

# Fabco Power

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## *Instruction Manual for Model HYDRO ARC-S-6500 JSBC Hydraulic Generator Welder*

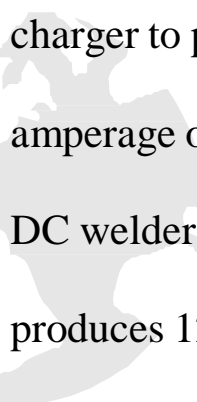
**Manufacturing of: Vehicle Mounted Generators • Hydraulic Generators**

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# Caution

When used with customer supplied flow regulator, use extreme caution on initial setup. Over speed will cause physical damage and is not covered under manufacturer's warranty.

# General Information



The Hydro Arc-S-6500 JSBC welder/generator are welders that produce DC current welding power. The unit consists of three major components: a DC welder, an AC generator and a jumpstart battery charger to power 36 volt Dc wire feeders in CC and CV. The amperage of the DC welder is controlled by selector switches. All JS DC welders are operating at 3600 RPM. The AC generator section produces 120/240Volt and 60 Hz sine wave output at 3600 RPM. The welder generator is equipped with a high volume internal fan for a maximum cooling effect.

**GENERAL INFORMATION AND SPECIFICATIONS**  
**HYDRO-ARC-S-6500 DC WELDER AC GENERATOR**

**GENERATOR DC / AC 60 HZ, SPEED = ...3600 RPM**

**GENERATOR VOLTAGE.....120 OR 120 / 240**

**MOTOR STARTING SURGE ...= 300% OF CONTINUOUS**

**OUTPUT.....5,000 WATTS CONTINUOUS AC OR DC**  
**6,500 WATTS PEAK AC**  
**AC AMPS @ 240 VOLT = 25**  
**AC AMPS @ 120 VOLT = 50**  
**DC WELDING AMPS = 300**

**HYDRAULIC MOTOR SPECIFICATIONS**

**AXIAL PISTON TYPE .....11 cc DISPLACEMENT**

**MOTOR SHAFT DIAMETER.....ONE INCH**

**FLOW CONTROL (OPTIONAL)...CARTRIDGE TYPE**

**RATED FLOW = 11.6 GPM ..... RATED PSI = 2,400**

**MOTOR SPEED = 3,600 RPM..... MAXIMUM = 4,200 RPM**

**INLET PORT SIZE = 1 & 1/16 – 12 S.A.E**  
**RETURN PORT SIZE = 1 & 1/16 – 12 S.A.E**  
**CASE DRAIN PORT SIZE = 1 & 1/16 – 12 S.A.E**

# General Operating Instructions

This hydraulically-driven welder-generator consists of 3 main components:

- a) Hydraulic drive
- b) DC welder
- c) AC generator

For the welder or generator to function properly the hydraulic drive must maintain the proper speed (3600 – 3720 for 60 Hz, 3000-3120 for 50 Hz) under all conditions. Always allow the set to run for at least 2 minutes before operating the welder or generator.

## Operation

- 1) Connect welder leads (observe polarity).
- 2) Set Range Switch to the highest position for startup
- 3) Fine tune amp selector switch to desired amperage.
- 4) Start hydraulic system.

After waiting for a few minutes the welder is now ready for welding.

Increase amperage if necessary or decrease if amperage is too high.

Never operate any switches during welding.

The generator can be used during welding operation. A flicker and low Voltage in the lights will occur every time you strike an arc, this cannot be avoided.

In order to obtain rated output of your generator section, the range switch must be in the high position. The generator output is 120 VAC at 60 Hz and 230 V at 50 Hz. An optional 120/240 panel is available.

# Hydro Arc 6500 Welder

## General Installation

The Arc 6500 is a hydraulically-driven AC welder/generator that will deliver rated amperage when the proper flow is delivered to its hydraulic drive. Oil temperature should be between 100-140°F. A 10-micron filter is also recommended to maintain the drive at its maximum performance. Depending on the size of the reservoir, an oil cooler must be used; the smaller the reservoir; the larger the cooler.

\* The tank should NEVER be smaller than 2 times the required GPM.

