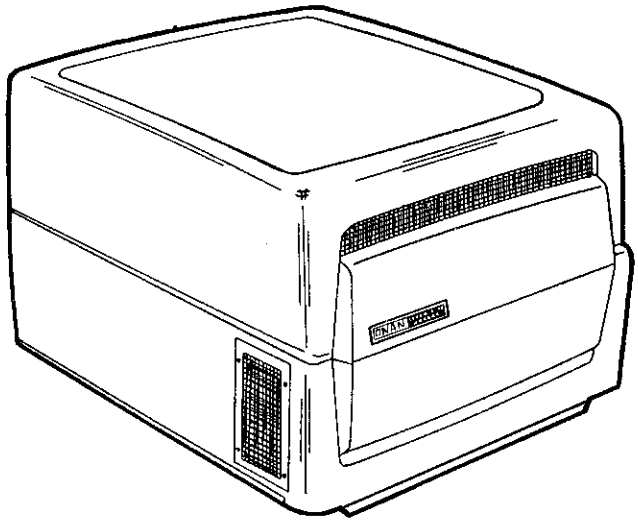
Onan®

OPERATORS MANUAL AND PARTS CATALOG

FOR

CCK

HOME STANDBY ELECTRIC GENERATING SET



927-0360

10R73
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Congratulations on your choice of an Onan generating set . . and **Welcome** to the growing family of Onan power.

This manual gives you all the operation and maintenance instructions you need to keep your unit running like new. Read it carefully. Remember . . any machine, regardless of design or type, will perform only in relation to the services it gets.

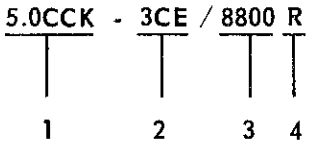
If you ever need help with your generating set, contact your nearest Onan Parts and Service Organization which is factory-trained and experienced to keep your generating set "on the go."

TABLE OF CONTENTS

GENERAL INFORMATION

This manual contains instructions for installation, operation, and maintenance of the CCK generating sets used for home standby applications. Identify the model of your unit by referring to the model and specication number shown on the Onan nameplate. Electrical specifications are shown on the lower portion of the nameplate.

How to interpret the MODEL and SPEC NO.



1. Factory code indicating capacity and series.
2. Combines with "5.0CCK" to identify model. Number "3" is the voltage code for 120/240 volts, single phase. "C" is the code for reconnectible (120 volts, 2 wire; 240 volts, 2 wire; and 120/240 volts, 3 wire). "E" is for electric starting.
3. Factory code for designating optional equipment.
4. Specification letter which advances when factory makes production modifications.

Upon receipt of your unit, check it thoroughly for any damage that may have occurred during shipping. Tighten loose parts, replace missing parts, and repair any damage before putting the unit into operation.

Throughout this manual, engine end is considered front of the generating set. Left and right are determined while facing engine end.

CAUTION *Onan uses this symbol throughout the text to warn of possible equipment damage.*

WARNING *This symbol is used to warn of possible personal injury.*

SPECIFICATIONS

Dimensions	
Height	30-1/8 ″
Width	33-13/16 ″
Length	41-3/8 ″
Number of Cylinders	2
Bore	3-1/4 ″
Stroke	3 ″
Displacement (cu. in.)	49.8
Compression Ratio	5.5 to 1
Compression PSI (sea level)	105 to 110
BHP (1800 rpm)	10.2
Lubrication	
Full Pressure Lubrication	Yes
Oil Capacity (U.S. quarts)	4
Fuel System	
Fuel Used	Gasoline *
Fuel Pump	Bendix electric
Carburetor	Downdraft
Choke	Manual
Fuel Tank Capacity (U.S. gallons)	5
Governor (with vacuum booster)	Enclosed, mechanical flyball
Governor Regulation	5 percent
Ignition	12-volt, battery
Starting	Electric
Battery Recommended	
SAE Group 60 (number used)	One
Amp/Hr SAE 20 Hr. Minimum	74
Alternator	
Basic Design	Revolving armature, 4-pole
KW Rating	5
Battery Charging	12-volt, negative ground
Frequency Regulation (no load to full load)	5 percent

* Nonleaded or regular grade. See "OPERATION" section for special instructions.

DIMENSIONS AND CLEARANCES

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

	Minimum	Maximum
Valve Stem in Guide – intake	0.001	0.0025
Valve Stem in Guide – exhaust	0.0025	0.0040
Valve Spring Length		
Free Length	1.662	
Compressed Length	1.375	
Valve Spring Tension (lb)		
Open	71	79
Closed	38	42
Valve Seat Bore Diameter		
Intake	1.443	1.444
Exhaust	1.189	1.190
Valve Seat Diameter		
Intake	1.446	1.447
Exhaust	1.192	1.193
Valve Stem Diameter		
Intake	0.3425	0.3430
Exhaust	0.3410	0.3415
Valve Guide Diameter (I.D.)	0.344	0.346
Valve Lifter Diameter	0.7475	0.7480
Valve Lifter Bore	0.7505	0.7515
Valve Seat Interference Width	1/32	3/64
Valve Face Angle	44°	
Valve Seat Angle	45°	
Valve Interference Angle	1°	
Crankshaft Main Bearing	0.0025	0.0038
Crankshaft End Play	0.006	0.012
Camshaft Bearing	0.0015	0.003
Camshaft End Play	0.003	–
Camshaft Lift	0.243	
Camshaft Bearing Diameter	1.3760	1.3770
Camshaft Journal Diameter	1.3740	1.3745
Rod Bearing	0.002	0.003
Connecting Rod End Play	0.002	0.016
Timing Gear Backlash	0.002	0.003
Oil Pump Gear Backlash	0.002	0.005
Piston to Cylinder, Strut Type (measured below oil-controlling ring – 90° from pin) Clearance	0.0015	0.0035
Piston Pin Diameter	0.7500	0.7502
Piston Pin in Piston	Thumb Push Fit	
Piston Pin in Rod	0.0002	0.0007
Piston Ring Groove Width		
Top 1	0.0960	0.0970
Top 2	0.0955	0.0965
Top 3	0.1880	0.1895
Piston Ring Gap in Cylinder	0.010	0.023
Piston Ring Side Clearance (top compression ring only)	0.002	0.008
Crankshaft Main Bearing Journal – standard size	1.9992	2.000
Main Bearing Diameter	2.0020	2.0030
Crankshaft Rod Bearing Journal – standard size	1.6252	1.6260
Cylinder Bore – standard size	3.249	3.250

Tune-Up Specifications

Breaker Point Gap (full separation)	0.020	
Spark Plug Gap – for gasoline fuel	0.025	
Ignition Timing	19°BTC	
Carburetor Float Clearance (between float bowl gasket and float)	1/4	
Valve Tappet Clearance (engine cold)		
Intake	0.006	0.008
Exhaust	0.015	0.017

ASSEMBLY TORQUES AND SPECIAL TOOLS

TORQUES

Assembly torques as given here require the use of a torque wrench. These assembly torques will assure proper tightness without danger of stripping the threads. If a torque wrench is not available, you will have to estimate the degree of tightness necessary for the stud, nut or screw being installed and tighten accordingly. Be careful not to strip the threads. Check all studs, nuts and screws often with the engine cold. Tighten as needed to prevent them from working loose.

TORQUE SPECIFICATIONS	FT.-LB.
Cylinder Head Bolts	29-31
Rear Bearing Plate	20-25
Connecting Rod Bolt	24-26
Flywheel Capscrew	35-40
Gear Case Cover	15-20
Oil Pump	7- 9
Other 5/16 Inch Cylinder Block Nuts	10-12
Manifold Screws	15-20
Carburetor Mounting Nuts	8-12
Alternator Adapter (to block)	20-25
Alternator Through-Stud Nut	14-16
Armature Through-Stud Nut	35-40
Oil Base Mounting Screws	43-48

SPECIAL TOOLS

These tools are available from Onan to aid service and repair work.

Crankshaft Gear Pulling Ring	420-0248
Flywheel Puller	420-0100
Combination Bearing Remover, Main and Cam	420-0325
Combination Bearing Driver, Main and Cam	420-0324
Valve Guide Driver	420-0300
Valve Seat Driver	420-0071
Oil Seal Guide and Driver	
Bearing Plate	420-0181
Gear Cover	420-0313
Carburetor Adjustment Wrench	420-0169

INSTALLATION

GENERAL

The CCK home standby generating set is a completely self-contained unit, having its own fuel supply and battery power source. The mounting base is the same base used for shipping. No special mounting base needs to be built.

LOCATION

Choose an installation area as close as practical to the transfer switch, an area accessible for service, an area level and dry. Be sure location of generating set doesn't present problems of exhaust fumes, etc. entering living quarters. (See Figure 1).

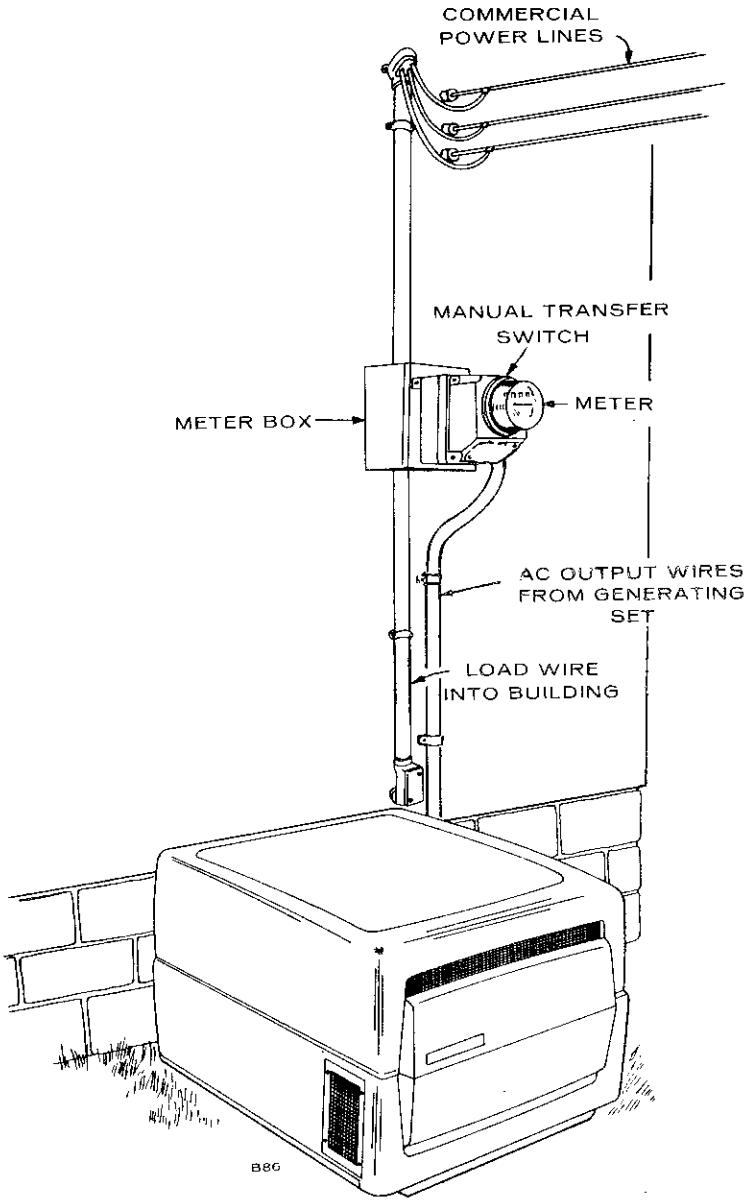


FIGURE 1. TYPICAL CCK GENERATING SET HOME STANDBY INSTALLATION

MOUNTING

Before positioning the unit, it might be desirable to make sure grass, weeds, etc. won't grow under the base. A screened opening under the engine is the only bottom opening in the base. Depending on the area, weeds or grass may not present any restriction in air flow for this opening. Remove the cover and level the generating set and mounting base. Be sure the 4 x 4 inch redwood base pieces rest squarely on the ground. Figure 2 shows the base of the home standby unit.

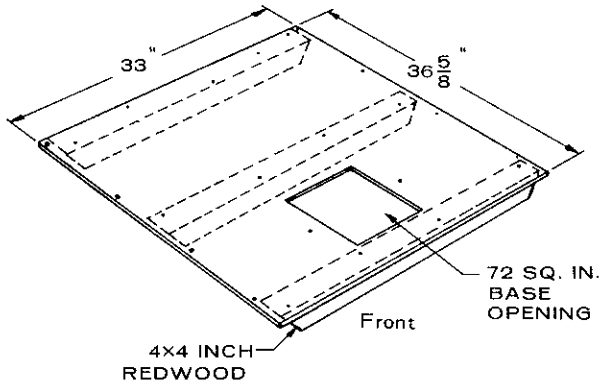


FIGURE 2. MOUNTING BASE

LOAD WIRING

The nameplate gives the generating set's rated output in watts, volts and hertz. Electrical connections and circuits are shown on the generating set's wiring diagram. Figure 3 shows the load connections and reconnections available.

All load wiring and electrical connections should be performed by a qualified serviceman or electrician. The installation must be inspected and approved, meeting all applicable code requirements. The CCK output box has provisions for connecting the load wires.

Use flexible conduit and multistrand wire inside the compartment to absorb vibration from the unit. Strip insulation from the wire ends as necessary for clean connections. Connect each wire to the correct alternator output wire. Alternator leads are marked M1, M2, M3 and M4 and correspond to marked leads on wiring diagram. Insulate the bare ends of the ungrounded wires.

NOTE: *Load wires can exit through rear or floor of compartment.*

Voltage Selections: The 5.0CCK-3CE is reconnectible for 120 volts, 2 wire; 240 volts, 2 wire or 120/240 volts, 3 wire. Use the connection for two-wire service when one load exceeds 1/2 the rated capacity. Balance the load when connected for three-wire service.

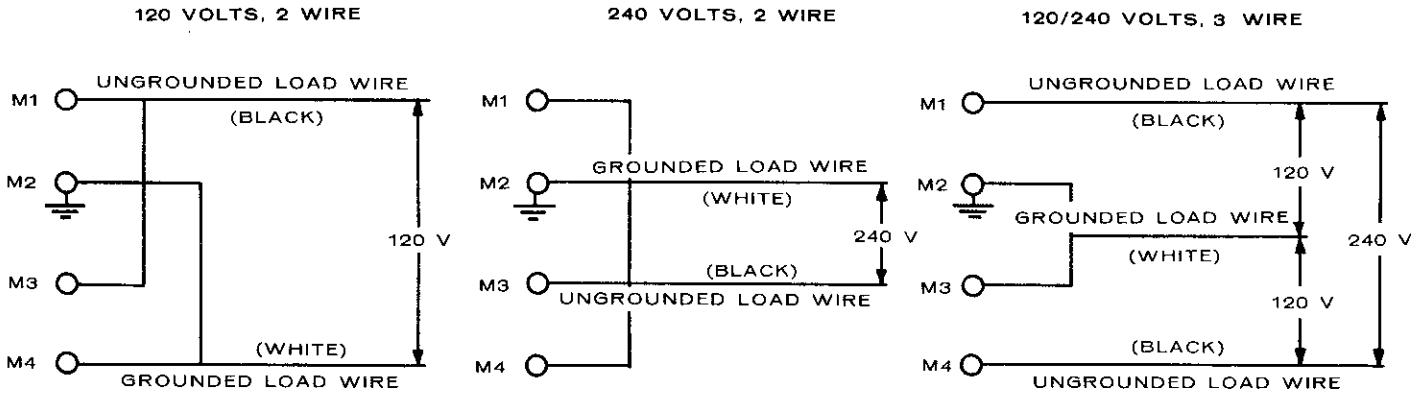


FIGURE 3. LOAD CONNECTIONS FOR RECONNECTIBLE ALTERNATOR

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

Battery Connections: Connect the positive battery cable from the start switch (control box) to the battery positive terminal. See Figure 4. Connect the negative battery cable from alternator frame to negative battery terminal.

