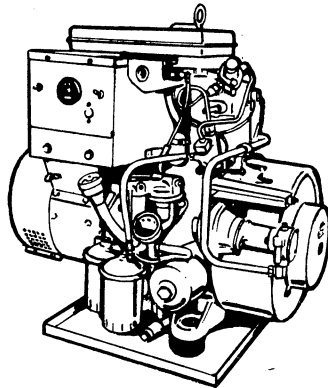


# **OPERATOR'S MANUAL AND PARTS CATALOG**

**FOR  
ELECTRIC GENERATING SETS**

## **MDJA SERIES**



# 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.*

# Important Safety Precautions

---

Read and observe these safety precautions when using or working on electric generators, engines and related equipment. Also read and follow the literature provided with the equipment.

Proper operation and maintenance are critical to performance and safety. Electricity, fuel, exhaust, moving parts and batteries present hazards that can cause severe personal injury or death.

## FUEL, ENGINE OIL, AND FUMES ARE FLAMMABLE AND TOXIC

Fire, explosion, and personal injury can result from improper practices.

- Used engine oil, and benzene and lead, found in some gasoline, have been identified by government agencies as causing cancer or reproductive toxicity. When checking, draining or adding fuel or oil, do not ingest, breathe the fumes, or contact gasoline or used oil.
- Do not fill tanks with engine running. Do not smoke around the area. Wipe up oil or fuel spills. Do not leave rags in engine compartment or on equipment. Keep this and surrounding area clean.
- Inspect fuel system before each operation and periodically while running.
- Equip fuel supply with a positive fuel shutoff.
- Do not store or transport equipment with fuel in tank.
- Keep an ABC-rated fire extinguisher available near equipment and adjacent areas for use on all types of fires except alcohol.
- Unless provided with equipment or noted otherwise in installation manual, fuel lines must be copper or steel, secured, free of leaks and separated or shielded from electrical wiring.
- Use approved, non-conductive flexible fuel hose for fuel connections. Do not use copper tubing as a flexible connection. It will work-harden and break.

## EXHAUST GAS IS DEADLY

- Engine exhaust contains carbon monoxide (CO), an odorless, invisible, poisonous gas. Learn the symptoms of CO poisoning.
- Never sleep in a vessel, vehicle, or room with a genset or engine running unless the area is equipped with an operating CO detector with an audible alarm.
- Each time the engine or genset is started, or at least every day, thoroughly inspect the exhaust system. Shut down the unit and repair leaks immediately.

- Warning: Engine exhaust is known to the State of California to cause cancer, birth defects and other reproductive harm.

*Make sure exhaust is properly ventilated.*

- Vessel bilge must have an operating power exhaust.
- Vehicle exhaust system must extend beyond vehicle perimeter and not near windows, doors or vents.
- Do not use engine or genset cooling air to heat an area.
- Do not operate engine/genset in enclosed area without ample fresh air ventilation.
- Expel exhaust away from enclosed, sheltered, or occupied areas.
- Make sure exhaust system components are securely fastened and not warped.

## MOVING PARTS CAN CAUSE SEVERE PERSONAL INJURY OR DEATH

- Do not remove any guards or covers with the equipment running.
- Keep hands, clothing, hair, and jewelry away from moving parts.
- Before performing any maintenance, disconnect battery (negative [-] cable first) to prevent accidental starting.
- Make sure fasteners and joints are secure. Tighten supports and clamps, keep guards in position over fans, drive belts, etc.
- If adjustments must be made while equipment is running, use extreme caution around hot manifolds and moving parts, etc. Wear safety glasses and protective clothing.

## BATTERY GAS IS EXPLOSIVE

- Wear safety glasses and do not smoke while servicing batteries.
- Always disconnect battery negative (-) lead first and reconnect it last. Make sure you connect battery correctly. A direct short across battery terminals can cause an explosion. Do not smoke while servicing batteries. Hydrogen gas given off during charging is explosive.
- Do not disconnect or connect battery cables if fuel vapors are present. Ventilate the area thoroughly.

## **DO NOT OPERATE IN FLAMMABLE AND EXPLOSIVE ENVIRONMENTS**

Flammable vapor can be ignited by equipment operation or cause a diesel engine to overspeed and become difficult to stop, resulting in possible fire, explosion, severe personal injury and death. **Do not operate diesel equipment where a flammable vapor environment can be created by fuel spill, leak, etc., unless equipped with an automatic safety device to block the air intake and stop the engine.**

## **HOT COOLANT CAN CAUSE SEVERE PERSONAL INJURY**

- Hot coolant is under pressure. Do not loosen the coolant pressure cap while the engine is hot. Let the engine cool before opening the pressure cap.

## **ELECTRICAL SHOCK CAN CAUSE SEVERE PERSONAL INJURY OR DEATH**

- Do not service control panel or engine with unit running. High voltages are present. Work that must be done while unit is running should be done only by qualified service personnel.
- Do not connect the generator set to the public utility or to any other electrical power system. Electrocutation can occur at a remote site where line or equipment repairs are being made. An approved transfer switch must be used if more than one power source is connected.
- Disconnect starting battery (negative [–] cable first) before removing protective shields or touching electrical equipment. Use insulative mats placed on dry wood platforms. Do not wear jewelry, damp clothing or allow skin surface to be damp when handling electrical equipment.
- Use insulated tools. Do not tamper with interlocks.
- Follow all applicable state and local electrical codes. Have all electrical installations performed by a qualified licensed electrician. Tag open switches to avoid accidental closure.
- With transfer switches, keep cabinet closed and locked. Only authorized personnel should have cabinet or operational keys. Due to serious shock hazard from high voltages within cabinet, all service and adjustments must be performed by an electrician or authorized service representative.

If the cabinet must be opened for any reason:

1. Move genset operation switch or Stop/Auto/Handcrank switch (whichever applies) to Stop.
2. Disconnect genset batteries (negative [–] lead first).
3. Remove AC power to automatic transfer switch. If instructions require otherwise, use extreme caution due to shock hazard.

## **MEDIUM VOLTAGE GENERATOR SETS (601V TO 15kV)**

- Medium voltage acts differently than low voltage. Special equipment and training are required to work on or around medium voltage equipment. Operation and maintenance must be done only by persons trained and qualified to work on such devices. Improper use or procedures will result in severe personal injury or death.
- Do not work on energized equipment. Unauthorized personnel must not be permitted near energized equipment. Induced voltage remains even after equipment is disconnected from the power source. Plan maintenance with authorized personnel so equipment can be de-energized and safely grounded.

## **GENERAL SAFETY PRECAUTIONS**

- Do not work on equipment when mentally or physically fatigued or after consuming alcohol or drugs.
- Carefully follow all applicable local, state and federal codes.
- Never step on equipment (as when entering or leaving the engine compartment). It can stress and break unit components, possibly resulting in dangerous operating conditions from leaking fuel, leaking exhaust fumes, etc.
- Keep equipment and area clean. Oil, grease, dirt, or stowed gear can cause fire or damage equipment by restricting airflow.
- Equipment owners and operators are solely responsible for operating equipment safely. Contact your authorized Onan/Cummins dealer or distributor for more information.

**KEEP THIS DOCUMENT NEAR EQUIPMENT FOR EASY REFERENCE.**

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RETELEX PARTS TO CONVERT 24V BATT CHGE MOD. 205MDJA-224R/1E  
SER 35C807953 TO 120/240V 50HZ MOD 205MDJA-53CR/1E:  
ONE EACH

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2008-0016 REPLACEMENT GENERATOR ASSY \$952.30B  
610-0247-01 CONTROL ASSY \$241.95B  
333-0106 GLOW PLUG 12V  
140-0804 ADAPTER AIR CLEANER  
140-0584 GASKET  
141-0281 GASKET  
307-0628 SOLENOID DECOMPRESSION  
166-0316 POINT SET ANT-FLICKER  
160-0800 PLUNGER BREAKER  
160-0799 GUIDE PLUNGER  
160-0382 DIAPHRAGM  
509-0091 O RING  
160-0796 COVER ANTI-FLICKER NAMPLATE

ALSO SLOW DOWN ENGINE RPM FROM 1750 TO 1500  
SHIPMENT ALL PARTS WITHIN 30-45 DAYS AFTER RECEIVING  
ORDER. ONAN QUOTATION NO 1320 VALID 60 DAYS

VARIAN

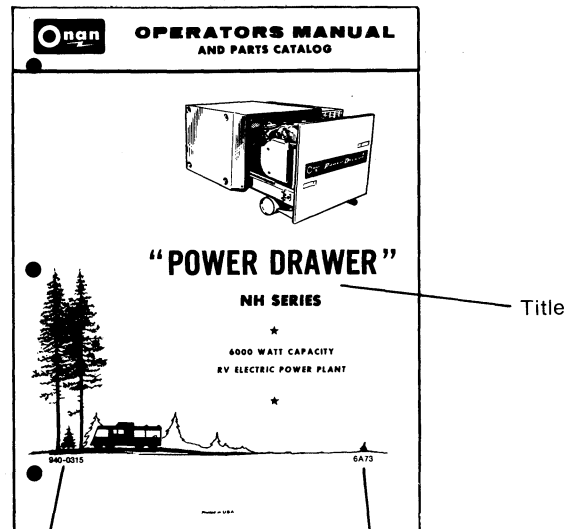
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*Thank You!*

Sample Cover



Manual Number  
(e.g. 940-0315)

Publication Date  
(e.g. 6A73)

TEAR ALONG PERFORATION AND DETACH

## COMMENTS ON MANUAL

MANUAL NUMBER \_\_\_\_\_ TITLE \_\_\_\_\_ PUBLICATION DATE \_\_\_\_\_

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

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

UNIT HISTORY: Model Number \_\_\_\_\_

Type of Application \_\_\_\_\_

Unit Purchased From \_\_\_\_\_

### Optional Information

Name \_\_\_\_\_ Street (or R.Rt.) \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

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**ATTN: TECHNICAL PUBLICATIONS**

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# GENERAL INFORMATION

Identify your model by referring to the MODEL and SPECIFICATION NO. as shown on the Onan nameplate. Electrical characteristics as shown on the lower portion of the sets nameplate.


How to interpret MODEL and SPEC NO.

3.0	MDJA	-	3CR	/	96	T
1	2		3		4	5

1. Kilowatt rating.
2. Factory code for general information.
3. Specific Type  
C - Indicates reconnectible.  
R - Remote starting - for permanent installation.  
Can be connected to optional accessory equipment for remote or automatic control of starting and stopping.
4. Factory code for optional equipment.
5. Specification (Spec) letter advances when factory makes production modifications.

**WARNING** Onan uses this symbol throughout the text to warn of possible injury or death.

**CAUTION** This symbol is used to warn of possible equipment damage.



### MANUFACTURER'S GENERAL WARRANTY

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

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

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

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

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

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LITHO IN U.S.A. 7-273 AB-47

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

# SPECIFICATIONS

**Model Series  
MDJA**

## GENERAL

### Nominal Dimensions of Generator Set (inches)

Height .....	26-13/16"
Width .....	20-5/8"
Length .....	28-5/8"
Weight (approx. lb.) .....	365

## ENGINE DETAILS

Number of Cylinders (verticle in line) .....	1
Displacement (cubic inch) .....	30
Cylinder Bore (inches) .....	3-1/4"
Piston Stroke (inches) .....	3-5/8"
BHP at 1800rpm .....	7
RPM (for 60hertz) .....	1800
RPM (for 50hertz) .....	1500
Compression Ratio .....	19:1

## CAPACITIES AND REQUIREMENTS

Battery Voltage (AC Set, Except Dual Purpose) .....	12volt**
Battery Size (AC Set, Except Dual Purpose)	
SAE Group 1H 6volt - Two in Series .....	Yes
Amp. Hr., SAE 20Hr. (nominal) .....	105
Battery Charge Rate Ampere (normal) - AC Sets .....	2-5
Oil Capacity in U.S. Quarts - Refill .....	2.5★
Cooling Water Flow (gallons per minute) .....	4
Generator Cooling Air (CFM at 1800rpm) .....	75
Combustion Air (CFM at 1800rpm) .....	16
Total Cubic Feet Per Minute of Air Required .....	91
Diesel Fuel Lift .....	6'

## GENERATOR DETAILS

Output is rated at Unity Power Factor Load .....	1phase
Ratings (Output in Watts)	
60hertz AC Service .....	3000
50hertz AC Service .....	2500
24-30 VDC Battery Charger .....	2500
32-40 VDC Battery Charger .....	3000
AC Voltage Regulation in % .....	5
AC Frequency Regulation in % .....	5
Generator Design.....	Revolving Armature

## TUNE-UP SPECIFICATIONS

Cylinder Head Bolt Torque (lbs. ft.).....	44-46
Valve Clearance	
Intake .....	.020
Exhaust .....	.020

\* - 30-9/16" on 3wire models.

\*\* - 24 and 32volt batteries for certain models.

★ - Plus 1/2 quart for new filter.

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

# INSTALLATION

## GENERAL

Proper installation is very important. Consider the following points:

1. Adequate generator cooling air.
2. Discharge of circulated air.
3. Adequate fresh induction air.
4. Adequate engine cooling water.
5. Discharge of circulated water.
6. Discharge of exhaust gases.
7. Electrical connections.
8. Fuel connection.
9. Sturdy and flat floor.
10. Accessible for operation and service.

Use this manual as a guide to help with the installation; refer to Figures 1 and 2. For more complete instructions, request Onan Technical Bulletin T-021.

Each installation must be considered individually and executed by compliance with all regulations which may affect the installation. The advice and guidance contained in the booklet entitled *Fire Protection Standard for Motor Craft*; (NFPA No. 302) offered by the National Fire Protection Association International, Boston, Massachusetts, will be helpful to the installer of equipment in vessels.

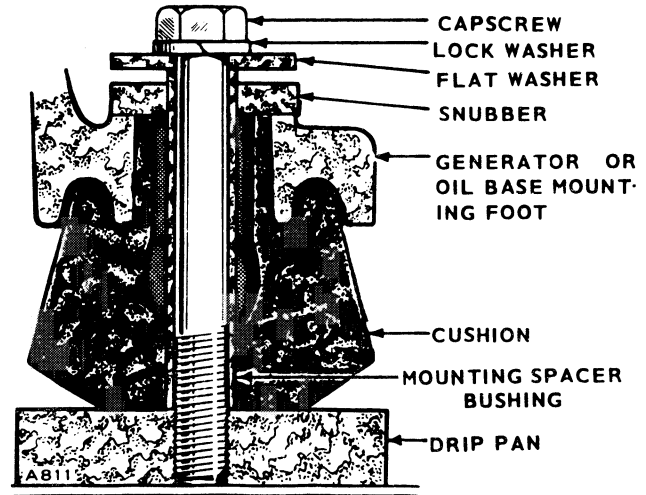


FIGURE 1. MOUNTING INSTALLATION

## LOCATION

Select a location for the set, preferably near the vessels main keel, which is dry, properly ventilated, above low lying vapors and splash from the bilge. Provide accessibility for minor servicing operations, draining of the crankcase lubricating oil and the cooling system.

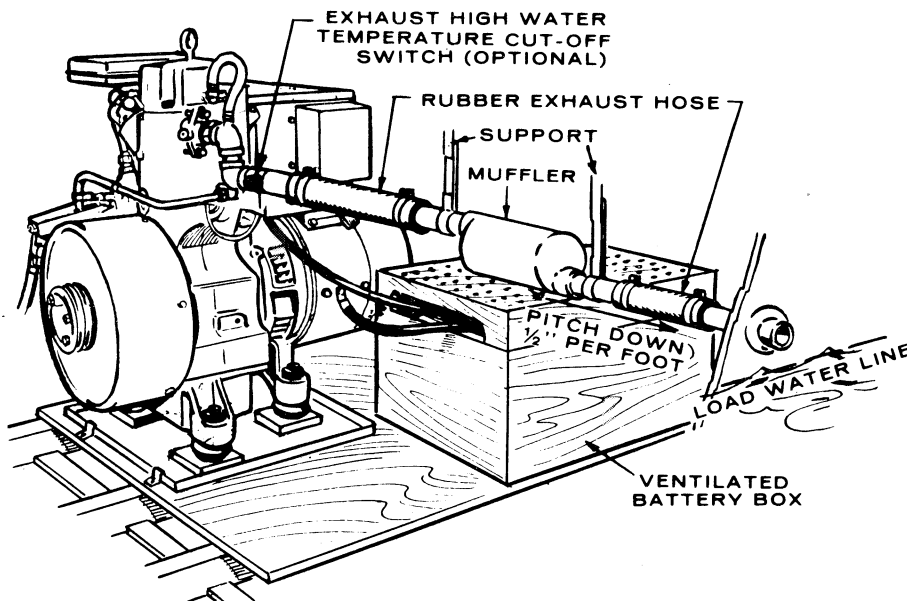


FIGURE 2. TYPICAL INSTALLATION

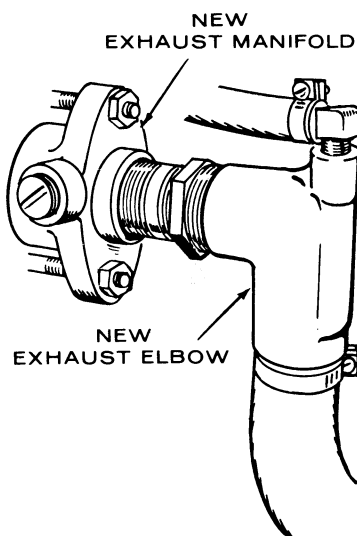
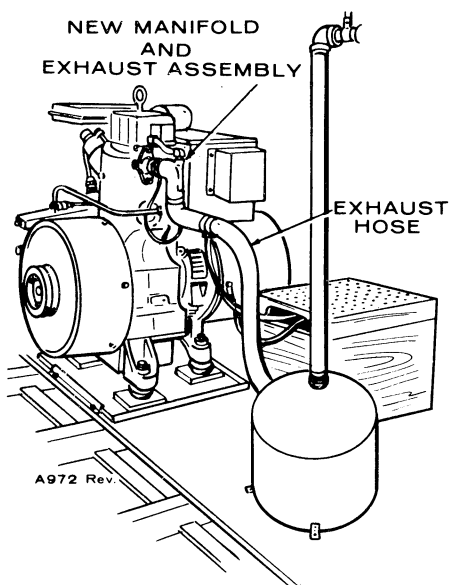


FIGURE 3. EXHAUST INSTALLATION

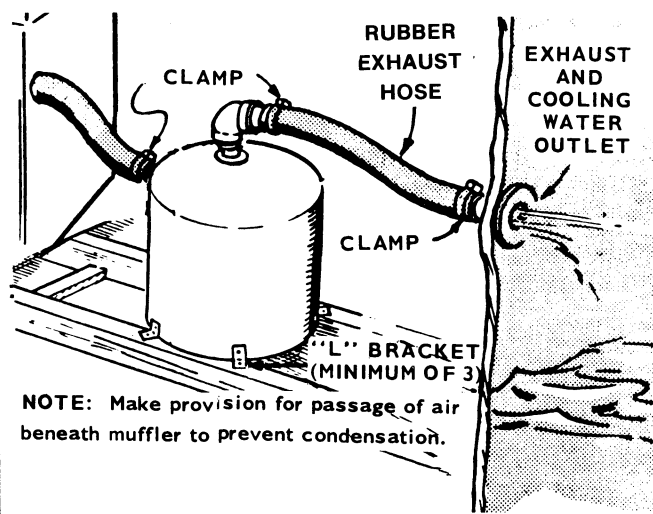


FIGURE 4. ABOVE WATER LINE INSTALLATION

## MOUNTING

The floor should be flat and give support directly under the set mounting points. The unit will rock on its mounts. A 2-1/2 inch clearance around the unit is required to permit rocking on its mounts without restraint. Use adequately flexible exhaust line, fuel line, battery cables, and electrical wires.

Install two hold-down clamps to the drip pan (front and rear or both sides). Secure the clamps to the mounting base.

## EXHAUST

See installation, Figure 2 and 4. The engine exhaust connection is 1-1/4 inch pipe tapped. Pipe exhaust gases outside of the hull.

### **WARNING** EXHAUST GASES ARE POISONOUS!

Install a separate exhaust line as follows:

1. Above vessel load water line.
2. Pitched downward to prevent water backflow.
3. Shield line near combustible material.
4. Use flexible hose or tubing (see Figures 2 and 3).
5. For turns, use sweeping (long radius) elbows.
6. Increase one pipe size for every 10 feet in length.

Provide a tee for water line connection for wet exhaust (Figure 3). Refer to *Water Discharge Line Instructions*. Raise the dry portion of exhaust line high enough to prevent water back-flowing into the engine under all conditions.

Onan recommends using the Aqualift muffler for maximum silencing efficiency and ease of installation. Provide a recommended or equal silencer and install it near the end of the wet exhaust line.

### **CAUTION** Dry exhaust will damage interior coating of an Aqualift muffler.

Install Siphon Break Kit (155-0950) if exhaust injection elbow is below load water line. Locate the Siphon Break at least 12" above load water line and in a vertical position. Remote mounting the siphon break is permissible within a 5' radius of water injection exhaust elbow. Vertical position and height of valve must be maintained.

## OIL DRAIN

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

## AQUALIFT MUFFLER

The Aqualift is a highly efficient marine muffler designed for above or below water line installations when water cooled exhaust systems are used. Because of installation variables, customers must provide the brackets, hoses and clamps, required for installation.

**CAUTION** DO NOT USE SCOOP TYPE WATER INLET FITTINGS when installing an Aqualift muffler. Forward facing scoops develop sufficient ram pressure to force water past the set's water pump, flooding the exhaust system where it may flow back, flooding the engine cylinders. This can happen only if the electric set is not running and boat is underway.

