gasket, Breather, Pulsation Damper - Spec S Only
48	503-0563	1	Hose, Damper Cover to Intake Manifold - Spec S Only
49	503-0562	1	Hose, Damper Cover to Breather Cap - Spec S Only
50	503-0170	4	Clamp, Hose - Breather Pulsation - Spec S Only
51	505-0682	1	Tee, Oil Drain - Spec S Only
52	505-0683	1	Nipple, Half - Damper Hose to Oil Drain - Spec S Only
53	517-0103	1	Plug, Core Hole (Block) - Begin Spec T
54	102-0558	1	Heater, Oil Base (Optional)
55	LOCKWASHER		
	850-0055	10	Oil Base Mounting (7/16")
	850-0045	2	Oil Fill Tube Mounting (5/16")
56	SCREW, HEX CAP		
	800-0072	10	Oil Base Mounting (7/16-14 x 1-1/4")
	800-0026	2	Oil Fill Mounting (5/16-18 x 3/4")
57	WASHER, FLAT		
	526-0245	6	Bearing Plate Mounting
	526-0035	2	*Center Main Bearing Housing
58	816-0212	4	+Bolt, Carriage (7/16-14 x 5-1/2") - Cushion Mounting - Begin Spec B
59	862-0004	4	+Nut, Hex (7/16-14) - Cushion Mounting
60	850-0055	4	+Washer, Lock (7/16") - Cushion Mounting
	402-0291	4	Hardware Package, Mounting (Includes Parts Marked +)

\* - Included in Cylinder Block Assembly.

+ - Included in 402-0291 Mounting Hardware Package.

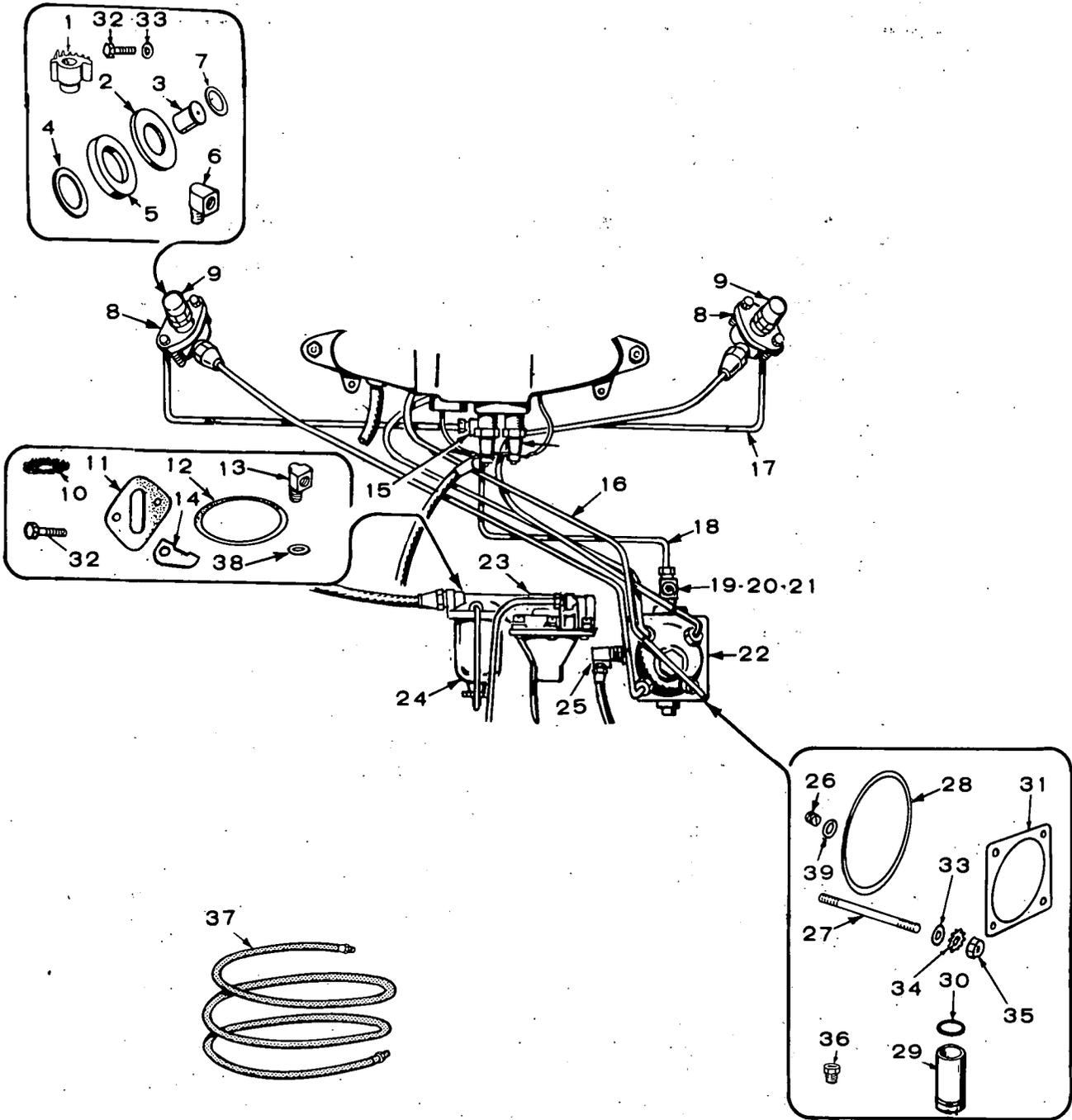
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	—	1	Bracket, Lifting - Spec A (Not available; order 403-0690 and Hardware)
2	SCREW, HEX HEAD - LIFTING BRACKET		
	800-0091	2	Spec A (1/2-13 x 1-1/4")
	800-0094	2	Begin Spec B (1/2-13 x 2")
3	WASHER - LIFTING BRACKET		
	850-0060	2	Lock - Spec A (1/2)
	526-0100	2	Flat - Begin Spec B (1/2)
4	402-0361	2	Cushion, Vibration - Begin Spec B
5	402-0362	2	Spacer - Begin Spec B
6	800-0038	1	Screw, Hex Head - Begin Spec B (5/16-18 x 3-1/4")
7	850-0044	1	Washer, Lock - Begin Spec B (5/16)
8	403-0826	1	Spacer - Begin Spec B
9	800-0025	1	Screw, Hex Head - Begin Spec B (5/16-18 x 5/8")
10	850-0044	1	Washer, Lock - Begin Spec B (5/16)
11	862-0015	1	Nut, Hex - Begin Spec B (5/16-18)
12	403-0690	1	Bracket, Lifting - Begin Spec B
13	403-0890	1	Brace, Lifting Bracket - Begin Spec B
14	SCREW, HEX HEAD - ROCKER COVER MOUNTING		
	800-0030	8	Spec A (5/16-18 x 1-1/4")
	800-0030	7	Begin Spec B (5/16-18 x 1-1/4")
15	115-0134	2	Cover Assembly, Rocker (Includes replaceable parts marked *)
16	115-0130	2	*Gasket, Rocker Cover
17	120-0628	2	*Oil Line, Rocker Cover
18	526-0130	2	*Washer, Flat
19	809-0042	2	*Screw, Round Head, Sheet Metal (10-3/8")
20	403-0620	2	Nut, Extension - Spec A
21	520-0626	2	Stud, Cylinder Head - Spec A
22	SCREW, HEX HEAD - CYLINDER HEAD		
	110-1264	10	3/8-16 x 4-1/4"
	800-0503	10	Spec A (3/8-16 x 1-3/4")
	800-0503	12	Begin Spec B (3/8-16 x 1-3/4")
23	526-0174	12	Washer, Flat (3/8)
24	123-1140	2	Standpipe, Vent - Cylinder Head - Begin Spec T
25	505-0008	2	£Plug, Pipe - Spec A thru S (Replacement part with cylinder head)
26	115-0150	8	Locknut - Rocker Arm
27	115-0127	8	Ball, Pivot - Rocker Arm
28	ARM, ROCKER		
	115-0128	4	Exhaust Valves
	115-0129	4	Intake Valves
29	110-0859	8	Cap, Valve Stem
30	110-0858	16	Lock, Valve Stem
31	110-1220	8	Retainer, Valve Spring
32	110-1221	8	Spring, Valve
33	509-0090	4	Seal, Oil - Intake Valve Stem
34	110-1278	4	Valve, Exhaust - Stellite
35	110-1320	4	Valve, Intake
36	115-0196	2	£Guide, Push Rod
37	115-0152	8	Stud, Rocker Arm
38	333-0106	4	Kit, Glow Plug (Includes plug, gasket, terminal and sleeving)
39	115-0149	8	Rod, Push - Valve
40	509-0084	8	Seal, Shield - Push Rod
41	115-0151	8	Shield, Push Rod
42	115-0146	8	Spring, Push Rod Shield
43	115-0155	8	Washer, Flat - Push Rod Shield
44	TAPPET, VALVE		
	115-0132	8	Spec A through N
	115-0195	8	Begin Spec P
45	GUIDE, VALVE		
	110-1501	8	£Standard
	110-1501-01	8	.001" Oversize
46	INSERT, VALVE SEAT (Stellite)		
	110-1268	8	£Standard
	110-1268-02	8	.002" Oversize
	110-1268-05	8	.005" Oversize
	110-1268-10	8	.010" Oversize
	110-1268-25	8	.025" Oversize



CYLINDER HEAD, VALVE AND ROCKER GROUP



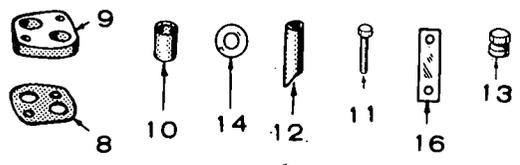
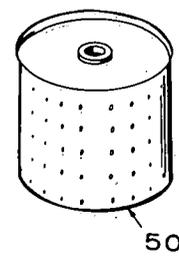
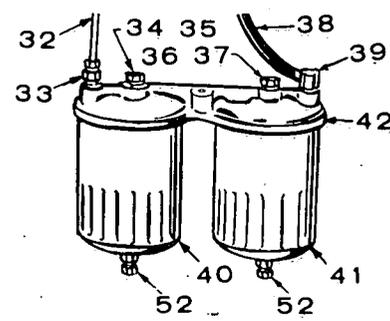
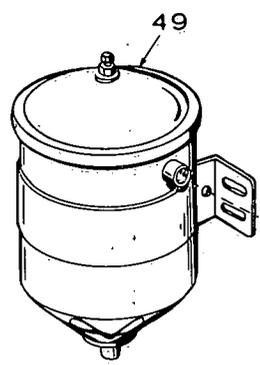
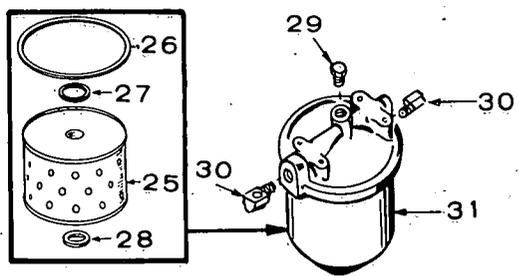
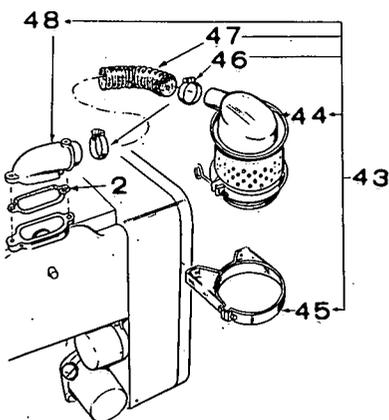
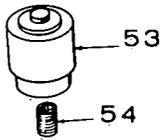
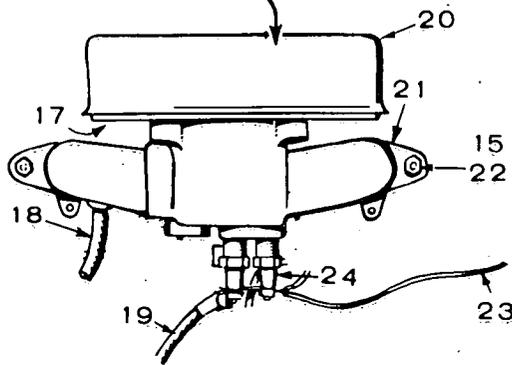
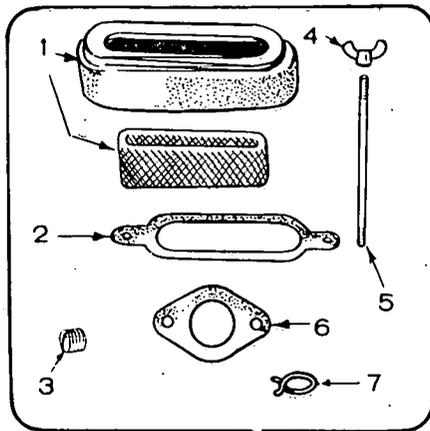
# FUEL TRANSFER PUMP AND INJECTION SYSTEM GROUP



REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
	149-1046	1	Repair Kit, Fuel Pump (Includes Diaphragm & Gaskets) Does Not Apply for AC Pumps
1	147-0133	2	Adapter, Injection Nozzle, #1 & 3 Cylinders
1	147-0132	2	Adapter, Injection Nozzle, #2 & 4 Cylinders
2	147-0043	4	Gasket, Nozzle Heat Shield (Asbestos)
3	147-0134	4	Nozzle Only, Component of Nozzle & Holder Assembly
4	110-0419	4	Gasket, Shield to Head (Copper)
5	147-0044	4	Shield, Nozzle Heat (Steel)
6	502-0065	2	Elbow, Inverted, 45°, Nozzle (Fuel Return Line), Cylinders 1 & 4
6	502-0002	2	Elbow, Inverted 90°, Nozzle (Fuel Return Line) Cylinders 2 & 3
7	147-0243	4	Gasket, Nozzle
8	147-0141	4	Flange, Injection Nozzle Hold-down
9	147-0136	4	Nozzle & Holder Assembly
10	149-0463	1	Screen, Fuel Pump Filter
11	149-0792	1	Gasket, Fuel Transfer Pump Mounting
12	149-0517	1	Gasket, Fuel Pump Bowl
13	502-0002	2	Elbow, Fuel Pump Inlet & Outlet
14	149-1307	2	Washer, Flange - Fuel Pump Mounting
15	502-0245	1	Adapter, Return Lines
16	LINE, INJECTION PUMP TO NOZZLE, INCLUDES FITTINGS		
	149-0963	1	#1 Cylinder - Spec A thru Q
	149-1150	1	#1 Cylinder - Begin Spec R
	149-0964	1	#2 Cylinder - Spec A thru Q
	149-1151	1	#2 Cylinder - Begin Spec R
	149-0965	1	#3 Cylinder - Spec A thru Q
	149-1152	1	#3 Cylinder - Begin Spec R
	149-0966	1	#4 Cylinder - Spec A thru Q
	149-1153	1	#4 Cylinder - Begin Spec R
17	LINE, NOZZLE FUEL RETURN		
			#1 Cylinder
	149-0909	1	Spec A thru N (16-7/16")
	149-1060	1	Begin Spec P (19-1/8")
			#2 & 3 Cylinders
	149-0908	2	Spec A thru N (16-7/16")
	149-1059	2	Begin Spec P (12-3/8")
			#4 Cylinder
	149-0910	1	Spec A thru N (16-7/16")
	149-1061	1	Begin Spec P (19-5/16")
18	LINE, INJECTION PUMP TO FUEL RETURN LINES TEE		
	149-0949	1	Spec A through N
	149-1062	1	Begin Spec P
19	502-0048	1	Tee, Return Line, Early Models Only

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
20	502-0029	1	Bushing, Pipe, Return Line Tee to Pump Bleeder Valve, Early Models Only
21	147-0183	1	Valve, Bleeder, Injection Pump (Replaces 147-0162)
22	PUMP, INJECTION		
	147-0231	1	Spec A thru Q (Includes Buttons 2, 4, 12 & Injection Lines)
	147-0232	1	Begin Spec R (Includes Buttons 2, 4, 12)
23	149-1020	1	Pump, Fuel Transfer
24	149-0116	1	Bowl, Fuel Pump (Glass)
25	ELBOW, INJECTION PUMP INLET		
	502-0054	1	Spec A through R
	502-0039	1	Begin Spec S
26	BUTTON, INJECTION PUMP PLUNGER		
	147-0147	1	.119 - Marked 1 or A
	147-0148	1	.116 - Marked 2 or B
	147-0149	1	.113 - Marked 3 or C
	147-0150	1	.110 - Marked 4 or D
	147-0151	1	.107 - Marked 5 or E
	147-0161	1	.104 - Std. Marked 11 or no Mark
	147-0152	1	.101 - Marked 6 or F
	147-0153	1	.098 - Marked 7 or H
	147-0154	1	.095 - Marked 8 or J
	147-0155	1	.092 - Marked 9 or K
	147-0156	1	.089 - Marked 10 or L
	147-0190	1	.122 - Marked 12 or M
	147-0189	1	.125 - Marked 13 or N
	147-0188	1	.128 - Marked 14 or P
	147-0187	1	.131 - Marked 15 or R
	147-0186	1	.134 - Marked 16 or S
27	520-0129	4	Stud, Injection Pump Mounting
28	509-0094	1	Seal, O-Ring, Injection Pump to Crankcase
29	147-0182	1	Tappet, Injection Pump
30	147-0196	1	Gasket, O-Ring, Injection Pump Tappet
31	147-0145	1	Shim Kit, Injection Pump Mounting
32	SCREW, HEX CAP		
	800-0508	8	Nozzle & Holder Mounting (5/16-18 x 2-3/4")
	800-0027	2	Transfer Pump Mounting (5/16-18 x 7/8")
33	WASHER, FLAT		
	526-0122	8	Nozzle & Holder Mounting
	526-0022	4	Injection Pump Mounting
34	850-0045	4	Lockwashers, Injection Pump Mounting (5/16")
35	862-0015	4	Nut, Injection Pump Mounting (5/16-18)
36	502-0176	1	Adapter, Pipe, Bleeder Valve to Pump, Early Models Only
37	501-0007	2	Line, Fuel (28")
38	149-1307	2	Washer, Fuel Pump Mounting
39	147-0259	1	Ring, Retaining - Timing Button

