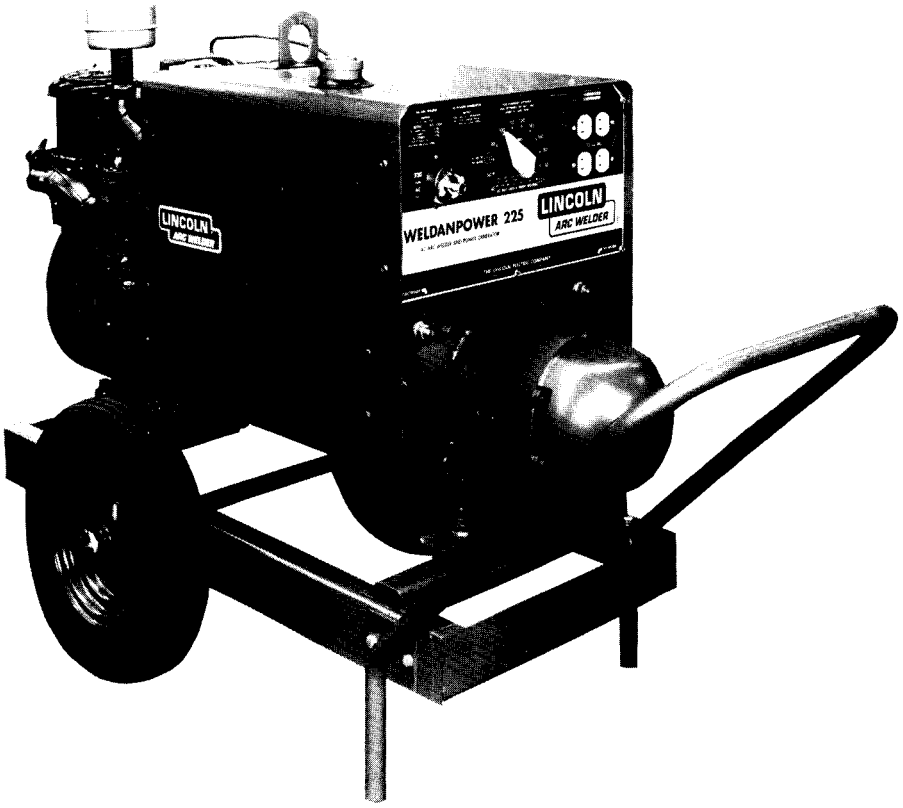
LINCOLN® WELDERS

OPERATING MANUAL

IM-242-A
Weldanpower 225
IM242
February, 1986
4792; 4851; 4875; 4977; 4978; 4989; 5229; 5230; 5387; 5388; 5436; 5761; 5783; 5802; 5822; 6780; 6781

WELDANPOWER® 225

Combination 225 Ampere AC Welder and Standby Power Generator



MODELS

AC-225/5-AS Engine Driven (obsolete)
AC-225/5-BS Belted (obsolete)

This manual covers equipment which is obsolete and no longer in production by The Lincoln Electric Co. Specifications and the availability of optional features may have changed.

DAMAGE CLAIMS

When this equipment is shipped, title passes to the purchaser upon receipt by the carrier. Consequently, claims for material damaged in shipment must be made by the purchaser against the transportation company at the time the shipment is received.

SAFETY DEPENDS ON YOU

Lincoln arc welding equipment is designed and built with safety in mind. However, your overall safety can be increased by proper installation ... and thoughtful operation on your part. DO NOT INSTALL, OPERATE OR REPAIR THIS EQUIPMENT WITHOUT READING THIS OPERATING MANUAL AND THE ARC WELDING SAFETY PRECAUTIONS ON THE INSIDE FRONT COVER. And most importantly, think before you act and be careful.

For operating instructions and parts lists for the older "Weldanpower" AC-200/5-AT and AC-200/5-BT models see IM-183-E.

LINCOLN® ELECTRIC

THE LINCOLN ELECTRIC COMPANY
World's Largest Manufacturer of Arc Welding Products • Manufacturer of Industrial Motors
Sales and Service Worldwide
Cleveland, Ohio 44117-1199 U.S.A.

Arc Welding Safety Precautions

PROTECT YOURSELF AND OTHERS FROM POSSIBLE SERIOUS INJURY OR DEATH. READ AND UNDERSTAND BOTH THE SPECIFIC INFORMATION GIVEN IN THE OPERATING MANUAL FOR THE WELDER AND/OR OTHER EQUIPMENT TO BE USED AS WELL AS THE FOLLOWING GENERAL INFORMATION.

1. HAVE ALL INSTALLATION, OPERATION, MAINTENANCE AND REPAIR WORK performed only by qualified people.

2. ELECTRIC SHOCK can kill.

   Protect yourself from possible dangerous electrical shock:

   a. The electrode and work (or ground) circuits are electrically "hot" when the welder is on. Never permit contact between "hot" parts of the circuits and bare skin or wet clothing. Wear dry, hole-free gloves to insulate hands.

   b. Always insulate yourself from the work and ground by using dry insulation. When welding in damp locations, on metal floors, gratings or scaffolds, and when in positions such as sitting or lying, make certain the insulation is large enough to cover your full area of physical contact with work and ground.

   c. Always be sure the work cable makes a good electrical connection with the metal being welded. The connection should be as close as possible to the area being welded.

   d. Ground the work or metal to be welded to a good electrical ground.

   e. Maintain the electrode holder, work clamp, welding cable and welding machine in good, safe operating condition.

   f. Never dip the electrode in water for cooling.

   g. Never simultaneously touch electrically "hot" parts of electrode holders connected to two welders because voltage between the two can be the total of the open circuit voltage of both welders.

   h. If using the welder as a power source for mechanized welding, the above precautions also apply for the automatic electrode, electrode reel, welding head, nozzle or semiautomatic welding gun.

   i. When working above floor level, protect yourself from a fall should you get a shock.

   j. Also see Items 6c and 8.

