

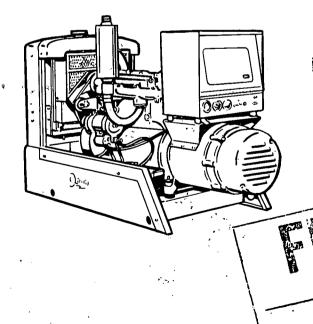
OPERATORS MANUAL AND PARTS CATALOG

FOR

ELECTRIC GENERATING SETS

RDJF

and superty pourling Page 21



RETURN TO FILE
TECH. PUB. DEPT.

INTRODUCTION

THIS OPERATOR'S MANUAL CONTAINS INFORMATION PERTAINING TO THE INSTALLATION, OPERATION, AND MAINTENANCE OF YOUR ONAN UNIT. A PARTS CATALOG IS ALSO INCLUDED IN THIS MANUAL.

WE SUGGEST THAT THIS MANUAL AND THE WIRING DIAGRAM WHICH ACCOMPANIES EVERY ONAN UNIT BE RETAINED AND REFERRED TO WHEN MAKING EQUIPMENT ADJUSTMENTS OR ORDERING PARTS. ADDITIONAL COPIES ARE AVAILABLE FOR A NOMINAL CHARGE FROM YOUR ONAN DISTRIBUTOR.

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

FOR MAJOR REPAIR SERVICE, CONTACT YOUR ONAN AUTHORIZED DISTRIBUTOR.

WARNING

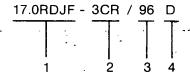
ONAN RECOMMENDS THAT ALL SERVICE INCLUDING INSTALLATION OF REPLACEMENT PARTS BE DONE BY QUALIFIED ELECTRICAL AND/OR MECHANICAL SERVICEMEN. FROM THE STANDPOINT OF POSSIBLE INJURY AND/OR EQUIPMENT DAMAGE IT IS IMPERATIVE THAT THE SERVICEMAN IS QUALIFIED.

GENERAL INFORMATION

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 reconnectible.
 - 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).

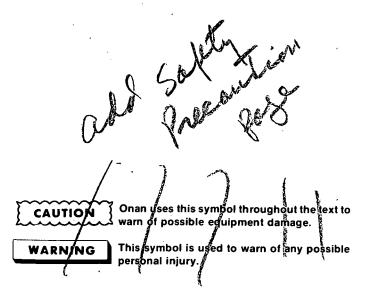
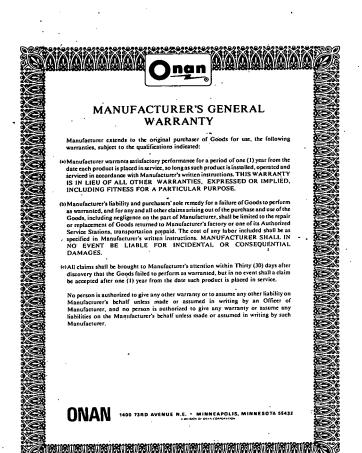


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IMPORTANT...RETURN WARRANTY CARD ATTACHED TO UNIT

SPECIFICATIONS

GENERAL	
Nominal dimensions of set (inches)	
Unhoused	40-1/8 h x 27 w x 62 la
Housed	
1100000	Carro
Weight (Nominal)	
Unhoused	1120 lb
Housed	
	1, 1220 10.
ENGINE DETAILS Number sylinders (vertical in line)	
Number cylinders (vertical in-line)	
Displacement (cubic inch)	
Cylinder bore	, ·
Piston stroke	
Compression ratio	
RPM (for 60 Hertz)	
RPM (for 50 Hertz)	
Exhaust connection (pipe tapped)	
Governor	, ,,
	(Externally Adjustable)
Air cleaner type	
Diesel fuel lift (maximum feet)	6
Oil filter	Full Flow Type
CAPACITIES AND REQUIREMENTS	
Battery voltage	12 Volt
Battery size (AC plant)	
SAE group 1H	2 in Series
Amp/hr, SAE 20-hr (nominal)	105
Starting by solenoid shift starter with over-running clutch	
Centrifugal start-disconnect switch	
Battery charge rate amperes (normal)	2
Charge ammeter scale	į 5-0-5
*Oil capacity in U.S. quarts (refill)	6
Water capacity (radiator cooled)	12 quarts
Ventilation required (cfm at 1800 rpm)	
Engine	2750
Generator	125
Combustion	62
GENERATOR DETAILS	No December 1
Output is rated at unity power factor load on these models	1 Phase
Output is rated at 0.8 power factor load on these models	
Rating (AC output in watts)	5 Fliase
60 Hertz - Continuous Standby	17,500
60 Hertz - Continuous Standby	17,500
50 Hauta Continuous Standby	14,500
50 Hertz - Continuous Standby	14,500
AC voltage regulation	Plus or Minus 20/
AC frequency regulation	Plus or Minus 3%
AC frequency regulation	5%
Generator type	Revolving Field
120/240 Volt single phase model reconnectible	Yes
Broad range 3-phase 12-lead reconnectible (Begin Spec AA)	Yes
Excitation (Prior to Spec AA)	Static Exciter
Excitation (Begin Spec AA)	Brushless Exciter

^{* -} Plus 1/2 quart for new filter.

DIMENSIONS AND CLEARANCES

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

coloriu	Minimum	Maximum
CAMSHAFT		
Bearing Journal Diameter, Front	2.500	2.505
Bearing Journal Diameter, Rear	1.1875	1.1880
Bearing Clearance Limit	.0015	.0030
End Play, Camshaft.	.007	.039
Cam Tappet Diameter	.8725	.8730
Cam Tappet Hole Diameter	.8755	.8765
CONNECTING RODS		
CONNECTING RODS Large Bore Diameter	2.1871	2.1876
Small Bore Diameter	1.044	1.045
Distance Center Large Bearing Bore to Small Bore	5.998	6.002
Clearance, Beafing-to-Crankshaft	.001	.003
CYLINDER /		
CYLINDER Cylinder Diameter Limits	3.4995	3.5005
CRANKSHAFT/	,	•
Main Bearing Journal Diameter	2.2437	2.4445
Main Bearingg Clearanceູູ້້້້	.0030	.0043
Connecting Rod Journal Diameter	2.0600	2.0605
Rod Bearing Clearance	.0019	.0038
End Play, Crankshaft	.010	.015
PISTON PISTON		
Piston Clearance to Cylinder Wall (Measure 90° to Pin, Just Below	.0055	
Oil Ring Groove)	.0055	.0075
DIOTON DIN		
PISTON PIN Piston Clearance	Thumb I	Duch Eit
Connecting Rod Bushing	.0002	.0007
Connecting Hod Bushing	.0002	.0007
PISTON RINGS	à	
Piston Ring Gap	.010	.020
Ping Width Top	.0925	.0935
Ring Width, Top	.0925	.0935
3rd	.0925	.0935
	1	.0000
VALVE, INTAKE (Stellite Faced)	, and the second second	
Stem Diameter	3405	.0415
Guide Clearance	.0015	.0030
Valve Face	\ 42	<u>2</u> °
Valve Clearance	· 0.	17
	1	
VALVE, EXHAUŠT (Stellite Faced)	1	
Stem Diameter	.3405į	.3415
Guide Clearance	.0025	.0045
Valve Face	4:5	5°
Valve Clearance	.0	17

/ALVE GUIDE Length	- 43iin		1-20	5/32
Outside Diameter Inside Diameter (Afte	· / · · · · · · · · · · · · · · · · · · ·		 . 4690	.4695
Exhaust			.344	.345
Intake			 .342	.343
Cylinder Block Bore [Diameter 🖟	· · · · · · · · · · · • • • • • • • • •	 .467	.468
VALVE SEATS (Stellite) Valve Seat Bore Diameter Outside D Seat Insert Outside D Seat Width Seat Angle Available Oversizes	der Head Face)		 1.361 .433 1.364 3/64 4!	1.362 .439 1.365 1/16 5° .010, .025
ALVE SPRINGS			, ,	,
Load, Valve Open Load, Valve Closed			87.2 lbs. 45 lbs.	97.2 lbs. 49 lbs.

-.

DESCRIPTION

GENERAL

An Onan RDJF Series electric generating set consists of a four-cylinder, in-line diesel engine and a 17.5KW (14.5KW for 50 Hertz) alternating current generator with standard or optional equipment as ordered.

ENGINE

The RDJF engine has 140 cubic inch piston displacement, 19 to 1 compression ratio, and is radiator-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 shatt, 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 enginegenerator 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.

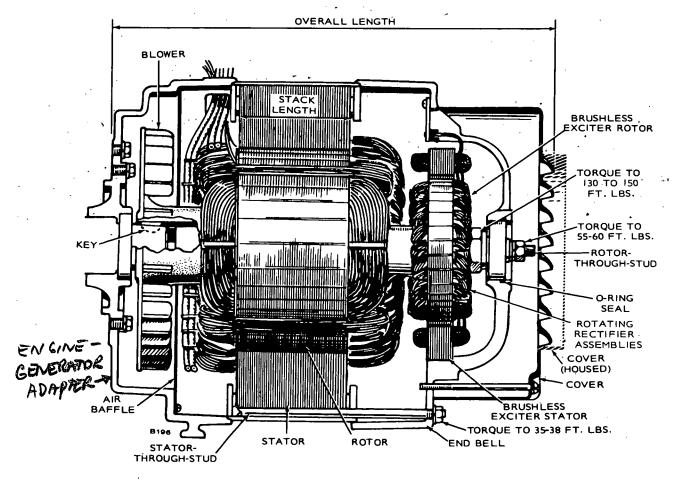


FIGURE 1. GENERATOR (CUTAWAY VIEW)

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.

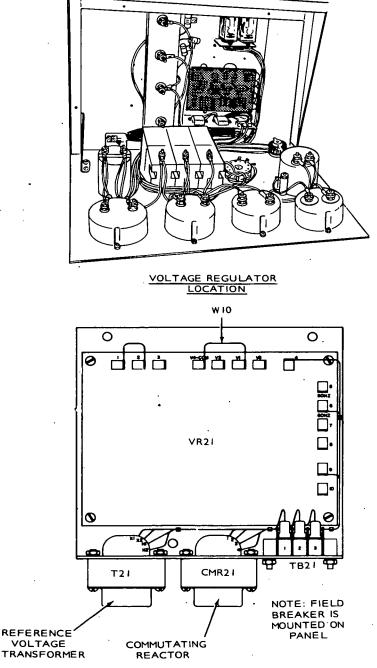


FIGURE 2. VOLTAGE REGULATOR

The generator rotor also produces AC voltage (19 to 21 volts) in the charging winding of the stator which is converted to direct current for battery charging.

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(R2)(Optional)

Figure 2 shows the above components in a typical control box on radiator cooled electric generating sets.

CONTROLS

The standard radiator-cooled, diesel powered generating set control box has an upper and a lower instrument panel door, Figure 3. Standard control components include a battery charge rate DC ammeter, a RUN-STOP-REMOTE switch, HEATER OIL PRESSURE gauge, WATER TEMPERATURE gauge, and a field circuit breaker. Optional controls that may be added on the upper door panel include three AC ammeters, an AC voltmeter, a running time HOUR meter, a phase selector switch, a 50 or 60 Hertz frequency meter, line circuit breakers, and a voltage regulator adjust knob. Optional controls that may be added on the lower panel door include a PLANT FAILED TO START fault lamp, a CRANKING LIMITER, and three fault indication lamps for LOW OIL PRESSURE, HIGH WATER TEMPERATURE, and OVERSPEED with their associated pushbutton reset switches.

CONTROL PANEL COMPONENTS

Controls and instruments on the RDJF series control panels vary according to the customers purchase order. The following is a brief description of typical components located on the panels.

Standard:

Run-Stop-Remote Switch: Starts and stops the unit locally or from a remote location.

Preheat Switch: Controls manifold heater and glow plugs.

Battery Charge Rate DC Ammeter: Indicates the battery charging current.

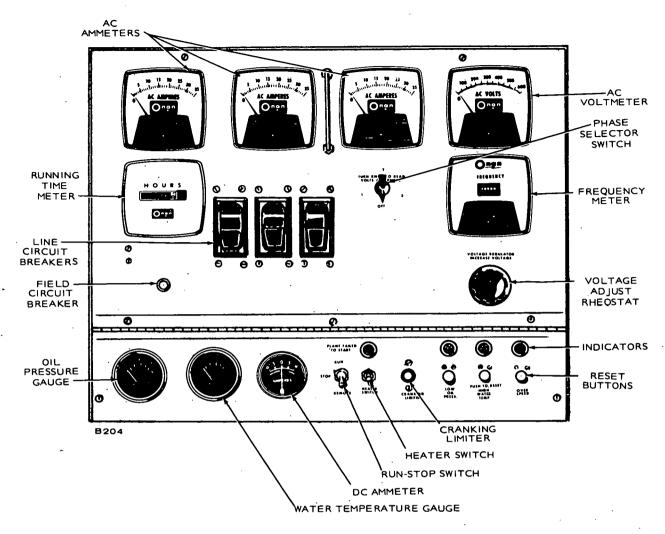


FIGURE 3. TYPICAL RADIATOR-COOLED SET CONTROL PANEL

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.

Oil Pressure Gauge: Indicates pressure of lubricating oil in engine (wired to a sensor unit located on the engine).

Water Temperature Gauge: Indicates temperature of circulating coolant in engine. (Wired to a sensor unit located on the engine.)

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.

AC Voltmeter: Indicates AC generator output voltage.

Voltmeter-Ammeter Phase Selector Switch: Selects the phases of the generator output to be measured by the AC voltmeter and AC ammeter.

Voltage Adjust Rheostat: Provides approximately plus or minus 5% 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: Four red indicator lights give warning of:

- 1. Plant failed to start.
- 2. Overspeed.
- 3. Low oil pressure.
- 4. High engine temperature.

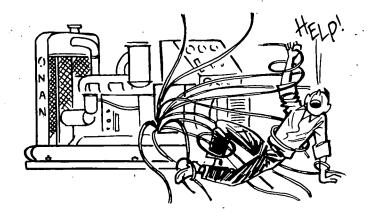
Three reset pushbuttons permit restarting after trouble is corrected.

Line Circuit Breakers: Protects generator line overloads.

VOLTAGE RECONNECTION WITH OP-TIONAL INSTRUMENTS

The optional AC instruments on the control panel (such as voltmeters, ammeters, 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 voltage codes or voltages are made.

CAUTION Contact your Onan Service Center for required instrument changes, new wiring diagrams, proper specification number, and voltage before attempting to re-connect a generator with instruments on the control panel.



INSTALLATION

GENERAL

Installations must be considered individually. Use these instructions as a general guide. Meet regulations of local building codes, fire ordinances, etc., which may affect installation details. See Figure

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 clearance from wall to permit set to rock on its mounts; at least 24 inches clearance is required around all other sides for service accessibility.

MOUNTING

A permanent installation needs a sturdy, level mounting base of concrete, heavy wood or structural steel, preferably raised to aid oil changing and operation. Set may be bolted in position if desired. Allow at least 24 inch clearance on all sides of the set for convenience in servicing.

Mobile applications (as in trucks or trailers) must be securely bolted down to prevent shifting in transit. Extra support for the vehicle flooring may be necessary. On all installations, carefully assemble the mounting cushions, washers and spacer bushing. The spacer bushing prevents compression of the snubber (upper rubber cushion). Place the cushions under the engine and generator mounting feet, using cushions with higher number (part number is shown on cushion) on generator (heavier) end. Space the 7/16-inch diameter mounting bolts in floor or base with distances between hole centers as follows: Engine end — 11 inches; generator end — 10-1/2 inches; and engine-to-generator — 21 inches.

Be sure there is at least 1/2-inch clearance between oil filter and end of mounting bolt to avoid puncturing the filter.

VENTILATION

Generator sets create a considerable amount of heat which must be removed by proper ventilation. Outdoor installation can rely on natural air circulation, but mobile and indoor installations need properly sized and positioned vents for the required air flow. See Specifications for air requirements at 1800 rpm.

Cooling air travels from the rear of the set to the front end. Locate the room or compartment air inlet where most convenient, preferably to the rear of the set. The inlet opening should be at least as large as the radiator area.

Engine heat is removed by a pusher fan which blows cooling air out through the front of the radiator. The cooling air outlet should be directly in front of the radiator and as close as is practical. The opening size should be at least as large as the radiator area. A duct of canvas or sheet metal may be used between the radiator and the air outlet opening. Ducts prevent recirculation of heated air.

Generator cooling air is discharged from the engineto-generator-adapter on the left side of the engine.

In cold weather a means of restricting the air flow can be provided to keep the room or compartment temperature at a normal point.

On city water cooled sets, the conventional radiator is not used and a constant water flow cools the engine. Ventilation is seldom a problem, but sufficient air movement and fresh air must be available to properly cool the generator and support combustion in the engine. For small compartments, a duct larger than the generator outlet opening is recommended to remove heated air from the generator to the outside. Limit bends and use radius type elbows where needed. A large, well ventilated compartment or room does not require a hot air duct. Water cooled exhaust manifolds are recommended.

CITY WATER COOLING (OPTIONAL)

Connections on the engine are 3/8-inch pipe. A solenoid shut-off valve and a lockshield supply valve are furnished but not installed. The solenoid valve is coordinated with the engine control to shut off the water supply when set is not in use.

The lock shield valve is manually adjusted to control water rate-of-flow for proper cooling with a minimum flow of water. Final adjustment should be made under the maximum load the set will carry with the engine thoroughly warmed up and water temperature stabilized. Refer to Specifications for water flow data.

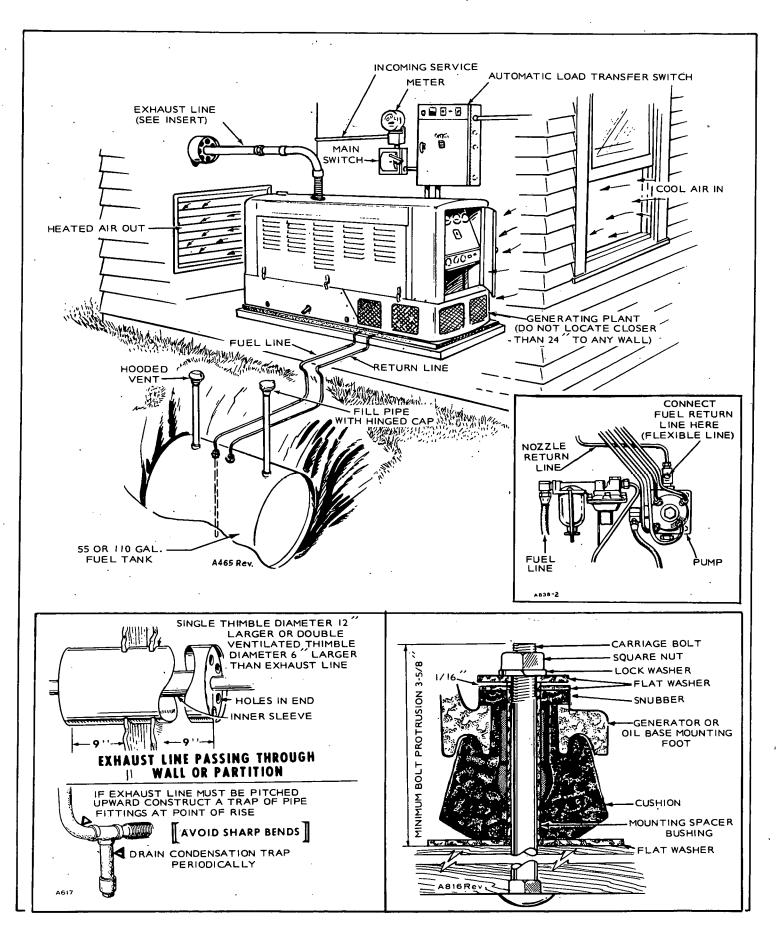


FIGURE 4. TYPICAL INSTALLATION

JOHN RHING

HEAT EXCHANGER COOLING (OPTIONAL)

This is a closed cooling system commonly referred to as fresh water cooling, Figure 5. Water circulated through the engine is termed fresh water, hot water, jacketed water, etc. Water circulated through the heat exchanger only is called raw water, sea water, cold water, discharged water, city water, etc. This system (with anti-freeze coolant) is recommended where freezing hazards exist or where the owner wants to prevent salt water problems.

Two conditions prevail: (1) Factory installed heat exchanger, and (2) Customer installed Onan heat exchanger kit. Get details from Onan.

Use a centrifugal metal impeller water pump (Oberdorfer 1-GP, or equal) in the hot water side. Drive it with a belt from the engine power takeoff.

CAUTION \ Use an expansion tank in the hot water side.

Fill closed cooling systems with clean, alkali-free water, to the proper level in the expansion tank. Add an approved rust inhibitor to the coolant. If the coolant is anti-freeze, test it periodically.

EXHAUST

Pipe exhaust gases outside any enclosure. The exhaust outlet is 1-1/2-inch pipe size. Locate the exhaust outlet far from the air inlet to avoid gases reentering the enclosure. Use flexible tubing to connect between the engine exhaust and any rigid pipe extension. Shield the line if it passes through a combustible wall, Figure 4. If bends are necessary, use sweeping (large radius) elbows. If pitched upward install a condensation trap at point of rise. Increase one pipe size for each additional 10 feet in length.

FUEL TANK AND LINES

Where a separate fuel tank is used, install the fuel tank so that the bottom of the tank will be less than 8 feet below the fuel pump. The top of the fuel supply tank must be below the fuel pump to prevent siphoning if a system leak occurs. For servicing put a valve at the tank. Where the fuel is shared, do not connect to an existing line at a point above the fuel supply level. This avoids starving the engine.

If fuel lift exceeds 6 feet, install an auxiliary electric fuel pump near the fuel supply. See Wiring Diagram for installation connection.

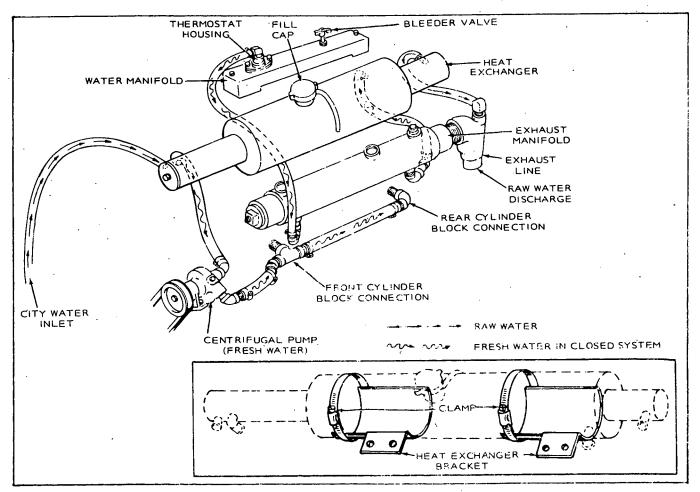


FIGURE 5. HEAT EXCHANGER PLUMBING

Use approved flexible fuel line next to the engine. Diesel engines require a fuel supply line and a separate fuel return line. Install the fuel supply line from the supply tank to the inverted flare male elbow mounted in the inlet of the fuel pump. Install the fuel return line from the injection pump bleeder valve to the supply tank, Figure 6.

