OPERATOR'S MANUAL AND PARTS CATALOG

Onan®

ELECTRIC

POWER PLANTS

FOR RECREATIONAL VEHICLES

•

SERIES

CCK

•

27-310

3AR73 Printed in U.S.A.

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.

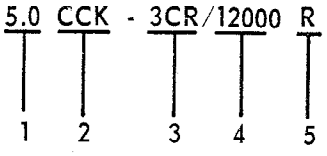
WHEN ORDERING PARTS REMEMBER TO INCLUDE THE ONAN MODEL, SPECIFICATION LETTER, AND SERIAL NUMBER LOCATED ON THE NAMEPLATE OF YOUR ONAN UNIT. THIS IS ESSENTIAL TO ENSURE THE CORRECT PART IS SHIPPED TO YOU.

FOR MAJOR REPAIR SERVICE, CONTACT YOUR ONAN AUTHORIZED DISTRIBUTOR.

GENERAL INFORMATION

This manual includes instructions for the installation, operation, and maintenance of the CCK electric generating sets used in recreational vehicles. Identify your model by referring to the MODEL AND SPECIFICATION NUMBER as shown on the Onan nameplate. Electrical characteristics are shown on the lower portion of the nameplate.

How to interpret MODEL and SPEC NO.



1. Indicates KW rating.
2. Factory code for Series identification.
3. Combines with 1 and 2 to indicate model.
   3 - 120/240 voltage.
   C - Indicates reconnectible feature.
   R - REMOTE. Electric starting at the set or from a remote location.
4. Factory code for optional equipment added to unit.
5. Specification (Spec) letter. Advances when factory makes production modifications.

Onan

MANUFACTURER'S WARRANTY

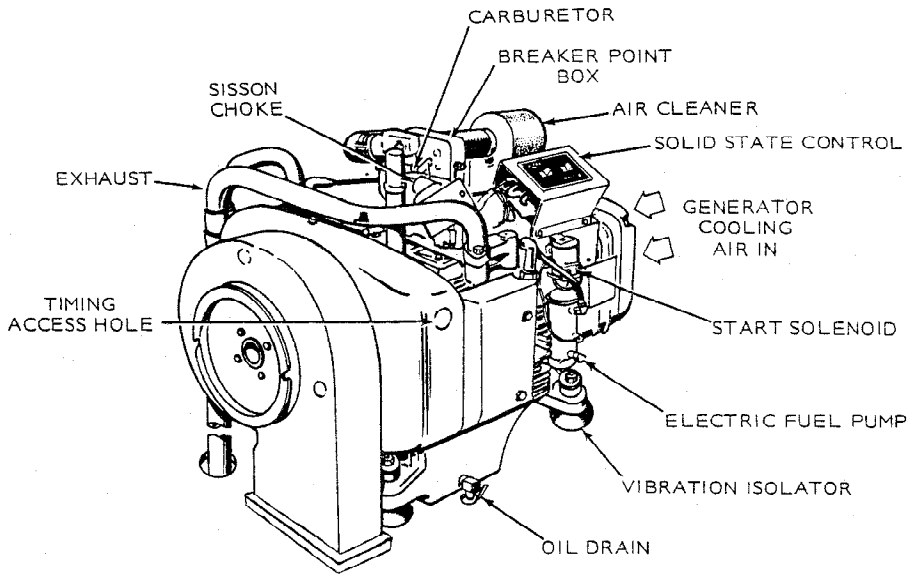
Onan warrants, to the original user, that each product of its manufacture is free from defects in material and factory workmanship if properly installed, serviced and operated under normal conditions according to Onan's instructions.

Onan will, under this warranty, repair or replace, as Onan may elect, any part which on examination shall disclose to Onan's satisfaction to have been defective in material and workmanship; provided that such part shall be returned to Onan's factory or one of its Authorized Service Stations, transportation charges prepaid, not later than one (1) year after the product is first placed in service. Such defective part will be repaired or replaced free of charge, including labor (in accordance with rates approved by Onan) during the stated one (1) year coverage under this warranty.

THIS WARRANTY AND ONAN'S OBLIGATION THEREUNDER IS IN LIEU OF ALL WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WITHOUT LIMITATION, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, AND ALL OTHER OBLIGATIONS OR LIABILITIES, INCLUDING LIABILITY FOR INCIDENTAL AND CONSEQUENTIAL DAMAGE.

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

ONAN 1400 73RD AVENUE N.E. • MINNEAPOLIS, MINNESOTA 55432
A DIVISION OF ONAN CORPORATION



TYPICAL CCK FOR RECREATIONAL VEHICLES

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LIST OF ILLUSTRATIONS

SPECIFICATIONS

	4.0CCK 5.0CCK
ENGINE	
Number of Cylinders	2
Cubic Inch Displacement	49.8
Cylinder Bore	3-1/4
Piston Stroke	3
Compression Ratio	5.5:1
RPM	1800
Ignition Type	Battery
Battery Voltage	12 volt
Battery Size	
SAE Group 60	One
SAE Rating - 20 Hour (nominal)	74 Amp/Hr.
Battery Charge Rate	Two-Step
Maximum	6 Amp.
Minimum	1.5 Amp.
Ventilation Required (cfm)	
Engine	750 cfm
Generator	75 cfm
Combustion	32 cfm
Recommended Spark Plugs	Champion H-8 or equivalent

	4.0CCK	5.0CCK
GENERATOR		
AC Voltage Regulation	±4%	±4%
AC Frequency Regulation	5%	5%
60 Hertz Recreational Vehicle Rating (watts)	4000	5000
Current Rating (amperes)	16.7*	20.8**
Phase	Single	Single
Power Factor	1.0	1.0
SET DIMENSIONS (Approximate)		
Length	29-3/4	32-1/8
Width	19-1/2	19-1/2
Height	22-7/16	22-7/16
Weight	290	315

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

* - Reconnectible to deliver rated output at 120 volt, 2-wire (33.3 amp); 240 volt, 2-wire (16.7 amp).
** - Reconnectible to deliver rated output at 120 volt, 2-wire (41.6 amp); 240 volt, 2-wire (20.8 amp).

ASSEMBLY TORQUES

	FT.-LB.
Blower Housing Screws	10-15
Connecting Rod Bolts	24-26
Cylinder Head Screws	29-31
Exhaust Manifold Screws	15-20
Flywheel Mounting Screws	35-40
Fuel Pump Mounting Screws	5-6
Generator Adapter Screws	20-25
Intake Manifold Screws	15-20
Oil Base Screws	43-48
Oil Pump Mounting Screws	7-9
Rear Bearing Plate Capscrews	20-25
Spark Plugs	25-30
Timing Gear Cover Screws	15-20

SPECIAL TOOLS

Bearing Clearance Guide (Plasti-Gage)
- .002″ to .006″ 420P256
- .004″ to .009″ 420P257

Combination Bearing Remover -
- Main & Cam 420A325

Combination Bearing Driver -
- Main & Cam 420B324

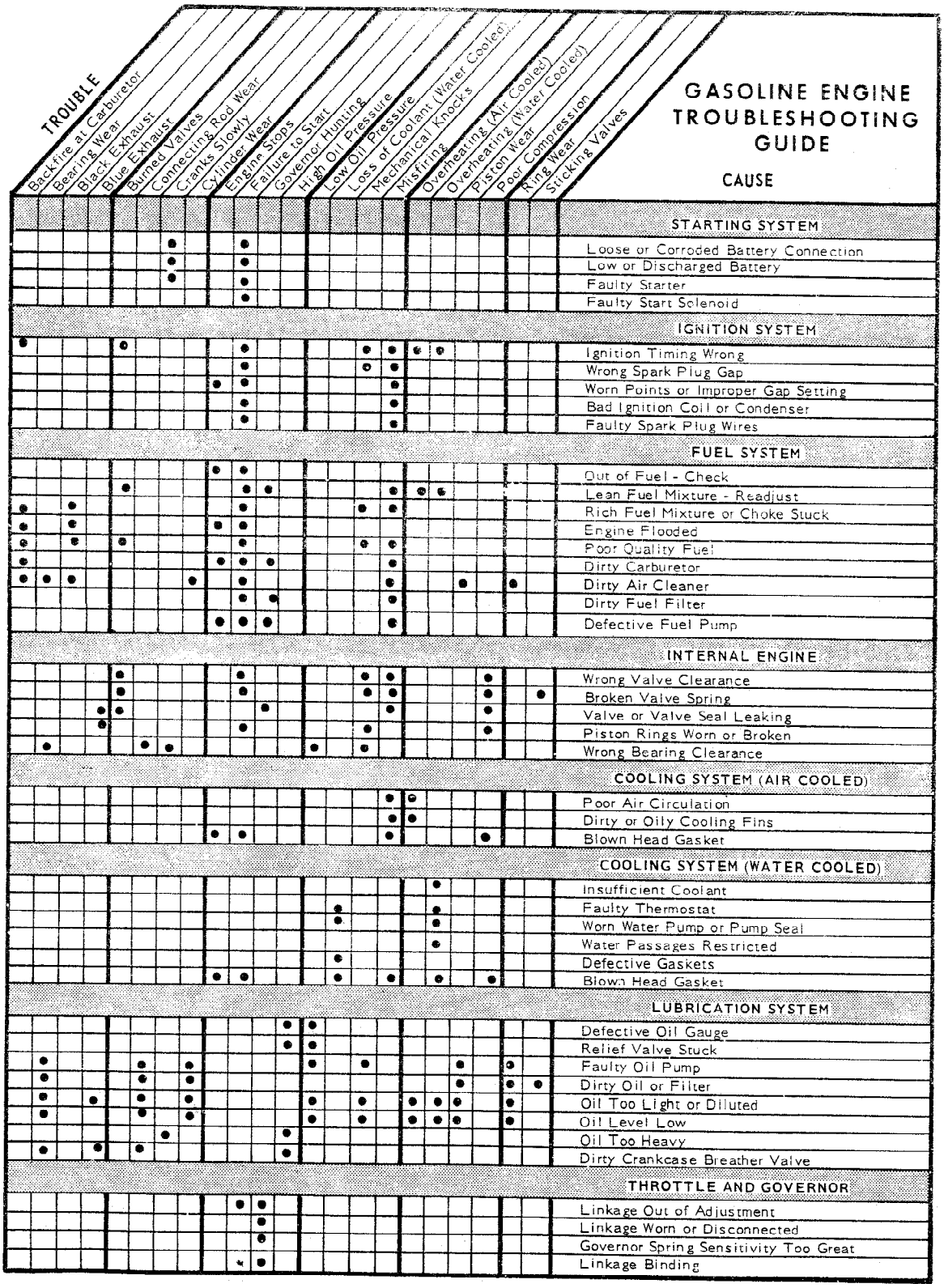
Crankshaft Gear Puller 420B72
Gear Puller Ring 420A248
Flywheel Puller 420A100
Carburetor Adjustment Wrench 420B169
Continuity Tester 420B290
Series Circuit Tester 420A288
Torque Wrench - 1/2″ Drive
- 0 to 100 Ft-Lb 420P222

Spray Can Paint - Green 525P137
Valve Seat Driver 420A71
Valve Guide Driver 420A300
Valve Spring Compressor 420P119
Valve Lock Replacer 420P105
Tappet Lock Wrench 420A186
Valve Guide Honing Set 420P305
Ridge Reamer 420P260
Cylinder Hone 420P304
Cylinder Wall Micro-Finishing Brush 420P320
Ring Compressor 420P214
Ring Spreader 420P146
Piston Groove Cleaner 420P332
Oil Seat Guide & Driver
- Bearing Plate 420B181
- Gear Cover 420B313

DIMENSIONS AND CLEARANCES

	Minimum	Maximum
CYLINDER & PISTONS		
Piston to Pin	Thumb Push Fit	
Piston to Connecting Rod	.0002	.0007
Piston Ring Gap in Cylinder	.010	.023
Piston Clearance in Cylinder (Measured Below Oil Control Ring 90° From Pin)	.0015	.0035
Cylinder Bore - Honed	3.249	3.250
CRANKSHAFT & CAMSHAFT		
Crankshaft Main Bearing - Journal to Bearing Clearance	.0025	.0038
Crankshaft End Play	.006	.012
Camshaft Bearing to Camshaft Clearance	.0015	.0030
Camshaft End Play	.003	
Connecting Rod End Play	.002	.016
Crankshaft Rod Journal to Rod Bearing Clearance	.0020	.0033
Timing Gear Backlash	.002	.003
Oil Pump Gear Backlash	.002	.005
TAPPETS & VALVES		
Valve Tappet Clearance –		
Intake	.006	.008
Exhaust	.015	.017
Valve Seat Width	1/32	3/64
Valve Stem to Guide –		
Intake	.001	.0025
Exhaust	.0025	.0040
Valve Face Angle	44°	
Valve Seat Angle	45°	
IGNITION		
Spark Plug Gap	.025	
Ignition Breaker Point Gap (Full Separation)	.020	
Ignition Timing	19° BTC	

GASOLINE ENGINE TROUBLESHOOTING GUIDE



INSTALLATION

If the electric generating set is to operate properly, it must be correctly installed. This manual gives some of the more important aspects of installation. For more details, a Technical Bulletin (T-012) is available from Onan.

Ventilation is the most important factor to be considered. The unit must have enough cooling air to operate safely and efficiently. The heated air must be disposed of to keep the engine from overheating and losing power.

For the CCK set running at 1800 rpm, the amount of air discharged is 750 cfm. The minimum free air inlet with no filter or restriction is 140 sq. in.

Onan Vacu-Flo cooled units are specifically designed for mounting in small compartments (where proper cooling is difficult) and are equipped to provide sufficient cooling air and adequate disposition of heated air. With this type of cooling, a centrifugal fan in a scroll housing pulls cooling air into the compartment

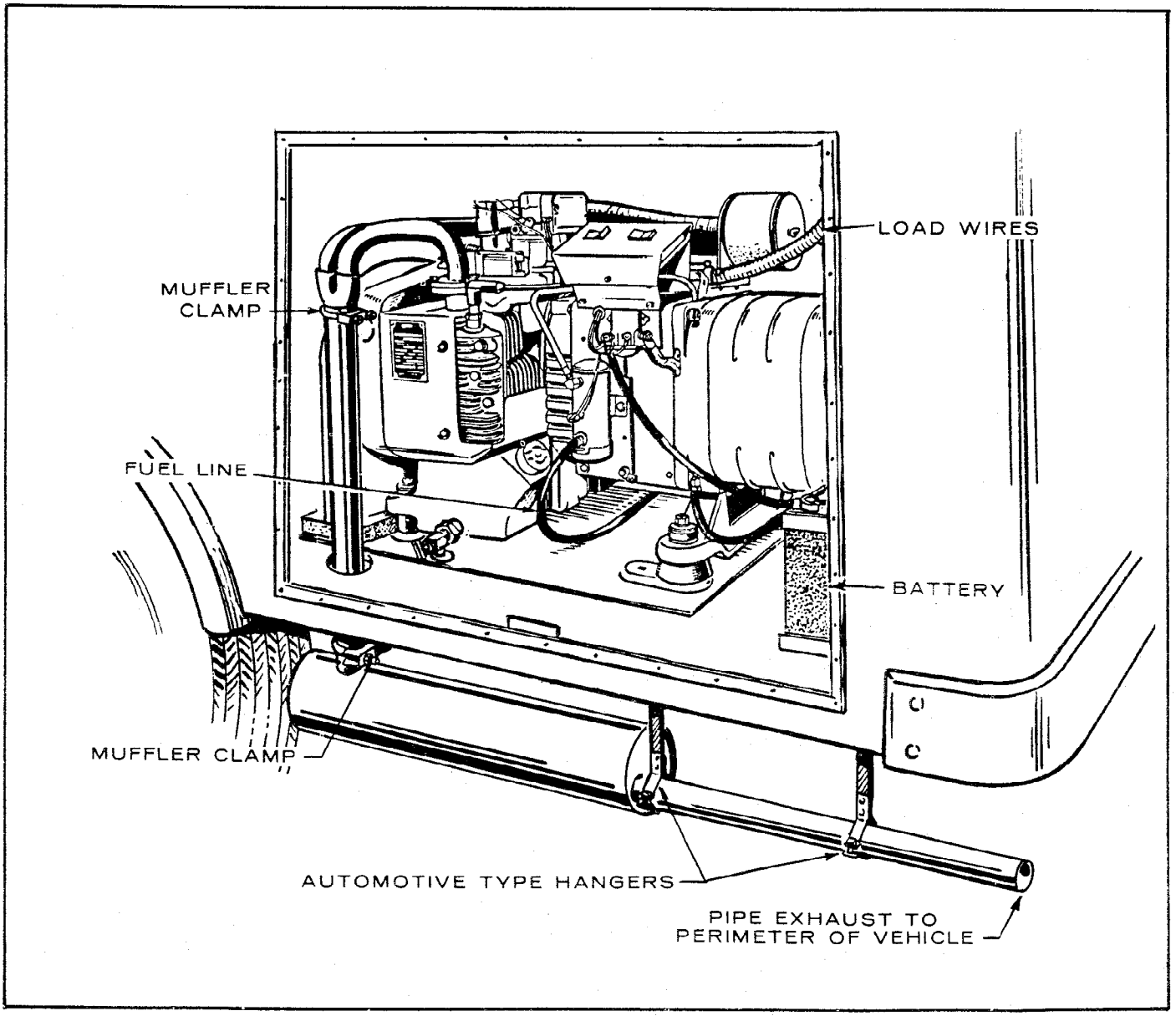


FIGURE 1. TYPICAL MOBILE INSTALLATION

and over the cooling fins and surfaces of the engine. Heated air is expelled through a single discharge and away from the unit and installation area.

LOCATION

The compartment itself should be of vapor tight design and completely independent of living quarters. The interior lining should be fireproof. A sheet metal covered compartment may be readily sealed and lends itself easily to treatment. The set may have to be removed for service, so make the door large enough to facilitate removal of the unit.

The compartment location is determined by physical size, access opening and most important, best mounting support. Allow 2″ clearance on all sizes of the unit for rocking on mounts.

POSITIONING

The following should be considered for accessibility when mounting the unit in a compartment. (Position so operating instructions and nameplate are visible and/or install an accessible nameplate, data decal or sticker.)

1. Make air discharge duct as short as possible. Position so exhaust heated air is not drawn into cool air inlet.
2. Air cleaner should be easy to remove and service.
3. Battery or batteries must be accessible for service.
4. Oil fill tube cap should be easy to reach.
5. The control box switch should be visible.
6. Provide space for muffler.
7. Oil drain should be readily accessible.
8. Cylinder head should be readily accessible for service.
9. Rope start sheave should be accessible.

MOUNTING

The best method of mounting is to attach the set to a mounting platform using Onan vibration isolators. See Figure 2. The vibration isolators must be properly installed to minimize vibration. The Onan mounts are a "fail-safe" type with mounting bolts that prevent the unit from breaking loose if the mounts are damaged.

The mounting base should be fastened directly to the supporting frame. Channel, box or angle iron can be used for a mounting base frame. This will provide the greatest support, plus a base sealed against air, dirt and sound. Do not use sheet metal or thin plate without a supporting frame.

CAUTION *Plywood is vulnerable to climatic elements, will tend to become oil soaked, and is not fireproof.*

The supporting base or platform must be strong enough to withstand the shock from sharp turns, bumps, holes, etc. which accompany mobile applications. Brace the mounting platform to eliminate any chance of the platform bowing or bending.

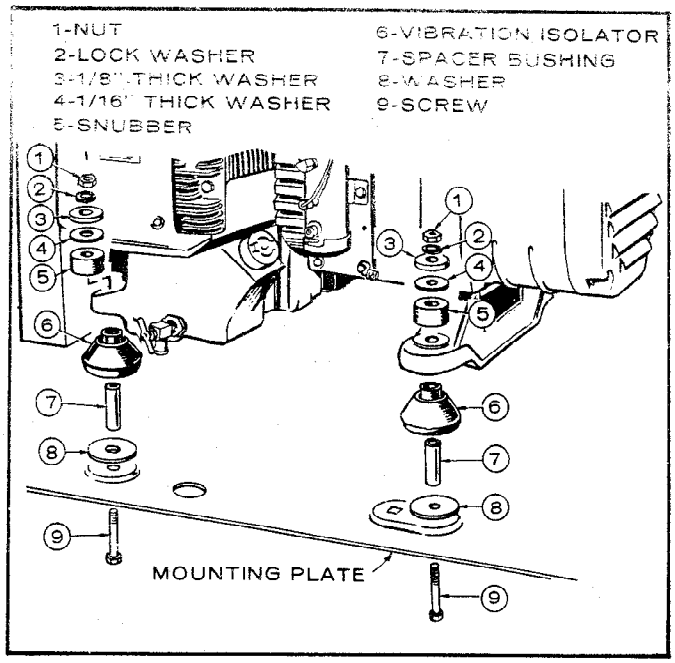


FIGURE 2. ONAN VIBRATION ISOLATORS

FUEL SUPPLY (GASOLINE)

Install a separate fuel tank for the unit. If the set has to be connected to the vehicle supply tank, do not tee off the vehicle supply line. The generating set must have a separate fuel line because the more powerful vehicle fuel pump will starve the generating unit for gasoline.

FUEL LINES

Use annealed copper or seamless steel tubing and flared connections. Run fuel lines, at the top level of the tank to a point as close to the engine as possible, to reduce the danger of fuel siphoning out of the tank if the line should break. Install lines so they are accessible at all times and protected from mechanical injury. Use nonferrous metal straps, without sharp edges, to secure the fuel lines.

EXHAUST SYSTEM

Observe the following when installing the set's exhaust system:

1. Construct exhaust system to prevent damage from leakage and vibration. Use automotive type hangers and connections under the vehicle.
2. Use an insulating thimble where exhaust piping passes through a partition or floor of flammable material.
3. Terminate the exhaust outlet to the rear of the set compartment and extend to perimeter of vehicle so DEADLY exhaust fumes will not enter vehicle under ordinary conditions of driving or parking.

WARNING *Do not install the exhaust outlet less than three feet from the gasoline filler spout. Do not pipe exhaust into Vacu-Flo scroll.*

When installing mufflers, other than those supplied with the unit or if the exhaust system is excessively complicated, the exhaust back pressure should be checked. Exhaust back pressure at rated load, measured at the exhaust manifold, should not exceed 2 in. Hg. (Mercury column). Where a tapped hole is not provided, the manifold and/or a pipe coupling may be drilled and tapped. After measurement is made, plug the hole with an ordinary pipe plug.

WARNING *Do not use discharged Vacu-Flo air for heating since it may contain carbon monoxide or other poisonous gases.*

BATTERY CONNECTION

Connect the positive (+) battery cable to the start solenoid. Connect the negative (–) cable to the generator through-bolt. Refer to Figure 3.

CAUTION *Do not disconnect the starting batteries while the engine is running. The resulting overvoltage will damage the electric choke and other control components. Do not reverse battery connections; doing so may damage the electrical system.*

In mobile applications where the generator is normally operated in ambient temperatures above 0°F and the battery is kept charged by frequent running of the unit, a single 12 volt battery of 74 amp/hr capacity minimum is sufficient.

LOAD WIRE CONNECTIONS

The set nameplate shows the electrical output rating of the set in watts, volts and cycles. The wiring diagram shows the electrical circuits and connections necessary for the available output voltage. Also see Figure 4.

Meet all applicable code requirements. A qualified serviceman or electrician should make the installation and the installation should be inspected and approved. The AC output box has provisions to accomodate load wires. Use flexible conduit and stranded load wires near the set to absorb vibration. Use sufficiently large insulated wires. Strip the insulation from the wire ends as necessary for clean connections. Connect each load wire to the proper generator output lead inside the AC output box. Insulate bare ends of ungrounded wires. Install a fused main switch (or circuit breaker) between the generating set and the load.

Ground (Generator to Vehicle): A solderless terminal is provided between AC output box and control on top side of unit. Connect a ground between this terminal and clean, bare metal on vehicle frame. See Figure 3.

Output Lead Markings: Generator leads are marked, M1, M2, M3 and M4. These identifying marks also appear on the wiring diagram.