# AIR CLEANER AND FUEL FILTERS GROUP

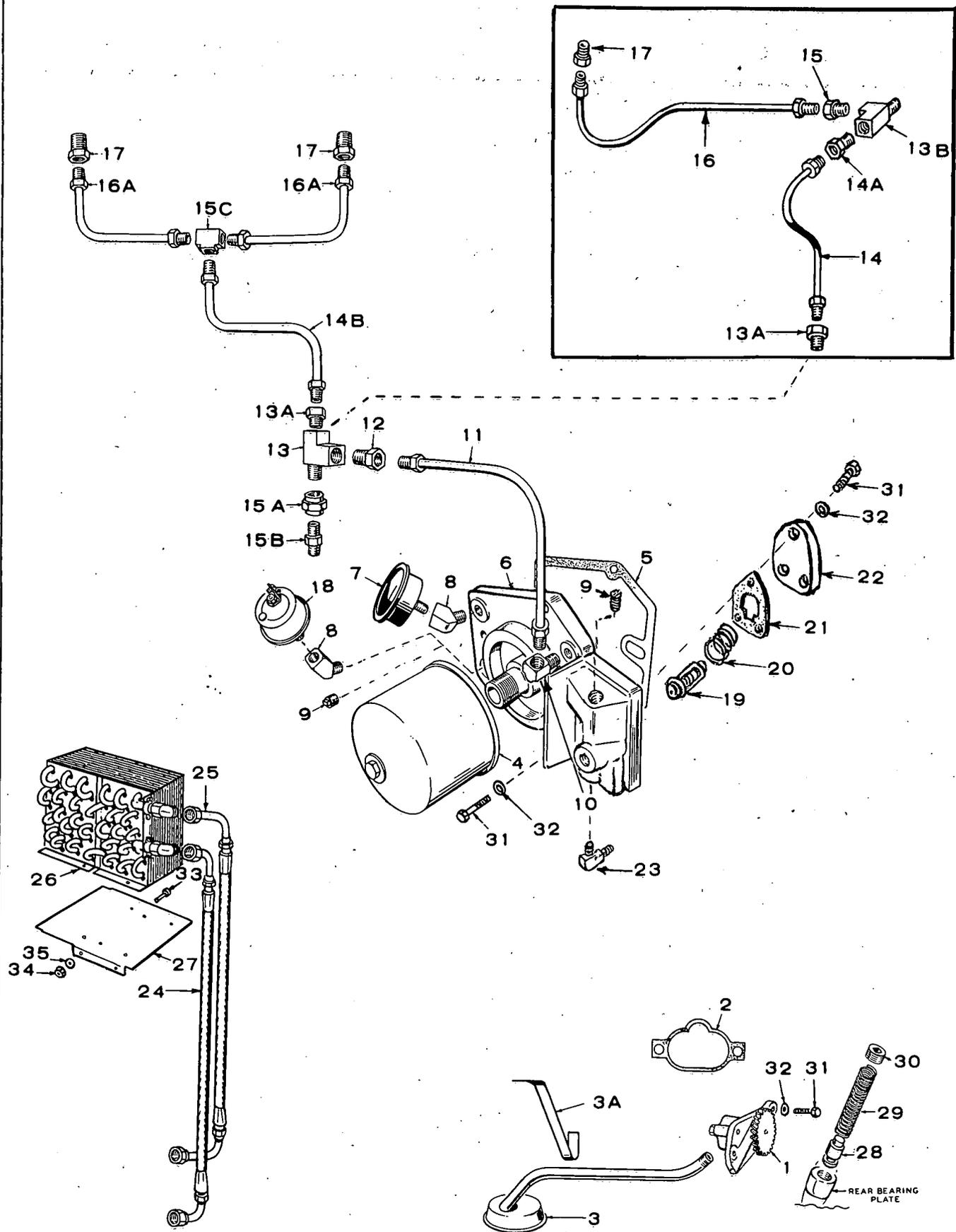


REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	140-0636	1	Element and Retainer, Air Cleaner
2	140-0584	1	Gasket, Air Cleaner
3	505-0054	1	Plug, Pipe, 1/4", Air Cleaner Adapter & Intake Manifold
4	865-0020	2	Nut, Wing - Air Cleaner
5	520-0621	2	Stud, Air Cleaner
6	154-0733	2	Gasket, Intake Manifold
7	503-0171	2	Clamp, Breather Hose (NOTE: See Crankcase & Oil Base Group - Begin Spec S)
8	140-0706	1	Gasket, Manifold Heater Insulator
9	140-0705	1	Plate, Manifold Heater Mounting
10	508-0103	2	Sleeve, Insulator - Manifold Heater Mounting
11	114-0023	2	Screw (1/4-20 x 1-1/4") Manifold Heater Mounting
12	123-1113	1	Tube, Nylon, Breather Hose to Manifold - Spec A thru S
13	505-0180	1	Plug, Intake Manifold
14	508-0102	2	Washer, Insulator Mica, Manifold Heater Mounting
15	520-0011	4	Stud, Intake Manifold
16	332-0829	1	Strap, Jumper, Air Heater
17	140-0595	1	Pan, Air Cleaner
18	503-0328	1	Hose, Breather - Spec A thru R (NOTE: See Crankcase & Oil Base Group - Begin Spec S)
19	336-1331	1	Lead, Air Heater to Solenoid in Control
20	COVER, AIR CLEANER		
	140-0594	1	Early Models Without Restriction Indicator
	140-1194	1	Late Models With Restriction Indicator
21	154-0840	1	Manifold, Intake
22	870-0137	4	Nut, Intake Manifold Mounting (5/16-24)
23	LEAD, GLOW PLUG TO AIR HEATER		
	336-1314	1	#1 Cylinder (10-1/4") Round Terminal
	336-1313	2	#2 & 3 Cylinder (5-1/4") Round Terminal
	336-1505	2	#2 & 3 Cylinder (5-1/4") Blade Terminal
	336-1333	1	#4 Cylinder (18") Round Terminal
	336-1504	2	#1 & 4 Cylinder (12-1/4") Blade Terminal
24	154-0712	2	Heater, Manifold, Includes Gasket (12 Volt)
25	149-0428	1	Cartridge, Secondary Fuel Filter - Spec A through R
26	149-0456	1	Gasket, Secondary Filter, Bowl to Cover - Spec A through R
27	149-0455	1	Gasket, Secondary Filter, Cartridge to Head - Spec A through R

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
28	149-0493	1	Gasket, Secondary Filter, Cartridge to Retainer - Spec A through R
29	149-0769	1	Plug, Air Bleed, Secondary Filter - Spec A through R
30	502-0041	2	Elbow, Inverted Male, Secondary Filter Inlet & Outlet - Spec A through R
31	149-0408	1	Filter, Secondary Fuel, Includes Cartridge (NOTE: Bleed Plug 149-0769 is Available Separately - Spec A through R)
32	LINE, FUEL PUMP TO SECONDARY FILTER		
	149-0806	1	Spec A through R
	149-1189	1	Begin Spec S
33	502-0003	1	Connector, Primary Fuel Filter Inlet - Begin Spec S
34	526-0068	1	Washer, Primary Fuel Filter Mounting - Begin Spec S
35	801-0074	1	Screw, Hex Cap - Primary Fuel Filter Mounting - Begin Spec S
36	526-0066	1	Washer, Secondary Fuel Filter Mounting - Begin Spec S
37	801-0053	1	Screw, Hex Cap - Secondary Fuel Filter Mounting - Begin Spec S
38	LINE, FUEL, SECONDARY FILTER TO INJECTION PUMP		
	501-0091	1	Spec A through R
	501-0129	1	Begin Spec S
39	502-0099	1	Elbow, Reducer - Secondary Fuel Filter Outlet - Begin Spec S
40	122-0325	1	Filter, Fuel - Primary - Begin Spec S
41	122-0326	1	Filter, Fuel - Secondary - Begin Spec S
42	149-1185	1	Adapter, Fuel Filters - Begin Spec S
43	140-0677	1	Conversion Kit, Oil Bath Air Cleaner (Optional) Includes Parts Marked ** Plus Hardware
44	140-0500	1	**Cleaner, Air, Oil Bath
45	140-0519	1	**Band, Air Cleaner
46	503-0365	2	**Clamp, Air Cleaner Hose
47	503-0444	1	**Hose, Air Cleaner to Adapter
48	140-1212	1	**Adapter, Oil Bath Air Cleaner
49	149-1078	1	Filter, Fuel - Mounted between Fuel Tank & Transfer Pump - Spec A through R
50	149-0846	1	Cartridge (For 149-1078 Filter) - Spec A through R
51	517-0104	1	Plug, Core Hole (Intake Manifold) - Begin Spec T
52	502-0080	2	Plug, Drain - Fuel Filter
53	140-0961	1	Indicator, Restriction - Some early models do not use.
54	140-1260	1	Nipple, Indicator to Air Cleaner Cover - Some early models do not use.

\*\* - Included in Optional 140-0677 Oil Bath Air Cleaner Conversion Kit.

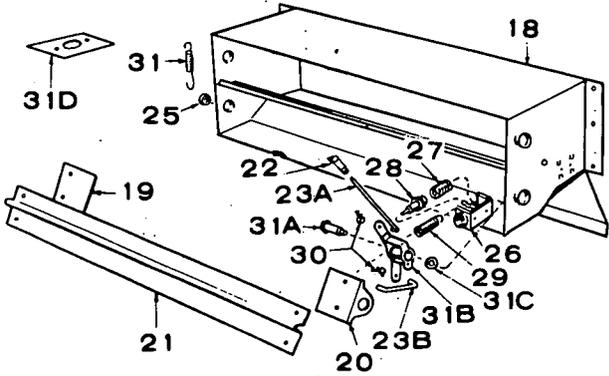
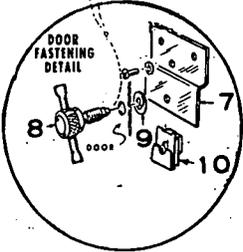
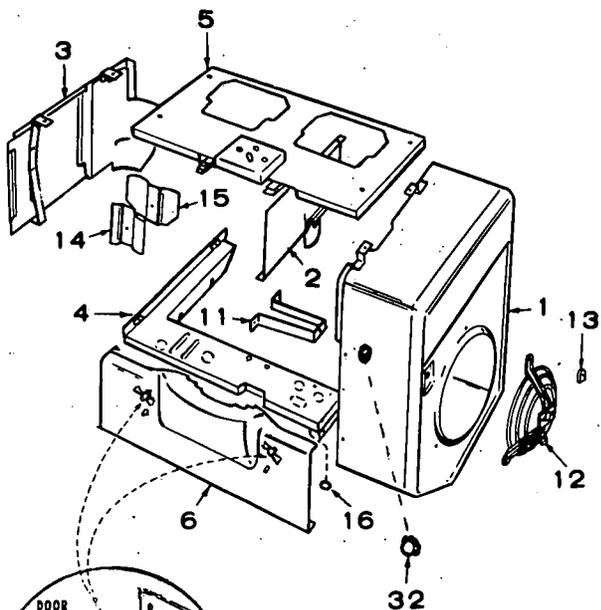
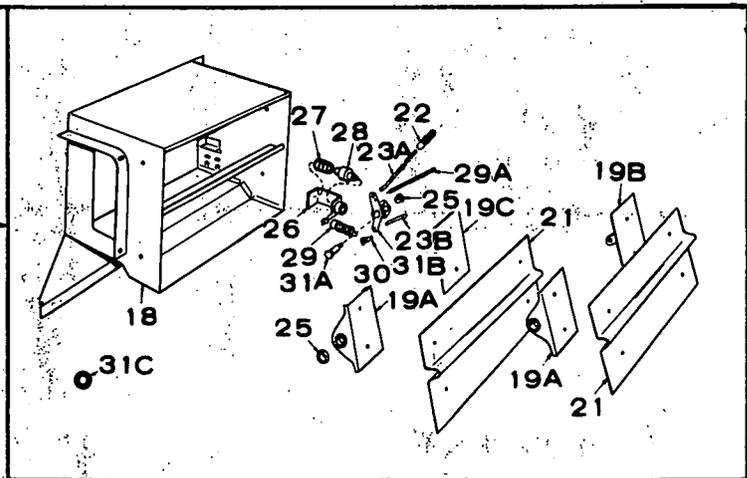
# OIL SYSTEM GROUP



REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	120-0547	1	Pump Assembly, Oil
2	120-0580	1	Gasket Kit, Oil Pump
3	120-0601	1	Cup Assembly, Oil Pump Intake
3A	120-0602	1	Bracket, Intake Cup
4	122-0185	1	Filter
5	122-0246	1	Gasket, Adapter
6	122-0245	1	Adapter, Oil Filter
7	193-0006	1	Gauge, Oil Pressure
8	502-0053	2	Elbow, Oil Gauge, Also For Optional Pressure Switch
9	PLUG, PIPE		
	505-0008	1	Slotted Drive (1/8")
	505-0057	1	Square Drive (1/8")
10	ELBOW, OIL LINE TO ADAPTER		
	502-0019	1	Spec A through N
	502-0037	1	Begin Spec P
11	LINE, ADAPTER TO INJECTION PUMP TEE		
	120-0584	1	Spec A through N
	120-0614	1	Begin Spec P
12	CONNECTOR, ADAPTER LINE TO INJECTION PUMP TEE		
	502-0030	1	Spec A through N
	502-0274	1	Begin Spec P
13	502-0242	1	Tee, Restricted - Injection Pump Lubrication
13A	CONNECTOR, INJECTION PUMP LINE TO CYLINDER HEAD LINE		
	502-0030	1	Spec A through N
	502-0097	1	Begin Spec P
13B	502-0282	1	Tee, Restricted - Front Cylinder Head - Spec A thru S
14	LINE, INJECTION PUMP TEE TO CYLINDER HEAD		
	120-0583	1	Spec A through N
	120-0632	1	Spec P through S
14A	CONNECTOR, CYLINDER HEAD LINE TO FRONT CYLINDER HEAD TEE		
	502-0030	1	Spec A through N
	502-0097	1	Spec P through S
14B	120-0696	1	Line, Injection Pump Tee to Cylinder Head Tee - Begin Spec T
15	502-0097	1	Connector, Front Cylinder Head Tee to Rear Cylinder Head Line - Spec A thru S
15A	502-0051	1	Coupling, Injection Pump Tee to Injection Pump Nipple - Begin Spec P
15B	502-0082	1	Nipple, Injection Pump to Coupling - Begin Spec P
15C	502-0373	1	Tee, Oil Lines - Begin Spec T

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
16	LINE, FRONT CYLINDER HEAD TEE TO REAR CYLINDER HEAD CONNECTOR		
	120-0575	1	Spec A through N
	120-0635	1	Spec P through S
16A	120-0695	2	Line, Cylinder Head - Begin Spec T
17	CONNECTOR, REAR CYLINDER HEAD		
	502-0097	1	Spec A through N
	502-0281	1	Spec P through S
	502-0281	2	Begin Spec T
18	309-0169	1	Switch, Low Oil Pressure (Optional)
19	309-0130	1	Thermostat, Oil Cooler By-Pass
20	122-0242	1	Spring, By-Pass Thermostat Retainer
21	122-0243	1	Gasket, By-Pass Thermostat Cover Plate
22	122-0244	1	Plate, By-Pass Thermostat Cover
23	502-0277	2	Elbow, Oil Cooler Line to Adapter
24	501-0109	1	Line, Flexible, Oil Cooler (Short Elbow)
25	501-0110	1	Line, Flexible, Oil Cooler (Long Elbow)
26	102-0615	1	*Cooler, Oil
27	102-0518	1	Bracket, Oil Cooler Mounting
28	120-0539	1	Valve, Oil By-Pass
29	120-0555	1	Spring, By-Pass Valve
30	505-0274	1	Plug, 1/8" Oil By-Pass
31	SCREW, HEX HEAD, CAP		
	800-0030	2	Oil Pump Mounting (5/16-18 x 1-1/4")
	800-0028	3	Oil Filter Adapter Mounting (5/16-18 x 1")
	800-0005	3	Oil Thermostat Mounting (1/4-20 x 3/4")
32	WASHER, LOCK		
	850-0045	3	Oil Filter Adapter Mounting (5/16)
	850-0040	3	Oil Thermostat Mounting (1/4)
	850-0045	2	Oil Pump Mounting (5/16)
33	800-0003	4	Screw, Hex Cap (1/4-20 x 1/2") Oil Cooler Mounting
34	862-0001	4	Nut (1/4 x 20) Oil Cooler Mounting
35	853-0013	4	Washer, Shakeproof - Oil Cooler Mounting

\* - Spec A through Q sets also order 501-0109 and 501-0110 Lines.



