

POWER FEED 15M

For use with machines having Code Number : 10940



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

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.



NRTL/C

OPERATOR'S MANUAL



LINCOLN[®]
ELECTRIC

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- World's Leader in Welding and Cutting Products •
- Sales and Service through Subsidiaries and Distributors Worldwide •

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⚠ WARNING

⚠ CALIFORNIA PROPOSITION 65 WARNINGS ⚠

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

The Above For Diesel Engines

The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

The Above For Gasoline Engines

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 W117.2-1974. 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.



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.

Mar '95



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.

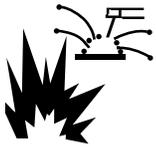
- 4.a. Use a shield with the proper filter and cover plates to protect your eyes from sparks and the rays of the arc when welding or observing open arc welding. Headshield and filter lens should conform to ANSI Z87.1 standards.
- 4.b. Use suitable clothing made from durable flame-resistant material to 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 with electrodes which require special ventilation such as stainless or hard facing (see instructions on container or MSDS) or on lead or cadmium plated steel and other metals or coatings which produce highly toxic fumes, keep exposure as low as possible and below Threshold Limit Values (TLV) using local exhaust or mechanical ventilation. In confined spaces or in some circumstances, outdoors, a respirator may be required. Additional precautions are also required when welding on galvanized steel.**
- 5.b. Do not weld in locations near chlorinated hydrocarbon vapors coming from degreasing, cleaning or spraying operations. The heat and rays of the arc can react with solvent vapors to form phosgene, a highly toxic gas, and other irritating products.
- 5.c. Shielding gases used for arc welding can displace air and cause injury or death. Always use enough ventilation, especially in confined areas, to insure breathing air is safe.
- 5.d. Read and understand the manufacturer's instructions for this equipment and the consumables to be used, including the material safety data sheet (MSDS) and follow your employer's safety practices. MSDS forms are available from your welding distributor or from the manufacturer.
- 5.e. Also see item 1.b.

Mar '95



WELDING 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.



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-1, "Precautions for Safe Handling of Compressed Gases in Cylinders," available from the Compressed Gas Association 1235 Jefferson Davis Highway, Arlington, VA 22202.



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.

Mar '95

PRÉCAUTIONS DE SÛRETÉ

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

Sûreté Pour Soudage A L'Arc

1. Protégez-vous contre la secousse électrique:
 - a. Les circuits à l'électrode et à la pièce 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 vêtements mouillés. Porter des gants secs et sans trous pour isoler les mains.
 - b. Faire très attention de bien s'isoler de la masse quand on soude dans des endroits humides, ou sur un plancher métallique ou des grilles métalliques, 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 de fonctionnement.
 - 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 précautions pour le porte-électrode s'appliquent 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 où 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 latéraux 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 accidentel peut provoquer un échauffement et un risque d'incendie.
8. S'assurer que la masse est connectée le plus près 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 chaînes de levage, câbles de grue, ou autres circuits. Cela peut provoquer des risques d'incendie ou d'échauffement des chaînes et des câbles jusqu'à ce qu'ils se rompent.
9. Assurer une ventilation suffisante dans la zone de soudage. Ceci est particulièrement 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 pistelage. La chaleur ou les rayons de l'arc peuvent réagir avec les vapeurs du solvant pour produire du phosgène (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 châssis du poste conformément au code de l'électricité et aux recommandations du fabricant. Le dispositif de montage ou la pièce 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 faire des travaux à l'intérieur de poste, la débrancher à l'interrupteur à la boîte de fusibles.
4. Garder tous les couvercles et dispositifs de sûreté à leur place.

Mar. '93

Thank You

for selecting a **QUALITY** product by Lincoln Electric. We want you to take pride in operating this Lincoln Electric Company product
••• as much pride as we have in bringing this product to you!

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.

Please record your equipment identification information below for future reference. This information can be found on your machine nameplate.

Product _____

Model Number _____

Code Number or Date Code _____

Serial Number _____

Date Purchased _____

Where Purchased _____

Whenever you request replacement parts or information on this equipment, always supply the information you have recorded above. The code number is especially important when identifying the correct replacement parts.

On-Line Product Registration

- Register your machine with Lincoln Electric either via fax or over the Internet.

- For faxing: Complete the form on the back of the warranty statement included in the literature packet accompanying this machine and fax the form per the instructions printed on it.
- For On-Line Registration: Go to our **WEB SITE at www.lincolnelectric.com**. Choose "Quick Links" and then "Product Registration". Please complete the form and submit your registration.

Read this Operators Manual completely before attempting to use this equipment. Save this manual and keep it handy for quick reference. Pay particular attention to the safety instructions we have provided for your protection. The level of seriousness to be applied to each is explained below:

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**.

Installation	Section A
Technical Specifications	A-1
Safety Precautions	A-2
Location	A-2
High Frequency Protection	A-2
Digital Welding System Components	A-2
Control Cable Connection	A-3
Weld Cable Size and Table	A-3
Coaxial Weld Cable	A-4
Electrode Polarity	A-4
Shielding Gas Connection	A-4
Changing The Drive Motor Gears	A-5
Wire Drive Configuration	A-6
Procedure to Install Drive Rolls and Wire Guides	A-6
Remote Sense Lead Specification	A-7
<hr/>	
Operation	Section B
Safety Precautions	B-1
Graphic Symbols that appear on this Machine or in this Manual	B-1
Definition of Welding Terms	B-2
General Description.....	B-3
Duty Cycle	B-3
Recommended Processes	B-3
Processes Limitations	B-3
Equipment Limitations	B-3
Making a Weld with Waveform Technology Power Sources	B-4
General Welding Adjustments	B-4
1. WFS/AMPS	B-4
2. Volts/Trim	B-4
3. Welding Mode	B-4
4. Arc Control	B-4
Constant Voltage (CV) Welding	B-5
Pulse Welding	B-5
STT Synergic Welding.....	B-6
Case Front Controls	B-7 thru B-10
Extended Features Menu	B-11
Internal Controls	B-12
Cold Feed/Gas Purge Switch	B-12
Idle Roll Pressure Setting.....	B-12
Flow Meter.....	B-13
2 Step - 4 Step Trigger Operation and Graphics	B-14 thru B-18
<hr/>	
Accessories	Section C
Factory Installed Equipment.....	C-1
Drive Roll Kits used	C-1
Common Packages with Accessories Used.....	C-1
<hr/>	
Maintenance	Section D
Safety Precautions	D-1
Routine Maintenance	D-1
Periodic Maintenance.....	D-1
Calibration Specification.....	D-1
<hr/>	
Troubleshooting	Section E
How to Use Troubleshooting Guide	E-1
Error Fault Codes	E-2,E-3
Troubleshooting Guide	E-4 thru E-5
<hr/>	
Wiring Diagram & Dimension Prints	Section F
<hr/>	
Parts Pages	P484

TECHNICAL SPECIFICATIONS – POWER FEED 15M K2196-1
INPUT VOLTAGE and CURRENT

MODEL	DUTY CYCLE	INPUT VOLTAGE \pm 10%	INPUT AMPERES
K2196-1 Domestic	35% rating 60% rating 100% rating	40 VDC	5A

ELECTRODE DIAMETERS and SPEED RANGE

PROCESS	ELECTRODE DIAMETER RANGE	OUTPUT RANGE (AMPERES)	WIRE FEED SPEED RANGE
GMAW	.023 - .052" (0.6 -1.3 mm)	up to 500 Amps	50 - 700 ipm (1.3 - 17.8 m/min)
GMAW-Pulsed	.023 - .052" (0.6 -1.3 mm)		
GMAW-STT	.023 - .052" (0.6 -1.3 mm)		
FCAW	0.035 - 5/64" (0.9mm - 2.0 mm)		
FCAW- Gas Shielded	0.035 - 5/64" (0.9mm - 2.0 mm)		

PHYSICAL DIMENSIONS

MODEL	HEIGHT	WIDTH	DEPTH	WEIGHT
K2196-1 Domestic	12 Inches (305 mm)	9 Inches (229 mm)	23.3 Inches (590 mm)	34 lbs (15.5 kg)

TEMPERATURE RANGE

OPERATION:	-14° F to 140° F (- 10° C to 60° C)
STORAGE:	- 40° F to 185° F (- 40° C to 85° C)

SAFETY PRECAUTIONS

⚠ WARNING

ELECTRIC SHOCK CAN KILL.



- **ONLY QUALIFIED PERSONNEL SHOULD PERFORM THIS INSTALLATION.**

- Turn off input power to the power source 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 working on the equipment.

- Do not touch electrically hot parts.

LOCATION

The Power Feed 15M has an IP23 rating, suitable for outdoor use.

The Power Feed 15M should be positioned upright on a horizontal surface. Do not submerge the Power Feed 15M in water. The best practice is to keep the wire feeder in a dry environment. When working outdoors in severe wet weather, place the Power Feed 15M with the door facing up.

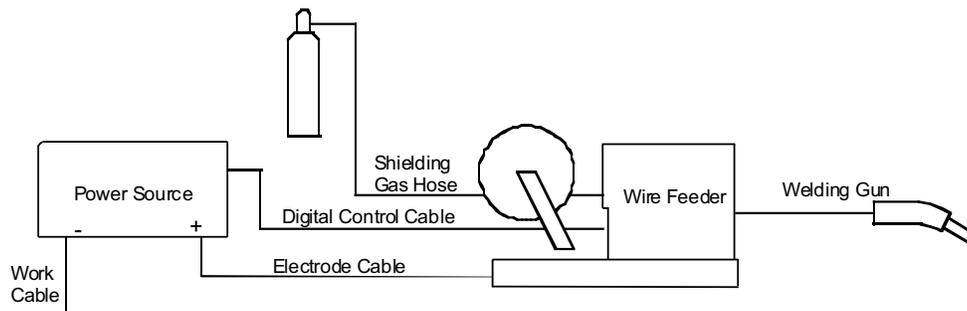
HIGH FREQUENCY PROTECTION

⚠ CAUTION

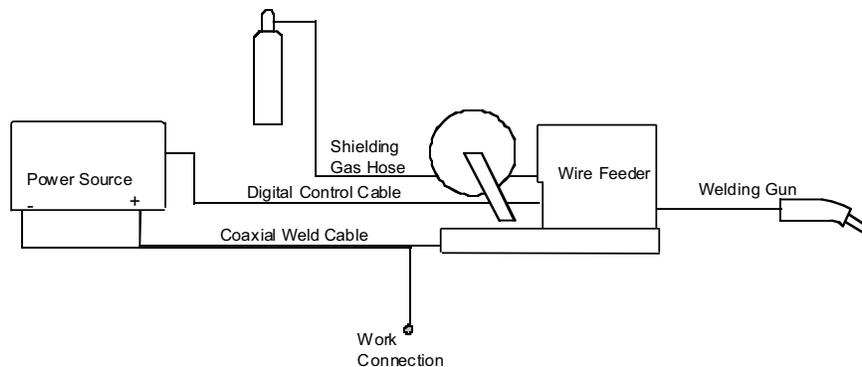
Locate the Power Feed 15M away from radio controlled machinery. The normal operation of the Power Feed 15M may adversely affect the operation of RF controlled equipment, which may result in bodily injury or damage to the equipment.