1. Secure the muffler to the predetermined location (within ten-feet of the engine exhaust outlet) using "L" brackets (Figure 5) or other suitable mounting devices such as wood blocks or metal straps. Flexible mounts may be used if so desired.
2. Connect the exhaust line (1-1/4") to the exhaust elbow on the engine and to the exhaust inlet on the muffler. The distance from the base of the muffler to the upper elbow on the exhaust tubing from the muffler outlet must not exceed four-feet (see Figure 3).
3. Connect the exhaust line to the muffler outlet and to the upper elbow. A conventional automobile tail-pipe hanger bracket may be used to hang the upper elbow. Rigid pipe may be used in place of flexible hose for certain applications. See Figure 4 and 5. There must be a pitch of one-half inch per foot (i.e., a 2-1/2" drop for a 5' run) in the exhaust tubing between the engine exhaust elbow and the muffler inlet. Muffler may be mounted below the level of the engine if necessary. A minimum drop of one-foot is necessary between the engine exhaust outlet on the hull to prevent water from washing into the system (see Figure 3). An increase of one standard pipe size for every ten running feet of exhaust from the muffler to the exhaust outlet is necessary to prevent excessive back pressure.
4. Connect the exhaust line from the upper elbow to the exhaust outlet on the hull. The exhaust outlet on the hull must be positioned so that a minimum of water will enter while at anchor or under way.

Be sure all fittings are tight.

### CAUTION

Welding on the muffler will damage the interior protective coating decreasing the life expectancy.

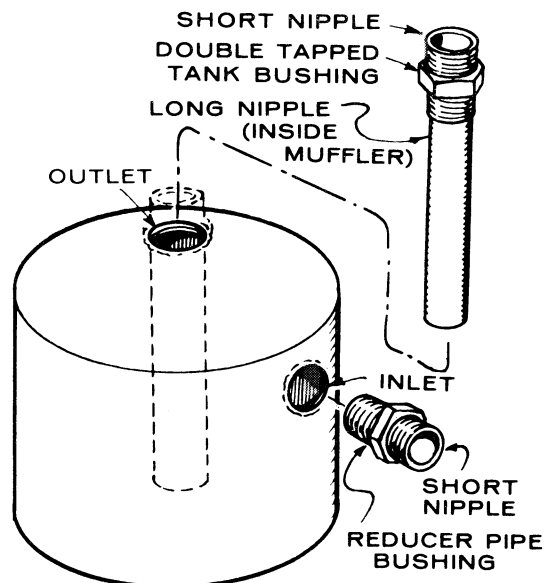
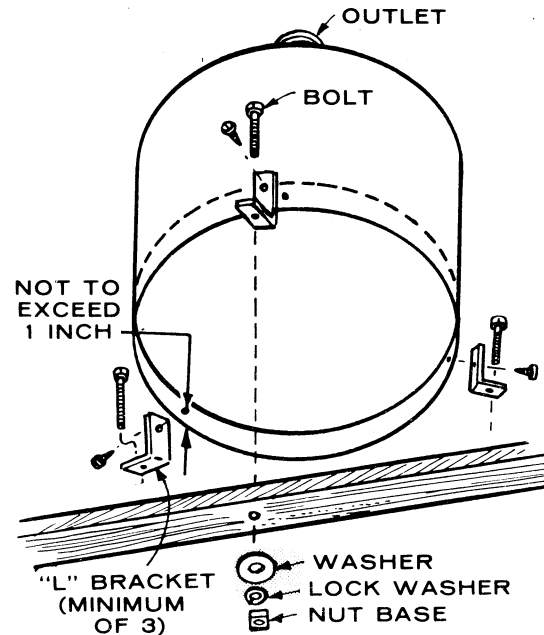


FIGURE 5. AQUALIFT MUFFLER  
INSTALLATION (OPTIONAL)

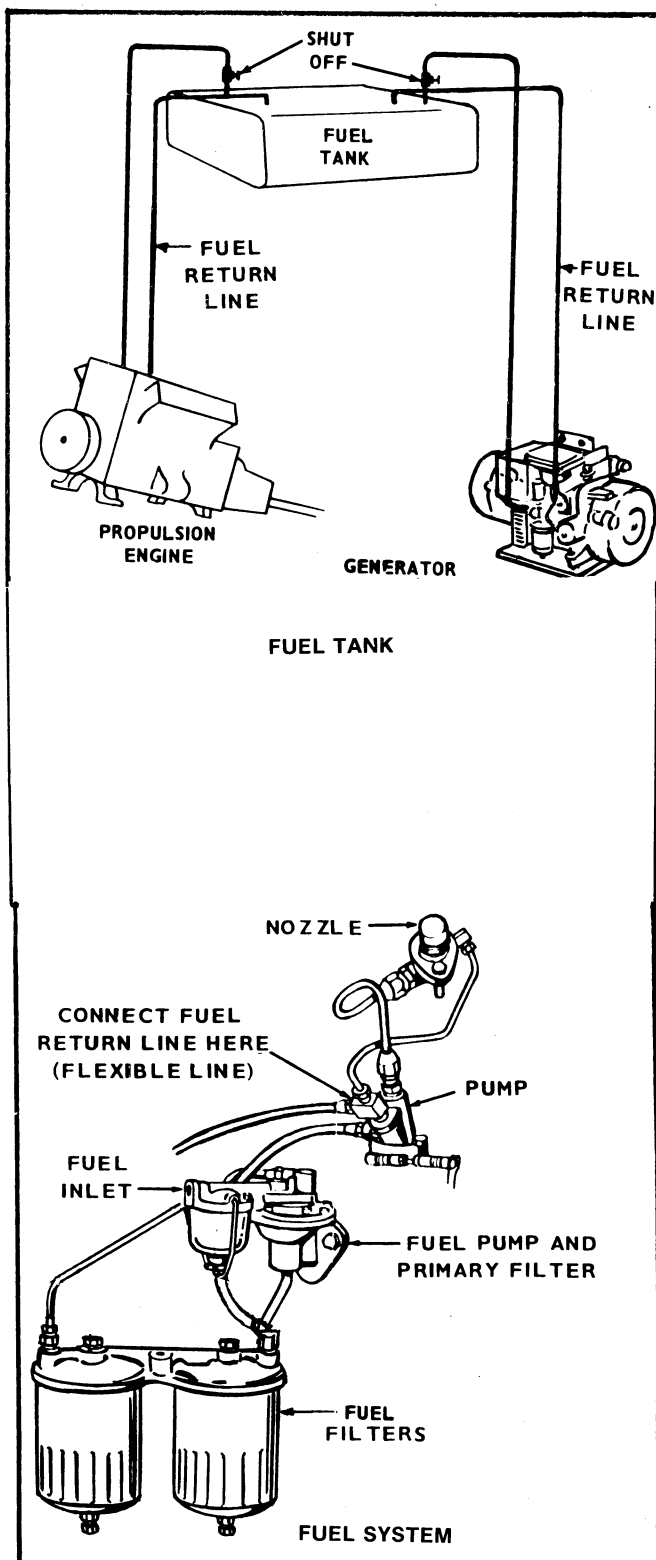


FIGURE 6. FUEL INSTALLATION

## FUEL CONNECTION

Connect the fuel line to the fuel pump inlet. Pump is threaded 1/8-27 NPTF (American Standard Internal Tapered Pipe Thread).

**Always use flexible tubing between engine and the fuel supply.**

The diesel engine requires a fuel line and a separate fuel return line. Install the fuel return line from the 7/16-24 size opening in the overflow fitting located on the injection pump (where the nozzle fuel return line is also connected) to the top of the fuel supply tank (Figure 6).

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.

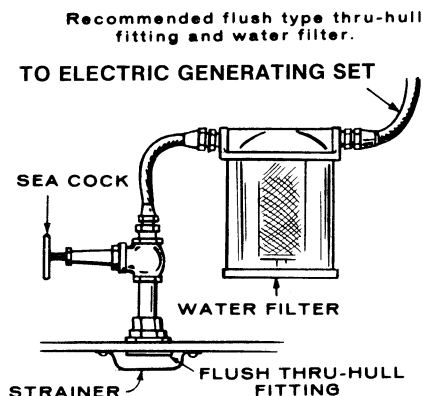
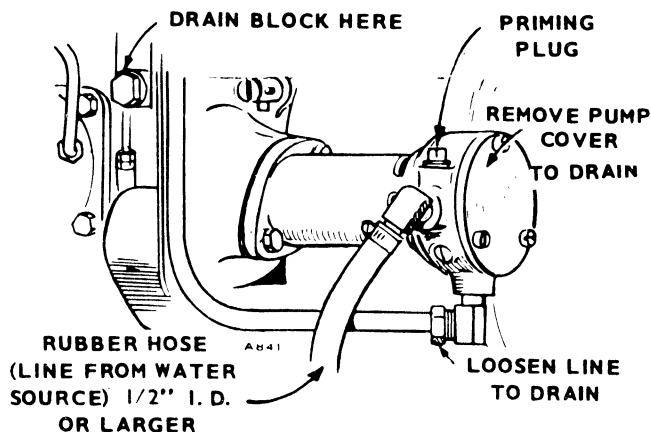
## FUEL TANK

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

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

## VENTILATION

The generating set requires fresh air for combustion and generator cooling. Onan recommends that the ventilation system be able to deliver 1-1/2 to 2 times the air required by the set. When the ventilation system depends on wind or boat motion, use powered exhausters to provide ventilation when the boat is not in motion. For more information, refer to *Onan Technical Bulletin T-021*.



### WARNING

Do not use scoop type water inlet fittings on electric generating sets using Aqualift muffler systems.

FIGURE 7. WATER PUMP AND WATER INLET INSTALLATION

## WATER SUPPLY LINE

A continuous supply of cooling water is required. The water pump inlet is 1/2" I.D. hose connection (Figure 7). Use a section of hose (that will not collapse) near the set (or entire run) to absorb vibrations. The inside diameter of the plumbing must be 1/2" or larger. Use permatex or other pipe sealer on all pipe fittings in supply line to pump. Normally, the pump should deliver 3.5 gallons of cooling water per minute. Measure the discharged water flow after thermostat opens, to assure the supply line is large enough. Reduce resistance on pipe runs longer than 5 ft. by using larger inside diameter plumbing. To prove suction line is air tight, see that no bubbles appear in discharged water. An *air leak* reduces lubrication and *shortens life of pumps impeller*. Install a strainer in the water suction line inlet and where accessible for cleaning.

## WATER DISCHARGE LINE

The 1/2" I.D. water outlet hose fitting is on the exhaust manifold next to the exhaust outlet (see Figure 3).

Use plumbing at least as large as the supply line. Use a section of hose near the set or the entire run. Connect the line to discharge the heated water into the exhaust line several feet ahead of the Aqualift or neoprene silencer. Be sure water will not back flow in the *exhaust line*. See *Optional Heat Exchanger Cooling*.

## HEAT EXCHANGER COOLING (Optional)

This is a closed cooling system commonly referred to as fresh water cooling. 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, etc. This system containing fresh water (or 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.

### CAUTION

Do not use existing neoprene impeller water pump for water side of cooling system. Heat or soluble oil (in many rust inhibitors and anti-freezes) will damage the impeller. Always connect the neoprene impeller pump to the cold water side. Use a metal impeller centrifugal type water pump (Oberdorfer 1-GP, or equal) in the hot water side. Drive it with a belt from the set's power take-off.

### CAUTION

Use an expansion tank in the hot water side.

On early models with heat exchangers, the discharged water leaves at the exhaust manifold. On later models, discharged water leaves at the heat exchanger and then to exhaust system water inlet. Supply line connections in both systems are the same. Refer to the instructions for standard systems in this section.

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. *Cooling system capacity is 2-1/4 quarts.*

Install a new zinc "pencil" (Figure 16) which screws into raw water inlet end of heat exchanger, every two months or as inspection dictates.

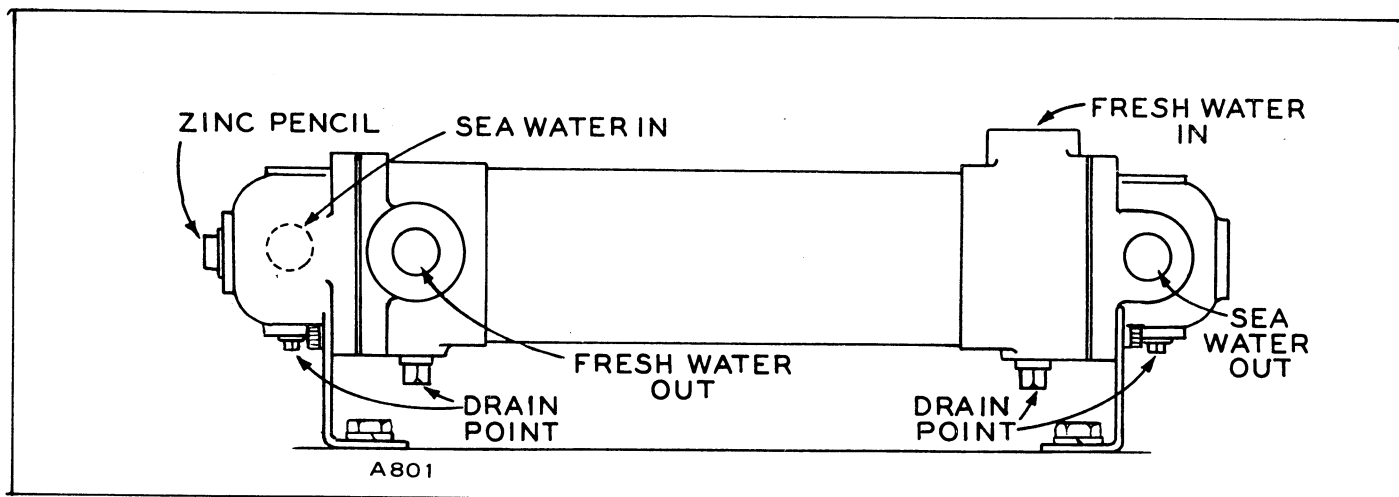


FIGURE 8. HEAT EXCHANGER (OPTIONAL)

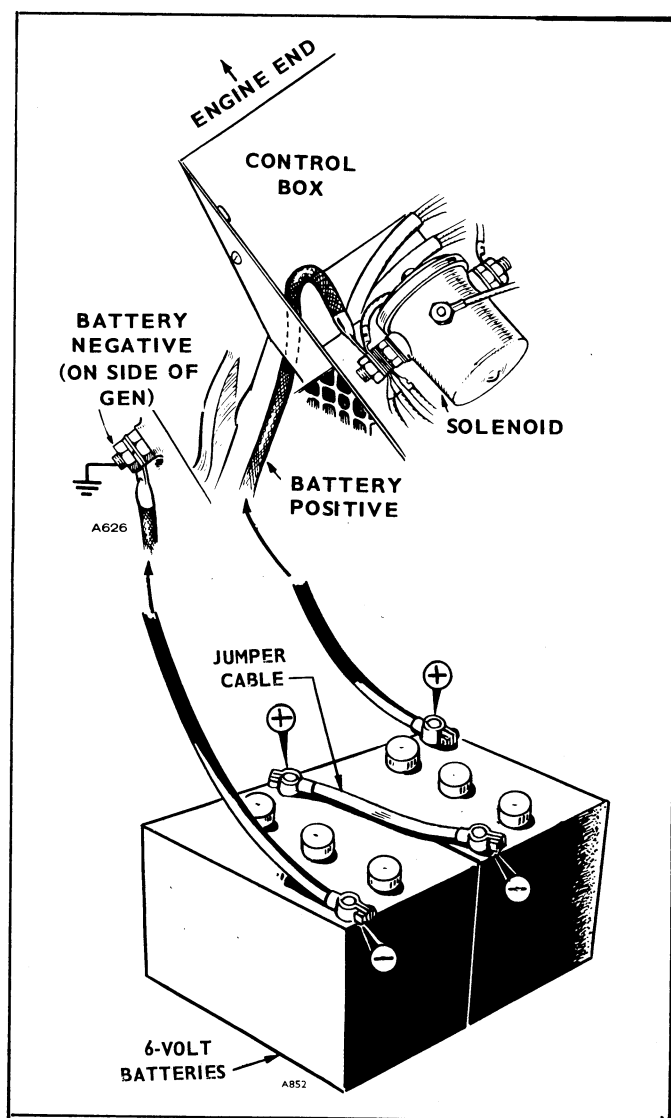


FIGURE 9. 12 VOLT BATTERY CONNECTION

## BATTERY CONNECTION

**12 Volt System:** Refer to the wiring diagram and Figure 9. If battery ground must be changed to agree with other equipment aboard a vessel, reverse the connections to the charge ammeter or remark the correct direction of charge.

Provide two 6 volt batteries connected in series (one battery's negative to other battery's positive) for a 12 volt source. See *Specifications* for minimum battery requirements. Connect the remaining battery positive (+) to the start solenoid (located in the control box). Connect the battery negative (-) to a good ground on the generator frame.

**24 Volt or 32 Volt System:** Refer to the wiring diagram and Figure 10. The dual purpose sets and battery charging sets have a *GROUND*ED system. Battery ground is negative, reversible in the field. Battery polarity must agree with polarity of other electrical equipment aboard a vessel. If the positive lead is grounded, reverse the connections to the charge ammeter or remark the direction of charge.

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



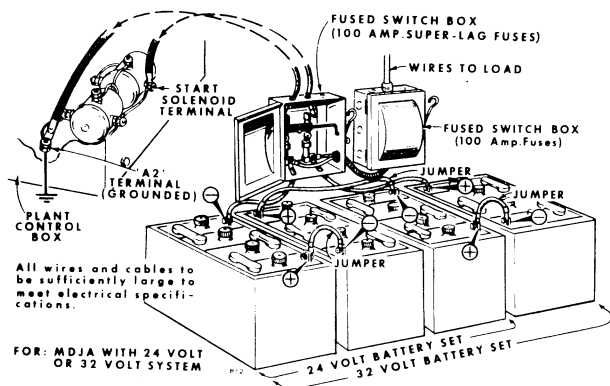


FIGURE 10. 24-32 VOLT BATTERY CONNECTION

## REMOTE START-STOP SWITCH (OPTIONAL)

For remote control starting and stopping, use 3 wires to connect the remote switch (single pole, double throw, momentary contact, center-off type) to the terminal block marked B+, 1, 2, 3, in the set control box using wire sizes as listed in Figure 11. Preheat circuit requires an extra wire to terminal H and momentary contact switch, single pole, single throw connection. Remove jumper between terminals 3 and H before installing remote wiring.

## LOAD WIRE CONNECTIONS (AC)

Set nameplate shows the electrical output rating of the set in watts, volts and hertz. The set wiring diagram shows the electrical circuits and connections necessary for the available output voltage. Also see Figure 11.

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

The set 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's control box. Insulate bare ends of ungrounded wires. Use a

bolt (through the control box) to connect the grounded generator lead and load wire. Install a fused main switch (or circuit breaker) between the generating set 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.

**Dual Purpose Sets:** A maximum of 750 watts of direct current and 2250 watts of alternating current may be used at the same time or divided in any proportion within the rated output limits of the generator (3000 watts). If only alternating current is used, 3000 watts is available. Subtract the amount of direct current used from the total generator capacity to find the amount of alternating current available. **Example:** If 500 watts DC is used, only 2500 watts AC is available.

## LOAD CONNECTIONS (Battery Charging Sets 24 Volt and 32 Volt)

Connect the main line load circuit to the batteries through a 1000 ampere fused switch or circuit breaker. Lead wires from the battery fuse block to the main line fuse block should be sufficient to carry the full rated capacity of the battery. Branch circuits should be properly fused. Smaller wire may be used for branch circuits but large enough to carry the amperage of the load on each circuit.

Make connections from the main line switch to the fused battery switch. Connect leads to the terminals on the battery side of both switches. Observe the same polarity used in connecting the battery (Figure 10).

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

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

**Shore Power:** If the installation connects to shore power, install a double-throw transfer switch (either manual or automatic type) to prevent feeding generator output into the shore 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 11

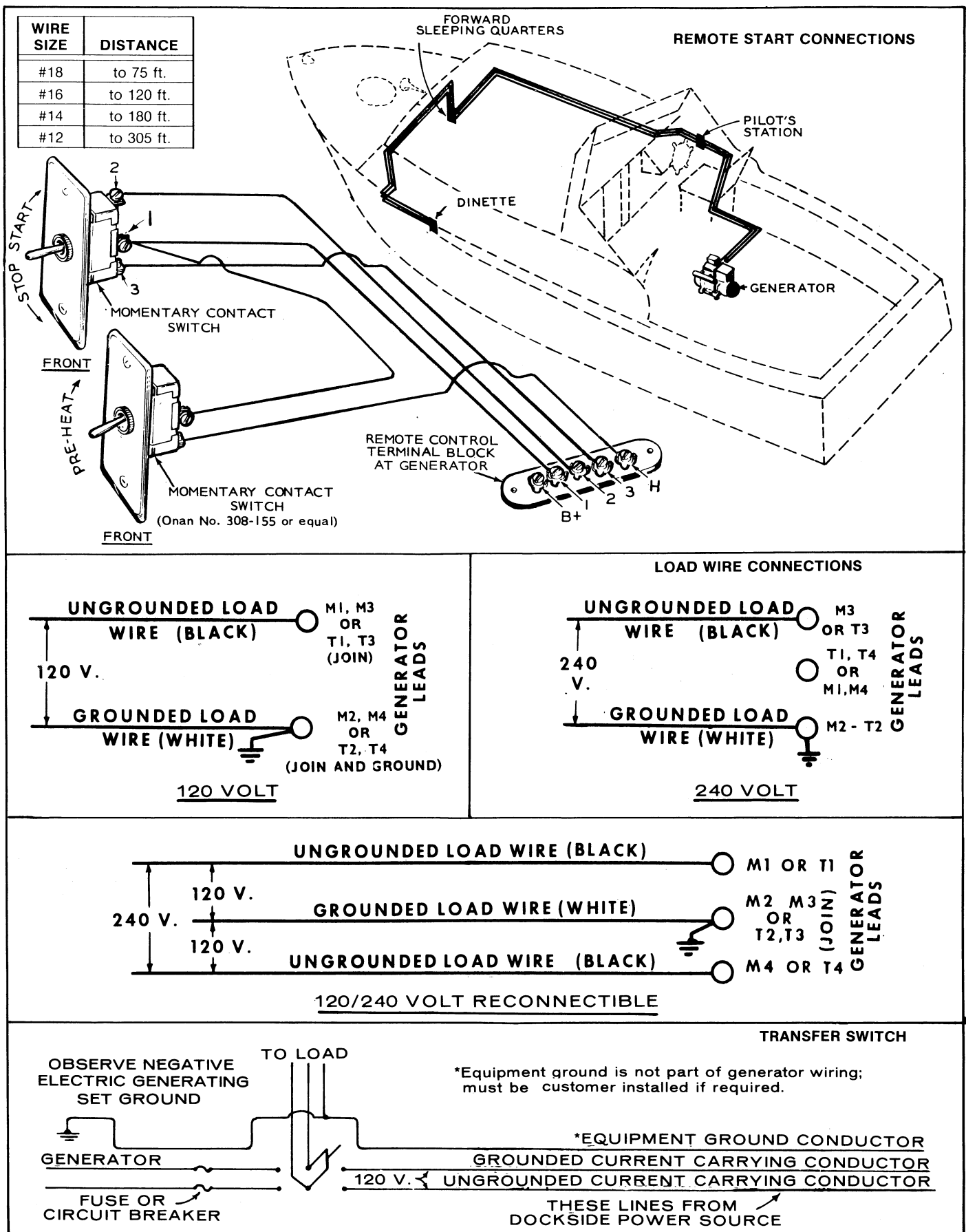


FIGURE 11. WIRING CONNECTIONS

# OPERATION

## CRANKCASE OIL

Use an oil with the API designation CD/SD or CD/SC. 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
Below 0°F	SAE 5W-30

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

If the oil supply in your local area still has the API designations ML, MM, MS, DG, DM and DS, use an oil with the DS designation which has passed the Series 3 Test and at least Sequence I of the Automotive Manufacturer's Sequence Tests. To reduce oil consumption to a normal level in the shortest time on a new or rebuilt engine, use DG or DM oil (passing the MS Sequence Tests) for the first fill only (50 hours). Then use the recommended oil. See *MAINTENANCE SCHEDULE* for suggested oil changes.