3. FUMES AND GASES can be dangerous to your health.

   a. Welding may produce fumes and gases hazardous to health. Avoid breathing these fumes and gases. When welding, keep your head out of the fume. Use enough ventilation and/or exhaust at the arc to keep fumes and gases away from the breathing zone. When welding on galvanized, lead or cadmium plated steel and other metals which produce toxic fumes, even greater care must be taken.

   b. Do not weld in locations near chlorinated hydrocarbon vapors coming from degreasing, cleaning or spraying operations. The heat and rays of the arc can react with solvent vapors to form phosgene, a highly toxic gas, and other irritating products.

   c. Shielding gases used for arc welding can displace air and cause injury or death. Always use enough ventilation, especially in confined areas, to insure breathing air is safe.

   d. Read and understand the manufacturer's instructions for this equipment and the consumables to be used, including the material safety data sheet (MSDS) and follow your employer's safety practices.

   e. Also see item 9b.

4. ARC RAYS can injure eyes and burn skin.

   a. Use a shield with the proper filter and cover plates to protect your eyes from sparks and the rays of the arc when welding or observing open arc welding. Headshield and filter lens should conform to ANSI Z87.1 standards.

   b. Use suitable clothing made from durable, flame-resistant material to protect your skin and that of your helpers from the arc rays.

   c. Protect other nearby personnel with suitable non-flammable screening and/or warn them not to watch the arc nor expose themselves to the arc rays or to hot spatter or metal.

5. FIRE OR EXPLOSION can cause death or property damage.

   a. Remove fire hazards well away from the area. If this is not possible cover them to prevent the welding sparks from starting a fire. Remember that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas. Have a fire extinguisher readily available.

   b. Where compressed gases are to be used at the job site, special precautions should be used to prevent hazardous situations. Refer to "Safety in Welding and Cutting" (ANSI Standard Z49.1) and the operating information for the equipment being used.

   c. When not welding, make certain no part of the electrode circuit is touching the work or ground. Accidental contact can cause overheating and create a fire hazard.

d. Do not heat, cut or weld tanks, drums or containers until the proper steps have been taken to insure that such procedures will not cause flammable or toxic vapors from substances inside. They can cause an explosion even though they have been "cleaned." For information purchase "Recommended Safe Practices for the Preparation for Welding and Cutting of Containers and Piping That Have Held Hazardous Substances.", AWS F4.1-80 from the American Welding Society (see address below).

e. Vent hollow castings or containers before heating, cutting or welding. They may explode.

f. Also see items 6c and 9c.

6. For Welding in General.

a. Droplets of molten slag and metal are thrown or fall from the welding arc. Protect yourself with oil free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes and a cap over your hair. Wear ear plugs when welding out of position or in confined places. Always wear safety glasses when in a welding area. Use glasses with side shields when near slag chipping operations.

b. Keep all equipment safety guards, covers and devices in position and in good repair. Keep hands, hair, clothing and tools away from V-belts, gears, fans and all other moving parts when starting, operating or repairing equipment.

c. Be sure the work cable is connected to the work as close to the welding area as practical. Work cables connected to the building framework or other locations some distance from the welding area increase the possibility of the welding current passing through lifting chains, crane cables or other alternate circuits. This can create fire hazards or overheat lifting chains or cables until they fail.

7. For Gas-Shielded Arc Welding.

a. Use only compressed gas cylinders containing the correct shielding gas for the process used and properly operating regulators designed for the gas and pressure used. All hoses, fittings, etc. should be suitable for the application and maintained in good condition.

b. Always keeps cylinders in an upright position securely chained to an undercarriage or fixed support.

c. Cylinders should be located:
- Away from areas where they may be struck or subjected to physical damage.
- A safe distance from arc welding or cutting operations and any other source of heat, sparks, or flame.

d. Never allow the electrode, electrode holder, or any other electrically "hot" parts to touch a cylinder.

e. Keep your head and face away from the cylinder valve outlet when opening the cylinder valve.

f. Valve protection caps should always be in place and handtight except when the cylinder is in use or connected for use.

g. Read and follow the instructions on compressed gas cylinders, associated equipment, and CGA publication P-1 "Precautions for Safe Handling of Compressed Gases in Cylinders" available from the Compressed Gas Association, 1235 Jefferson Davis Highway, Arlington, VA 22202.

8. For Electrically Powered Equipment.

a. Turn off input power using the disconnect switch at the fuse box before working on the equipment.

b. Make the electrical installation in accordance with the National Electrical Code, all local codes and the manufacturer's recommendations.

c. Properly ground the equipment in accordance with the National Electrical Code and the manufacturer's recommendations.

9. For Engine Powered Equipment.

a. Turn the engine off before troubleshooting and maintenance work unless the maintenance work requires it to be running.

b. Operate the internal combustion engines in open, well-ventilated areas or vent the engine exhaust fumes outdoors.

c. Do not add the fuel near an open flame, welding arc or when the engine is running. Stop the engine and, if possible, allow it to cool when refueling to prevent spilled fuel from vaporizing on contact with hot engine parts and igniting. Do not spill fuel when filling tank. If fuel is spilled, wipe it up and do not start engine until fumes have been eliminated.

d. In some cases it may be necessary to remove safety guards to perform required maintenance. Remove guards only when necessary and replace them when the maintenance requiring their removal is complete. Always use the greatest care when working near moving parts.

e. Do not put your hands near the engine fan. Do not attempt to override the governor or idler by pushing on the throttle control rods while the engine is running.

f. To prevent accidentally starting gasoline engines while turning the engine or welding generator during maintenance work, disconnect the spark plug wires, distributor cap or magneto wire as appropriate.

g. To avoid scalding, do not remove the radiator pressure cap when the engine is hot.

