50-AMP WELDER

JOHN DEERE

OPERATORS MANUAL

50-AMP WELDER

OMTY4573 I3 English

OMTY4573 I3

LITHO IN THE U.S.A.
ENGLISH

To The Purchaser

Reading this operator's manual before using the welder will enable you to do a better, safer job.

⚠ This safety alert symbol identifies important safety messages in this manual. When you see this symbol, be alert to the possibility of personal injury and carefully read the message that follows.

After you have read this manual thoroughly, keep it handy for ready reference. When in need of parts and major service, see your authorized John Deere dealer.

Right-hand (R.H.) and left-hand (L.H.) references are determined by standing in front of and facing the welder.

The warranty on this welder appears on your copy of the purchase order which you should have received from your dealer when you purchased the welder.

Record the transformer serial number of your welder. Provide this number to your John Deere dealer when ordering parts. He needs this information in order to give you the most prompt and efficient service. (See page 18.)

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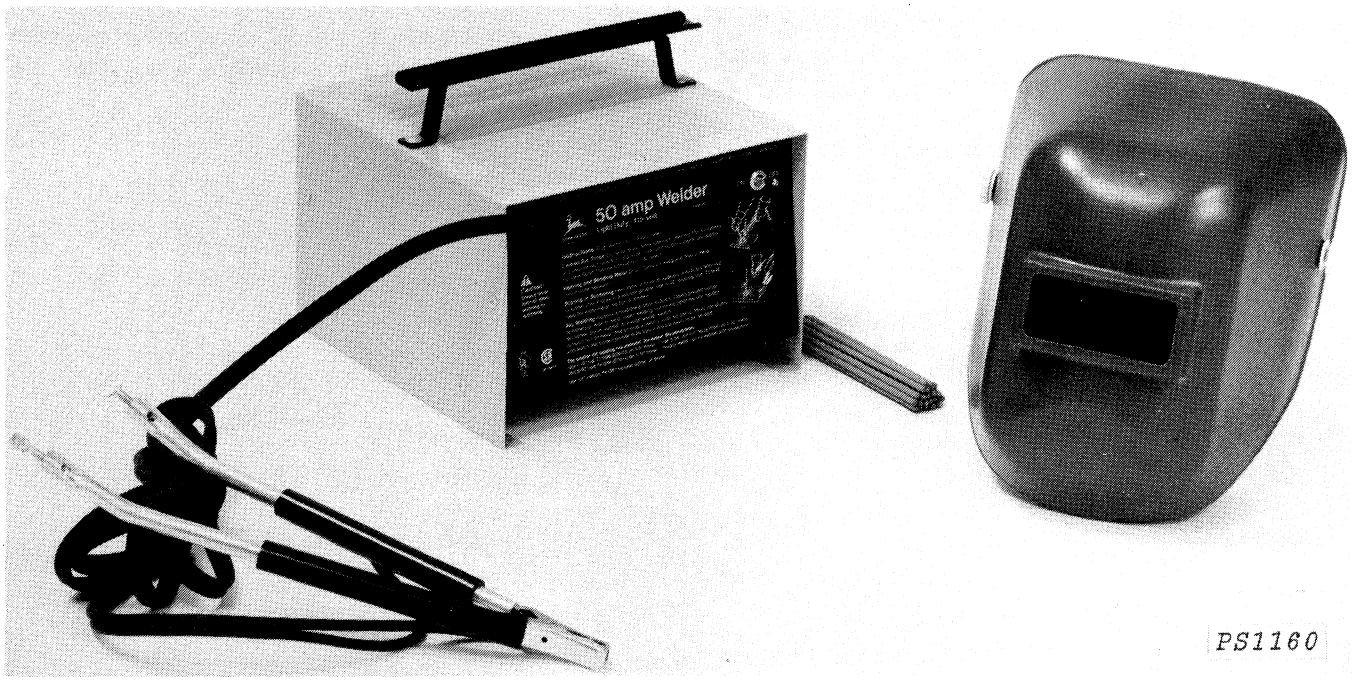


John Deere 50-Amp Welder

Safety Suggestions

Observe all *safety* precautions. Here are the basic rules:

Be sure the welding area has a good, safe floor. Concrete or masonry is recommended. The floor should not be wood, plastic tile or carpeted.

Keep all combustible materials at a safe distance.

Do not use gloves or other clothing which contain oil or grease.

Be sure all power wiring is correctly installed and maintained. Don't overload the welding cables.

Always be sure your machine is properly grounded. Never work in a damp area.

To avoid shocks, shut off the welding machine before making repairs or adjustments.

Follow the manufacturer's rules on operating the switches, and making other adjustments.

Protect others with a screen and yourself with a protective shield. Flying sparks are a danger to your eyes. Arc rays can also cause painful burns.

Keep a fire extinguisher handy at all times.

Avoid damp areas and keep the hands and clothing dry at all times. Dampness on the body may conduct an electric shock.

Never strike an arc on a compressed gas cylinder.

Welding equipment should be installed according to provisions of the National Electric Code.

Your power supply should be equipped with a power disconnect switch conveniently located at or near the welder so the power can be shut off quickly.

Suitable spark shields must be used around equipment in flash welding.

Keep the uninsulated portion of the electrode holder from touching the welding ground when the current is on. This will cause a flash.

Keep welding cables dry and free from oil and grease.

To prevent electrical shock, never carry welding cables coiled around the shoulders when they are carrying power.

Operation

HOW THE WELDER WORKS

The arc creates an intense heat between the end of the electrode and the surface of the metal to be welded. All future references to the metal to be welded will be "base metal" or "the work."

Heat energy generated by the arc causes the base metal to revert to almost liquid state at the point the arc is directed. A molten pool (puddle) is created and is always present on the base metal during the welding process.

This same heat melts down the electrode and the metal falls through the arc into the molten pool. This additional molten metal mixes with the base metal puddle which results in complete fusion of the two metals. As the electrode melts, and is moved forward, it forms a uniform pile of metal along the base metal known as "the bead."

INSTALLATION

Power Source

The welder must be connected to a power source that corresponds to the power required for the welder. Check your power source to see that it meets the following specifications:

PRIMARY VOLTS 115
PRIMARY AMPS (this indicates minimum fuse size) 15
PHASE (nearly all welders are single phase) ..... Single
CYCLES (nearly all welders are 60 cycles) 60

Connecting to Receptacle

The welder is equipped with a 3-prong plug. This will give the proper ground if plugged into correct wall receptacle or proper extension cord.

EXTENSION CORD

A No. 16 or heavier 3-wire (grounded) extension cord is required for the 50-amp welder.

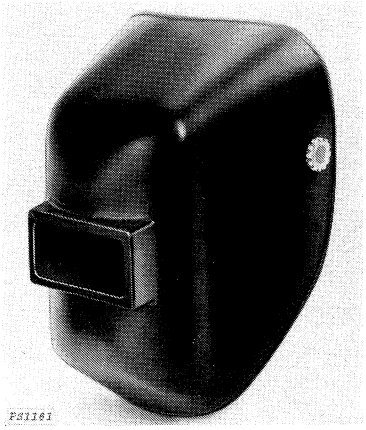
CONNECTING CABLES

Good performance of your welder depends upon power transmitted through the cables and connections.

Make sure that rust and scale are cleared away at the point of connection of your ground clamp. Poor connection at this point will waste power, heat up the clamp or both.

Be sure of a positive grip on the welding rod at the holder. Always keep rod clean and dry.

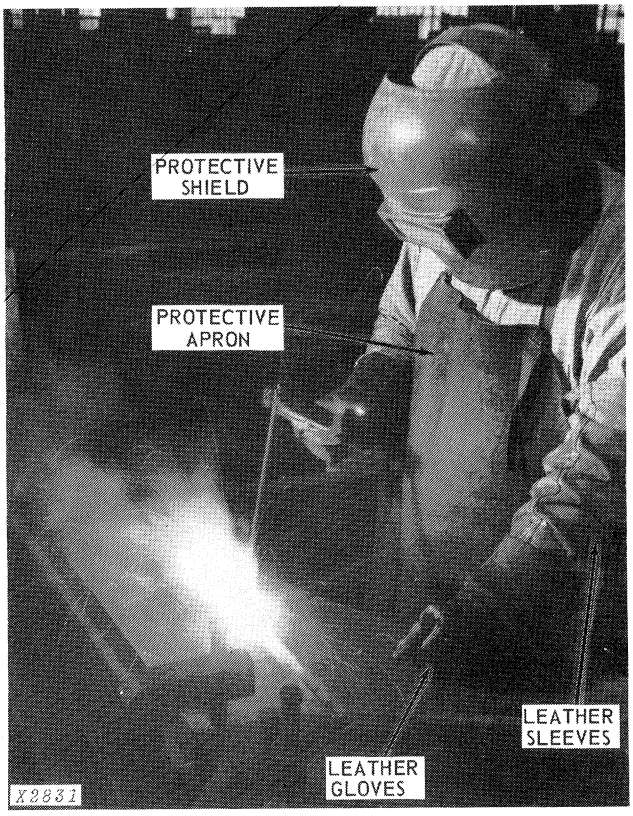
PROTECTIVE CLOTHING



Welder's Helmet

Never strike an arc unless your helmet is on and in position. Your eyes should always be protected during welding process. A protective cap should also be worn under the helmet.