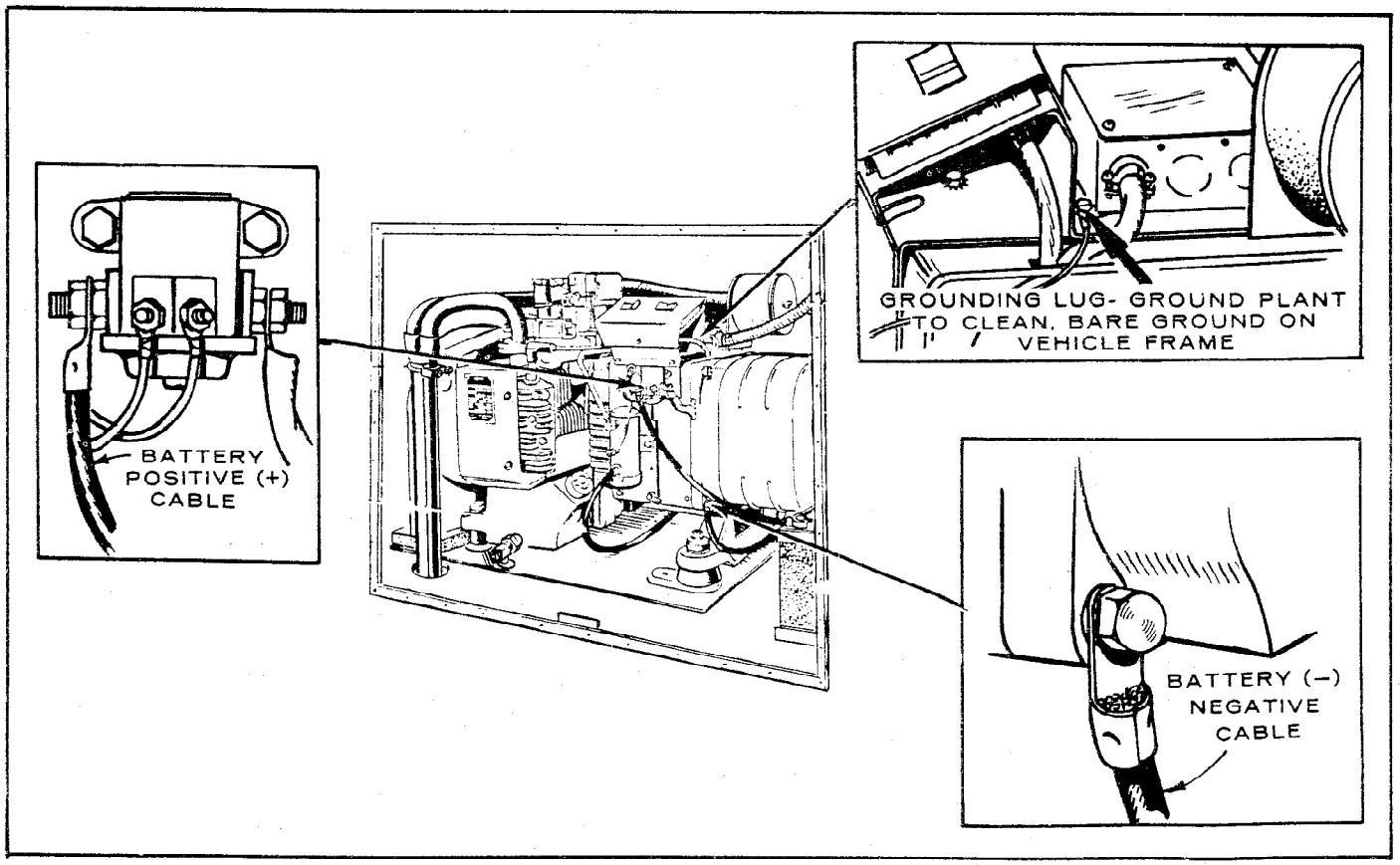


FIGURE 3. BATTERY AND GROUND CONNECTION

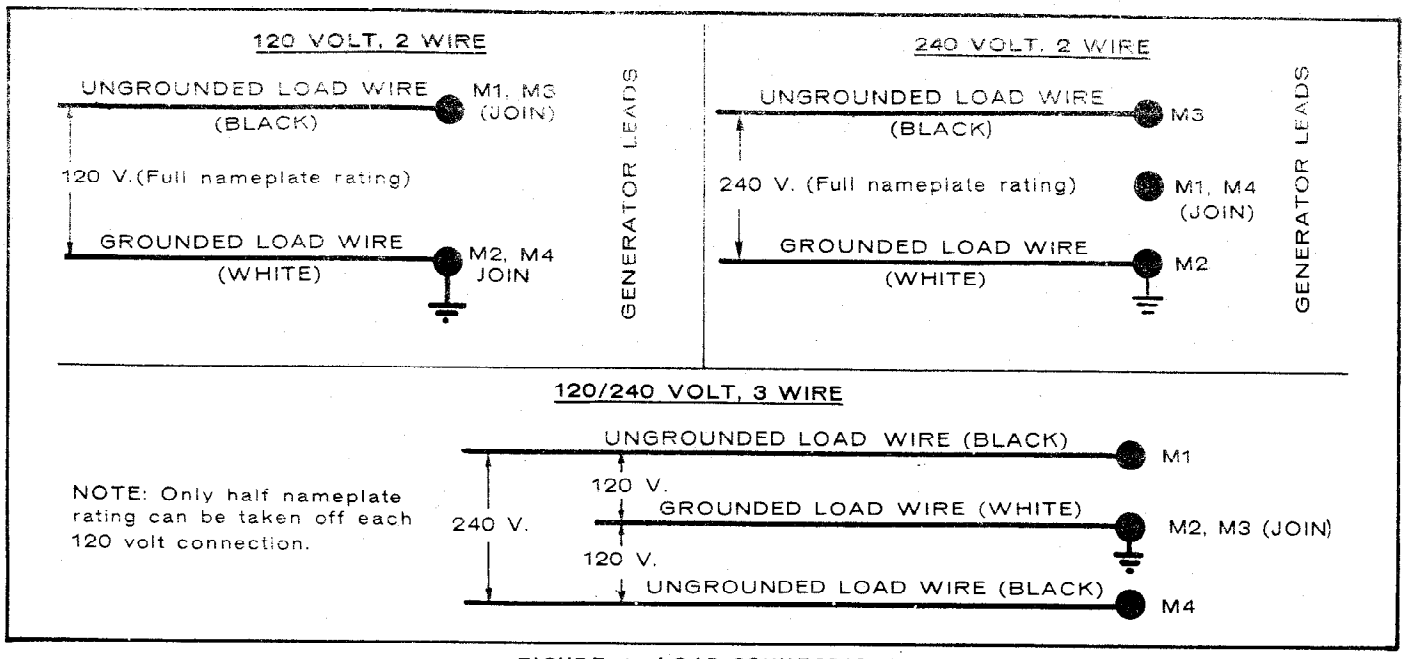


FIGURE 4. LOAD CONNECTIONS

Voltage Selection on Reconnectible Single Phase Generators: These units are reconnectible for use as 120/240 volt, 3 wire; 120 volt, 2 wire; or a 240 volt, 2 wire power source (see Figure 4). Use the connection for two wire service when one load exceeds 1/2 the rated capacity. Balance the load when connecting for three-wire service.

Balancing the Load: Current for any one output lead must not exceed nameplate rating. Serious overloading can damage the generator windings. When two or more single phase circuits are available, divide the load equally between them.

Load Connections: Refer to the figure which illustrates the load connection for the output shown on the nameplate.

CONTROL BOARD REMOTE WIRING (BEGIN SPEC R)

The printed circuit board (located under start-stop control) is the "heart" of the generator set's control system. Terminals 1 through 9, on the left side of printed circuit board, (Figure 6) connect to engine components.

Terminals 10 through 18, located on right side of printed circuit board, are for connection to a remote switch and instruments (customer installed) used inside the recreational vehicle (see Figure 5).

Start-Stop Switch: Connect a remote start-stop, double-pole, double-throw, momentary switch to terminals 13, 14, 15 and 16. Use Onan switch 308A329 or similar switch(es) and number 18 or larger wires for connections.

CAUTION *Be sure the start-stop switch is momentary contact only. If not, the start solenoid will be damaged.*

DC Ammeter: Connect a direct reading 0 to 10 ampere ammeter (Onan number 302-561) to terminals 17 (+) and 18 (–). For distances up to 10 feet make connections with no smaller than number 18 wire. When installed, Jumper W1 must be removed from the printed circuit board. Jumper W1 is located near the 1-1/4 x 2 inch copper heat sink.

CAUTION *Terminal 13 is the ground connection for the printed circuit board and must always be connected.*

Running Time Meter: Connect running time meter (Onan number 302-885) to terminals 10 and 13 (Grd.) using number 18 or larger wire. Terminal 10 operates at approximately 30 volts during normal operation.

DC Voltmeter: Connect DC voltmeter (Onan number 302-562) between terminals 15 and 13 (Grd.) using number 18 wire.

24 Volt Generating Lamp: Connect a 24 volt generating lamp between terminals 10 and 15. Use a diode (IN4004) in series as shown.

12 Volt Generating Lamp: Connect a 12 volt generating lamp between terminals 10 and 15. Connect a diode (IN4004) on one end of lamp and a 5 watt, 6 volt zener diode (IN5340) on the other end.

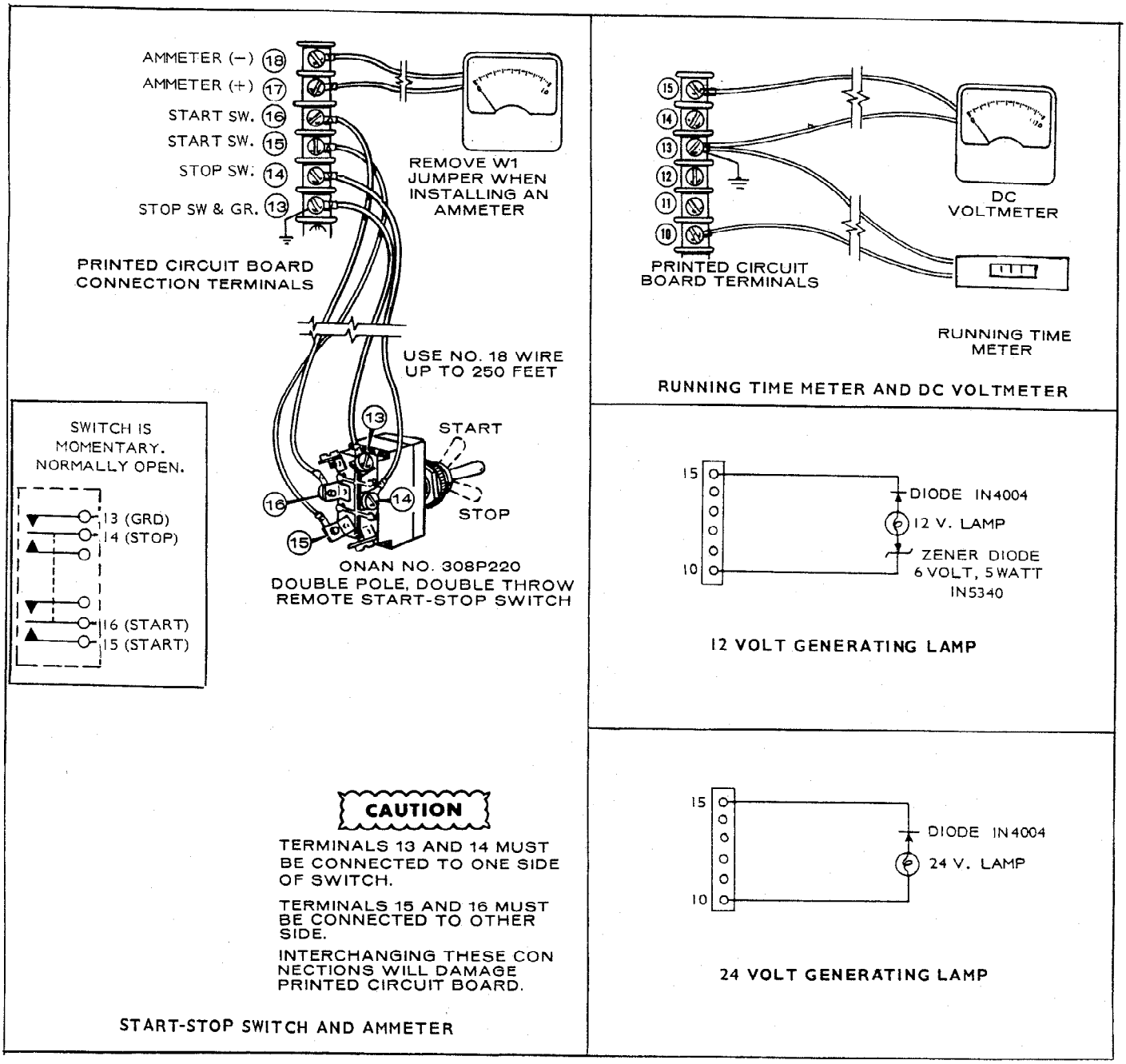


FIGURE 5. INSTRUMENT CONNECTIONS

Fused Connections: A small fuse (F1) used to protect the circuit against reversed battery connections, is located under the "STOP" side of Start-Stop Switch next to CR4. If fuse is damaged, replace by carefully clearing out solder holes and replacing the fuse with a bare, number 36 wire and re-soldering the holes.

Later models use a 9 amp fuse (F1) which is located in the wiring harness between terminal 5 (on printed circuit board) and battery. If fuse is damaged (caused by connecting battery backwards), replace with an SFE9 automotive type fuse.

Terminal 5 has a PC fuse connection (F2) in the battery lead to protect the printed circuit board from any shorts on the board or from external remote connections. Terminal 10 has a PC fuse connection (F3) in the generator lead to protect the printed circuit board from any external shorts when using the remote connections. If F2 or F3 printed circuit board path is "blown", replace either with number 22 wire, one inch long and solder into circuit.

CAUTION *Do not attempt to check for current flow on the printed circuit board by jumpering across components with a screwdriver, wire, etc. Always have these boards checked by an authorized Onan service center or a qualified electrician using the proper instruments (e.g. voltmeter, ohmmeter, or multimeter).*

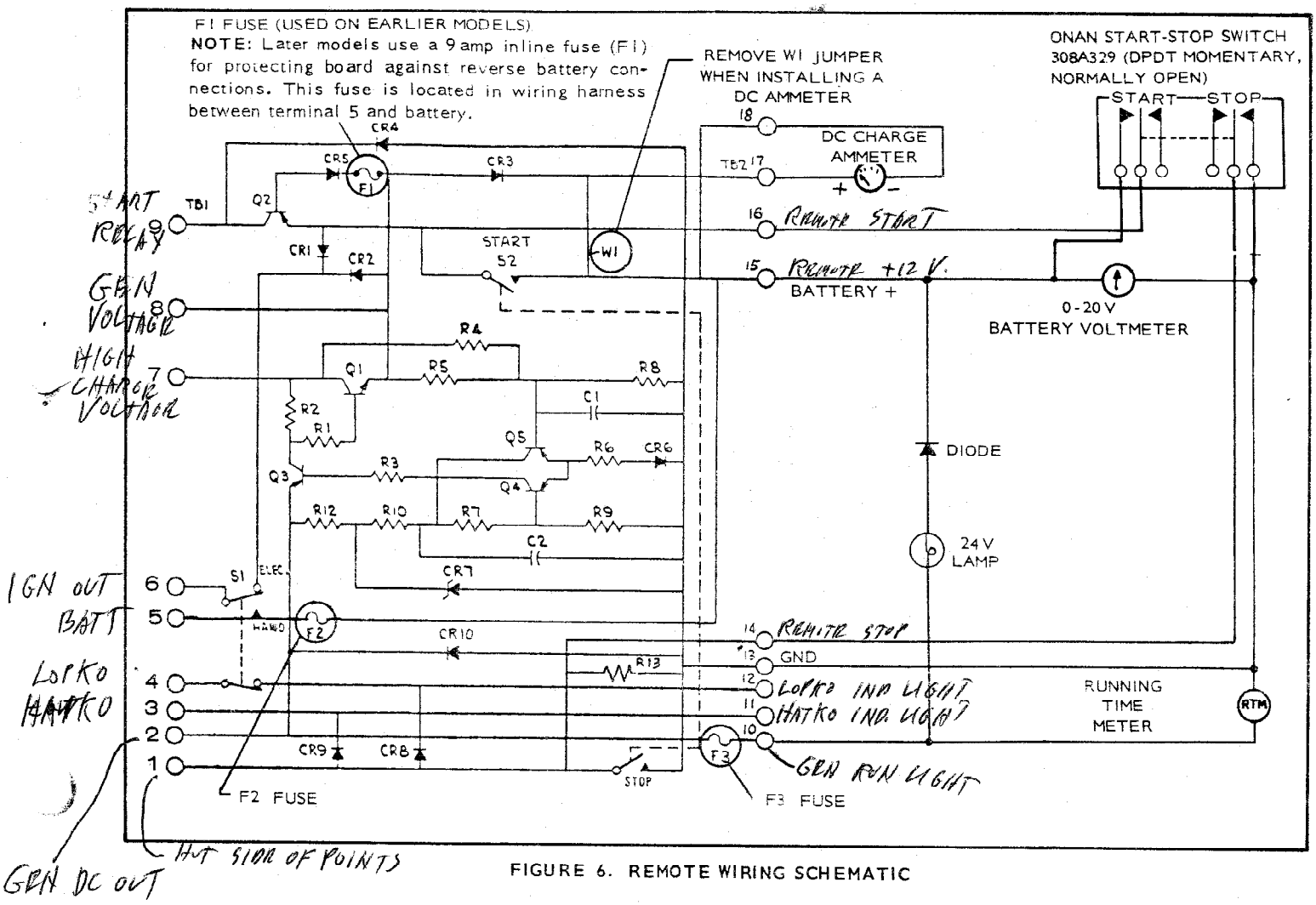


FIGURE 6. REMOTE WIRING SCHEMATIC

REMOTE CONTROL ASSEMBLY INSTALLATION (BEGIN SPEC R)

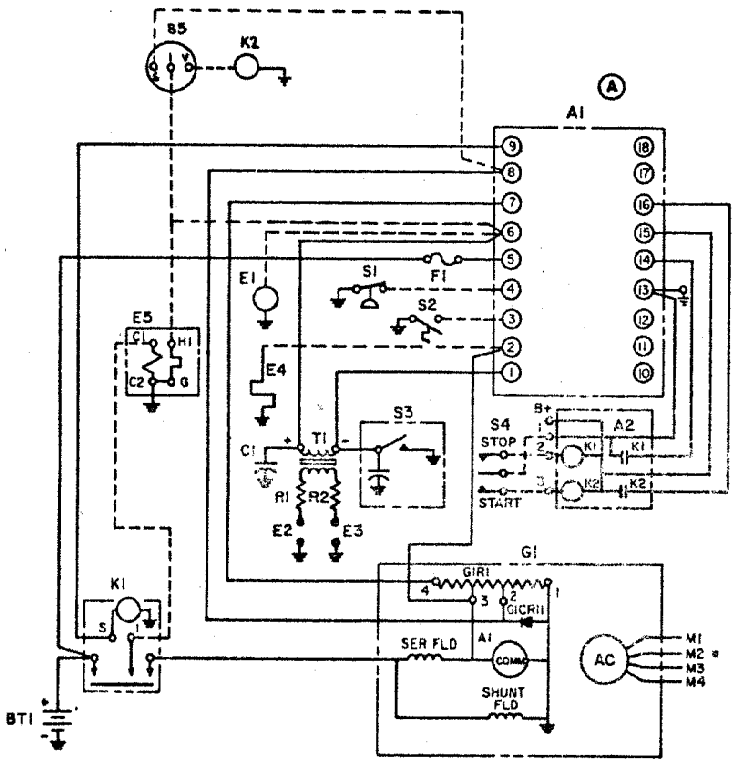
These instructions apply to the Onan remote switch #300-942 and the Onan deluxe remote switch #300-943. See Figure 6A.

1. Measure and cut correct size hole in wall for mounting switch assembly. Switch assembly #300-942 requires an opening 1-5/16″ wide by 1-5/8″ high. For deluxe switch assembly #300-943 cut opening 4-1/8″ wide by 2-3/8″ high.
2. Open the electric plant compartment. Connect #18 wire to the printed circuit board on the generator. Thread these leads through the plant compartment to the inside of the motor home. (If necessary, cut a small hole in the compartment for these leads.) Run the lead ends from inside the motor home through the wall cutout.
3. Connect the leads to the remote control terminals. **NOTE**: *Terminal numbers are stamped on the raised portion on the back of the remote control switch.*
4. Insert the remote control switch into the wall cutout and secure with #5 wood screws (shipped with the Assembly).

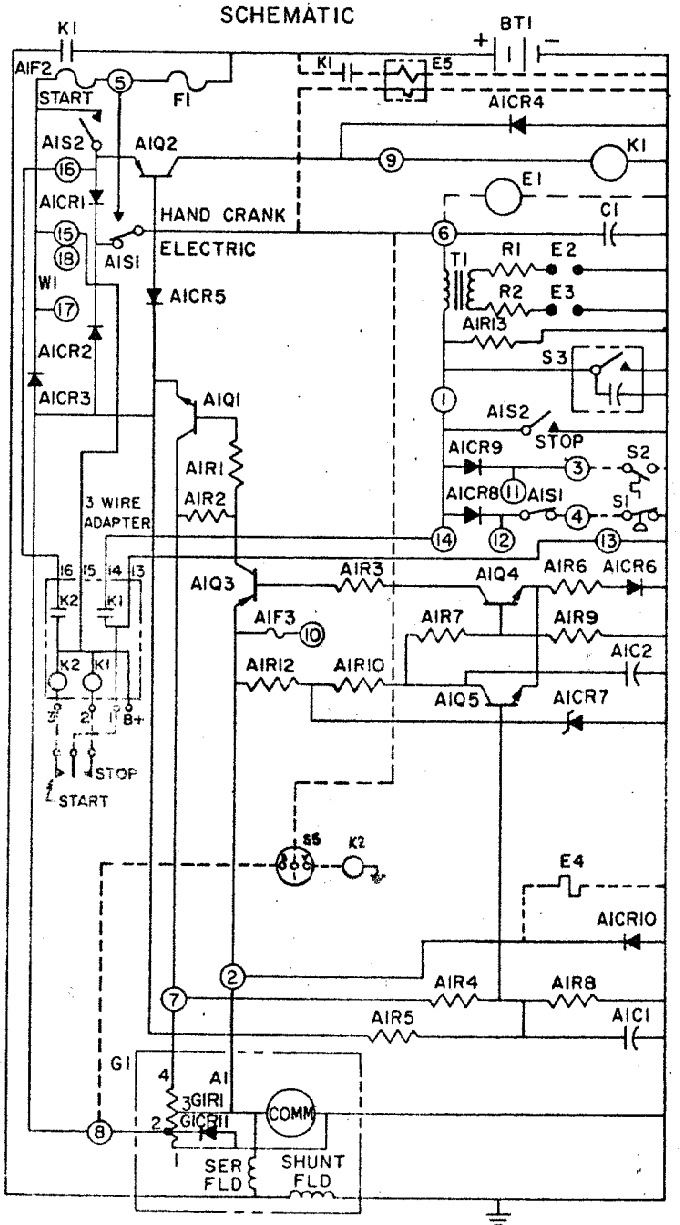
WARNING *To prevent noxious gases from entering the interior of the motor home, seal any openings made in the plant compartment for the lead wires.*

611C1090

WIRING DIAGRAM



SCHEMATIC



PARTS LIST

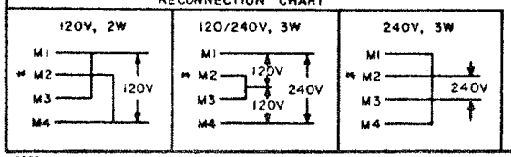
REF. DES.	PART NO.	QTY.	DESCRIPTION
	300C1001	1	CONTROL ASSY
A1	300C859(REF)	1	CONTROL-GEN SET ASSY
A2	300B935(REF)	1	CONTROL-START ADAPTER (4 TO 3 WIRE)
W1	SEE TAB	1	WIRING HARNESS
			PARTS LIST ENG GEN (REF)
BT1		1	BATTERY-12 VDC
C1		1	CAPACITOR-0.1 MFD
E1		1	PUMP-FUEL OR GAS VALVE
E2, E3		2	SPARK PLUG
E4		1	CHOKE-ONAN (WHEN USED)
E5		1	CHOKE-THERMO MAG (WHEN USED)
G1		1	GENERATOR
G1CR11	357-17	1	DIODE-3A
G1R1	353-47	1	RESISTOR
K1	307B1166	1	RELAY-START SOLENOID
K2	307P312	1	FUEL-SOLENOID
F1	321P193	1	FUSE-9A
R1		1	LEAD ASSY-HI TENSION
R2		1	LEAD ASSY-HI TENSION
S1		1	SWITCH-LOW OIL PRESS
S2		1	SWITCH-HIGH AIR TEMP (WHEN USED)
S3		1	BREAKER & CAP ASSY
S4		1	SWITCH-START STOP (CUSTOMER REMOTE)
S5	148B367	1	SWITCH-VACUUM (FUEL SOLENOID)
T1		1	COIL-IGNITION

060D119

AC SLIP RINGS — VOLTAGE CODE

COMM END		BEARING END			
M4	M3	M2	M1	3C	120/240V, 1PH
M3	M2	M0	M1	4	120/208V, 3PH
M3	M2	M0	M1	5D	120/240V, 3PH
M3	M2	M0	M1	7	220/380V, 3PH
M0	M1	M2	M3	4X	277/480V, 3PH

RECONNECTION CHART



* GROUNDED AC LEAD

DASH NO	CHOKE	MODEL	WIRING HARNESS
-01	ONAN CHOKE	CCK	338D682
-02	NO CHOKE, GAS VALVE	CCK	338D719
-03	THERMAL MAG C, LOPKO	NH	338D718
-04	NO CHOKE, GAS, LOPKO, HATKO	CCK	338D722
-05	NO CHOKE, GAS VALVE, HATKO	CCK	338D723
-06	ONAN CHOKE, LOPKO	CCK	338D724
-07	ONAN CHOKE, HATKO, F. PUMP	CCK	338D729
-08	F.PUMP, CHOKE, HATKO, LOPKO	CCK	338D731
-09	ONAN CHOKE, HATKO.	CCK	338D732
-10	LOPKO	CCK, NH	338D738
-11	COMB CARB	CCK	338D739

REV	DESCRIPTION	BY	DATE
E	ADDED -11	KJ	4-17-73
D	ADDED -10	KJ	4-13-73
C	ADDED -08 & -09	KJ	3-26-73
B	ADDED -04, -05, -06, -07	KJ	3-13-73
A	REM NOTE	KJ	2-23-73

SUPERSEDS DWG SAME NO DATED 3-21-72

Onan — DIVISION OF STUDEBAKER CORPORATION

MODEL NO	DATE	BY	CHK'D	APP'D
4.0 & 5.0 CCK-**R/IR	2-15-73	JTM	G.F.T.	W.H.

