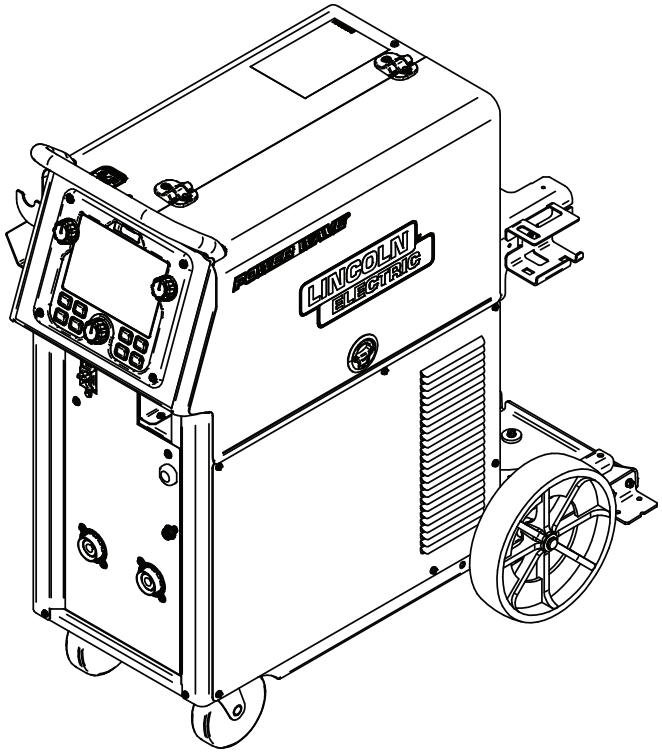
Service Manual

POWER WAVE® 300C



For use with machines having Code Numbers:

12942, 12943, 12944, 12945, 13200, 13406, 13407

GENUINE LINCOLN PARTS™

Register your machine:
www.lincolnelectric.com/register

Authorized Service and Distributor Locator:
www.lincolnelectric.com/locator

Save for future reference

Date Purchased

Code: (ex: 10859)

Serial: (ex: U1060512345)

SVM10591-C | Issue Date Sep - 22

THE LINCOLN ELECTRIC COMPANY
22801 St. Clair Avenue • Cleveland, OH • 44117-1199 • U.S.A.
Phone: +1.216.481.8100 • www.lincolnelectric.com

THANK YOU FOR SELECTING A QUALITY PRODUCT BY LINCOLN ELECTRIC.

PLEASE EXAMINE CARTON AND EQUIPMENT FOR DAMAGE IMMEDIATELY

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 and cutting 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 MANUAL AND THE SAFETY PRECAUTIONS CONTAINED THROUGHOUT.** And, most importantly, think before you act and be careful.

⚠ WARNING

This statement appears where the information must be followed exactly to avoid serious personal injury or loss of life.

⚠ CAUTION

This statement appears where the information must be followed to avoid minor personal injury or damage to this equipment.

KEEP YOUR HEAD OUT OF THE FUMES.

DON'T get too close to the arc. Use corrective lenses if necessary to stay a reasonable distance away from the arc.

READ and obey the Safety Data Sheet (SDS) and the warning label that appears on all containers of welding materials.

USE ENOUGH VENTILATION or exhaust at the arc, or both, to keep the fumes and gases from your breathing zone and the general area.

IN A LARGE ROOM OR OUTDOORS, natural ventilation may be adequate if you keep your head out of the fumes (See below).

USE NATURAL DRAFTS or fans to keep the fumes away from your face.

If you develop unusual symptoms, see your supervisor. Perhaps the welding atmosphere and ventilation system should be checked.

WEAR CORRECT EYE, EAR & BODY PROTECTION

PROTECT your eyes and face with welding helmet properly fitted and with proper grade of filter plate (See ANSI Z49.1).

PROTECT your body from welding spatter and arc flash with protective clothing including woolen clothing, flame-proof apron and gloves, leather leggings, and high boots.

PROTECT others from splatter, flash, and glare with protective screens or barriers.

IN SOME AREAS, protection from noise may be appropriate.

BE SURE protective equipment is in good condition.

Also, wear safety glasses in work area **AT ALL TIMES.**

SPECIAL SITUATIONS

DO NOT WELD OR CUT containers or materials which previously had been in contact with hazardous substances unless they are properly cleaned. This is extremely dangerous.

DO NOT WELD OR CUT painted or plated parts unless special precautions with ventilation have been taken. They can release highly toxic fumes or gases.

Additional precautionary measures

PROTECT compressed gas cylinders from excessive heat, mechanical shocks, and arcs; fasten cylinders so they cannot fall.

BE SURE cylinders are never grounded or part of an electrical circuit.

REMOVE all potential fire hazards from welding area.

ALWAYS HAVE FIRE FIGHTING EQUIPMENT READY FOR IMMEDIATE USE AND KNOW HOW TO USE IT.

SECTION A: WARNINGS

CALIFORNIA PROPOSITION 65 WARNINGS

WARNING: Breathing diesel engine exhaust exposes you to chemicals known to the State of California to cause cancer and birth defects, or other reproductive harm.

- Always start and operate the engine in a well-ventilated area.
- If in an exposed area, vent the exhaust to the outside.
- Do not modify or tamper with the exhaust system.
- Do not idle the engine except as necessary.

For more information go to www.P65 warnings.ca.gov/diesel

WARNING: This product, when used for welding or cutting, produces fumes or gases which contain chemicals known to the State of California to cause birth defects and, in some cases, cancer. (California Health & Safety Code § 25249.5 *et seq.)*

WARNING: Cancer and Reproductive Harm www.P65warnings.ca.gov

ARC WELDING CAN BE HAZARDOUS. PROTECT YOURSELF AND OTHERS FROM POSSIBLE SERIOUS INJURY OR DEATH. KEEP CHILDREN AWAY. PACEMAKER WEARERS SHOULD CONSULT WITH THEIR DOCTOR BEFORE OPERATING.

Read and understand the following safety highlights. For additional safety 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 or CSA Standard W117.2. A Free copy of "Arc Welding Safety" booklet E205 is available from the Lincoln Electric Company, 22801 St. Clair Avenue, Cleveland, Ohio 44117-1199.

BE SURE THAT ALL INSTALLATION, OPERATION, MAINTENANCE AND REPAIR PROCEDURES ARE PERFORMED ONLY BY QUALIFIED INDIVIDUALS.

FOR ENGINE POWERED EQUIPMENT.

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

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

1.c. Do not add the fuel near an open flame welding arc or when the engine is running. Stop the engine and allow it to cool before 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.

1.d. 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.

1.e. 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.f. 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.

1.g. 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.

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

1.i. Using a generator indoors CAN KILL YOU IN MINUTES.

1.j. Generator exhaust contains carbon monoxide. This is a poison you cannot see or smell.

1.k. NEVER use inside a home or garage, EVEN IF doors and windows are open.

1.l. Only use OUTSIDE and far away from windows, doors and vents.

1.m. Avoid other generator hazards. READ MANUAL BEFORE USE.

ELECTRIC AND MAGNETIC FIELDS MAY BE DANGEROUS

2.a. Electric current flowing through any conductor causes localized Electric and Magnetic Fields (EMF). Welding current creates EMF fields around welding cables and welding machines

2.b. EMF fields may interfere with some pacemakers, and welders having a pacemaker should consult their physician before welding.

2.c. Exposure to EMF fields in welding may have other health effects which are now not known.

2.d. All welders should use the following procedures in order to minimize exposure to EMF fields from the welding circuit:

- 2.d.1. Route the electrode and work cables together - Secure them with tape when possible.
- 2.d.2. Never coil the electrode lead around your body.
- 2.d.3. Do not place your body between the electrode and work cables. If the electrode cable is on your right side, the work cable should also be on your right side.
- 2.d.4. Connect the work cable to the workpiece as close as possible to the area being welded.
- 2.d.5. Do not work next to welding power source.

ELECTRIC SHOCK CAN KILL.

3.a. The electrode and work (or ground) circuits are electrically “hot” when the welder is on. Do not touch these “hot” parts with your bare skin or wet clothing. Wear dry, hole-free gloves to insulate hands.

3.b. Insulate yourself from work and ground using dry insulation. Make certain the insulation is large enough to cover your full area of physical contact with work and ground.

In addition to the normal safety precautions, if welding must be performed under electrically hazardous conditions (in damp locations or while wearing wet clothing; on metal structures such as floors, gratings or scaffolds; when in cramped positions such as sitting, kneeling or lying, if there is a high risk of unavoidable or accidental contact with the workpiece or ground) use the following equipment:

- Semiautomatic DC Constant Voltage (Wire) Welder.
- DC Manual (Stick) Welder.
- AC Welder with Reduced Voltage Control.

3.c. In semiautomatic or automatic wire welding, the electrode, electrode reel, welding head, nozzle or semiautomatic welding gun are also electrically “hot”.

3.d. 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.

3.e. Ground the work or metal to be welded to a good electrical (earth) ground.

3.f. Maintain the electrode holder, work clamp, welding cable and welding machine in good, safe operating condition. Replace damaged insulation.

3.g. Never dip the electrode in water for cooling.

3.h. 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.

3.i. When working above floor level, use a safety belt to protect yourself from a fall should you get a shock.

3.j. Also see Items 6.c. and 8.

ARC RAYS CAN BURN.

4.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. I standards.

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

4.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.

FUMES AND GASES CAN BE DANGEROUS.

5.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 hardfacing (see instructions on container or SDS) or on lead or cadmium plated steel and other metals or coatings which produce highly toxic fumes, keep exposure as low as possible and within applicable OSHA PEL and ACGIH TLV limits using local exhaust or mechanical ventilation unless exposure assessments indicate otherwise. In confined spaces or in some circumstances, outdoors, a respirator may also be required. Additional precautions are also required when welding on galvanized steel.**

5. b. The operation of welding fume control equipment is affected by various factors including proper use and positioning of the equipment, maintenance of the equipment and the specific welding procedure and application involved. Worker exposure level should be checked upon installation and periodically thereafter to be certain it is within applicable OSHA PEL and ACGIH TLV limits.

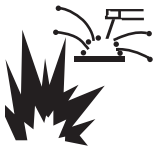
5.c. Do not weld in locations near chlorinated hydrocarbon vapors coming from degreasing, cleaning or spraying operations. The heat and rays of the arc can react with solvent vapors to form phosgene, a highly toxic gas, and other irritating products.

5.d. 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.

5.e. Read and understand the manufacturer’s instructions for this equipment and the consumables to be used, including the Safety Data Sheet (SDS) and follow your employer’s safety practices. SDS forms are available from your welding distributor or from the manufacturer.

5.f. Also see item 1.b.

WELDING AND CUTTING SPARKS CAN CAUSE FIRE OR EXPLOSION.



6.a. Remove fire hazards from the welding 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. Avoid welding near hydraulic lines. Have a fire extinguisher readily available.

6.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.

6.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.

6.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 from the American Welding Society (see address above).

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

6.f. Sparks and spatter are thrown from the welding arc. Wear 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 with side shields when in a welding area.

6.g. Connect the work cable to the work as close to the welding area as practical. Work cables connected to the building framework or other locations away 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.

6.h. Also see item 1.c.

6.I. Read and follow NFPA 51B "Standard for Fire Prevention During Welding, Cutting and Other Hot Work", available from NFPA, 1 Batterymarch Park, PO box 9101, Quincy, MA 022690-9101.

6.j. Do not use a welding power source for pipe thawing.

CYLINDER MAY EXPLODE IF DAMAGED.

7.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.

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

7.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.

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

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

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

7.g. Read and follow the instructions on compressed gas cylinders, associated equipment, and CGA publication P-I, "Precautions for Safe Handling of Compressed Gases in Cylinders," available from the Compressed Gas Association, 14501 George Carter Way Chantilly, VA 20151.

FOR ELECTRICALLY POWERED EQUIPMENT.

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

8.b. Install equipment in accordance with the U.S. National Electrical Code, all local codes and the manufacturer's recommendations.

8.c. Ground the equipment in accordance with the U.S. National Electrical Code and the manufacturer's recommendations.

Refer to http://www.lincolnelectric.com/safety for additional safety information.

ECO design information

The equipment has been designed in order to be compliant with the Directive 2009/125/EC and the Regulation 2019/1784/EU.

Efficiency and idle power consumption:

Name	Efficiency when max power consumption / Idle power consumption	Equivalent model
Power Wave 300C CE with Advance Module	75% / 210W	No equivalent model

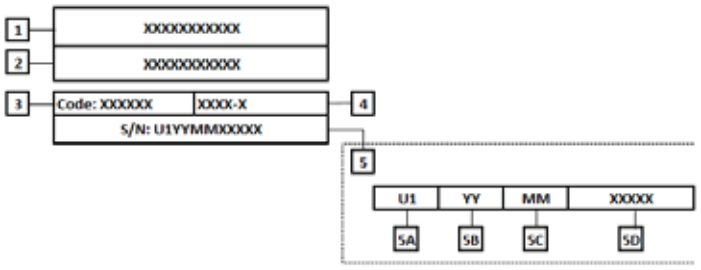
Idle state; machine powered on regular start up without making output

Efficiency:

The Efficiency procedure itself requires the use of a grid. Power Wave Manager can be downloaded from powerwavesoftware.com along with the Power Wave Manager instruction. The Power Wave Manager instructions explain how to test a machine using a resistive load. This is described in section 6 under calibration.

The value of efficiency and consumption in idle state have been measured by method and conditions defined in the product standard EN 60974-1

Manufacturer's name, product name, code number, product number, serial number and date of production can be read from rating plate and serial number label.



Where:

1- Manufacturer name and adress
2- Product name
3- Code number
4- Product number
5- Serial number
5A- country of production
5B- year of production
5C- month of production
5D- progressive number different for each machine

Typical gas usage for **MIG/MAG** equipment:

Material type	Wire diameter [mm]	DC electrode positive		Wire Feeding [m/min]	Shielding Gas	Gas flow [l/min]
		Current [A]	Voltage [V]			
Carbon, low alloy steel	0,9 - 1,1	95 - 200	18 - 22	3,5 – 6,5	Ar 75%, CO_2 25%	12
Aluminum	0,8 - 1,6	90 - 240	18 - 26	5,5 – 9,5	Argon	14 - 19
Austenitic stainless steel	0,8 - 1,6	85 - 300	21 - 28	3 - 7	Ar 98%, O_2 2% / He 90%, Ar 7,5% CO_2 2,5%	14 - 16
Copper alloy	0,9 - 1,6	175 - 385	23 - 26	6 - 11	Argon	12 - 16
Magnesium	1,6 - 2,4	70 - 335	16 - 26	4 - 15	Argon	24 - 28

Tig Process:

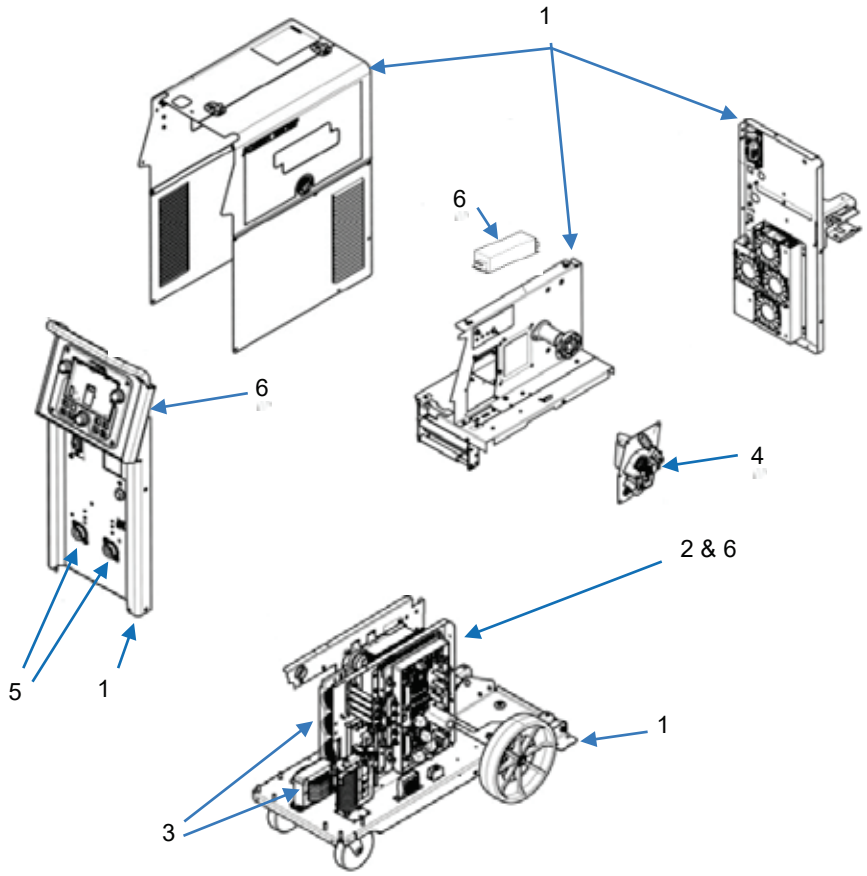
In TIG welding process, gas usage depends on cross-sectional area of the nozzle. For comonly used torches:
Helium: 14-24 l/min
Argon: 7-16 l/min
Notice: Excessive flow rates causes turbulence in the gas stream which may aspirate atmospheric contaminantion into the welding pool.

Notice: A cross wind or draft moving can disrupt the shielding gas coverage, in the interest of saving of protective gas use screen to block air flow.

End of life

At end of life of product, it has to be disposal for recycling in accordance with Directive 2012/19/EU (WEEE), information about the dismantling of product and Critical Raw Material (CRM) present in the product, can be found at: www.lincolnelectriceurope.com

PW 300C ADV CE



Item	Component	Material for recovery	CRM	Selective treatment
1	Enclosure	Steel	-	-
2	Heat sink, 4 total	Aluminum	Si, 37 g Mg, 62 g	-
3	Choke Internal cables	Copper	-	
4	Feed plate casting	Aluminum	Si, 39 g Mg, 0.2 g	
5	Output terminal	Brass	-	-
6	PC board & CE filter, 10 total	-	-	Required
7	External cables – not shown	Copper	-	Required

Reference: P-1568-A, code 12945

PRÉCAUTIONS DE SÛRETÉ

Pour votre propre protection lire et observer toutes les instructions et les précautions de sûreté specifiques qui parraissent dans ce manuel aussi bien que les précautions de sûreté générales suivantes:

Sûreté Pour Soudage A L'Arc

1. Protegez-vous contre la secousse électrique:

   a. Les circuits à l'électrode et à la piéce sont sous tension quand la machine à souder est en marche. Eviter toujours tout contact entre les parties sous tension et la peau nue ou les vétements mouillés. Porter des gants secs et sans trous pour isoler les mains.
   b. Faire trés attention de bien s'isoler de la masse quand on soude dans des endroits humides, ou sur un plancher metallique ou des grilles metalliques, principalement dans les positions assis ou couché pour lesquelles une grande partie du corps peut être en contact avec la masse.
   c. Maintenir le porte-électrode, la pince de masse, le câble de soudage et la machine à souder en bon et sûr état defonctionnement.
   d.Ne jamais plonger le porte-électrode dans l'eau pour le refroidir.
   e. Ne jamais toucher simultanément les parties sous tension des porte-électrodes connectés à deux machines à souder parce que la tension entre les deux pinces peut être le total de la tension à vide des deux machines.
   f. Si on utilise la machine à souder comme une source de courant pour soudage semi-automatique, ces precautions pour le porte-électrode s'applicuent aussi au pistolet de soudage.

2. Dans le cas de travail au dessus du niveau du sol, se protéger contre les chutes dans le cas ou on recoit un choc. Ne jamais enrouler le câble-électrode autour de n'importe quelle partie du corps.

3. Un coup d'arc peut être plus sévère qu'un coup de soliel, donc:

   a. Utiliser un bon masque avec un verre filtrant approprié ainsi qu'un verre blanc afin de se protéger les yeux du rayonnement de l'arc et des projections quand on soude ou quand on regarde l'arc.
   b. Porter des vêtements convenables afin de protéger la peau de soudeur et des aides contre le rayonnement de l'arc.
   c. Protéger l'autre personnel travaillant à proximité au soudage à l'aide d'écrans appropriés et non-inflammables.

4. Des gouttes de laitier en fusion sont émises de l'arc de soudage. Se protéger avec des vêtements de protection libres de l'huile, tels que les gants en cuir, chemise épaisse, pantalons sans revers, et chaussures montantes.

5. Toujours porter des lunettes de sécurité dans la zone de soudage. Utiliser des lunettes avec écrans lateraux dans les zones où l'on pique le laitier.

6. Eloigner les matériaux inflammables ou les recouvrir afin de prévenir tout risque d'incendie dû aux étincelles.

7. Quand on ne soude pas, poser la pince à une endroit isolé de la masse. Un court-circuit accidental peut provoquer un échauffement et un risque d'incendie.

8. S'assurer que la masse est connectée le plus prés possible de la zone de travail qu'il est pratique de le faire. Si on place la masse sur la charpente de la construction ou d'autres endroits éloignés de la zone de travail, on augmente le risque de voir passer le courant de soudage par les chaines de levage, câbles de grue, ou autres circuits. Cela peut provoquer des risques d'incendie ou d'echauffement des chaines et des câbles jusqu'à ce qu'ils se rompent.

9. Assurer une ventilation suffisante dans la zone de soudage. Ceci est particuliérement important pour le soudage de tôles galvanisées plombées, ou cadmiées ou tout autre métal qui produit des fumeés toxiques.

10. Ne pas souder en présence de vapeurs de chlore provenant d'opérations de dégraissage, nettoyage ou pistolage. La chaleur ou les rayons de l'arc peuvent réagir avec les vapeurs du solvant pour produire du phosgéne (gas fortement toxique) ou autres produits irritants.

11. Pour obtenir de plus amples renseignements sur la sûreté, voir le code "Code for safety in welding and cutting" CSA Standard W 117.2-1974.

PRÉCAUTIONS DE SÛRETÉ POUR LES MACHINES À SOUDER À TRANSFORMATEUR ET À REDRESSEUR

1. Relier à la terre le chassis du poste conformement au code de l'électricité et aux recommendations du fabricant. Le dispositif de montage ou la piece à souder doit être branché à une bonne mise à la terre.

2. Autant que possible, l'installation et l'entretien du poste seront effectués par un électricien qualifié.

3. Avant de faires des travaux à l'interieur de poste, la debrancher à l'interrupteur à la boite de fusibles.

4. Garder tous les couvercles et dispositifs de sûreté à leur

ELECTROMAGNETIC COMPATIBILITY (EMC)

CONFORMANCE

Products displaying the CE mark are in conformity with European Community Council Directive of 15 Dec 2004 on the approximation of the laws of the Member States relating to electromagnetic compatibility, 2004/108/EC. It was manufactured in conformity with a national standard that implements a harmonized standard: EN 60974-10 Electromagnetic Compatibility (EMC) Product Standard for Arc Welding Equipment. It is for use with other Lincoln Electric equipment. It is designed for industrial and professional use.

INTRODUCTION

All electrical equipment generates small amounts of electromagnetic emission. Electrical emission may be transmitted through power lines or radiated through space, similar to a radio transmitter. When emissions are received by other equipment, electrical interference may result. Electrical emissions may affect many kinds of electrical equipment; other nearby welding equipment, radio and TV reception, numerical controlled machines, telephone systems, computers, etc.

Warning: This Class A equipment is not intended for use in residential locations where the electrical power is provided by the public low-voltage supply system. There may be potential difficulties in ensuring electro-magnetic compatibility in those locations, due to conducted as well as radiated disturbances.

INSTALLATION AND USE

The user is responsible for installing and using the welding equipment according to the manufacturer's instructions.

If electromagnetic disturbances are detected then it shall be the responsibility of the user of the welding equipment to resolve the situation with the technical assistance of the manufacturer. In some cases this remedial action may be as simple as earthing (grounding) the welding circuit, see Note. In other cases it could involve constructing an electromagnetic screen enclosing the power source and the work complete with associated input filters. In all cases electromagnetic disturbances must be reduced to the point where they are no longer troublesome.

Note: The welding circuit may or may not be earthed for safety reasons. Follow your local and national standards for installation and use. Changing the earthing arrangements should only be authorized by a person who is competent to assess whether the changes will increase the risk of injury, e.g., by allowing parallel welding current return paths which may damage the earth circuits of other equipment.

ASSESSMENT OF AREA

Before installing welding equipment the user shall make an assessment of potential electromagnetic problems in the surrounding area. The following shall be taken into account:

a) other supply cables, control cables, signaling and telephone cables; above, below and adjacent to the welding equipment;

b) radio and television transmitters and receivers;

c) computer and other control equipment;

d) safety critical equipment, e.g., guarding of industrial equipment;

e) the health of the people around, e.g., the use of pacemakers and hearing aids;

f) equipment used for calibration or measurement;

g) the immunity of other equipment in the environment. The user shall ensure that other equipment being used in the environment is compatible. This may require additional protection measures;

h) the time of day that welding or other activities are to be carried out.

The size of the surrounding area to be considered will depend on the structure of the building and other activities that are taking place. The surrounding area may extend beyond the boundaries of the premises.

METHODS OF REDUCING EMISSIONS

Public Supply System

Welding equipment should be connected to the public supply system according to the manufacturer's recommendations. If interference occurs, it may be necessary to take additional precautions such as filtering of the system. Consideration should be given to shielding the supply cable of permanently installed welding equipment, in metallic conduit or equivalent. Shielding should be electrically continuous throughout its length. The shielding should be connected to the welding power source so that good electrical contact is maintained between the conduit and the welding power source enclosure.

Maintenance of the Welding Equipment

The welding equipment should be routinely maintained according to the manufacturer's recommendations. All access and service doors and covers should be closed and properly fastened when the welding equipment is in operation. The welding equipment should not be modified in any way except for those changes and adjustments covered in the manufacturer's instructions. In particular, the spark gaps of arc striking and stabilizing devices should be adjusted and maintained according to the manufacturer's recommendations.

Welding Cables

The welding cables should be kept as short as possible and should be positioned close together, running at or close to the floor level.

Equipotential Bonding

Bonding of all metallic components in the welding installation and adjacent to it should be considered. However, metallic components bonded to the work piece will increase the risk that the operator could receive a shock by touching these metallic components and the electrode at the same time. The operator should be insulated from all such bonded metallic components.

Earthing of the Workpiece

Where the workpiece is not bonded to earth for electrical safety, nor connected to earth because of its size and position, e.g., ship's hull or building steelwork, a connection bonding the workpiece to earth may reduce emissions in some, but not all instances. Care should be taken to prevent the earthing of the workpiece increasing the risk of injury to users, or damage to other electrical equipment. Where necessary, the connection of the workpiece to earth should be made by a direct connection to the workpiece, but in some countries where direct connection is not permitted, the bonding should be achieved by suitable capacitance, selected according to national regulations.

Screening and Shielding

Selective screening and shielding of other cables and equipment in the surrounding area may alleviate problems of interference. Screening of the entire welding installation may be considered for special applications.

Page

TECHNICAL SPECIFICATIONS - POWER WAVE® 300C STANDARD

POWER SOURCE-INPUT VOLTAGE AND CURRENT

Model	Input Voltage ± 10% (* includes 380V to 415V)	Maximum Input Amperes (1 Phase in parenthesis)	Idle Power	Power Factor @ Rated Output
K4487-1	208/230/**400***/460/575 1/3 phase 50/60 Hz	39/35/22/18/14.5 (57/52/NA/32/NA)	N/A	N/A
K4489-1	208/230/**400***/460/575 3 phase 50/60 Hz	39/35/22/18/14.5		

RATED OUTPUT

Process	Duty Cycle	Volts (RMS) at Rated Amperes		Amperes (RMS)	
		1 Phase	3 Phase	1 Phase	3 Phase
GMAW GMAW-Pulse FCAW	40%	28	31.5	280	350
	60%	28	29	280	300
	100%	28	29	280	300
SMAW	40%	30.8	33	270	325
	60%	30	31.2	250	280
	100%	30	31.2	250	280
GTAW-DC	40%	23	24	325	350
	60%	21.2	22	280	300
	100%	21.2	22	280	300

RECOMMENDED INPUT WIRE AND FUSE SIZES[1]

INPUT VOLTAGE / PHASE/ FREQUENCY	EFFFECTIVE INPUT AMPERES RATING	CORD SIZES[3] AWG SIZES (mm²)	TIME DELAY FUSE OR BREAKER SIZE[2] (AMPS)
208/1/50/60	53	6 (16)	70
208/3/50/60	31	8 (10)	45
230/1/50/60	49	6 (16)	70
230/3/50/60	28	8 (10)	45
400/3/50/60	17.5	12 (4)	30
460/1/50/60	31	8 (10)	45
460/3/50/60	14.5	14 (2.5)	25
575/3/50/60	11.5	14 (2.5)	20

1 Wire and Fuse Sizes based upon the U.S. National Electric Code and maximum output for 40°C (104°) ambient.
2 Also called “inverse time” or “thermal/magnetic” circuit breakers; circuit breakers that have a delay in tripping action that decreases as the magnitude of current increases.
3 Type SO cord or similar in 30°C ambient.

TECHNICAL SPECIFICATIONS - POWER WAVE® 300C ADVANCED

POWER SOURCE-INPUT VOLTAGE AND CURRENT

Model	Input Voltage ± 10% (* includes 380V to 415V)	Maximum Input Amperes (1 Phase in parenthesis)	Idle Power	Power Factor @ Rated Output
K4488-[ ]	208/230/400*/460/575 1/3 phase 50/60 Hz	44/40/25/20/16.5 (61/58/NA/34/NA)	N/A	N/A
K4490-[ ]	208/230/400*/460/575 3 phase 50/60 Hz	44/40/25/20/16.5		

RATED OUTPUT

Process	Duty Cycle	Volts (RMS) at Rated Amperes		Amperes (RMS)	
		1 Phase	3 Phase	1 Phase	3 Phase
GMAW GMAW-Pulse FCAW	40%	28	31.5	280	350
	60%	28	29	280	300
	100%	28	29	280	300
SMAW	40%	30.8	33	270	325
	60%	30	31.2	250	280
	100%	30	31.2	250	280
GTAW-DC	40%	23	24	325	350
	60%	21.2	22	280	300
	100%	21.2	22	280	300

RECOMMENDED INPUT WIRE AND FUSE SIZES[1]

INPUT VOLTAGE / PHASE/ FREQUENCY	EFFFECTIVE INPUT AMPERES RATING	CORD SIZES[3] AWG SIZES (mm²)	TIME DELAY FUSE OR BREAKER SIZE[2] (AMPS)
208/1/50/60	59	6 (16)	70
208/3/50/60	35	8 (10)	50
230/1/50/60	55	6 (16)	70
230/3/50/60	32	8 (10)	50
400/3/50/60	19.5	12 (4)	30
460/1/50/60	34	8 (10)	50
460/3/50/60	16	14 (2.5)	25
575/3/50/60	14	14 (2.5)	20

1 Wire and Fuse Sizes based upon the U.S. National Electric Code and maximum output for 40°C (104°) ambient.
2 Also called “inverse time” or “thermal/magnetic” circuit breakers; circuit breakers that have a delay in tripping action that decreases as the magnitude of current increases.
3 Type SO cord or similar in 30°C ambient.

WIRE FEED SPEED RANGE-WIRE SIZE

WFS RANGE	GMAW MILD STEEL WIRE SIZES	GMAW ALUMINUM WIRE SIZES	GMAW STAINLESS WIRE SIZES	FCAW WIRE SIZES
50 – 800 ipm (1.3 – 17.8 m/min)	.025 – .045" (0.6 – 1.1mm)	.030 – 3/64" (0.8 – 1.2mm)	.035 – .045" (0.9 – 1.1mm)	.035 – .052" (0.9 – 1.4mm)

WELDING PROCESS

PROCESS	OUTPUT RANGE (AMPERES)	OCV (U_o)
GMAW GMAW-Pulse FCAW	40 - 350	70 VDC average, 74V peak
GTAW-DC	5 – 350	24 VDC average, 45V peak
SMAW	5 – 350	60 VDC average, 65V peak

WIRE SPEED RANGE

Wire Speed	50 – 800 IPM (1.27 – 17.8 m/minute)

PHYSICAL DIMENSIONS

MODEL	HEIGHT	WIDTH	DEPTH	WEIGHT
K4487-1	39.7in (1008mm)	39.4in (1001mm)	20.5in (521mm)	194lbs (88kg)*
K4488-1		39.4in (1001mm)	20.5in (521mm)	214lbs (97kg)*
K4488-2, -3		43.3in (1100mm)	28.4in (721mm)	259lbs (118kg)*
K4489-1		39.4in (1001mm)	20.5in (521mm)	194lbs (88kg)*
K4490-1		39.4in (1001mm)	20.5in (521mm)	214lbs (97kg)*
K4490-2		39.4in (1001mm)	20.5in (521mm)	214lbs (97kg)*
K4490-3, -4		43.3in (1100mm)	28.4in (721mm)	259lbs (118kg)*

TEMPERATURE RANGES

OPERATING TEMPERATURE RANGE	STORAGE TEMPERATURE RANGE
Environmentally Hardened: -4°F to 104°F (-20C to 40C)	Environmentally Hardened: -40°F to 185°F (-40C to 85C)

IP21S 155º(F) Insulation Class

* Weight does not include input cord.

Thermal tests have been performed at ambient temperature. The duty cycle (duty factor) at 40°C has been determined by simulation.

SAFETY PRECAUTIONS Read this entire installation section before you start installation.

⚠ WARNING

ELECTRIC SHOCK can kill.

- **Only qualified personnel should perform this installation.**
- **Turn the input power OFF at the disconnect switch or fuse box before working on this equipment. turn off the input power to any other equipment connected to the welding system at the disconnect switch or fuse box before work ing on the equipment.**
- **Do not touch electrically hot parts.**
- **Always connect the POWER WAVE® 300C grounding lug (located inside the reconnect input access door) to a proper safety (Earth) ground.**

SELECT SUITABLE LOCATION

The POWER WAVE® 300C will operate in harsh environments. Even so, it is important that simple preventative measures are followed in order to assure long life and reliable operation.

- The machine must be located where there is free circulation of clean air such that air movement in the back, out the sides and bottom will not be restricted.
- Dirt and dust that can be drawn into the machine should be kept to a minimum. The use of air filters on the air intake is not recommended because normal air flow may be restricted. Failure to observe these precautions can result in excessive operating temperatures and nuisance shutdown.
- Keep machine dry. Shelter from rain and snow. Do not place on wet ground or in puddles.
- Do not mount the POWER WAVE® 300C over combustible surfaces. Where there is a combustible surface directly under stationary or fixed electrical equipment, that surface shall be covered with a steel plate at least .060" (1.6mm) thick, which shall extend not less than 5.90" (150mm) beyond the equipment on all sides.

⚠ WARNING

- **Lift only with equipment of adequate lifting capacity.**
- **Be sure machine is stable when lifting.**
- **Do not operate machine while suspended when lifting.**

FALLING EQUIPMENT can cause injury.

STACKING

The POWER WAVE® 300C cannot be stacked.

TILTING

Place the machine directly on a secure, level surface or on a recommended undercarriage. The machine may topple over if this procedure is not followed.

INPUT AND GROUND CONNECTIONS

Only a qualified electrician should connect the POWER WAVE® 300C. Installation should be made in accordance with the appropriate National Electrical Code, all local codes and the information in this manual.

MACHINE GROUNDING

The frame of the welder must be grounded. A ground terminal marked with a ground symbol is located next to the input power connection block.

See your local and national electrical codes for proper grounding methods.

HIGH FREQUENCY PROTECTION

The EMC classification of the POWER WAVE® 300C is Industrial, Scientific and Medical (ISM) group 2, class A. The POWER WAVE® 300C is for industrial use only. (See **Electromagnetic compatibility EMC Safety Section)**.

Locate the POWER WAVE® 300C away from radio controlled machinery. The normal operation of the POWER WAVE® 300C may adversely affect the operation of RF controlled equipment, which may result in bodily injury or damage to the equipment.

INPUT CONNECTION

⚠ WARNING

Only a qualified electrician should connect the input leads to the POWER WAVE® 300C. Connections should be made in accordance with all local and national electrical codes and the connection diagram located on the inside of the reconnect access door of the machine. Failure to do so may result in bodily injury or death.

A 10 ft. power cord is provided and wired into the machine. Follow the power cord connection instructions.

For Single Phase Input

Non-CE Models

Connect green lead to ground per National Electrical Code.

Connect black and white leads to power.

Wrap red lead with tape to provide 600V insulation.

CE Models

Not supported.

For Three Phase Input

Non-CE Models

Connect green lead to ground per National Electric Code.

Connect black, red and white leads to power.

CE Models

Connect green/yellow lead to ground per National Electric Code.

Connect grey, brown and black leads to power.

ENSURE INPUT LEADS ARE PROPERLY ROUTED THROUGH TORROIDS.

White, brown, and grey leads pass through all three torroids.

Green/yellow lead passes through two torroids.

INPUT FUSE AND SUPPLY WIRE CONSIDERATIONS

Refer to Specification Section for recommended fuse, wire sizes and type of the copper wires. Fuse the input circuit with the recommended super lag fuse or delay type breakers (also called "inverse time" or "thermal/magnetic" circuit breakers). Choose input and grounding wire size according to local or national electrical codes. Using input wire sizes, fuses or circuit breakers smaller than recommended may result in "nuisance" shut-offs from welder inrush currents, even if the machine is not being used at high currents.

INPUT VOLTAGE SELECTION

The POWER WAVE® 300C automatically adjusts to work with different input voltages. No reconnect switches settings are required.

⚠ WARNING

The POWER WAVE® 300C ON/OFF switch is not intended as a service disconnect for this equipment. Only a qualified electrician should connect the input leads to the POWER WAVE® 300C. Connections should be made in accordance with all local and national electrical codes and the connection diagram located on the inside of the reconnect access door of the machine. Failure to do so may result in bodily injury or death.

POWER CORD REPLACEMENT

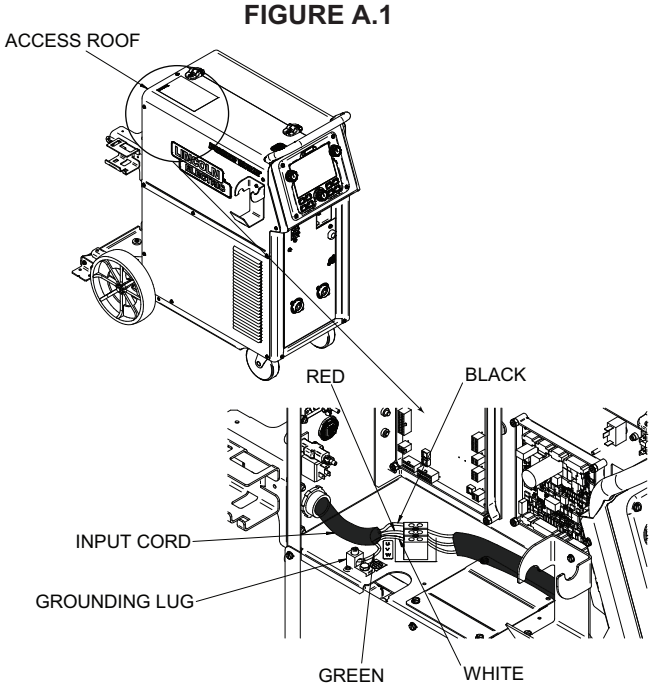
⚠ WARNING

Only a qualified electrician should connect the input leads to the POWER WAVE® 300C. Connections should be made in accordance with all local and national electrical codes and the connection diagram located on the inside of the reconnect access door of the machine. Failure to do so may result in bodily injury or death.

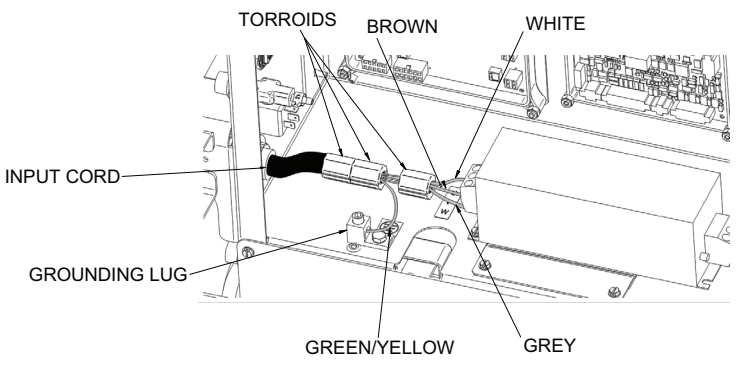
If the input power cord is damaged or needs to be replaced an input power connection block is located in the access panel under the wire spool.

ALWAYS CONNECT THE POWERWAVE GROUNDING LUG (LOCATED INSIDE THE ACCESS PANEL) TO A PROPER SAFETY (EARTH) GROUND. ENSURE INPUT LEADS ARE PROPERLY ROUTED THROUGH TORROIDS ON CE MODELS.

FIGURE A.1



NON-CE MODELS



CE MODELS

RECOMMENDED WORK CABLE SIZES FOR ARC WELDING

A 15 ft. work cable is provided with the POWER WAVE® 300C. This cable is appropriately sized for all of the POWER WAVE® 300C's welding procedures. If the work cable needs to be replaced a similar quality of cable should be used as excessive voltage drops caused by undersized welding cables can result in unsatisfactory welding performance. Always use the largest work cables that is practical, and be sure all connections are clean and tight.

Note: Excessive heat in the weld circuit indicates undersized cables and/or bad connections.

VOLTAGE SENSING OVERVIEW

Since the POWER WAVE® 300C has the ability to be in close proximity to the welding arc, the POWER WAVE® 300C does not require the use of remote sense leads.

Although, depending upon the process, inductance within the electrode and work cables can influence the voltage apparent at the studs of the welder, and have a dramatic effect on performance. Remote voltage sense leads are used to improve the accuracy of the arc voltage information supplied to the control pc board. Sense Lead Kits (K940-xx) are available for this purpose.

The POWER WAVE® 300C (Advanced All In One ONLY) has the ability to automatically sense when remote sense leads are connected. With this feature there are no requirements for setting-up the machine to use remote sense leads. This feature can be disabled through the Weld Manager Utility (available at www.powerwavesoftware.com) or through the set up menu on the UI screen.

SEMI-AUTOMATIC WELDING POLARITY

Most GMAW welding procedures use Electrode Positive welding. For these applications, connect the wire drive's connection block to the positive (+) output stud and connect the work lead to the negative (-) output stud.

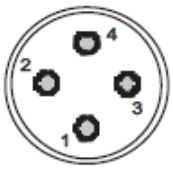
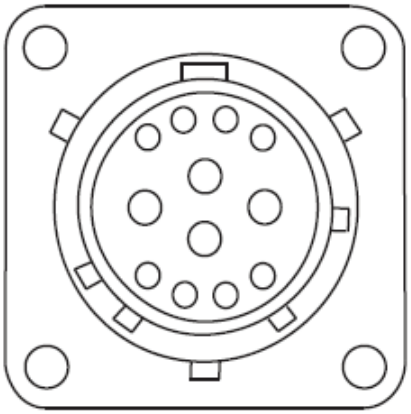
Some FCAW-S does use Electrode Negative Polarity. For these applications, connect the wire drive's connection block to the negative (-) output stud and connect the work lead to the positive (+) output stud.

The advanced model has the ability to self configure the electrode polarity based on the UI selection.

CABLE CONNECTIONS

There are two connections under the front panel.
(See 4-pin and 12-pin---Figure A.2---Table A.1)

TABLE A.1

FIGURE A.2	Function	PIN	Wiring
	4-pin trigger connector for push-only guns.*	1 2 3 4	Supply Voltage for Dual Procedure Dual Procedure Input Trigger Input Supply Voltage for Trigger
	12 pin connector for Push pull guns; foot pedal; remote controls; Hand –amptrols.	A B C D E F G H J K L M	CANL CANH Remote Pot Common Remote Pot Wiper Remote Pot +10VDC ArcLink Peripheral Sense Trigger Trigger Power Common Power + Motor Negative Motor Positive

***NOTE: 4-Pin connection not present on K4489 and K4490 models**

CABLE INDUCTANCE AND ITS EFFECTS ON WELDING

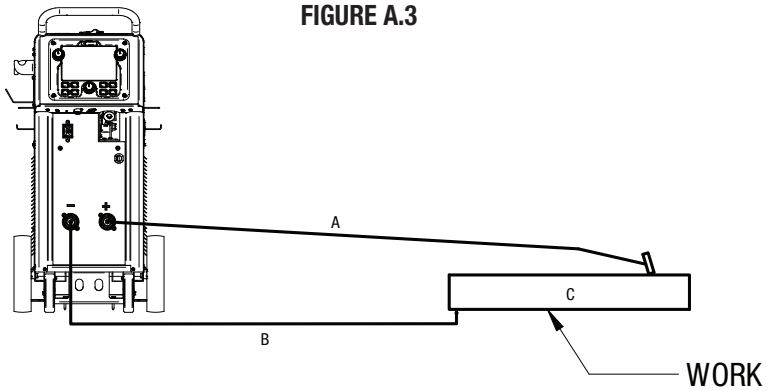
Whenever possible always weld in a direction away from the work (ground) connection.

Excessive cable inductance will cause the welding performance to degrade. There are several factors that contribute to the overall inductance of the cabling system including cable size, and loop area. The loop area is defined by the separation distance between the electrode and work cables, and the overall welding loop length. The welding loop length is defined as the total of length of the electrode cable (A) + work cable (B) + work path (C) (see Figure A.3).

To minimize inductance always use the appropriate size cables, and whenever possible, run the electrode and work cables in close proximity to one another to minimize the loop area. Since the most significant factor in cable inductance is the welding loop length, avoid excessive lengths and do not coil excess cable. For long work piece lengths, a sliding ground should be considered to keep the total welding loop length as short as possible.

For additional Safety information regarding the electrode and work cable set-up, See the standard "SAFETY INFORMATION" located in the front of this Instruction Manual.

FIGURE A.3



SHIELDING GAS CONNECTION

⚠ WARNING

CYLINDER may explode if damaged.

- **Keep cylinder upright and chained to support.**
- **Keep cylinder away from areas where it may be damaged.**
- **Never lift welder with cylinder attached.**
- **Never allow welding electrode to touch cylinder.**
- **Keep cylinder away from welding or other live electrical circuits.**

- **BUILD UP OF SHIELDING GAS MAY HARM HEALTH OR KILL.**
- **Shut off shielding gas supply when not in use.**
- **See American National Standard Z-49.1, "Safety in Welding and Cutting" Published by the American Welding Society.**

Customer must provide a cylinder of shielding gas, a pressure regulator, a flow control valve, and a hose from the flow valve to the gas inlet fitting of the wire drive unit. Connect a supply hose from the gas cylinder flow valve outlet to the 5/8-18 female inert gas fitting on the back panel of the Power Wave® 300C.

MAXIMUM INLET PRESSURE IS 100 PSI. (6.9 BAR.)

Install the shielding gas supply as follows:

1. Secure the cylinder to prevent it from falling.

2. Remove the cylinder cap. Inspect the cylinder valves and regulator for damaged threads, dirt, dust, oil or grease. Remove dust and dirt with a clean cloth. **DO NOT ATTACH THE REGULATOR IF OIL, GREASE OR DAMAGE IS PRESENT!** Inform your gas supplier of this condition. Oil or grease in the presence of high pressure oxygen is explosive.

3. Stand to one side away from the outlet and open the cylinder valve for an instant. This blows away any dust or dirt which may have accumulated in the valve outlet.

4. Attach the flow regulator to the cylinder valve and tighten the union nut(s) securely with a wrench. **Note:** if connecting to 100% CO^2 cylinder, insert regulator adapter between regulator and cylinder valve. If adapter is equipped with a plastic washer, be sure it is seated for connection to the CO^2 cylinder.

5. Attach one end of the inlet hose to the outlet fitting of the flow regulator. Attach the other end to the welding system shielding gas inlet. Tighten the union nuts with a wrench.

6. Before opening the cylinder valve, turn the regulator adjusting knob counterclockwise until the adjusting spring pressure is released.

7. Standing to one side, open the cylinder valve slowly a fraction of a turn. When the cylinder pressure gage stops moving, open the valve fully.

8. The flow regulator is adjustable. Adjust it to the flow rate recommended for the procedure and process being used before making a weld

LOADING SPOOLS OF WIRE

⚠ WARNING

- **Keep hands, hair, clothing and tools away from rotating equipment.**
- **Do not wear gloves when threading wire or changing wire spool.**
- **Only qualified personnel should install, use or service this equipment.**

Loading 10 to 15 lb. (4.5 – 6.8kg) Spools.

A K468 spindle adapter permits 8” (203mm) O.D. spools to be mounted on 2” (51mm) O.D. spindles.

1. Squeeze the release bar on the retaining collar and remove it from the spindle.

2. Place the spindle adapter on the spindle, aligning the spindle brake pin with the hole in the adapter.

3. Place the spool on the spindle and align the adapter brake tab with one of the holes in the back side of the spool. An indicator mark on the end of the spindle shows the orientation of the brake tab. Be certain the wire feeds off of the spool in the proper direction.

4. Re-install the retaining collar. Make sure that the release bar snaps out and that the retaining collar fully engages the groove on the spindle.

Loading 16 to 44 lb. (7.3 – 20kg) Spools

1. Squeeze the release bar on the retaining collar and remove it from the spindle.

2. Place the spool on the spindle, aligning the spindle brake pin with one of the holes in the back side of the spool. An indicator mark on the end of the spindle shows the orientation of the brake holding pin. Be certain the wire feeds off of the spool in the proper direction.

3. Re-install the retaining collar. Make sure that the release bar snaps out and that the retaining collar fully engages the groove on the spindle

WIRE DRIVE CONFIGURATION

(See Figure A.4)

Changing the Gun Receiver Bushing

⚠ WARNING

ELECTRIC SHOCK can kill.

- **Turn the input power OFF at the welding power source before installation or changing drive rolls and/or guides.**
- **Do not touch electrically live parts.**
- **When inching with the gun trigger, electrode and drive mechanism are "hot" to work and ground and could remain energized several seconds after the gun trigger is released.**
- **Do not operate with covers, panels or guards removed or open.**
- **Only qualified personnel should perform maintenance work.**

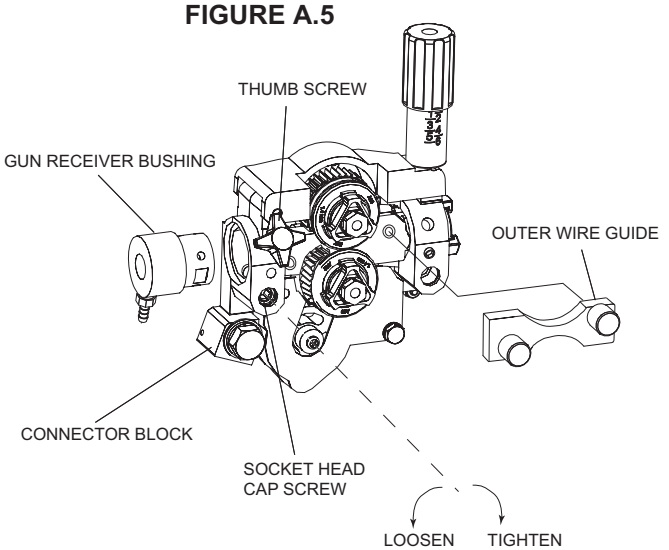
Tools required:

- 1/4" hex key wrench.

Note: Some gun bushings do not require the use of the thumb screw.

1. Turn power off at the welding power source.
2. Remove the welding wire from the wire drive.
3. Remove the thumb screw from the wire drive.
4. Remove the welding gun from the wire drive.
5. Loosen the socket head cap screw that holds the connector bar against the gun bushing.
   Important: Do not attempt to completely remove the socket head cap screw.
6. Remove the outer wire guide, and push the gun bushing out of the wire drive. Because of the precision fit, light tapping may be required to remove the gun bushing.
7. Disconnect the shielding gas hose from the gun bushing, if required.

FIGURE A.5



8. Connect the shielding gas hose to the new gun bushing, if required.
9. Rotate the gun bushing until the thumb screw hole aligns with the thumb screw hole in the feed plate. Slide the gun receiver bushing into the wire drive and verify the thumb screw holes are aligned.
10. Tighten the socket head cap screw.
11. Insert the welding gun into the gun bushing and tighten the thumb screw.

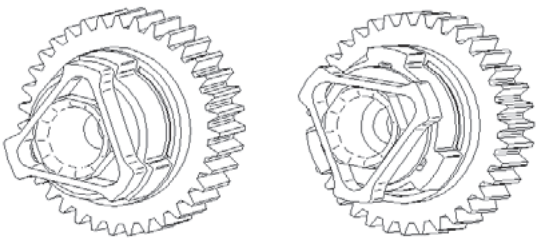
PROCEDURE TO INSTALL DRIVE ROLLS AND WIRE GUIDES

⚠ WARNING

- **Turn the input power OFF at the welding power source before installation or changing drive rolls and/or guides.**
- **Do not touch electrically live parts.**
- **When inching with the gun trigger, electrode and drive mechanism are "hot" to work and ground and could remain energized several seconds after the gun trigger is released.**
- **Do not operate with covers, panels or guards removed or open.**
- **Only qualified personnel should perform maintenance work.**

---

1. Turn power off at the welding power source.
2. Release the idle roll pressure arm.
3. Remove the outer wire guide by turning the knurled thumbscrews counter-clockwise to unscrew them from the feed plate.
4. Rotate the triangular lock and remove the drive rolls.



UNLOCKED POSITION — LOCKED POSITION

5. Remove the inner wire guide.
6. Insert the new inner wire guide, groove side out, over the two locating pins in the feed plate.
7. Install a drive roll on each hub assembly secure with the triangular lock.
8. Install the outer wire guide by aligning it with the pins and tightening the knurled thumbscrews.
9. Close the idle arm and engage the idle roll pressure arm. Adjust the pressure appropriately

GUN USED

The Magnum® PRO CURVE 300 Ready-Pak is the recommended gun for the POWER WAVE® 300C. Refer to the Magnum PRO CURVE 300 Ready-Pak's operators manual for installation instructions.

FEEDING ELECTRODE AND BRAKE ADJUSTMENT

1. Turn the Reel or spool until the free end of the electrode is accessible.

2. While tightly holding the electrode, cut off the bent end and traighten the first 6" (150 mm). Cut off the first 1" (25 mm) (If the electrode is not properly straightened, it may not feed or may jam causing a "birdnest").

3. Insert the free end through the incoming guide tube.

4. Press the Cold Inch key and push the electrode into the drive roll.

5. Feed the electrode through the gun.

6. Adjust the brake tension with the thumbscrew on the spindle hub, until the reel turns freely but with little or no overrun when wire feeding is stopped. Do not over tighten.

DRIVE ROLL PRESSURE SETTING

ELECTRIC SHOCK can kill.
- **Turn the input power OFF at the welding power source before installation or changing drive rolls and/or guides.**
- **Do not touch electrically live parts.**
- **When feeding with the gun trigger, unless "COLD FEED" trigger mode is selected, the electrode and drive mechanism are always "HOT" to work and ground and could remain "HOT" several seconds after the gun trigger is released.**
- **Do not operate with covers, panels, or guards removed or open.**
- **Only qualified personnel should perform maintenance work.**

The POWER WAVE® 300C's optimum drive roll pressure varies with type of wire, surface condition, lubrication, and harness. Too cmuch pressure could cause "birdnesting", but too little pressure could cause wire feed slippage with load and/or acceleration. The optimum drive roll setting can be determined as follows:

1. Press end of gun against a solid object that is electrically isolated from the welder output and press the gun trigger for several seconds.

2. If the wire "birdnests", jams, or breaks at the drive roll, the drive roll pressure is too great. Back the pressure setting out turn, run new wire through gun, and repeat above steps.