Heavy leather gloves should be used. Use asbestos gloves when working in intense heat. Leather sleeves will give extra protection from sparks and intense heat.



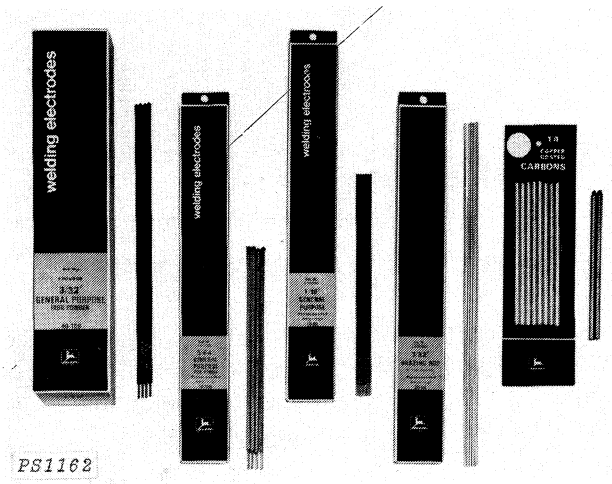
Protective Clothing

Leather or asbestos aprons are recommended for heavy welding or cutting.

Wear heavy shoes and never roll pant legs as molten metal may fall into them.

ELECTRODES AND CARBONS

Sizes and Types



Electrode size depends on the thickness of the material to be welded. Position and type of joint are also factors in determining the size of the electrode.

Only "General Purpose" electrodes are recommended for use with your 50-amp welder.

Rod sizes available for this 50-amp welder are shown in the photo above.

Use 1/4" carbon (TY1847) to heat solder or braze. Use (TY1848) 3/32" brazing rod in conjunction with the 1/4" carbon.

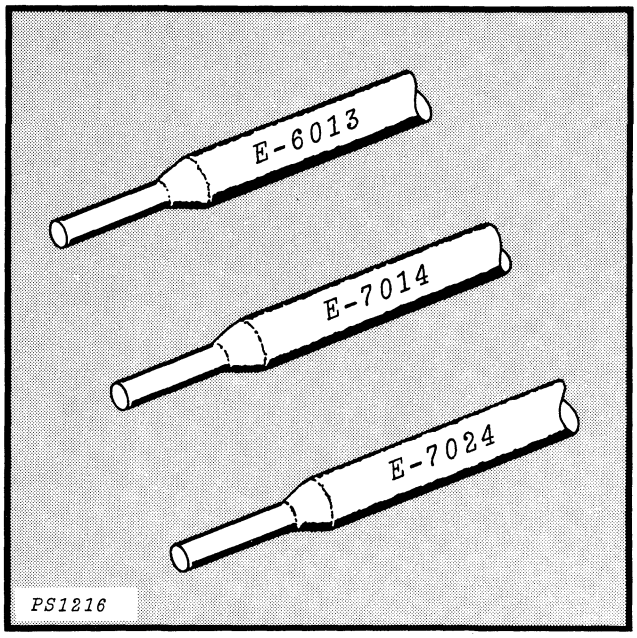
The 3/32" rod, TY1846 (E7014) is used on 1/16" metal.

Use a 5/64" rod, TY1782 (E7024) on 3/32" metal.

The 1/16" rod TY1598 (E6013) is used on 1/8" metal.

Thicker metals can be welded with preparation.

Remember — the smaller the welding rod diameter, the deeper the penetration.



Electrodes are marked to ensure some degree of uniformity by all manufacturers. Each electrode has been assigned a specific symbol such as E-6013 — E-7014 — E-7024. The prefix E identifies the electrode for electric arc welding. The first two digits designate the minimum allowable tensile strength of the deposited weld metal in thousands of pounds per square inch. For example, the 60 series electrodes have a minimum pull strength of 60,000 pounds per square inch; the 70 series, 70,000 pounds per square inch.

The third digit indicates possible welding positions. Number 1 is for an electrode that can be used in any position. Number 2 represents an electrode restricted to welding in horizontal and flat positions. Number 3 represents an electrode to be used in the flat position only.

The fourth digit shows some special characteristic of the electrode such as weld quality, type of current, or amount of penetration. For all practical purposes, fourth position marking will not affect the rod you would normally purchase.

Changing Electrodes

If it becomes necessary to change an electrode before a weld is completed, refer to the following instructions:

1. Raise end of electrode from base metal to break the arc; then remove left-over portion.

2. Clean unfinished weld thoroughly with a wire brush before starting the welding procedure again.

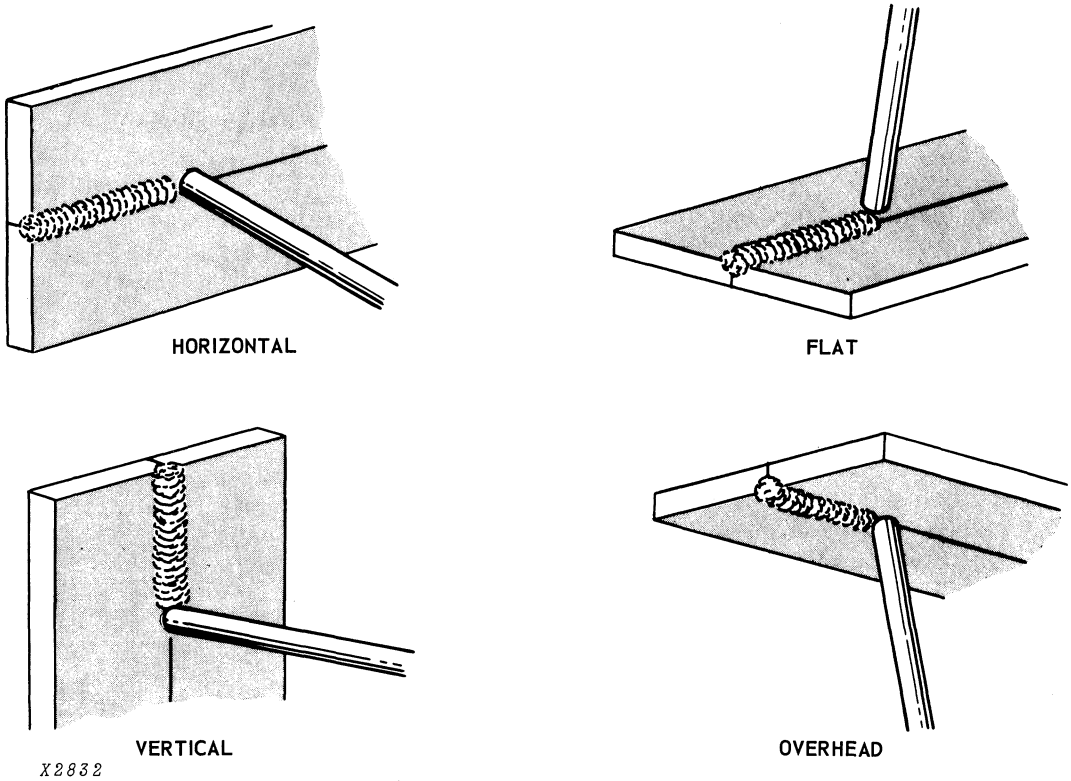
3. Position new electrode in the holder and strike a new arc just ahead of the crater. Move arc nearly to the back of the crater and fill with metal deposited from the electrode. The welding procedure can then be continued as before.

Storing Electrodes

When storage of electrodes is required, be sure storage area is dry. Moisture may affect the coating on the rod causing sputters or sticking when electrode is in use.