CONNECTION DIAGRAMS

CV Welding: Figure A.1



Pulse Welding or STT Welding: Figure A.2



POWER FEED 15M



CONTROL CABLE CONNECTION:

WELD CABLE SIZE

Digital Control Cable: Figure A.3

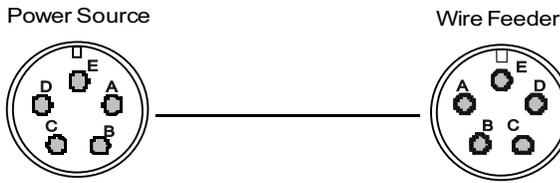
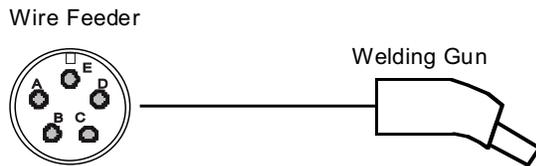


Table A.1 located below are copper cable sizes recommended for different currents and duty cycles. Lengths stipulated are the distance from the welder to work and back to the welder again. Cable sizes are increased for greater lengths primarily for the purpose of minimizing cable drop.

Power Source		Wire Feeder	
Pin	Function	Pin	Function
A	Digital I/O	A	Digital I/O
B	Digital I/O	B	Digital I/O
C	"67" voltage sense	C	"67" voltage sense
D	40 VDC	D	40 VDC
E	40 VDC	E	40 VDC

Welding Gun/Wire Feeder Trigger Connector
Wire Feeder: Figure A.4



WIRE FEEDER	
Pin	Function
A	Gun Trigger
B	-
C	Common
D	Dual Procedure
E	Common

TABLE A.1

RECOMMENDED CABLE SIZES (RUBBER COVERED COPPER - RATED 167°F or 75°C)**						
AMPRESSES	PERCENT DUTY CYCLE	CABLE SIZES FOR COMBINED LENGTHS OF ELECTRODE AND WORK CABLES				
		0 to 50Ft. (0 to 15M)	50 to 100Ft. (15 to 30M)	100 to 150 Ft. (30 to 46M)	150 to 200 Ft. (46 to 61M)	200 to 250 Ft. (61 to 76M)
200	60	2	2	2	1	1/0
200	100	2	2	2	1	1/0
225	20	4 or 5	3	2	1	1/0
225	40 & 30	3	3	2	1	1/0
250	30	3	3	2	1	1/0
250	40	2	2	1	1	1/0
250	60	1	1	1	1	1/0
250	100	1	1	1	1	1/0
300	60	1	1	1	1/0	2/0
325	100	2/0	2/0	2/0	2/0	3/0
350	60	1/0	1/0	2/0	2/0	3/0
400	60	2/0	2/0	2/0	3/0	4/0
400	100	3/0	3/0	3/0	3/0	4/0
500	60	2/0	2/0	3/0	3/0	4/0

** Tabled values are for operation at ambient temperatures of 104°F(40°C) and below. Applications above 104°F(40°C) may require cables larger than recommended, or cables rated higher than 167°F(75°C).

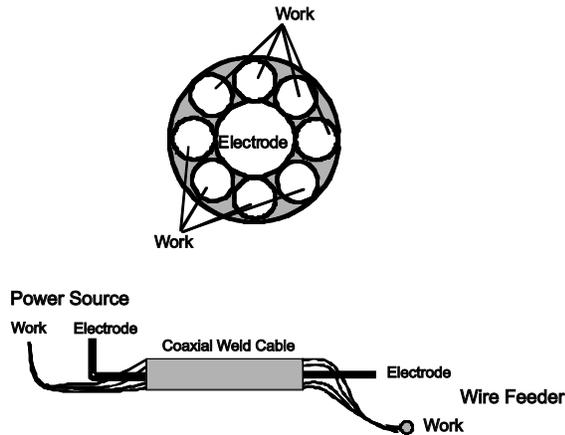
COAXIAL WELD CABLE

Coaxial welding cables are specially designed welding cables for pulse welding or STT welding. Coaxial weld cables feature low inductance, allowing fast changes in the weld current. Regular cables have a higher inductance which may distort the pulse or STT waveshape. Inductance becomes more severe as the weld cables become longer.

Coaxial weld cables are recommended for all pulse and STT welding, especially when the total weld cable length (electrode cable + work cable) exceeds 50 feet (7.6m)

A coaxial weld cable is constructed by 8 small leads wrapped around one large lead. The large inner lead connects to the electrode stud on the power source and the electrode connection on the wire feeder. The small leads combine together to form the work lead, one end attached to the power source and the other end to the work piece. See Figure A.5

FIGURE A.5



ELECTRODE POLARITY

⚠ CAUTION

When changing the electrode polarity, the weld cables must be changed at the power source studs and the DIP switch inside the Power Feed 15M must be properly set. Operation with the DIP switch in the wrong position will cause erratic arc performance.

The Power Feed 15M is factory set for Electrode Positive welding. Most welding procedures use Electrode Positive welding. Some Innershield procedures may use Electrode Negative welding.

To change the DIP switch inside the Power Feed 15M electrode polarity:

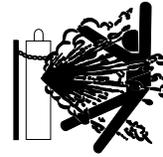
1. Turn off power at the welding power source.
2. Remove the rear access panel on the wire drive.
3. Locate DIP switches on the Wire Drive Board.
4. Set DIP switch #7 to the desired polarity.

DIP Switch #7 Position	Polarity
ON (Up) -	(negative) polarity
OFF (Down)	+ (positive) polarity

5. Assemble the rear access panel to the wire drive.
6. Restore power.

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 SUPPLY 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.

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% CO₂ 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 CO₂ 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.

POWER FEED 15M



CHANGING THE DRIVE MOTOR GEAR RATIO

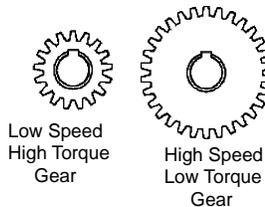
WARNING

- Turn off input power at the welding power source before installation or changing drive roll and/or wire guides.
- Do not touch electrically live parts such as the wire drive or internal wiring.

- When feeding with the gun trigger, the electrode and wire drive mechanism are "hot" to work and ground and could remain energized several seconds after the gun trigger is released.
- Only qualified personnel should perform this operation.

Tools required:

- 1/4" hex key wrench
- 3/4" socket and ratchet wrench
- 9/16" socket and ratchet wrench
- 7/16" nut driver
- 5/16" nut driver
- Phillips screw driver



1. Remove the spool of electrode from the wire feeder.
2. Loosen the thumb screw at the wire drive and remove the welding gun. Take the tension off the drive rollers and open the tension handle.
3. Remove the outer wire guide, drive rolls and inner wire guide.
4. Use a 7/16" nut driver to remove the gear cover.
5. Use 9/16" socket and ratchet wrench to remove the lower drive roll hub retainer. Remove the lower drive roll hub.
6. With a Phillips screwdriver, remove the screw, washer and collar holding the pinion gear. Remove the pinion gear.
7. Remove the electrode lead by unscrewing the bolt using a 3/4" socket and ratchet wrench.
8. With a 1/4" hex key wrench, loosen the socket head cap screw securing the gun bushing. Remove the gun bushing from the wire drive.
9. With a 5/16" nut driver remove the screws securing the cover assembly protecting the display board. Lift out the cover assembly enough so it does not overlap the wire drive.
10. Use a 7/16" nut driver to remove the bolt at the top securing the wire drive insulated panel to the sheet metal case.

11. Use a 5/16" nut driver to remove the four screws and washers holding the insulated panel to the sheet metal bracket.
12. Lift the wire drive assembly partially out of the wire feeder. With a Phillips screw driver, remove the three screws and lock washers securing the motor. Remove the motor.
13. Place the motor in the new position.
14. Assemble the three screws and lock washers holding the wire drive motor.
15. Place the wire drive assembly inside the wire feeder. With a 5/16" nut driver, assemble the four screws and lock washers to hold the insulating panel to the sheet metal bracket.
16. With a 7/16" nut driver, replace the bolt at the top securing the wire drive insulated panel to the sheet metal case.
- 17) Move DIP switch #8 on the Feed head board to the appropriate position.

Gear Select	DIP Switch #8 Setting	Range
High Speed	ON	50 – 700 ipm
Low Speed	OFF	50 – 400 ipm

18. Reassemble the cover assembly protecting the display board with a 5/16" nut driver.
19. Place the gun bushing in the wire drive and align the threaded hole in the gun bushing with the hole in the feed plate. With a 1/4" hex key, tighten the socket head cap screw to secure the bushing in the wire drive.
20. Reassemble the electrode and tighten the mounting hardware with a 3/4" socket and ratchet wrench.
21. Place the new gear on the motor shaft. Secure the gear to the motor shaft with the collar, washer and screw.
22. Reassemble the lower drive roll hub and lower drive roll hub retainer.
23. Reassemble the gear cover.
24. Reassemble the inner wire guide, drive rolls and outer wire guide.
25. Place the welding gun into the gun bushing and secure with the thumb screw.

POWER FEED 15M



WIRE DRIVE CONFIGURATION

(See Figure A-6)

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.
- Only qualified personnel should perform maintenance work.