## 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 load.

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 nozzle.

## INITIAL START

Check the engine to make sure it has been filled with oil and fuel.

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. If the camshafts pump lobe is up, crank engine one revolution to permit hand priming. When finished, return priming lever inward (disengaged position) to permit normal pump operation. Temporarily remove the plug from the water pump inlet fitting, Figure 7. Fill the pump with water to lubricate and prime it.

Batteries may be conserved by using this alternate method of bleeding the fuel system. Completely loosen the lower nut on the injection pump to nozzle fuel line. Loosen the delivery valve holder, located below the fuel line nut, until it can be turned with the fingers. Crank engine until clear fuel emerges around the loosened delivery valve holder. Retighten the delivery valve holder and fuel line. Fuel injection should occur almost immediately when engine is cranked.

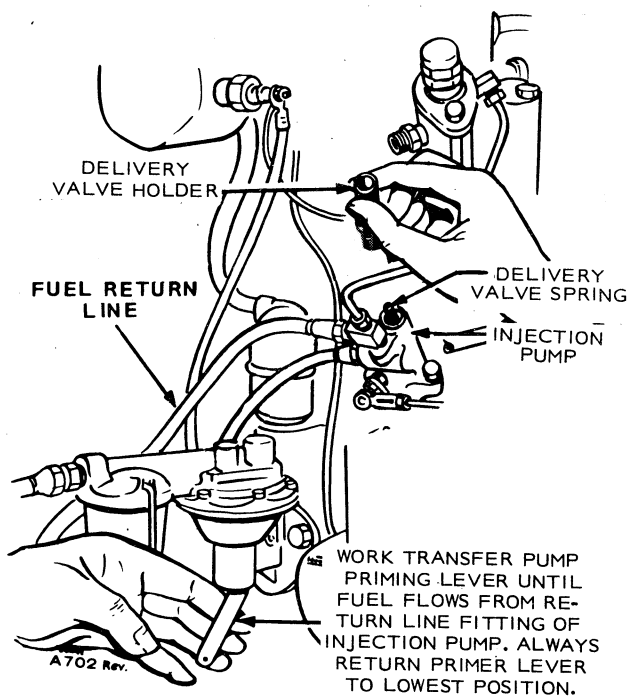


FIGURE 12. BLEEDING THE FUEL SYSTEM

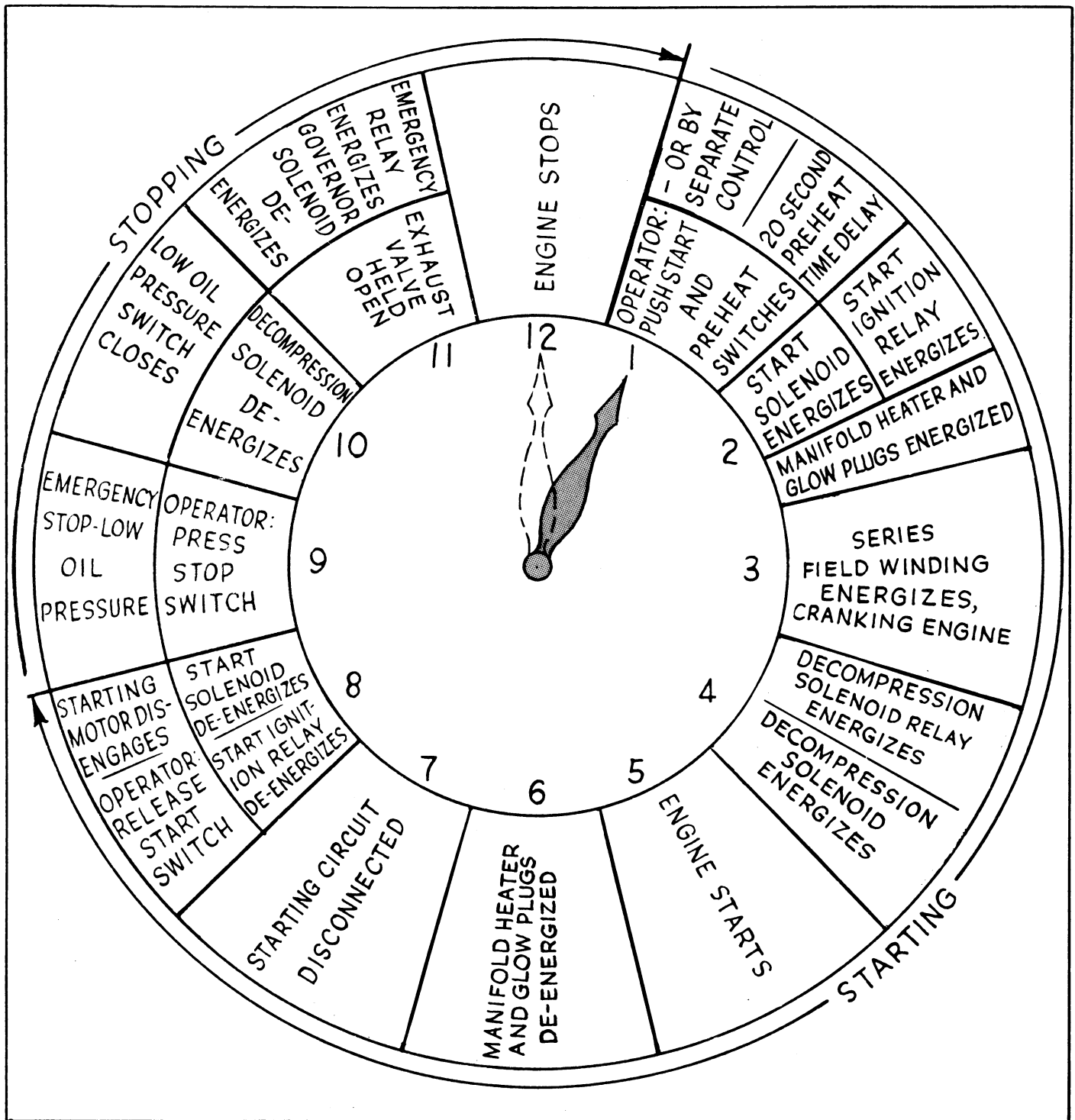


FIGURE 13. OPERATING CYCLE

## STARTING

For cold engine starting below 55°F, depress the manifold heater switch for one minute. Push START-STOP switch to its START position. Release switch after engine starts and reaches speed. Oil pressure should read at least 20psi (pressure-relief valve is not adjustable).

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.

An adjustable resistor slide tap (in the charging circuit AC sets) is set to give approximately 2ampere 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 set is stopped. Avoid overcharging. The resistor is located on the outside of the control box.

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.

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

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

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.

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

**Automatic Starting and Stopping:** Separate controls may be used for automatic start and stop, but must provide engine pre-heating.

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

## STOPPING

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

## Automatic Starting And Stopping

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

The automatic control as a time delay relay to preheat glow plugs and the manifold heater for about 20 seconds before cranking occurs. Remove the jumper in the set's control box which connects terminal H (heater) to terminal 3 (start circuit) and

connect separate-control preheat circuit to the set H terminal when installing the control. The time delay relay also delays engagement of the starter when load is reapplied before the engine stops completely.

## Stopping

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

## Applying Load

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

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

## Exercise Standby Sets

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

## 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 the initial oil after 50 hours of operation while the engine is still hot.**

## Safety Devices

In case of dangerously high coolant (water) temperature or low oil pressure, the cut-off switch stops the set. After an emergency stop, investigate and correct the cause.

## Emergency Operation If Battery Fails

MDJA generating sets require a battery for running. If the set battery fails completely and set must be operated during an emergency, a battery can be shared with other equipment.

## Fuel System

1. Cover air intake openings.
2. Clean throttle linkage (and governor linkage) thoroughly. Lubricate metal ball joints with light machine oil (do not lubricate plastic ball joints).

## 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.

## Returning The Set To Operation

1. Check *service identification tags* to properly service the set.
2. Remove any dust, dirt or foreign matter from set.
3. Check fuel supply tanks for moisture accumulations (drain tanks if necessary). Check lubricating oil for moisture or contamination (drain if necessary). Check fuel line connections, all wiring connections, and exhaust line connections.
4. Service air cleaner (if used). Torque fuel injectors and bleed fuel system (if moisture or contamination are found in fuel, replace secondary filter and clean primary filter).
5. Service cooling system with clean fresh water. Prime water pump and see that all air is bled from cooling system. If anti-freeze was left in closed type cooling system, check level and service as required.
6. Check entire set for water, fuel, or oil leaks. Correct leakage as required.
7. Install fully charged batteries.

## Cooling System

1. Drain entire cooling system including water cooled exhaust manifold and exhaust line. Drain heat exchanger or keel cooler components, engine cylinder block, and water pumps.

Generating sets equipped with heat exchanger or keel cooling may be filled with a good quality anti-freeze if freezing temperatures are expected. Drain only those components not protected from freezing (exhaust line, water intake and outlet lines, etc.).

## Electrical System Batteries

1. Clean generator brushes, commutator, and slip rings by wiping with a clean, dry, lint-free cloth. Do not lubricate these parts.
2. Remove dust and dirt deposits in control box and junction boxes.
3. Disconnect batteries and remove from vessel. Service batteries by maintaining liquid level and using a trickle charger to maintain specific gravity.

### CAUTION

Discharged batteries are subject to severe damage if exposed to freezing temperatures: **STORE ALL BATTERIES IN A FULLY CHARGED CONDITION AND MAINTAIN CHARGE DURING STORAGE.**

## General

1. Cover or seal all exposed openings (exhaust outlet, water parts, etc.).
2. Cover entire generating set. TAG and IDENTIFY set to indicate service required before attempting to operate. List all items requiring attention and service prior to operation.

### WARNING

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

## Oil System

1. Drain engine lubricating oil while engine is warm. Service the engine with proper oil. TAG the engine to IDENTIFY the lubricating oil installed. Secure the oil filter cap.
2. Remove fuel injector. Pour 2 tablespoons of rust inhibitor oil (SAE50 substitute) into each cylinder. Crank engine over by hand several revolutions to lubricate cylinder walls, pistons, and rings. Install injector.
3. Remove and service oil filter.
4. Clean crankcase breather valve.

8. Start the set in normal method. Check the running set for leaks, correct voltage output, proper cooling.

## **LOW TEMPERATURES**

1. Use correct SAE No. oil for temperature conditions. Change oil only when engine is warm. If an unexpected temperature drop causes an emergency, apply heated air (never an open flame) externally until oil flows freely.
2. Protect fuel against moisture condensation.
3. Keep batteries in a well charged condition.
4. Partially restrict cool air flow, but use care to avoid overheating.
5. All good quality anti-freeze if danger of freezing exists.

Aqualift muffler need not be drained.

# ADJUSTMENTS

## CHECK ANTI-FLICKER POINTS

Replace burned or faulty points. If only slightly burned, dress smooth with file or fine stone. Measure gap with thickness gauge (Figure 16). Loosen and adjust stationary contact to correct gap.

## GOVERNOR

The governor controls engine speed. Rated speed and voltage appear on the nameplate (see also *Specifications*). Engine speed equals frequency multiplied by 30, on a 4pole generator, thus 1800rpm gives 60hertz frequency. Preferred speed does not vary more than 3hertz from no-load to full-load operation. Be sure throttle, linkage and governor mechanism operate smoothly.

Changing spring tension (by turning the nut) changes engine speed (Figure 14). More spring tension (turning nut clockwise) gives more rpm. Turn nut counterclockwise to reduce governed speed. Hold a tachometer against the stud in the generator axis. On revolving armature generators, adjust engine speed to attain proper voltage with load connected and using a voltmeter.

The sensitivity (no load to full load speed droop) is adjusted by turning the governor sensitivity adjusting ratchet nut. If speed drops too much when full load is applied, turn the ratchet nut (Figure 14) counterclockwise to increase spring tension to compensate for reduced rpm. Too close a sensitivity adjustment approaching no speed drop when load is applied, will result in a hunting condition (increase and decrease in speed). After adjusting speed and sensitivity secure the speed stud lock nut.

Change spring tension on early models by holding the governor spring stud and turning the nut. Sensitivity is adjusted by turning the governor spring stud (Figure 14).

The raw water side of the heat exchanger is protected from corrosion by a zinc pencil mounted on a pipe plug in one end of the heat exchanger. Inspect the pencil at least every two months and replace if deteriorated to less than half its original size.

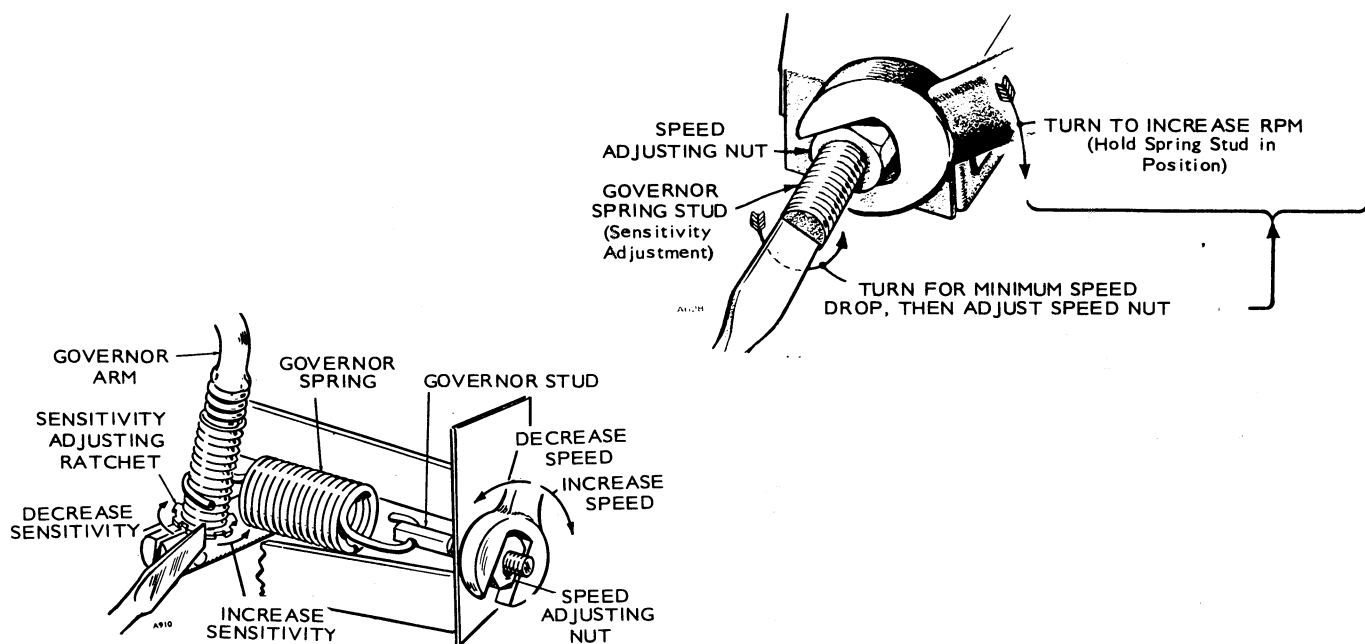


FIGURE 14. GOVERNOR ADJUST



# GENERAL MAINTENANCE

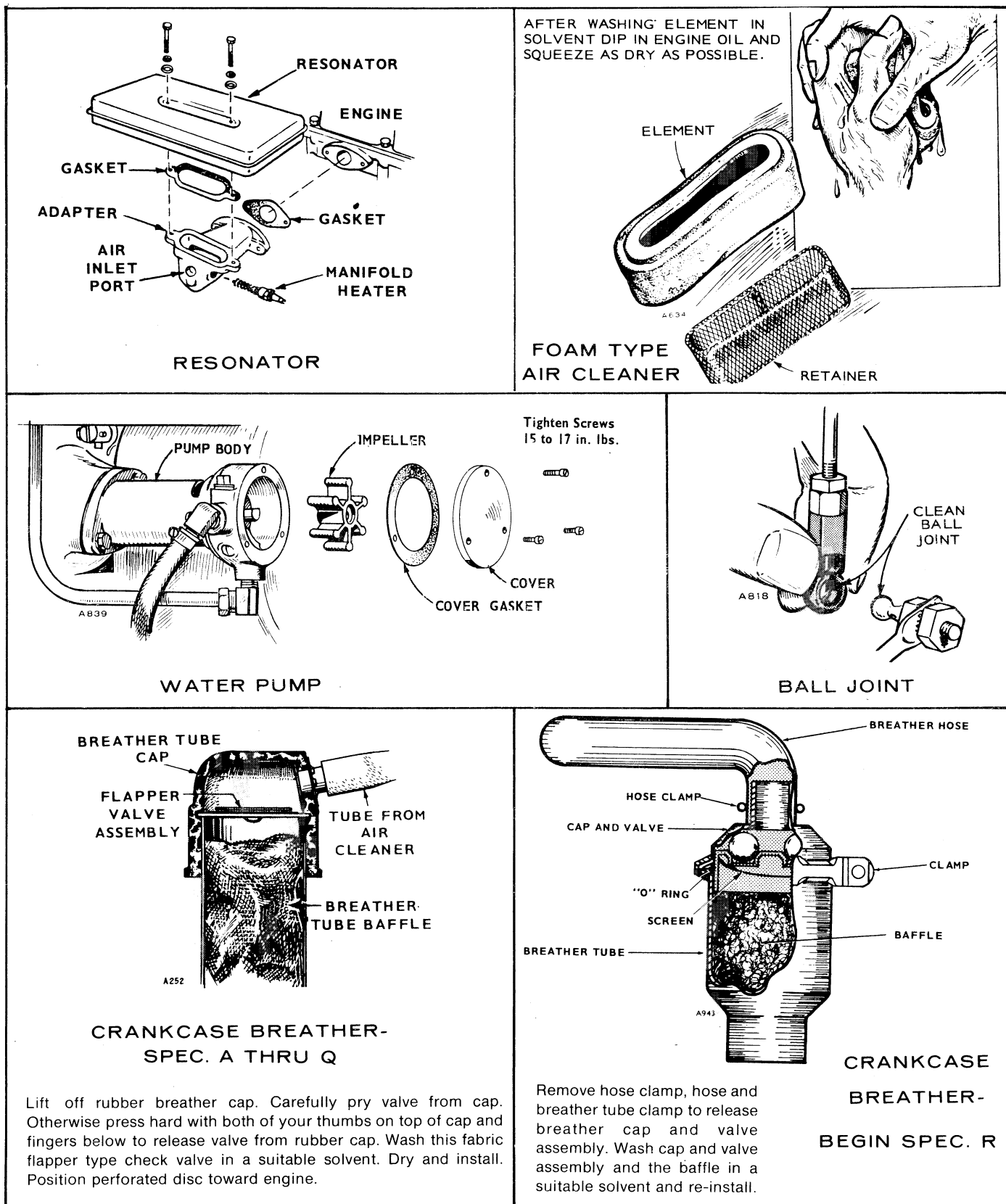


FIGURE 15. SERVICING PROCEDURES

CAP AND OIL  
LEVEL INDICATOR.

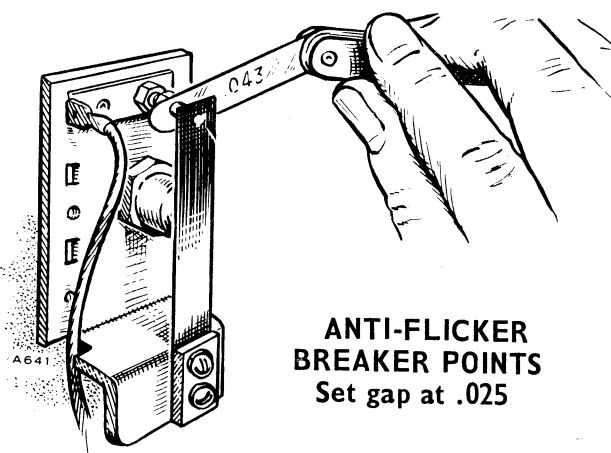
KEEP OIL  
AT THIS LEVEL

NEVER OPERATE  
ENGINE WITH OIL  
BELOW THIS LEVEL

A874

ALWAYS REPLACE  
CAP TIGHTLY, OR  
OIL LEAKAGE MAY  
OCCUR.