Welding Techniques

WELDING POSITIONS



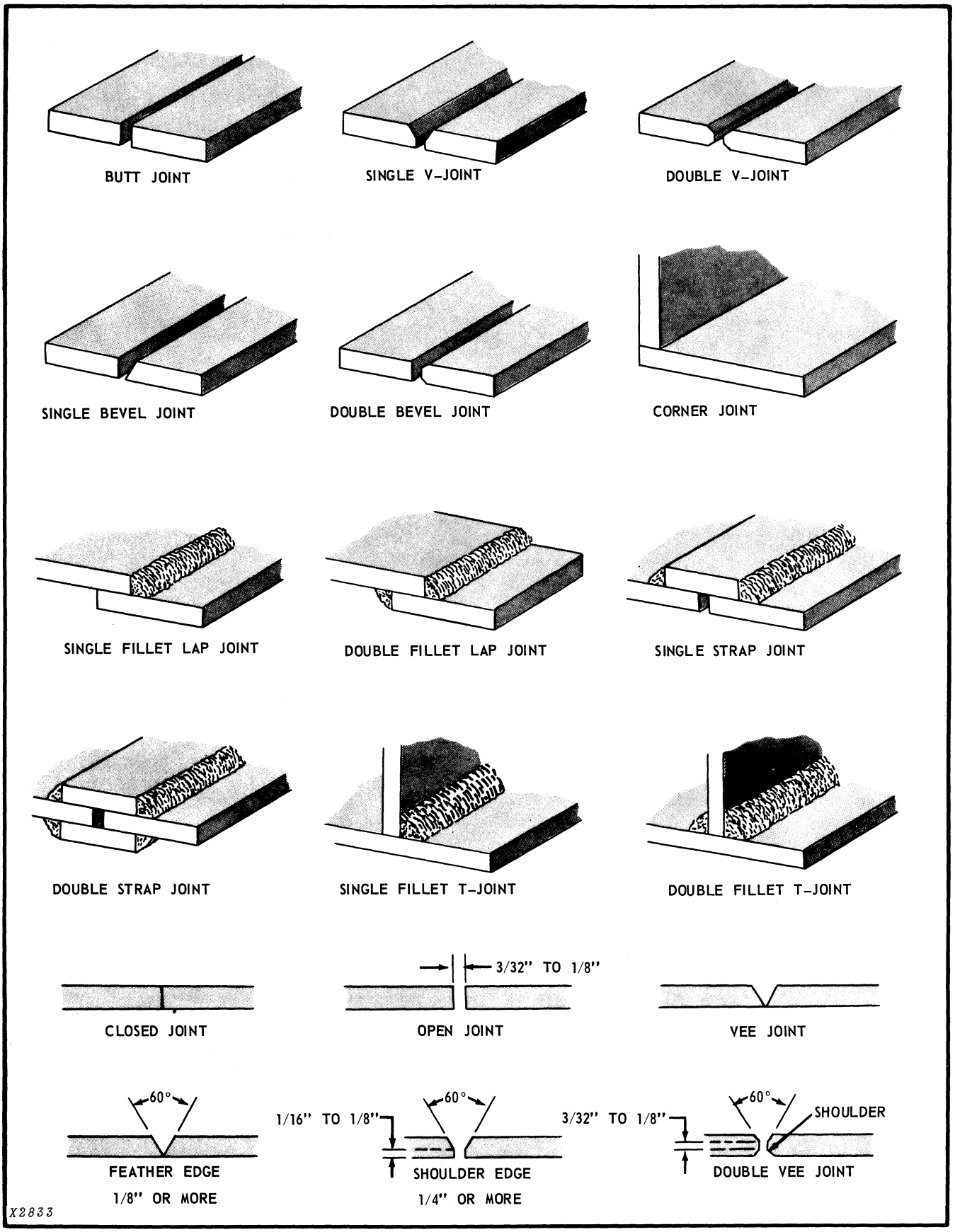
Arc welding can be done in any of the four basic positions shown above.

The flat position is generally easier and faster, plus allowing better penetration.

PREPARING JOINTS

The surfaces to be welded must be free of rust, scale, oil and paint. Welding on metals not properly cleaned will cause a brittle and porous weld.

Beveling may be necessary on one plate or the edges of both plates, depending on the thickness of the metal. Angle of bevel is usually 60° between the two plates as shown.

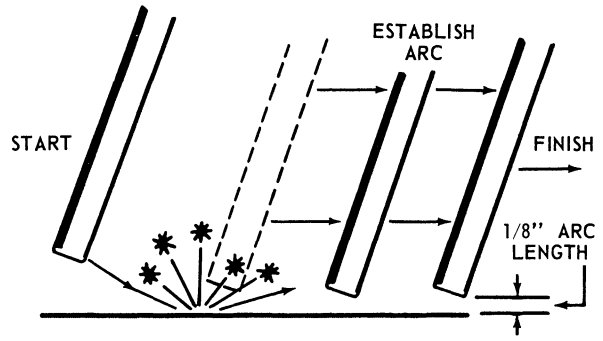


Types of Joints

STRIKING THE ARC

⚠ CAUTION: Never strike an arc unless your eyes and body are protected. Wear helmet, gloves, and protective apron to prevent burns from sparks or molten metal.

Inspect electrode end to be sure it is clean and shiny, to make good contact with the base metal.



Striking An Arc

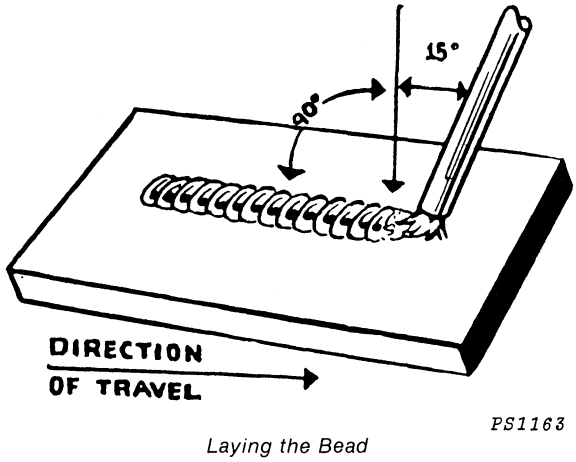
With a short stroke, rather like striking a match, move the electrode across the surface to be welded. You will soon hear a sputter and see an arc.

As soon as the arc has been struck, raise the electrode 1/8" to prevent electrode from sticking to the base metal. This will probably happen the first few times you try welding.

A good suggestion for the beginning welder is to practice striking arcs over and over again until it presents no problem for you. Some users will strike a satisfactory arc after three tries, while others may take a dozen tries before they get on tothe method.

Knowing you have a good arc is a matter of experience. A good, crisp, cracking sound which sound like eggs frying accompanies a good arc.

LAYING THE BEAD



Laying the Bead

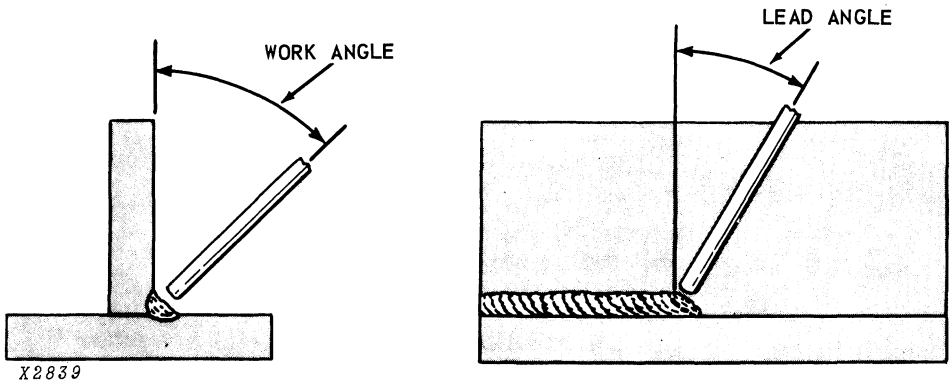
Three basic factors underlie a good weld. They are (1) the proper size electrode, (2) proper length of arc, and (3) the speed of moving the arc along the base metal.

NOTE: See page 4 for proper size of electrode.

Hold the electrode at the angle shown in the illustration below. It is good practice to "lead" the weld a little so you can watch the puddle behind the arc.

As the electrode melts away you must move the holder down closer to the base metal or the arc will break before the welding has been completed.

When lifting the electrode from the base metal, never move it too far or the arc will break, as the arc cannot jump more than a limited distance.



Electrode Angle

Proper Length of Arc

The length of the arc determines the amount of penetration — the depth to which the heat goes into the metal. A short arc, created by holding the electrode tip close to the base metal, gives more heat and deeper penetration. For most purposes, this is the best arc.

Speed of Moving Electrode Holder

Moving the electrode holder too rapidly will not allow the electrode to melt down and fuse properly with the molten base metal. For a good weld, don't work too fast, move the arc very slowly.

NOTE: To insure proper penetration and evenness of the weld, learn to watch the molten pool of metal forming just behind the arc.

