Forney

MODEL F-85
DC WELDER & AC POWER PLANT

Operating and Service Instructions

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Arc Welders Ltd. CANADA

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FORNEY MODEL F-85

DC WELDER AND AC POWER PLANT

OPERATING INSTRUCTIONS

This PORTABLE 240 AMP DC WELDER AND AC POWER PLANT which you have just purchased is a very useful and important piece of equipment. It is part of an extensive line of products manufactured by Forney Manufacturing Company, a Division of Forney Industries, Inc. The unit was engineered by Forney for long life and dependability coupled with ease of operation. The years of satisfactory, trouble free, dependable service that are built into this unit can be easily obtained by operating the unit as outlined in these instructions.

The unit Serial Number is stamped on the base below the front case panel. Write the engine serial number, the unit serial number, and the date purchased below and save this manual for reference. Be sure to mention these serial numbers and date purchased in any correspondence about the unit.

Model F-85 Serial Number _____

Engine Serial Number _____

Date Purchased _____

This Model F-85 is constructed in a rugged compact unit designed to withstand long hours of continuous service. The base is equipped with four openings for insertion of two lifting handles for use when the unit is to be manually transported. The large strap at the top of the unit is convenient for lifting the Model F-85 by means of overhead support.

The Model F-85 is designed to furnish portable DC welding current for use on jobs, in areas, and at locations where other sources of welding current are not available or practical for the work being performed. Also this unit will produce adequate 115 volt auxiliary power for use in emergencies or at locations away from normal power service. (230 volt two wire units are also available.)

DC WELDER USES

DC welding is used for those welding applications which require a different rate of heat development in the electrode than in the work. (AC welding gives an equal rate of heat development.) DC current is assumed to flow from the positive terminal through the arc and back to the negative terminal. When an arc is established using direct current, more heat is liberated at the positive side of arc. This gives considerable control of penetration since the electrode can be made either positive or negative by changing the cable plugs on the Model F-85.

MODEL F-85
SPECIFICATIONS

DC WELDING OUTPUT

Maximum Output	240 Amps		
Range	30 - 240 Amps	Duty Cycle	50% @ 240 Amps
Heat Stages	32		100% @ 175 Amps
Voltage @ Full Load	30 Volts		

AC POWER OUTPUT

Voltage	115 (230)	Maximum total wattage	3500
Frequency	60 cycles	Maximum total amperage	30
Phase	single	Size of Breaker @ each 115 volt outlet	20 Amps
		(230 volt outlet)	(15)

ENGINE AND GENERATOR

Consult separate Instruction Manual for Onan Engine and Generator Specifications.

OVERALL DIMENSIONS

Shipping	35½" high x 24" wide x 35" long
Uncrated	29½" high x 22" wide x 35" long

WEIGHT Shipping 500 pounds Net 460 pounds

BEFORE OPERATING THE UNIT

Before you attempt to start and operate the unit, inspect it carefully to determine if any damage has occurred in shipping and handling. Also check the engine carefully to see that the oil level is proper for correct operation. A SEPARATE INSTRUCTION MANUAL IS PROVIDED FOR THE ONAN ENGINE AND GENERATOR. Read this manual carefully, doing so may save you valuable time and expense later on.

STARTING THE ENGINE

Procedures for starting the engine and preparing the unit for receiving a load are given in the Onan Manual. Re-read that portion of the manual to review the steps leading up to the application of a load on the engine.

BREAKING IN THE ENGINE

Before applying a full load to a new or reconditioned engine, the engine should be broken in the same as would be with an automobile engine. This break-in period consists of first applying a small load to the unit and then make gradual increases until a full load can be applied. The chart on Page 3 is the recommended method of breaking in your Model F-85 engine.

NOTE: Gasoline engines require several more hours of use - after the original break-in period - before they reach their maximum output. This engine should noticeably increase in output capacity for the first 15-20 hours use. The increase will then become less noticeable and after about 50 hours of use the engine will level off at its maximum capacity. Consult the ENGINE INSTRUCTION MANUAL if you detect any troubles in the operation of the engine.

MODEL F-85
BREAK-IN LOAD CHART

1st ½ hour	Apply 1500 watt AC power load
2nd ½ hour	Increase AC power load to about 3000 watts
3rd ½ hour	Apply DC welding loads up to 145 Amps (observe 20% duty cycle for this period)
4th ½ hour	Increase welding loads up to 200 Amps (observe 20% duty cycle)
5th ½ hour	Normal loads can now be applied as desired (observe 20% duty cycle until the unit has run at least 5 hours)

FOR AC POWER

Shift the speed control lever to the right hand (POWER) position. This cuts off the welding current and turns on the power. Also the governor is automatically reset to maintain the engine speed at 1800 RPM to give governor-controlled, 60 cycle AC current.

Connect the AC load into either or both of the safety grounded receptacles. Each receptacle is equipped with a breaker for protection of the individual circuit. The breaker will trip and must be reset if the receptacle load is increased over the limit. Overloading the unit by exceeding the total load limit will tend to greatly reduce the engine speed and the voltage of the AC power will drop below the desired level.