For more detailed information it is strongly recommended that you purchase a copy of "Safety in Welding & Cutting — ANSI Standard Z49.1" from the American Welding Society, P.O. Box 351040 Miami, Florida 33135.

PROPER GROUNDING DURING INSTALLATION

The 1985 National Electrical Code does not require this machine to be grounded under normal operating circumstances.

Some State, local or other codes or unusual operating circumstances may require the machine frame to be grounded. It is recommended that you determine the extent to which such requirements may apply to your particular situation and follow them explicity.

In general, if the machine is to be grounded, it should be connected with a #8 or larger copper wire to a solid earth ground such as a metal pipe going into the ground for at least ten feet and having no insulated joints, or to the metal framework of a building which has been effectively grounded. The National Electrical Code lists a number of alternate means of grounding electrical equipment. (If an older portable welder does not have a grounding stud, connect the ground to an unpainted frame screw or bolt.)

INSTALLATION, CONNECTION, AND MAINTENANCE OF BATTERY

To prevent EXPLOSION when:

a) Installing a new battery — disconnect the negative cable from the old battery first and connect the negative cable to the new battery last.

b) Connecting a battery charger — remove the battery from the welder by disconnecting the negative cable first, then the positive cable and battery clamp. When reinstalling, connect the negative cable last.

c) Using a booster — connect the positive lead to the battery first then connect the negative lead to the copper strap on the engine foot.

To prevent ELECTRICAL DAMAGE when:

a) Installing a new battery.

b) Using a booster.

Use correct polarity — Negative Ground.

To prevent BATTERY DISCHARGE, if you have an ignition switch, turn it off when the engine is not running.

To prevent BATTERY BUCKLING, tighten nuts on battery clamp only until snug.

(S-17851)

OPERATION OF ENGINE WELDERS

WARNING: Operate internal combustion engines in open, well ventilated areas or vent engine exhaust fumes outdoors.

OPERATION OF ALL WELDERS

DO NOT TURN THE "CURRENT RANGE SELECTOR" WHILE WELDING because the current may arc between the contacts and damage the switch.

MAINTENANCE AND TROUBLESHOOTING WARNINGS

WARNING: Have qualified personnel do the maintenance and troubleshooting work. Turn the engine (or electrical power at the switchbox) off before working inside the machine. In some cases, it may be necessary to remove safety guards to perform required maintenance. Remove guards only when necessary and replace them when the maintenance requiring their removal is complete. Always use the greatest care when working near moving parts.

ATTENTION OWNERS OF ENGINE WELDERS

WARNING: Do not put your hands near the engine fan. Do not attempt to override the governor or idler by pushing on the throttle control rods while the engine is running. If a problem cannot be corrected by following the instructions, take the machine to the nearest Lincoln Field Service Shop.

CAUTION WHEN INSPECTING THE COMMUTATOR AND BRUSHES

WARNING: Uncovered rotating equipment can be dangerous. Use care so your hands, hair, clothing or tools do not catch in the rotating parts. Protect yourself from particles that may be thrown out by the rotating armature when stoning the commutator.

NAMEPLATES

Whenever routine maintenance is performed on this machine — or at least yearly — inspect all nameplates and labels for legibility. Replace those which are no longer clear. Refer to the parts list for the replacement item number.

The National Electrical Code does not require this machine to be grounded under normal operating circumstances. (See exception when connecting to premise wiring.)

Some state, local or other codes or unusual operating circumstances may require the machine frame to be grounded. It is recommended that you determine the extent to which such requirements may apply to your particular situation and follow them explicitly. A machine grounding stud marked with the symbol ⏚ is provided on the welder *control panel.* (If an older machine does not have a grounding stud, connect the ground wire to an unpainted frame screw or bolt.

OPERATION

See the Wisconsin engine operating instructions supplied with your welder for detailed engine starting, operating and maintenance instructions, parts lists and safety precautions.

EXHAUST SPARK ARRESTER

Some federal, state or local laws may require that gasoline engines be equipped with exhaust spark arresters when they are operated in certain locations where unarrested sparks may present a fire hazard. The standard mufflers included with these welders do not qualify as spark arresters. When required by local regulations, suitable spark arresters must be installed and properly maintained.

Notice: An incorrect arrester may lead to damage of the engine or its performance. Contact the engine manufacturer for specific recommendations.

STARTING THE ENGINE

Preparation

Before starting the engine, be sure the crank case is filled to the proper level with oil. Also, fill the gas tank and open the shut-off valve in the fuel line. Be sure any welding or auxiliary power loads are turned off or disconnected.

WARNING: Operate internal combustion engines in open well ventilated areas or vent the engine exhaust fumes outdoors.

Optional Electric Starter

Installation & Operation

Fill the dry charged batteries with the electrolyte per the instructions furnished with the machine.

WARNING: Use care as the electrolyte is a strong acid. Avoid contact with eyes and skin.

To prevent EXPLOSION when:

a.) Installing a new battery — disconnect the negative cable from the old battery first and connect the negative cable to the new battery last.

b.) Connecting a battery charger — remove the battery from the welder by disconnecting the negative cable first, then the positive cable and battery clamp. When reinstalling, connect the negative cable last.

c.) Using a booster — connect the positive lead to the battery first then connect the negative lead to the copper strap on the engine foot.

To prevent ELECTRICAL DAMAGE when:
a.) Installing a new battery.
b.) Using a booster.
Use correct polarity — Negative Ground.

To prevent BATTERY DISCHARGE, if you have an ignition switch, turn it off when engine is not running.

To prevent BATTERY BUCKLING, tighten nuts on battery clamp only until snug.

To start the engine, turn the ignition switch on and push the start button. These switches are located on the engine control panel. Choke as necessary (see the Wisconsin engine manual). If no battery power is available, start the engine by hand cranking.