CAUTION *Battery terminals must be located as shown in Figure 4. Be sure to connect cables to correct battery terminals (always use negative ground).*

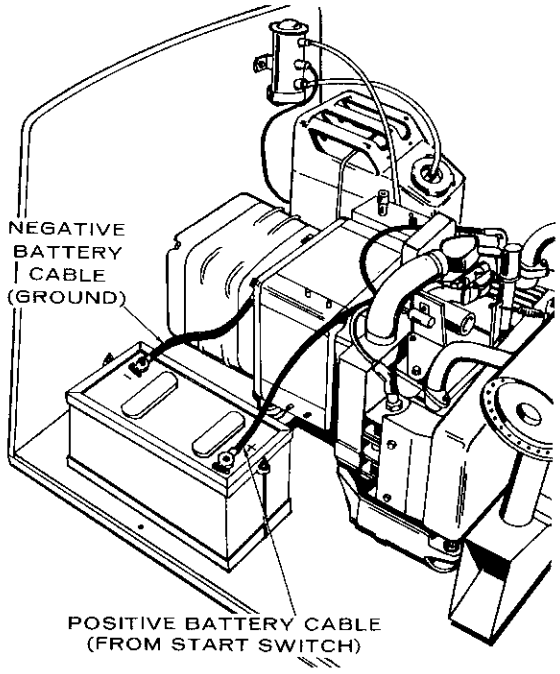


FIGURE 4. BATTERY CABLE CONNECTIONS

VENTILATION

Cooling air is drawn into the compartment through two openings in the front compartment housing and opening in base (Figure 5). Once the cooling air enters the compartment, it's drawn into the engine and alternator.

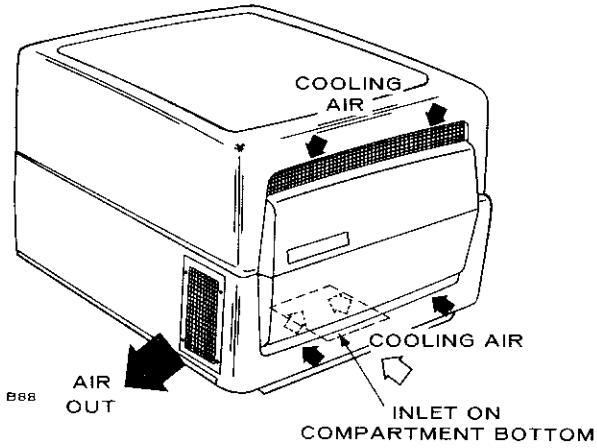


FIGURE 5. COMPARTMENT AIR INLETS AND OUTLET

After the air passes through the alternator, over the engine and becomes heated, it is pushed out the compartment by the blower and scroll assembly (Vacu-Flo) on engine end.

Because the compartment is completely enclosed, installation doesn't usually affect ventilation, except possibly for air inlet in base. Be sure adequate air volume can pass under base to this opening.

NOTE: *Exhaust gases are mixed with the heated ventilation air just before leaving compartment.*

OPERATION

BEFORE STARTING

Oil: Be sure the crankcase has been filled to the FULL mark with an oil with the American Petroleum Institute (API) designation SE or SE/CC and of the viscosity recommended on the nameplate. If this oil is not available, an SD or SD/CC oil may be used. See PERIODIC MAINTENANCE section for complete oil lubrication recommendations.

Fuel: Use a good grade of nonleaded automotive gasoline if the engine is new. If a leaded gasoline has been used for more than a few hours, the engine head should be removed and all lead deposits cleaned out before using the nonleaded fuel.

CAUTION *If the engine has previously used leaded gasolines, be sure to clean lead and carbon deposits from the combustion chambers before using nonleaded gasolines. If not performed, preignition could occur and cause severe damage to the engine.*

STARTING (FIGURE 6)

1. Close the manual choke about three quarters of the way or as necessary according to temperature conditions.

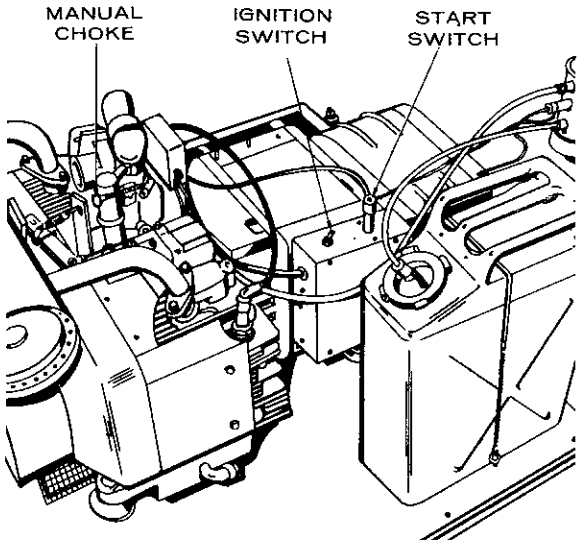


FIGURE 6. CHOKE, IGNITION SWITCH AND START SWITCH

2. Move the ignition switch to ON.
3. Push the START button to crank the engine.

If the engine doesn't start initially after using the foregoing instructions, remove the spark plugs, clean, dry thoroughly and re-install. Smoky exhaust, due to oil in the cylinders, might appear on initial start and is normal.

APPLYING LOAD

When applying load to a new or reconditioned engine, it should be applied gradually in about four steps (if possible), each step of not less than 30 minutes running time. Start with 1/4 load, then 1/2, 3/4 and full load after that.

NOTE: *After the first 50 hours of initial operation, change the crankcase oil. See PERIODIC MAINTENANCE section.*

STOPPING

1. Remove the electrical load from the generating set.
2. Move the ignition switch to OFF.

NOTE: *If possible, let the generating set run 5 to 10 minutes without load to allow for stabilization of engine temperatures.*

HIGH AMBIENT TEMPERATURE CONDITIONS

1. See that nothing obstructs air flow to and from the unit compartment.
2. Keep cooling fins clean. Generating set's air housing should be properly installed and undamaged.

LOW AMBIENT TEMPERATURE CONDITIONS

1. Use correct SAE weight oil for temperature conditions. Change oil only when engine is warm.
2. Use fresh fuel. A fuel tank kept full prevents moisture condensation.
3. Keep fuel system clean and battery in a well charged condition.

EXTREMELY DUSTY OR DIRTY CONDITIONS

1. Keep generating set clean. Keep cooling surfaces clean.
2. Service air cleaner as frequently as necessary.
3. Change crankcase oil every 50 operating hours.
4. Keep governor linkage clean.
5. Clean alternator 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 ADJUSTMENTS section). Maximum power will be reduced approximately 4 percent for each 1000 feet above sea level after the first 1000 feet.

OUT-OF-SERVICE PROTECTION

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

1. Run unit until thoroughly warm.
2. Turn off fuel supply and run until unit 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 one ounce or two tablespoons of rust inhibitor (or SAE 50 oil) into each cylinder. Crank engine (if possible, 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 entire unit. Coat rustable parts with a light film of grease or oil.
9. Disconnect the battery and follow battery storage procedures.

SEQUENCE OF OPERATION

Figure 7 shows the operation sequence of the CCK home standby generating set. Note the sequence is only for the generating set only and doesn't include a transfer switch.

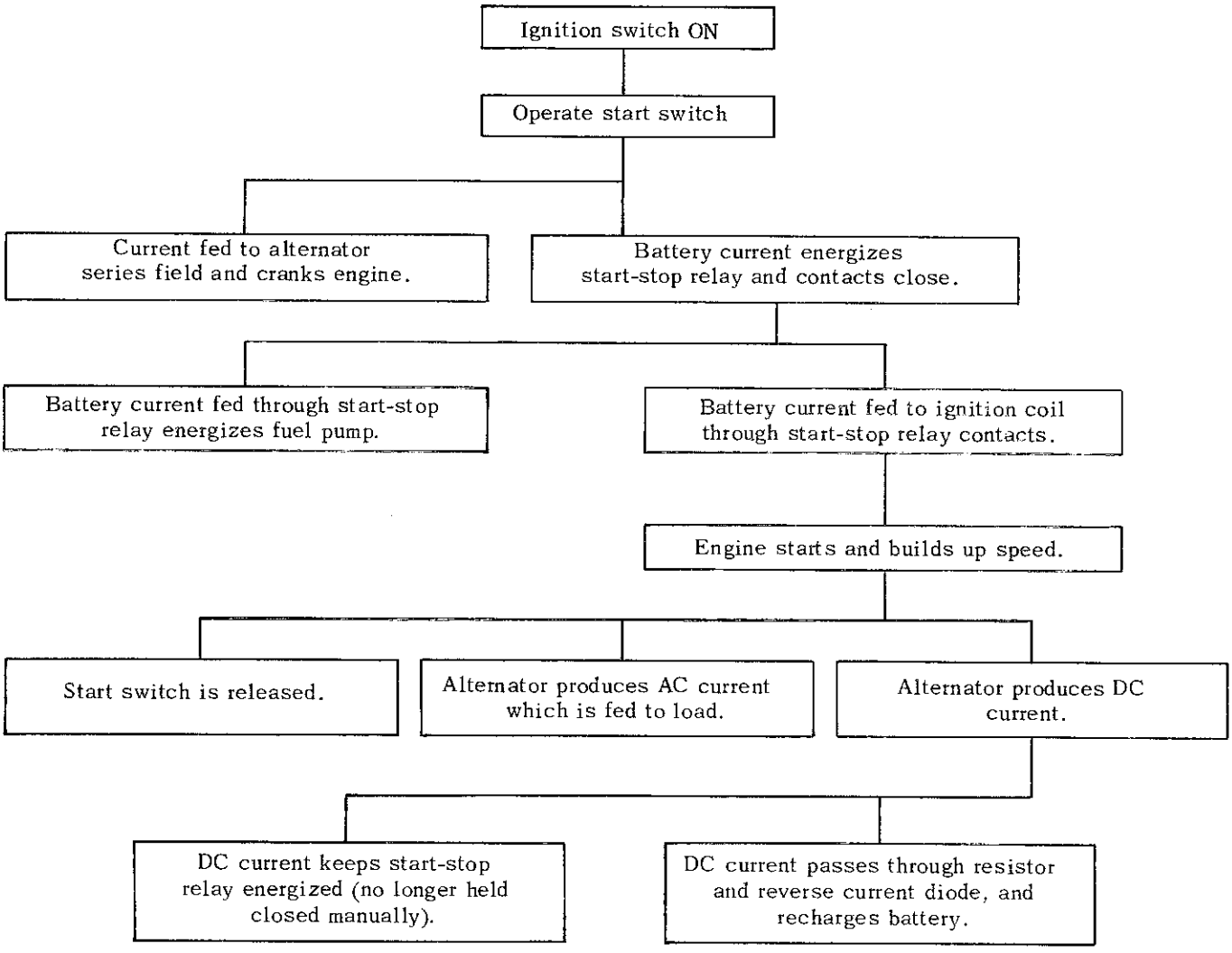


FIGURE 7. SEQUENCE OF OPERATION

PERIODIC MAINTENANCE

PERIODIC MAINTENANCE SCHEDULE

Regularly scheduled maintenance is the key to lower operating costs and longer service life for the unit. The schedules can be used as a guide. However, actual operating conditions under which a unit is run should be the determining factor in establishing a maintenance schedule. When operating in very dusty or dirty conditions, some of the service periods may have to be reduced. Check the condition of the crankcase oil, fuel filters, etc. frequently until the proper service time periods can be established.

When any abnormalities occur in operation – unusual noises from engine or accessories, loss of power, overheating, etc. – contact your Onan dealer.

CRANKCASE OIL

Oil capacity of the CCK generating set is four U.S. quarts. Fill the crankcase until the oil reaches the "FULL" mark on the oil level indicator (Figure 8).

OPERATOR MAINTENANCE SCHEDULE
(Performed by Owner)

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

x1 - Replace every 250 hours.

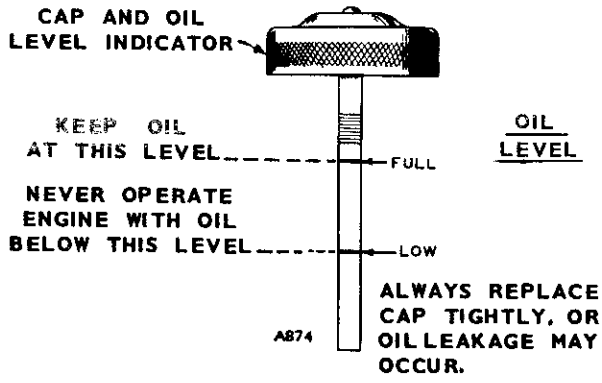


FIGURE 8. ENGINE OIL LEVEL INDICATOR

CRITICAL MAINTENANCE SCHEDULE
(Performed by Onan Dealer)

MAINTENANCE ITEMS	OPERATIONAL HOURS		
	100	500	1000
Check Breaker Points	x		
Clean Commutator and Collector Rings			x
Check Brushes		x	
Remove Deposits From Combustion Chamber		x	
Check Valve Clearance		x	
Clean Alternator			x
Inspect Valves, Grind If Necessary			x

Use a good quality, heavy duty oil with the API (American Petroleum Institute) designation SE or SE/CC. If this oil is not available, SD or SD/CC designated oil can be used.

Check oil level daily and change oil every 100 normal operating hours. If operating in extremely dusty or dirty conditions, the oil might have to be changed sooner. When adding oil between changes, use the same brand as in the crankcase. Various brands of oil might not be compatible when mixed together.

TEMPERATURE	GRADE
Below 0°	5W or 5W-30
0° to 30°	10W or 10W-40
Above 30°	30

Oil consumption may be higher with a multi-grade oil than with a single-grade oil if both oils have comparable viscosities at 210°F. Therefore, single-grade oils are generally more desirable unless anticipating a wide range of temperatures. Use the proper grade oil for the expected conditions.

AIR CLEANER

Proper maintenance of the air cleaner is extremely important. Negligence of regular routine maintenance will result in reduced engine life.

Remove the oil cup on the bottom of the air breather (Figure 9), empty the existing oil, and thoroughly clean the cup and screen in a suitable solvent. Dry the cup and screen, fill cup with oil (same weight oil as in crankcase) to oil level mark.

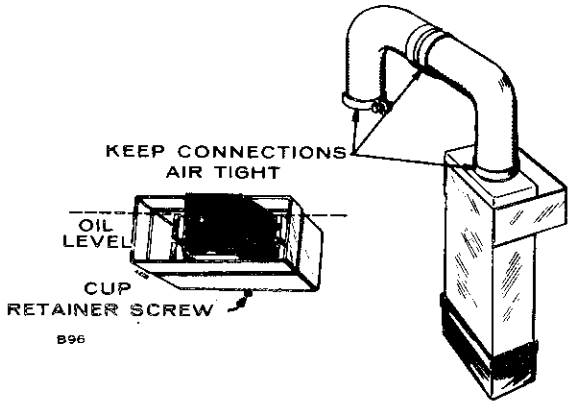


FIGURE 9. AIR CLEANER ASSEMBLY

CRANKCASE BREATHER

Lift off the rubber breather cap and carefully pry valve from cap (Figure 10). If valve doesn't come out easily, press hard with both your thumbs on top of the cap and fingers below to release the valve from the cap. Wash and rinse the whole valve in a suitable solvent. Dry the valve and re-install. Be sure the perforated disc is toward the engine.