3. If the only result is drive roll slippage, disengage the gun, pull the gun cable forward about 6" (150 mm). There should be a slight waviness in the exposed wire. If there is no waviness, the pressure is too low. Increase the pressure setting turn, reconnect the gun, tighten locking clamp and repeat the above steps.

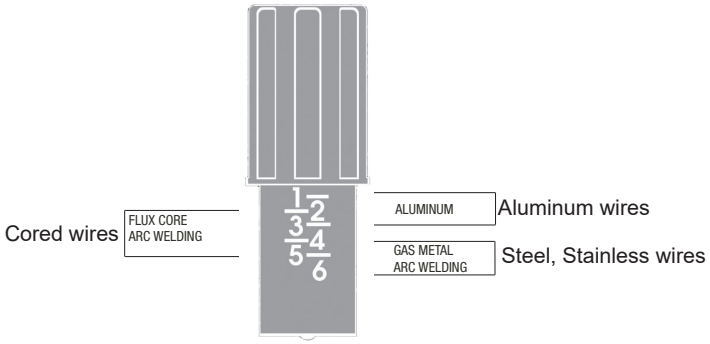
PRESSURE ARM ADJUSTMENT

The pressure arm controls the amount of force the drive rolls exert on the wire. Proper adjustment of pressure arm gives the best welding performance.

Set the pressure arm as follows: (See Figure A.6)

Aluminum wires	between 1 and 3
Cored wires	between 3 and 4
Steel, Stainless wires	between 4 and 6

FIGURE A.6



GTAW WELDING

(Figure A.7)

GTAW uses Electrode Negative Polarity so for this application, connect the TIG torch to the negative (-) output stud (standard model) or electrode stud (advanced model) and connect the work clamp to the positive (+) output stud (standard model) or electrode stud (advanced model) The TIG torch gas connection should be connected to the POWER WAVE® 300C's internal gas supply connection. If required a foot amptrol can be connected to the remote control receptacle.

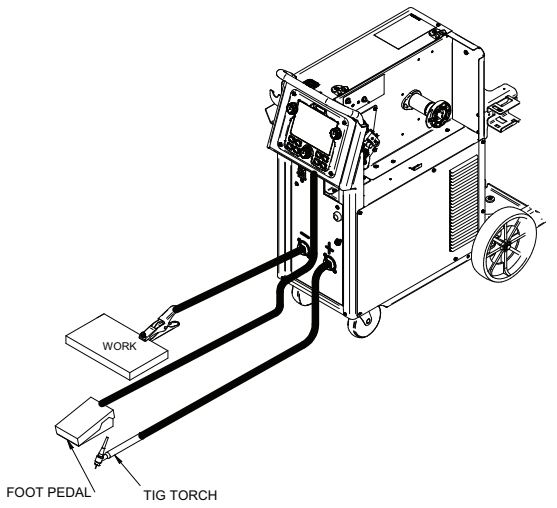
SMAW WELDING

Most SMAW welding procedures use Electrode Positive welding. For these applications, connect the stick electrode holder to the positive (+) output stud (standard model) or electrode stud (advanced model) and connect the work clamp to the negative (-) output stud (standard model) or electrode stud (advanced model).

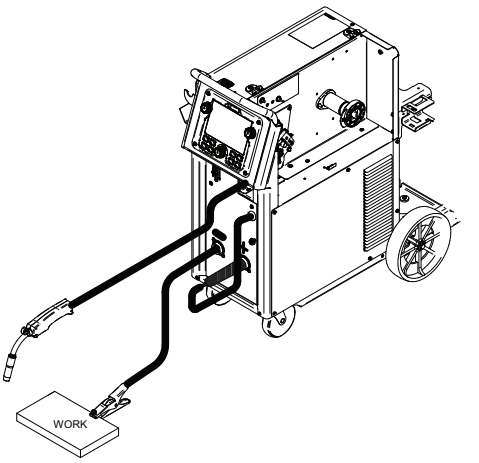
Some SMAW welding procedures use Electrode Negative Polarity. For these applications, connect the stick electrode holder to the negative (-) output stud and connect the work clamp to the positive (+) output stud on the standard model.

The advanced model has the ability to self configure the electrode polarity based on the UI selection.

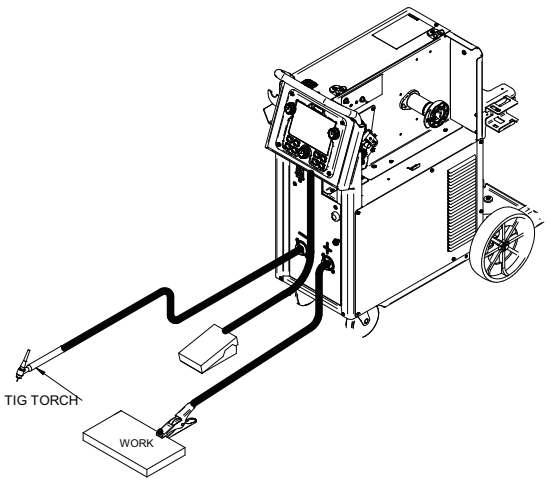
FIGURE A.7



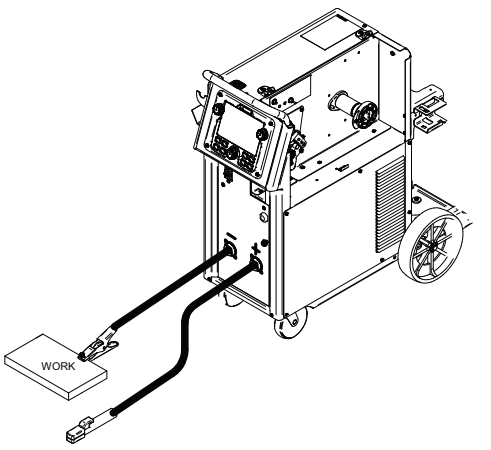
GTAW - ADVANCED MODEL



GMAW - STANDARD AND ADVANCED MODELS



GTAW - STANDARD MODEL



SMAW - STANDARD AND ADVANCED MODELS

SAFETY PRECAUTIONS

READ AND UNDERSTAND ENTIRE SECTION BEFORE OPERATING MACHINE.

⚠ WARNING

- **ELECTRIC SHOCK CAN KILL. Unless using COLD FEED feature, when feeding with gun trigger, the electrode and drive mechanism are always electrically energized and could remain energized several seconds after the welding ceases.**
- **Do not touch electrically live part or electrode with skin or wet clothing.**
- **Insulate yourself from work and ground.**
- **Always wear dry insulating gloves.**
- **Do not operate with covers, panels or guards removed or open.**

- **FUMES AND GASSES can be dangerous.**
- **Keep your head out of fumes.**
- **Use ventilation or exhaust to remove fumes from breathing zone.**

- **WELDING SPARKS can cause fire or explosion.**
- **Keep flammable material away.**

ARC RAYS can burn.

- **Wear eye, ear and body protection.**

SEE ADDITIONAL WARNING INFORMATION UNDER ARC WELDING SAFETY PRECAUTIONS AND IN THE FRONT OF THIS OPERATING MANUAL.

GRAPHIC SYMBOLS THAT APPEAR ON THIS MACHINE OR IN THIS MANUAL

WARNING OR CAUTION

DANGEROUS VOLTAGE

POSITIVE OUTPUT - Standard Model

NEGATIVE OUTPUT - Standard Model

HIGH TEMPERATURE

STATUS

PROTECTIVE GROUND

REMOTE

WORK - Advanced Model

ELECTRODE - Advanced Model

POWER-UP SEQUENCE

When the POWER WAVE® 300C is powered it can take as long as 30 seconds for the machine to be ready to weld. During this time period the user interface will not be active.

DUTY CYCLE

The POWER WAVE® 300C has 100%, 60% and 40% duty cycles. The duty cycle is based on a ten-minute period. A 60% duty cycle represents 6 minutes of welding and 4 minutes of idling in a ten-minute period. See machine specifications section for amperes and machine ratings.

PRODUCT DESCRIPTION

The Power Wave® 300C is a high performance multi-process machine with GMAW, FCAW, SMAW, DC GTAW, and pulse capability. Additionally, the advanced model has the following capabilities:

- STT
- AC Welding Process
- High Frequency GTAW

The Power Wave® 300C will provide the following:

- Multi Input Voltage with no reconnect - 208-600V, 50-60 Hz input.
- Single and Three Phase Power.
- Environmentally Hardened - IP21S rated for operating in difficult environments.
- Feeding Options – Standard MIG guns
- Ethernet connectivity – allows access to the Power Wave utilities software tools.

RECOMMENDED PROCESSES AND EQUIPMENT

RECOMMENDED PROCESSES

The Power Wave® 300C is a high speed, multi-process power source capable of regulating the current, voltage, or power of the welding arc. With an output range of 5 to 350 amperes, it supports a number of standard processes including synergic GMAW, GMAW-P, FCAW, FCAW-S, SMAW, GTAW and GTAW-P on various materials especially steel, aluminum and stainless steel.

The following capabilities are supported:

- 12-Pin Lincoln Electric Accessories such as the GTAW Arc Start Switch (K814-2), GTAW Foot Amptrol (K870-2), and GTAW Hand Amprol (K963-4), GMAW Magnum Pro 250 LX GT Spool Gun (K3569-2 w/K2910-1), and Magnum Pro AL Push-Pull Guns.
- Standard MIG gun trigger connection (4-pin).
- The unit will have the K1500-1 gun bushing for LECO backend connections.
- Simple process to switch between different welding processes.

PROCESS LIMITATIONS

The software based weld tables of the Power Wave® 300C limit the process capability within the output range and the safe limits of the machine. In general the processes will be limited to .035-.045 solid steel and stainless wire, .045-1/16 cored wire, as well as .035, 3/64 and 1/16 Aluminum wire.

The following items will not be supported on the standard model, but are supported by the advanced model in the product portfolio:

- STT
- AC welding processes

⚠ WARNING

The Power Wave® 300C is not recommended for pipe thawing.

EQUIPMENT LIMITATIONS

- Maximum gun length is 25 ft (7.6m) for push-only systems.
- Maximum spool size is 12 in (305 mm) diameter.
- Maximum spool weight is 44 lb (20 kg).
- Other gun bushings are required for welding guns that do not have a Magnum (Tweco #2-#4 compatible) back end.

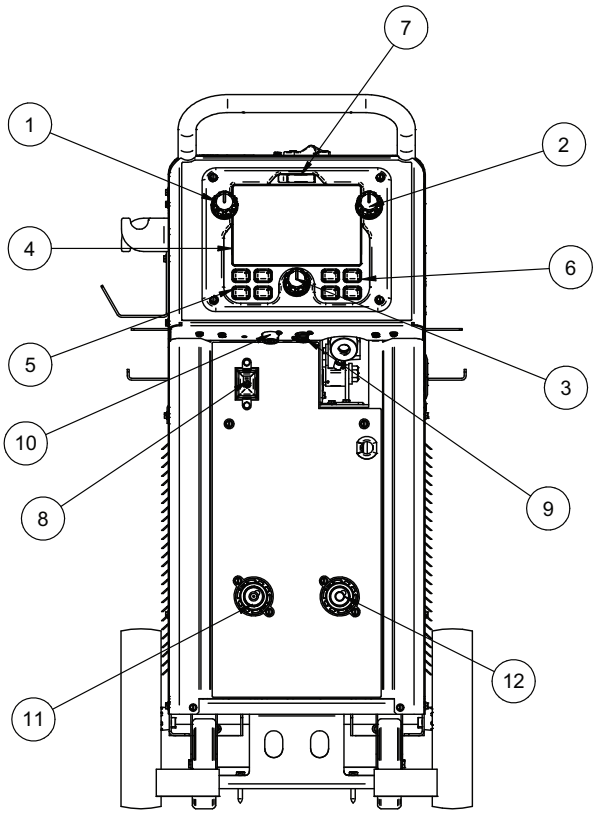
DESIGN FEATURES

Loaded with Standard Features

- Multiple process DC output range: 5 - 350 Amps.
- 200 – 600 VAC, 1/3 phase, 50-60Hz input power.
- New and Improved Line Voltage Compensation holds the output constant over wide input voltage fluctuations.
- Utilizes next generation microprocessor control, based on the ArcLink® platform.
- State of the art power electronics technology, yields superior welding capability.
- Electronic over current protection.
- Input over voltage protection.
- F.A.N. (fan as needed). Cooling fan runs when the output is energized 15 seconds following the strike of the welding arc and will continue to run 4 minutes following the end of the weld.
- Thermostatically protected for safety and reliability.
- Recessed connection panel for protection against accidental impact.
- Ethernet connectivity via IP-67 rated ODVA compliant RJ-45 connector.
- Panel mounted Status and Thermal LED indicators facilitate quick and easy troubleshooting.
- Potted PC boards for enhanced ruggedness/reliability.
- Remote control/Foot amptrol ready.
- Waveform Control Technology™ for good weld appearance and low spatter, even when welding nickel alloys.
- 4 memories for easily selecting procedures.
- Full sequence control for tailoring the weld from start to end.
- Patented MAXTRAC™ 2 roll drive system.
- Patent pending drive rolls improve traction on solid wire by up to 20%.
- Patented split wire guides fully support the wire and virtually eliminate birdnesting.
- No tools required to change the drive rolls and wire guides.
- Patent pending dual spring pressure arms have sensitivity for feeding soft wires without crushing them, and have plenty of compression force for feeding solid or stiff wires.
- All gear driven rolls for more feeding force.
- Changeable gun bushings easily accept guns from other manufacturers.
- Brass-to-brass connections between the electrode connection and the gun minimize voltage drop variations, resulting in consistent arc performance all day, every day.
- Powerful, quiet motor with integrated tachometer for accurate WFS regulation.

CASE FRONT CONTROLS - STANDARD MODEL

FIGURE B.1

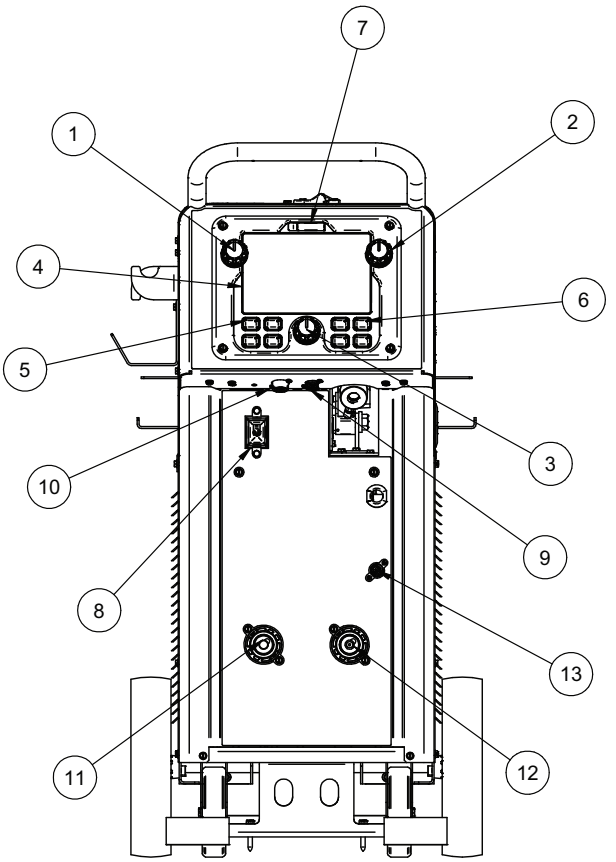


All operator controls and adjustments are located on the case front of the Power Wave. **(See Figure B.1)**

1. **PROCESS ADJUSTMENT KNOB -** Adjusts wire feed speed/Amps.
2. **PROCESS ADJUSTMENT KNOB** - Adjusts Voltage/Trim.
3. **NAVIGATION/SELECT KNOB** - Use to Navigate/Select settings or process.
4. **MAIN DISPLAY** - Shows detailed welding /process information.
5. **PROCESS SELECTION BUTTONS -** Quick common procedures selection.
6. **MEMORY SELECTION BUTTONS -** Use to save up to 4 process memories.
7. **USB PORT**
8. **ON/OFF SWITCH**
9. **GUN TRIGGER CONNECTOR**
10. **12-PIN REMOTE CONNECTOR**
11. **NEGATIVE (-) OUTPUT STUD**
12. **POSITIVE (+) OUTPUT STUD**

CASE FRONT CONTROLS - ADVANCED MODEL

FIGURE B.2

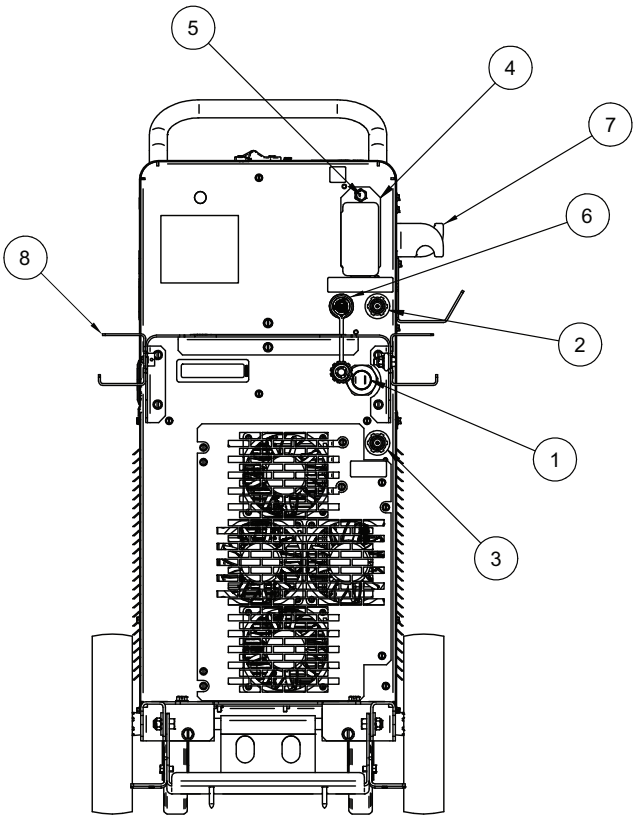


All operator controls and adjustments are located on the case front of the Power Wave. **(See Figure B.2)**

1. **PROCESS ADJUSTMENT KNOB -** Adjusts wire feed speed/Amps.
2. **PROCESS ADJUSTMENT KNOB** - Adjusts Voltage/Trim.
3. **NAVIGATION/SELECTION KNOB** - Use to Navigate/Select settings or process.
4. **MAIN DISPLAY** - Shows detailed welding /process information.
5. **PROCESS SELECTION BUTTONS -** Quick common procedures selection.
6. **MEMORY SELECTION BUTTONS -** Use to save up to 4 process memories.
7. **USB PORT**
8. **ON/OFF SWITCH**
9. **GUN TRIGGER CONNECTOR**
10. **12-PIN REMOTE CONNECTOR**
11. **WORK OUTPUT STUD**
12. **ELECTRODE OUTPUT STUD**
13. **SENSE LEAD CONNECTOR**

CASE BACK CONTROLS - STANDARD AND ADVANCED MODELS

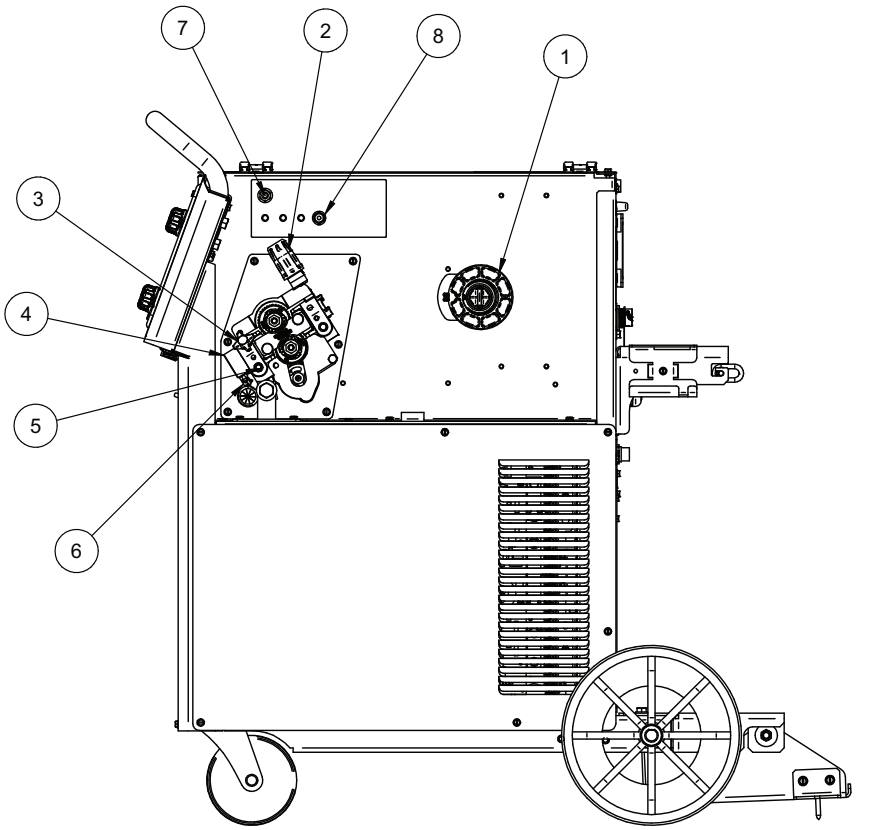
FIGURE B.3



1. **POWER CORD LOCATION**
2. **GAS CONNECTION, GMAW AND FCAW**
3. **GAS CONNECTION, GTAW**
4. **OPTIONAL - 115 VOLT, 10 AMPS 60 Hz RECEPTACLE FOR GENERAL USE - K2829-1**
5. **CIRCUIT BREAKER**
6. **ETHERNET CONNECTOR**
7. **COIL CLAW™**
8. **TOOL HOLDER**

INTERNAL CONTROLS - STANDARD AND ADVANCED MODELS

FIGURE B.4



1. SPINDLE BRAKE

2. WIRE DRIVE PRESSURE ARM

3. THUMB SCREW FOR SECURING THE WELDING GUN

4. GUN BUSHING

5. SOCKET HEAD CAP SCREW FOR SECURING THE GUN BUSHING

6. GAS CONNECTION, GMAW OR FCAW GUN

7. CIRCUIT BREAKER

8. COLD INCH / GAS PURGE SWITCH

MAKING A WELD WITH WAVEFORM TECHNOLOGY POWER SOURCES

⚠ WARNING

MAKING A WELD

The serviceability of a product or structure utilizing the welding programs is and must be the sole responsibility of the builder/user. Many variables beyond the control of The Lincoln Electric Company affect the results obtained in applying these programs. These variables include, but are not limited to, welding procedure, plate chemistry and temperature, weldment design, fabrication methods and service requirements. The available range of a welding program may not be suitable for all applications, and the build/user is and must be solely responsible for welding program selection.

Choose the electrode material, electrode size, shielding gas, and process (GMAW, GMAW-P etc.) appropriate for the material to be welded.

Select the weld mode that best matches the desired welding process. The standard weld set shipped with the Power Wave 300C encompasses a wide range of common processes that will meet most needs.

All adjustments are made through the user interface. Because of the different configuration options your system may not have all of the following adjustments. Regardless of availability, all controls are described in the following section (See Figure B.4 Panel Controls Used)

DEFINITION OF WELDING MODES

NON-SYNERGIC WELDING MODES

- A **Non-synergic** welding mode requires all welding process variables to be set by the operator.

SYNERGIC WELDING MODES

- A **Synergic** welding mode offers the simplicity of single knob control. The machine will select the correct voltage and amperage based on the wire feed speed (WFS) set by the operator.

BASIC WELDING CONTROLS

WELD MODE

Selecting a weld mode determines the output characteristics of the Power Wave power source. Weld modes are developed with a specific electrode material, electrode size, and shielding gas. For a more complete description of the weld modes programmed into the Power Wave at the factory, refer to the **Weld Set Reference Guide** available at **www.powerwavesoftware.com**.

WIRE FEED SPEED (WFS)

In synergic welding modes (synergic CV, GMAW-P), WFS is the dominant control parameter. The user adjusts WFS according to factors such as wire size, penetration requirements, heat input, etc. The Power Wave then uses the WFS setting to adjust the voltage and current according to settings contained in the Power Wave.

In non-synergic modes, the WFS control behaves like a conventional power source where WFS and voltage are independent adjustments. Therefore, to maintain proper arc characteristics, the operator must adjust the voltage to compensate for any changes made to the WFS.

AMPS

In constant current modes, this control adjusts the welding current.

VOLTS

In constant voltage modes, this control adjusts the welding voltage.

TRIM

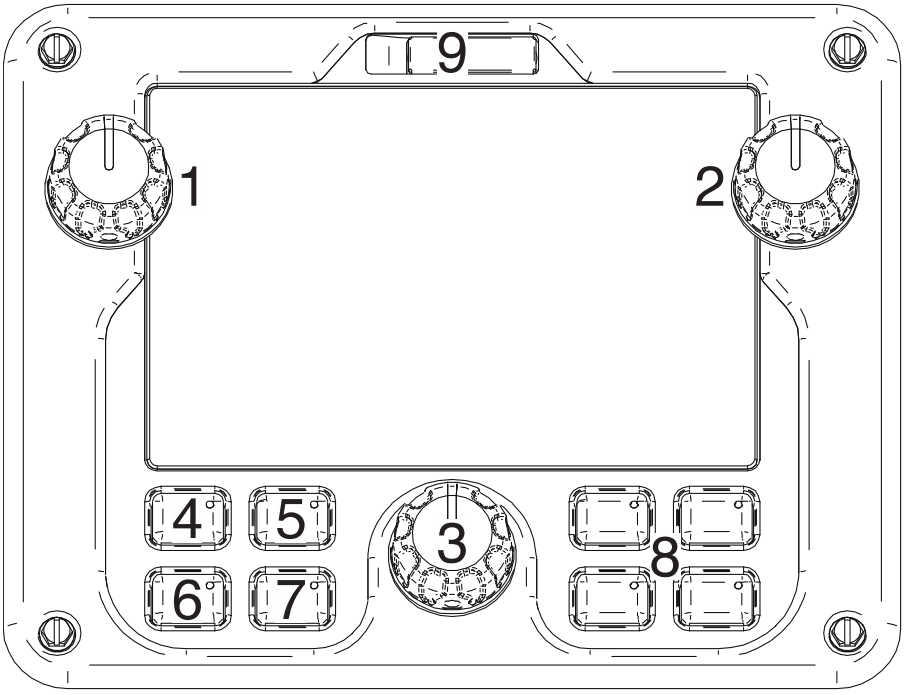
In pulse synergic welding modes, the Trim setting adjusts the arc length. Trim is adjustable from 0.50 to 1.50. 1.00 is the nominal setting and is a good starting point for most conditions.

ULTIMARC™ CONTROL

UltimArc™ Control allows the operator to vary the arc characteristics from “soft” to “crisp”. UltimArc™ Control is adjustable from –10.0 to +10.0 with a normal setting of 0.0.

USER INTERFACE LAYOUT

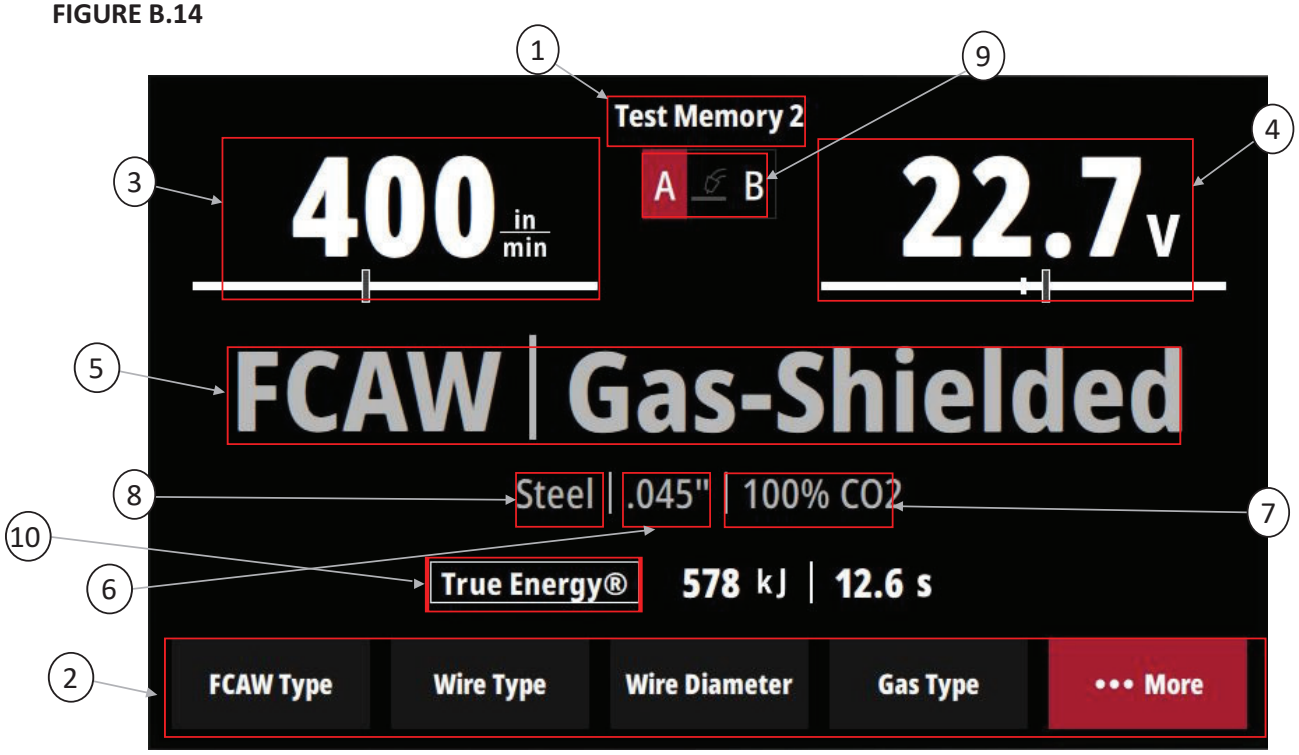
FIGURE B.5



1. Process Adjustment Knob: Turn to adjust setpoint (dependent on the process).
2. Process Adjustment Knob: Turn to adjust setpoint (dependent on the process).
3. Navigation/Select Knob: Turn to scroll through the menu and press to select a highlighted option.
4. SMAW Button: Press to set the system to SMAW mode.
5. GTAW Button: Press to set the system to GTAW mode.
6. FCAW Button: Press to set the system to FCAW mode.
7. GMAW Button: Press to set the system to GMAW mode.
8. Memory Buttons: Memories can be saved for each welding process. These can be accessed by pressing the applicable memory button labeled one through four. To save a memory, hold the desired memory location down until the screen indicates the memory is saved. To view a list of all stored memory tiles for the selected process, momentarily press any 2 memory buttons simultaneously.
9. USB Connector: A USB drive can be inserted to upload/download memories and update the user interface software.

SIMPLIFIED HOME SCREEN

FIGURE B.14

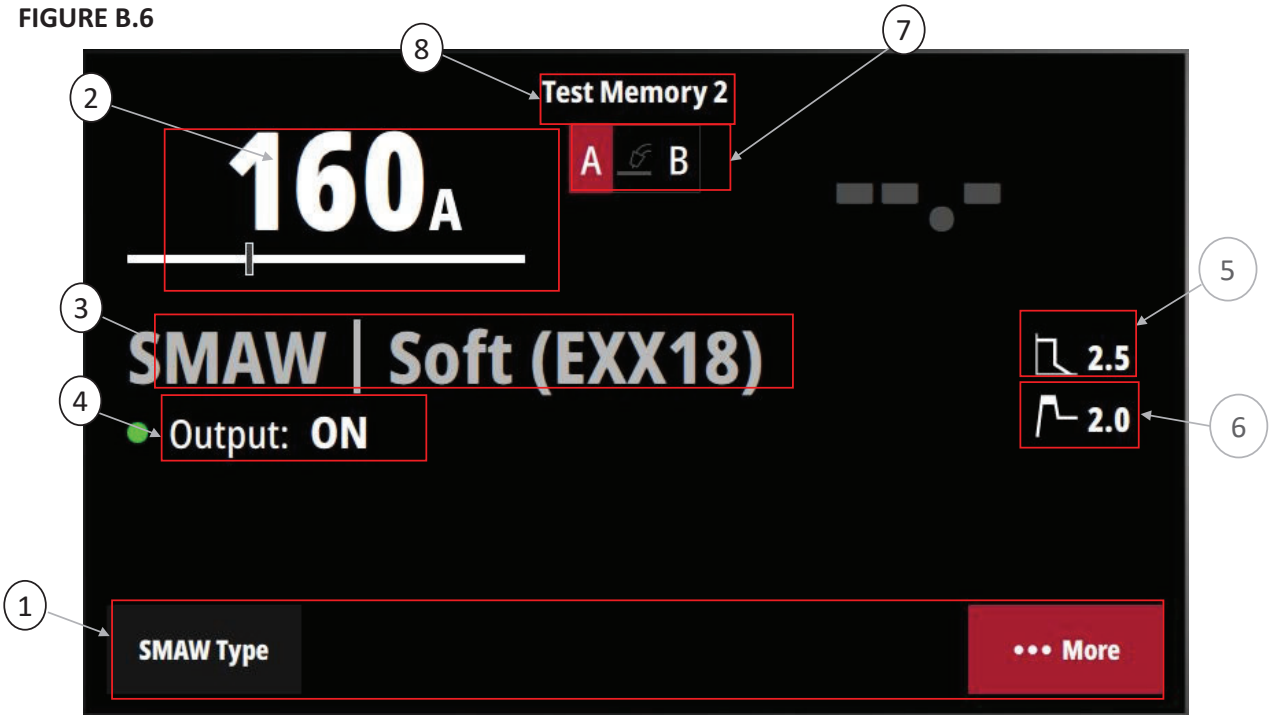


1. Memory Name
2. Menu Bar - Use the Menu knob to scroll through the options along the bottom of the screen. Press the knob to select the highlighted option.
3. Wire Feed Speed Setting - Sets the desired wire feed speed.
4. Voltage Setting - Sets the voltage.
5. Weld Mode.
6. Wire Diameter Selection.
7. Gas Type Selection.
8. Wire Type Selection.
9. Dual Procedure Indicator.
10. True Energy - Automatically calculates the heat input for the weld.

USER INTERFACE NAVIGATION

SMAW HOME SCREEN (ADVANCED VIEW)

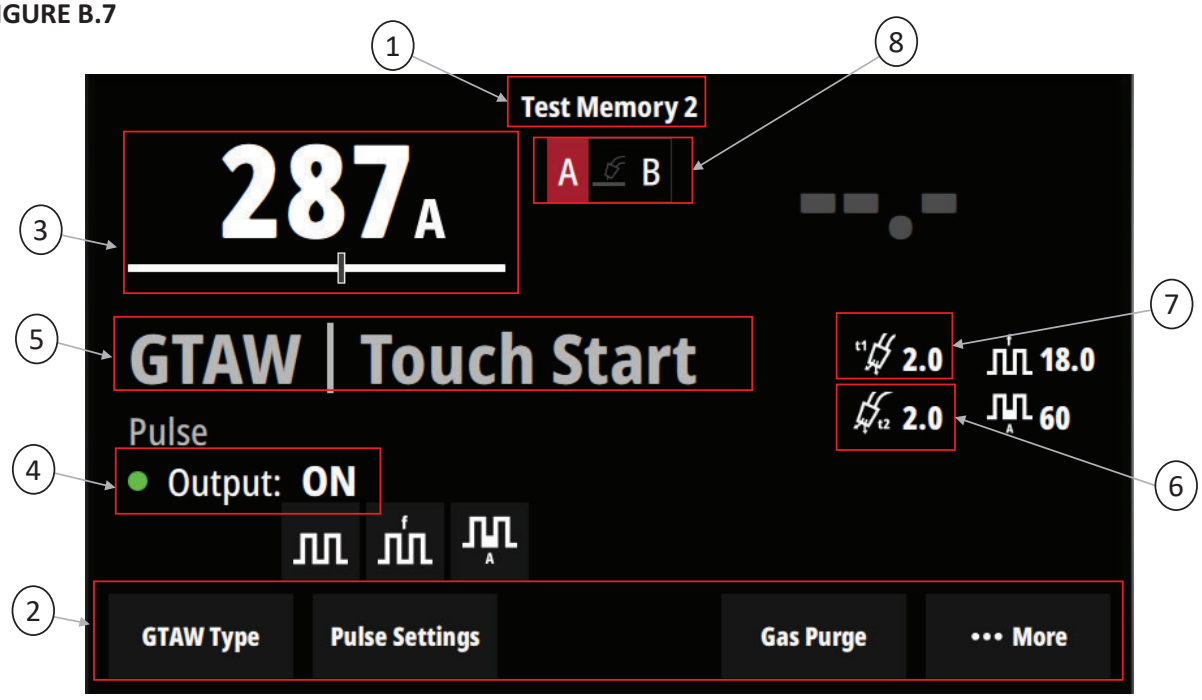
FIGURE B.6



1. Menu Bar - Use the Menu knob to scroll through the options along the bottom of the screen. Press the knob to select the highlighted option.
2. Current Setting - Sets the desired current, use left knob to adjust. to adjust the allowable ranges to be set by a remote.
3. Weld Mode
4. Output Indicator (Note: Output is “ON” at all times in SMAW process).
5. Arc Force
6. Hot Start
7. Dual Procedure Indicator – Displays the active welding procedure/schedule. Pressing the active process button switches between the procedure/schedule options.
8. Memory Name

GTAW HOME SCREEN (ADVANCED VIEW)

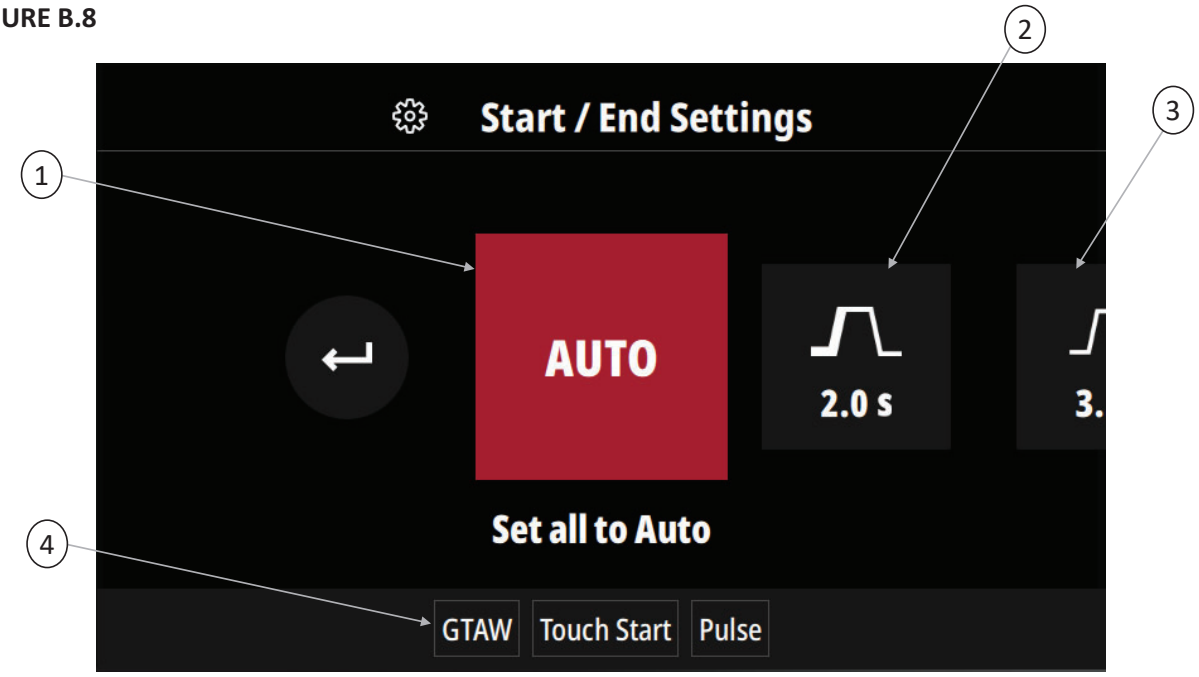
FIGURE B.7



1. Memory Name
2. Menu Bar - Use the Menu knob to scroll through the options along the bottom of the screen. Press the knob to select the highlighted option.
3. Current Setting - Sets the desired current, use left knob to adjust.
4. Output Indicator - Output will be on in Touch Start mode without a remote. Output will be off until triggered when a remote is connected. Note: HF mode requires a remote to be connected.
5. Weld Mode
6. Balance
7. Frequency
8. Dual Procedure Indicator – Displays the active welding procedure/schedule. Pressing the active process button switches between the procedure/schedule options.

GTAW START/END SETTINGS

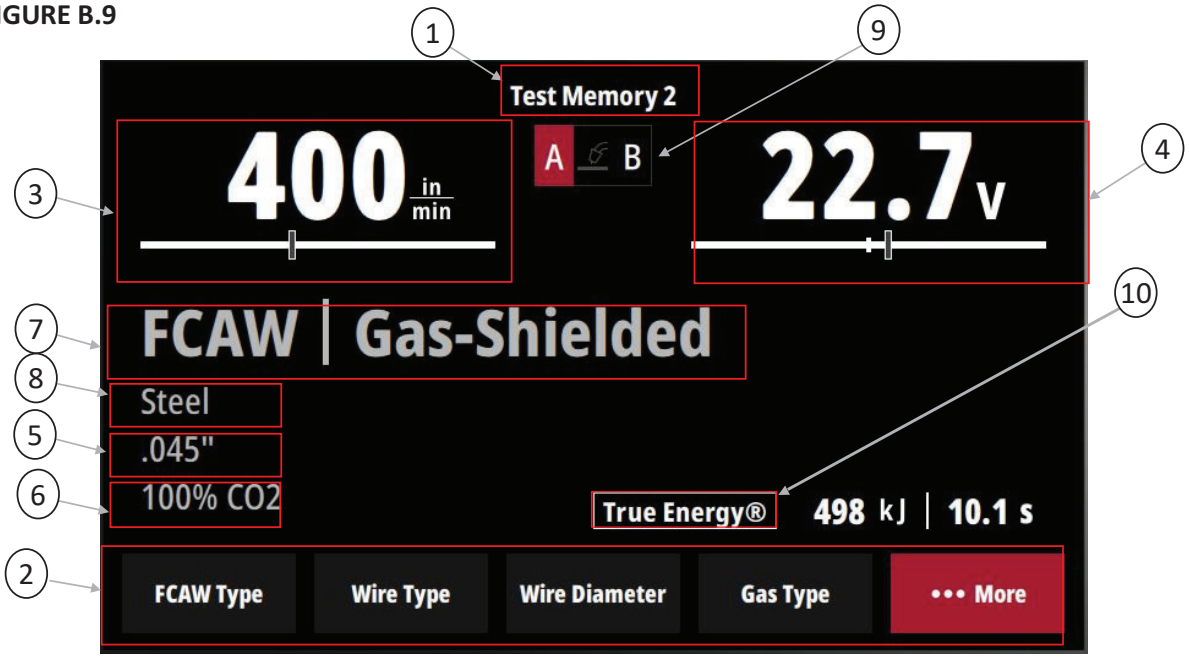
FIGURE B.8



1. Set all to Auto – Start/End settings are set to “auto” by default. These settings are programmed based on process and setpoint to provide ideal welding.
2. Start Time – Controls the voltage for a specified time at the beginning of the weld. During that time, the machine will ramp from the Start Procedure to the Welding Procedure.
3. Crater Time – Controls the voltage for a specified time at the end of the weld after the trigger is released. During the Crater time, the machine will ramp from the Weld Procedure to the Crater Procedure.
4. Active Weld Settings

FCAW HOME SCREEN (ADVANCED VIEW)

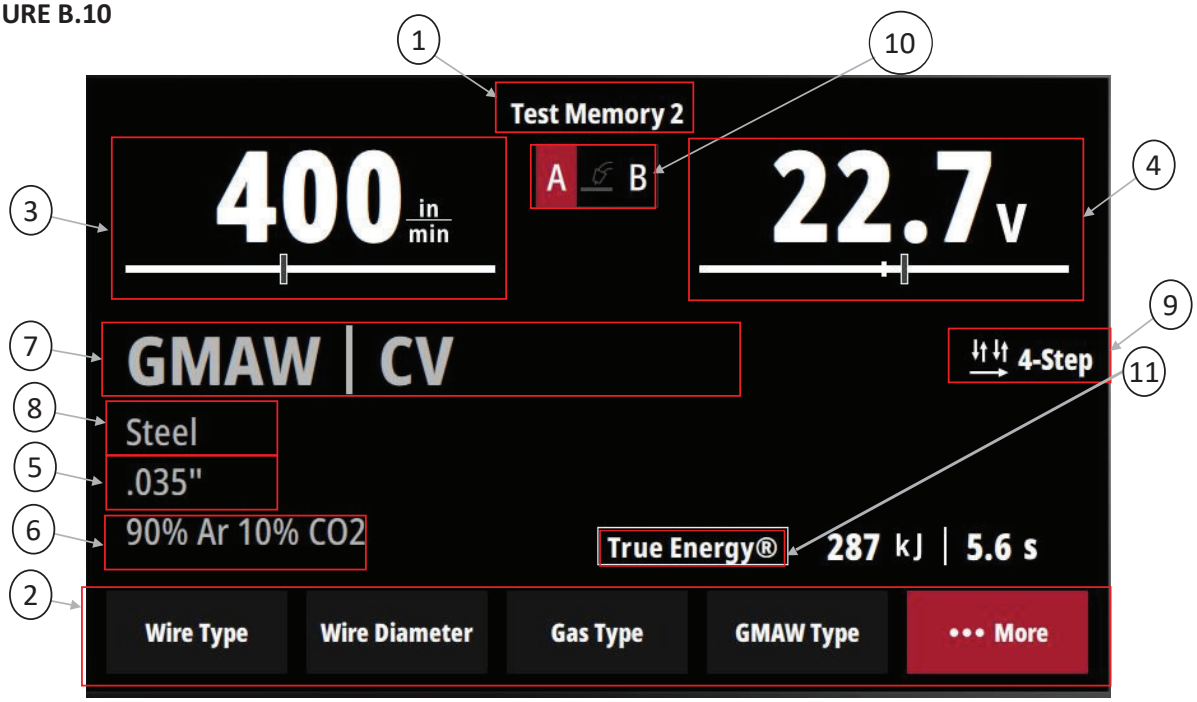
FIGURE B.9



1. Memory Name
2. Menu Bar - Use the Menu knob to scroll through the options along the bottom of the screen. Press the knob to select the highlighted option.
3. Wire Feed Speed Setting - Sets the desired wire feed speed, use left knob to adjust.
4. Voltage Setting - Sets the voltage, use right knob to adjust.
5. Wire Diameter Selection
6. Gas Type Selection
7. Weld Mode
8. Wire Type Selection
9. Dual Procedure Indicator - Displays the active welding procedure/schedule. Pressing the active process button switches between the procedure/schedule options.
10. True Energy - Automatically calculates the heat input for the weld.

GMAW HOME SCREEN (ADVANCED VIEW)

FIGURE B.10

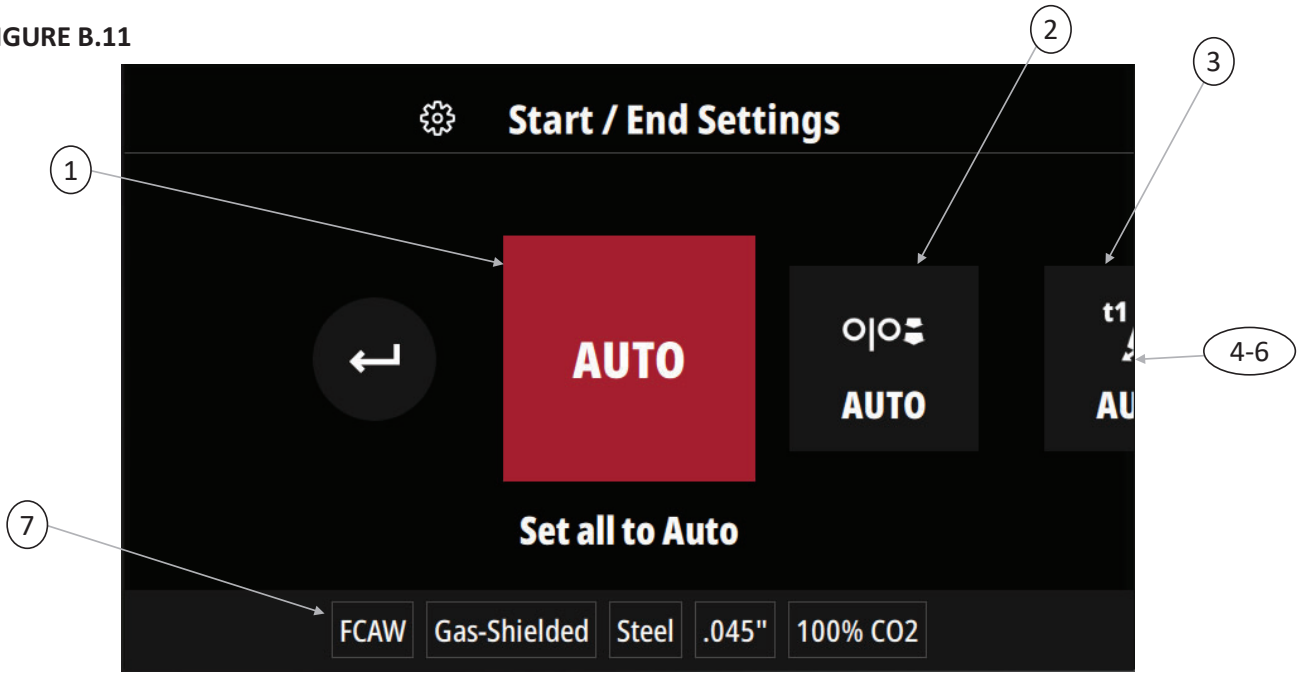


1. Memory Name
2. Menu Bar - Use the Menu knob to scroll through the options along the bottom of the screen. Press the knob to select the highlighted option.
3. Wire Feed Speed Setting - Sets the desired wire feed speed, use left knob to adjust.
4. Voltage/Trim Setting - Sets the voltage or trim, use right knob to adjust.
5. Wire Diameter Selection
6. Gas Type Selection
7. GMAW Mode Selection
8. Wire Type Selection
9. 2-Step/4-Step Trigger Interlock - Toggles between 2-Step and 4-Step Trigger Interlock. 2-Step provides weld power and feeds wire only when the trigger is depressed. 4-Step eliminates the need to hold the trigger while welding. It operates in 4 steps:
    1. Close trigger and establish welding arc.
    2. Release trigger and continue welding.
    3. Reclose trigger near end of weld.
    4. Release trigger again to stop welding.

    NOTE: No symbol will be shown if 2-Step mode is active.
10. Dual Procedure Indicator - Displays the active welding procedure/schedule. Pressing the active process button switches between the procedure/schedule options.
11. True Energy - Automatically calculates the heat input for the weld.

FCAW/GMAW START/END SETTINGS

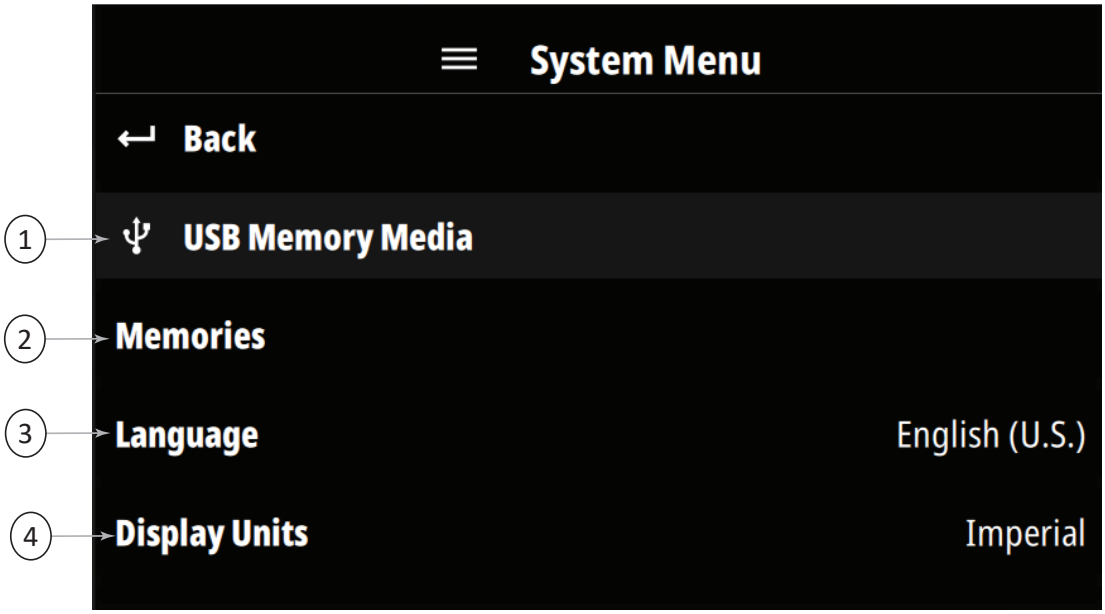
FIGURE B.11



1. Set all to Auto – Start/end settings are set to “auto” by default. These settings are programmed based on process and setpoint to provide ideal welding. The settings may be adjusted if desired.
2. Run-In – Allows adjusting the wire feed speed prior to the arc being established. A low run-in speed permits smooth arc starts. After the arc is speed will change from run-in to welding wire feed speed. The run-in option is available in GMAW and FCAW modes.
3. Pre-Flow Time - Adjusts the time that shielding gas flows before the welding output turns on.
4. Start Time – Controls the WFS and Volts for a specified time at the beginning of the weld. During the start time, the machine will ramp from the Start Procedure to the preset Welding Procedure.
5. Crater Time – Controls the WFS and voltage for a specified time at the end of the weld after the trigger is released. During the Crater time, the machine will ramp from the Weld Procedure to the Crater Procedure.
6. Post Flow Time - Adjusts the time that shielding gas flows after the welding output turns off.
7. Active Weld Settings

SYSTEM MENU

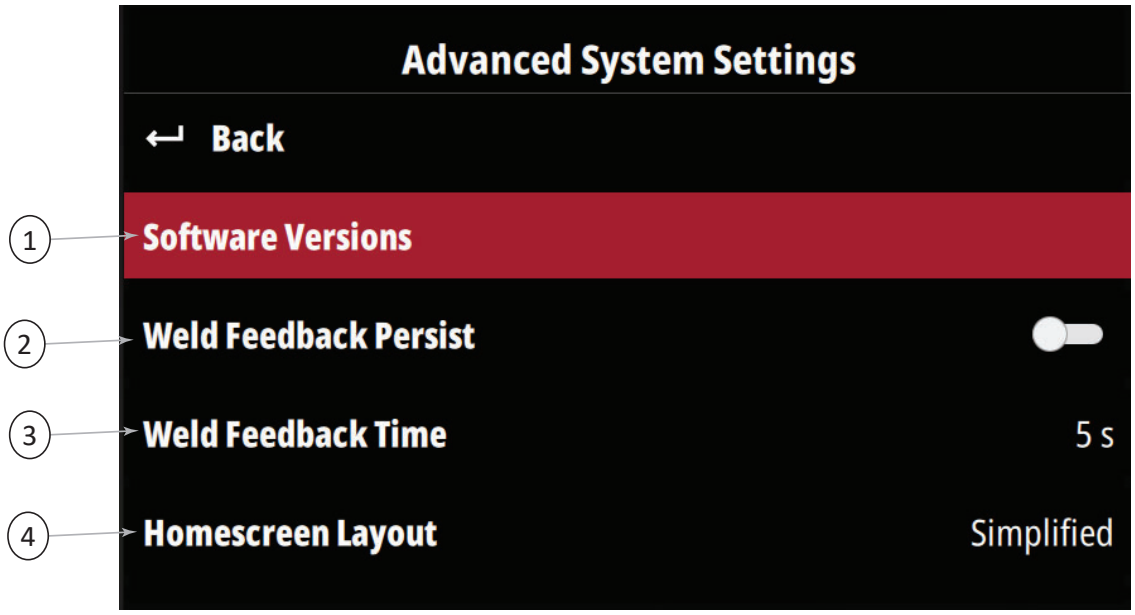
FIGURE B.12



1. USB Memory Media Connected.
2. Memories – View the saved memories for each process.
3. Language – Allows the user interface to be translated into the user's preferred language.
4. Display Units – Allows units to be displayed in metric or imperial.