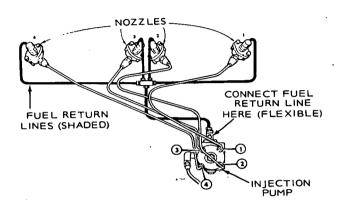


FIGURE 6. FUEL SYSTEM

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

OIL DRAIN

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

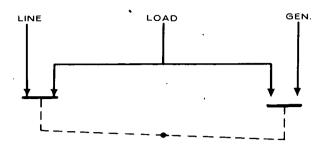
ELECTRICAL CONNECTIONS

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 control box to connect the generator ground lead and



NOTE: SHOWN WITH LINE CONNECTED TO LOAD.

FIGURE 7. LOAD TRANSFER SWITCH

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 7.

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^1 , T^2 , 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:

- Connect one ungrounded (hot) generator lead to the unused terminal on each ammeter.
- 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.

	100 100 100 100 100 100 100 100 100 100	* / ** /	PHASE	Come Co	From No Supple	GENE SCI		R CONNECTION		. LOAD GENERATOR (WIRING DI	CONNECTION AGRAM
**************************************		\angle	<u> </u>	2 2 g						(1 TO VR21-5 FOR 50 HE OR 60 HERTZ GENERA	
3C	120/240	1	60	VI		A B	_, ,	c	A L2	B L1 L2	C Li LO L2
53C	120/240 115/230 110/220		50 50 50	VI V2 V3		T1 L1 T3 T1 T4 T2	L_L2.	T1 T2 T3 L0	T1 T2 T3 T4	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	T, T2 T3 T4
18	120/208 127/220 139/240	3 3 3	60 60 60	V1 V2 V4	PARALLEL WYE	L1 171 172 174 179	T8 L2 T2 T2				L3
518	110/190 115/200 120/208 127/220	3 3 3	50 50 50 50	VI V2 V3 V4	PARAL	T3 + 1	12 w 9		T4 T5 T6 T10 T	11112 71 77 72 7	8 T3 T9
18	240/416 254/440 277/480	3 3	60 60 60	VI V2 V4	S WYE	LI	T5 T	2		\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	Ĭ \
518	220/380 230/400 240/416 254/440	3 3 3	50 50 50 50	VI V2 V3 V4	SERIES WYE	LO T6 T3 L3	9		TIO TII TI2 TI T	4 77 72 75 78	T3 T6 T9
18	120/240	3	60	VI	TA	T1 T6	2 T1		L0 L2		Ĭ.
518	110/220 115/230 120/240	3 3 3	50 50 50	VI V2 V3	SERIES DELTA	T1 Van T875 Van T875 Van T8	T10		T4 T7 T2 T10 T	5 TB T3 T11 T6	T9 T1 T12
18	120/240	'	60	VI	,TA	T3, T6	-L1		Å	Ĭ	1
518	110/220 115/230 120/240	1	50 50 50	VI V2 V3	DOUBLE DEL	T544T2 T97T12 T11144	T4 - L0 T7 T 10 -L2:		T2 T4 T7 T12 T	1 T6 T3 T5 T8 T	10 T9 TII
18	120	ı	60	VI	LTA	T3, T6			À	<u> </u>	
518	110 115 .	1	50 50 50	V1 V2 V3	PARALLEL DELTA	T9 T12	T1 T7		T1 T7 T6 T12	T3 T9 T5 T11 T4	T10 T2 T8
9X B200	347/600	3	The Control of the Co	Ty/	· WYE	TO T3 L3	ر 12 کور ام	.2	LI	L2 L3 L0	

FIGURE 8. GENERATOR WIRING AND CONNECTION DIAGRAMS

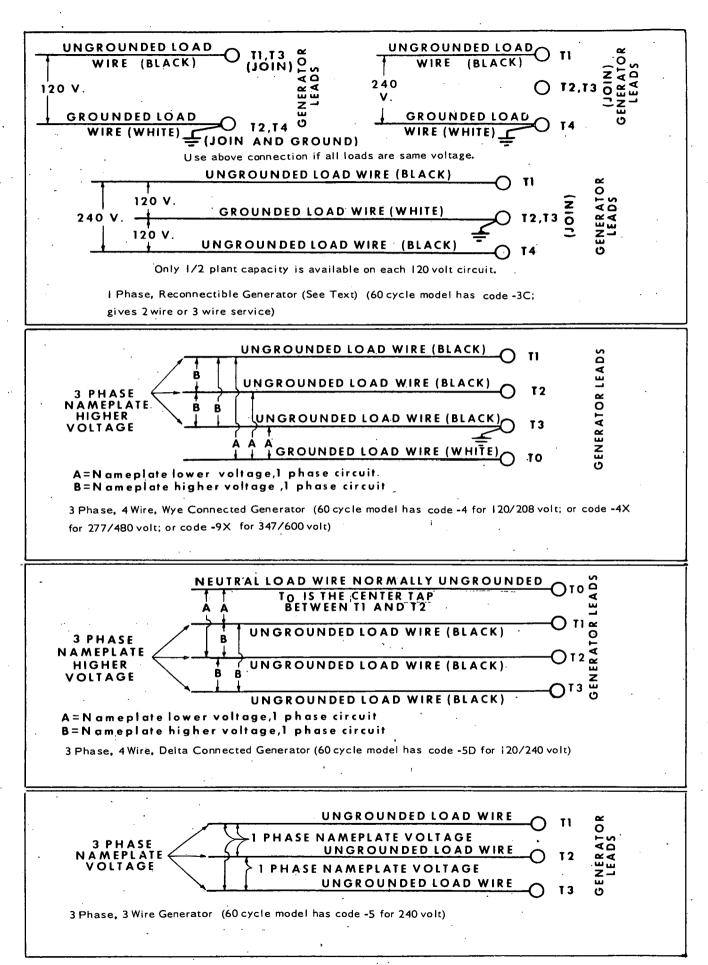


FIGURE 9. LOAD WIRE CONNECTIONS

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 T¹-T⁴ or T¹-T¹² 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 8.

Code 3C or 53C Reconnectible Generators: The single phase, 60 and 50 Hertz generators have output leads T^1 , T^2 , T^3 , and T^4 available for making the single phase voltage and load connections shown in Figure 8 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 T¹ through T¹² available for making several single and three phase voltage load connections shown in Figure 8. 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 V4 (common) and V1, V2, or V3 as listed on the reconnection diagram. If V4 to V4 Confiection means the jumper is not vegulation. 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 T¹, T², T³, and T⁰ 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 RDJF series prior to Spec AA, have four leads. Connections for these generators are shown in Figure 9.

Reconnectible Single Phase Generators: Code 3C models, such as RDJF-3C are reconnectible for use as 120/240 volt 3 wire; 120 volt two wire; or 240 volt 2 wire units (Figure 8) except when optionally equipped with a meter panel.

Delta Generators: On these generators, T^0 is the center tap between T^1 and T^2 ; T^0 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.

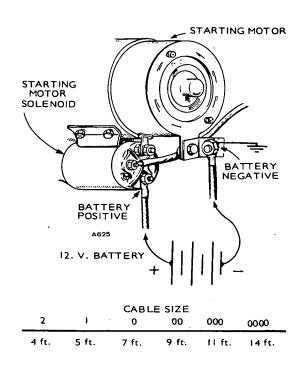


FIGURE 10. BATTERY CONNECTION

BATTERY CONNECTIONS

The battery is connected for negative (-) ground, Figure 10. 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

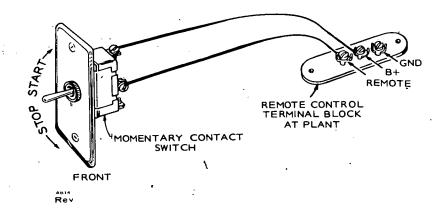
If battery polarity is wrong, damage will occur within 3 minutes while stopped or 5 seconds while running. Alternator windings will be damaged almost instantly if battery charging circuit is shorted between resistor R21 and the B1 end of the charging winding.

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).

OPTIONAL ALARM

The GND terminal on the remote control terminal block is for a customer supplied alarm at a remote location to warn of emergency shutdown. Refer to Wiring Diagram for proper voltages.



WIRE SIZE	DISTANCE
#18	to 900 ft.
#16	to 1500 ft.
#14	to 2400 ft.
#12	to 3700 ft.

FIGURE 11. REMOTE CONTROL SWITCH

REMOTE START-STOP SWITCH (Optional)

For remote control starting and stopping, use 2-wires to connect the remote switch single-pole double-throw, momentary contact (center-off type), to the terminal block marked B+ and remote in control box using wire sizes as listed in Figure 11.

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		SAE 30
0°F to 30°F	SAE 10W or	5W-30
	SAE	

Multigrade oils are recommended for temperature 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;
- 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 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 12. 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.

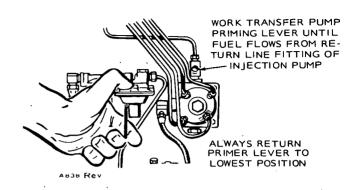


FIGURE 12. PRIMING FUEL SYSTEM

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.

Radiator: See Specifications for water capacity. Check to see that the radiator drain valve is closed and cylinder block drain plug is tight. Fill the radiator with clean, soft (alkali free) water such as rain water. The use of a good rust and scale inhibitor is recommended.

If the set will be exposed to freezing temperatures, use a standard anti-freeze solution. Use the correct proportion of anti-freeze as recommended by the anti-freeze manufacturer, to protect to at least 10°F below the lowest expected temperature.

AC Generator: Periodic inspections, that coincide with engine oil changes will ensure good performance.

STARTING SEQUENCE

The starting and stopping (Figure 13) sequence shows the manual, mechanical, and electrical events required for satisfactory start, run, and stop cycles.

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.

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.

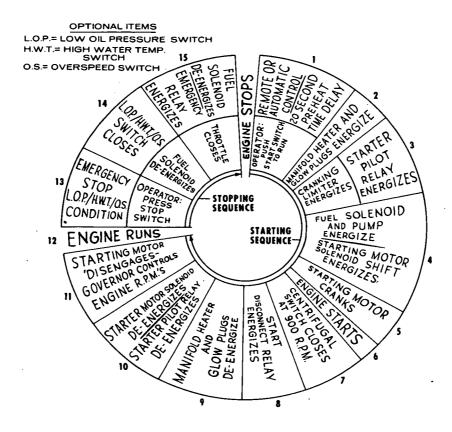


FIGURE 13. OPERATING CYCLE

Push the RUN-STOP switch to its RUN position (engine will preheat and crank in about 20 seconds). After engine starts, see that the oil pressure gauge reads at least 20 psi. Relief valve pressure is not adjustable.

When starting set from a remote station, the switch on the set control must be in its REMOTE position.

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 on the initial start or from other conditions such as out of fuel, remedy the cause. Wait one minute before resetting the cranking limiter and reattempting to start.

Make sure centrifugal switch closes during speed buildup (about 900 rpm's).

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.
- 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.

SAFETY DEVICES

In case of dangerously high coolant (water) temperature or low oil pressure, the cutoff switch stops the unit. After an emergency stop, investigate and correct the cause. Press reset button before restarting.

BREAK-IN PROCEDURE

The unit should be run in the following sequence:

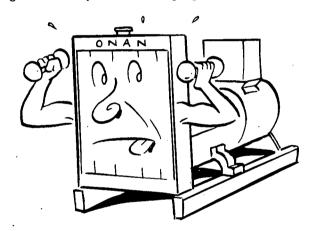
- 1. One half hour at 1/2 load.
- 2. One half hour at 3/4 load.
- 3. Full load.

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.

EXERCISE STANDBY PLANTS

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



LOW TEMPERATURES

- 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.
- 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 preheat time before cranking. Between 30°F and 55°F preheat for one minute; below 30°F preheat for two minutes. At low temperatures, if engine won't start after cranking one minute, repeat preheating step.

6. If freezing temperature is anticipated during stopped periods and engine is not protected with anti-freeze, drain radiator and engine block. Attach warning tag to refill before operation.

HIGH TEMPERATURES

- 1. See that nothing obstructs air flow to and from set
- 2. Be sure set location is properly ventilated.
- Check level of battery electrolyte frequently and add approved water when necessary to maintain proper level.
- 4. Keep cooling system clean, radiator filled and see that fan belt tension is properly adjusted.

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.

ENGINE RATINGS

Ratings apply to altitudes up to 1000 feet, standard cooling, normal ambients and with No. 2 Diesel fuel. Consult nearest Onan service center or factory for operating characteristics under other conditions.

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. Shut down engine and drain oil base while still warm. Refill and attach a warning tag indicating viscosity of oil used.
- 3. Remove injectors. Pour 1-ounce of rust inhibitor (or SAE #10 oil) into each cylinder. Crank engine over several times. Install injectors.
- 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:

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

- 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.

HEAT EXCHANGER FILLING

Improper filling of the heat exchanger (Figure 14) can cause overheating of the engine. Therefore, to prevent this possibility, follow these instructions whenever adding coolant to the heat exchanger.

- 1. Remove fill cap.
- 2. Open fill vent valve (turn counterclockwise).
- 3. Remove vent plug (older models only).
- 4. Fill with coolant until vents begin to overflow.
- Close fill vent valve (turn clockwise).
- 6. Replace vent plug (older models only).
- 7. Replace fill cap.
- Operate unit 10 minutes at full load; watch for leaks.
- 9. Shut down unit.

After running unit 10 minutes, the closed cooling system is pressurized and hot. Open the 14 pound pressure cap slowly to vent pressure.

- 10. Slowly open pressure cap and check water level.
- 11. Fill system to top with coolant.

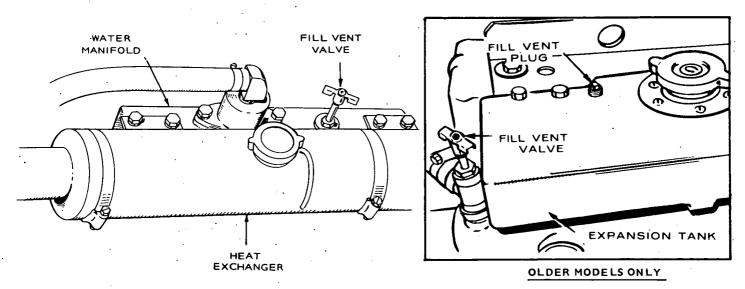


FIGURE 14. FILLING HEAT EXCHANGER

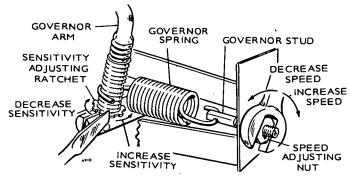
ADJUSTMENTS

CENTRIFUGAL SWITCH

The start-disconnect centrifugal switch (Figure 15) 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.

GOVERNOR

The governor controls engine speed. Rated speed and voltage appear on the nameplate (see also Specifications). Engine speed equals frequency mul-



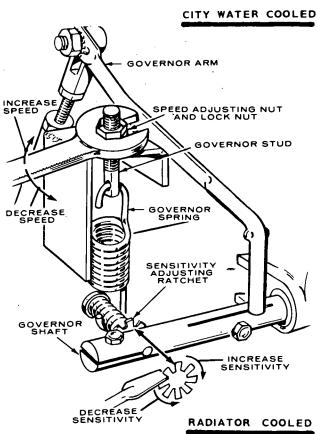


FIGURE 16. ADJUSTING GOVERNOR

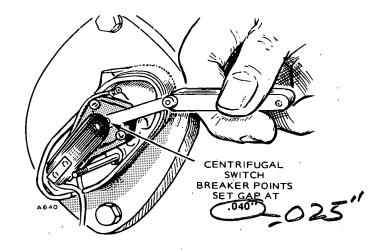


FIGURE 15. ADJUSTING BREAKER POINTS

tiplied 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 16). 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.

FAN BELT

To adjust the fan belt, loosen the nut on the belt tightener pulley shaft. Move the shaft left or right in the elongated slot in pulley mounting bracket until a deflection of 1/2-inch is obtained when about 15 pounds of force is applied at a point midway between the fan pulley and belt tightener pulley. Be sure to tighten nut securely.

SERVICE AND MAINTENANCE

Follow a definite 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 Figure 17 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.
- 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. 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	 Inspect generator set Check fuel supply, see Note 1 Check oil level, see Figure 17.
50 (more often in dusty conditions)	 Check air cleaner, see Figure 17
100	 Clean governor linkage, see Figure 17 Change crankcase oil Drain fuel condensation traps in lines and filters, see Note 1
200	 Clean crankcase breather, see Figure 17. Replace oil filter Check battery condition
500 Call Onan serviceman	 Check start-disconnect circuit Check generator slip rings and brushes (prior to Spec AA) on older sets; replace if worn to 5/16" Check valve clearances
600	Change primary filter
2000 Call Onan serviceman	 Grind valves (if required) Clean holes in rocker box oil line Check nozzle spray pattern, see Note 2 Clean generator Replace baffle in pulsation filter, Figure 17.
3000	Change secondary fuel filter
5000 Call Onan serviceman	 General overhaul (if required) see Note 3

- 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.
 - 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.

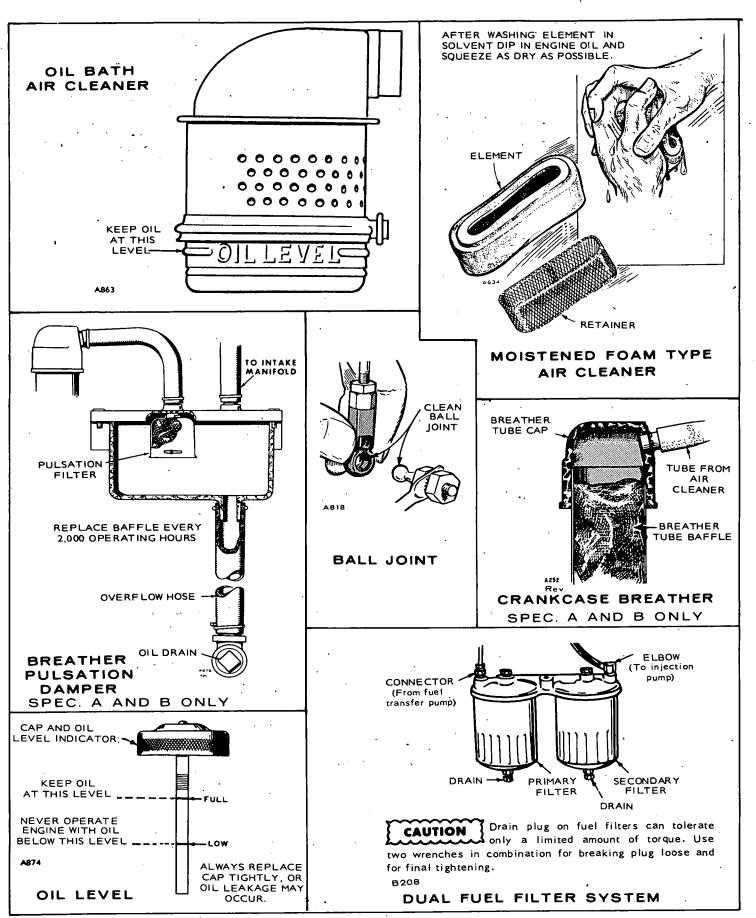


FIGURE 17. GENERAL MAINTENANCE

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		╛															•										•		•	Worn or Dirty Valve Guides
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PARTS CATALOG

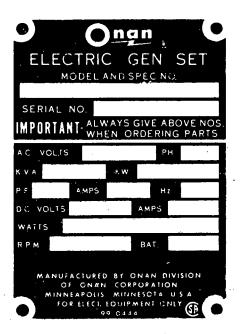
INSTRUCTIONS FOR ORDERING REPAIR PARTS

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.



For handy reference, insert YOUR generating set 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 RDJF Generating Sets as listed below. Parts are arranged in groups of related items and are identified by a reference number. Parts illustrations are typical. Using the MODEL and SPEC NO. from the Onan nameplate, select the Parts Key No. (1, 2, etc. in the last column) that applies to your unit. This Parts Key No. represents parts that differ between models. Unless otherwise mentioned in the description, parts are interchangeable between models. Right and left generator set sides are determined by FACING the engine end (front) of the unit.

GENERATOR SET DATA TABLE

£	COOLING		ELEC	CTRICAL DAT	PARTS			
MODEL & SPEC NO.	SYSTEM	WATTS	VOLTS HERTZ		WIRE	PHASE	KEY NO.	
14.5RDJF-53CR/*	. Radiator	14500	120/240	50	** .	1	1	
14.5RDJF-518R/*	Radiator	14500	+	50	12	3		
17.5RDJF-3CR/*	Radiator	17500	120/240	60	**	1		
17.5RDJF-4R/*	Radiator	17500	120/208	60	4	3		
17.5RDJF-4XR/*	Radiator	17500	277/480	60 -	4	3	1	
17.5RDJF-5DR/*	 Radiator 	17500	120/240	60	4	3		
17.5RDJF-9XR/*	Radiator	17500	347/600	_. 60	4 .	3		
17.5RDJF-18R/*	Radiator	17500	+	60	12	3		
14.5RDJF-53CR/*	City Water Cooled	14500	120/240	50	**	1	2	
14.5RDJF-518R/*	City Water Cooled	14500	+	50	12	3		
17.5RDJF-3CR/*	City Water Cooled	17500	120/240	60	**	1		
17.5RDJF-4R/*	City Water Cooled	17500	120/208	60	4	3		
17.5RDJF-4XR/*	City Water Cooled	17500	277/480	60	4	3	2	
17.5RDJF-5DR/*	City Water Cooled	17500	120/240	60	4	3		
17.5RDJF-9XR/*	City Water Cooled	17500	347/600	60	4	3		
17.5RDJF-18R/*	City Water Cooled	17500	+	60	12	3		

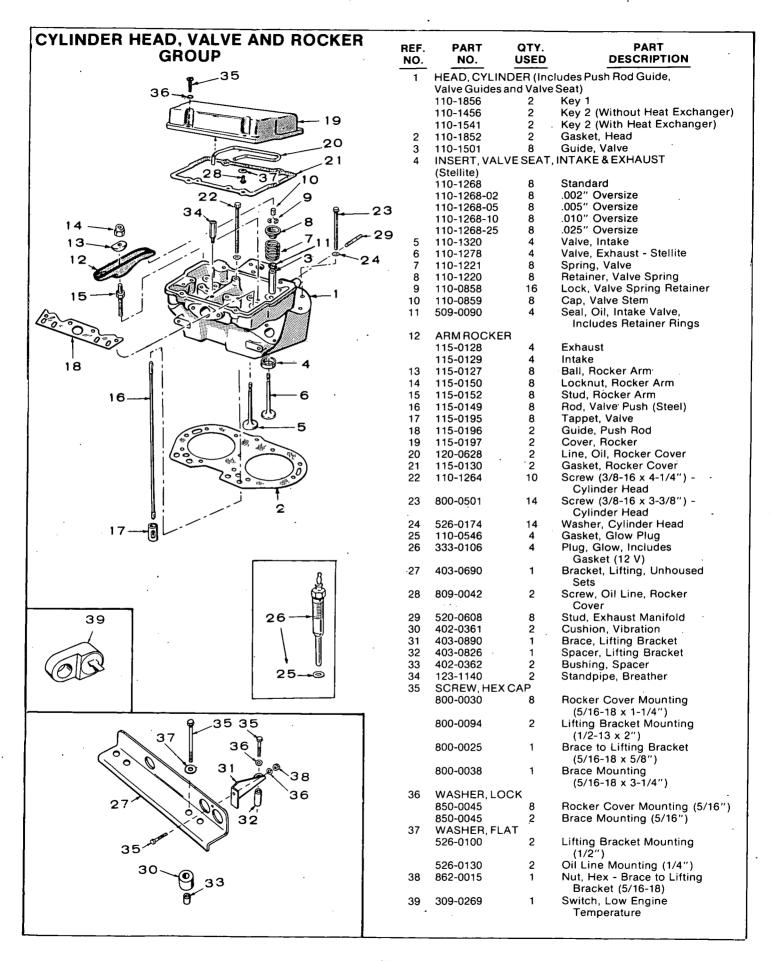
NOTE: Hertz is a unit of frequency equal to one cycle per second.