NOTE: The engine can be stopped either with the ignition switch or by holding the button on the side of the magneto down until the engine stops.

Battery Charging

Current for charging the battery is supplied by the welding generator.

Set the charging rate switch located on the engine control panel to "high" or "low" per the instructions on the switch nameplate. Actual charging current appears on the ammeter. The charging rate is about 3 amperes at the high setting and 1-1/2 amperes at the low setting with the engine running at full speed.

When undercharging the battery, it cranks the engine slower at each start. If overcharging the battery, water must be added frequently. Overcharging tends to shorten battery life.

If you operate the welder with the battery disconnected, tape the battery leads to avoid damaging the charging circuit.

The ammeter is the best indicator of charging circuit trouble. The ammeter indicates the charging current when the engine is running and reads 0 with the engine stopped. Other combinations in the following table indicate trouble.

Meter Readings		
Engine Running	**Engine Stopped**	**Possible Causes**
Discharge	Discharge	1. Shorted diode.
Zero	Zero	2. Diode open.
Charge	Charge	3. Battery connected backwards.

OPERATION AS AN AC POWER GENERATOR

Suitable for temporary, standby or emergency power using engine manufacturer's recommended maintenance schedule. Not recommended for long term primary power.

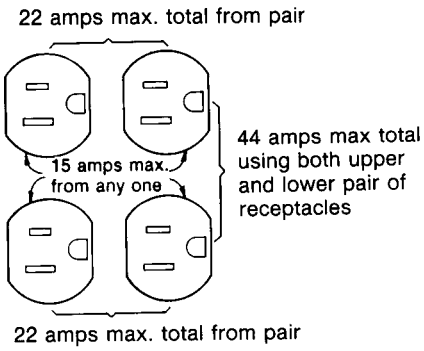
The Weldanpower 225 is a single phase 60 hertz generator with a 5 KVA maximum output, 100% duty cycle. To operate the machine as a generator, pull the throttle control lever out until the position washer on the throttle shaft is even with the "Power" mark on the throttle plate. The no load speed at this throttle position is 1925 RPM.

One 230 volt and two pair of 115 volt receptacles are located on the control panel. Connect all power loads to the Weldanpower through the receptacles. The machine can operate 115 volt and 230 volt loads at the same time provided the total power draw does not exceed 5 KVA.

To carry the full output use #10 wire.

115 Volt Operation

As indicated by the sketch, the largest single load which can be operated **continuously** from one receptacle is 15 amps. Most 1-1/2 HP 115 volt motors can be started using a Weldanpower if there is no load on the motor. However, a 1-1/2 HP motor must not be operated continuously above 75% of its rating because the 20 ampere full load current will overheat the receptacle. A 3/4 HP motor is the largest size that can be operated continuously from one receptacle.



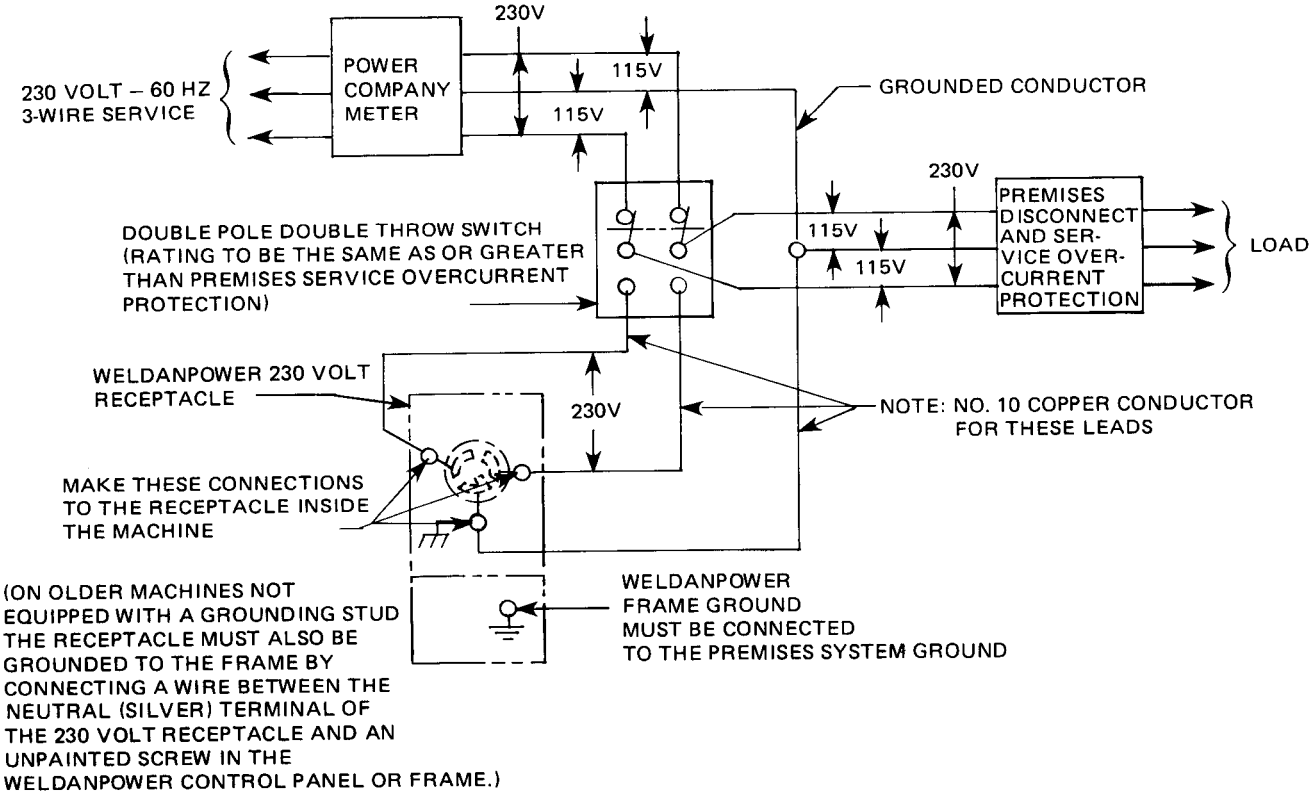
The maximum load that can be drawn from either the upper pair or the lower pair of receptacles is 22 amps. Do not parallel the upper receptacles with lower receptacles to supply more than 22 amps to any one load. In other words, a load which requires more than 22 amps of 115 volt current cannot be operated by a Weldanpower.