When starting a new hydraulic system, we strongly recommend that you connect the pressure line to the return, bypassing the hydraulic welder drive. You should operate the system for 10 minutes that way. This will clean the system; otherwise, all kinds of problems will occur. After connecting the pressure and return line to the welder's hydraulic drive, state your system at a low speed, slowly increasing the speed until you reached the proper operating speed. While setting up a hydraulically-driven welder or generator, it is necessary to check the speed setting of the hydraulic drive, since most systems will vary in many ways (temperature – flow – viscosity / type of oil – etc.) from our test set up.

NEVER allow the welder to exceed 3900 RPM.

The return line pressure, under no circumstances, should reach 100 PSI or seal failure will occur.

The case drain must be connected directly to the tank (do NOT connect to the return line). We strongly recommend that the case drain be connected to the upper portion of the tank. Making it easier for the case drain oil to return to the tank.

Return line must be  $\frac{3}{4}$  or larger

\*This does not apply if using *FABCO POWER'S* high efficiency Super V Tank & Cooler

# Important Hydraulic Circuit Installation Information

If the hydraulically-driven welder/generator or generator is mounted below the system tank, it is highly recommended that a check valve with a very low cracking pressure is installed in the case drain line (free flow motor to tank, blocking tank to motor). This will eliminate seal leakage during non-use time. It is also recommended that the case drain be connected directly to the top of the tank and not through a cooler or filter.

# Operating Instructions

This welder is a hydraulically driven welder and it is extremely important that the hydraulic system can supply the proper flow and pressure to maintain a welder speed of 3,600 RPM under load. If the welder drops below 3600 RPM, it cannot perform properly.

- %o Start Hydraulic system
- %o Turn welder hydraulic system on
- %o Allow welder 2-3 minutes for warm-up
- %o Be sure the red light between the 2 AC receptacles is lit
- %o This will show you that the welder is close to the proper RPM and that you have AC generator output
- %o Insert welding leads into welding receptacles

**CAUTION** – Be sure that the positive cable is in the positive receptacle and the negative cable in the negative receptive.

Set Range Selector switch to the position that is in the amperage range you need for your welding job. Then set the Amp Selector switch to the amperage that is nearest your desired amperage. Begin to weld. You may have to switch one position up or down to get the desired amperage.

**NEVER MOVE ANY SWITCHES DURING WELDING**



# Welder-Generator Operations

1. Start Hydraulic System.
2. Allow system to operate for about 5 minutes before engaging welder-generator.
3. Engage welder-generator
- 3a. The red light between the receptacle must be lit bright indicating that the welder rotates at the proper speed.
4. Set the range switch to the setting that covers the amperage you wish to weld at.
5. Set the amperage selector switch to the amperage that is closest to the amperage you want to weld at.
6. If the amperage is too high set the -10 amp switch to -10 amp side. This will lower the amperage by 10 amps from the amperage selector switch setting.

In order to maintain the set amperage welder must maintain its speed (3600 rpm). The max diameter rod you can use on this welder is 1/4" rod.

Do not change any switch settings during welding. The generator can be used during welding. To get the 6Kw at 120 volts from the generator the range switch must be in the 235-300 position.

The welder and generator are working as soon as the welder reaches the proper RPM (3600).

The generator can be used during welding operation.

## Hydro ARC S-6500 JSBC Welder Specifications

The ARC DC Welder/Generators are a combination Unit the will include DC Welding , AC Power at 60 Hertz pure Sine Wave with less than 4 % Distortion, Jump Starting of Vehicles in both 12 and 24 Volt , Batteries' Charging for 12 and 24 Volt and will provide 36 Volt DC in CC and CV to power Wire Feeders ( Mig ).

All the Functions can be performed at the same time with some limitations.

The compact size of this Unit will save valuable space on Vehicles.

When compared to conventional Welders with some of the Features of this Unit the Weight is reduced by around 70 %.

MODEL	WELDING DC AMP	AC POWER WATT	JUMP STARTING	BATTERY CHARGING	CC and CV 36 VDC
ARC-S-6500	300	6000	400	400	YES

## **For WELDING**

Connect Welding Leads to Pos and Neg Welding Terminals  
Set Range Switch to desired Welding Range  
Set rotary Switch to desired Amperage  
With the Min 10 Switch you can lower the Amperage 10  
Amps

## **For Battery Charging 12 VDC**

Connect Battery Cables to lower left and lower right  
Terminals  
Set Range Switch to Center (BC) Position  
Connect Cables to Battery. Select Charging Amps w. rotary  
Sw.