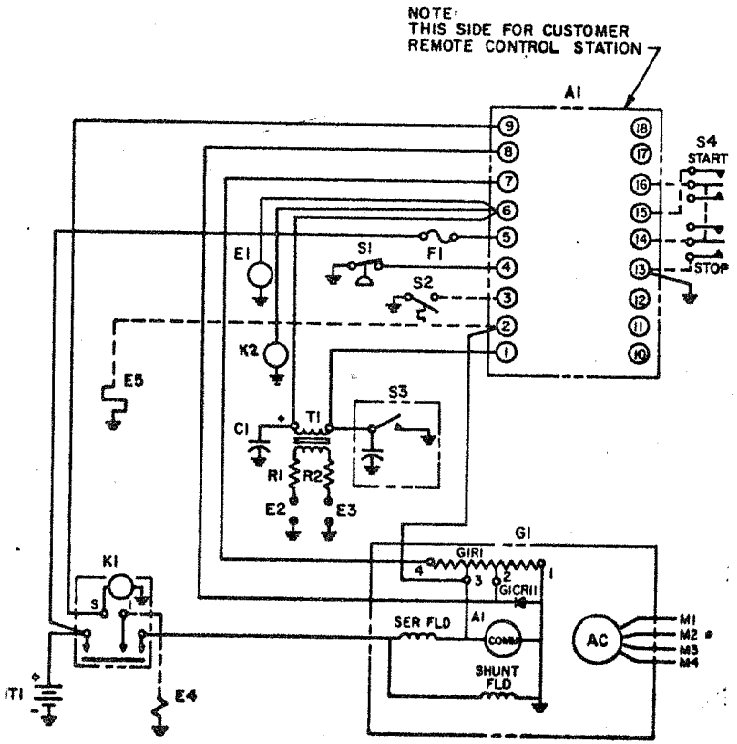
NAME: CONTROL - GEN SET WIRING DIAGRAM

DWG. NO. 611C1090

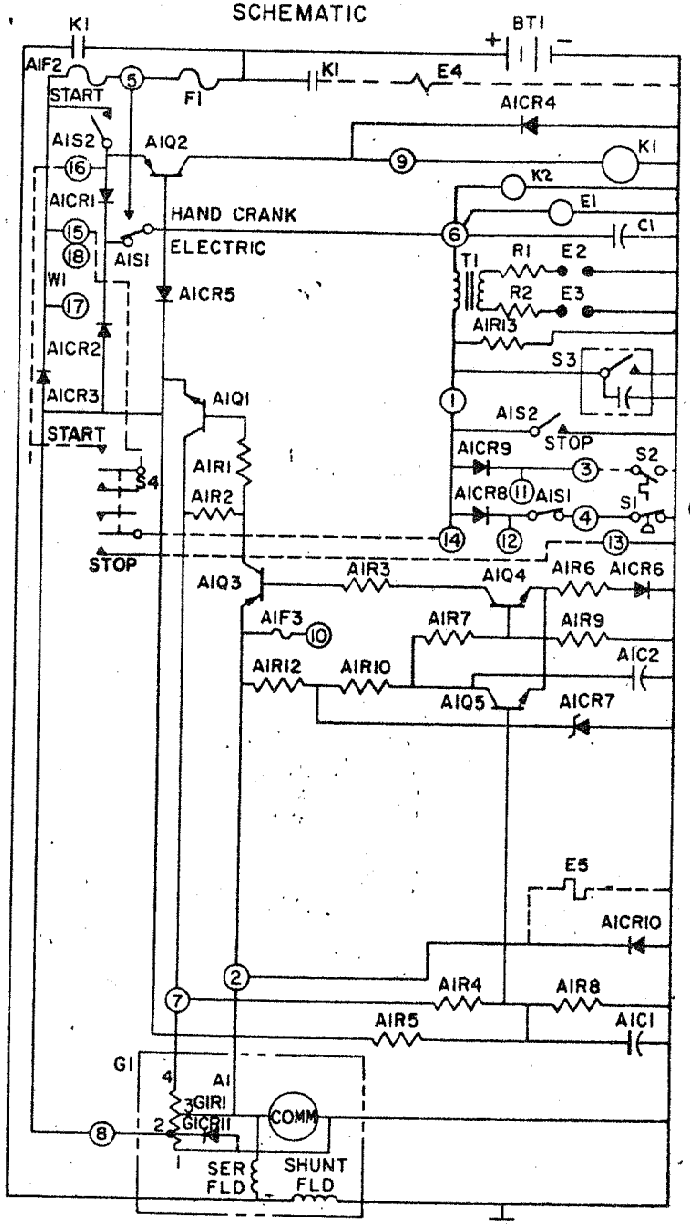
120/240V, 1 PH., 4 TO 3W, 60 Hz

6111C1086

WIRING DIAGRAM



SCHEMATIC

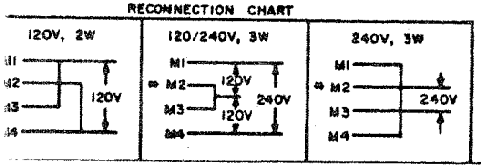


PARTS LIST			
REF. DES.	PART NO.	QTY.	DESCRIPTION
	300C1000	1	CONTROL ASSY
A1	300C859(REF)	1	CONTROL-GEN SET ASSY
A2	300B935(REF)	1	CONTROL-START ADAPTER (4 TO 3 WIRE)
S4		1	SWITCH-START STOP (CUSTOMER REMOTE)
W1	SEE TAB	1	WIRING HARNESS
		PARTS	LIST ENG GEN (REF)
BT1		1	BATTERY-12 VDC
C1		1	CAPACITOR-0.1 MFD
E1		1	PUMP-FUEL (WHEN USED)
E2,E3		2	SPARK PLUG
E4		1	CHOKE-SISSON (WHEN USED)
E5		1	CHOKE-ONAN (WHEN USED)
G1		1	GENERATOR
GICR11	357-17	1	DIODE-3A
GIR1	353-47	1	RESISTOR
K1	307B1166	1	RELAY-START SOLENOID
F1	321P193	1	FUSE-9A
K2		1	SOLENOID-FUEL
R1	167B1557	1	LEAD ASSY-HI TENSION
R2	167B1520	1	LEAD ASSY-HI TENSION
RT1	304-60	1	RESISTOR-HYFENCO 1 7/2Ω, 25W
S1		1	SWITCH-LOW OIL PRESS
S2		1	SWITCH-HIGH AIR TEMP (WHEN USED)
S3		1	BREAKER & CAP ASSY
S4		1	SWITCH-REMOTE START STOP
T1		1	COIL-IGNITION

9801C119

DASH NO	CHOKE	MODEL	WIRING HARNESS
-01	SISSION CHOKE	CCK,NH	338D640
-02	ONAN CHOKE	CCK	338D691

RECONNECTION CHART



⏚ GROUNDED AC LEAD

5.5NH-53CR/12000R 35B4.2CCK-53CR/12000R	6.5 NH - 3CR/12000R 4 & 5CCK-3CR/12000R
120/240V., 1PH 4W., 50Hz	120/240V., 1 PH 4W., 60Hz

A	ADDED FUEL SOLENOID	KT	6-19-73
SUPERSEDES DWG SAME NO DATED 11-17-71			
LET	REVISION	CHKD	DATE

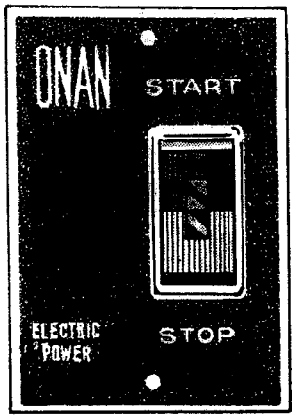
Onan DIVISION OF STUDEBAKER CORPORATION

DATE 2-15-73 BY JTM TRACED F.T.C. CHKD

NAME CONTROL-GEN SET WIRING DIAGRAM

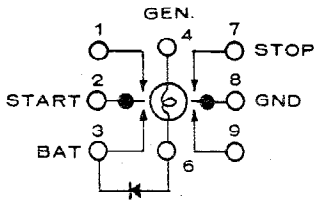
DWG. NO. 611C1086

FRONT SIDE OF REMOTE CONTROL SWITCH



REMOTE CONTROL ASSEMBLY
#300-942

CONTROL SWITCH SCHEMATIC (REAR VIEW)

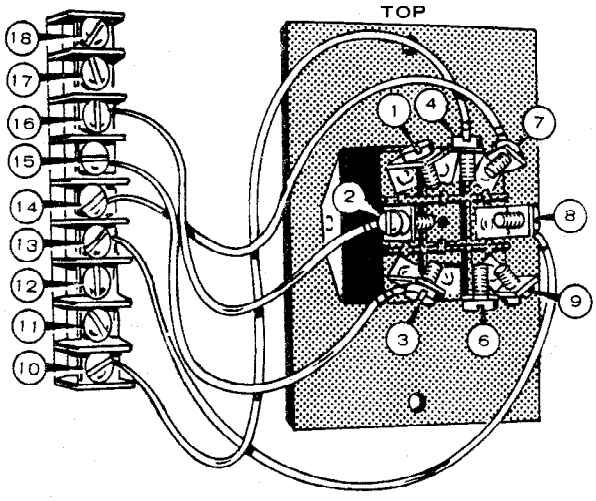


NOTE: TERMINALS 1 AND 9 NOT USED.

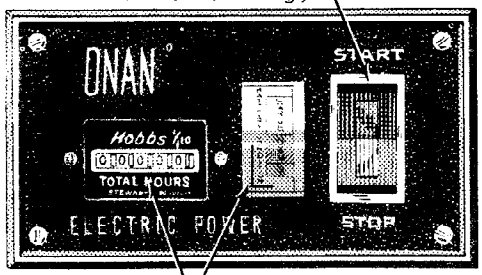
REMOTE CONTROL SWITCH TERMINAL	FUNCTION
2	START
3	BATTERY
7	STOP
8	GROUND
4	GENERATING LAMP

PRINTED CIRCUIT BOARD CONNECTION TERMINALS ON GENERATOR

BACK SIDE OF REMOTE CONTROL SWITCH



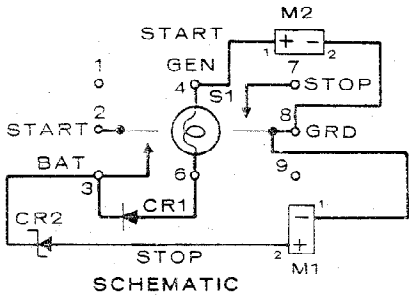
STOP-START SWITCH (DPDT)
(Amber light glows when generator set is running)



RUNNING TIME METER (M2)

BATTERY CONDITION METER (M1)

DELUXE REMOTE CONTROL ASSEMBLY
#300-943



SCHEMATIC
(REAR VIEW OF CONTROL)
NOTE: TERMINALS 1 AND 9 ON REMOTE CONTROL NOT USED.

FIGURE 6A. CONNECTING REMOTE CONTROL TO ELECTRIC GENERATING PLANT

OPERATION

BEFORE STARTING

Crankcase Oil: Be sure the crankcase has been filled with oil to the "FULL" mark on the oil level indicator. Refer to the *Maintenance Section* for the recommended oil changes and complete lubricating oil recommendations.

Recommended Fuel: Use clean, fresh, regular grade, automotive gasoline. Do not use highly leaded premium types.

For new engines, the most satisfactory results are obtained by using nonleaded gasoline. For older engines that have previously used leaded gasoline, heads must be taken off and all lead deposits removed from engine before switching to nonleaded gasoline.

CAUTION *If lead deposits are not removed from engine before switching from leaded to nonleaded gasoline, preignition could occur causing severe damage to the engine.*

ELECTRIC STARTING

Push the Start-Stop switch to its "START" position. Release the switch as soon as the engine starts.

If the engine fails to start at first try, inhibitor oil used at the factory may have fouled the spark plugs. Remove the plugs, clean in a suitable solvent, dry thoroughly and install. Heavy exhaust smoke when the engine is first started is normal and is caused by the inhibitor oil.

OPTIONAL MANUAL STARTING (Begin Spec R)

If the battery charge condition is too low to crank the engine, some engines equipped with a rope sheave, can be started manually. Move "Rope Start" button to "Hold" position. Pull the rope with a fast, steady pull to crank the engine. Do not jerk. After starting, release "Hold" switch.

NOTE: *Units not equipped with rope sheave cannot be started manually.*

MANUAL STARTING (Through Spec P)

Set the control box switch to its *manual* start position. Pull the rope with a fast, steady pull to crank the engine. Do not jerk. After starting, return the control box switch to the *electric start* position to avoid discharging the battery.

APPLYING LOAD

If practical, allow set to warm up before connecting a heavy load. Continuous generator overloading may cause high operating temperatures that can damage the windings. Keep the load within nameplate rating.

STOPPING

1. Push Start-Stop switch to "STOP" position.
2. Release switch when unit stops.

BREAK-IN PROCEDURE

Controlled break-in with the proper oil and a conscientiously applied maintenance program will help to assure satisfactory service from your Onan electric generating set.

When operating engine for the first time, use the following sequence using SE or SE/CC oil (former designation was MS or MS/DG):

1. One half hour at 1/2 load.
2. One half hour at 3/4 load.
3. Full load.
4. Change crankcase oil after the first 50 hours of operation.

BATTERY CHARGING (Begin Spec R)

The battery charge rate is automatically controlled by a solid-state voltage regulator. The high charge rate was set at the factory for average operating conditions.

INFREQUENT SERVICE

If the set is used infrequently, extended shutdown periods can result in difficult starting. Run unit at least 30 minutes every week to eliminate hard starting.

HIGH TEMPERATURES

1. See that nothing obstructs air flow to and from the set.
2. Keep cooling fins clean. Air housing should be properly installed and undamaged.
3. Keep ignition timing properly adjusted.

LOW TEMPERATURES

1. Use correct SAE No. oil for temperature conditions. Change oil only when engine is warm. If an unexpected temperature drop causes an emergency, move the vehicle to a warm location.
2. Use fresh gasoline. Protect against moisture condensation. Below 0°F adjust carburetor main jet for a slightly richer fuel mixture.
3. Keep ignition system clean, properly adjusted and batteries in a well charged condition.
4. Partially restrict cool air flow, but use care to avoid overheating.

OUT-OF-SERVICE PROTECTION

Protect a set that will be out-of-service for more than 30 days as follows:

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

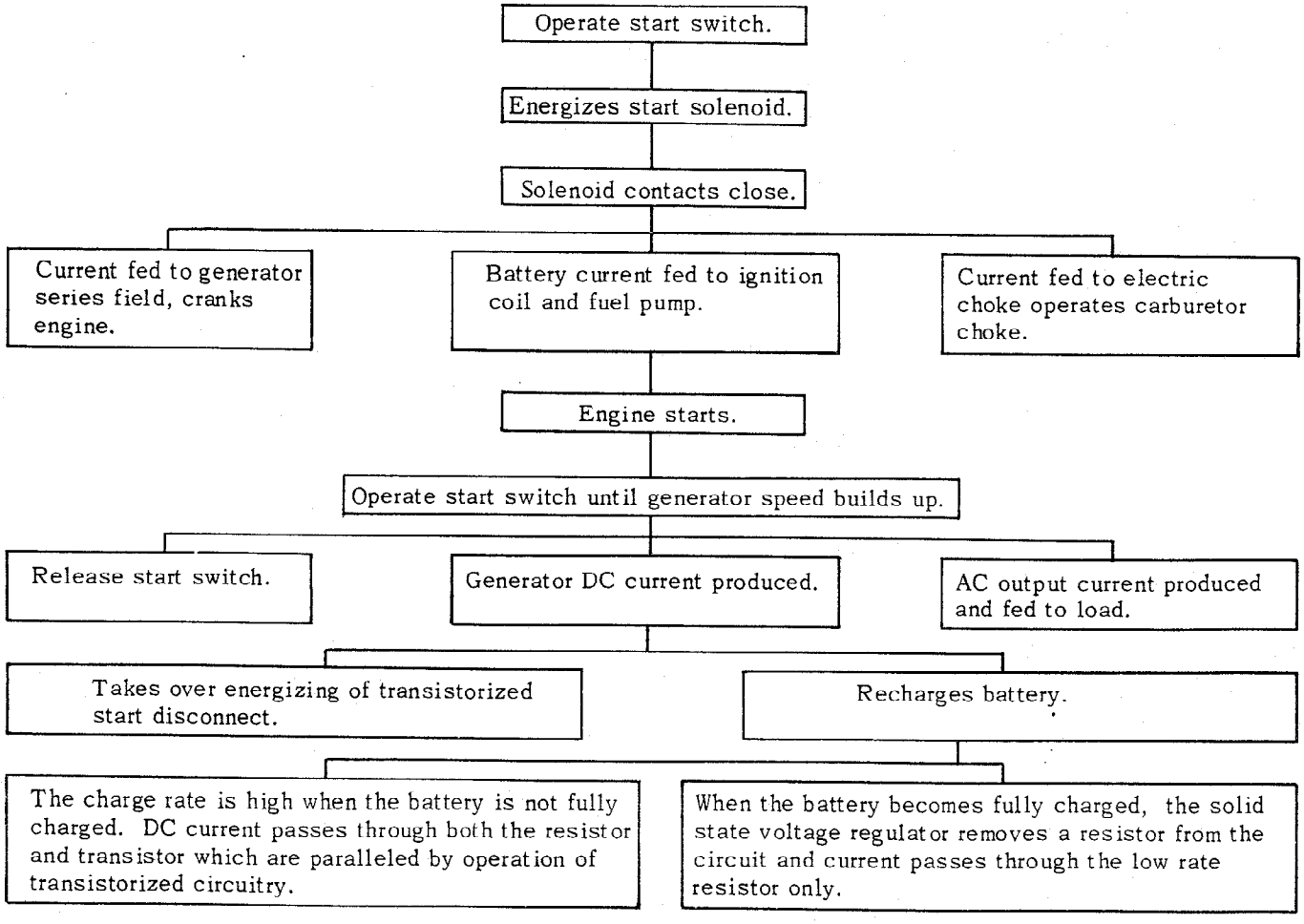
DUST AND DIRT

1. Keep set clean. Keep cooling surfaces clean.
2. Service air cleaner as frequently as necessary.
3. Change crankcase oil every 50 operating hours or sooner.
4. Keep oil and gasoline in dust-tight containers.
5. Keep governor linkage clean.
6. Clean generator brushes, slip rings and commutator. Do not remove normal (dark brown) film. Do not polish.

HIGH ALTITUDE

For operation at altitudes of 2500 feet above sea level, close carburetor main jet adjustment slightly to maintain proper air-to-fuel ratio (refer to the *Adjustment Section*). Maximum power will be reduced approximately 4% for each 1000 feet above sea level, after the first 1000 feet.

SEQUENCE OF OPERATION



ADJUSTMENTS

BREAKER POINTS

1. Remove the two screws and the cover on the breaker box.
2. Remove the two spark plugs so engine can be easily rotated by hand.
3. Turn flywheel in a clockwise direction approximately 1/4 turn after top center (TC).
4. To adjust gap refer to Figure 7. Loosen screws (A) and turn cam (B) until point gap measures .020″ with a flat thickness gauge. Retighten screws (A) and recheck gap.
5. If points are slightly burned, dress smooth with a file or fine stone. If points appear to be burned and pitted, replace them with a new set.
6. Replace spark plugs and breaker box cover.

IGNITION TIMING

Both spark plugs on the CCK fire simultaneously, thus the need for a distributor is eliminated. Spark advance is set at 19° BTC (before top center) and should be maintained for best engine performance. Always check timing after replacing ignition points or if noticing poor engine performance. Proceed as follows:

Timing Procedure – Engine Running:

1. To accurately check the ignition timing, use a timing light when engine is running. Connect the timing light according to its manufacturer's instructions. Either spark plug can be used as they fire simultaneously.
2. Remove the plug from the timing hole.
3. Start the engine and check the timing. The mark on the flywheel should line up with the 19°BTC mark on the cover.
4. If timing needs adjustment, loosen the mounting screws on breaker box and move left to advance or right to retard the timing.
5. Start engine to be sure mark on flywheel lines up with 19° mark on cover.
6. Tighten all screws, replace timing plug.

Timing Procedure – Engine Not Running:

1. Connect a continuity test lamp set across the ignition breaker points. Touch one test prod to the breaker box terminal to which the coil lead is connected and touch the other test prod to a good ground on the engine.
2. Turn crankshaft against rotation (counterclockwise) until the points close. Then slowly turn the crankshaft with rotation (clockwise).
3. The lamp should go out just as the points break which is the time at which ignition occurs (19° BTC).

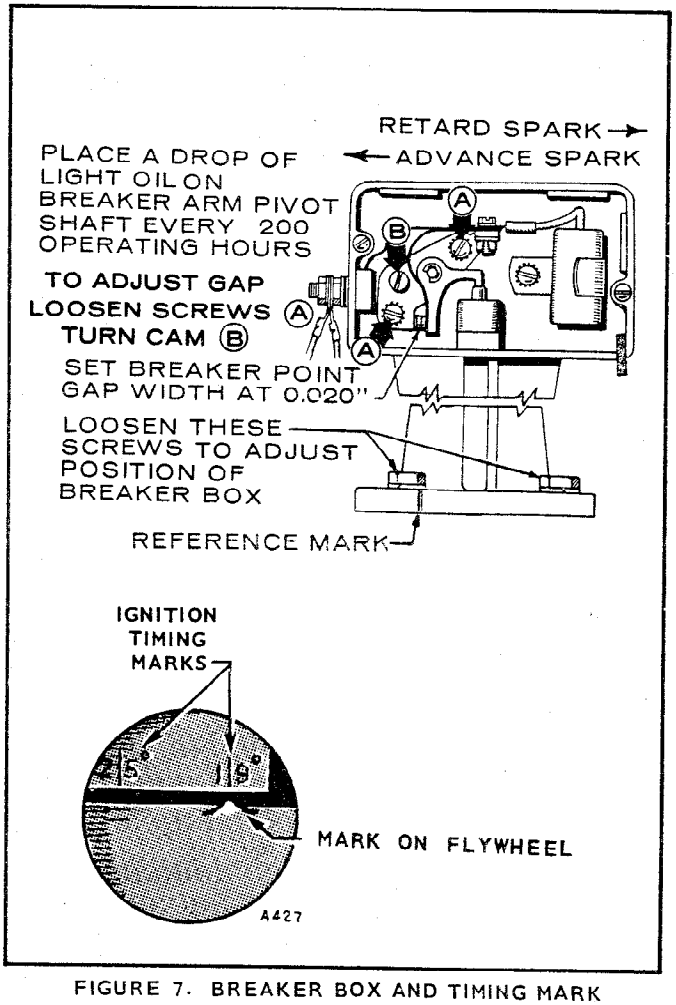


FIGURE 7. BREAKER BOX AND TIMING MARK

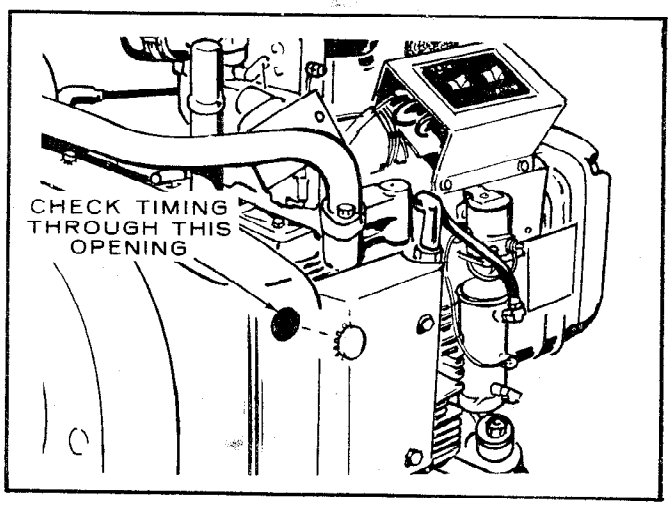


FIGURE 8. TIMING ACCESS HOLE

CARBURETOR, GASOLINE

The carburetor has an adjustable idling jet and an adjustable main jet. If the engine runs unevenly at half or full load due to faulty carburetion, the main adjusting needle requires adjustment. The idle adjustment needle normally requires little attention other than a periodic cleaning. A hunting condition (alternate increase and decrease in engine speed) at no load can sometimes be adjusted by an idle jet adjustment. Make all adjustments with the engine at normal operating temperature.

To adjust the main jet, connect a full or nearly full load to the engine. Turn the main adjusting needle out about two full turns. Then turn it in slowly until the engine begins to lose power and speed. Then turn it out slowly until the engine runs smoothly at full power and speed. If the engine develops a hunting condition try correcting by opening the main adjusting needle a little more. Do not open more than 1/2 turn beyond the maximum point of power. If this does not correct the condition, adjust the sensitivity of the governor.

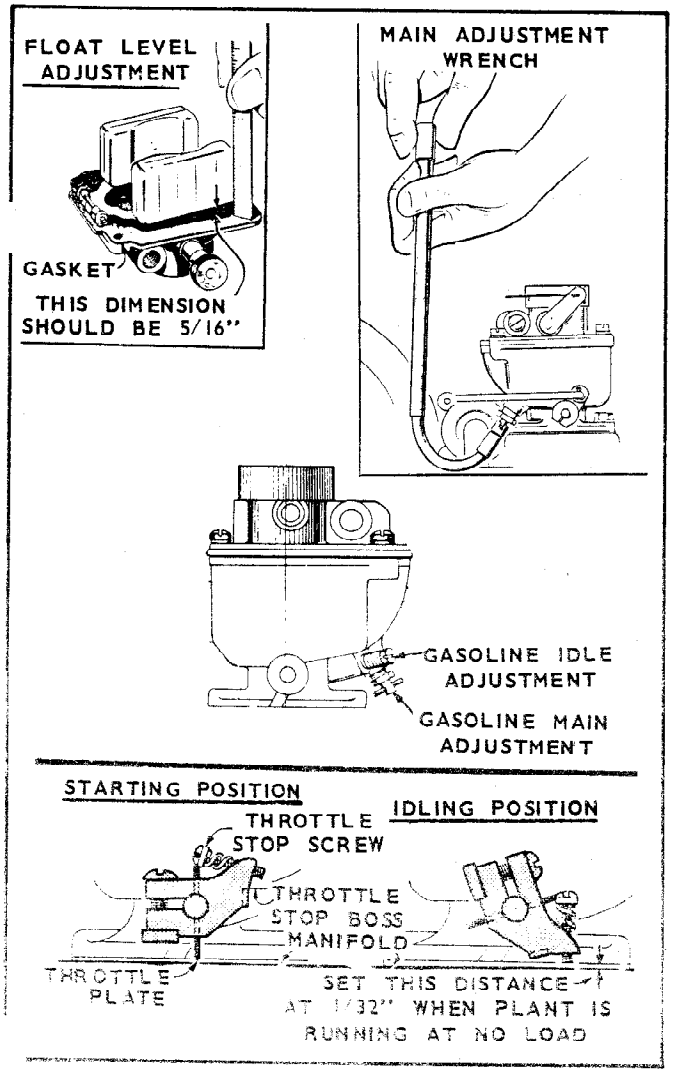


FIGURE 9. CARBURETOR ADJUSTMENTS

Make the idle jet adjustment with no load connected to the engine. Turn the needle in until the engine loses considerable speed. Then turn it out until the engine runs smoothly.

SISSON CHOKE

This choke should not require any seasonal readjustment. If adjustment becomes necessary, pull choke lever up and insert a 1/16" diameter rod through shaft hole (opposite end from lever) and engage rod in notch of mounting flange, to lock shaft in place.

Loosen the choke lever clamp screw. With air inlet removed, adjust choke lever so carburetor choke plate is completely closed, or not more than 5/16" open. Tighten choke lever clamp screw and remove locking rod from shaft.

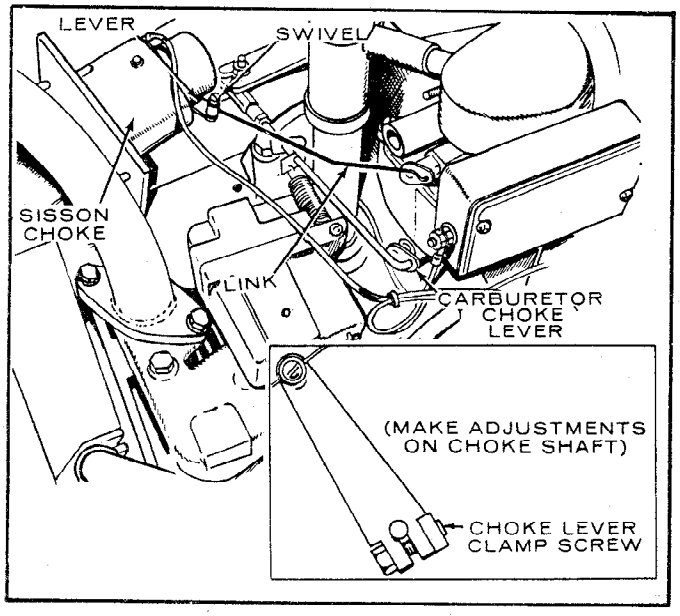


FIGURE 10. SISSON CHOKE

THERMO-MAGNETIC CHOKE

This choke uses a strip heating element and a heat sensitive bimetal spring to control the choke plate position. In addition to this, a solenoid is actuated during engine cranking, closing the choke all or part way, depending on ambient temperature. The bimetal is factory set to position the choke to the proper opening under any ambient condition.

If adjustment of the bimetal is needed, it must be made at ambient temperature. Do not attempt adjustments until the engine has been shut down for at least one hour. Loosen the screw which secures the choke body assembly (see Figure 11). Rotating the choke body clockwise richens and counterclockwise leans the choking effect. For ambient temperatures below 60°F the choke should be opened 1/8" with the solenoid not engaged. Tighten the screw that secures the choke body.