230 Volt Operation

A 3 prong plug that fits the 230 volt receptacle is supplied with the machine. To lock the plug in the receptacle, insert it all the way and twist to the right.

When operating continuously, a maximum of 22 amperes or 5 KVA can be drawn from the 230 volt receptacle. 3 HP motors can be started and operated from the 230 volt receptacle provided there is no load on the motor and no other

CONNECTION OF W/P-225 TO PREMISES SYSTEM



load connected to the Weldanpower when starting. The maximum size motor which can be started under load is 2 HP provided the starting torque requirements are not greater than the rated running torque of the motor.

Power tools plugged into the welder will be properly grounded to the welder frame. They will not be grounded to the earth unless the frame of the Weldanpower has been properly grounded. See instructions on page 6. (On older machines not equipped with a grounding stud, the receptacle must also be grounded to the frame by connecting a wire between the neutral (silver) terminal of the 230 volt receptacle and an unpainted screw in the Weldanpower control panel or frame. If required, ground the frame per instructions on page 6.)

Standby Power Connections

The Weldanpower 225 can be permanently installed as a standby power unit for a 230 volt-3 wire, 22 ampere service. Connections must be made by a licensed electrician who can determine how the the 115/230 volt Weldanpower 225 can be adapted to the particular installation and comply with all applicable electrical codes. The following information can be used as a guide by the electrician for most applications.

1. Install a double pole, double throw switch between the power company meter and the premises disconnect. Switch rating must be the same as or greater than the customer premises disconnect and service overcurrent protection.
2. Remove the Weldanpower cover and make permanent connections from the Weldanpower 230 volt receptacle terminals to the switch installed in step #1. Use caution in routing the leads under the cover and protect from any sharp corners and edges. Replace the Weldanpower cover.
3. Properly ground the Weldanpower 225 frame to the premises system ground.
4. Take necessary steps to assure load is limited to the capacity of the Weldanpower 225. Maximum rated load for the 230 volt auxiliary is 22 amperes.

OPERATION AS AN AC WELDER

Rating

The welding output is rated 225 amps at 25 arc volts, 70 Hertz AC current. Duty cycle (based on a 10 minute period) on the 225 amp setting is 40%, on the 75 amp setting 100%, and on all other settings 50%.

Welding Current Selection

Connect the electrode cable to the 'Electrode' stud and the work cable to the 'To Work' stud. The output amperes are marked at each position of the current selector switch. Turn the switch to the current required for each job.

The current selector switch settings are marked for a no-load engine speed of 2,200 RPM. To get this speed pull the throttle control lever out until the position washer on the throttle shaft is even with the 'Weld' mark on the throttle plate. If intermediate currents are needed, adjust the throttle control lever to position the washer between the 'Weld' and 'Power' marks. At this setting the output current will be about half way between the amperes indicated for that setting and the next lower setting.

There is a slight amount of play at each selector switch position. It is good practice to move the switch back and forth once within this play after switching to a new position. This wiping action helps keep the contacts free from dirt and oxides.

DO NOT TURN THE SELECTOR SWITCH WHILE WELDING BECAUSE THIS MAY DAMAGE THE CONTACTS.

SIMULTANEOUS OPERATION AS WELDER AND POWER SOURCE

With the throttle set at the "Power" mark (1800 RPM full load speed) the Weldanpower can be used for welding with some loss of arc stability providing the following total load limits are not exceeded:

Power Load (Volt-Amps)	Max. Electrode Size	Max. Switch Setting
None	5/32"	180
700	1/8"	160
1500	3/32"	130
2200	5/64"	100

Do not attempt to use the machine for power with the throttle set at the "Weld" mark (2200 RPM idle speed). The resulting power voltage is about 20% higher, causing bulbs to burn brighter and tool motors to run faster and hotter. Also, the frequency will be about 10% above normal.

PIPE THAWING — CAUTION

Pipe thawing, if not done properly, can result in fire, explosion, damage to wiring which may make it unsafe, damage to pipes, burning up the welder, or other hazards. Do not use a welder to thaw pipe before reviewing Lincoln bulletin E-695.1 (dated December '76 or later).

Use only the 75 amp setting for thawing. Do not use the machine for any other purpose while thawing.

MAINTENANCE

WARNING: Have qualified personnel do the maintenance work. Turn the engine off before working inside the machine. In some cases it may be necessary to remove safety guards to perform required maintenance. Remove guards only when necessary and replace them when the maintenance requiring their removal is complete. Always use the greatest care when working near moving parts.

1. Blow out the welder and controls with low pressure air periodically. In particularly dirty locations this may be required once each week.
2. Replace the engine crankcase oil every 50 hours of operation.
3. Clean the oil bath air filter every 50 hours of normal operation.
4. Governor and carburetor joints and the throttle shaft must be kept clean and lubricated.
5. Refer to the Wisconsin engine manual for engine maintenance and troubleshooting instructions.

COMMUTATOR AND BRUSHES

The rotor slip ring and brushes require almost no attention. If the brushes require replacement, they are fitted by placing a piece of sandpaper between the brush and slip ring and working the sandpaper back and forth.