**AIR HOUSING AND OPTIONAL SHUTTER GROUP**

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	134-1447	1	Housing, Blower
2	134-1449	1	Housing, Cylinder Air, Front
3	134-1051	1	Housing, Cylinder Air, Rear
4	PANEL, CYLINDER AIR HOUSING (BOTTOM)		
	134-1418	1	Spec A through R and . Begin Spec T
	134-1905	1	Spec S Only
5	134-1200	1	Cover, Nozzle & Housing
6	134-1202	1	Panel, Air Housing Door
7	134-1089	2	Bracket, Air Housing Door Panel
8	134-1373	2	Screw, Door Panel
9	134-1180	4	Washer, Door Panel (Early Models, 8 for Top Cover)
10	870-0194	6	U-Clip, Door Panel & Cover
11	134-1088	1	Support, Blower Housing
12	134-1178	1	Grille and Plate
13	134-1092	3	Retainer, Grille
14	134-1097	1	Baffle, Cylinder (Injection Pump Side)
15	134-1098	1	Baffle, Cylinder (Opposite Pump Side)
16	508-0005	2	Grommet, Bottom Housing Panel
17	134-1810	1	Shutter Assembly (Optional) Includes parts marked *
18	134-1805	1	*Duct only, Air Outlet (*NOTE: Cannot be used on early model shutter assembly with external shutter pivot springs)
19	134-1242	3	+Bracket and Pivot Assembly, Shutter
19	134-1242	2	£Bracket and Pivot Assembly, Shutter
19	134-1612	1	£Bracket and Pivot Assembly, Shutter
19A	134-2411	2	*Bracket and Pivot Assembly, Shutter
19B	134-1802	1	*Bracket and Pivot Assembly, Shutter and Rod
19C	134-1801	1	*Bracket and Pivot Assembly, Shutter and Spring
20	134-1238	1	+Bracket, Shaft and Pin Assembly, Shutter

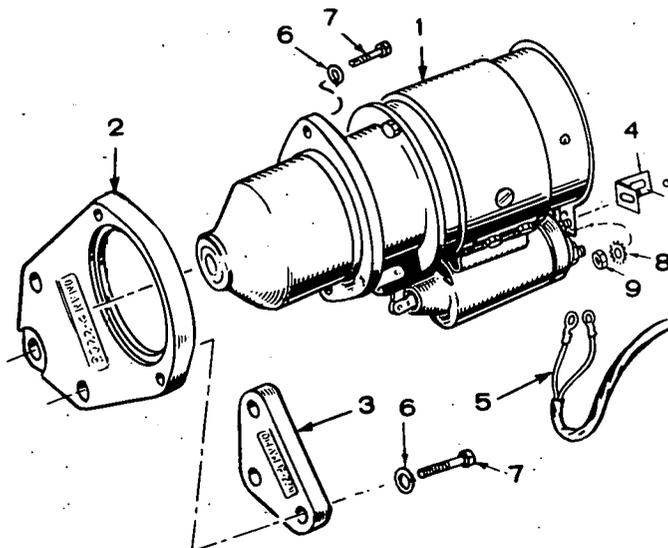
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
20	134-1611	1	£Bracket, Shaft and Pin Assembly, Shutter
21	134-1237	2	+Shutter, Air Outlet
21	134-1614	2	*£Shutter, Air Outlet
22	150-1358	1	*£+Joint, Ball
23	134-1247	1	+Rod, Shutter Control
23A	134-1606	1	*£Rod, Shutter Control (Upper)
23B	134-1607	1	*£Rod, Shutter Control (Lower)
24	309-0162	1	+Switch, Hi-Temperature - Spec A Only
25	134-1248	4	+Bearing, Air Shutter
25	134-1248	6	£Bearing, Air Shutter
25	134-1783	4	*Bearing, Shutter
25	134-1248	2	*Bearing, Actuating Arm
26	134-1244	1	+Bracket & Guide, Vernatherm
27	134-0656	1	*£+Spring, Vernatherm Element
28	309-0085	1	*£+Element, Vernatherm
29	134-0658	1	*£+Spring, Shutter Return
29A	134-1817	1	*Spring, Shutter Return - Upper
30	*£+CLIP, ROD END		
	518-0004	1	Right Hand
	518-0006	2	Left Hand - Begin Spec B
31	134-1437	2	£+Spring, Shutter Pivot (External)
31A	134-1605	1	*£Shaft, Actuating Arm
31B	134-1604	1	*£Arm, Actuating
31C	526-0045	1	£Washer, Actuating Shaft
31C	526-0213	1	*Washer, Actuating Shaft
31D	134-1375	1	*£Plate, Exhaust Outlet Cover
31E	154-0738	1	*£Gasket, Exhaust Outlet
32	517-0035	1	Plug, Dot Button (Governor Access) - Begin Spec R

\* - Included in OPTIONAL Air Discharge Shutter used on late model plants (has Internal Shutter Springs).

£ - These parts apply to OPTIONAL Air Discharge Shutter (External Shutter Pivot Springs) used Spec B until the use of shutter assembly with internal shutter springs.

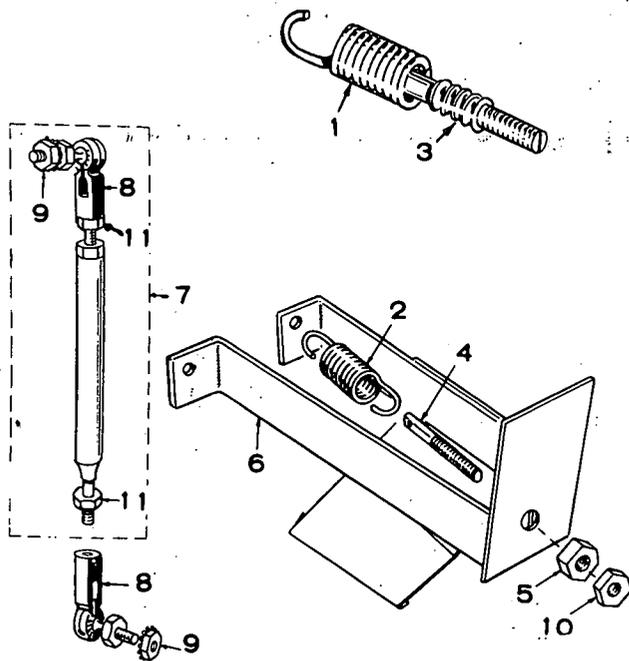
+ - These parts apply to OPTIONAL Air Discharge Shutter (External Shutter Pivot Springs) used Spec A only.

### AUTOMOTIVE STARTER GROUP



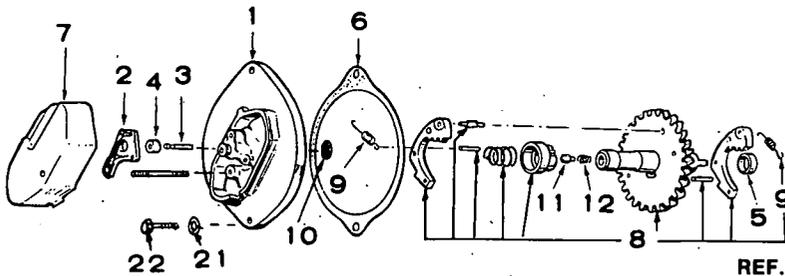
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	MOTOR, STARTER (12 Volt)		
	191-0324	1	12 Volt
	191-0443	1	24-32 Volt
2	191-0512	1	Flange, Starter Mounting
3	191-0311	1	Spacer, Starter Flange
4	191-0365	1	Bracket, Starter
5	338-0265	1	Harness, Starter to Control
6	850-0050	7	Lockwasher, Starter Motor and Flange Mounting (3/8")
7	SCREW, HEX CAP		
	800-0051	2	Starter Motor Mounting (3/8-16 x 1-1/4")
	800-0054	3	Flange Mounting (3/8-16 x 2")
	800-0046	1	Support Bracket to Starter (3/8-16 x 1/2")
	800-0052	2	Support Mounting (3/8-16 x 1-1/2")
8	856-0010	1	Washer, Shakeproof
9	864-0003	1	Nut (3/8-16) - Support Bracket

## GOVERNOR GROUP

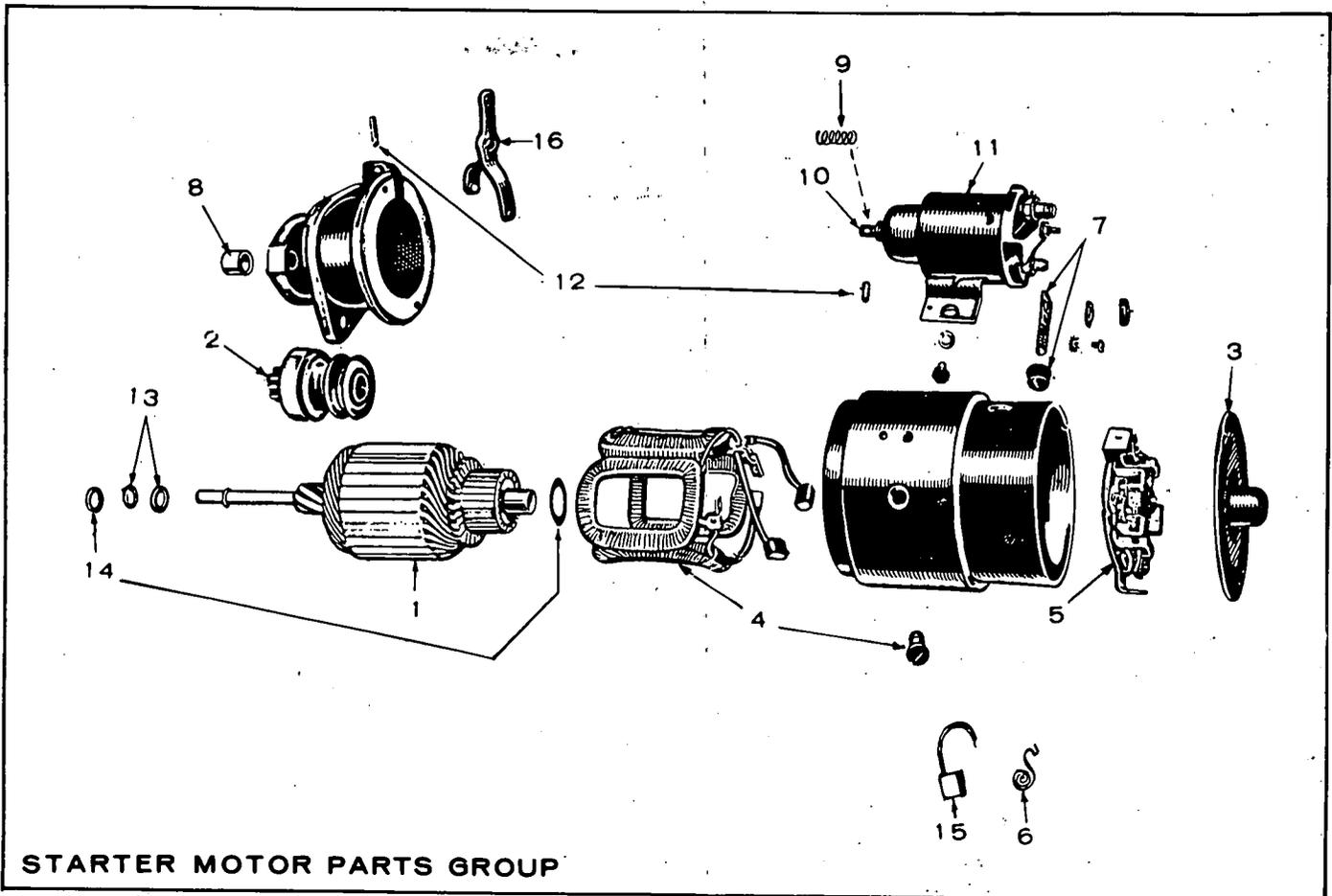


REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	150-0846	1	Spring, Governor - Spec A through Q
2	150-1084	1	Spring, Governor - Begin Spec R
3	150-0822	1	Stud, Adjusting - Spec A through Q
4	150-1083	1	Stud, Adjusting - Begin Spec R
5	NUT, ADJUSTING		
	104-0091	1	Spec A through Q
	862-0011	1	Begin Spec R
6	BRACKET ASSEMBLY		
	150-0814	1	Spec A through Q
	150-1110	1	Begin Spec R
7	LINKAGE ASSEMBLY		
	150-0831	1	Spec A through Q
	150-1132	1	Begin Spec R
8	JOINT, BALL		
	150-0974	2	Spec A through Q
	150-0939	2	Begin Spec R
9	870-0131	1	Nut, Keps, Joint Arm
10	NUT, LOCKING		
	870-0130	1	Spec A through Q (3/8-24")
	870-0133	1	Begin Spec R (3/8-16")
11	871-0010	2	Nut, Hex (10-32)

## START- DISCONNECT PLATE AND STOP SOLENOID GROUP



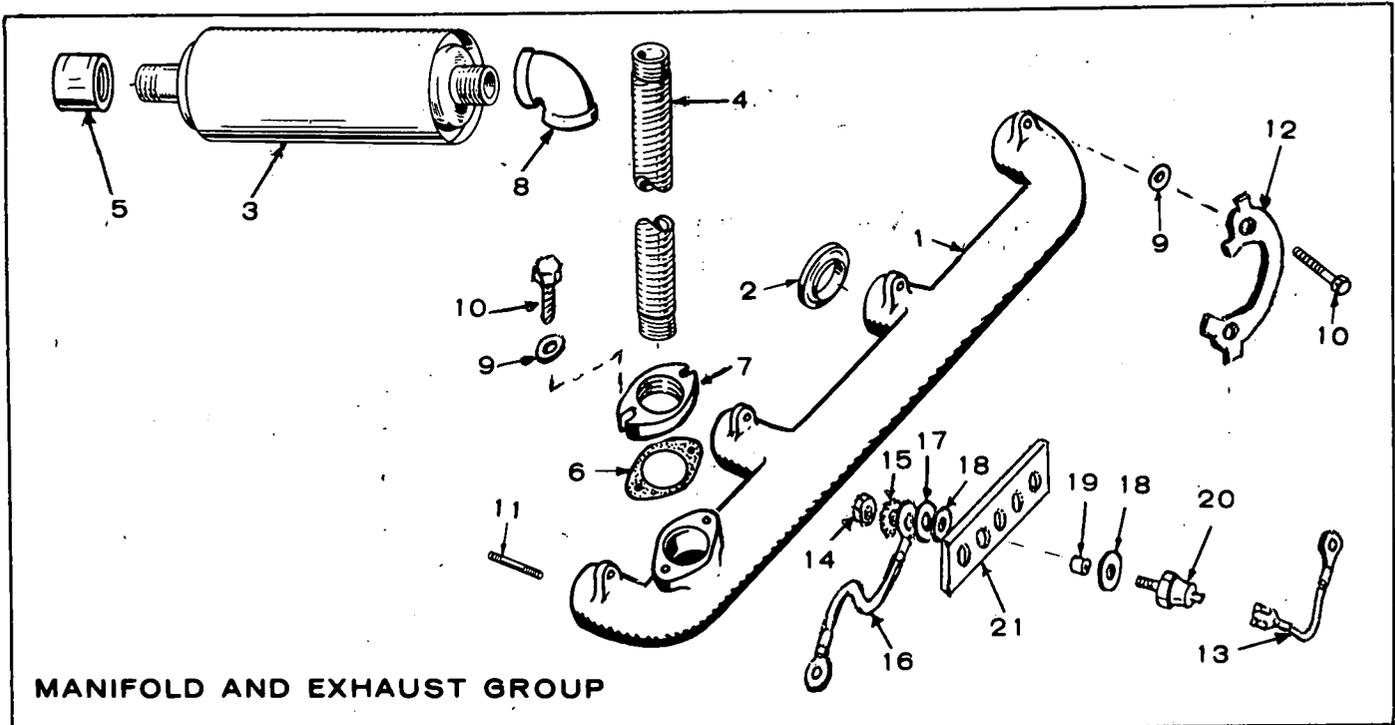
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	191-0496	1	Plate
2	309-0134	1	Switch Assembly
3	309-0152	1	Plunger, Switch
4	160-1143	1	Diaphragm, Switch Plunger
5	160-0720	1	Spacer, Switch Plate
6	160-0721	1	Gasket, Plate
7	191-0392	1	Cover, Switch Plate
8	191-0388	1	Control Assembly, Switch
9	160-0711	2	Spring, Weight (Included in Switch Control Assembly)
10	160-0806	1	Disc, Thrust Plunger
11	160-0774	1	Plunger, Thrust
12	160-0773	1	Spring, Thrust Plunger
13	307-0628	1	Solenoid; Stopping
14	306-0162	1	Retainer, Solenoid Plunger
15	306-0161	1	Spring, Solenoid Plunger
16	306-0159	1	Plunger, Solenoid
17	518-0203	1	Ring, Snap, Spring Retainer
18	336-0706	1	Lead, Solenoid Ground
19	338-0264	1	Harness, Wiring, Switch Plate to Control
20	150-0963	1	Gasket, Solenoid Mounting
21	850-0050	2	Lockwasher, Start Disconnect Plate Mounting (3/8")
22	800-0052	2	Screw, Hex Cap - Start Disconnect Plate Mounting (3/8-16 x 1-1/2")
23	862-0001	1	Nut, Hex (1/4-20)
24	306-0242	1	Screw (1/4-20 x 1") - Plunger Adjustment