### CRANKCASE OIL LEVEL INDICATOR



### ANTI-FLICKER POINTS

FUEL PUMP AND  
FILTER BODY

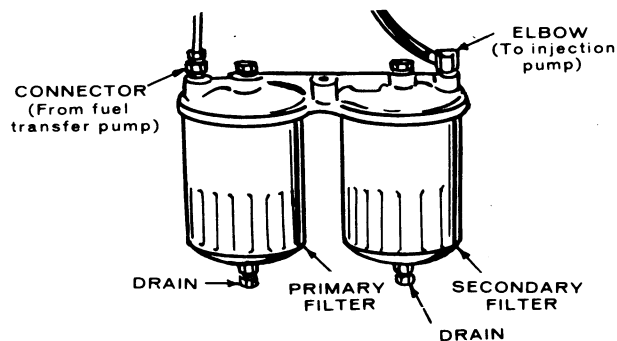
FILTER

GASKET

BOWL

A725

### PRIMARY FUEL FILTER



### DUAL FUEL FILTER SYSTEM- BEGIN SPEC. S

Drain water periodically as required. Replace primary filter every six hundred (600) hours. Perform more often in extremely dusty conditions. Replace secondary filter with every 5th change of the primary filter.

**CAUTION**

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

BLEED  
SCREW

COVER

GASKET

FILTER  
ELEMENT

BODY

### SECONDARY FUEL FILTER SPEC. A THRU R

A931

DRAIN  
PLUG

FIGURE 16. MAINTENANCE

The raw water side of the heat exchanger is protected from corrosion by a zinc pencil mounted on a pipe plug in one end of the heat exchanger. Inspect the pencil at least every two months and replace if deteriorated to less than half its original size.

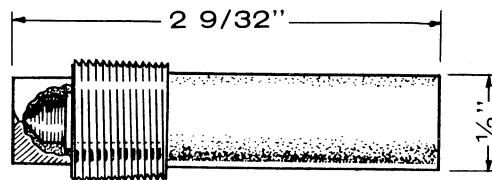


FIGURE 17. ZINC PENCIL

## 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.

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

- NOTE**
1. Water or foreign material in fuel can ruin the injection system. If daily inspection shows water or excessive dirt in sediment bowl fuel, handling and storing facilities should be checked and situation corrected. Primary and secondary fuel filters must be replaced following correction of fuel contamination problem.
  2. This service must be conducted by trained diesel injection equipment personnel with suitable test facilities. Omit this service until these conditions can be met.
  3. Tighten head bolts and adjust valve clearance after first 50 hours on an overhauled engine.
  4. Inspect *Exhaust System* as well as overall generating set.

TABLE 1.  
OPERATOR AND SERVICE MAINTENANCE SCHEDULE

HOURS OF OPERATION	MAINTENANCE TASK
8	<ul style="list-style-type: none"> <li>• Inspect generator set, see Note 4</li> <li>• Check fuel supply, see Note 1</li> <li>• Check oil level</li> <li>• Check water level (heat exchanger models)</li> </ul>
50 (more often in dusty conditions)	<ul style="list-style-type: none"> <li>• Check air cleaner</li> </ul>
100	<ul style="list-style-type: none"> <li>• Clean governor linkage</li> <li>• Change crankcase oil</li> <li>• Drain fuel condensation traps in lines and filters, see Note 1</li> </ul>
200	<ul style="list-style-type: none"> <li>• Clean crankcase breather</li> <li>• Replace oil filter</li> <li>• Check battery condition</li> </ul>
500 call Onan serviceman	<ul style="list-style-type: none"> <li>• Check generator slip rings and brushes on older sets; replace if worn to 5/16"</li> <li>• Check valve clearances</li> </ul>
600	<ul style="list-style-type: none"> <li>• Change primary filter</li> </ul>
2000 call Onan serviceman	<ul style="list-style-type: none"> <li>• Replace flicker points</li> <li>• Grind valves (if required)</li> <li>• Clean holes in rocker box oil line</li> <li>• Check nozzle spray pattern, see Note 2</li> <li>• Clean generator</li> </ul>
3000	<ul style="list-style-type: none"> <li>• Change secondary fuel filter</li> </ul>
5000 call Onan serviceman	<ul style="list-style-type: none"> <li>• General overhaul (if required), see Note 3</li> </ul>

# TROUBLESHOOTING GUIDE

TROUBLE															DIESEL ENGINE TROUBLESHOOTING GUIDE LIQUID OR AIR COOLED														
															CAUSE														
															STARTING SYSTEM														
															Discharged or Defective Battery														
															Defective Glow Plug or Lead														
															Load Connected When Starting														
															Defective Solenoid														
															Defective Starter														
															Defective Control Circuit														
															FUEL SYSTEM														
															Defective Fuel System														
															Air in Fuel System														
															Incorrect Timing														
															Restricted Air Intake - Dirty Air Filter														
															Poor Quality Fuel														
															Dirty Fuel Filters														
															Out of Fuel or Shut Off Closed														
															Worn or Damaged Transfer Pump, Leaking Diaphragm														
															Faulty Injection Pump, Nozzles or Gaskets														
															Fuel Line Leaks														
															Wrong Timing Button in Injection Pump														
															Wrong Thickness Pump Mounting Gaskets														
															Run For Long Periods of Time at NO LOAD														
															LUBRICATION SYSTEM														
															Low Oil Supply														
															Defective Oil Gauge														
															Excess Oil in Crankcase														
															Oil Leaks From Engine Base or Connections														
															Light or Diluted Crankcase Oil														
															Leaky Oil Seals														
															Improper Lubrication														
															Faulty Oil By-Pass														
															Worn Oil Pump														
															Heavy Oil or Clogged Passages														
															Dirty Oil Filter														
															GOVERNOR SYSTEM														
															Loose or Disconnected Linkage														
															Binding Linkage														
															Excessive Wear in Linkage														
															Incorrect Governor Adjustment														
															High Spring Sensitivity														
															Incorrectly Installed Governor Yoke or Cup														
															Overloaded Generator														
															COOLING SYSTEM														
															Insufficient Coolant														
															Faulty Thermostat														
															Worn Water Pump or Defective Seals														
															Water Passages Restricted														
															Blown Head Gasket														
															Overheating														
															Restricted or Too Long Water Lines														
															Defective Expansion Tank Pressure Cap														
															Dirt on Cooling Fins (Air Cooled)														
															Inadequate Air Circulation (Air Cooled)														
															INTERNAL ENGINE														
															Poor Compression														
															Loose Piston														
															Loose Connecting Rod or Crankshaft Bearing														
															Incorrect Valve Clearance														
															Broken or Weak Valve Spring														
															High Exhaust Back Pressure														
															Valves Not Seating Properly														
															Worn Bearings														
															Worn Cylinder Walls, Pistons, Rings														
															Sticking Valves														
															Worn or Dirty Valve Guides														

# PARTS CATALOG

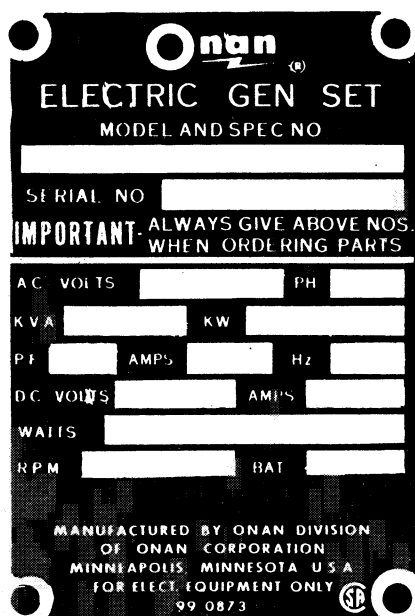
## INSTRUCTIONS FOR ORDERING REPAIR PARTS

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.



The image shows a black nameplate for an Onan Electric Gen Set. It features the Onan logo at the top, followed by 'ELECTRIC GEN SET' and 'MODEL AND SPEC NO'. Below these are blank lines for 'MODEL AND SPEC NO' and 'SERIAL NO'. A bold 'IMPORTANT' section states 'ALWAYS GIVE ABOVE NOS. WHEN ORDERING PARTS'. Below this are fields for 'A.C. VOLTS', 'PH', 'KVA', 'KW', 'PF', 'AMPS', 'Hz', 'D.C. VOLTS', 'AMPS', 'WATTS', 'RPM', and 'BAT'. At the bottom, it says 'MANUFACTURED BY ONAN DIVISION OF ONAN CORPORATION MINNEAPOLIS, MINNESOTA U.S.A. FOR ELECT. EQUIPMENT ONLY' and '99 0873'.

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 MDJA Electric Generating Sets as listed below. Parts are arranged in groups of related items. Each illustrated part is identified by a reference number corresponding to the same reference number below the illustration. Parts illustrations are typical. Using the MODEL and SPEC NO. from the set nameplate, select the PARTS KEY NO. (1, 2, etc., in the last column) that applies to your set MODEL and SPEC NO. This PARTS KEY NO. represents parts that differ between models. Unless otherwise mentioned in the description, parts are interchangeable between models. Right and left generating set sides are determined by FACING the engine end (front) of the generating set.

### GENERATING SET DATA TABLE

★ MODEL AND SPEC NO.	ELECTRICAL DATA					PARTS KEY NO.
	WATTS	VOLTS	HERTZ	WIRE	PHASE	
2.5MDJA-51R/*	2,500	120	50	2	1	1
2.5MDJA-52R/*	2,500	240	50	2	1	1
2.5MDJA-53R/*	2,500	120/240	50	3	1	1
2.5MDJA-53CR/*	2,500	120/240	50	£	1	1
3.0MDJA-1R/*	3,000	120	60	2	1	1
3.0MDJA-2R/*	3,000	240	60	2	1	1
3.0MDJA-3R/*	3,000	120/240	60	3	1	1
3.0MDJA-3CR/*	3,000	120/240	60	£	1	1
2.5MDJA-51R4/*	2,500	120AC/32DC	50	2	1	2
3.0MDJA-1R4/*	3,000	120AC/32DC	60	2	1	2
2.5MDJA-224R/*	2,500	24DC	DC			3
3.0MDJA-232R/*	3,000	32DC	DC			4

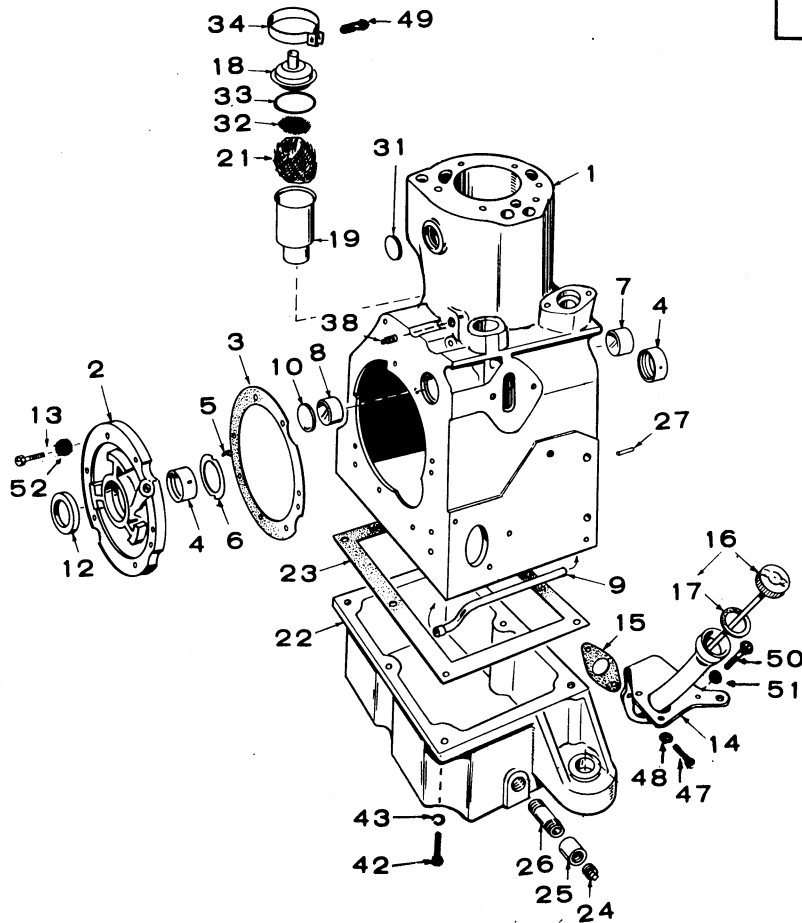
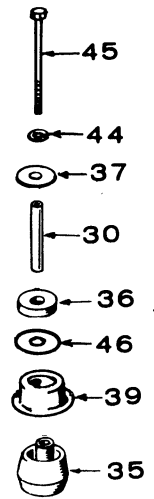
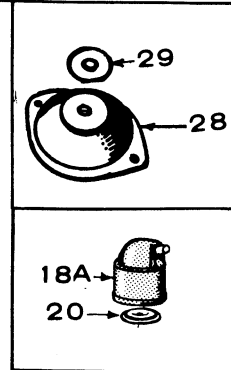
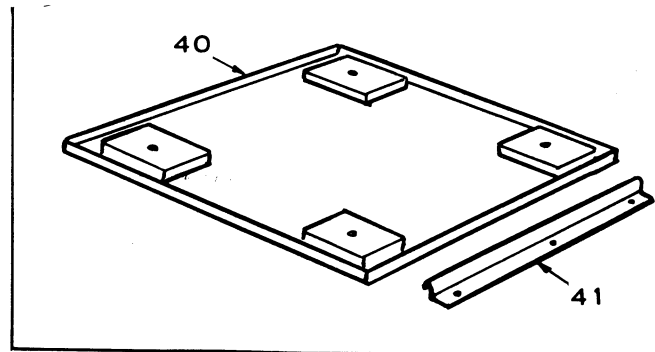
\* - The Specification Letter advances (A to B, B to C, etc.) with manufacturing changes.

£ - Generating set is reconnectable 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: 2.5MDJA was formerly 205MDJA and 3.0MDJA was formerly 3MDJA.

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

# CRANKCASE AND OIL BASE GROUP



REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	110-1357	1	Block Assembly, Cylinder (Includes Parts Marked *)
2	101-0337	1	*Plate, Bearing (Less Bearing and Pins)
3	101-0386	1	Gasket and Shim Kit - Rear Bearing Plate
4	BEARING, PRECISION CRANKSHAFT		
	101-0359	2	*Standard
	101-0359-02	2	.002" Undersize
	101-0359-10	2	.010" Undersize
	101-0359-20	2	.020" Undersize
	101-0359-30	2	.030" Undersize
6	104-0420	2	*Washer, Crankshaft Thrust
7	101-0339-363	1	*Bearing, Precision Cam, Front - Standard Only
8	101-0332-363	1	*Bearing, Precision Cam, Rear - Standard Only
9	120-0572	1	*Tube, Crankcase Oil
10	517-0053	1	*Plug, Camshaft Opening
12	509-0086	1	*Seal, Crankshaft - Rear
13	805-0019	6	*Bolt, Place (3/8-16 x 1-1/4") - Bearing Plate
14	TUBE, OIL FILL		
	123-0724	1	Spec A through R
	123-1084	1	Begin Spec S
15	123-0667	1	Gasket, Oil Fill Tube
16	123-0716	1	Cap and Indicator
17	123-0191	1	Gasket, Cap
18	123-0954	1	Cap and Valve Assembly, Breather - Begin Spec R
18A	CAP, BREATHER		
	123-0458	1	Spec A Only
	123-0787	1	Spec B through P
19	TUBE, BREATHER		
	123-0645	1	Spec A through Q
	123-0952	1	Begin Spec R
20	123-0315	1	Valve, Breather - Spec A through Q
21	123-0865	1	Baffle, Breather
22	BASE, OIL		
	102-0488	1	Spec A and B
	102-0541	1	Begin Spec C
23	102-0459	1	Gasket, Base
24	505-0056	1	Plug (1/2")
25	505-0014	1	Coupling (1/2")
26	505-0002	1	Nipple (1/2" x 3")
27	516-0141	2	Pin, Dowel - Gear Cover Locating
28	CUSHION, VIBRATION CENTER FLANGE (Lord Mount) - SPEC A AND B		
	402-0242	2	Engine End
	402-0244	2	Generator End

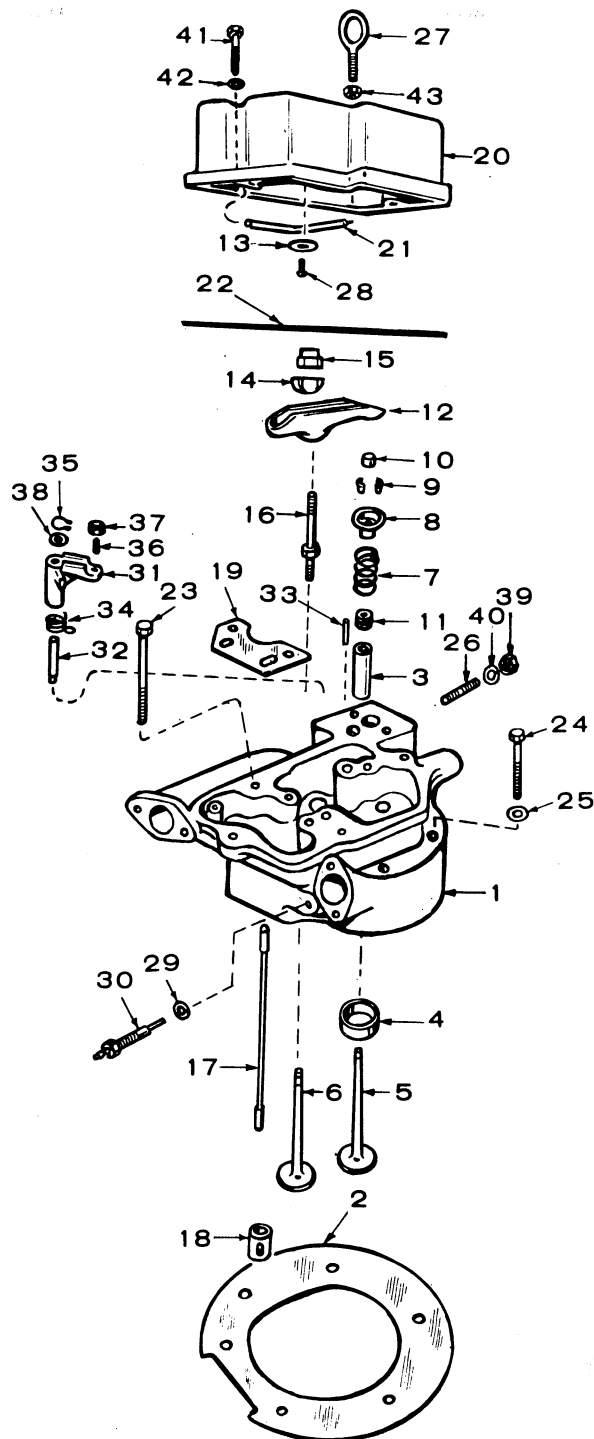
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
29	WASHER, MOUNTING RUBBER - SPEC A AND B		
	526-0181	4	Lower (17/32 x 2-7/8 x 1/8")
	526-0182	4	Upper (17/32 x 2-7/8 x 1/4")
30	402-0328	4	+Bushing, Spacer - Vibration Mount - Begin Spec C
31	517-0059	3	*Plug, Expansion - Cylinder Block
32	123-0958	1	Screen, Breather - Begin Spec R
33	509-0117	1	Seal, "O" Ring - Begin Spec R
34	123-0951	1	Clamp, Breather - Begin Spec R
35	CUSHION, VIBRATION (Cone Shaped) - BEGIN SPEC C		
	402-0284	2	Engine End
	402-0285	2	Generator End
36	402-0282	4	+Snubber, Shock Mounting - Begin Spec C
37	526-0014	4	+Washer (29/64" I.D. x 1-1/2" O.D. x 1/8") Only With Cone Shaped Cushion
38	505-0054	1	Plug (1/4") - Water Drain
39	402-0300	4	+Cup, Cushion Retaining
40	PAN, DRIP		
	405-1290	1	Spec A and B
	405-1400	1	Begin Spec C
41	405-1265	2	Clamp, Drip Pan Hold-down
42	800-0050	6	Screw (3/8-16 x 1") - Oil Base Mounting
43	850-0050	6	Washer, Lock (3/8)
44	850-0055	4	+Washer, Lock (7/16) - Begin Spec C
45	800-0081	4	+Screw, Cap (7/16-14 x 3-1/2") - Cushion Mounting - Begin Spec C
46	526-0198	As Req.	+Washer, Flat (5/8" I.D. x 1-1/2" O.D. x 1/16") - Begin Spec C
47	800-0026	2	Screw (5/16-18 x 3/4") - Oil Fill Tube Mounting
48	850-0045	2	Washer, Lock (5/16")
49	809-0035	1	Screw (#8 x 3/4") - Breather Clamp
50	800-0026	3	Screw (5/16-18 x 3/4") - Fill Tube to Filter Adapter
51	850-1045	3	Washer, Lock (5/16")
52	526-0245	6	Washer, Flat (3/8") - Rear Bearing Plate
	402-0302	4	Hardware Package, Mounting (Includes Parts Marked +)

+ - Included in Mounting Hardware Package.

\* - Included in Cylinder Block Assembly.