## **For Battery Charging 24 VDC**

Repeat 12 VDC Steps except connect cables to lower  
Center and lower right Terminals.

## **Jumpstarting 12 V Batteries**

Connect Cables to lower left and right Terminals  
Set Range Switch to left or right Position (right is higher charging) Set  
Rotary Switch to highest Position  
Crank Engine

### **For Jumpstarting 24 V Batteries**

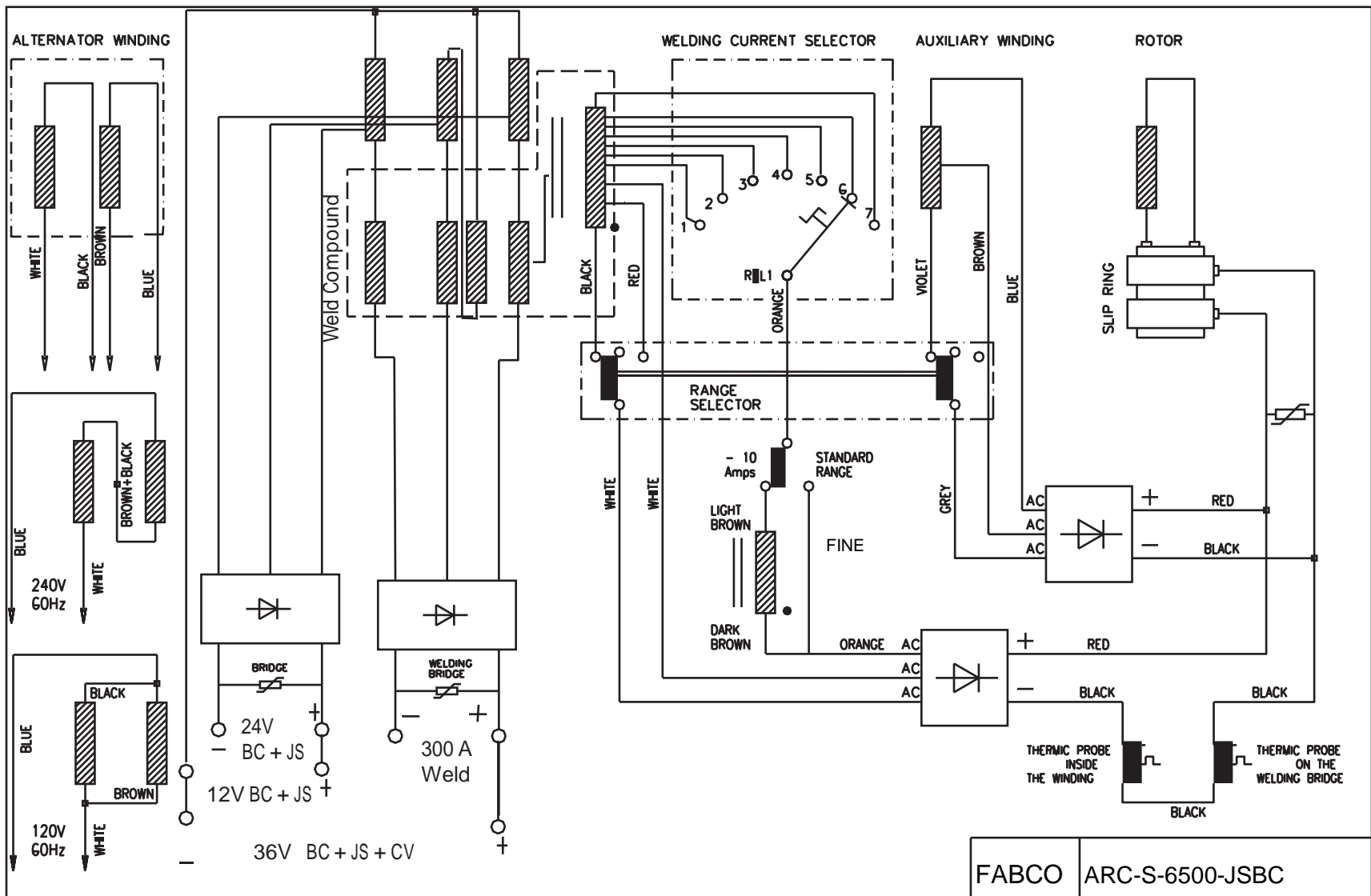
Connect Cables to lower right and Center Terminals

Repeat above Switch Settings

### **For wire Feeders**

Connect Wire feeder to lower left and POS Weld Terminal

Set Switches to desired Amperage.