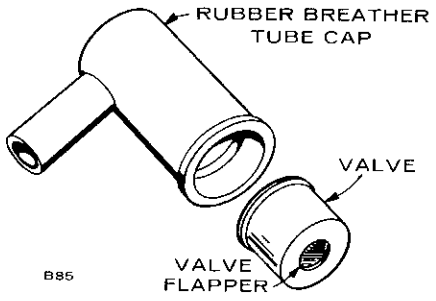


FIGURE 10. CRANKCASE BREATHER

FUEL SYSTEM

Fuel Filters: Every 100 hours or sooner, clean the fuel filter elements. Remove the gas tank cap and fuel pickup assembly. Inspect the ball check and valve (Figure 11) and clean in suitable solvent.

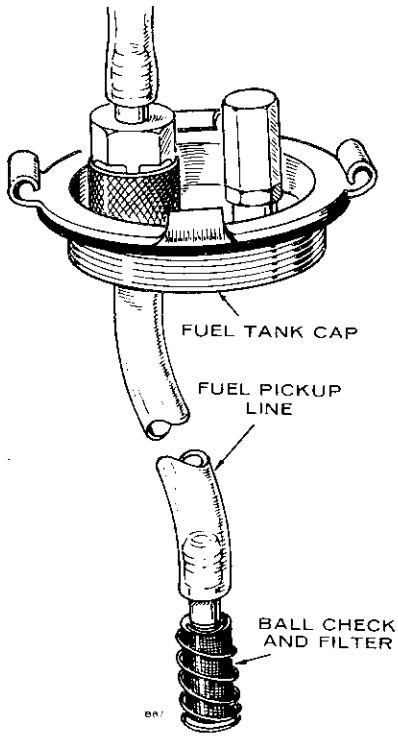


FIGURE 11. FUEL CAP AND PICKUP ASSEMBLY

Every 100 hours or sooner, drain the 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 12.

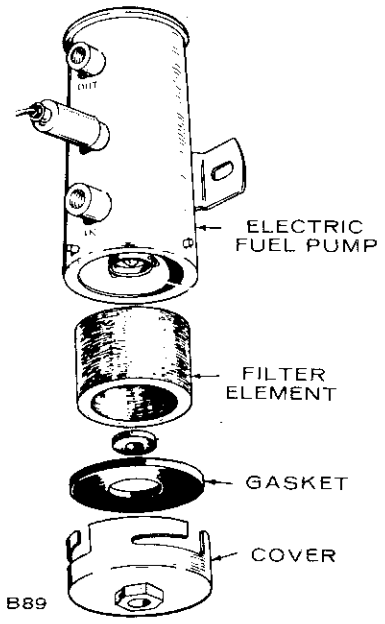


FIGURE 12. ELECTRIC FUEL PUMP

Vacuum 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 (Figure 13). Do not enlarge this hole.

If there is tension on the external spring when the generating set 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.

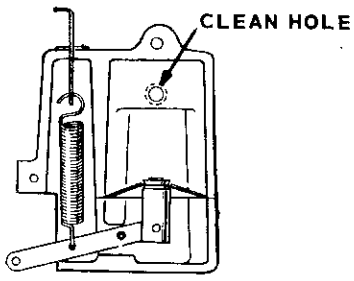


FIGURE 13. VACUUM SPEED BOOSTER

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 14. Also inspect the linkage for binding, excessive slack and wear.

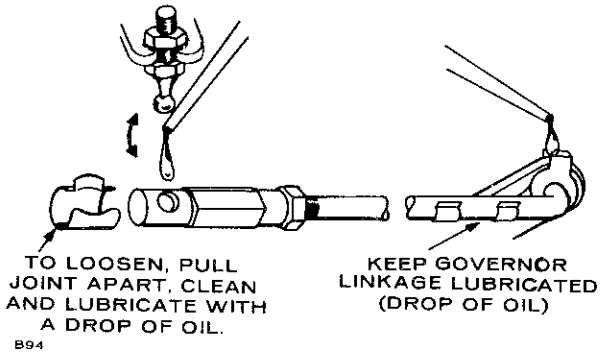


FIGURE 14. CLEANING GOVERNOR LINKAGE JOINT

SPARK PLUGS

Each time the spark plugs are removed, inspect, clean and regap (Figure 15). If the plug looks discolored or has fouled, replace it.

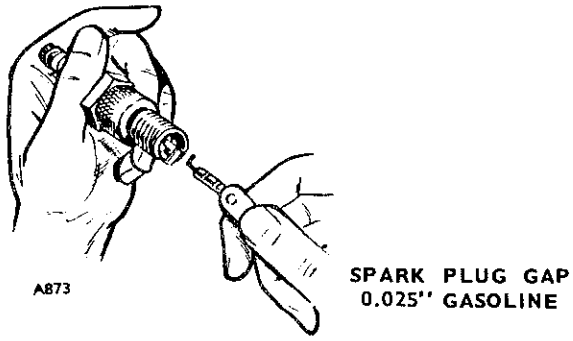
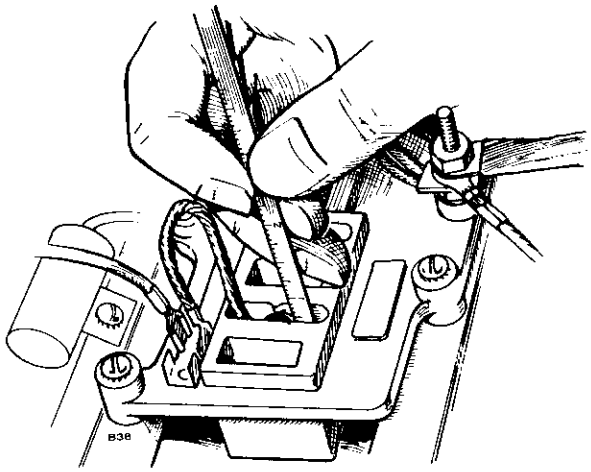


FIGURE 15. CHECKING SPARK PLUG GAP

ALTERNATOR MAINTENANCE

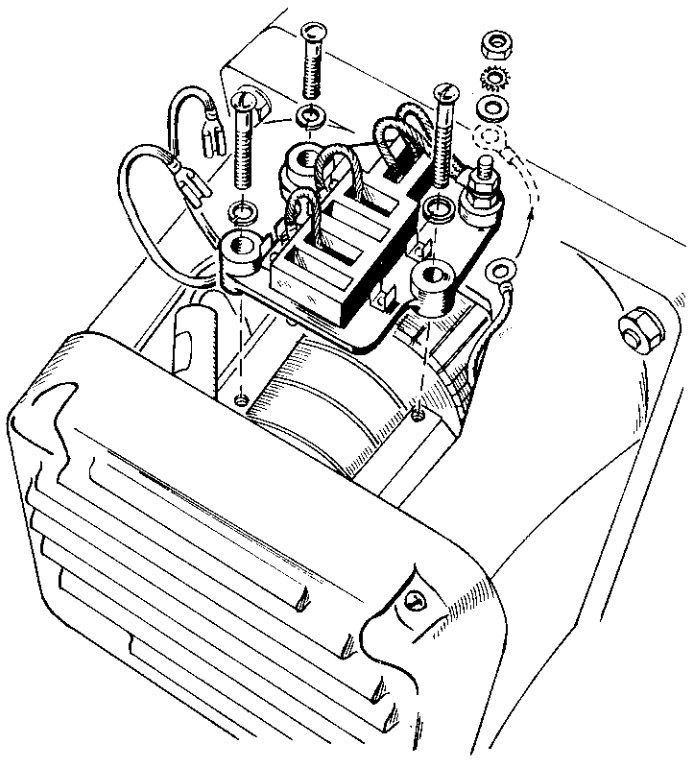
The alternator normally needs little care other than a periodic check of the brushes, commutator and collector rings. If a major repair job on the alternator should become necessary, have the equipment checked by a competent electrician who is thoroughly familiar with the operation of electric generating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



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 16. MEASURING BRUSH WEAR



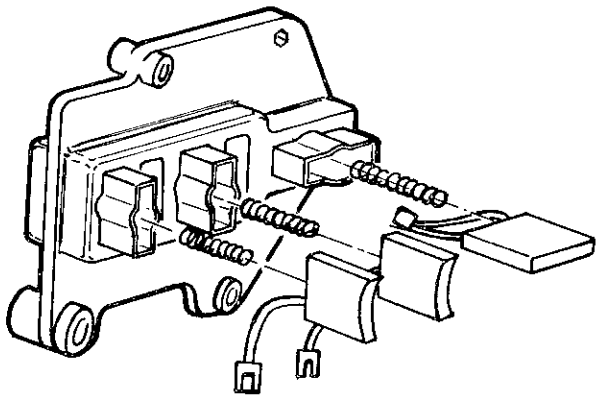
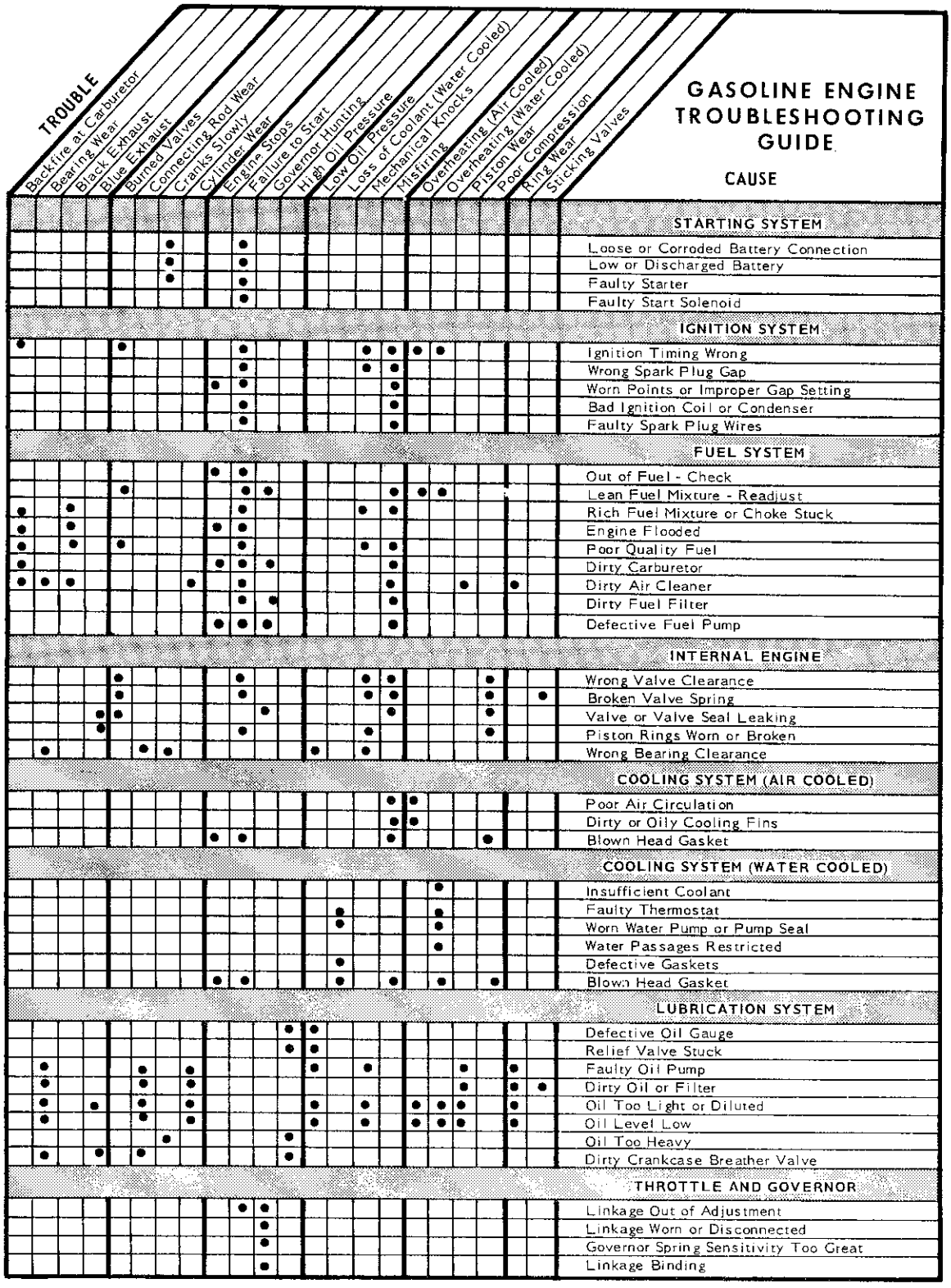


FIGURE 17. REMOVING ALTERNATOR BRUSHES

Brush Replacement: Install new brushes when the old ones are worn to the dimensions shown in Figure 16. Remove the end bell band and the end cover to expose the brush holders. Remove the three screws holding each brush holder in place (Figure 17). 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, because 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 generating set under 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 alternator.

ENGINE TROUBLESHOOTING



ADJUSTMENTS

Satisfactory generating set performance relies mostly on correct adjustments. If trouble does develop, follow an orderly procedure to determine the cause before making adjustments. Also refer to ENGINE TROUBLE-SHOOTING and PERIODIC MAINTENANCE sections for help in checking causes of troubles.

CARBURETOR

The CCK generating set has a carburetor with two fuel mixture adjustments, an idle mixture which affects operation mainly at no load and a main adjustment which affects mixture for maximum load (Figure 18).

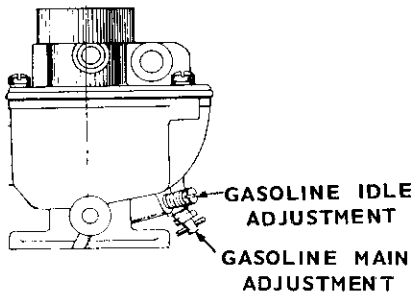


FIGURE 18. CARBURETOR FUEL MIXTURE ADJUSTMENTS

If your generating set has a "hunting" condition at no load or full load and cannot be corrected by carburetor adjustments, check governor linkage and adjustments (see "GOVERNOR" in this section).

A hunting condition at no load can often be corrected by an idle fuel adjustment.

CAUTION *When determining fuel mixture settings, never force the fuel mixture adjustment needles against their seats (damages the seats and needles).*

Main Fuel Adjustment (With Load)

1. Start generating set and allow the engine to warm up for a minimum of 10 minutes.
2. With main adjustment needle two full turns off its seat, slowly turn in (clockwise) until engine loses speed.
3. Turn main adjustment needle out (clockwise) until the engine runs smoothly at full power and speed.

NOTE: *If the engine develops a slight hunting condition, open the main needle a little more (not more than 1/2 turn beyond maximum power point).*

Idle Fuel Adjustment (No Load)

1. Start the generating set and allow to warm up for a minimum of 10 minutes.
2. Turn out idle adjustment screw (counterclockwise) until the engine loses speed. Note this position.
3. Slowly turn in idle needle (clockwise) past the point where the engine is running smoothly and again loses engine speed. Note this position.
4. Turn out adjustment screw again, only midway between the preceding two positions. The engine should be running smoothly.

Carburetor Float Adjustment

1. Disconnect throttle control, choke cable and fuel line from carburetor.
2. With a screwdriver, remove the three screws on the top of the carburetor and lift off.
3. With the carburetor casting inverted and the float resting lightly against the needle and seat, there should be 1/4-inch clearance between the bowl cover gasket and the free end of the float (side opposite needle and seat). See Figure 19.