ADVANCED SYSTEM SETTINGS

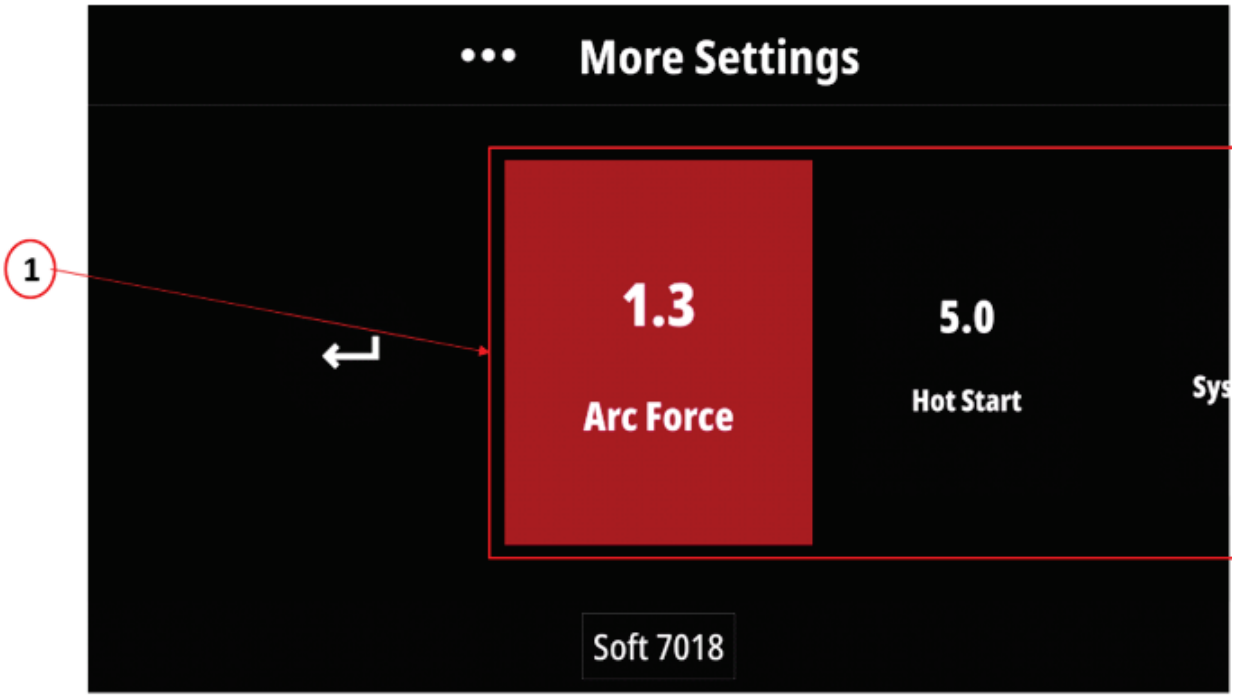
FIGURE B.13



1. Software Versions
2. Weld Feedback Persists
3. Weld Feedback Time
4. Home Screen Layout – Choose between Advanced and Simplified.

MORE SETTINGS MENU (ALL PROCESSES)

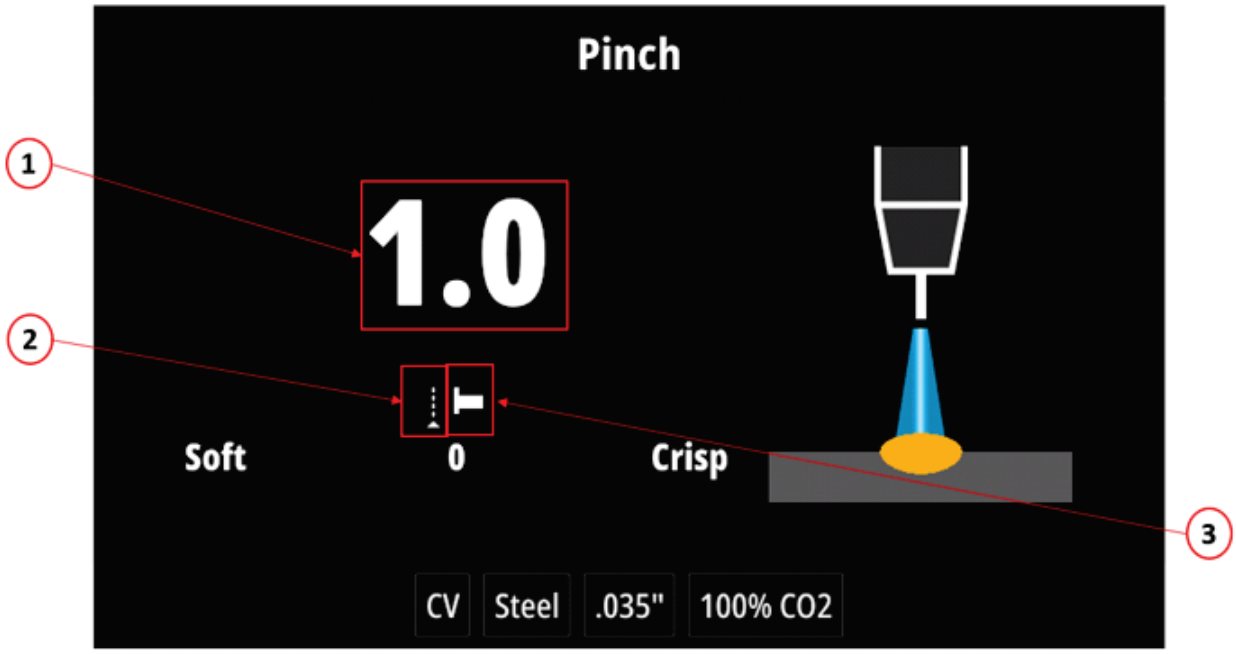
FIGURE B.15



1. Advanced process settings will appear here. Each weld process will have different settings. The most common advanced settings are: Pinch, Arc Force, Hot Start, Pre-Flow Time, Post-Flow Time, 2-Step/4-Step Trigger, and Ultimarc. Advanced settings will only be displayed when set to a non-zero value.

PREVIOUS SETTING INDICATOR

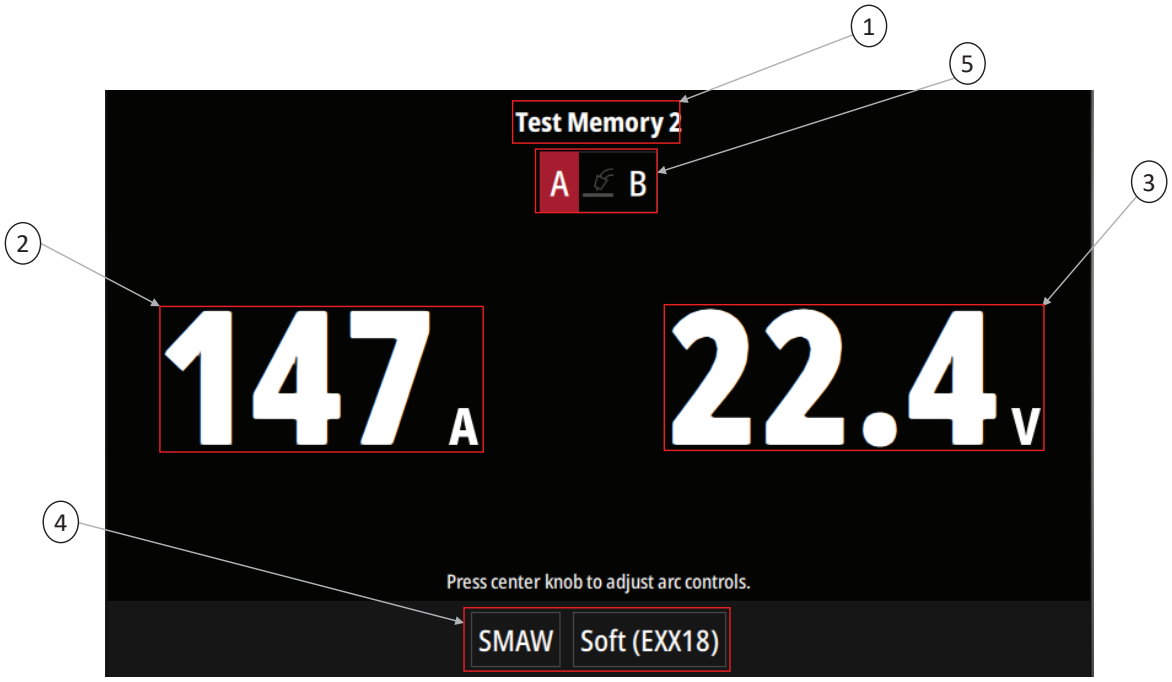
FIGURE B.16



1. Pinch Setting
2. Previous Setting Indicator – The dotted line will indicate where on the bar the most recent setting was.
3. Pinch Setting Indicator – Increasing the value will move the bar to the right, decreasing the value will move the bar to the left.

WELDING SCREEN

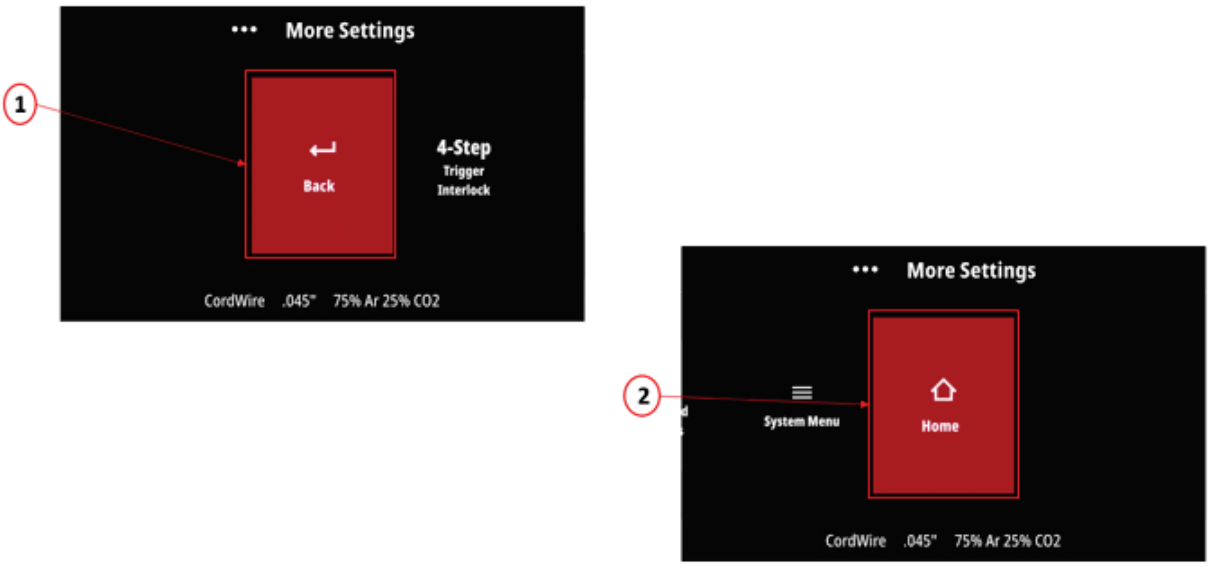
FIGURE B.17



1. Memory Name
2. Weld Feedback Current
3. Weld Feedback Voltage
4. Active Weld Settings
5. Dual Procedure Indicator - Displays the active welding procedure/schedule. Pressing the active process button switches between the procedure/schedule options.

BACK/HOME BUTTONS

FIGURE B.18



1. Back Button - Selecting the back button takes the system back one screen.
2. Home Button – Selecting the home button takes the system back to the home screen.

MEMORY OPERATION

FIGURE B.19

Memories can be saved for each welding process. These can be accessed by touching the applicable memory button labeled one through four.

To save a memory, hold the desired memory location down until the screen indicates the memory is saved.

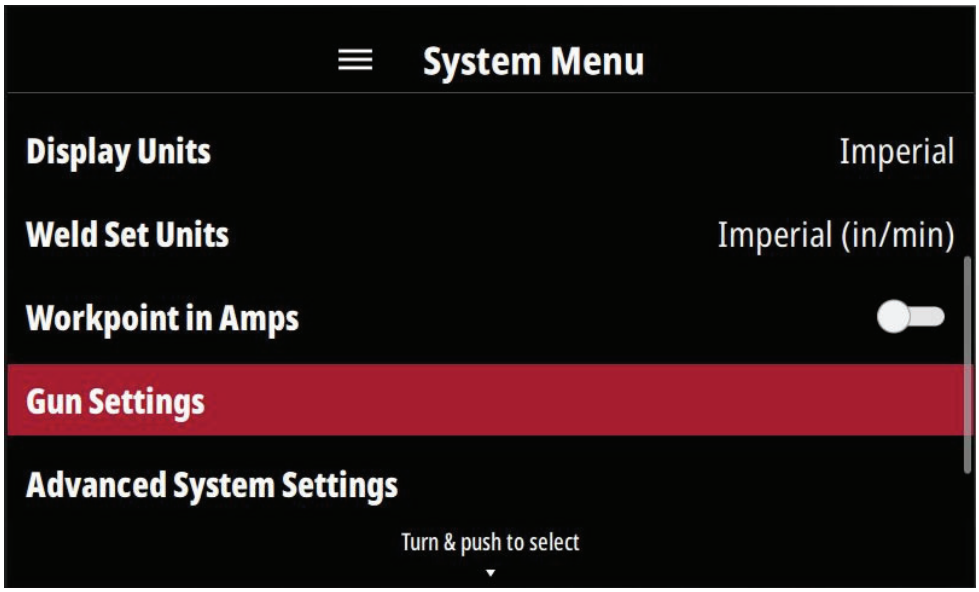
When one memory is selected the LED will be lit, if any settings are changed the LED will go out. If the memory button is pressed again, the settings will revert to the settings saved in the memory.

Four distinct memories can be saved for each process to the 4 memory buttons on the User Interface. 4 for SMAW, 4 for GTAW, 4 for GMAW, and 4 for FCAW. There are also 6 additional memory slots available for each process within the Memories Menu, allowing for a total of 40 possible memories.

All memories can be reviewed on the memory tile screens. These tiles can be accessed via the "Memories" option of the System Menu or by pressing any 2 memory buttons simultaneously.

GUN SETTINGS

FIGURE B.20

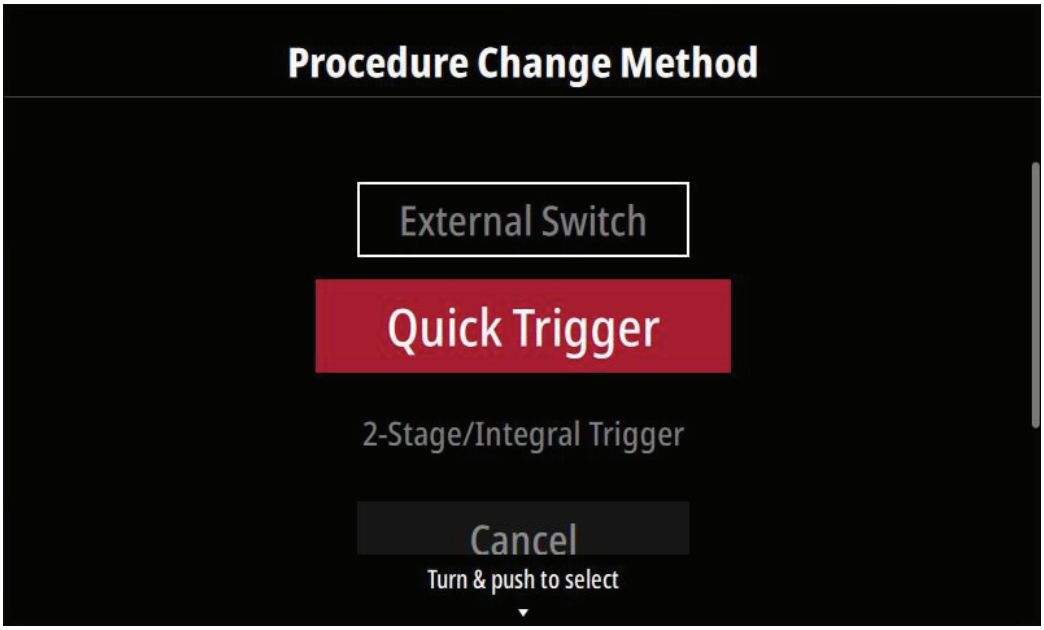


Gun settings is located in the System Menu. This is where Trigger Memory Recall, Procedure Change Method, and aluminum specific gun settings can be found."

Trigger Memory Recall allows a user to quickly recall any saved memory by pulling the trigger the amount of times that match the tile of where the memory is saved.

PROCEDURE CHANGE METHOD

FIGURE B.21



Procedure Change Method enables the user to change procedures while welding by switching between A, Gun, and B settings. There are four ways to utilize this setting:

1. External Switch selection - Change from A to B procedures with a remote.
2. Quick Trigger - When enabled, you can quickly pull and release the trigger to automatically switch from A to B procedures.
3. 2-Stage/Integral Trigger - Using a dual procedure gun, the user can switch between procedures directly from the gun.
4. From the UI - The user can double click any of the four process buttons to switch between procedures.

12-Pin GMAW/FCAW Gun allows the user to select which type of Magnum PRO aluminum gun they're using. When toggled on, the user will be prompted with a Gun Selection menu, Gun Knob Behavior, and Gun Calibration.

Gun Selection

The user has the option to tell the machine if they are using the Magnum Pro Al Standard Push-Pull gun, the Magnum Pro Al Pistol Push-Pull gun, or the Magnum Pro 250LX GT Spool Gun.

Gun Knob Behavior

Gun Knob Behavior is a feature that allows the user to decide where they want to control their WFS settings from.

- When disabled, the user will control the WFS directly from the UI.
- When enabled, the user will control the WFS directly from the gun knob.
- When on Schedule A Only, the gun knob will only control the WFS in Schedule A while Schedule B is set on the UI.

Gun Calibration

After selecting the push-pull or spool gun, the user will need to calibrate their gun with the machine. The push-pull and spool gun will need to be calibrated any time the gun is disconnected and reconnected, a new wire size and type is used, or if a new gun is being used.

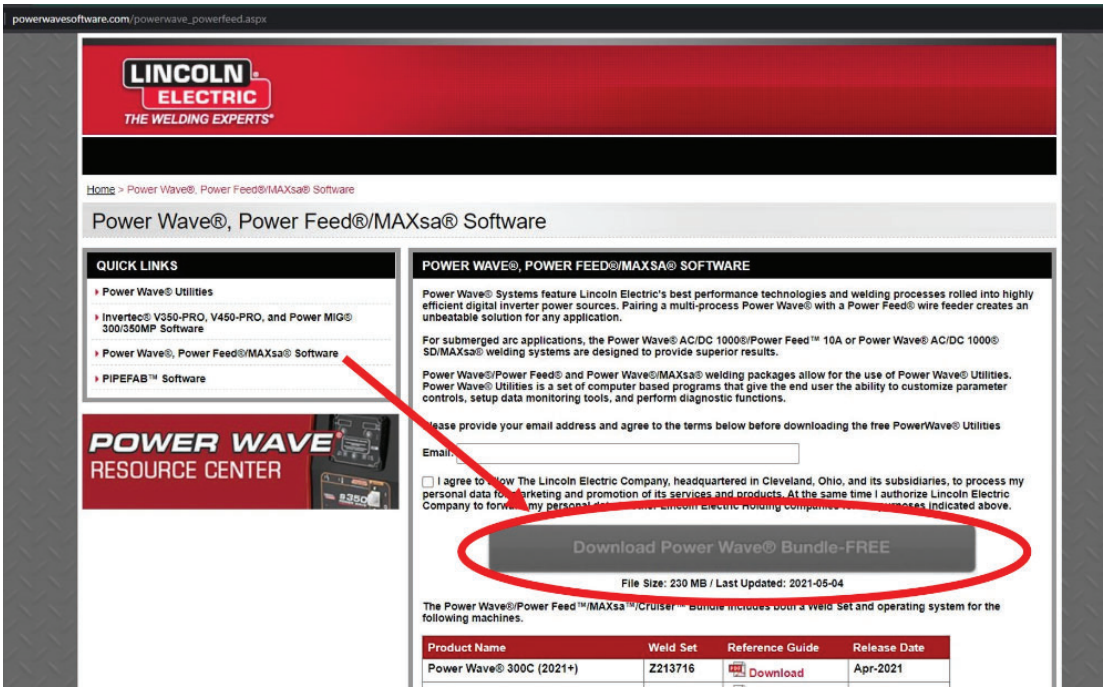
Before starting the calibration, be sure that the wire is fed through the gun entirely.

GUN CALIBRATION

FIGURE B.22

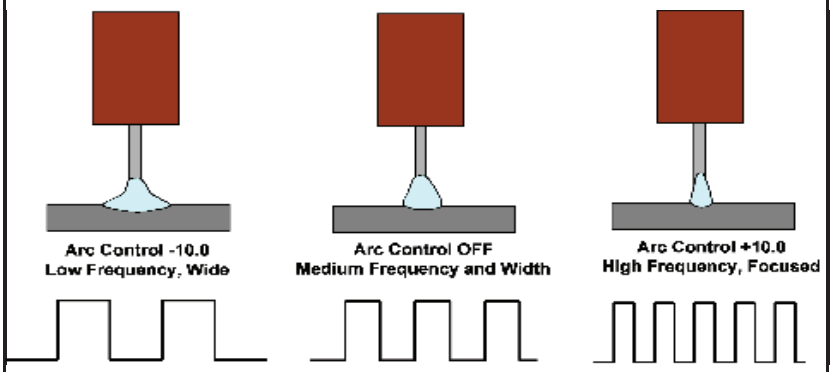
When Gun Calibration is selected, the user interface will ask the user if they would like to start the calibration. The user will select yes, and the UI will prompt to pull the trigger and wire will begin to cold feed. Once calibration is complete, the wire will stop feeding and the user interface will prompt the user that the calibration was complete and to release the trigger. NOTE: Be sure to hold the trigger during the entire calibration to avoid interrupting the calibration process.

USER INTERFACE PROGRAMMING



1. Download Power Wave software from www.powerwavesoftware.com
2. Double-click to run the downloaded software through SystemUpdate.
3. Connect to the Power Wave 300C using Ethernet. If required, select "I do not know the IP address of the welder", and click "Refresh List".
4. Once the list of machines shows, highlight 300C to be updated.
5. Click on "Connect"
6. SystemUpdate will then load a list of modules that are available for update. Once this populates, click "Start Update".
7. A screen will pop up, prompting the user to insert a blank USB drive into the computer. Insert the USB now and select Yes to load the user interface software onto the USB drive.
8. Once successfuly loaded onto the USB, the laptop will notify you to insert the USB into the USB slot above the user interface on the machine. DO NOT SELECT OK ON THE LAPTOP.
9. Using the center knob, select Confirm on the user interface. The interface will go through a series of progress screens.
10. Once it is successfully updated, the power source will reboot. When it comes back up, a Warning screen will show. Select Cancel and remove the USB drive from the UI. Go back to the laptop and select OK.
11. After selecting OK, the laptop will run the rest of the updates on the power source via your Ethernet connection. The update status report will show when the software update in the computer has been completed.

WAVE CONTROL

PROCESS	WAVE CONTROL NAME	EFFECT / RANGE	DESCRIPTION
SMAW	ARC FORCE	SOFT (-10.0) TO CRISP (10.0)	ARC FORCE ADJUSTS THE SHORT CIRCUIT CURRENT FOR A SOFT ARC, OR FOR A FORCEFUL, DRIVING ARC. IT HELPS TO PREVENT STICKING AND SHORTING OF ORGANIC COATED ELECTRODES, PARTICULARITY GLOBULAR TRANSFER TYPES SUCH AS STAINLESS AND LOW HYDROGEN. ARC FORCE IS ESPECIALLY EFFECTIVE FOR ROOT PASS ON PIPE WITH STAINLESS ELECTRODE AND HELPS TO MINIMIZE SPATTER FOR CERTAIN ELECTRODES AND PROCEDURE AS WITH LOW HYDROGEN, ETC.
GMAW AND FCAW	PINCH	SOFT (-10.0) TO CRISP (10.0)	PINCH CONTROLS THE ARC CHARACTERISTICS WHEN SHORT-ARC WELDING.
GMAW	ULTIMARC	SOFT (-10.0) TO STIFF (10.0)	ULTIMARC REGULATES THE FOCUS OR SHAPE OF THE ARC. ULTIMARC VALUES GREATER THAN 0.0 INCREASE THE PULSE FREQUENCY WHILE DECREASING THE BACKGROUND CURRENT, RESULTING IN A TIGHT, STIFF ARC BEST FOR HIGH SPEED SHEET METAL WELDING. ULTIMARC VALUES LESS THAN 0.0 DECREASE THE PULSE FREQUENCY WHILE INCREASING THE BACKGROUND CURRENT, FOR A SOFT ARC GOOD FOR OUT-OF-POSITION WELDING. 
GTAW	1. AC Frequency 2. Pulse Frequency 3. Background 4. AC Balance	…	1. This function controls the frequency of the AC wave in cycles per second. A lower frequency results in a wider bead. A higher.frequency results in a more focused bead. 2. Set for bead shape and travel speed: Higher for thinner plate and faster travel. Lower for thicker plate and slower travel. 3. Sets the Background Current as a percentage of Peak Current. 4. AC balance controls the amount of time, as a percentage, that the polarity is electrode negative. A lower AC Balance results in an arc with increased cleaning action. A higher AC Balance results in an arc with higher penetration.

2-STEP - 4-STEP TRIGGER OPERATION

EXAMPLE 1 - 2 STEP TRIGGER:
The simplest trigger operation occurs with a 2 Step trigger and the Start and Crater functions all set to OFF. (See Figure B.19)

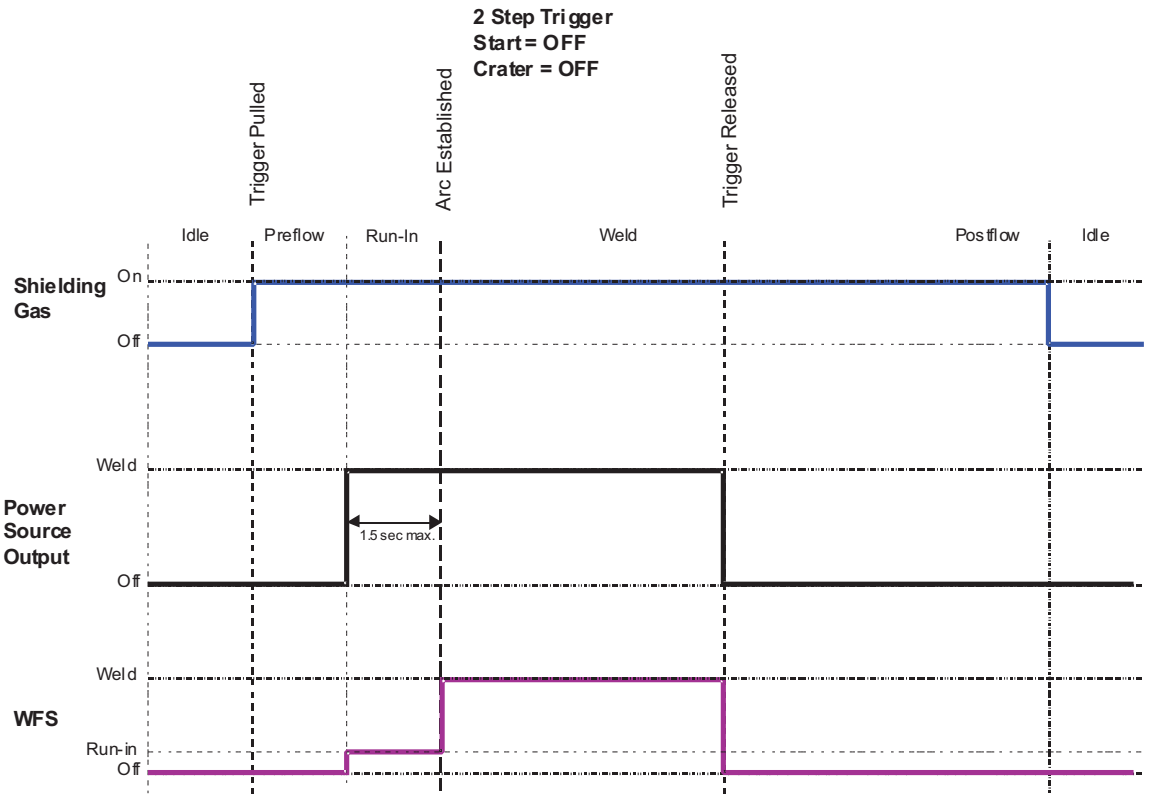
For this sequence,
PREFLOW:
Shielding gas begins to flow immediately when the gun trigger is pulled.

RUN-IN:
After preflow time expires, the power source regulates to the welding output and wire is advanced towards the work piece at the Run-In WFS. If an arc is not established within 1.5 seconds, the wire feed speed will jump to the welding wire feed speed

WELD:
The power source output and the wire feed speed continue at the weld settings for as long as the trigger is pulled.

POSTFLOW: As soon as the trigger is released, the power source output and the wire feed speed are turned OFF. Shielding gas continues until the post flow timer expires.

FIGURE B.20



EXAMPLE 2 - 2 STEP TRIGGER: Improved Arc Start and Arc End. Tailoring the arc start and arc end is a common method for reducing spatter and improving weld quality. This can be accomplished with the Start function set to a desired values and Crater set to OFF. (See Figure B.20)

For this sequence,

PREFLOW:
Shielding gas begins to flow immediately when the gun trigger is pulled.

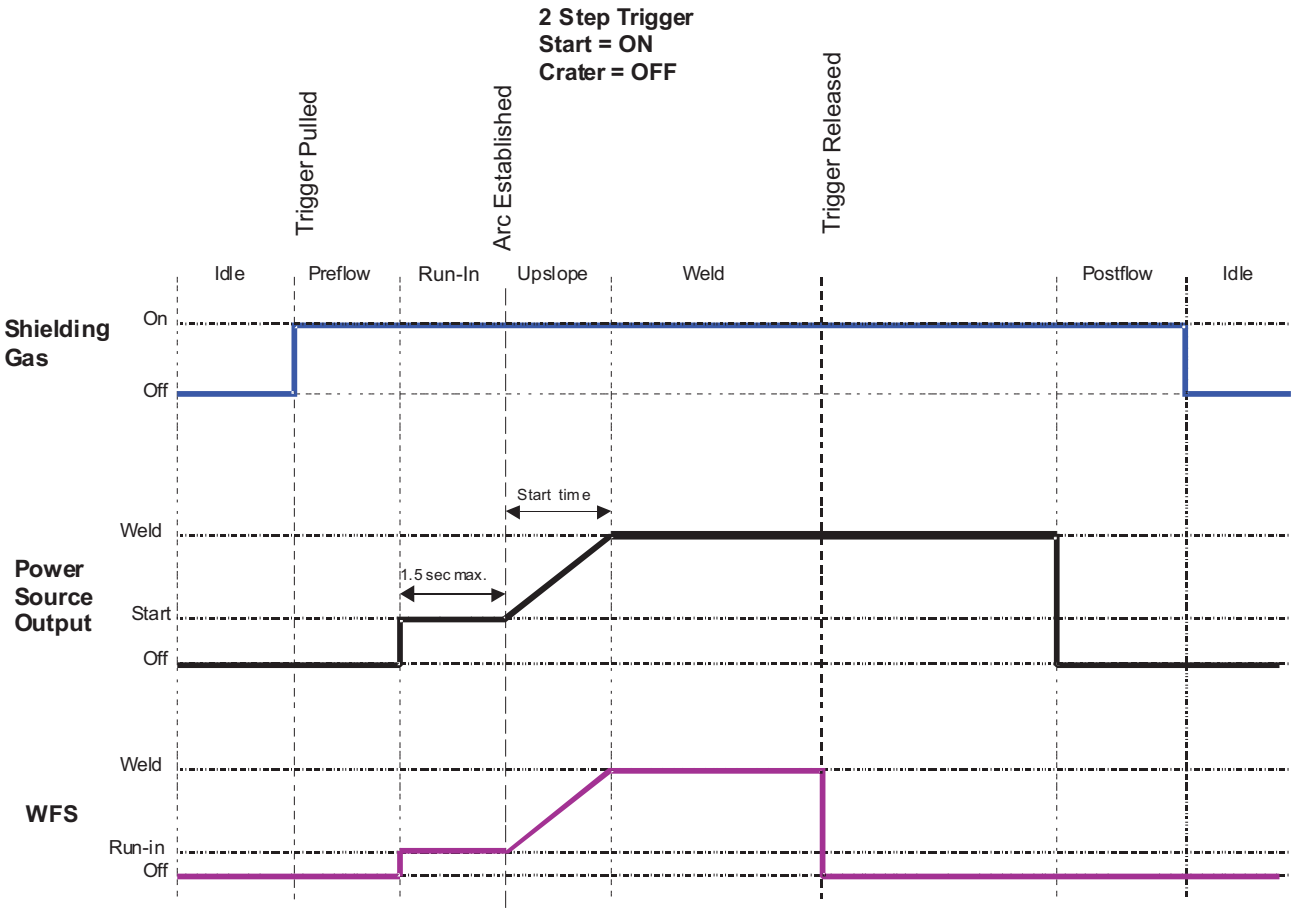
RUN-IN:
After preflow time expires, the power source regulates to the start output and wire is advanced towards the work piece at the Run-In WFS. If an arc is not established within 1.5 seconds, the power source output and wire feed speed skips to the weld settings.

UPSLOPE:
Once the wire touches the work and an arc is established, both the machine output and the wire feed speed ramp to the weld settings throughout the start time. The time period of ramping from the start settings to the weld settings is called UPSLOPE.

WELD:
After upslope, the power source output and the wire feed speed continue at the weld settings.

POSTFLOW:
Next, the machine output is turned OFF and shielding gas continues until the post flow timer expires.

FIGURE B.21



EXAMPLE 3 - 2 STEP TRIGGER: Customized Arc Start, Crater and Arc End. Sometimes it is advantageous to set specific arc start, crater and arc ending parameters for the ideal weld. Many times when welding aluminum crater control is necessary to make a good weld. This is done by setting Start and Crater function to desired values. (See Figure B.21)

For this sequence,

PREFLOW:
Shielding gas begins to flow immediately when the gun trigger is pulled.

RUN-IN:
After preflow time expires, the power source regulates to the start output and wire is advanced towards the work piece at the Run-In WFS. If an arc is not established within 1.5 seconds, the power source output and wire feed speed skips to the weld settings.

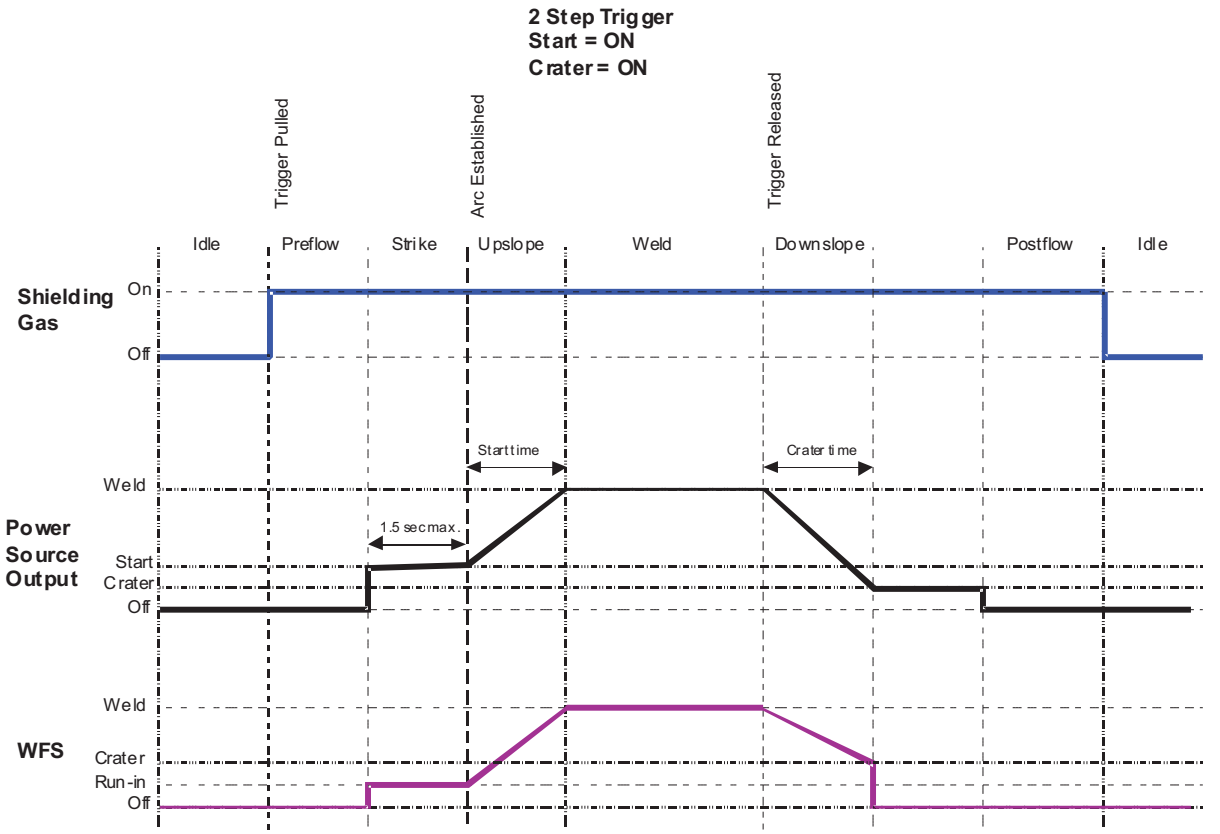
START & UPSLOPE:
As soon as the trigger is pulled, this starts preflow. The Strike arc established, Start time, and Upslope parameters are used at the beginning of the weld sequence to establish a stable arc and provide a smooth transition to the weld settings.

WELD:
After upslope, the power source output and the wire feed speed continue at the weld settings.

CRATER & DOWNSLOPE:
As soon as the trigger is released, the wire feed speed and power source output ramp to the crater settings throughout the crater time. The time period of ramping from the weld settings to the crater settings is called DOWNSLOPE.

POSTFLOW:
Next, the machine output is turned OFF and shielding gas continues until the post flow timer expires.

FIGURE B.22



EXAMPLE 4 – 4 STEP TRIGGER: Trigger Interlock
The 4 step trigger can be configured as a trigger interlock. Trigger interlock adds to the welder's comfort when making long welds by allowing the trigger to be released after an initial trigger pull. Welding stops when the trigger is pulled a second time and then released, or if the arc is interrupted. (See Figure B.23)

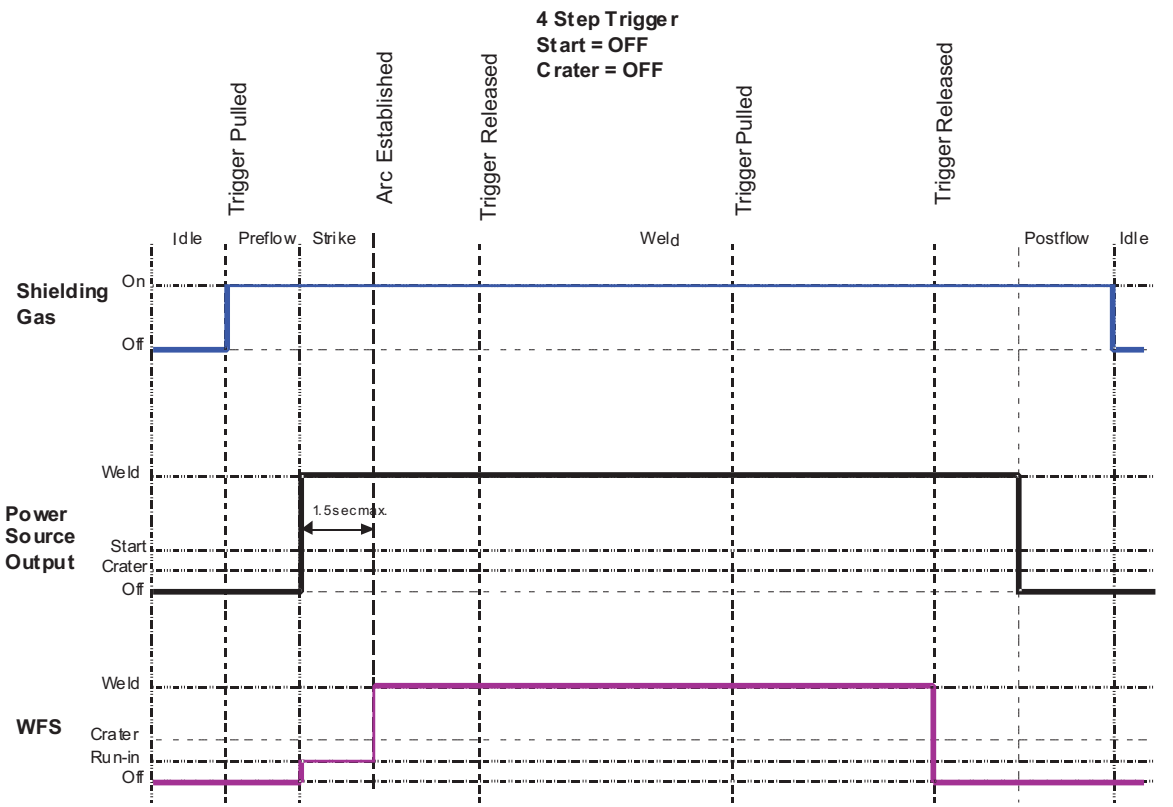
For this sequence,
PREFLOW:
Shielding gas begins to flow immediately when the gun trigger is pulled.

RUN-IN:
After preflow time expires, the power source regulates to the welding output and wire is advanced towards the work piece at the Run-In WFS. If an arc is not established within 1.5 seconds, the wire feed speed will jump to the welding wire feed speed.

WELD:
The power source output and the wire feed speed continue at the weld settings. Welding continues when the trigger is pulled a second time.

POSTFLOW:
As soon as the trigger is released for the second time, the power source output and the wire feed speed are turned OFF. Shielding gas flows until the post flow timer expires.

FIGURE B.23



EXAMPLE 5 - 4 STEP TRIGGER: Manual control of Start and Crater times. The 4 step trigger sequence gives the most flexibility when the Start and Crater functions are active. This is a popular choice when welding aluminum because extra heat may be needed during Start and less heat desired during crater. With 4 step trigger, the welder chooses the amount of time to weld at the Start, Weld and Crater settings by using the gun trigger. (See Figure B.24)

In this sequence,

PREFLOW:
Shielding gas begins to flow immediately when the gun trigger is pulled.

RUN-IN:
After preflow time expires, the power source regulates to the start output and wire is advanced towards the work piece at the run-in WFS. If an arc is not established within 1.5 seconds, the power source output and wire feed speed skips to the weld settings.

START:
The power source welds at the start WFS and voltage until the trigger is released.

UPSLOPE:
During upslope, the power source output and the wire feed speed ramp to the weld settings throughout the start time. The time period of ramping from the start settings to the weld settings is called UPSLOPE.

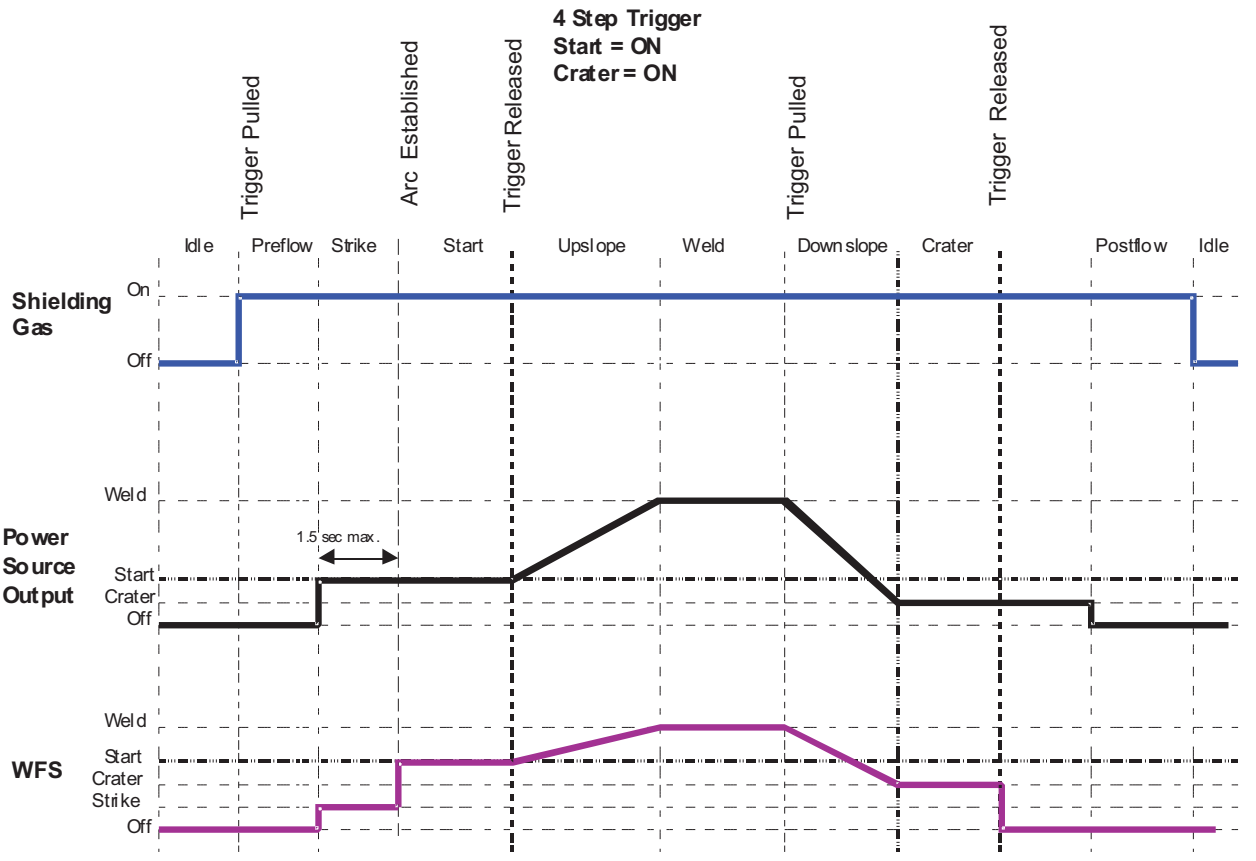
WELD:
After upslope, the power source output and the wire feed speed continue at the weld settings.

DOWNSLOPE:
As soon as the trigger is pulled, the wire feed speed and power source output ramp to the crater settings throughout the crater time. The time period of ramping from the weld settings to the crater settings is called DOWNSLOPE.

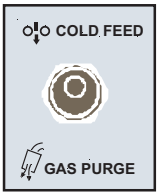
CRATER:
During CRATER, the power source continues to supply output at the crater WFS and voltage.

POSTFLOW:
Next, the machine output is turned OFF and shielding gas continues until the post flow timer expires.

FIGURE B.24



COLD FEED/GAS PURGE SWITCH



Cold Feed and Gas Purge are combined into a single spring centered toggle switch.

To activate Cold Feeding, hold the switch in the **FORWARD** position. The wire drive will feed electrode but neither the power source nor the gas solenoid will be energized. Adjust the speed of cold feeding by rotating the WFS knob. Cold feeding, or "cold inching" the electrode is useful for threading the electrode through the gun.

Hold with toggle switch in the **BACK** position to activate Gas Purge and let the shielding gas flow. The gas solenoid valve will energize but neither the power source output nor the drive motor will be turned on. The Gas Purge switch is useful for setting the proper flow rate of shielding gas. Flow meters should always be adjusted while the shielding gas is flowing.

OPTIONS / ACCESSORIES

POWER WAVE® 300C DUAL GAS BOTTLE UPGRADE KIT (K4866-1) -

Allows for the use of multiple gas bottles or a combination of a gas bottle and water cooler on the rear of a Power Wave® 300C.

POWER WAVE® 300C WATER COOLER ADAPTER KIT (K4898-1) -

Allows Cool Arc® 40 Water Cooler to be installed in place of a gas bottle on the 300C single or dual bottle rack. Kit Includes: (1) 300C Cool Arc 40 Mounting Assembly and Hardware Kit, (1) Cool Arc 40 CGA to QD Water Hose Extension Kit, and (2) Quick Disconnect Adapters (KP4642-1)

COOL ARC® 40 WATER COOLER (K1813-1) -

Water cooler with quick disconnects for MIG guns and TIG torches.

POWER WAVE® 300C 115V AUXILIARY KIT (K2829-1) -

Adds a duplex 115v outlet to the rear of the machine. Includes harness and PC board.

SCREEN PROTECTOR* ORDER KP4735-1

MAGNUM® PRO WELDING GUNS -

See publications E12.05 and E12.08.

GUN CONNECTOR KIT - POWER WAVE 300C® / Power MIG -

Configures Lincoln Electric Magnum PRO guns to connect to Power Wave® 300C and Power MIG power sources. For use with KP42 & KP44 series liners. Order K466-6.

MAGNUM® PRO DUAL PROCEDURE ADAPTER*

Required to use Magnum® PRO Dual Procedure or Dual Schedule guns with the Power Wave® 300C. Order K3159-1.

FAST-MATE™ ADAPTER*

Allows guns with a Fast-Mate™ style back end to connect into Power Wave® 300C and Power MIG® power sources. Order K489-8.

ARC START SWITCH -

Attaches to TIG torch for convenient finger control. Comes equipped with 12-pin connector. Order K814-2.

REMOTE OUTPUT CONTROL WITH 12-PIN UNIVERSAL CONNECTOR*

Consists of a control box with choice of two cable lengths. Permits remote adjustment of output. Order K857-2 (25 ft 7.6 m) Order K857-3 (100 ft 30.5m)

HAND AMPTROL ROTARY TRACK STYLE, 12-PIN AMPHENOL -

(25 ft) Remote current control for GTAW welding. Order K963-4.

FOOT AMPTROL™ -

Provides 25 ft. (7.6 m) of remote output control for GTAW welding. (12-pin plug connection). Order K870-2.

PTA-17F -

Air Cooled TIG Ready-PAK® Flexible head and Ultra-Flex™ cables provide ultimate comfort and maneuverability. Pre-configured package with K1622-1 Twist-Mate™ adapter, cable cover. Includes: #7 nozzle, 1/16 in. (1.6 mm) and 3/32 in. (2.4 mm) collets, collet bodies and E3® Tungsten Order: K1782-14 (12.5 ft 3.8 m) Order K1782-18 (25 ft, 7.6 m) Additional TIG torch options in E12.150

SPINDLE ADAPTER FOR SMALL SPOOLS*

Permits 8 in. (200 mm) O.D. spools to be mounted on 2 in. (51 mm) O.D. spindles. Order K468.

SPINDLE ADAPTER FOR 14LB COILS*

Permits 14 lb. (6 kg) Innershield® coils to be mounted on 2 in (51mm) O.D. spindles. Order K435.

MAGNUM PRO AL FIXED CONDUIT PUSH-PULL GUN

The Magnum PRO AL Fixed Conduit Push-Pull Guns feature a new rigid liner which provides a smooth, premium aluminum welding solution. The enhanced feeding capabilities will reduce downtime and increase arc on time. Order K4797-2 (Air Cooled) or K4798-2 (Water Cooled)

MAGNUM® PRO 250LX GT SPOOL GUN

With longer-lasting Magnum PRO Expendables and direct connect functionality, the Magnum PRO 250LX GT spool gun results in less downtime and hassle-free setup. Requires 7-pin to 12-pin adapter (K2910-1) Order K3569-2 & K2910-1

SAFETY PRECAUTIONS

⚠ WARNING

ELECTRIC SHOCK can kill.

- **Do not operate with covers removed.**
- **Turn off power source before installing or servicing.**
- **Do not touch electrically hot parts.**

- **Turn the input power to the welding power source off at the fuse box before working in the terminal strip.**
- **Only qualified personnel should install, use or service this equipment.**

ROUTINE MAINTENANCE

Routine maintenance consists of periodically blowing out the machine, using a low-pressure air stream, to remove accumulated dust and dirt from the intake and outlet louvers, and the cooling channels in the machine.

PERIODIC MAINTENANCE

Calibration of the Power Wave® 300C is critical to its operation. Generally speaking the calibration will not need adjustment. However, neglected or improperly calibrated machines may not yield satisfactory weld performance. To ensure optimal performance, the calibration of output Voltage and Current should be checked yearly.

CALIBRATION SPECIFICATION

Output Voltage and Current are calibrated at the factory. Generally the machine calibration will not need adjustment. However, if the weld performance changes, or the yearly calibration check reveals a problem, use the calibration section of the **Diagnostics Utility** to make the appropriate adjustments.

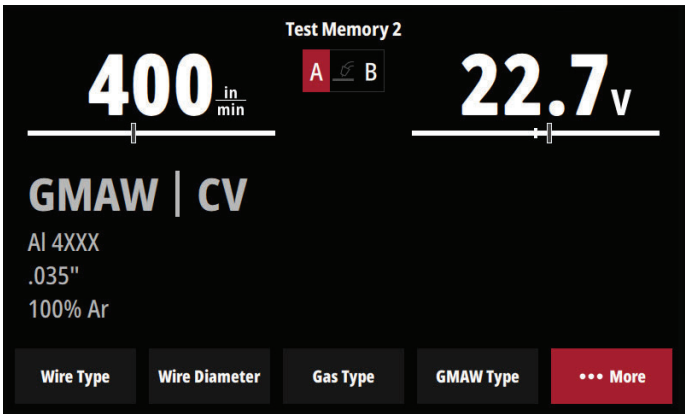
The calibration procedure itself requires the use of a grid, and certified actual meters for voltage and current. The accuracy of the calibration will be directly affected by the accuracy of the measuring equipment you use. The **Diagnostics Utility** includes detailed instructions, and is available on the **Service Navigator CD** or at **www.powerwavesoftware.com**.

SYSTEM SNAPSHOT

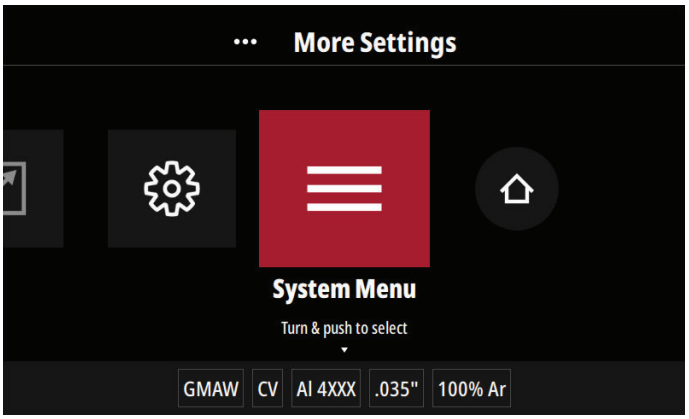
If experiencing issues with welding performance or system performance, a System Snapshot of the machine can be sent to PowerWaveSupport@LincolnElectric.com for evaluation.