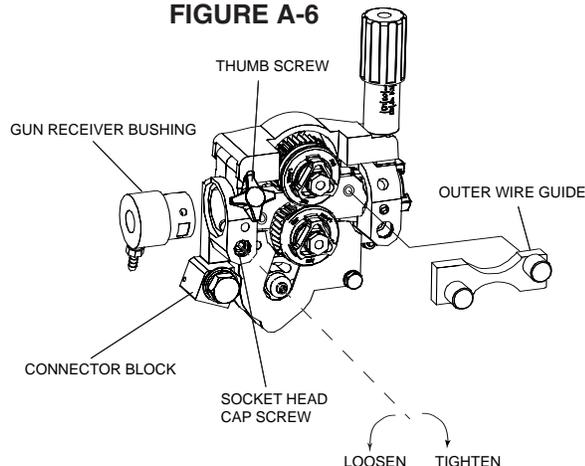
Tools required:

- 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.
 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.

FIGURE A-6



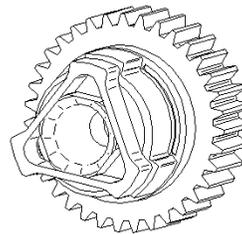
10. Tighten the socket head cap screw.
11. Insert the welding gun into the gun bushing and tighten the thumb screw.

PROCEDURE TO INSTALL DRIVE ROLLS AND WIRE GUIDES

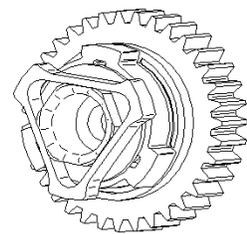
⚠ WARNING

- Turn off input power at the welding power source before installation or changing drive roll and/or wire guides.
- Do not touch electrically live parts such as the wire drive or internal wiring.
- When feeding with the gun trigger, the electrode and wire drive mechanism are "hot" to work and ground and could remain energized several seconds after the gun trigger is released.
- Only qualified personnel should perform this operation.

1. Release the idle roll pressure arm.
2. Remove the outer wire guide by turning the knurled thumbscrews counter-clockwise to unscrew them from the feed plate.
3. Rotate the triangular shaped drive roll retaining mechanism to unlock the drive rolls and remove the drive rolls.
4. Remove the inner wire guide.
5. Insert the new inner wire guide, groove side out, over the two locating pins in the feed plate.



UNLOCKED
POSITION



LOCKED
POSITION

6. Install a drive roll on each hub assembly and lock by rotating the triangular drive roll retaining mechanism.
7. Install the outer wire guide by aligning it with the pins and tightening the knurled thumbscrews.
8. Close the idle arm and engage the idle roll pressure arm. Adjust the pressure appropriately.

POWER FEED 15M



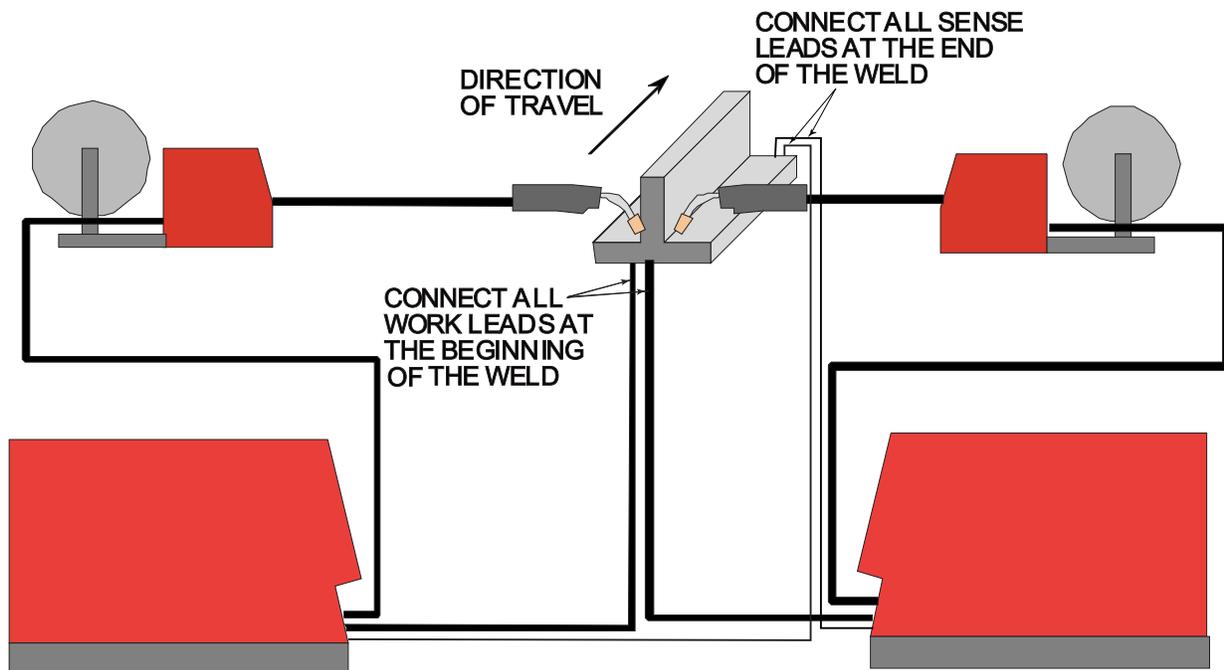
REMOTE SENSE LEAD SPECIFICATIONS

Welding with Multiple Arcs:
(See Figure A.7)

Special care must be taken when more than one arc is welding simultaneously on a single part. Arc blow and arc interference may occur or be magnified. Each power source requires a work lead from the work stud to the welding fixture. Do not combine all of the work leads into one lead. Performing welding in the direction away from the work leads. Connect all of the work sense leads from each power source to the work piece at the end of the weld, such that they are out of the path of the weld current. See Figure A.7

For the best results when pulse welding, set the wire size and wire feed speed the same for all the arcs. When these parameters are identical, the pulsing frequency will be the same, helping to stabilize the arcs.

FIGURE A.7



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.



• **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

 INPUT POWER

 ON

 OFF

 WIRE FEEDER

 POSITIVE OUTPUT

 NEGATIVE OUTPUT

 INPUT POWER

 DIRECT CURRENT

U_0 OPEN CIRCUIT VOLTAGE

U_1 INPUT VOLTAGE

U_2 OUTPUT VOLTAGE

I_1 INPUT CURRENT

I_2 OUTPUT CURRENT

 PROTECTIVE GROUND

 WARNING OR CAUTION

DEFINITION OF WELDING TERMS**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.

WFS

- Wire Feed Speed

CC

- Constant Current

CV

- Constant Voltage

GMAW

- Gas Metal Arc welding

GMAW-P

- Gas Metal Arc welding-(Pulse Arc)

GMAW-STT

- Gas Metal Arc welding-(Surface Tension Transfer)

SMAW

- Shielded Metal Arc welding

FCAW

- Flux Core Arc Welding

CAC

- Carbon Arc Cutting

CAG

- Carbon Arc Gouging

GENERAL DESCRIPTION

The Power Feed 15M is a portable wire feeder for customers seeking high end arc performance all packed in a rugged stainless steel case. The stainless steel case provides protection from corrosion, heat and rough handling. The heart of the Power Feed-15M is a rugged two roll, two speed wire drive capable of driving electrode under the most demanding conditions. Shielding gas flow is easily regulated with a built-in, standard flow meter that includes a flow control valve.

The Power Feed 15M runs with the Power Wave power sources. "Dual boot" software programmed into the Power Feed 15M operates with both ArcLink and LincNet Power Waves. Customers may transport the feeder between one vintage of power source and the other without having to set any special switches.

A **Mode Select Panel-3** type panel is permanently mounted to the case front of the Power Feed 15M. The panel allows the operator to customize many weld parameters, including preflow and postflow times, start and crater procedures, burnback, and many more.

An ON/OFF switch on the case front controls power to the feeder.

DUTY CYCLE

The Power Feed 15M is rated for 500 amps, 60% duty cycle and 350 amps, 100% duty. The duty cycle is based on a 10 minute cycle.

For example, when welding at 500 amps, the Power Feed 15M may run continuously for 6 minutes and then must be shut off for 4 minutes.

RECOMMENDED PROCESSES

The Power Feed 15M is best suited for alloy electrodes, out-of-position work, root welding and general fabrication.

- GMAW
- GMAW-Pulse
- GMAW-STT
- FCAW
- SMAW

PROCESS LIMITATIONS

The Power Feed 15M is not suitable for:

- SAW
- CAG
- GTAW

EQUIPMENT LIMITATIONS

- The Power Feed 15M does not operate with the Power Wave 450.
- The Power Feed 15M does not operate with any analog based power sources (CV-xxx machines, DC-xxx machines, etc.)
- Electrode spool size must not exceed 8" diameter.
- K435 spindle adapters ("pie pans") for Innershield electrode do not fit in the Power Feed 15M.

MAKING A WELD WITH WAVEFORM TECHNOLOGY POWER SOURCES

WARNING

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.

The steps for operating the Power Wave will vary depending upon the user interface of the welding system. The flexibility of the Power Wave lets the user customize operation for the best performance.

First, consider the desired welding process and the part to be welded. Choose an electrode material, diameter, shielding gas and process (GMAW, GMAW-P, GMAW-STT, etc.)

Second, find the program in the welding software that best matches the desired welding process. The standard software shipped with the Power Waves encompasses a wide range of common processes and will meet most needs. If a special welding program is desired, contact the local Lincoln Electric sales representative.

All adjustments are made on 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 below.

GENERAL WELDING ADJUSTMENTS

1. WFS / AMPS:

In synergic welding modes (synergic CV, pulse GMAW, STT or power mode) WFS (wire feed speed) is the dominant control parameter, controlling all other variables. The user adjusts WFS according to factors such as weld size, penetration requirements, heat input, etc. The power source then uses the WFS setting to adjust its output characteristics (output voltage, output current) according to pre-programmed settings. In non-synergic modes, the WFS control behaves more like a conventional CV power source where WFS and voltage are independent adjustments. Therefore to maintain the arc characteristics, the operator must adjust the voltage to compensate for any changes made to the WFS.

2. VOLTS / TRIM:

In constant voltage modes (synergic CV, standard CV) the control adjusts the welding voltage.

In pulse synergic welding modes (pulse GMAW only) the user can change the Trim setting to adjust the arc length. It is adjustable from 0.500 to 1.500. A Trim setting of 1.000 is a good starting point for most conditions.

In STT modes, the user can adjust the Trim setting to change the overall heat input to the weld.

3. WELDING MODE:

May be selected by name (CV/MIG, CC/Stick Crisp, Gouge, etc.) or by a mode number (10, 24, 71, etc.). Selecting a welding mode determines the output characteristics of the power source.