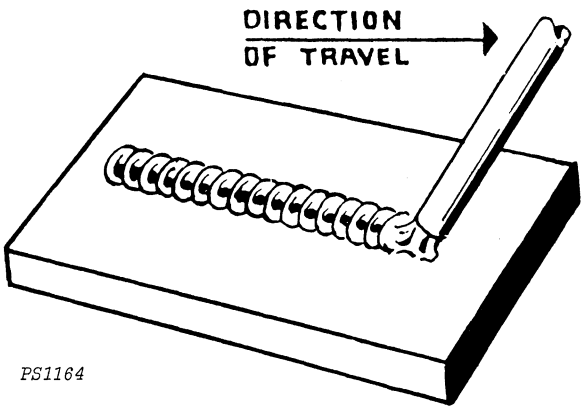
The "bead" is created as the molten metal from the electrode falls into the base metal puddle.

The coating on the outside of the electrode provides protection and insulation for the arc. As the coating burns off, it forms protective gases which envelop the space around the weld. This space prevents the air from reaching the molten metal and creating an undesirable chemical reaction.

Slag formation, the accumulation of dirty metal scale on the finished weld, may be removed with a hammer or chisel after it has cooled. Peening a weld with a hammer is accepted practice because it relieves the strains set up by intense heat. This is especially true in the case of cast iron.

TYPES OF BEADS

Stringer Bead



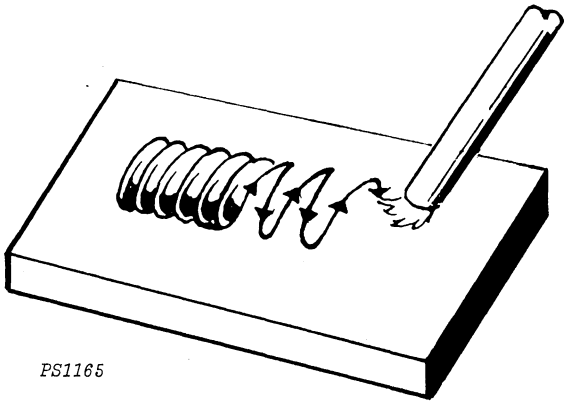
Stringer Bead

A stringer bead is made by one continuous passage of the electrode without weaving or oscillating.

To lay a stringer bead, first strike an arc and hold at the starting point for a short period to insure fusion and to allow bead to build up slightly. Use a short arc about 1/8" long. Move the electrode forward at a steady rate of speed. As the forward movement continues, move the electrode down at a uniform rate to compensate for the metal melted away.

If you are right-handed, move from left to right. If left-handed, reverse the process. The top of the electrode in the holder should be slightly ahead of the arc. This position will throw the molten metal behind the arc and insure good penetration. The bead will be about 1/8" high, using a 1/8" electrode. A good weld will be of consistent width and height and will have uniform ripples.

Weave Bead



Weave Bead

The weave bead will deposit metal in a wider space than would normally be possible with the stringer bead.

The weave bead is accomplished by weaving from one edge of the space to be filled in to the other edge. Continue this motion as well as forward speed of travel. Hesitate momentarily at each edge of the weave. This will provide the same heat at the edge of the weave as in the middle.

RECOGNIZING METALS

Because of the effect on the properties of steel caused by three variables: carbon content, temperature, and time, a welder must be able to determine accurately the nature of the steel being handled.

The manufacturer's specifications for the particular steel are desirable. Where specifications are not available, other methods may be used to determine the nature of the metal.

The most common tests for shop use are:

1. Magnetic test.
2. Color test.
3. Spark test.

Magnetic Test

The magnetic test is a basic test used to identify iron and steel metals from the nonferrous metals. Generally, all steels are affected by magnetism while the nonferrous metals are not. However, some stainless steels are not magnetic.

Color Test

The two main divisions of metal include the irons and steels which are indicated by their typical gray-white color, and the nonferrous metals which come in two general color classifications of yellow and white. Copper may be easily identified by a welder and the same applies to brass and bronze. Aluminum, white metal, aluminum alloys, zinc, and the like are all of somewhat the same silver-gray color, although they may vary in shade.

Spark Test

This method of identifying metals is widely used by welders to identify irons and steels.

A power grinder is used as the test equipment.

CAUTION: To help prevent eye injuries when grinding, you must always wear goggles. The grinder must be inspected to see that it is in good condition before proceeding with the test.

When testing a sample, if you touch the rim of the revolving wheel *lightly* with the metal, the friction of the wheel surface as it contacts the metal heats the particles removed to the incandescent and burning temperature.

The sparks resulting from the contact are found to differ in character for different steels.

The *lighter* the contact, the better; use a black background to better identify the spark.

The theory of the spark test is that when a metal is heated, the different parts of the metal oxidize at different rates and the oxidation colors are different.

Relatively pure iron when heated by the grinding wheel does not oxidize quickly; therefore, the sparks are long and fade out on cooling. As the carbon content of steel or cast iron increases, the compounds of carbon and iron have different ignition temperatures, and therefore the characteristics of the sparks differ.

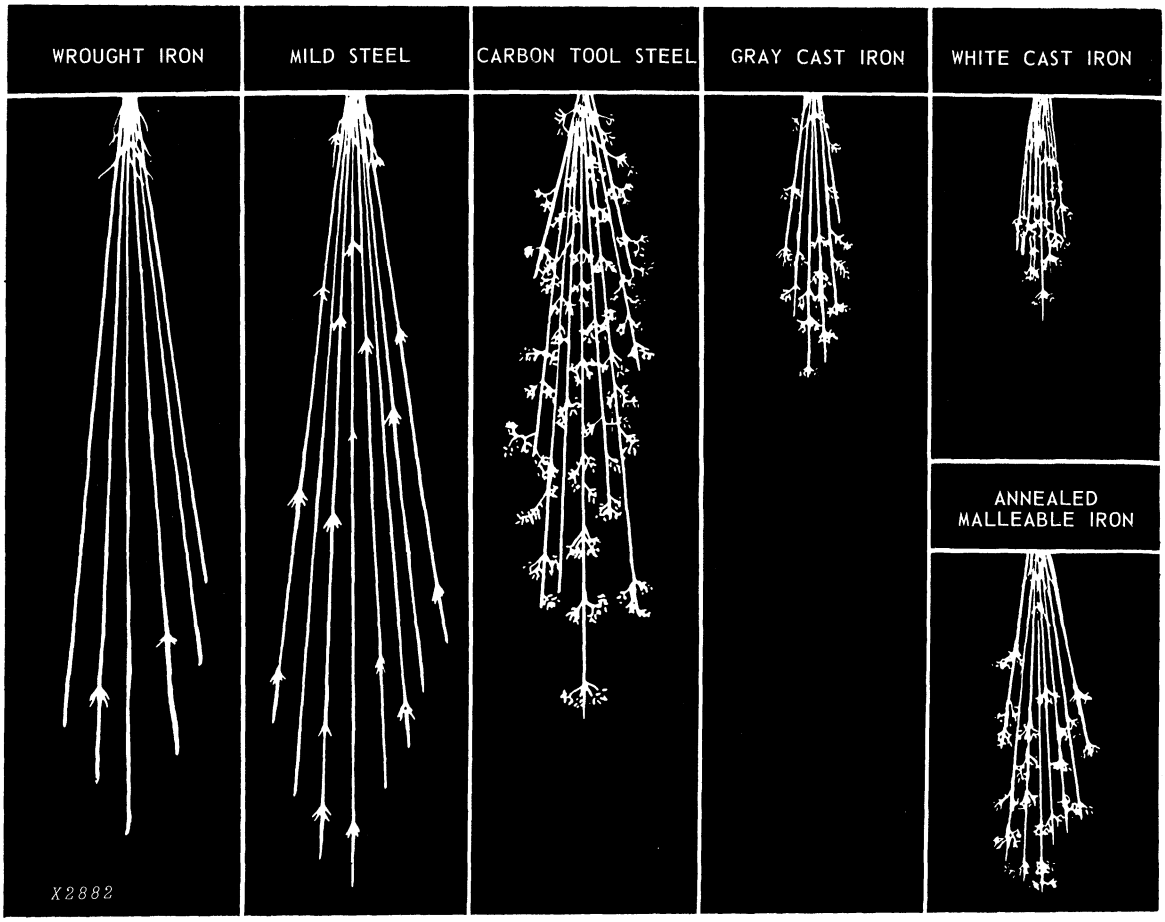
Four characteristics of the spark generally tell the nature and condition of the steel. They are:

1. Color of spark.

2. Length of spark.

3. Number of explosions (spurts) along the length of the individual sparks.

4. Shape of the explosions (forking or repeating).



Spark Test

For example, a mild steel containing 20 point carbon (.20 percent) will show a long white spark which will jump approximately 70 inches from the power grinder (using a 12-inch wheel). Some of these sparks will suddenly explode, shooting off smaller sparks at approximately 45 degree angles to the direction of travel of the original spark.

