

# FORNEY

## FS-250 AC/DC

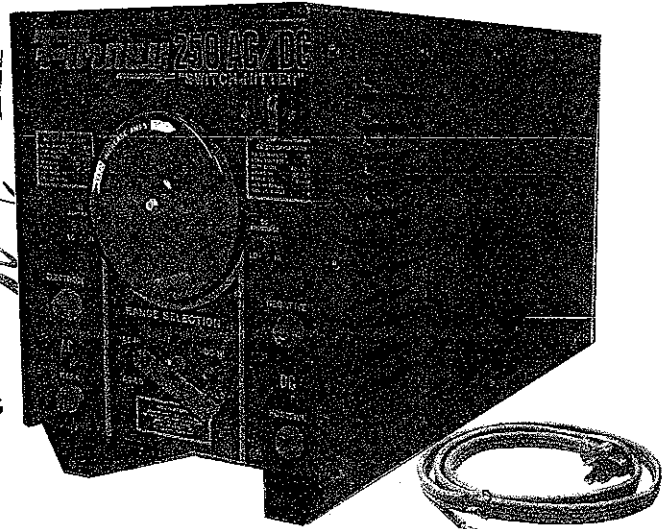
### "SWITCH-HITTER" ALL PURPOSE WELDER

**For Schools,  
Commercial Shops,  
Light Production  
& Maintenance Repair  
Requirements**

**LETS YOU USE  
ALMOST ANY ROD —  
IN ANY POSITION —  
WITH ANY METAL**



CATALOG  
NO. 325-0



#### CHARACTERISTICS

1. Stepless current control - for exact amperage required.
2. High and Low Ranges for flexibility and ease in handling problem rods. Quick and easy to change.
3. Fan cooled - allows long periods of use.
4. Designed to operate more quietly.
5. Insulation - double dipped and baked.
6. "Quick View" amperage window indicates at a glance the selected amperage for both AC and DC.
7. On-Off Switch conveniently located on the front of the unit.
8. One Switch selects AC Hi - AC Lo, DC Hi - DC Lo.
9. Diodes and Transformer tunnel cooled.
10. Separate AC & DC plug-ins below appropriate readout.
11. Optional power lead-in cable with connecting lugs.

#### VERSATILE

May be used for all types of arc welding, including cutting, gouging and hardfacing. Carbon Arc Torch optional. Ideal for brazing, heating and forming.

#### LEAD-IN CORD SET - OPTIONAL

10' 6-6-8 heavy duty lead-in cable complete with flat blade male plug and with lugs for direct connection to receptacle in rear of welder  
Catalog No. 52080-0

#### SPECIFICATIONS

	AC*	DC
Rated amperes at		
AC 30 Volts load		
20% Duty Cycle	250	
DC 25 Volts load		
20% Duty Cycle		250
Current ranges (amperes) Max.		
Low range	25-215	15-180
High range	35-315	25-250
Open circuit volts		
Low ranges, Max.	80	80
High ranges, Max.	78	78
Primary Input at	VOLTS AC	Amperes AC
250 Amperes, at 30 volt load	230/460	88/44
295 Amperes, at 30 volt load	230/460	97/49
315 Amperes, at 30 volt load	230/460	105/53
*KVA-20.3, KW-11.0		
Size: Height-19.5"	Width-15.5"	Depth-31.5"
Weight: Net - 165.0 lbs. Shipping 172.0 lbs.		

#### GUARANTEE & WARRANTY

All parts are warranted against defects in workmanship and material for a period of one year and transformer is guaranteed against burn out for three years from date of purchase by the original owner.  
DC rectification is made through high efficiency full wave type hermetically sealed silicon diode rectifiers and each diode is backed by a lifetime warrantee and if ever damaged can be individually replaced.

**FORNEY ARC WELDERS DIV. OF FORNEY INDUSTRIES, INC. Fort Collins, Colorado, U.S.A. Regina, Sask., Canada**



# MODEL FS-250 AC/DC "SWITCH-HITTER"

## COMBINATION AC-DC WELDER

### Operating and Service Instructions



**Foreney**  
INDUSTRIES, INC.

Fort Collins, Colorado, U.S.A.  
Regina, Sask., Canada

Rev. 5-18-79

O-139

#### MODEL 250 AC-DC "SWITCH HITTER" VERTICAL SHUNT WELDER GENERAL INFORMATION AND PARTS LIST 27400

##### 1. GENERAL

This AC-DC arc welder is a precision engineered, quality manufactured machine designed for long life and dependable service. It is an easy-to-use practical welder for general repair shops--light manufacturing--farm repair--body and sheet metal work.

This combination unit has two output welding ranges for AC welding current and two for DC welding current with stepless amperage settings within each range. The indicator arms (visible through slots in front panel) indicate at a glance the amperage you have selected on either the AC side or the DC side.