4. ARC CONTROL:

Also known as Inductance or wave control. Allows operator to vary the arc characteristics from "soft" to "harsh" in all weld modes. It is adjustable from -10.0 to +10.0, with a nominal setting of 0.0. Also varies inductance in CV, in pulse modes, changes pulsing frequency and background current.

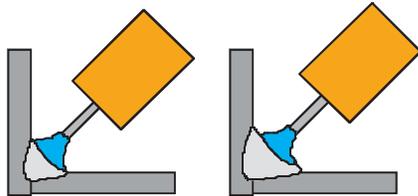
CONSTANT VOLTAGE (CV) WELDING

(See figure B.1)

• **Synergic CV:**

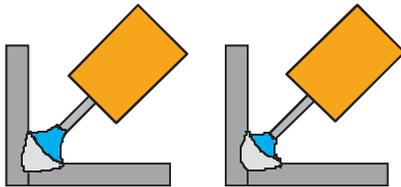
Synergic welding allows for easy procedure setting. The WFS and Voltage change together to maintain optimal arc length.

When synergic welding and the WFS (right) knob is rotated, the WFS is adjusted accordingly to control deposition rate. The voltage changes too, to maintain a similar arc length.



Change WFS to change deposition rate.

When the Voltage (left) knob is rotated, the voltage is adjusted accordingly to control the arc length.



Change Voltage to change Arc length.

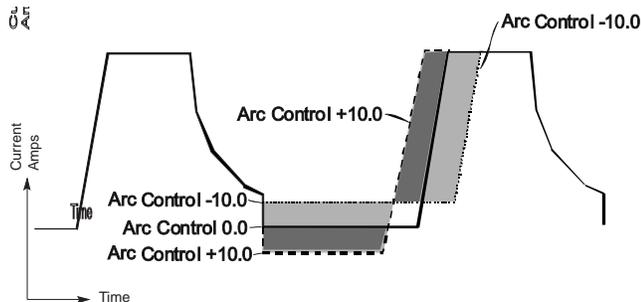
• **Non Synergic CV:**

This type of CV mode behaves more like a conventional CV power source. WFS and Voltage are independent adjustments. Therefore to maintain the arc characteristics, the operator must adjust the voltage to compensate for any changes made to the WFS.

• **All CV Modes:**

Arc Control adjusts the inductance of the waveshape. (This adjustment is often referred to as "pinch". Inductance is inversely proportional pinch.) Increasing Arc Control greater than 0.0 results in a crisper, colder arc while decreasing the Arc Control to less than 0.0 provides a softer, hotter arc.

CURRENT WAVE FORM (CV)
FIGURE B.1



PULSE WELDING

(See figure B..2)

Pulse welding procedures are set by controlling an overall "arc length" variable. When pulse welding, the arc voltage is highly dependent upon the waveform. The peak current, back ground current, rise time, fall time and pulse frequency all affect the voltage. The exact voltage for a given wire feed speed can only be predicted when all the pulsing waveform parameters are known. Using a preset voltage becomes impractical, and instead the arc length is set by adjusting "trim".

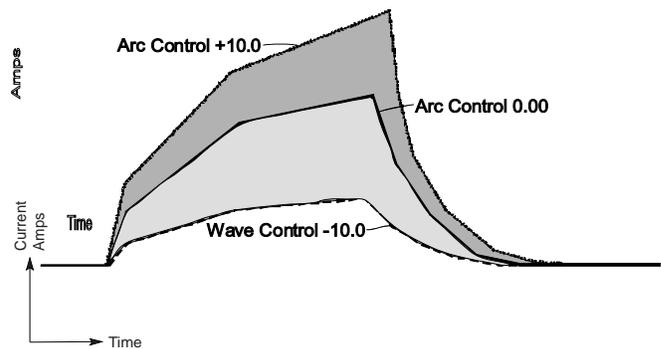
Trim adjusts the arc length and ranges from 0.50 to 1.50, with a nominal value of 1.00. Higher trim values increase the arc length, while lower trim values decrease the arc length.

Most pulse welding programs are synergic. As the wire feed speed is adjusted, the power source will automatically recalculate the waveform parameters to maintain similar arc properties.

Power Wave power sources utilize "adaptive control" to compensate for changes in electrical stick-out while welding. (Electrical stick-out is the distance from the contact tip to the work piece.) Power Wave waveforms are optimized for a 0.75" (19mm) stick-out. The adaptive behavior supports a range of stickouts from 0.50" (13mm) to 1.25" (32mm). At very low or high wire feed speeds, the adaptive range may be less due to reaching physical limitations of the welding process.

Arc Control in pulse programs usually adjusts the focus or shape of the arc. Arc Control 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. Arc Control values less than 0.0 decrease the pulse frequency while increasing the background current, for a soft arc good for out-of-position welding.

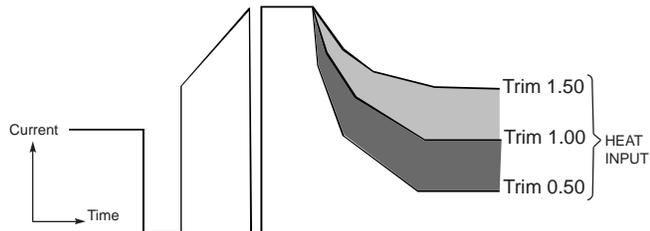
CURRENT WAVE FORM
FIGURE B.2



STT SYNERGIC WELDING

The Figures B.3 and B.3a is the waveshape of current for the process. They are not drawn to scale, and are intended only for the purpose of showing how the variables effect the waveform.

FIGURE B.3



Trim in the STT mode changes the heat input by adjusting the tailout and background portion of the waveform. For open root processes, the tailout is fixed, and the trim affects only the background level. Trim values greater than 1.0 add more energy to the weld and make the weld puddle hotter; trim values less than 1.0 reduce energy to the weld. A nominal value of 1.0 will work for most applications.

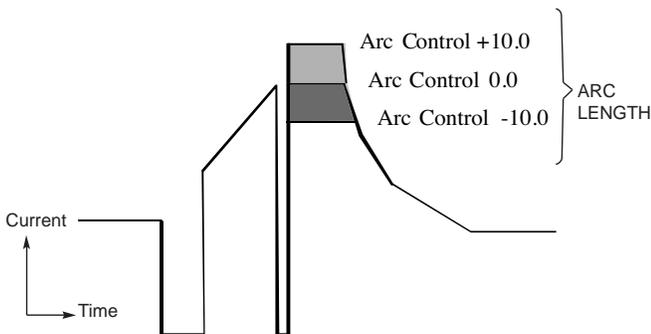


FIGURE B.3a

Arc control adjusts the arc length in the STT mode. This is accomplished by changing the peak portion of the current waveform. An arc control value of +10.0 maximizes the arc length by increasing the peak current, while a arc control of -10.0 minimizes the arc length by decreasing the peak current. The nominal value is "OFF" (0.0), and should work for most applications.

CASE FRONT CONTROLS (See Figure B.3b)

1. WIRE FEED SPEED/AMMETER DISPLAY-This meter displays either the wire feed speed or current value (Amps) depending upon the status of the wire feeder and the power source. Written below the display is "WFS" and "Amps". A LED light illuminates the units of the value displayed on the meter.

- Prior to CV welding, the meter displays the desired preset WFS value.
- During welding, the meter displays the actual amperage.
- After welding, the meter holds the actual current value for 5 seconds. The display blinks to indicate the Power Feed 15M is in the "Hold" period. If the Wire Feed Speed knob is adjusted while in the "Hold" period, the Power Feed 15M will revert to the "Prior to welding" display described above.

The default wire feed speed units are inches/minute and can be changed to meters/minute by entering the "Extended Feature Menu" during power-up. The wire feed speed is calibrated to within ±2%. Refer to the power source manual for calibration specifications of the ammeter.

2. WIRE FEED SPEED KNOB-The Wire Feed Speed knob that adjusts of the rate of feeding electrode.

3. VOLTAGE / TRIM DISPLAY-The voltage/trim meter displays either the voltage or trim value, depending upon the status of the wire feeder and the power source.

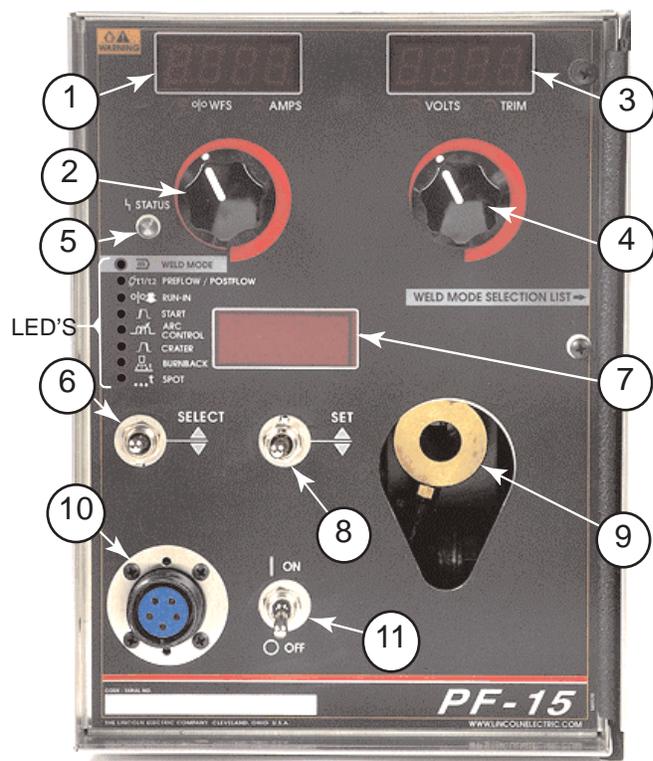
The voltage display shows the actual average arc voltage during the welding.

After welding, the meter holds the actual average arc voltage for 5 seconds. During this time, the display flashes to indicate the product name is in the "Hold" period. Output adjustment while in the "Hold" period results in the "prior to operation" characteristics described above.

The voltage is calibrated to ±2% over a range of 10 to 45 volts.

4. VOLTAGE / TRIM KNOB- The Voltage / Trim knob is rotated to adjust the ideal voltage / trim for each personal welding mode process used.