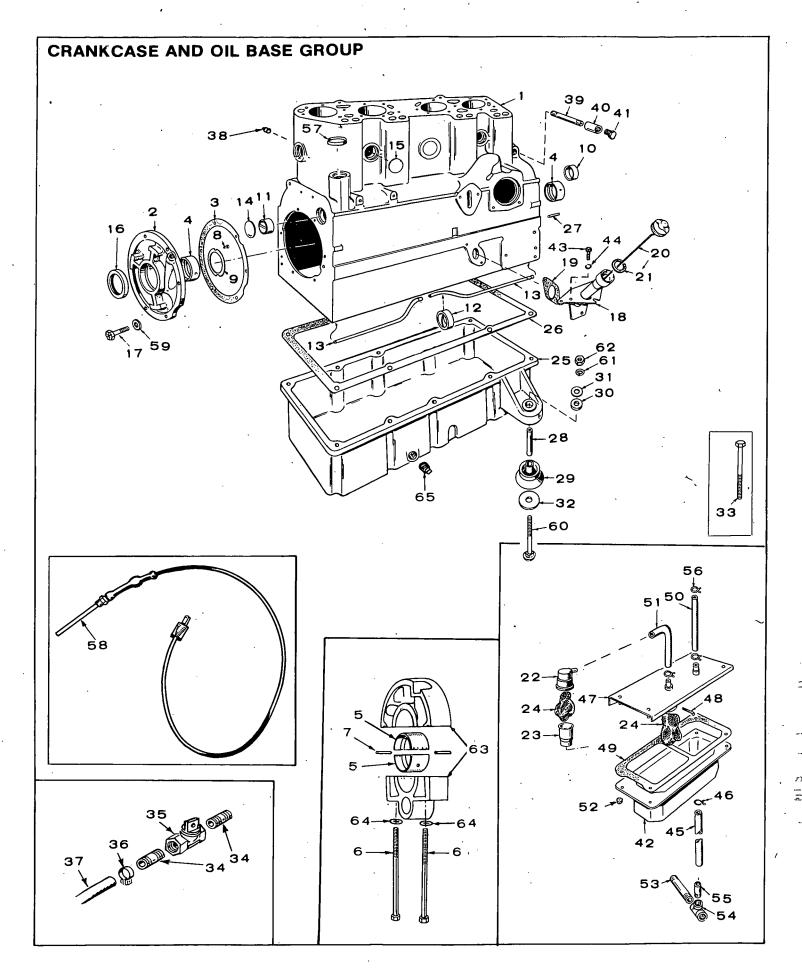
^{* -} The Specification Letter Advances (A to B, B to C, ..., Z to AA, etc.) with manufacturing changes.

^{** -} Set is reconnectible for 120 volt 2 wire, 240 volt 2 wire or 120/240 volt 3 wire service.

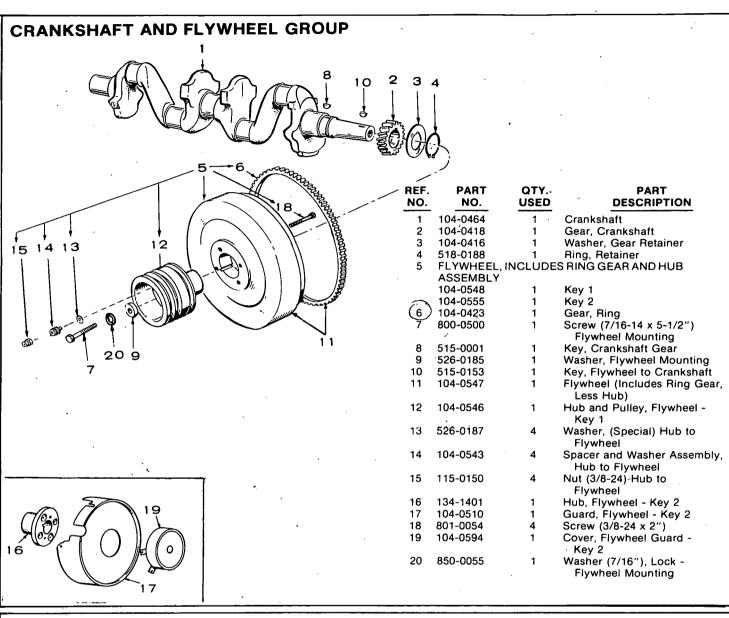
^{£ -} New model designations shown, begin during 1969. Previous designations did not use a decimal in the KW rating. EXAMPLE: 14.5RDJF was formerly 14RDJF.

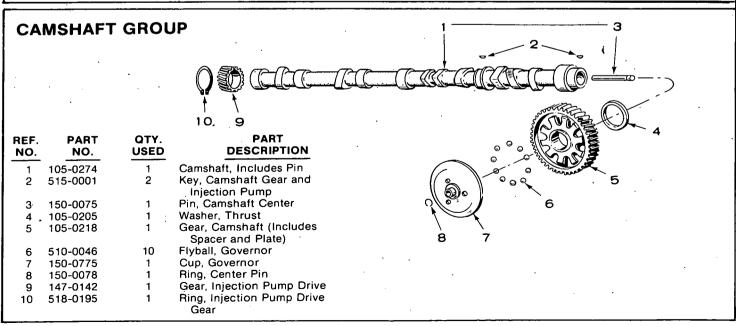
^{+ -} Reconnectible sets beginning Spec AA, refer to AC voltage codes and Voltages Table (Installation Section).