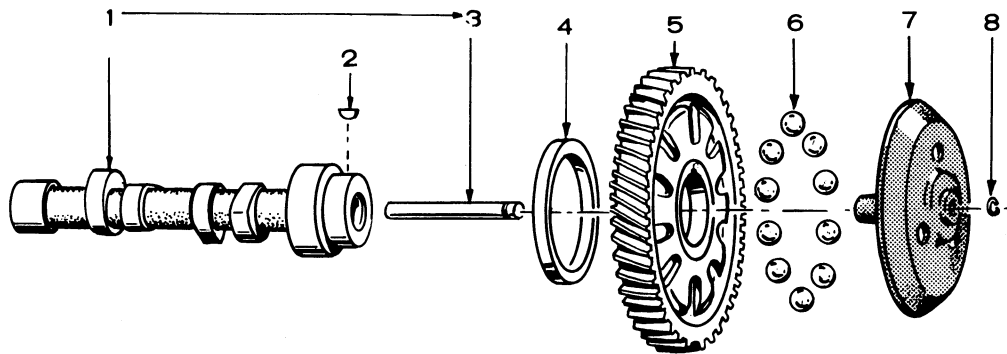
# **CYLINDER HEAD, VALVE AND ROCKER GROUP**



REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	110-1675	1	Head Assembly, Cylinder (Includes Parts Marked *)
2	110-1294	1	Gasket, Head
3	*GUIDE, VALVE		
	110-1501	2	Standard
	110-1501-01	2	.001" Oversize
4	*INSERT, VALVE SEAT		
	110-1268	2	Standard
	110-1268-02	2	.002" Oversize
	110-1268-05	2	.005" Oversize
	110-1268-10	2	.010" Oversize
	110-1268-25	2	.025" Oversize
5	110-1320	1	Valve, Intake
6	110-1278	1	Valve, Exhaust, Stellite
7	110-1221	2	Spring, Valve
8	110-1220	2	Retainer, Valve Spring
9	110-0858	4	Lock, Valve Spring Retainer
10	110-0859	2	Cap, Valve Stem
11	509-0090	1	Seal, Oil, Intake Valve (Includes Retainer Rings)
12	ARM, ROCKER		
	115-0128	1	Exhaust
	115-0129	1	Intake
13	526-0130	1	Washer, Flat - Oil Line Mounting
14	115-0127	2	Ball, Rocker Arm
15	115-0150	2	Lock Nut, Rocker Arm
16	115-0152	2	Stud, Rocker Arm
17	115-0149	2	Rod, Valve Push (Steel)
18	TAPPET, VALVE		
	115-0132	2	Spec A through Q
	115-0195	2	Begin Spec R
19	115-0147	1	Guide, Push Rod
20	115-0188	1	Cover, Rocker (Includes Oil Line)
21	120-0595	1	Line, Oil, Rocker Cover
22	115-0160	1	Gasket, Rocker Cover
23	110-1264	2	Screw (3/8-16 x 4-1/4") - Cylinder Head
24	800-0501	4	Screw (3/8-16 x 3-3/8") - Cylinder Head
25	526-0174	4	Washer, Cylinder Head
26	520-0608	2	Stud, Exhaust Manifold
27	403-0671	1	Bolt, Lifting
28	809-0042	1	Screw, Oil Line, Rocker Cover
29	110-0546	1	Gasket, Glow Plug
30	PLUG, GLOW (Includes Gasket)		
	333-0106	1	Key 1, 12 Volt
	333-0107	1	Key 3, 24 Volt
	333-0112	1	Key 2, 4, 32 Volt
31	110-1512	1	Arm, Decompression Release
32	110-1444	1	*Pin, Decompression Release
33	516-0090	1	Pin, Roll (3/16 x 1-3/8")
34	110-1356	1	Spring, Decompression Release
35	518-0207	1	Ring, Retainer, Decompression Release
36	815-0252	1	Set Screw, Decompression Release
37	870-0134	1	Palnut, Decompression Release
38	110-1511	1	Washer, Decompression Release (Not used on early models with cast iron arm)
39	110-0445	2	Nut, Hex (5/16-24)
40	526-0045	2	Washer, Flat
41	110-0879	2	Screw (5/16-18 x 1-1/4") - Rocker Cover Mounting
42	850-0045	2	Washer, Lock
43	862-0003	1	Nut, Hex (3/8)

\* - Included in Cylinder Head Assembly.

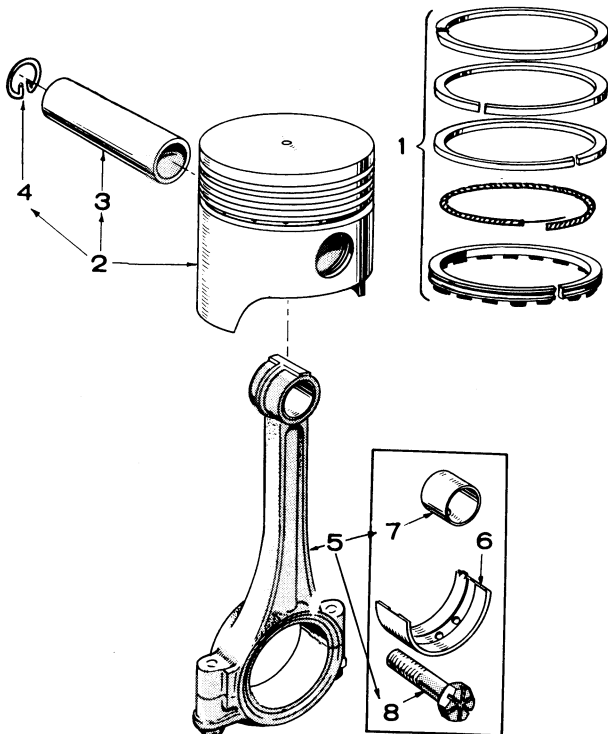
## CAMSHAFT GROUP



REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	CAMSHAFT - INCLUDES CENTER PIN		
	105-0248	1	Spec A through Q
	105-0299	1	Begin Spec R
2	515-0001	1	Key, Camshaft Gear or Distributor Gear
3	150-0075	1	Pin, Center

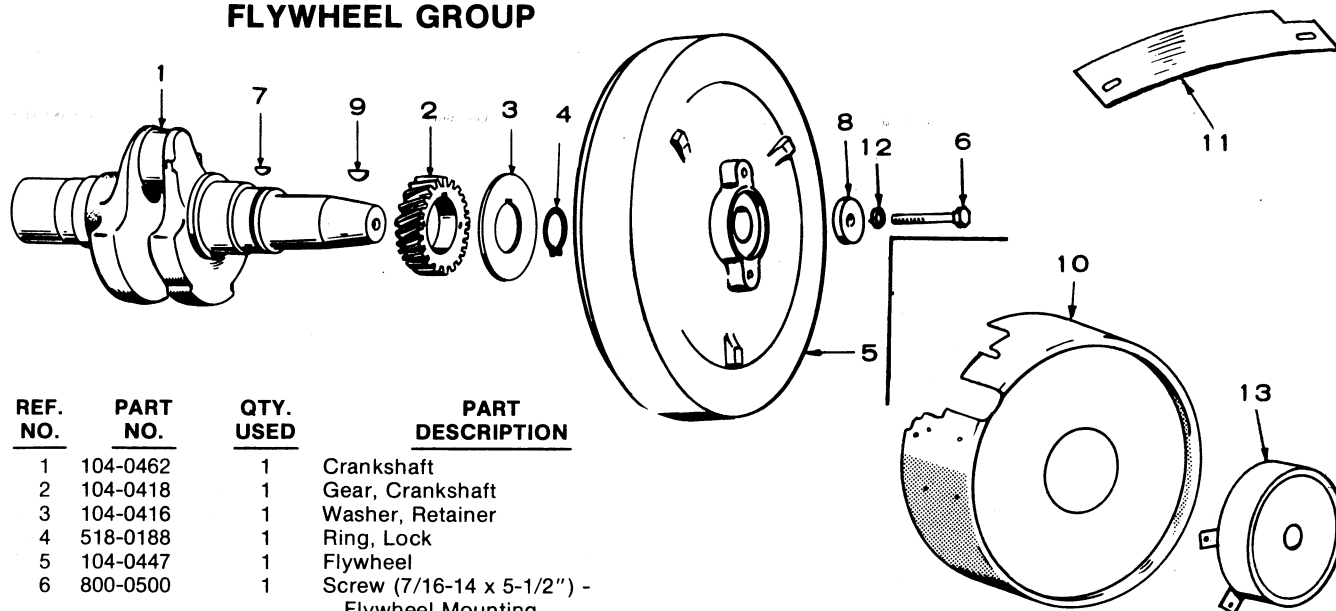
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
4	105-0205	1	Washer, Thrust
5	105-0218	1	Gear, Camshaft (Includes Flyball Spacer and Plate)
6	510-0046	10	Ball, Fly - Governor
7	150-0775	1	Cup, Governor
8	150-0078	1	Ring, Snap - Center Pin

## PISTON AND CONNECTING ROD GROUP



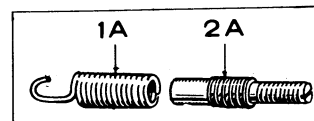
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	RING SET		
	113-0130	1	Standard
	113-0130-05	1	.005" Oversize
	113-0130-10	1	.010" Oversize
	113-0130-20	1	.020" Oversize
	113-0130-30	1	.030" Oversize
	113-0130-40	1	.040" Oversize
2	PISTON AND PIN (Includes Pin Retainer Rings)		
			Spec A through N
	112-0103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

## CRANKSHAFT AND FLYWHEEL GROUP

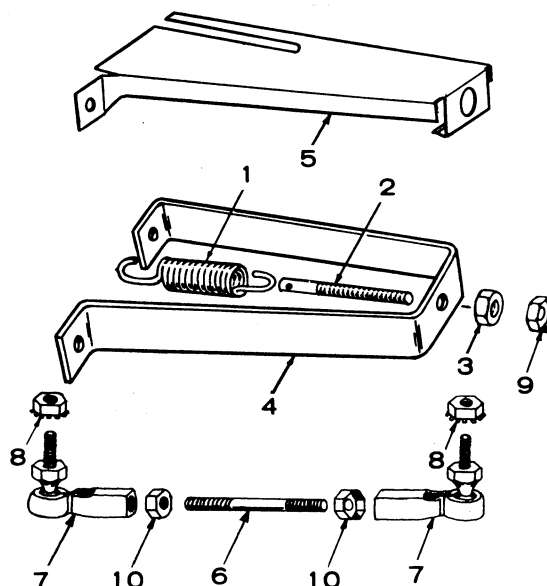


REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	104-0462	1	Crankshaft
2	104-0418	1	Gear, Crankshaft
3	104-0416	1	Washer, Retainer
4	518-0188	1	Ring, Lock
5	104-0447	1	Flywheel
6	800-0500	1	Screw (7/16-14 x 5-1/2") - Flywheel Mounting
7	515-0001	1	Key, Gear
8	526-0185	1	Washer, Flywheel
9	515-0153	1	Key, Flywheel to Crankshaft
10	104-0467	1	Guard, Flywheel
11	104-0564	1	Cover, Flywheel Guard
12	850-0055	1	Washer, Lock (7/16")
13	104-0594	1	Cover, Flywheel Guard

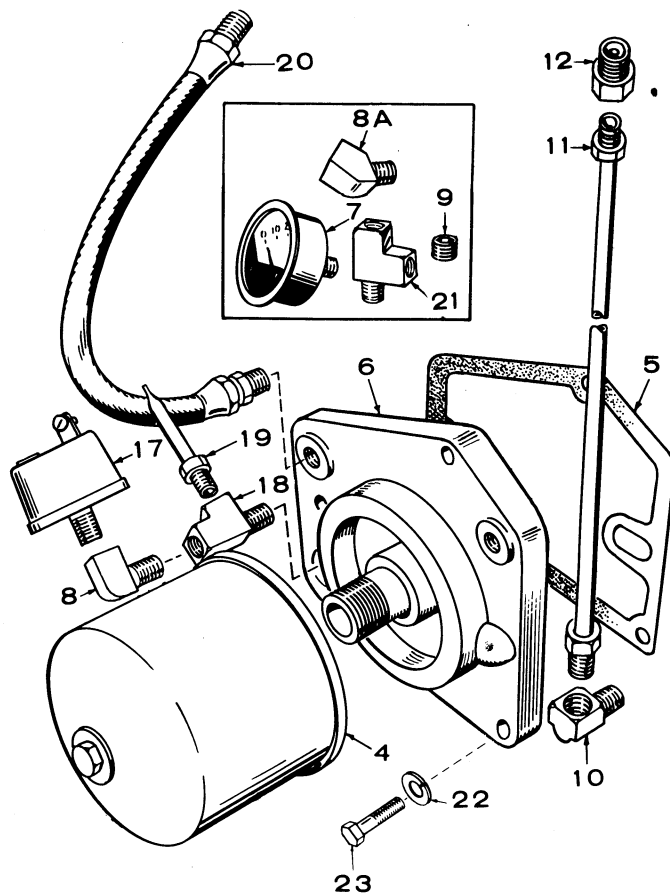
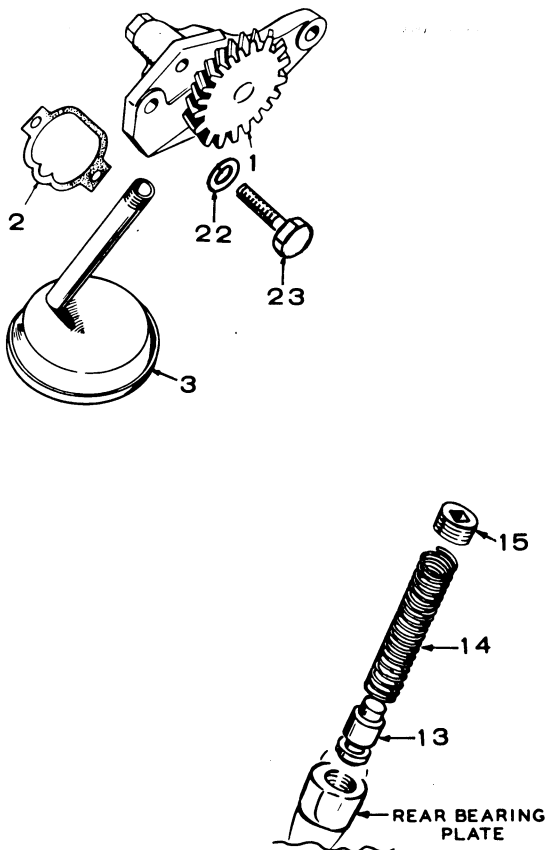
## GOVERNOR GROUP



REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	150-1084	1	Spring - Begin Spec R
1A	150-0821	1	Spring - Spec A through Q
2	150-1082	1	Stud, Adjusting - Begin Spec R
2A	150-0822	1	Stud, Adjusting - Spec A through Q
3	NUT, ADJUSTING STUD		
	104-0091	1	Spec A through Q
	862-0003	1	Begin Spec R
4	BRACKET ASSEMBLY		
	150-0810	1	Spec A through Q
	150-1103	1	Begin Spec R
5	150-0823	1	Cover, Governor Bracket
6	LINK, GOVERNOR		
	150-0883	1	Spec A through Q
	150-1201	1	Begin Spec R
7	JOINT, BALL		
	150-0974	2	Spec A through Q
	150-0939	2	Begin Spec R
8	870-0131	2	Nut, Keps, Joint Arm
9	870-0130	1	Nut, Lock
10	870-0053	2	Nut, Lock - Governor Link - Begin Spec R



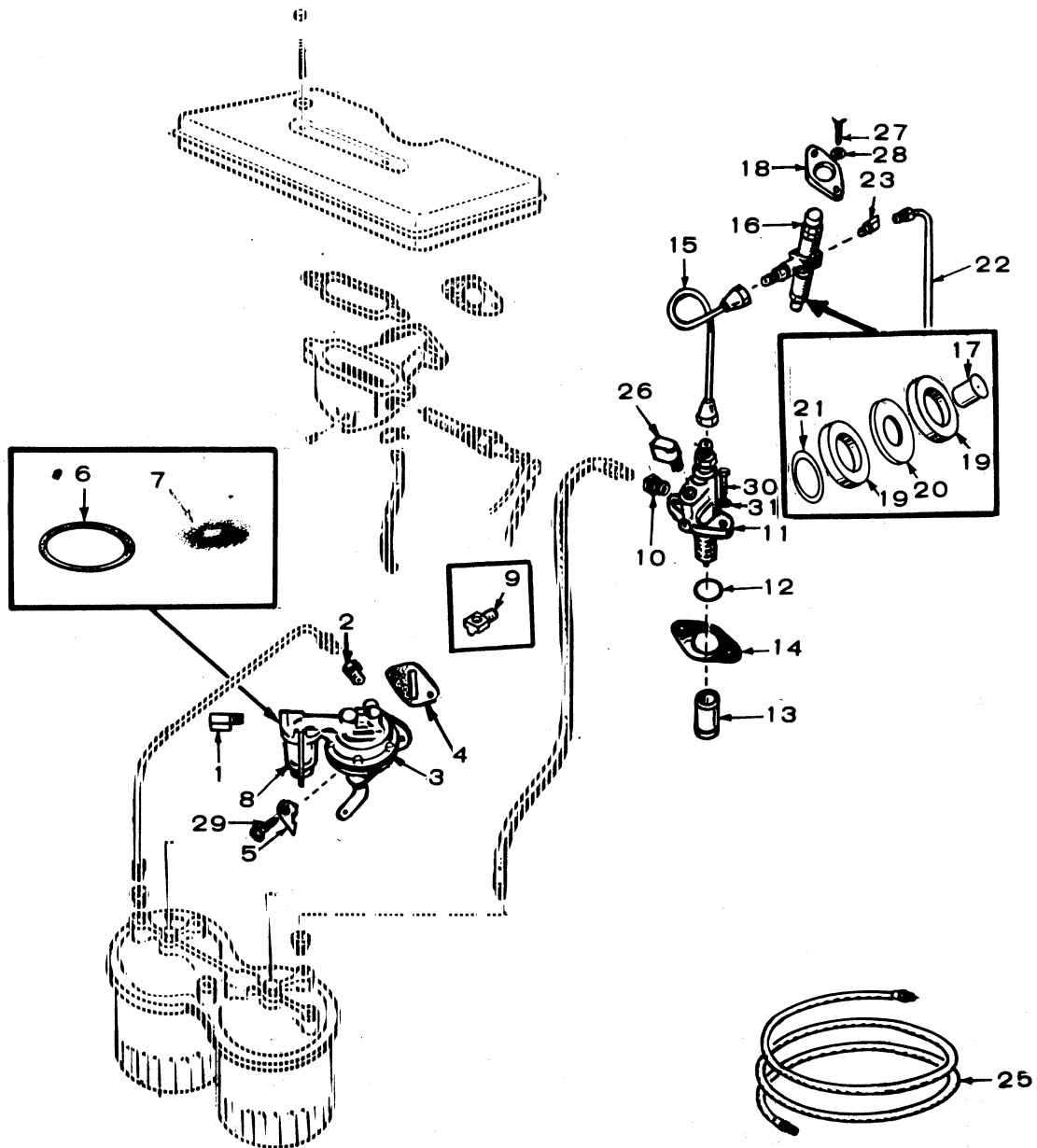
## OIL SYSTEM GROUP



REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	120-0547	1	Pump Assembly, Oil
2	120-0580	1	Gasket Kit, Pump
3	120-0551	1	Cup, Oil Intake
4	122-0185	1	Filter
5	122-0188	1	Gasket, Adapter
6	122-0182	1	Adapter, Oil Filter
7	193-0006	1	Gauge, Oil Pressure
8	502-0020	1	Elbow, Street (90°) - Low
8A	502-0053	1	Elbow, Street (45°) - Oil Gauge Mounting
9	505-0274	2	Plug, 1/8" (1) Adapter, (1) Oil Gauge Bracket
10	ELBOW, OIL LINE TO FILTER ADAPTER		
	502-0019	1	Spec A through Q
	502-0037	1	Begin Spec R
11	LINE, ADAPTER TO CYLINDER HEAD		
	120-0562	1	Spec A through Q
	120-0622	1	Begin Spec R
12	CONNECTOR, RESTRICTED - CYLINDER HEAD		
	502-0235	1	Spec A through Q
	502-0281	1	Begin Spec R

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
13	120-0539	1	Valve, Oil By-Pass
14	120-0555	1	Spring, By-Pass Valve
15	505-0274	1	Plug, 1/8" Oil By-Pass
17	309-0104	1	Switch, Oil Pressure
18	502-0255	1	Tee, Restricted, Air Trap Tube
19	120-0598	1	Tube, Air Trap, Switch
20	501-0003	1	Line, Oil Gauge - Begin Spec S
21	502-0001	1	Tee, Oil Gauge Mounting - Begin Spec S
22	WASHER, LOCK		
	850-0045	2	Oil Pump Mounting (5/16")
	850-0045	3	Oil Filter Adapter Mounting (5/16")
23	SCREW, HEX CAP		
	800-0030	2	Oil Pump Mounting (5/16-18 x 1")
	800-0026	3	Oil Filter Adapter Mounting (5/16-18 x 3/4")