Periodically inspect the exciter commutator and brushes by removing the commutator cover. DO NOT remove or replace this cover while the machine is running.

Commutators require little attention. However, if they are black or appear uneven, clean while running with fine sandpaper or a commutator stone. Never use emery cloth or paper for this purpose.

Replace brushes when they wear within 1/4" of the pigtail. A complete set of replacement brushes should be kept on hand. Lincoln brushes have a curved face to fit the commutator. Seat these brushes by lightly stoning the commutator as the armature rotates at full speed until contact is made across the full face of the brushes. After stoning, blow out the dust with low pressure air.

Caution: Uncovered rotating equipment can be dangerous. Use care so hands, hair, clothing or tools do not catch in the rotating parts. Protect yourself from particles that may be thrown out by the rotating armature when stoning the commutator.

BEARINGS

This welder is equipped with a double-shielded ball bearing having sufficient grease to last indefinitely under normal service. When the welder is used constantly or in excessively dirty locations, it may be necessary to add one-half ounce of grease per year. A pad of grease one inch wide, one inch long, and one inch high weighs approximately one-half ounce. Over greasing is far worse than insufficient greasing.

When greasing the bearings, keep all dirt out of the area. Wipe the fittings completely clean and use clean equipment. More bearing failures are caused by dirt introduced during greasing than from insufficient grease.

BELT DRIVEN MODELS (OBSOLETE)

Request IM-146 for mounting and connecting instructions.

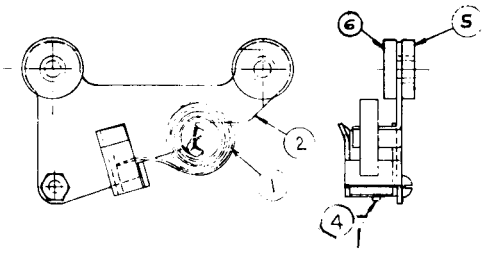
The direction of rotation of a belted Weldanpower can be changed by installing a new exciter armature and the brush holders. This can best be done by the trained men in an authorized Lincoln Field Service Shop.

To operate a belted Weldanpower as a power generator, regulate the tractor engine or other power supply used to drive the machine for a maximum no-load shaft speed of 1925 RPM. Full-load shaft speed must be 1800 RPM.

To operate a belted Weldanpower as a welder, regulate the tractor engine or other power source used to drive the machine for a maximum no-load shaft speed of 2200 RPM. Full-load shaft speed should be 2050 RPM.

All other instructions for engine driven Weldanpowers also apply to the belt driven models.