Low voltage due to overload will not harm the unit but caution should be observed in order to avoid damage to the equipment being supplied with AC power.

CONNECTING THE WELDING CABLES

There are two types of DC welding applications. They are distinguished by the polarity of the work and the electrode holder and are referred to as "STRAIGHT" and "REVERSED" polarity.

"Straight Polarity" (DCSP) DC welding (work positive, electrode negative) is used in those applications where it is desirable to heat the work more than the electrode. This enables higher amperages to be used with small diameter electrodes (welding rods) resulting in deep narrow welds.

"Reversed Polarity" (DCRP) DC welding (work negative, electrode positive) is used in those applications where the greater heat concentration is desired in the electrode and not in the work. The use of larger than normal rods is required and the resulting deposits of molten metal form a wide shallow weld. There is also a slight cleaning action on the work obtained just ahead of the electrode. This is very advantageous, especially when welding aluminum.

For "Straight Polarity" (DCSP) output from your Model F-85, connect the work clamp cable (red sleeved plug) into the desired amperage positive heat jack (red buttons) on the welder panel. Then the electrode holder cable (black sleeved plug) should be connected into the desired LOW, MED LOW, MED HIGH, or HIGH negative jack (black buttons). Note the correlation between the four amperages marked at each positive jack and the corresponding negative jack. The first positive heat jack is marked 30 40 and

35 50

for welding at 35 amps put the negative cable plug in the MED LOW jack, for 40 amps use the MED HIGH, etc.

With this Straight Polarity (DCSP) the work is positive and the electrode negative resulting in a higher concentration of the welding arc heat in the work than on the electrode end.

For "Reverse Polarity" (DCRP) output from your Model F-85, reverse the red and black sleeved cables. Thus the red sleeved work cable is plugged into a black buttoned negative jack and the black sleeved electrode cable is plugged into a red buttoned positive jack. This Reverse Polarity (DCRP) welding current makes the arc heat concentration on the electrode end rather than in the work resulting in faster depositing of the electrode metal in a broad shallow weld.

The cable plugs have the colored sleeves to help in preventing polarity mistakes. Remember:

1. For straight polarity the electrode is negative and the cable sleeve colors are matched to the button colors.
2. For reverse polarity the electrode is positive and the cable sleeve colors are reversed to the button colors.

WHEN TO USE STRAIGHT OR REVERSED POLARITY

Straight polarity is preferred for welding mild steel and other general welding applications. Also heavy work such as steel plates, beams etc., are welded best with straight polarity since more of the base metal is melted for fusion and fewer electrodes are consumed.

Use reverse polarity when welding thin sheets, cast iron, bronze, or aluminum. With such metals it is desirable to keep the base metal temperature as low as possible during the welding process.

ELECTRODES TO USE

Most electrode manufacturers specify which of their electrodes may be used for DC welding. Also it is common practice for electrode manufacturers to specify straight or reverse polarity to be used with each type electrode. The welding current must be of the correct polarity for the type of electrode being used.

For example, a reverse polarity electrode will not work properly when the welder cables are connected for straight polarity. Whenever possible, always consult the original electrode container to see if the polarity is specified for the particular electrode being used.

GENERAL NOTES

THIS IS A RUGGED WELL-BUILT PIECE OF EQUIPMENT WHICH WILL LAST FOR MANY YEARS WITH A MINIMUM AMOUNT OF ATTENTION. HOWEVER, A LITTLE EXTRA TIME SPENT IN PREVENTATIVE MAINTENANCE AND IN SERVICING THIS UNIT WILL PAY OFF IN DIVIDENDS AMOUNTING TO DOUBLING THE USEFUL LIFE OF THE UNIT.

a. Protect the unit from the weather by using a canvas or plastic cover whenever possible (avoid placing a cover over a unit which is still hot from running; allow it to cool first.)

