

SA-200 HERCULES IXB ENGINE DRIVE

"Shield-Arc" WELDER

WITH DUAL CONTROL

IM109
 Shield-Arc SA-200
 Hercules
 6; 42; 50; 100; 104;
 377; 378; 381; 404;
 444; 457; 460

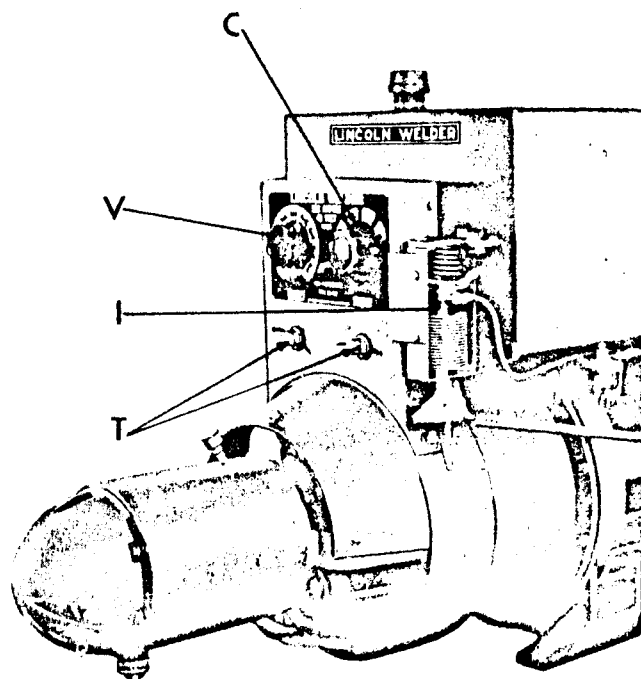
OPERATION OF MACHINE AND CONTROL OF WELDING CURRENT

After checking the gasoline engine to make sure that the oil is at the proper level and the radiator is full, the electrode and ground cables should be connected to the studs on the front of the welder control panel - studs are marked "Positive" and "Negative". Some types of electrodes require the electrode positive and others negative, therefore, consult the instructions for the particular welding electrode being used to determine which welding lead is to be attached to the "Positive" stud and which to the "Negative" stud. Wing nuts are provided to make easy the changing of the welding leads.

This welder is equipped with Dual Control of the welding current. To meet the varied requirements of present day welding it is highly desirable to be able to vary the voltage and current separately. Dual Control means that it is possible to get proper welding current through the range of the machine in two or more ways. The Selective Current Control and the Continuous Voltage Control may be compared to the controls of an automobile where you get the major variations in speed with the gearshift and the finer gradations of speed with the accelerator.

The Current Control gives the coarse adjustment and is always set first. Set the Current Control to one of the four points, nearest, but lower than the current recommended for the electrode. The fine adjustment is then made by turning the Voltage Control to the left from Position #10, until just the right arc characteristics are obtained.

The steps obtained by the different positions of the Current Control overlap, that is, for any position of the Current Control, the current or welding "heat" obtained when the Voltage Control is at Position #100 will be higher than that obtained by going to the next higher Current Control step and turning the Voltage Control back to Position #10. This completely eliminates "blind spots" in the welding range and assures the exact heat for every job.



- V. Continuous Voltage Control
- C. Selective Current Control
- T. Welding Lead Terminals
- I. Idling Device

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

The operator can readily observe the working of this principle by following the suggested experiment below:

Start the engine, turn the Current Control to the minimum setting at the right, then turn the Voltage Control to the right to its lowest value. Insert a 3/32" electrode in the electrode holder and try to start the arc in the usual way. Probably some difficulty will be experienced because the current and voltage are too low. Turn V (Voltage Control) to the left 10 or 20 positions and repeat striking the arc. Continue this, each time turning V a little to the left. At some point will be found the place where the arc is easiest to strike and maintain with good fusion and a minimum of spatter.

Now use the same size electrode and move the Current Control to the next higher step and the Voltage Control back to the lowest value on Position #10. Repeat the operation above of striking the arc and of moving the Voltage Control to the left until the best operating characteristics are reached.