How to take a System Snapshot:

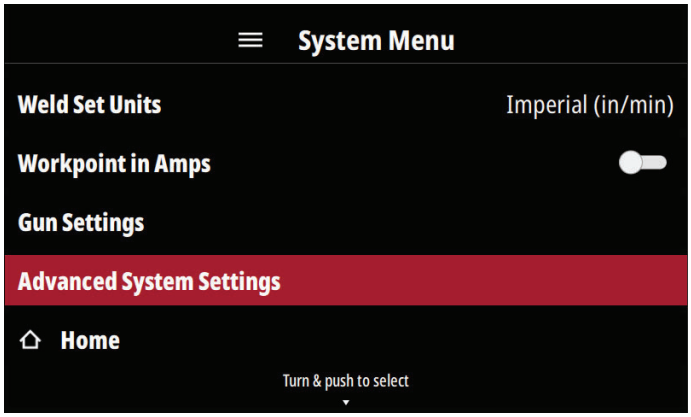
1. Insert a blank USB drive into the USB port above the user interface.
2. Once the blank USB is inserted, navigate to the ... More menu



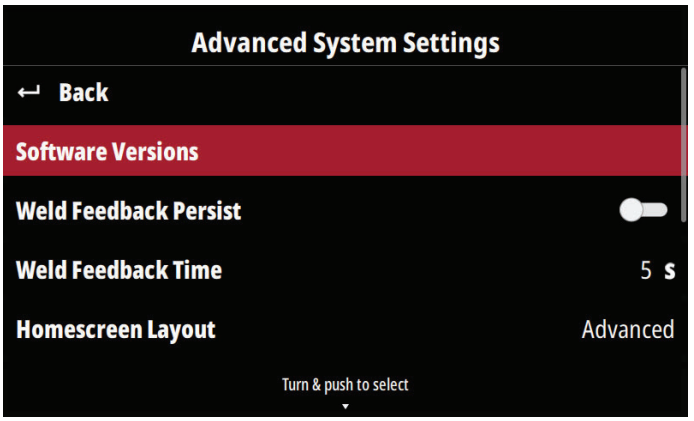
3. Scroll to the right to System Menu and select.



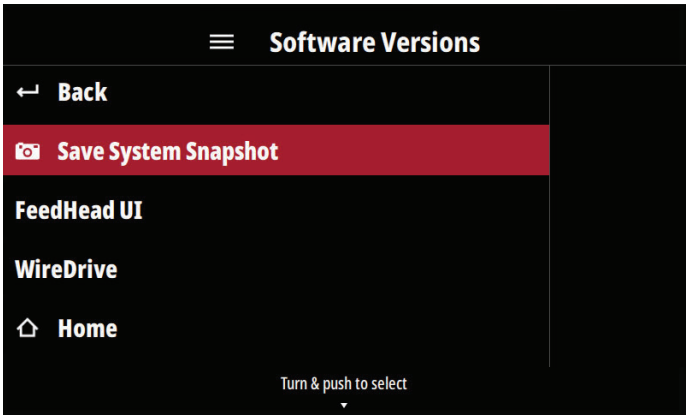
4. Once in the System Menu, scroll down to Advanced System Settings.



5. Once selected, Software Versions will be the first option. Select Software Versions.



6. Next you will save your snapshot by selecting Save System Snapshot. The screen will then show a progress bar of the snapshot status.

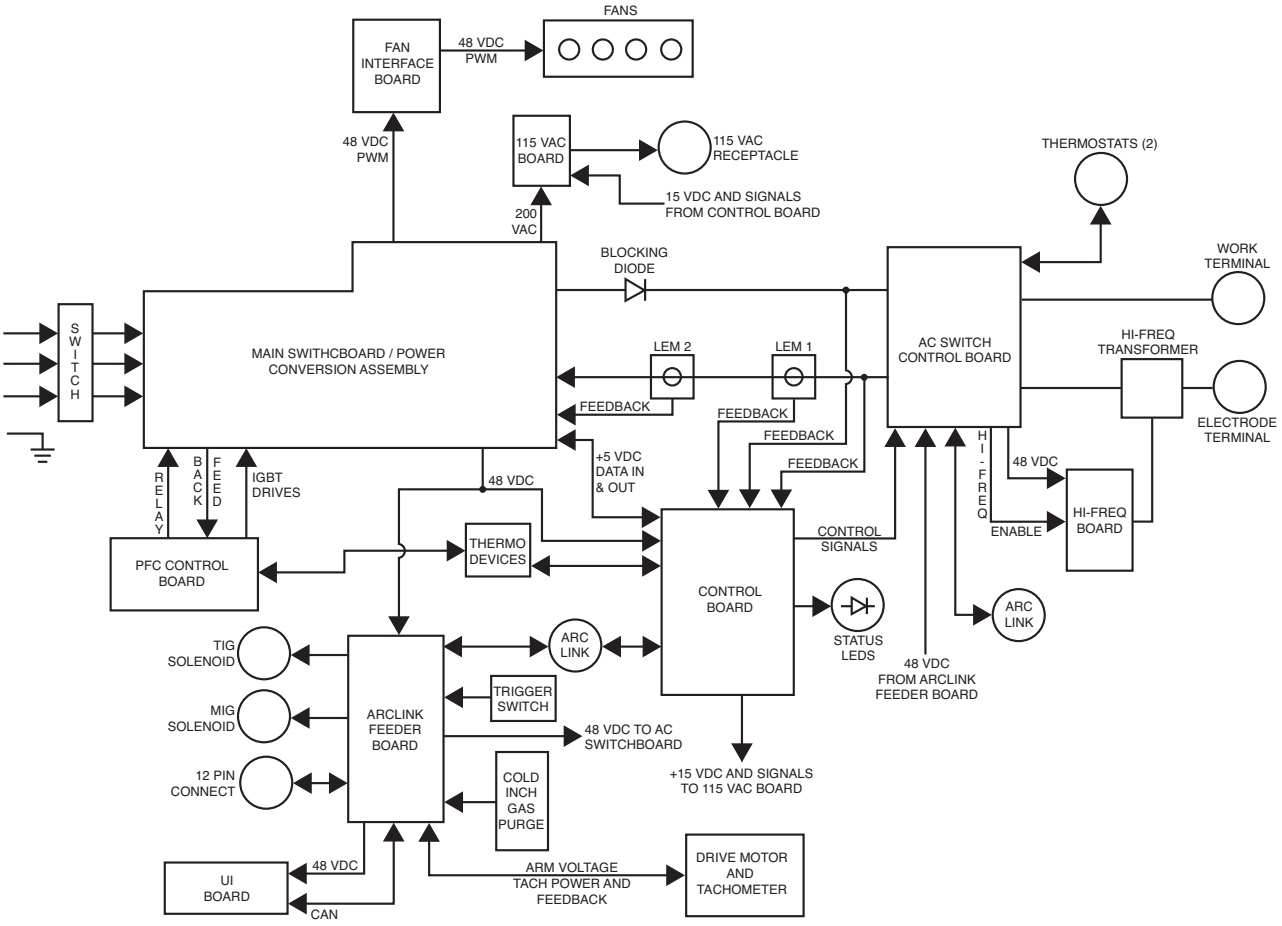


7. Once the snapshot is saved to the USB drive, remove the drive from the user interface and insert it into a computer.
8. Email the snapshot file to PowerWaveSupport@LincolnElectric.com for evaluation and service support.

TABLE OF CONTENTS

Theory Of Operation

Figure E.1 – Block diagram



Product Description

The Power Wave 300C is a high-performance multi-process power supply and a wirefeeder all in one package. It has GMAW, FCAW, SMAW, DC GTAW, and pulse capabilities. Additionally, the advanced model has STT, AC Welding and High Frequency GTAW capabilities.

The software-based weld tables of the Power Wave 300C limit the process capability within the output range and the safe limits of the machine. In general, the processes will be limited to .035 - .045 solid steel and stainless wire, .045 – 1/16 cored wire, as well as .035, 3/64 and 1/16 aluminum wire.

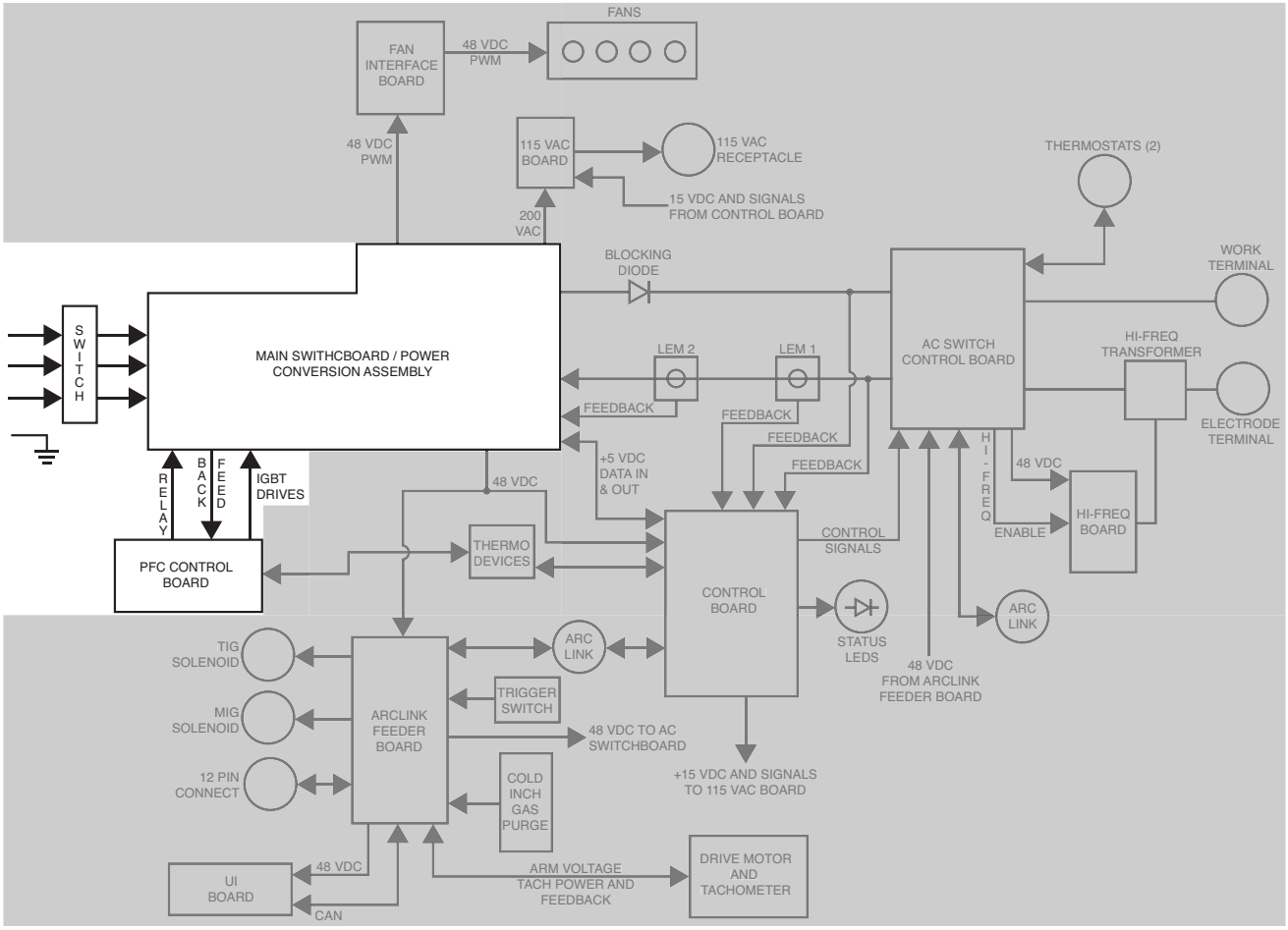
The Power Wave 300C is a three-stage inverter with Buck/Boost technology. The output of the Buck/Boost circuitry is applied to a planar transformer primary. The secondary voltage of the planar transformer is applied to a six-phase chopper. This technology provides for greater efficiencies, lighter weight, faster response times to the welding arc, and waveform control.

The main switchboard / power conversion assembly houses much of the input and output components and circuitry including the following:

- Input Rectifier
- Soft Start Circuitry

- DC Link Capacitor
- Buck/Boost Circuitry
- Planar Transformer
- Output Rectifiers
- Output Capacitors
- Chopper Control Board

Figure E.2 – Power-up sequence and input section



POWER-UP SEQUENCE AND INPUT SECTION

MAIN INPUT SWITCH, INPUT RECTIFIER, SOFT START/INPUT RELAY, DC LINK CAPACITOR, BUCK/BOOST AND POWER FACTOR CORRECTION CONTROL BOARD

The Power Wave 300C can be connected to a variety of both three-phase or single-phase input voltages. The Power Wave 300C automatically adjusts to operate with different AC input voltages. No reconnect switch settings are required. The initial input power is applied through a line switch. This AC input voltage is applied to an input rectifier where it is rectified to a DC voltage. The DC voltage is then applied to a soft-start circuit consisting of a 100 ohm resistor and a DC relay. The rectified input power is also connected, through a blocking diode, to the power factor correction board.

Initially the DC relay is not activated, and the incoming DC voltage is applied to the DC link capacitor via two parallel 100 ohm thermistors. These thermistors function as current limiting devices allowing the DC link capacitor to charge slowly. The PFC board uses the incoming DC voltage to create separate 15 VDC supplies. These auxiliary voltages are used to power the circuitry for the control circuits as well as the +15 volts for the buck/boost IGBTs and the soft start relay.

Under normal operating conditions the PFC board activates the soft start relay 50ms after input power is applied to the machine. The two 100 ohm thermistors will be “shorted out” by the relay’s contacts and the full input potential will be applied to the DC link capacitor. The DC link capacitor also functions as a voltage clamp for the buck-boost circuit.

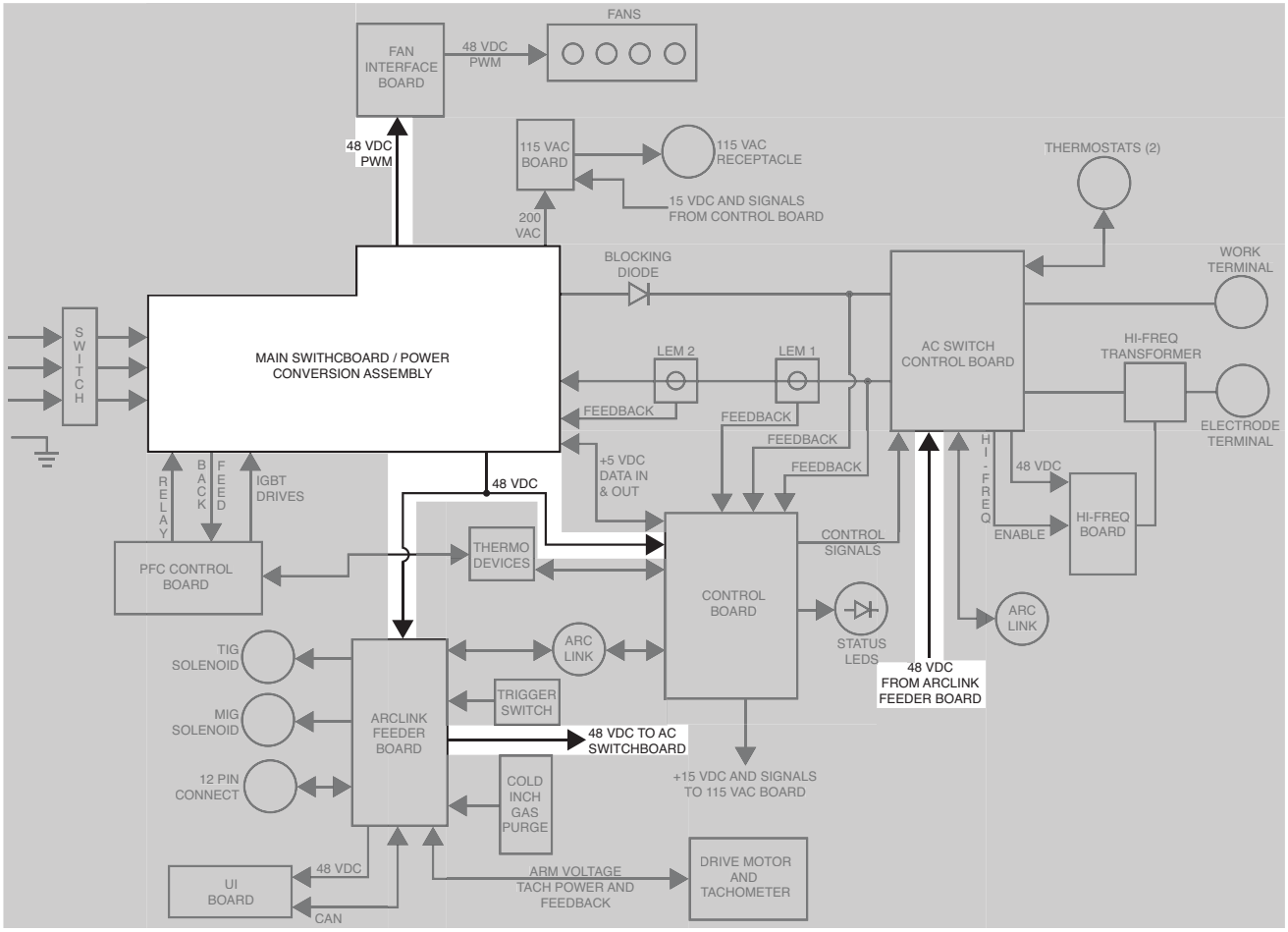
The buck-boost circuit, located on the main switchboard / power conversion assembly, consists of a buck converter followed by a boost converter. The boost switch is active when the input voltage is at 230 VAC input or less. Under this condition the Buck switch is held on the entire time. The buck switch is active when the input voltage is at 325 VAC or more. Under this condition the boost switch is not active for most of the time. The buck/boost circuit operates at 25kHz. The buck-boost circuit's output is a 400 volt regulated bus.

The output of the buck/boost circuit is filtered and applied to an IGBT controlled full wave bridge inverter that is located on the switchboard. The resultant 400 volt output is coupled to the primary winding of a planar transformer that is also located on the switchboard. The full wave bridge operates at 50kHz switching frequency with a 99% on time. See ***IGBT Operation and Pulse Width (PWM) Operation*** in this section.

The PFC board controls the "firing" of the buck/boost circuit and the IGBT full wave bridge circuit. This permits the PFC board to monitor and control the wave shape of the applied input current to provide an optimal power factor correction for the Power Wave 300C.

NOTE: Unshaded areas of Block Logic Diagram are the subject of discussion.

Figure E.3 – First stage output section



FIRST STAGE OUTPUT SECION

PLANAR TRANSFORMER, OUTPUT RECTIFICATION AND FILTERING

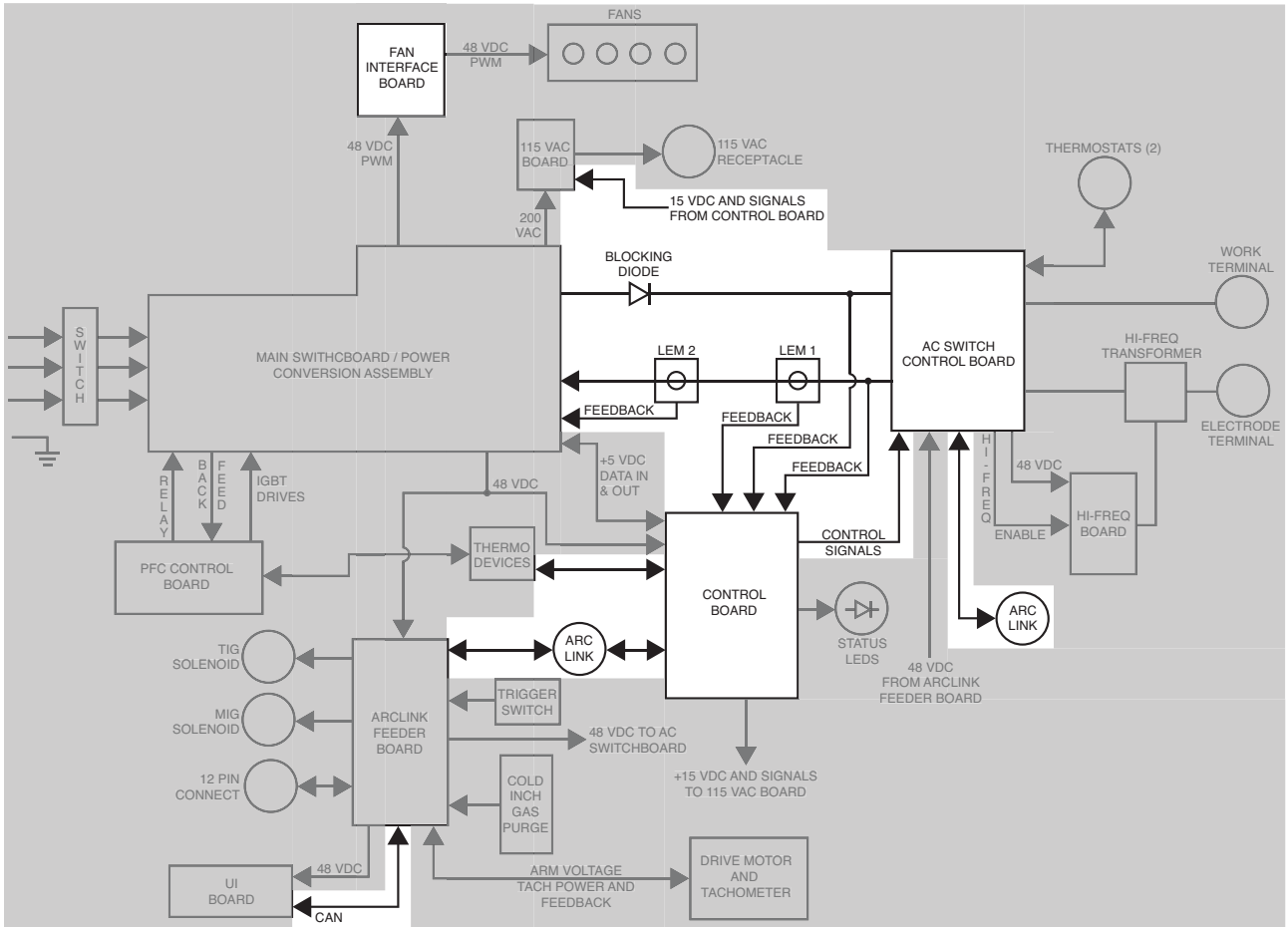
The planar transformer has three secondary windings. The 100 volt weld winding is center tapped and rectified. The 48 volt auxiliary winding is also center tapped and rectified. The third 200 volt winding is there to power the 115 VAC PC Board. The term “Planar” refers to the design and construction of the transformer. The windings are created on printed circuit boards and stacked up to create a transformer. The primary and secondary connections are oriented at opposite ends of the transformer. This type of assembly provides for tighter magnetic coupling between the primary and secondary windings resulting in lower leakage inductance, higher efficiency, cooler operation, and reduced size.

The 100 volt output of the weld winding is rectified and filtered by capacitors and an inductor. This filtered DC voltage is applied to the multi-phase output chopper circuit.

The 48 volt output from the planar transformer’s auxiliary winding is also rectified and filtered and is used to provide power for the fan interface board, the ArcLink feeder board, the control board, the high frequency board, and the AC Switchboard.

NOTE: Unshaded areas of Block Logic Diagram are the subject of discussion.

Figure E.4 – Second stage output section



SECOND STAGE OUTPUT SECTION

MULTI-PHASE CHOPPER, CHOPPER CONTROL BOARD, CURRENT TRANSDUCERS (LEMS), FAN INTERFACE BOARD, OPTIONAL 115V AC BOARD, USER INTERFACE MODULE AND CONTROL BOARD

The multi-phase chopper is used to control the welding voltage and current output. It receives the 100 volt DC from the planar transformer and produces a regulated output for welding purposes. It contains six chopper phases in parallel that turn on 60 degrees out of phase. Two or complimentary, phases each conduct 180 degrees out of phase through the same output choke assembly.

The chopper board, located on the switchboard, receives welding output commands from the control board. The chopper board then determines the on-time of the six chopper IGBTs to meet the requirements set forth from the control board. LEM 2 provides current feedback information to control the multi-phase chopper.

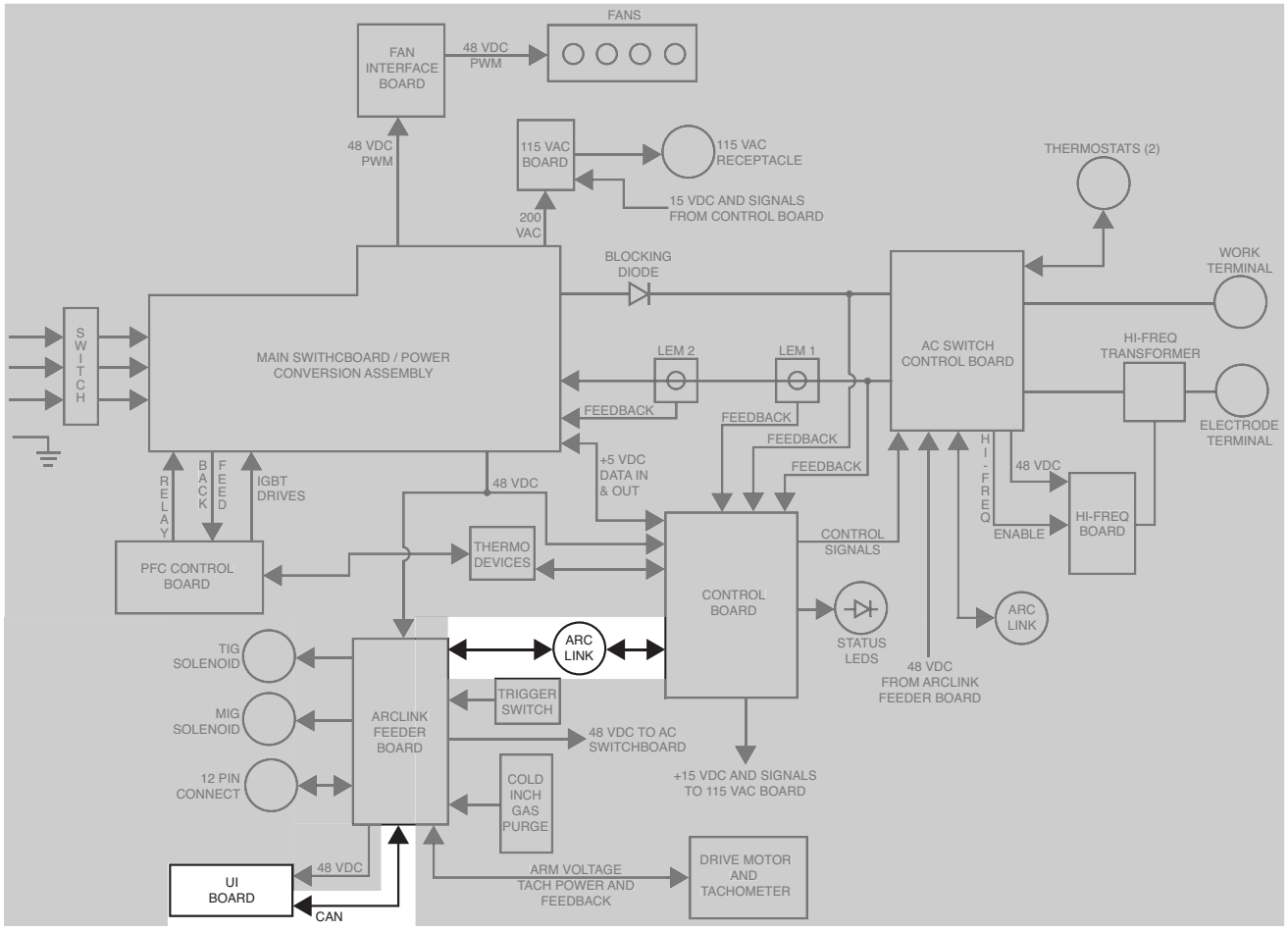
The control board receives commands and feedback information, via ArcLink communication, from the user interface module, the ArcLink receptacle, and the chopper board. It also receives output current and voltage information from the current transducer (LEM 1) and leads 202 and 206.

The current transducer monitors the output current and converts that information into a low voltage signal that is sent to the control board (500 Amps = 4.0VDC). The control board uses this current feedback

information along with the output voltage feedback to monitor and control the output of the machine. The control board also houses the software welding tables.
In addition, the control board monitors temperature circuitry, the shutdown circuitry and controls the four fans via the main switchboard and fan interface board.
The control board also sends control signals to the optional 115 VAC board, and via ArcLink to the AC switchboard.

NOTE: Unshaded areas of Block Logic Diagram are the subject of discussion.

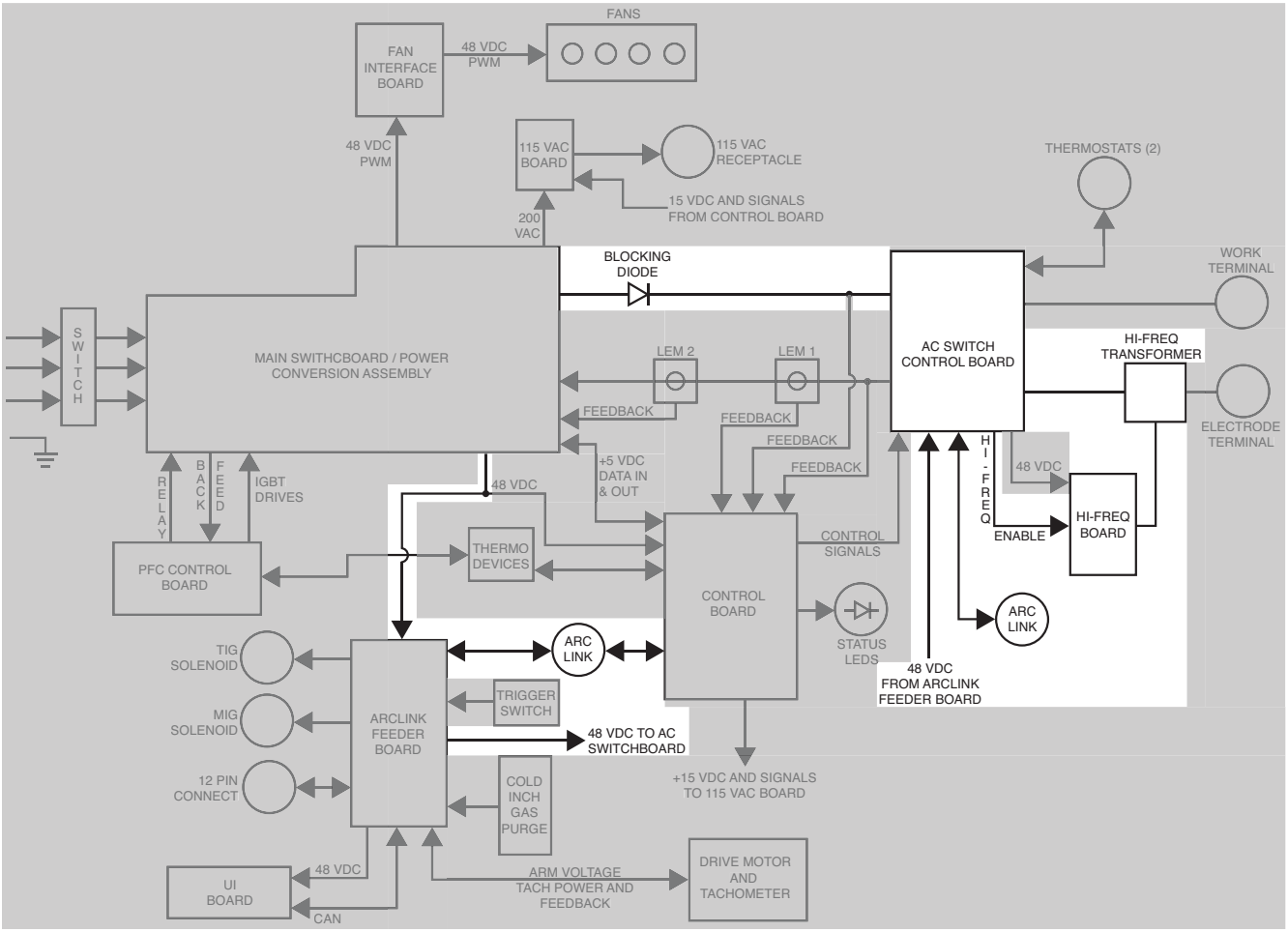
Figure E.5 – User control section



USER CONTROL SECTION
USER INTERFACE MODULE

The user interface board receives commands from the user/operator and sends this information, via ArcLink to the ArcLink feeder board and the control board. In this process the wire feed speed and the welding waveforms and processes are determined.

Figure E.6 – Advanced output section



ADVANCED OUTPUT SECTION

AC SWITCH CONTROL BOARD, HIGH FREQUENCY BOARD, AND HIGH FREQUENCY TRANSFORMER.

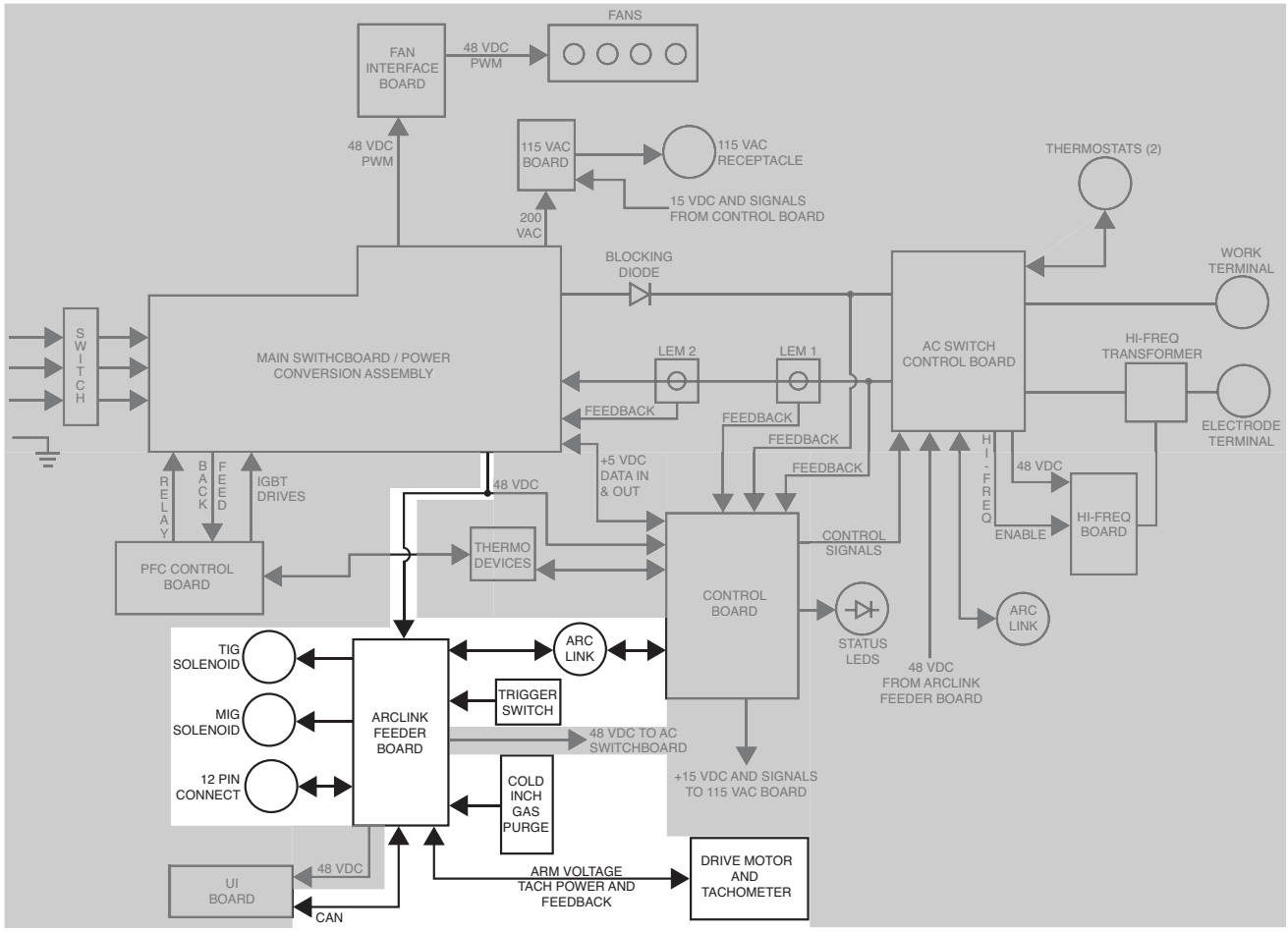
The AC switch control board is utilized when a STT (Surface Tension Transfer) process is selected or a TIG process or an AC welding process.

The AC switch control board receives controlled DC welding power from the multi-phase chopper. Dependent upon the welding process selected the AC switch control board will convert this DC voltage into an AC output, or a STT controlled output. It receives 48 VDC from the main switchboard via the ArcLink feeder board. It also receives direct commands from the control board via ArcLink.

When a TIG process is selected the AC switch control board sends command signals to the high frequency board. The output of this board is delivered to the high frequency transformer where, through transformer action, the high frequency is impressed upon the electrode connection. This high frequency is required for arc starting and arc stability when AC TIG welding.

NOTE: Unshaded areas of Block Logic Diagram are the subject of discussion.

Figure E.7 – Wire feeding section



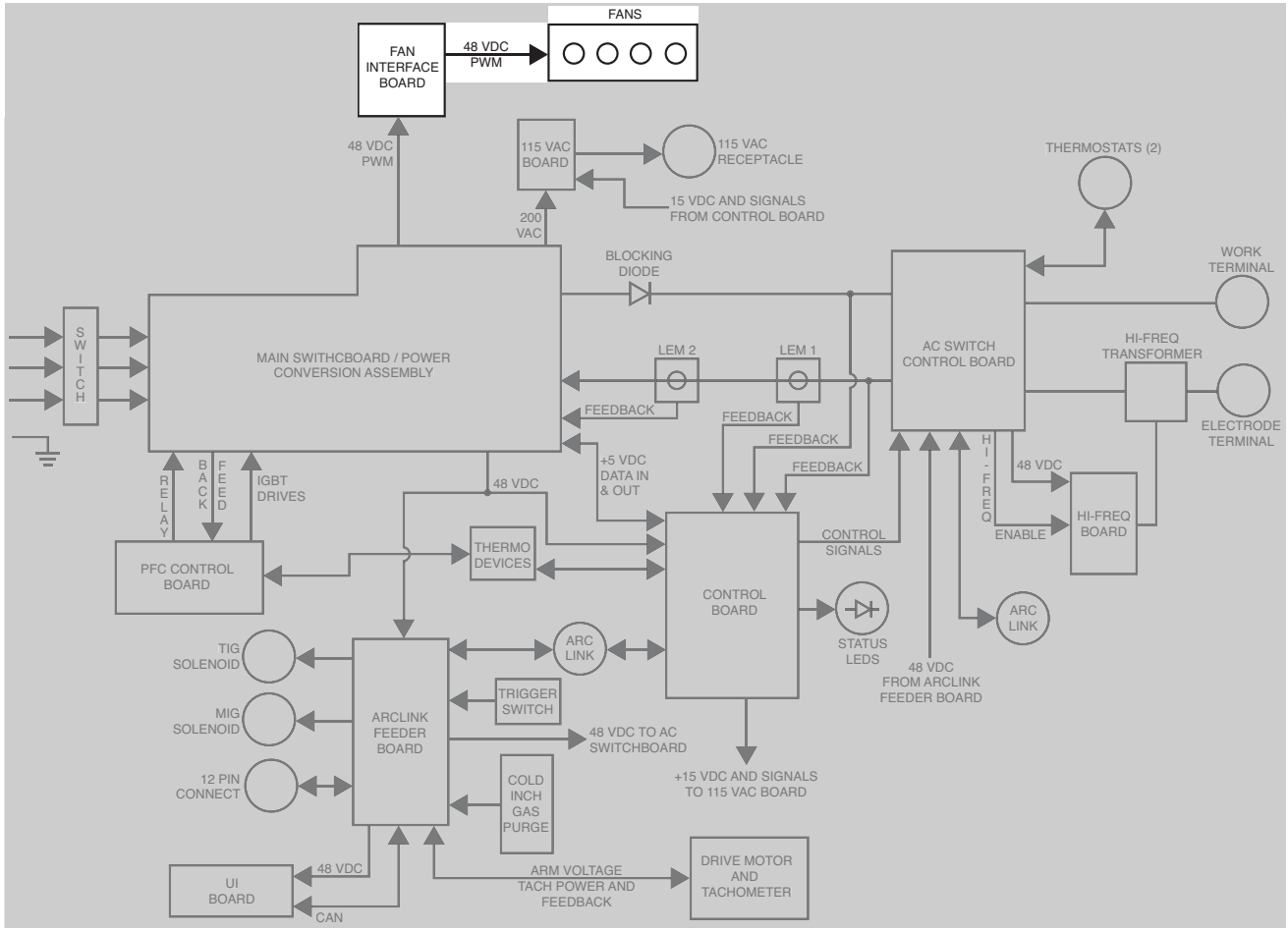
WIRE FEEDING SECTION

ARCLINK FEEDER BOARD

The ArcLink feeder board receives 48 VDC from the main switchboard and also receives command signals from the user interface module and the control board via ArcLink communications. The ArcLink feeder board then supplies power and control information to the wire drive motor, the tachometer circuit, the gas solenoids, and the optional push pull motor. The ArcLink feeder board also receives command signals from the gun trigger, the gas purge/cold inch switch and an optional remote control device.

NOTE: Unshaded areas of Block Logic Diagram are the subject of discussion.

Figure E.8 – Machine protection



MACHINE PROTECTION

THERMAL PROTECTION

Two thermistors, located on the main switchboard, protect the machine from excessive operating temperatures. They are monitored by the PFC board and the control board to provide commands for fan speed and shutdown if necessary. Two additional (NC) thermostats are located on the optional AC switchboard. Excessive temperatures may be caused by a lack of cooling air or by operating the machine beyond its duty cycle or output rating. If excessive operating temperatures should occur, the temperature sensing devices will prevent output from the machine. The thermostats are self-resetting once the machine cools sufficiently. If the thermostat shutdown was caused by excessive output or duty cycle and the fans are operating normally, the power switch may be left on and the reset should occur within a 15-minute period. If the fans are not turning or the intake air louvers are obstructed, the power must be removed from the machine and the fan condition or air obstruction corrected.

NOTE: Unshaded areas of Block Logic Diagram are the subject of discussion.

FANS

Four variable speed fans provide cooling air for the Power Wave 300C.

PROTECTIVE CIRCUITS

Protective circuits are designed into the Power Wave 300C to sense trouble and shut down the machine before damage occurs to the machine's internal components. Error Codes will be flashed out by the light on the control board and will help identify the reason for the shutdown. They should all be steady green. See the ***Troubleshooting Section*** for more information regarding Error Codes. Fault codes can also be seen by using the diagnostic software.

OVER CURRENT PROTECTION

In the case of a secondary over current condition (400 amps average) the LEM 1 will signal the control board to disable welding output.

TABLE OF CONTENTS

Troubleshooting & Repair

HOW TO USE TROUBLESHOOTING GUIDE

⚠ WARNING

Service and repair should be performed by only Lincoln Electric Factory Trained Personnel. Unauthorized repairs performed on this equipment may result in danger to the technician and machine operator and will invalidate your factory warranty. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions detailed throughout this manual.

This Troubleshooting Guide is provided to help you locate and repair possible machine malfunctions. Simply follow the three-step procedure listed below.

Step 1. LOCATE PROBLEM (SYMPTOM). Look under the column labeled "PROBLEM" (SYMPTOMS). This column describes possible symptoms that the machine may exhibit. Find the listing that best describes the symptom that the machine is exhibiting. Symptoms are grouped into three main categories: Output Problems, Function Problems and Engine Problems.

Step 2. PERFORM EXTERNAL TESTS. The second column, labeled "POSSIBLE AREAS OF MISADJUSTMENT(S)", lists the obvious external possibilities that may contribute to the machine symptom. Perform these tests/checks in the order listed. In general, these tests can be conducted without removing the case cover.

Step 3. PERFORM COMPONENT TESTS. The last column, labeled "Recommended Course of Action" lists the most likely components that may have failed in your machine. It also specifies the appropriate test procedure to verify that the subject component is either good or bad. If there are a number of possible components, check the components in the order listed to eliminate one possibility at a time until you locate the cause of your problem.

All of the referenced test procedures referred to in the Troubleshooting Guide are described in detail at the end of this section. Refer to the Troubleshooting and Repair Table of Contents to locate each specific Test Procedure. All of the referred to test points, components, terminal strips, etc., can be found on the referenced electrical wiring diagrams and schematics. Refer to the Electrical Diagrams Section Table of Contents to locate the appropriate diagram.

⚠ CAUTION

If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

PC BOARD TROUBLESHOOTING PROCEDURES

⚠ WARNING

ELECTRIC SHOCK can kill.

• Have an electrician install and service this equipment. Turn the input power OFF at the fuse box before working on equipment. Do not touch electrically hot parts.

⚠ CAUTION

Sometimes machine failures appear to be due to PC board failures. These problems can sometimes be traced to poor electrical connections. To avoid problems when troubleshooting and replacing PC boards, please use the following procedure:

1. Determine to the best of your technical ability that the PC board is the most likely component causing the failure symptom.
2. Check for loose connections at the PC board to assure that the PC board is properly connected.
3. If the problem persists, replace the suspect PC board using standard practices to avoid static electrical damage and electrical shock. Read the warning inside the static resistant bag and perform the following procedures:

PC board can be damaged by static electricity.

• Remove your body's static charge before opening the static-shielding bag. Wear an anti-static wrist strap. For safety, use a 1 Meg ohm resistive cord connected to a grounded part of the equipment frame.

ATTENTION
Static-Sensitive Devices
Handle only at Static-Safe Workstations

Reusable Container
Do Not Destroy

• If you don't have a wrist strap, touch an un-painted, grounded, part of the equipment frame. Keep touching the frame to prevent static build-up. Be sure not to touch any electrically live parts at the same time.

• Tools which come in contact with the PC board must be either conductive, anti-static or static-dissipative.

• Remove the PC board from the static-shielding bag and place it directly into the equipment. Don't set the PC board on or near paper, plastic or cloth which could have a static charge. If the PC board can't be installed immediately, put it back in the static-shielding bag.

• If the PC board uses protective shorting jumpers, don't remove them until installation is complete.

• If you return a PC board to The Lincoln Electric Company for credit, it must be in the static-shielding bag. This will prevent further damage and allow proper failure analysis.

4. Test the machine to determine if the failure symptom has been corrected by the replacement PC board.

NOTE: It is desirable to have a spare (known good) PC board available for PC board troubleshooting.

NOTE: Allow the machine to heat up so that all electrical components can reach their operating temperature.

5. Remove the replacement PC board and substitute it with the original PC board to recreate the original problem.

a. If the original problem does not reappear by substituting the original board, then the PC board was not the problem. Continue to look for bad connections in the control wiring harness, junction blocks and terminal strips.

b. If the original problem is recreated by the substitution of the original board, then the PC board was the problem. Reinstall the replacement PC board and test the machine.

6. Always indicate that this procedure was followed when warranty reports are to be submitted.

NOTE: Following this procedure and writing on the warranty report, "INSTALLED AND SWITCHED PC BOARDS TO VERIFY PROBLEM," will help avoid denial of legitimate PC board warranty claims.

Troubleshooting guide

Observe Safety Guidelines detailed in the beginning of this manual.		**TROUBLESHOOTING GUIDE**
PROBLEMS (SYMPTOMS)	**POSSIBLE AREAS OF MISADJUSTMENT(S)**	**RECOMMENDED COURSE OF ACTION**
OUTPUT PROBLEMS		
Major physical or electrical damage is evident when the PW300C case is removed.	1. Contact your local authorized Lincoln Electric Service Facility.	1. Contact the Lincoln Electric Service Department at 1-888-935-3877.
The input fuses repeatedly fail, or the input circuit breakers keep tripping.	1. Make certain the fuses or breakers are correctly sized for the PW 300C machine. 2. The welding process may be drawing too much input current. 3. Check for error codes. See Status LED Charts.	1. Perform the ***Input Line Switch Test Procedure***. 2. Perform the ***Main Switchboard / Power Conversion Assembly Test Procedure***. 3. Perform the ***PFC Control Board Test Procedure***.
The machine will not power up. No lights or displays. The machine appears to be off.	1. Make sure the proper input voltage is being applied to the machine (check fuses / breakers). 2. Make sure the input line switch is in the ON position.	1. Perform the ***Input Line Switch Test Procedure***. 2. Perform the ***Main Switchboard / Power Conversion Assembly Test Procedure***. 3. Perform the ***PFC Control Board Test Procedure***. 4. Perform the ***ArcLink Feeder Board Test Procedure***.
The PW 300C does not have welding output when output is triggered to be on.	1. If there is an error code see ***Status LEDs And Fans Conditions Upon Initial Power Up Of The Machine***. 2. Remove all external loads from the output terminals and restart machine. 3. If the thermal LED is lit the machine may be overheated.	1. Perform the ***AC Switch Control Board Test Procedure***. 2. Perform the ***Digital Control Board Test Procedure***. 3. Perform the ***ArcLink Feeder Board Test Procedure***. 4. Perform the ***Sense Lead Interface Board Test Procedure***. 5. Check for continuity between the AC switch control board and the output terminals. See Wiring Diagram.
The Thermal LED is on. The machine regularly overheats. There is no open circuit voltage	1. The welding process may be exceeding the recommended	1. Check the thermostats and associated wiring. See Wiring Diagram.

when the machine is triggered on.	duty cycle or current limits of the machine. 2. Dirt or dust may have clogged the cooling channels inside the machine. Perform Maintenance. 3. Make sure the fans are functioning correctly. The fans should run at a low speed when the machine is at idle and high speed when the welding output is activated. The fans should also run at high speed if a thermostat is tripped.	2. If the fans are not functioning correctly perform the ***Fan Interface Board Test Procedure.***
The PW300C will not produce full welding output.	1. The input voltage may be too low. 2. See ***Status LEDs And Fans Conditions Upon Initial Power Up Of The Machine***.	1. The current transducer may be faulty. 2. Perform the Power Wave verification and Calibration Procedures. See SVM251. 3. Perform the ***AC Switch Control Board Test Procedure***. 4. Perform the ***Digital Control Board Test Procedure***. 5. Perform the ***Sense Lead Interface Board Test Procedure***. 6. Perform the ***Main Switchboard / Power Conversion Assembly Test Procedure***.
The machine's welding output is higher than the setting.	1. See ***Status LEDs And Fans Conditions Upon Initial Power Up Of The Machine***.	1. Perform the ***AC Switch Control Board Test Procedure***. 2. Perform the ***Digital Control Board Test Procedure***. 3. Perform the ***Main Switchboard / Power Conversion Assembly Test Procedure***.
The Machine welds in DC Modes but not AC modes.	1. Make sure the mode selection matches the expected process.	1. Perform the ***AC Switch Control Board Test Procedure***. 2. Perform the ***Digital Control Board Test Procedure***.

The Machine welds in AC Modes but not in DC Modes.	1. Make sure the mode selection matches the expected process.	1. Perform the ***AC Switch Control Board Test Procedure***. 2. Perform the ***Digital Control Board Test Procedure***.

⚠ CAUTION

If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

Observe Safety Guidelines detailed in the beginning of this manual.		TROUBLESHOOTING GUIDE
PROBLEMS (SYMPTOMS)	**POSSIBLE AREAS OF MISADJUSTMENT(S)**	**RECOMMENDED COURSE OF ACTION**
WIRE FEEDING PROBLEMS		
When the gun trigger is activated, the wire will not feed.	1. Check for obstructions in the wire feeding path. 2. The welding wire will not feed if the machine is in the SMAW (stick) or TIG mode.	1. Perform the ***ArcLink Feeder Board Test Procedure***. 2. Perform the ***Wire Drive Motor Test Procedure***.
The wire feed speed is high and uncontrollable.	1. Make sure the wire feed setting is correct for the process being used.	1. Perform the ***ArcLink Feeder Board Test Procedure***. 2. Perform the ***Motor Tachometer Test Procedure***.

⚠ CAUTION

If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

Observe Safety Guidelines detailed in the beginning of this manual.		**TROUBLESHOOTING GUIDE**
PROBLEMS (SYMPTOMS)	**POSSIBLE AREAS OF MISADJUSTMENT(S)**	**RECOMMENDED COURSE OF ACTION**
FUNCTION PROBLEMS		
The High Frequency does not work correctly.	1. Make sure the process being used requires high frequency. 2. Check the welding gun and associated wiring.	1. Perform the ***High Frequency Board Test Procedure***. 2. Perform the ***AC Switch Control Board Test Procedure***. 3. The High Frequency Transformer may be faulty.
The 115 VAC is not present at the receptacle (if equipped).	1. Check the 115 VAC receptacle and associate wiring for loose or faulty connections. See Wiring Diagram.	1. Perform the ***115 VAC Inverter Board Test Procedure***.
No gas flow when gun trigger is activated. The welding wire feeds.	1. Make sure there is gas available at the input of the gas solenoid. 2. Make sure the gas line is not obstructed. 3. Make sure the welding mode selection is correct.	1. The gas solenoid may be faulty. The normal solenoid coil resistance is about 56 Ohms. 2. Perform the ***ArcLink Feeder Board Test Procedure***.
During a weld the machine shuts down.	1. The secondary current limit has been exceeded and the machine shuts down to protect itself. Adjust the procedure to reduce the load and lower the output current draw.	1. A non-recoverable internal fault will interrupt the welding output. This condition will also result in a status light blinking. See ***Status LEDs And Fans Conditions Upon Initial Power Up Of The Machine***.
The wire burns back to the tip at the end of the weld.	1. Reduce the burnback time.	1. N/A.

⚠ CAUTION

If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

STATUS LEDS AND FANS CONDITIONS UPON INITIAL POWER UP OF THE MACHINE.

FANS

Fans will run at high speed for several seconds then run at low speed until welding output is energized.

LEDs

DIGITAL CONTROL BOARD LED LEGEND			
LED#	**STATUS**	**COLOR**	**FUNCTION**
LED 1	ON	GREEN	STATUS “OK”
LED 5	ON	GREEN	ELECTRODE SENSE
LED 6	ON	GREEN	WORK SENSE
LED 7	ON	GREEN	ETHERNET LINK/ACTIVITY STATUS
LED 8	ON	GREEN	ETHERNET SPEED STATUS
LED 9	ON	GREEN	INPUT SUPPLY 30 VDC TO 55 VDC

MAIN SWITCHBOARD LED LEGEND			
LED#	**STATUS**	**COLOR**	**FUNCTION**
1	ON	GREEN	48 VDC AUXILIARY POWER PRESENT
2	ON	GREEN	BUCK IGBT FUNCTIONING (DEPENDENT UPON INPUT VOLTAGE)
3	ON	GREEN	BOOST IGBT FUNCTIONING (DEPENDENT UPON INPUT VOLTAGE)
4	ON	GREEN	15 VDC POWER FUNCTIONING/PRESENT

PFC CONTROL BOARD LED LEGEND		
LED#	**COLOR**	**FUNCTION**
2	GREEN	15 VDC POWER SUPPLY FUNCTIONING PROPERLY

115 VAC INVERTER BOARD LED LEGEND			
LED#	**STATUS**	**COLOR**	**FUNCTION**
LED 2	ON	GREEN	RECEPTACLE OUTPUT IS ON (115VAC)
LED 3	ON	GREEN	INPUT POWER PRESENT POWER SUPPLY ON

ARCLINK FEEDER BOARD LED LEGEND			
LED#	**STATUS**	**COLOR**	**FUNCTION**
LED 1	ON	GREEN	ARC LINK STATUS “OK”
LED 2	ON	GREEN	ARC LINK STATUS “ERROR”
LED 3	ON	GREEN	PSOC STATUS
LED 4	ON	GREEN	PSOC STATUS

AC SWITCHBOARD LED LEGEND			
LED#	**FUNCTION**	**COLOR**	**INDICATION**
LED 1	H-BRIDGE STATUS	GREEN	**NORMAL STATUS:** ON. **FAULT CONDITION:** SNUBBER CAPACITOR VOLTAGE EXCEEDS THRESHOLD, THE ACCEPTABLE VOLTAGE ACROSS THE SWITCH IS EXCEEDED, OR THE POWER SUPPLIES VOLTAGES ARE INSUFFICIENT LED WILL BE OFF.
LED 2	POWER SUPPLY	GREEN	**NORMAL STATUS:** ON. **FAULT CONDITION:** IF THERE IS A SHORT ON ANY OF THE POWER SUPPLIES, THIS LED WILL BLINK, IF NO POWER IS PRESENT LED WILL BE OFF.
LED 3	BOARD STATUS	RED/GREEN	**NORMAL STATUS:** SOLID GREEN. **FAULT CONDITION:** IF THE SWITCH ENCOUNTERS AN ERROR THIS LED WILL FLASH OUT THE ERROR CODE.
LED 5 AND LED 6	POSITIVE SWITCH	RED	INDICATES SWITCH IS CONFIGURED FOR POSITIVE POLARITY OR AC OUTPUT.
LED 9 AND LED 11	POSITIVE STT POLARITY	RED	INDICATES SWITCH IS CLOSED IN POSITIVE POLARITY WILL DETECT SLIGHT DIMMING IF PERFORMING NEGATIVE STT.
LED 13	SNUBBER VOLTAGE	RED	INDICATES HIGH VOLTAGE IS PRESENT ON THE SNUBBER CAPACITOR.