A 30 point carbon steel will have sparks almost identical to the 20 point carbon steel with the exception that more streamlined sparks will explode while the total length of the sparks will decrease slightly. This shows that as the carbon content of steel increases, the explosions of the sparks become more frequent. Also, as the carbon content increases the length of the spark is decreased because of the interruption during their flight of the individual explosions or extemely rapid oxidation of some of the materials in the incandescent particle.

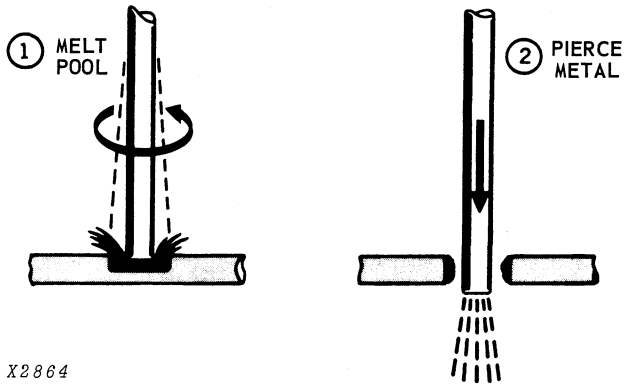
For example, a high carbon tool steel, containing 80 point carbon, has a very short spark with explosions occurring so rapidly that it is hard to identify the longer streamlined [illegible] shapes. Refer to illustration. The sparks dissip[illegible]ery quickly.

When higher carbon content metals are tested, you may become confused between extremely high carbon steel and cast iron because the spark is somewhat the same. Heat treatments have the same confusing effect on the nature of the spark.

The appearance of cast iron and high carbon steel on the basis of the spark are almost identical, however, the cast iron spark, when leaving the point of contact, is a dull red and the spark jumps only 20 to 25 inches from the wheel. The spark from a high carbon steel of approximately 130 point carbon is white, is faster in disappearing, and the length of the spark is usually a little longer. Both of these metals show a small spark explosion at the end of the spark flight. The amount of the spark is considerably less than one would expect from such a high carbon content.

BURNING HOLES AND CUTTING

Burning Holes

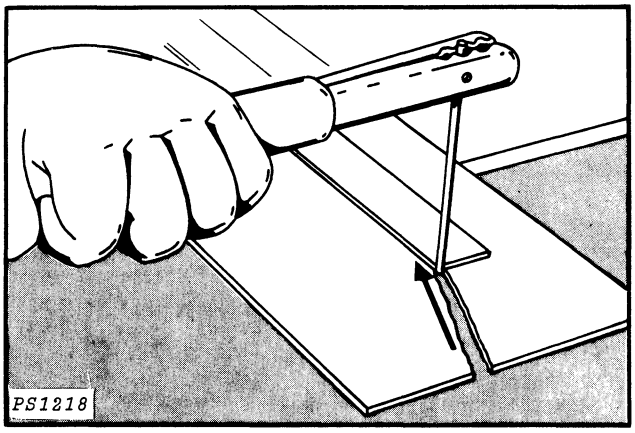


Burning Holes with Arc

When burning holes, the electrode is held perpendicular to the base metal and the arc is rotated in a small circle until the base metal becomes soft. Pushing or jabbing the electrode firmly through the base metal starts the actual hole. Its size and shape are determined by directing the arc in larger circles.

NOTE: It is recommended that you do not burn any metal heavier than sheet metal.

Cutting



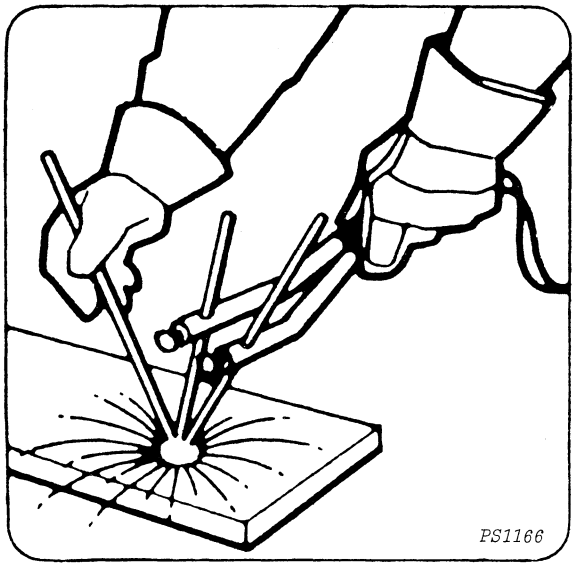
Cutting Metals

The procedure used in cutting is very simple. The heat of the arc is used to melt away the base metal along the side of the cut. The cut should be started at the edge of the base metal with the electrode pointed in at the cut. If the metal is fairly thick, the electrode should be worked up and down during the cutting operation from the top to the bottom of the cut. Less electrode will be consumed if soaked in water a moment before use.

NOTE: It is recommended that you do not cut any metal heavier than sheet metal.

CARBON ARC TORCH

Description



Carbon Arc Torch

The carbon arc torch greatly facilitates pre-heating for bending and shaping. It enables the user to solder, braze, and weld such metals as aluminum, brass, bronze, cast iron, malleable iron, malleable steel, and monel metal by the flame method.

When using the torch, it is not necessary to ground the base metal since the arc is created by the transfer of energy from one carbon to the other instead of from the electrode to the base metal. Because of its very hot flame (approximately 10,000 degrees F. at the arc), the carbon arc torch is highly suitable for bending, shaping, welding, and brazing operations.

Bending and Shaping

Before heating for bending or shaping, the metal should be placed in a vise, or some suitable tool where it can be held firmly. Heat the metal with the torch to a temperature where it will bend easily. Iron and steel when heated to a cherry red color will bend freely. Apply bending pressure pipe wrench, hammer, etc.

Brazing

Brazing is the process of joining two metals, often of a different type, by means of a third metal. Brazing differs from welding in that the parts being joined are not brought to a fluid or plastic state. The strength of the brazed joints is limited to the strength of the third metal.

Brazing Copper or Brass

To braze copper or brass, a good grade of commercial bronze filler rod (used in the same manner as ordinary solder with the arc torch) is all that is required.

Two methods may be used to join the base metal and the filler rod:

1. Fusion Method

In this method, the melting temperature of the base metal and the filler rod are about the same. The base metal and the filler rod are heated to the same degree of plasticity and mixed during brazing.

2. Bonding Method

In the bonding method, the base metal requires more heat than the filler rod. The base metal must therefore be heated to temperature greater than that required to melt the filler rod. When the base metal reaches the proper temperature, the filler rod is held under the flame where it melts and flows into the porous surface of the base metal.

As the difference between the melting temperature of the base metal and the melting temperature of the filler rod determines which method is to be used, heat either the base metal or the base metal and filler rod as necessary. The base metal should be a dull red color before filler rod is added.

Brazing Galvanized Iron

Brazing, rather than welding, is suggested when working on galvanized iron because brazing is done at a lower temperature. This protects the zinc coating on galvanized iron.

Use the bonding method described under Brazing Copper or Brass. Hold the flame close to the base metal and add brazing flux and a good grade of commercial bronze filler rod.

Brazing Cast Iron

Light cast iron castings may be brazed by the same method used for brazing galvanized iron. The casting should be heated to a cherry red color before adding metal from the filler rod.