**STARTER MOTOR PARTS GROUP**

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
	MOTOR, STARTER		
	191-0324	1	12 Volt
	191-0443	1	24 Volt
1	ARMATURE		
	191-0712	1	12 Volt
	191-0713	1	24 Volt
2	191-0432	1	Clutch
3	191-1023	1	Head Assembly, Commutator End
4	COIL PACKAGE, FIELD		
	191-1024	1	12 Volt
	191-1043	1	24 Volt
5	PLATE ASSEMBLY, BRUSH		
	191-1025	1	12 Volt
	191-1042	1	24 Volt
6	191-1020	1	Spring Set, Brush (Set of 4)

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
7	191-1026	1	Connector Package
8	191-0497	1	Bearing (Bronze), Drive End
9	191-1027	1	Spring, Plunger
10	191-1028	1	Core Assembly, Moving
11	SWITCH, SOLENOID		
	191-0433	1	12 Volt
	191-0715	1	24 Volt
12	191-1029	1	Yoke Parts Package
13	191-1030	1	Stop and Lock Ring Package, Pinion
14	191-1031	1	Thrust Washer Package, Armature (Use as Required)
15	BRUSH SET, SERVICE		
	191-0434	1	12 Volt
	191-0714	1	24 Volt
16	191-1032	1	Yoke



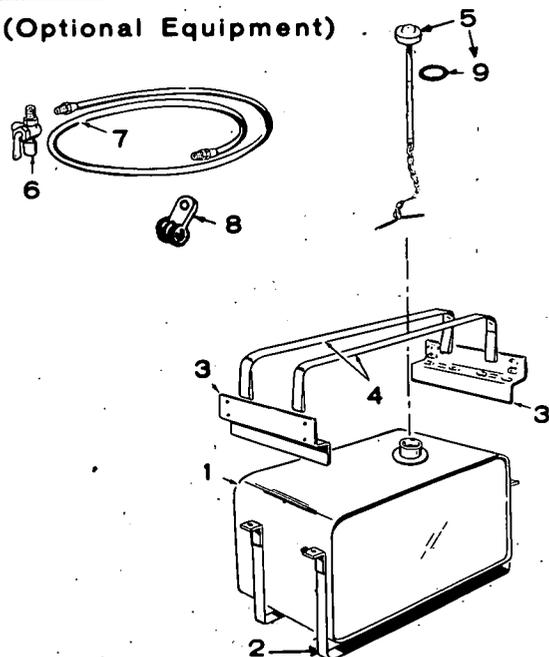
**MANIFOLD AND EXHAUST GROUP**

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	154-0714	1	Manifold, Exhaust
2	154-0463	4	Gasket, Exhaust Manifold
3	154-0456	1	Muffer
4	155-0493	1	Tube, Flexible, Exhaust (36")
5	505-0032	1	Coupling, Pipe
6	154-0738	1	Gasket, Exhaust Outlet
7	155-0782	1	Flange, Exhaust Outlet
8	505-0043	1	Elbow, Pipe
9	WASHER, FLAT		
	526-0045	8	Manifold Mounting
	526-0174	2	Flange Mounting
10	SCREW, HEX HEAD, CAP		
	114-0022	8	Manifold Mounting - Begin Spec P (5/16-18 x 1-3/4")
	800-0052	2	Flange Mounting (3/8-16 x 1-1/2")
11	520-0608	8	Stud, Manifold Mounting (5/16 x 2-1/4") - Spec A through N

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
12	154-1665	4	Lock Tab (Begin Spec AA)
13	336-1588	1	Lead, Electrical - High Temperature Switch
14	862-0001	1	Nut, Hex (1/4-20)
15	856-0006	1	Washer, Lock, External Tooth (1/4)
16	336-1892	1	Lead, Electrical - High Temperature Switch
17	526-0021	1	Washer, Flat (17/64 I.D. x 3/4 O.D.)
18	508-0126	2	Insulator, Washer
19	508-0127	1	Insulator, Sleeve
20	309-0196	1	Switch, Thermostat - High Temperature
21	309-0195	1	Bracket, Switch

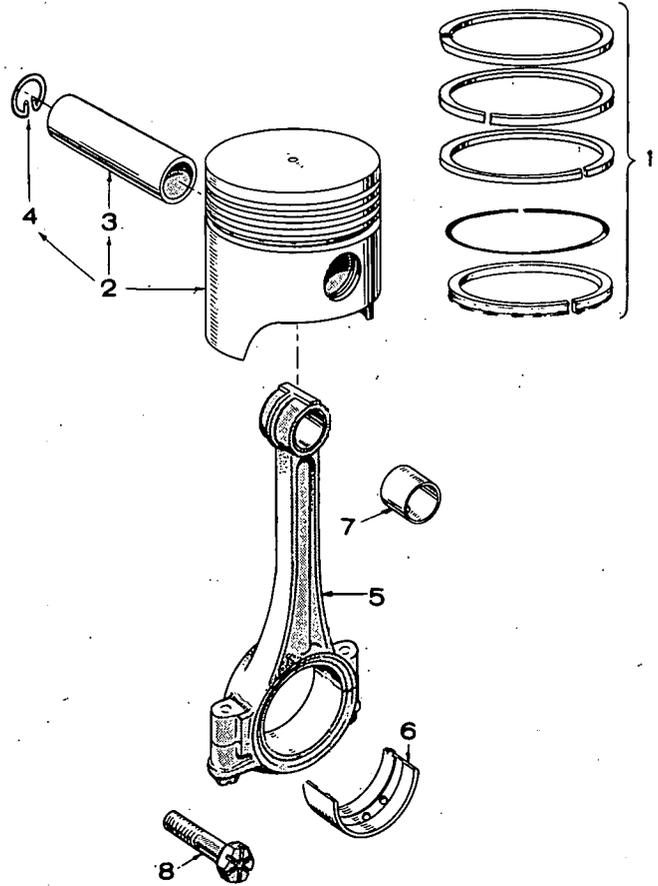
**MOUNTED FUEL TANK- HOUSED MODELS (Optional Equipment)**

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	159-0788	1	Tank, 15 Gallon
2	159-0786	2	Strap, Mounting
3	159-0789	2	Bracket, Support
4	159-0787	2	Strap, Hold-down
5	159-0512	1	Cap and Indicator
6	504-0004	1	Valve, Shut-Off
7	LINE, FLEXIBLE		
	501-0005	1	18-1/2"
	501-0010	1	42"
8	332-0050	2	Clip, Fuel Line
9	159-0751	1	Gasket, Fuel Tank Cap

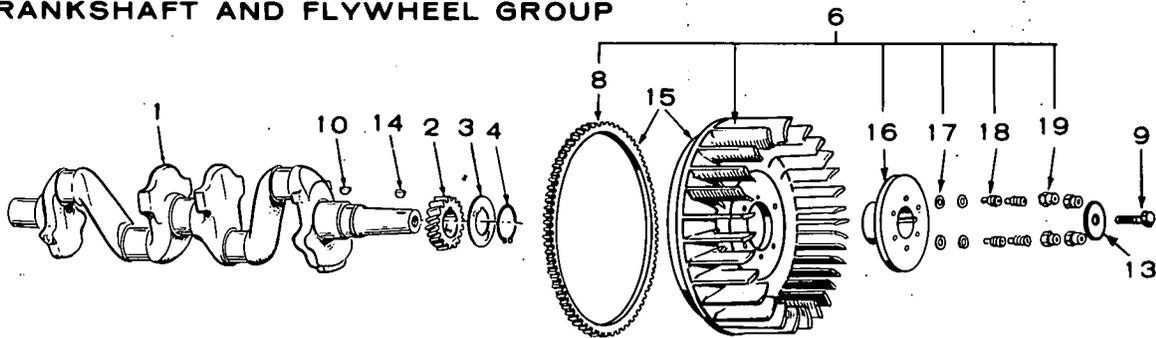


## PISTON AND CONNECTING ROD GROUP

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	RING SET, PISTON		
	113-0130	4	Standard
	113-0130-05	4	.005" Oversize
	113-0130-10	4	.010" Oversize
	113-0130-20	4	.020" Oversize
	113-0130-30	4	.030" Oversize
	113-0130-40	4	.040" Oversize
2	PISTON & PIN, INCLUDES PIN RETAINING RINGS		
			Spec A through N
	112-0103	4	Standard
	112-0103-05	4	.005" Oversize
	112-0103-10	4	.010" Oversize
	112-0103-20	4	.020" Oversize
	112-0103-30	4	.030" Oversize
	112-0103-40	4	.040" Oversize
			Begin Spec P
	112-0109	4	Standard
	112-0109-05	4	.005" Oversize
	112-0109-10	4	.010" Oversize
	112-0109-20	4	.020" Oversize
	112-0109-30	4	.030" Oversize
	112-0109-40	4	.040" Oversize
3	112-0093	4	Pin, Piston
4	112-0085	8	Ring, Retaining, Pin
5	114-0168	4	Rod Assembly, Connecting (Forged)
6	BEARING HALF, CONNECTING ROD		
	114-0164	8	Standard
	114-0164-02	8	.002" Undersize
	114-0164-10	8	.010" Undersize
	114-0164-20	8	.020" Undersize
	114-0164-30	8	.030" Undersize
7	114-0170	8	Bushing, Piston Pin, Connecting Rod, Semi-Finished
8	805-0012	8	Bolt (5/16-24 x 1-13/16")



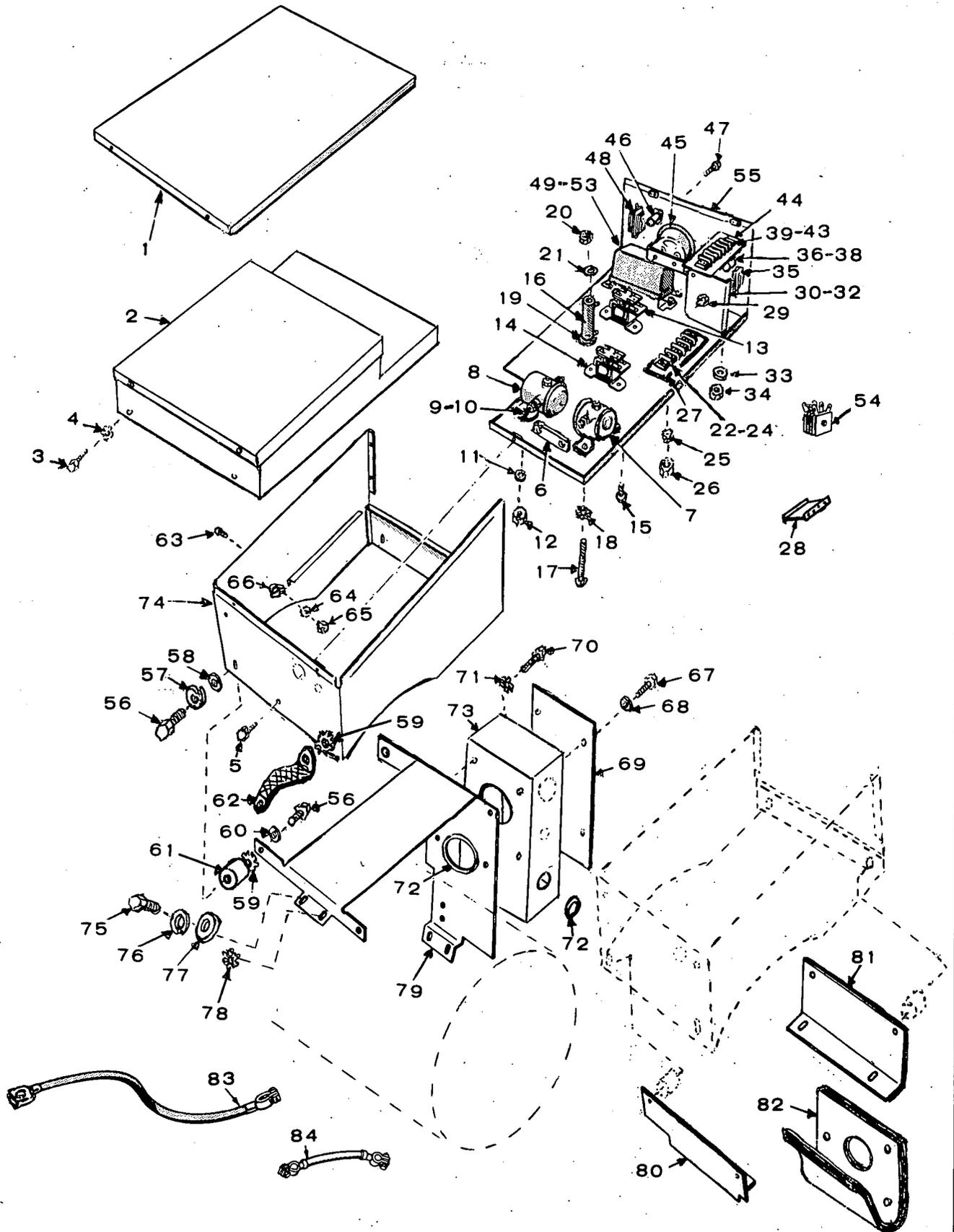
## CRANKSHAFT AND FLYWHEEL GROUP



REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	104-0464	1	Crankshaft
2	104-0418	1	Gear, Crankshaft
3	104-0416	1	Washer, Gear Retainer
4	518-0188	1	Ring, Lock
6	134-1405	1	Flywheel, Includes Ring Gear & Hub Assembly
8	104-0423	1	Gear, Ring
9	800-0500	1	Screw (7/16-14 x 5-1/2") Flywheel Mounting
10	515-0001	1	Key, Crankshaft Gear

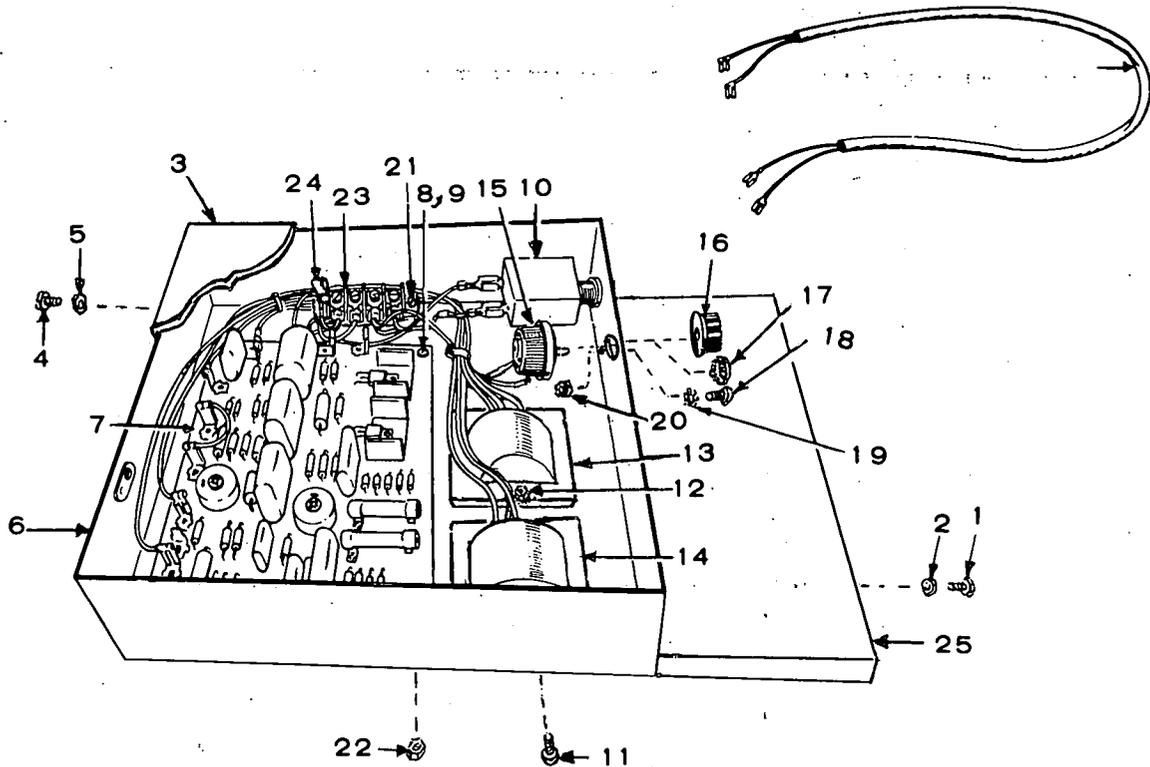
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
13	526-0185	1	Washer, Flywheel Mounting
14	515-0153	1	Key, Flywheel to Crankshaft
15	134-1404	1	Flywheel (Includes Ring Gear, Less Hub)
16	134-1401	1	Hub, Flywheel
17	526-0187	4	Washer (Special) Hub to Flywheel
18	104-0543	4	Spacer & Washer Assembly, Hub to Flywheel
19	115-0150	4	Nut (3/8-24) Hub to Flywheel