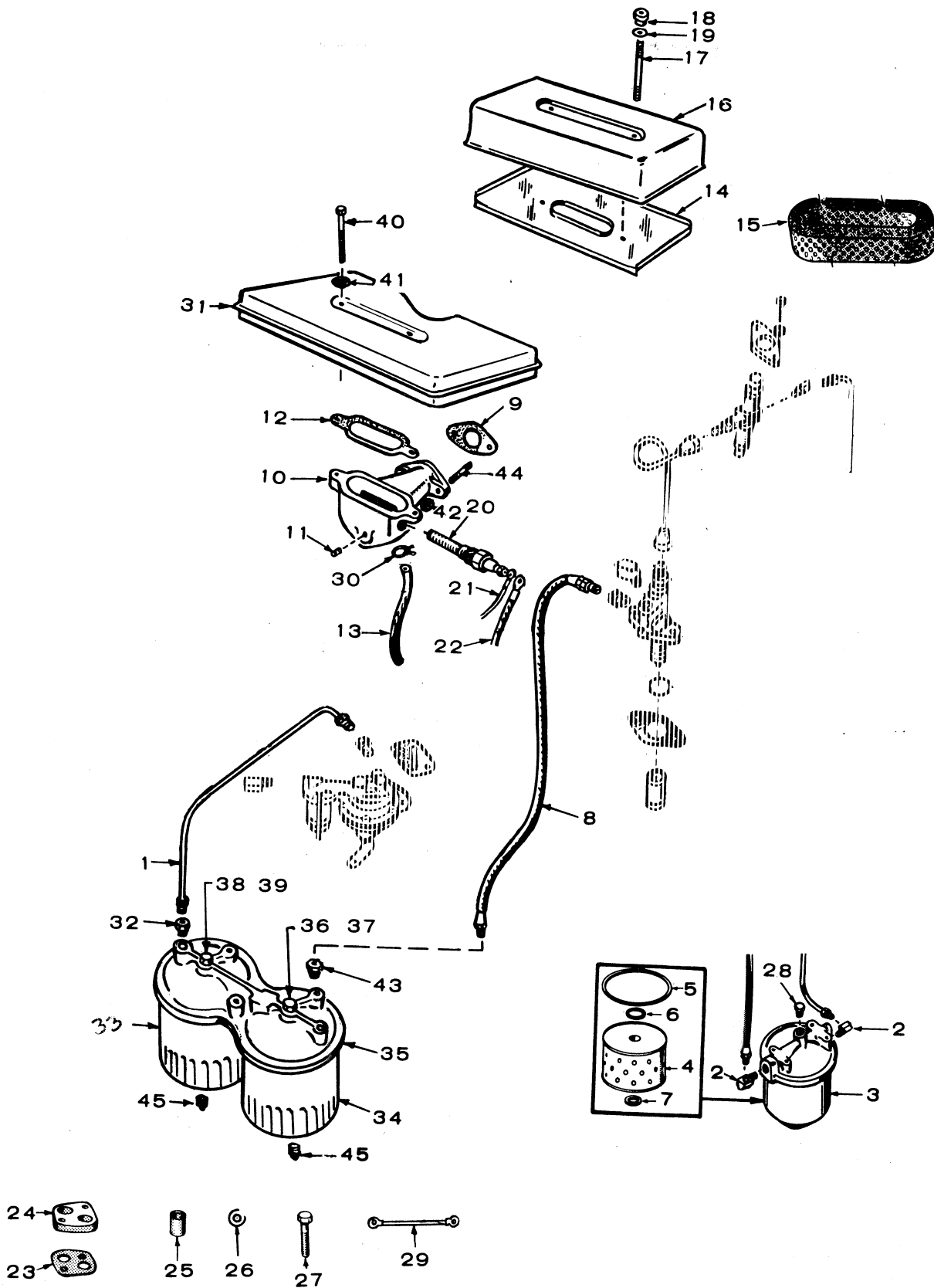
# FUEL TRANSFER PUMP AND INJECTION SYSTEM GROUP



REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
	149-1047	1	Repair Kit, Fuel Pump (Includes Diaphragm and Gaskets)
1	502-0002	1	Elbow, Inverted Male, Fuel Pump Inlet
2	502-0065	1	Elbow (45°), Inverted Male, Fuel Pump Outlet
3	149-0938	1	Pump, Fuel Transfer
4	149-0792	1	Gasket, Pump Mounting
5	149-1307	2	Washer, Flange - Pump Mounting
6	149-0517	1	Gasket, Fuel Pump Bowl
7	149-0463	1	Screen, Fuel Transfer Pump
8	149-0662	1	Bowl, Pump (Metal)
9	502-0041	1	Elbow, Injection Pump Inlet - Spec A Only
10	502-0033	1	Connector, Injection Pump Inlet - Begin Spec B
11	PUMP, INJECTION 147-0167	1	Spec A Only (For replacement order 147-0180 Pump, 502-0033 Control, 149-0947 Line and Instructional Sheet E 154)
	147-0180	1	Begin Spec B
12	509-0101	1	Seal, "O" Ring - Injection Pump to Crankcase
13	115-0166	1	Tappet, Injection Pump
14	147-0172	1	Shim Kit, Injection Pump Mounting

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
15	149-0936	1	Line, Injection Pump to Nozzle
16	147-0136	1	Nozzle and Holder Assembly
17	147-0134	1	Nozzle Only, Component of Nozzle and Holder Assembly
18	147-0141	1	Flange, Injection Nozzle Hold-down
19	147-0044	2	Shield, Nozzle Heat (Steel)
20	147-0043	1	Gasket, Heat Shield (Asbestos)
21	110-0419	1	Gasket, Shield to Head (Copper)
22	LINE, NOZZLE FUEL RETURN		
	149-0958	1	Spec A Only
	149-0947	1	Begin Spec B
23	502-0065	1	Elbow, Inverted, 45°, Nozzle (Fuel Return Line)
25	501-0007	2	Line, Fuel
26	147-0183	1	Valve, Check - Begin Spec B
27	114-0171	2	Screw (5/16-18 x 2") - Nozzle Mounting
28	526-0122	2	Washer, Flat
29	800-0027	2	Screw (5/16-18 x 7/8") - Transfer Pump Mounting
30	800-0031	2	Screw (5/16-18 x 1-1/2") - Injection Pump Mounting
31	850-0045	2	Washer, Lock (5/16)
32	149-1307	2	Washer, Fuel Pump Mounting

# AIR CLEANERS AND FUEL FILTERS GROUP

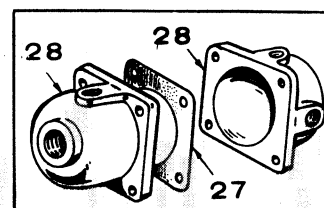
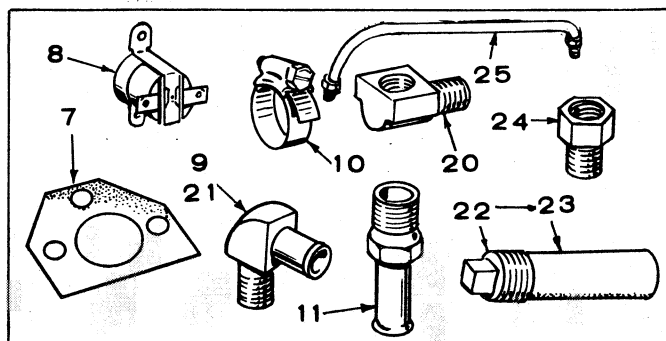
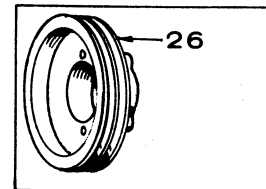
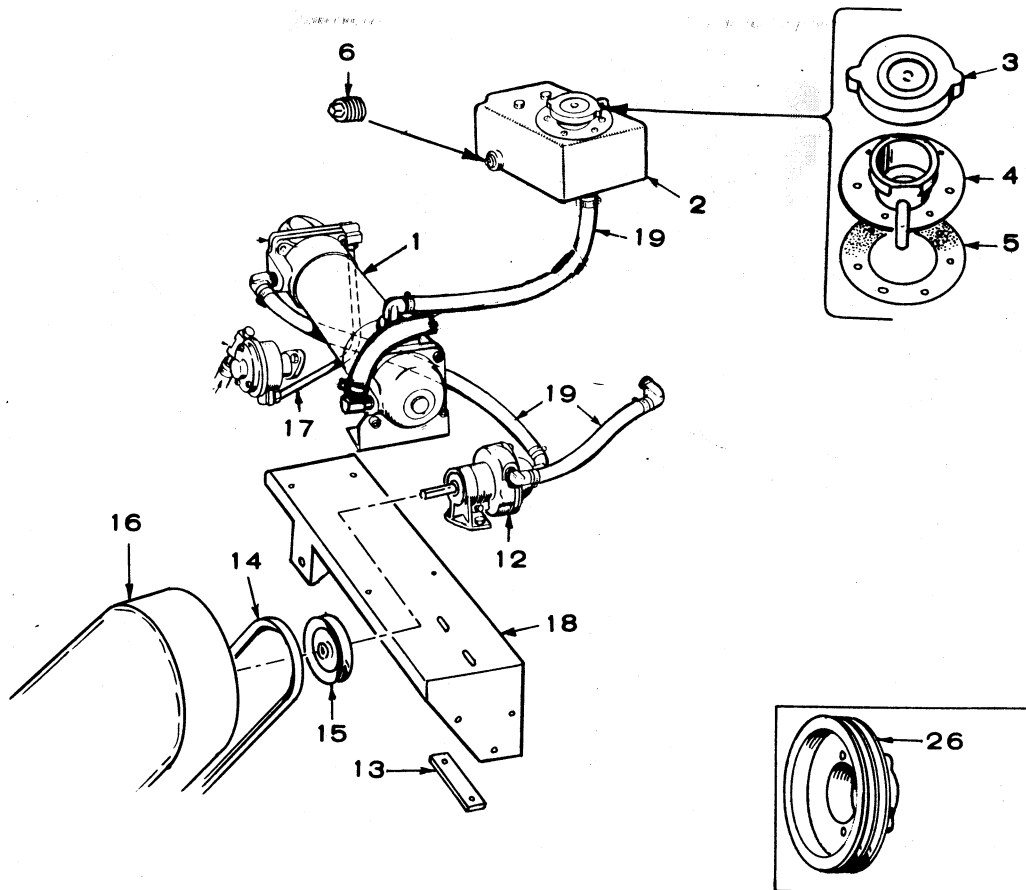


REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	LINE, PUMP TO SECONDARY FILTER		
	501-0032	1	Spec A through R
	149-1191	1	Begin Spec S
2	ELBOW, SECONDARY FILTER TO LINE - SPEC A THROUGH R		
	502-0041	1	Inlet
	502-0054	1	Outlet
3	149-0408	1	Filter, Secondary, Includes Cartridge ( <b>NOTE:</b> Bleed Plug 149-0769 is also available) - Spec A thru R
4	149-0428	1	Cartridge, Secondary Fuel Filter - Spec A thru R
5	149-0456	1	Gasket, Secondary Filter, Bowl to Cover - Spec A through R
6	149-0455	1	Gasket, Secondary Filter, Cartridge to Head - Spec A through R
7	149-0493	1	Gasket, Secondary Filter, Cartridge to Retainer - Spec A through R
8	501-0103	1	Line, Fuel, Secondary Filter to Injection Pump
9	141-0281	1	Gasket, Air Cleaner Adapter to Engine
10	ADAPTER, AIR CLEANER		
	140-0804	1	Key 1
	140-0816	1	Key 2, 4
	140-0817	1	Key 3
11	505-0180	1	Plug, Pipe (1/4"), Air Cleaner Adapter and Intake Manifold
12	140-0584	1	Gasket, Air Cleaner
13	HOSE, BREATHER		
	123-0769	1	Spec A Only
	503-0479	1	Spec B through P
	503-0560	1	Begin Spec R
14	140-0607	1	Pan, Air Cleaner - Spec A through C
15	140-0606	1	Element, Air Cleaner, Foam Type - Spec A through C
16	140-0594	1	Cover, Air Cleaner - Spec A through C
17	520-0621	2	Stud, Air Cleaner - Spec A through C
18	871-0070	2	Nut, Knurled, Brass - Spec A through C
19	140-0602	2	Washer, Rubber - Spec A through C
20	HEATER, MANIFOLD - INCLUDES GASKET (12 Volt)		
	154-0712	1	Key 1
	154-0712	3	Key 2, 4
	154-0712	2	Key 3

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
21	LEAD, GLOW PLUG TO AIR HEATER		
	336-1313	1	Round Type Terminal
	336-1505	1	Blade Type Terminal
22	336-1418	1	Lead, Air Heater to Solenoid in Control
23	140-0706	1	Gasket, Manifold Heater Insulated - Key 2, 3, 4
24	140-0705	1	Plate, Manifold Heater Mounting - Key 2, 3, 4
25	508-0103	2	Sleeve, Insulated, Manifold Heater Mounting - Key 2, 3, 4
27	114-0023	2	Screw, Cap (1/4-20 x 1-1/4") - Manifold Heater Mounting
28	149-0769	1	Plug, Air Bleed, Secondary Filter - Spec A through R
29	LEAD, JUMPER - AIR HEATER		
	336-1051	1	Key 2, 4
	336-1408	1	Key 3
30	503-0171	2	Clamp, Breather Hose
31	140-0803	1	Resonator - Begin Spec D
32	502-0003	1	Connector, Secondary Fuel Filter Inlet - Begin Spec S
33	122-0325	1	Filter, Fuel - Primary - Begin Spec S
34	122-0326	1	Filter, Fuel - Secondary - Begin Spec S
35	149-1185	1	Adapter, Fuel Filter - Begin Spec S
36	526-0068	1	Washer, Secondary Fuel Filter Mounting - Begin Spec S
37	801-0074	1	Screw, Hex Cap - Secondary Fuel Filter Mounting - Begin Spec S
38	526-0066	1	Washer, Primary Fuel Filter Mounting - Begin Spec S
39	801-0053	1	Screw, Hex Cap - Primary Fuel Filter Mounting - Begin Spec S
40	800-0011	2	Screw (1/4-20 x 2") - Resonator Mounting
41	850-0040	2	Washer, Lock (1/4)
42	870-0137	2	Nut, Huglock (5/16) - Adapter Mounting
43	502-0003	1	Connector, Secondary Fuel Filter Outlet - Begin Spec S
44	STUD, AIR CLEANER ADAPTER MOUNTING		
	520-0011	1	Key 1, 2, 4 (1-7/16" Long)
	520-0752	1	Key 1, 2, 4 (1-15/16" Long)
	520-0011	2	Key 3 (1-7/16" Long)
45	502-0080	2	Plug, Fuel Filter Drain - Begin Spec S



# HEAT EXCHANGER GROUP (OPTIONAL EQUIPMENT)

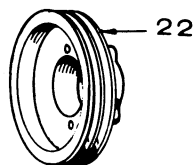
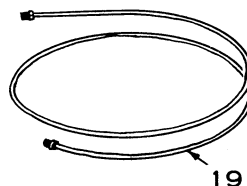
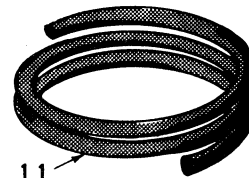
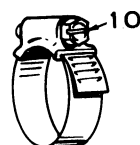
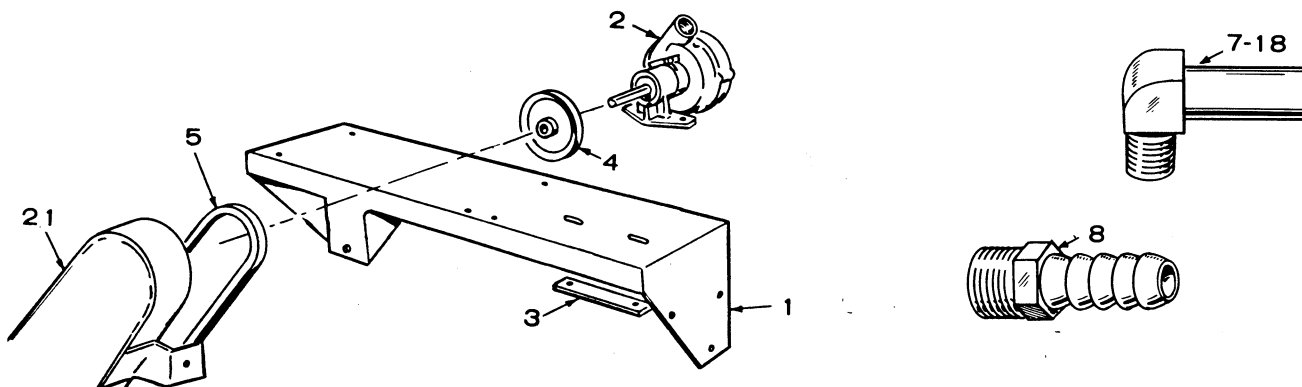


REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	130-0514	1	Exchanger, Heat
2	130-0512	1	Tank, Expansion
3	130-0589	1	Cap, Pressure
4	130-0590	1	Neck and Adapter, Expansion Tank Cap
5	130-0519	1	Gasket, Neck and Adapter
6	505-0110	1	Plug, Pipe (3/8") - Expansion Tank
7	309-0145	1	Gasket, Thermostat Chamber
8	309-0156	1	Switch, Hi-Temperature Cut-Off
9	502-0237	7	Elbow, Brass - Rubber Hose Connection - <b>NOTE:</b> Quantity used is (4) Spec A and B, and (5) Prior to Serial #04827 (During Spec E)
10	503-0183	6	Clamp, Hose
11	502-0238	1	Nipple, Brass Hose - Expansion Tank Outlet (Also 1 used for Centrifugal Pump Inlet - Spec A and B)
12	132-0110	1	£Pump, Centrifugal Water - Less Pulley
13	131-0130	1	Bar, Pump Hold-down
14	511-0067	1	Belt, Centrifugal Water Pump
15	512-0042	1	Pulley, Centrifugal Water Pump
16	130-0591	1	Guard, Belt
17	LINE, WATER - RAW WATER PUMP TO HEAT EXCHANGER		
	130-0527	1	Spec A through D
	130-0627	1	Begin Spec E
18	BRACKET, HEAT EXCHANGER AND GOVERNOR SPRING		
	130-0587	1	Spec A through Q
	130-0692	1	Begin Spec R
19	503-0159	1	Hose, Rubber (1/2" I.D. x 34" - Total Length Required for all Hoses)

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
20	ELBOW, INVERTED MALE		
	502-0074	2	Heat Exchanger Inlet and Outlet - Spec A through Serial #04827 (During Spec E)
	502-0074	1	Heat Exchanger Inlet - Begin Serial #04827 (During Spec E)
21	502-0237	2	Elbow, Brass - Rubber Hose - (1) Heat Exchanger Outlet, (1) Exhaust Elbow - Begin Serial #04827 (During Spec E)
22	130-0626	1	Pencil Assembly, Zinc (Included in Heat Exchanger)
23	130-0625	1	Pencil Only, Zinc
24	502-0126	1	Connector, Male - Exhaust Manifold - Spec A through Serial #04827 (During Spec E)
25	130-0570	1	Line, Water - Heat Exchanger to Exhaust Manifold - Spec A through Serial #04827 (During Spec E)
26	104-0550	1	Pulley, Flywheel
27	130-0726	2	Gasket, End Bonnet - Heat Exchanger
28	130-0727	2	Bonnet, Heat Exchanger
	130-0614	1	Conversion Kit, Heat Exchanger (Includes All Necessary Parts, Hardware, etc., for Field Installation)
	REPAIR KIT, WATER PUMP (Includes Shaft & Bearing, Seal, Gasket and Cover Screws)		
	132-0080	1	For Oberdorfer Model, 1GP #50P9 & 1GP #10P11 (Onan #132-0070 & 132-0095)
	132-0111	1	For Oberdorfer Model, 1GP #50P25 (Onan #132-0110)

£ - See Separate Group for Component Parts.

**SPECIAL PARTS FOR  
KEEL COOLING MODELS -  
(OPTIONAL EQUIPMENT)**



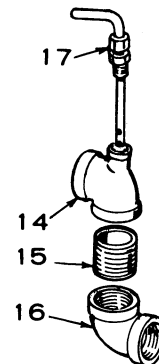
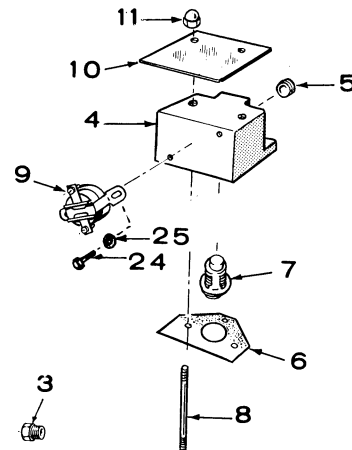
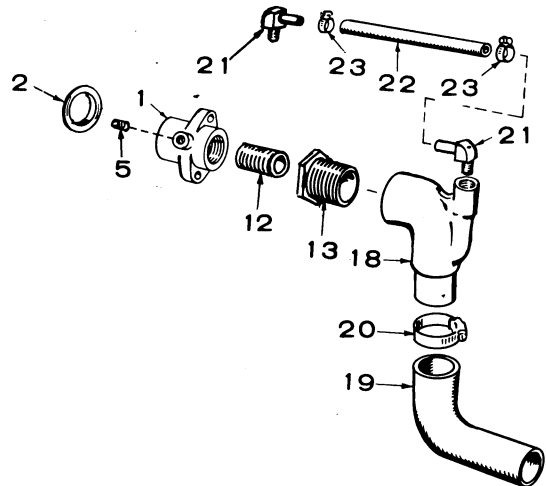
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	BRACKET, PUMP AND GOVERNOR SPRING		
	130-0587	1	Spec A through Q
	130-0692	1	Begin Spec R
2	132-0110	1	*Pump, Water - Less Pulley
			<b>NOTE:</b> Repair Kit listed Below
3	131-0130	1	Bar, Pump Hold-down
4	512-0042	1	Pulley, Water Pump
5	511-0067	1	Belt, Water Pump Drive
7	502-0237	1	Elbow, Outlet (Brass) - Pump
8	502-0238	1	Nipple, Pump Inlet (Brass)
10	503-0183	2	Clamp, Hose
11	503-0434	1	Hose, Rubber - Pump to Block
18	502-0237	2	Elbow, Pipe (Brass) - (1) Thermostat Cover, (1) Block
19	130-0596	1	Line, Water Outlet - Raw Water Pump to Manifold - Spec A through D
19	130-0655	1	Line, Water Outlet - Raw Water Pump to Manifold - Begin Spec E
20	332-0051	1	Clamp, Water Outlet Line
21	130-0591	1	Guard, Belt
22	104-0550	1	Pulley, Flywheel
	REPAIR KIT, WATER PUMP (Includes Shaft and Bearing, Seal, Gasket and Cover Screws)		
	132-0080	1	For Oberdorfer Model 1GP #50P9 & 1GP #10P11 (Onan #132-0070 & 132-0095)
	132-0111	1	For Oberdorfer Model 1GP #50P15 (Onan #132-0110)

\* - See Separate Group for Component Parts.