Trouble Shooting

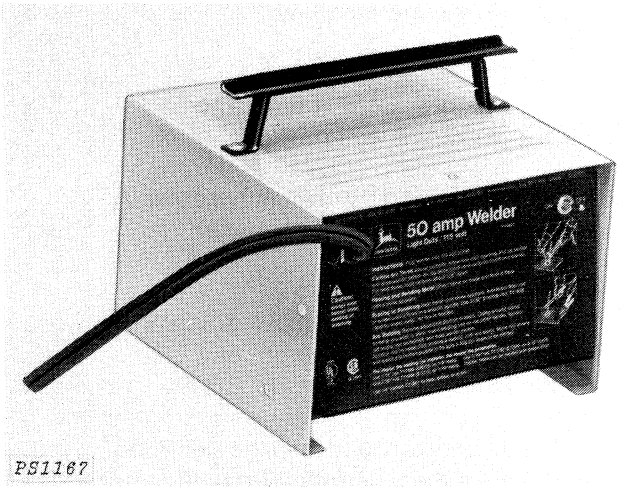
Trouble	Possible Cause	Possible Remedy	Page
Welder output too low.	Input line not of proper capacity.	Have an electrician check to see that line is 110-120 volt, single-phase, and that the wiring is delivering rated power.	. .
Welder causing shocks.	Welder wired with a "Hot" wire to the "Ground" terminal.	Disconnect the welder, then check "Ground" connection of welder receptacle.	. .
Trickle Shocks.	Moist ground.	Stand on dry board or other dry surface.	. .
Welder does not hum when turned on.	Welder not getting power.	Check fuses and circuit breakers back to meter.	. .
Welder hums but does not weld.	Poor connection outside welder.	Disconnect welder, then check welding ground clamp connection.	3
Welder hums but does not weld.	Poor connection inside welder.	Disconnect welder, then check cable connections and leads inside welder.	. .
Welder hums but does not weld.	Wrong electrodes.	Check to be sure proper electrodes are being used.	4

COMMON WELDING PROBLEMS

Trouble	Possible Cause	Possible Remedy	Page
Arc hard to strike.	Wrong type of electrode.	Check to be sure electrode is not a direct current type. Direct current electrodes require higher voltage and will not operate on alternating current welders successfully.	4
	Electrode too large.	Try an electrode with a smaller diameter.	4
	Base metal not grounded properly.	Check ground carefully.	3
	Voltage from power line low due to heavy loads.	Try to strike arc at a time when less current is being used.	3
Bead too thin in places.	Uneven speed of moving electrode across base metal.	Slow down and try to maintain a steady rate of travel over the surface to be welded.	9
Bead too thick in places.	Holding the electrode too long in one place or moving it too slowly across base metal.	Speed up and maintain a uniform rate of speed along the length of the bead.	9
Excessive spatter.	Holding too long an arc.	Hold a short arc and feed the electrode down as the electrode burns off.	8
Ragged depressions at edge of weld.	Moving the arc too rapidly or too short an arc.	Slow down, if that doesn't help, try a longer arc.	9
Overlapping beads.	Arc too long or rate of travel too fast.	Try a shorter arc or slower electrode movement.	9
Electrode sticks to work.	Electrode in direct contact with base metal while arc is being struck.	Move electrode away from the base metal immediately after the arc is struck.	8

Service

REMOVING CASE COVER



⚠ CAUTION: Before disassembling the 50-amp Mini-Welder, be certain the connection to the power source has been disconnected.

Remove 4 screws on each side of case cover and two screws from top; then slip case cover off of case bottom.

POWER CORD

Removal

Disconnect the power cord wire leads to the switch and transformer coil. Remove ground wire inside the case bottom and pry out strain relief bushing. Pull power cord out rear of case bottom.

Inspection and Repair

Inspect all wire leads and cable connections for frayed or broken wires. If damage is noted replace power cord.

Replace wire insulation sleeves if broken or cracked.

Replacement

Insert power cord through hole in back of case bottom and attach black lead wire to switch and white wire to transformer coil. Connect ground wire and secure cord with strain relief bushing.

SWITCH

Disconnect power cord lead and transformer lead from rear of toggle switch.

Remove knurled nut from front panel of bottom case and pull switch from welder.

To replace switch, position in panel and secure with knurled nut. Attach wire leads—long lead from power cord to top and short lead to side.

ELECTRODE HOLDER AND TORCH ASSEMBLY

Remove cover and disconnect leads to transformer.

Remove strain relief bushing from front panel and pull cable through case.

To install, push cable through front panel of case bottom. Connect wire leads to transformer coil. Assemble bushing to cord and secure cable to front panel.

TRANSFORMER

Removal

Remove cover and disconnect wire lead from electrode holder cable. Disconnect wire leads from power cord and switch.

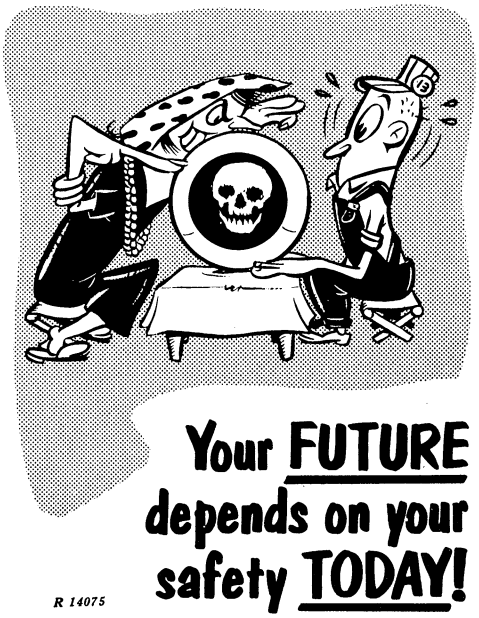
Remove three bolts and three clip nuts that secure transformer to bottom case. Remove nut, bolt and internal tooth washer, which provide the positive ground for the transformer, and then lift transformer from the welder bottom case.

Replacement

To install the transformer, secure with bolts, clip nuts (3 required) and regular washer and nut as required.

Connect all wire leads to the transformer coil. Be certain electrode holder and torch assembly are connected to the coil having the heavier wire wrapping.

Assemble cover. Welder should be operational. If it is not, disconnect power cord and check all wiring to be certain there are no loose or improper connections.



Specifications

Primary volts	115
Primary amps	15
Frequency	60 Cycles
Open Circuit Volts	45
Secondary amps	50
Phase	Single
Arc volts	25
Temperature rise	115°C
Duty cycle	20%
Height	8 in.
Weight (approximate)	31 lbs.

(Specifications and design are subject to change without notice.)

SERIAL NUMBER

The serial number is stamped on the transformer. You will have to remove the cover to read the serial number (see page 16).

When ordering parts, always bring with you the serial number as given on the serial number plate. By doing so, you will assist your John Deere dealer in giving you prompt, efficient service. For your convenience, a space is provided to the right for recording this information.

TRANSFORMER SERIAL NO. _____

DATE PURCHASED _____

(To be filled in by purchaser)

Glossary

ALL TERMS

Arc — Term given to the flow of electricity through a gaseous space or air gap. In arc welding, this flow of electricity through the air produces the high temperatures.

Arc Welding — Fusing two metals together using an electric arc as the source of heat.

Base Metal — Metal to be welded, cut or brazed. Also called the "work."

Bead — Denotes the appearance of the finished weld; describes neatness of the ripples formed by the metal in a semiliquid state.

Bevel — Angling the metal edge where welding is to take place.

Bond — Junction of the weld metal and the base metal.

Braze Welding — Making an adhesion groove, fillet or plug connection with a brazing alloy.

Brazing — Making an adhesion connection with a minimum of alloy which melts above 800°F and which flows by capillary between close-fitting parts.

Butt Joint — An assembly in which the two pieces joined are in the same plane, with the edge of one piece touching the edge of the other.

Carbon Electrode — Carbon in solid form used for arc welding.

Covered Electrode — Metal rod used in arc welding which has a covering of materials to aid in arc welding process.

Electrode — A substance which brings electricity up to the point where the arc is to be formed. In electric arc welding the electrode is usually melted and becomes a part of the weld.

Filler Rod — Metal wire that is melted and added to the welding puddle to produce the necessary increase in bead thickness.

Fillet Weld — Metal fused into a corner formed by two pieces of metal whose welded surfaces are approximately 90° to each other.

Flux — A chemical used to promote fusion of metals during the welding process.

Fusion — Mixing of molten metals.

Horizontal Position — A weld performed on a horizontal seam at least partially on a vertical surface.

Joint — Where two pieces meet when a structure is made of smaller pieces.

Lead Wire — Electric wire from the power source to the electrode holder or to the ground clamp.

Overhead Position — A weld made on the underside of the joint with the face of the weld in a horizontal plane.

Penetration — Depth of fusion into the base metal as measured from the surface of the base metal.

Puddle — Portion of a weld that is molten at the place the heat is supplied.

Soldering — Means of fastening metals together by adhering another metal to the two pieces of these metals. The joining metal only is melted during this process.

Tack Weld — Small weld used to temporarily hold together components of an assembly.

Undercut — A depression at the toe of the weld which is below the surface of the base metal.

Vertical Position — Type of weld where welding is done on a vertical plane and on a vertical surface.

Welding — Art of fastening metal together by means of interfusing metals.