The information presented herein has been prepared especially for familiarization with design, installation, operation and maintenance of the welding machine. All material presented here should be given careful attention to assure maximum performance and service of the equipment.

##### 2. INITIAL INSPECTION

Upon receipt of your welding machine it should be uncrated and inspected. Remove all packing material from around the unit and examine it carefully for damage that may have been caused in shipment. Any claims for loss or damage that occurred in transit must be filed by the buyer with the carrier. Copies of the bill of lading and freight bill can be obtained from the carrier if occasion to file claim arises.

##### 3. SAFETY PRECAUTIONS

Always employ safety precautions when operating an arc welder to insure maximum personal safety and the safety of nearby persons and observe all operating instructions.

Protection from electrical shock

\* Be sure your power supply to the welder is adequate rating of voltage, Amperage, Frequency (Hertz Cycles) for the specification Markings on the welder. Be sure the Power Supply meets the National Electrical Code and Related Local Codes. The safety ground wire must be properly connected.

\* When welder is turned on and the electrode and ground cable are plugged into welder, the ground clamp and holder are electrically energized ready to weld. Do not permit uninsulated parts of holder, clamp or plugs to come in contact with bare skin or wet clothing.

\* Insulate yourself from damp or wet ground or from metal pipe, Gratings, floor, etc. while operating welder.

\* Use electrode holders that are fully insulated. Maintain holder, clamp, connections and plugs in good safe operating condition. Replace frayed or worn cables.

\* Always use a good welding helmet to protect eyes and face from rays and sparks of the arc when welding or observing Arc Welding. Use approved filter lens with cover plate. Lens should be shade 10-12 and conform to ANSI Z87.1 standards. Provide non-reflective screens to protect nearby personnel and/or make suitable warning.

\* Wear suitable clothing to protect skin from arc rays and arc splatter. Wear leather gauntlet welding gloves and additional special protective garments as required. Other recommendations are cufflers trousers, cap to protect hair, high shoes, ear plugs on high level or overhead welding.

\* Wear safety glasses or shield when in shop or welding area near grinding or slag chipping.

\* Remove all fire hazards away from welding area, or properly cover with non-inflammable material. Welding sparks can penetrate small openings or cracks.

\* Do not weld near chlorinated Hydrocarbon vapors coming from cleaning or degreasing situations. Arc rays and heat can react with these vapors and form toxic gases and other irritating substances.

\* Do not weld on, heat, or cut; tanks, drums, hollow castings, pipe, etc., until proper actions have been accomplished to insure flammable, explosive or toxic vapors will not explode or be formed.

\* Take care in laying down electrode holder near grounded work or clamp which could cause accidental arcing or grounding creating overheating and a fire hazard. Turn welder off when not in use.

#### 4. ACCESSORIES ARE OPTIONAL

Electrode Holder and Cable - The electrode holder is fully insulated heavy duty holder allowing a full range of welding rod diameters and has four positions to hold welding rod. The cable is extra flexible fine strand welding cable. The plug is machined brass with a molded rubber integral insulation and grip.

Ground Clamp and Cable - The ground clamp is heavy duty and will clamp to a wide variety of shapes and sizes to be welded. Cable quality and plug-in the same as electrode cable.

Helmet - The helmet is molded rugged fiberglass with semi-flexible headband fully adjustable for comfort fit. Its main features besides the rugged quality are its light weight and snug size. It is especially advantageous to repair around machines, under cars and trucks and other confining repair jobs. Comes complete with Government approved welding arc filter lens and special spatter resistant clear cover lens.

Electric Arc Torch - A very useful accessory for brazing, heavy soldering, preheating, bending, paint and scale removing. Plugs into welding stages and gives up to 9000 F flame. Easy to use.

Welding Rod - Flux - Brazing Rod - Hardsurfacing Materials - Extension Cables - Many other Welding Supplies and Equipment.

Rev. 5-18-79

-2-

O-139

#### 5. INSTALLATION

The location you pick for your welder is quite important and certain factors should be considered. Among them are the following:

A. Place your welder in an area that is free of any volatile liquids, or any other easily flammable items that sparks from welding may ignite.

B. The welding machine should be located so the air vents in the rear and side panels are clear of any obstruction. Cooling air is drawn in through the rear panel vent and expelled out of the louvers in the side panels.

C. Location should be such that a minimum amount of dust and dirt will be drawn into the cooling air stream.

D. Place your welder in a location that is free from damp or wet floor or ground.

E. An open area with adequate floor space is important as many things to be welded need to be laid out on the floor or on a large bench for easier operation.

F. If you intend to weld on large equipment that cannot be brought inside the building it is best to locate the welder near the door or provide a power supply near the door so your welder can be used both inside and outside.