It can thus be seen that for each size of electrode the machine is designed to give at least two methods of securing the correct welding current. The method used by the operator is determined by the arc characteristics needed for a particular job.

It is generally better to set the Current Control at as low a value as possible with the Voltage Control set on a high value so as to give a high open circuit voltage. High open circuit voltage is useful with coated electrodes and where a long arc is needed with normal penetration. High open circuit voltage is often used with low current settings on light gauge metals. For a short forceful or penetrating arc, especially on vertical and overhead work, a low open circuit voltage is desired and it is better to set the Current Control at the next higher point and keep the Voltage Control at a fairly low position.

When welding at considerable distances from the machine care should be taken that ample size welding cables are used. Small size cables for long distance welding merely reduce the output at the point of welding.

After the machine has been in operation for some time, all external connections should be checked to make certain they are tight.

It is considered good practice to blow out the machine with compressed air occasionally.

BEARINGS

Your welder is equipped with double-shield ball bearings having sufficient grease to last indefinitely under normal service conditions. Where the welder is used constantly or in excessively dirty locations, it may be necessary to add one ounce of grease per year.

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

COMMUTATOR AND BRUSHES

The commutator and brushes are inspected by removing the commutator cover. Do not remove or replace the cover while the welder is running.

The brushes on the generator and exciter are properly adjusted when the welder arrives. No particular attention is required to keep the brushes in good condition. When the brushes wear within 1/8-in. of the pigtails, they must be replaced. One complete set of brushes should always be kept on hand. Use only Lincoln replacement brushes. Seat the brushes by lightly stoning the commutator while the armature rotates at full speed. This operation is completed when the brushes make contact over the entire contact face. Visually inspect the brushes to make sure they are fully seated. After stoning blow out the dust with low pressure air. DO NOT SHIFT THE BRUSHES.

The commutator requires practically no attention. It should be cleaned from time to time with a clean rag or, while running, with a commutator stone or a piece of fine sandpaper. Never use emery cloth or paper for this purpose.

THE LINCOLN ELECTRIC COMPANY

World's Largest Manufacturer of Arc Welding Equipment and Electrodes
Manufacturer of Motors Since 1895

Cleveland, Ohio 44117

**RENEWAL PARTS
For Model SA 200 Engine Driven**

Always give full nameplate reading of welder when ordering renewal parts.

(For Engine Parts Refer to Engine Catalog)