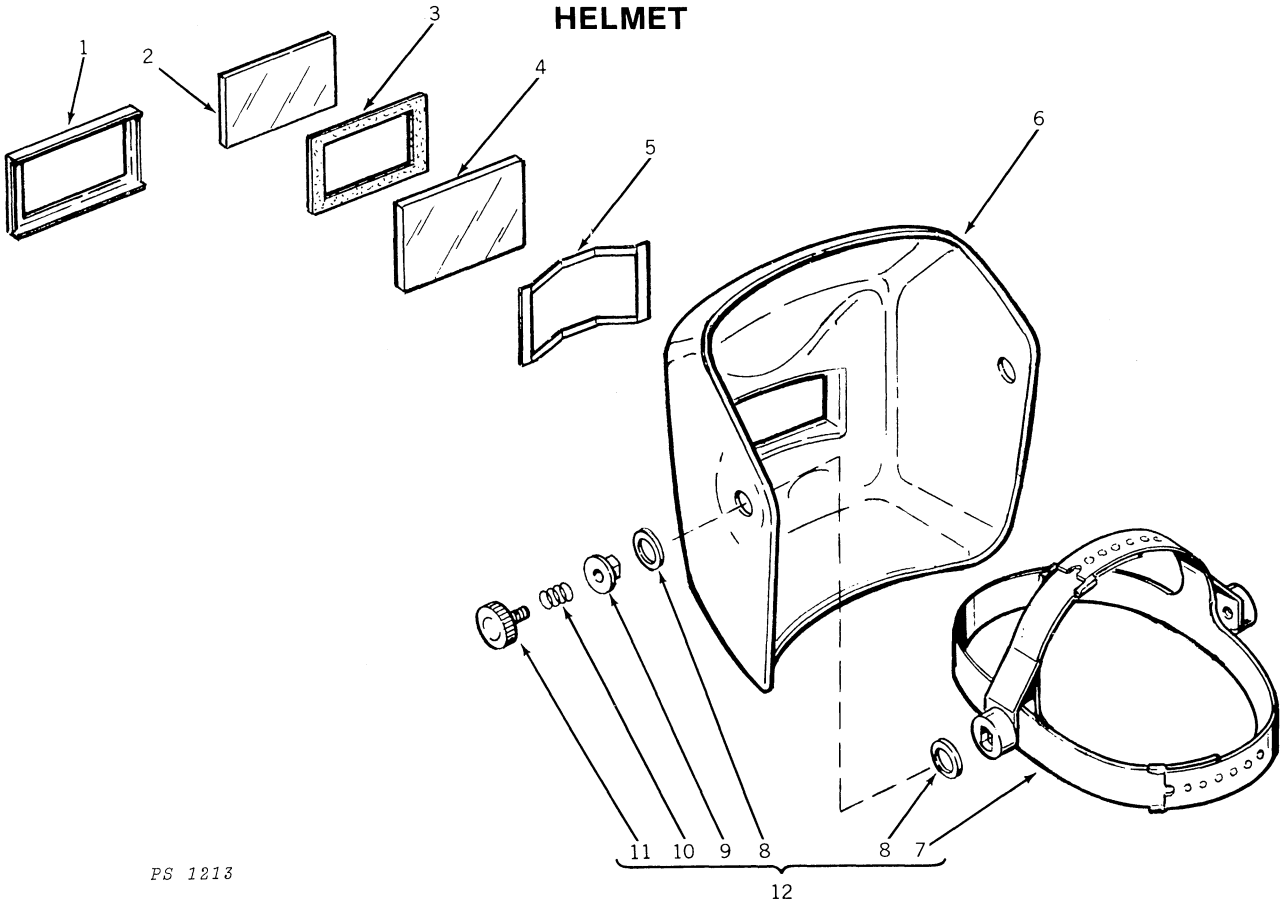
Welding Rod — Wire which is melted into the weld metal.

Parts List

The "exploded view" method of illustrating parts is used in this parts list.

Each available part has been given a key number which is used only as a reference to the exploded view. The key number is not a part number. Do not use it when ordering parts.

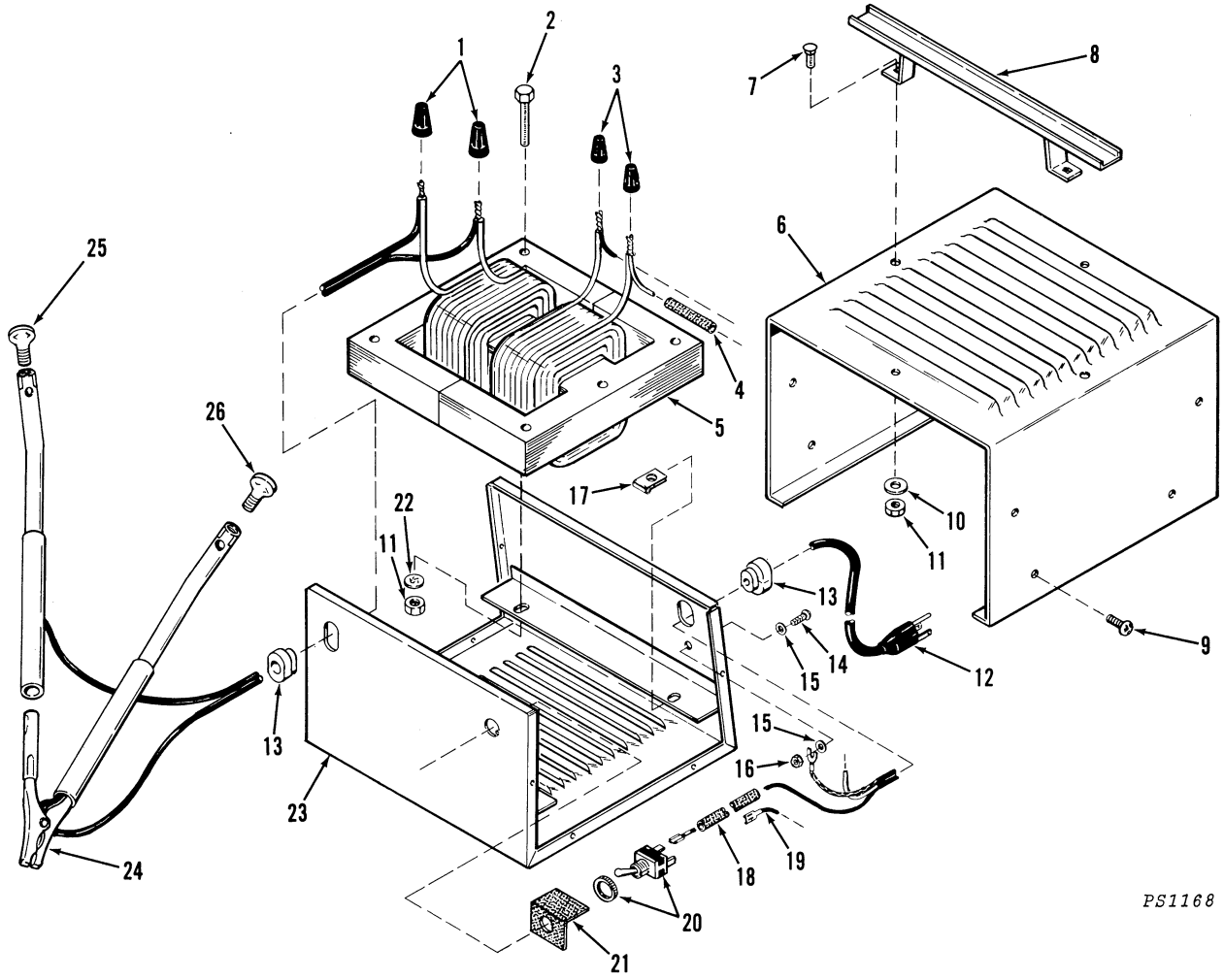
HELMET



PS 1213

Key	Part No.		Serial No.	Description
1	...	....	(-)	Retainer, lens
2	TY	4635	(-)	Cover, plastic, clear
3	...	....	(-)	Gasket
4	TY	4636	(-)	Lens, No. 10 Shade
5	...	....	(-)	Holder, spring, lens
6	...	....	(-)	Shield, helmet
7	...	....	(-)	Headband
8	...	....	(-)	Washer, fiber (4 used)
9	...	....	(-)	Spacer (2 used)
10	...	....	(-)	Spring (2 used)
11	...	....	(-)	Knob, adjusting (2 used)
12	TY	4637	(-)	Headband assembly
••	TY	4605	(-)	Helmet, complete