EXCITER BRUSH HOLDER

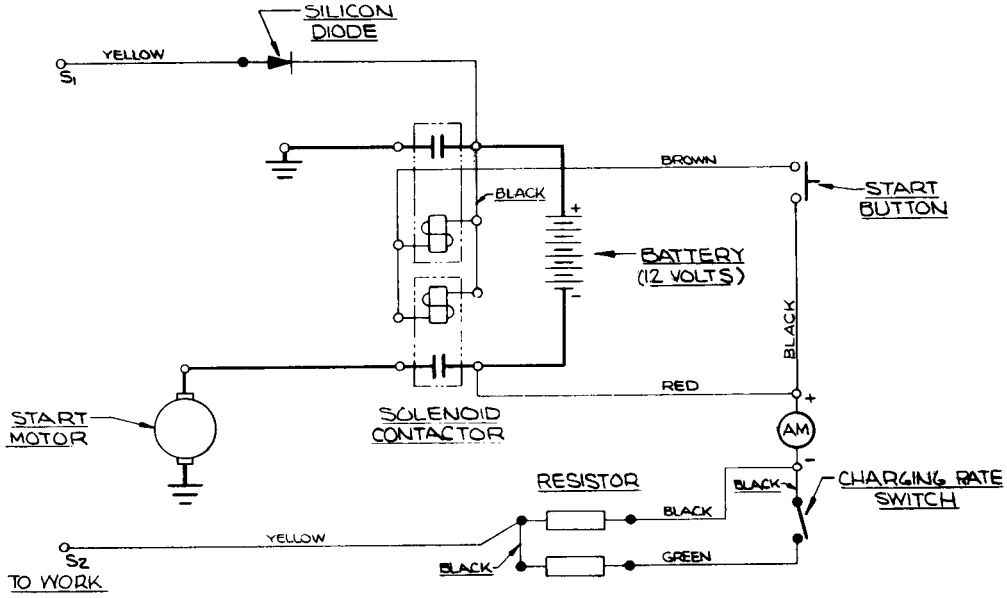


Parts List P-69-M

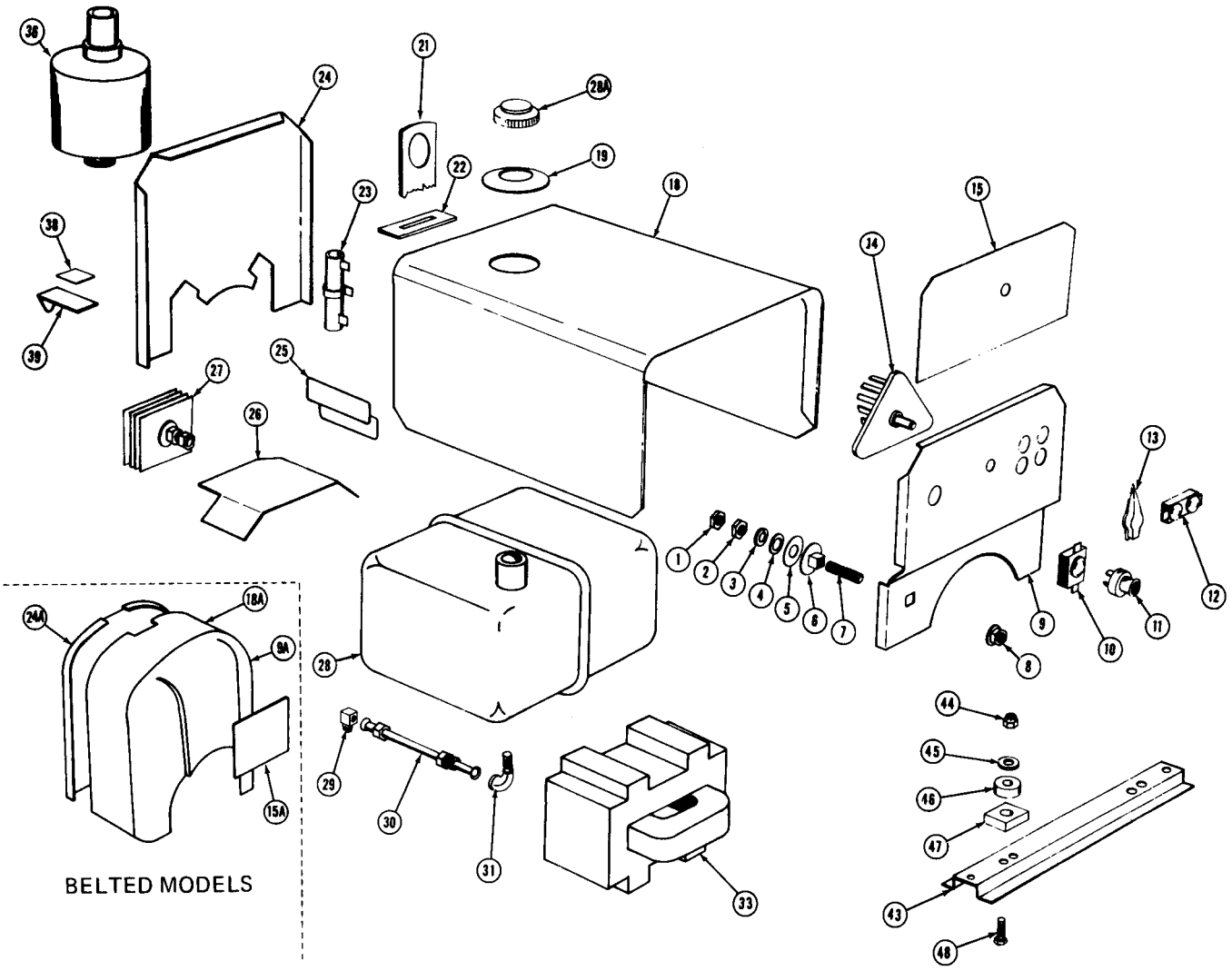
ITEM	PART NAME AND DESCRIPTION	NO. REQ'D.
	Exciter Brush Holder Assembly Includes:	1
1	Spring	1
2	Brush holder	1
4	Hex Nut	1
5	Insulating Washer	2
6	Bushing	2

ELECTRIC START DIAGRAM

S-12258 (11-8-63B)