FIGURE B.3b



Weld Process	Voltage / Trim Display prior to operation
Nonsynergic CV	Displays the preset Voltage value
Synergic CV	Displays the preset Voltage value.
Synergic CV-Pulse	Displays the preset Trim value from 0.50 to 1.50, with 1.00 as the default. Trim adjusts the arc length for Pulse programs. Lower the trim value to decrease the arc length, and raise the trim value to increase the arc length. A trim value of 1.00 is a setting for most conditions.
Synergic CV-STT	<ul style="list-style-type: none"> • Adjusts the background current of the STT waveform. Used to modify the heat input. • Linc Net Power Sources: Displays the background current as a value from 0.50 to 1.50, with 1.00 as the default. Lower the trim value to decrease the heat input, and raise the trim value to increase the heat input. A trim value of 1.00 is a good setting for most conditions. • Arc Link Power Sources: Displays the background current in amps. Lower the background current to decrease the heat input and raise the background current to increase the heat input.
Nonsynergic Power	Displays the preset CP value from 0 to 20. The Power mode is best for thin sheet metal and aluminum applications.

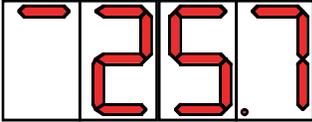
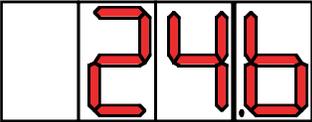
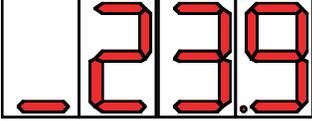
POWER FEED 15M



Synergic CV Voltage Display

Synergic CV programs feature an ideal voltage best suited for most procedures. Use this voltage as a starting point for the weld procedure and adjust if needed for personal preferences.

When the **Voltage / Trim Knob** is rotated, the display will show an upper or lower bar indicating if the voltage is above or below the ideal voltage.

- Preset voltage above ideal voltage. (upper bar displayed) 
- Preset voltage at ideal voltage. (no bar displayed) 
- Preset voltage below ideal voltage. (lower bar displayed) 

5. STATUS LED-The status LED indicates system status. Normal operation is a steady green light.

Note: During normal power-up, the LED may flash red and/or green as the equipment performs self tests.

Light Condition	Meaning
Steady Green	System OK. Power source communicating normally with wire feeder and its components.
Blinking Green	Occurs during a reset and indicates the power source is identifying each component in the system. This is normal for the first 10 seconds after power-up, or if the system configuration is changed during operation.
Alternating Green and Red	Non-recoverable system fault. If the power source or wire feeder status LED is flashing any combination of red and green, errors are present in the system. Read the error code before the machine is turned off. Instructions for reading the error code are detailed in the Service Manual. Individual code digits are flashed in red with a long pause between digits. If more than one code is present, the codes will be separated by a green light. To clear the error, turn the power source OFF, and then back ON to reset. See Troubleshooting Section.
Steady Red	Non recoverable hardware fault. Generally indicates a problem with the cables connecting the wire feeder to the power source.
Blinking Red	Not applicable.

MSP-3 Multi-Process Panel

The center portion of the Power Feed-15M front case enables selection of weld modes and fine tuning of weld parameters within each weld mode. Preflow, Postflow, Run In, Arc Control, Burnback, Postflow, Crater and Spot are all adjustable with the SET and SELECT toggle switches and 3 digit display.

6. SELECT toggle switch- Toggles through the 8 adjustable welding parameters detailed above the switch. A red LED is located next to each welding parameter and is illuminated when the parameter is active.

7. DISPLAY METER- Shows the active value of the weld parameter.

8. SET toggle switch- changes the value of the active weld parameter shown in the display meter.

Weld Mode

The Weld Mode selection is enabled by toggling the SELECT toggle switch until the LED next to WELD MODE is lit. The present mode number will be displayed. Toggling the SET toggle switch up or down will increase or decrease the WELD MODE number. The weld mode on the display will become the active weld mode after 2 seconds of SET toggle switch inactivity.

The last active weld mode is saved at power down and will be automatically selected upon the next power up of the feeder.

Preflow

The Preflow setting adjusts the amount of time the shielding gas flows after the trigger is pulled and prior to wire feeding and arc strike. Preflow times can be adjusted from 0 to 2.5 seconds in 0.1 second increments.

To adjust the Preflow time, toggle the SELECT toggle switch until the LED next to PREFLOW/POSTFLOW is lit. The display will read:



The present Preflow time will be displayed. Toggle the SET toggle switch up or down to change the Preflow time to a new value.

POSTFLOW

The Postflow setting adjusts the amount of time the shielding gas flows after the trigger is released and welding current is turned off. Postflow times can be adjusted from 0 to 10.0 seconds in 0.1 second increments.

To adjust the Postflow time, toggle the SELECT toggle switch until the LED next to PREFLOW/POSTFLOW is lit. Then toggle the SELECT toggle switch once more until the display reads:



The present Postflow time will be displayed. Toggle the SET toggle switch up or down to change the Postflow time to a new value.

Run In

The Run In function sets the wire feed speed from the time when the trigger is pulled until the time an arc is established. The Run In speed is independent of the welding or start wire feed speed.

To change the Run In speed, toggle the SELECT toggle switch until the LED next to Run In is lit. The display will show the present Run In speed. Toggle the SET toggle switch up and down to change the Run In speed to a new value. Do not use the left Knob, WIRE FEED SPEED Knob. The WIRE FEED SPEED Knob adjusts welding wire feed speed, not Run In wire feed speed.

Run In speed is adjustable from 50 to 150 ipm (1.27 to 3.81 m/min).

The default value for Run In is OFF (Run In wire feed speed = Welding wire feed speed.)

Start

The Start function sets the wire feed speed and voltage at the beginning of the weld for a specified time period prior to initiation of the preset values for WFS and Volts. The start timer begins at arc strike and the WFS and Volts settings will ramp up/down from the start WFS and Volts values to the Weld mode WFS and Volts values over the time selected.

To change the Start function values, toggle the SELECT toggle switch until the LED next to START is flashing. Rotate the WIRE FEED SPEED Knob to adjust the Start WFS and rotate the VOLTAGE / TRIM KNOB to adjust the Start Volts / Trim. Change the Start time by toggling the SET toggle switch up and down to a new value.

The Start time is adjustable from 0 to 0.50 seconds in 0.01 second increments.

The default Start time is OFF (0 seconds)

Arc Control

Arc Control is a generic control that allows fine tuning the waveform. The function of Arc Control depends on the active weld process.

To change the Arc Control values, toggle the SELECT toggle switch until the LED next to ARC CONTROL is flashing. Then use the SET toggle switch to raise or lower the arc control setting to the new value.

The Arc Control value ranges from -10.0 to 10.0 in increments of 0.1, with "OFF" being the midpoint, equivalent to 0.0.

Weld Process	Arc Control Function
CV	Arc Control regulates the pinch effect for synergic and nonsynergic GMAW and FCAW weld programs. A low Arc Control value gives a soft arc best for welding with Argon blend shielding gases. A high Arc Control value gives a crisp arc suitable for welding with FCAW and CO ₂ shielding gases. Most self shielded electrodes work well with Arc Control value "5".
GMAW-Pulse	Arc Control regulates the pulse frequency. Lower the Arc Control value for a lower pulse frequency, and raise the Arc Control value for a higher frequency.
GMAW-STT	Arc Control regulates the background current of the STT waveform.
Power	Arc Control regulates pinch.

Crater

The Crater function sets an endpoint WFS and Voltage to achieve over a specified time period. At the end of the weld when the trigger is released, the crater time begins and the WFS and Voltage values ramp from the welding WFS and Voltage to the crater WFS and Voltage.

To change the Crater function values, toggle the SELECT toggle switch until the LED next to Crater is flashing. Rotate the WIRE FEED SPEED Knob to adjust the Crater WFS and rotate the VOLTAGE / TRIM KNOB to adjust the Crater Volts/Trim. Change the Crater time by toggling the SET toggle switch up and down to a new value.

The Crater time is adjustable from 0 to 10.0 seconds in 0.1 second increments.

The default Crater time is OFF (0 seconds).

Burnback

The Burnback function continues current flow for a specified time period at the end of the weld after wire feeding has stopped. Burnback is used to prevent the electrode from sticking in the weld puddle and to condition the end of the electrode for the next arc start.

To change the Burnback function value, toggle the SELECT toggle switch until the LED next to Burnback is lit. The display will show the present Burnback time. Toggle the SET toggle switch up and down to set a new Burnback time.

The default Burnback time is "OFF" (0.0 seconds.)

The Burnback time is adjustable from 0.0 to 0.25 seconds in 0.01 second increments.

Spot

The Spot function is useful when making many short, repetitive welds. When the Spot function is active, the power source will weld for a set time after the trigger has been pulled and an arc established. Once the Spot time expires, the power source will continue to the Crater function and Burnback function, if active. The trigger must be released and pulled again to make another weld and repeat the Spot cycle.

To change the Spot time, toggle the SELECT toggle switch until the LED next to Spot is lit. The display will show the present Spot time. Toggle the SET toggle switch up and down to set a new Spot time.

The default Spot time is "OFF" (0.0 seconds.)

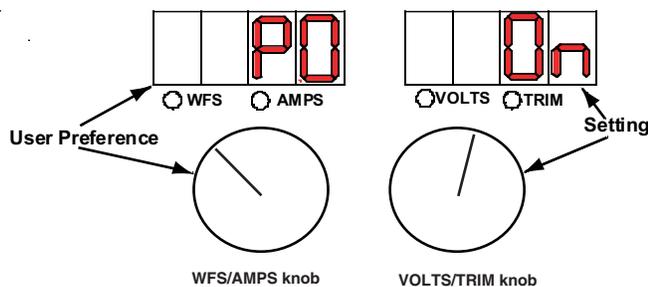
The Spot time is adjustable from 0.0 to 10.0 seconds in 0.1 second increments.

EXTENDED FEATURES MENU

The Extended Features Menu gives access to the set-up configuration. Stored in the set-up configuration are user preferences that rarely change, like calibration test modes or wire feed speed units.

To access the Extended Features Menu, turn power OFF to the feeder and then hold the SELECT switch in the up position. Continue to hold while the Power Feed 15M powers up. Release the SELECT switch when the display shows the first user preference that may be changed.

FIGURE B.4



The left display shows the User Preference number and is changed with the WFS/AMPS knob. The right display shows the present setting and is changed with the VOLTS/TRIM knob.