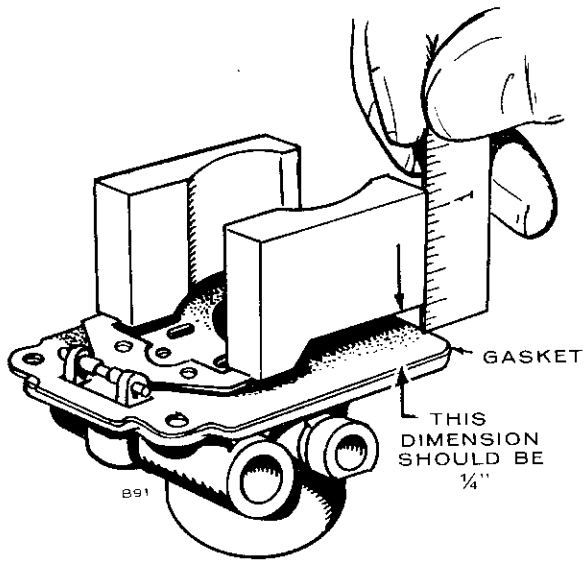


FIGURE 19. CARBURETOR FLOAT SETTING

4. If it is necessary to reset the float level, bend the float near the shaft to obtain the correct level.

Throttle Stop Screw: The throttle stop screw is located on the throttle shaft lever (side of carburetor by ignition coil). It must be adjusted and set for 1/32-inch clearance over the manifold surface when the generating set is running with no load. See Figure 20.

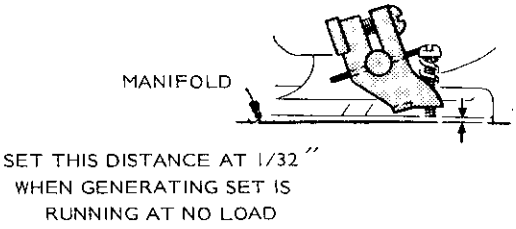


FIGURE 20. THROTTLE STOP SCREW SETTING

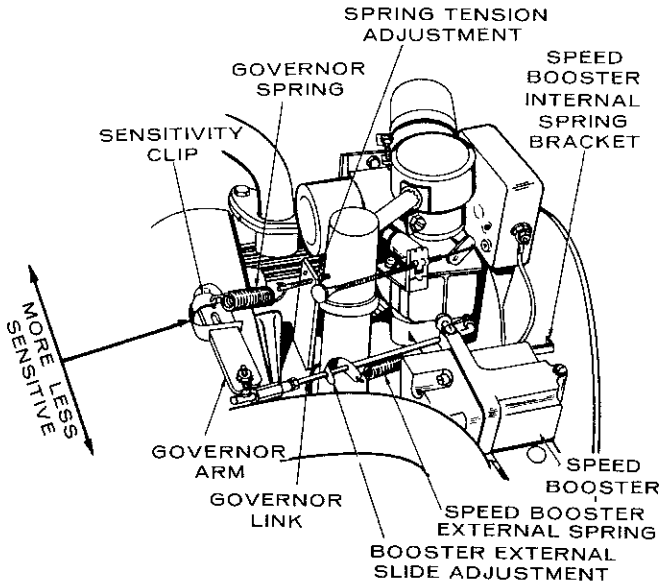


FIGURE 21. GOVERNOR AND SPEED BOOSTER

GOVERNOR

Before making any governor adjustments, run the generating set for at least 10 minutes to allow the engine to come up to operating temperature. Be sure the carburetor is adjusted before attempting to adjust governor. Also be sure to clean, check and lubricate the governor linkage before making any adjustments. Binding in the linkage joints can cause erratic operation.

NOTE: *If carburetor and the following governor adjustments have already been made and the governor action is still erratic, replace the governor spring (Figure 21) with a new one and readjust the governor. Springs lose their calibrated tension through fatigue after long usage.*

Speed Adjustment

1. Start generating set and allow to warm up without load.
2. Remove the speed booster external spring from the bracket slide on the governor link (Figure 21).
3. Refer to the voltage and speed charts. If needed, increase the speed by increasing tension on the govemor spring (Figure 21). Decrease tension on the governor spring to reduce speed.
4. Add a full-rated load to the generating set and compare lower speed and voltage with those shown in the charts. If operation does not remain in these

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 (Frequency)	63
Minimum Full-Load Speed (Without Booster)	
RPM	1770
Hertz (Frequency)	59

limits, check governor linkage and governor spring, and, if necessary, follow preceding procedure again.

5. Check and, if necessary, adjust governor sensitivity ("Sensitivity Adjustment").

Sensitivity Adjustment

1. Start generating set and allow to warm up.
2. Check voltage and speed, first without load and then with a full load. See voltage and speed charts.
3. Increase sensitivity (closer regulation) by shifting adjusting clip toward governor shaft (Figure 21). Move clip away from governor shaft to decrease sensitivity.

NOTE: *Too much sensitivity causes the engine to hunt. Too little sensitivity results in too much speed difference between no-load and full-load conditions.*

4. A change in sensitivity adjustment usually requires a compensating speed adjustment (spring tension). Then proceed to "Speed Booster."

Speed Booster

1. After sensitivity adjustment, connect booster external spring to slide on governor link (Figure 21).
2. With generating set running at no load, move adjustable slide to point where there is no tension on spring.
3. Apply full-rated load to generating set.
4. If the speed increases more than the no-load frequency when the load is applied, lessen the speed booster's internal spring tension. To change tension, pull out the spring bracket and move the pin to a different hole (Figure 21). If speed decreases when the load is applied, increase the booster's internal spring tension.

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 22. Loosen screws (A) and turn cam (B) until point gap measures .020 inch 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 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. See Figure 23.

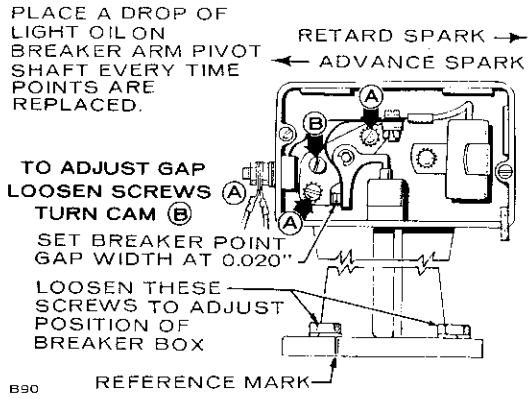


FIGURE 22. SETTING BREAKER POINTS

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 the engine is running. Connect

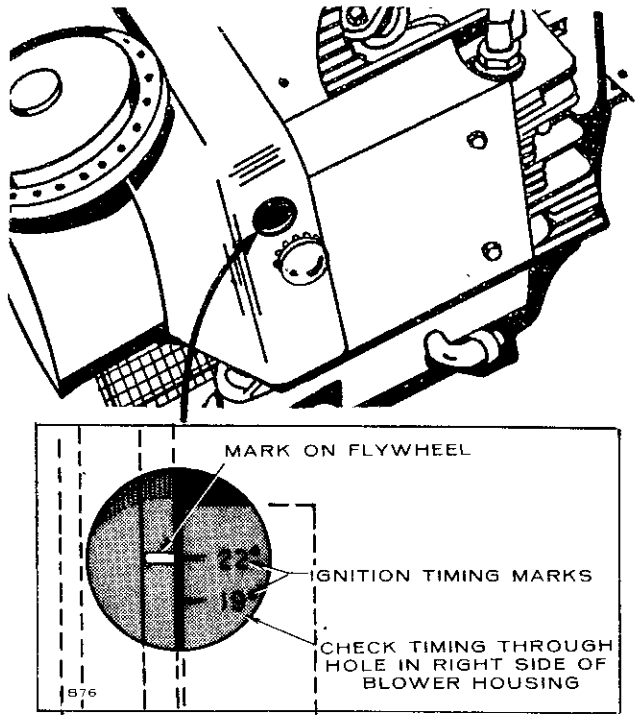


FIGURE 23. IGNITION TIMING MARKS

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).
4. If timing needs adjustment, loosen the mounting screws on the breaker box and move left to advance or right to retard the timing.

PARTS CATALOG

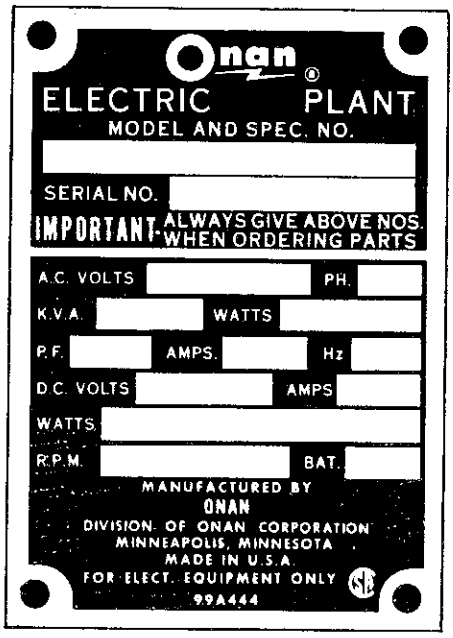
INSTRUCTIONS FOR ORDERING REPAIR PARTS

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 CCK Home Standby Generating Sets. Parts are arranged in groups of related items. Each illustrated part is identified by a reference number corresponding to the same reference number following the illustration. Parts illustrations are typical. Unless otherwise mentioned in the description, parts are interchangeable between models. Right and left plant sides are determined by *facing* the blower end (front) of the engine.

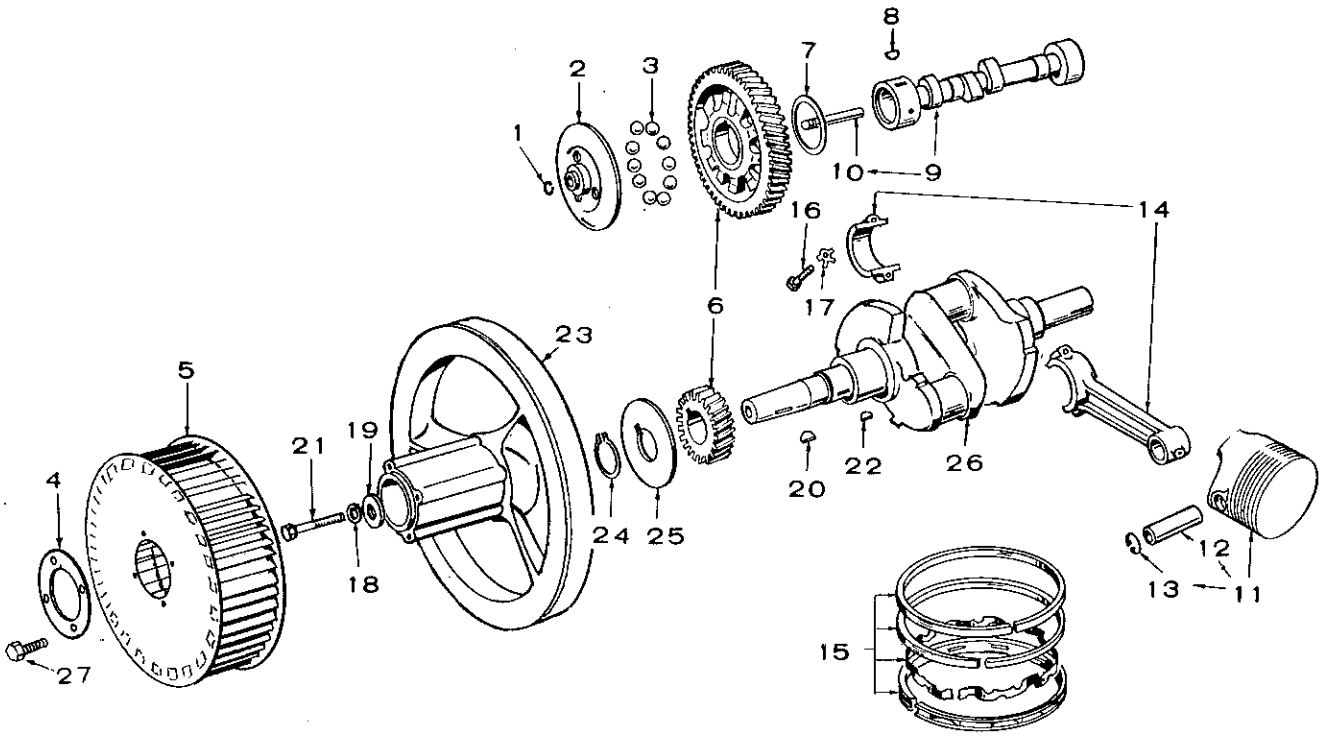
PLANT DATA TABLE

MODEL AND SPEC	ELECTRICAL DATA				
	WATTS	VOLTS	HERTZ	WIRE	PHASE
5.0CCK-3CE/*	5000	120/240	60	**	1

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

** - Plant is reconnectible for 120 volt, 2 wire; 240 volt, 2 wire or 120/240 volt, 3 wire service.

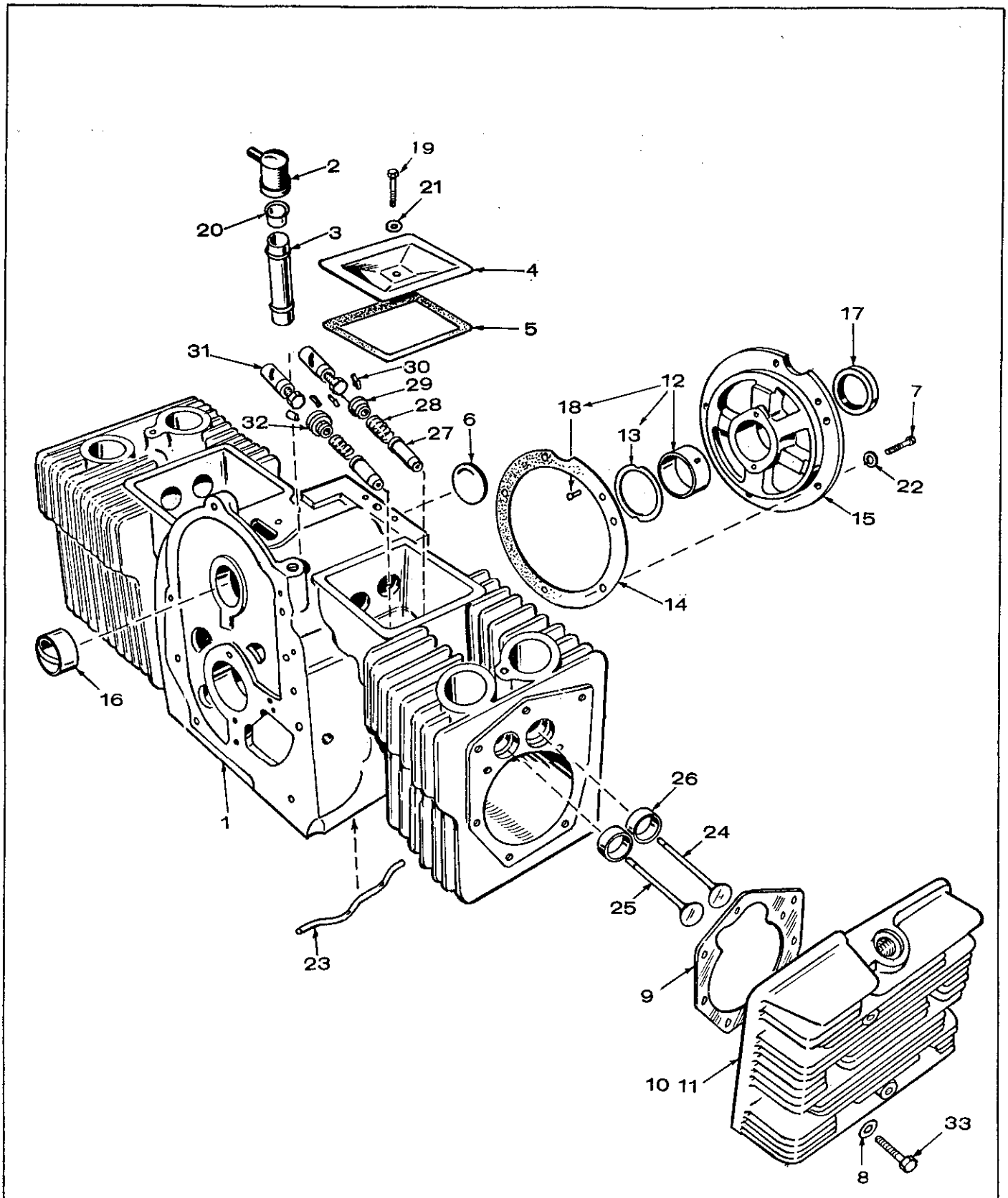
NOTE: Hertz is a unit of frequency equal to one cycle per second.