Test Procedures

CASE COVER REMOVAL AND REPLACEMENT PROCEDURE

Service and repair should be performed by only Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment may result in danger to the technician or machine operator and will invalidate your factory warranty. For your safety and to avoid electrical shock, please observe all safety notes and precautions detailed throughout this manual. If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

This procedure will aid the technician in the removal and replacement of the Case Covers.

MATERIALS NEEDED

8mm Nutdriver
Wiring Diagram

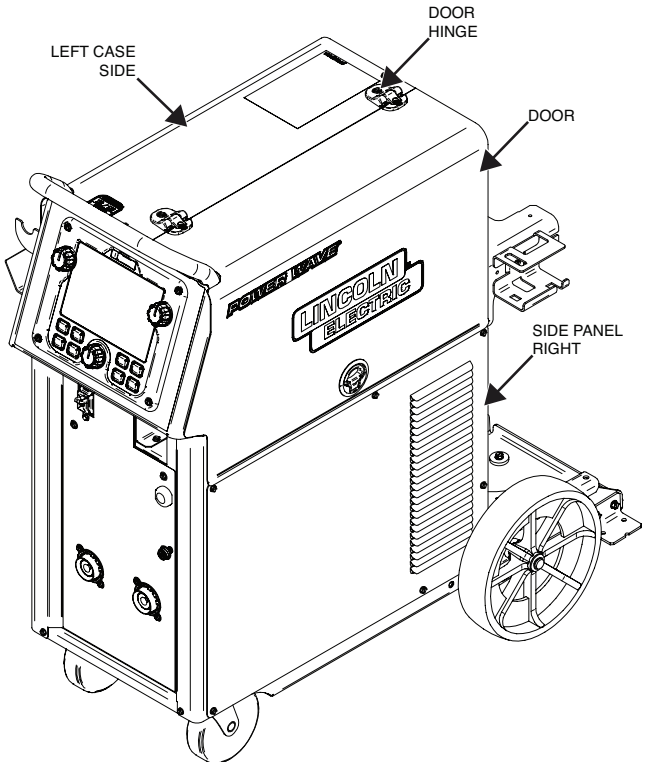
REMOVAL PROCEDURE

1. Carefully remove input power to the Power Wave 300C machine.
2. Using an 8mm nutdriver, remove the two screws securing the door hinge to the left case side. See ***Figure F.1***. The door can now be carefully removed.
3. Using an 8mm nutdriver, remove the nine screws securing the left case side to the machine. See ***Figure F.1***. The left case side can now be removed.
4. Using an 8mm nutdriver, remove the three screws securing the side panel left to the machine. The side panel left can now be removed.
5. Using an 8mm nutdriver, remove the six screws securing the side panel right to the machine. See ***Figure F.1***. The side panel right can now be removed.
6. Perform any tests / replacement procedures.

REPLACEMENT PROCEDURE

1. Carefully position the side panel right onto the machine.
2. Using an 8mm nutdriver, attach the six screws securing the side panel right to the machine.
3. Carefully position the side panel left onto the machine.
4. Using an 8mm nutdriver, attach the three screws securing the side panel left to the machine.
5. Carefully position the left case side onto the machine.
6. Using an 8mm nutdriver, attach the nine screws securing the left case side to the machine.
7. Carefully position the door onto the machine.
8. Using an 8mm nutdriver, attach the two screws securing the door hinge to the left case side.

Figure F.1 – Case cover components location



CAPACITOR DISCHARGE PROCEDURE

Service and repair should be performed by only Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment may result in danger to the technician or machine operator and will invalidate your factory warranty. For your safety and to avoid electrical shock, please observe all safety notes and precautions detailed throughout this manual. If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

This procedure will ensure that the DC link Capacitor has been discharged.

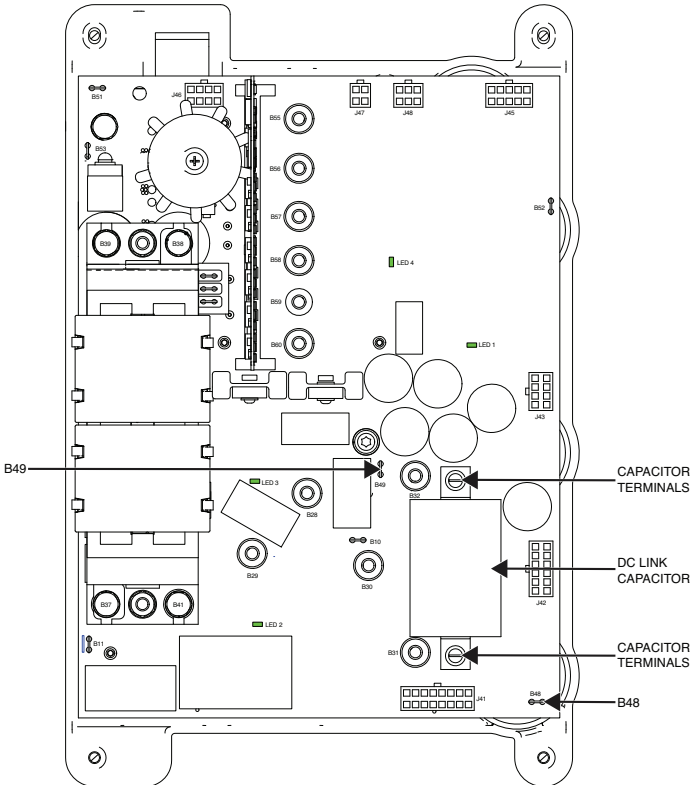
MATERIALS NEEDED

Volt/Ohmmeter
Resistor (25-1000 ohms and 25 watts minimum)
Electrically Insulated Gloves
Electrically Insulated Pliers
Jumper Leads
Wiring Diagram

TEST PROCEDURE

1. Carefully remove input power to the Power Wave 300C machine.
2. Perform the ***Case Cover Removal Procedure***.
3. Locate the DC link capacitor on the main switchboard / power conversion assembly. See ***Figure F.1***. See Wiring Diagram.
4. Using a volt/ohmmeter, measure the voltage at the DC capacitor terminals and at terminals B48 and B49. See ***Figure F.1***. See Wiring Diagram. Voltage should be zero. If any voltage is present, continue with discharge procedure.
5. Using a high wattage resistor (25-1000 ohms @ 25 watts (minimum), electrically insulated gloves and pliers, hold the resistor terminals across the capacitor terminals for ten seconds. See Wiring Diagram.
6. Using a volt/ohmmeter, measure the voltage at the DC capacitor terminals and at terminals B48 and B49. See ***Figure F.1***. See Wiring Diagram. Voltage should be zero. If any voltage is present, repeat discharge procedure until no voltage is present.
7. Perform the ***Case Cover Replacement Procedure***.

Figure F.1 – Main switchboard / power conversion assembly location



115 VAC INVERTER BOARD TEST PROCEDURE

Service and repair should be performed by only Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment may result in danger to the technician or machine operator and will invalidate your factory warranty. For your safety and to avoid electrical shock, please observe all safety notes and precautions detailed throughout this manual. If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

This test will determine if the 115 VAC Inverter Board is functioning properly.

MATERIALS NEEDED

Volt/Ohmmeter
Wiring Diagram

TEST PROCEDURE

1. Carefully remove input power to the Power Wave 300C machine.
2. Perform the ***Case Cover Removal Procedure***.
3. Perform the ***Capacitor Discharge Procedure***.
4. Locate the 115 VAC inverter board. See ***Figure F.1***. See Wiring Diagram.
5. Carefully apply the correct input power to the machine and turn the machine ON.
6. Visually inspect the board to ensure the LEDs are operating per ***Table F.1***. See ***Figure F.2***. See Wiring Diagram.
7. Using a volt/ohmmeter, perform the voltage tests outlined in ***Table F.2***. See ***Figures F.2*** and ***F.3***. See Wiring Diagram.
8. If any of the tests fail, the 115 VAC inverter board may be faulty.
9. If faulty, replace.
10. Perform the ***Case Cover Replacement Procedure***.

Table F.1 – 115 VAC inverter board LED tests

LED #	LED STATUS	LED COLOR	INDICATION
1	ON	RED	ERROR CODE LED WILL FLASH OUT ERROR
2	ON	GREEN	RECEPTACLE OUTPUT IS ON (115 VAC)
3	ON	GREEN	INPUT POWER PRESENT POWER SUPPLY ON

Table F.2 – 115 VAC inverter board voltage tests

COMPONENT/CIRCUIT TESTED	CONDITION(S)	+ METER LEAD	- METER LEAD	EXPECTED VALUE
SUPPLY FROM DIGITAL CONTROL BOARD	MACHINE ON	PLUG J62 PIN 2	PLUG J62 PIN 4	+15 VDC
FAN VOLTAGE	MACHINE ON – FANS ON	PLUG J62 PIN 1	PLUG J62 PIN 2	+15 VDC
FAN VOLTAGE	MACHINE ON	PLUG J62 PIN 1	PLUG J62 PIN 4	+15 VDC
AC POWER FROM SWITCH BOARD	MACHINE ON	TERMINAL B5	TERMINAL B6	~200VAC @ 50KHZ.
SUPPLY FROM DIGITAL CONTROL BOARD	MACHINE ON	PLUG J62 PIN 5	PLUG J62 PIN 4	+15 VDC
OUTPUT TO RECEPTACLE	MACHINE ON	PLUG J63 PIN 3	PLUG J63 PIN 1	+115 VAC

Figure F.1 – 115 VAC inverter board location

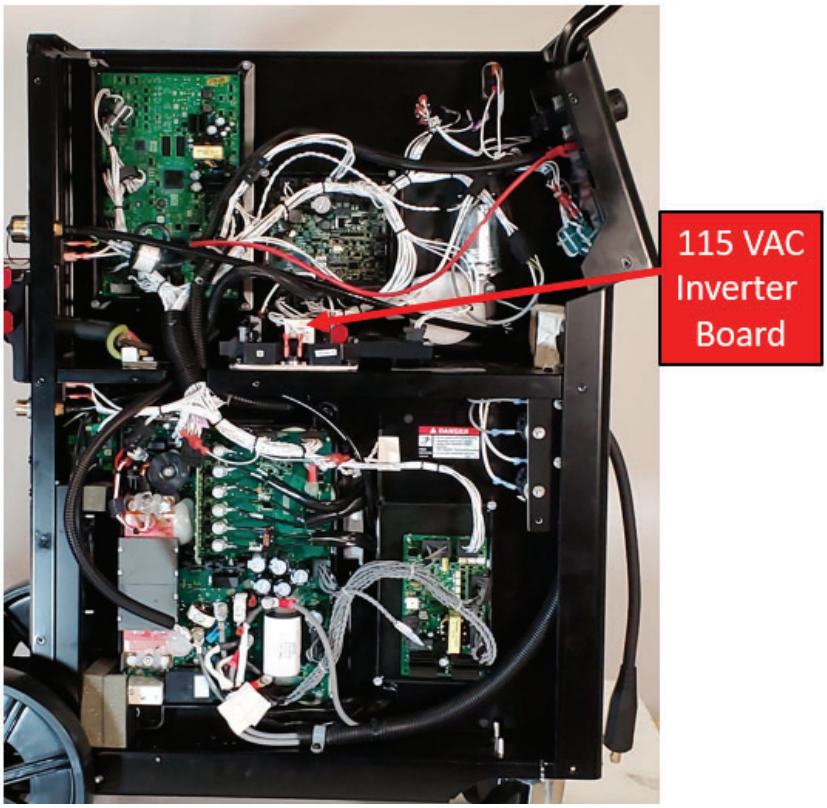


Figure F.2 – 115 VAC inverter board plug and terminal locations

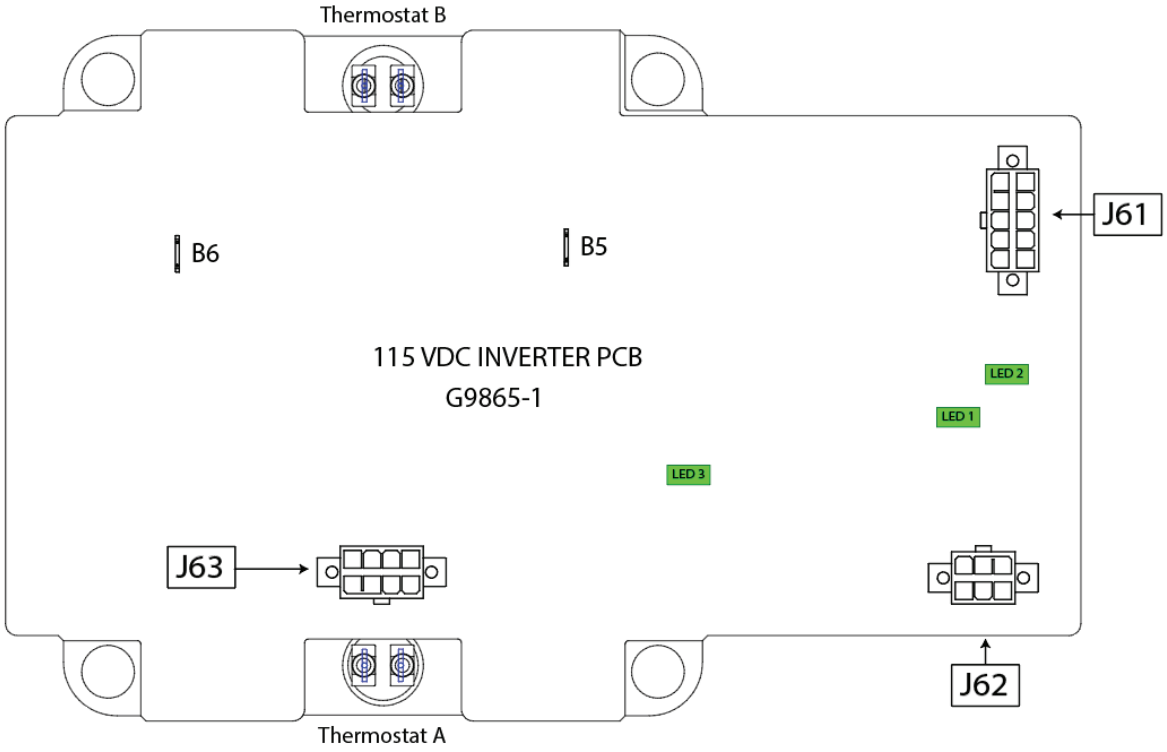
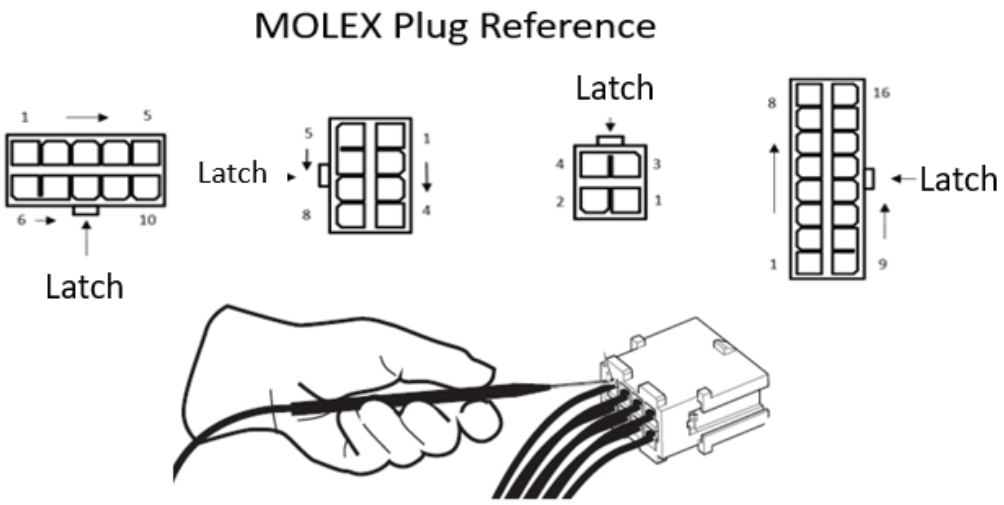


Figure F.3 – Molex plug reference



1) Always make all measurements from the wire side of the Molex connection
2) Locate the securing latch for the Molex connection to be tested
3) Starting in the upper left corner pin location #1 find the designated pin location to be tested

AC SWITCH CONTROL BOARD TEST PROCEDURE

Service and repair should be performed by only Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment may result in danger to the technician or machine operator and will invalidate your factory warranty. For your safety and to avoid electrical shock, please observe all safety notes and precautions detailed throughout this manual. If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

This test will determine if the AC Switch Control Board is functioning properly.

MATERIALS NEEDED

Volt/Ohmmeter
Wiring Diagram

TEST PROCEDURE

1. Carefully remove input power to the Power Wave 300C machine.
2. Perform the ***Case Cover Removal Procedure***.
3. Perform the ***Capacitor Discharge Procedure***.
4. Locate the AC switch control board. See ***Figure F.1***. See Wiring Diagram.
5. Carefully apply the correct input power to the machine and turn the machine ON.
6. Visually inspect the board to ensure the LEDs are operating per ***Table F.1***. See ***Figure F.2***. See Wiring Diagram.
7. Carefully remove input power to the Power Wave 300C machine.
8. Using a volt/ohmmeter, perform the resistance tests outlined in ***Table F.2***. See ***Figures F.2*** and ***F.3***. See Wiring Diagram.
9. Carefully apply the correct input power to the machine and turn the machine ON.
10. Using a volt/ohmmeter, perform the voltage tests outlined in ***Table F.3***. See ***Figures F.2*** and ***F.3***. See Wiring Diagram.
11. If any of the tests fail, the AC switch control board may be faulty.
12. If faulty, perform the ***AC Switch Control Board Removal And Replacement Procedure***.
13. Perform the ***Case Cover Replacement Procedure***.

Table F.1 – AC switch control board LED tests

LED #	LED FUNCTION	LED COLOR	INDICATION
LED 1	H-BRIDGE STATUS	GREEN	**NORMAL STATUS:** ON **FAULT CONDITION:** SNUBBER CAPACITOR VOLTAGE EXCEEDS THRESHOLD, THE ACCEPTABLE VOLTAGE ACROSS THE SWITCH IS EXCEEDED, OR THE POWER SUPPLIES VOLTAGES ARE INSUFFICIENT LED WILL BE OFF
LED 2	POWER SUPPLY	GREEN	**NORMAL STATUS:** ON **FAULT CONDITION:** IF THERE IS A SHORT ON ANY OF THE POWER SUPPLIES, THIS LED WILL BLINK, IF NO POWER IS PRESENT LED WILL BE OFF
LED 3	BOARD STATUS	RED/GREEN	**NORMAL STATUS:** SOLID GREEN **FAULT CONDITION:** IF THE SWITCH ENCOUNTERS AN ERROR THIS LED WILL FLASH OUT THE ERROR CODE.
LED 4 AND LED 7	NEGATIVE SWITCH	RED	INDICATES SWITCH IS CONFIGURED FOR NEGATIVE POLARITY OR AC OUTPUT
LED 5 AND LED 6	POSITIVE SWITCH	RED	INDICATES SWITCH IS CONFIGURED FOR POSITIVE POLARITY OR AC OUTPUT
LED 8 AND LED 10	NEGATIVE STT POLARITY	RED	INDICATES SWITCH IS CLOSED IN NEGATIVE POLARITY WILL DETECT SLIGHT DIMMING IF PERFORMING NEGATIVE STT
LED 9 AND LED 11	POSITIVE STT POLARITY	RED	INDICATES SWITCH IS CLOSED IN POSITIVE POLARITY WILL DETECT SLIGHT DIMMING IF PERFORMING NEGATIVE STT
LED 13	SNUBBER VOLTAGE	RED	INDICATES HIGH VOLTAGE IS PRESENT ON THE SNUBBER CAPACITOR
LED 14	MAIN BUS OVERVOLTAGE	RED	**FAULT CONDITION:** INDICATES THAT A VOLTAGE >120 VDC WAS PRESENT ACROSS THE BRIDGE. LATCHED ERROR
LED 15	SNUBBER CAPACITOR OVERVOLTAGE	RED	**FAULT CONDITION:** INDICATES THAT A VOLTAGE >500 VDC WAS PRESENT ON THE SNUBBER CAPACITOR

Table F.2 – AC switch control board resistance tests

COMPONENT/CIRCUIT TESTED	CONDITION(S)	+ METER LEAD	- METER LEAD	EXPECTED VALUE
THERMOSTAT CIRCUIT	MACHINE OFF	PLUG J4 PIN 1	PLUG J4 PIN 2	< 1 OHM
SNUBBER RESISTANCE	MACHINE OFF	PLUG J5 PIN 8	PLUG J5 PIN 5	100 OHMS
IGBT #1	MACHINE OFF (METER SET FOR DIODE TEST)	ELECTRODE TERMINAL	B1C	~+.3-.7 VDC
IGBT #2	MACHINE OFF (METER SET FOR DIODE TEST)	B2E	ELECTRODE TERMINAL	~+.3-.7 VDC
IGBT #3	MACHINE OFF (METER SET FOR DIODE TEST)	WORK TERMINAL	B4C	~+.3-.7 VDC
IGBT #4	MACHINE OFF (METER SET FOR DIODE TEST)	B3E	WORK TERMINAL	~+.3-.7 VDC

Table F.3 – AC switch control board voltage tests

COMPONENT/CIRCUIT TESTED	CONDITION(S)	+ METER LEAD	- METER LEAD	EXPECTED VALUE
40 VDC ARCLINK SUPPLY	MACHINE ON	PLUG J1 PIN 4	PLUG J1 PIN 3	~+40 VDC
OUTPUT VOLTAGE (OCV)	MACHINE ON – STICK MODE	PLUG J22 PIN 10	PLUG J22 PIN 5	OCV (~+60 VDC)
POWER TO AC SWITCH CONTROL BOARD	MACHINE ON	PLUG J22 PIN 2	PLUG J22 PIN 1	~+48 VDC
CAN COMMUNICATION	MACHINE ON	PLUG J22 PIN 3	PLUG J22 PIN 4	~+2 VDC
15 VDC SUPPLY TO BOARD	MACHINE ON	PLUG J22 PIN 9	PLUG J22 PIN 1	~+15 VDC
SUPPLY TO 12 PIN AMPHENOL	MACHINE ON	PLUG J7 PIN 2	PLUG J7 PIN 1	~+48 VDC
CAN COMMUNICATION TO 12 PIN AMPHENOL	MACHINE ON	PLUG J8 PIN 8	PLUG J8 PIN 7	~+2 VDC
OCV TO AC SWITCH CONTROL BOARD	MACHINE ON – STICK MODE	B1C	B2E	OCV (~+60 VDC)
OCV TO AC SWITCH CONTROL BOARD	MACHINE ON – STICK MODE	B4C	B3E	OCV (~+60 VDC)

Figure F.1 – AC switch control board location

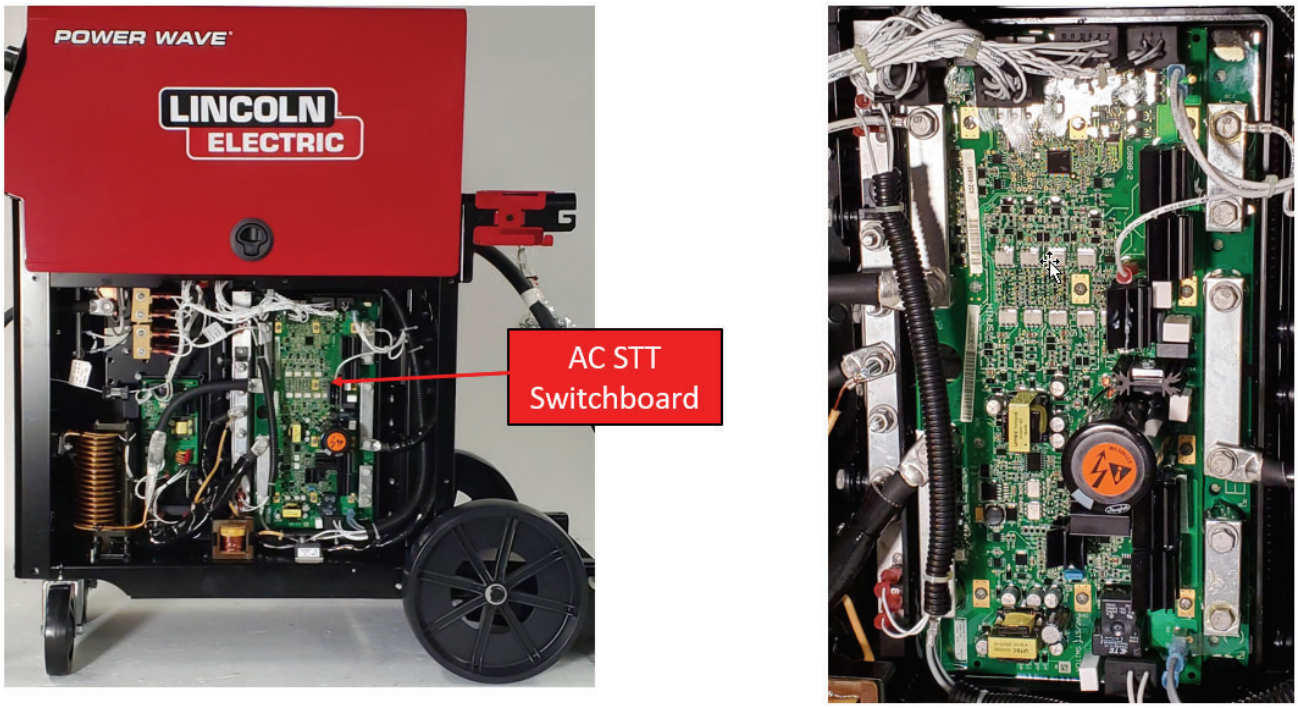


Figure F.2 – AC switch control board plug and thermostat locations

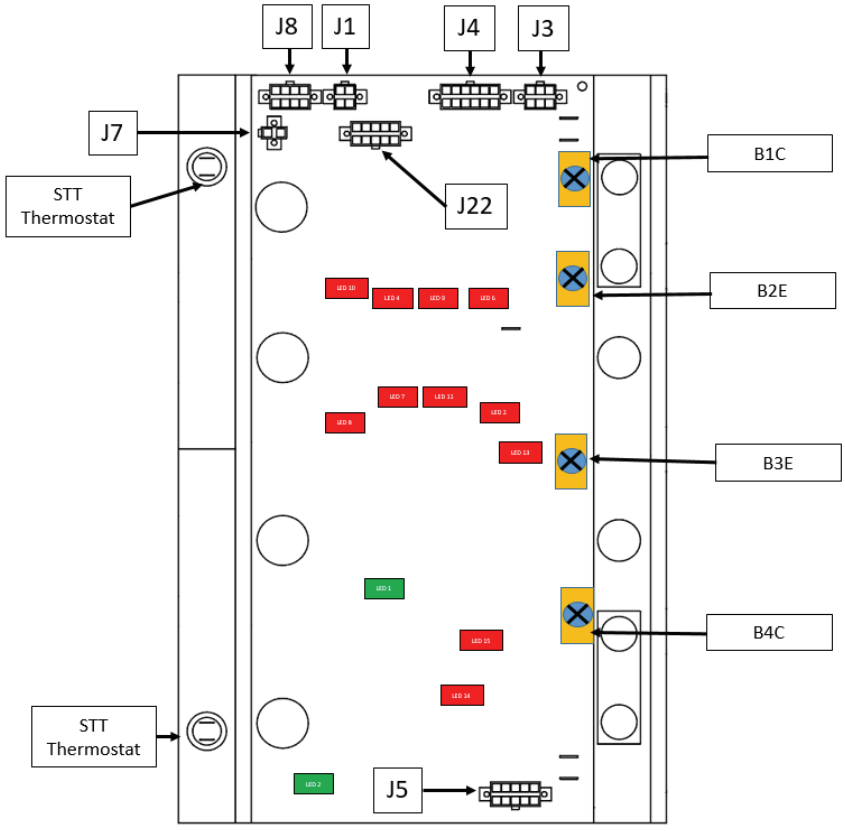
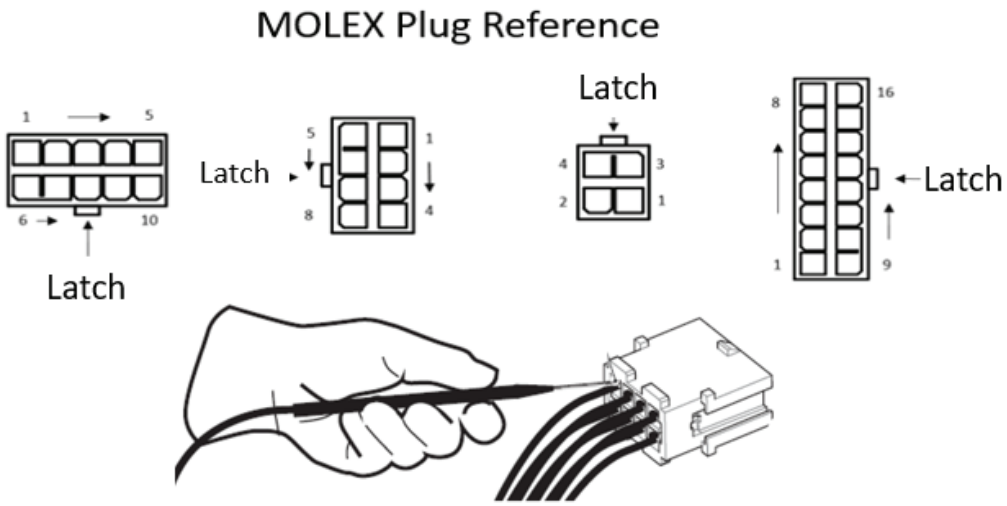


Figure F.3 – Molex plug reference



1) Always make all measurements from the wire side of the Molex connection
2) Locate the securing latch for the Molex connection to be tested
3) Starting in the upper left corner pin location #1 find the designated pin location to be tested

ARCLINK FEEDER BOARD TEST PROCEDURE

Service and repair should be performed by only Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment may result in danger to the technician or machine operator and will invalidate your factory warranty. For your safety and to avoid electrical shock, please observe all safety notes and precautions detailed throughout this manual. If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

This test will determine if the ArcLink Feeder Board is functioning properly.

MATERIALS NEEDED

Volt/Ohmmeter
Wiring Diagram

TEST PROCEDURE

1. Carefully remove input power to the Power Wave 300C machine.
2. Perform the ***Case Cover Removal Procedure***.
3. Perform the ***Capacitor Discharge Procedure***.
4. Locate the ArcLink feeder board. See ***Figure F.1***. See Wiring Diagram.
5. Carefully apply the correct input power to the machine and turn the machine ON.
6. Visually inspect the board to ensure the LEDs are operating per ***Table F.1***. See ***Figure F.2***. See Wiring Diagram.
7. Using a volt/ohmmeter, perform the tests outlined in ***Table F.2***. See ***Figures F.2*** and ***F.3***. See Wiring Diagram.
8. If any of the tests fail, the ArcLink feeder board may be faulty.
9. If faulty, perform the ***ArcLink Feeder Board Removal And Replacement Procedure***.
10. Perform the ***Case Cover Replacement Procedure***.

Table F.1 – ArcLink feeder board LED tests

LED #	LED STATUS	LED COLOR	INDICATION
LED 1	ON	GREEN	ARCLINK STATUS “OK”
LED 2	ON	RED	ARCLINK STATUS “ERROR”
LED 3	ON	GREEN	PSOC STATUS
LED 4	ON	GREEN	PSOC STATUS

Table F.2 – ArcLink feeder board tests

COMPONENT/CIRCUIT TESTED	CONDITION(S)	+ METER LEAD	- METER LEAD	EXPECTED VALUE
INPUT FROM SWITCHBOARD	MACHINE ON	PLUG J83 PIN 5	PLUG J83 PIN 6	+48 VDC
CONNECTION TO SENSE LEAD INTERFACE BOARD	MACHINE ON	PLUG J83 PIN 3	PLUG J83 PIN 4	+48 VDC
COLD FEED SWITCH / CIRCUIT	MACHINE ON – SWITCH OPEN	PLUG J85 PIN 5	PLUG J85 PIN 9	+15 VDC
COLD FEED SWITCH / CIRCUIT	MACHINE ON – SWITCH CLOSED	PLUG J85 PIN 5	PLUG J85 PIN 9	0 VDC
GAS PURGE SWITCH / CIRCUIT	MACHINE ON – SWITCH OPEN	PLUG J85 PIN 5	PLUG J85 PIN 3	+15 VDC
GAS PURGE SWITCH / CIRCUIT	MACHINE ON – SWITCH CLOSED	PLUG J85 PIN 5	PLUG J85 PIN 3	0 VDC
OUTPUT TO UI MODULE	MACHINE ON	PLUG J81 PIN 4	PLUG J81 PIN 3	+48 VDC
REMOTE POT SUPPLY	MACHINE ON	PLUG J85 PIN 2	PLUG J85 PIN 11	+1 VDC
TRIGGER SUPPLY	MACHINE ON – TRIGGER OPEN	PLUG J85 PIN 6	PLUG J85 PIN 14	+15 VDC
ARCLINK CAN COMMUNICATION	MACHINE ON	PLUG J81 PIN 2	PLUG J81 PIN 1	+2 VDC
MOTOR SUPPLY VOLTAGE A VARIES WITH MOTOR SPEED	MACHINE ON – GMAW MODE TRIGGER ON	PLUG J84 PIN 1	PLUG J84 PIN 6	+3 TO +30 VDC
MOTOR SUPPLY VOLTAGE B VARIES WITH MOTOR SPEED	MACHINE ON – GMAW MODE TRIGGER ON	PLUG J84 PIN 2	PLUG J84 PIN 7	+3 TO +30 VDC
TACHOMETER SUPPLY VOLTAGE	MACHINE ON	PLUG J84 PIN 8	PLUG J84 PIN 3	+5 VDC
TACHOMETER FEEDBACK A VARIES WITH MOTOR SPEED	MACHINE ON – WIRE FEED MOTOR RUNNING	PLUG J84 PIN 9	PLUG J84 PIN 3	165 HZ - 1.8 KHZ
TACHOMETER FEEDBACK B VARIES WITH MOTOR SPEED	MACHINE ON – WIRE FEED MOTOR RUNNING	PLUG J84 PIN 4	PLUG J84 PIN 3	165 HZ 1.8 KHZ

MIG GAS SOLENOID	MACHINE ON – MIG MODE – TRIGGER ON	PLUG J86 PIN 8	PLUG J86 PIN 7	+3.0 VDC
TIG GAS SOLENOID	MACHINE ON – TIG MODE – TRIGGER ON	PLUG J86 PIN 10	PLUG J86 PIN 12	+3.0 VDC

Figure F.1 – ArcLink feeder board location

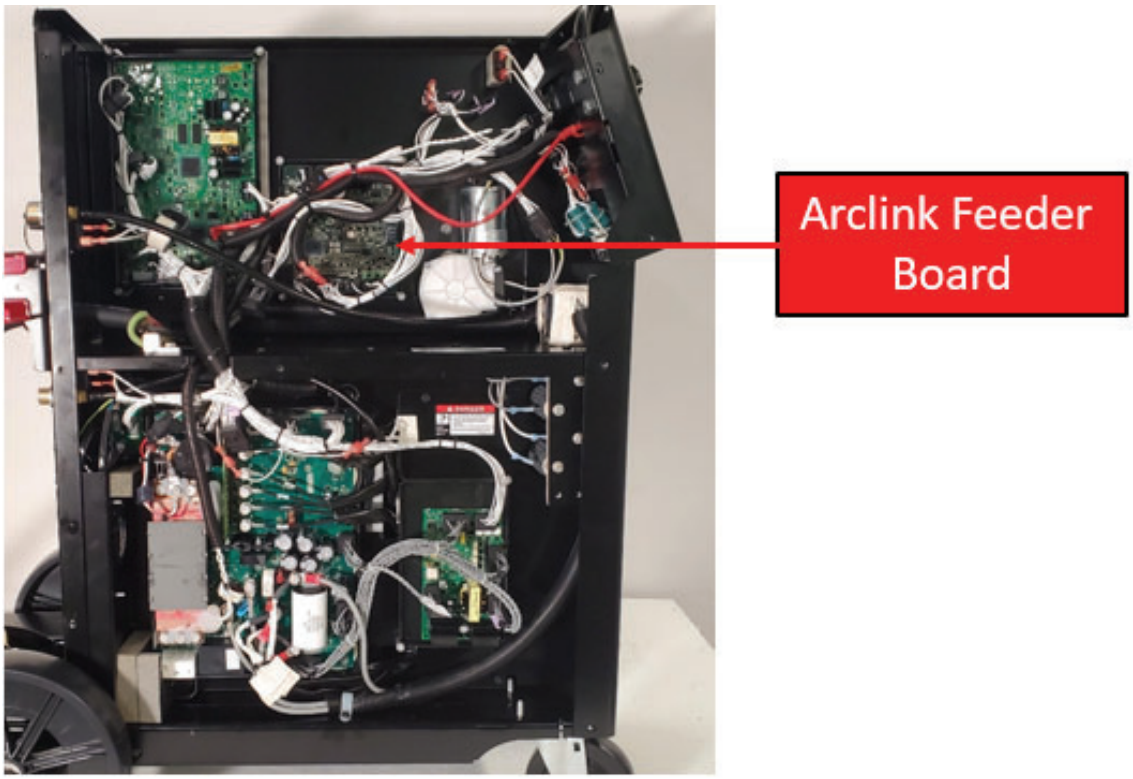


Figure F.2 – ArcLink feeder board LED and plug locations

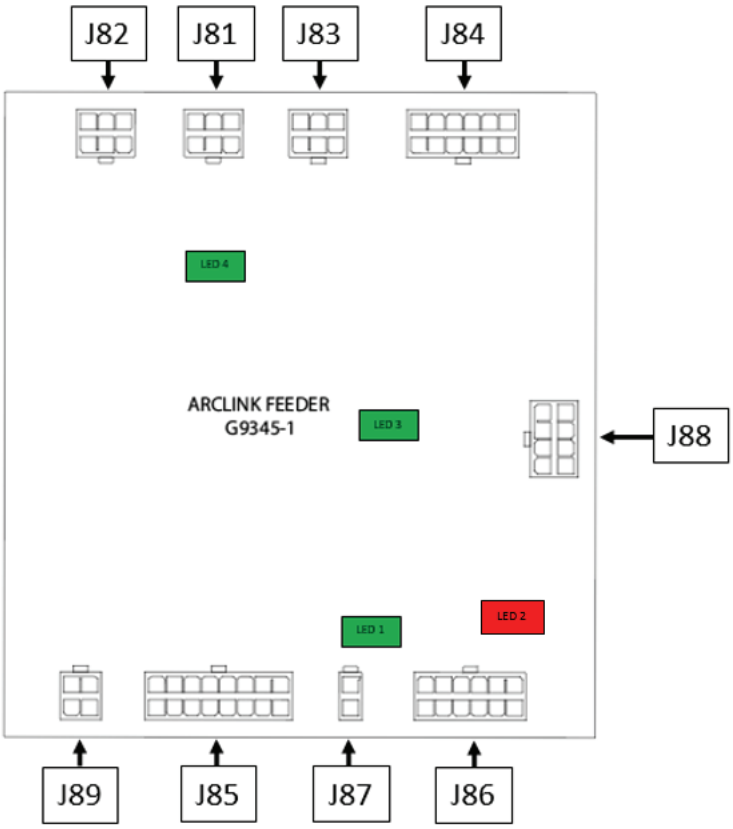
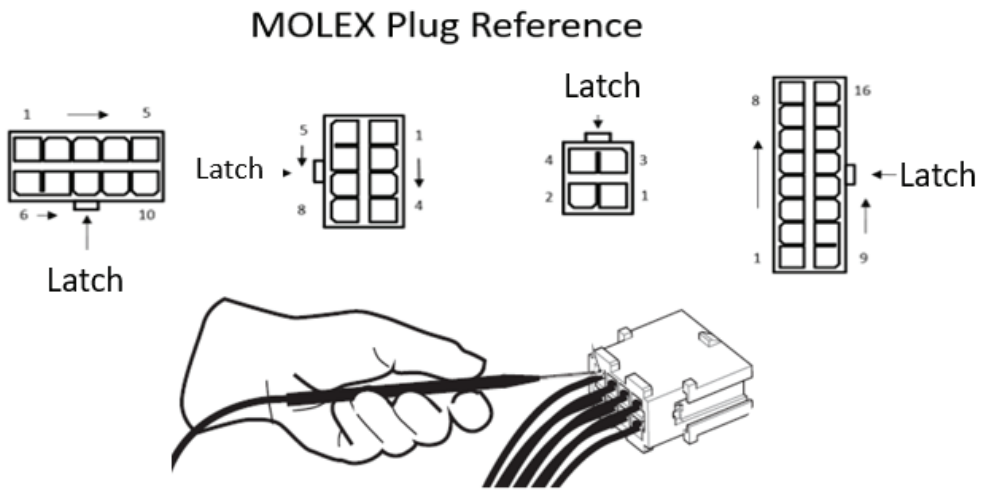


Figure F.3 – Molex plug reference



1) Always make all measurements from the wire side of the Molex connection
2) Locate the securing latch for the Molex connection to be tested
3) Starting in the upper left corner pin location #1 find the designated pin location to be tested

DIGITAL CONTROL BOARD TEST PROCEDURE

Service and repair should be performed by only Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment may result in danger to the technician or machine operator and will invalidate your factory warranty. For your safety and to avoid electrical shock, please observe all safety notes and precautions detailed throughout this manual. If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

This test will determine if the Digital Control Board is functioning properly.

MATERIALS NEEDED

Volt/Ohmmeter
Wiring Diagram

TEST PROCEDURE

1. Carefully remove input power to the Power Wave 300C machine.
2. Perform the ***Case Cover Removal Procedure***.
3. Perform the ***Capacitor Discharge Procedure***.
4. Locate the digital control board. See ***Figure F.1***. See Wiring Diagram.
5. Carefully apply the correct input power to the machine and turn the machine ON.
6. Visually inspect the board to ensure the LEDs are operating per ***Table F.1***. See ***Figure F.2***. See Wiring Diagram.
7. Using a volt/ohmmeter, perform the voltage tests outlined in ***Table F.2***. See ***Figures F.2*** and ***F.3***. See Wiring Diagram.
8. If any of the tests fail, the digital control board may be faulty.
9. If faulty, perform the ***Digital Control Board Removal And Replacement Procedure***.
10. Perform the ***Case Cover Replacement Procedure***.

Table F.1 – Digital control board LED tests

LED #	LED STATUS	LED COLOR	INDICATION
LED 1	ON	GREEN	STATUS “OK”
LED 2	ON	RED	STATUS “ERROR” WILL BLINK OUT ERROR CODE
LED 3	ON	GREEN	OUTPUT ENABLE
LED 4	ON	GREEN	SINGLE PHASE FAULT
LED 5	ON	GREEN	ELECTRODE SENSE
LED 6	ON	GREEN	WORK SENSE
LED 7	ON	GREEN	ETHERNET LINK/ACTIVITY STATUS
LED 8	ON	GREEN	ETHERNET SPEED STATUS
LED 9	ON	GREEN	INPUT SUPPLY 30 VDC TO 55 VDC
LED 10	ON	GREEN	DEVICENET EXTERNAL 24 VDC PRESENT

Table F.2 – Digital control board voltage tests

COMPONENT/CIRCUIT TESTED	CONDITION(S)	+ METER LEAD	- METER LEAD	EXPECTED VALUE
INPUT VOLTAGE FROM SWITCHBOARD	MACHINE ON	PLUG J4 PIN 1	PLUG J4 PIN 2	+48 VDC
SUPPLY TO 115V BOARD	MACHINE ON	PLUG J4 PIN 8	PLUG J8 PIN 7	+15 VDC
5 VDC ISOLATED SUPPLY	MACHINE ON	PLUG J12 PIN 3	PLUG J12 PIN 12	+5 VDC
FAN CONTROL	MACHINE ON – FANS RUNNING AT LOW SPEED	PLUG J7 PIN 6	PLUG J5 PIN 1	+15 VDC
SECONDARY 15 VDC SUPPLY	MACHINE ON	PLUG J7 PIN 14	PLUG J6 PIN 10	+15 VDC
LEM SUPPLY	MACHINE ON	PLUG J8 PIN 2	PLUG J8 PIN 6	+15 VDC
LEM SUPPLY	MACHINE ON	PLUG J8 PIN 3	PLUG J8 PIN 6	-15 VDC
LEM FEEDBACK	MACHINE ON AND OUTPUT LOADED	PLUG J8 PIN 1	PLUG J8 PIN 6	4 VDC = 500 AMPS
WELDING VOLTAGE FEEDBACK	MACHINE ON BUT OUTPUT NOT LOADED	PLUG J9 PIN 1	PLUG J9 PIN 3	~OPEN CIRCUIT VOLTAGE
ARCLINK COMMUNICATION	MACHINE ON	PLUG J11 PIN 1	PLUG J11 PIN 2	+2.0 VDC
FAN SIGNAL FROM 115V BOARD	MACHINE ON – FANS RUNNING	PLUG J6 PIN 16	PLUG J8 PIN 7	< +1 VDC
OUTPUT SIGNAL TO 115V BOARD	MACHINE ON	PLUG J7 PIN 10	PLUG J8 PIN 7	+15 VDC

Figure F.1 – Digital control board location

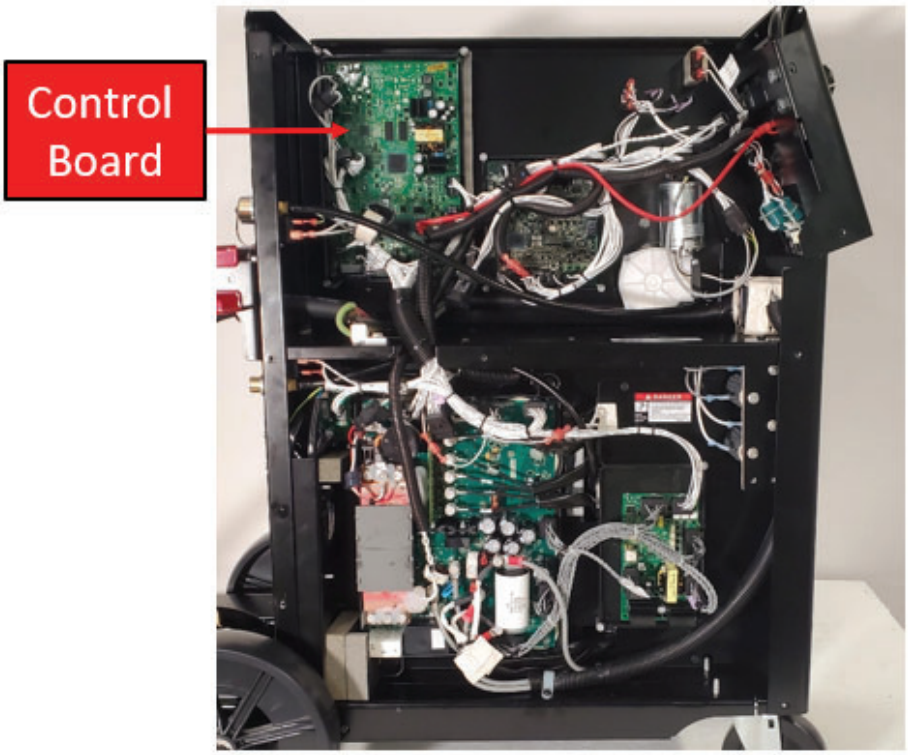


Figure F.2 – Digital control board LED and plug locations

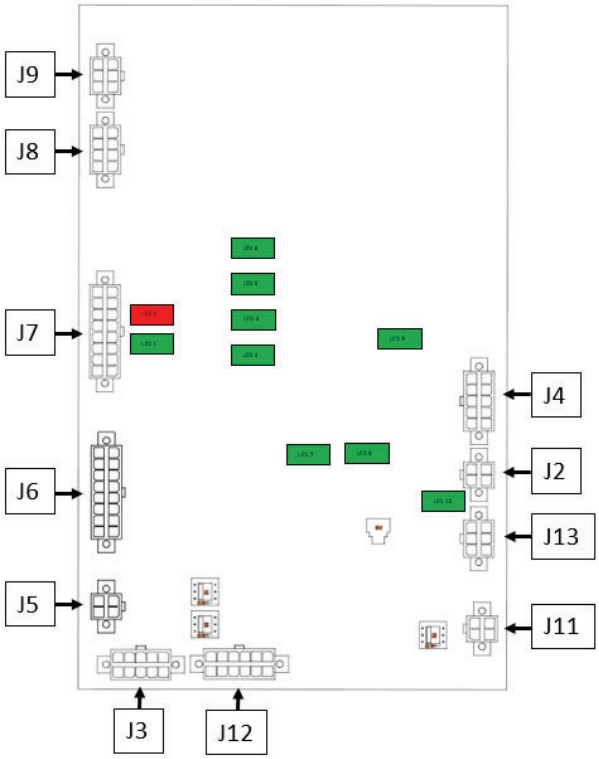
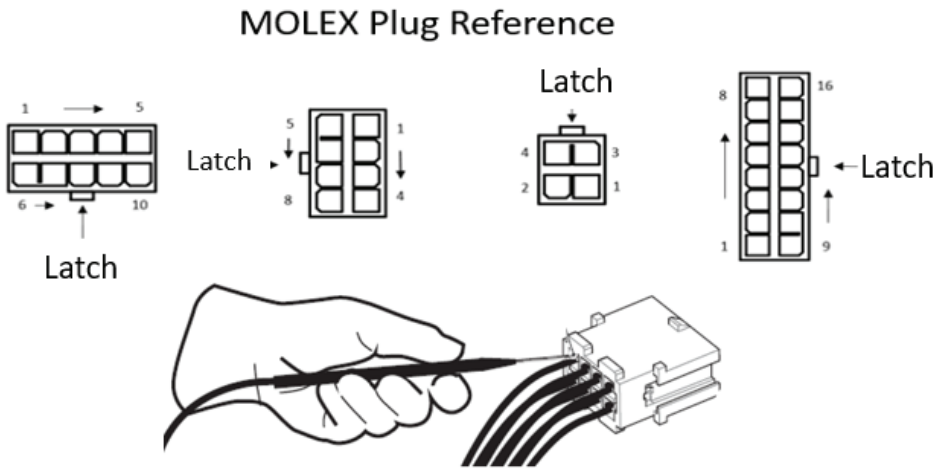


Figure F.3 – Molex plug reference



1) Always make all measurements from the wire side of the Molex connection
2) Locate the securing latch for the Molex connection to be tested
3) Starting in the upper left corner pin location #1 find the designated pin location to be tested

FAN INTERFACE BOARD TEST PROCEDURE

Service and repair should be performed by only Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment may result in danger to the technician or machine operator and will invalidate your factory warranty. For your safety and to avoid electrical shock, please observe all safety notes and precautions detailed throughout this manual. If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

This test will determine if the Fan Interface Board is functioning properly.

MATERIALS NEEDED

Volt/Ohmmeter
Wiring Diagram

TEST PROCEDURE

1. Carefully remove input power to the Power Wave 300C machine.
2. Perform the ***Case Cover Removal Procedure***.
3. Perform the ***Capacitor Discharge Procedure***.
4. Locate the fan interface board. See ***Figure F.1***. See Wiring Diagram.
5. Carefully apply the correct input power to the machine and turn the machine ON.
6. Using a volt/ohmmeter, perform the tests outlined in ***Table F.1***. See ***Figures F.2*** and ***F.3***. See Wiring Diagram.
7. If any of the tests fail, the fan interface board may be faulty.
8. If faulty, perform the ***Fan Interface Board Removal And Replacement Procedure***.
9. Perform the ***Case Cover Replacement Procedure***.