Rotate the WFS/AMPS knob to the desired User Preference. User Preferences for the Power Feed 15M are:

- P0 On = Enter the Extended Features Menu
Off = Exit the Extended Features Menu
- P1 On = m/min wire feed speed units
Off = In/min wire feed speed units (default)
- P2 On = The left display shows Amperage while welding.
Off = The left display shows Wire Feed Speed while welding. (default).
- P101 On = All weld modes and test modes are accessible. The test modes allow for calibration of the power supply. When wire feeder power is turned off, User Preference P101 will revert back to the "Off" and only the weld modes will be available.
Off = Only weld modes are accessible (default).

P513 Adjust the stall factor for a push-pull gun.

The stall factor controls the torque of the wire drive inside the Power Feed 15M when using a push-pull gun. The Power Feed 15M is factory set to generate enough torque for pushing the electrode but not so much as to cause bird nesting. Check for other feeding problems before adjusting the stall factor.

Default value for the stall factor is 25, with a range of 5 - 35.

To change the stall factor:

- Use the VOLTS/TRIM knob to adjust the stall factor. Increasing the stall factor raises the motor torque and decreasing the stall factor lowers the motor torque. Do not increase the stall factor more than necessary. A high stall factor may increase the occurrence of bird nesting and a low stall factor may cause the wire to burn back to the tip.

P514 Adjust pull gun offset.

The push-pull gun offset calibration adjusts the wire feed speed calibration of the pull motor. The procedure should only be performed when other possible corrections do not solve the push-pull feeding problems. A rpm meter is required to perform the pull gun motor offset calibration.

To perform the calibration procedure:

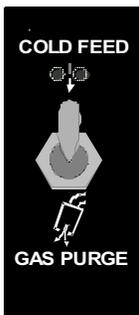
- Release the pressure arm on both the pull and push wire drives.
- Remove wire from the pull wire drive.
- Hold the rpm meter to the drive roll in the pull gun.
- Pull the trigger on the push-pull gun.
- Measure the rpm of the pull motor. The rpm should be between 115 and 125 rpm. If necessary, decrease the calibration setting to slow the pull motor, or increase the calibration setting to speed up the motor. The calibration range is -30 to +30, with 0 as the default value.

INTERNAL CONTROLS (Figure B.5)

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 UP 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 DOWN 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.

IDLE ROLL PRESSURE SETTING

⚠ 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.
- Only qualified personnel should perform maintenance work.

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 B.5a):

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

FIGURE B-5a

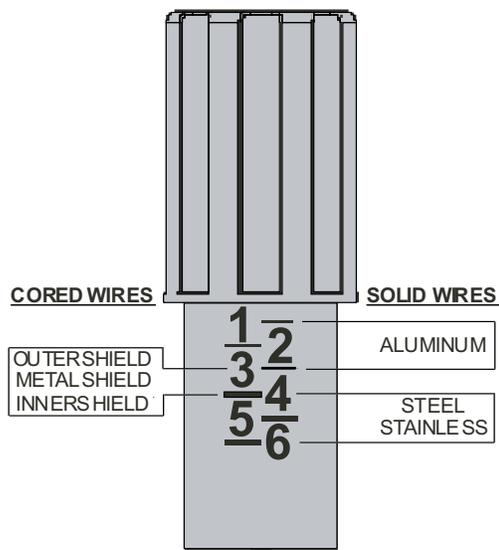
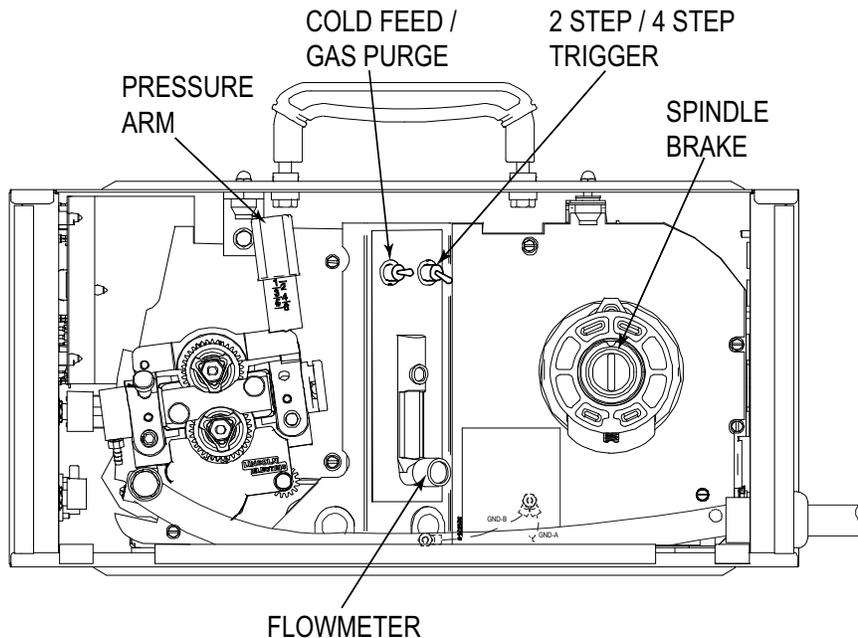


FIGURE B.5



POWER FEED 15M

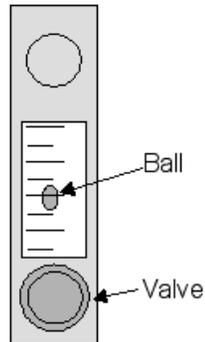


FLOW METER

The flowmeter shows the flow rate of shielding gas and has a valve to adjust the flow. The flow meter is calibrated for CO₂, Ar, and CO₂/Ar blends. The middle of the ball indicates the flow rate of shielding gas.

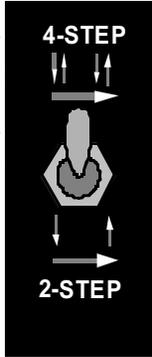
Adjust the flow rate by turning the valve at the bottom of the meter. Most weld procedures require 25-40 scfh (11.8 - 18.9 lpm) for sufficient shielding gas coverage. Gun angle, nozzle diameter, joint configuration and wind conditions may effect the amount of shielding gas required.

SCFH	Liter/Min.
10	4.7
20	9.4
30	14.2
40	18.9
50	23.6
60	28.3
70	33.1
80	37.8



2 STEP - 4 STEP - TRIGGER OPERATION

The 2 Step - 4 Step switch changes the function of the gun trigger. 2 Step trigger operation switches the welding output ON-OFF in direct response to the trigger. 4 Step trigger operation provides “trigger interlock” capability and gives the ability to control the amount of time spent in the arc start and arc crater steps.



Place the toggle switch in the DOWN position for 2 Step operation and in the UP position for 4 Step operation.

The 2 Step - 4 Step trigger has no effect when welding with SMAW or CAG procedures.

• 2 STEP TRIGGER

2 Step trigger operation is the most common. When the gun trigger is pulled, the welding system (power source and wire feeder) 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.

• 4 STEP TRIGGER

4 Step trigger operation gives the welder additional control in the welding sequence. 4 step trigger allows the welder to choose the arc start, weld and arc end time. It may also be set-up to work as a trigger interlock.

EXAMPLE 1 - 2 STEP TRIGGER: Simple operation
The simplest trigger operation occurs with a 2 Step trigger and the Start, Crater and Burnback functions all set to OFF. (See Figure B.6)

For this sequence,

PREFLOW:

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

STRIKE:

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

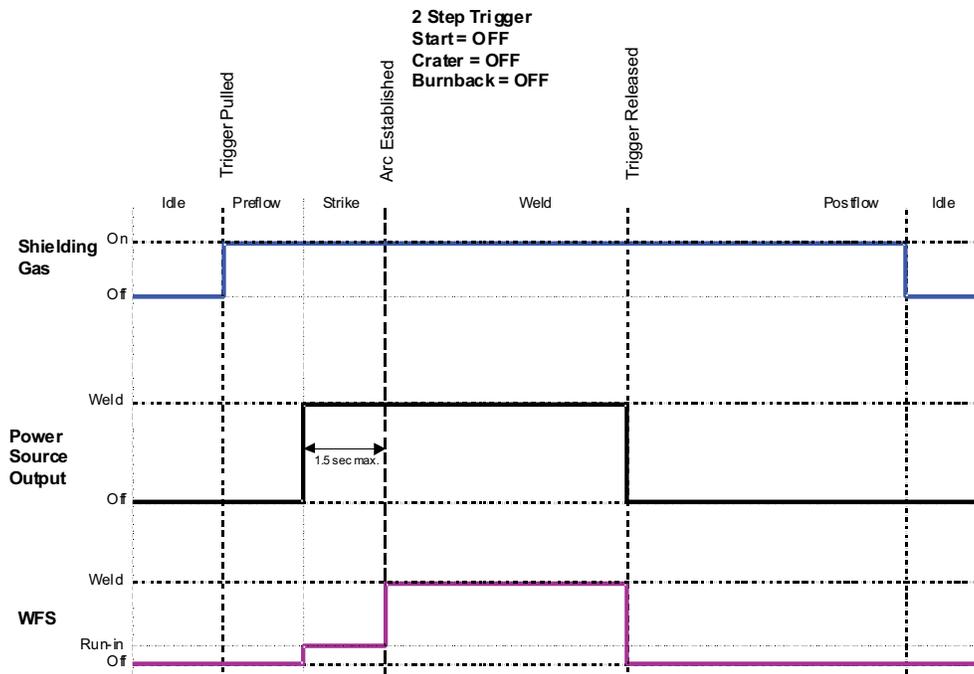
WELD:

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.6



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 and Burnback functions set to a desired values and Crater set to OFF. (See Figure B.7)

For this sequence,

PREFLOW:

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

STRIKE:

After preflow time expires, the power source regulates to the start output and wire is advanced towards the work piece at the Strike 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.