GENERAL ASSEMBLY

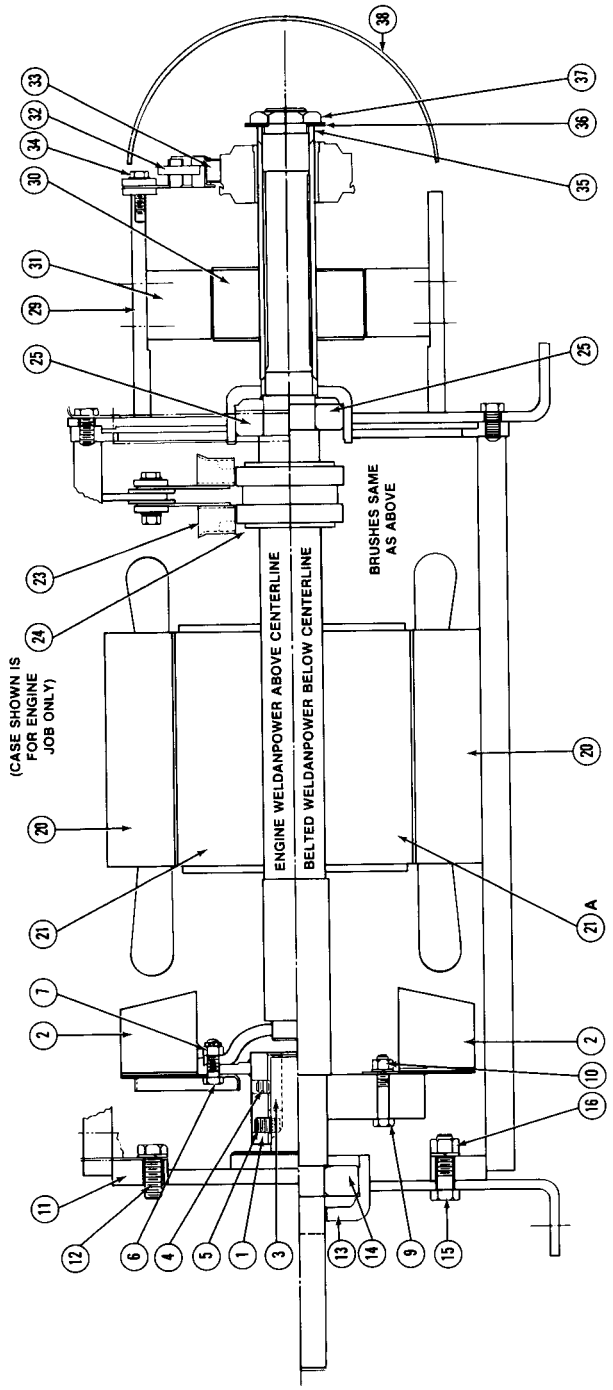


Parts List P-69-C

ITEM	PART NAME AND DESCRIPTION	NO. REQ'D.
1	Hex Nut	2
2	Brass Nut	2
3	Lockwasher	2
4	Plain Washer	2
5	Insulating Washer	2
6	Insulating Bushing	2
7	Stud	2
8	Flanged Weld Nut	2
9	Case Front Panel	1
9A	Case Front Panel (Belted Only)	1
10	Three Prong Receptacle	1
11	Three Prong Plug	1
12	Duplex Receptacle	2
13	Switch Handle, Includes:	1
	Set Screw	1
14	Selector Switch	1
	Self Tapping Screw, Switch Mounting	2
15	Nameplate	1
15A	Nameplate (Belted and Below Code 4900)	1
	Self Tapping Screw, Nameplate Mounting	6
18	Roof	1
	Self Tapping Screw, Roof to Front and Rear Panels	22
18A	Roof, Belted Only	1
19	Gasket	1
21	Lift Bale	1
	Hex Screw, Bale to Frame	2

ITEM	PART NAME AND DESCRIPTION	NO. REQ'D.
22	Lift Bale Seal	1
23	Resistor	1
	Resistor Mounting Bracket	1
	Self Tapping Screw	2
24	Rear Panel	1
24A	Rear Panel, Belted Only	1
25	Decal	2
26	Air Baffle	1
	Thread Cutting Screw, Air Baffle to Frame	2
27	Rectifier	1
28	Gas Tank, Includes	1
28A	Gas Tank Cap	1
29	Elbow, Filter End	1
30	Gas Line	1
31	Elbow, Tank End	1
33	Reactor Coil	1
36	Muffler	1
38	Throttle Plate	1
39	Throttle Plate Bracket	1
43	Mounting Rail	2
44	Hug Nut	4
45	Plain Washer	4
46	Rubber Washer	4
47	Rubber Washer	4
48	Hex Head Screw	4

GENERATOR AND EXCITER



Parts List P-69-D

ITEM	PART NAME AND DESCRIPTION	NO. REQ'D.
1	Coupling Hub and Disc	1
2	Blower Segments	3
3	Key	1
4	Set Screw	1
5	Set Screw	1
6	Hex Head Screw, Coupling to Rotor	6
7	Hug Nut, Coupling to Rotor	6
9	Hex Head Screw	6
10	Hex Nut	6
11	Blower Cover	1
12	Hex Head Screw	4
13	End Plate and Hub	1
14	Bearing	1
15	Hex Head Screw	2
16	Hex Nut	2
	Rotation Arrow, Not Illustrated, (Belted Only)	1
20	Frame, Includes:	1
	Coil	1
	Generator Cover	1
21	Rotor	1
21A	Rotor, Belted Only, Includes Items 2, 9 and 10	1
23	Brushholder	2
24	Brush	2
25	Bearing	1
29	Exciter Frame	1
30	Armature, Includes:	1
	Armature Coil	1
31	Main Pole Piece	2
	Field Coil	2
32	Brushholder	2
	Brushholder Parts	See P-25-M
33	Brush	2
34	Shakeproof Screw	4
35	Sleeve Collar	1
36	Washer	1
37	Nut	1
38	End Shell	1
	Shakeproof Screw, Shell Mounting	1

ELECTRIC STARTER (Optional)

Parts List P-69-E

ITEM	PART NAME AND DESCRIPTION	NO. REQ'D.
	Solenoid	2
	Resistor	2
	Diode and Heat Sink	1
	Grommet	4
	Loom	1
	Starter Control Panel, Includes:	1
	Control Panel	1
	Start Button	1
	Ammeter	1
	Charging Switch	1
	Switch Plate	1
	Ignition Switch	1
	Switch Plate	1
	Self Tapping Screw, Panel Mounting	3
	Case Front	1
	Case Bottom and Back	1
	Vibration Mount	4

HOW TO ORDER REPLACEMENT PARTS

Order parts only from Lincoln offices or from the Authorized Field Service Shops listed in the "Service Directory". Give the following information:

(a) From the nameplate — machine model, code and serial numbers.
(b) From this manual — complete part name and description, item number, quantity required and the number of the list used to get this information.

Any items indented in the "Parts Name" column are included in the assembly under which they are listed. The indented items may be ordered separately. If the entire assembly is needed, do ***not*** order the indented parts.

GUARANTEE

The Lincoln Electric Company, the Seller, warrants all new equipment except engines and accessories thereof against defects in workmanship and material for a period of one year from date of shipment, provided the equipment has been properly cared for, and operated under normal conditions. Engines and engine accessories are warranted free from defects for a period of ninety days from the date of shipment.

If the Buyer gives the Seller written notice of any defects in equipment or electrode or flux within any period of warranty and the Seller's inspection confirms the existence of such defects, then the Seller shall correct the defect or defects at its option, either by repair or replacement F.O.B. its own factory or other place as designated by the Seller. The remedy provided Buyer herein for breach of Seller's warranty shall be exclusive.

No expense, liability or responsibility will be assumed by the Seller for repairs made outside of the Seller's factory without written authority from the Seller.

The Seller shall not be liable for any consequential damages in case of any failure to meet the conditions of any warranty. The liability of the Seller arising out of the supplying of said equipment or electrode or its use by the Buyer, whether on warranties or otherwise, shall not in any case exceed the cost of correcting defects in the equipment or replacing defective electrodes in accordance with the above guarantee. Upon the expiration of any period of warranty, all such liability shall terminate.

The foregoing guarantees and remedies are exclusive and except as above set forth. There are no guarantees or warranties with respect to engines, accessories, equipment, electrodes, or flux, either express or arising by operation of law or trade usage or otherwise implied, including without limitation the warranty of merchantability, all such warranties being waived by the Buyer.

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