Table F.1 – Fan interface board tests

COMPONENT/CIRCUIT TESTED	CONDITION(S)	+ METER LEAD	- METER LEAD	EXPECTED VALUE
INPUT VOLTAGE TO FAN INTERFACE BOARD	MACHINE ON – FANS RUNNING	PLUG J5 PIN 1	PLUG J5 PIN 2	+48 VDC
PWM SIGNAL FROM SWITCHBOARD	MACHINE ON – FANS RUNNING	PLUG J5 PIN 3	PLUG J5 PIN 2	+20 KHZ
INPUT VOLTAGE TO FAN MOTOR 1	MACHINE ON – FANS RUNNING	PLUG J1 PIN 1	PLUG J1 PIN 2	+48 VDC
PWM SIGNAL TO FAN MOTOR 1	MACHINE ON – FANS RUNNING AT LOW SPEED	PLUG J1 PIN 3	PLUG J1 PIN 2	+1.7 VDC
PWM SIGNAL TO FAN MOTOR 1	MACHINE ON – FANS RUNNING AT HIGH SPEED	PLUG J1 PIN 3	PLUG J1 PIN 2	+5.0 VDC
INPUT VOLTAGE TO FAN MOTOR 2	MACHINE ON – FANS RUNNING	PLUG J2 PIN 1	PLUG J2 PIN 2	+48 VDC
PWM SIGNAL TO FAN MOTOR 2	MACHINE ON – FANS RUNNING AT LOW SPEED	PLUG J2 PIN 3	PLUG J2 PIN 2	+1.7 VDC
PWM SIGNAL TO FAN MOTOR 2	MACHINE ON – FANS RUNNING AT HIGH SPEED	PLUG J2 PIN 3	PLUG J2 PIN 2	+5 VDC
INPUT VOLTAGE TO FAN MOTOR 3	MACHINE ON – FANS RUNNING	PLUG J3 PIN 1	PLUG J3 PIN 2	+48 VDC
PWM SIGNAL TO FAN MOTOR 3	MACHINE ON – FANS RUNNING AT LOW SPEED	PLUG J3 PIN 3	PLUG J3 PIN 2	+1.7 VDC
PWM SIGNAL TO FAN MOTOR 3	MACHINE ON – FANS RUNNING AT HIGH SPEED	PLUG J3 PIN 3	PLUG J3 PIN 2	+5.0 VDC
INPUT VOLTAGE TO FAN MOTOR 4	MACHINE ON – FANS RUNNING	PLUG J4 PIN 1	PLUG J4 PIN 2	+48 VDC
PWM SIGNAL TO FAN MOTOR 4	MACHINE ON – FANS RUNNING AT LOW SPEED	PLUG J4 PIN 3	PLUG J4 PIN 2	+1.7 VDC
PWM SIGNAL TO FAN MOTOR 4	MACHINE ON – FANS RUNNING AT HIGH SPEED	PLUG J4 PIN 3	PLUG J4 PIN 2	+5 VDC

Figure F.1 – Fan interface board location

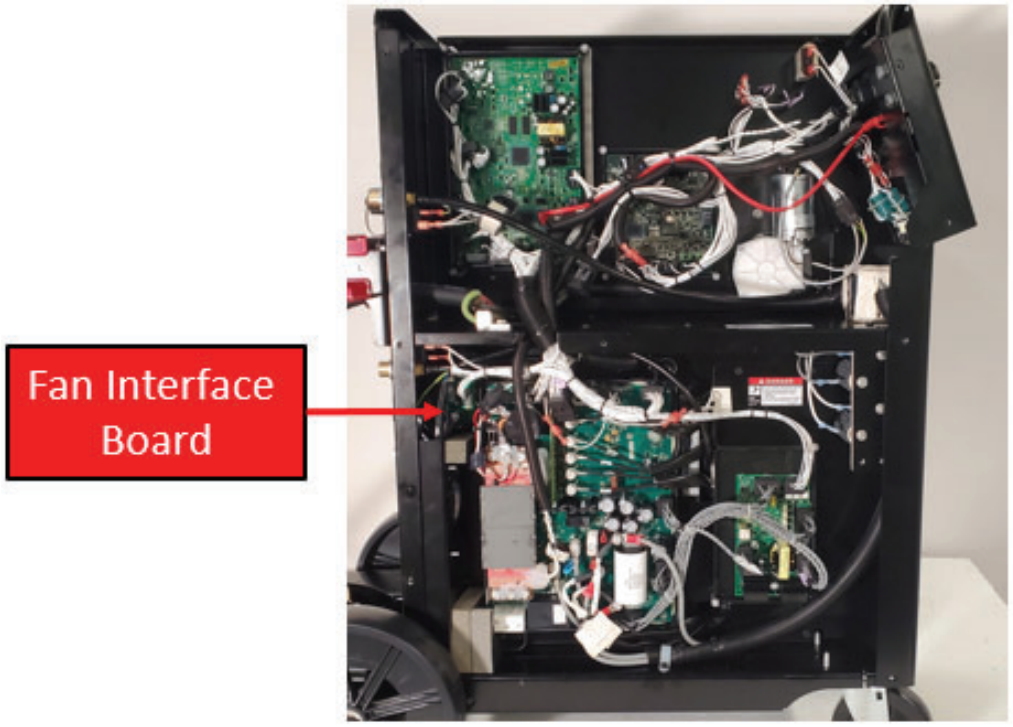


Figure F.2 – Fan interface board plug locations

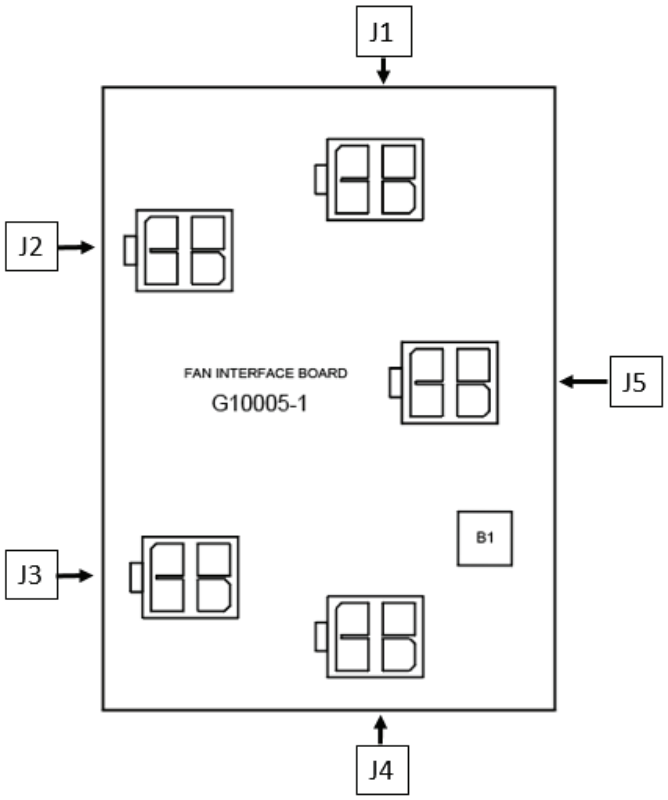
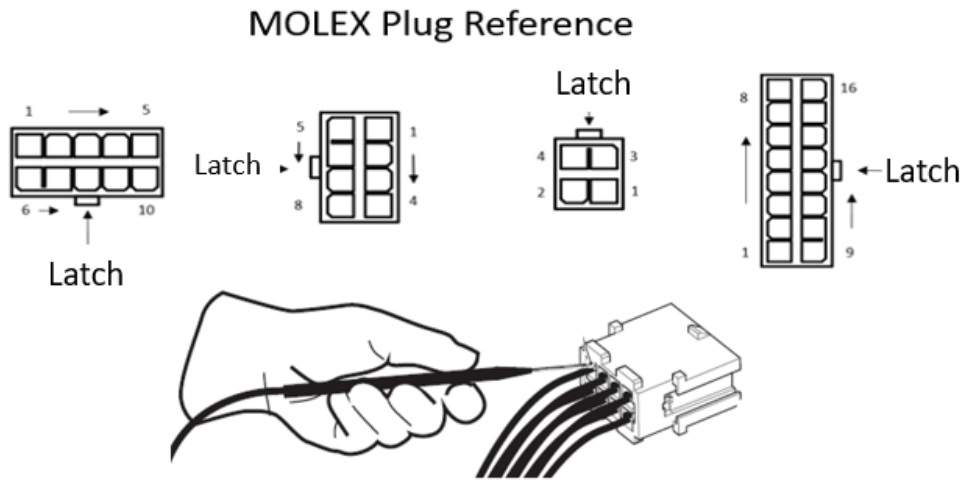


Figure F.3 – Molex plug reference



1) Always make all measurements from the wire side of the Molex connection
2) Locate the securing latch for the Molex connection to be tested
3) Starting in the upper left corner pin location #1 find the designated pin location to be tested

HIGH FREQUENCY BOARD TEST PROCEDURE

Service and repair should be performed by only Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment may result in danger to the technician or machine operator and will invalidate your factory warranty. For your safety and to avoid electrical shock, please observe all safety notes and precautions detailed throughout this manual. If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

This test will determine if the High Frequency Board is functioning properly.

MATERIALS NEEDED

Volt/Ohmmeter
Wiring Diagram

TEST PROCEDURE

1. Carefully remove input power to the Power Wave 300C machine.
2. Perform the ***Case Cover Removal Procedure***.
3. Perform the ***Capacitor Discharge Procedure***.
4. Locate the high frequency board. See ***Figure F.1***. See Wiring Diagram.
5. Carefully apply the correct input power to the machine and turn the machine ON.
6. Visually inspect the board to ensure the LEDs are operating per ***Table F.1***. See ***Figure F.2***. See Wiring Diagram.
7. Carefully remove input power to the Power Wave 300C machine.
8. Using a volt/ohmmeter, perform the resistance tests outlined in ***Table F.2***. See ***Figures F.2*** and ***F.3***. See Wiring Diagram.
9. Carefully apply the correct input power to the machine and turn the machine ON.
10. Using a volt/ohmmeter, perform the voltage tests outlined in ***Table F.3***. See ***Figures F.2*** and ***F.3***. See Wiring Diagram.
11. If any of the tests fail, the high frequency board may be faulty.
12. If faulty, perform the ***High Frequency Board Removal And Replacement Procedure***.
13. Perform the ***Case Cover Replacement Procedure***.

Table F.1 – High frequency board LED tests

LED #	LED STATUS	LED COLOR	INDICATION
1	ON	RED	48 VDC INPUT VOLTAGE PRESENT
2	ON	GREEN	15 VDC HIGH FREQUENCY ENABLE OUTPUT ON

Table F.2 – High frequency board resistance tests

COMPONENT/CIRCUIT TESTED	CONDITION(S)	+ METER LEAD	- METER LEAD	EXPECTED VALUE
EXTERNAL LOAD RESISTORS	MACHINE OFF	PLUG J4 PIN 7	PLUG J4 PIN 5	500 OHMS

Table F.3 – High frequency board voltage tests

COMPONENT/CIRCUIT TESTED	CONDITION(S)	+ METER LEAD	- METER LEAD	EXPECTED VALUE
INPUT POWER FROM AC SWITCH CONTROL BOARD	MACHINE ON – AC TIG MODE	PLUG J2 PIN 4	PLUG J2 PIN 3	+48 VDC
HIGH FREQUENCY ENABLE	MACHINE ON – AC TIG MODE – OUTPUT ON	PLUG J3 PIN 1	PLUG J3 PIN 2	15 VDC
HIGH FREQUENCY ENABLE	MACHINE ON – AC TIG MODE – OUTPUT OFF	PLUG J3 PIN 1	PLUG J3 PIN 2	0 VDC

Figure F.1 – High frequency board location

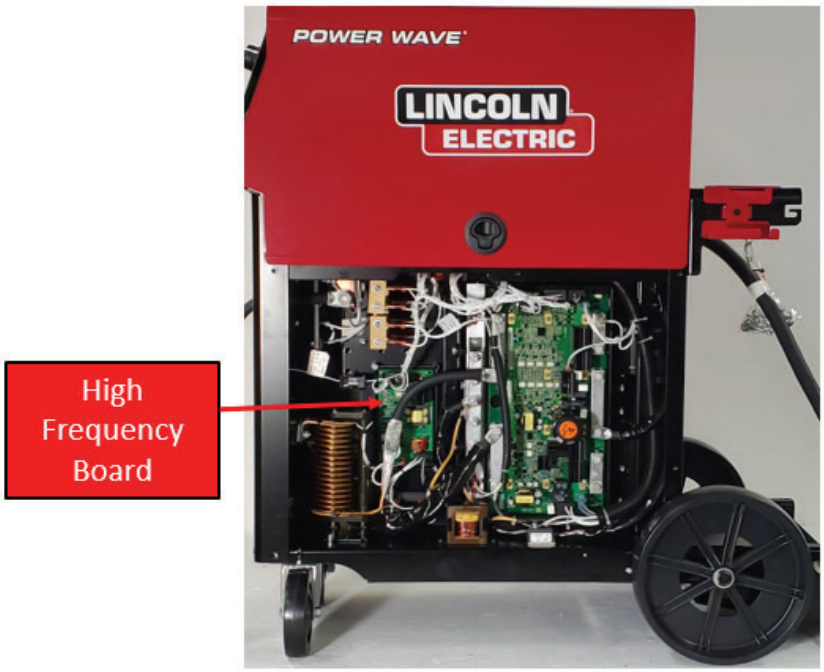


Figure F.2 – High frequency board lead locations

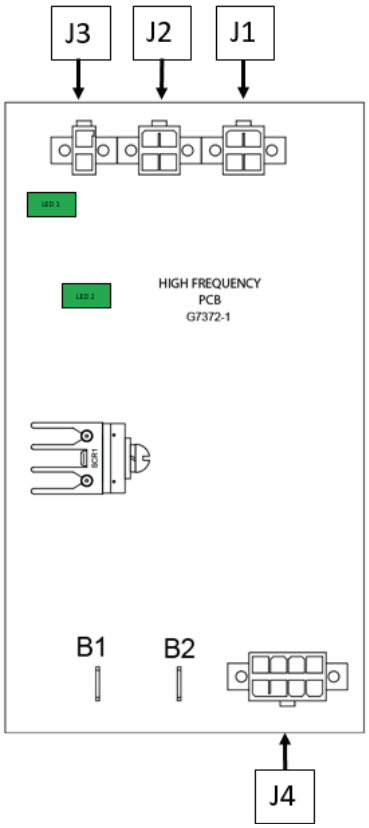
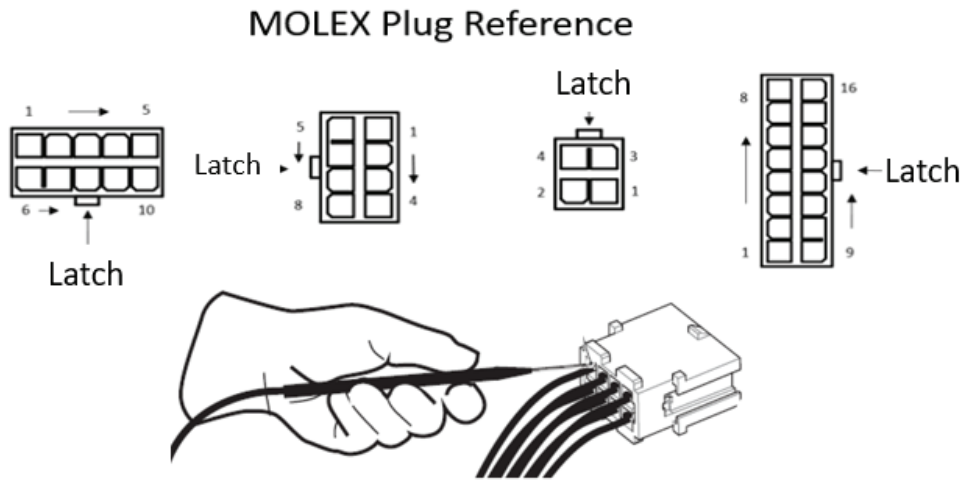


Figure F.3 – Molex plug reference



1) Always make all measurements from the wire side of the Molex connection
2) Locate the securing latch for the Molex connection to be tested
3) Starting in the upper left corner pin location #1 find the designated pin location to be tested

MAIN SWITCHBOARD / POWER CONVERSION ASSEMBLY TEST PROCEDURE

Service and repair should be performed by only Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment may result in danger to the technician or machine operator and will invalidate your factory warranty. For your safety and to avoid electrical shock, please observe all safety notes and precautions detailed throughout this manual. If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

This test will determine if the Main Switchboard / Power Conversion Assembly is functioning properly.

MATERIALS NEEDED

7/16” Nutdriver
Volt/Ohmmeter
Wiring Diagram

TEST PROCEDURE

1. Carefully remove input power to the Power Wave 300C machine.
2. Perform the ***Case Cover Removal Procedure***.
3. Perform the ***Capacitor Discharge Procedure***.
4. Locate the main switchboard / power conversion assembly. See ***Figure F.1***. See Wiring Diagram.
5. Carefully apply the correct input power to the machine and turn the machine ON.
6. Visually inspect the board to ensure the LEDs are operating per ***Table F.1***. See ***Figure F.2***. See Wiring Diagram.
7. Carefully remove input power to the Power Wave 300C machine.
8. Using a 7/16” nutdriver, remove the six bolts and washers securing leads A, A2, A3, A4, A5 and A6 to terminals B55, B56, B57, B58, B59, and B60 of the main switchboard / power conversion assembly. See ***Figure F.2***. See Wiring Diagram.
9. Using a volt/ohmmeter (set for diode testing), perform the diode tests outlined in ***Table F.2***. See ***Figures F.2*** and ***F.3***. See Wiring Diagram.
10. Using a 7/16” nutdriver, attach the six bolts and washers securing leads A, A2, A3, A4, A5 and A6 to terminals B55, B56, B57, B58, B59, and B60 of the main switchboard / power conversion assembly. See ***Figure F.2***. See Wiring Diagram.
11. Carefully apply the correct input power to the machine and turn the machine ON.
12. Using a volt/ohmmeter, perform the tests outlined in ***Table F.3***. See ***Figures F.2*** and ***F.3***. See Wiring Diagram.
13. If any of the tests fail, the main switchboard / power conversion assembly may be faulty.
14. If faulty, perform the ***Main Switchboard / Power Conversion Assembly Removal And Replacement Procedure***.
15. Perform the ***Case Cover Replacement Procedure***.

Table F.1 – Main switchboard / power conversion assembly LED tests

LED #	LED STATUS	LED COLOR	INDICATION
1	ON	GREEN	48 VDC AUXILIARY POWER PRESENT
2	ON	GREEN	BUCK IGBT FUNCTIONING
3	ON	GREEN	BOOST IGBT FUNCTIONING
4	ON	GREEN	15 VDC POWER FUNCTIONING/PRESENT

Table F.2 – Main switchboard / power conversion assembly diode tests

COMPONENT/CIRCUIT TESTED	CONDITION(S)	+ METER LEAD	- METER LEAD	EXPECTED VALUE
INPUT RECTIFIER	MACHINE OFF	B30	B10	~.3 - .7 VDC
INPUT RECTIFIER	MACHINE OFF	B31	B10	~.3 - .7 VDC
INPUT RECTIFIER	MACHINE OFF	B32	B10	~.3 - .7 VDC
INPUT RECTIFIER	MACHINE OFF	B13	B30	~.3 - .7 VDC
INPUT RECTIFIER	MACHINE OFF	B13	B31	~.3 - .7 VDC
INPUT RECTIFIER	MACHINE OFF	B13	B32	~.3 - .7 VDC
BUCK IGBT	MACHINE OFF	B28	B12	~.3 - .7 VDC
BOOST IGBT	MACHINE OFF	B13	B29	~.3 - .7 VDC
H BRIDGE CIRCUIT	MACHINE OFF	B11	B48	~.3 - .7 VDC
H BRIDGE CIRCUIT	MACHINE OFF	B37	B48	~.3 - .7 VDC
H BRIDGE CIRCUIT	MACHINE OFF	B49	B11	~.3 - .7 VDC
H BRIDGE CIRCUIT	MACHINE OFF	B49	B37	~.3 - .7 VDC
MULTI-PHASE CHOPPER	MACHINE OFF	B52	B55	~.3 - .7 VDC
MULTI-PHASE CHOPPER	MACHINE OFF	B52	B56	~.3 - .7 VDC
MULTI-PHASE CHOPPER	MACHINE OFF	B52	B57	~.3 - .7 VDC
MULTI-PHASE CHOPPER	MACHINE OFF	B52	B58	~.3 - .7 VDC
MULTI-PHASE CHOPPER	MACHINE OFF	B52	B59	~.3 - .7 VDC
MULTI-PHASE CHOPPER	MACHINE OFF	B52	B60	~.3 - .7 VDC

Table F.3 – Main switchboard / power conversion assembly tests

COMPONENT/CIRCUIT TESTED	CONDITION(S)	+ METER LEAD	- METER LEAD	EXPECTED VALUE
INCOMING LINE VOLTAGE	MACHINE ON	B30	B31	(VAC) LINE VOLTAGE
INCOMING LINE VOLTAGE	MACHINE ON	B30	B32	(VAC) LINE VOLTAGE
INCOMING LINE VOLTAGE	MACHINE ON	B32	B31	(VAC) LINE VOLTAGE
FILTERED/RECTIFIED AC VOLTAGE	MACHINE ON	PLUG J42 PIN 1	PLUG J42 PIN 12	(VDC) LINE VOLTAGE X 1.4
FILTERED/RECTIFIED AC VOLTAGE	MACHINE ON	PLUG J42 PIN 8	PLUG J42 PIN 12	(VDC) LINE VOLTAGE X 1.4
+400 VDC BUS VOLTAGE	MACHINE ON	PLUG J42 PIN 4	PLUG J42 PIN 12	~+400 VDC
MAIN BUCK SUPPLY VOLTAGE	MACHINE ON	PLUG J41 PIN 11	PLUG J41 PIN 3	~+15 VDC
AUX. BUCK SUPPLY	MACHINE ON	PLUG J41 PIN 1	PLUG J41 PIN 9	~+15 VDC
FAN CONTROL VOLTAGE	MACHINE ON - FANS ON LOW SPEED	PLUG J45 PIN 5	PLUG J41 PIN 10	~+12 VDC
48 VDC FAN INPUT VOLTAGE	MACHINE ON	PLUG J45 PIN 3	PLUG J45 PIN 2	~+48 VDC
PWM SIGNAL TO FAN INTERFACE BOARD	MACHINE ON - FANS ON LOW SPEED	PLUG J45 PIN 4	PLUG J45 PIN 2	~+1.7 VDC
48 VDC OUTPUT TO ARCLINK BOARD	MACHINE ON	PLUG J45 PIN 7	PLUG J45 PIN 9	~+48 VDC
5 VDC ISOLATED CHOPPER SUPPLY TO DIGITAL CONTROL BOARD	MACHINE ON	PLUG J46 PIN 1	PLUG J46 PIN 2	~+5 VDC
+15 VDC LEM SUPPLY VOLTAGE	MACHINE ON	PLUG J47 PIN 3	PLUG J47 PIN 4	~+15 VDC
-5 VDC LEM SUPPLY VOLTAGE	MACHINE ON	PLUG J47 PIN 2	PLUG J47 PIN 4	~-5 VDC
DIGITAL CONTROL BOARD SUPPLY	MACHINE ON	PLUG J45 PIN 8	PLUG J45 PIN 6	~+48 VDC
BUCK/BOOST OUTPUT	MACHINE ON	B48	B49	~+400 VDC
PLANAR TRANSFORMER INPUT	MACHINE ON	B37	B41	50 KHZ
INPUT TO CHOPPER BOARD	MACHINE ON	B51	B52	~+100 VDC

Figure F.1 – Main switchboard / power conversion assembly location

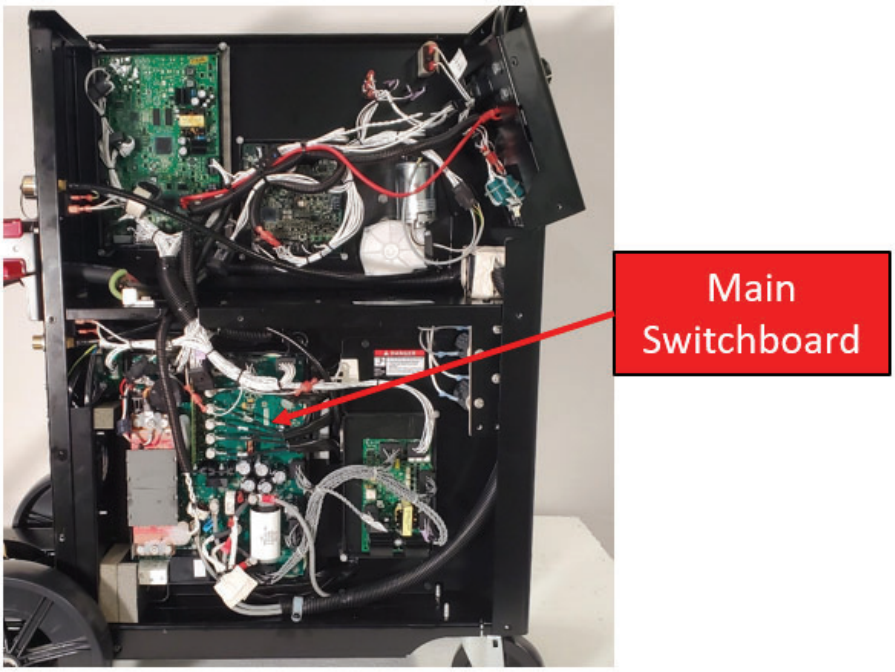


Figure F.2 – Main switchboard / power conversion assembly plug and terminal locations

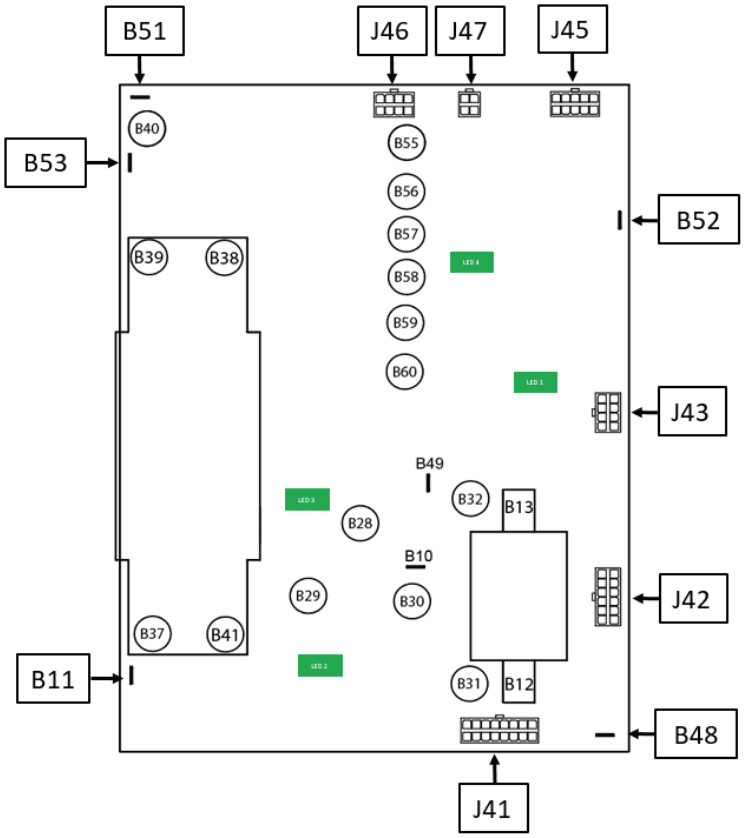
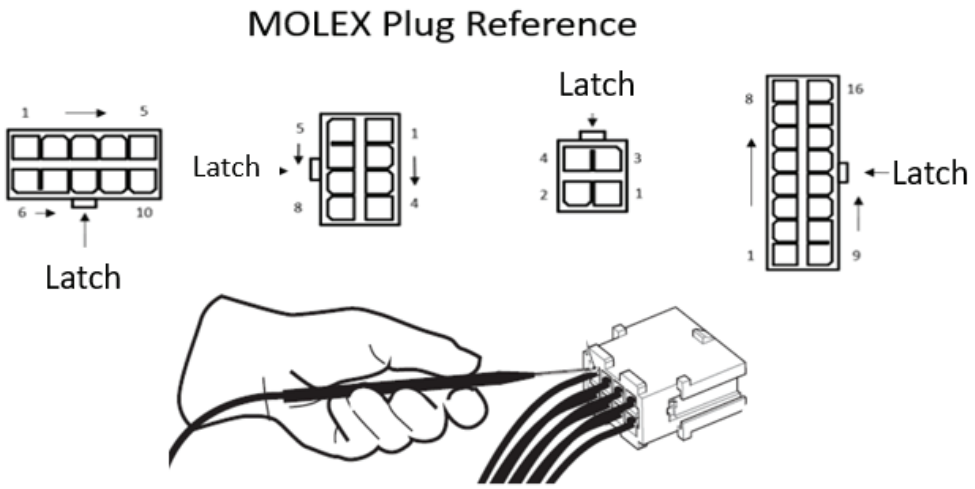


Figure F.3 – Molex plug reference locations



1) Always make all measurements from the wire side of the Molex connection
2) Locate the securing latch for the Molex connection to be tested
3) Starting in the upper left corner pin location #1 find the designated pin location to be tested

PFC CONTROL BOARD TEST PROCEDURE

Service and repair should be performed by only Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment may result in danger to the technician or machine operator and will invalidate your factory warranty. For your safety and to avoid electrical shock, please observe all safety notes and precautions detailed throughout this manual. If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

This test will determine if the PFC Control Board is functioning properly.

MATERIALS NEEDED

Volt/Ohmmeter
Wiring Diagram

TEST PROCEDURE

1. Carefully remove input power to the Power Wave 300C machine.
2. Perform the ***Case Cover Removal Procedure***.
3. Perform the ***Capacitor Discharge Procedure***.
4. Locate the PFC control board. See ***Figure F.1***. See Wiring Diagram.
5. Carefully apply the correct input power to the machine and turn the machine ON.
6. Visually inspect the board to ensure the LEDs are operating per ***Table F.1***. See ***Figure F.2***. See Wiring Diagram.
7. Carefully remove input power to the Power Wave 300C machine.
8. Using a volt/ohmmeter, perform the diode and resistance tests outlined in ***Table F.2***. See ***Figures F.2*** and ***F.3***. See Wiring Diagram.
9. Carefully apply the correct input power to the machine and turn the machine ON.
10. Using a volt/ohmmeter, perform the tests outlined in ***Table F.3***. See ***Figures F.2*** and ***F.3***. See Wiring Diagram.
11. If any of the tests fail, the PFC control board may be faulty.
12. If faulty, perform the ***PFC Control Board Removal And Replacement Procedure***.
13. Perform the ***Case Cover Replacement Procedure***.

Table F.1 – PFC control board LED tests

LED #	LED STATUS	LED COLOR	INDICATION
1	ON	RED	ERROR CODE (LED WILL FLASH ERROR CODE)
2	ON	GREEN	15 VDC POWER SUPPLY FUNCTIONING PROPERLY

Table F.2 – PFC control board resistance and diode tests

COMPONENT/CIRCUIT TESTED	CONDITION(S)	+ METER LEAD	- METER LEAD	EXPECTED VALUE
RELAY DRIVE CIRCUIT	MACHINE OFF	PLUG J23 PIN 3	PLUG J23 PIN 4	38K OHMS
AUX. BUCK DRIVE ZENER DIODE	MACHINE OFF	PLUG J23 PIN 2	PLUG J23 PIN 1	~+.121 VDC
SINGLE PHASE DETECT ZENER DIODE	MACHINE OFF	PLUG J23 PIN 2	PLUG J23 PIN 7	~+.121 VDC
MAIN BUCK DRIVE ZENER DIODE	MACHINE OFF	PLUG J23 PIN 11	PLUG J23 PIN 12	~+.121 VDC
MAIN BOOST IGBT DRIVE ZENER DIODE	MACHINE OFF	PLUG J23 PIN 8	PLUG J23 PIN 7	~+.121 VDC
MAIN AUX. BOOST IGBT DRIVE ZENER DIODE	MACHINE OFF	PLUG J23 PIN 9	PLUG J23 PIN 10	~+.121 VDC

Table F.3 – PFC control board voltage tests

COMPONENT/CIRCUIT TESTED	CONDITION(S)	+ METER LEAD	- METER LEAD	EXPECTED VALUE
INPUT POWER SUPPLY FROM SWITCHBOARD	MACHINE ON	PLUG J27 PIN 4	PLUG J27 PIN 3	(VDC) LINE VOLTAGE X 1.4
MAIN BUCK SUPPLY	MACHINE ON	PLUG J26 PIN 1	PLUG J26 PIN 4	~+15 VDC
AUX. BUCK SUPPLY	MACHINE ON	PLUG J26 PIN 3	PLUG J26 PIN 6	~+15 VDC
RECTIFIED AC	MACHINE ON	PLUG J25 PIN 1	PLUG J25 PIN 11	(VDC) LINE VOLTAGE X 1.4
400 VDC CAP VOLTAGE	MACHINE ON	PLUG J25 PIN 9	PLUG J27 PIN 3	~+400 VDC
MAIN RELAY DRIVE	MACHINE ON	PLUG J23 PIN 3	PLUG J23 PIN 4	~+15 VDC

Figure F.1 – PFC control board location

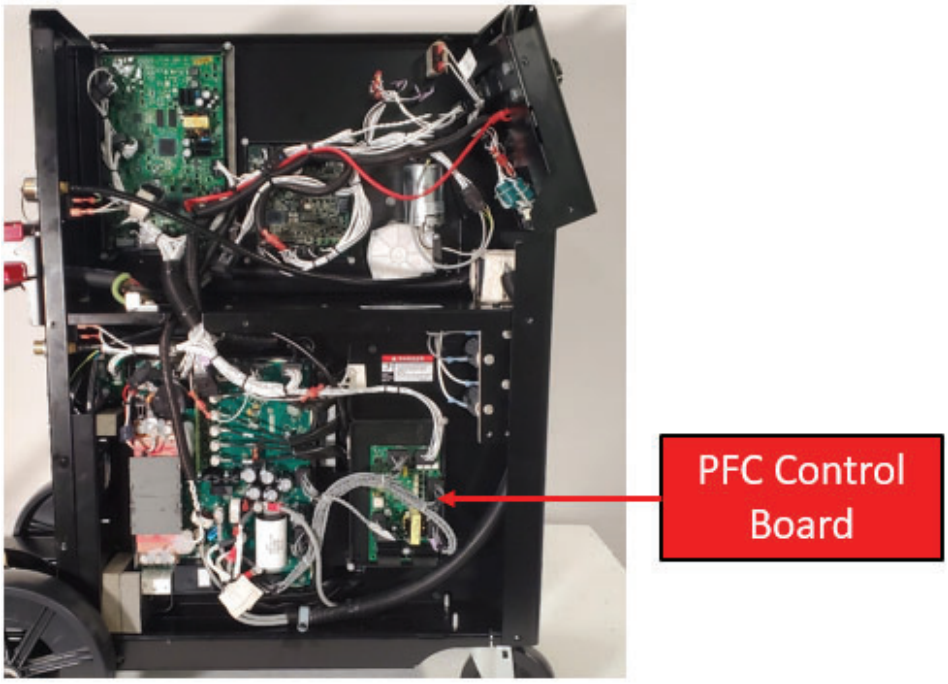


Figure F.2 – PFC control board LED and plug locations

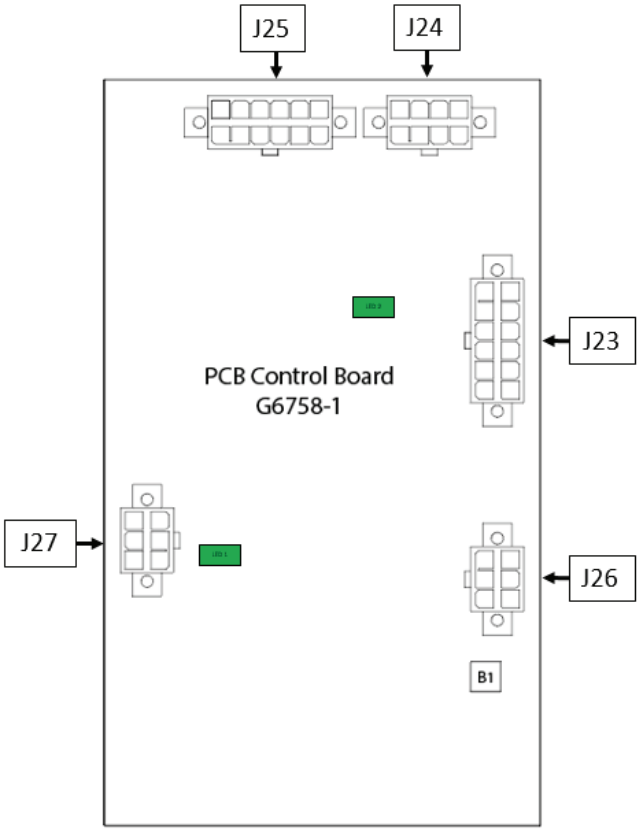
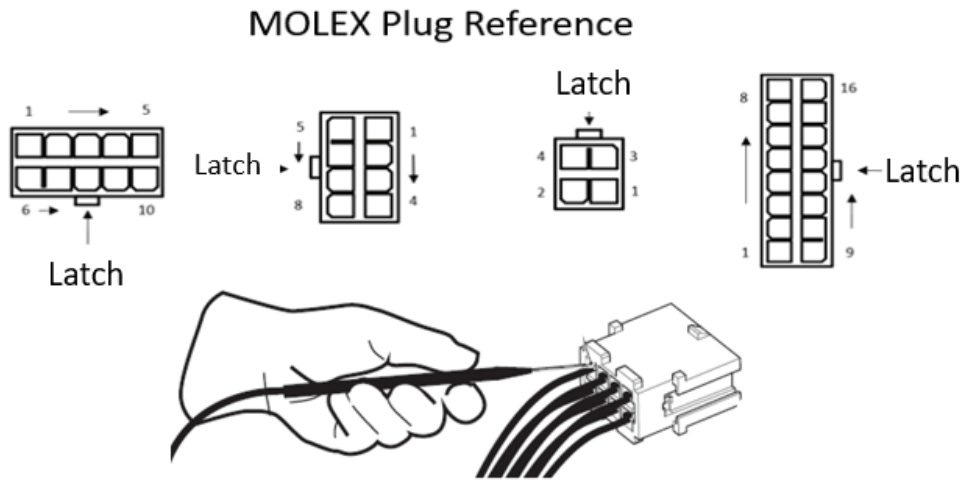


Figure F.3 – Molex plug reference



1) Always make all measurements from the wire side of the Molex connection
2) Locate the securing latch for the Molex connection to be tested
3) Starting in the upper left corner pin location #1 find the designated pin location to be tested

SENSE LEAD INTERFACE BOARD TEST PROCEDURE

Service and repair should be performed by only Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment may result in danger to the technician or machine operator and will invalidate your factory warranty. For your safety and to avoid electrical shock, please observe all safety notes and precautions detailed throughout this manual. If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

This test will determine if the Sense Lead Interface Board is functioning properly.

MATERIALS NEEDED

Volt/Ohmmeter
Wiring Diagram

TEST PROCEDURE

1. Carefully remove input power to the Power Wave 300C machine.
2. Perform the ***Case Cover Removal Procedure***.
3. Perform the ***Capacitor Discharge Procedure***.
4. Locate the sense lead interface board. See ***Figure F.1***. See Wiring Diagram.
5. Carefully apply the correct input power to the machine and turn the machine ON.
6. Using a volt/ohmmeter, perform the tests outlined in ***Table F.1***. See ***Figures F.2*** and ***F.3***. See Wiring Diagram.
7. If any of the tests fail, the sense lead interface board may be faulty.
8. If faulty, perform the ***Sense Lead Interface Board Removal And Replacement Procedure***.
9. Perform the ***Case Cover Replacement Procedure***.

Table F.1 – Sense lead interface board voltage tests

COMPONENT/CIRCUIT TESTED	CONDITION(S)	+ METER LEAD	- METER LEAD	EXPECTED VALUE
INPUT VOLTAGE FROM ARCLINK FEEDER BOARD	MACHINE ON	PLUG J2 PIN 8	PLUG J2 PIN 7	+48 VDC
CAN COMMUNICATION	MACHINE ON	PLUG J2 PIN 4	PLUG J2 PIN 3	+2 VDC
VOLTAGE TO AC SWITCHBOARD	MACHINE ON	PLUG J22 PIN 2	PLUG J22 PIN 1	+48 VDC
CAN COMMUNICATION	MACHINE ON	PLUG J22 PIN 4	PLUG J22 PIN 3	+2 VDC
VOLTAGE FROM AC SWITCHBOARD	MACHINE ON	J22 PIN 9	J22 PIN 1	+15 VDC

Figure F.1 – Sense lead interface board location

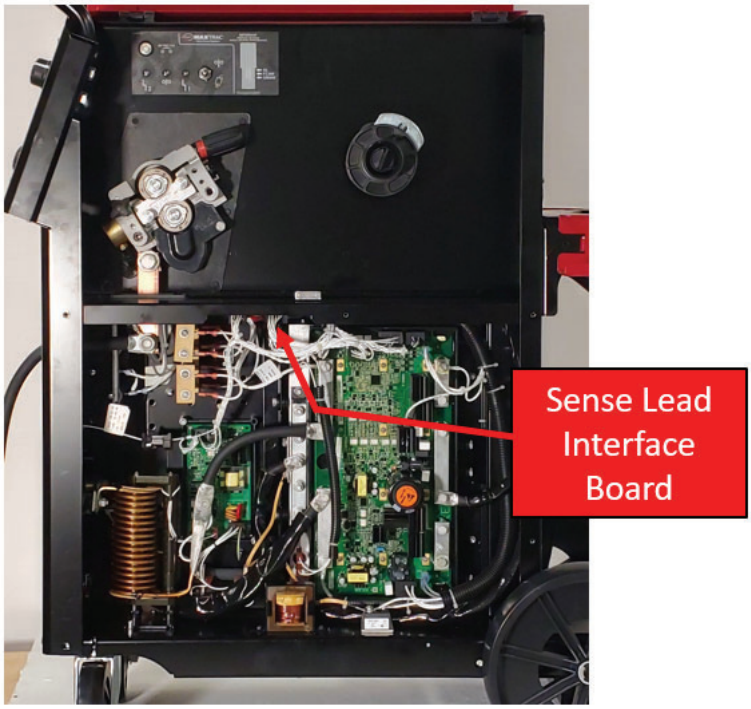


Figure F.2 – Sense lead interface board plug locations

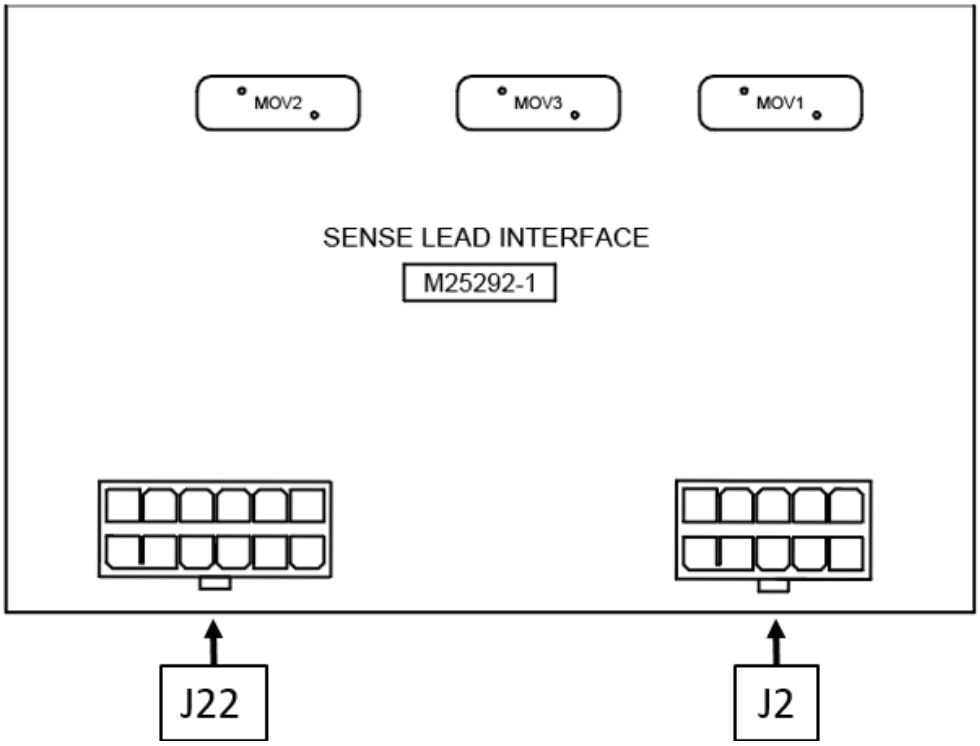
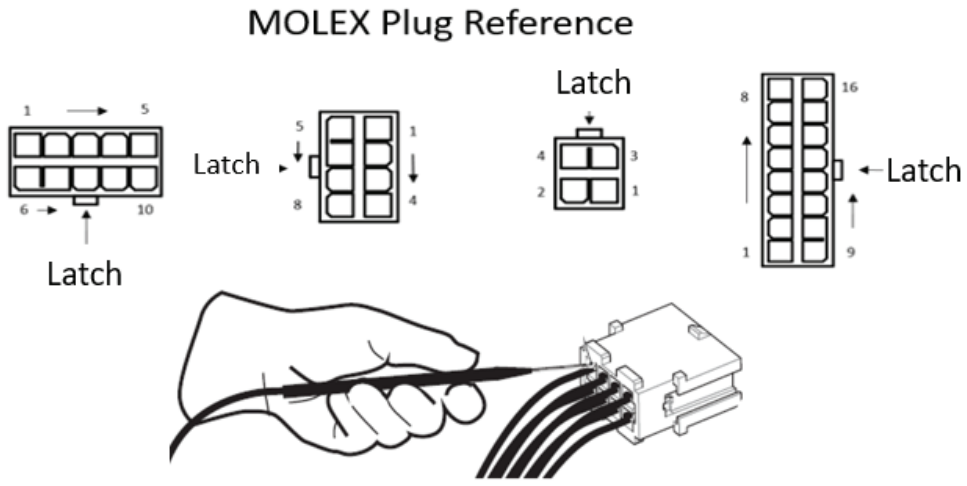


Figure F.3 – Molex plug reference



1) Always make all measurements from the wire side of the Molex connection
2) Locate the securing latch for the Molex connection to be tested
3) Starting in the upper left corner pin location #1 find the designated pin location to be tested

INPUT LINE SWITCH TEST PROCEDURE

Service and repair should be performed by only Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment may result in danger to the technician or machine operator and will invalidate your factory warranty. For your safety and to avoid electrical shock, please observe all safety notes and precautions detailed throughout this manual. If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

This test will determine if the Input Line Switch is functioning properly.

MATERIALS NEEDED

Phillips Screwdriver
Volt/Ohmmeter
Wiring Diagram

TEST PROCEDURE

1. Carefully remove input power to the Power Wave 300C machine.
2. Perform the ***Case Cover Removal Procedure***.
3. Perform the ***Capacitor Discharge Procedure***.
4. Locate the input line switch. See ***Figure F.1***. See Wiring Diagram.
5. Using a Phillips screwdriver, loosen the six screws securing the leads to the terminals of the input line switch. See Wiring Diagram. Label and disconnect the six leads from the input line switch.
6. Using a volt/ohmmeter, perform the resistance tests outlined in ***Table F.1***. See ***Figure F.2***. See Wiring Diagram.
7. Using a Phillips screwdriver, tighten the six screws securing the leads to the terminals of the input line switch. See Wiring Diagram.
8. If any of the tests fail, the input line switch may be faulty.
9. If faulty, perform the ***Input Line Switch Removal And Replacement Procedure***.
10. Perform the ***Case Cover Replacement Procedure***.

Table F.1 – Input line switch resistance tests

COMPONENT/CIRCUIT TESTED	CONDITION(S)	+ METER LEAD	- METER LEAD	EXPECTED VALUE
UPPER SECTION OF LINE SWITCH	SWITCH IN OFF POSITION	TERMINAL L1	TERMINAL T1	OPEN (OL)
UPPER SECTION OF LINE SWITCH	SWITCH IN ON POSITION	TERMINAL L1	TERMINAL T1	LESS THAN 1 OHM
MIDDLE SECTION OF LINE SWITCH	SWITCH IN OFF POSITION	TERMINAL L2	TERMINAL T2	OPEN (OL)
MIDDLE SECTION OF LINE SWITCH	SWITCH IN ON POSITION	TERMINAL L2	TERMINAL T2	LESS THAN 1 OHM
LOWER SECTION OF LINE SWITCH	SWITCH IN OFF POSITION	TERMINAL L3	TERMINAL T3	OPEN (OL)
LOWER SECTION OF LINE SWITCH	SWITCH IN ON POSITION	TERMINAL L3	TERMINAL T3	LESS THAN 1 OHM
INPUT SECTION OF LINE SWITCH	SWITCH IN OFF POSITION	TERMINAL L1	TERMINAL L2	OPEN (OL)
INPUT SECTION OF LINE SWITCH	SWITCH IN OFF POSITION	TERMINAL L2	TERMINAL L3	OPEN (OL)
INPUT SECTION OF LINE SWITCH	SWITCH IN OFF POSITION	TERMINAL L3	TERMINAL L1	OPEN (OL)
OUTPUT SECTION OF LINE SWITCH	SWITCH IN OFF POSITION	TERMINAL T1	TERMINAL T2	OPEN (OL)
OUTPUT SECTION OF LINE SWITCH	SWITCH IN OFF POSITION	TERMINAL T2	TERMINAL T3	OPEN (OL)
OUTPUT SECTION OF LINE SWITCH	SWITCH IN OFF POSITION	TERMINAL T3	TERMINAL T1	OPEN (OL)

Figure F.1 – Input line switch location

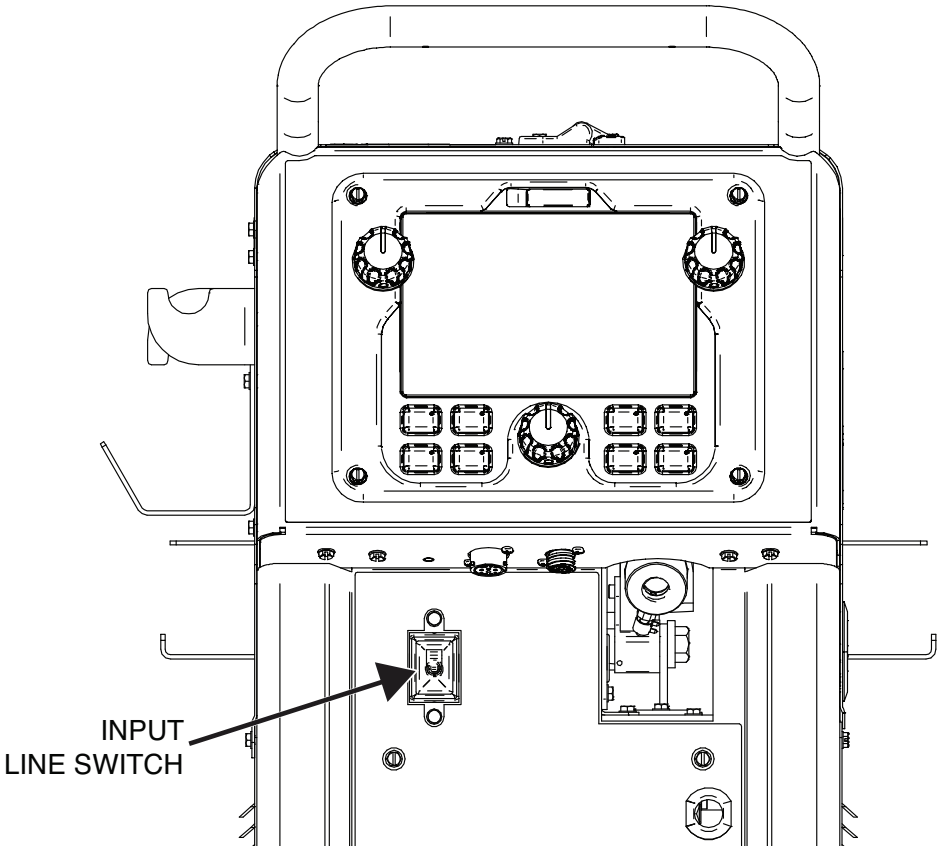
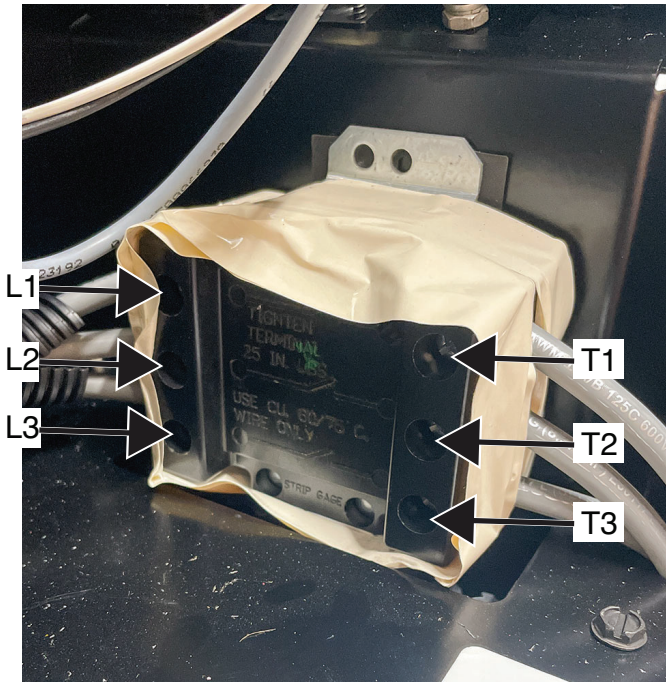


Figure F.2 – Input line switch terminal locations



MOTOR TACHOMETER TEST PROCEDURE

Service and repair should be performed by only Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment may result in danger to the technician or machine operator and will invalidate your factory warranty. For your safety and to avoid electrical shock, please observe all safety notes and precautions detailed throughout this manual. If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

This test will determine if the Motor Tachometer is functioning properly.

MATERIALS NEEDED

Volt/Ohmmeter
Wiring Diagram

TEST PROCEDURE

1. Carefully remove input power to the Power Wave 300C machine.
2. Perform the ***Case Cover Removal Procedure***.
3. Perform the ***Capacitor Discharge Procedure***.
4. Locate the motor tachometer. See ***Figure F.1***. See Wiring Diagram.
5. Using a volt/ohmmeter, perform the tests outlined in ***Table F.1***. See ***Figure F.2***. See Wiring Diagram.
6. If any of the tests fail, the motor tachometer may be faulty.
7. If faulty, perform the ***Wide Drive Motor And Gear Box Assembly Removal And Replacement Procedure***.
8. Perform the ***Case Cover Replacement Procedure***.

Table F.1 – Motor tachometer tests

COMPONENT/CIRCUIT TESTED	CONDITION(S)	+ METER LEAD	- METER LEAD	EXPECTED VALUE
SUPPLY VOLTAGE TO MOTOR TACHOMETER	MACHINE ON AND WIRE DRIVE MOTOR RUNNING	PLUG P8 RED LEAD	PLUG P8 BLACK LEAD	+5 VDC
TACHOMETER FEEDBACK A VARIES WITH MOTOR SPEED	MACHINE ON AND WIRE DRIVE MOTOR RUNNING	PLUG P8 YELLOW LEAD	PLUG P8 BLACK LEAD	165 HZ. TO 1.8 KHZ.
TACHOMETER FEEDBACK B VARIES WITH MOTOR SPEED	MACHINE ON AND WIRE DRIVE MOTOR RUNNING	PLUG P8 BLUE LEAD	PLUG P8 BLACK LEAD	165 HZ. TO 1.8 KHZ.