G. The welder must be located where there is an adequate power supply. The unit requires a heavy fuse or breaker. (Refer to specification chart for primary input amps). Your power supply wire should be adequate in size to eliminate any excessive voltage drop. For a very short distance # 6 wire can be used. If larger distances are required a # 4 wire is recommended. If other electrical equipment is to be operated at the same time you are welding, an increasingly larger wire size will be necessary and can be figured by your electrician.

H. This AC/DC arc welding machine is a single phase unit and must be connected to a single phase power line.

A precautionary measure should be taken to provide maximum protection against electrical shock. Before electrical connections are made, be sure that the line disconnect switch has been opened or the primary input circuit fuses have been removed and remain that way until the installation has been completed.

The two primary leads are connected to the terminals L1 and L2 on the primary terminal Plate inside of the welder. The Ground lead is connected to the place labeled GROUND inside of the welder.

#### PRIMARY INPUT VOLTAGE

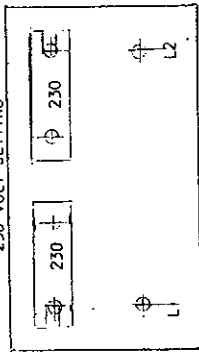
The standard welding machine is designed to operate on either 230 or 460 volts, 60 Hz primary electrical power. The machine when shipped from factory is set on 230 volt. To change welding machine for 460 volt operation, position the two jumper-plates as indicated on terminal plate and is shown in sketches on following page.

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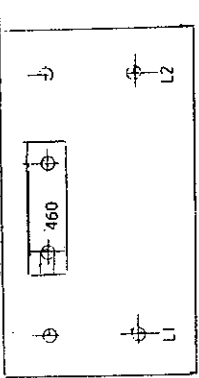
-3-

O-139

230 VOLT SETTING



460 VOLT SETTING



**OPERATING INSTRUCTIONS**

WELDING--Good strong welds can be easily attained by following these instructions.

1. Prepare the joint to be welded, making certain the metal is clean and free of all foreign materials.
2. Select the correct rod type and size to properly weld the joint.
3. Your Forney FS-250 AC-DC welder is equipped with a range selector switch. Set this switch lever so it points to the setting you wish to use--AC-HIGH, AC-LOW or DC-HIGH, DC-LOW.

NOTE: When welding on the DC (Direct Current) settings the current flows to positive. To weld with DC straight polarity, plug the ground cable into the positive plug and the electrode cable into the negative plug. To weld with DC reverse polarity, plug the electrode cable into the positive plug and the ground cable into the negative plug.

4. Connect the electrode holder and ground clamp cables to the proper output jacks, turn the crank so the output amperage is matched to the amperage requirements of the rod used.
5. Turn the welder on and proceed to weld using accepted welding procedures.

BRAZING--With the carbon arc torch it is very easy to do. You simply use the regular AC amperage plugs with the torch. The torch is designed to use 5/16", 3/8", and 1/2" copper coated carbon rods. The most popular sizes for regular work are 5/16" and 3/8" diameters. Use 1/2" for heating.

5/16" carbon...not more than 75 amps    3/8" carbon... not more than 90 amps  
 1/2" carbon...not more than 140 amps