CRANKSHAFT, FLYWHEEL, CAMSHAFT AND PISTON GROUP

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	150-0078	1	Ring, Camshaft Center Pin
2	150-0612	1	Cup, Governor
3	510-0015	10	Ball, Governor Fly
4	134-0911	1	Plate, Blower Wheel - Prior to Spec N
5	134-0565	1	Wheel, Blower
6	105-0353	1	Gear Set, Timing (Includes Camshaft & Crankshaft Gears)
7	105-0004	1	Washer, Camshaft Gear Thrust
8	515-0001	1	Key, Camshaft Gear Mounting
9	105-0140	1	Camshaft (Includes Center Pin)
10	150-0075	1	Pin, Camshaft Center
11	PISTON & PIN (Includes Retainer Rings)		
	112-0071	2	Standard
	112-0071-10	2	.010 ″ Oversize
	112-0071-20	2	.020 ″ Oversize
	112-0071-30	2	.030 ″ Oversize
	112-0071-40	2	.040 ″ Oversize
12	PIN, PISTON		
	112-0069	2	Standard
	112-0069-02	2	.002 ″ Oversize
13	112-0003	4	Ring, Piston Pin Retainer

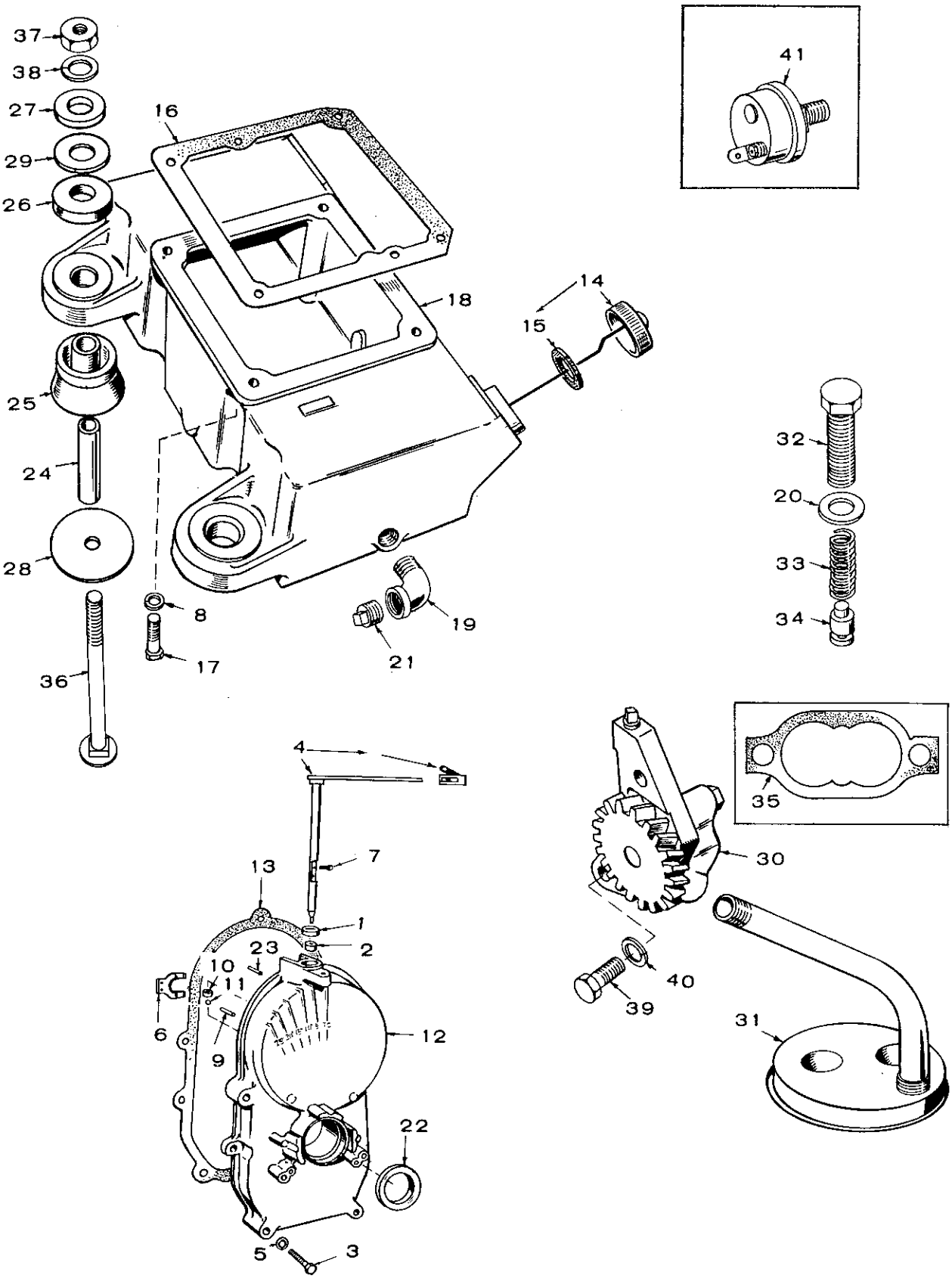
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
14	ROD, CONNECTING		
	114-0098	2	Standard
	114-0098-10	2	.010 ″ Undersize
	114-0098-20	2	.020 ″ Undersize
	114-0098-30	2	.030 ″ Undersize
15	RING SET, PISTON		
	113-0152	2	Standard
	113-0152-10	2	.010 ″ Oversize
	113-0152-20	2	.020 ″ Oversize
	113-0152-30	2	.030 ″ Oversize
	113-0152-40	2	.040 ″ Oversize
16	110-0284	4	Screw, Connecting Rod Cap
17	114-0059	4	Washer, Connecting Rod Cap Screw Lock
18	850-0055	1	Washer, Lock (7/16 ″)
19	526-0017	1	Washer, Wheel Mounting
20	515-0002	1	Key, Wheel Mounting
21	104-0170	1	Screw, Wheel Mounting
22	515-0001	1	Key, Crankshaft Gear Mounting
23	104-0499	1	Flywheel
24	518-0014	1	Lock, Crankshaft Gear Washer
25	104-0043	1	Washer, Crankshaft Gear Ret.
26	104-0578	1	Crankshaft
27	821-0010	4	Screw, Blower Wheel Mounting (1/4-20 x 1/2 ″)



CYLINDER BLOCK GROUP

REF. NO	PART NO.	QTY. USED	PART DESCRIPTION
1	110-0915	1	Block Assembly, Cylinder (Includes Parts Marked *)
2	123-0293	1	Cap, Breather Tube (Rubber)
3	123-0129	1	Tube, Breather (Includes Steel Baffles)
4	110-0666	2	Cover, Valve Compartment
5	110-0667	2	Gasket, Valve Cover
6	517-0048	1	*Plug, Camshaft Expansion
7	800-0512	5	Screw (5/16-18 x 1″) - Rear Bearing Plate Mounting
8	526-0208	18	Washer (Flat) - Cylinder Head Screws
9	110-0892	2	Gasket, Cylinder Head
10	110-0890	1	Head, Cylinder, Right, #2 Cylinder
11	110-0891	1	Head, Cylinder, Left, #1 Cylinder
12	*BEARING, CRANKSHAFT – FRONT OR REAR		
	101-0420	2	Standard
	101-0420-02	2	.002″ Undersize
	101-0420-10	2	.010″ Undersize
	101-0420-20	2	.020″ Undersize
	101-0420-30	2	.030″ Undersize
13	104-0575	2	*Washer, Crankshaft Bearing Thrust
14	101-0115	1	*Gasket Kit, Bearing Plate
15	101-0316	1	*Plate, Bearing (Excluding Bearing)
16	101-0367	2	*Bearing, Camshaft Front or Rear (Precision)
17	509-0041	1	Seal, Bearing Plate
18	516-0072	4	*Pin, Main Bearing Stop
19	800-0012	2	Screw (1/4-20 x 2-1/4″) - Valve Compartment Cover
20	123-0104	1	Valve, Breather Tube
21	526-0063	2	Washer (Copper), Valve Comp.
22	850-0045	5	*Washer, Lock (5/16 x Special Width) Rear Bearing Plate
23	120-0386	1	*Tube, Crankcase Oil
24	110-0881	2	Valve, Intake (Steel)
25	110-0880	2	Valve, Exhaust (Stellite)
26	*INSERT, EXHAUST VALVE SEAT (STELLITE)		
	110-0872	2	Standard
	110-0872-02	2	.002″ Oversize
	110-0872-05	2	.005″ Oversize
	110-0872-10	2	.010″ Oversize
	110-0872-25	2	.025″ Oversize
27	110-0902	4	*Guide, Valve
28	110-0539	4	Spring, Valve
29	110-0893	2	Washer, Valve Spring Retainer, Intake
30	110-0639	8	Lock, Valve & Spring Retainer
31	TAPPET, VALVE		
	115-0006	4	Standard
	115-0006-05	4	.005″ Oversize
32	110-0904	2	Rotocap, Exhaust Valve
33	SCREW, HEX HEAD CAP (HARDENED)		
	110-0879	8	Cylinder Head (5/16-18 x 1-1/4″)
	114-0022	10	Cylinder Head (5/16-18 x 1-3/4″)

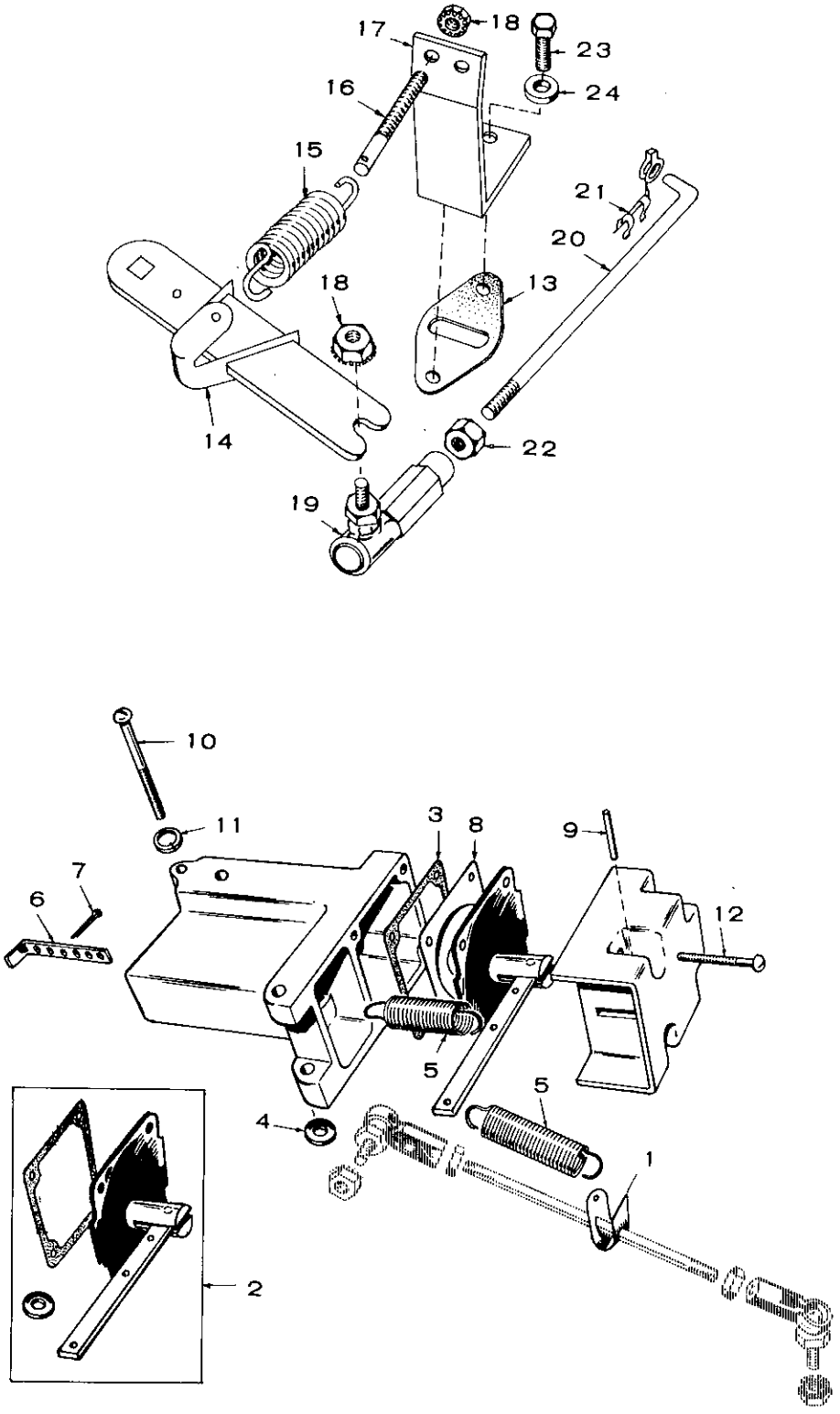
* - Included in #110-0915 Block Assembly.