# Troubleshooting

## Welder Completely Dead – No AC or Weld Power

Make sure welder is at proper speed=3600RPM. Unplug all external connections. A shorted weld cable or generator accessory plugged in can cause the welder not to build up. Several components can cause the welder to stop functioning completely. This is mainly in the excitation circuit. Consisting of armature (rotor), Excitations Bridge (left bottom corner) and auxiliary winding. Check the resistance of the auxiliary winding by removing the two purple wires from the Excitation Bridge located at the left bottom corner. The reading should be about 1.5ohms. Check the resistance of the armature between the two slip rings – this should be 22ohms. Remove all wires for the left bottom Rectifier Bridge and test for continuity between the terminals. Again, you should get a high and low reading. If those three main components test out ok, try to flash the armature with a 24volt circuit. Apply 12 volts to the slip ring for about 20 seconds.

# Troubleshooting

## No Output on Weld Receptacles or AC Receptacles

This problem can be caused by many different factors. At rare occasions a welder/generator could lose its residual magnetism, which will cause the welder to be completely dead. To Re-energize the magnetism remove the receptacle panel. Locate the 2 exciter bridges on bottom left and bottom right, pull off the red and black wire coming from the brushes on the left bridge and red wire which is jumped over to the right bottom bridge. With an OHM meter check the resistance between the red and black wire which will check the resistance of the rotor, this should be about 25 ohms, try to rotate the rotor while you take the reading to be sure the brushes are receded – if the reading is intermitted check the resistance right on the slip rings. If necessary, remove the brush holder. (See brush holder replacement). Apply 12Volts to the terminals on the red and black wire coming from the brush holder. Apply 12 Volts for about 5 seconds. Re-install wires – reinstall receptacle panel and louvered end cover and start welding.

# Troubleshooting

## No Output on Weld Receptacles but AC Receptacle Output OK

If you have no welding power at all but the AC (120volts) is fully operational, this could be caused by three components

- The welding impedance (transformer)
- The stator windings
- The main welding rectifier bridge

Using the electrical diagram check for continuity of the welding impedance. By disconnecting the three heavy lead wires from the main welding bridge rectifier, you can check continuity between those three wires. In any combination, the resistance should be between one and 2 ohms. All three readings should be the same. If you have readings that determines that the stator winding and impedance winding are in good condition. With the three wires removed, you can now check the resistance of the main Rectifier Bridge. By measuring resistance between the three terminals forward and reverse you always should get a high and a low reading, for example; if you measure between one and two, if the first reading is very high the reverse reading should be very low. You also can check the bridge by taking a resistance reading on the main welding terminals. Again, you should have a high and low reading by reversing the leads.



# Troubleshooting

## No AC Output but Weld Output

If the welder section functions properly but you have no AC output remove the receptacle panel and make sure the white plugs are plugged solid. If there are connected all the way, disconnect and make a resistance reading as follows

Blue to Brown (1.2ohm)

Black to White (1.2ohms)

If either one of those two readings are open the AC windings are defective. If they both check out ok, check the receptacle and the wires going to the receptacles. To be certain that is in the receptacle panel wiring, very carefully startup the welder and check for 120 volts between Blue and Brown and again 120 Volts between Black and White. If you have 120 Volts pressing at those two readings, you must have a defective receptacle or receptacle wiring.

# Troubleshooting

## Low Welding Amps

Low welding amps can be caused by three components

A defective Excitation Bridge located on the bottom right hand corner

B an open fine control (Optional). Resistance should be 6 ohms.