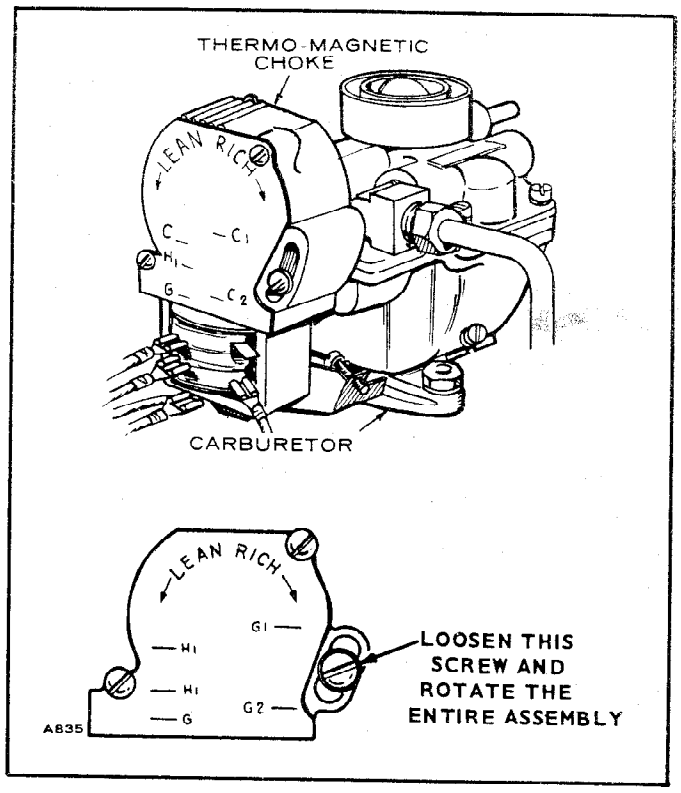


FIGURE 11. THERMO-MAGNETIC CHOKE

ELECTRIC CHOKE

If extremes in starting temperatures require a readjustment of the choke, loosen slightly the two cover retaining screws. For less choking action, turn the cover assembly a few degrees in a clockwise direction. For more choking action, turn counterclockwise. Retighten the cover screws.

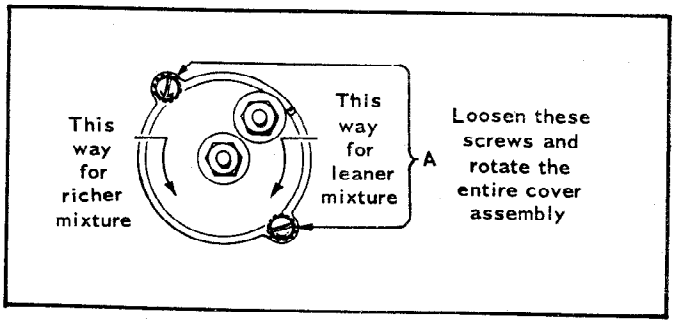


FIGURE 12. ELECTRIC CHOKE

GOVERNOR AND BOOSTER

The governor and booster control the speed of the engine. A speed adjustment includes adjusting both devices (Figure 13).

GOVERNOR

Before making final governor adjustments, run the unit about 15 minutes under light load to reach normal operating temperature. (If governor is completely out of adjustment, make a preliminary adjustment at no load to first attain a safe voltage operating range).

Engine speed determines the output voltage and current frequency of the generator. By increasing the engine speed, generator voltage and frequency are increased, and by decreasing the engine speed, generator voltage and frequency are decreased. An accurate voltmeter or frequency meter (preferably both) should be connected to the generator output in order to correctly adjust the governor. A small speed drop not noticeable without instruments will result in an objectionable voltage drop. The engine speed can be checked with a tachometer.

A binding in the bearings of the governor shaft, in the ball joint, or in the carburetor throttle assembly will cause erratic governor action or alternate increase and decrease in speed (hunting). A lean carburetor adjustment may also cause hunting. Springs of all kinds have a tendency to lose their calibrated tension through fatigue after long usage. If all governor and carburetor adjustments are properly made, and the governor action is still erratic, replacing the spring with a new one and resetting the adjustments will usually correct the trouble.

1. Adjust the carburetor main jet for the best fuel mixture while operating the set with a full rated load connected.
2. Adjust the carburetor idle needle with no load connected.
3. Adjust the length of the governor linkage and check linkage and throttle shaft for binding or excessive looseness.
4. Adjust the governor spring tension for rated speed at no load operation with booster disconnected (or held inoperative).
5. Adjust the governor sensitivity.
6. Recheck the speed adjustment.
7. Set the carburetor throttle stop screw.
8. Set the vacuum speed booster.

LINKAGE

The engine starts at wide open throttle. The length of the linkage connecting the governor arm to the throttle shaft and lever is adjusted by rotating the ball joint. Adjust this length so that with the engine stopped and tension on the governor spring, the stop on the carburetor throttle lever just contacts the underside of the carburetor bowl. This setting allows immediate control by the governor after starting. It also synchronizes travel of the governor arm and the throttle shaft.

SPEED ADJUSTMENT

With the warmed-up unit operating at no load, and with the booster external spring disconnected (or

otherwise held inactive), adjust the tension of the governor spring. Refer to Voltage Chart and the Speed Chart and select the column which corresponds to the nameplate of the unit in question. Turn the speed adjusting nut to obtain a voltage and speed reading within the limits shown.

VOLTAGE CHART FOR CHECKING GOVERNOR REGULATION

AC GENERATING SETS	120 VOLT 1 PHASE 2 WIRE	120/240 VOLT 1 PHASE 3 WIRE
Maximum No Load Volts	126	126/252
Minimum Full Load Volts Without Booster	110	110/220

NOTE: Output rating is at UNITY power factor load.

SPEED CHART FOR CHECKING GOVERNOR REGULATION

Maximum No Load Speed	
RPM	1890
Hertz (Current Frequency)	63
Minimum Full Load Speed Without Booster	
RPM	1770
Hertz	59

SENSITIVITY ADJUSTMENT

Refer to the Governor Adjustment illustration, and to the Voltage and Speed Charts. Check the voltage and speed, first with no load connected and again with a full load. Adjust the sensitivity to give the closest regulation (least speed and voltage difference between no load and full load) without causing a hunting condition.

To increase sensitivity (closer regulation), shift the adjusting clip toward the governor shaft.

An adjustment for too much sensitivity will cause alternate increase and decrease of engine speed (hunting).

To decrease sensitivity, shift the adjusting clip toward the outer end of the governor arm. Too little sensitivity will result in too much difference in speed between no load and full load conditions.

Any change in the sensitivity adjustment usually requires a compensating speed (spring tension) adjustment.

SPEED BOOSTER

After satisfactory performance under various loads has been attained by governor adjustments without the booster, the booster can be connected. Connect the booster external spring to the bracket on the governor link (rod). With the unit operating at no load, slide the bracket on the governor link just to the position where there is no tension on the external spring (Figure 13).

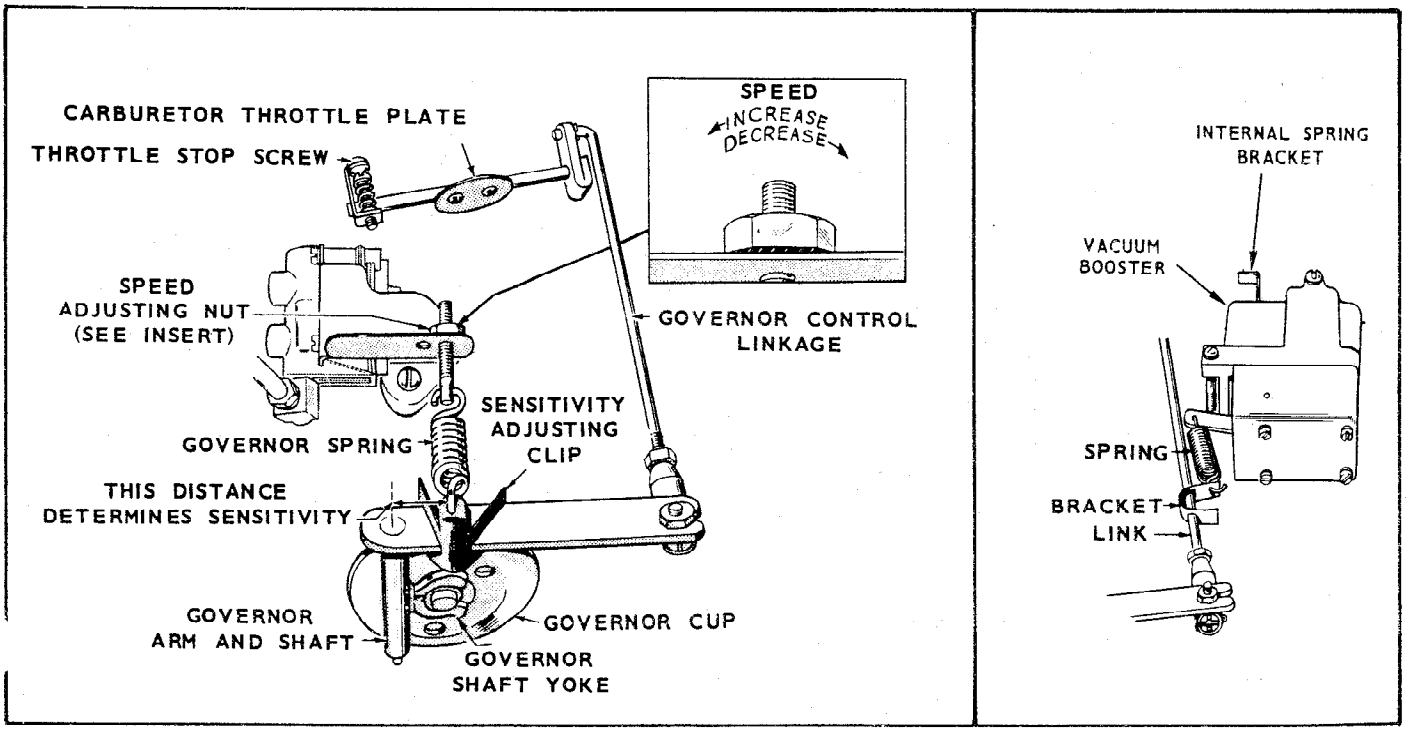


FIGURE 13. GOVERNOR AND SPEED BOOSTER

Apply a full rated electrical load to the generator. The output voltage should stabilize at nearly the same reading for full load as for no load operation. The speed may remain about the same or increase when the load is applied, resulting in a frequency 1 or 2 hertz *higher than* the no load frequency (1 hertz is equal to 30 rpm for a 4 pole generator). If the rise in frequency is more than 2 hertz, lessen the internal spring tension. If there is a drop in the frequency, increase the booster internal spring tension. To increase the tension, pull out on the spring bracket and move the pin to a different hole.

With the booster disconnected, a maximum drop of 3 hertz from no load to full load is normal. With the booster in operation, a maximum *increase* of 2 hertz from no load to full load is normal. A drop of 1 hertz at 1/4 load is permissible, giving an overall spread of 3 hertz maximum.

The effect of the booster is limited by the general condition of the engine. The booster cannot compensate for a loss in engine vacuum caused by leaky valves, worn piston rings, etc.

SERVICE AND MAINTENANCE

CRANKCASE OIL

Fill to the "F" mark on the oil level dipstick. Use a good quality detergent oil that meets the API (American Petroleum Institute) service designations SE or SE/CC. Oil should be labeled as having passed the MS sequence tests (also known as the ASTM G-IV sequence tests) and the MIL-L-2104B tests. Use the proper SAE number of oil for the expected temperature conditions. Do not mix brands or grades. Extremely dusty or low temperature conditions require oil changes more often than normal. Oil capacity is 4 U.S. quarts.

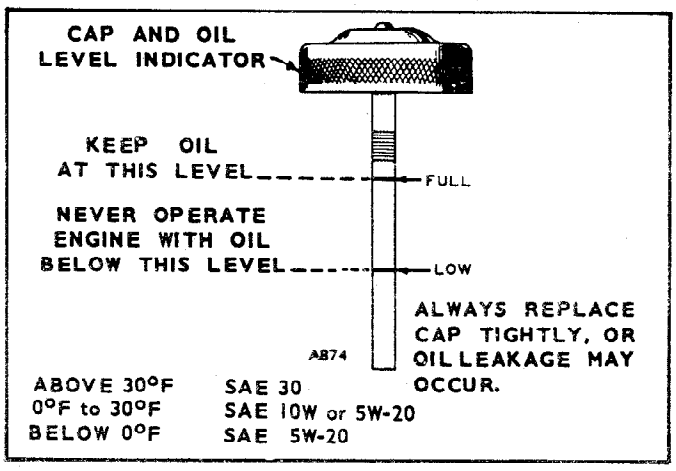


FIGURE 14. OIL LEVEL INDICATOR

CRANKCASE BREATHER

Lift off rubber breather cap. Carefully pry valve from cap. Otherwise press hard with both thumbs on top of the cap and fingers below to release valve from rubber cap. Wash this fabric flapper type check valve in a suitable solvent. Dry and install. Position perforated disc toward engine.

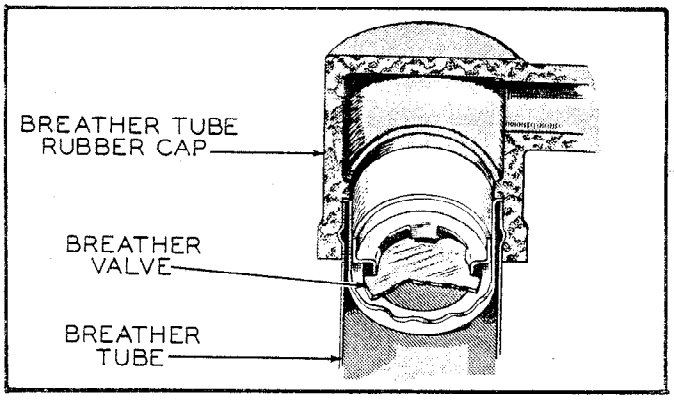


FIGURE 15. CRANKCASE BREATHER

AIR CLEANER

Begin Spec R: Under normal operating conditions clean the air filter every 50 hours. To clean, remove foam strip and element and tap element on a clean flat surface to dislodge the dirt particles. Do not use high pressure compressed air as damage may occur to paper pleats. Replace element every 500 hours. Replace more often in dusty conditions.

Thru Spec P: Clean screen and cup in a suitable solvent. Refer to level indicated on cup. Use the same type of oil as used in crankcase. Refer to Operator Maintenance Schedule for further recommendations.

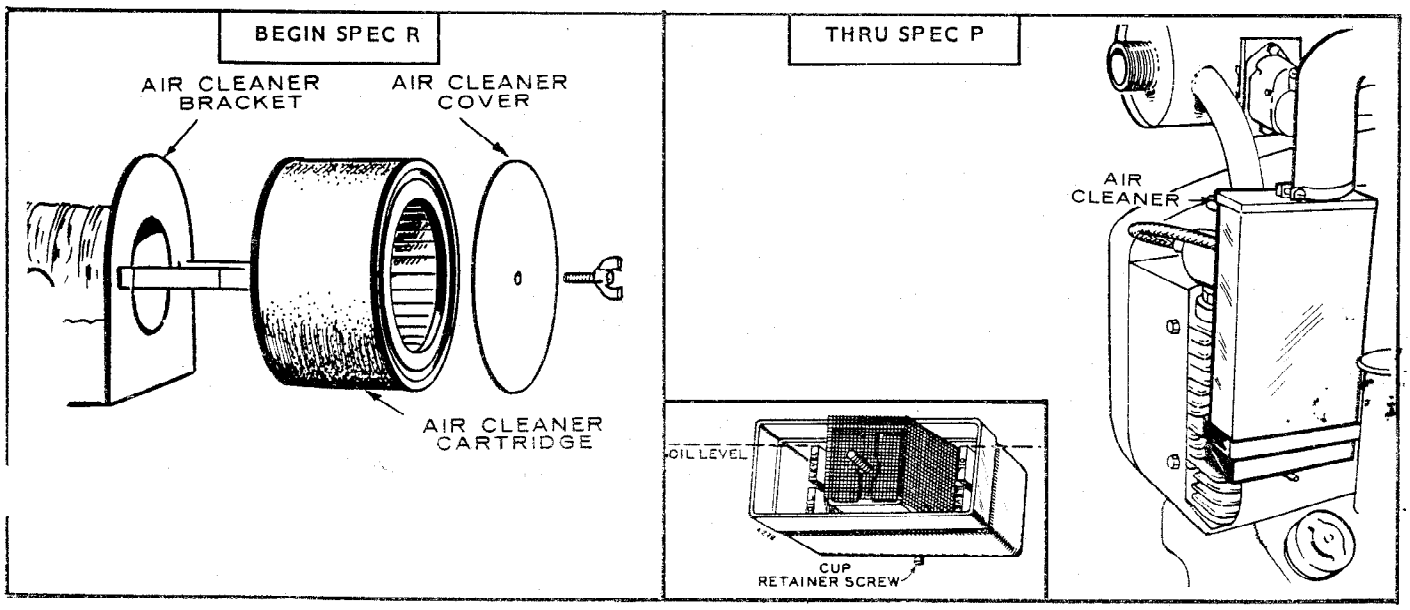


FIGURE 16. AIR CLEANERS

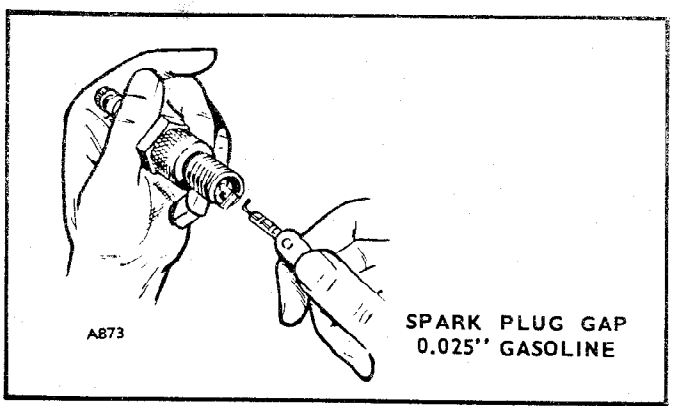


FIGURE 17. SPARK PLUG GAP

SPEED BOOSTER

Use a fine wire to clean the small hole in the short vacuum tube which fits into the hole in the top of the engine intake manifold. Do not enlarge this hole. If there is tension on the external spring when the unit is operating at no load or light load, it may be due to improper adjustment, restricted hole in the small vacuum tube, or a leak in the booster diaphragm or gasket.

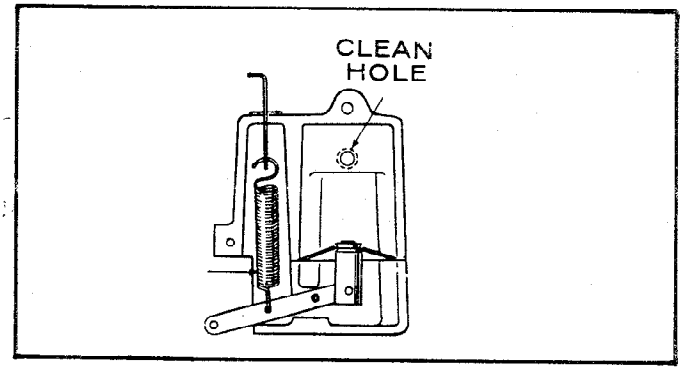


FIGURE 18. VACUUM SPEED BOOSTER

GOVERNOR LINKAGE

The linkage must be able to move freely through its entire travel. Every 50 hours of operation, clean the joints and lubricate, as shown in Figure 19. Also inspect the linkage for binding, excessive slack and wear.

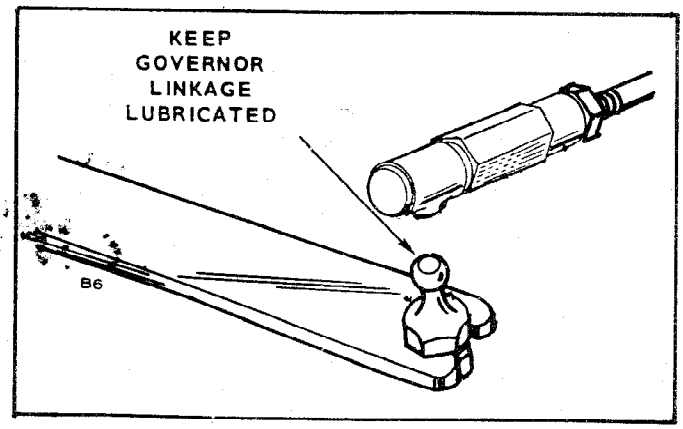


FIGURE 19. GOVERNOR LINKAGE

FUEL SEDIMENT

Every 100 hours or sooner, drain fuel pump and check filter element. Turn hex nut on base of electric fuel pump to gain access to filter element. If element appears dirty, replace with a new one. Be sure to replace gaskets when reassembling. See Figure 20.

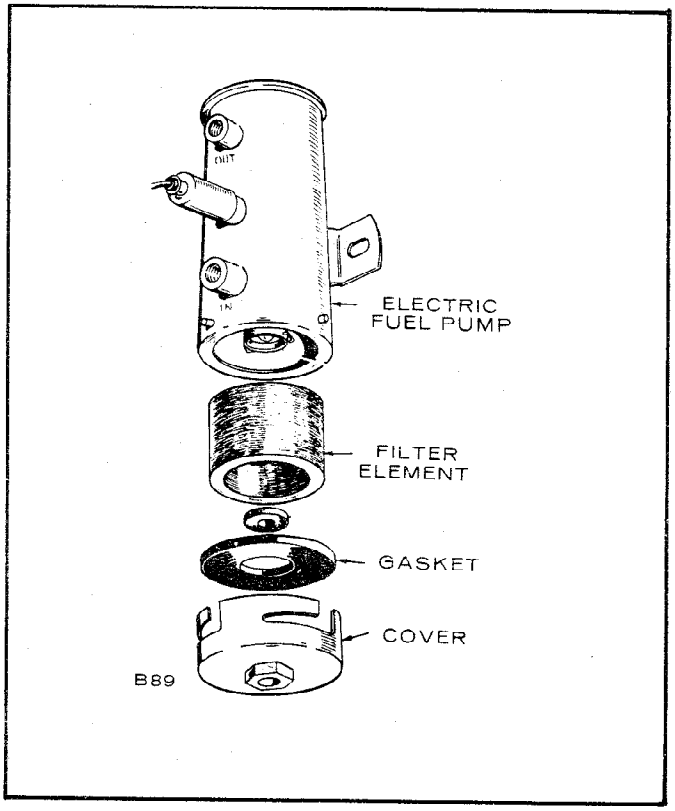
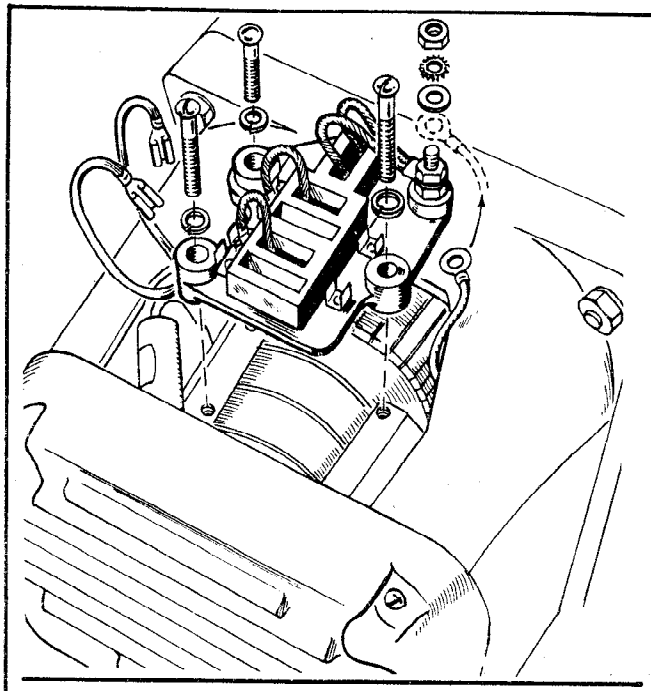


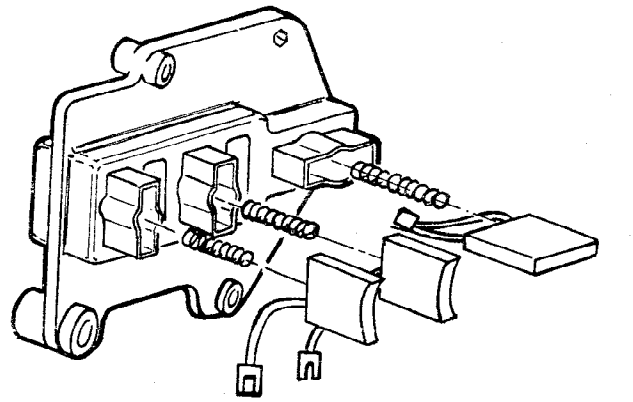
FIGURE 20. FUEL FILTER

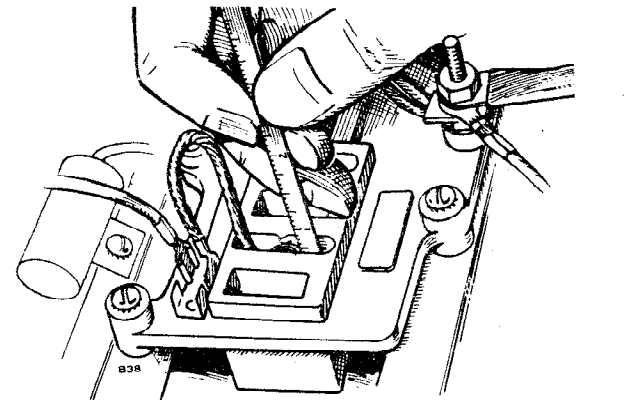
GENERATOR MAINTENANCE

The generator normally needs little care other than a periodic check of the brushes, commutator and collector rings. If a major repair job on the generator should become necessary, have the equipment checked by a competent electrician who is thoroughly familiar with the operation of electric generating equipment.

Brush Replacement (Begin Spec R): Install new brushes when the old ones are worn to the dimensions shown in Figure 21. Remove the end bell band to expose the brush holders. Remove the three screws holding each brush holder in place. Remove the old brushes and clean the holders so the new brushes can move easily in their holders. Install the new brushes in the same manner as the old ones. Always use the correct brush as listed in the *Parts Catalog* section. Never substitute a brush which may appear to be the same, for it may have different characteristics. New brushes are shaped to fit and seldom need sanding to seat properly. If some brush sparking occurs after replacing brushes, run the set under a light load until the brushes wear to a good seat.