# CONTROL GROUP



REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION	REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	301-1963	1	Cover, Control Box - Spec A through Z	41	853-0003	2	Lockwasher, External Tooth (No. 6)
2	VOLTAGE REGULATOR ASSEMBLY - BEGIN SPEC AA (See Separate Group for Components)			42	850-0020	2	Lockwasher (No. 6)
	305-0532	1	Not Adjustable	43	860-0005	2	Nut, Hex (6-32)
	305-0533	1	Adjustable	44	332-0616	1	Marker Strip (B+, 1, 2, 3, H)
3	815-0178	4	Screw, Hex Head (10-32 x 5/8")	45	302-0446	1	Ammeter
4	853-0008	4	Lockwasher, External Tooth (No. 10)	46	SWITCH 308-0091	1	Reset - Used with Low Oil Pressure Switch - Spec A through E
5	815-0178	5	Screw, Hex Head (10-32 x 5/8")		320-0104	1	Emergency - Used with Low Oil Pressure Switch - Begin Spec F
6	332-0602	1	Jumper, Solenoid to Solenoid	47	812-0079	2	Screw, Round Head (8-32 x 1/2")
7	RELAY, SOLENOID - MANIFOLD HEATER			48	308-0037	1	Switch, Toggle - Manifold Heater
	307-1046	1	12 and 24 Volt DC	49	307-0597	1	Relay - Ignition Start - Spec A through Z
	307-0061	1	32 Volt DC	50	812-0079	2	Screw, Round Head (8-32 x 1/2")
8	RELAY, SOLENOID - ENGINE START			51	853-0008	2	Lockwasher, External Tooth (No. 8)
	307-1046	1	12 and 24 Volt DC - Spec A through Z	52	850-0025	2	Lockwasher (No. 8)
	307-0845	1	12 and 24 Volt DC - Begin Spec AA	53	860-0008	2	Nut, Hex (8-32)
	307-0061	1	32 Volt DC - Spec A through Z	54	305-0197	1	Rectifier, Full Wave - Used with Low Oil Pressure Switch - Spec A through E
	307-0875	1	32 Volt DC - Begin Spec AA	55	PANEL, CONTROL		
9	815-0180	4	Screw, Round Head (10-32 x 3/4")		301-1961	1	Standard
10	853-0008	4	Lockwasher, External Tooth (No. 10)		301-2376	1	Special - With Low Oil Pressure and Overspeed Indicator Lamps
11	850-0030	4	Lockwasher (No. 10)	56	800-0024	8	Screw, Hex Head (5/16-18 x 1/2")
12	870-0053	4	Nut, Hex (10-32)	57	850-0045	8	Lockwasher (5/16)
13	307-0623	1	Relay - Start Disconnect	58	526-0115	4	Washer, Flat (5/16)
14	307-0614	1	Relay - Used with Low Oil Pressure Switch - Spec A through E	59	856-0008	6	Lockwasher, External Tooth (5/16)
15	812-0079	4	Screw, Round Head (8-32 x 1/2)	60	854-0017	4	Lockwasher, Internal Tooth (5/16)
16	RESISTOR, FIXED, WIRE WOUND			61	402-0078	4	Mount, Rubber
	304-0032	1	15-Ohm, 10 Watt	62	STRAP, GROUND		
	304-0217	1	1-Ohm, 10 Watt, Used with Low Oil Pressure Switch - Begin Spec F		337-0052	1	Spec A through Z
17	812-0090	2	Screw, Round Head (8-32 x 2-1/4")		337-0036	1	Begin Spec AA
18	853-0008	1	Lockwasher, External Tooth (No. 8)	63	812-0079	1	Screw, Round Head (8-32 x 1/2")
19	508-0035	8	Washer, Insulating, Mica	64	856-0002	2	Lockwasher, External Tooth (No. 8)
20	526-0048	2	Washer, Flat, Brass (No. 8)	65	860-0008	2	Nut, Hex (8-32)
21	860-0008	2	Nut, Hex (8-32)	66	416-0096	1	Clamp, Loop
22	332-0706	1	Terminal Block (6 Place)	67	815-0027	4	Screw, Truss Head (10-32 x 1/2")
	812-0066	2	Screw, Round Head (6-32 x 3/4")	68	854-0017	4	Lockwasher, Internal Tooth (5/16)
24	853-0003	2	Lockwasher, External Tooth (No. 6)	69	301-0856	1	Cover, Output Box
25	850-0020	2	Lockwasher (No. 6)	70	815-0236	3	Screw, Hex Head, Thread Cutting (5/16 x 5/8")
26	860-0005	2	Nut, Hex (6-32)	71	854-0017	3	Lockwasher, External Tooth (5/16)
27	332-0739	1	Marker Strip (4, 5, 6, 7, 8, 9)	72	GROMMET, RUBBER		
28	332-0750	1	Marker Strip and Holder - Early Models Only		508-0183	1	1-3/4" Diameter
29	RECTIFIER, CURRENT				508-0011	2	3/4" Diameter
	305-0235	1	10 Amp, 100 Volt (For 12 and 24 Volt DC)	73	BOX, OUTPUT		
	358-0015	1	12 Amp, 100 Volt (For 32 Volt DC)		301-1978	1	Spec A through Z
30	305-0254	1	Heat Sink, Rectifier		301-3682	1	Begin Spec AA
31	813-0103	2	Screw, Round Head (10-32 x 3/4")	74	301-1962	1	Box, Control
32	853-0008	2	Lockwasher, External Tooth (No. 10)	75	815-0236	4	Screw, Hex Head, Thread Cutting (5/16 x 5/8)
33	850-0030	2	Lockwasher (No. 10)	76	850-0045	3	Lockwasher (5/16)
34	870-0053	2	Nut, Hex (10-32)	77	526-0115	3	Washer, Flat (5/16)
35	308-0154	1	Switch, Toggle - Start/Stop	78	856-0008	1	Lockwasher, External Tooth (5/16)
36	322-0004	2	Lamp, Incandescent - Optional (Low Oil Pressure & Overspeed)	79	301-3683	1	Bracket, Control Box Mounting - Begin Spec AA
37	322-0069	2	Lamp Holder - Optional	80	301-1980	1	Bracket, Control Box Mounting - Spec A through Z
38	307-1129	2	Relay - Optional (Low Oil Pressure and Overspeed)	81	301-2208	1	Bracket, Control Box Mounting - Spec A through Z
39	332-0604	1	Terminal Block (5 Place)	82	301-3720	1	Bracket, Output Box - Spec A through Z
40	812-0063	2	Screw, Round Head (6-32 x 1/2)	83	CABLE, BATTERY		
					416-0077	2	Used with Unhoused Sets (25")
					416-0037	2	Used with Housed Sets (48")
					416-0133	1	Cable, Jumper, Battery

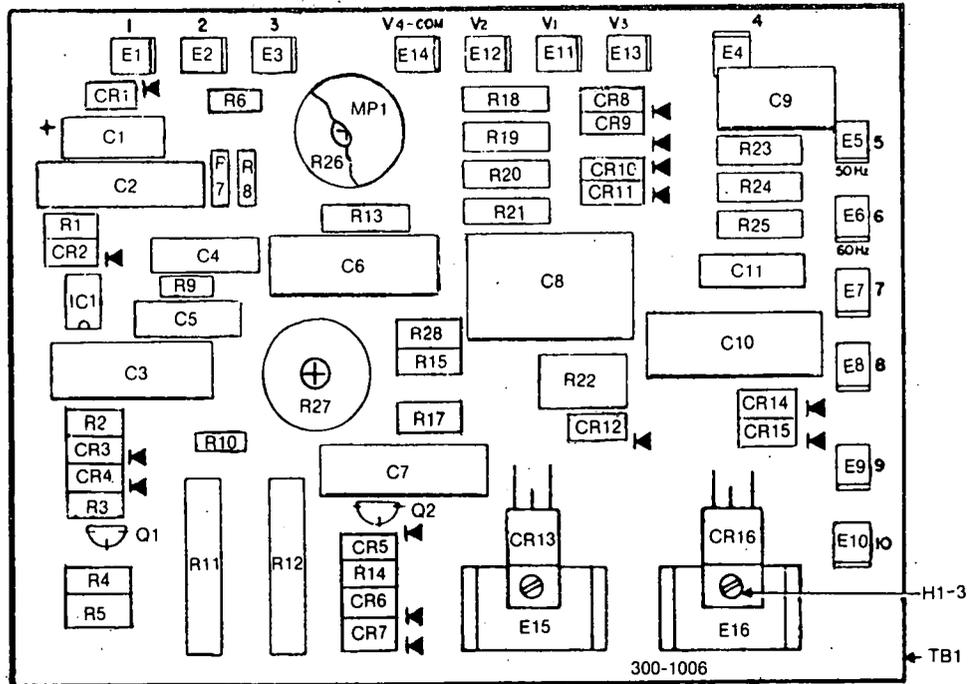
# VOLTAGE REGULATOR GROUP - BEGIN SPEC AA



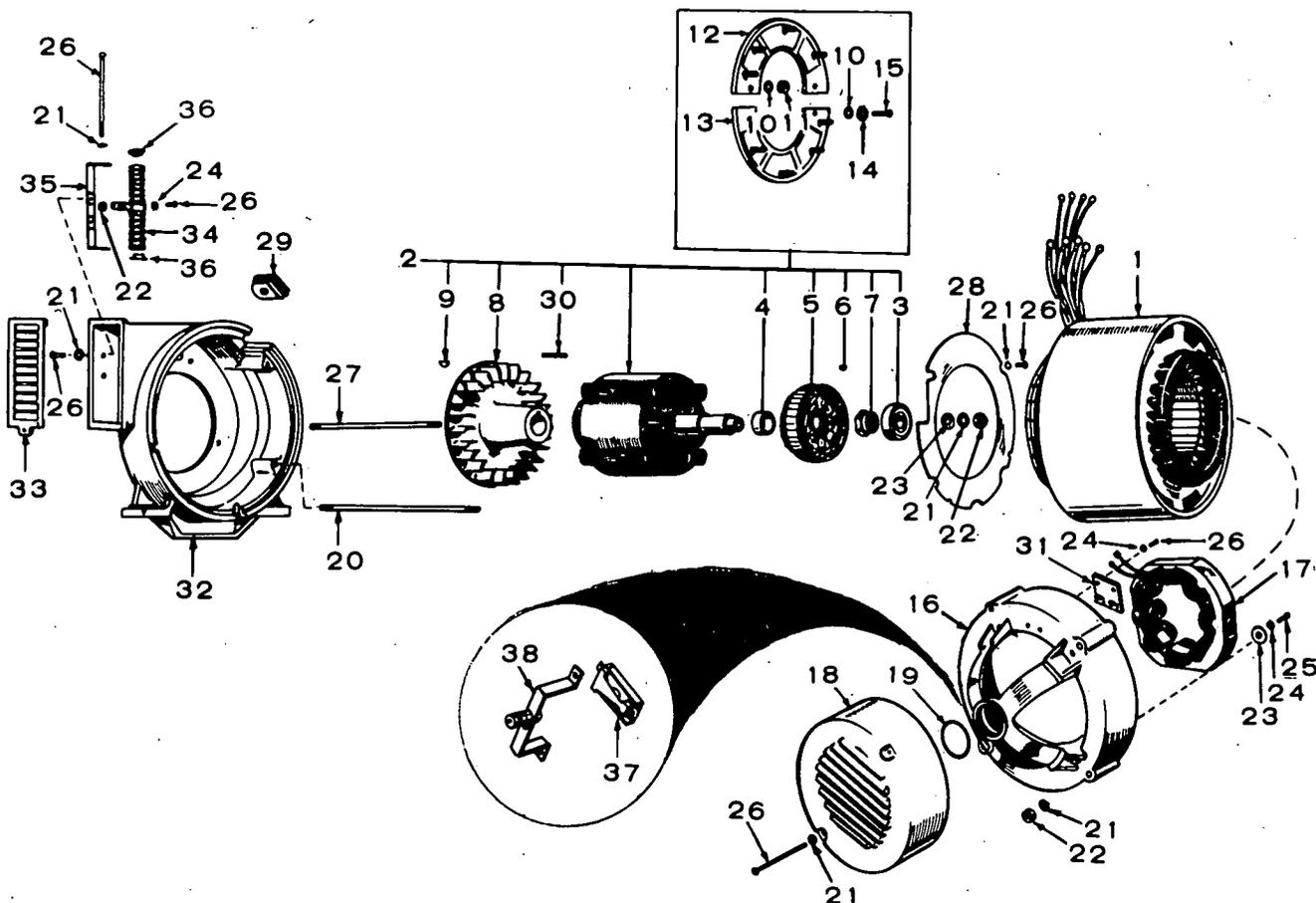
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION	REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	815-0263	4	Screw, Slotted Hex Head (10-32 x 3/8")	14	315-0386	1	*†Transformer, Voltage (T21)
2	850-0030	4	Lockwasher (#10)	15	303-0103	1	†Rheostat (R21)
3	301-3714	1	Cover, Voltage Regulator	16	303-0194	1	†Knob
4	815-0263	4	Screw, Slotted Hex Head (10-32 x 3/8")	17	517-0045	1	*Plug, Dot Button
5	850-0030	4	Lockwasher (#10)	18	812-0027	1	*Screw, Round Head (4-40 x 1/4")
6	VOLTAGE REGULATOR ASSEMBLY			19	853-0001	1	*Lockwasher, Ext. Tooth (#4)
	305-0532	1	Without Voltage Adjustment (Includes Parts Marked *)	20	860-0003	1	*Nut, Hex (4-40)
	305-0533	1	With Voltage Adjustment (Includes Parts Marked †)	21	812-0063	2	*†Screw, Round Head, Slotted (6-32 x 1/2")
7	300-1006	1	*†Printed Circuit Board Assy. (VR21) (See Separate Group For Components)	22	870-0183	2	*†Nut, Hex (6-32)
8	815-0190	4	*†Screw, Round Head (8-32 x 3/8")	23	332-1647	1	*†Terminal Strip (TB21)
9	853-0005	4	*†Lockwasher (#8)	24	332-1646	2	*†Clip, Retaining
10	320-0505	1	*†Circuit Breaker (CB21)	25	301-3713	1	*†Panel, Mounting
11	812-0068	4	*†Screw, Round Head (6-32 x 1")	26	WIRING HARNESS - VOLTAGE REGULATOR TO EXCITER STATOR		
12	870-0183	4	*†Nut, Hex (#6-32)		338-0744	1	Used on Unhoused Sets
13	315-0391	1	*†Reactor (CMR21)		338-0755	1	Used on Housed Sets

\* - Parts Included in Non-Adjustable Voltage Regulator Assembly.  
 † - Parts Included in Adjustable Voltage Regulator Assembly.