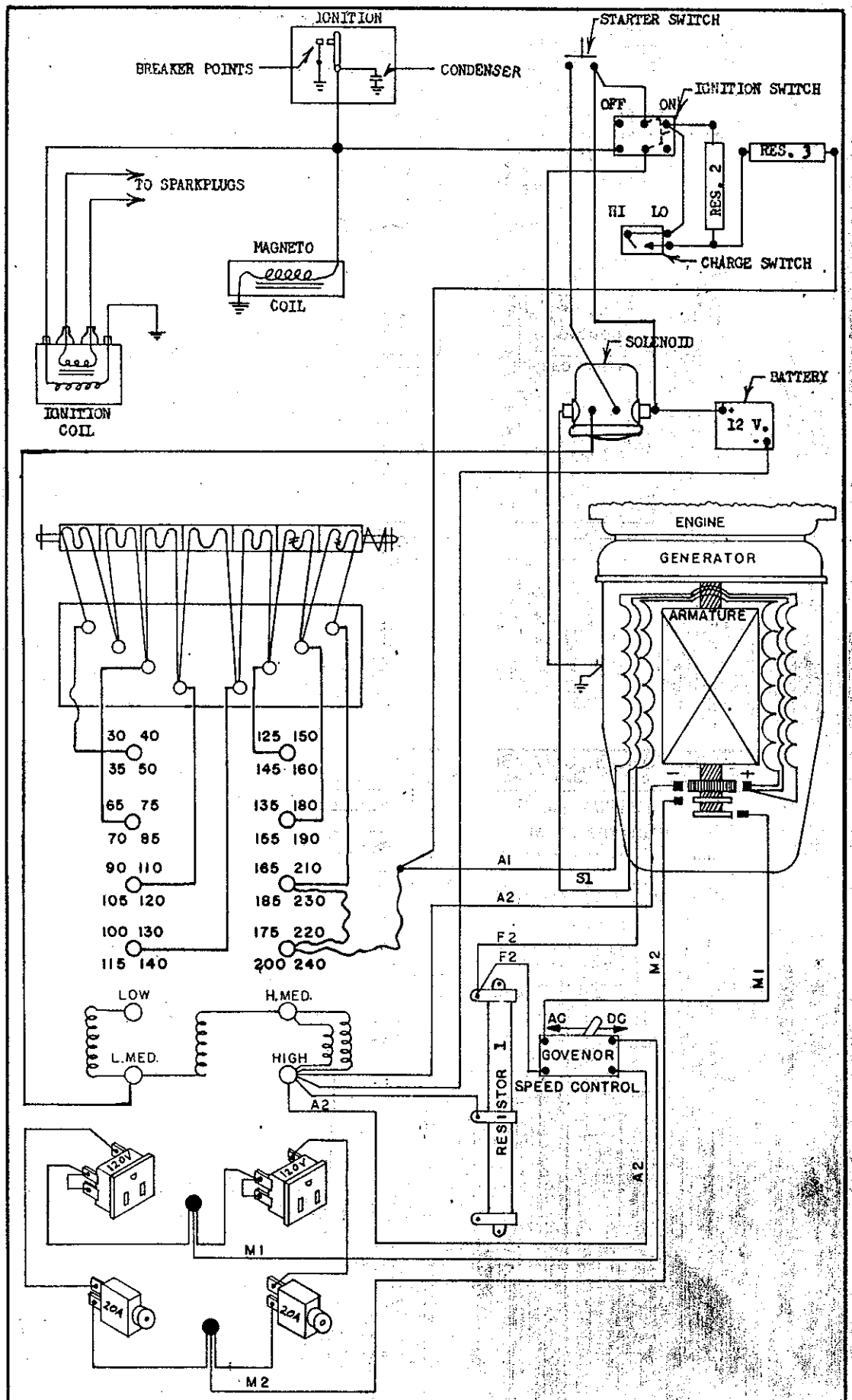
b. Keep the unit wiped free of dust, dirt, and oil to provide neater appearance and better cooling.

c. Wax the welder case the same as you would a car finish.

d. Keep all bolts, nuts, clamps and other connections tight. A loose bolt or nut is easily tightened but if let go, it can end up resulting in a broken part.

e. Keep your electrode holder and work clamp clean and free of deposits or corrosion. Also the cable plugs should be inspected frequently.

f. Use clean fresh regular grade fuel and keep the gas tank full to prevent moisture condensation in the gas tank. Use a funnel with a filter screen to keep foreign material out of the fuel supply.



SCHEMATIC, ELECTRICAL
DC WELDER, AC POWER PLANT COMB. "F 85 W-ST SPEC #115

DRAWN	W. P.
DATE	10-2-65

FORNEY MANUFACTURING CO.
DIV. OF FORNEY INDUSTRIES INC.

DWG. NO. 8308

PARTS — NOT AVAILABLE

FORNEY MODEL F-85
DC Welder and AC Power Plant

Parts Price List
Welder-Power Assembly Only*

ITEM*	PART NO.	NO. REQ'D. F-85	PART NAME	RETAIL PRICE EACH
2	50400	2	Breaker, 115V, 20 amp	$ 2.05
21-22	57500	12	Jacks, Output w/washers	1.00
	57501R	8	Buttons, Plastic Red	.20
	57501B	4	Buttons, Plastic Black	.20
1	58200	2	Outlets 115 volt	.65
NOT AVAIL.	8310	1	Case, Front Center	8.75
NOT AVAIL	8318	1	Case, Front Left	5.75
NOT AVAIL	8319	1	Case, Front Right	5.75
NOT AVAIL	8317	1	Case, Top & Sides	9.75
NOT AVAIL	8316	1	Case, Rear	17.20
NOT AVAIL	8320	1	Base Frame	52.25
NOT AVAIL	8329	1	Gas Tank	23.50
NOT AVAIL	8329-5	1	Fuel Strainer	1.70
26	8328	1	Panel, Resistor Mt'g.	5.50
4, 5, 6	8335	4	Resistor, Lo-Hi Neg.	3.00
3	8330-16	1	Resistor, Voltage, 25 ohm 70 watt	5.15

1965 prices

* Contact your nearest ONAN Parts-Service Center for parts not listed here.

Always give model and serial number when ordering parts. Send orders to Service Department, Forney Mfg. Co., Div., Forney Industries, Inc., Fort Collins, Colo.

FORNEY MANUFACTURING CO.
Div., Forney Industries, Inc.
Fort Collins, Colo.

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