MEASURE FROM TOP FACE OF BRUSH BLOCK TO TOP OF BRUSH

	DC	AC
NEW	5/8"	11/16"
½ WEAR	13/16"	7/8"
REPLACE	1"	1 1/16"

FIGURE 21. GENERATOR BRUSHES (BEGIN SPEC R)

Collector rings acquire a glossy brown finish in normal operation. Do not attempt to maintain a bright newly machined appearing surface. Ordinary cleaning with a dry, lint free cloth is usually sufficient. Very fine sandpaper (#00) may be used to remove slight roughness. Use only light pressure on the sandpaper, while the unit is operating. Do not use emery or carburundum paper or cloth. Clean out all carbon dust from the generator.

Brush Replacement (Thru Spec P): Install new commutator brushes when the old ones are worn to 5/8″ in length. The collector ring brush may be used until worn to 5/8″ in length. It is not necessary to remove the brush rig to install new brushes. Remove the end cover to expose the brush rig. Brushes and leads are then easily accessible. New brushes are shaped to fit and seldom need sanding to seat properly. Always use the correct brush as listed in the parts list. Never substitute a brush which may appear to be the same, but may have different electrical characteristics. Be sure to tighten the brush lead terminal nuts. If some brush sparking occurs after replacing brushes, run the unit at a light load until the brushes wear to a good seat.

Collector rings acquire a glossy brown finish in normal operation. Do not attempt to maintain a bright newly machined appearing surface. Ordinary cleaning with a dry, lint free cloth is usually sufficient. Very fine sandpaper (#00) may be used to remove slight roughness. Use only light pressure on the sandpaper, while the unit is operating. Do not use emery or carborundum paper or cloth. Clean out all carbon dust from the generator.

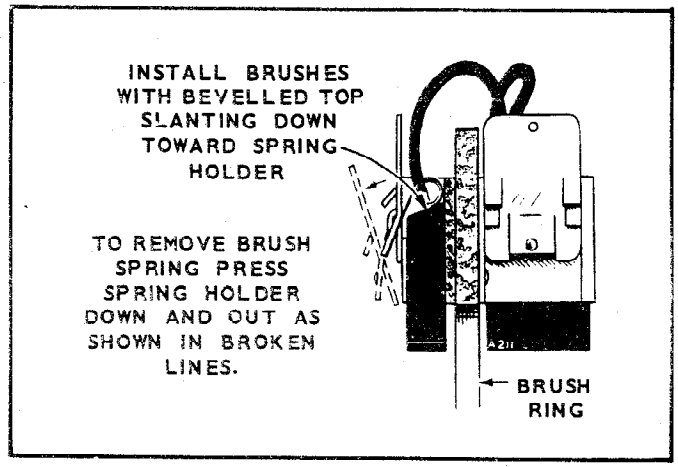


FIGURE 22. GENERATOR BRUSHES (THRU SPEC P)

MAINTENANCE SCHEDULE

Use factory recommended maintenance schedule (based on favorable operating conditions) to serve as a guide to get long and efficient unit life. Neglecting routine maintenance can result in failure or permanent damage to the set. Maintenance is divided into two categories:

1. Operator maintenance – performed by the operator.
2. Critical maintenance – performed by qualified service personnel (Onan dealer).

For any abnormalities in operation, unusual noises from engine or generator, loss of power, overheating, etc., contact your Onan dealer.

OPERATOR MAINTENANCE SCHEDULE

MAINTENANCE ITEMS	OPERATIONAL HOURS			
	8	50	100	200
General Inspection	x			
Check Fuel Supply	x			
Check Oil Level	x			
Service Air Cleaner		x1		
Clean Governor Linkage		x1		
Check Spark Plugs			x	
Change Crankcase Oil			x1	
Clean Fuel Filter			x	
Clean Crankcase Breather				x
Check Battery Electrolyte				x

x1 - Perform more often in extremely dusty conditions.

CRITICAL MAINTENANCE SCHEDULE

MAINTENANCE ITEMS	OPERATIONAL HOURS			
	200	500	1000	5000
Check Breaker Points	x			
Check Brushes	x			
Clean Commutator & Collector Rings		x1		
Remove Carbon & Lead		x		
Check Valve Clearance		x		
Clean Carburetor		x		
Clean Generator			x	
Remove & Clean Oil Base			x	
Grind Valves			x	
General Overhaul				x

x1 - Perform more often in extremely dusty conditions.

PARTS CATALOG

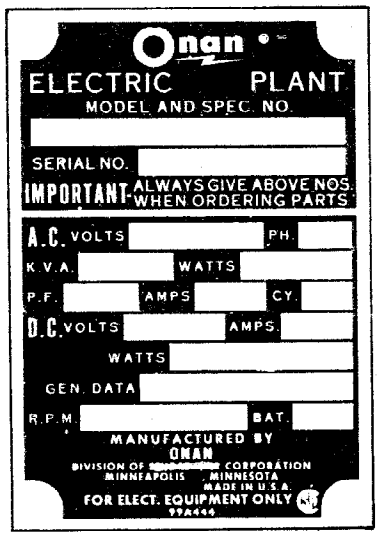
INSTRUCTIONS FOR ORDERING REPAIR PARTS

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

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

Always refer to the nameplate on your unit:

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



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

2. Do not order by reference number or group number, always use part number and description.
3. Give the part number, description and quantity needed of each item. If an older part cannot be identified, return the part prepaid to your dealer or nearest AUTHORIZED SERVICE STATION. Print your name and address plainly on the package. Write a letter to the same address stating the reason for returning the part.
4. State definite shipping instructions. Any claim for loss or damage to your unit in transit should be filed promptly against the transportation company making the delivery. Shipments are complete unless the packing list indicates items are back ordered.

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

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

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

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

This catalog applies to the standard CCK Mobile Plants as listed below. Parts are arranged in groups of related items. Each illustrated part is identified by a reference number corresponding to the same reference number below the illustration. Parts illustrations are typical. Using the *Model and Spec No.* from the plant nameplate, select the Parts Key No. (1, 2, etc. in the last column) that applies to your plant Model and Spec No. This Parts Key No. represents parts that differ between models. Unless otherwise mentioned in the description, parts are interchangeable between models. Right and left plant sides are determined by *facing* the engine end (front) of the plant.

PLANT DATA TABLE

★* MODEL & SPEC NO.	TYPE	ELECTRICAL DATA					PARTS KEY NO.
		WATTS	VOLTS	HERTZ	WIRE	PHASE	
4.0CCK-1R/ ‡	REMOTE	4000	120	60	2	1	
4.0CCK-3R/ ‡	REMOTE	4000	120/240	60	3	1	1
4.0CCK-3CR/ ‡	REMOTE	4000	120/240	60	†	1	
5.0CCK-1R/ ‡	REMOTE	5000	120	60	2	1	
5.0CCK-3R/ ‡	REMOTE	5000	120/240	60	3	1	2
5.0CCK-3CR/ ‡	REMOTE	5000	120/240	60	†	1	

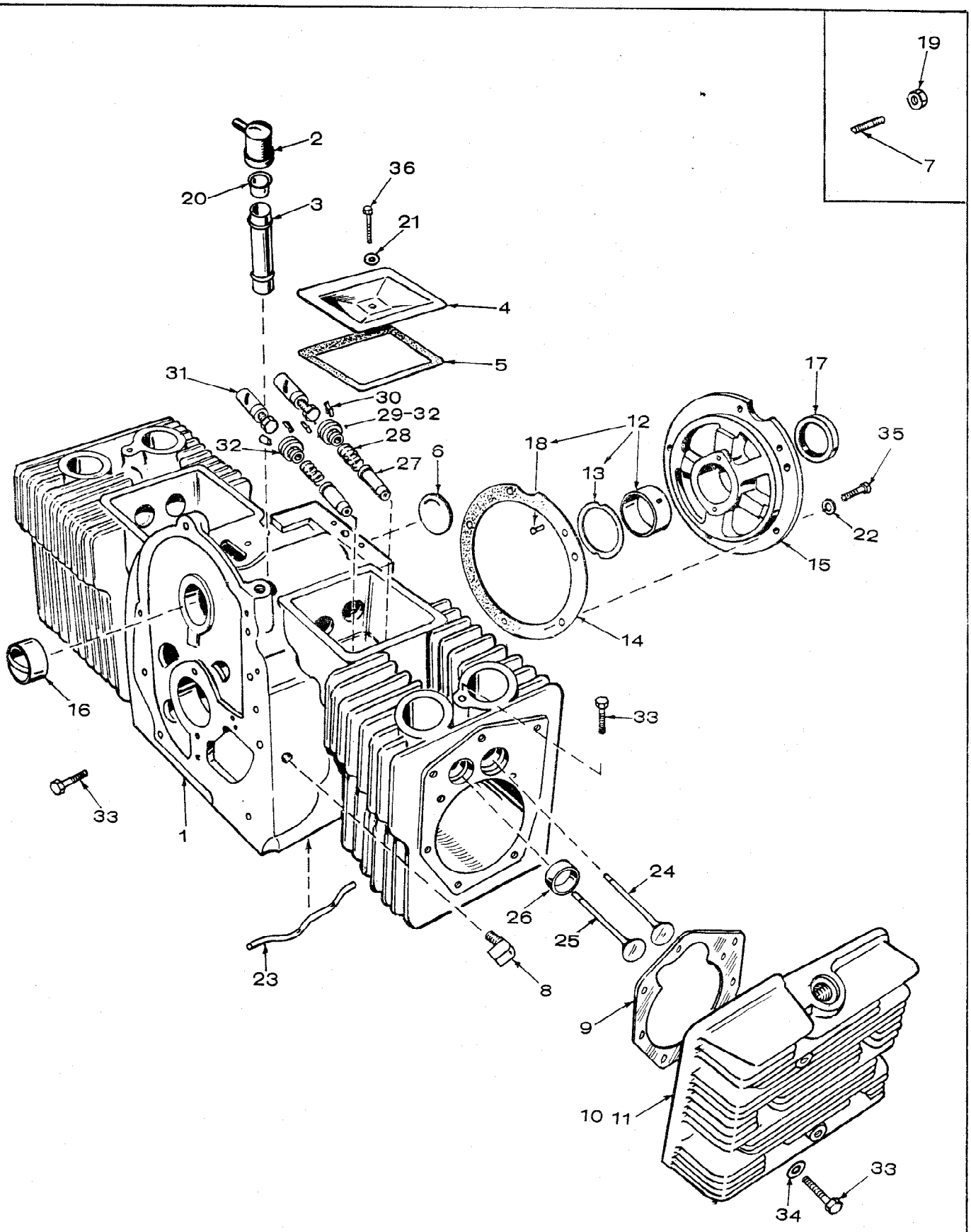
‡ - The Specification Letter advances (A to B, B to C, etc.) with manufacturing changes.

† - These generators have 4 load wires which are reconnectible for 120 volt 2 wire service, or 240 volt 2 wire service, 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: 4.0CCK was formerly 4CCK and 5.0CCK was formerly 5CCK. Also previously a V was used in the model to designate vacu-flo cooling.

* - For units beginning with the 12,000 series, during spec R (EXAMPLE: 5.0CCK-3CR/12000R) refer to the Optional Installation Parts Group following the Standard Parts List.

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



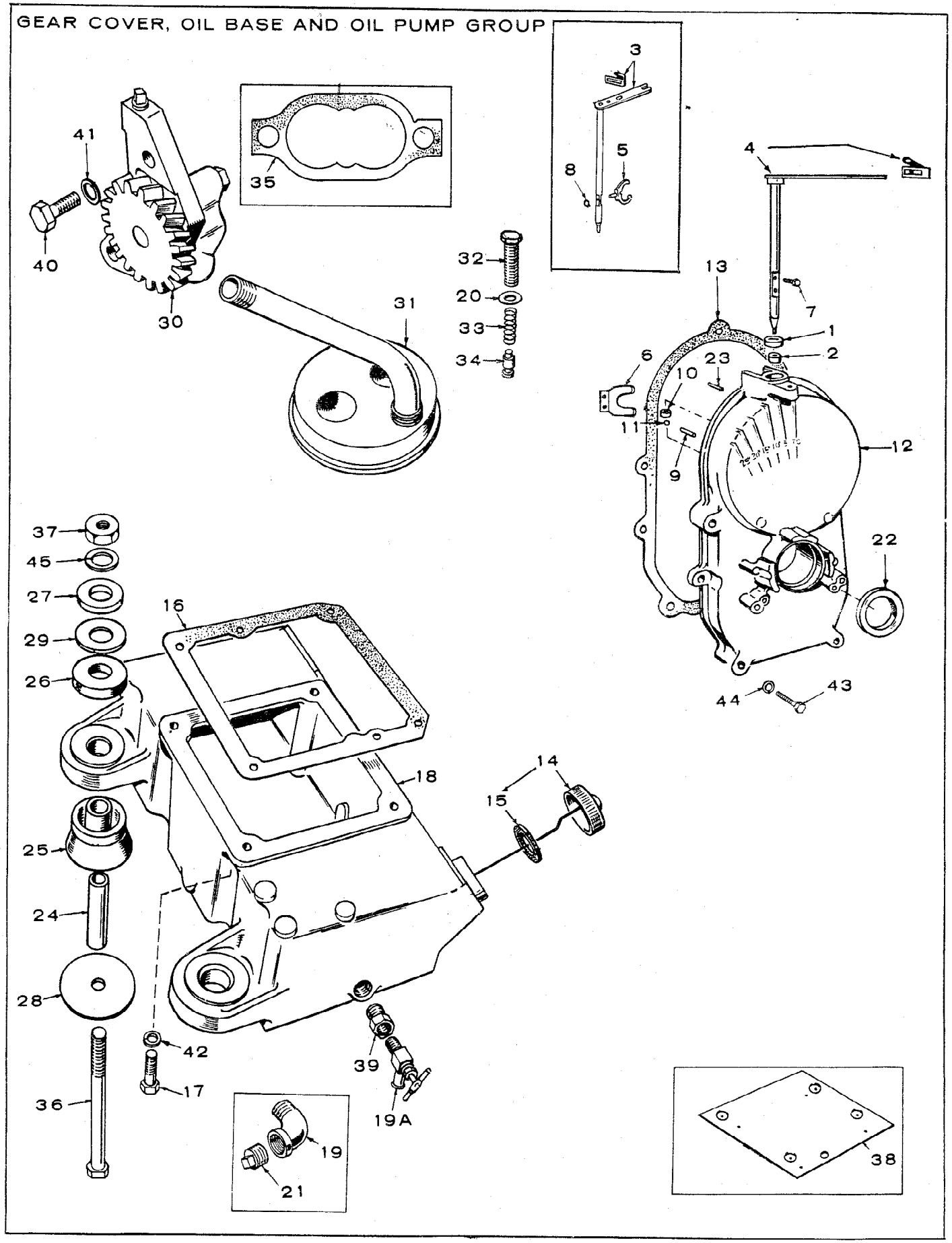
CYLINDER BLOCK GROUP

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	110A915	1	Block Assembly, Cylinder (Includes Parts Marked *)
2	123B293	1	Cap, Breather Tube (Rubber)
3	123A129	1	Tube, Breather (Includes Steel Baffles)
4	110A666	2	Cover, Valve Compartment
5	110A667	2	Gasket, Valve Cover
6	517-48	1	*Plug, Camshaft Expansion
7	520A114	5	*Stud, Rear Bearing Plate Mounting - Spec A thru Q
8	502A20	1	Elbow, Street - Oil Line
9	110A892	2	Gasket, Cylinder Head
10	110D890	1	Head, Cylinder, Right, #2 Cylinder
11	110D891	1	Head, Cylinder, Left, #1 Cylinder
12	*BEARING, CRANKSHAFT – FRONT OR REAR		
	101K420	2	Standard
	101K420-02	2	.002 " Undersize
	101K420-10	2	.010 " Undersize
	101K420-20	2	.020 " Undersize
	101K420-30	2	.030 " Undersize
13	104A575	2	*Washer, Crankshaft Bearing Thrust
14	101K115	1	*Gasket Kit, Bearing Plate
15	101C316	1	*Plate, Bearing (Excludes Bearing)
16	101A367	2	*Bearing, Camshaft Front or Rear (Precision)
17	509A41	1	Seal, Bearing Plate
18	516A72	4	*Pin, Main Bearing Stop
19	110A445	5	*Nut, Bearing Plate Stud - Spec A thru Q
20	123A104	1	Valve, Breather Tube
21	526-63	2	Washer (Copper), Valve Compartment
22	850-45	5	*Washer, Lock (5/16 x Special Width) - Rear Bearing Plate

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
23	120A386	1	*Tube, Crankcase Oil
24	110B881	2	Valve, Intake (Steel)
25	110B880	2	Valve, Exhaust (Stellite)
26	*INSERT, EXHAUST VALVE SEAT (STELLITE)		
	110A872	2	Standard
	110A872-02	2	.002 " Oversize
	110A872-05	2	.005 " Oversize
	110A872-10	2	.010 " Oversize
	110A872-25	2	.025 " Oversize
27	110A902	4	*Guide, Valve
28	110A539	4	Spring, Valve
29	110A893	2	Washer, Valve Spring Retainer - Intake - Prior to Serial # 355651, During Spec R
30	110A639	8	Lock, Valve & Spring Retainer
31	TAPPET, VALVE		
	115A6	4	Standard
	115A6-05	4	.005 " Oversize
32	ROTOCAP		
	110A904	2	Exhaust Valve
	110A904	2	Intake Valve - Begin Serial #355651, During Spec R
33	SCREW, HEX HEAD CAP (HARDENED)		
	110A879	8	Cylinder Head (5/16-18 x 1-1/4 ")
	114A22	10	Cylinder Head (5/16-18 x 1-3/4 ")
34	526-208	18	Washer, Flat - Cylinder Head Screws
35	800P512	5	Screw, Hex Cap - Rear Bearing Plate Mounting - Begin Spec R
36	800-12	2	Screw (1/4-20 x 2-1/4 ") - Valve Compartment Cover

* - Included in #110A915 Block Assembly.

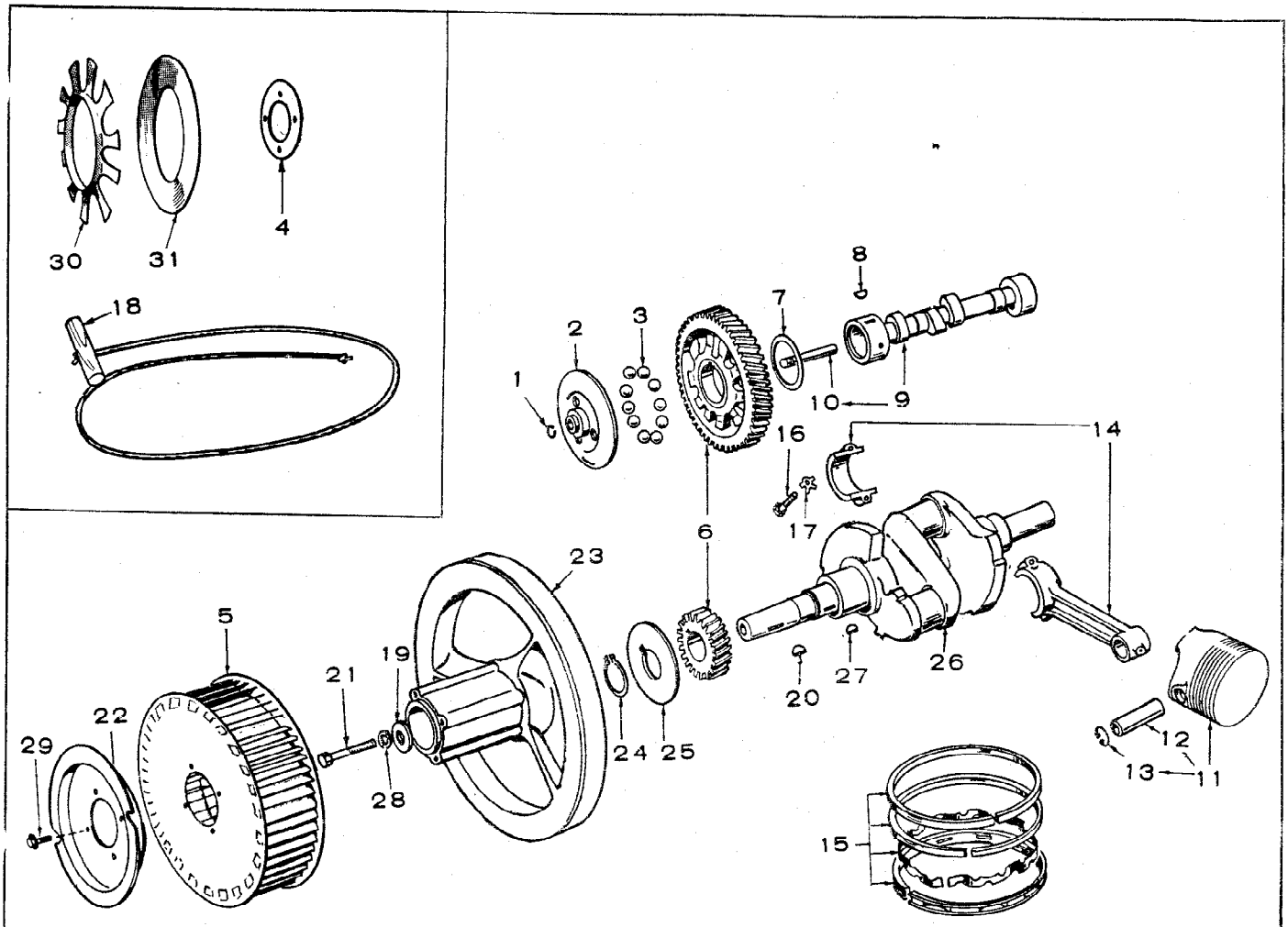
GEAR COVER, OIL BASE AND OIL PUMP GROUP



REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	509P8	1	*Seal, Oil - Governor Shaft
2	510P13	1	*Bearing, Governor Shaft Upper
	*SHAFT & ARM ASSEMBLY, GOVERNOR (INCLUDES ADJUSTABLE CLIP)		
3	150-710	1	Spec A thru M
4	150A1286	1	Begin Spec N
	*YOKE, GOVERNOR SHAFT		
5	150A620	1	Spec A thru M
6	150B1187	1	Begin Spec N
7	815-46	2	*Screw (#8-32) - Governor Yoke Mounting - Begin Spec N
8	518-129	1	*Ring, Yoke Retainer "E" - Spec A thru M
9	516-130	1	*Pin, Governor Cup Stop (In Gear Cover)
10	510A8	1	*Bearing, Governor Shaft, Lower
11	510P14	1	*Ball, Bearing, Governor Shaft
12	COVER ASSEMBLY, GEAR (INCLUDES PARTS MARKED *)		
	103-207	1	Spec A thru M
	103A357	1	Begin Spec N
13	103B11	1	Gasket, Gear Cover
14	123A489	1	Indicator, Oil Fill
15	123A191	1	Gasket, Oil Fill Cap
16	102B158	1	Gasket, Oil Base Mounting
17	102A455	4	Screw, Cap, Oil Base to Block
18	102A579	1	Base, Oil
19	505-50	1	Elbow, Street - Oil Drain - Prior to Serial #355651, During Spec R
19A	504-92	1	Valve, Oil Drain - Begin Serial #355651, During Spec R
20	526-66	1	Washer, Oil Pressure Relief Valve Adjusting Screw
21	505-56	1	Plug, Oil Drain (1/2) - Prior to Serial #355651, During Spec R
22	509A40	1	*Seal, Gear Cover
23	516A11	2	Pin, Gear Cover (5/16 x 1/8 ")
24	402A290	4	+Bushing, Spacer - Vibration Mount

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
25	CUSHION, VIBRATION		
	402B283	2	Engine End
	402B284	2	Generator End - Prior to Serial #355651, During Spec R
	402B283	2	Generator End - Begin Serial #355651, During Spec R
26	402A282	4	+Snubber, Shock Mounting
27	526-14	4	+Washer (29/64 "I.D. x 1-1/2 "O.D. x 1/8 ")
28	526A195	4	+Washer (29/64 "I.D. x 3-1/4 "O.D. x 1/8 ")
29	526A198	As Req.	+Washer (5/8 "I.D. x 1-1/2 " O.D. x 1/16 ")
30	120A491	1	Pump, Oil, Complete (Internal Parts Not Sold Separately)
31	120B400	1	Cup, Oil Pump Intake (includes Pipe, Cup & Screen)
32	801-48	1	Screw, Hex Cap, By-Pass (Replaces Stud)
33	120A140	1	Spring, By-Pass Valve
34	120A398	1	Valve, By-Pass
35	120K161	1	Gasket Kit, Oil Pump
36	800-82	4	+Screw, Hex (7/16-14 x 3-3/4 ")
37	862-4	4	+Nut (7/16-14)
38	PLATE, MOUNTING - GENERATOR SET - OPTIONAL		
	403C933	1	Spec A thru Q
	403C986	1	Begin Spec R
39	505-19	1	Bushing, Oil Drain - Begin Serial #355651, During Spec R
40	800-7	2	Screw (1/4-20 x 1 ") - Oil Pump Mounting
41	850-40	2	Washer, Lock (1/4 ")
42	850-50	4	Washer, Lock (3/8 ")
43	SCREW, HEX HEAD		
	800P32	4	5/16-18 x 1-3/4 "
	800-34	1	5/16-18 x 2-1/4 "
44	850-45	5	Washer, Lock (5/16 ")
45	850-55	4	+Washer, Lock (7/16 ")
	402B364	1	Hardware Package, Mounting (Includes Parts Marked +)

* - Included in Gear Cover Assembly.
+ - Included in Mounting Hardware Package.