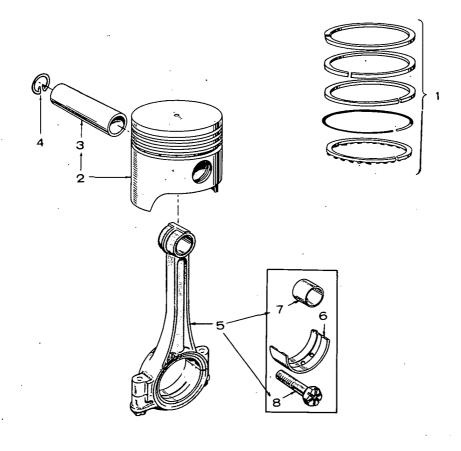




BLOCK ASSEMBLY (Includes Parts Marked * Plus Tappets 101-0712 1 Key 1 101-0336 1 Key 1 101-0339 101-0339 101-0339 - 102 2 Undersize 33 505-0100 2 Key 2 101-0349 101-0359 - 102 2 Undersize 33 505-0266 2 Key With a total on Chassis 101-0359 - 102 2 Undersize 33 505-0266 2 Key With a total on Chassis 101-0359 - 102 2 Undersize 34 505-0267 1 Key 1 101-0359 - 102 2 Undersize 35 505-0449 1 Key 1 101-0359 - 102 2 Undersize 45 505-0267 1 Key 1 101-0363 1 Key 1 101-0365 1 K	REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION	.	REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
Tappets 101-1712 1 Key 1 110-1625 1 Key 2 110-1635 1 Key 2 101-0337 1 Pittle, Rear Bearing 33 800-0081 3 F36-0198 4 F36-0198	1	BLOCK ASSE	MBLY (Ir	ncludes Parts Marked * Plus	- 1	32	WASHER		
110-1712 1 Key 1 110-1712 1 Key 2 110-10337 1 Plate, Rea Bearing (Less Bearing) (Less Bearing) (Less Bearing) 110-10337 1 Plate, Rea Bearing (Less Bearing) 110-10337 1 Plate, Rea Bearing 110-10337 1 Plate Mashers 34 505-0100 3 800-0081 4 Screw (Vibration Mount - Housed and Unhoused Sets 110-10359 2 Standard 35 500-0011 1 Valve, Oil Drain 101-0359 2 Standard 35 500-0011 1 Valve, Oil Drain 101-0359-02 2 002" Undersize 35 500-0011 1 Valve, Oil Drain 101-0359-02 2 002" Undersize 35 505-0268 2 Plug, Cyllore Block (3/8") 101-0359-02 2 002" Undersize 35 505-0268 2 Plug, Cyllore Block (3/8") 101-0359-02 2 002" Undersize 41 502-0153 1 Hose, Oil Drain 101-0361-02 2 002" Undersize 41 502-0153 1 Brass (1/4") 101-0361 2 010" Undersize 41 502-0153 1 Brass (1/4") 101-0361-02 2 002" Undersize 42 23-1061 1 Damper (Sets Hall) 101-0361-02 2 030" Undersize 43 800-0026 3 Screw (6/16-18 x 3/4") 101-0361-02 2 030" Undersize 44 800-0026 3 Screw (6/16-18 x 3/4") 101-0361-02 2 030" Undersize 44 800-0026 3 Screw (6/16-18 x 3/4") 101-0361-02 2 030" Undersize 45 800-0026 3 Screw (6/16-18 x 3/4") 101-0361 101-0361 101-0361 101-0361 101-0361 101-0361 101-0361 101-0361 101-0361 101-0361 101-0361 101-0361 101-0361 101-0361 101-0361 101-0361 101-0361 101-0361 101-0361 101-0361 101-0361 101-0361 101-0361 101-0361 101-0361 101-0361 101-0361 101-0361 101-0361 101-0361 101-0361 101-0361 101-0361 101-0361 101-0361 101-0361 101-0361 101-0361 101-0361 101-0361 101-0361 101-0361 101-0361 101-0361 101-0361 101-0361 101-0361 101-0361 101-0361 101-0361 101-0361 101-0361 101-0361 101-0361 101-0361 101-0361 101-0361 101-0361 101-0361 101-0361 101-0361 101-0361 101-0361 101-0361 101-0361 101-036			•			-		4	†29/64" I.D. x 3-1/4" O.D.
101-0337		110-1712	1	Key 1				•	x 1/8" - Unhoused Sets
101-0337		110-1665	1	Key 2			526-0198	As Req	•†5/8" I.D. x 1-1/2" O.D.
101-0386 1 'Gasket and Shims Kit, Rear Bearing Plate Vashers Bearing Plate Vashers Bearing Plate Washers Bearing Plate Washers Sering Plate Washer	2	101-0337	1	*Plate, Rear Bearing			•	•	
Bearing Plate Vashers Bearing Plate Washers Bearing Plate Washers Bearing Plate Washers 101-0359	•	101 0000	_			33	800-0081	4	
## BEARING, PRECISION MAIN - FRONT AND REAR 101-0359	3	101-0386	1						
BEARING, PRECISION MAIN-FRONT AND REAR 101-0359-0 2 2 2 2 2 2 2 2 2 2				•		24	505 0100	2	· · · · · · · · · · · · · · · · · · ·
101-0359-02 2 Standard 36 503-0197 1 Clamp, Hose 101-0359-02 2 002" Undersize 37 503-0316 1 Hose, Oil Drain 101-0359-10 2 010" Undersize 38 505-0266 2 Plug, Cylinder Block (3/8") 101-0359-30 2 020" Undersize 40 505-0027 1 101-0359-30 2 030" Undersize 41 502-0153 1 101-0361 2 Standard 101-0361 2 Standard 101-0361 2 Standard 101-0361 2 Coupling, Water Drain (1/4") 101-0361 2 Coupling, Water Drain (1/4") 101-0361 2 Coupling, Water Drain (1/4") 101-0361 101-0361-30 2 030" Undersize 42 123-1061 Damper, Breather Pulsation - Damper, Breather Pulsation - Damper, Spec A and B 101-0362 2 1020" Undersize 43 800-0263 3 Screw (5/16-18 x 3/4") Coupling, Water Drain (1/4") Plug, Water Drain (1/4") Plu	4	*DEADING DE	CICION						• • • • • • • • • • • • • • • • • • • •
101-0359-10 2 0.002" Undersize 37 503-0316 1 Hose, Oil Drain Hose 101-0359-30 2 0.002" Undersize 39 505-0449 1 101-0359-30 2 0.002" Undersize 40 505-00027 1 101-0361 2 Standard 101-0361 2 Standard 101-0361-10 2 0.002" Undersize 41 502-0153 1 Brass (1/4") 101-0361-10 2 0.002" Undersize 42 123-1061 1 Brass (1/4") Damper, Breather Pulsation - Spec A and B 101-0361-20 2 0.002" Undersize 43 800-0026 3 Screw (5/16-18 x 3/4") Damper, Spec A and B 101-0361-30 2 0.002" Undersize 43 800-0026 3 Screw (5/16-18 x 3/4") Damper Spec A and B 101-0363 1 Bearing, Precision Cam Front (Standard Only) Earing, Precision Cam Rear (Standard Only) Earing, Precision Cam Rear (Standard Only) Earing, Precision Cam Rear (Standard Only) Earing, Precision Cam Copening 120-0566 1 Front 120-0566	4								
101-0359-02 2 0.010" Undersize 36 505-0266 2 Plug, Cylinder Block (3/8") 101-0359-20 2 0.020" Undersize 40 505-0027 1 1 101-0359-30 2 0.030" Undersize 41 502-0153 1 1 101-0351 2 101-0351 2 0.02" Undersize 42 123-1061 1 Plug, Water Drain (1/4 x") 101-0351 2 0.02" Undersize 43 800-0026 3 3 Marker Plusation - Spec A and B 101-0351 2 0.02" Undersize 44 850-0045 3 3 Marker Plusation - Spec A and B 101-0351-02 2 0.02" Undersize 44 850-0045 3 Marker Plusation - Spec A and B 101-0351-02 2 0.02" Undersize 45 503-0564 1 Plug. Water Drain Plass (1/4") 101-0351-02 2 Bolt, Center Bearing Housing 45 503-0564 1 Plug. Center (Standard Only) 101-0363 1 Bearing, Precision Cam Front (Standard Only) 11 101-0365 1 Bearing, Precision Cam Facar (Standard Only) 12 101-0364 1 Bearing, Precision Cam Facar (Standard Only) 13 TUBE, CRANKCASE OIL Plug. Expansion Rear Cam Opening 5 805-0681 1 120-0585 1 Rear 120-0585 1 Rear 120-0585 1 Rear 120-0586 1 Front 120-0585 1 Rear 120-0586 1 Plug. Expansion Rear Cam Opening 5 805-0682 1 Plug. Expansion Rear Cam Opening 5 805-0682 1 Plug. Cort Hole - Begin 123-0687 1 Gasket, Cap 123-0191 1 Gasket, Cap See A and B See, Old Plass See A and B See, Old Plass See A and B									• *
101-0359-30									
101-0359-30 2 0.030" Undersize 101-0361 2 Standard 101-0361-02 2 .002" Undersize 101-0361-02 2 .002" Undersize 101-0361-02 2 .002" Undersize 101-0361-02 2 .020" Undersize 101-0361-02 2 .030" Undersize 101-0361-02 2 .030" Undersize 101-0361-030 2 .030" Undersize 101-0361-0361 2 .000" Undersize 101-0361-030 2 .030" Undersize 101-0361-030 2									
SEARING, HALF, PRECISION MAIN - CENTER 101-0361 2 Standard 101-0361-10 2 .002" Undersize 42 123-1061 1 Damper, Breather Pulsation - Spec A and B 101-0361-20 2 .002" Undersize 43 800-0026 3 Screw (5/16-18 x 3/4") Washer (5/16'), Lock 4850-0045 3 Screw (5/16-18 x 3/4") Washer (5/16'), Lock 4850-0045 3 Screw (5/16-18 x 3/4") Washer (5/16'), Lock 4850-0045 3 Screw (5/16-18 x 3/4") Washer (5/16'), Lock 4850-0045 3 Screw (5/16-18 x 3/4") Washer (5/16'), Lock 4850-0045 3 Screw (5/16-18 x 3/4") Washer (5/16'), Lock 4850-0045 3 Screw (5/16-18 x 3/4") Washer (5/16'), Lock 4850-0045 3 Screw (5/16-18 x 3/4") Washer (5/16'), Lock 4850-0045 3 Screw (5/16-18 x 3/4") Washer (5/16'), Lock 4850-0045 3 Screw (5/16-18 x 3/4") Washer (5/16'), Lock 4850-0045 3 Screw (5/16-18 x 3/4") Washer (5/16'), Lock 4850-0045 3 Screw (5/16-18 x 3/4") Washer (5/16'), Lock 4850-0045 3 Screw (5/16-18 x 3/4") Washer (5/16'), Lock 4850-0045 3 Screw (5/16-18 x 3/4") Washer (5/16'), Lock 4850-0045 3 Screw (5/16-18 x 3/4") Washer (5/16'), Lock 4850-0045 3 Screw (5/16-18 x 3/4") Washer (5/16'), Lock 4850-0045 4 Screw (5/16-18 x 3/4") Washer (5/16'), Lock 4850-0045 4 Screw (5/16-18 x 3/4") Washer (5/16'), Lock 4 Screw									Coupling Water Drain (1/4 x 6)
101-0361 2 Standard 101-0361-02 2 002" Undersize 42 123-1061 1 Damper, Facher Pulsation - Spec A and B 101-0361-30 2 030" Undersize 43 800-0026 3 Spec A and B Strew (5/16-1), Lock 45 850-0045 3 Washer (5/16"), Lock 46 850-0045 3 Washer (5/16"), Lock 47 850-0045 3 Washer (5/16"), Lock 48 850-0045 3 Washer (5/16"), Lock 48 850-0045 3 Washer (5/16"), Lock 48 850-0045 3 Washer (5/16"), Lock 47 530-0564 48 850-0045 3 Washer (5/16"), Lock 49 101-0362 1 Hose, Coverflow - Pulsation Damper - Spec A and B Clamp, Overflow - Pulsation Damper - Spec A and B Clamp, Overflow - Pulsation Damper - Spec A and B Front (Standard Only) 11 101-0365 1 Bearing, Frecision Cam Front (Standard Only) 12 101-0364 1 Bearing, Frecision Cam Front (Standard Only) 13 TUBE, CFANKCASE OIL 120-0586 1 Rear 120-0586 1 Plug, Expansion Rear Cam Opening 52 870-0240 4 Manifold - Spec A and B Manifold - Spec A and B 120-0586 1 Plug, Expansion Rear Cam Opening 52 870-0240 4 Nut, Washer Base - Spec A & B 157-0096 As Req. 1-3/16" 55 550-0683 1 Tee, Oil Drain - Spec A & B 157-0096 As Req. 1-3/16" 55 550-0683 1 Tee, Oil Drain - Spec A & B 150-0086 1 Sea, Cramp, Spec 157-0096 As Req. 1-3/16" 59 526-0245 6 Solot, Carriage - Set Mounting 120-0586 1 Gasket, Oil Fill 59 526-0245 6 Solot, Carriage - Set Mounting 120-0586 1 Gasket, Oil Base Spec A and B Solot, Carriage - Set Mounting 120-0586 1 Gasket, Oil Base Spec A and B Solot, Carriage - Set Mounting 120-0586 1 Gasket, Oil Base Spec A and B Solot, Carriage - Set Mounting 120-0586 1 Gasket, Oil Base Spec A and B Solot, Carriage -	5	*BEVBING M							
101-0361-102	3					41	302-0133	'	
101-0361-10						42	122-1061		· ·
101-0361-320						42	123-1001	'	
101-0361-30						42	900 0026	2	
6 101-0342 2 'Pin, Center Bearing Housing 7 516-0149 2 'Pin, Chroter Bearing Housing 8 516-0072 4 'Pin, Thrust Washer 9 104-0420 2 'Washer, Crankshaft Thrust 10 101-0363 1 'Bearing, Precision Cam Front (Standard Only) 11 101-0365 1 'Bearing, Precision Cam Rear (Standard Only) 12 101-0365 1 'Bearing, Precision Cam Rear (Standard Only) 13 'TUBE, CRANKCASE OIL 120-0586 1 Front 120-0586 1 Front 120-0586 1 Rear Opening Opening 15 'PLUG, CYLINDER BLOCK EXPANSION Order by Size) 17-0059 As Req. 1-9/16" 517-0097 As Req. 1-9/16" 517-0097 As Req. 1-9/16" 517-0097 As Req. 1-9/16" 517-0097 As Req. 1-9/16" 5101, Rear Bearing Plate (JW-16) 1 Cap and Indicator 21 123-0665 1 Cap and Indicator 21 123-0665 2 Baffle, Breather Tube Spec A and B 10-0288 2 Generator End Guezova 4 **Issaher Fube Ago-20287 2 Generator End Guezova 4 **Issaher Fube Sets on Chassis (Includes Parts included in the Cylinder Block Assembly. 1- Parts included in the Cylinder Block Assembly. 1- Parts included in the 402-0291 Hardware Package. 1-					i				
7 516-0149 2 'Pin, Conter Bearing Housing 8 516-0072 4 'Pin, Thrust Washer 9 104-0420 2 'Washer, Crankshaft Thrust 10 101-0363 1 'Bearing, Precision Cam Front (Standard Only) 11 101-0365 1 'Bearing, Precision Cam Rear (Standard Only) 12 101-0364 1 'Bearing, Precision Cam Rear (Standard Only) 13 'TUBE, CRANKCASE OIL 120-0386 1 Front 120-0386 1 Rear 120-0386 1 Rear 1517-0053 1 'Plug, Expansion Rear Cam Opening Corder by Size) 517-0096 As Req. 1-7/16" 517-0097 As Req. 1-3/4" 16 509-0086 1 Seal, Crankshaft Rear 16 509-0086 1 Seal, Crankshaft Rear 17 805-0019 6 'Bolt, Rear Bearing Plate (3/8-16 x 1-1/4") 18 123-1086 1 Tube, Oil Fill 19 123-0667 1 Gasket, Oil Fill 19 123-0667 1 Gasket, Cap 21 123-0787 1 Cap, Breather Tube-Spec A and B 22 123-0865 2 Baffle, Breather Tube-Spec A and B 23 120-0389 2 Baffle, Breather Tube-Spec A and B 24 123-0865 2 Baffle, Breather Tube-Spec A and B 25 102-0378 1 Gasket, Oil Base 26 102-0475 1 Gasket, Oil Base 27 102-0589 2 Baffle, Breather Tube-Spec A and B 28 0402-0285 2 Engine End 402-0286 2 Generator End 402-0287 2 Generator End 46 503-019 4 Fonding-Plus 47 123-1045 1 Cover, Breather Pulsation Damper - Spec A and B 47 123-1045 1 Cover, Breather Pulsation Damper - Spec A and B 47 123-1045 1 Cover, Breather Pulsation Damper - Spec A and B 47 123-1045 1 Cover, Breather Pulsation Damper - Spec A and B 48 516-0177 1 Gasket, Oil Same - Spec A and B 49 123-1049 1 133-1049 1 Gasket, Oil Base 517-0059 As Req. 1-3/16" 55 503-0563 1 Hose, Damper Hose Cap - Spec A and B 50 505-0682 1 Tee, Oil Drain - Spec A & B 517-0096 As Req. 1-3/16" 55 505-0682 1 Tee, Oil Drain - Spec A & B 517-0097 As Req. 1-3/16" 55 505-0682 1 Tee, Oil Drain - Spec A & B 517-0097 As Req. 1-3/16" 55 505-0682 1 Tee, Oil Drain - Spec A & B 517-0097 As Req. 1-3/16" 55 505-0682 1 Tee, Oil Drain - Spec A & B 517-0097 As Req. 1-3/16" 55 505-0682 1 Tee, Oil Drain - Spec A & B 65 503-0170 4 Clamper Hose Color - Value - Va	. 6								
8 516-0072 4 *Pin, Thrust Washer 9 104-0420 2 *Washer, Crankshaft Thrust 10 101-0363 1 *Bearing, Precision Cam Front (Standard Only) 11 101-0365 1 *Bearing, Precision Cam Rear (Standard Only) 12 101-0364 1 *Bearing, Precision Cam Center (Standard Only) 13 *TUBE, CRANKCASE OIL 120-0586 1 Front 120-0586 1 Plug, Expansion Rear Cam Opening 5 505-0681 1 Hose, Damper Cover to Manifold - Spec A and B 15 *PLUG, CYLINDER BLOCK EXPANSION 5 505-0681 1 Nipple, Damper Spec A & B 517-0059 As Req. 1-7/16" 5 505-0681 1 Nipple, Damper Spec A & B 517-0059 As Req. 1-9/16" 5 505-0683 1 Nipple, Damper Spec A & B 517-0059 As Req. 1-9/16" 5 505-0681 1 Nipple, Damper Spec A & B 517-0059 As Req. 1-9/16" 5 505-0681 1 Nipple, Damper Spec A & B 517-0059 As Req. 1-9/16" 5 505-0681 1 Nipple, Damper Spec A & B 517-0059 As Req. 1-9/16" 5 505-0681 1 Nipple, Damper Spec A & B 517-0059 As Req. 1-9/16" 5 505-0683 1 Nipple, Damper Spec A & B 517-0059 As Req. 1-3/4" 5 505-0681 1 Nipple, Damper Spec A & B 517-0059 As Req. 1-3/4" 5 505-0683 1 Nipple, Damper Spec A & B 517-0059 As Req. 1-3/4" 5 505-0681 1 Nipple, Damper Spec A & B 517-0059 As Req. 1-3/4" 5 505-0681 1 Nipple, Damper Spec A & B 517-0059 As Req. 1-3/4" 5 505-0681 1 Nipple, Damper Spec A & B 517-0059 As Req. 1-3/4" 5 505-0681 1 Nipple, Damper Spec A & B 517-0059 As Req. 1-3/4" 5 505-0681 1 Nipple, Damper Spec A & B 517-0059 As Req. 1-3/4" 5 505-0681 1 Nipple, Damper Spec A & B 517-0059 As Req. 1-3/4" 5 505-0681 1 Nipple, Damper Spec A & B 517-0059 As Req. 1-3/4" 5 505-0681 1 Nipple, Damper Spec A & B 6 505-0059 As Req. 1-3/4" 5 505-0681 1 Nipple, Damper Spec A & B 6 505-0055 4 Parts Marked † 1 Nipple, Damper Spec A & B 6 505-0055 4 Parts Marked † 1 Nipple, Damper Pose A and B 6 505-0055 4 Parts Marked † 1 Nipple, Damper Parks Marked * 1 Nipple, Damper Parks Marked						45	303-0364	ı	
9 104-0420 2 'Washer, Crankshaft Thrust 10 101-0363 1 'Bearing, Precision Cam Front (Standard Only) 11 101-0365 1 'Bearing, Precision Cam Rear (Standard Only) 12 101-0364 1 'Bearing, Precision Cam Rear (Standard Only) 13 'TUBE, CRANKCASE OIL 120-0386 1 Front 120-0386 1 Front 120-0386 1 Rear 151-0053 1 'Plug, Expansion Rear Cam Opening 15 'PLUG, CYLINDER BLOCK EXPANSION 16 'Order by Size) 17-0059 As Req. 1-7/16" 17-0097 As Req. 1-3/4" 18 123-1086 1 Seal, Crankshaft Rear 16 509-0086 1 Seal, Crankshaft Rear 17 805-0019 6 'Bolt, Rear Bearing Plate 19 123-0667 1 Gasket, Oil Fill 19 123-0667 1 Gasket, Cap 12 123-0787 1 Cap, Breather Tube-Spec A and B 102-0287 2 Generator End 20 123-0865 2 Baffle, Breather Tube-Spec A and B 21 120-0287 2 Generator End 20 120-0287 2 Generator End 30 402-0282 4 * Snubber, Shock Mounting} 31 526-0014 4 * Washer (29/64" I.D. x 47 123-1045 1 Cover, Breather Pulsation Damper - Spec A and B 31 616-0179 1 Gasket, Oil Base 9in, Cotter - Filter Retainer - Spec A and B 47 123-1045 1 Cover, Breather Pulsation Damper - Spec A and B 48 516-0171 2 Plog-Cotter Jugget 1 Plug, Cotter - Filter Retainer - Spec A and B 49 123-1049 1 Gasket, Pulsation Damper - Spec A and B 402-0286 2 Horns And B 402-0287 2 Generator End 47 123-1045 1 Cover, Breather Pulsation Damper - Spec A and B 402-0287 2 Generator End 47 123-1045 1 Cover, Breather Pulsation Damper - Spec A and B 47 123-1045 1 Plug-Cotter Fulsation Damper - Spec A and B 47 123-1049 1 Gasket, Pulsation Damper - Spec A and B 48 516-0179 1 Plug-Cotter for Breather Pulsation Damper - Spec A and B 49 123-1049 1 Gasket, Pulsation Manifold - Spec A and B 402-0286 1 Front Damper - Spec A and B 402-0286 2 Baffle, Pulsation Damper - Spec A and B 402-0287 2 Generator End 47 100-0366 1 Plug-Cotter Pulsation Mount 47 123-1049 1 Gasket, Pulsation Damper - Spec A and B 47 123-1049 1 Base, Oil Damper - Spec A and B 48 516-017 1 Plug-Cotter Pulsation Damper - Spec A and B 49 102-0286 1 Plug-Cotter Pulsation Damper - Spec A and B 49 102-0286 1 Plug-Cotter Pulsation Damp						. 46	502 0107	2	
10 101-0363 1 *Bearing, Precision Cam Front (Standard Only) 101-0365 1 *Bearing, Precision Cam Rear (Standard Only) 12 101-0364 1 *Bearing, Precision Cam Center (Standard Only) 13 *TUBE, CRANKCASE OIL 120-0586 1 *Front 120-0586 1 *Front 120-0586 1 *Front 120-0586 1 *Front 120-0585 1				·		46	503-0197	۷ .	
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Center (Standard Only) 13 *TUBE, CRANKCASE OIL 120-0586	10	101.0064				40	100 1010		- •
13 *TUBE, CRANKCASE OIL	12	101-0364	1 .			49	123-1049	ו	
120-0586 1 Front 120-0585 1 Rear 120-0585 1 Rear 14 517-0053 1 'Plug, Expansion Rear Cam	12	TUBE COAN	KCASE C		ł		500 0500	_	
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14 517-0053 1 'Plug, Expansion Rear Cam Opening Openi							500 0500		
Second	4.4					51	503-0562	ı	
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(Order by Size) 517-0059	4.5	*0.110.001.18	יסבט פו ע		1				
517-0059 As Req. 1-7/16" 517-0096 As Req. 1-9/16" 517-0097 As Req. 1-9/16" 517-0097 As Req. 1-3/4" 517-013 1 Plug, Core Hole - Begin Spec C 61 Base - Optional 61 Base - Optional 62 Base - Optional 63 102-0212 4 †Bolt, Carriage - Set Mounting - Unhoused Sets 61 850-0055 4 *†Washer, Lock - Set Mounting - Unhoused Sets 62 Base-0004 4 †Nut, Hex - Set Mounting - Unhoused Sets 63 101-0356 1 *Housing, Center Main Bearing 64 526-0035 2 *Washer (1/2"), Flat 65 505-0056 1 *Plug (1/2"), Square Head 67 505-0056 1 *Plug (1/2"), Square Head 68 505-0056 1 *Plug (1/2"), Square Head 69 505-0056 1 *Plug (1/2"), Square Head 60 505-0056 1 *Plug (1/2"), Square Head	15			JCK EXPANSION					
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16 509-0086 1 Seal, Crankshaft Rear 17 805-019 6 Bolt, Rear Bearing Plate (3/8-16 x 1-1/4") 18 123-1086 1 Tube, Oil Fill 19 123-0667 1 Gasket, Oil Fill 20 123-1056 1 Cap and Indicator 21 123-0191 1 Gasket, Cap 22 123-0787 1 Cap, Breather Tube - Spec A and B 23 123-0645 1 Tube, Breather Tube - Spec A and B 24 123-0865 2 Baffle, Breather Tube - Spec A and B 25 102-0539 1 Base, Oil 26 102-0475 1 Gasket, Oil Base 27 516-0141 2 Pin, Gear Cover Locating 28 402-0290 4 ●†Bushing, Spacer, Vibration Mount Mount Mount Mount Mount 9 CUSHION, VIBRATION, CONE SHAPED 402-0285 2 Engine End 402-0287 2 Generator End 30 402-0282 4 ●†Snubber, Shock Mounting 31 526-0014 4 •†Washer (29/64" I.D. x 57 517-0103 1 Plug, Core Hole - Begin Spec C Heater, Oil Base - Optional Spec A Spec A of Base-Option Spec A Spec C Heater, Oil Base - Optional Spec A Spec A of Base-Option Spec A Spec A of Base-Option Spec						56	E02 0170	4	
17 805-0019 6 *Bolt, Rear Bearing Plate (3/8-16 x 1-1/4") 58 102-0558 1 Heater, Oil Base - Optional 18 123-1086 1 Tube, Oil Fill 59 526-0245 6 Washer, Flat - Bearing Plate 123-0667 1 Gasket, Oil Fill 59 526-0245 6 Washer, Flat - Bearing Plate 123-0667 1 Gasket, Oil Fill 60 816-0212 4 Holoused Sets 1 123-0191 1 Gasket, Cap 123-1056 1 Cap and Indicator 123-0787 1 Cap, Breather Tube - Spec A and B 123-0645 1 Tube, Breather Tube - Spec A and B 123-0865 2 Baffle, Breather Tube - Spec A and B 123-0865 2 Baffle, Breather Tube - Spec A and B 123-0865 2 Baffle, Breather Tube - Spec A and B 123-0865 2 Baffle, Breather Tube - Spec A and B 123-0865 2 Basket, Oil Base 102-0475 1 Gasket, Oil Base 102-0356 4 Hardware Package - Mounting Housed Sets and Unhoused Sets on Chassis (Includes Parts Marked ◆) 129 CUSHION, VIBRATION, CONE SHAPED 129 CUSHION, VIBRATION, CONE SHAPED 130 402-0285 2 Engine End 1402-0285 4 •†Snubber, Shock Mounting 1502-0287 2 Generator End 1502-0044 4 •†Snubber, Shock Mounting 1502-0287 2 Farts included in the 402-0291 Hardware Package. 1502-0356 Hardware Package. 1502-0	16		•						
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19 123-0667	10	123-1096	1						
20 123-1056					·				
21 123-0191					ı	. 00	010-0212	7	
22 123-0787				Gasket Can		61	850-0055	4	
Spec A and B Unhoused Sets			•		ł				
23 123-0645 1 Tube, Breather - Spec A and B 24 123-0865 2 Baffle, Breather Tube - Spec A and B 25 102-0539 1 Base, Oil Self-0141 2 *Pin, Gear Cover Locating August Package - Mounting - Parts Marked †) 26 402-0290 4 *Pin, Gear Cover Locating August Package - Mounting - Housed Sets and Unhoused Sets on Chassis (Includes Parts Marked *) 27 516-0141 2 *Pin, Gear Cover Locating August Package - Mounting - Housed Sets and Unhoused Sets on Chassis (Includes Parts Marked *) 28 402-0290 4 *Pin, Gear Cover Locating August Package - Mounting - Housed Sets and Unhoused Sets on Chassis (Includes Parts Marked *) 29 *CUSHION, VIBRATION, CONE SHAPED August Package - Mounting - Parts included in the Cylinder Block Assembly * - Parts included in the Cylinder Block Assembly * - Parts included in the 402-0291 Hardware Package * - Parts included in the 402-0356 Hardware Package * - Parts included in the 402-0356 Hardware Package * - Parts included in the 402-0356 Hardware Package * - Parts included in the 402-0356 Hardware Package * - Parts included in the 402-0356 Hardware Package * - Parts included in the 402-0356 Hardware Package * - Parts included in the 402-0356 Hardware Package * - Parts included in the 402-0356 Hardware Package * - Parts included in the 402-0356 Hardware Package * - Parts included in the 402-0356 Hardware Package * - Parts included in the 402-0356 Hardware Package * - Parts included in the 402-0356 Hardware Package * - Parts included in the 402-0356 Hardware Package * - Parts included in the 402-0356 Hardware Package * - Parts included in the 402-0356 Hardware Package * - Parts included in the 402-0356 Hardware Package * - Parts included in the 402-0356 Hardware Package * - Parts included in the 402-0356 Hardware Package * - Parts included in the 402-0356 Hardware Package * - Parts included in the 402-0356 Hardware Package * - Parts included in the 402-0356 Hardware Package * - Parts included in the 402-0356 Hardware Package * - P	22	125-0707	•			02	002-0004	₩.	
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Spec A and B 25	24	122 0965	2						
25 102-0539 1 Base, Oil 26 102-0475 1 Gasket, Oil Base 27 516-0141 2 *Pin, Gear Cover Locating 28 402-0290 4 •†Bushing, Spacer, Vibration	24	120-0000	2			03			
26 102-0475 1 Gasket, Oil Base 27 516-0141 2 *Pin, Gear Cover Locating 28 402-0290 4 •†Bushing, Spacer, Vibration	25	102-0530	1	• .			402-0251	4	
27 516-0141 2 *Pin, Gear Cover Locating 28 402-0290 4 •†Bushing, Spacer, Vibration Mount 29 CUSHION, VIBRATION, CONE SHAPED 402-0285 2 Engine End 402-0287 2 Generator End 30 402-0282 4 •†Snubber, Shock Mounting 31 526-0014 4 •†Washer (29/64" I.D. x 402-0356 4 Hardware Package - Mounting - Housed Sets and Unhoused Sets on Chassis (Includes Parts Marked •) - Parts included in the Cylinder Block Assembly. † - Parts included in the 402-0291 Hardware Package. • - Parts included in the 402-0356 Hardware Package.									·
28 402-0290 4 •†Bushing, Spacer, Vibration Mount 29 CUSHION, VIBRATION, CONE SHAPED 402-0285 2 Engine End 402-0287 2 Generator End 30 402-0282 4 •†Snubber, Shock Mounting 31 526-0014 4 •†Washer (29/64" I.D. x •†Rushing, Spacer, Vibration Mount Sets on Chassis (Includes Parts Marked •) • Parts included in the Cylinder Block Assembly. † - Parts included in the 402-0291 Hardware Package. • - Parts included in the 402-0356 Hardware Package.							400 0056	4	
Mount 29 CUSHION, VIBRATION, CONE SHAPED 402-0285 2 Engine End 402-0287 2 Generator End 30 402-0282 4 •†Snubber, Shock Mounting 31 526-0014 4 •†Washer (29/64" I.D. x Sets on Chassis (Includes Parts Marked •) * - Parts included in the Cylinder Block Assembly. † - Parts included in the 402-0291 Hardware Package. • - Parts included in the 402-0356 Hardware Package.							402-0330	4	
29 CUSHION, VIBRATION, CONE SHAPED 402-0285 2 Engine End 402-0287 2 Generator End 30 402-0282 4 •†Snubber, Shock Mounting 31 526-0014 4 •†Washer (29/64" I.D. x Parts Marked •) * - Parts included in the Cylinder Block Assembly. † - Parts included in the 402-0291 Hardware Package. • - Parts included in the 402-0356 Hardware Package.	20	402-0290	4						
402-0285 2 Engine End 402-0287 2 Generator End 30 402-0282 4 •†Snubber, Shock Mounting 31 526-0014 4 •†Washer (29/64" I.D. x 402-0285 2 Engine End - Parts included in the Cylinder Block Assembly. † - Parts included in the 402-0291 Hardware Package. - Parts included in the 402-0356 Hardware Package.	20	CHELION	IDDATIO				1		•
402-0287 2 Generator End * - Parts included in the Cylinder Block Assembly. 30 402-0282 4 •†Snubber, Shock Mounting † - Parts included in the 402-0291 Hardware Package. 31 526-0014 4 •†Washer (29/64" I.D. x • - Parts included in the 402-0356 Hardware Package.	29				ļ		•		rarts Markeo ●)
30 402-0282 4 •†Snubber, Shock Mounting † - Parts included in the 402-0291 Hardware Package. 31 526-0014 4 •†Washer (29/64" I.D. x • - Parts included in the 402-0356 Hardware Package.					İ		D- 4- 1 1 1		Dulla dan Dia at Ass. 11
31 526-0014 4 ●†Washer (29/64" I.D. x • - Parts included in the 402-0356 Hardware Package.					1				
1-1/2 U.U. X 1/8)	31	526-0014	4		}	• -	Parts include	ed in the 4	102-0356 Hardware Package.
				1-1/2 U.U. X 1/8)	•				

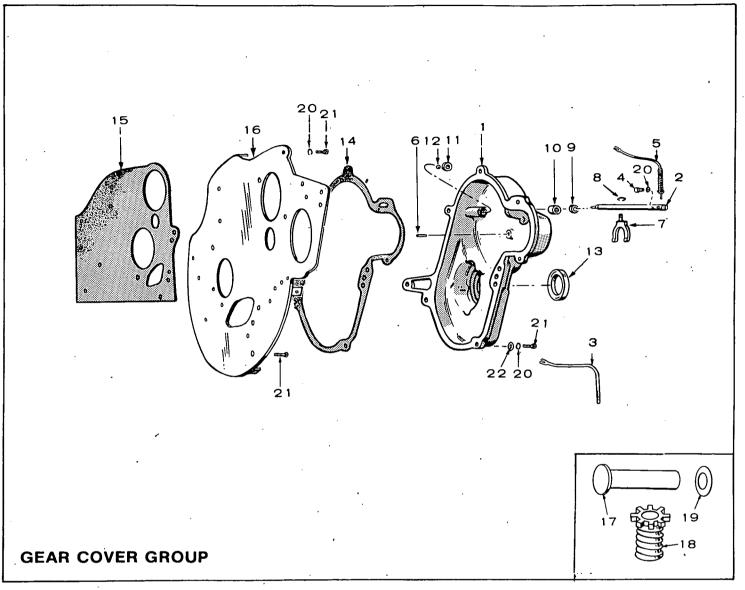




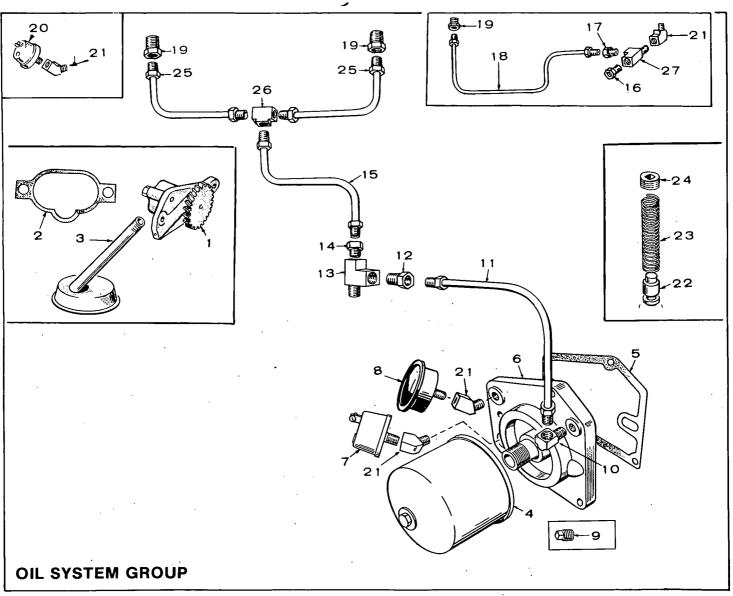


PISTON AND CONNECTING ROD GROUP

REF.	PART NO.	QTY. USED	PART DESCRIPTION	REI		PART NO.	QTY. USED	PART DESCRIPTION
1	RING SET, PIS	STON		4	112	-0085	8	Ring, Retaining - Piston
	113-0137	4	Standard	j				Pin
	113-0137-05	4	.005" Oversize	5	114	-0168	4	Rod Assembly, Connecting
	113-0137-10	4	.010" Oversize	-				(Forged)
	113-0137-20	4	.020" Oversize	1 6	BEA	RING HAL	F, CONN	IECTING ROD
	113-0137-30	4	.030" Oversize		114	-0164	8	Standard
	113-0137-40	4	.040" Oversize	-	114	-0164-02	8	.002" Undersize
2	PISTON AND	PIN (Incl	udes Pin Retaining Rings)		114	-0164-10	8	.010" Undersize
	112-0118	4	Standard	1	114	-0164-20	8	.020" Undersize
	112-0118-05	4	.005" Oversize		114	-0164-30	8	.030" Undersize
	112-0118-10	4	.010" Oversize	7	114	-0170	8	Bushing, Piston Pin,
	112-0118-20	4	.020" Oversize					Connecting Rod,
	112-0118-30	4	.030" Oversize					Semi-finished
	112-0118-40	4	.040" Oversize	8	805	-0012	8	Bolt (5/16-24 x 1-13/16"),
3	112-0117	4	Pin, Piston					Place - Connecting Rod



REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION	REF NO.		QTY. USED	PART DESCRIPTION	
1	COVERASS	EMBLY. G	SEAR, COMPLETE	18	150-1160	1	*Hub, Governor Shaft - Key 1	
	(Includes Parts Marked *)			19	150-1155	1	*Washer, Spring - Governor	
	103-0307	1	Key 1				. Shaft - Key 1	
	103-0277	1	Key 2	20	WASHER, LC	CK	•	
2	*SHAFT, GOV	/ERNOR			850-0045	5	Gear Cover Mounting (5/16")	
	150-0901	· 1	Key 1		850-0045	1	Gear Cover Backplate	
	150-0838	1	Key 2				Mounting (5/16")	
3	150-1228	1	Arm, Governor - Key 1		850-0025	1	*Governor Shaft (#8) - Key 1	
4	815-0176	1	*Screw (#8-32 x 1/2") -				Includes 2	
			Key 1 Includes 2	21	SCREW, HEX	CAP	•	
5	150-1095	1	Arm, Governor - Key 2	•	800-0028	_. 1	Gear Cover Mounting	
6	516-0111	1	*Pin, Governor Cup Stop			-	(5/16-18 x 1")	
7	150-0777	1	*Yoke, Governor		110-0879	4	Gear Cover Mounting	
8	518-0129	1	*Ring, Yoke Retaining				(5/16-18 x 1-1/4")	
. 9	509-0088	1	*Seal, Governor Shaft		800-0026	. 1	Gear Cover Backplate Mounting	
10	510-0048	1	*Bearing, 1/2" Shaft				(5/16-18 x 3/4")	
11	510-0082	1	*Bearing, 1/4" Shaft	•	815-0347	2	Gear Cover Backplate Mounting	
12	510-0043	4	*Ball, Governor Shaft Thrus			_	(1/4-20 x 1/2")	
13	509-0087	1	*Seal	22	526-0115	5	Washer (5/16") - Gear	
14	103-0251	1	Gasket, Gear Cover		*		Cover Mounting	
15	103-0218	1	Gasket, Blackplate			_		
16	103-0228	1	Backplate	 Included in Gear Cover Assembly. 				
17	150-1154	1	*Pin, Governor Shaft Hub - Key 1					

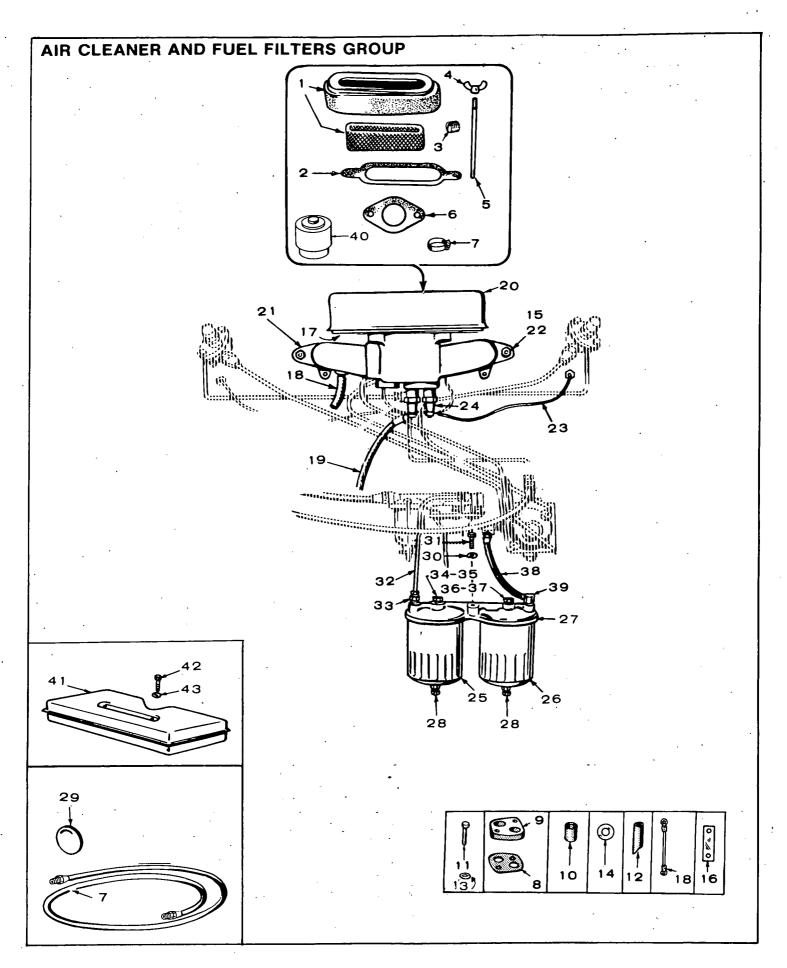


REF.	PART NO.	QTY. USED	PART DESCRIPTION	REF.	PART NO.	QTY. USED	PART DESCRIPTION
1	120-0547	1	Pump Assembly, Oil	17	502-0097	1	Connector, Front Cylinder Head
2	120-0580	1	Gasket Kit, Oil Pump			·	Tee to Rear Cylinder Head
3	120-0551	1	Cup Assembly, Oil Pump	Ì			Line - Spec A and B
			Intake .	18	120-0635	1	Line, Front Cylinder Head Tee
4	122-0185	1	Filter	ŀ			to Rear Cylinder Head
5	122-0188	1	Gasket, Adapter				Connector - Spec A and B
6	122-0182	1	Adapter, Oil Filter	19	502-0281	2	Connector, Cylinder Heads
7	193-0108	1	Sender, Oil Pressure Gauge				NOTE: 1 Only used Spec A
8	193-0006	1	Gauge, Oil Pressure			•	and B on Rear Head
9	505-0057	2	Plug, 1/8"	20	309-0169	1	Switch, Low Oil Pressure (Not
10	502-0037	1	Elbow, Oil Line to Adapter				 used on Pennsylvania
11	120-0636	1	Line, Adapter to Injection				Approved Models)
			Pump Tee	21	502-0053	2	Elbow (45°), Low Oil
12	502-0274	1	Connector, Adapter Line to	ļ			Pressure Sender and Switch -
			Injection Pump Tee				NOTE: 1 Used on Front
13	502-0242	1	Tee, Restricted	1		_	Cylinder Head Spec A and B)
14	502-0097	1	Connector, Injection Pump Tee	22	120-0539	1	Valve, Oil By-Pass
			to Cylinder Head Line	23	120-0555	1	Spring, By-Pass Valve
15	•			24	505-0274	1	Plug, 1/8" Oil By-Pass
	HEAD TEE		,	25	120-0695	2	Line, Oil - To Cylinder Heads -
	120-0630	1	Spec A and B				Begin Spec C
	120-0697	. 1	Begin Spec C	26	502-0373	1	Tee, Cylinder Head Lines -
16	502-0097	1	Connector, Cylinder Head Line	l	•		Begin Spec C
. •	002 000.	•	to Front Cylinder Head Tee -	27	502-0282	1	Tee, Front Cylinder Head -
			Spec A and B	1			Spec A and B

FUEL TRANSFER PUMP AND INJECTION SYSTEM GROUP

REF.	PART NO.	QTY. USED	PART DESCRIPTION
	149-1046	1	Repair Kit, Fuel Pump (Includes Diaphragm and Gaskets)
			Does Not Apply for
			AC Pumps
1	862-0015	4 ·	Nut, Injection Pump Mounting
'	002-0013	4	(5/16-18)
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	8	Shield, Nozzle Heat (Steel)
6	ELBOW, NO	ZZLE (Fuel	Return Line)
	502-0065	2	Inverted 45° (#1 and 4
			Cylinders)
	502-0002	2	Inverted 90° (#2 and 3
_			Cylinders)
7	147-0243	4	Gasket, Nozzle
8	147-0141	. 4	Flange, Injection Nozzle Holddown
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
14	526-0065	2	Washer, Fuel Pump Mounting
15	502-0245	1	Adapter, Return Lines
16		CTION PUM	IPTO NOZZLE, INCLUDES
	FITTING		
	149-1150	1	#1 Cylinder
	149-1151	1	#2 Cylinder
	149-1152	1	#3 Cylinder #4 Cylinder
17	149-1153 LINE, NOZZ		
17	149-1060	1	#1 Cylinder
	149-1059	2	#2 & 3 Cylinders
	149-1061	1	#4 Cylinder
18	149-1062	1	Line, Injection Pump to Fuel
.5	0 .002		Return Lines Tee
19	WASHER, F	LAT	
-	526-0122	4	Nozzle & Holder Mounting
	526-0022	4	Injection Pump Mounting

REF.	PART NO.	QTY. USED	PART DESCRIPTION
20	850-0045	4	Lockwashers, Injection Pump Mounting (5/16")
21	147-0183	. 1	Valve, Bleeder, Injection Pump
22	147-0232	1	Pump, Injection (Includes Buttons 2, 4, 11 & 12)
23	149-1020	1	Pump, Fuel Transfer
24	149-0116	1	Bowl, Fuel Pump (Glass)
25	502-0039	1	Elbow, Injection Pump Inlet
26	BUTTON	NJECTION	PUMP PLUNGER
0	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	i	.110 - Marked 4 or D
	147-0151	1	.107 - Marked 5 or E
	147-0161	i	.104 - Standard Marked II or
	141 0101	•	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	i	.089 - Marked 10 or L
	147-0190	i .	.122 - Marked 12 or M
	147-0189	1	.125 - Marked 13 or N
	147-0188	i	.128 - Marked 14 or P
	147-0187	1	.131 - Marked 15 or R
	147-0186	i	.134 - Marked 16 or S
27	520-0129	4	Stud, Injection Pump Mounting
28	509-0094	i	Seal, O-Ring, Injection Pump
			to Crankcase
- 29	147-0182	1	Tappet, Injection Pump
30	147-0196	1	Gasket, O-Ring, Injection
00	0.00	,	Pump Tappet
31	147-0145	1	Shim Kit, Injection Pump
			Mounting
32	SCREW, H	IEX CAP	•
	114-0171	8	Nozzle & Holder Mounting
			(5/16-18 x 2")
	800-0027	2	Transfer Pump Mounting
			(5/16-18 x 7/8")
33	526-0122	8	Washer, Flat - Nozzle and Holder Mounting

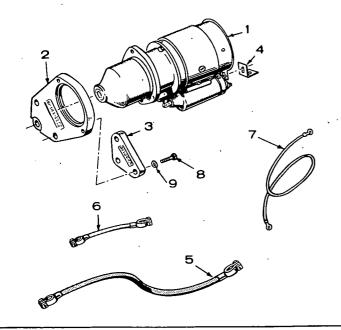


REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	140-0636	1	Element, Air Cleaner
2	140-0584	1	Gasket, Air Cleaner
3	505-0054	1	Plug, Pipe, 1/4", Intake
4	865-0020	0	Manifold
5	520-0621	2	Nut, Wing-Air Cleaner
6		2 2 2	Stud, Air Cleaner
7	154-0733	2	Gasket, Intake Manifold
	501-0007		Line, Flexible - Fuel (24")
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")
10.	123-1113	1	Manifold Heater Mounting
12	123-1113	'	Tube, Nylin, Breather Hose to Manifold - Spec A and B
. 13	850-0040	2	Washer (1/4") - Manifold
14	500.0400	_	Heater Mounting
14	508-0103	2	Washer, Insulator Mica, Manifold Heater Mounting
15	STUD, INTA	KEMANIE	
	520-0011	2	5/16 x 1-7/16"
	520-0338	2	5/16 x 2-7/8"
16	332-0829	1	
17	140-0595	i	Strap, Jumper, Air Heater Pan, Air Cleaner
18	334-0031	i	
19	336-1229	1	Lead, Jumper - Air Heater
15	330-1229	r	Lead, Air Heater to Solenoid in Control
20	140-0594	1	Cover, Air Cleaner
21	154-1378	1	Manifold, Intake
	•		
21	MANIFOLD,	INTAKE	
	154-1378	1	Key 1
	154-1376	1	Key 2
22	870-0137	4	Nut, Intake Manifold Mounting (5/16-24)

REF.	PART NO.	QTY. USED	PART DESCRIPTION
23		OW PLUG TO	AIRHEATER
	336-1505	2 2	#2 & #3 Cylinder (5-1/4")
	336-1504	2	#1 & #4 Cylinder (12-1/4")
24	154-0712	2	Heater, Manifold, Includes
05	400 0005		Gasket (12 Volt)
25	122-0325 122-0326	1 1	Filter, Fuel - Primary Filter, Fuel - Secondary
26 27			Adapter, Fuel Filters
	149-1185	1	
28	502-0080	2 1	Plug, Filter Drain
29	517-0104	1	Plug, Core Hole (Intake Manifold) - Begin Spec C
00	050 0045	2	Washer, Lock - Fuel Filter
30	850-0045	3	Adapter Mounting
31	800-0026	3	Screw, Hex Cap - Fuel Filter
31	800-0020	3	Adapter Mounting
32	149-1189	1	Line, Fuel Pump to
32	149-1109	ı	Secondary Filter
33	502-0003	1	Connector, Primary Fuel
33	302-0003	•	Filter Inlet
34	526-0068	1	Washer, Primary Fuel
04	020 0000	·	Filter Mounting
35	801-0074	1	Screw, Hex Cap - Primary
			Fuel Filter Mounting
36	526-0066	1	Washer, Secondary Fuel
			Filter Mounting
37	801-0053	1	Screw, Hex Cap - Secondary
			Fuel Filter Mounting
38	501-0129	1 '	Line, Fuel, Secondary Filter to Injection Pump
39	502-0099	. 1	Elbow, Reducer - Secondary Fuel Filter Outlet
40	140-0961	1	Indicator, Air Cleaner
	, .0 0001	•	Element Service
41	140-0803	1	Resonator - City Water Cooled
			Models
42	800-0012	2	Screw (1/4-20 x 2-1/4") -
			Resonator Mounting
43	850-0040	2	Washer (1/4"), Lock

GOVERNOR GROUP PART DESCRIPTION QTY. USED REF. **PART** NO. NO. 150-1084 Spring Governor 2 150-1082 Stud, Governor Adjusting Nut, Adjusting Bracket, Governor Adjusting -3 862-0011 150-1105 Key 1 150-1103 Bracket, Governor - Key 2 150-1132 Linkage Assembly, Governor JOINT, BALL 150-1358 Governor Linkage Assembly 150-0939 Injection Pump Assembly Nut, Joint Cover, Governor Spring 8 870-0131 12 150-0823 9 Control - Key 2 Palnut, Locking Nut, Locking - Governor Link Nut (10-32) 10 870-0133 11 871-0010 12 870-0053

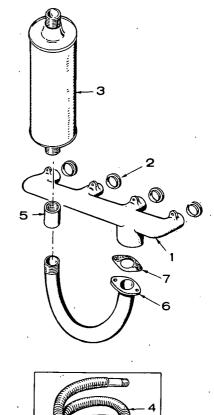
AUTOMOTIVE STARTER GROUP

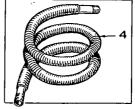


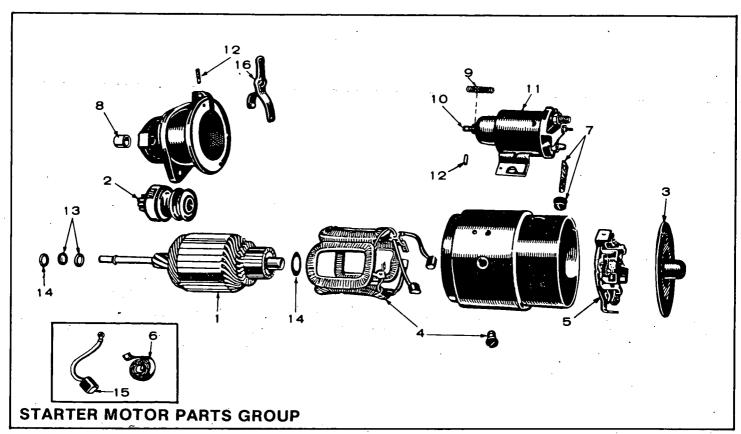
REF.	PART NO.	QTY. USED	PART DESCRIPTION
1	191-0324	1	*Motor, Starter, (12 Volt) - See Separate Group for Components
2	191-0512	1	Flange, Starter Mounting
3	191-0311	1 '	Spacer, Starter Flange
4	191-0365	1	Bracket, Starter
5	416-0021	2	Cable, Battery
6	416-0133	1 .	Cable, Battery Jumper
7	336-1364	1	Lead, Starter to Heater Relay
8	800-0051	2	Screw (3/8-16 x 1-1/4")
9	850-0050	2	Washer (3/8"), Lock

MANIFOLD AND EXHAUST GROUP

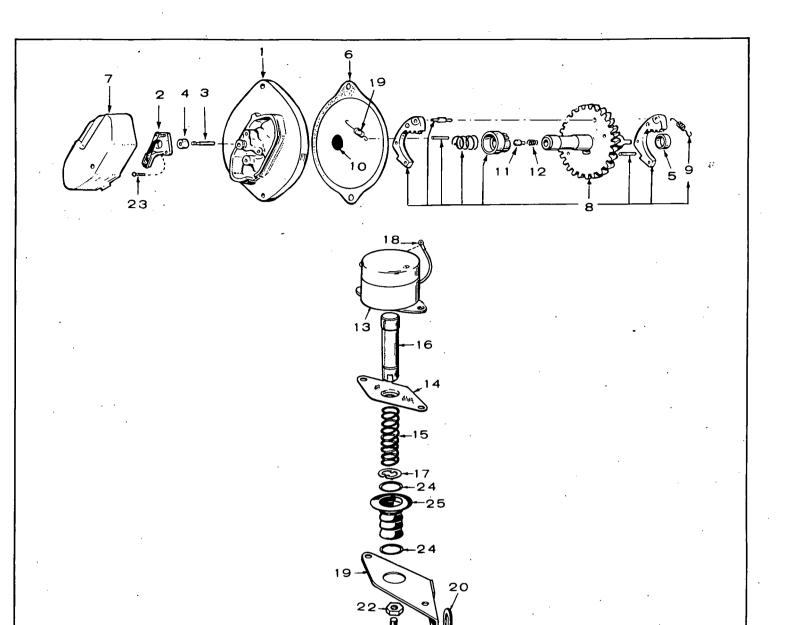
REF.	PART NO.	QTY. USED	PART DESCRIPTION
1	154-0714	1	Manifold, Exhaust - Key 1
2	154-1057	4	Gasket, Exhaust Manifold
3	155-0456	1	Muffler, Exhaust
4	155-0493	1	Tube, Exhaust - Flexible
5	.505-0032	1	Coupling, Pipe (1-1/2") - Exhaust
6	155-0806	.1	Tube, Exhaust Outlet - Key 1
7	154-0738	1 1	Gasket, Exhaust Outlet - Key 1





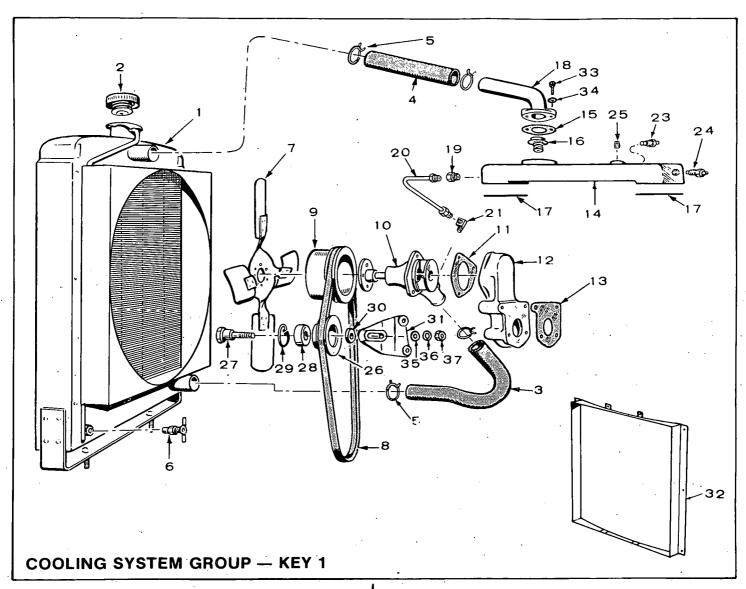


REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION		REF.	PART NO.	QTY. USED	PART DESCRIPTION
	191-0324	1	Motor Assembly, Starting		9	191-1027	1	Spring, Plunger
1	191-0712	1	Armature		10	191-1028	1	Core Assembly, Moving
2	191-0432	1	Clutch	1	11	191-0433	1	Switch, Solenoid
3	191-1023	1	Head Assembly, Commutator	· ·	12	191-1029	1	Yoke Parts Package
			End	1	13	191-1030	1	Stop and Lock Ring Package,
4	191-1024	1	Coil Package, Field					Pinion
5	191-1025	1	Plate Assembly, Brush	1 .	14	191-1031	1	Thrust Washer Package, Armature
6	191-1020	1	Spring Set, Brush (Set of 4)	1				(Use as Required)
7	191-1026	.1	Connector Package		15	191-0434	1	Brush Set, Service
.8	191-0497	1	Bearing (Bronze), Drive End		16	191-1032	1	Yoke