# PRINTED CIRCUIT BOARD ASSEMBLY GROUP - BEGIN SPEC AA



REF. DES.	PART NO.	QTY. USED	PART DESCRIPTION	REF. DES.	PART NO.	QTY. USED	PART DESCRIPTION
	300-1006		Printed Circuit Board Assembly				
C1	356-0039	1	Capacitor, Electrolytic (100 Mfd, 10 Volt)	R7	350-0455	1	Resistor (270,000-Ohm, 1/2 Watt, 5%)
C2	355-0006	1	Capacitor, Plastic (.47 Mfd, 200 Volt)	R8	350-0435	1	Resistor (100,000-Ohm, 1/2 Watt, 5%)
C3	355-0005	1	Capacitor, Plastic (.22 Mfd, 200 Volt)	R9	350-0459	1	Resistor (1 Megohm, 1/2 Watt, 5%)
C4	355-0015	1	Capacitor, Plastic (.1 Mfd, 200 Volt)	R10	350-0435	1	Resistor (100,000-Ohm, 1/2 Watt, 5%)
C5	355-0015	1	Capacitor, Plastic (.1 Mfd, 200 Volt)	R11	353-0048	1	Resistor (4,000-Ohm, 5 Watt, 5%)
C6	355-0006	1	Capacitor, Plastic (.47 Mfd, 200 Volt)	R12	353-0048	1	Resistor (4,000-Ohm, 5 Watt, 5%)
C7	355-0005	1	Capacitor, Plastic (.22 Mfd, 200 Volt)	R13	351-0293	1	Resistor (11,000-Ohm, 1/4 Watt, 1%)
C8	355-0016	1	Capacitor, Plastic (1 Mfd, 100 Volt)	R14	350-0363	1	Resistor (100-Ohm, 1/2 Watt, 5%)
C9	355-0031	1	Capacitor, Ceramic (.39 Mfd, 100 Volt)	R15	350-0351	1	Resistor (33-Ohm, 1/2 Watt, 5%)
C10	355-0017	1	Capacitor, Plastic (.47 Mfd, 400 Volt)	R16	Deleted		
C11	355-0015	1	Capacitor, Plastic (.1 Mfd, 200 Volt)	R17	350-0351	1	Resistor (33-Ohm, 1/2 Watt, 5%)
CR1	359-0036	1	Diode	R18	351-0332	1	Resistor (28,000-Ohm, 1/4 Watt, 1%)
CR2	359-0025	1	Diode	R19	351-0240	1	Resistor (3,090-Ohm, 1/4 Watt, 1%)
CR3	357-0004	1	Rectifier	R20	351-0211	1	Resistor (1,530-Ohm, 1/4 Watt, 1%)
CR4	357-0004	1	Rectifier	R21	351-0234	1	Resistor (2,670-Ohm, 1/4 Watt, 1%)
CR5	359-0026	1	Diode	R22	350-0973	1	Resistor (270-Ohm, 2 Watt, 5%)
CR6-11	357-0004	6	Rectifier	R23	350-0512	1	Resistor (10-Ohm, 1/2 Watt, 5%)
CR12	357-0021	1	Rectifier	R24	351-0353	1	Resistor (46,400-Ohm, 1/4 Watt, 1%)
CR13	365-0002	1	Rectifier	R25	351-0349	1	Resistor (42,200-Ohm, 1/4 Watt, 1%)
CR14	357-0021	1	Rectifier	R26	303-0168	1	Potentiometer (5,000-Ohm, 2 Watt, 20%)
CR15	357-0021	1	Rectifier	R27	303-0164	1	Potentiometer (8,000-Ohm, 2 Watt, 20%)
CR16	365-0002	1	Rectifier	R28	350-0355	1	Resistor (47-Ohm, 1/2 Watt, 5%)
CR17	Deleted			TB1	332-1566	1	Printed Wiring Board
E1-14	332-1511	14	Terminal, Lug				
E15-16	363-0069	2	Heatsink, Diode				
H1	812-0029	2	Screw, Round Head (4-40 x 3/8")				
H2	526-0257	2	Washer, Flat (#4)				
H3	860-0003	2	Nut, Hex (4-40)				
IC1	367-0005	1	Integrated Circuit				
MP1	517-0127	1	Cover, Potentiometer				
Q1	362-0017	1	Transistor				
Q2	361-0003	1	Transistor				
R1	350-0423	1	Resistor (33,000-Ohm, 1/2 Watt, 5%)				
R2	350-0443	1	Resistor (220,000-Ohm, 1/2 Watt, 5%)				
R3	350-0447	1	Resistor (330,000-Ohm, 1/2 Watt, 5%)				
R4	350-0398	1	Resistor (3,000-Ohm, 1/2 Watt, 5%)				
R5	350-0466	1	Resistor (2 Megohm, 1/2 Watt, 5%)				
R6	351-0202	1	Resistor (1,240-Ohm, 1/4 Watt, 1%)				



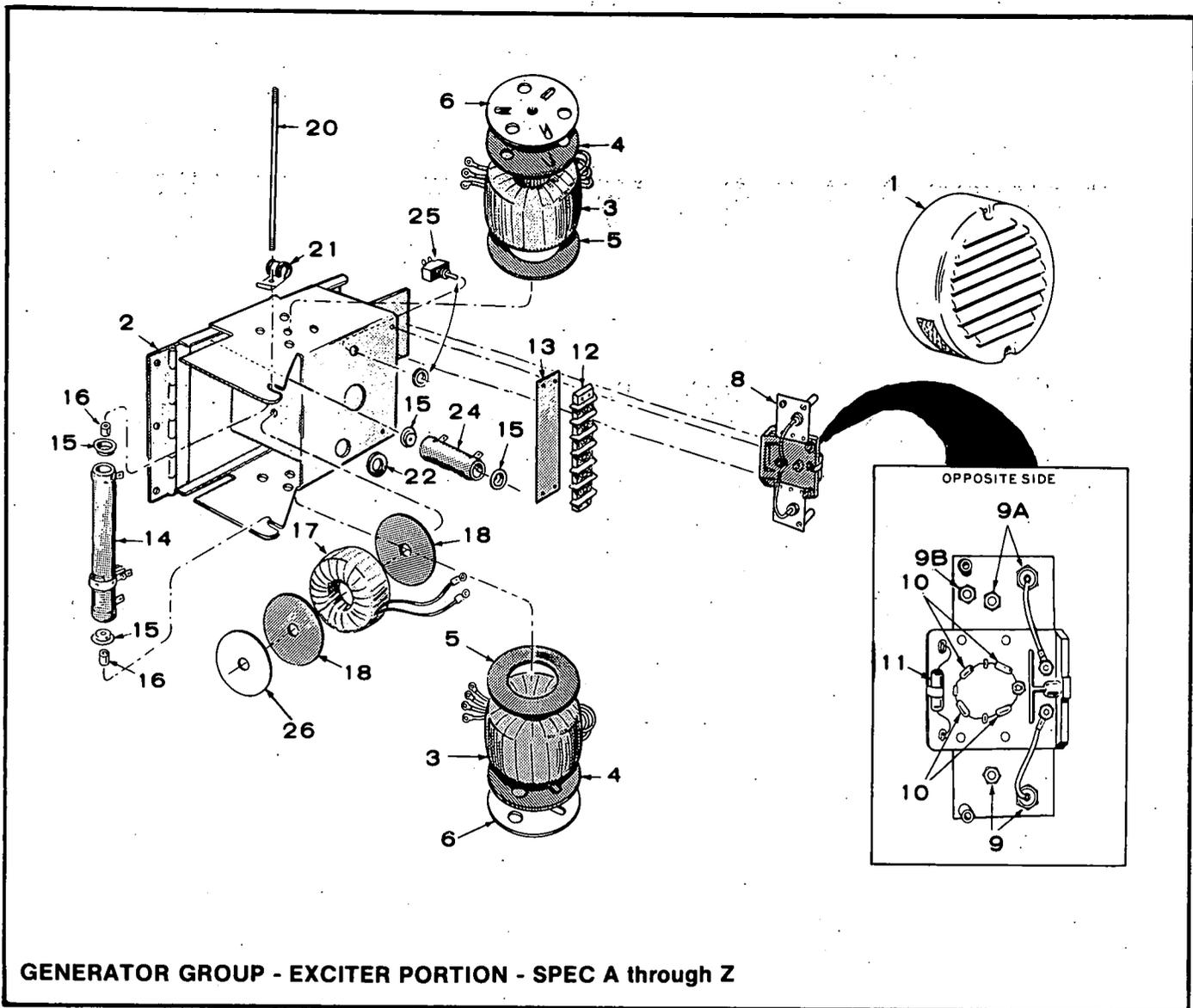
**GENERATOR PARTS GROUP- BEGIN SPEC. AA**

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION	REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	STATOR, WOUND			15	813-0100	4	+Screw, Round Head (#10-32 x 1/2")
	220-2025	1	1 Phase, 50 Hertz (AC) - 12 Volt (DC)	16	211-0237	1	Bell, End
	220-2207	1	1 Phase, 50 Hertz (AC) - 24 Volt (DC)	17	220-2009	1	Stator, Wound - Exciter
	220-2232	1	1 Phase, 50 Hertz (AC) - 32 Volt (DC)	18	COVER, END BELL		
	220-2017	1	1 Phase, 60 Hertz (AC) - 12 Volt (DC)		234-0185	1	Unhoused Sets
	220-2199	1	1 Phase, 60 Hertz (AC) - 24 Volt (DC)		234-0223	1	Housed Sets
	220-2224	1	1 Phase, 60 Hertz (AC) - 32 Volt (DC)		234-0498	1	Housed and Unhoused Sets with Overspeed Switch
	220-2050	1	3 Phase, 50 Hertz (AC) - 12 Volt (DC)	19	509-0094	1	Seal, Bearing ("O" Ring)
	220-2157	1	3 Phase, 50 Hertz (AC) - 24 Volt (DC)	20	520-0797	4	Stud, Generator Through
	220-2182	1	3 Phase, 50 Hertz (AC) - 32 Volt (DC)	21	WASHER, LOCK		
	220-2042	1	3 Phase, 60 Hertz (AC) - 12 Volt (DC)		850-0050	4	Generator Through Stud (3/8")
	220-2149	1	3 Phase, 60 Hertz (AC) - 24 Volt (DC)		850-0040	2	End Bell Cover Mounting (1/4")
	220-2174	1	3 Phase, 60 Hertz (AC) - 32 Volt (DC)		850-0040	2	Resistor Bracket Mounting (1/4")
2	201-2157	1	Rotor Assembly, Wound - Includes parts marked +		850-0055	1	Rotor Through Stud (7/16")
3	510-0112	1	+Bearing, Rotor		850-0040	1	Resistor Through Screw (1/4")
4	232-2398	1	+Spacer, Bearing		850-0030	4	Air Baffle Mounting (#10)
5	201-2151	1	+Rotor, Wound - Exciter	22	NUT, HEX		
6	515-0094	1	+Key, Exciter Rotor		862-0011	4	Generator Through Stud (3/8-16)
7	870-0284	1	+Nut, Exciter Rotor Locking		870-0203	1	Rotor Through Stud (7/16-20)
8	205-0105	1	+Fan, Generator		871-0010	1	Resistor Tap (#10-32)
9	515-0103	1	+Key, Fan	23	WASHER, FLAT		
10	526-0008	12	+Washer, Flat		526-0260	2	Exciter Stator Mounting
11	870-0131	8	+Nut, Hex (#10-32)		526-0034	1	Rotor Through Stud
12	358-0069	1	+Rectifier Assembly (Positive)	24	WASHER, SHAKEPROOF		
13	358-0070	1	+Rectifier Assembly (Negative)		853-0013	2	Exciter Stator Mounting (1/4")
14	853-0008	4	+Washer, Shakeproof (#10)		853-0008	2	End Bell Cover Mounting (#10)
					856-0003	1	Resistor Tap (#10)

<u>REF. NO.</u>	<u>PART NO.</u>	<u>QTY. USED</u>	<u>PART DESCRIPTION</u>
25	800-0004	2	Screw, Hex Cap - Exciter Stator Mounting (1/4-20 x 5/8")
26	SCREW		
	812-0165	2	End Bell Cover Mounting (1/4-20 x 4-1/2")
	813-0100	2	End Bell Cover Mounting (#10-32 x 3/8")
	813-0098	4	Air Baffle Mounting (#10-32 x 3/8)
	812-0150	2	Resistor Bracket Mounting (1/4-20 x 5/8)
	812-0169	1	Resistor Through (1/4-20 x 5-1/2")
	811-0098	1	Resistor Tap (#10-32 x 3/8")
27	520-0789	1	Stud, Rotor Through
28	234-0462	1	Baffle, Air
29	GROMMET, RUBBER		
	508-0112	1	2-3/4 x 1-7/8" (Lead Outlet)
	508-0095	1	25/32 x 21/32"

<u>REF. NO.</u>	<u>PART NO.</u>	<u>QTY. USED</u>	<u>PART DESCRIPTION</u>
30	515-0006	1	Key, Fan
31	232-2418	1	Board, Connection
32	231-0161	1	Adapter, Generator
33	234-0491	1	Cover, Air Outlet
34	RESISTOR, TAPPED (Adjustable)		
	304-0500	1	12 and 24 Volt DC
	304-0534	1	32 Volt DC
35	232-2399	1	Bracket, Resistor Mounting
36	304-0006	2	Washer, Centering - Resistor Mounting
37	150-0956	1	Switch Assembly, Overspeed - Optional
38	150-1446	1	Bracket and Point Assembly, Overspeed - Optional

+ - Included in the Rotor Assembly.



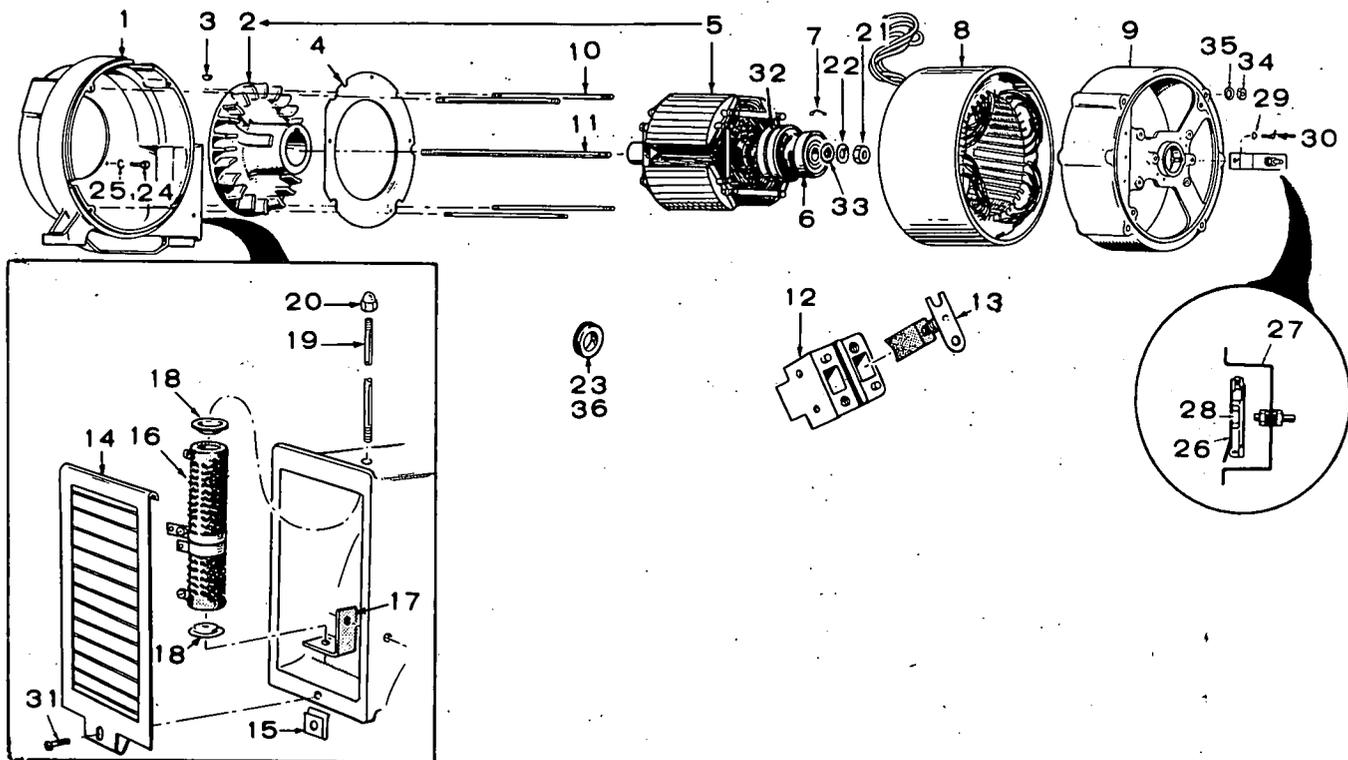
**GENERATOR GROUP - EXCITER PORTION - SPEC A through Z**

**NOTE:** 06SX1N1B used on all 60 hertz sets Spec A through N.  
 06SX1N1B used on 60 hertz 120/240 volt, 277/480 volt, and 600 volt 3 phase sets Spec P through Z.  
 06SX1N3B used on all 60 hertz sets except 120/240 volt, 277/480 volt, and 600 volt 3 phase sets Spec P through Z.  
 06SX51N1B used on all 50 hertz sets Spec A through N.  
 06SX51N1B used on 50 hertz sets 120/240 volt, 277/480 volt, and 600 volt 3 phase sets Spec P through Z.  
 06SX51N3B used on all 50 hertz sets except 120/240 volt, 277/480 volt, and 600 volt 3 phase sets Spec P through Z.  
 Check set nameplate for Magne-citer number and use correct column.