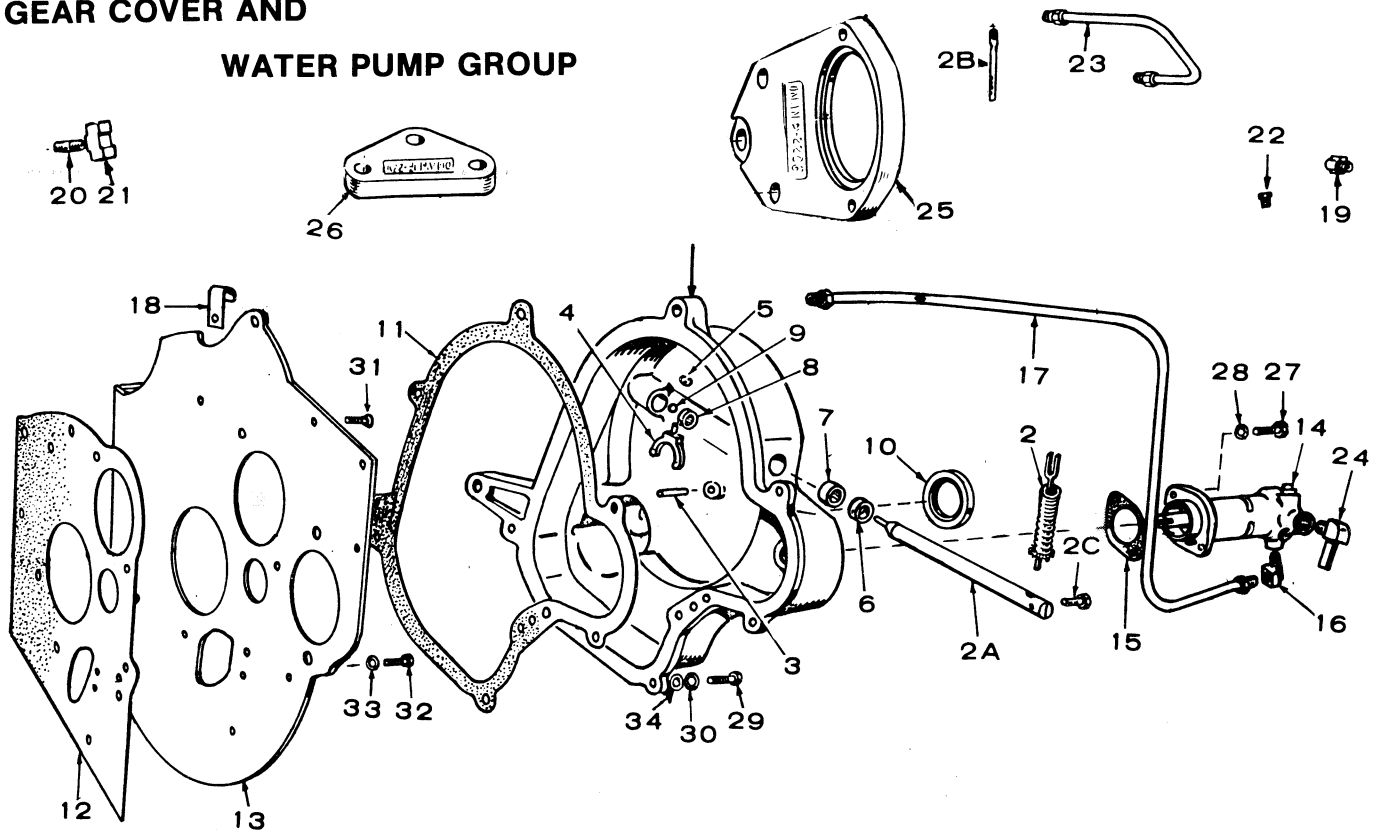
## MANIFOLD AND THERMOSTAT GROUP

**NOTE:** For Electric Generating Sets with Heat Exchanger or Keel Cooling  
see also separate group.

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	MANIFOLD, EXHAUST		
	154-0725	1	Spec A through Serial #04827 (During Spec E)
	154-0971	1	Begin Serial #04827 (During Spec E)
2	154-1057	1	Gasket, Exhaust Manifold to Head
3	502-0103	1	Connector, Inverted Male - Thermostat Cover, Outlet - Spec A through Serial #04827 (During Spec E)
4	COVER, THERMOSTAT		
	309-0144	1	Sets WITHOUT Keel Cooling
	309-0161	1	Sets WITH Keel Cooling
5	505-0274	2	Plug (1/8") - (1) Thermostat Cover, (1) Exhaust Manifold
6	309-0145	1	Gasket, Thermostat Cover
7	309-0130	1	Thermostat
8	520-0143	2	Stud, Thermostat Cover
9	SWITCH, HIGH TEMPERATURE CUT-OFF		
	309-0151	1	Mounted in Thermostat Cover
	309-0156	1	Mounted on Side of Cylinder Head
	309-0156	1	Heat Exchanger or Keel Cooling
10	309-0154	1	Cover, Thermostat Switch - Sets with Switch Mounted on Cover
11	869-0002	2	Nut, Acorn (5/16-24) - Thermostat Cover Stud
12	505-0624	1	Nipple (1 x 2"), Exhaust - Begin Serial #04827 (During Spec E)
13	505-0617	1	Bushing, Reducer (1-1/4 x 1") - Exhaust - Begin Serial #04827 (During Spec E)
14	505-0485	1	Tee, Reducer - Exhaust - Begin Serial #04827 (During Spec E) - Not used on later models
15	505-0625	1	Nipple, Close (1-1/4") - Exhaust - Begin Serial #04827 (During Spec E) - Not used on later models
16	505-0493	1	Elbow (1-1/4 x 90°) - Exhaust - Begin Serial #04827 (During Spec E) - Not used on later models
17	154-0894	1	Tube, Water Injection - Exhaust - Begin Serial #04827 (During Spec E) - Not used on later models
18	155-1058	1	Tee, Reducing - Exhaust (With provision for water line) - Later Models
19	503-0575	1	Elbow, Exhaust Hose - Later Models
20	503-0465	1	Clamp, Hose - Exhaust Elbow - Later Models
21	502-0237	2	Elbow, Brass - Water Hose Adapter - Later Models
22	503-0586	1	Hose, Rubber (1/2 x 36") - Water Inlet and Outlet
23	503-0446	2	Clamp, Water Hose
24	813-0096	2	Screw (10-32 x 1/4") - Switch Mounting
25	850-0030	2	Washer, Lock (#10)



# GEAR COVER AND WATER PUMP GROUP



REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	103-0267	1	Cover Assembly, Gear, Complete (Includes Parts Marked *)
2	150-1089	1	Arm, Governor - Begin Spec R
2A	150-0838	1	*Shaft, Governor
2B	150-0856	1	Arm, Governor - Spec A through Q
2C	815-0176	1	*Screw (#8-32 x 1/2")
3	516-0111	1	*Pin, Roll - Governor Cup Stop
4	150-0777	1	*Yoke, Governor
5	518-0129	1	*Ring, Yoke
6	509-0088	1	*Seal, Oil
7	510-0048	1	*Bearing (1/2"), Governor Shaft
8	510-0082	1	*Bearing (1/4"), Governor Shaft
9	510-0043	1	*Ball, Bearing - Governor Shaft Thrust
10	509-0087	1	*Seal, Oil
11	103-0251	1	Gasket, Gear Cover
12	103-0218	1	Gasket, Backplate
13	103-0228	1	Backplate
14	£PUMP, WATER 131-0182	1	*Spec A through D (Also Order 130-0628 Line)
	131-0152	1	Begin Spec E
15	131-0127	1	Gasket, Water Pump Mounting
16	502-0076	1	Elbow, Inverted Male - Water Pump
17	LINE, WATER PUMP TO BLOCK 130-0509	1	Spec A through D
	130-0628	1	Begin Spec E
18	130-0511	1	Clamp, Water Line
19	502-0074	1	Elbow, Inverted Male - Water Line to Block

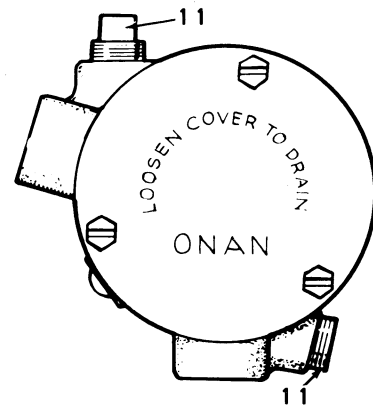
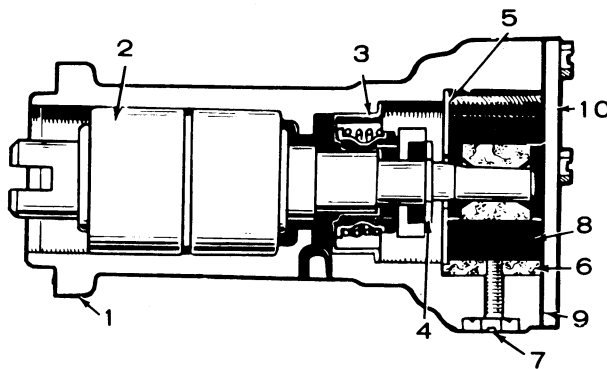
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
20	502-0047	1	Nipple, Close - Brass - Water Pump - Spec A through D
21	502-0157	1	Tee, Water Pump - Spec A through D
22	502-0153	1	Plug, Brass - Water Pump Tee - Spec A through D
23	130-0535	1	Line, Water Outlet - Prior to Serial #04827 (During Spec E)
24	502-0304	1	Elbow, Water Pump Inlet - Begin Spec E
25	191-0512	1	Flange (Used with Keel Cooling or Heat Exchanger Only)
26	191-0311	1	Spacer, Flange (Used with Keel Cooling or Heat Exchanger Only)
27	800-0006	2	Screw (1/4-20 x 7/8") - Pump Mounting
28	850-0040	2	Washer, Lock (1/4")
29	SCREW, GEAR COVER MOUNTING 800-0028	1	5/16-18 x 1"
	110-0879	4	5/16-18 x 1/4"
30	850-0045	5	Washer, Lock (5/16)
31	815-0347	2	Screw, Flat Head - Gear Cover Backplate Mounting (1/4-20 x 1/2")
32	800-0026	1	Screw, Hex Cap - Gear Cover Backplate Mounting (5/16-18 x 3/4")
33	850-0045	1	Lockwasher, Gear Cover Backplate Mounting (5/16")
34	526-0115	5	Washer, Flat (5/16")

\* - Included in Gear Cover Assembly.

£ - See Separate Group for Component Parts.

## WATER PUMP (131-0152 AND 131-0182) PARTS GROUP

**NOTE:** This group applies to all Electric Generating Sets begin Spec E and replaced pumps Spec A through D Electric Generating Sets.



REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
	PUMP, WATER - COMPLETE		
	131-0182	1	**Spec A thru D (Also Order 130-0628 Line)
	131-0152	1	Begin Spec E
	131-0179	1	Kit, Water Pump Repair (Includes Parts Marked *)
1.		1	Body, Water Pump (Not Sold Separately)
2	131-0154	1	Bearing & Shaft Assembly
3	131-0157	1	*Seal Assembly
4	518-0221	1	*Retaining Ring
5	131-0158	1	*Wear Plate, Rear

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
6	131-0159	1	*Cam
7	815-0283	4	Screw, H.H. Brass (1) *Cam, (3) Cover
8	131-0160	1	*Impeller
9	131-0161	1	*Gasket, Cover
10	131-0162	1	*Cover, Pump
11	502-0080	2	Plug, Pipe

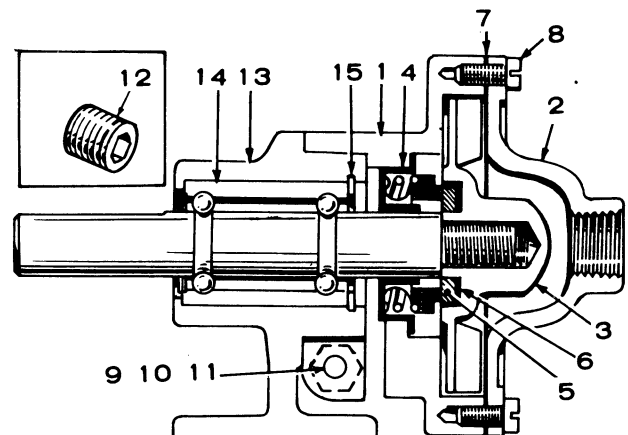
\* - Contained in Repair Kit.

\*\* - Electric Generating Sets with heat exchanger order 130-0627 line.

## WATER PUMP PARTS GROUP (132-0110)

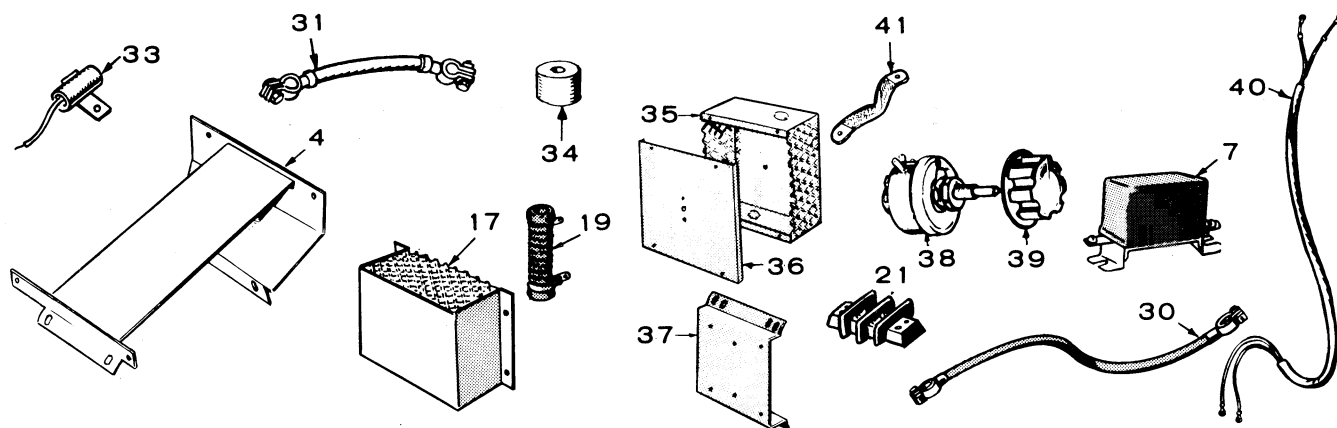
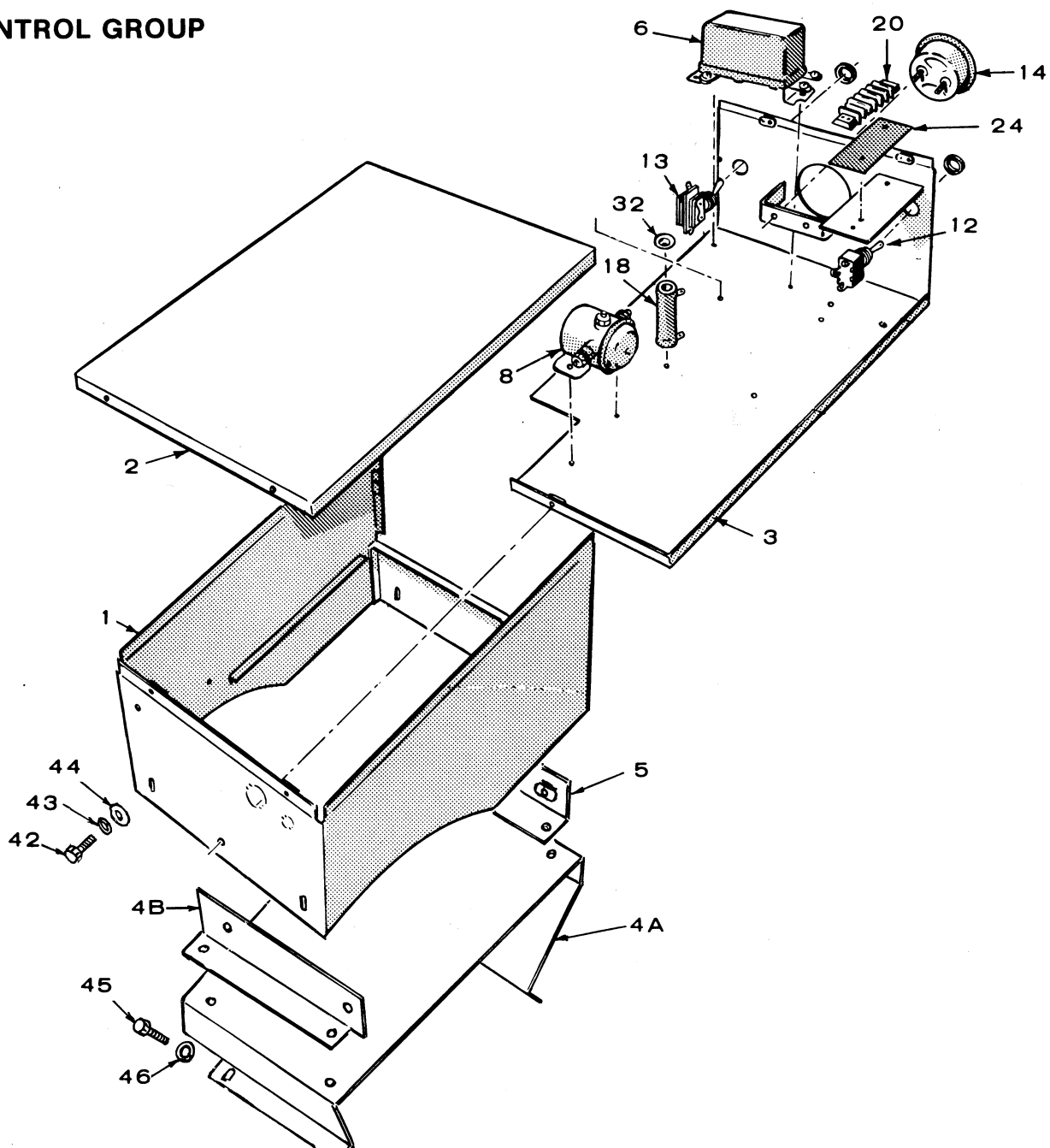
**NOTE:** This pump used on Electric Generating Sets with heat exchanger only.

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
	132-0110	1	Pump, Water - Complete
	132-0111	1	Repair Kit (Includes Parts Marked *)
1	132-0136	1	Body, Pump
2	132-0137	1	Cover, Pump
3	132-0114	1	*Impeller
4	132-0101	1	*Seal
5	132-0091	1	*Face, Wear
6	132-0092	1	*Seat, Seal
7	132-0112	1	*Gasket, Cover
8	132-0113	6	*Screw, Cover
9	132-0138	1	Screw, Cap
10	132-0139	1	Lockwasher
11	132-0140	1	Nut, Hex
12	132-0141	1	Plug, Drain
13	132-0142	1	Pedestal
14	132-0089	1	*Shaft and Bearing Assembly
15	132-0132	1	Ring, Snap



\* - Parts included in the 132-0111 Repair Kit.

# CONTROL GROUP

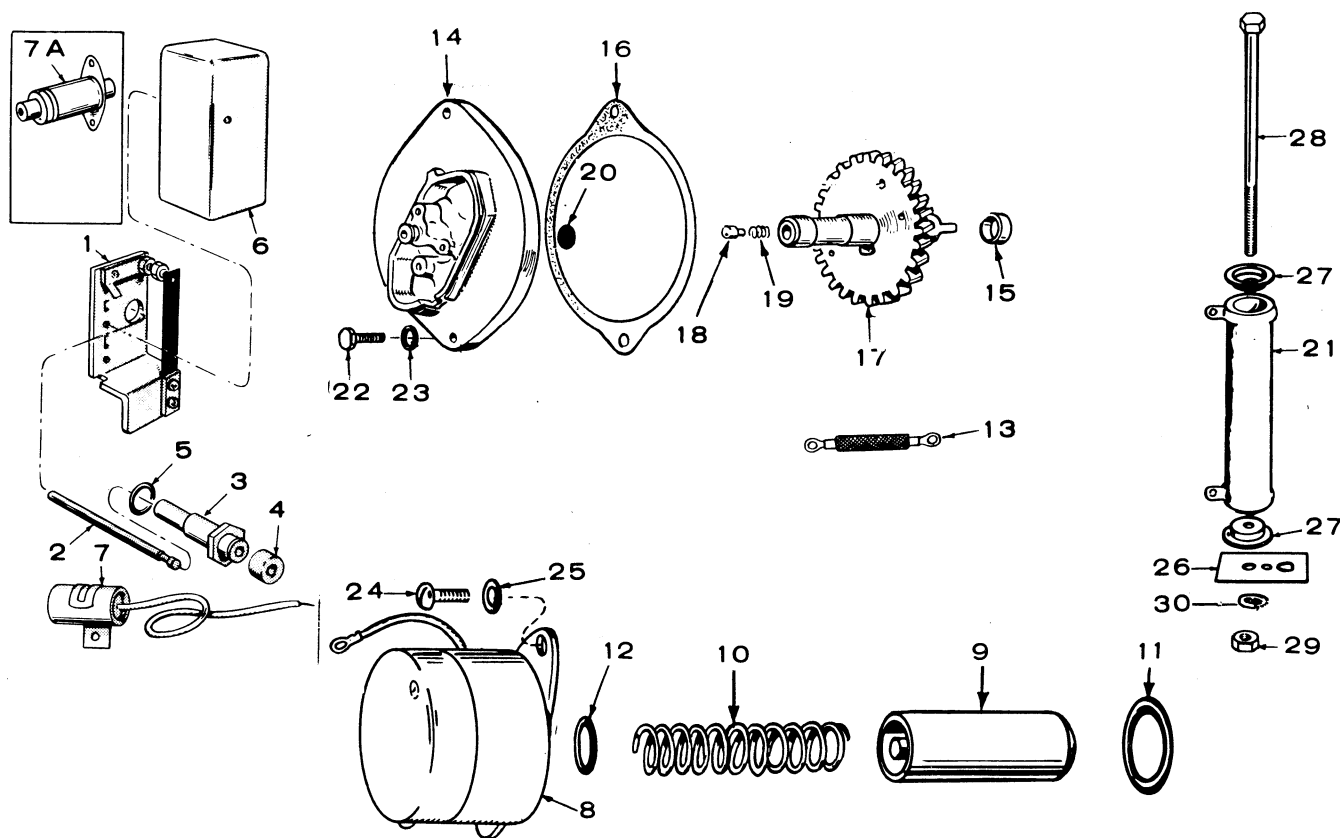


REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	301-2008	1	Box, Control
2	301-1963	1	Cover, Control Box
3	PANEL, CONTROL BOX		
	301-2009	1	Key 1
	301-2295	1	Key 2
	301-2274	1	Key 3, 4
4		1	Bracket, Control Box Mounting - One Piece (Order 301-2424, 301-2425 and 301-2426)
4A	301-2424	1	Bracket, Control Box Mounting
4B	301-2425	1	Bracket, Control Box Mounting - R.H.
5	301-2426	1	Bracket, Control Box Mounting - L.H.
6	307-0004	1	Relay, Decompression Solenoid
7	RELAY, REVERSE CURRENT		
	307-0180	1	Key 1
	307-0496	1	Key 2
	307-0007	1	Key 3
	307-0361	1	Key 4
8	SOLENOID, MANIFOLD HEATER AND START		
	307-1046	2	Key 1
	307-0061	2	Key 2, 3, 4
12	308-0154	1	Switch, Start Stop
13	308-0037	1	Switch, Manifold Heater
13	308-0007	1	Switch, Hi-Low Charge - Key 2
14	AMMETER, CHARGE		
	302-0446	1	Key 1 (5-0-5)
	302-0061	1	Key 2 (30-0-30)
	302-0064	1	Key 3, 4 (100-0-100)
17	301-2012	1	Cover, Resistor - Key 1
18	RESISTOR, FIXED		
	304-0032	1	15-Ohm, 10 Watt - Key 1
	304-0257	1	75-Ohm, 25 Watt - Key 2
	304-0011	1	50-Ohm, 25 Watt - Key 3
	304-0256	1	75-Ohm, 25 Watt - Key 4
19	RESISTOR, ADJUSTABLE		
	304-0506	1	6-Ohm, 150 Watt - Key 1, 2
	304-0175	1	1-Ohm, 50 Watt - Flicker - Key 1
	304-0016	1	2.5-Ohm, 50 Watt - Flicker - Key 2