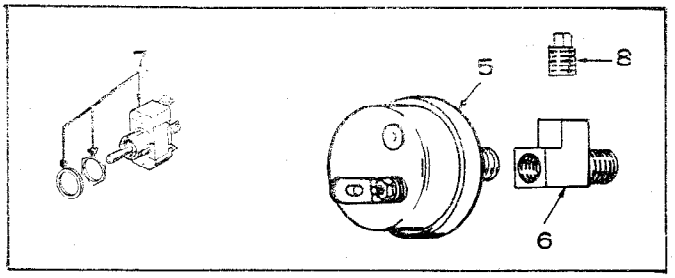
CRANKSHAFT, FLYWHEEL, CAMSHAFT AND PISTON GROUP

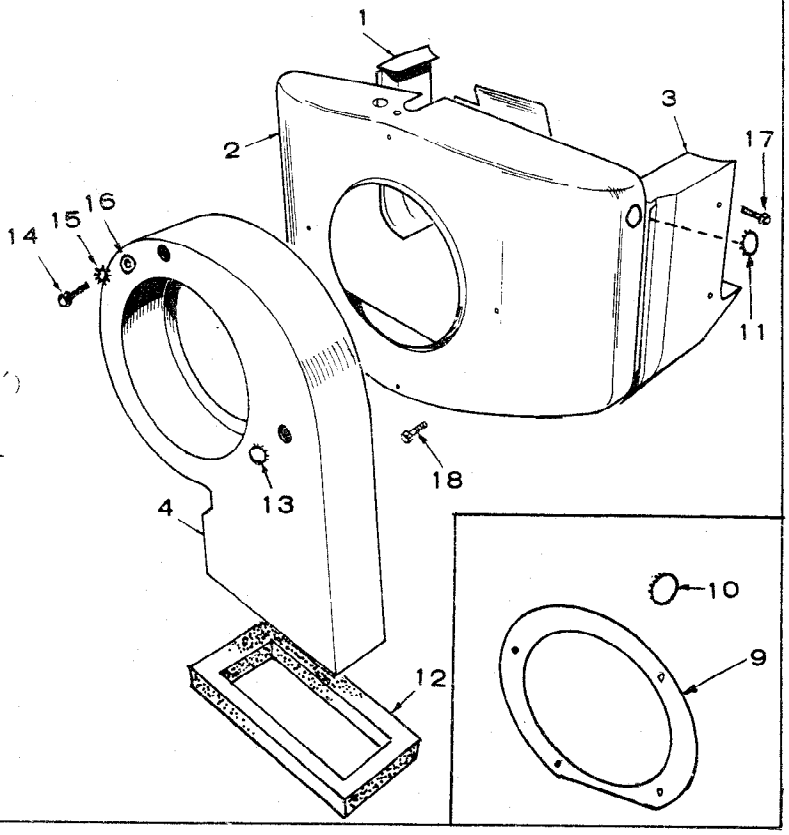
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	150A78	1	Ring, Camshaft Center Pin
2	150A612	1	Cup, Governor
3	510P15	10	Ball, Fly - Governor
4	134A911	1	Plate, Blower Wheel - Spec A thru M
5	134B565	1	Wheel, Blower
6	105-353	1	Gear Set, Timing (Includes Camshaft & Crankshaft Gears)
7	105A4	1	Washer, Camshaft Gear Thrust
8	515-1	1	Key, Camshaft Gear Mounting
9	105-140	1	Camshaft (Includes Center Pin)
10	150A75	1	Pin, Camshaft Center
11	PISTON & PIN (Includes Retainer Rings)		
	112A71	2	Standard
	112A71-05	2	.005 ″ Oversize
	112A71-10	2	.010 ″ Oversize
	112A71-20	2	.020 ″ Oversize
	112A71-30	2	.030 ″ Oversize
	112A71-40	2	.040 ″ Oversize
12	PIN, PISTON		
	112A69	2	Standard
	112A69-02	2	.002 ″ Oversize
13	112A3	4	Ring, Piston Pin Retainer
14	ROD, CONNECTING		
	114C98	2	Standard
	114C98-10	2	.010 ″ Undersize
	114C98-20	2	.020 ″ Undersize
	114C98-30	2	.030 ″ Undersize

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
15	RING SET, PISTON		
	113A152	2	Standard
	113A152-05	2	.005 ″ Oversize
	113A152-10	2	.010 ″ Oversize
	113A152-20	2	.020 ″ Oversize
	113A152-30	2	.030 ″ Oversize
	113A152-40	2	.040 ″ Oversize
16	110A284	4	Screw, Connecting Rod Cap
17	114A59	4	Washer, Connecting Rod Cap Screw Lock
18	192A83	1	Rope, Manual Starting
19	526A17	1	Washer, Wheel Mounting
20	515-2	1	Key, Wheel Mounting
21	104A170	1	Screw, Wheel Mounting
22	192B272	1	Sheave, Rope
23	104D499	1	Flywheel
24	518-14	1	Lock, Crankshaft Gear Washer
25	104A43	1	Washer, Crankshaft Gear Retainer
26	104D578	1	Crankshaft
27	515-1	1	Key, Crankshaft Gear Mounting
28	850-55	1	Washer, Lock (7/16 ″)
29	821-18	4	Screw (1/4-20 x 5/8 ″) - Blower Wheel & Rope Sheave Mounting
30	150B1257	1	Spacer, Governor Fly Ball - Begin Serial #370369
31	150A77	1	Plate, Governor Fly Ball - Begin Serial #370369

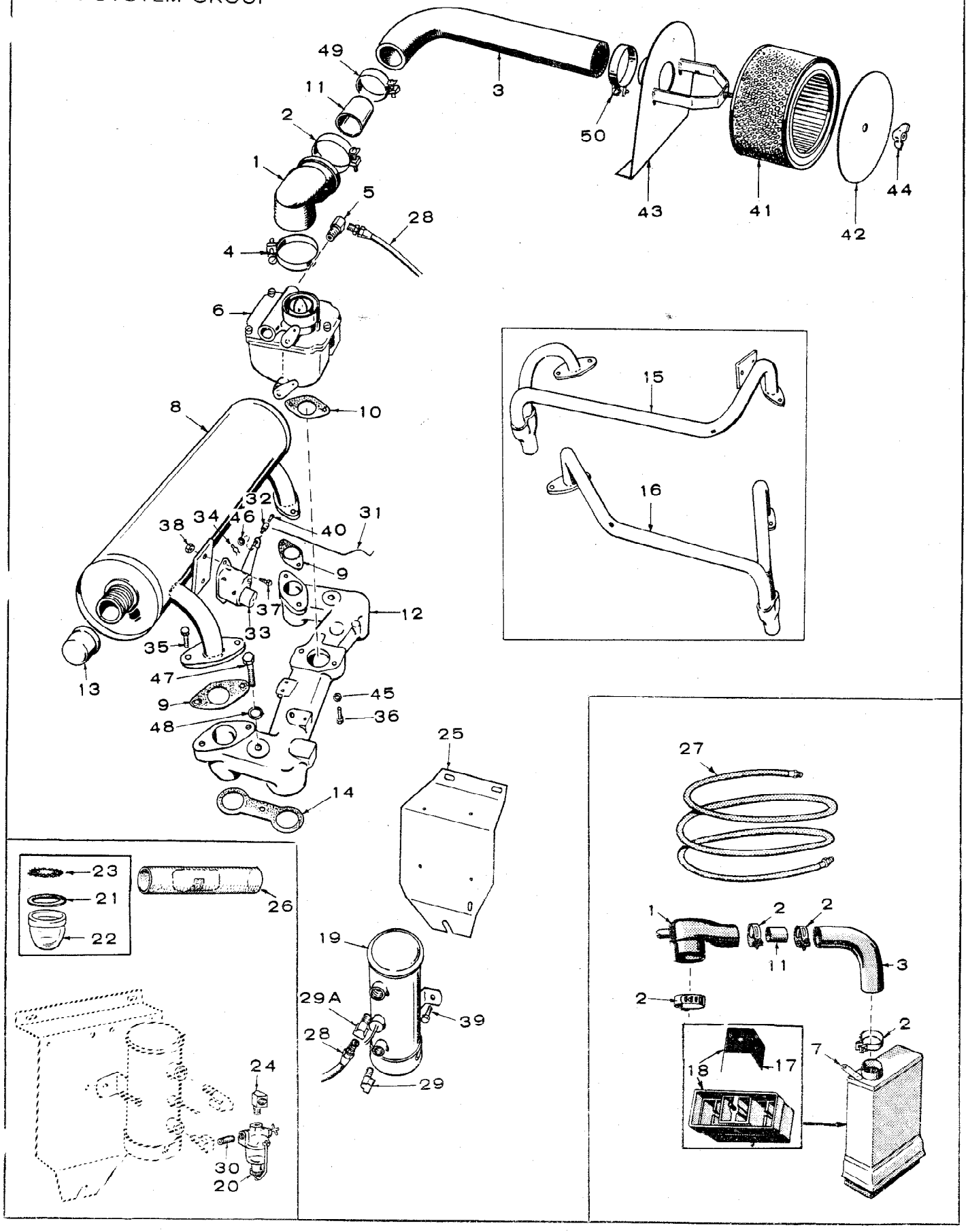
AIR HOUSING GROUP

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	134D589	1	Housing, Cylinder Air, Left (#1 Cylinder)
2	HOUSING, BLOWER		
	134D1572	1	Spec A thru M
	134C2102	1	Begin Spec N
3	134C1591	1	Housing, Cylinder Air, Right (#2 Cylinder)
4	SCROLL, AIR		
	134D768	1	Spec A thru M
	134D564	1	Spec N Only
	134B2111	1	Begin Spec P
5	SWITCH, LOW OIL PRESSURE		
	309-10	1	Prior to Serial #355651, During Spec R
	309P237	1	Begin Serial #355651, During Spec R
6	502-58	1	Tee, Oil Line
7	308-97	1	Switch, Stop
8	505-57	1	Plug, Oil Tee
9	134B761	1	Spacer, Scroll Mounting - Closed Type - Spec A thru M
10	517-9	1	Plug, Dot Button (2 ″) - Spec A thru M
11	517-35	1	Plug, Dot Button (1-1/16 ″)
12	134B2112	1	Seal, Blower Scroll - Begin Spec P
13	517-21	2	Plug, Dot Button (7/8 ″) - Air Scroll
14	800-2	4	Screw (1/4-20 x 3/8 ″) - Scroll Mounting
15	853-13	4	Washer, Shakeproof (1/4)
16	526-15	4	Washer, Flat (1/4)
17	815-261	4	Screw (1/4-20 x 1/2 ″) - Air Housing Mounting
18	SCREW, BLOWER HOUSING MOUNTING		
	821-10	2	1/4-20 x 1/2 ″
	815-261	1	1/4-20 x 7/16 ″





FUEL SYSTEM GROUP

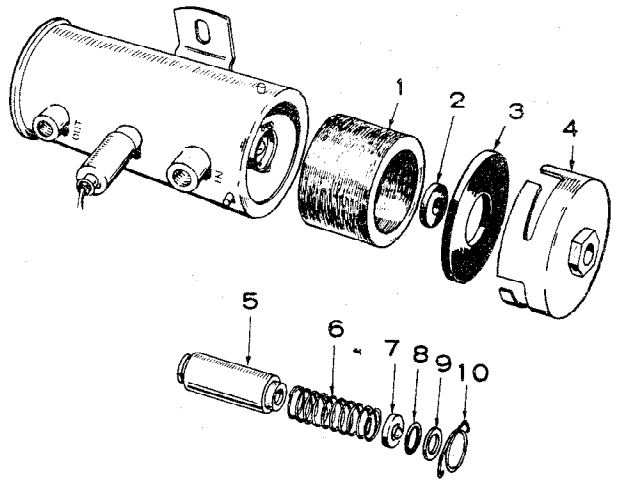


REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	INLET, CARBURETOR AIR		
	140B693	1	Spec A thru Q
	145A94	1	Begin Spec R
2	503-280	1	Clamp, Air Cleaner Hose (4 Used Spec A thru Q)
3	HOSE (ELBOW), AIR CLEANER		
	503A480	1	Spec A thru Q
	503B643	1	Begin Spec R
4	503-107	1	Clamp, Air Inlet to Carburetor - Begin Spec R
5	ELBOW (INVERTED MALE), CARBURETOR		
	502-2	1	Prior to Serial #355651, During Spec R
	502-65	1	Begin Serial #355651, During Spec R
6	*CARBURETOR, GASOLINE		
	142A363	1	Sisson Choke - Standard
	142A364	1	Electric Choke - Optional
	142A483	1	Thermo-Magnetic Choke - Optional
7	140C692	1	Cleaner, Air - Spec A thru Q
8	155B714	1	Muffler, Exhaust
9	154A360	2	Gasket, Exhaust Manifold Mounting
10	141A78	1	Gasket, Carburetor Mounting
11	140A211	1	Sleeve, Air Cleaner Hose
12	154B383	1	Manifold, Intake
13	505-479	1	Cap, Pipe - Muffler
14	154A13	2	Gasket, Intake Manifold
15	154C1522	1	Manifold, Exhaust (L.H. Down)-Optional
16	154C1523	1	Manifold, Exhaust (R.H. Down) - Optional
17	140A68	1	Screen, Air Cleaner - Spec A thru Q
18	140K403	1	Cup Assembly, Air Cleaner, Includes Screen - Spec A thru Q
19	149P650	1	*Pump, Fuel (Electric)
20	149B79	1	Filter, Fuel - Spec A thru Q
21	149-149	1	Gasket, Fuel Filter Bowl - Spec A thru Q
22	149-150	1	Bowl, Fuel Filter - Spec A thru Q
23	149-202	1	Screen, Fuel Filter - Spec A thru Q
24	502-2	1	Elbow, Inverted Male - Filter - Spec A thru Q

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
25	BRACKET, FUEL PUMP MOUNTING		
	160B763	1	Spec A thru M
	160B1109	1	Spec N thru Q
26	332-556	1	Connector, Fuel Pump Lead
27	501B5	1	Line, Fuel, Flexible (18-1/2 ″)
28	LINE, FUEL - PUMP TO CARBURETOR		
	501-7	1	Spec A thru M
	501A197	1	Begin Spec N
29	502-20	1	Elbow, Street, Fuel Pump Inlet
29A	ELBOW, STREET, FUEL PUMP OUTLET		
	502-20	1	Spec A thru M
	502-2	1	Begin Spec N
30	502P82	1	Nipple (1/8 x 3/4 ″) - Filter to Pump - Spec A thru Q
31	153A361	1	Linkage, Choke
32	152A155	1	Swivel, Choke Linkage
33	153A223	1	Choke, Sisson
34	516-59	1	Clip, Cotter - Choke
35	821-16	4	Screw (5/16-18 x 3/4 ″) - Muffler Mounting
36	800-9	2	Screw (1/4-20 x 1-1/2 ″) - Carburetor Mounting
37	815-315	2	Screw (1/4-20 x 1/2 ″) - Choke Mounting
38	860-13	2	Nut, Hex (1/4-20) - Choke Mounting - Early Models
39	821-9	2	Screw (1/4-20 x 1/2 ″) - Fuel Pump Mounting
40	815-104	1	Screw, Set (8-32 x 5/16 ″)
41	140B495	1	Cartridge, Air Cleaner - Begin Spec R
42	140A1153	1	Cover, Air Cleaner - Begin Spec R
43	140B1173	1	Bracket, Air Cleaner - Begin Spec R
44	518-56	1	Screw, Wing - Air Cleaner - Begin Spec R
45	850-40	2	Washer, Lock (1/4 ″)
46	526-6	1	Washer, Flat (#12)
47	800-54	2	Screw (3/8-16 x 2 ″) - Intake Manifold Mounting
48	850-50	2	Washer, Lock (3/8 ″)
49	503-4	1	Clamp, Hose (1-7/8 ″) - Begin Spec R
50	503-311	1	Clamp, Hose (2-1/8 ″) - Begin Spec R

* - See separate group for components and service kits.

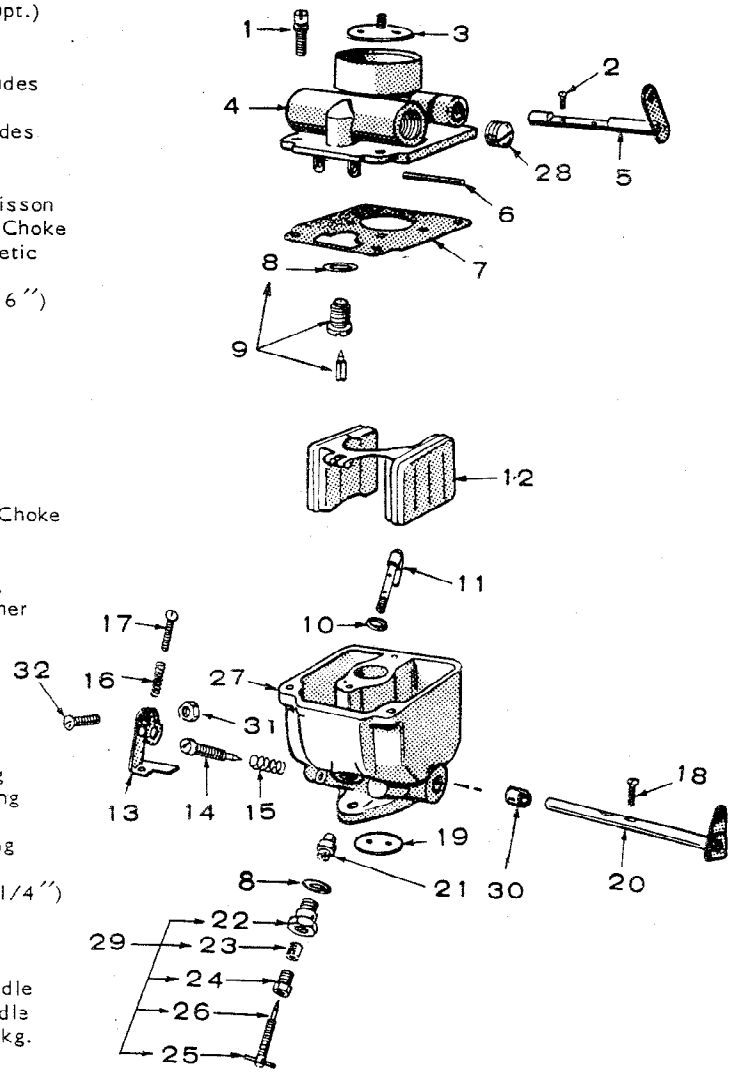
ELECTRIC FUEL PUMP GROUP



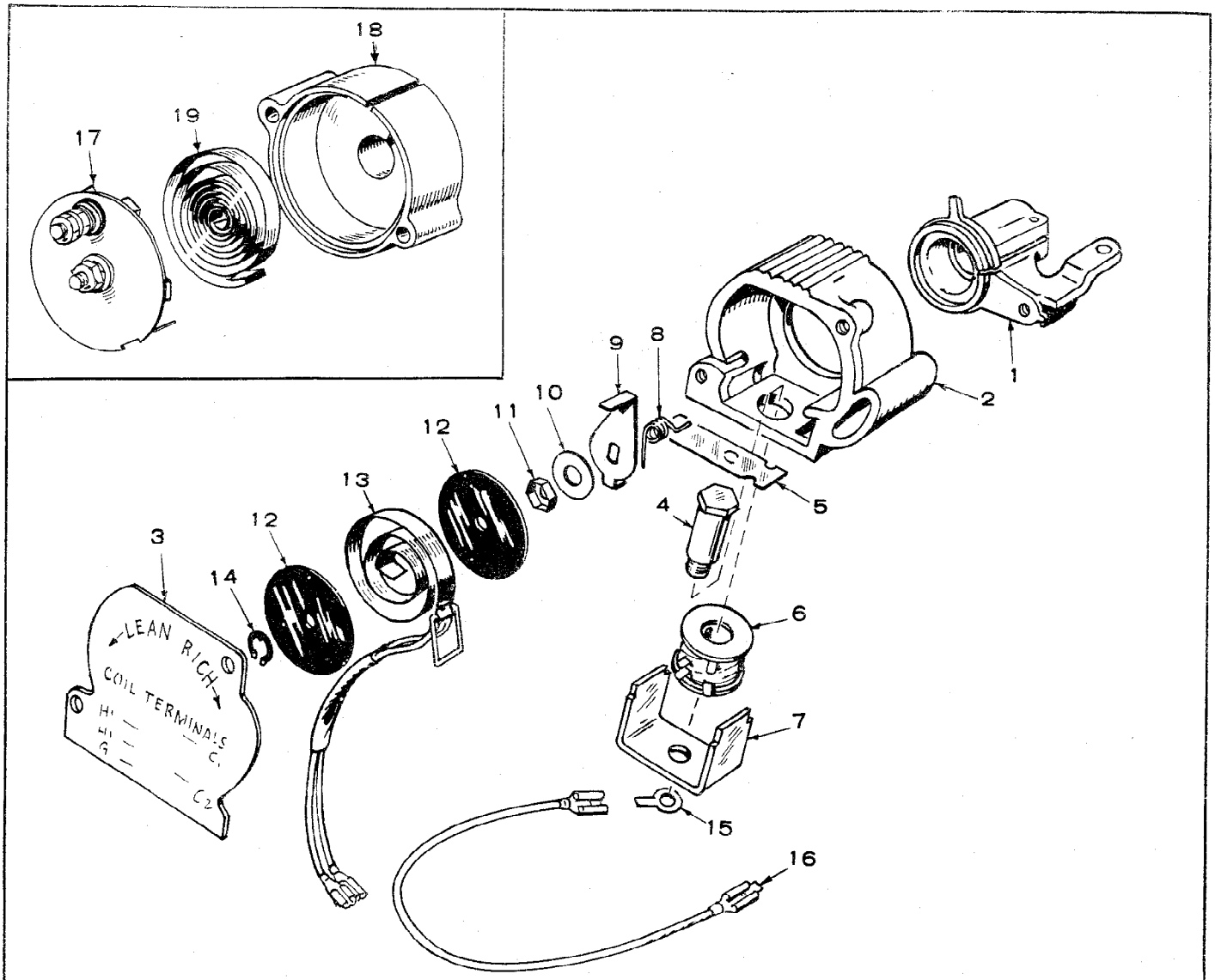
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
	149P650	1	Pump, Fuel (Complete)
1	149-1445	1	Filter
2	149-1447	1	Magnet
3	149-1446	1	Gasket, Cover
4	149-1453	1	Cover
5	149-1452	1	Plunger
6	149P767	1	Spring, Plunger Return
7	149-1451	1	Spring Cup & Valve
8	149-1450	1	Gasket, Spring Cup
9	149-1449	1	Washer, Cup Gasket
10	149-1448	1	Retainer, Cup & Plunger

CARBURETOR PARTS GROUP

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
	CARBURETOR, GASOLINE		
	142A363	1	Units with Sisson Choke (Std.)
	142A364	1	Units with Electric Choke (Opt.)
	142A483	1	Units with Thermo-Magnetic Choke (Opt.)
	142-33	1	**Gasket Kit, Carburetor (Includes Parts Marked *)
	142K371	1	Repair Kit, Carburetor (Includes Parts Marked **)
1	SCREW, BOWL COVER		
	815-103	1	#10-24 x 1/2" - Units with Sisson Choke or Thermo-Magnetic Choke
	815-109	2	#10-24 x 5/8" (Thermo-Magnetic Choke Units use Q.ty. of 3)
2	815-91	2	**Screw, Choke Fly (4-40 x 3/16")
3	FLY, CHOKE		
	142-55	1	Units with Sisson Choke
	142-37	1	Units with Electric Choke or Thermo-Magnetic Choke
4	142-205	1	Sleeve Assy., Choke (Cover)
5	SHAFT ASSEMBLY, CHOKE		
	142-217	1	Units with Sisson Choke
	142-183	1	Units with Electric Choke
	142A468	1	Units with Thermo-Magnetic Choke
6	142-39	1	**Shaft, Float
7	142-31	1	*Gasket, Body to Bowl
8	148A17	2	*Gasket, (1) Float Valve Seat, (1) Main Adj. Needle Retainer
9	142-49	1	**Valve & Seat Assembly
10	142-32	1	*Gasket, Nozzle
11	142-285	1	Nozzle Assembly
12	142-361	1	Float & Lever Assembly
13	145A8	1	Lever, Throttle Stop
14	142-40	1	**Needle, Idle Adjusting
15	142-282	1	Spring, Idle Needle Adjusting
16	142A35	1	Spring, Throttle Stop Adjusting Screw
17	812-63	1	Screw, Throttle Stop Adjusting (#6-32 x 1/2")
18	815-72	2	**Screw, Throttle Fly (#4-40 x 1/4")
19	142-369	1	Fly, Throttle
20	142-368	1	**Shaft Assembly, Throttle
21	142-370	1	Nut & Jet, Nozzle
22	142-46	1	Retainer, Main Adjusting Needle
23	142-206	1	*Packing, Main Adjusting Needle
24	142-45	1	Retainer, Main Adj. Needle Pkg.
25	516A27	1	Pin, Main Adjusting Needle
26	142A41	1	**Needle, Main Adjusting
27		1	Body Assy. (Not Sold Separately)
28	505-53	1	Plug, Gas Inlet
29	142-42	1	Needle Assy. (Includes Packing, Nut & Retainer)
30	142-343	2	Bushing, Throttle Shaft
31	870-53	1	Nut, Throttle Stop
32	813-102	1	Screw, Throttle Stop Clamp



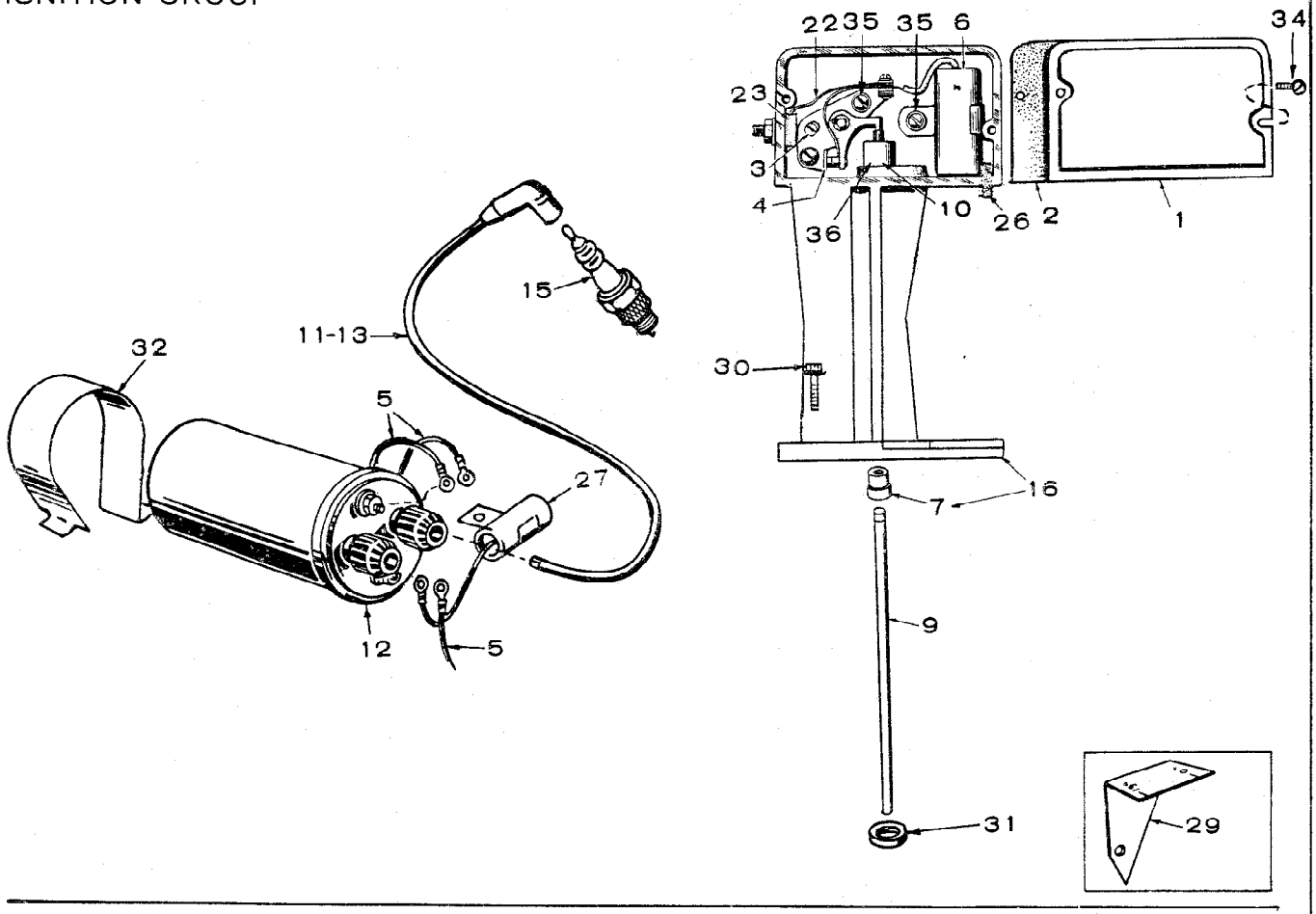
* Parts contained in Gasket Kit #142-33.
** Parts contained in Repair Kit #142K371.