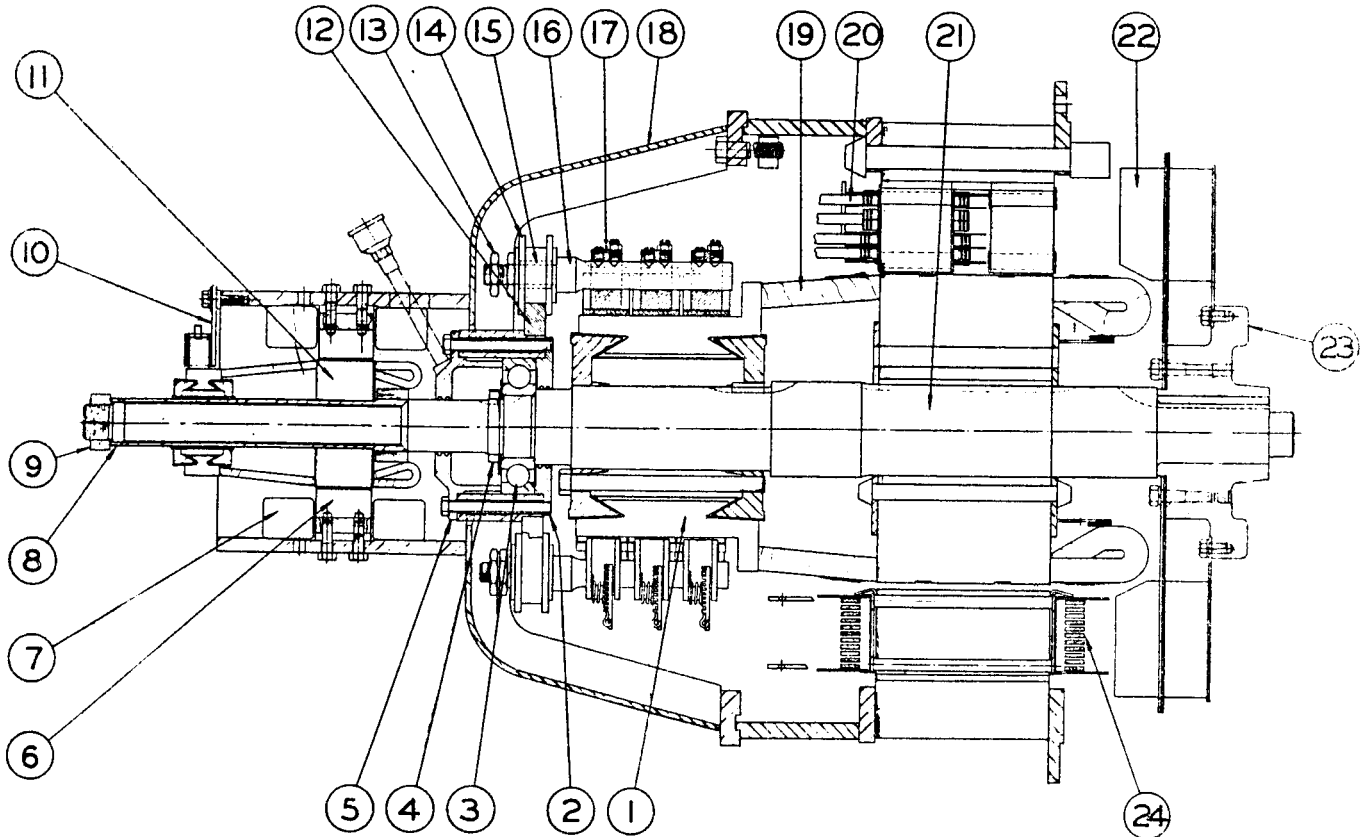


FIGURE IM-109-E

1. Commutator	{ 81 Bar ----- M-6111-F 83 Bar ----- M-6111-E	13. Brushholder Stud Nuts	----- T-1449	Old Style	New Style
2. Inner Dust Cap	----- S-4386	14. Insulating Washer	----- T-4479		T-4479
3. Bearing	----- #308	15. Insulating Tube	----- T-2667		T-2667
4. Bearing Locknut & Washer		16. Brushholder Stud	----- T-3117		M-6302-4A
5. Outer Dust Cap	----- S-4387	17. Brushholder	----- S-3939		
6. Exciter Field Poles	{ Standard T-3980-4 Oversize T-3980-1	18. End Bracket	{ Standard ----- M-4884-1 Oversize ----- M-4883-1		
7. Exciter Field Coils		19. Armature Coils			
8. Exciter Sleeve Collar	----- T-5345	20. Main Field Coils (Shunt or Series)			
9. Exciter Sleeve Locknut		21. Shaft	{ Below Code 444 ----- M-5859-1 Code 444 & Up ----- M-5859		
10. Exciter Brushholder Assembly	S-6531-A	22. Fan Assembly	----- M-6141		
11. Exciter Armature, with Commutator, Wound		23. Coupling, Generator Half	----- L-2427		
12. Rocker	----- M-1961	24. Interpole Coil	----- S-5050		

(Part #23 does not show drive pins or rubber bushings
used between generator coupling and engine flange)

RENEWAL PARTS
For Control Panel
Used on SA 200 Engine Driven

Always give full nameplate reading of welder when ordering renewal parts.