REF. NO.	QTY. USED	PART DESCRIPTION	PART NUMBER			
			06SX1N1B	06SX1N3B	06SX51N1B	06SX51N3B
	1	Exciter Complete (Less Cover)	209-0008	209-0010	209-0012	209-0013
1	1	Cover, Exciter	234-0185	234-0185	*234-0185	234-0185
2	1	Panel Only, Exciter	234-0188	234-0188	234-0188	234-0188
3	2	Reactor, Gate	315-0102	315-0102	315-0104	315-0104
4	2	Gasket, Gate Reactor Mounting, Outer	232-1553	232-1553	232-1553	232-1553
5	2	Gasket, Gate Reactor Mounting, Inner	232-1551	232-1551	232-1551	232-1551
6	2	Retainer, Gate Reactor	232-1552	232-1552	232-1552	232-1552
7	1	Stud, Gate Reactor Mounting				
8	1	Rectifier Assembly, Resistor & Complete	305-0264	305-0388	305-0264	305-0388
9	2	Rectifier Only, Power Field, Negative	305-0238	•305-0238	305-0238	•305-0238
9A	2	Rectifier Only, Power Field, Positive	305-0239	305-0239	305-0239	305-0239
9B	1	Rectifier, Field Flash		305-0239		305-0239
10	4	Rectifier, Voltage Control	305-0240	305-0240	305-0240	305-0240
11	1	Resistor, Included in Rectifier Assembly (150-Ohm, 50-Watt)	304-0512	304-0512	304-0512	304-0512
11	1	Resistor, Included in Rectifier Assembly (500-Ohm, 5-Watt)				
12	1	Block, Terminal	332-0745	332-0745	332-0745	332-0745
13	1	Strip, Block Marker	332-0746	332-0925	332-0746	332-0925
14	1	Resistor, Fixed (200-Ohm, 50-Watt)				
14	1	Resistor, Tapped, 500-Ohm (425-Fixed, 75-Adj.)				
14	1	Resistor, Tapped, 500-Ohm (425-Fixed, 75-Adj.)	304-0527	304-0527	304-0527	304-0527
15	4	Washer, Resistor Centering (Two Only Used for 02SX1N1A)	304-0015	304-0015	304-0015	304-0015
16	2	Spacer, Resistor Mounting	232-1474	232-1474	232-1474	232-1474
17	1	Reactor, Voltage Control	315-0100	315-0100	315-0105	315-0105
18	2	Gasket, Voltage Control Reactor	232-1548	232-1548	232-1548	232-1548
19	1	Relay, Field Build-up				
20	1	Stud (or Screw) Tapped Resistor Mounting	520-0641	520-0641	520-0641	520-0641
21	1	Clip, Tinnerman	332-0050	332-0050	332-0050	332-0050
22	1	Grommet, Rubber, 7/8" Hole	508-0008	508-0008	508-0008	508-0008
23	1	Cover, Relay				
24	1	Resistor, Fixed (250-Ohm, 25-Watt)	304-0510	304-0510	304-0510	304-0510
25	1	Switch, Residual Reset	308-0175		308-0175	
26	1	Washer, Retainer, Voltage Control Reactor	526-0173	526-0173	526-0173	526-0173

\* - Use cover 234-0223 for housed plants.

• - Later Models use a quantity of 3.



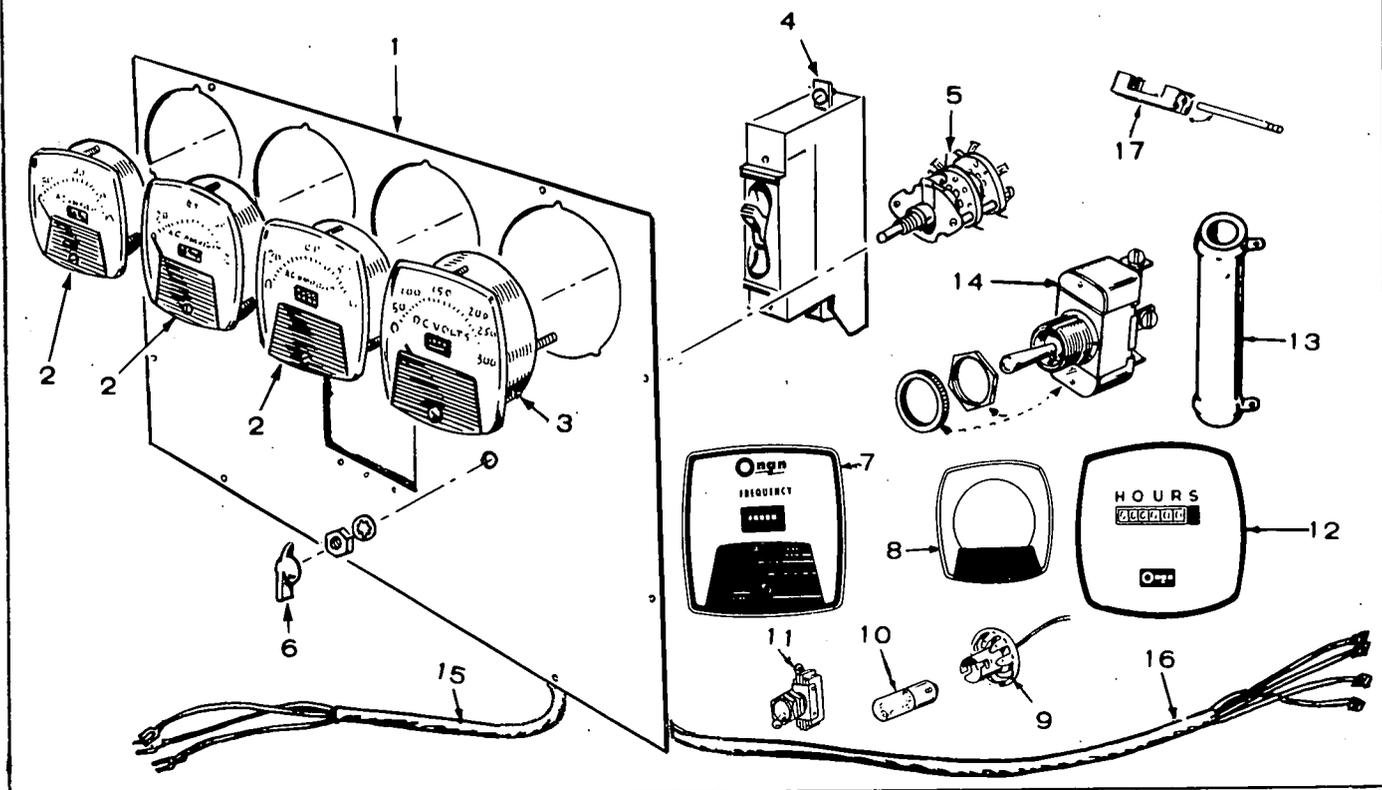
**GENERATOR GROUP, ALTERNATOR PORTION- SPEC. A THROUGH Z**

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	ADAPTER, ENGINE TO GENERATOR		
	231-0099	1	Spec A Only
	231-0111	1	Spec B through Z
2	205-0064	1	Blower, Generator
3	515-0006	1	Key, Blower
4	234-0162	1	Baffle, Generator Air
5		1	Rotor Assembly, Wound (Includes Bearing & Blower)
6	510-0047	1	Bearing, Rotor
7	232-0596	1	Clip, Bearing Stop
8		1	Stator Assembly, Wound
9	211-0146	1	Bell, End - Alternator to Exciter
10	520-0639	4	Stud, Generator Through
11	520-0614	1	Stud, Rotor Through
12	212-1064	2	Block, Collector Ring Brush
13	214-0059	4	Brush, Collector Ring
14	234-0172	1	Cover, Air Outlet
15	870-0177	1	Clip, Air Outlet Cover
16	304-0500	1	Resistor, Tapped Adjustable
17	232-1565	1	Bracket, Resistor Mounting
18	304-0006	2	Washer, Resistor Centering
19	520-0620	1	Stud, Resistor Mounting
20	866-0001	1	Nut, Resistor Mounting
21	870-0203	1	Nut, Rotor Stud

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
22	232-0200	1	Washer, Rotor Stud
23	508-0095	1	Grommet, Rubber - Air Baffle
24	SCREW, HEX CAP - ADAPTER MOUNTING		
	800-0050	2	3/8-16 x 1"
	800-0051	2	3/8-16 x 1-1/4"
25	850-0050	4	Lockwasher (3/8"), Adapter Mounting
26	150-0956	1	Switch Assembly, Overspeed
27	150-0958	1	Bracket & Point Assembly, Overspeed
28	868-0004	1	Nut, Jam (7/16-20)
29	850-0030	2	Washer, Lock (#10)
30	813-0100	2	Screw (10-32 x 1/2")
31	809-0046	1	Screw, Round Head - Air Outlet Cover Mounting
32	204-0061	1	Collector Ring
33	850-0055	1	Washer, Lock (7/16")
34	862-0015	4	Nut, Hex (5/16-18) - Generator Through Stud
35	850-0045	4	Washer, Lock (5/16")
36	508-0112	1	Grommet, Rubber - Lead Out

\* - Refer to factory giving complete Model, Spec and Serial number.

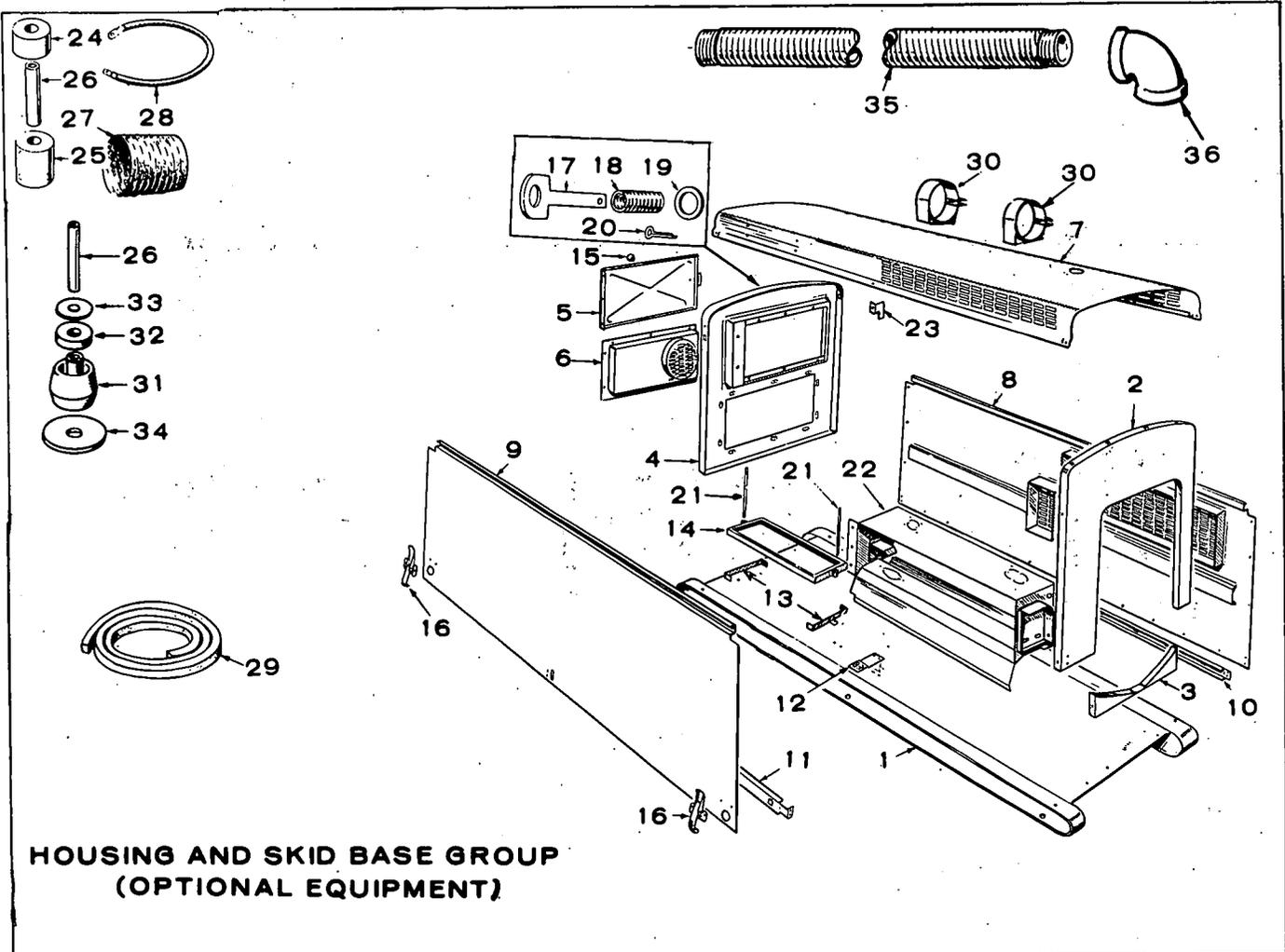
# AC METER PANEL GROUP- HOUSED MODELS (Optional Equipment)



REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1		1	Panel
2	AMMETER, AC (Check Scale, Select According to Rating)		
	302-0460	As Req.	Scale Reads 0-20
	302-0418	As Req.	Scale Reads 0-30
	302-0444	As Req.	Scale Reads 0-35
	302-0419	As Req.	Scale Reads 0-50
	302-0458	As Req.	Scale Reads 0-80
	302-0410	As Req.	Scale Reads 0-150
3	VOLTMETER, AC (Check Scale, Select According to Rating)		
	302-0420	1	Scale Reads 0-150
	302-0421	1	Scale Reads 0-300
	302-0422	1	Scale Reads 0-600
	302-0423	1	Scale Reads 0-750
	302-0612	1	Scale Reads 0-500
4	BREAKER, CIRCUIT (Check Original Part, Select According to Amperage and Voltage)		
	320-0150	As Req.	20 Amp., 480 Volt (Single Pole)
	320-0151	As Req.	25 Amp., 480 Volt (Single Pole)
	320-0020	As Req.	35 Amp., 120/240 Volt (Single Pole)
	320-0153	As Req.	40 Amp., 240 Volt (Single Pole)
	320-0198	As Req.	45 Amp., 240 Volt (Single Pole)
	320-0052	As Req.	50 Amp., 240 Volt (Single Pole)
	320-0195	As Req.	55 Amp., 240 Volt (Single Pole)
	320-0021	As Req.	60 Amp., 240 Volt (Single Pole)
	320-0366	As Req.	65 Amp., 240 Volt (Single Pole)
	320-0148	As Req.	70 Amp., 240 Volt (Single Pole)
	320-0367	As Req.	75 Amp., 240 Volt (Single Pole)
	320-0251	As Req.	100 Amp., 240 Volt (Single Pole)
	320-0486	As Req.	20 Amp., 480 Volt (3 Pole Companion)
	320-0487	As Req.	25 Amp., 480 Volt (3 Pole Companion)
	320-0488	As Req.	30 Amp., 480 Volt (3 Pole Companion)
	320-0514	As Req.	15 Amp., 600 Volt (3 Pole Companion)
	320-0459	As Req.	20 Amp., 600 Volt (3 Pole Companion)

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
5	308-0012	1	Switch, Voltmeter Selector (3 Phase Only)
6	303-0076	1	Knob, Selector Switch (3 Phase Only)
7	METER, FREQUENCY (Check Meter Face for Part Numbers)		
	302-0213	1	100 through 150 Volt, 60 Hertz
	302-0221	1	200 through 250 Volt, 60 Hertz
	302-0716	1	480 Volt, 60 Hertz
	302-0717	1	600 Volt, 60 Hertz
	302-0234	1	100 through 150 Volt, 50 Hertz
	302-0256	1	200 through 250 Volt, 50 Hertz
	302-0825	1	480 Volt, 50 Hertz
	302-0788	1	600 Volt, 50 Hertz
8	302-0488	1	Plate, Meter Face
9	322-0072	2	Receptacle, Panel Lights
10	LAMP, PANEL LIGHT		
	322-0004	2	12 Volt
	322-0017	2	24 Volt
11	308-0002	1	Switch, Panel Lights
12	METER, RUNNING TIME		
	302-0465	1	120 Volt, 60 Hertz
	302-0466	1	240 Volt, 60 Hertz
	302-0467	1	480 Volt, 60 Hertz
	302-0468	1	120 Volt, 50 Hertz
	302-0469	1	240 Volt, 50 Hertz
	302-0470	1	480 Volt, 50 Hertz
13	304-0536	1	Resistor, Dropping (Fixed) Running Time Meter - 600 Volt Sets (9000-Ohm, 50 Watt)
14	308-0154	1	Switch, Start-Stop
15	338-0305	1	Harness, Wiring - Start-Stop
16	338-0495	1	Harness, Wiring - Remote
17	BAR, CIRCUIT BREAKER TIE		
	320-0187	1	For 3 Circuit Breakers
	320-0202	1	For 2 Circuit Breakers

\* - Order by description giving complete Model, Spec and Serial Number.