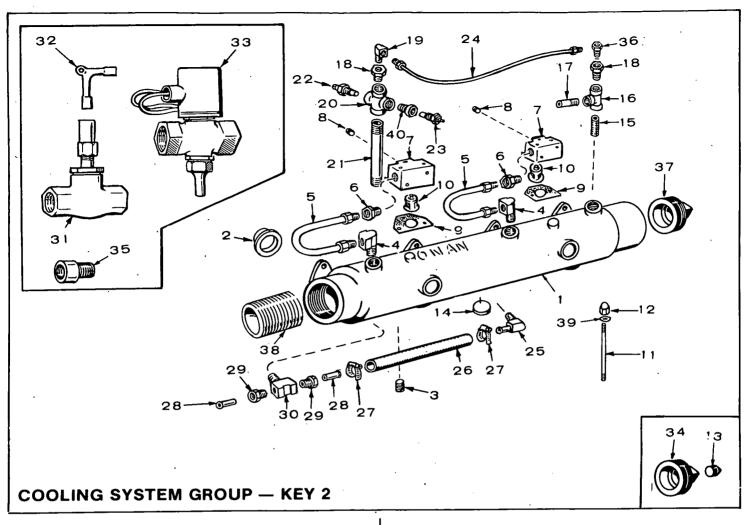


START-DISCONNECT PLATE AND STOP SOLENOID GROUP

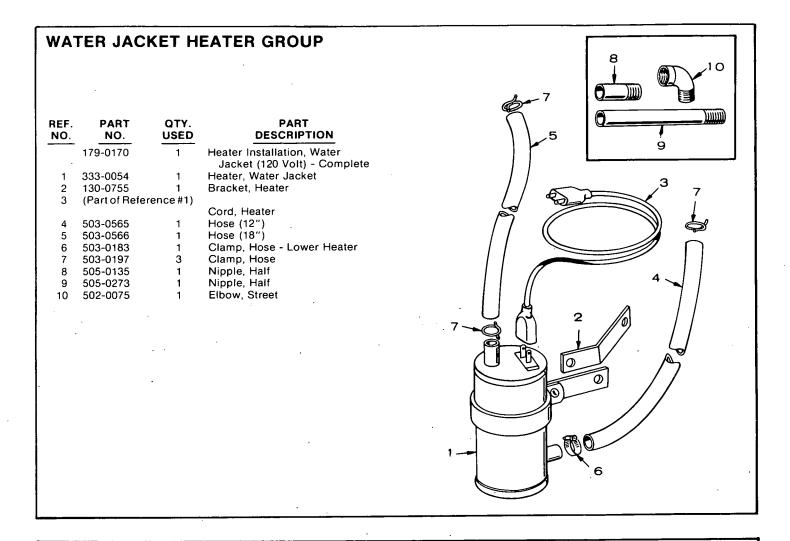
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION	REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	191-0496	1	Plate	16	306-0159	1	Plunger, Solenoid
2	309-0134	. 1	Switch Assembly	17	518-0203	1	Ring, Snap, Spring
3	309-0152	. 1	Plunger, Switch				Retaining
4	160-1143	1	Diaphragm, Switch Plunger	18	336-0706	1	Lead, Solenoid Ground
5	160-0720	1	Spacer, Switch Plate	19	306-0158	1	Bracket, Solenoid
6	160-0721	1	Gasket, Plate	. 20	526-0180		Spacer, Solenoid
7	191-0392	1 .	Cover, Switch Plate	21	306-0242	1	Screw, Hex Cap - Plunger
8	191-0388	1	Control Assembly, Switch				Adjusting
9	160-0711	2	Spring, Weight, Included in Switch Control Assembly	22	862-0001	1	Nut, Plunger Adjusting Screw Lock
10	160-0806	1	Disc, Thrust Plunger	23	815-0201	2	Screw (8-32 x 3/8") -
11	160-0774	- 1	Plunger, Thrust				Round Head
12	160-0773	1	Spring, Thrust Plunger	24	518-0218	2	Ring, Retaining - City Water
13	307-0628	1	Solenoid, Stopping				Cooled Models
14	306-0162	1	Retainer, Solenoid Plunger	· 25	306-0193	1	Cover, Solenoid Plunger -
15	306-0161	1	Spring, Solenoid Plunger				City Water Cooled Models



REF NO.	PART NO.	QTY. USED	PART DESCRIPTION		F. PART O. NO.	QT USI	
1	130-0569	, 1	Radiator	23	309-0179	1	Switch, High Temperature
2	130-0553	1	Cap, Radiator	1 -		*	Cut-Off
3	503-0204	1	Hose, Radiator - Curved	24	193-0104	1	Sender, Water Temperature
4	503-0400	1	Hose, Radiator			•	Gauge - Engine Unit
5	503-0129	4	Clamp, Radiator Hose	25	505-0110	1	Plug, (3/8") Square Head -
6	504-0003	· 1	Valve, Radiator Drain				Water Outlet Housing
7	130-0343	1	Fan, Radiator - 4 Blade	26	130-0557	1	Pulley, Idler
8	511-0066	1	Belt, Fan	27	130-0556	1	Shaft, Idler Pulley
9	512-0039	1	Pulley, Water Pump	28	510-0025	1	Bearing, Ball
10	132-0133	1	Pump, Water	29	518-0210	1	Ring, Snap
11	132-0072	1	Gasket, Water Pump	30	130-0560	1	Spacer, Idler Pulley
			Mounting	31	130-0680	. 1	Bracket, Idler Pulley
12	131-0186	1	Housing, Water Pump	32	405-1157	1	Flange, Air Duct Adapter -
13	131-0139	1	Gasket, Water Pump Housing	İ			Optional
			to Block	33	800-0030	2	Screw (5/16-18 x 1-1/4")
14	131-0137	1	Housing, Water Outlet -	34	526-0065	2	Washer (5/16"), Copper
			Cylinder Head	35	526-0035	1	Washer (1/2")
15	131-0140	1	Gasket, Water Outlet Elbow	36	850-0060	1	Washer (1/2"), Lock
16	309-0054	1	Thermostat	37	110-0707	1	Nut (1/2-20)
17	309-0145	2	Gasket, Water Outlet Housing				
18	131-0138	1	Elbow, Water Outlet		132-0082	1	Repair Kit, Water Pump
19	502-0036	1	Connector, Inverted Male -				(Includes Shaft and Bearing
		•	By-Pass Line to Housing				Impeller, Fan Hub and Gasket)
20	130-0592	1	Line, Water By-Pass				
21	502-0043	1	Elbow, Inverted Male -	1			
			By-Pass Line to Pump	1			



REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION	REF. NO.		QTY. USED	PART DESCRIPTION
1	154-0723	1	Manifold, Exhaust Water Cooled,	18	505-0016		Bushing, Reducer (3/8 x 1/8")
2	154-1057	4	Gasket, Exhaust Manifold to				By-Pass Line
			Head	19	502-0037	1 '	Elbow, By-Pass Line
3	505-0110	1	Plug, Pipe (3/8") -	20	505-0475	1	Cross, Pipe - (3/8")
			Manifold Water Drain	21	505-0224	1	Nipple, Pipe (3/8" x 4-1/2")
4	502-0074	2	Elbow, Inverted Male - Manifold	22	309-0178	1	Switch, High Water Temperature
			Water Line Inlet				Cut-Off (Not used on
⁺ 5	130-0510	2	Line, Water - Thermostat	. -	-		Pennsylvania Approved Models)
			Cover to Manifold	23	193-0104	1	Sender Unit - Water Temperature
6	502-0103	2	Connector, Inverted Male -	24	130-0633	1	Line, Water By-Pass
			Thermostat Cover Outlet	25	502-0237	1	Elbow, Brass - Water Inlet
7	309-0160	2	Cover, Thermostat	26	503-0394	1	Hose, Rubber (1/2 x 9-5/8")
8	505-0274	2	Plug, Pipe (1/8") -				Water In (Tee to Elbow)
			Countersunk - Thermostat Cover	27	503-0183	2	Clamp, Hose - Water Inlet
9	309-0145	2	Gasket, Thermostat Cover	28	130-0533	2	Adapter, Hose - Water Inlet
10	309-0130	2	Thermostat	29	502-0239	2	Nut, Inverted - Water Inlet
11	520-0143	4	Stud, Thermostat Cover Mounting	30	502-0247	1	Tee, Male Branch - Water Inlet
12	869-0002	4	Nut, Acorn (5/16-24)	31	504-0019	1	Valve, Lockshield
			Thermostat	32	504-0020	1	Key, Lockshield
13	502-0080	1	Plug, Brass (1/8")	33	307-0833	1	Valve, Solenoid
•	•		Exhaust Manifold End Cap - Used on some early models	34	505-0489	1	Plug, Exhaust Manifold End - Used on some early models
14	517-0041	4	Plug, Expansion - Exhaust Manifold	35	309-0081	. 1	Extension, Water Temperature Sender
15	505-0101	1	Nipple, Close Pipe (3/8 x 1")	36	502-0097	1.	Connector, By-Pass Line
			Exhaust Manifold	37	505-0402	1	Plug (1-1/2"), Square Head
16	505-0060	1	Tee, Pipe (3/8")	38	505-0194	1	Nipple (1-1/2 x 1-3/4"), Close
			Exhaust Manifold .	39	526-0022	4	Washer (5/16")
17	505-0135	1	Nipple, Pipe (3/8" x 1-1/2") Exhaust Manifold	40	309-0081	1	Extension, Pipe - Water Temperature Sender



NOTE: This pump used on plants with heat exchanger only. REF. **PART** QTY. **PART DESCRIPTION** NO. NO. **USED** 132-0110 Pump, Water - Complete 1 Repair Kit (Includes Parts 132-0111 Marked *) 1413 132-0136 Body, Pump 132-0137 Cover, Pump 3 132-0114 *Impeller *Seal 132-0101 5 132-0091 *Face, Wear 132-0092 *Seat, Seal 6 *Gasket, Cover 132-0112 132-0113 *Screw, Cover Screw, Cap 132-0138 132-0139 10 Lockwasher 132-0140 Nut, Hex 11 132-0141 Plug, Drain 12 . 132-0142 13 Pedestal 10 11 132-0089 *Shaft and Bearing Assembly 14 132-0132 15 Ring, Snap * - Parts included in the 132-0111 Repair Kit.

WATER PUMP PARTS GROUP (132-0110)

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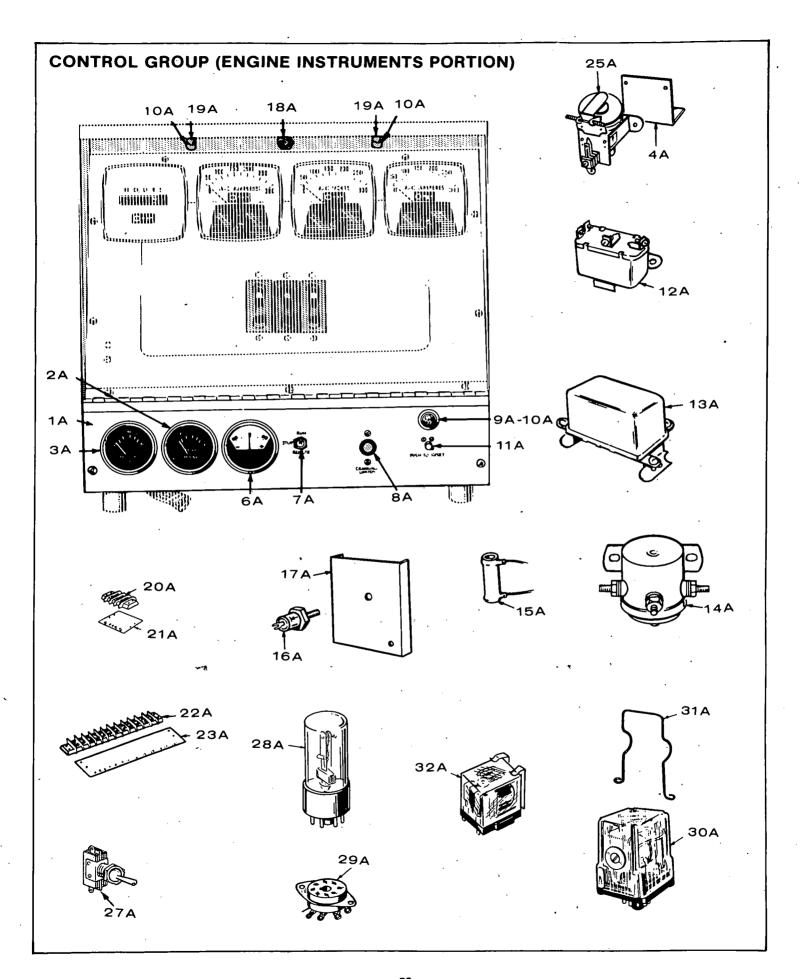
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HEAT EXCHANGER GROUP (OPTIONAL EQUIPMENT) KEY 2 — SPEC A THROUGH Z **₽** эo DIVAVI

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION	REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1 2	130-0624 130-0575	1 1	Exchanger, Heat Line, Water - Expansion Tank	34	504-0006	1	Valve Air Bleed Manifold Outlet
3	502-0103	1	to Exhaust Manifold Connector, Inverted Male -	35	502-0300	2	Elbow, Brass Heat Exchanger Fresh Water Hoses
4	130-0646	1	Expansion Tank Outlet Tank Expansion	36	502-0302	1	Elbow, Brass Heat Exchanger Raw Water Inlet Hose
5	502-0080	2	Plug, Expansion Tank Fill Vent	37	502-0237	1	Elbow, Brass Heat Exchanger Raw Water Outlet Hose
6	130-0589	1	Cap, Pressure	38	104-0546	1	Pulley, Flywheel
7	130-0590	1	Neck and Adapter, Expansion Tank Cap	39	154-0723	1	Manifold, Exhaust - Water Cooled
8	130-0519	1	Gasket, Neck and Adapter	40	154-1057	4	Gasket, Exhaust Manifold to
9	502-0155	1	Plug (3/8")	i			Head
10 12	309-0145 502-0258	2	Gasket, Thermostat Chamber Nipple (3/8" x 2") Hose	41	505-0110	1	Plug, Pipe (3/8") Manifold Water Drain
	002 0200	ŭ	Connector	42	309-0130	2	Thermostat
13	503-0183	9	Clamp (1-1/16")	43	502-0080	1	Plug (1/8") Square Head
13	503-0446	2	Clamp (25/32")				Brass - Manifold End Plug -
14	502-0263	3	Elbow (90° - 3/8")				Used on some early models
15	502-0085	6	Nipple (3/8")	. 44	505-0489	1	Plug, Exhaust Manifold End -
15A	132-0110	1	Pump, Centrifugal Water -	1		·	Used on some early models
		·	Less Pulley (See Separate Group for Components)	45	130-0729	1	Gasket, Heat Exchanger Fresh Water End
16	131-0130	1	Bar, Pump Holddown	46	130-0730	1	Gasket, Heat Exchanger
17	511-0067	.1	Belt, Centrifugal Water Pump	1	100 0700		Raw Water End
18	512-0042	1	Pulley, Centrifugal Water Pump	47	130-0731	1	Bonnet, Heat Exchanger Fresh
19	130-0591	1	Guard, Belt		100 0701	•	Water
20	130-0692	.1	Bracket, Heat Exchanger and Governor Spring	48	130-0732	1	Bonnet, Heat Exchanger Raw Water
21	503-0463	1	Hose, Rubber (3/4" I.D. x 54" -	49	505-0224	1	Nipple, Pipe (3/8 x 4-1/2")
			Total Length Required for All	50	505-0475	1	Cross, Pipe (3/8")
			Hoses) - (Except Raw Water Pump)	51	309-0178	1	Switch, High Water Temperature Cut-Off
21	503-0285	1	Hose, Rubber (1/2" I.D. x 14") -	52	193-0104	1	Sender Unit - Water Temperature
	•		Raw Water Pump to Heat	53	505-0016	1	Bushing, Reducer (3/8" x 1/8")
22	502-0257	2	Exchanger Tee (3/8")	54	309-0081	1	Extension, Pipe - Temperature Switch
26	502-0298	1 .	Elbow, 45°	55	SCREW, HE	X CAP	
27	505-0266	i	Plug (3/8") Exhaust Manifold		800-0005	2	Water Pump Mounting
28	502-0074	1	Elbow, Inverted Male - Manifold		800-0004	4	Heat Exchanger Mounting
	002 007 7		Water Line Inlet	56 ⁻	WASHER, L	оск	gg
29	502-0037	2	Elbow, Heat Exchanger to Line		850-0040	2	Water Pump Mounting
30	130-0813	1	Line, Heat Exchanger to]	850-0040	4 .	Heat Exchanger Mounting
32	130-0626	2	Cylinder Head Pencil, Zinc (Included in Heat	57	517-0041	4	Plug, Expansion - Exhaust Manifold
J2	100-0020	۷	Exchanger)	58	505-0402	1	Plug (1-1/2"), Square Head
33	502-0049	1	Bushing, Reducer (3/8 x 1/8")	.		,	· · · · · · · · · · · · · · · · · · ·
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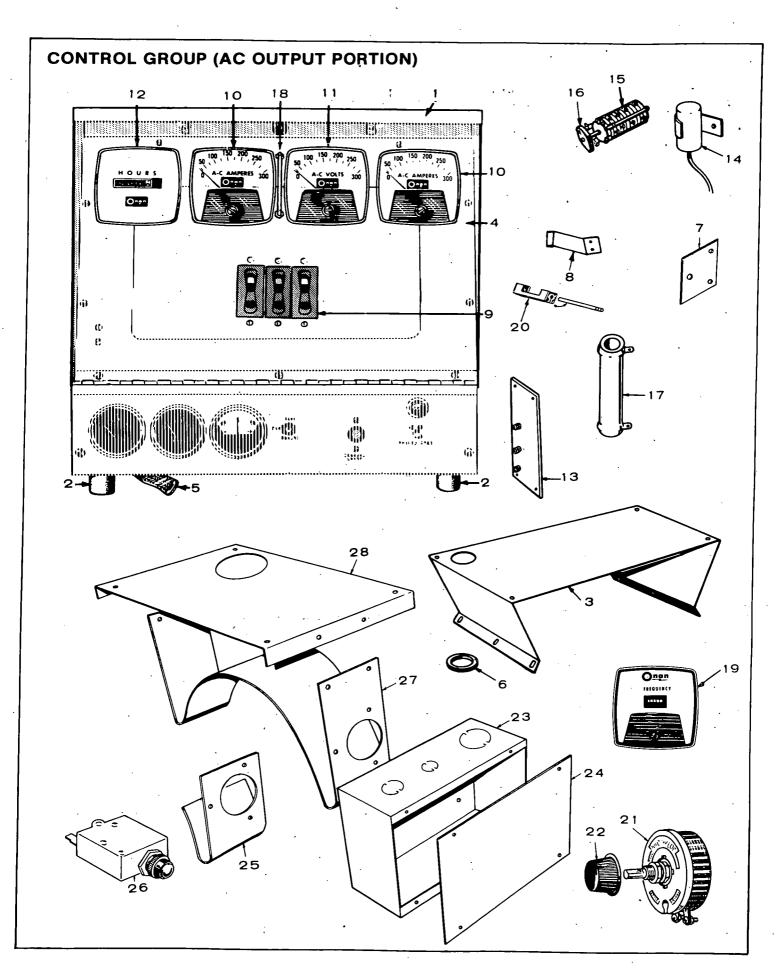
HEAT EXCHANGER GROUP (OPTIONAL EQUIPMENT) — BEGIN SPEC AA ²29

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION	REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	130-0911	1	Exchanger, Heat				. ———
2	130-0910	2	Bracket, Heat Exchanger		503-0472	1	Hose (3/4") - Water Pump
_	.00 00 10		Mounting		E00 0000	4	Outlet to Block
3	131-0137	1	Manifold, Water		503-0699	1	Hose (3/4") - Water Manifold
4	504-0006	1	Valve, Drain	20	500 0057	4	to Exhaust Manifold
5	131-0140	1	Gasket, Water Manifold Outlet	22 23	502-0257 130-0589	1 1	Tee (3/8")
6	131-0197	i	Housing, Thermostat	23 24	503-0589	1	Cap, Pressure
7	502-0300	1	Elbow, Hose	24		2	Hose (13"), Overflow
8	800-0030	2	Screw (5/16-18 x 1-1/4") -	25	800-0005	2	Screw (1/4-20 x 3/4") -
		_	Water Pump Mounting	26	850-0040	^	Water Pump Mounting
9	526-0065	2	Washer (5/16"), Copper	26 27	505-0266	2 1	Washer (1/4"), Lock
10	309-0145	2	Gasket, Water Manifold	27 28	503-0266		Plug (3/8"), Exhaust Manifold
11	309-0156	1	Switch, Hi-Temperature Cut-Off	20	303-0612	2	Clamp, Heat Exchanger Mounting
12	502-0258	4	Nipple (3/8" x 2") Hose	29	502-0298	1	
		•	Connection	30	505-0135	2	Elbow (45° x 3/8") Nipple, Half (3/8 x 1-1/2")
13	503-0183	As Req.		31	505-0133	4	Elbow (3/8 x 90°)
14	502-0263	3	Elbow (90° - 3/8")	32	505-0039	2	Nipple, Close (3/8 x 1-1/2")
15	502-0085	5	Nipple (3/8"), Close Brass		505-0277	2	Nipple, Close (3/8 x 1")
15A	132-0110	1	*Pump, Centrifugal Water -	34	800-0035	4	Screw (5/16-18 x 2-1/2") -
16	131-0130	1	Less Pulley Bar, Pump Holddown	04	000-0000	7	Heat Exchanger Bracket
17	511-0067	'n	Belt, Centrifugal Water Pump	25	500 0400	4	Mounting
· 18	512-0042	i .	Pulley, Centrifugal Water	35	526-0122	4	Washer (5/16")
10	,312-0042	•	Pump	. 36	526-0113	4.	Washer (5/16")
19	130-0920	1	Guard, Belt	·38	309-0179	1	Switch, High Water
20	130-0520	, 1	Bracket, Heat Exchanger and		000 0054	_	Temperature Cut-Off .
		•	Governor Spring	39	309-0054	1	Thermostat - Mounted in Water Manifold
21	HOSE, WATI		11 (4.00) 0 111	40	505-0110	1	Plug, Square Head
	503-0710	1	Hose (1/2") - Sea Water Discharge	41	505-0016	1 1	Bushing (3/8 x 1/8"), Reducer
	503-0711	1	Hose (3/4") - Heat Exchanger	44	502-0237	1	Elbow, Raw Water Outlet
			to Water Pump .	45	502-0370	1	Adapter, Hose - Raw Water
	503-0712	1	Hose (1/2") - Sea Water Inlet				Inlet
	503-0711	1	Hose (3/4") - Exhaust Manifold to Heat Exchanger	46	502-0372	1	Bushing, Reducer - Raw Water Outlet
	503-0478	. 1	Hose (3/4") - Cylinders]	130-0915	1	Conversion Kit, Heat Exchanger
			#1 & 2 to Cylinders #3 & 4				(Includes all necessary parts, hardware, etc. for field installation)



REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1A	PANEL OF	NLY, LOWER	-
	301-2124	1	Standard Units
	301-2125	1	Units With 4 Signal Lights
	301-2895	. 1	Pennsylvania Approved Units
2A	193-0106	1	Gauge, Water Temperature
3A	193-0107	1	Gauge, Oil Pressure
4A	301-1685	1	Bracket, Time Delay Relay
			Mounting (Used Only With Low
			Oil Pressure Cutoff Switch)
6A	302-0446	1	Ammeter, Charge
7A		SELECTOR	
	308-0220	1	All Units Except Pennsylvania Approved - Begin Spec D
	308-0068	1	Pennsylvania Approved Units -
	000 0000	•	Begin Spec D
8A	320-0104	. 1	Switch, Cranking Limiter
9A	322-0069	As Req.	Receptacle, Signal Light
			(Red) - Not Used on
			Pennsylvania Approved Units
10A 1	322-0004		Bulb, Signal and Panel Light
11A	307-0655	As Req.	
			Not Used on Pennsylvania
			Approved Units
12A	307-0052	1 .	Relay, Start-Disconnect
	307-0597	1	Relay, Ignition
14A	307-0514	1	Relay, Starter Pilot
15A	304-01.92	1	Resistor (3-Ohm, 10 Watt) -
			Cranking Limiter
16A	305-0235	1	Rectifier, Charge
			. (10-Amp, 100 Volt Peak)