Figure F.1 – Motor tachometer location

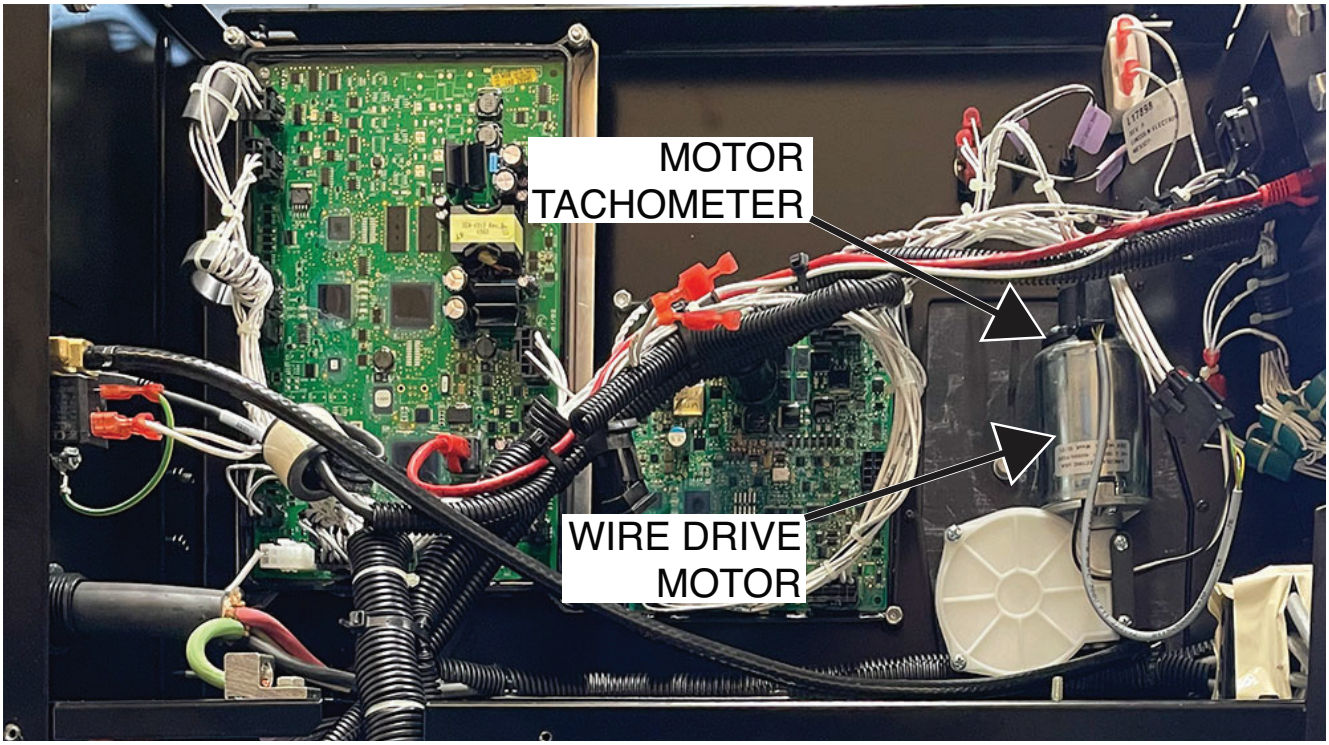
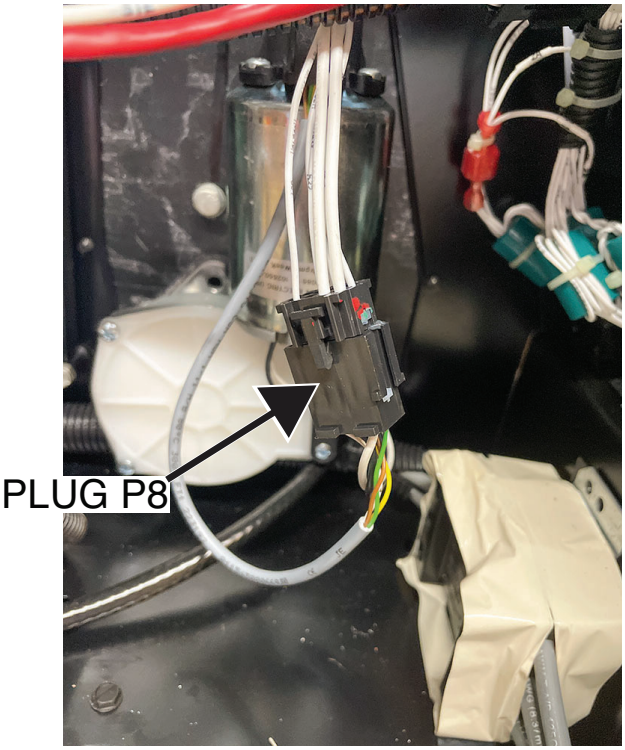


Figure F.2 – Wire drive motor plug P8 location



WIRE DRIVE MOTOR TEST PROCEDURE

Service and repair should be performed by only Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment may result in danger to the technician or machine operator and will invalidate your factory warranty. For your safety and to avoid electrical shock, please observe all safety notes and precautions detailed throughout this manual. If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

This test will determine if the Wire Drive Motor is functioning properly.

MATERIALS NEEDED

Volt/Ohmmeter
Wiring Diagram

TEST PROCEDURE

1. Carefully remove input power to the Power Wave 300C machine.
2. Perform the ***Case Cover Removal Procedure***.
3. Perform the ***Capacitor Discharge Procedure***.
4. Locate the wire drive motor. See ***Figure F.1***. See Wiring Diagram.
5. Using a volt/ohmmeter, perform the resistance tests outlined in ***Table F.1***. See ***Figure F.2***. See Wiring Diagram.
6. Carefully apply the correct input power to the machine and turn the machine ON.
7. Using a volt/ohmmeter, perform the voltage tests outlined in ***Table F.2***. See ***Figures F.2***. See Wiring Diagram.
8. If any of the tests fail, the wire drive motor may be faulty.
9. If faulty, perform the ***Wire Drive Motor And Gear Box Removal And Replacement Procedure***.
10. Perform the ***Case Cover Replacement Procedure***.

Table F.1 – Wire drive motor resistance tests

COMPONENT/CIRCUIT TESTED	CONDITION(S)	+ METER LEAD	- METER LEAD	EXPECTED VALUE
MOTOR ARMATURE RESISTANCE	PLUG P8 DISCONNECTED	WHITE LEAD AT P8	BLACK LEAD AT P8	1.9 OHMS
MOTOR ARMATURE ISOLATION	PLUG P8 DISCONNECTED	WHITE LEAD AT P8	MOTOR CASE	MORE THAN 500,000 OHMS

Table F.2 – Wire drive motor voltage tests

COMPONENT/CIRCUIT TESTED	CONDITION(S)	+ METER LEAD	- METER LEAD	EXPECTED VALUE
ARMATURE VOLTAGE APPLIED TO MOTOR	MOTOR RUNNING AT APPROXIMATELY 50 INCHES PER MINUTE – PLUG P8 CONNECTED	WHITE LEAD AT PLUG P8	BLACK LEAD AT PLUG P8	+3.0 VDC
ARMATURE VOLTAGE APPLIED TO MOTOR	MOTOR RUNNING AT APPROXIMATELY 700 INCHES PER MINUTE – PLUG P8 CONNECTED	WHITE LEAD AT PLUG P8	BLACK LEAD AT PLUG P8	+30 VDC

Figure F.1 – Wire drive motor location

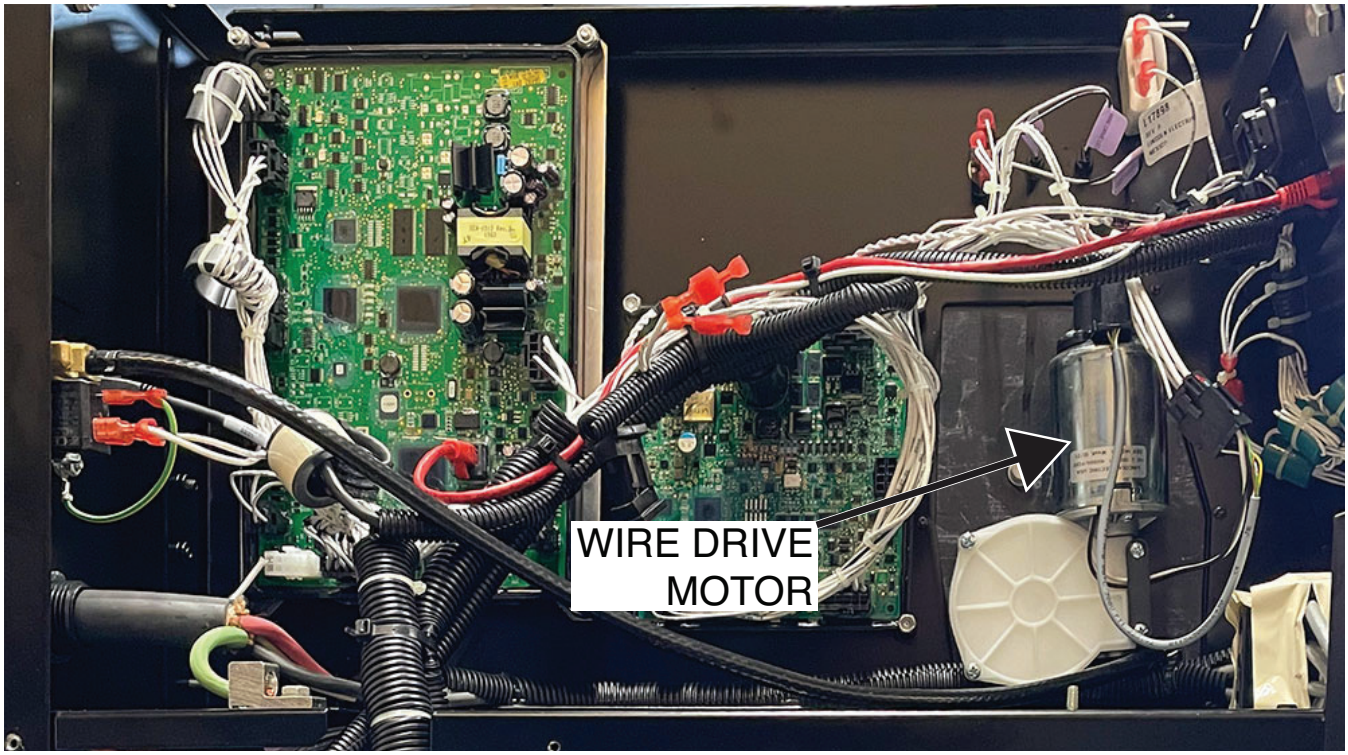
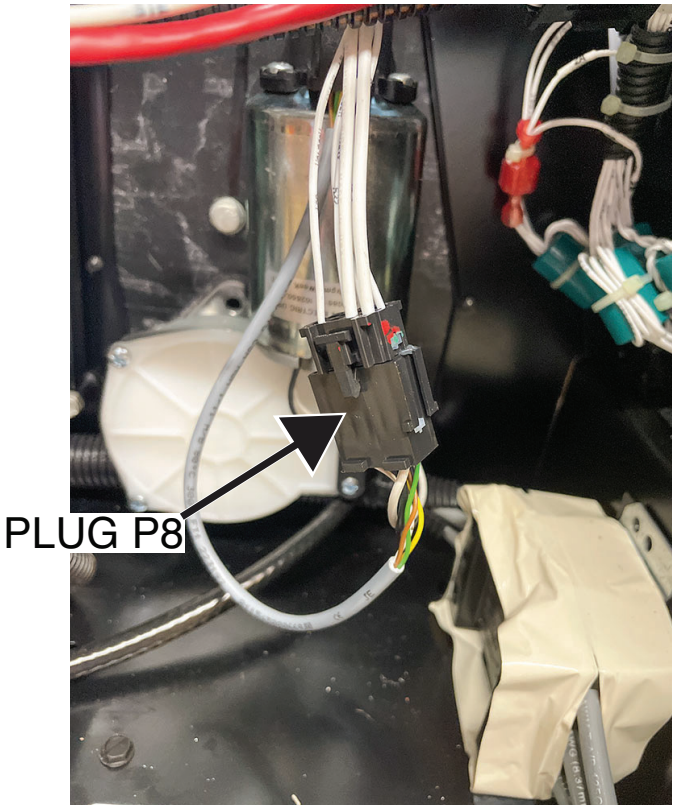


Figure F.2 – Wire drive motor plug P8 location



Removal And Replacement Procedures

AC SWITCH CONTROL BOARD REMOVAL AND REPLACEMENT PROCEDURE

Service and repair should be performed by only Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment may result in danger to the technician or machine operator and will invalidate your factory warranty. For your safety and to avoid electrical shock, please observe all safety notes and precautions detailed throughout this manual. If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

This procedure will aid the technician in the removal and replacement of the AC Switch Control Board.

MATERIALS NEEDED

7/16” Nutdriver
7/16” Open-End Wrench
Wiring Diagram

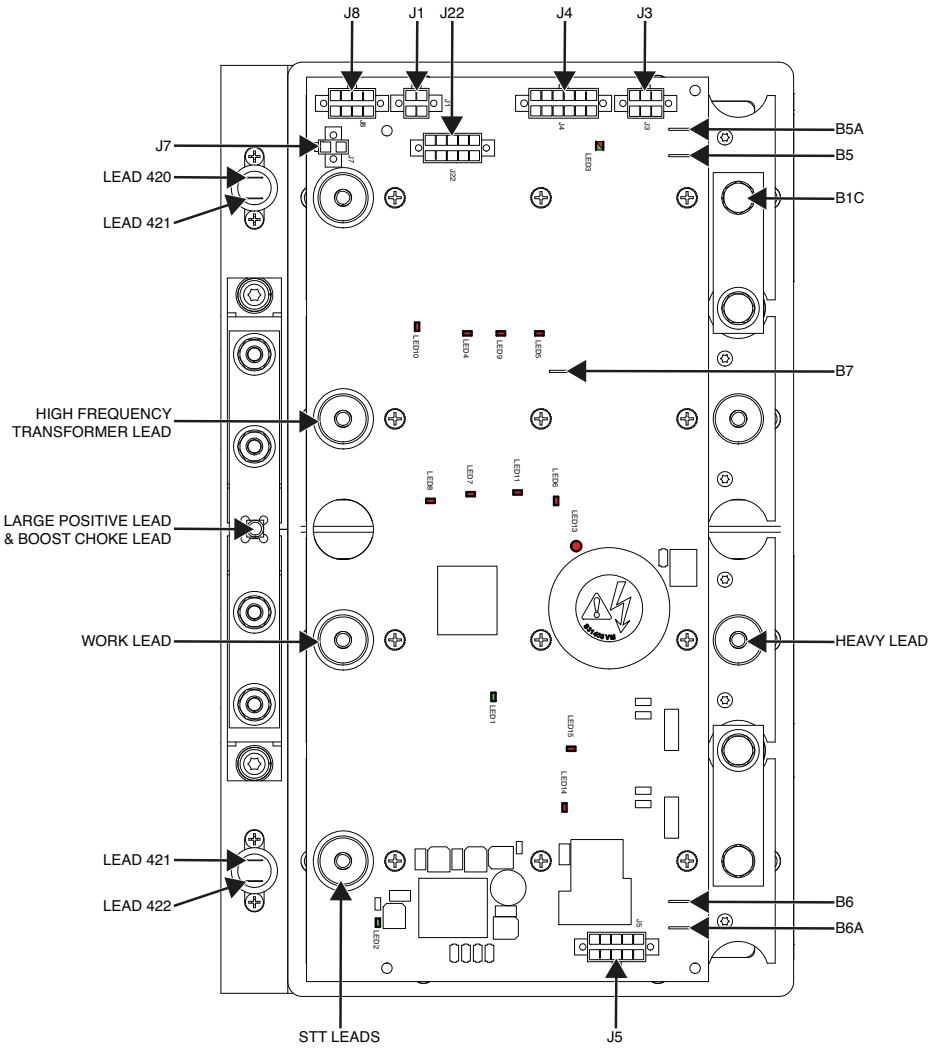
REMOVAL PROCEDURE

1. Carefully remove input power to the Power Wave 300C machine.
2. Perform the ***Case Cover Removal Procedure***.
3. Perform the ***Capacitor Discharge Procedure***.
4. Label and disconnect plugs J3, J4, J1, J8, J7, J22 and J5 from the AC switch control board. See ***Figure F.1***. See Wiring Diagram.
5. Label and disconnect leads B5A, B5, B7, B6, B6A, 420, 421, 422 and 421 from the AC switch control board. See ***Figure F.1***. See Wiring Diagram.
6. Using a 7/16” nutdriver, remove the five bolts, lock washers and flat washers securing the STT leads, heavy lead, lead B1C, high frequency transformer lead and work lead to the AC switch control board. See ***Figure F.1***. See Wiring Diagram.
7. Using a 7/16” nutdriver, remove the nut, lock washer and flat washer securing the large positive lead and the boost choke lead to the AC switch control board. See ***Figure F.1***. See Wiring Diagram. Label and disconnect leads.
8. Using a 7/16” open-end wrench, remove the six bolts, lock washers, flat washers and plastic insulators securing the AC switch control board to the machine. Mounting hardware is located on the sides of the board assembly.
9. The AC switch control board can now be removed and replaced.

REPLACEMENT PROCEDURE

1. Carefully position the new AC switch control board into the machine.
2. Using a 7/16” open-end wrench, attach the six bolts, lock washers, flat washers and plastic insulators securing the AC switch control board to the machine.
3. Using a 7/16” nutdriver, attach the nut, lock washer and flat washer securing the large positive lead and the boost choke lead to the AC switch control board. See Wiring Diagram.
4. Using a 7/16” nutdriver, attach the five bolts, lock washers and flat washers securing the STT leads, heavy lead, lead B1C, high frequency transformer lead and work lead to the AC switch control board. See Wiring Diagram.
5. Connect leads B5A, B5, B7, B6, B6A, 420, 421, 422 and 421 to the AC switch control board. See Wiring Diagram.
6. Connect plugs J3, J4, J1, J8, J7, J22 and J5 to the AC switch control board. See Wiring Diagram.
7. Perform the ***Case Cover Replacement Procedure***.
8. Perform the ***Retest After Repair Procedure***.

Figure F.1 – AC switch control board plug and terminal locations



ARCLINK FEEDER BOARD REMOVAL AND REPLACEMENT PROCEDURE

Service and repair should be performed by only Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment may result in danger to the technician or machine operator and will invalidate your factory warranty. For your safety and to avoid electrical shock, please observe all safety notes and precautions detailed throughout this manual. If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

This procedure will aid the technician in the removal and replacement of the ArcLink Feeder Board.

MATERIALS NEEDED

3/8” Nutdriver
Wiring Diagram

REMOVAL PROCEDURE

1. Carefully remove input power to the Power Wave 300C machine.
2. Perform the ***Case Cover Removal Procedure***.
3. Perform the ***Capacitor Discharge Procedure***.
4. Label and disconnect plugs J89, J86, J87, J82, J83, J85, J81 and J84 from the ArcLink feeder board. See ***Figure F.1***. See Wiring Diagram.
5. Using a 3/8” nutdriver, remove the four mounting nuts securing the ArcLink feeder board to the machine. See ***Figure F.2***.
6. The ArcLink feeder board can now be removed and replaced.

REPLACEMENT PROCEDURE

1. Carefully position the new ArcLink feeder board into the machine.
2. Using a 3/8” nutdriver, attach the four mounting nuts securing the ArcLink feeder board to the machine.
3. Connect plugs J89, J86, J87, J82, J83, J85, J81 and J84 to the ArcLink feeder board. See Wiring Diagram.
4. Perform the ***Case Cover Replacement Procedure***.
5. Perform the ***Retest After Repair Procedure***.

Figure F.1 – ArcLink feeder board plug locations

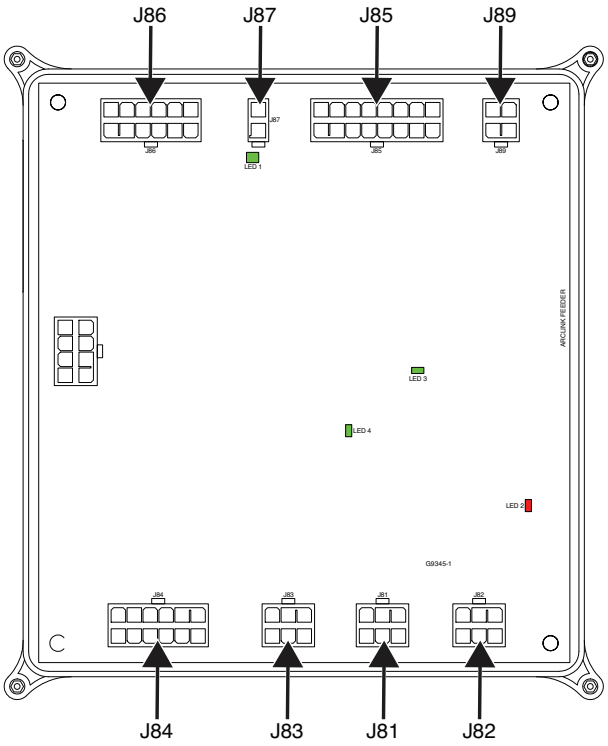
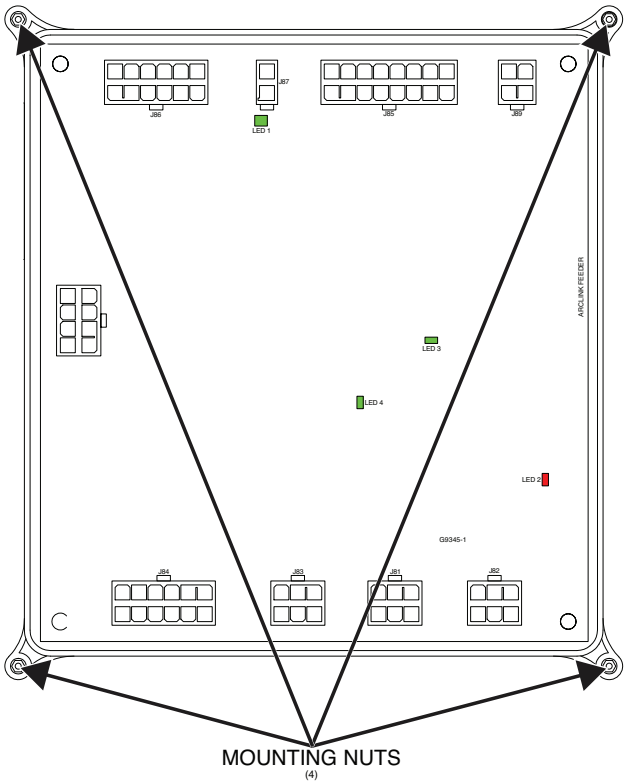


Figure F.2 – ArcLink feeder board mounting hardware locations



DIGITAL CONTROL BOARD REMOVAL AND REPLACEMENT PROCEDURE

Service and repair should be performed by only Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment may result in danger to the technician or machine operator and will invalidate your factory warranty. For your safety and to avoid electrical shock, please observe all safety notes and precautions detailed throughout this manual. If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

This procedure will aid the technician in the removal and replacement of the Digital Control Board.

MATERIALS NEEDED

3/8” Nutdriver
Wiring Diagram

REMOVAL PROCEDURE

1. Carefully remove input power to the Power Wave 300C machine.
2. Perform the ***Case Cover Removal Procedure***.
3. Perform the ***Capacitor Discharge Procedure***.
4. Label and disconnect plugs J9, J8, J7, J6, J5, J3, J12, J11, J4 and J15 (ethernet cable) from the digital control board. See ***Figure F.1***. See Wiring Diagram.
5. Using a 3/8” nutdriver, remove the four mounting nuts securing the digital control board to the machine. See ***Figure F.2***. See Wiring Diagram.
6. The digital control board can now be removed and replaced.

REPLACEMENT PROCEDURE

1. Carefully position the new digital control board into the machine.
2. Using a 3/8” nutdriver, attach the four mounting nuts securing the digital control board to the machine.
3. Connect plugs J9, J8, J7, J6, J5, J3, J12, J11, J4 and J15 (ethernet cable) to the digital control board. See Wiring Diagram.
4. Perform the ***Case Cover Replacement Procedure***.
5. Perform the ***Retest After Repair Procedure***.

Figure F.1 – Digital control board plug and terminal locations

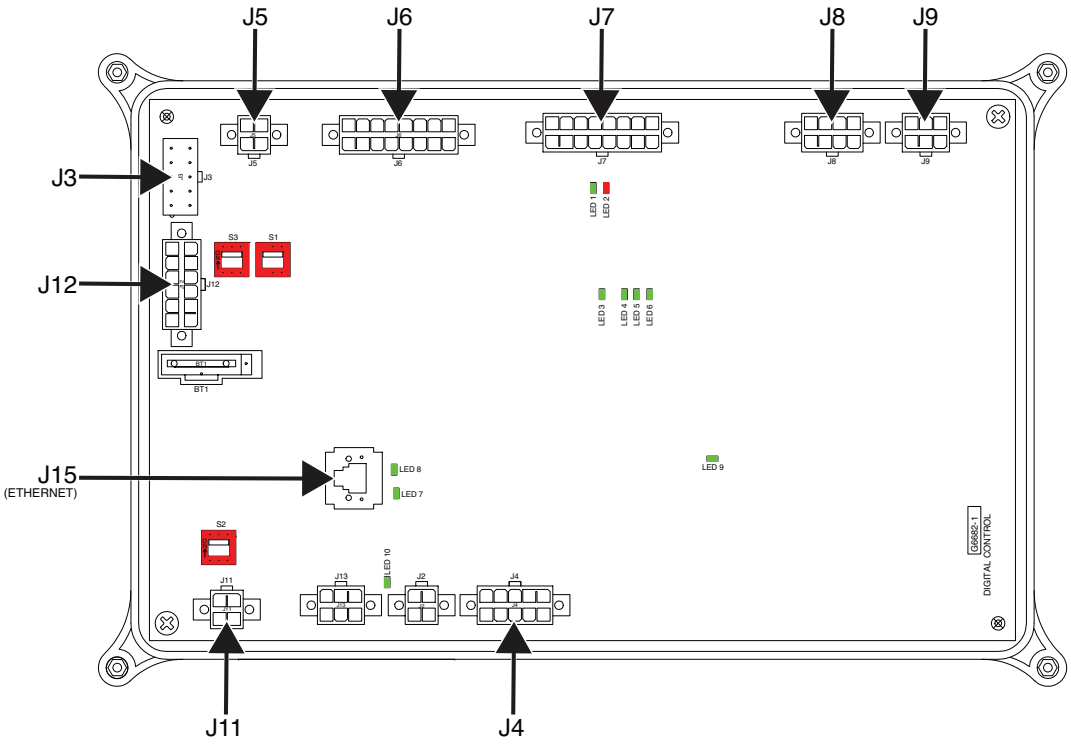
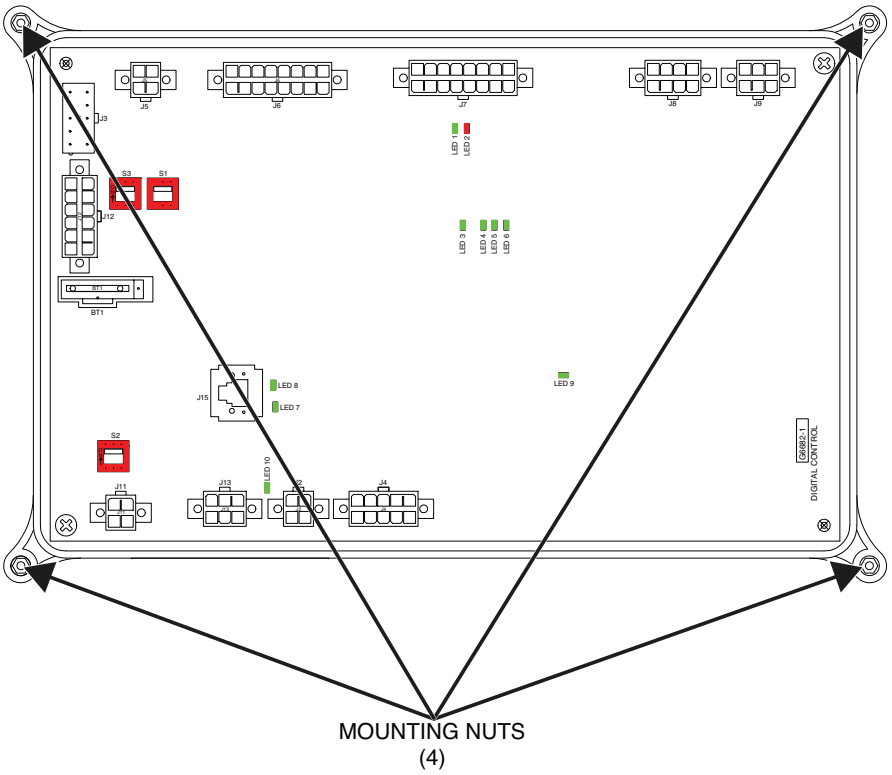


Figure F.2 – Digital control board mounting hardware locations



FAN INTERFACE BOARD REMOVAL AND REPLACEMENT PROCEDURE

Service and repair should be performed by only Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment may result in danger to the technician or machine operator and will invalidate your factory warranty. For your safety and to avoid electrical shock, please observe all safety notes and precautions detailed throughout this manual. If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

This procedure will aid the technician in the removal and replacement of the Fan Interface Board.

MATERIALS NEEDED

Wiring Diagram

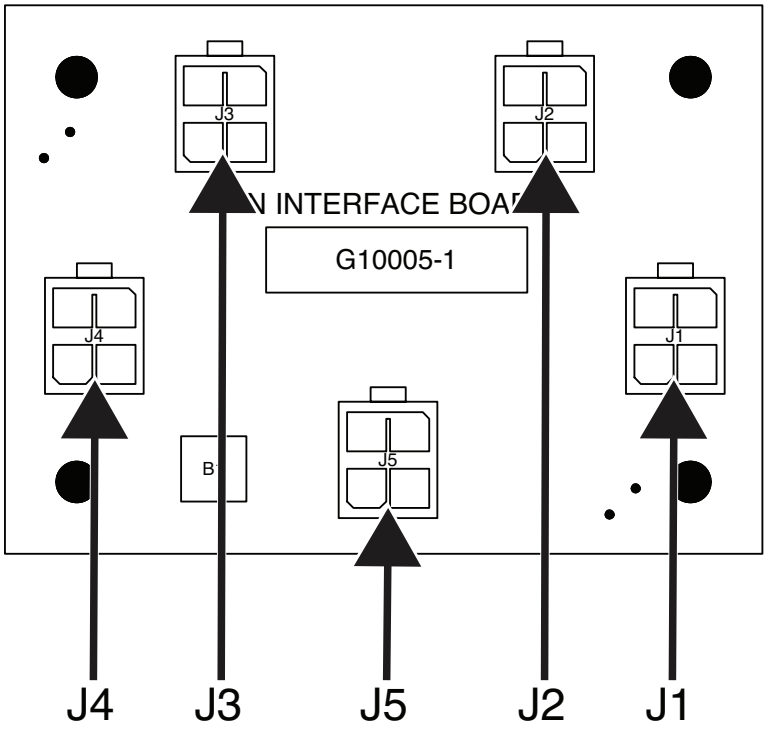
REMOVAL PROCEDURE

1. Carefully remove input power to the Power Wave 300C machine.
2. Perform the ***Case Cover Removal Procedure***.
3. Perform the ***Capacitor Discharge Procedure***.
4. Label and disconnect plugs J1, J2, J3, J4 and J5 from the fan interface board. See ***Figure F.1***. See Wiring Diagram.
5. Carefully remove the board from the mounting standoffs.
6. The fan interface board can now be removed and replaced.

REPLACEMENT PROCEDURE

1. Carefully position the new fan interface board into the machine.
2. Carefully attach the fan interface board to the mounting standoffs.
3. Connect plugs J1, J2, J3, J4 and J5 to the fan interface board. See Wiring Diagram.
4. Perform the ***Case Cover Replacement Procedure***.
5. Perform the ***Retest After Repair Procedure***.

Figure F.1 – Fan interface board plug locations



HIGH FREQUENCY BOARD REMOVAL AND REPLACEMENT PROCEDURE

Service and repair should be performed by only Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment may result in danger to the technician or machine operator and will invalidate your factory warranty. For your safety and to avoid electrical shock, please observe all safety notes and precautions detailed throughout this manual. If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

This procedure will aid the technician in the removal and replacement of the High Frequency Board.

MATERIALS NEEDED

3/8” Nutdriver
Wiring Diagram

REMOVAL PROCEDURE

1. Carefully remove input power to the Power Wave 300C machine.
2. Perform the ***Case Cover Removal Procedure***.
3. Perform the ***Capacitor Discharge Procedure***.
4. Label and disconnect plugs J2, J3 and J4 from the high frequency board. See ***Figure F.1***. See Wiring Diagram.
5. Label and disconnect leads from terminals B1 and B2 of the high frequency board. See ***Figure F.1***. See Wiring Diagram.
6. Using a 3/8” nutdriver, remove the two nuts securing the high frequency board to the machine. See ***Figure F.2***.
7. The high frequency board can now be removed and replaced.

REPLACEMENT PROCEDURE

1. Carefully position the new high frequency board into the machine.
2. Using a 3/8” nutdriver, attach the two nuts securing the high frequency board to the machine.
3. Connect the previously disconnected leads to terminals B1 and B2 of the high frequency board. See Wiring Diagram.
4. Connect plugs J2, J3 and J4 to the high frequency board. See Wiring Diagram.
5. Perform the ***Case Cover Replacement Procedure***.
6. Perform the ***Retest After Repair Procedure***.

Figure F.1 – High frequency board plug and terminal locations

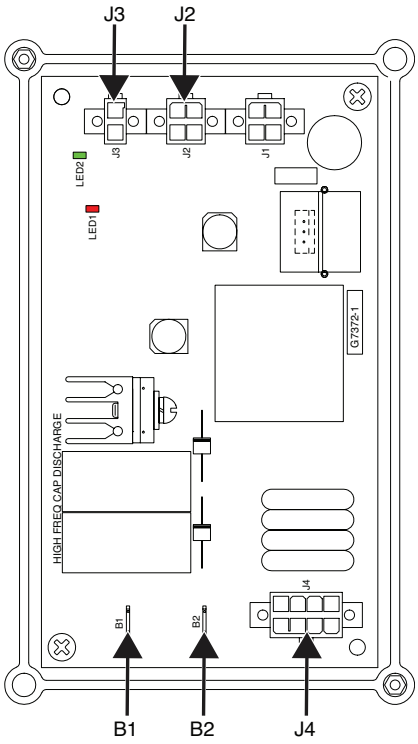
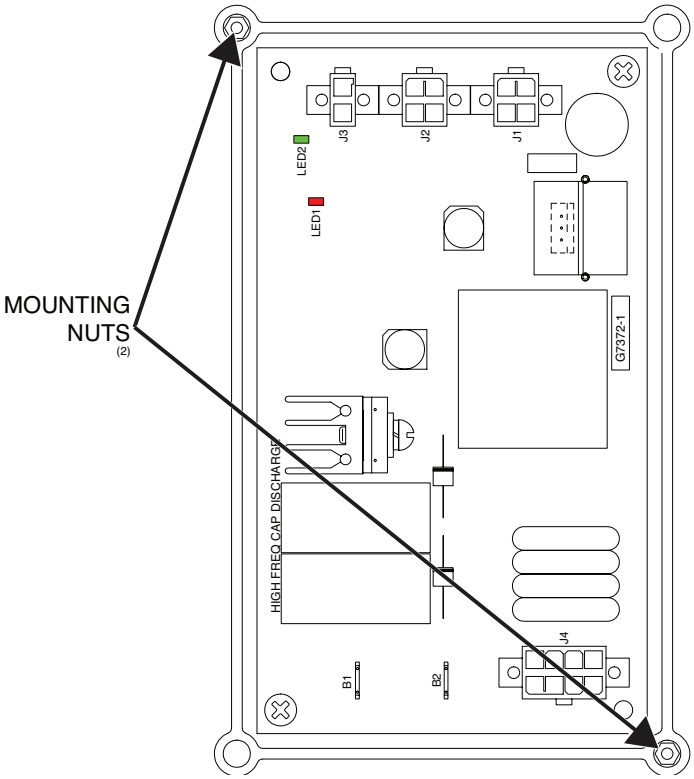


Figure F.2 – High frequency board mounting hardware locations



MAIN SWITCHBOARD / POWER CONVERSION ASSEMBLY REMOVAL AND REPLACEMENT PROCEDURE

Service and repair should be performed by only Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment may result in danger to the technician or machine operator and will invalidate your factory warranty. For your safety and to avoid electrical shock, please observe all safety notes and precautions detailed throughout this manual. If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

This procedure will aid the technician in the removal and replacement of the Main Switchboard / Power Conversion Assembly.

MATERIALS NEEDED

7/16” Nutdriver
5/16” Nutdriver
Wiring Diagram

REMOVAL PROCEDURE

1. Carefully remove input power to the Power Wave 300C machine.
2. Perform the ***Case Cover Removal Procedure***.
3. Perform the ***Capacitor Discharge Procedure***.
4. Label and disconnect plugs J41, J42, J43, J45, J46, J47, J48 and B53 from the main switchboard / power conversion assembly. See ***Figure F.1***. See Wiring Diagram.
5. Using a 7/16” nutdriver, remove the six bolts and washers securing leads A, A2, A3, A4, A5, and A6 to terminals B55, B56, B57, B58, B59 and B60. See ***Figure F.1***. See Wiring Diagram. Label and disconnect leads.
6. Using a 7/16” nutdriver, remove the three bolts and washers securing leads T1, T2, T3 and associated MOV’s to terminals B30, B31 and B32. See ***Figure F.1***. See Wiring Diagram. Label and disconnect leads.
7. Using a 7/16” nutdriver, remove the two bolts and washers securing leads B28 and B29 to terminals B28 and B29. See ***Figure F.1***. See Wiring Diagram. Label and disconnect leads.
8. Label and disconnect plug P9 from the planar transformer. See ***Figure F.1***. See Wiring Diagram.
9. Using a 7/16” open-end wrench, remove the bolt, nut and lock washer securing the heavy lead and lead 206A to the positive output tab. See ***Figure F.1***. See Wiring Diagram. Label and disconnect leads.
10. Using a 5/16” nutdriver, remove the four screws, lock washers and flat washers securing the main switchboard / power conversion assembly to the machine. See ***Figure F.2***.
11. Cut cable ties as necessary to allow for the removal of the main switchboard / power conversion assembly.

12. The main switchboard / power conversion assembly can now be removed and replaced.

REPLACEMENT PROCEDURE

1. Carefully position the new main switchboard / power conversion assembly into the machine.
2. Using a 5/16” nutdriver, attach the four screws, lock washers and flat washers securing the main switchboard / power conversion assembly to the machine.
3. Using a 7/16” open-end wrench, attach the bolt, nut and lock washer securing the heavy lead and lead 206A to the positive output tab.
4. Connect plug P9 to the planar transformer. See Wiring Diagram.
5. Using a 7/16” nutdriver, attach the two bolts and washers securing leads B28 and B29 to terminals B28 and B29. See Wiring Diagram.
6. Using a 7/16” nutdriver, attach the three bolts and washers securing leads T1, T2, T3 and associated MOV’s to terminals B30, B31 and B32. See Wiring Diagram.
7. Using a 7/16” nutdriver, attach the six bolts and washers securing leads A, A2, A3, A4, A5, and A6 to terminals B55, B56, B57, B58, B59 and B60. See Wiring Diagram.
8. Connect plugs J41, J42, J43, J45, J46, J47, J48 and B53 to the main switchboard / power conversion assembly. See Wiring Diagram.
9. Replace any previously removed cable ties.
10. Perform the ***Case Cover Replacement Procedure***.
11. Perform the ***Retest After Repair Procedure***.

Figure F.1 – Main switchboard / power conversion assembly plug and terminal locations

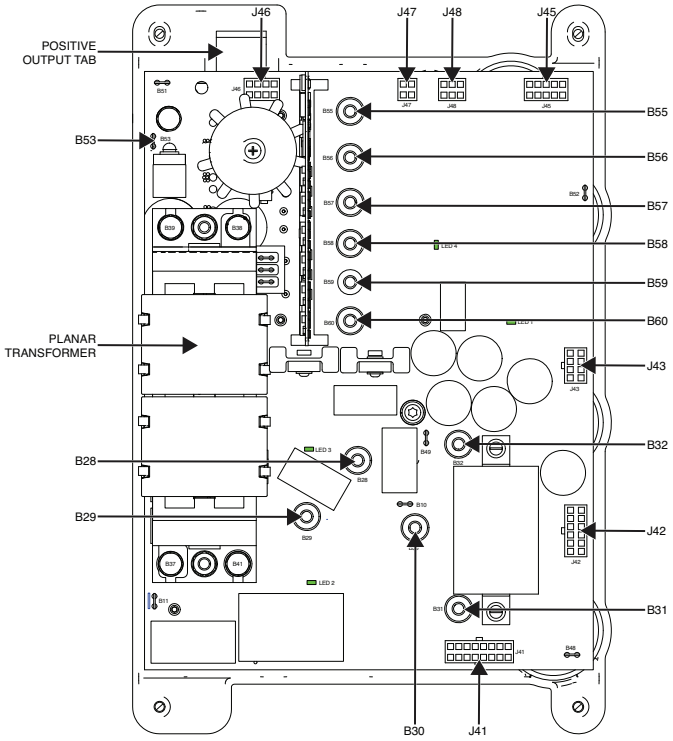
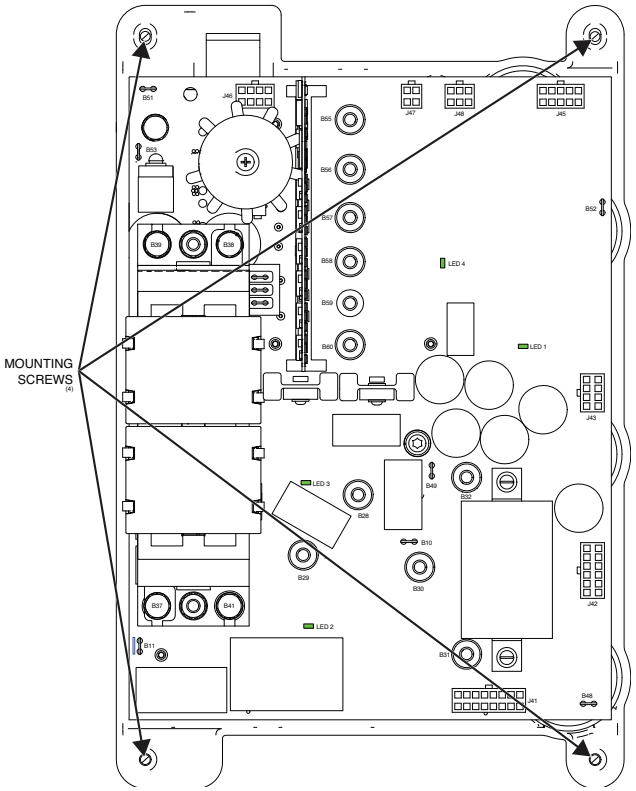


Figure F.2 – Main switchboard / power conversion assembly mounting hardware locations



PFC CONTROL BOARD REMOVAL AND REPLACEMENT PROCEDURE

Service and repair should be performed by only Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment may result in danger to the technician or machine operator and will invalidate your factory warranty. For your safety and to avoid electrical shock, please observe all safety notes and precautions detailed throughout this manual. If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

This procedure will aid the technician in the removal and replacement of the PFC Control Board.

MATERIALS NEEDED

3/8” Nutdriver
Wiring Diagram

REMOVAL PROCEDURE

1. Carefully remove input power to the Power Wave 300C machine.
2. Perform the ***Case Cover Removal Procedure***.
3. Perform the ***Capacitor Discharge Procedure***.
4. Label and disconnect plugs J23, J24, J25, J26 and J27 from the PFC control board. See ***Figure F.1***. See Wiring Diagram.
5. Using a 3/8” nutdriver, remove the two mounting nuts securing the PFC control board to the machine. See ***Figure F.2***.
6. The PFC control board can now be removed and replaced.

REPLACEMENT PROCEDURE

1. Carefully position the new PFC control board into the machine.
2. Using a 3/8” nutdriver, attach the two mounting nuts securing the PFC control board to the machine.
3. Connect plugs J23, J24, J25, J26 and J27 to the PFC control board. See Wiring Diagram.
4. Perform the ***Case Cover Replacement Procedure***.
5. Perform the ***Retest After Repair Procedure***.

Figure F.1 – PFC control board plug locations

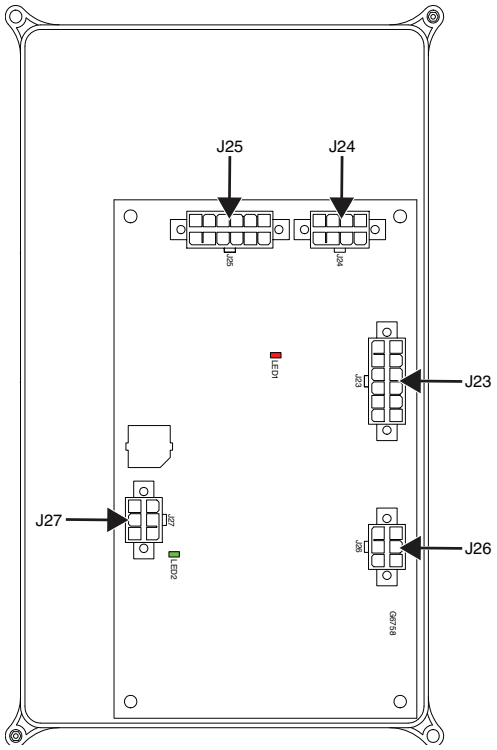
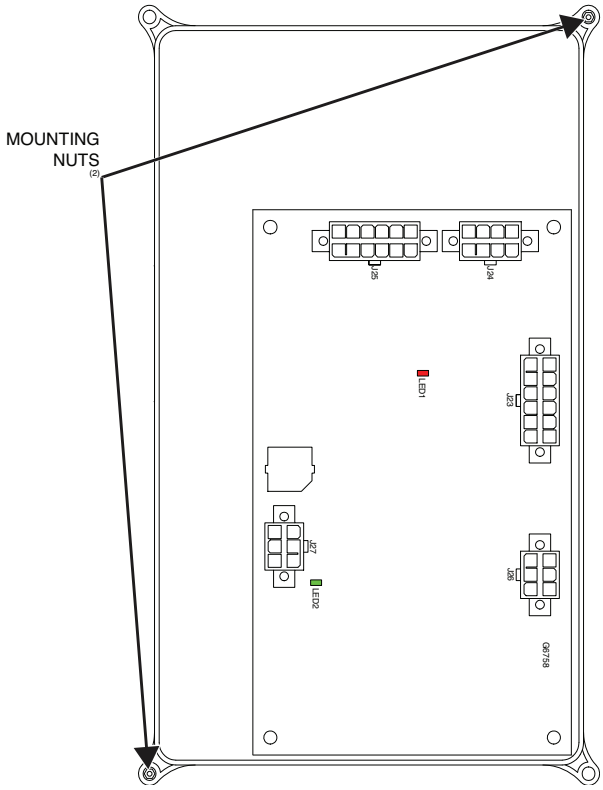


Figure F.2 – PFC control board mounting hardware locations



SENSE LEAD INTERFACE BOARD REMOVAL AND REPLACEMENT PROCEDURE

Service and repair should be performed by only Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment may result in danger to the technician or machine operator and will invalidate your factory warranty. For your safety and to avoid electrical shock, please observe all safety notes and precautions detailed throughout this manual. If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

This procedure will aid the technician in the removal and replacement of the Sense Lead Interface Board.

MATERIALS NEEDED

Wiring Diagram

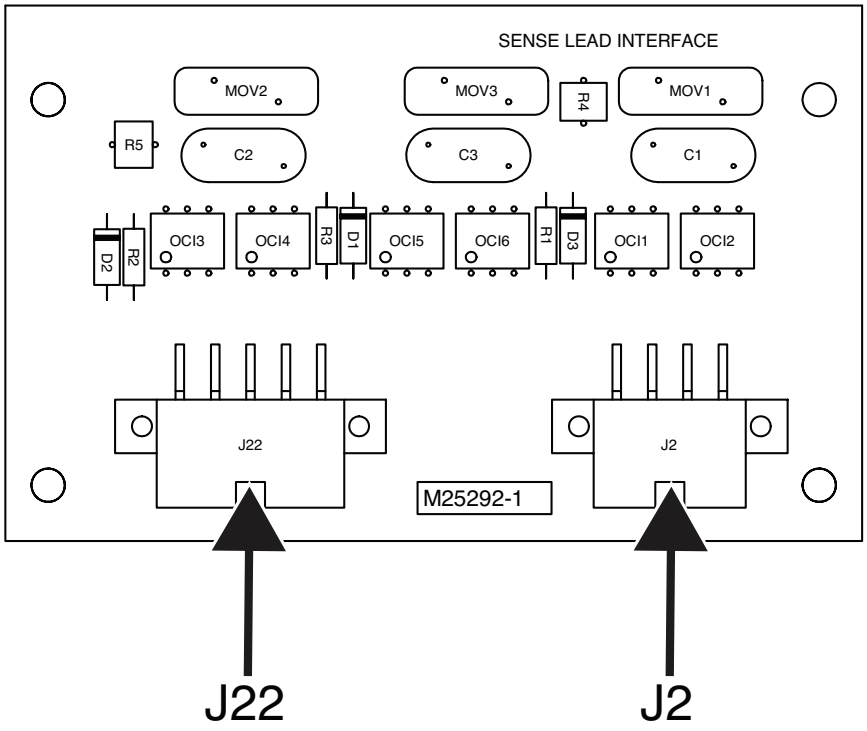
REMOVAL PROCEDURE

1. Carefully remove input power to the Power Wave 300C machine.
2. Perform the ***Case Cover Removal Procedure***.
3. Perform the ***Capacitor Discharge Procedure***.
4. Label and disconnect plugs J2 and J22 from the sense lead interface board. See ***Figure F.1***. See Wiring Diagram.
5. Carefully remove the board from the mounting standoffs.
6. The sense lead interface board can now be removed and replaced.

REPLACEMENT PROCEDURE

1. Carefully position the new sense lead interface into the machine.
2. Carefully attach the sense lead interface board to the mounting standoffs.
3. Connect plugs J2 and J22 to the sense lead interface board. See Wiring Diagram.
4. Perform the ***Case Cover Replacement Procedure***.
5. Perform the ***Retest After Repair Procedure***.

Figure F.1 – Sense lead interface board plug locations



INPUT LINE SWITCH REMOVAL AND REPLACEMENT PROCEDURE

Service and repair should be performed by only Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment may result in danger to the technician or machine operator and will invalidate your factory warranty. For your safety and to avoid electrical shock, please observe all safety notes and precautions detailed throughout this manual. If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

This procedure will aid the technician in the removal and replacement of the Input Line Switch.

MATERIALS NEEDED

Phillips Screwdriver
5/16” Nutdriver
Wiring Diagram

REMOVAL PROCEDURE

1. Carefully remove input power to the Power Wave 300C machine.
2. Perform the ***Case Cover Removal Procedure***.
3. Perform the ***Capacitor Discharge Procedure***.
4. Carefully remove the protective tape from the input line switch. See ***Figure F.1***.
5. Using a Phillips screwdriver, loosen the six screws securing the six leads to the input line switch. See ***Figure F.1***. See Wiring Diagram. Label and disconnect the six leads.
6. Using a 5/16” nutdriver, remove the two bolts and lock washers securing the input line switch to the machine. See ***Figure F.2***.
7. The input line switch can now be removed and replaced. Note the placement of the switch cover for reassembly.

REPLACEMENT PROCEDURE

1. Carefully position the new input line switch and switch cover into the machine.
2. Using a 5/16” nutdriver, attach the two bolts and lock washers securing the input line switch to the machine.
3. Using a Phillips screwdriver, tighten the six screws securing the six leads to the input line switch. See Wiring Diagram.
4. Carefully apply protective tape to the input line switch.
5. Perform the ***Case Cover Replacement Procedure***.
6. Perform the ***Retest After Repair Procedure***.

Figure F.1 – Protective tape and input line switch terminal locations

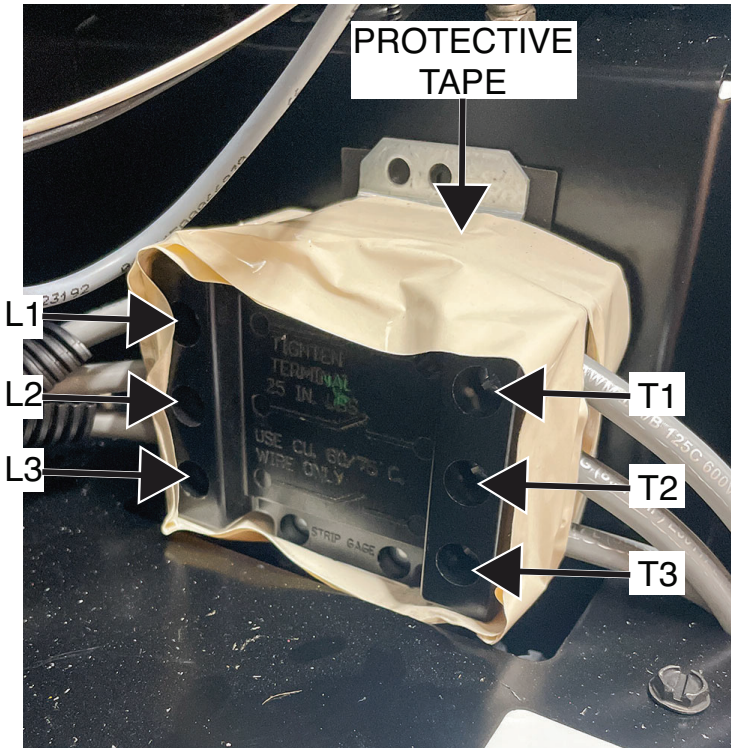
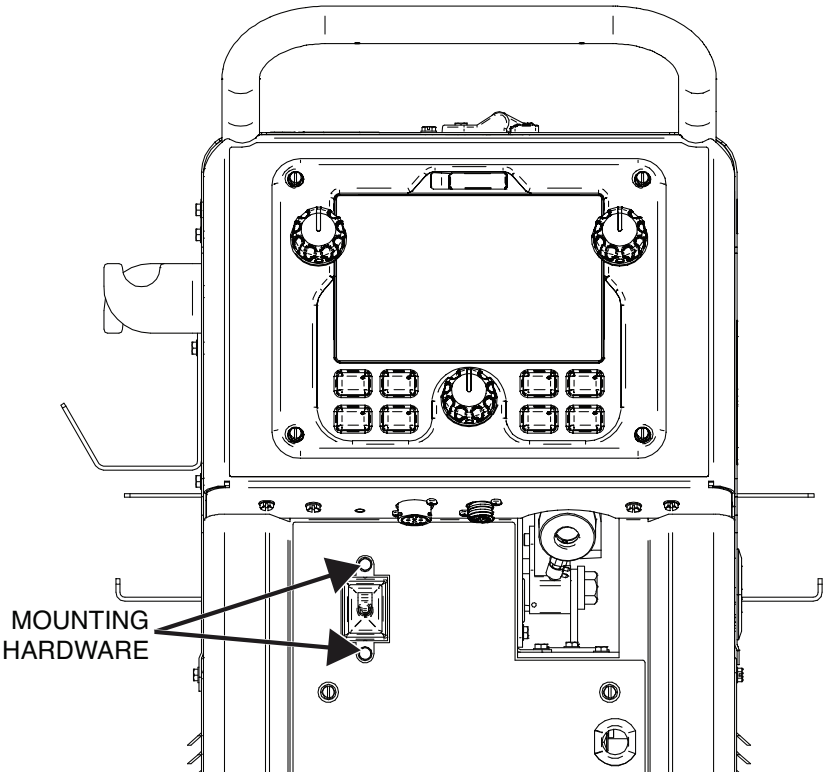


Figure F.2 – Input line switch mounting hardware locations



WIRE DRIVE MOTOR AND GEAR BOX ASSEMBLY REMOVAL AND REPLACEMENT PROCEDURE

Service and repair should be performed by only Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment may result in danger to the technician or machine operator and will invalidate your factory warranty. For your safety and to avoid electrical shock, please observe all safety notes and precautions detailed throughout this manual. If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

This procedure will aid the technician in the removal and replacement of the Wire Drive Motor And Gear Box Assembly.