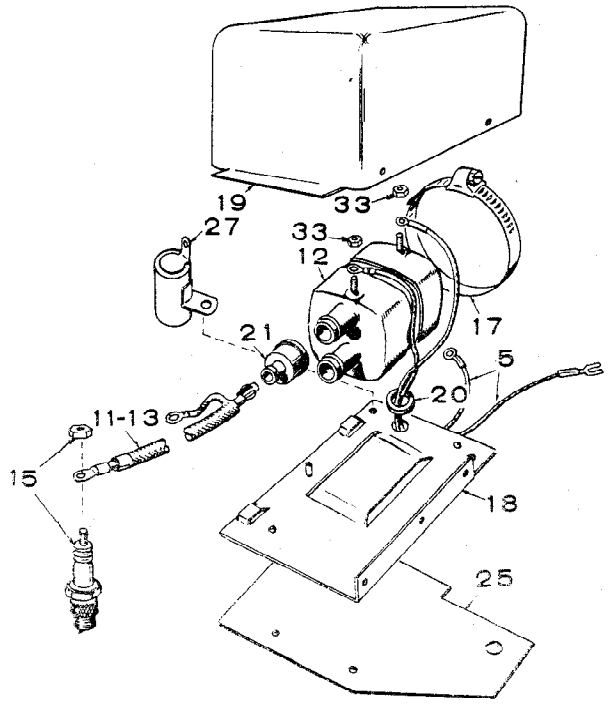


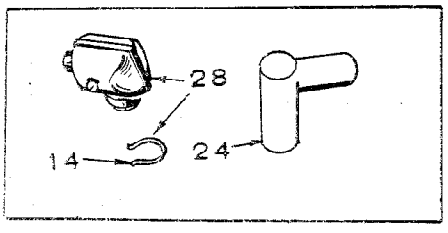
ELECTRIC CHOKE AND THERMO-MAGNETIC CHOKE GROUP

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	153B417	1	Adapter, Choke Mounting
2	153D386	1	Body
3	153C389	1	Cover
4	153B391	1	Core, Solenoid
5	153A395	1	Armature
6	307B801	1	Coil, Solenoid Assembly
7	153B392	1	Frame, Solenoid
8	153B418	1	Spring
9	153B390	1	Lever, Thermostat
10	526-18	1	Washer (17/64" I.D. x 5/8" O.D. x 1/16")
11	870-134	1	Palnut (1/4-20)
12	153A399	2	Insulator
13	153B400	1	Heater Assembly
14	518P129	1	Ring, Retaining
15	332A876	1	Terminal, Ground
16	LEAD, CHOKE		
	336A1741	1	Choke to Ground
	336A1549	1	Choke Solenoid Ground
17	153A114	1	Cover, Electric Choke
18	153A58	1	Bracket, Electric Choke
19	153A17	1	Element, Bi-Metal, Electric Choke

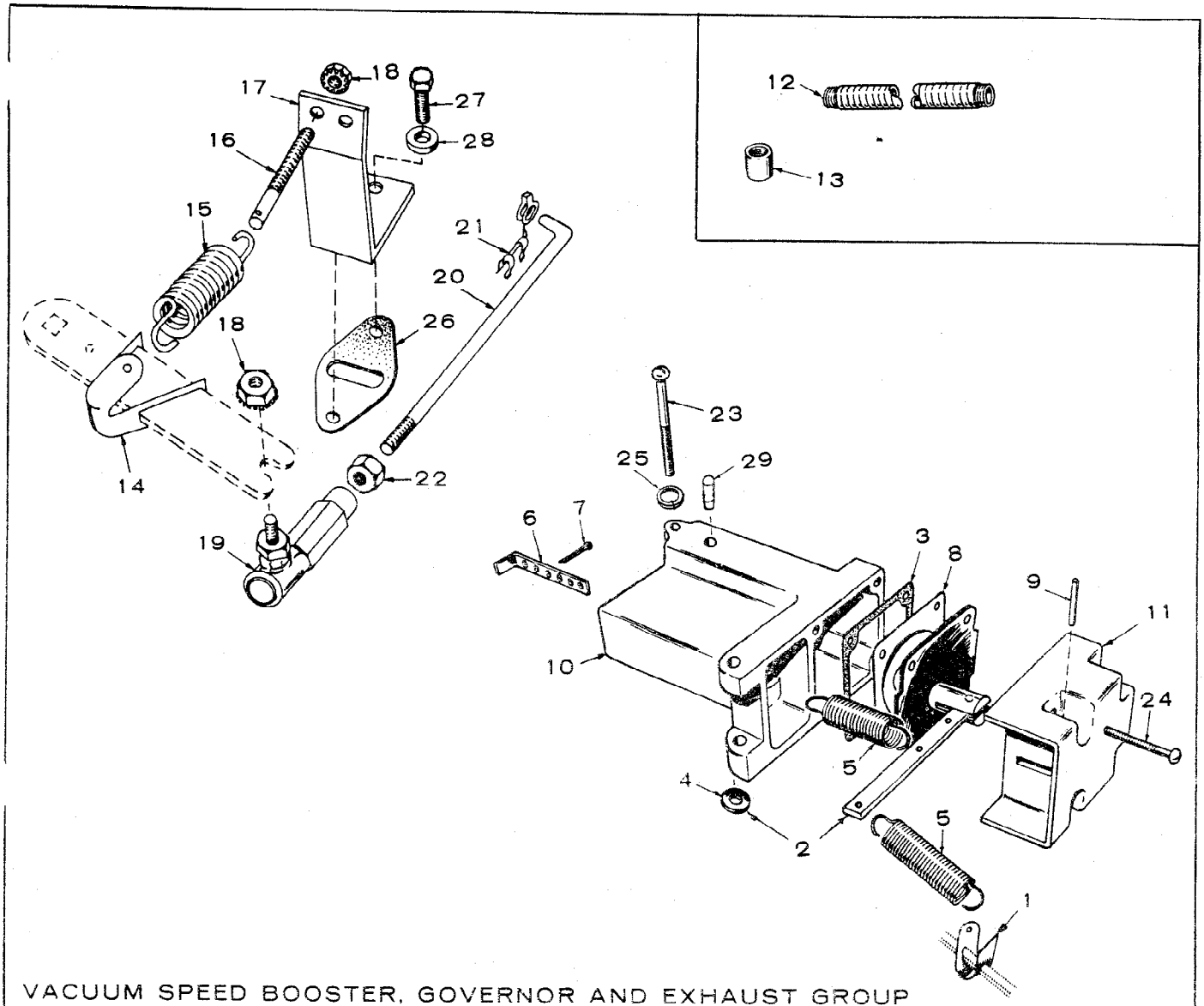
IGNITION GROUP







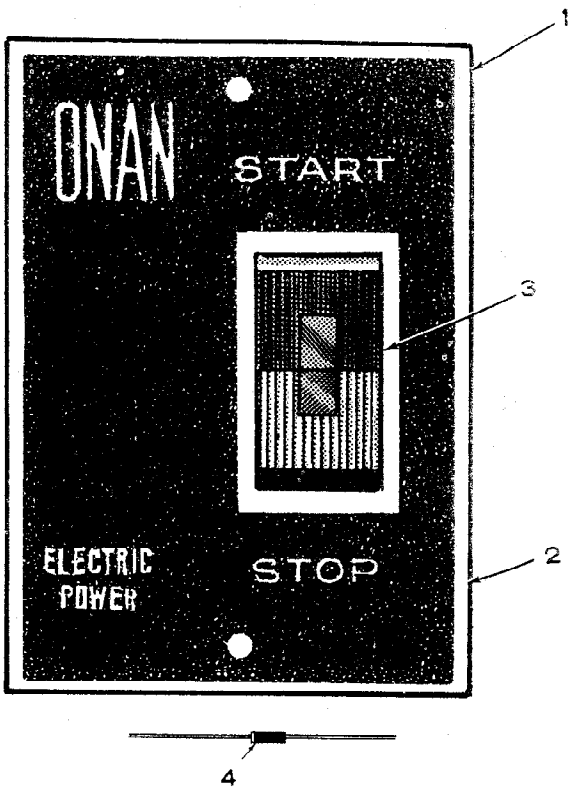
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	160A930	1	Cover, Breaker Box
2	160A150	1	Gasket, Breaker Box Cover
3	160A75	1	Pivot, Breaker Arm
4	160A2	1	Point Set, Breaker
5	334-28	1	Lead (4 ft. Piece of Bulk Wire)
6	312A69	1	Condenser, Breaker Box (.3 Mfd.)
7	BUSHING, BREAKER BOX		
	160A929	1	Spec A thru Q
	160A1041	1	Begin Spec R
8	160A43	1	Gasket, Breaker Box Mounting - Spec A thru Q
9	160A723	1	Plunger, Breaker
10	160A1143	1	Diaphragm, Plunger
11	CABLE, SPARK PLUG LEFT		
	167A1467	1	Spec A thru Q (13 ″)
	167A1520	1	Begin Spec R (7-1/2 ″)
12	COIL, IGNITION		
	166C346	1	Spec A thru Q
	166B535	1	Begin Spec R
13	CABLE, SPARK PLUG RIGHT		
	167A1468	1	Spec A thru Q (21-1/2 ″)
	167A1557	1	Begin Spec R (14-1/2 ″)
14	167A64	2	Clamp, Spark Plug Shield - Spec A thru Q
15	167-242	2	Plug, Spark
16	BOX ASSEMBLY, IGNITION BREAKER (COMPLETE)		
	160A963	1	Spec A thru Q
	160A1135	1	Begin Spec R
17	503P514	1	Clamp, Ignition Coil - Spec A thru Q
18	166B383	1	Bracket, Ignition Coil - Spec A thru Q
19	166C385	1	Cover, Ignition Coil - Spec A thru Q
20	508P114	1	Grommet, Ignition Coil Mounting Bracket - Spec A thru Q
21	160A558	2	Nipple, Ignition Coil Rubber - Spec A thru Q
22	160A428	1	Strap, Point Set to Breaker Box Terminal Block
23	160A349	1	Block & Terminal, Breaker Box
24	166P250	2	Cover, Spark Plug (Optional) - Spec A thru Q
25	166A466	1	Bracket, Coil Mounting Adapter - Spec A thru Q
26	160A261	1	Wick, Breaker Box
27	CONDENSER, IGNITION		
	312A162	1	Spec A thru Q
	312A27	1	Begin Spec R
28	167A67	2	Shield, Spark Plug (Includes Clamp & Shield) - Spec A thru Q
29	166B519	1	Bracket, Timing - Begin Spec N
30	815P357	2	Screw, and Shakeproof Washer Breaker Box Mounting
31	160A1040	1	Gasket, Breaker Box Mounting - Begin Spec R
32	166B588	1	Clamp, Coil - Begin Spec R
33	870-53	2	Nut, Hex (10-32)
34	812-77	2	Screw (8-32 x 3/8 ″) - Cover Mounting
35	815A285	3	Screw (8-32 x 5/16 ″) - (1) Condenser Mounting (2) Breaker Points Mounting
36	160A931	1	Guide, Plunger

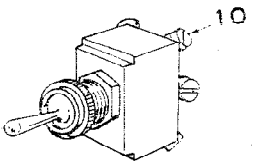


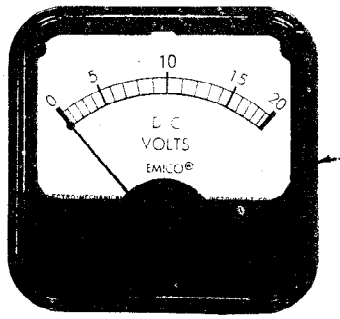
VACUUM SPEED BOOSTER, GOVERNOR AND EXHAUST GROUP

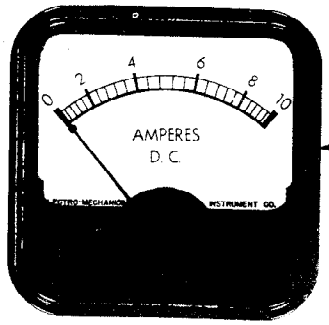
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
	150K433	1	Kit, Vacuum Speed Booster Replacement (Includes External Spring & Mounting Gasket)
1	150A430	1	Bracket, Spring to Governor Link
2	150K434	1	Kit, Diaphragm Replacement (Includes Gaskets)
3	150A668	1	Gasket, Diaphragm Plate
4	150A425	1	Gasket, Booster to Manifold
5	150A366	2	Spring, Internal & External
6	150A376	1	Bracket, Internal Spring Adjustment
7	516-39	1	Pin, Cotter (3/32 x 5/8 ″) - Adjustment Bracket
8	150A666	1	Plate, Diaphragm
9	516A85	1	Pin (3/32 x 3/4 ″) - Diaphragm Lever Pivot
10		1	Housing, Vacuum Booster (Not Sold Separately)
11		1	Cover, Vacuum Booster Housing (Not Sold Separately)
12	1558491	1	Tubing, Flexible Exhaust (36 ″)

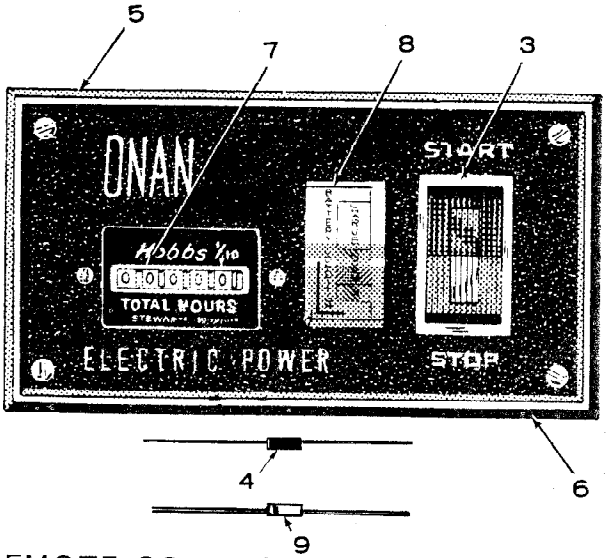
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
13	505-30	1	Coupling, Pipe (1 ″) - Exhaust
14	150A678	1	Clip, Governor Sensitivity Adjustment
15	150A98	1	Spring, Governor
16	150A96	1	Stud, Governor Speed Adjusting
17	150A159	1	Bracket, Governor Spring
18	870-131	2	Nut, Keps
19	150A639	1	Joint, Ball - Governor Link
20	150A629	1	Link, Governor Arm to Carburetor
21	518-6	1	Clip, Rod End
22	870-53	1	Nut, Hex (#10-32)
23	813-110	2	Screw (#10-32 x 2 ″) - Vacuum Booster Mounting
24	815-148	4	Screw (#8-32 x 7/8 ″) - Cover Mounting
25	853-8	2	Washer, Shakeproof (#10)
26	149A3	1	Gasket, Fuel Pump Hole Cover
27	800-4	2	Screw (1/4-20 x 5/8 ″) - Bracket Mounting
28	526-63	2	Washer (Cooper - 1/4 ″)
29	150A1352	1	Pin, Vent

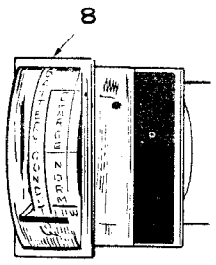










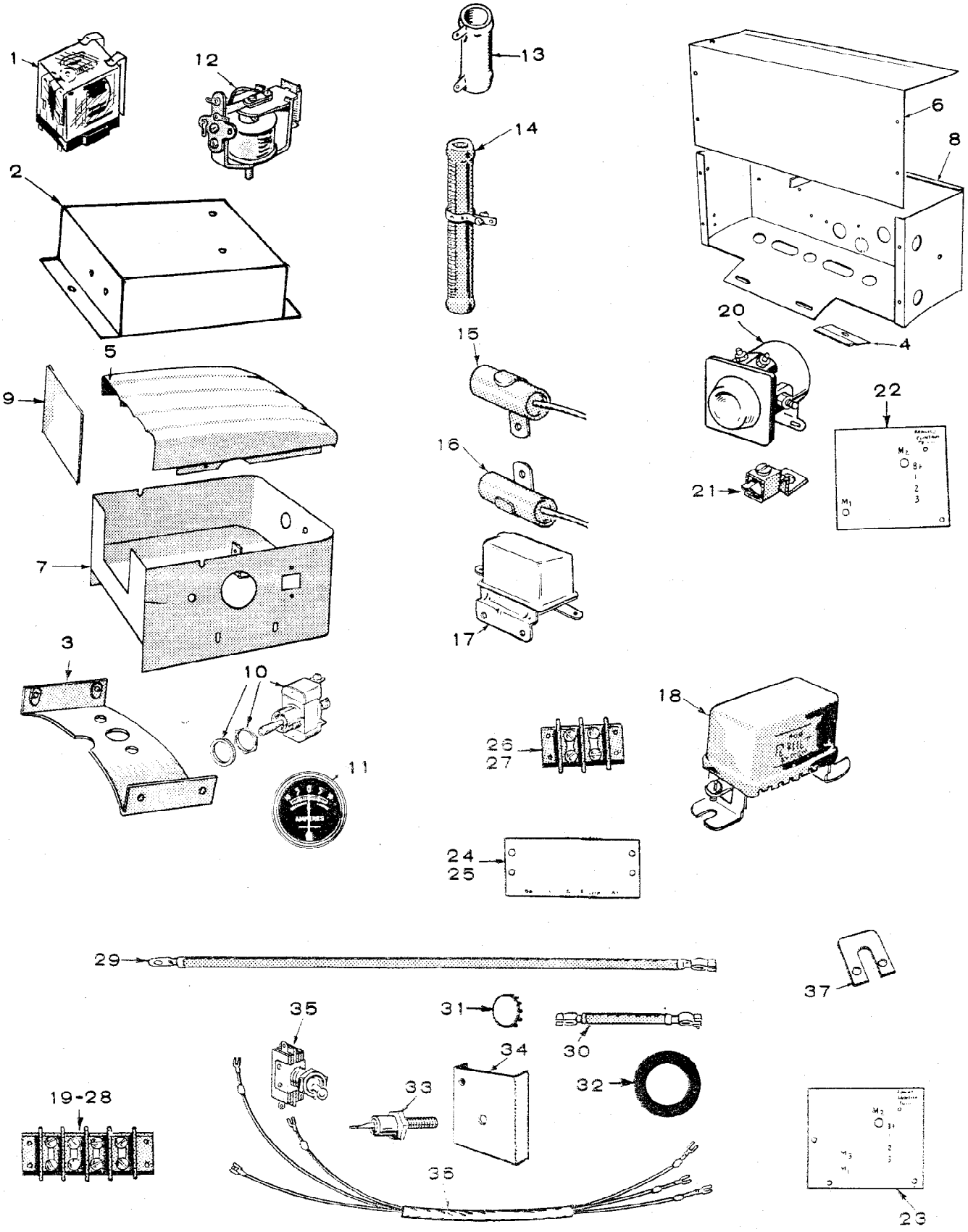


REMOTE CONTROL GROUP- BEGIN SPEC. R
OPTIONAL EQUIPMENT

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	300B942	1	Control Assembly, Remote (Includes Parts Marked +)
2	301B3566	1	+Panel, Control
3	308P330	1	*+Switch, Rocker
4	357-4	1	*+Rectifier
5	300B943	1	Control Assembly, Deluxe Remote (Includes Parts Marked *)
6	301B3606	1	*Panel, Control
7	302A885	1	*Meter, Running Time
8	302P888	1	*Meter, Battery Voltage
9	359B8	1	*Diode, Zener
10	308A329	1	Switch, Start-Stop (Momentary - DPDT)
11	302P562	1	Voltmeter, DC (0-20)
12	302P561	1	Ammeter, DC (0-10)

+ - Included in 300B942 Control Assembly.
* - Included in 300B943 Control Assembly.

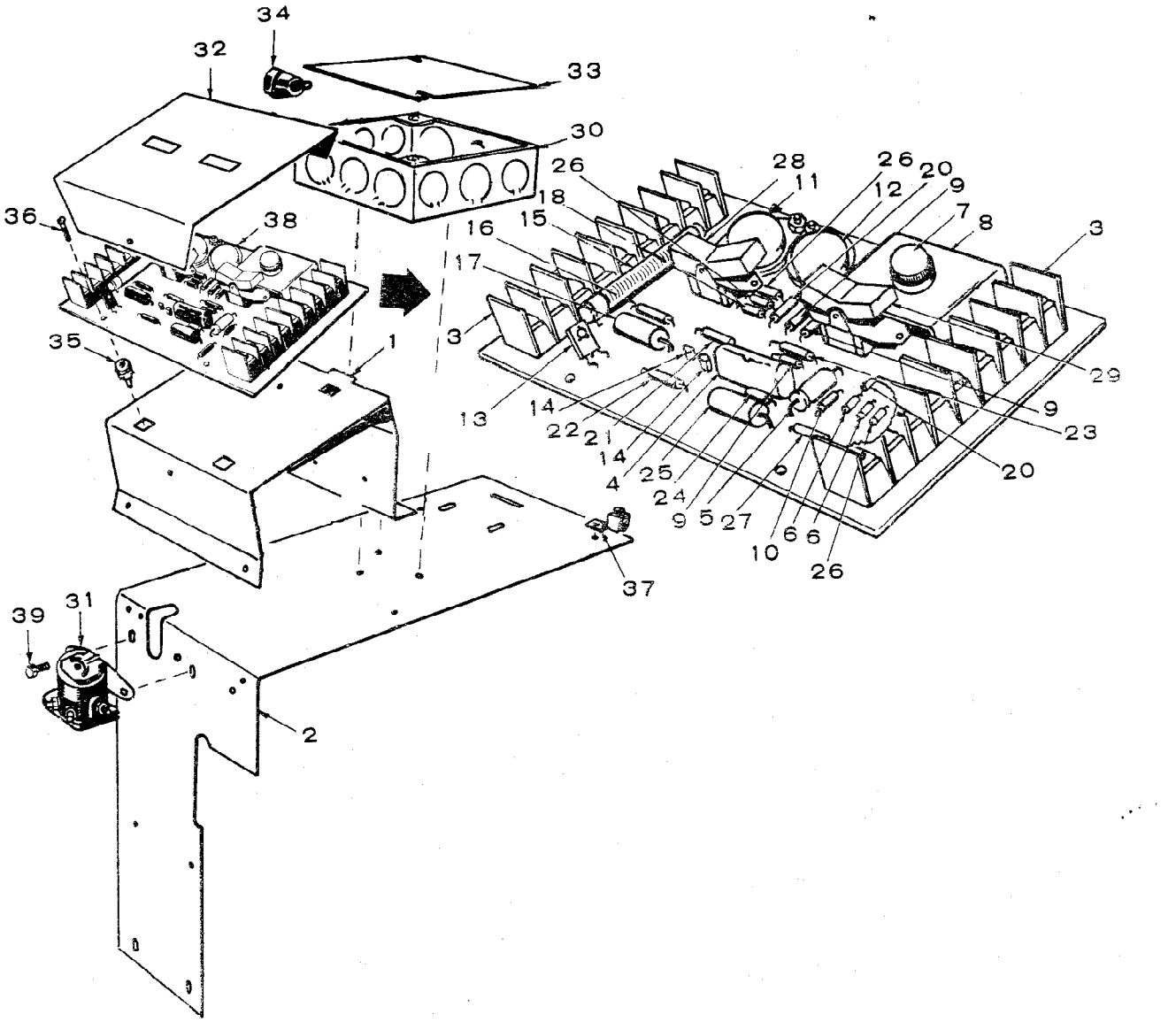
CONTROL GROUP - SPEC A THROUGH Q

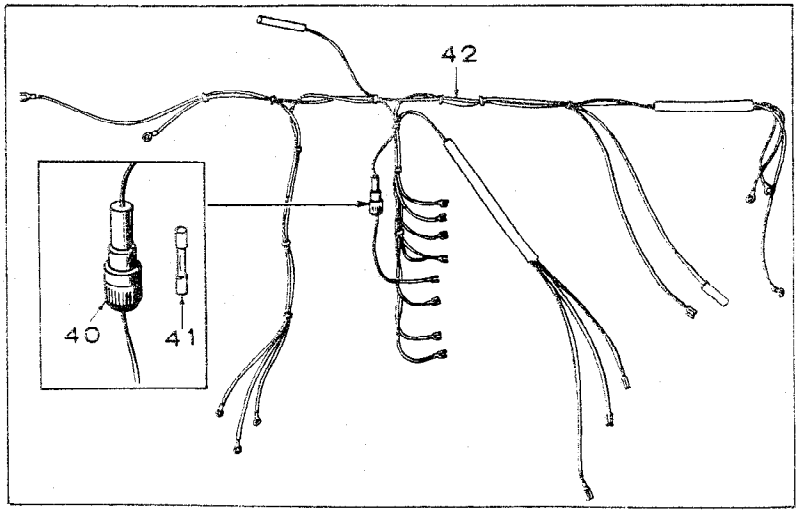


REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	307B642	1	Relay, Choke - Spec A thru M
2	301B2722	1	Relay & Terminal Block - Spec A thru M
	BRACKET, CONTROL MOUNTING		
3	301B1198	1	Spec A thru M
4	301B3227	1	Begin Spec N
	COVER, CONTROL BOX		
5	301C1244	1	Spec A thru M
6	301B3102	1	Begin Spec N
	BOX, CONTROL		
7	301B2723	1	Spec A thru M
8	301D3228	1	Begin Spec N
9	301B1271	1	Plate, Control Box End - Spec A thru M
10	308P154	1	Switch, Start-Stop
11	302A58	1	Ammeter, Charge - Spec A thru M
12	307B253	1	Relay, Stop
13	RESISTOR, FIXED		
	304A251	1	30-Ohm, 5 Watt
	304A344	1	1-Ohm, 24 Watt (3/4 x 2 ″)
	304A60	1	1.72-Ohm, 25 Watt (9/16 x 2 ″) - Ignition
14	304A175	1	Resistor, Adjustable (1-Ohm) - (3/4 x 4 ″)
15	CONDENSER (0.1 Mfd.), LOAD TERMINAL SUPPRESSION - SPEC A THRU M		
	312A58	1	120 Volt
	312A58	2	120/240 Volt (Non-Reconnectible)
	312A58	3	120/240 Volt (Reconnectible)
16	312A57	1	Condenser (1 Mfd.) Start Solenoid Suppression
17	REGULATOR, VOLTAGE (CHARGE CIRCUIT)		
	305A1	1	Spec A thru M
	305B383	1	Begin Spec N
18	307B180	1	Relay, Reverse Current - Spec A thru M