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
20	332-0604	1	Block, Terminal (5 Place) - Remote Control - Key 1, 2
20	332-0537	1	Block, Terminal (4 Place) - Remote Control - Key 2
20	332-0537	2	Block, Terminal (4 Place) - (1) Remote Control, (1) Terminal Load - Key 3, 4
21	332-0609	1	Block, Terminal (2 Place) - Load - Key 1
24	332-0616	1	Strip, Marker (B+, 1, 2, 3, H)
24	332-0554	1	Strip, Marker (F2, 4, 5, 6) - Key 2, 3, 4
30	416-0077	2	Cable, Battery - Key 1, 2
31	416-0004	1	Cable, Battery Jumper - Key 1, 2
32	WASHER, RESISTOR CENTERING		
	304-0006	2	Key 1, 2 (1-1/8" O.D.)
	304-0015	2	Key 1 (3/4" O.D.)
	304-0015	4	Key 2 (3/4" O.D.)
	304-0014	2	Key 3, 4 (9/16" O.D.)
33	312-0057	1	Condenser (1.0 Mfd.), Anti- Flicker - Key 1, 2
34	402-0078	4	Mount, Rubber - Control Box
35	301-2290	1	Box, Rheostat Mounting - Key 3, 4
36	301-2291	1	Panel, Rheostat Box - Key 3, 4
37	301-2129	1	Bracket, Rheostat Box Mounting - Key 3, 4
38	RHEOSTAT		
	303-0046	1	Key 3 (10-Ohm, Model P)
	303-0010	1	Key 4 (8-Ohm, Model P)
39	303-0047	1	Knob, Rheostat - Key 3, 4
40	338-0313	1	Harness, Wiring - Rheostat - Key 3, 4
41	337-0052	1	Strip, Ground - Control Box to Generator
42	800-0024	4	Screw (5/16-18 x 1/2") - Control Box to Bracket
43	850-0045	4	Washer, Lock (5/16")
44	526-0115	4	Washer, Flat (5/16")
45	800-0024	4	Screw (5/16-18 x 1/2") - Control Bracket to Frame
46	850-0045	4	Washer, Lock (5/16")



# **ANTI-FLICKER, STOP SOLENOID AND WATER PUMP DRIVE GROUP**

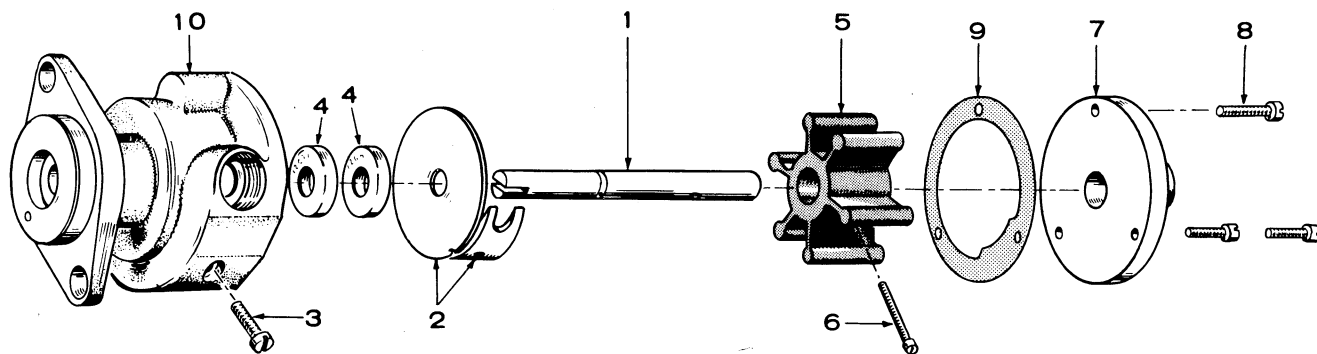


REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	166-0316	1	Point Set, Anti-Flicker - Key 1, 2
2	160-0800	1	Plunger, Breaker - Key 1, 2
3	160-0799	1	Guide, Breaker Plunger - Key 1, 2
4	160-1143	1	Diaphragm, Breaker Plunger - Key 1, 2
5	509-0091	1	Seal, "O" Ring - Key 1, 2
6	COVER, ANTI-FLICKER		
	160-0796	1	Key 1
	160-0918	1	Key 2
7	312-0057	1	Condenser, 1.0 Mfd. (Mounts in Control Box, Also in Control Group - Key 1, 2
7A	312-0083	1	Condenser, Feed thru - Key 2
8	SOLENOID, DECOMPRESSION RELEASE		
	307-0628	1	12 Volt, Spec A thru S, Key 1
	307-1098	1	12 Volt, Begin Spec T, Key 1
	307-0680	1	32 Volt, Spec A thru S, Key 2, 4
	307-1100	1	32 Volt, Begin Spec T, Key 2, 4
	307-0668	1	24 Volt, Spec A thru S, Key 3
	307-1099	1	24 Volt, Begin Spec T, Key 3
9	306-0167	1	Plunger, Solenoid (Includes Pin)
10	306-0166	1	Spring, Solenoid Plunger
11	509-0018	1	Seal, "O" Ring - Stop Solenoid
12	307-0736	1	Gasket, Solenoid Mounting
13	337-0051	1	Strap, Ground - Solenoid to Engine
14	131-0142	1	Plate, Water Pump Drive Shaft Bearing

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
15	160-0720	1	Spacer, Bearing Plate
16	160-0721	1	Gasket, Bearing Plate
17	GEAR & SHAFT ASSEMBLY, WATER PUMP DRIVE		
	191-0361	1	Spec A through D
	191-0552	1	Begin Spec E
18	160-0774	1	Plunger, Thrust
19	160-0773	1	Spring, Thrust Plunger
20	160-0806	1	Disc, Thrust Plunger
21	RESISTOR, DECOMPRESSION RELEASE SOLENOID - BEGIN SPECT		
	304-0003	1	For 12 Volt Solenoid - Key 1
	304-0110	1	For 32 Volt Solenoid - Key 2, 4
	304-0078	1	For 24 Volt Solenoid - Key 3
22	800-0052	2	Screw (3/8-16 x 1-1/2) - Bearing Plate Mounting
23	850-0050	2	Washer, Lock (3/8")
24	812-0150	2	Screw (1/4-20 x 5/8") - Solenoid Mounting
25	850-0040	2	Washer, Lock (1/4")
26	304-0704	1	Bracket, Resistor Mounting - Begin Spec T
27	WASHER, CENTERING - BEGIN SPECT		
	304-0427	2	Key 1, 2, 4
	304-0014	2	Key 3
28	SCREW - BEGIN SPECT		
	812-0165	1	1/4-20 x 4-1/2" - Key 1, 2, 4
	813-0118	1	10-32 x 4-1/2" - Key 3
29	NUT, HEX - BEGIN SPECT		
	862-0001	1	1/4-20 - Key 1, 2, 4
	870-0053	1	10-32 - Key 3
30	WASHER, LOCK - BEGIN SPECT		
	856-0006	1	1/4" - Key 1, 2, 4
	850-0030	1	#10 - Key 3

## WATER PUMP PARTS GROUP (132-0059)

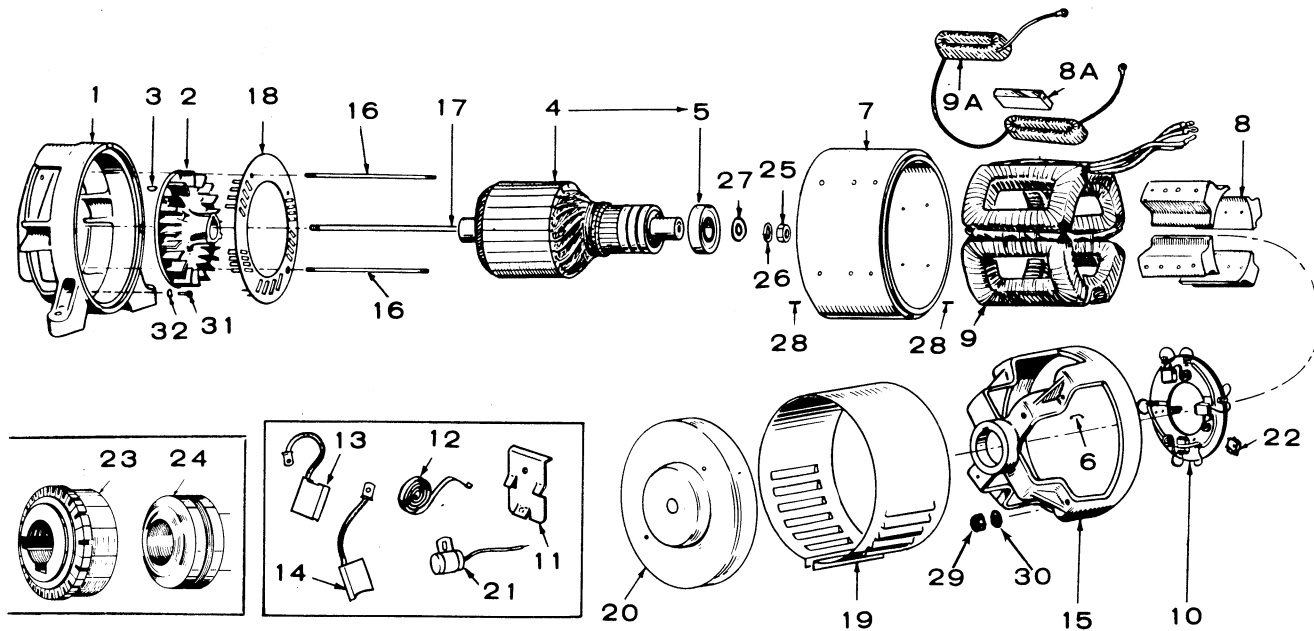
**NOTE:** This group applies to Electric Generating Sets Spec A through D.



REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
	132-0069	1	Kit, Water Pump Service (Includes Parts Marked *)
1	132-0060	1	Shaft, Water Pump
2	132-0061	1	Plate Assembly, Cam & Wear
3	132-0062	1	Screw, Cam and Plate
4	132-0063	2	*Seal, Water Pump
5	132-0064	1	*Impeller, Water Pump - Includes Screw
6	132-0065	1	*Screw, Impeller
7	132-0066	1	Cover, Water Pump End
8	132-0062	3	*Screw, End Cover
9	132-0068	1	*Gasket, End Cover
10			Body, Water Pump (Not Sold Separately)

\* - Contained in Repair Service Kit.

# GENERATOR GROUP



REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	ADAPTER		
	231-0100	1	Spec A and B
	231-0113	1	Begin Spec C
2	205-0065	1	Blower, Generator
3	515-0006	1	Key, Blower
4	ARMATURE ASSEMBLY (Includes Bearing and Blower)		
			Key 1
	201-1202	1	120 Volt, 50 Hertz
	201-1159	1	240 Volt, 50 Hertz, 1 Phase
	201-1214	1	120/240 Volt, 50 Hertz (Non-Reconnectible)
	201-1236	1	120/240 Volt, 50 Hertz (Reconnectible)
	201-1116	1	120 Volt, 60 Hertz
	201-1207	1	240 Volt, 60 Hertz, 1 Phase
	201-1178	1	120/240 Volt, 60 Hertz (Non-Reconnectible)
	201-1235	1	120/240 Volt, 60 Hertz (Reconnectible)
			Key 2
	201-1223	1	50 Hertz
	201-1206	1	60 Hertz
	201-1192	1	Key 3
	201-1216	1	Key 4
5	510-0047	1	Bearing, Ball - Armature
6	232-0596	1	Clip, Bearing Stop
7	FRAME ONLY, LESS COILS & POLE SHOES		
	210-0348	1	Key 1, 2
	210-0362	1	Key 3, 4
8	SHOE, POLE		
	221-0091	4	Key 1, 2
	221-0126	4	Key 3, 4
8A	221-0129	2	Shoe, Pole, Interpole - Key 3, 4
9	COIL ASSEMBLY, FIELD, SET OF 4 COILS		
	222-1593	1	Key 1
	222-1610	1	Key 2
	222-1608	1	Key 3
	222-1613	1	Key 4

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
9A	COIL ASSEMBLY, INTERPOLE, SET OF 2 COILS		
	222-1607	1	Key 3
	222-1614	1	Key 4
10	RIG ASSEMBLY, BRUSH		
			Key 1
	212-0294	1	120 Volt & 240 Volt, 1 Phase
	212-0296	1	120/240 Volt (Non-Reconnectible)
	212-0303	1	120/240 Volt (Reconnectible)
	212-0301	1	Key 2
	212-0116	1	Key 3
	212-0244	1	Key 4
	SPRING, BRUSH		
11	212-1105	8	120 Volt, 240 Volt (1 Phase) & 120AC/32DC Volt, Key 1, 2 - AC and DC
11	212-1106	4	Key 4, Commutator (DC)
11	212-1105	4	120/240 Volt, 1 Phase (Reconnectible), DC, Key 1
11	212-1123	4	120/240 Volt, 1 Phase (Reconnectible), AC, Key 1 - Spec A through C
11	212-1105	4	120/240 Volt, 1 Phase (Reconnectible), AC, Key 1 - Begin Spec D
11	212-1105	7	120/240 Volt, 1 Phase (Non-Reconnectible) AC and DC
12	212-1003	4	120/240 Volt, 1 Phase (Non-Reconnectible) DC, Key 1 - Spec A through C
12	212-1004	3	120/240 Volt, 1 Phase (Non-Reconnectible) AC, Key 1 - Spec A through C

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
12	212-1011	4	Key 3, Commutator (DC)
13	BRUSH, COMMUTATOR (DC)		Key 1
	214-0061	4	120 Volt, 240 Volt or 120/240 Volt (Reconnectible), 1 Phase
	214-0030	4	120/240 Volt, 1 Phase (Non-Reconnectible) - Spec A through C
	214-0061	4	120/240 Volt, 1 Phase (Non-Reconnectible) - Begin Spec D
	214-0009	4	Key 2 - Spec A through C
	214-0083	4	Key 2 - Begin Spec D
	214-0018	4	Key 3
	214-0068	4	Key 4
14	BRUSH, COLLECTOR RING (AC)		Key 1
	214-0050	4	120 Volt & 240 Volt, 1 Phase (Reconnectible)
	214-0056	4	120/240 Volt, 1 Phase (Non-Reconnectible) - Spec A through C
	214-0079	3	120/240 Volt, 1 Phase (Non-Reconnectible) - Begin Spec D
	214-0050	3	120/240 Volt, 1 Phase (Non-Reconnectible) - Begin Spec D
	214-0050	4	Key 2
15	BELL, END		Key 1
	211-0097	1	120 Volt & 240 Volt, 1 Phase
	211-0098	1	120/240 Volt, 1 Phase
	211-0097	1	Key 2, 3, 4
16	520-0502	2	Stud, Generator Through
17	STUD, ARMATURE THROUGH		Key 1
	520-0491	1	120 Volt & 240 Volt, 1 Phase
	520-0525	1	120/240 Volt, 1 Phase
	520-0491	1	Key 2, 3, 4
18	232-1256	1	Scroll, Generator Air
19	BAND, END BELL		Key 1
	234-0002	1	120 Volt & 240 Volt, 1 Phase
	234-0005	1	120/240 Volt, 1 Phase
	234-0002	1	Key 2, 3, 4
20	211-0099	1	Cover, End Bell

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
21	CONDENSER		Key 1
	312-0058	1	AC, .1 Mfd., 120 Volt & 240 Volt, 1 Phase
	312-0058	2	AC, .1 Mfd., 120/240 Volt, 1 Phase (Non-Reconnectible)
	312-0058	2	AC, .1 Mfd., 120/240 Volt, 1 Phase (Reconnectible)
	312-0027	1	NOTE: 60 Hertz used Qty. of 4 - Begin Spec D
	312-0027	1	DC, .5 Mfd., 120 Volt, 240 Volt & 120/240 Volt, 1 Phase
	312-0058	1	Key 2
	312-0027	1	AC, .1 Mfd.
	312-0017	2	DC, .5 Mfd.
	312-0017	1	Key 3, DC .5 Mfd.
	312-0017	1	Key 4
	312-0027	1	DC, .5 Mfd.
22	212-1214	4	Clamp, Brush Rig - Begin Spec D
23	COMMUTATOR (DC)		Key 1
	203-0127	1	Key 2
	203-0008	1	Key 3
	203-0058	1	Key 4
	203-0088	1	Key 4
24	COLLECTOR RING (AC)		Key 1
	204-0009	1	120 Volt & 240 Volt, 1 Phase
	204-0010	1	120/240 Volt, 1 Phase (Non-Reconnectible)
	204-0092	1	120/240 Volt, 1 Phase (Reconnectible)
	204-0009	1	Key 2
25	862-0004	1	Nut, Hex (7/16-14)
26	850-0055	1	Washer, Lock (7/16)
27	526-0032	1	Washer, Flat (7/16)
28	516-0103	2	Pin, Roll - Generator Frame (1/8 x 1/2")
29	860-0015	2	Nut, Hex (5/16-18) - Generator Through Stud
30	850-0045	2	Washer, Lock (5/16)
31	SCREW, GENERATOR ADAPTER MOUNTING		3/8-16 x 1"
	800-0050	2	3/8-16 x 1-1/4"
	800-0051	2	3/8-16 x 1-1/4"
32	850-0050	4	Washer, Lock (3/8)

#### 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
	98-1807	1	Decal Kit
	168-0091	1	Gasket Kit, Electric Generating Set
	OVERHAUL KIT, ELECTRIC GENERATING SET		
	522-0204	1	Spec A through D
	522-0218	1	Spec E through R
	522-0248	1	Begin Spec S
	525-0216	1	Paint, Touch-Up Enamel (Marine White) 16 Ounce Pressurized Can

*Decarbonizing Kit*

*1 309-145 gasket*

*1 141-281 gasket*

*1 154-1057 gasket*

*1 110-1294 gasket*

*1 115-160 gasket*

## OWNER'S MARINE SERVICE WARRANTY

### QUALITY OF PRODUCT

Your Onan Marine Electric Generator set is engineered and designed especially for below-deck installation on pleasure and commercial craft. With proper installation and operation, regular maintenance and periodic repair service, the equipment will provide reliable service.

### GENERAL WARRANTY PRACTICES

All Onan marine engine-driven electric generator sets, separate generators and controls are manufactured and sold with a full one-year warranty. This warranty is issued only to the original user and promises that these products will provide satisfactory performance when properly installed, serviced, and operate 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, or is included in the boat manufacturer's manual.

1. **Warranty Registration:** A Warranty Registration card accompanies each Onan Marine Product. This card must be properly filled out and returned to Onan factory for you to qualify for Warranty consideration as covered in this bulletin. When requesting warranty repair work you must provide boat registration or license number, purchase date, Onan Model and Serial numbers of the equipment.
2. **Material Allowances:** Onan will allow credit or furnish free of charge to the Onan Authorized Distributor or his Approved and Registered Service Dealers, all genuine Onan parts used in a warranty repair of these products which fail to perform as warranted.
3. **Labor Allowances:** Onan will allow warranty repair credit to the Onan Authorized Distributor and his Approved or Registered Dealers for straight labor time 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 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 boat owner.
4. **Miscellaneous Expense Allowances:** During the first six (6) months for the original owner's date of purchase, no charge will be made for travel time or mileage when it is necessary to perform actual warranty repair at the owner's boat location if such repair work is performed by an authorized Onan Distributor or his Approved or Registered Dealers, and if the boat is docked within the local area normally served by the approved servicing organization.

The owner will be expected to pay the service organization a regular service fee for travel time and mileage after the first six (6) months period has elapsed and, at any time during the one year warranty period or thereafter when repair work is not covered by the warranty.

The Onan Division's General Warranty practice does not provide for allowance of expenses such as start-up charges, communication charges, transportation charges, unit removal or reinstallation, cost of fuel, oil, normal maintenance adjustments, tune-up adjustments or parts maintenance items, and does not cover incidental or consequential damages.

5. **Administration:** Warranty of Onan Marine Products is administered through Onan Authorized Distributor in whose territory the equipment is located. These Service Stations and their Approved or Registered 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, or the boat manufacturer's manual, 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 of Onan Marine Products is usually performed by the boat manufacturer or his dealer. If the owner experiences any difficulty with such items as mounting, ventilation, exhaust location, water or fuel lines, wiring, etc., he should immediately contact the dealer from whom he purchased the boat so that corrective action can be taken. Although the Onan Authorized Distributor or his Approved and Registered 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, Division of Onan Corporation  
Minneapolis, Minnesota 55432

MSS-21B  
Replaces MS-12 and MSS-21A  
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