MATERIALS NEEDED

3/4” Nutdriver
5/16” Nutdriver
Needle-Nose Pliers
Wiring Diagram

REMOVAL PROCEDURE

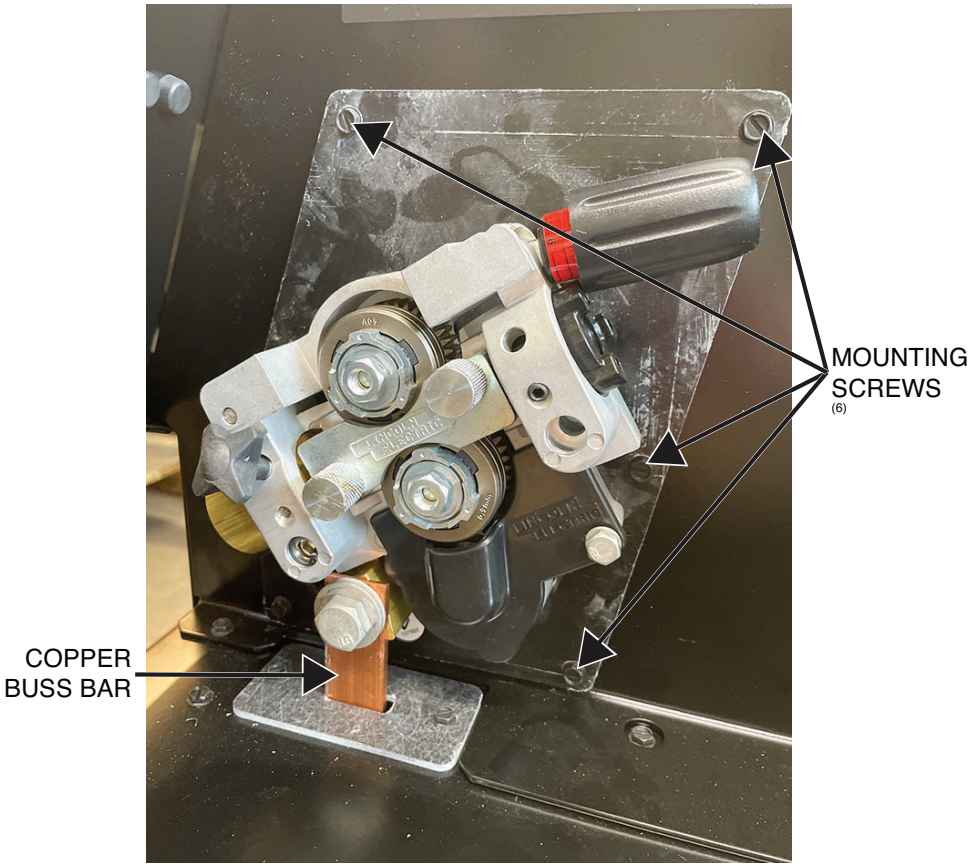
1. Carefully remove input power to the Power Wave 300C machine.
2. Perform the ***Case Cover Removal Procedure***.
3. Perform the ***Capacitor Discharge Procedure***.
4. Label and disconnect plug P8. See Wiring Diagram.
5. Using a 3/4” nutdriver, remove the bolt and flat washer securing the copper buss bar to the wire drive motor and gear box assembly. See ***Figure F.1***. See Wiring Diagram. The copper buss bar can carefully be pushed downward to make room for the wire drive assembly to be removed.
6. Using a 5/16” nutdriver, remove the six screws securing the wire drive motor and gear box assembly to the machine. See ***Figure F.1***.
7. Carefully maneuver the wire drive motor and gear box assembly forward to gain access to the gas hose.
8. Using needle-nose pliers, carefully loosen the hose clamp securing the gas hose and disconnect the gas hose.
9. The wire drive motor and gear box assembly can now be removed and replaced.

REPLACEMENT PROCEDURE

1. Carefully position the new wire drive motor and gear box assembly into the machine.

2. Using needle-nose pliers, carefully attach the gas hose to the wire drive motor and gear box assembly and secure with the hose clamp.
3. Using a 5/16” nutdriver, attach the six screws securing the wire drive motor and gear box assembly to the machine.
4. Using a 3/4” nutdriver, attach the bolt and flat washer securing the copper buss bar to the wire drive motor and gear box assembly.
5. Connect plug P8. See Wiring Diagram.
6. Perform the ***Case Cover Replacement Procedure***.
7. Perform the ***Retest After Repair Procedure***.

Figure F.1 – Copper buss bar and wire drive motor and gear box mounting hardware locations



GAS SOLENOID REMOVAL AND REPLACEMENT PROCEDURE

Service and repair should be performed by only Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment may result in danger to the technician or machine operator and will invalidate your factory warranty. For your safety and to avoid electrical shock, please observe all safety notes and precautions detailed throughout this manual. If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

This procedure will aid the technician in the removal and replacement of the Mig and/or Tig Gas Solenoid.

MATERIALS NEEDED

Needle Nose Pliers
Slotted Screwdriver
Hammer
Wiring Diagram

REMOVAL PROCEDURE

1. Carefully remove input power to the Power Wave 300C machine.
2. Perform the ***Case Cover Removal Procedure***.
3. Perform the ***Capacitor Discharge Procedure***.
4. Label and disconnect leads 552A, 553A and the ground lead from the mig gas solenoid and/or leads 554A, 553A and the ground lead from the tig gas solenoid. See ***Figure F.1***. See Wiring Diagram.
5. Using needle nose pliers and a slotted screwdriver, loosen hose clamp and carefully pry the gas hose from the rear of the gas solenoid to be replaced. See ***Figure F.1***.
6. Using a hammer and slotted screwdriver, carefully loosen the nut on the back of the machine securing each gas solenoid to the case back. Note washer placement for reassembly. See ***Figure F.2***.
7. The gas solenoid(s) can now be removed and replaced.

REPLACEMENT PROCEDURE

1. Carefully position the new gas solenoid(s) into the machine.
2. Using a hammer and slotted screwdriver, tighten the nut on the back of the machine securing each gas solenoid to the case back.
3. Using needle nose pliers, attach hose clamp securing the gas hose to the rear of the gas solenoid.
4. Connect leads 552A, 553A and the ground lead to the mig gas solenoid and/or leads 554A, 553A and the ground lead to the tig gas solenoid. See Wiring Diagram.
5. Perform the ***Case Cover Replacement Procedure***.
6. Perform the ***Retest After Repair Procedure***.

Figure F.1 – Gas solenoid lead and gas hose locations

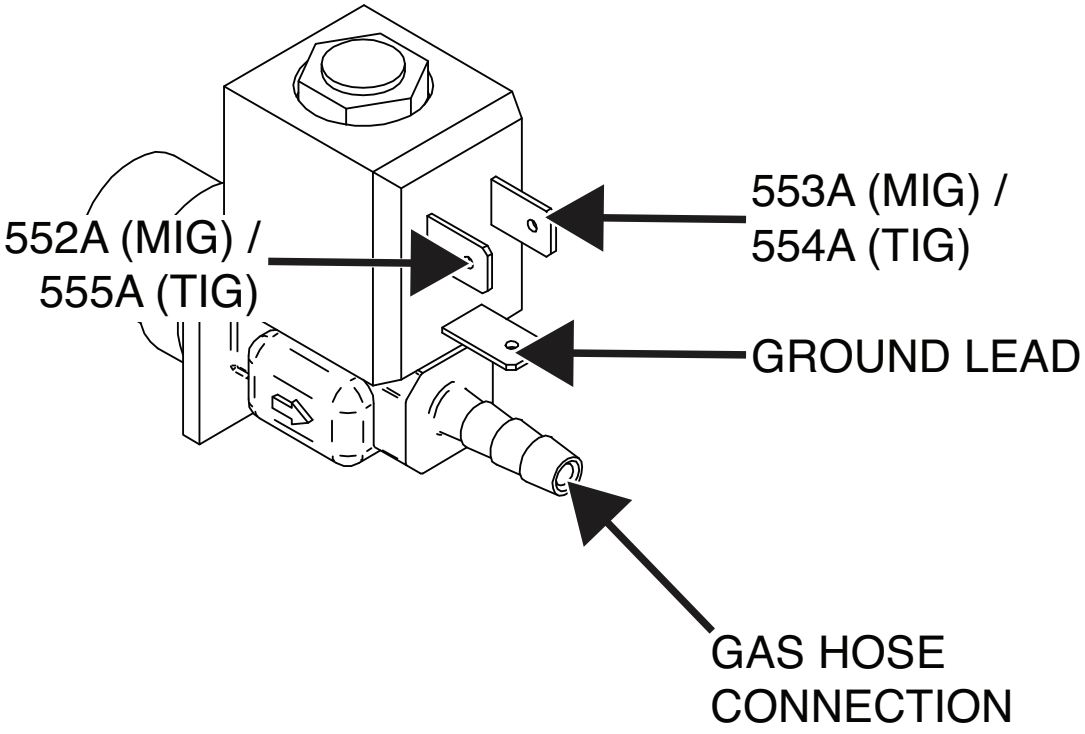
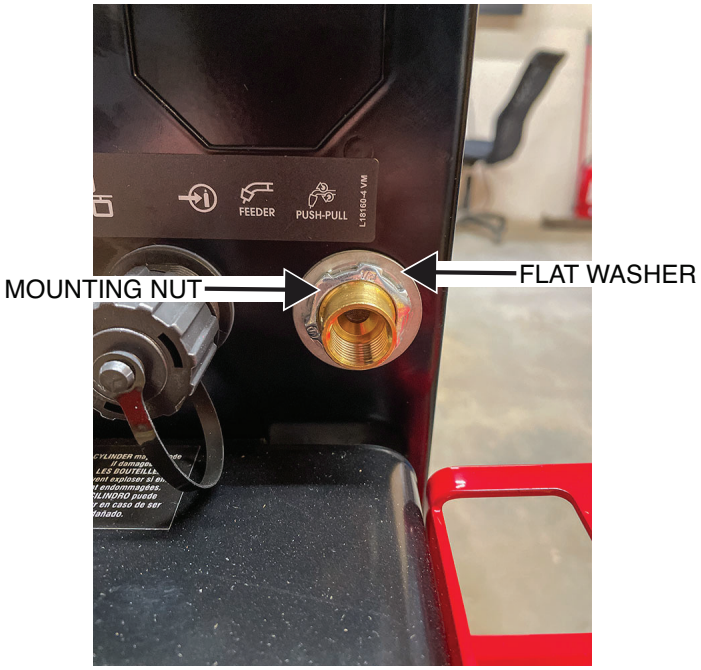


Figure F.2 – Gas solenoid mounting hardware locations



RETEST AFTER REPAIR

Retest a machine:

• If it is rejected under test for any reason that requires you to remove any part which could affect the machine's electrical characteristics.

OR

• If you repair or replace any electrical components.

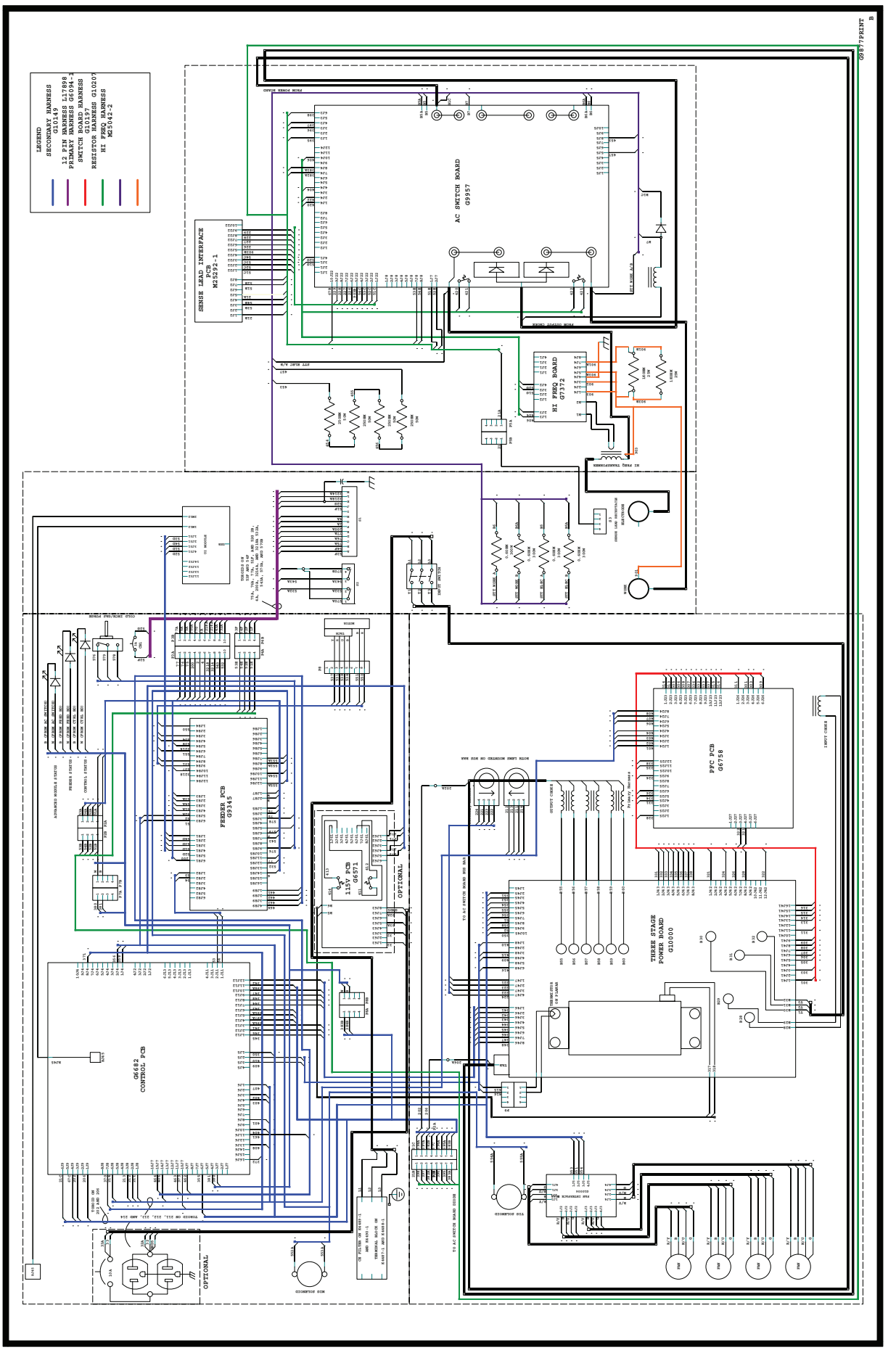
PROCESS	DUTY CYCLE	VOLTS (RMS) AT RATED AMPERES		AMPERES (RMS)	
		1 PHASE	3 PHASE	1 PHASE	3 PHASE
GMAW GMAW-PULSE FCAW	40%	28	31.5	280	350
	60%	28	29	280	300
	100%	28	29	280	300
SMAW	40%	30.8	33	270	325
	60%	30	31.2	250	280
	100%	30	31.2	250	280
GTAW-DC	40%	23	24	325	350
	60%	21.2	22	280	300
	100%	21.2	22	280	300

WELDING PROCESS		
PROCESS	OUTPUT RANGE (AMPERES)	OCV
GMAW GMAW-PULSE FCAW	40 - 350	70 VDC AVERAGE, 74V PEAK
GTAW-DC	5 - 350	24 VDC AVERAGE, 45V PEAK
SMAW	5 - 350	60 VDC AVERAGE, 65V PEAK

WIRE SPEED RANGE	
WIRE SPEED	50 – 800 IPM (1.27 – 17.8 M/MINUTE)

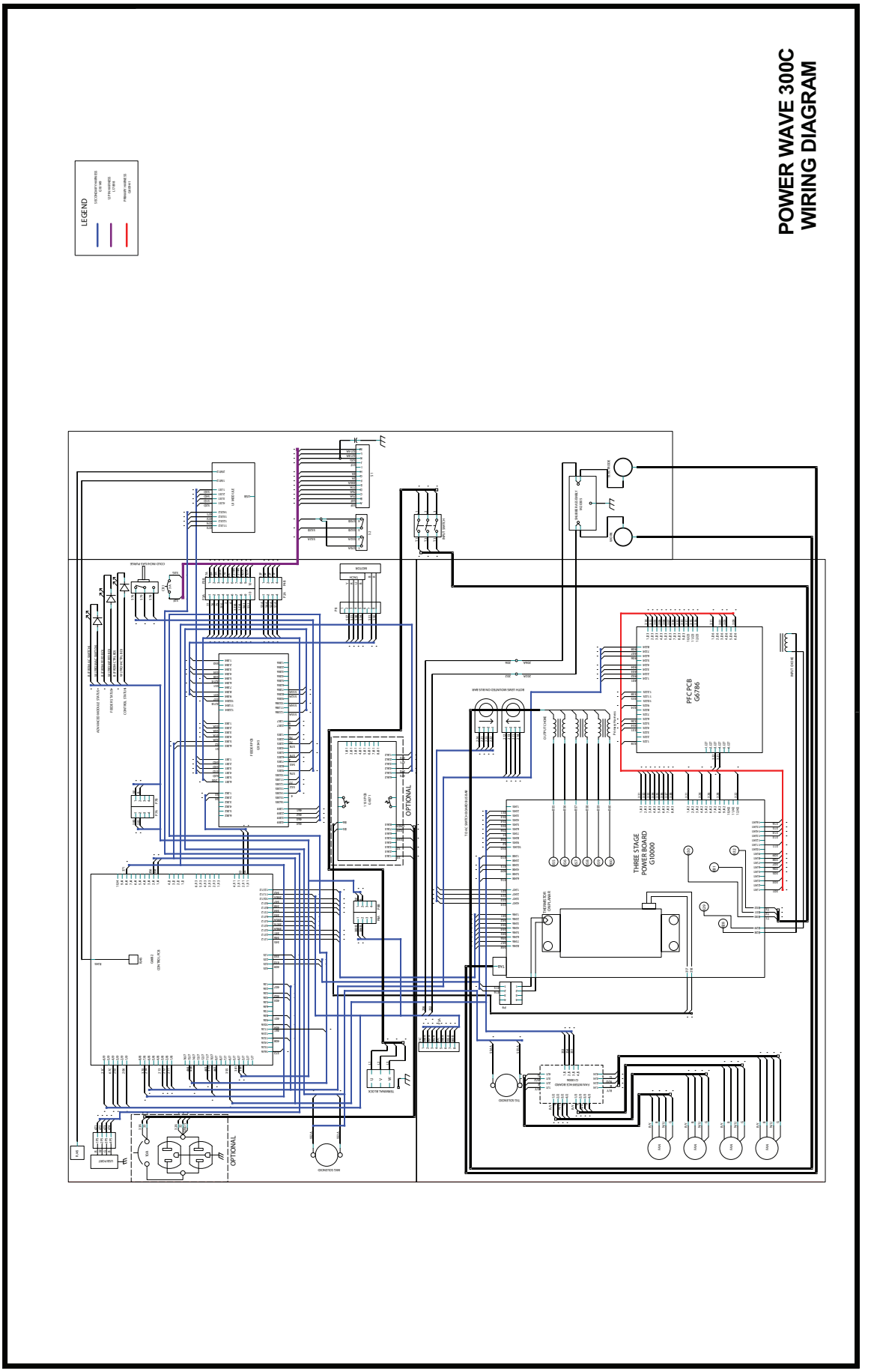
Power Wave 300C Advanced Model Wiring Diagram for code(s) - 12943,12945, 13200, 13406, & 13407

300C ADVANCED



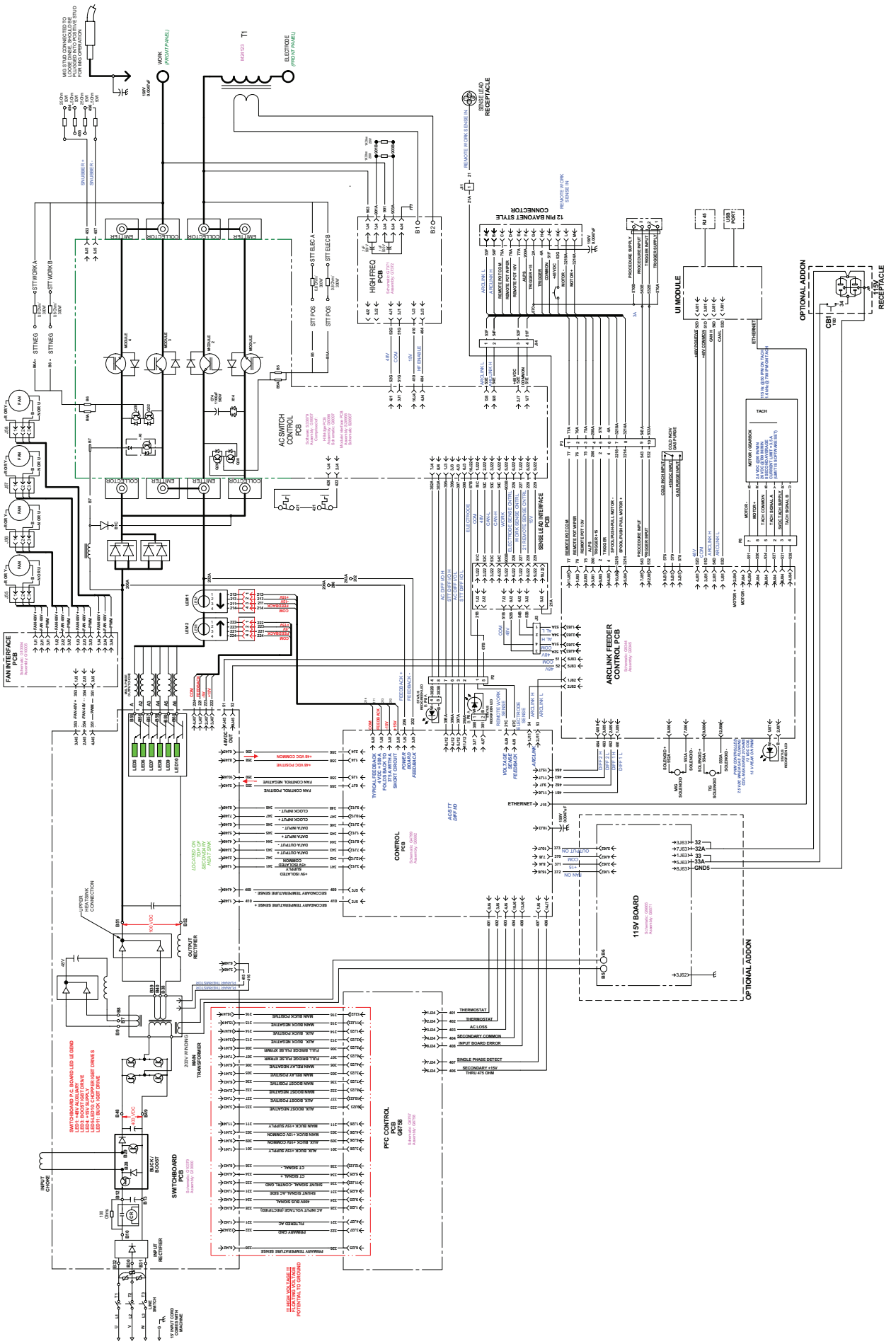
NOTE: This diagram is for reference only. It may not be accurate for all machines covered by this manual. The specific diagram for a particular code is pasted inside the machine on one of the enclosure panels. If the diagram is illegible, write to the Service Department for a replacement. Give the equipment code number.

Power Wave 300C Standard Model Wiring Diagram for code(s) - 12942 & 12944

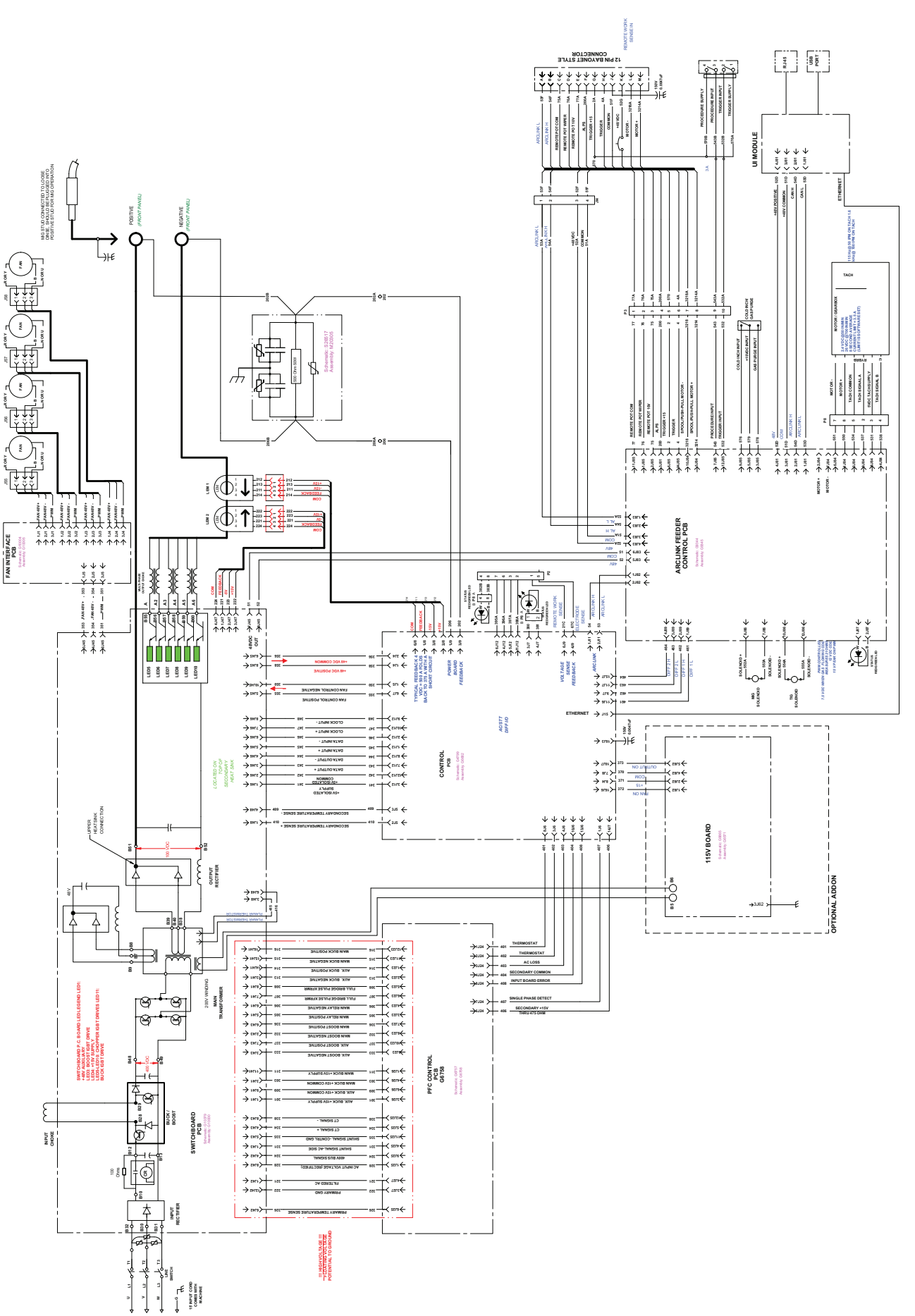


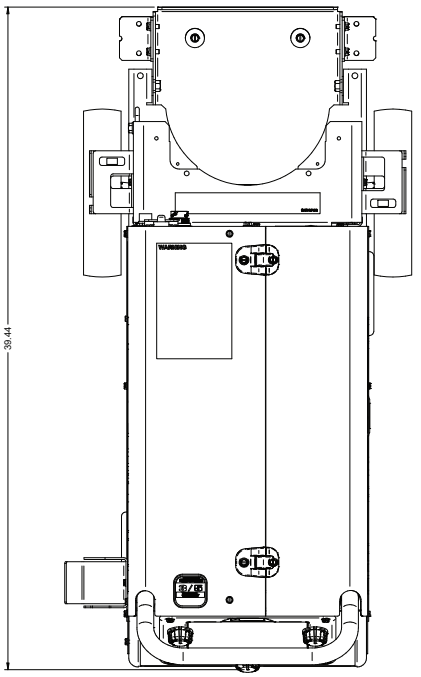
NOTE: This diagram is for reference only. It may not be accurate for all machines covered by this manual. The specific diagram for a particular code is pasted inside the machine on one of the enclosure panels. If the diagram is illegible, write to the Service Department for a replacement. Give the equipment code number.

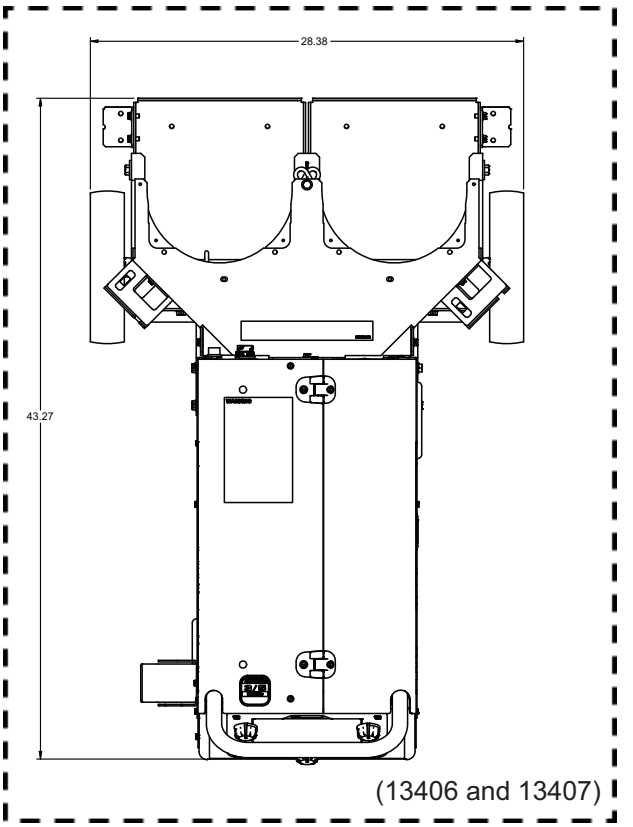
Power Wave 300C Advanced Model for code(s) - 12943,12945, 13200, 13406, & 13407



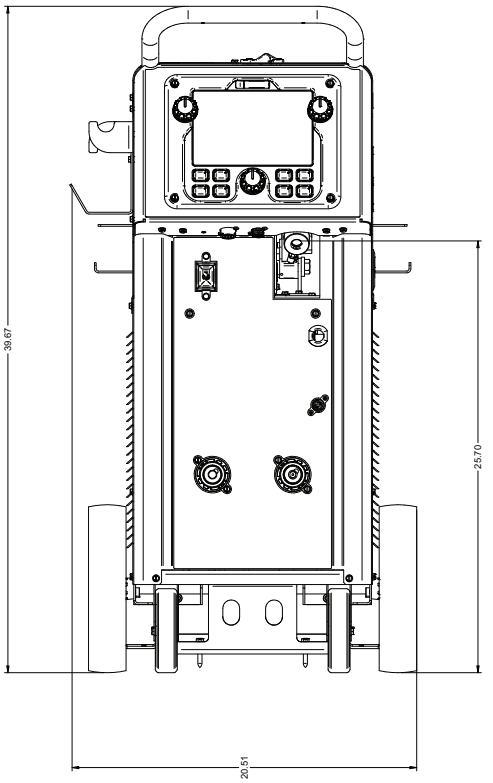
Power Wave 300C Standard Model Schematic for code(s) - 12942 & 12944

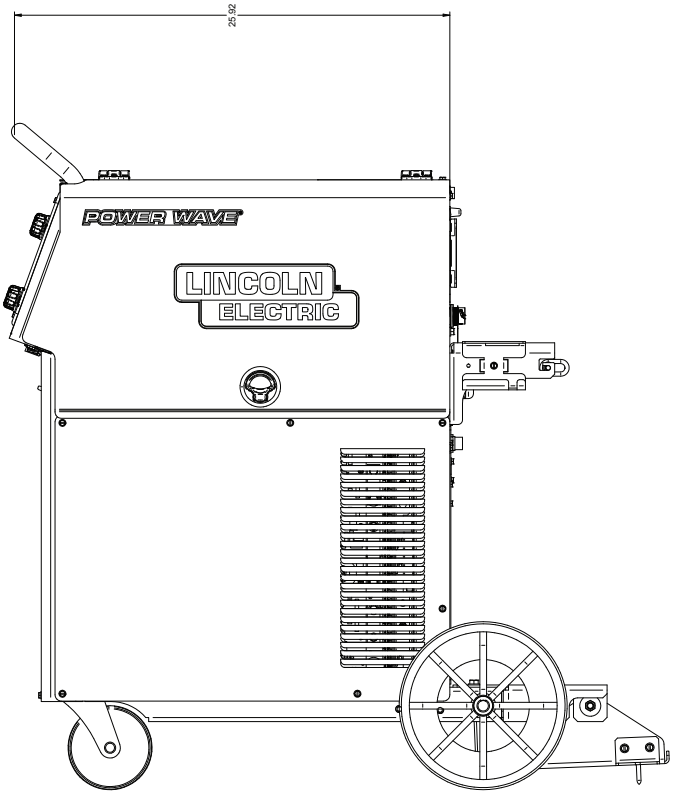






(13406 and 13407)





2 Step – When the gun trigger is pulled, the welding system cycles through the arc starting sequence and into the main welding parameters. The welding system will continue to weld as long as the gun trigger is activated. Once the trigger is released, the welding system cycles through the arc ending steps.

3 Phase voltage – Three AC voltage sources that are phase shifted 120° with respect to each other.

4 Step – The 4 step trigger adds to the welder's comfort when making long welds by allowing the trigger to be released after an initial trigger pull. When the gun trigger is pulled, the welding system cycles through the arc starting sequence and into the main welding parameters. Welding stops when the trigger is pulled a second time and then released and the welding system cycles through the arc ending steps.

A-lead – The single wire used to configure the machine reconnect for various input Voltages.

AC (Alternating Current) – Voltage or current that changes polarity or direction, respectively, over time.

Active Condition – The machine is energized either by connection to a power source or has some kind of mechanical motion within the unit.

Alternator – An electric generator that produces alternating current. The main function of this device is to change mechanical energy into electrical energy. The mechanical energy can be supplied by either a motor or engine.

Ampere (Amp) – The standard measurement unit of current flow. Symbol: A

Anode – The positively charged electrode of a device.

Arc Control (Pinch) – Adjusts how quickly the current will rise when the wire is shorted to the work resulting in a soft or crisp arc.

Arc Force – A temporary increase of the output current during SMAW welding when the arc is too short.

Arc Length – The physical gap between the end of the electrode and the weld puddle.

Across the Arc – The device is electrically connected to the welding terminals. This device is powered by the same voltage that is used for welding.

Arc-link cable – Used between the power source and wire feeder in a bench system and between the power source, control box and wire drive in a boom system. This 5 pin cable supplies voltage from the power source to power the feeder and also transmits digital signals between the two.

Armature – The part of an electric device that includes the main current-carrying winding and in which the electromotive force is induced.

Armature Reaction – A force set up by the current induced in the armature of a generator that results in altering as to both magnitude and direction the flux due to the field magnet.

Asynchronous Welder Generator – An alternator that utilizes an air-gap rotating magnetic-field between a stator and a rotor to interact with an induced current in a rotor winding. It is sometimes called an induction generator.

Auxiliary Windings – Stator winding used to power the auxiliary connections.

Battery – A combination of two or more cells electrically connected to work together to produce electric energy.

Block Diagram – visual representation of a machine that utilizes simplified blocks to represent the principal parts or functions of the machine.

Boost Converter – The boost converter increases applied voltage to a higher level. This circuitry only applies to DC voltage and is only active if the applied voltage is below a predetermined value.

Bridge Rectifier – A type of full wave rectifier which uses four or more diodes in a bridge circuit configuration to efficiently convert the Alternating Current (AC) into Direct Current (DC).

Brushes – An electrical contact which conducts current between stationary wires and moving parts, most commonly in a rotating shaft.

Buck Converter – The buck converter decreases applied voltage to a lower level. This circuitry only applies to DC voltage and is only active if the applied voltage is above a predetermined value.

Buck/Boost Converter – The combined buck/boost circuitry is utilized to increase or decrease an applied voltage to a predetermined value.

CAN communication – Controller Area Network (CAN bus) is a robust vehicle bus standard designed to allow microcontrollers and devices to communicate with each other's applications without a host computer. It broadcasts messages to the nodes presented in a network.

Cathode – The negatively charged electrode of a device.

Capacitance – The ability of a body to store an electrical charge.

Capacitor – A device used to store an electric charge, consisting of one or more pairs of conductors separated by an insulator. Capacitance is measured in Farad's (F) and some capacitors are polarity sensitive which is typically noted on the device as such.

Circuit Breaker – A device to prevent excessive current flow in a circuit that may be caused by a short circuit or heavy loads. The circuit breaker will stop the flow of current (open) if such a situation occurs.

Collector – The positively charged electrode of a transistor device.

Commutator – A cylindrical ring or disk assembly of conducting members, individually insulated in a supporting structure with an exposed surface for contact with current-collecting brushes and mounted on the armature shaft, for changing the frequency or direction of the current in the armature windings.

Conductor – A type of material that allows the flow of charge (**electrical** current) in one or more directions

Connectors – Various devices for connecting one object to another.

Constant Current – A process where the power source keeps the current as constant as possible even when the operator varies the arc length. The voltage varies, formerly known as "variable voltage". Mainly used for Stick and TIG welding.

Constant Voltage – A process where the power source keeps the voltage as constant as possible and allows amperage to vary considerably. Mainly used for MIG and Flux core welding using wire feeders.

Contactor – A mechanically or electrically operated switch used in high current applications.

Control cable – A multistrand cable used for transmission of power, command and feedback information.

Crosslinc – A welding system communication technology. When using a Crosslinc enabled power source and wire feeder, welding voltage can be controlled remotely, through the welding cable without the use of an additional control cable.

Current – The flow of electrons through a conductor.

Current Transducer – A device used to detect DC current flow.

Cycle – One complete wave of alternating current or voltage.

DC (Direct Current) – A voltage or current that never crosses zero and maintains current flow in one direction.

Diode – A device used in a circuit that allows current to flow in one direction only. Typically current flow will occur if the diode's anode is more positive than its cathode. Typical configurations used can be: blocking, flashing, free-wheeling, full wave bridge rectifier, half wave rectifier.

Display – An electronic device with a screen used for displaying information.

Duty Cycle – The percentage of a ten (10) minute period that a power source can operate its rated load before exceeding its thermal limit.

Efficiency – The ratio of the output power divided by the input power.

Electrical Interference (noise) – Unwanted noise or other effects from electromagnetic radiation.

Electricity – The flow of electrons through a conductor from the source to a ground.

Electrode Negative – When the electrode is connected to the negative output terminal.

Electrode Positive – When the electrode is connected to the positive output terminal.

Electromagnetism – Magnetism developed by a current of electricity.

Emitter – The negatively charged electrode of a transistor device.

Encoder – An electro-mechanical device that converts the angular position or motion of a shaft or axle to digital output signals.

Excitation – The process of generating a magnetic field by means of an electric current. The source of this can be from a magnet or an external voltage source.

Excitation Windings – Stator winding that powers the excitation process in an alternator or generator.

Farads – The standard measurement unit of capacitance. Symbol: f

Feedback – To provide actual output information to a control circuit so as to maintain a constant output.

Feeder Winding – Stator winding that powers the wire feeders.

Field Windings – The stationary windings of a generator.

Field Current – The current flow through the Field Windings

Light Emitting Diode (LED) – A semiconductor device that emits light when an electric current passes through it.

Flashing – A generic term referring to the initial excitation of an electrical magnetic field.

Forward Biased – When voltage is applied to a semiconductor device in the direction that allows current to flow.

Frequency – The number of occurrences of a repeating event (cycles) per unit of Time.

Full Wave – A rectifier that converts alternating current into continuous current and that utilizes both halves of each cycle of the alternating current.

Fuse – An electrical safety device that operates to provide overcurrent protection of an electrical circuit. Its essential component is a metal wire or strip that melts when too much current flows through it, thereby interrupting current flow.

Gate – Is the control terminal in a semiconductor device. Typically a small voltage is applied to the Gate to trigger or latch the device.

Generator – An electric generator that produces direct current. The main function of this device is to change mechanical energy into electrical energy. The mechanical energy can be supplied by either a motor or engine.

GFCI (Ground Fault Circuit Interrupter) – A device which interrupts current flow when it senses an imbalance between the outgoing and incoming current.

Ground Connection – A safety connection from a welding machine frame to an earth ground.

Half Wave - A rectifier that utilizes one half cycle of alternating current and suppresses the other.

Henry – The standard measurement unit of inductance. Symbol: H

Hertz – The standard measurement unit of electrical frequency. Symbol: Hz

High Frequency – A high frequency used for arc ignition and stabilization when TIG welding.

Hot Start – Increases the output amperage for a designated amount of time at the start of a weld.

Insulated Gate Bipolar Transistor (IGBT) – A high speed solid state switching device that can be turned on by applying a voltage signal to the gate. When the gate signal is removed the IGBT will turn off. An IGBT will operate on DC voltage only.

Inductance – The tendency of an electrical conductor to oppose a change in the electric current flowing through it.

Inductor – A passive component which stores the electrical energy in a magnetic field when the electric current passes through it.

Interpole Coils – Utilized in generators. They counteract the effects of armature reaction.

Inverter – circuitry that changes direct current (DC) to alternating current (AC).

Life Cycle – The length of time a product is introduced to consumers until it's removal from the shelves.

Motor – An electrical device that converts electrical energy into mechanical energy.

Magnetic Field – The area around a magnet or coil in which there is magnetic force.

Magnetic Flux – The measurement of the total magnetic field lines that pass throug a given surface area.

Magnetism – The force that arises from the motion of electric charges.

MOLEX – Is the vernacular term for a two-piece pin and socket interconnection that was pioneered by Molex Connector Company.

Negative Temperature Co-efficient (NTC) – A type of thermistor in which the resistance decreases in relation to a rise in temperature.

OCV (Open Circuit Voltage) –The potential voltage in the welding circuit before the arc is initiated or a load applied; measured in volts.

Ohms – The standard measurement unit of electrical resistance. Symbol: Ω

Ohm's Law – current passing through a conductor is proportional to the voltage over the resistance. I = V / R.

Parallel Circuit – a circuit that has multiple current paths.

Peak Value – The maximum value attained by the current during one cycle. There is a positive and negative peak.

Peak to Peak Value – The maximum value attained by both peaks during one cycle.

Phase – A relative variation or change of state or a cycle.

Phaseback (foldback) – A current limiting feature (a type of overload protection).

Pilot Arc – The electrical pathway between the torch nozzle and electrode tip. This function aids in the transfer of current from the electrode tip to the work piece.

Polarity – The polarity of the electrode as compared to the polarity of the work piece.

Positive Temperature Co-efficient (PTC) – A type of thermistor in which the resistance increases in relation to a rise in temperature.

Potentiometer – It is a variable resistor with three terminals. The middle terminal is adjustable. The potential at the third terminal can be adjusted to give any fraction of the potential voltage across the two outer terminals.

Power – The rate, over time, in which electrical energy is transferred within an electrical circuit.

Power Factor – The ratio of the real power that is used to do work to the apparent power that is supplied to the circuit.

Printed Circuit Boards – A physical device that houses one or more electrical circuits.

Pulsating DC – A periodic current which changes in value but never changes direction.

Rated Load – The average amperage and voltage the power source is designed to produce for a given specific duty cycle time period. For example, 400 amps, 36 load volts, at 60 percent duty cycle.

RCBO (Residual Current Breaker with Over-current) – A combination of a RCD and Circuit Breaker.

RCD (Residual Current Device) – Detects imbalance in the currents of the supply and return conductors of a circuit. Does not protect against shorts.

Reactor – An electrical magnetic component used to maintain current at constant levels by resisting any changes in the current.

Reconnect Panel – Used to configure the machine's internal components for various input power voltages

Rectification – The process of converting alternating current to direct current.

Relay – An electrically operated switch used in low current applications.

Resistance – The opposition to the passage of an electric current through a conductor. Measured in Ohms (Ω) and is not polarity sensitive.

Resistor – Used to regulate voltage and current levels in a circuit.

Reverse Biased – When voltage is applied to a semiconductor device in the direction that does not allows current to flow.

Rheostat – A two terminal adjustable resistor that may have its resistance value changed without opening the circuit in which it is connected, thereby controlling the current through the circuit.

Ripple – The residual periodic variation of the DC voltage within a power supply which has been derived from an alternating current source.

RMS (Root Means Squared) – The same amount of heat dissipation across a resistor as Direct Current.

Rotor – A rotating component of an electromagnetic system in an electric motor, or alternator.

RPM (Revolutions per minute) – A unit of rotational speed or the frequency of rotation around a fixed axis.

Saturation – The state reached when an increase in applied external magnetic field cannot increase the magnetization of the material further.

Saw Tooth Wave Form – A non-sinusoidal waveform. It is so named based on its resemblance to the teeth of a plain-toothed saw.

Schematic Diagram – A representation of the electronic components of a machine utilizing graphic symbols rather than realistic pictures.

Schematic Symbols – A standardized pictogram used to represent various electrical and electronic devices or function.

Series Circuit – a circuit that has only one current path.

Series - Parallel Circuit – a circuit that has both a single current path and multiple current paths.

Silicon Controlled Rectifier (SCR) – Very similar to a Diode in which it allows current to flow when the anode is more positive than the cathode. However, current flow will occur only if a small signal is applied to its Gate and will stop flowing when the voltage drops to zero or goes negative.

Shunt – A type of low value resistance used to detect circuit current.

Sinusoidal Wave Form – A curve that describes a smooth repetitive oscillation of a waveform.

Slip Rings – An electromechanical device that allows the transmission of electrical power from a stationary to a rotating structure. Normally a copper or brass circular device attached to a rotating member.

Solenoid – An electromechanical device that when energized acts like a magnet so that a movable core is drawn into the coil when a current flows and that is used especially as a switch or control for a mechanical device (such as a valve).

Source – Provides the electrical potential that is required for electricity to flow.

Spark Gap Generator – Used to initiate and maintain the arc in a TIG machine.

Square Wave Form – A type of waveform where the signal has only two levels. The signal transitions between these levels at regular intervals and the switching time is very rapid.

Standard Units of Measurement – Is a quantifiable language that helps everyone understand the association of the object with the measurement.

Static Condition – The machine is not connection to a power source and has no mechanical motion.

Stator – The stationary part of a rotary system, found in electric alternators, generators and electric motors.

Switch – A mechanical device used to interrupt the flow of current in a circuit. Switches are essentially binary devices: they are either completely on (closed) or completely off (open).

Tachometer – A device or circuit used to measure the rotations of a mechanical device.

Thermistor – A type of resistor in which resistance changes due to temperature, two main types: Positive Temperature Co-efficient (PTC), Negative Temperature Co-efficient (NTC).

Thermostat – A mechanical device that interrupts or closes a circuit when a pre-determined temperature limit is reached.

Toroid – A device used to filter unwanted electrical noise.

Trigger Interlock – The gun trigger will stay closed (activated) as long as welding current is flowing and will open (deactivate) when welding current stops.

Transformer – A device with a group of mutually-inductive coils used to magnetically induce AC power from one coil to the other. Typical examples are as follows:

> ***Isolation Transformer*** – A transformer usually used for circuit protection.
>
> ***Step Down Transformer*** – A transformer where the secondary voltage is lower than the primary voltage.
>
> ***Step Up Transformer*** – A transformer where the secondary voltage is higher than the primary voltage.
>
> ***Current Transformer*** – A type of transformer used as a current monitoring device.
>
> ***Power Transformer*** – A transformer that contains multiple primary windings to accommodate a variety of input voltages.

Twisted Pair – A cable consisting of two wires of a single circuit twisted around each other for the purposes of improving electromagnetic compatibility.

Voltage – The pressure or difference in electrical potential between two points in a circuit that causes current to flow.

Volts – The standard unit of measurement for Voltage. Symbol: V

User Interface – A device where interactions between operators and machines occur.

Watts – The standard measurement unit of electrical power. Symbol: W

Watts Law – power of an electrical circuit is the product of its voltage and current. P = I x V.

Weld Winding – Stator winding that provides the power for the welding components.

Welding Electrode – A consumable component of the welding circuit through which current is conducted between the electrode holder and the arc that becomes part of the weldment.

Welding Gun – In semi-automatic or automatic welding, a device to transfer current and guide the electrode wire into the arc puddle.

Wire Harness – A system of insulated conducting wires bound together with insulating materials.

Wiring Diagram – a simple visual representation of the physical connections and physical layout of the electrical system of the machine.

WFS (Wire Feed Speed) – The speed at which the consumable wire is fed into the weld joint puddle.

			
WARNING	● Do not touch electrically live parts or electrode with skin or wet clothing. ● Insulate yourself from work and ground.	● Keep flammable materials away.	● Wear eye, ear and body protection.
Spanish **AVISO DE PRECAUCION**	● No toque las partes o los electrodos bajo carga con la piel o ropa mojada. ● Aislese del trabajo y de la tierra.	● Mantenga el material combustible fuera del área de trabajo.	● Protéjase los ojos, los oídos y el cuerpo.
French **ATTENTION**	● Ne laissez ni la peau ni des vêtements mouillés entrer en contact avec des pièces sous tension. ● Isolez-vous du travail et de la terre.	● Gardez à l'écart de tout matériel inflammable.	● Protégez vos yeux, vos oreilles et votre corps.
German **WARNUNG**	● Berühren Sie keine stromführenden Teile oder Elektroden mit Ihrem Körper oder feuchter Kleidung! ● Isolieren Sie sich von den Elektroden und dem Erdboden!	● Entfernen Sie brennbarres Material!	● Tragen Sie Augen-, Ohren- und Körperschutz!
Portuguese **ATENÇÃO**	● Não toque partes elétricas e electrodos com a pele ou roupa molhada. ● Isole-se da peça e terra.	● Mantenha inflamáveis bem guardados.	● Use proteção para a vista, ouvido e corpo.
Japanese **注意事項**	● 通電中の電気部品、又は溶材にヒフやぬれた布で触れないこと。 ● 施工物やアースから身体が絶縁されている様にして下さい。	● 燃えやすいものの側での溶接作業は絶対にしてはなりません。	● 目、耳及び身体に保護具をして下さい。
Chinese **警 告**	● 皮肤或濕衣物切勿接觸帶電部件及銲條。 ● 使你自己與地面和工件絶緣。	● 把一切易燃物品移離工作場所。	● 佩戴眼、耳及身體勞動保護用具。
Korean **위 험**	● 전도체나 용접봉을 젖은 헝겁 또는 피부로 절대 접촉치 마십시요. ● 모재와 접지를 접촉치 마십시요.	● 인화성 물질을 접근 시키지 마시요.	● 눈, 귀와 몸에 보호장구를 착용하십시요.
Arabic **تحذير**	● لا تلمس الاجزاء التي يسري فيها التيار الكهربائي أو الالكترود بجلد الجسم أو بالملابس المبللة بالماء. ● ضع عازلا على جسمك خلال العمل.	● ضع المواد القابلة للاشتعال في مكان بعيد.	● ضع أدوات وملابس واقية على عينيك وأذنيك وجسمك.

READ AND UNDERSTAND THE MANUFACTURER'S INSTRUCTION FOR THIS EQUIPMENT AND THE CONSUMABLES TO BE USED AND FOLLOW YOUR EMPLOYER'S SAFETY PRACTICES.

SE RECOMIENDA LEER Y ENTENDER LAS INSTRUCCIONES DEL FABRICANTE PARA EL USO DE ESTE EQUIPO Y LOS CONSUMIBLES QUE VA A UTILIZAR, SIGA LAS MEDIDAS DE SEGURIDAD DE SU SUPERVISOR.

LISEZ ET COMPRENEZ LES INSTRUCTIONS DU FABRICANT EN CE QUI REGARDE CET EQUIPMENT ET LES PRODUITS A ETRE EMPLOYES ET SUIVEZ LES PROCEDURES DE SECURITE DE VOTRE EMPLOYEUR.

LESEN SIE UND BEFOLGEN SIE DIE BETRIEBSANLEITUNG DER ANLAGE UND DEN ELEKTRODENEINSATZ DES HERSTELLERS. DIE UNFALLVERHÜTUNGSVORSCHRIFTEN DES ARBEITGEBERS SIND EBENFALLS ZU BEACHTEN.

			
● Keep your head out of fumes. ● Use ventilation or exhaust to remove fumes from breathing zone.	● Turn power off before servicing.	● Do not operate with panel open or guards off.	**WARNING**
● Los humos fuera de la zona de respiración. ● Mantenga la cabeza fuera de los humos. Utilice ventilación o aspiración para gases.	● Desconectar el cable de alimentación de poder de la máquina antes de iniciar cualquier servicio.	● No operar con panel abierto o guardas quitadas.	Spanish **AVISO DE PRECAUCION**
● Gardez la tête à l'écart des fumées. ● Utilisez un ventilateur ou un aspirateur pour ôter les fumées des zones de travail.	● Débranchez le courant avant l'entretien.	● N'opérez pas avec les panneaux ouverts ou avec les dispositifs de protection enlevés.	French **ATTENTION**
● Vermeiden Sie das Einatmen von Schweibrauch! ● Sorgen Sie für gute Be- und Entlüftung des Arbeitsplatzes!	● Strom vor Wartungsarbeiten abschalten! (Netzstrom völlig öffnen; Maschine anhalten!)	● Anlage nie ohne Schutzgehäuse oder Innenschutzverkleidung in Betrieb setzen!	German **WARNUNG**
● Mantenha seu rosto da fumaça. ● Use ventilação e exhaustão para remover fumo da zona respiratória.	● Não opere com as tampas removidas. ● Desligue a corrente antes de fazer serviço. ● Não toque as partes elétricas nuas.	● Mantenha-se afastado das partes moventes. ● Não opere com os paineis abertos ou guardas removidas.	Portuguese **ATENÇÃO**
● ヒュームから頭を離すようにして下さい。 ● 換気や排煙に十分留意して下さい。	● メンテナンス・サービスに取りかかる際には、まず電源スイッチを必ず切って下さい。	● パネルやカバーを取り外したままで機械操作をしないで下さい。	Japanese **注意事項**
●頭部遠離煙霧。 ●在呼吸區使用通風或排風器除煙。	●維修前切斷電源。	●儀表板打開或沒有安全罩時不準作業。	Chinese **警 告**
● 얼굴로부터 용접가스를 멀리하십시요. ● 호흡지역으로부터 용접가스를 제거하기 위해 가스제거기나 통풍기를 사용하십시요.	● 보수전에 전원을 차단하십시요.	● 판넬이 열린 상태로 작동치 마십시요.	Korean **위 험**
● ابعد رأسك بعيداً عن الدخان. ● استعمل التهوية أو جهاز ضغط الدخان للخارج لكي تبعد الدخان عن المنطقة التي تتنفس فيها.	● اقطع التيار الكهربائي قبل القيام بأية صيانة.	● لا تشغل هذا الجهاز اذا كانت الاغطية الحديدية الواقية ليست عليه.	Arabic **تحذير**

LEIA E COMPREENDA AS INSTRUÇÕES DO FABRICANTE PARA ESTE EQUIPAMENTO E AS PARTES DE USO, E SIGA AS PRÁTICAS DE SEGURANÇA DO EMPREGADOR.

使う機械や溶材のメーカーの指示書をよく読み、まず理解して下さい。そして貴社の安全規定に従って下さい。

請詳細閱讀並理解製造廠提供的説明以及應該使用的銀捍材料，並請遵守貴方的有関勞動保護規定。

이 제품에 동봉된 작업지침서를 숙지하시고 귀사의 작업자 안전수칙을 준수하시기 바랍니다.

اقرأ بتمعن وافهم تعليمات المصنع المنتج لهذه المعدات والمواد قبل استعمالها واتبع تعليمات الوقاية لصاحب العمل.

CUSTOMER ASSISTANCE POLICY

The business of Lincoln Electric is manufacturing and selling high quality welding equipment, automated welding systems, consumables, and cutting equipment. Our challenge is to meet the needs of our customers, who are experts in their fields, and to exceed their expectations. On occasion, purchasers may ask Lincoln Electric for information or technical information about their use of our products. Our employees respond to inquiries to the best of their ability based on information and specifications provided to them by the customers and the knowledge they may have concerning the application. Our employees, however, are not in a position to verify the information provided or to evaluate the engineering requirements for the particular weldment, or to provide engineering advice in relation to a specific situation or application. Accordingly, Lincoln Electric does not warrant or guarantee or assume any liability with respect to such information or communications. Moreover, the provision of such information or technical information does not create, expand, or alter any warranty on our products. Any express or implied warranty that might arise from the information or technical information, including any implied warranty of merchantability or any warranty of fitness for any customers' particular purpose or any other equivalent or similar warranty is specifically disclaimed.

Lincoln Electric is a responsive manufacturer, but the definition of specifications, and the selection and use of specific products sold by Lincoln Electric is solely within the control of, and remains the sole responsibility of the customer. Many variables beyond the control of Lincoln Electric affect the results obtained in applying these types of fabrication methods and service requirements.

WELD FUME CONTROL EQUIPMENT

The operation of welding fume control equipment is affected by various factors including proper use and positioning of the equipment, maintenance of the equipment and the specific welding procedure and application involved. Worker exposure level should be checked upon installation and periodically thereafter to be certain it is within applicable OSHA PEL and ACGIH TLV limits.

THE LINCOLN ELECTRIC COMPANY
22801 St. Clair Avenue • Cleveland, OH • 44117-1199 • U.S.A.
Phone: +1.216.481.8100 • www.lincolnelectric.com