BASIC WELDER



Key	*Part No.*	*Serial No.*	*Description*
1	. . . . .	(-)	Connector, wire (for use with 10 ga. wire) (2 used)
2	19H 1914	(-)	Screw, cap, hex. hd., 1/4" x 1" (4 used)
3	TY 4112	(-)	Connector, wire (for use with 16 ga. wire) (2 used)
4	. . . . .	(-)	Sleeve, insulation (6-1/2 inches)
5	TY 4595	(-)	Transformer Assembly
6	TY 4596	(-)	Cover, case
7	3H 1063	(-)	Bolt, carriage, 1/4" x 1/2" (2 used)
8	TY 4597	(-)	Handle assembly
9	21H 1158	(-)	Screw, mach., rd. hd., No. 8 x 1/2" (10 used)
10	12H 302	(-)	Washer, lock, 1/4" (2 used)
11	14H 786	(-)	Nut, hex., 1/4" (2 used)
12	TY 4598	(-)	Cord, power
13	TY 4599	(-)	Bushing, strain relief (2 used)
14	21H 1301	(-)	Screw, mach., rd. hd., No. 10 x 1/2"
15	12H 295	(-)	Washer, lock, internal tooth, No. 10 (2 used)
16	14H 778	(-)	Nut, hex., No. 10 (1 used)
17	. . . . .	(-)	Nut, clip, 1/4" (3/4" x 1/2"—for 14 ga. metal) (3 used)
18	. . . . .	(-)	Sleeve, insulation, 2-3/4"
19	TY 4600	(-)	Lead, wire
20	TY 4601	(-)	Switch with nut, 20-amp
21	TY 4602	(-)	Insulation, switch
22	12H 291	(-)	Washer, lock, internal tooth, 5/16"
23	TY 4603	(-)	Bottom, case
24	TY 4604	(-)	Electrode holder and ground clamp assembly
25	. . . . .	(-)	Screw, thumb, 1/4-20 x 1"
26	. . . . .	(-)	Screw, thumb, 1/4-20 x 3/4" (1 used)

Parts listed below are not illustrated

--	TY 1598	(-)	Rod, welding, 1/16" (1/2 lb. pkg.)
--	TY 1782	(-)	Rod, welding, 5/64" (1/2 lb. pkg.)
--	TY 1846	(-)	Rod, welding, 3/32" (5 lb. pkg.)
--	TY 1847	(-)	Rod, carbon, 1/4" (pkg. of 8 rods)
--	TY 1848	(-)	Rod, brazing, 3/32" (1 lb. pkg.)

MEMORANDA

MEMORANDA

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Technical Manual 50, 230, and 295-Amp Welders	TM-1173 (Feb. 79)		

NOTE: If you want manuals or catalogs for equipment not shown on this list, list the model number, serial number and name of the equipment below.

FMO Manual - Tractors	FMO-101B		
FMO Manual - Tillage	FMO-111B		
FMO Manual - Planting	FMO-121B		
FMO Manual - Crop Chemicals	FMO-131B		
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FMO Manual - Combine Harvesting	FMO-151B		
FMO Manual - Preventive Maintenance	FMO-161B		
FMO Manual - Machinery Management	FMO-171B		
FMO Manual - Machine Safety	FMO-181B		
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FOS Manual - Hydraulics	FOS-10B		
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FOS Manual - Engines	FOS-30B		
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FOS Manual - Belts and Chains	FOS-53B		
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FOS Manual - Fasteners	FOS-60B		
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SET OF ELEVEN FOS MANUALS FOS-51B, 52B, 53B, 54B, 55B, 56B, 57B, 58B, 59B, 60B and 61B	FOS-71 Set		
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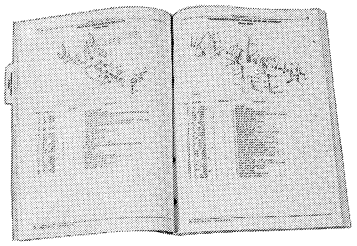
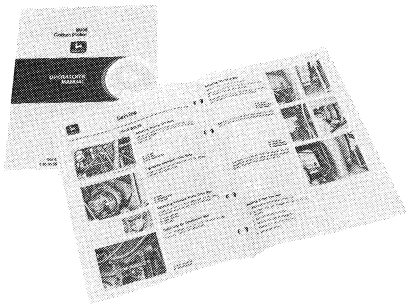
PARTS CATALOG



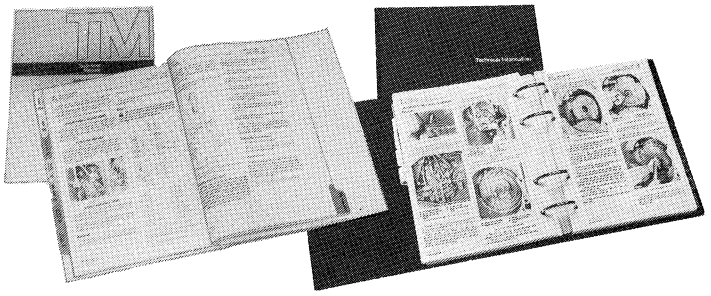
A parts catalog containing exploded view illustrations and lists of all parts is useful when purchasing service parts. Helps identify the correct parts. Useful in assembling and disassembling.

OPERATOR'S MANUAL



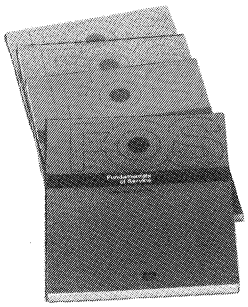
An extra copy of the operator's manual may be important if the copy furnished with your machine is misplaced.

TECHNICAL MANUAL



The technical manual is a service guide for your machine. Included in the manual are specifications, diagnosis and adjustments, illustrations of special assembly and disassembly procedures, hydraulic oil flows, and wiring diagrams.

FMO AND FOS MANUALS



These are basic manuals covering most all types and makes of agricultural machinery. FMO manuals tell you how to *operate* machines; FOS manuals tell you how to *service* machines. Each manual starts with basic theory and is fully illustrated with colorful diagrams and photographs. Both the"whys" and "hows" of adjustments and repairs are covered in this reference library.

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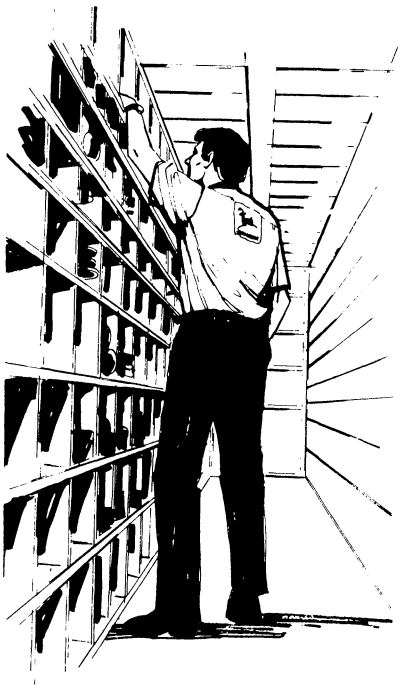

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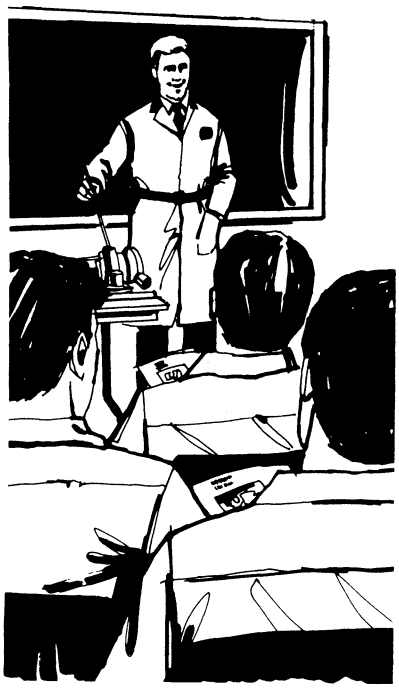

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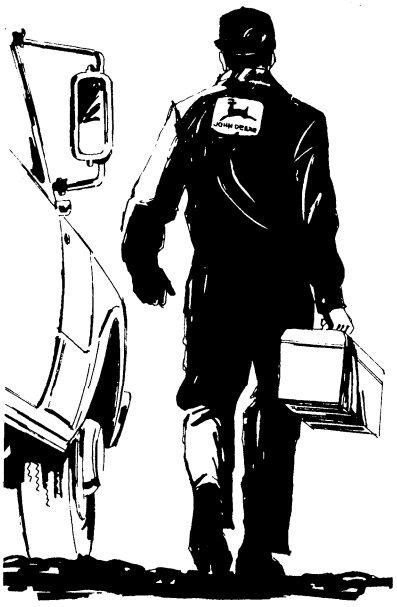

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