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
17A	305-0254	1	Bracket, Rectifier Mounting
18A	308-0002	1	Switch, Panel Light
19A	322-0072	2	Receptacle, Panel Light
	332-0611	1	Block, Terminal (3 Place)
21A	332-1009	1	Strip, Marker (GRD, B+, REMOTE)
22A	BLOCK, TE	ERMINAL	•
	332-0607	1	Standard Units
	332-1005	1	Units With 4 Signal Lights
	332-0795	1	Pennsylvania Approved Units
23A	STRIP, BLO	OCK MARKE	R
	332-0607	1	Standard Units
	332-1007	1	Units With 4 Signal Lights
	332-0862	1	Pennsylvania Approved Units
25A	307-0388	1	Relay, Time Delay - Used Only
			With Low Oil Cutoff Switch
27A		· 1	Switch, Manifold Heater
28A	RELAY, TII	ME DELAY PI	
	307-0645		Above 60F (20 sec)
	307-0658		'60F to 30F (60 sec)
29A	323-0052	As Req.	Socket, Emergency Latching Relay
30A	307-0819	. 1 .	Relay, Start-Disconnect
31A	307-0778	1	Spring, Start-Disconnect
		•	Relay Holddown
32A	307-0860	1	Relay, Field Build Up -
			Pennsylvania Approved Units Only

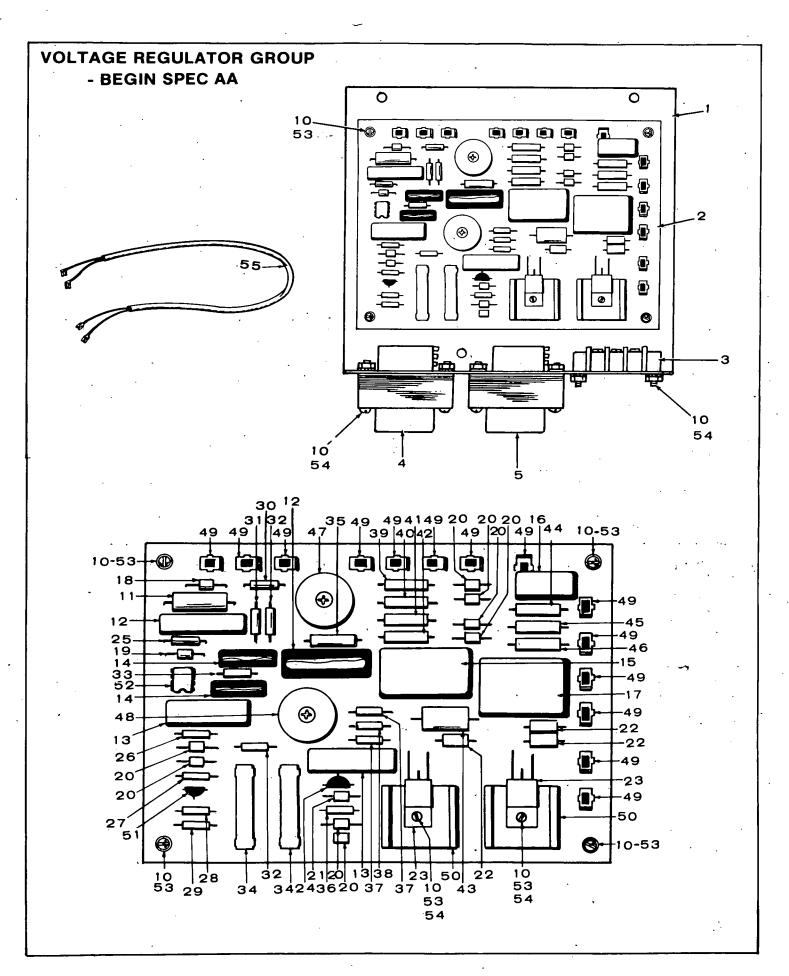


NOTE: See Separate Group for Voltage Regulator Components, Begin Spec AA.

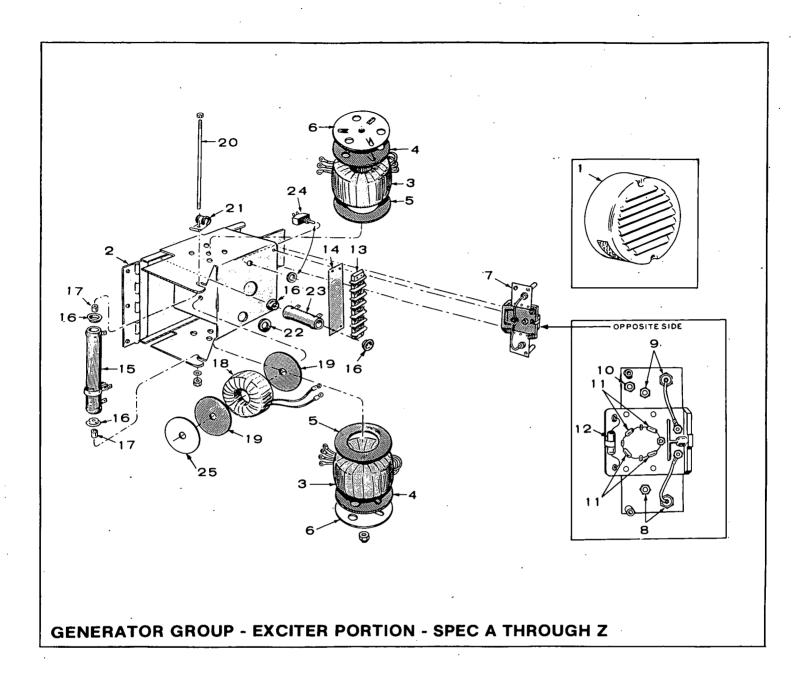
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	301-2115	1	Box Only, Control
2	402-0078	4	Rubber Mounting - Unhoused Sets
3	301-2106	1	Bracket, Control Box Mounting
Ŭ	001 2100	•	(Unhoused Sets) - Spec A
			through Z
4	•	1	Panel Only, Upper
5	STRAP, GRO	UND (Unt	noused Sets Only)
	337-0044	1	Spec A through Z
	337-0036	1	Begin Spec AA
6	GROMMET, I	RUBBER	
	508-0063	2	For 2-3/4" Hole - Unhoused
			Uses 1
	508-0183	1	For 1-3/4" Hole - Output Box
7	301-0648	1	Plate, Ground - Spec A
_			through Z
. 8	301-1914		Bracket, Panel Stop
9			heck Existing Breaker -
	Select Accord		00 A 0 Ph 0 P-1-
	320-0228	·· .1	20 Amp, 3 Phase, 3 Pole
	320-0487	1	Companion Switch 25 Amp, 3 Phase, 3 Pole
	320-0467		Companion Switch
	320-0488	1	30 Amp, 3 Phase, 3 Pole
	320-0400	•	Companion Switch
	320-0489	1	35 Amp, 3 Phase, 3 Pole
		•	Companion Switch
	320-0198	3	45 Amp, 3 Phase
	320-0052	3	50 Amp, 3 Phase
	320-0195	3	55 Amp, 3 Phase
	320-0021	2	60 Amp, 1 Phase, 3 Wire
		÷	(120 Volt uses Qty. of 1)
	320-0366	3	65 Amp, 3 Phase
	320-0367	2	75 Amp, 1 Phase, 3 Wire
10	ANAMETED A	C (Chack	(120 Volt uses Qty. of 1) Scale - Select Accordingly)
10	302-0460	As Reg.	
	302-0418	As Req.	
	302-0444		Scale Reads 0-35
	302-0419	As Req.	
	302-0458		Scale Reads 0-80
	302-0410	As Req.	
	302-0411	As Req.	
11	VOLTMETER		ck Scale - Select Accordingly)
	302-0421	1	Scale Reads 0-300
	302-0422	1	Scale Reads 0-600
	302-0423	1	Scale Reads 0-750
12			IE (Check Meter Face for Part Number)
	302-0465	1	120 Volt, 60 Hertz
	302-0466	1	240 Volt, 60 Hertz
	302-0467 302-0468	1 1	480 Volt, 60 Hertz 120 Volt, 50 Hertz

50-Watt) - 600 Volt Sets 304-0402	REF NO.	PART NO.	QTY. USED	PART DESCRIPTION
13 332-0513 1 880 Volt, 50 Hertz		302-0469	1	240 Volt, 50 Hertz
13 332-0513			1	
14 312-0058 As Req. Condenser (.1 Mfd.), Filter Spec A through Z	13			
Spec A through Z Switch, Selector - Voltmeter, 3 Phase Sets			As Reg.	
15 308-0012	17	012 0000	710 1104.	Spec A through Z
16 303-0076	15	308-0012	1	Switch, Selector - Voltmeter,
304-0536	16	303-0076	1	Knob, Selector Switch -
304-0536	17	RESISTOR.	SERIES DR	OPPING (Fixed)
304-0402 1 Frequency Meter (60,000-Ohm, 10-Watt) - 600 Volt Sets (Spec A through Z) 18 301-2727 1 Handle, Control Panel 19 METER, FREQUENCY (Check Meter Face for Part Number 302-0213 1 100-150 Volt, 60 Hertz 302-0221 1 200-250 Volt, 60 Hertz 302-0716 1 480 Volt, 60 Hertz 302-0717 1 600 Volt, 60 Hertz 302-0234 1 100-150 Volt, 50 Hertz 302-0256 1 200-250 Volt, 60 Hertz 302-0825 1 480 Volt, 50 Hertz 302-0825 1 480 Volt, 50 Hertz 302-0825 1 480 Volt, 50 Hertz 302-0788 1 600 Volt, 50 Hertz 302-0788 1 600 Volt, 50 Hertz 302-0187 1 Used with 3 Circuit Breakers 320-0202 1 Used with 2 Circuit Breakers 320-0202 1 Used with 2 Circuit Breakers 320-0202 1 Used with 2 Circuit Breakers 320-0202 1 Used with Voltage Adjustment Begin Spec AA	•			Running Time Meter (9000-Ohm,
18 301-2727 1 Handle, Control Panel 19 METER, FREQUENCY (Check Meter Face for Part Number 302-0213 1 100-150 Volt, 60 Hertz 302-0221 1 200-250 Volt, 60 Hertz 302-0716 1 480 Volt, 60 Hertz 302-0717 1 600 Volt, 60 Hertz 302-0234 1 100-150 Volt, 50 Hertz 302-0825 1 200-250 Volt, 60 Hertz 302-0825 1 480 Volt, 50 Hertz 302-0788 1 600 Volt, 50 Hertz 302-0788 1 600 Volt, 50 Hertz 302-0788 1 Used with 3 Circuit Breakers 320-0187 1 Used with 2 Circuit Breakers 320-0202 1 Used with 2 Circuit Breakers 21 303-0197 1 Rheostat (2500-Ohm, 25 Watt) - Units with Voltage Adjustment Begin Spec AA 22 303-0032 1 Knob, Rheostat - Units with Voltage Adjustment Begin Spec AA 23 301-3682 1 Box, Output Box - Begin Spec AA 24 301-0856 1 Cover, Output Box (Housed Only) - Begin Spec AA	٠,	304-0402	1	Frequency Meter (60,000-Ohm, 10-Watt) - 600 Volt Sets
19 METER, FREQUENCY (Check Meter Face for Part Number 302-0213 1 100-150 Volt, 60 Hertz 302-0211 1 200-250 Volt, 60 Hertz 302-0716 1 480 Volt, 60 Hertz 302-0717 1 600 Volt, 60 Hertz 302-0234 1 100-150 Volt, 50 Hertz 302-0256 1 200-250 Volt, 60 Hertz 302-0825 1 480 Volt, 50 Hertz 302-0825 1 480 Volt, 50 Hertz 302-0788 1 600 Volt, 50 Hertz 302-0788 1 600 Volt, 50 Hertz 302-0788 1 Used with 3 Circuit Breakers 320-0187 1 Used with 2 Circuit Breakers 320-0187 1 Used with 2 Circuit Breakers 21 303-0197 1 Rheostat (2500-Ohm, 25 Watt) - Units with Voltage Adjustment Begin Spec AA 22 303-0032 1 Knob, Rheostat - Units with Voltage Adjustment Begin Spec AA 23 301-3682 1 Box, Output - Begin Spec AA 24 301-0856 1 Cover, Output Box - Begin Spec AA 25 301-3720 1 Bracket, Output Box (Housed Only) - Begin Spec AA 26 320-0505 1 Breaker, Circuit - Voltage Regulator 27 301-3715 1 Saddle, Control Box Mounting (Unhoused Only) - Begin Spec AA 28 301-3716 1 Plate, Control Mounting (Unhoused Only) - Begin				(Spec A through ∠)
302-0213 1 100-150 Volt, 60 Hertz 302-0221 1 200-250 Volt, 60 Hertz 302-0716 1 480 Volt, 60 Hertz 302-0717 1 600 Volt, 60 Hertz 302-0234 1 100-150 Volt, 50 Hertz 302-0256 1 200-250 Volt, 60 Hertz 302-0825 1 480 Volt, 50 Hertz 302-0788 1 600 Volt, 50 Hertz 302-0788 1 600 Volt, 50 Hertz 20 BAR, CIRCUIT BREAKER TIE 320-0187 1 Used with 3 Circuit Breakers 320-0202 1 Used with 2 Circuit Breakers 21 303-0197 1 Rheostat (2500-Ohm, 25 Watt) - Units with Voltage Adjustment Begin Spec AA 22 303-0032 1 Knob, Rheostat - Units with Voltage Adjustment - Begin Spec AA 23 301-3682 1 Box, Output - Begin Spec AA 24 301-0856 1 Cover, Output Box - Begin Spec AA 25 301-3720 1 Breaket, Output Box (Housed Only) - Begin Spec AA 26 320-0505 1 Breaker, Circuit - Voltage Regulator 27 301-3715 1 Saddle, Control Box Mounting (Unhoused Only) - Begin Spec AA 28 301-3716 1 Plate, Control Mounting (Unhoused Only) - Begin	18	301-2727		Handle, Control Panel
302-0221 1 200-250 Volt, 60 Hertz 302-0716 1 480 Volt, 60 Hertz 302-0717 1 600 Volt, 60 Hertz 302-0234 1 100-150 Volt, 50 Hertz 302-0256 1 200-250 Volt, 60 Hertz 302-0825 1 480 Volt, 50 Hertz 302-0788 1 600 Volt, 50 Hertz 302-0788 1 600 Volt, 50 Hertz 320-0187 1 Used with 3 Circuit Breakers 320-0202 1 Used with 2 Circuit Breakers 320-0202 1 Used with 2 Circuit Breakers Begin Spec AA 22 303-0197 1 Rheostat (2500-Ohm, 25 Watt) - Units with Voltage Adjustment Begin Spec AA 23 301-3682 1 Box, Output - Begin Spec AA 24 301-0856 1 Cover, Output Box - Begin Spec AA 25 301-3720 1 Bracket, Output Box (Housed Only) - Begin Spec AA 26 320-0505 1 Breaker, Circuit - Voltage Regulator Saddle, Control Box Mounting (Unhoused Only) - Begin Spec AA 28 301-3716 1 Plate, Control Mounting (Unhoused Only) - Begin Spec AA Plate, Control Mounting (Unhoused Only) - Begin Spec AA Plate, Control Mounting (Unhoused Only) - Begin Spec AA Plate, Control Mounting (Unhoused Only) - Begin Spec AA Plate, Control Mounting (Unhoused Only) - Begin Spec AA Plate, Control Mounting (Unhoused Only) - Begin Spec AA Plate, Control Mounting (Unhoused Only) - Begin Spec AA Plate, Control Mounting (Unhoused Only) - Begin Spec AA Plate, Control Mounting (Unhoused Only) - Begin Spec AA Plate, Control Mounting (Unhoused Only) - Begin Spec AA Plate, Control Mounting (Unhoused Only) - Begin Spec AA Plate, Control Mounting (Unhoused Only) - Begin Spec AA Plate, Control Mounting (Unhoused Only) - Begin Spec AA Plate, Control Mounting (Unhoused Only) - Begin Spec AA Plate, Control Mounting (Unhoused Only) - Begin Spec AA Plate, Control Mounting (Unhoused Only) - Begin Spec AA Plate, Control Mounting (Unhoused Only) - Begin Plate, Control Mounting (Unhoused Only) - Begin Plate, Control Mounting (Unhoused	19	METER, FR	EQUENCY ((Check Meter Face for Part Number)
302-0716		302-0213	1	
302-0717		302-0221	1	
302-0234		302-0716	. 1	480 Volt, 60 Hertz
302-0256		302-0717	· 1	600 Volt, 60 Hertz
302-0256		302-0234	1	100-150 Volt, 50 Hertz
302-0825 1 480 Volt, 50 Hertz 302-0788 1 600 Volt, 50 Hertz 20 BAR, CIRCUIT BREAKER T IE 320-0187 1 Used with 3 Circuit Breakers 320-0202 1 Used with 2 Circuit Breakers 21 303-0197 1 Rheostat (2500-Ohm, 25 Watt) - Units with Voltage Adjustment Begin Spec AA 22 303-0032 1 Knob, Rheostat - Units with Voltage Adjustment - Begin Spec AA 24 301-0856 1 Box, Output - Begin Spec AA 25 301-3720 1 Bracket, Output Box - Begin Spec AA 26 320-0505 1 Breaker, Circuit - Voltage Regulator Regulator Saddle, Control Box Mounting (Unhoused Only) - Begin Spec AA 28 301-3716 1 Plate, Control Mounting (Unhoused Only) - Begin Spec AA 28 301-3716 1 Plate, Control Mounting (Unhoused Only) - Begin Spec AA 27 Second Only) - Begin Spec AA 28 301-3716 1 Plate, Control Mounting (Unhoused Only) - Begin Spec AA Plate, Control Mounting (Unhoused Only) - Begin Spec AA Plate, Control Mounting (Unhoused Only) - Begin Spec AA Plate, Control Mounting (Unhoused Only) - Begin Spec AA Plate, Control Mounting (Unhoused Only) - Begin Spec AA Plate, Control Mounting (Unhoused Only) - Begin Spec AA Plate, Control Mounting (Unhoused Only) - Begin Spec AA Plate, Control Mounting (Unhoused Only) - Begin Spec AA Plate, Control Mounting (Unhoused Only) - Begin Spec AA Plate, Control Mounting (Unhoused Only) - Begin Spec AA Plate, Control Mounting (Unhoused Only) - Begin Spec AA Plate, Control Mounting (Unhoused Only) - Begin Spec AA Plate, Control Mounting (Unhoused Only) - Begin Spec AA Plate, Control Mounting (Unhoused Only) - Begin Spec AA Plate, Control Mounting (Unhoused Only) - Begin Plate, Control Mounting (Unhoused Only) - Plate, Control Mounting (Unhoused Only)			. 1	
302-0788			1	
20 BAR, CIRCUIT BREAKER TIE 320-0187 1				
320-0187 1	20	BAR CIRCI		
320-0202 1	20			Used with 3 Circuit Breakers
21 303-0197 1 Rheostat (2500-Ohm, 25 Watt) - Units with Voltage Adjustment Begin Spec AA 22 303-0032 1 Knob, Rheostat - Units with Voltage Adjustment - Begin Spec AA 23 301-3682 1 Box, Output - Begin Spec AA 24 301-0856 1 Cover, Output Box - Begin Spec AA 25 301-3720 1 Bracket, Output Box (Housed Only) - Begin Spec AA 26 320-0505 1 Breaker, Circuit - Voltage Regulator Saddle, Control Box Mounting (Unhoused Only) - Begin Spec AA 28 301-3716 1 Plate, Control Mounting (Unhoused Only) - Begin Spec AA 28 301-3716 1 Plate, Control Mounting (Unhoused Only) - Begin Spec AA 29 301-3716 1 Plate, Control Mounting (Unhoused Only) - Begin 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3716 301-3				
22 303-0032 1 Knob, Rheostat - Units with Voltage Adjustment - Begin Spec AA 23 301-3682 1 Box, Output - Begin Spec AA 24 301-0856 1 Cover, Output Box - Begin Spec AA 25 301-3720 1 Bracket, Output Box (Housed Only) - Begin Spec AA 26 320-0505 1 Breaker, Circuit - Voltage Regulator 27 301-3715 1 Saddle, Control Box Mounting (Unhoused Only) - Begin Spec AA 28 301-3716 1 Plate, Control Mounting (Unhoused Only) - Begin	21		•	Rheostat (2500-Ohm, 25 Watt) - Units with Voltage Adjustment -
23 301-3682 1 Box, Output - Begin Spec AA 24 301-0856 1 Cover, Output Box - Begin Spec AA 25 301-3720 1 Bracket, Output Box (Housed Only) - Begin Spec AA 26 320-0505 1 Breaker, Circuit - Voltage Regulator 27 301-3715 1 Saddle, Control Box Mounting (Unhoused Only) - Begin Spec AA 28 301-3716 1 Plate, Control Mounting (Unhoused Only) - Begin	22	303-0032	1	Knob, Rheostat - Units with Voltage Adjustment - Begin
24 301-0856 1 Cover, Output Box - Begin Spec AA 25 301-3720 1 Bracket, Output Box (Housed Only) - Begin Spec AA 26 320-0505 1 Breaker, Circuit - Voltage Regulator 27 301-3715 1 Saddle, Control Box Mounting (Unhoused Only) - Begin Spec AA 28 301-3716 1 Plate, Control Mounting (Unhoused Only) - Begin	23	301-3682	. 1	Box, Output - Begin Spec AA
25 301-3720 1 Bracket, Output Box (Housed Only) - Begin Spec AA 26 320-0505 1 Breaker, Circuit - Voltage Regulator 27 301-3715 1 Saddle, Control Box Mounting (Unhoused Only) - Begin Spec AA 28 301-3716 1 Plate, Control Mounting (Unhoused Only) - Begin			1	Cover, Output Box - Begin
26 320-0505 1 Breaker, Circuit - Voltage Regulator 27 301-3715 1 Saddle, Control Box Mounting (Unhoused Only) - Begin Spec AA 28 301-3716 1 Plate, Control Mounting (Unhoused Only) - Begin	25	301-3720	1.	Bracket, Output Box (Housed
27 301-3715 1 Saddle, Control Box Mounting (Unhoused Only) - Begin Spec AA 28 301-3716 1 Plate, Control Mounting (Unhoused Only) - Begin	26	320-0505	1	Breaker, Circuit - Voltage
28 301-3716 1 Plate, Control Mounting (Unhoused Only) - Begin	27	301-3715	1	Saddle, Control Box Mounting (Unhoused Only) - Begin
	28	301-3716	. 1	Plate, Control Mounting (Unhoused Only) - Begin

^{* -} Order by description, giving complete Model, Spec and Serial Number.



REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION	REF.	PART NO.	QTY. USED	PART DESCRIPTION
	305-0534	1	Regulator Assembly, Voltage	31	350-0445	1	*Resistor (270,000-Ohm, 1/2 Watt)
		·	(Complete) - Includes Parts	32	350-0435	2	*Resistor (100,000-Ohm, 1/4 Watt)
			Marked †	33	350-0459	1	*Resistor (1 Megohm, 1/2 Watt)
1	301-3719	- 1	†Panel, Voltage Regulator	34	353-0048	2	*Resistor, Wire Wound
			Mounting	37	000 0040	-	(4,000-Ohm, 5 Watt)
· 2	300-1006	1	†Board Assembly, Regulator	35	351-0521	1	*Resistor, Film
	•		(Includes Parts Marked *)	"	00.002.		(12,100-Ohm, 1/4 Watt)
3	332-1655	1	†Strip, Terminal	36	350-0397	1	*Resistor (2,700-Ohm, 1/2 Watt)
4	315-0386	1	†Transformer, Voltage Reference	37	350-0351	. 2	*Resistor (180,000-Ohm, 1/2 Watt)
5	315-0391	1	†Reactor	38	350-0409	1	*Resistor (8,200-Ohm, 1/2 Watt)
10	SCREW, RO	A3H DNUC		39	351-0332	1	*Resistor, Film
	812-0061	4	†Regulator Board Mounting	1			(28,000-Ohm, 1/4 Watt)
			(6-32 x 3/8")	40	351-0240	1	*Resistor, Film
	812-0068	4	†Reactor and Transformer				(3,090-Ohm, 1/4 Watt)
			Mounting (6-32 x 1")	41	351-0211	1	*Resistor, Film
	812-0063	2	†Terminal Strip Mounting	1			(1,530-Ohm, 1/4 Watt)
			(6-32 x 1/2")	42	351-0234	1	*Resistor, Film
	812-0036	2	*Heat Sink Mounting on	1			(2,670-Ohm, 1/4 Watt)
			Regulator Board	43	350-0985	1	*Resistor (820-Ohm, 2 Watt)
			(6-32 x 3/8")	44	350-0512	1	*Resistor (10-Ohm, 1/2 Watt)
11 .	. 356-0039	1 .	*Capacitor, Electrolytic	45	351-0353	1	*Resistor, Film
			(1)) Mfd., 10 Volt)		٠.		(46,400-Ohm, 1/4 Watt)
12	355-0006	2	*Capacitor (.47 Mfd., 100 Volt)	46	351-0349	1	*Resistor, Film
13	355-0005	2	*Capacitor (.22 Mfd., 200 Volt)				(42,200-Ohm, 1/4 Watt)
14	355-0015	2	*Capacitor (.1 Mfd., 200 Volt)	47	303-0168	1	*Potentiometer (2,500-Ohm)
15	355-0016	1	*Capacitor (1 Mfd., 100 Volt)	48	303-0164	1	*Potentiometer (8,000-Ohm)
16	355-0031	1 '	*Capacitor (.39 Mfd., 100 Volt)	49	332-1511	13	*Terminal, Stake Tab
17	355-0017	1	*Capacitor (.47 Mfd., 400 Volt)	50	363-0069	2 ·	*Sink, Heat
.18	359-0036	1	*Diode (5.6 Volt)	51	362-0017	1	*Transistor, NPN
19	359-0025	1	*Diode, Zener (20 Volt)	52	367-0005	1	*Circuit, Integrated
20	357-0004	8	*Rectifier, Diode	. 53	WASHER, S	HAKEPRO	
			(400 Milliamp, 400 Volt)	1	853-0003	2	*Heat Sink Mounting (#6)
21	359-0026	1	*Diode, Zener (18 Volt)	i	853-0003	4	†Regulator Board Mounting (#6)
22	357-0021	. 3	*Rectifier, Diode	54	NUT, HEX		
23	365-0002	2	*Rectifier, Gate - Control		860-0006	2	*Heat Sink Mounting (#6-32)
24	361-0006	. 1	*Transistor, Unijunction	i	870-0183	6	†Reactor, Transformer, and
25	350-0423	1	*Resistor (33,000-Ohm, 1/2 Watt)	ŀ			Terminal Strip Mounting (#6-32)
26	350-0443	1	*Resistor (220,000-Ohm, 1/2 Watt)	55		VIRING - ۱	VOLTAGE REGULATOR TO EXCITER
. 27	350-0447	1	*Resistor (330,000-Ohm, 1/2 Watt)		STATOR		_
28	350-0398	1	*Resistor (3,000-Ohm, 1/2 Watt)		338-0744	1	Unhoused Sets
29.	350-0466	1	*Resistor (2 Megohm, 1/2 Watt)		. 338-0755	1	Housed Sets
30	351-0744	· 1	*Resistor, Film				
			(1.740-Ohm, 1/4 Watt)	* -	Included in	300-1006 F	Regulator Board Assembly
			•	† -	Included in	305-0534 \	oltage Regulator Assembly.
				l .	•		



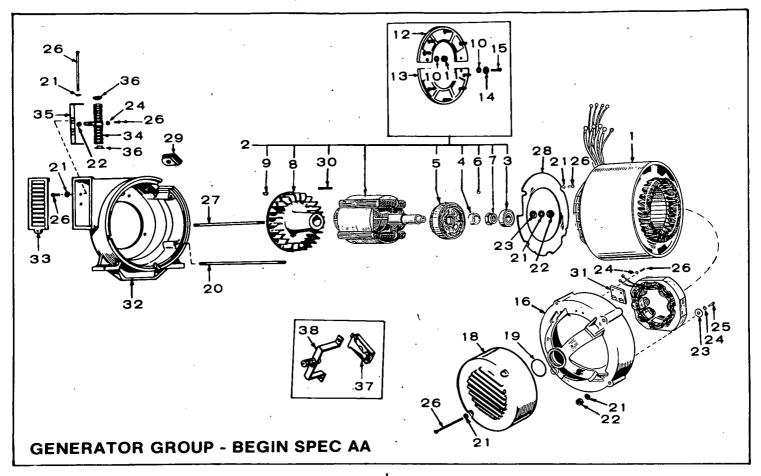
NOTE: 06SX1N1B used on 60 cycle 120/240 volt, 277/680 volt, and 347/600 volt 3 phase sets.
06SX1N3B used on all 60 cycle sets except 120/240 volt, 277/480 volt, and 600 volt 3 phase sets.
06SX51N1B used on 50 cycle sets 120/240 volt, 277/480 volt, and 600 volt 3 phase sets.
06SX51N3B used on all 50 cycle sets except 120/240 volt, 277/480 volt, and 600 volt, and 347/600 volt 3 phase sets.

Check set nameplate for Magneciter number and use correct column.

GENERATOR GROUP — EXCITER PORTION

REF.	QTY.	PART				
NO.	USED	DESCRIPTION	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

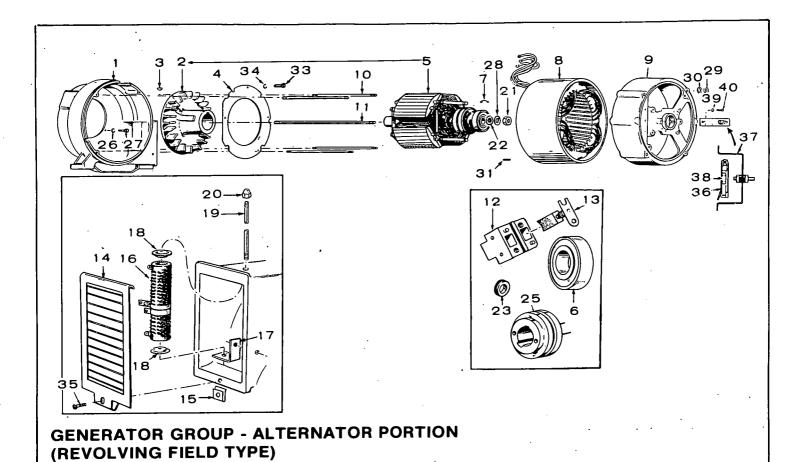
<sup>Use cover 234-0223 for housed plants.
Later Models use a quantity of 3.</sup>



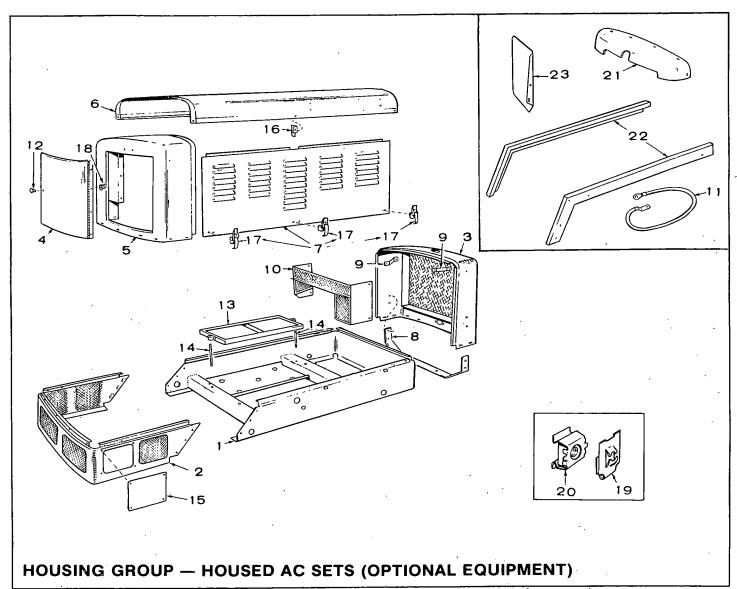
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION	REF NO.		QTY. USED	PART DESCRIPTION			
<u> </u>	STATOR, W	OUND		19	509-0094	1	Seal, Bearing ("O" Ring)			
	220-2027	1	1 Phase, 50 Hertz (AC) - 12 Volt (DC)	20	520-0799	4	Stud, Generator Through			
•	220-2209	1	1 Phase, 50 Hertz (AC) - 24 Volt (DC)	21	WASHER, LO	CK	· ·			
	220-2234	1	1 Phase, 50 Hertz (AC) - 32 Volt (DC)		850-0050	4	Generator Through Stud (3/8")			
	220-2019	1	1 Phase, 60 Hertz (AC) - 12 Volt (DC)	İ	850-0040	2	End Bell Cover Mounting (1/4")			
	220-2201	1	1 Phase, 60 Hertz (AC) - 24 Volt (DC)	İ	850-0040	2	Resistor Bracket Mounting (1/4")			
	220-2226	1	1 Phase, 60 Hertz (AC)- 32 Volt (DC)	1	850-0055	1 -	Rotor Through Stud (7/16")			
	220-2052	. 1	3 Phase, 50 Hertz (AC) - 12 Volt (DC)		850-0040	1	Resistor Through Screw (1/4")			
	220-2159	1	3 Phase, 50 Hertz (AC) - 24 Volt (DC)]	850-0030	4	SAir Baffle Mounting (#10)			
	220-2184	1	3 Phase, 50 Hertz (AC) - 32 Volt (DC)	22	NUT, HEX	-				
	220-2044	1	3 Phase, 60 Hertz (AC) - 12 Volt (DC)		862-0011	4	Generator Through Stud (3/8-16)			
	220-2151	1	3 Phase, 60 Hertz (AC) - 24 Volt (DC)		*870-0203	1	Rotor Through Stud (7/16-20)			
	220-2176	1	3 Phase, 60 Hertz (AC) - 32 Volt (DC)		871-0010	1	Resistor Tap (#10-32)			
2	201-2159	1	Rotor Assembly, Wound -	23	WASHER, FLA	١T				
			Includes parts marked +	1	526-0260	2	Exciter Stator Mounting			
3	510-0112	1	+Bearing, Rotor		526-0034	1	Rotor Through Stud			
4	232-2398	1	+Spacer, Bearing	24	WASHER, SHA	AKEPRO	OF			
5	201-2151	1	+Rotor, Wound - Exciter		853-0013	2	Exciter Stator Mounting (1/4")			
6	515-0094	1	+Key, Exciter Rotor	•	853-0008	. 5	End Bell Cover Mounting (#10)-			
7	870-0284	1	+Nut, Exciter Rotor Locking		856-0003	1	Resistor Tap (#10)			
8.	205-0105	1	+Fan, Generator	25	800-0004	2 .	Screw, Hex Cap - Exciter Stator			
9.	515-0103	1	+Key, Fan				Mounting (1/4-20 x 5/8")			
10	526-0008	12	+Washer, Flat	26	SCREW, ROU	ND HEAD				
11	870-0131	8	+Nut, Hex (#10-32)	·	812-0165	2	End Bell Cover Mounting			
12	358-0069	1	+Rectifier Assembly (Positive)				(1/4-20 x 4-1/2")			
13	358-0070	1	+Rectifier Assembly (Negative)		813-0100	2 .	End Bell Cover Mounting			
14	853-0008	4	+Washer, Shakeproof (#10)				(#10-32 x 3/8")			
15	813-0100	4	+Screw, Round Head (#10-32 x 1/2")		813-0098	4	Air Baffle Mounting			
16	211-0237	1	Bell, End			_	(#10-32 x 3/8)			
17	220-2009	1	Stator, Wound - Exciter		812-0150	2	Resistor Bracket Mounting			
- 18	COVER, EN	DBELL					(1/4-20 x 5/8)			
	234-0185	1	Unhoused Sets		812-0169	1	Resistor Through (1/4-20 x 5-1/2")			
	234-0223	1	Housed Sets	l	811-0098	1	Resistor Tap (#10-32 x 3/8")			
234-0498 1 Housed and Unhoused Sets with 27 520-0791 1 Stud, Rotor Through Overspeed Switch										
+ -	+ - Included in the Rotor Assembly.									

REF.	PART NO.	QTY. USED	PART DESCRIPTION
28	234-0462	1	Baffle, Air
29	GROMMET, RI	ŲBBER	
	508-0112	1	2-3/4 x 1-7/8" (Lead Oullel)
	508-0095	1	25/32 x 21/32"
30	515-0006	1	Key, Fan
31	232-2418	1	Board, Connection
32	231-0171	1	Adapter, Generator
33	234-0492	, 1	Cover, Air Outlet

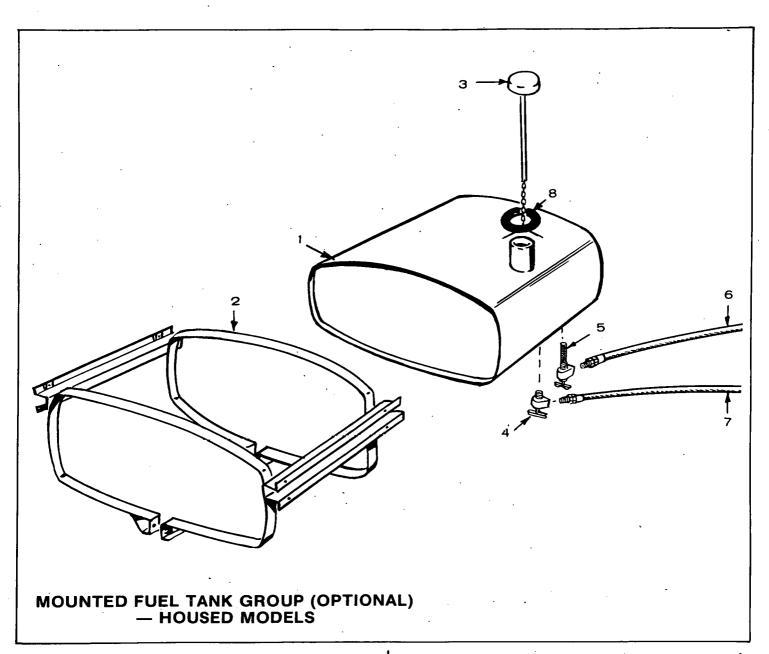
REF NO		QTY. USED	PART DESCRIPTION
34	RESISTOR, T	APPED (A	djustable)
	304-0500	1	12 and 24 Volt DC
	304-0534	1	32 Volt DC
35	232-2399	1	Bracket, Resistor Mounting
36	304-0006	2	Washer, Centering - Resistor Mounting
37	150-0956	1	Switch Assembly, Overspeed - Optional
38	150-1446	1	Bracket and Point Assembly, Overspeed - Ontional



REF.	PART NO.	QTY. USED	PART DESCRIPTION		REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
	231-0112	1	Adapter, Engine to Generator		23	GROMMET,	RUBBER	
2	205-0064	1	Blower, Generator	- 1		508-0095	1	Air Baffle
3	515-0006	i	Key, Blower			508-0112	1	Lead Outlet
4	234-0162	1	Baffle, Generator Air		25	204-0061	1	Collector Ring
5	*	1	Rotor Assembly, Wound (includes Bearing & Blower)		26	850-0040	4	Washer, Lock - Generator Adapter Mounting
6	510-0047	1	Bearing, Rotor		27			NERATOR ADAPTER
7	232-0596	1	Clip, Bearing, Stop			MOUNTING		
8	*	1	Stator Assembly, Wound	1		800-0051	2	3/8-16 x 1-1/4"
9	211-0146	1	Bell, End - Alternator to	- 1		800-0050	2	3/8-16 x 1"
			Exciter	ı	28	850-0055	1	Washer, Lock (7/16")
10	520-0640	4	Stud, Generator Through	-79	29	862-0015	4	Nut, Hex (5/16-18) -
11	520-0615	1 .	Stud, Rotor Through					Generator Through Stud
12	212-1064	2	Block, Collector Ring Brush		30	850-0045	4	Washer, Lock (5/16")
13	214-0059	4	Brush, Collector Ring		31	516-0083	2	Pin, RoII (3/16" x 5/8") -
	212-0280	1	Rig Assembly, Brush (Includes					Alignment
			Leads, Collector Ring Brushes (4) and Blocks (2)		33	813-0098	5	Screw (10-32 x 3/8") - Baffle Mounting
			and Hardware) - Not Shown		34	850-0030	· 5	Washer, Lock (#10)
14	234-0199	1	Cover. Air Outlet		35	812-0102	1	Screw, Round Head - Air
15	870-0177	1	Clip, Air Outlet Cover	1				Outlet Cover Mounting
16		TAPPEDA	DJUSTABLE		36	150-0956	1	Switch Assembly, Overspeed
10	304-0500	1	12 & 24 Volt Starting		37	150-0958	1.	Bracket & Point Assembly,
	304-0534	, i	32 Volt Starting		•			Overspeed
17	232-1565°	. 1	Bracket, Resistor Mounting	1	38	868-0004	1	Nut, Jam (7/16-20)
18	304-0006	,	Washer, Resistor Centering	i	39	850-0030	. 2	Washer, Lock (#10)
19	520-0620	1	Stud. Resistor Mounting		40	813-0100	. 2	Screw (10-32 x 1/2")
20	866-0001	1	Nut. Resistor Mounting	1	, -		_	, ,
21	870-0203	1	Nut, Rotor through Stud		* _	Order by Des	cription, a	iving Model, Spec and Serial
22	232-0200	. i	Washer, Tapered - Rotor			Number.	pe, g	
22	202 0200	•	through Stud					



REF.	PART NO.	QTY. USED	PART DESCRIPTION	REF NO.	·	QTY. USED	PART DESCRIPTION
	CHASSIS,	MOUNTING		17	406-0105	6	Fastener, Side Panel -
1	403-0718	1	Front Section				Housed Sets
2	403-0477 PANEL	1	Rear Section - Housed Sets	18	406-0088	1	Catch, Rear Door Panel - Housed Sets
3	405-1079	1	Front End (Radiator Grille)	19	870-0106	4	Nut, Speed - Rear Door Panel
4	405-1080	1	Rear Door - Housed Sets				Mounting - Housed Sets
5	405-1081	. 1	Rear End (Does NOT INCLUDE DOOR) - Housed Sets	20	870-0113	As Req.	End Panel to Housing Top,
6	405-1319	1	Housing Top - Housed Sets				Housed Sets (6) Radiator Hood
7	405-1084	2	Housing Side - Includes	1			Extension, Unhoused Sets
0	120 0200	4	Fasteners - Housed Sets	21	405-1089	. 1	Extension, Radiator Hood - Unhoused Sets
8	130-0396	1	Support, Radiator Mounting	22	EDGING C	-LASSIS - I I	INHOUSED SETS
9	130-0397	2	Bracket, Radiator	22	403-0479	1	Left Side
10	130-0623	1	Guard, Fan			1	
11	336-0476	1	Cable, Ground Strap	1	403-0478	- !	Right Side
12	406-0002	1	Knob, Rear Door Panel - Housed	23	155-0848	1	Shield, Muffler Heat
13	416-0495	1	Frame, Battery Holddown	NO	TE: Parts in	this group	are for both Housed and
14	520-0669	2	Stud, Battery Holddown Frame	Uni	noused Sets	unless other	erwise specified.
15	403-0373	1	Panel, Chassis - Housed Sets				
16	405-1181	2	Stop, Door - Housing Side Panel - Housed Sets			•	



REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION	REF.	PART NO.	QTY.	PART DESCRIPTION
1	159-0639	1	Tank, Fuel (15 Gallon)	6	501-0078	1	Line, Flexible Fuel
2	159-0640	1	Band, Fuel Tank Holddown				(18-1/2") Tank to Pump
3	159-0642	1	Cap & Indicator Assembly	7	501-0066	1 .	Line, Flexible Fuel (31")
4	504-0013	1	Valve and Screen Assembly,				Fuel Return
			Fuel Shut-Off - Tank Outlet	8	159-0751	1	Gasket, Gas Tank Filler
5	504-0007	1	Valve, Fuel Shut-Off - Tank Inlet (Return Line)		•		Neck

SERVICE KITS AND 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
	168-0108	1	Gasket Kit, Engine
	522-0244	1	Overhaul Kit, Set
	TOUCH-UP PAINT (Pressurized Can)		
	525-0137	1 `	Metallic Green (16 oz.)
	525-0305	1	Non-metallic Green (13 oz.)

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.

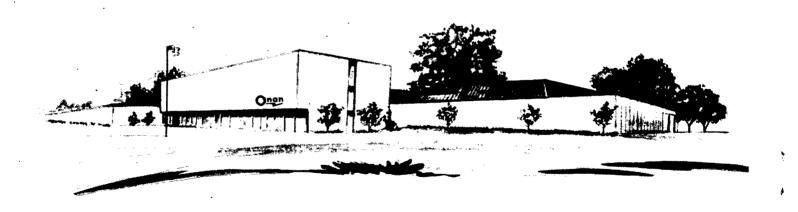
INSTALLATION

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



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