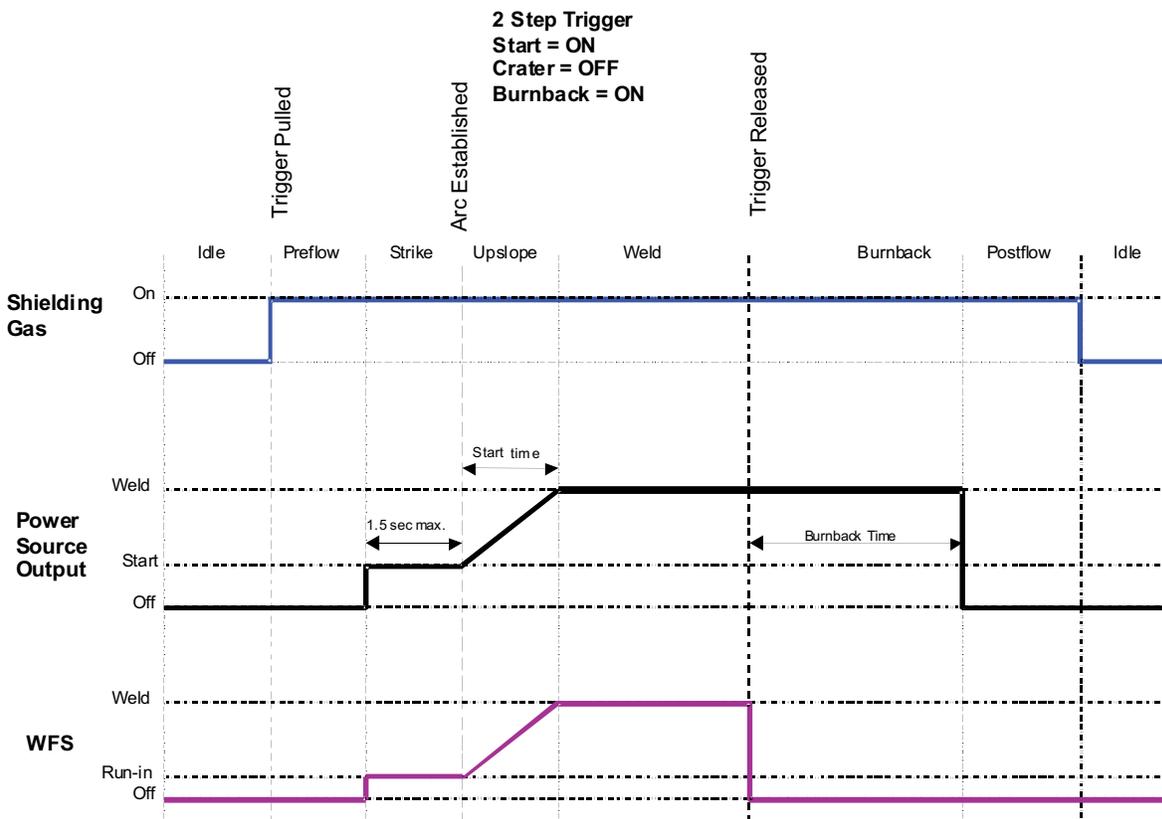
BURNBACK:

As soon as the trigger is released, the wire feed speed is turned OFF and the machine output continues for the burnback time.

POSTFLOW:

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

FIGURE B.7



EXAMPLE 3 - 2 STEP TRIGGER: Customize 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, Crater and Burnback functions to desired values. (See Figure B.8)

For this sequence,

PREFLOW:

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

STRIKE:

After preflow time expires, the power source regulates to the start output and wire is advanced towards the work piece at the Strike 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.

WELD:

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

CRATER:

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.

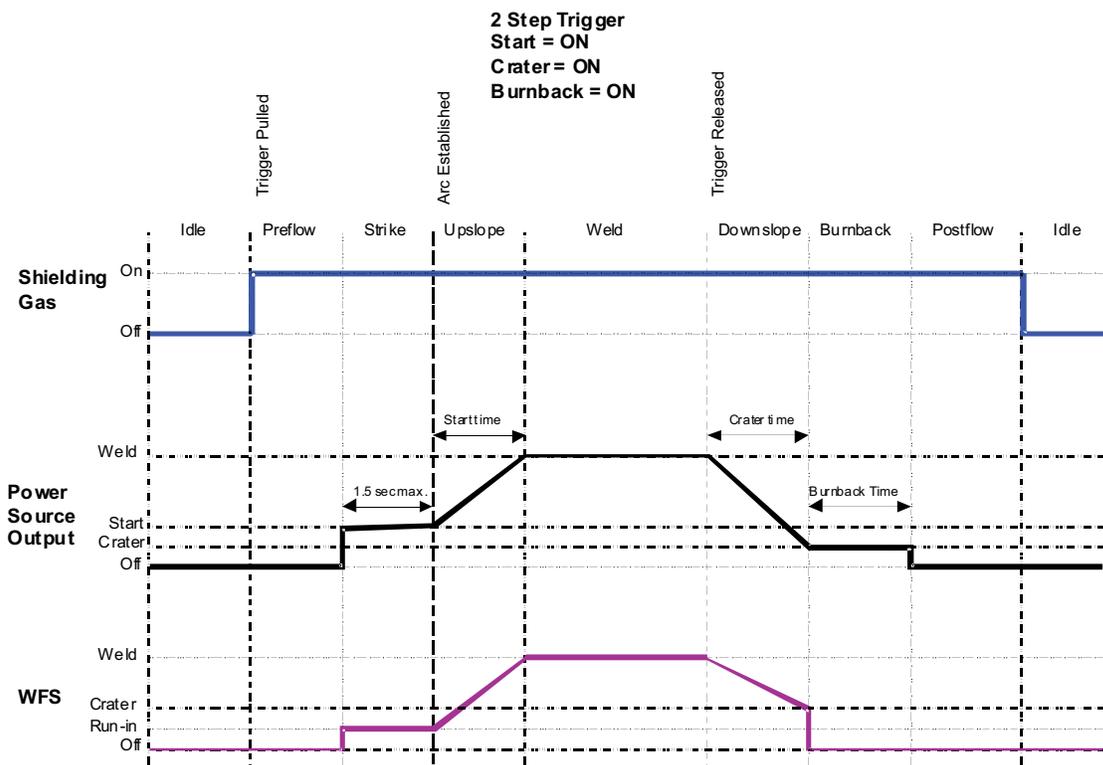
BURNBACK:

After the crater time expires, the wire feed speed is turned OFF and the machine output continues for the burnback time.

POSTFLOW:

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

FIGURE B.8



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.9)

For this sequence,

PREFLOW:

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

STRIKE:

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

WELD:

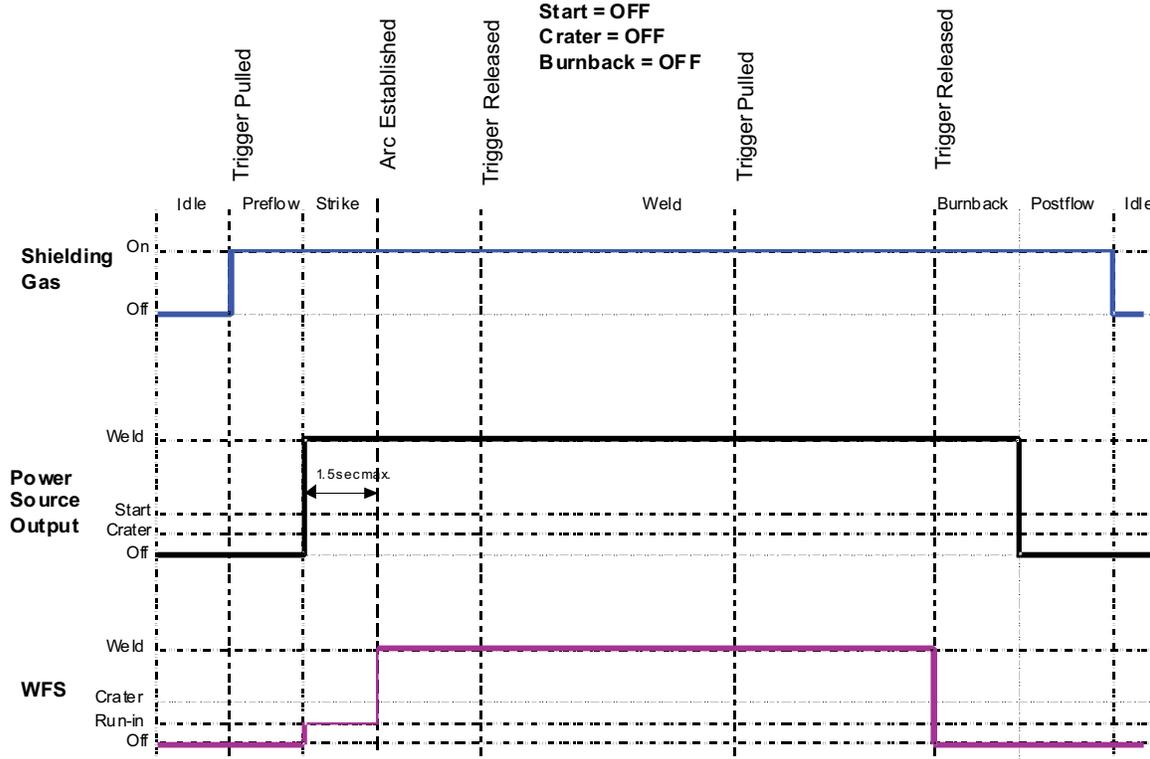
The power source output and the wire feed speed continue at the weld settings. Welding continues when the trigger is pulled a second time.

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.9

4 Step Trigger
Start = OFF
Crater = OFF
Burnback = OFF



EXAMPLE 5 - 4 STEP TRIGGER: Manual control of Start and Crater times with Burnback ON. The 4 step trigger sequence gives the most flexibility when the Start, Crater and Burnback 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. Burnback reduces the occurrence of wire to sticking into the weld pool at the end of a weld and conditions the end of the wire for the next arc start. (See Figure B.10)

In this sequence,

PREFLOW:

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

STRIKE:

After preflow time expires, the power source regulates to the start output and wire is advanced towards the work piece at the Strike 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 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.