GEAR COVER, OIL BASE AND OIL PUMP GROUP

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	509-0008	1	*Seal, Oil - Governor Shaft
2	510-0013	1	*Bearing, Governor Shaft Upper
3	SCREW, GEAR COVER MOUNTING		
	800-0032	4	5/16-18 x 1-3/4"
	800-0034	1	5/16-18 x 2-1/4"
4	150-1286	1	*Shaft & Arm Assembly, Governor (Includes Adjustable Clip)
5	850-0045	5	Washer, Lock (5/16")
6	150-1187	1	*Yoke, Governor Shaft
7	815-0046	2	*Screw (#8-32) - Governor Yoke Mounting
8	850-0050	4	Washer, Lock (3/8")
9	516-0130	1	*Pin, Governor Cup Stop (In Gear Cover)
10	510-0008	1	*Bearing, Governor Shaft, Lower
11	510-0014	1	*Ball, Bearing, Governor Shaft
12	103-0357	1	Cover Assembly, Gear (Includes Parts Marked *).
13	103-0011	1	Gasket, Gear Cover
14	123-0489	1	Indicator, Oil Fill
15	123-0191	1	Gasket, Oil Fill Cap
16	102-0158	1	Gasket, Oil Base Mounting
17	102-0455	4	Screw, Cap, Oil Base to Block
18	102-0579	1	Base, Oil
19	505-0050	1	Elbow, Street - Oil Drain
20	526-0066	1	Washer, Oil Pressure Relief Valve Adjusting Screw
21	505-0056	1	Plug, Oil Drain (1/2)
22	509-0040	1	*Seal, Gear Cover
23	516-0011	2	Pin, Gear Cover (5/16 x 1/8")
24	402-0290	4	+Bushing, Spacer, Vibration Mount
25	402-0283	4	+Cushion, Vibration
26	402-0282	4	+Snubber, Shock Mounting
27	526-0014	4	+Washer (29/64" I.D. x 1-1/2" O.D. x 1/8")
28	526-0182	8	+Washer (17/32" I.D. x 2-7/8" O.D. x 1/4")
29	526-0198	As Req	+Washer (5/8" I.D. x 1-1/2" O.D. x 1/16")
30	120-0491	1	Pump Oil, Complete (Internal Parts Not Sold Separately)
31	120-0400	1	Cup, Oil Pump Intake (Includes Pipe, Cup & Screen)
32	801-0048	1	Screw (3/8-24 x 3/4") - By-Pass Valve
33	120-0140	1	Spring, By-Pass Valve
34	120-0398	1	Valve, By-Pass
35	120-0161	1	Gasket Kit, Oil Pump
36	816-0211	4	+Bolt, Carriage (7/16-14 x 5") - Cushion Mounting
37	862-0004	4	+Nut (7/16-14)
38	850-0055	4	+Washer, Lock (7/16")
39	800-0007	2	Screw (1/4-20 x 1") - Oil Pump Mounting
40	850-0040	2	Washer, Lock (1/4)
41	309-0237	1	Switch, Low Oil Pressure
	402-0405	1	Hardware Package, Mounting (Includes Parts Marked +)

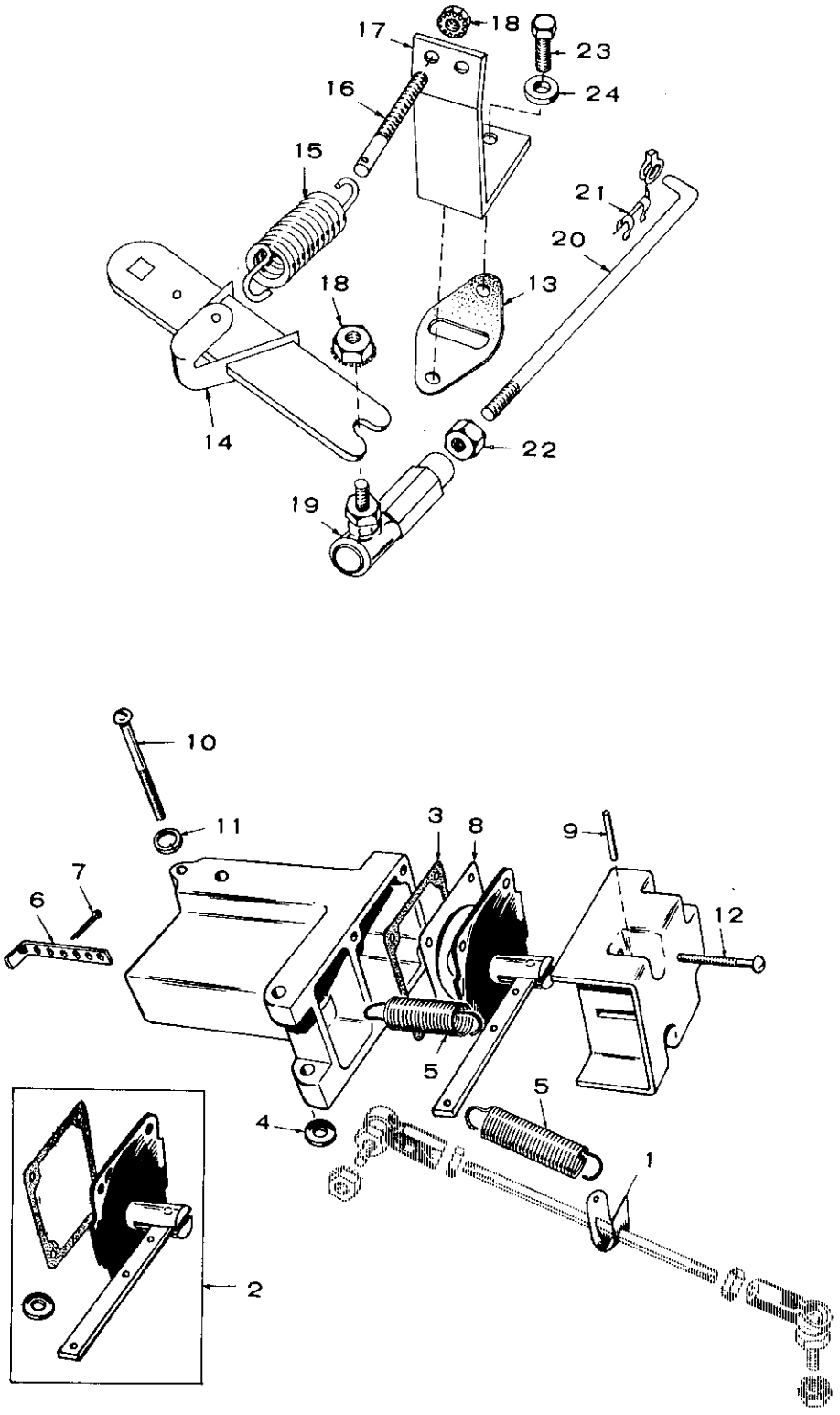
+ - Included in Mounting Hardware Package.
* - Included in Gear Cover Assembly.



VACUUM SPEED BOOSTER AND GOVERNOR GROUP

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	509-0008	1	*Seal, Oil - Governor Shaft
2	510-0013	1	*Bearing, Governor Shaft Upper
3	SCREW, GEAR COVER MOUNTING		
	800-0032	4	5/16-18 x 1-3/4"
	800-0034	1	5/16-18 x 2-1/4"
4	150-1286	1	*Shaft & Arm Assembly, Governor (Includes Adjustable Clip)
5	850-0045	5	Washer, Lock (5/16")
6	150-1187	1	*Yoke, Governor Shaft
7	815-0046	2	*Screw (#8-32) - Governor Yoke Mounting
8	850-0050	4	Washer, Lock (3/8")
9	516-0130	1	*Pin, Governor Cup Stop (In Gear Cover)
10	510-0008	1	*Bearing, Governor Shaft, Lower
11	510-0014	1	*Ball, Bearing, Governor Shaft
12	103-0357	1	Cover Assembly, Gear (Includes Parts Marked *) .
13	103-0011	1	Gasket, Gear Cover
14	123-0489	1	Indicator, Oil Fill
15	123-0191	1	Gasket, Oil Fill Cap
16	102-0158	1	Gasket, Oil Base Mounting
17	102-0455	4	Screw, Cap, Oil Base to Block
18	102-0579	1	Base, Oil
19	505-0050	1	Elbow, Street - Oil Drain
20	526-0066	1	Washer, Oil Pressure Relief Valve Adjusting Screw
21	505-0056	1	Plug, Oil Drain (1/2)
22	509-0040	1	*Seal, Gear Cover
23	516-0011	2	Pin, Gear Cover (5/16 x 1/8")
24	402-0290	4	+Bushing, Spacer, Vibration Mount
25	402-0283	4	+Cushion, Vibration
26	402-0282	4	+Snubber, Shock Mounting
27	526-0014	4	+Washer (29/64" I.D. x 1-1/2" O.D. x 1/8")
28	526-0182	8	+Washer (17/32" I.D. x 2-7/8" O.D. x 1/4")
29	526-0198	As Req	+Washer (5/8" I.D. x 1-1/2" O.D. x 1/16")
30	120-0491	1	Pump Oil, Complete (Internal Parts Not Sold Separately)
31	120-0400	1	Cup, Oil Pump Intake (Includes Pipe, Cup & Screen)
32	801-0048	1	Screw (3/8-24 x 3/4") - By-Pass Valve
33	120-0140	1	Spring, By-Pass Valve
34	120-0398	1	Valve, By-Pass
35	120-0161	1	Gasket Kit, Oil Pump
36	816-0211	4	+Bolt, Carriage (7/16-14 x 5") - Cushion Mounting
37	862-0004	4	+Nut (7/16-14)
38	850-0055	4	+Washer, Lock (7/16")
39	800-0007	2	Screw (1/4-20 x 1") - Oil Pump Mounting
40	850-0040	2	Washer, Lock (1/4)
41	309-0237	1	Switch, Low Oil Pressure
	402-0405	1	Hardware Package, Mounting (Includes Parts Marked +)

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

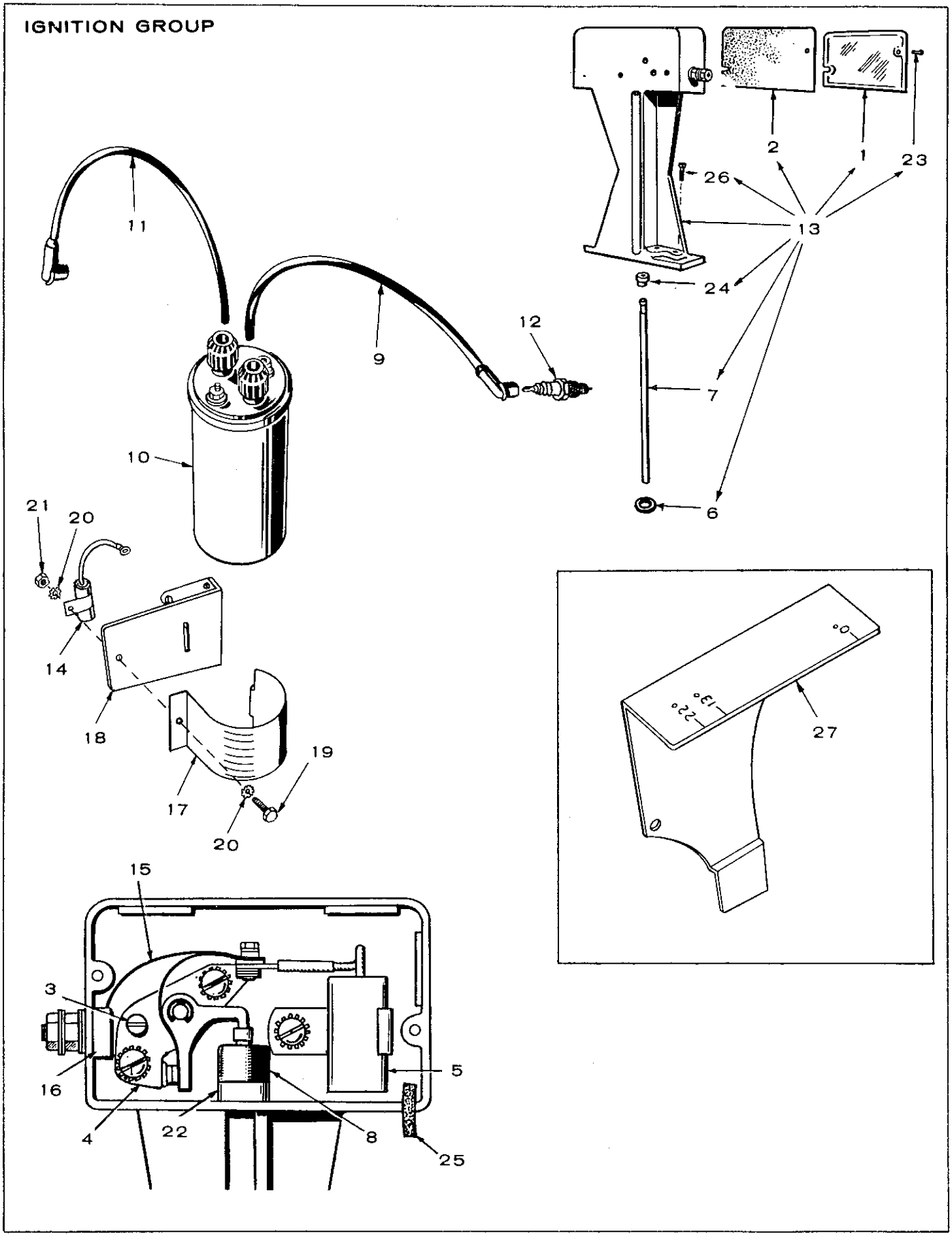


VACUUM SPEED BOOSTER AND GOVERNOR GROUP

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
	150-0433	1	Kit, Vacuum Speed Booster Replacement, Includes Ext. Spring & Mounting Gasket
1	150-0430	1	Bracket, Spring to Gov. Link
2	150-0434	1	Kit, Diaphragm Replacement, Includes Gaskets
3	150-0668	1	Gasket, Diaphragm Plate
4	150-0425	1	Gasket, Booster to Manifold
5	150-0366	2	Spring, Internal & External
6	150-0376	1	Bracket, Internal Spring Adjusting
7	516-0039	1	Pin, Cotter (3/32 x 5/8 ″) Adjusting Bracket
8	150-0666	1	Plate, Diaphragm
9	516-0085	1	Pin (3/32 x 3/4 ″) Diaphragm Lever Pivot
10	813-0010	2	Screw (10-32 x 2 ″) - Vacuum Booster Mounting
11	853-0008	2	Washer, Lock (#10)
12	815-0148	4	Screw (8-32 x 7/8 ″) - Cover Mounting
13	149-0003	1	Gasket, Bracket Mounting
14	150-0678	1	Clip, Governor Sensitivity Adjusting
15	150-0098	1	Spring, Governor
16	150-0096	1	Stud, Governor Speed Adjusting
17	150-0159	1	Bracket, Governor Spring
18	870-0131	2	Nut, Keps
19	150-0639	1	Joint, Ball - Governor Link
20	150-0629	1	Link, Governor Arm to Carburetor
21	518-0006	1	Clip, Rod End
22	870-0053	1	Nut, Hex (#10-32)
23	800-0004	2	Screw (1/4-20 x 5/8 ″) - Governor Bracket Mounting
24	526-0063	2	Washer (Copper) - Bracket Mounting

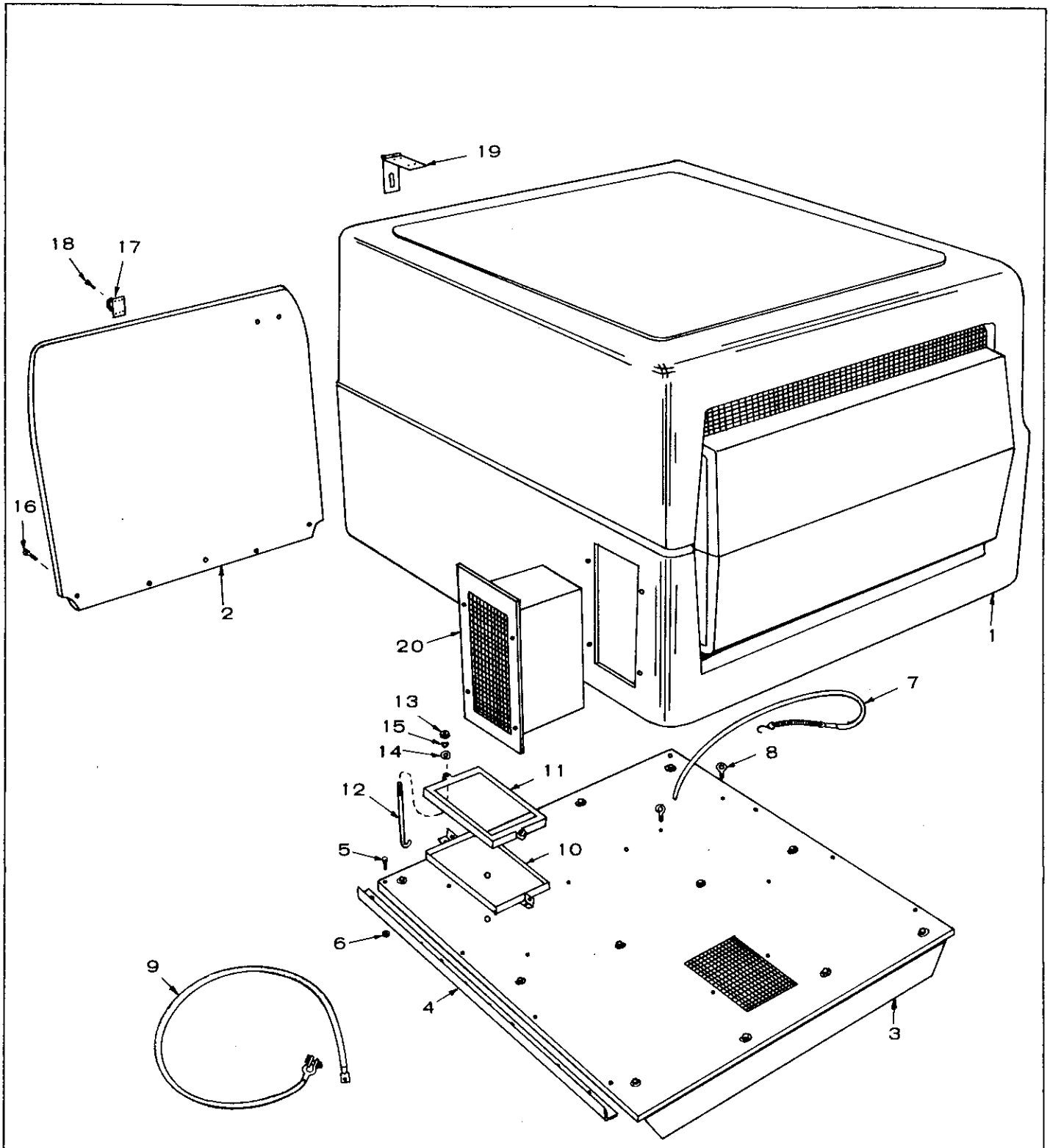
NOTE: Vacuum Booster Cover and Housing not sold Separately.