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
19	332A537	1	Block, Terminal - Remote Control
20	SOLENOID, START		
	307B1046	1	Spec A thru M
	307B845	1	Begin Spec N
21	332-142	As Req.	Terminal, Solderless
	STRIP, MARKER (LOAD TERMINAL) - SPEC A THRU M		
22	332A540	1	120 Volt
23	332A539	1	120/240 Volt (Non-Reconnectible)
24	332A435	1	120/240 Volt (Reconnectible)
25	STRIP, MARKER (REMOTE)		
	332A763	1	120/240 Volt (Reconnectible) - Spec A thru M
	332A566	1	All - Begin Spec N
26	332A609	1	Block, Terminal (2 Place) - Spec A thru M
27	332A231	1	Block, Terminal (Load) - 120/240 Volt (Non-Reconnectible) - Spec A thru M
28	332A254	1	Block, Terminal (Load) - 120/240 Volt (Reconnectible) - Spec A thru M
29	416A77	2	Cable, Battery (28 ″)
30	416A4	1	Cable, Battery Jumper
31	517-19	1	Plug, Dot Button (1/2 ″) - Spec A thru M
32	508-1	3	Grommet, Rubber - Begin Spec N
33	305B235	1	Rectifier - Begin Spec N
34	305A254	1	Sink, Heat (Rectifier Mounting Bracket) - Begin Spec N
35	308P2	1	Switch, Toggle (Manual-Electric Start) - Begin Spec N
36	338B526	1	Harness, Wiring - Begin Spec N
37	332A439	2	Jumper, Load Terminal Block - 120/240 Volt (Reconnectible) - Spec A thru M

CONTROL GROUP- BEGIN SPEC. R

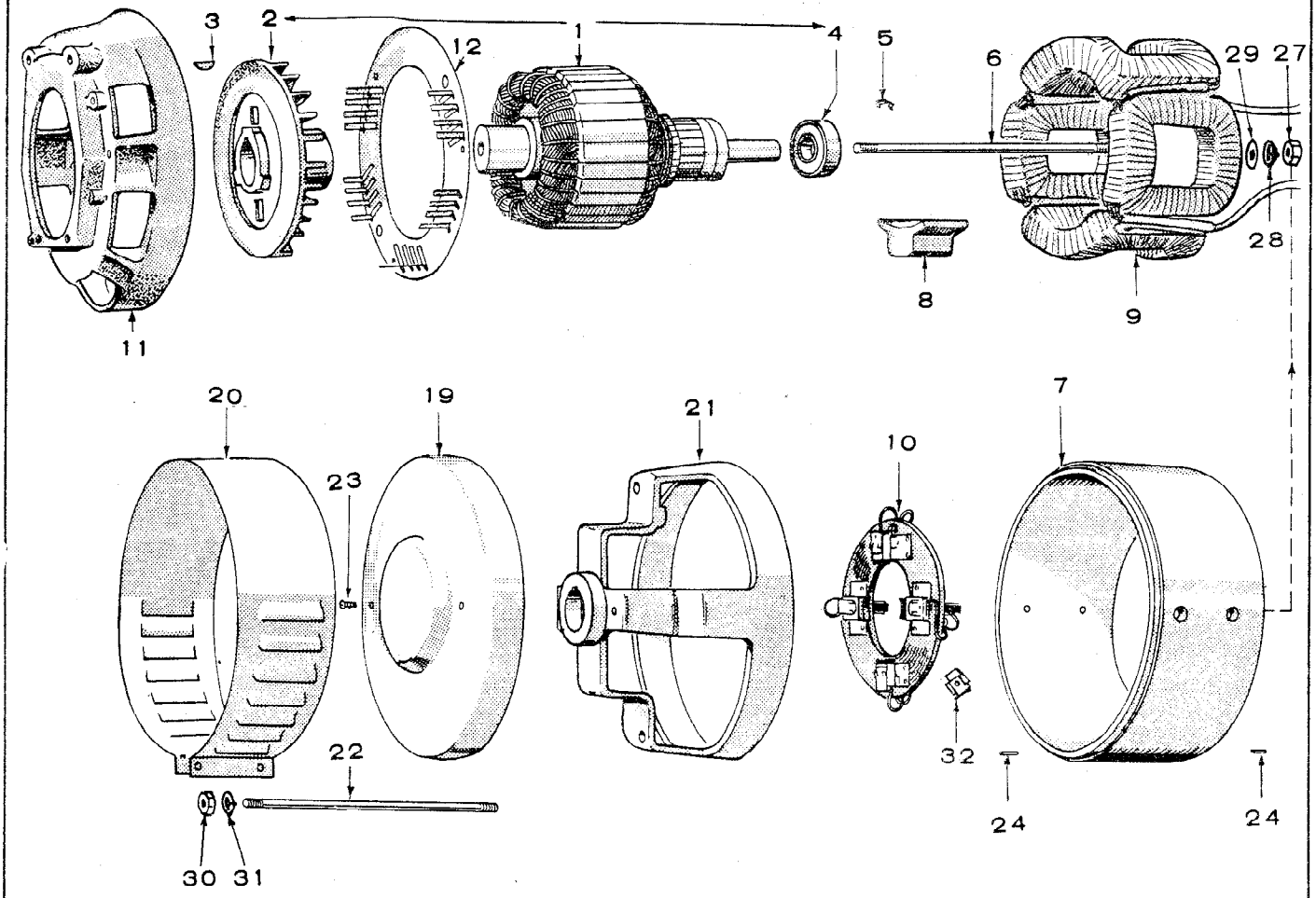


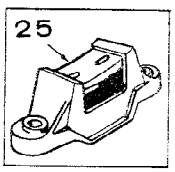


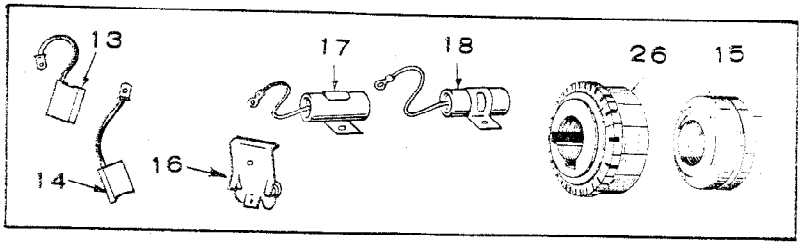
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	301C3481	1	Bracket, Control Mounting
2	301B3483	1	Bracket, Control Mounting
3	332A1450	2	*Block, Terminal
4	355P26	1	*Capacitor, .47 Mfd.
5	356A46	1	*Capacitor, 5 Mfd.
6	357B17	2	*Rectifier, Epoxy Case
7	358B26	1	*Rectifier, Silicon
8	363A63	1	*Sink, Heat
9	357A4	3	*Rectifier, Silicon
10	359A26	1	*Diode, Zener (18 Volt)
11	362A18	1	*Transistor, Power (2N3055)
12	362A33	1	*Transistor, Power (MJ2955)
13	362A28	1	*Transistor (2N4918)
14	362P11	2	*Transistor, Silicon (NPN)
15	353P43	1	*Resistor, Fixed (35-Ohm, 10 Watt)
16	350-437	1	*Resistor (120,000-Ohm, 1/2 Watt)
17	350-977	1	*Resistor (390-Ohm, 2 Watt)
18	350-427	1	*Resistor (47,000-Ohm, 1/2 Watt)
20	350-404	2	*Resistor (5,100-Ohm, 1/2 Watt)
21	350-315	1	*Resistor (1-Ohm, 1/2 Watt)
22	350-355	1	*Resistor (47-Ohm, 1/2 Watt)
23	350-379	1	*Resistor (470-Ohm, 1/2 Watt)
24	350-530	1	*Resistor (330-Ohm, 1/2 Watt)
25	350-983	1	*Resistor (680-Ohm, 2 Watt)
26	357B13	3	*Rectifier, Epoxy Case
27	350-673	1	*Resistor (270-Ohm, 1 Watt)
28	308A323	1	*Switch, Rocker (DPDT) - Electric - Hand
29	308A320	1	*Switch, Rocker (DPDT) - Start
30	330B28	1	Box, AC Outlet
31	307B1166	1	Solenoid, Start (Not Mounted in Control)
32	301B3484	1	Cover, Control
33	330-6	1	Cover, AC Outlet Box
34	508A179	1	Relief, Cable Strain - AC Outlet Box
35	870A263	4	Nut, Insulator
36	815-365	4	Screw, Self Tapping (8-32 x 3/4 ″)
37	332-142	1	Terminal, Solderless
38	300C859	1	Control Assembly, Complete (Includes Parts Marked *)
39	821-9	2	Screw (1/4-20 x 3/8 ″) - Solenoid Mounting
40	321P193	1	Holder Assembly, Fuse (Includes Fuse)
41	321P194	1	Fuse (9 Amp, 32 Volt)
42	HARNESS, WIRING (Includes Fuse Holder Assembly)		
	338D640	1	Units With Sisson Choke
	338D691	1	Units With Electric Choke

* - Included in 300C859 Control Assembly.

GENERATOR GROUP - SPEC. A THROUGH Q

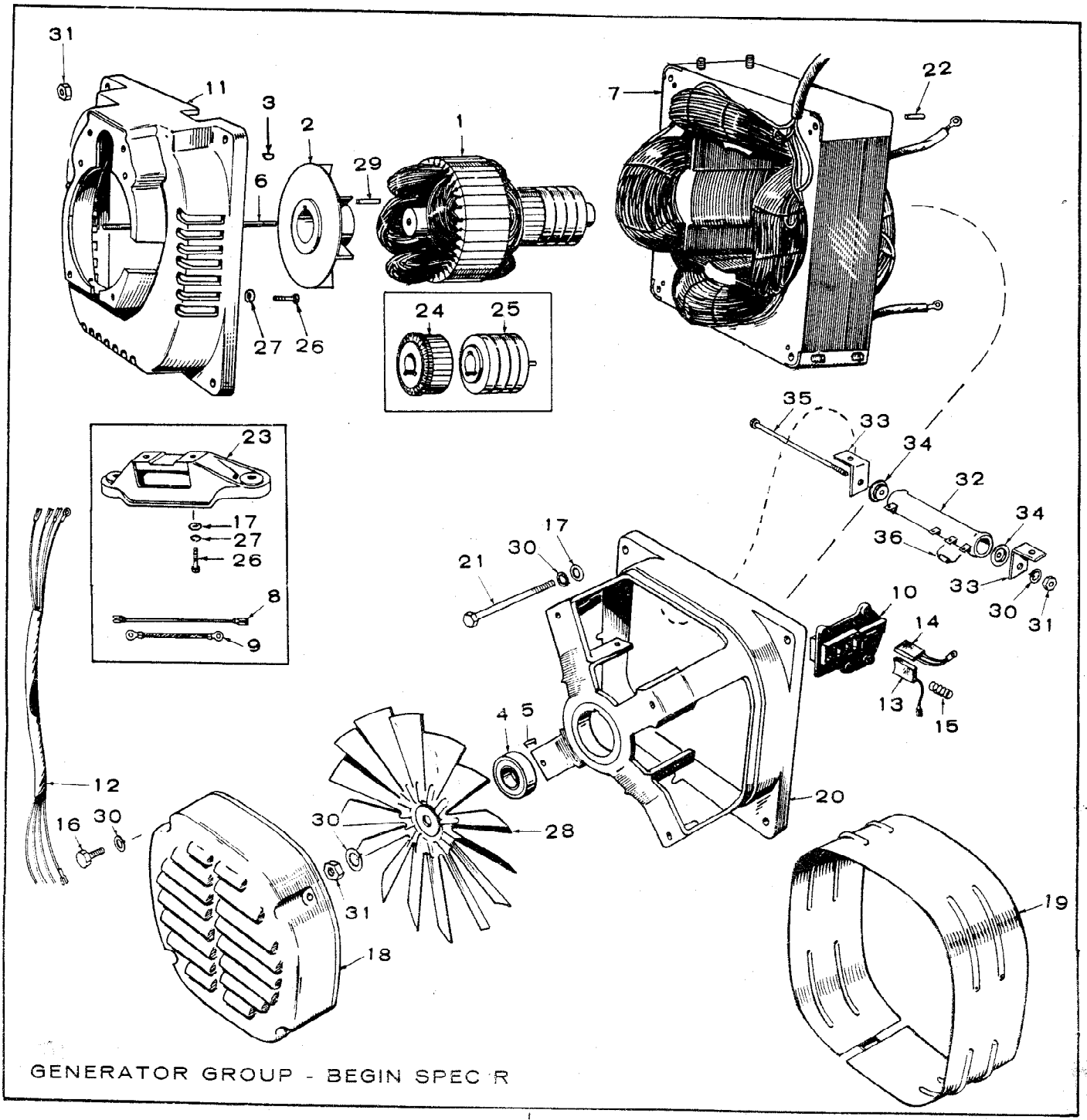






REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	ARMATURE ASSEMBLY (INCLUDES BEARING AND BLOWER)		
			Key 1
	201A759	1	120 Volt
	201A704	1	120/240 Volt (Non-Reconnectible)
	201A1099	1	120/240 Volt (Reconnectible)
			Key 2
	201A758	1	120 Volt
	201A705	1	120/240 Volt (Non-Reconnectible)
	201A1098	1	120/240 Volt (Reconnectible)
2	205C53	1	Blower, Generator
3	515-6	1	Key, Blower to Crankshaft
4	510A47	1	Bearing (Ball) - Armature
5	232A596	1	Clip, Bearing Stop
6	STUD, ARMATURE THROUGH		
			Key 1
	520A491	1	120 Volt (7/16 x 14-1/2 ")
	520A525	1	120/240 Volt (Reconnectible & Non-Reconnectible) - 7/16 x 15-7/8 "
			Key 2
	520A407	1	120 Volt (7/16 x 17-3/4 ")
	520A595	1	120/240 Volt (Reconnectible & Non-Reconnectible) - 7/16 x 19-1/2 "
7	FRAME ONLY, GENERATOR (Machined & Drilled, Less Coils & Pole Shoes)		
	210D244	1	Key 1
	210B238	1	Key 2
8	SHOE, POLE, FIELD		
	221A91	4	Key 1, (4-1/2 ")
	221A90	4	Key 2, (7-1/2 ")
9	COIL ASSEMBLY, FIELD (SET OF 4 COILS)		
	222A1435	1	Key 1
	222A1416	1	Key 2
10	RIG ASSEMBLY, BRUSH		
			Key 1
	212C294	1	120 Volt
	212C295	1	120/240 Volt (Non-Reconnectible)
	212C298	1	120/240 Volt (Reconnectible)
			Key 2
	212C293	1	120 Volt
	212C295	1	120/240 Volt (Non-Reconnectible)
	212C298	1	120/240 Volt (Reconnectible)
11	231B1006	1	Adapter, Generator to Engine
12	232B1256	1	Scroll, Air Baffle
13	214A61	4	Brush, Commutator
14	BRUSH, COLLECTOR RING		
			Key 1
	214A50	4	120 Volt
	214A56	4	120/240 Volt (Reconnectible)
	214A56	3	120/240 Volt (Non-Reconnectible)
			Key 2
	214A56	4	120 Volt or 120/240 Volt (Reconnectible)
	214A56	3	120/240 Volt (Non-Reconnectible)
15	COLLECTOR RING (AC)		
	204A9	1	120 Volt
	204A10	1	120/240 Volt (Non-Reconnectible)
	204A92	1	120/240 Volt (Reconnectible)
16	SPRING, BRUSH		
	212B1105	4	Commutator
	212B1105	4	Collector Ring, 120 Volt or 120/240 Volt (Reconnectible)
	212B1105	3	Collector Ring, 120/240 Volt (Non-Reconnectible)
17	CONDENSER (.5 MFD.), DC		
	312A17	1	120 Volt
	312A27	1	120/240 Volt (Reconnectible & Non-Reconnectible)
18	CONDENSER (.1 MFD.), AC		
	312A58	1	120 Volt
	312A58	2	120/240 Volt (Non-Reconnectible)
	312A58	3	120/240 Volt (Reconnectible)
19	211C99	1	Cover, End Bell
20	BAND, END BELL		
	234C2	1	120 Volt
	234C5	1	120/240 Volt (Reconnectible & Non-Reconnectible)
21	BELL, END		
	211D97	1	120 Volt
	211D98	1	120/240 Volt (Reconnectible & Non-Reconnectible)
22	STUD, GENERATOR THROUGH		
	520A502	2	Key 1 (5/16 x 12-3/16 ")
	520A498	2	Key 2 (5/16 x 15-11/16 ")
23	815-48	2	Screw, Round Head Self Tapping (#10-32 x 3/8 ") - End Bell Cover Mounting
24	516-103	2	Pin (Roll), Generator Frame - 1/8 x 1/2 "
25	232D1798	1	Support, Generator
26	COMMUTATOR (DC)		
	203A9	1	Key 1
	203A127	1	Key 2
27	862-4	1	Nut, Hex (7/16-14) - Armature Stud
28	850-55	1	Washer, Lock (7/16)
29	526-32	1	Washer, Flat
30	862-15	2	Nut, Hex (5/16-18) - Generator thru Stud
31	850-45	2	Washer, Lock (5/16)
32	212A1214	4	Clamp, Brush Rig

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



GENERATOR GROUP - BEGIN SPEC R

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	ROTOR ASSEMBLY, WOUND		
	201D1907	1	Key 1
	201D1903	1	Key 2
2	232C2316	1	Hub, Drive
3	515-6	1	Key, Rotor to Crankshaft
4	510A47	1	Bearing (Ball), Rotor
5	232A596	1	Clip, Bearing Stop
6	STUD, ROTOR THROUGH		
	520A732	1	Key 1
	520A733	1	Key 2
7	STATOR ASSEMBLY, WOUND		
	220D1818	1	Key 1
	220D1816	1	Key 2

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
8	LEAD ASSEMBLY, BRUSH		
	336A1891	4	Blade Type Terminals (9 ″)
	336A1890	2	Blade Type & Round Type Terminal (4 ″)
	336A2110	1	Blade Type & Round Type Terminal (6 ″)
9	336A186	2	Ground Jumper (3-1/2 ″)
10	BLOCK ASSEMBLY, BRUSH		
	212C345	1	Right Hand Position
	212C346	1	Upper Position
	212C353	1	Left Hand Position
	212C352	1	Lower Position
11	231E164	1	Adapter, Generator to Engine

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
12	338B642	1	Harness, Wiring
13	214A95	4	Brush, Commutator
14	214A96	8	Brush, Collector Ring
15	212A1232	12	Spring, Brush
16	812-156	4	Screw, Fan Cover Mounting
17	WASHER, FLAT		
	526-115	4	Generator Through Screw
	526-30	2	Support to Generator
18	232D2107	1	Cover, Generator Fan
19	234C362	1	Wrapper, End Bell
20	211E187	1	Bell, End
21	SCREW, HEX CAP - GENERATOR THROUGH		
	800-43	4	Key 1
	800-44	4	Key 2
22	516-182	8	Pin (Roll), Generator Frame, 1/4 x 3/4 ″
23	232D2321	1	Support, Generator
24	COMMUTATOR		
	203C153	1	Key 1
	203C152	1	Key 2
25	204B110	1	Collector Ring
26	800-51	6	Screw, Hex Cap - (4) Generator Adapter Mounting, (2) Support to Generator
27	850-50	6	Lockwasher - (4) Generator Adapter Mounting, (2) Support to Generator
28	205C90	1	Fan, Generator
29	515A7	1	Key, Drive Hub
30	WASHER, LOCK		
	850-55	1	Rotor Through Stud
	850-40	4	Fan Cover Mounting
	850-45	4	Generator Through Screw
	850-30	1	Resistor Mounting
31	NUT, HEX		
	867-4	1	Rotor Through Stud
	862-15	4	Generator Through Screw
	860-11	1	Resistor Mounting
32	353A47	1	Resistor, Tapped
33	304A706	2	Bracket, Resistor Mounting
34	304A15	2	Washer, Resistor Centering
35	812-118	1	Screw, Resistor Mounting (10-24 x 5 ″)
36	357-17	1	Rectifier (3 Amp)

* - Order by Description, giving complete Model and Serial Number (Onan Nameplate).

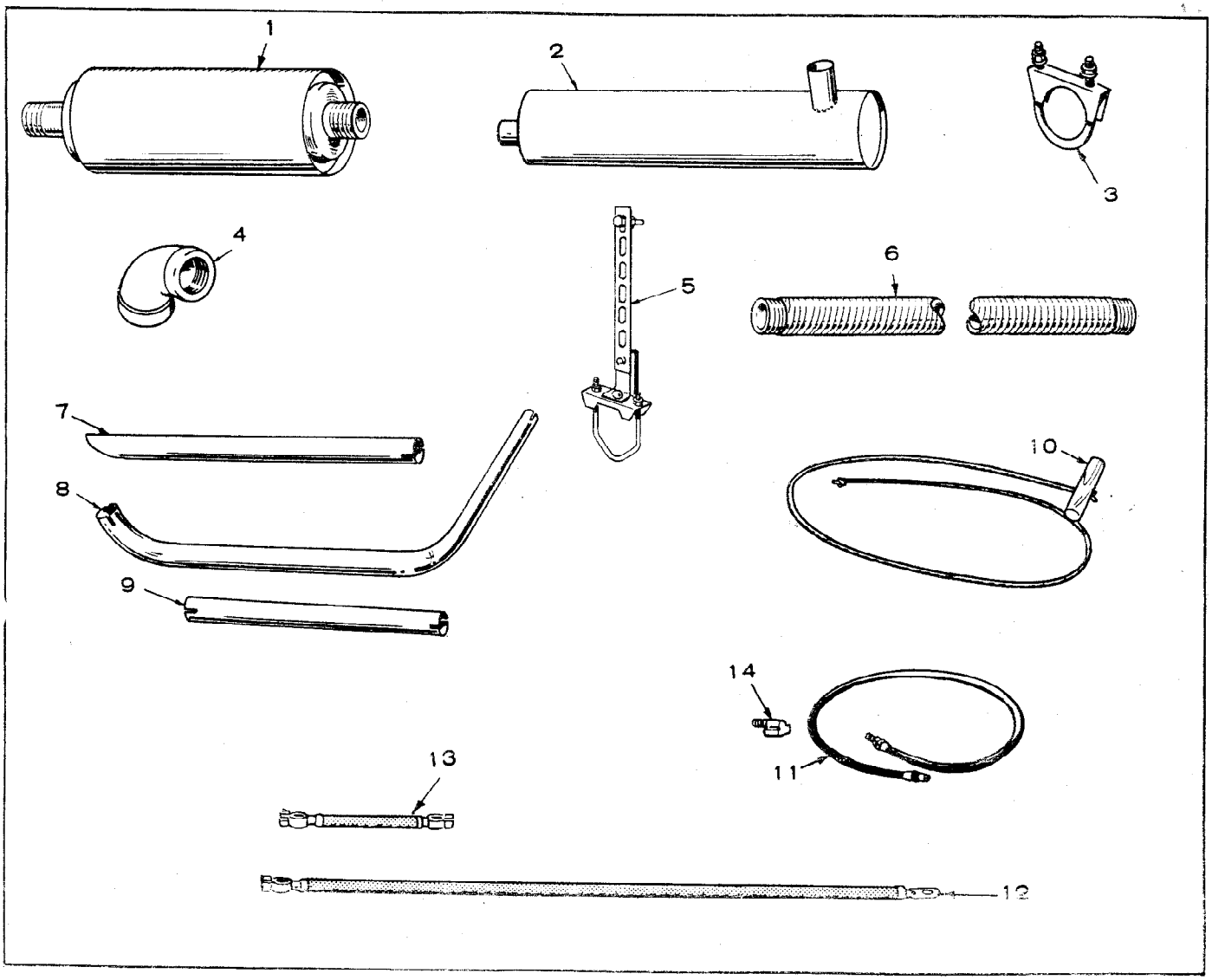
SERVICE KITS AND MISCELLANEOUS

PART NO.	QTY. USED	PART DESCRIPTION
98C1100	1	Decal Kit
160K836	1	Ignition Tune-Up Kit
168K103	1	Gasket Kit, Plant (Replaces #168K67)
168K95	1	Gasket Kit, Carbon Removal
412C28	1	Cover, Canvas
522K164	1	Overhaul Kit, Engine
PAINT, TOUCH-UP (PRESSURIZED CAN)		
525P137	As Req.	Metallic Green (16 oz.)
525P305	As Req.	Non-Metallic Green (13 oz.)

NOTE: For other kits, refer to the Group for the Part in question.

OPTIONAL INSTALLATION PARTS GROUP

Parts in this group were supplied by Onan for some models beginning with the 12,000 series, during spec R (Example: 5.0CCK-3CR/12000R). For installation parts not included in this group, contact the dealer from whom you purchased this equipment or your nearest authorized service station.



REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	MUFFLER, EXHAUST		
	155B76	1	16 ″ Long (1 ″ NPT)
	155P518	1	23 ″ Long (1 ″ NPT)
2	155B1222	1	Muffler, Exhaust - Side Inlet (21-9/16 ″ Long)
3	155P1239	2	Clamp, Muffler (1-5/8 ″ Pipe)
4	ELBOW, PIPE - EXHAUST		
	505-41	1	1 ″ x 90°
	505-473	1	1-1/4 ″ x 1 ″ x 90°
5	155P1234	1	Bracket, Hanger - Muffler
6	155B491	1	Tube, Exhaust (Flexible - 36 ″)
7	155A1235	1	Tube, Exhaust (1-1/2 ″ x 19 ″)
8	155B1236	1	Tube, Exhaust (1-5/8 ″ x 22 ″ Curved)

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
9	TUBE, EXHAUST		
	155A1240	1	1-5/8 ″ x 15 ″
	154A1578	1	1-5/8 ″ x 18 ″
10	192A83	1	Rope, Start
11	501A5	1	Line, Fuel (18-1/2 ″)
12	CABLE, BATTERY		
	416A77	2	28 ″ Long
	416A36	1	42-1/2 ″ Long
	416A37	1	48-3/8 ″ Long
13	416A4	1	Cable, Jumper - Battery
14	ELBOW, STREET - FUEL LINE		
	502-2	1	1/4 ″ Tube x 1/8 ″ NPT Male
	502-20	1	1/8 ″ NPT Female x 1/8 ″ NPT Male

CUSTOMER SERVICES

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

QUALITY OF PRODUCT

Onan products are engineered and designed to perform as stated on product nameplate and published specification. Only quality material and workmanship are used in the manufacture of this product. With proper installation, regular maintenance and periodic repair service, the equipment will provide many enjoyable hours of service.

GENERAL WARRANTY PRACTICES

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

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

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

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

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

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

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

MAINTENANCE

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

Maintenance is divided into two categories:

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

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

INSTALLATION

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

Onan

Minneapolis, Minnesota 55432

MSS-22A
Replaces 23B054
Rev. 11-1-71