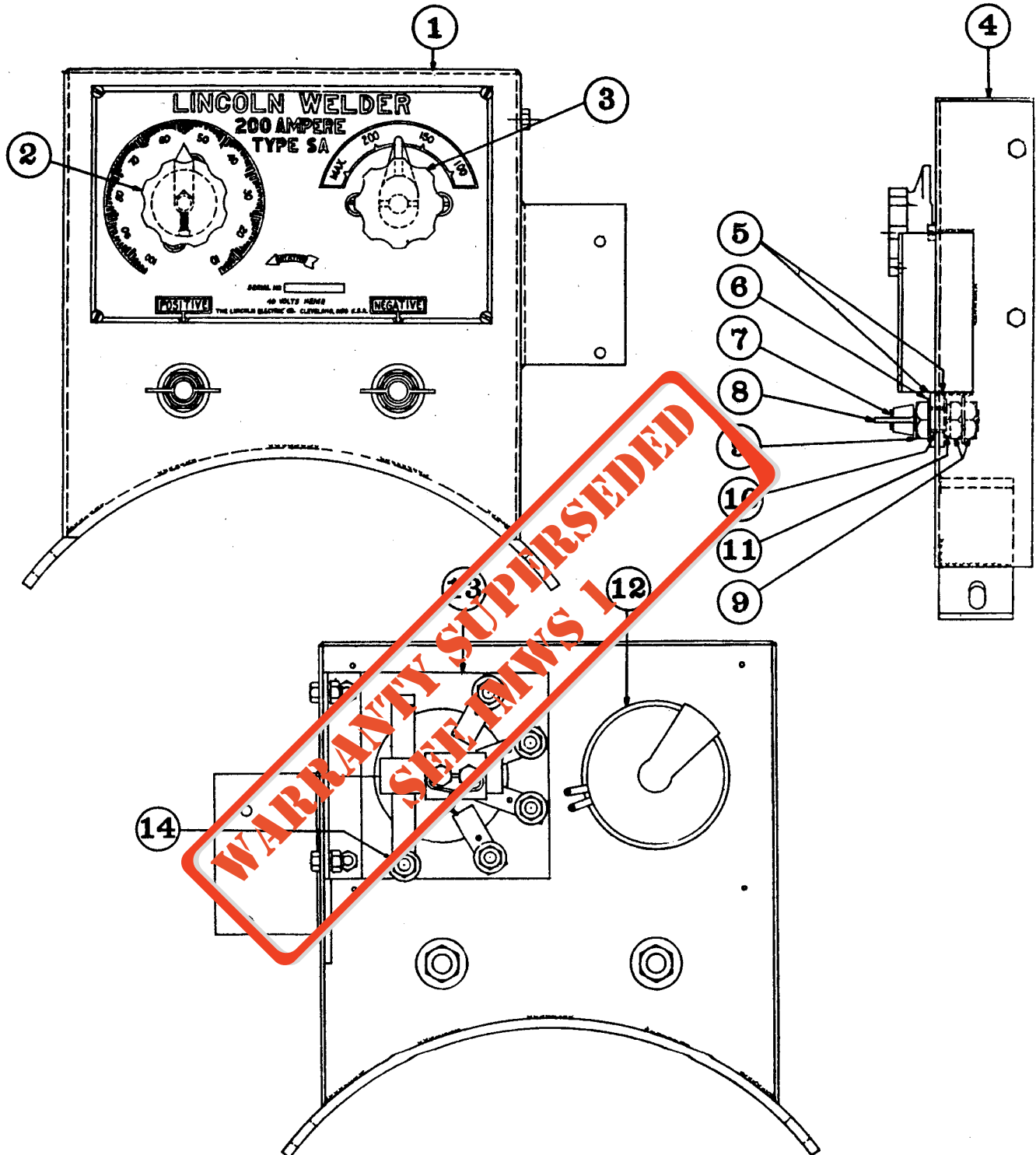


FIGURE IM-109-C

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|--------------------------------|----------|------------------------------|----------|
| 1. Control Panel Ass'y. | L-2316 | 8. Wing Nut | T-3960 |
| 2. Handle for Voltage Rheostat | S-6470 | 9. Brass Nut Copper Plated | T-4122 |
| 3. Current Control Handle | S-5441 | 10. Insulating Tube | M-5090-C |
| 4. Complete Panel Assembly | L-2316-1 | 11. Lock Washer - 1/2" Std. | M-5048 |
| 5. Insulating Washer | T-2719 | 12. Rheostat | |
| 6. Iron Washer Copper Plated | T-6931-2 | 13. Current Control Assembly | |
| 7. Terminal Stud | | 14. 5/16"-18 Hex Jam Nut | |