IGNITION GROUP



REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	160-0930	1	*Cover, Breaker Box
2	160-0150	1	*Gasket, Breaker Box Cover
3	160-0075	1	*Cam, Point Gap Adjusting
4	160-0002	1	*Point Set, Breaker
5	312-0069	1	*Condenser, Breaker Points
6	160-1040	1	*Gasket, Breaker Box Mounting
7	160-0723	1	*Plunger
8	160-1143	1	*Diaphragm, Breaker Box
9	167-1557	1	Cable (16-3/4″), Spark Plug
10	166-0535	1	Coil, Ignition
11	167-1558	1	Cable (12″), Spark Plug
12	167-0242	2	Plug, Spark
13	160-1135	1	Box, Breaker (Includes Parts Marked *)
14	312-0017	1	Condenser (.5 Mfd.), Ignition Coil Suppression
15	160-0428	1	*Strap, Point Set to Terminal Block
16	160-0349	1	*Block & Terminal Assembly
17	166-0588	1	Clamp, Coil
18	166-0590	1	Bracket, Coil Mounting
19	800-0004	1	Screw (1/4-20 x 5/8″) - Coil Clamp to Bracket
20	856-0006	2	Washer, Lock (1/4)
21	862-0001	1	Nut (1/4-20)
22	160-0931	1	*Guide, Plunger
23	812-0077	2	*Screw (8-32 x 3/8″) - Cover Mounting
24	160-1041	1	*Bushing, Breaker Box (Bottom)
25	160-0261	1	*Wick, Breaker Box
26	815-0357	2	*Screw, Mounting - Breaker Box
27	166-0519	1	Bracket, Timing

* - Included in Breaker Box Assembly.



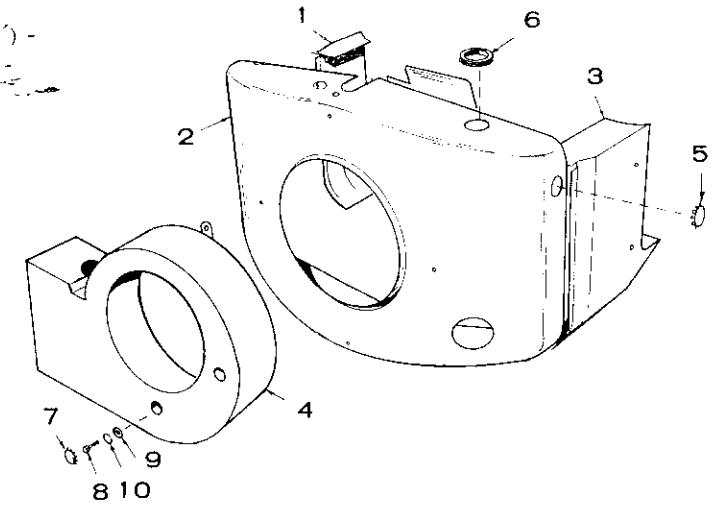
HOUSING GROUP

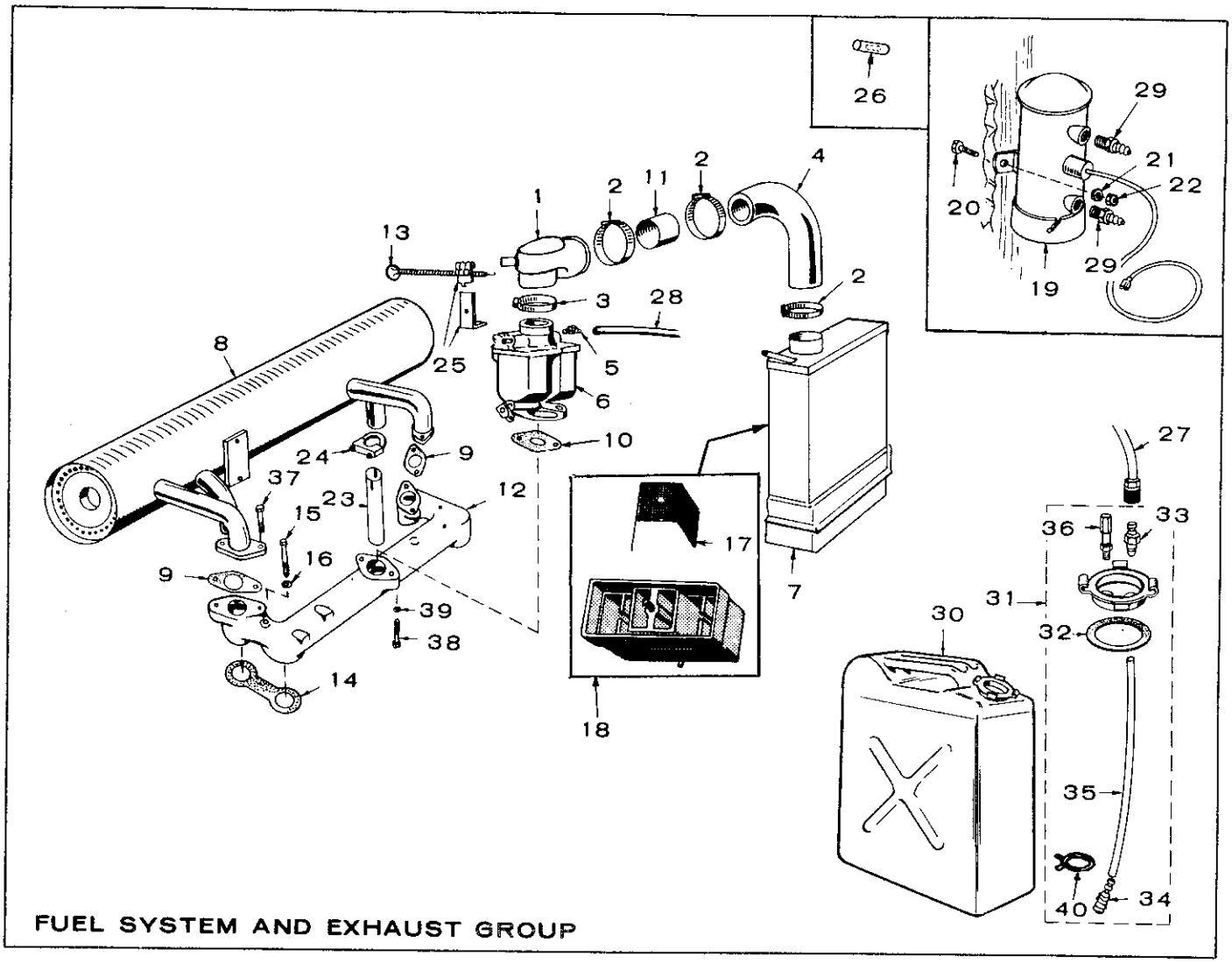
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	405-1928	1	Housing Assembly, Unit (Includes Parts Marked *)
2	405-1927	1	Panel, Rear Housing
3	403-1000	1	Base, Mounting
4	403-1001	2	Molding, Trim
5	813-0105	8	Screw (10-32 x 1-1/4″) - Trim Mounting
6	870-0131	8	Nut, Hex (10-32) - Trim Mounting
7	403-1002	1	Hold-Down Assembly, Fuel Tank
8	815-0363	4	Screw Eye, Wood - Fuel Tank Hold-down
9	CABLE, BATTERY		
	416-0049	1	Negative
	416-0549	1	Positive
10	416-0638	1	Tray, Battery
11	416-0612	1	Frame, Battery Hold-down
12	416-0541	2	Stud (5/16-18 x 7-1/2″) - Battery Hold-down
13	862-0015	2	Nut, Hex (5/16-18) - Battery Hold-down
14	526-0054	2	Washer, Flat (5/16″)
15	850-0045	2	Washer, Lock (5/16″)
16	815-0062	5	Bolt, Lag (3/8 x 3″) - Rear Housing Panel Mtg.
17	406-0360	1	Staple Plate, Hasp
18	815-0362	4	Screw, Wood (#8 x 3/4″) - Staple Plate Mounting
19	406-0359	1	*Hinge, Hasp
20	405-1925	1	*Duct, Air Housing
21	338-0721	1	Harness, Wiring

* - Included in Housing Assembly.

AIR HOUSING GROUP

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	134-0589	1	Housing, Cylinder Air, Left (#1 Cylinder)
2	134-2522	1	Housing, Blower
3	134-0588	1	Housing, Cylinder Air, Right (#2 Cylinder)
4	134-2524	1	Scroll, Air
5	517-0035	1	Plug, Dot Button (1-1/16″)
6	508-0166	1	Grommet, Rubber
7	517-0021	2	Plug, Dot Button (7/8″) - Air Scroll
8	800-0002	4	Screw (1/4-20 x 3/8″) - Scroll Mounting
9	526-0015	4	Washer, Flat (1/4″)
10	853-0013	4	Washer, Lock (1/4″)



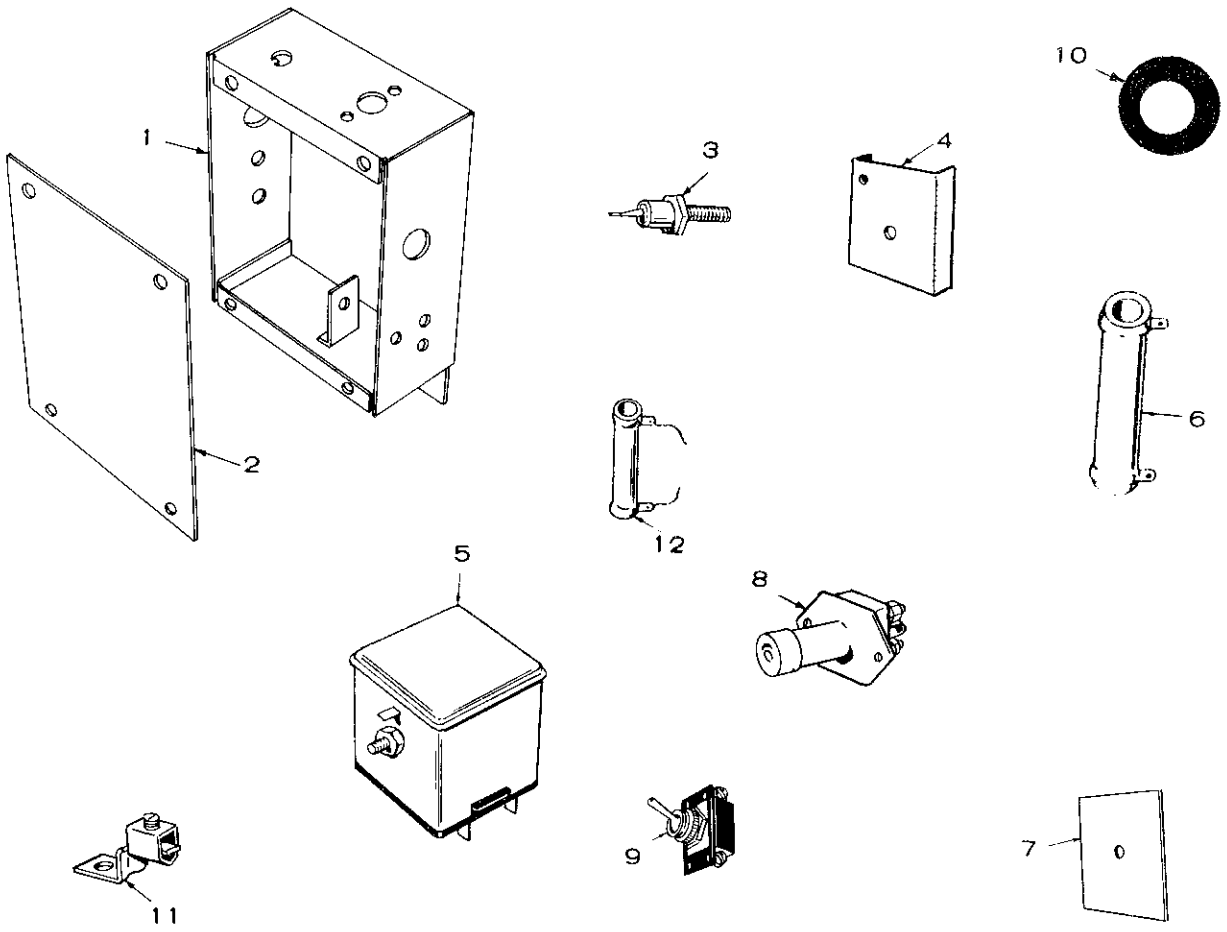


FUEL SYSTEM AND EXHAUST GROUP

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	145-0080	1	Inlet, Carburetor Air
2	503-0280	3	Clamp, Air Cleaner Hose
3	503-0107	1	Clamp, Air Inlet to Carburetor
4	503-0286	1	Hose, Air Cleaner
5	502-0313	1	Elbow (Inv. Male), Carburetor
6	142-0363	1	*Carburetor, Gasoline
7	140-0806	1	Cleaner, Air
8	155-1218	1	Muffler, Exhaust
9	154-0360	2	Gasket, Exhaust Manifold Mtg.
10	141-0078	1	Gasket, Carburetor Mounting
11	140-0211	1	Sleeve, Air Cleaner Hose
12	154-0383	1	Manifold, Intake
13	153-0351	1	Choke, Manual
14	154-0013	2	Gasket, Intake Manifold
15	800-0054	2	Screw (3/8-16 x 2 ″) - Intake Manifold Mounting
16	850-0050	2	Washer, Lock (3/8 ″)
17	140-0068	1	Screen, Air Cleaner
18	140-0403	1	Cup Assembly, Air Cleaner, Includes Screen
19	149-0650	1	Pump, Fuel (Electric)
20	800-0008	2	Screw (1/4-20 x 1-1/4 ″) - Fuel Pump Mounting
21	853-0013	3	Washer, Lock (1/4)
22	862-0001	2	Nut, Hex (1/4-20)
23	155-1195	1	Connector, Exhaust Tube