**HOUSING AND SKID BASE GROUP  
(OPTIONAL EQUIPMENT)**

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	403-0661	1	Base, Skid
2	405-1323	1	Panel, Front, Upper (Engine End)
3	405-1333	1	Panel, Front, Lower (Engine End)
4	PANEL, REAR (Generator End)		
	405-1322	1	Units without Meter Panel
	405-1331	1	Units with Meter Panel
5	PANEL, DOOR, REAR END		
	405-1329	1	Units without Meter Panel
	405-1332	1	Units with Meter Panel
6	405-1330	1	Panel, Generator Access
7	405-1326	1	Panel, Top
8	PANEL, RIGHT SIDE		
	405-1342	1	Units without Shutters
	405-1352	1	Units with Shutters
9	405-1325	1	Panel, Left Side
10	405-1327	1	Rail, Stiffener, Right Side
11	405-1328	1	Rail, Stiffener, Left Side
12	405-1341	2	Bracket, Stiffener Rail
13	416-0501	2	Bracket, Battery Support
14	416-0502	1	Frame, Battery Hold-down
15	406-0002	1	Knob, Rear End Door Panel
16	406-0105	2	Fastener, Housing Hold-down
17	405-1138	2	Pin, Shoulder, Rear End Panel
18	405-1139	2	Spring, Shoulder Pin, Rear End Panel
19	526-0115	2	Washer, Shoulder Pin, Rear End Panel
20	516-0039	2	Pin, Cotter, Shoulder Pin
21	520-0490	2	Stud, Battery Hold-down
22	DUCT, EXHAUST MANIFOLD		
	134-1235	1	Units without Shutters
	134-1234	1	Units with Shutters

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
23	405-1181	2	Stop, Door
24	402-0036	4	Mount, Cylindrical Shaped, Upper - Spec A Only
25	MOUNT, CYLINDRICAL SHAPED, LOWER		
	402-0038	2	Engine End - Spec A Only
	402-0251	2	Generator End - Spec A Only
26	BUSHING, SPACER, MOUNT		
	402-0046	4	Spec A Only
	402-0290	4	Begin Spec B
27	503-0423	1	Hose, Flexible - Generator Air Duct
28	336-0476	1	Strap, Ground, Engine to Frame
29	895-0104	1	Stripping, Foam Weather (76") - Cement in Place
30	140-0631	2	Band, Muffler
31	CUSHION, CONESHAPED (Tapered)		
	402-0285	2	Engine End - Begin Spec B
	402-0287	2	Generator End - Begin Spec B
32	402-0282	4	Snubber, Shock Mounting - Begin Spec B
33	526-0014	4	Washer (29/64" I.D. x 1-1/2" O.D. x 1/8") Only with Cone Shaped Cushions
34	WASHER (Only with Cone Shaped Cushions)		
	526-0199	4	29/64" I.D. x 3-1/4" O.D. x 1/8"
	526-0198	As Req.	5/8" I.D. x 1-1/2" O.D. x 1/16"
35	155-0841	1	Tube, Exhaust, Flexible (9-3/4")
36	505-0043	2	Elbow, Pipe

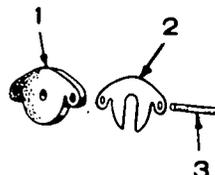
# SPECIAL PARTS SECTION

**FOR 12.0DJC-3CE/  
CONTRACTORS MODELS  
(Formerly 12DJC-3E2236/)**

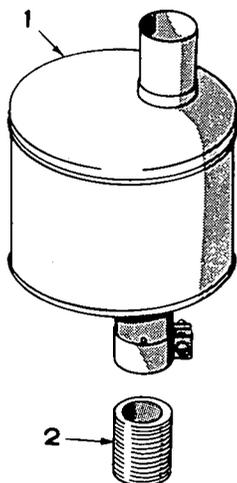
Parts not listed in this section, refer to the standard parts groups.  
Exception: Overhaul Kits do not apply.

## AUTOMOTIVE STARTER GROUP

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	191-0506	1	Seal, Dirt (Starter)
2	191-0505	1	Cover Plate, Dirt Seal
3	520-0662	1	Stud, Starter Mounting



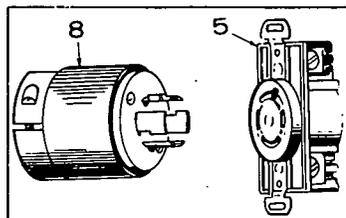
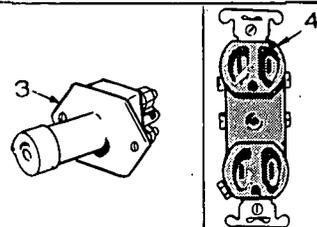
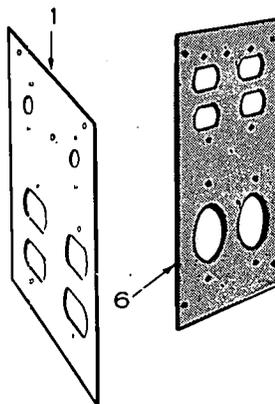
## MANIFOLD AND EXHAUST GROUP

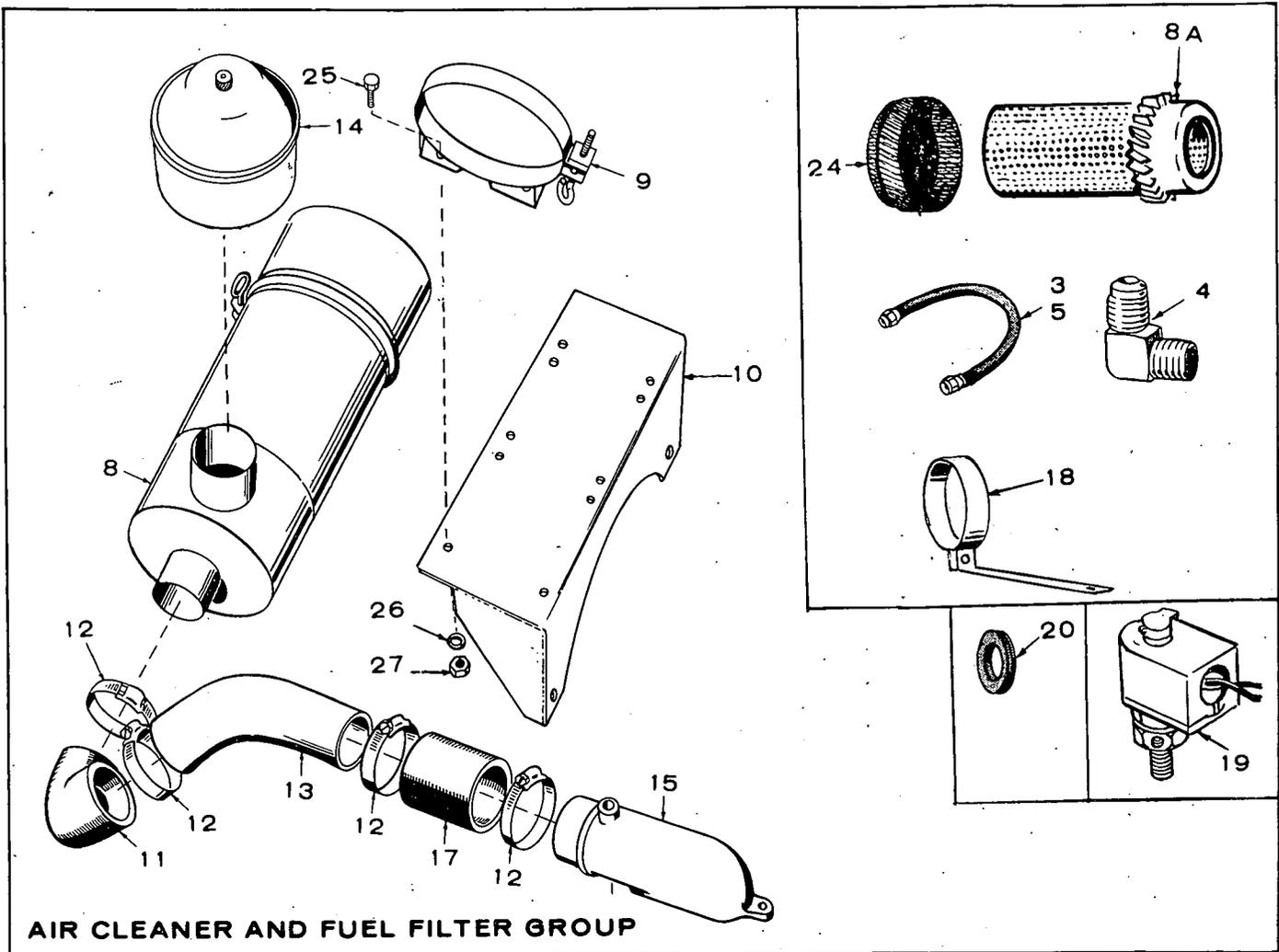


REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	155-0824	1	Muffler, Exhaust
2	505-0220	1	Nipple, Pipe Close, Exhaust

## CONTROL GROUP

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	301-2297	1	Panel, Control Box
2	308-0002	1	Switch, Stop-Run
3	308-0028	2	Switch, (1) Start (1) Heater
4	323-0184	2	Receptacle, Duplex
5	RECEPTACLE, TWISTLOCK		
	323-0856	2	Begin Spec AA
	323-0091	2	Spec A through Z
6	301-1170	1	Cover, Receptacle Box
7	332-0052	1	Clip, Tinnerman
8	PLUG, TWISTLOCK		
	323-0857	2	Begin Spec AA
	323-0185	2	Spec A through Z



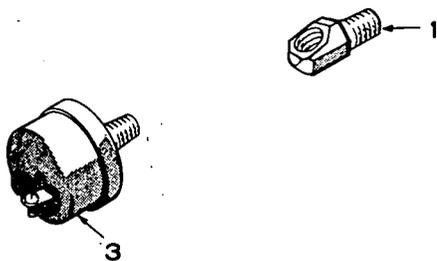


**AIR CLEANER AND FUEL FILTER GROUP**

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
3	501-0098	1	Line, Fuel Pump to Secondary Filter
4	502-0054	1	Elbow, Secondary Filter Inlet and Outlet
5	501-0097	1	Line, Secondary Filter to Injection Pump
8	140-0721	1	Cleaner, Air, Includes Element
8A	140-0765	1	Element Only, Air Cleaner
9	140-0722	2	Band, Air Cleaner Mounting
10	BRACKET, AIR CLEANER		
	140-0720	1	Spec A through Z
	140-1271	1	Begin Spec AA
11	503-0419	1	Elbow, Air Cleaner
12	503-0274	4	Clamp, Hose

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
13	140-0740	1	Tube, Air Induction
14	140-0723	1	Pre-cleaner, Air Cleaner, Plastic
15	140-0645	1	Adapter, Air Cleaner
17	503-0330	1	Hose, Air Cleaner Connector
18	140-0852	1	Bracket, Hose Support
19	307-0973	1	Solenoid Replacement Kit, Fuel Shut-Off - Spec P Only
20	508-0071	1	Grommet, Fuel Solenoid - Spec P Only
24	140-1267	1	Baffle, Air Cleaner
25	800-0024	4	Screw, Hex Head (5/16-18 x 1/2)
26	850-0045	4	Lockwasher (5/16)
27	862-0015	4	Nut, Hex (5/16-18)

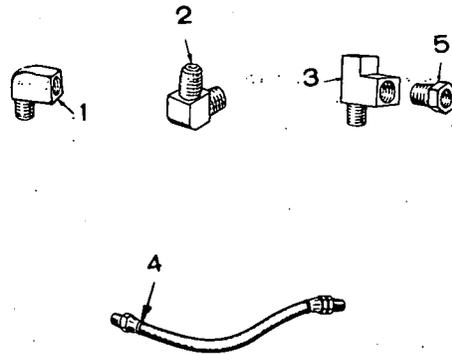
**OIL SYSTEM GROUP**



REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	502-0053	1	Elbow, Street (45°), Oil Pressure Switch Mounting
3	309-0169	1	Switch, Low Oil Pressure Cut-off

## FUEL TRANSFER PUMP AND INJECTION SYSTEM GROUP

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	502-0020	1	Elbow, Street - Fuel Pump Outlet
2	502-0138	1	Elbow, Male - Fuel Pump Outlet
3	502-0058	1	Tee, Fuel Return Line to Injection Pump - Spec P Only
4	501-0002	1	Line, Fuel Solenoid Valve to Injection Pump Return Line Tee
5	502-0017	1	Connector, Return Line - Begin Spec R



## SERVICE KITS & MISCELLANEOUS

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

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
	98-1100	1	Decal Kit
	168-0087	1	Gasket Kit, Set
	OVERHAUL KIT, SET		
	522-0202	1	Spec A through R
	522-0245	1	Begin Spec S
	525-0137	1	Paint, Touch-up Enamel (Metallic Green) 16 oz. Pressurized Can
	525-0305	1	Paint, Touch-up Enamel (Non-Metallic Green) 13 oz. Pressurized Can

# CUSTOMER SERVICES

OWNER'S WARRANTY SERVICE -  
ENGINE DRIVEN ELECTRIC GENERATOR SETS,  
SEPARATE GENERATORS, INDUSTRIAL ENGINES

## QUALITY OF PRODUCT

Onan products are engineered and designed to perform as stated on product nameplate and published specification. With proper installation and operation, regular maintenance and periodic repair service, the equipment will provide reliable service.

## GENERAL WARRANTY PRACTICES

All Onan-manufactured engine-driven electric generator sets, separate generators, and industrial engines are sold with a full one-year warranty. This warranty is issued only to the original user and promises satisfactory performance of the product when properly installed, serviced, and operated under normal conditions, according to the manufacturer's instructions. The text of the Onan published warranty appears in the Onan Operator's Manual sent with the product.

**Warranty Registration:** A Warranty Registration card accompanies each Onan Product. This card must be properly filled out and returned to the Onan Factory in order to qualify for warranty consideration as covered in this bulletin. When requesting warranty repair work you must provide the purchase date, Onan model, and serial number of the equipment.

**Warranty Authorization:** Warranty service must be performed by Onan Factory or Onan Authorized Distributors or their Approved and Registered Service Dealers. A complete listing of these Onan Authorized Parts and Service Centers is provided in our brochure F-115, a copy of which is supplied with each Onan Product. These Onan Authorized Service Centers have trained service personnel, parts stock, and the necessary facilities and tools for the service and repair of Onan equipment.

**Material Allowances:** Onan will allow credit or furnish free of charge to the Onan Authorized Service Station or his Approved Service Dealer, all genuine Onan parts used in a warranty repair of these products which fail to perform as warranted.

**Labor Allowance:** Onan will allow warranty repair credit to the Onan Authorized Parts and Service Center and his Approved Dealer at straight time labor when the cause of failure is determined to be defective material or factory workmanship. This labor allowance will be based on the factory's standard time schedule of published flat rate labor allowances, or, otherwise a time judged reasonable by the factory. Repair work not covered by warranty will be charged to the owner. The Onan's Warranty practice does not provide for allowance of expenses such as start-up charges, communication charges, transportation charges, travel time and/or mileage, unit removal or installation expense, cost of fuel, oil, normal maintenance adjustments, tune-up adjustments or parts maintenance items, and does not cover incidental or consequential damages.

**Administration:** Warranty of Onan Products is administered through Onan Authorized Distributors in whose territory the equipment is located. These Distributors and their Approved or Registered Onan Service Dealers are authorized to make settlement of all customer warranty claims within the limits of the manufacturer's warranty policy as described herein.

Onan reserves the right to change warranty practices without prior notice.

## **MAINTENANCE**

A Planned Preventive Maintenance Program is extremely important if you are to receive efficient operation and long service life from your Onan unit. Neglecting routine maintenance can result in premature failure or permanent damage to your equipment. The Onan Operator's Manual sent with the product contains recommended maintenance schedules and procedures.

Maintenance is divided into two categories:

1. Operator Maintenance . . . . . performed by the operator.
2. Critical Maintenance . . . . . performed only by qualified service personnel.

Regular maintenance will help you avoid sudden and costly repairs in the future. Adequate evidence of this scheduled maintenance must be offered when applying for a warranty claim.

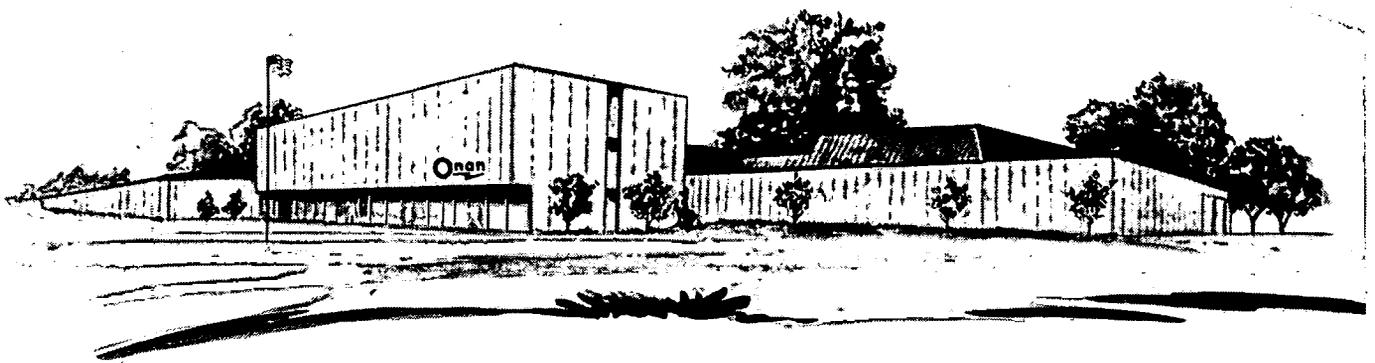
## **INSTALLATION**

Installation is extremely important and all Onan Products should be installed in accordance with the manufacturer's recommendations. If the owner experiences any difficulty with such items as mounting, ventilation, exhaust location, fuel lines, wiring, etc., he should immediately contact the company from whom he purchased the equipment so that corrective action can be taken. Although the Onan Authorized Distributor and his Approved or Registered Service Dealers may be able to remedy certain installation difficulties, such repair work is not considered Onan warranty and there will be a charge for this service.

Onan

Minneapolis, Minnesota 55432

MSS-22B  
Replaces 23B054 and MSS-22A  
Rev. 7-2-73



**ONAN** 1400 73RD AVENUE N.E. • MINNEAPOLIS, MINNESOTA 55432  
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