C Thermal trip in the windings. Disconnect the two AC wires off the bottom right hand Excitation Bridge (white&orange) and make a resistance reading. With the seven-step selector switch in the lowest position and the range switch and in the high position you should get about 2 ohms. Move the seven-step switch while observing the ohmmeter all the way to its highest position. The resistance should increase slightly with every step. You should end up with about 3 ohms. If you do not start off with 2 ohms and the circuit shows open move your ohm meter 1 lead to the center terminal on the range switch, the other ohm meter lead onto the terminal RL1 on the seven position switch. If you have a reading, there about 2ohms the transformer is ok. To test for the terminal trip in a windings take a reading between the center post of the range switch and the white wire you remove from the Excitation Bridge. You should get 0ohms. Any other readings on the trip are defective. To check the fine control put one-ohm meter lead on the seven-step switch terminal RL1, the other lead on the orange wire you removed from the Excitation Bridge. You should be able by moving the fine control up and down adjust the ohmmeter reading between 0 and 6 ohms. To check the Excitation Bridge, remove all wires from it and measure forward and backward going around clockwise. In any position and in any combination between terminals you should get a high and low reading. If any of the readings come out the same, the bridge is defective.

# Troubleshooting

## Intermitting Welder Operation

Welder works properly for a few minutes and then stop operating but returns to full welding power after several minutes of cooling off.

This will occur when the welder is operated past its duty cycle or in extreme high ambient temperatures or if welder-cooling circuit is blocked. Be sure air intake is free welder cooling might be affected by engine heat. Allow fresh air to enter louvered end cover on welder. A cooling off period is 4-5 times longer if welder is turned off and sitting still. Running it at its RPM will speed up the cooling and reset the internal thermal trip.

# Rotor Replacement

Remove two each fan grids. Remove receptacle panel Remove brush holder held with one screw. Remove four plastic stop nuts holding front shield (fan housing)

With gear puller push out rotor from slip ring side. Remove rotor assembly from stator. Remove snap ring from shaft end which had the Pulley on it. Push rotor out of front shield. Examine bearing and front shield to be sure it does not need to be replaced. Push new rotor into front shield. Re-install small snap ring. Be sure snap ring is in groove. Carefully re-install rotor into stator. Use rubber mallet to tap into place. Re-install four elastic stop nuts. Tighten elastic stop nuts in a criss/cross manner. Turn rotor by hand to make sure it turns freely. If rotor seems not to run freely, tap the casting with a small metal hammer on the slip ring end casting. This will seat the bearing. Apply 12Volts to the slip ring for about 20 seconds. This will make sure that the residual magnetism is energized. Re-install the brush holder. Be sure to have the insulator behind the brush holder. Check for brush alignment to slip ring. Re-install the two fan grids. re-install receptacle panel or louvered panel on slip ring end.

# REPLACE BRUSHES

Remove receptacle panel

Cut tie raps holding brush holder wires, red & black

Unplug red & black from rectifier bridges.

Install wires in same way with new brush holder – red to red and black to black

Remove old brush holder by removing one screw holding brush holder

Do not lose plastic insulator located behind the brush holder

Check slip rings

Clean and polish with very fine sandpaper

Check resistance of rotor (armature) on slip rings

Reading should be a 25 ohms  $\pm 3$  ohm

Install new brush holder with brushes. Make sure brush holder is seated (dimple in casting) Check brush to be on slip rings. Install tie rap's to hold wires

Check resistance of rotor (armature) on slip rings

Reading should be a 25 ohms  $\pm 3$  ohm

# ARC-S-6500-JSBC DC Welder Parts

572723 300 AMP DC WELDER  
572311 11 CC MOTOR PISTON TYPE  
572617 MR2-A MOTOR MOUNT  
572281 COUPLING 28 MM LO99  
572282 HYTREL SPIDER LO99  
572476 COUPLING 1" LO99  
572341 240 V TWIST LOCK RECEPTACLE

**WARRANTY**  
**TERMS**

**EACH FABCO POWER GENERATOR IS WARRANTED TO THE ORIGINAL OWNER TO BE FREE FROM DEFECTS IN MATERIAL OR WORKMANSHIP UNDER NORMAL USE AND SERVICE FOR ONE (1) YEAR FROM THE DATE OF PURCHASE.**

**OUR OBLIGATION UNDER THIS WARRANTY IS LIMITED TO REPLACING OR REPAIRING, AT OUR OPTION, ANY PART OR PARTS PROVED TO BE SO DEFECTIVE WILL REQUIRE AN RGA NUMBER.**

***ALL SHIPPING CHARGES ARE THE CUSTOMERS RESPONSIBILITY UNDER THIS WARRANTY.***