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
24	155-1015	1	Clamp, Muffler
25	153-0263	1	Bracket & Clip, Choke
26	332-0556	1	Connector, Fuel Pump Lead
27	159-0997	1	Line, Fuel - Tank to Pump
28	503-0652	1	Line, Fuel (31 ″) - Fuel Pump to Carburetor
29	502-0395	2	Connector, Hose - Pump Inlet and Outlet
30	159-1022	1	Tank, Fuel (5 Gal.)
31	159-0996	1	Cap & Pickup Assembly, Tank (Includes Parts Marked +)
32	159-1000	1	+Gasket, Fuel Tank Cap
33	502-0400	1	+Valve, Air Vent
34	502-0399	1	+Filter, Ball Check
35	503-0656	1	+Hose, Fuel
36	502-0398	1	+Coupling, Male
37	821-0016	4	Screw (5/16-18 x 3/4 ″) - Muffler Mounting
38	800-0009	2	Screw (1/4-20 x 1-1/2 ″) - Carburetor Mounting
39	850-0040	2	Washer, Lock (1/4 ″)
40	503-0301	3	Clamp, Hose

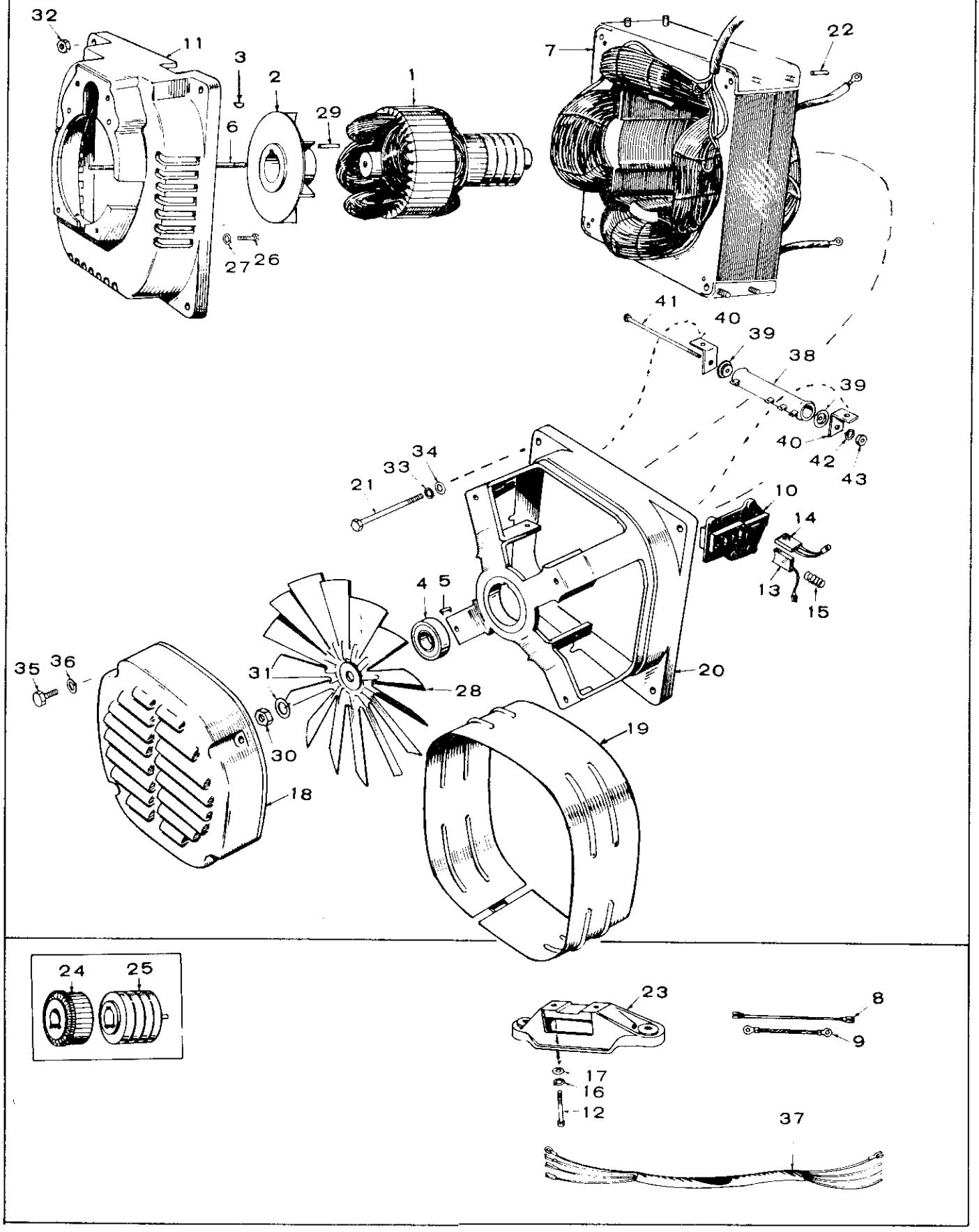
* - See Separate Group For Components and Service Kits.
+ - Included in Tank Cap and Pickup Assembly.



CONTROL GROUP

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	301-3452	1	Box, Control
2	301-3453	1	Cover, Control Box
3	305-0235	1	Rectifier - 10 Amp, 100 Volt
4	305-0254	1	Sink, Heat-Rectifier Mounting
5	307-1052	1	Relay, 6 Volt
6	353-0006	1	Resistor - 6-Ohm, 50 Watt
7	304-0292	1	Insulator, Resistor Mounting
8	308-0028	1	Switch, Start
9	308-0069	1	Switch, Ignition
10	508-0109	1	Grommet, Rubber - For 1" Hole
11	332-0142	1	Terminal, Ground
12	304-0251	1	Resistor - 30-Ohm, 5 Watt

GENERATOR GROUP

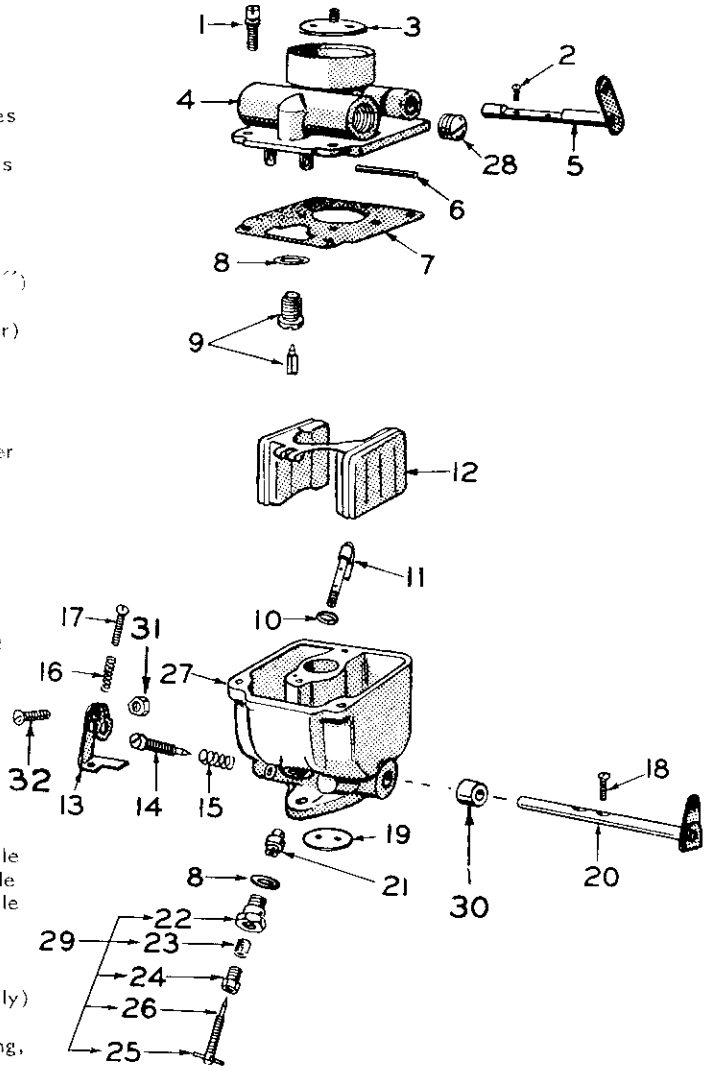


REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	201-1903	1	Rotor Assembly, Wound
2	232-2316	1	Hub, Drive
3	515-0006	1	Key, Rotor to Crankshaft
4	510-0047	1	Bearing (Ball), Rotor
5	232-0596	1	Clip, Bearing Stop
6	520-0733	1	Stud, Rotor Through
7	220-1816	1	Stator Assembly, Wound
8	LEAD ASSEMBLY, BRUSH		
	336-1891	4	Blade Type Terminals (9″)
	336-1890	1	Blade Type & Round Type Terminal (4″)
9	336-0186	2	Ground, Jumper (3-1/2″)
10	BLOCK ASSY., BRUSH (INCLUDES PARTS MARKED +)		
	212-0345	2	Lower & Right
	212-0346	2	Upper & Left
11	231-0164	1	Adapter, Generator to Engine
12	800-0051	2	Screw (3/8-16 x 1-1/4″) - Generator Support to Adapter
13	214-0095	4	+Brush, Commutator
14	214-0096	8	+Brush, Collector Ring
15	212-1232	12	+Spring, Brush
16	850-0050	2	Washer, Lock (3/8″)
17	526-0030	2	Washer, Flat (3/8″)
18	232-2107	1	Cover, Generator Fan
19	234-0362	1	Wrapper, End Bell
20	211-0187	1	Bell, End
21	800-0044	4	Screw, Generator Through (5/16-18 x 7-1/2″)
22	516-0182	8	Pin, Roll, Generator Frame (1/4 x 3/4″)
23	232-2321	1	Support, Generator
24	203-0152	1	Commutator
25	204-0110	1	Collector Ring
26	800-0051	4	Screw, Generator Adapter Mtg. (3/8-16 x 1-1/4″)
27	850-0050	4	Washer, Lock (3/8″)
28	205-0090	1	Fan, Generator
29	515-0007	1	Key, Drive Hub
30	867-0004	1	Nut, Hex (7/16-20)
31	850-0055	1	Washer, Lock (7/16)
32	862-0015	4	Nut, Hex (5/16-18) - Generator Through Screw
33	850-0045	4	Washer, Lock (5/16)
34	526-0115	4	Washer, Flat (5/16)
35	812-0156	4	Screw (1/4-20 x 1-1/2″) - Cover Mounting
36	850-0040	4	Washer, Lock (1/4)
37	338-0642	1	Harness Assembly, Wiring
38	353-0047	1	Resistor, Tapped
39	304-0015	2	Washer, Centering
40	304-0706	2	Bracket, Resistor Mounting
41	812-0118	1	Screw (10-24 x 5″) - Resistor Mounting
42	850-0030	1	Washer, Lock (#10)
43	860-0011	1	Nut, Hex (10-24)

+ - Included in Brush Block Assembly.

CARBURETOR PARTS GROUP

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
	142-0363	1	Carburetor, Gasoline
	142-0033	1	**Gasket Kit, Carburetor (Includes Parts Marked *)
	142-0371	1	*Repair Kit, Carburetor (Includes Parts Marked **)
1	SCREW, BOWL COVER		
	815-0103	1	#10-24 x 1/2"
	815-0109	2	#10-24 x 5/8"
2	815-0091	2	**Screw, Choke Fly (4-40 x 3/16")
3	142-0055	1	Fly, Choke
4	142-0205	1	Sleeve Assembly, Choke (Cover)
5	142-0217	1	Shaft Assembly, Choke
6	142-0039	1	**Shaft, Float
7	142-0031	1	*Gasket, Body to Bowl
8	148-0017	2	*Gasket, (1) Float Valve Seat, (1) Main Adj. Needle Retainer
9	142-0049	1	**Valve & Seat Assembly
10	142-0032	1	*Gasket, Nozzle
11	142-0285	1	Nozzle Assembly
12	142-0361	1	Float & Lever Assembly
13	145-0008	1	Lever, Throttle Stop
14	142-0040	1	**Needle, Idle Adjusting
15	142-0282	1	Spring, Idle Needle Adjusting
16	142-0035	1	Spring, Throttle Stop Adjusting Screw
17	812-0063	1	Screw, Throttle Stop Adjusting (#6-32 x 1/2")
18	815-0072	2	**Screw, Throttle Fly (#4-40 x 1/4")
19	142-0369	1	Fly, Throttle
20	142-0368	1	**Shaft Assembly, Throttle
21	142-0370	1	Nut & Jet, Nozzle
22	142-0046	1	Retainer, Main Adjusting Needle
23	142-0206	1	*Packing, Main Adjusting Needle
24	142-0045	1	Retainer, Main Adjusting Needle Package
25	516-0027	1	Pin, Main Adjusting Needle
26	142-0041	1	**Needle, Main Adjusting
27		1	Body Assy. (Not Sold Separately)
28	505-0053	1	Plug, Gas Inlet
29	142-0042	1	Needle Assy. (Includes Packing, Nut & Retainer)
30	142-0343	2	Bushing, Throttle Shaft
31	870-0053	1	Nut, Throttle Stop
32	813-0102	1	Screw, Throttle Stop Clamp



* - Parts Contained in Gasket Kit #142-0033.
** - Parts Contained in Repair Kit #142-0371.

SERVICE KITS AND MISCELLANEOUS

PART NO.	QTY. USED	PART DESCRIPTION
98-1100	1	Decal Kit
160-0836	1	Ignition Tune-Up Kit
168-0103	1	Gasket Kit, Plant
168-0095	1	Gasket Kit, Carbon Removal
522-0164	1	Overhaul Kit, Engine
525-0137		Paint, Touch-Up (Pressurized Can) 16 oz., Green Enamel

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

CUSTOMER SERVICES

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

QUALITY OF PRODUCT

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

GENERAL WARRANTY PRACTICES

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

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

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

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

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

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

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

MAINTENANCE

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

Maintenance is divided into two categories:

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

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

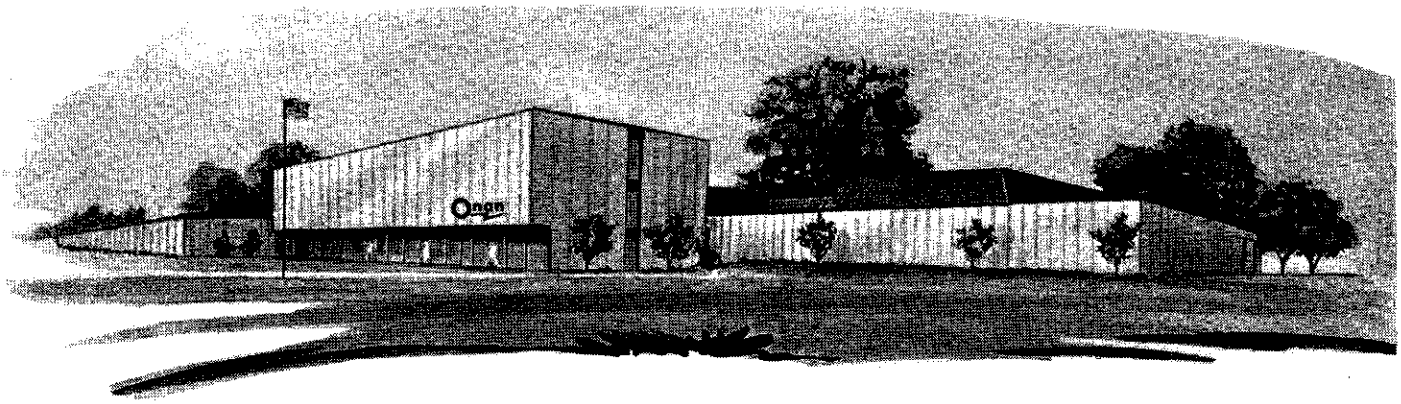
INSTALLATION

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

Onan

Minneapolis, Minnesota 55432

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



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