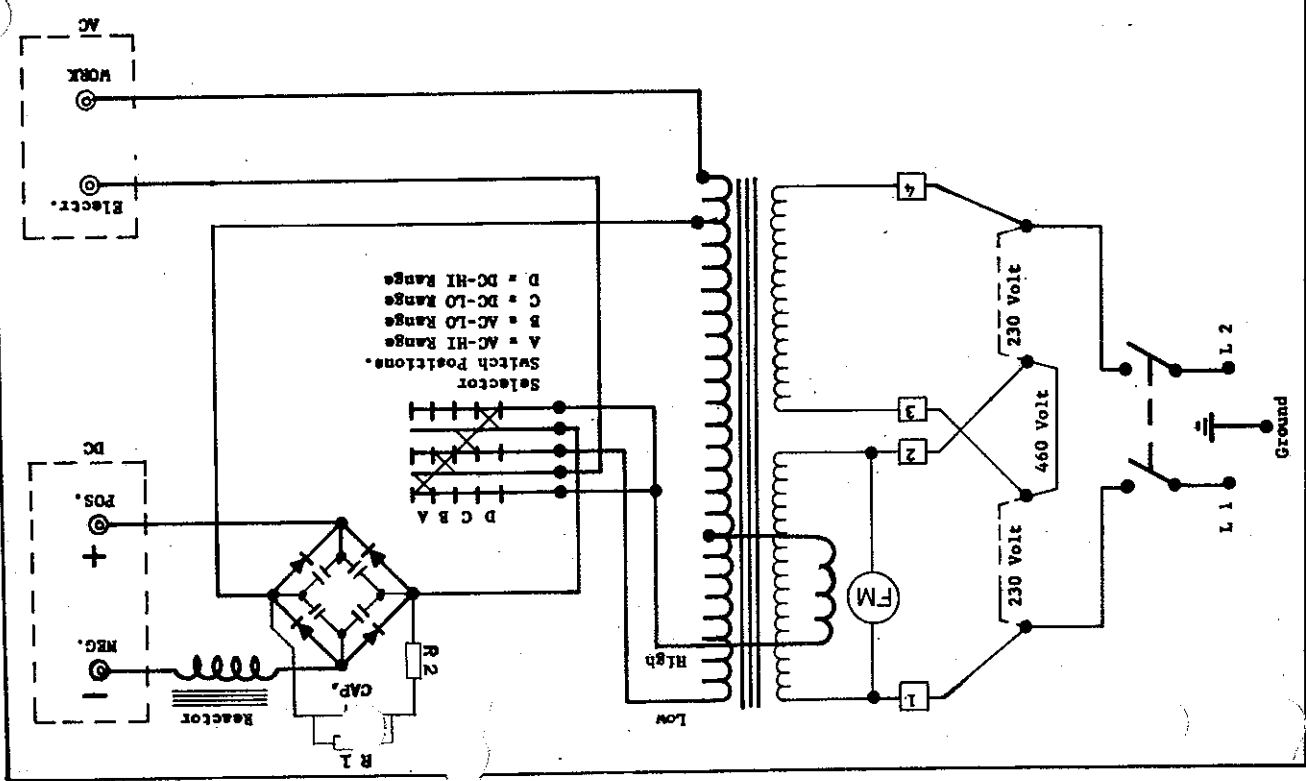
MAINTENANCE-- The welder requires little maintenance other than normal care. Keep the welder case clean and waxed to preserve the original finish. The electrode holder, ground clamp, and plugs SHOULD BE KEPT CLEAN to give BEST PERFORMANCE!

Caution: Do not force the crank at the end of the welding ranges; observe the indicator arms through slots on front panel. Some increase in transformer hum may be noted at some amperage settings more than others. This is normal, however, wear on the shunt locks or guides may cause hum to become excessive. This can be corrected by unhooking power supply cable, removing case top, locate shunt lock pressure plates on side of transformer, tighten each nut equally (not over 1/4 turn at a time). Under each nut is a special "spring" washer -- this washer should never be tightened completely flat. Tension can be checked by turning crank to determine if it cranks too hard. The locks should not be tightened beyond a comfortable turning on the crank with the fingers. A paste-type silicone grease may be added to the shunt locks and to shunt lead screw.

Before each operation of the welder check to see if the fan is turning properly after turning welder switch on. The fan has sealed lubricated bearings; however, dirt may accumulate on the fan blades or armature causing decreased air flow or fan stoppage. THE WELDER MUST NOT BE OPERATED IF FAN IS NOT RUNNING PROPERLY.

The fan can be removed for cleaning or checking by unhooking power supply cord. Remove lower front panel, loosen screws on fan motor straps allowing motor and fan assembly to be removed from shroud. The blade and motor can be observed and cleaned at this point. If necessary to remove completely, the leads can be disconnected at the switch. Apply 230 Volts AC to fan on bench checking.

Electrical Schematic  
 Shuntwelder Model FS 250 AC/DC, (230/460 Volt) Spec. 267-U-36  
 DRAWN SHAW  
 DATE 4-30-79  
 SCALE NONE  
 TOL. ± .015  
 FORTNEY MANUFACTURING CO.  
 DIV. OF FORTNEY INDUSTRIES, INC.  
 FORT COLLINS, COLORADO  
 CWC. NO. 27402



**SPECIFICATIONS**

Model FS 250 AC-DC SWITCH HITTER  
 Spec. # 267-U-36

RATED AMPERES AT	AC		DC	
	30 Volts Load 20% to 100% Duty Cycle	250 Amps	250 Amps.	
30 Volts Load 20% to 100% Duty Cycle				
CURRENT RANGES (amperes) Max.	LOW Range	25 - 215	15 - 180	
	HIGH Range	35 - 295	25 - 250	
OPEN CIRCUIT VOLTS	LOW Ranges, Max.	80	80	
	HIGH Ranges, Max.	78	75	
PRIMARY INPUT at	VOLTS AC	AMPERES AC	KVA	KW
	250 Amperes at 30 Volt load	230/460	88/44	20.3
295 Amperes at 30 Volt load	230/460	97/49	20.3	11.0

For other than standard primary voltages, the input amperes will vary accordingly.

SIZE: Height 32.0"  
 Width 20.0"  
 Depth 18.0"

WEIGHT: Net 165.0#  
 Shipping 172.0#