CRATER:

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

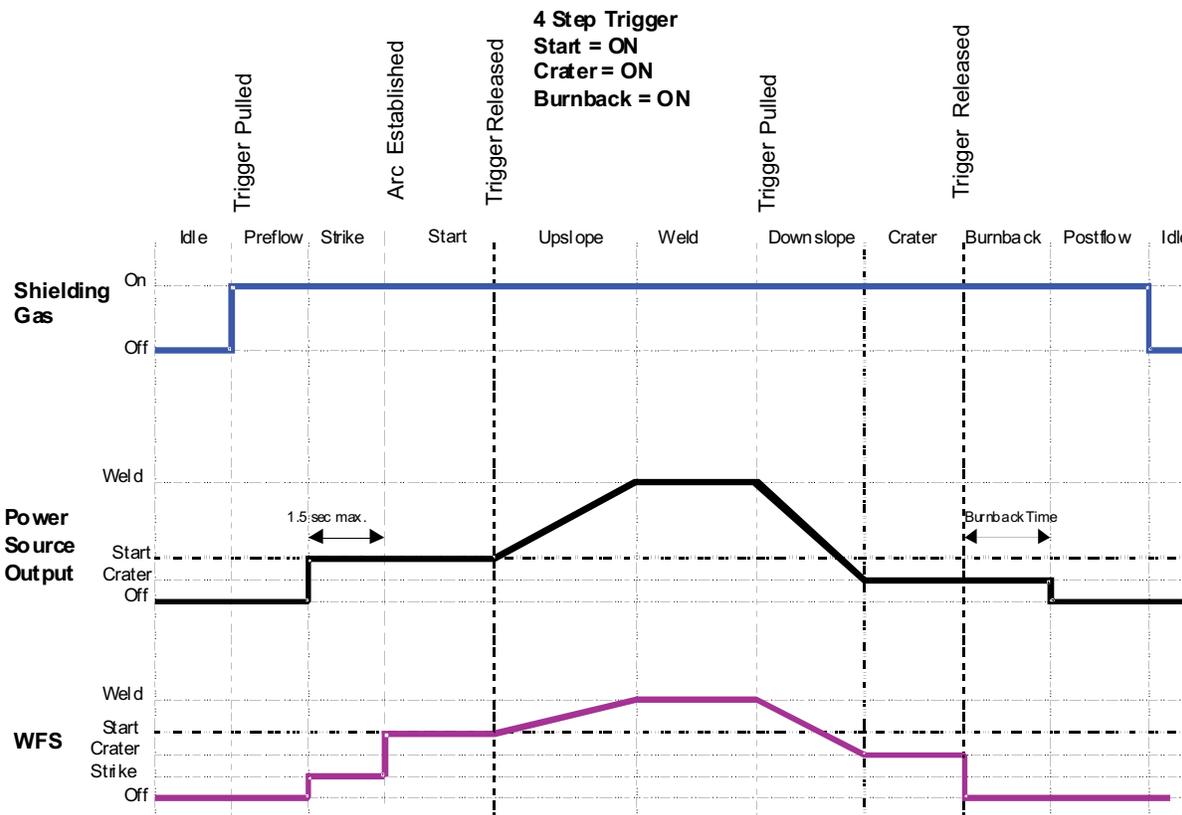
BURNBACK:

After the crater time expires, the wire feed speed is turned OFF and the machine output continues for the burnback time.

POSTFLOW:

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

FIGURE B.10

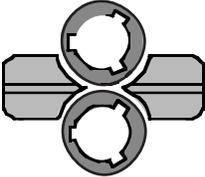
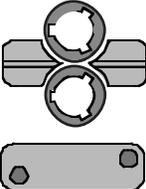


FACTORY INSTALLED EQUIPMENT

- K1500-2 Gun Receiver Bushing.

DRIVE ROLL KITS USED

- Drive Roll Kits (Includes drive rolls and inner wire guide necessary to feed the identified wire size and type).

WIRE TYPE	ELECTRODE SIZE	KP KIT		
Steel Wires:	.023-.030 (0.6-0.8mm) .035 (0.9mm) .045 (1.2mm) .052 (1.4mm) 1/16 (1.6mm) .035,.045 (0.9, 1.2mm) .040 (1.0mm)	KP1696-030S KP1696-035S KP1696-045S KP1696-052S KP1696-1/16S KP2307-6 KP2307-7	Includes: 2 V groove drive rolls and inner wire guide.	
Cored Wires:	.030-.035" (0.8-0.9mm) .040-.045" (1.0-1.2mm) .052" (1.4mm) 1/16" (1.6mm) .068-.072" (1.7-1.8mm) 5/64" (2.0mm)	KP1697-035C KP1697-045C KP1697-052C KP1697-1/16C KP1697-068 KP1697-5/64		
Aluminum Wires:	.035" (0.9 mm) .040" (1.0mm) 3/64" (1.2mm) 1/16" (1.6mm) 3/32" (2.4mm)	KP1695-035A KP1695-040A KP1695-3/64A KP1695-1/16A KP1695-3/32A	Includes: 2 polished U groove drive rolls, outer wire guide and inner wire guide.	

COMMON PACKAGES WITH ACCESSORIES USED**GMAW Pulse Welding System:**

- K2196-1 Power Feed 15M
- K2176-1 Twist mate to lug adapter
- K1796-xx Coaxial weld cables
- K1543-xx Digital Control Cables
- K2152-x Power Wave 355
- K470-2 Magnum 300 MIG Gun
- KP1696-035S .035" Drive roll kit

GMAW STT Welding System:

- K2196-1 Power Feed 15M
- K1796-xx Coaxial weld cables
- K1543-xx Digital Control Cables
- K1518-x Power Wave 455 STT
- K470-2 Magnum 300 MIG Gun
- KP1696-045S .045" Drive roll kit

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

- Check weld cables, control cables and gas hoses for cuts.
- Clean and tighten all weld terminals.

PERIODIC MAINTENANCE

- Clean drive rolls and inner wire guide and replace if worn.
- Blow out or vacuum the inside of the feeder.

CALIBRATION SPECIFICATION

All calibrations are factory set on the Power Feed 15M.

To verify the wire feed speed:

- Assemble a .045 (1.2mm) drive roll kit into the Power Feed 15M.
- Load a spool of .045 (1.2mm) electrode and thread the electrode through the wire drive.
- Adjust the wire feed speed to 300 in/min (7.62m/min).
- Press the COLD INCH switch and measure the actual wire feed speed with a calibrated wire feed speed tachometer.
- The measured wire feed speed should be within 2% of the set value.

To verify the voltage display:

- Set the welding power source and Power Feed 15M to a CV procedure that gives steady "spray" transfer in the arc.
- While a weld is being made, measure the voltage from the feedplate to work with a calibrated volt meter.
- The displayed voltage on the Power Feed 15M should be within 2% of the measured value.

POWER FEED 15M



HOW TO USE TROUBLESHOOTING GUIDE

WARNING

Service and Repair should only be performed by 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.

Step 2. POSSIBLE CAUSE.

The second column labeled “POSSIBLE CAUSE” lists the obvious external possibilities that may contribute to the machine symptom.

Step 3. RECOMMENDED COURSE OF ACTION

This column provides a course of action for the Possible Cause, generally it states to contact your local Lincoln Authorized Field Service Facility.

If you do not understand or are unable to perform the Recommended Course of Action safely, contact your local Lincoln Authorized Field Service Facility.

CAUTION

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact your **Local Lincoln Authorized Field Service Facility** for technical troubleshooting assistance before you proceed.

Observe all Safety Guidelines detailed throughout this manual

PROBLEMS (SYMPTOMS)	POSSIBLE AREAS OF MISADJUSTMENTS	RECOMMENDED COURSE OF ACTION
Linc-Net System Error Codes		
Fault Code	Description	Possible Adjustments
Err 006	1. The wire feeder has not received a recognition command from the power source. The power source has issued a shutdown command.	1. Verify the power source is operating properly (Status light steady green.) 2. Check control cable for loose or broken leads. 3. See power source Instruction Manual.
Err 100	1. The power source has issued a shutdown command.	1. Verify the power source is operating properly (Status light steady green.) 2. Check control cable for loose or broken leads. 3. See power source instruction Manual.
ArcLink System Error Codes		
Err 31 Primary overcurrent.	1. The power source has exceeded input current limits. 2. See the power source Instruction Manual.	1. Adjust the welding procedure to reduce the current draw. The welding procedure may exceed the capacity of the power source.
Err 32 Capacitor bank "A" under voltage.	1. The power source input power may be wired incorrectly.	1. Verify the power source reconnect panel wiring matches the input power. 2. See the power source Instruction Manual.
Err 33 Capacitor bank "B" under voltage.	1. The power source input power may be wired incorrectly.	1. Verify the power source reconnect panel wiring matches the input power. 2. See the power source Instruction Manual.
Err 34 Capacitor bank "A" overvoltage.	1. The power source input power may be wired incorrectly.	1. Verify the power source reconnect panel wiring matches the input power. 2. See the power source Instruction Manual.
Err 35 Capacitor bank "B" overvoltage.	1. The power source input power may be wired incorrectly.	1. Verify the power source reconnect panel wiring matches the input power. 2. See the power source Instruction Manual.
Err 41 Long term secondary overcurrent.	1. The power source has exceeded the output current limits. 2. See the power source Instruction Manual.	1. Adjust the welding procedure to reduce the current draw. The welding procedure may exceed the capacity of the power source.

 **CAUTION**

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact your **Local Lincoln Authorized Field Service Facility** for technical troubleshooting assistance before you proceed.

POWER FEED 15M

Observe all Safety Guidelines detailed throughout this manual

PROBLEMS (SYMPTOMS)	POSSIBLE AREAS OF MISADJUSTMENTS	RECOMMENDED COURSE OF ACTION
ArcLink System Error Codes		
Fault Code	Description	Possible Adjustments
Err 43 Capacitors are out of balance		<ol style="list-style-type: none"> 1. Verify the power source reconnect panel wiring matches the input power. 2. See the power source Instruction Manual.
Err 44 Main CPU problem.		<ol style="list-style-type: none"> 1. Verify the ground connection to the power source is wired correctly. 2. See the power source Instruction Manual.
Err 53 Voltage sense loss.		
Err 54 Short term secondary over-current.		
Err 81 Motor overload, long term.	<ol style="list-style-type: none"> 1. The wire drive motor has overheated. 	<ol style="list-style-type: none"> 1. Check that the electrode slides easily through the gun and cable. 2. Remove tight bends from the gun and cable. 3. Check that the spindle brake is not too tight. 4. Verify a high quality electrode is being used. 5. Wait for the error to reset and the motor to cool (approximately 1 minute).
Err 82 Motor overload, short term.	<ol style="list-style-type: none"> 1. The wire drive motor current draw has exceeded limits, usually because the motor is in a locked rotor state. 	<ol style="list-style-type: none"> 1. Check that motor can turn freely when idle arm is open. 2. Verify that the gears are free of debris and dirt.
Err 95 Spool gun or pull gun motor overload.	<ol style="list-style-type: none"> 1. The drive motor in the spool gun or push-pull gun is drawing too much current. 	
Err 263 No usable weld modes.	<ol style="list-style-type: none"> 1. The power source does not have any welding programs loaded. 	<ol style="list-style-type: none"> 1. See the power source Instruction Manual for load welding programs.

⚠ CAUTION

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact your **Local Lincoln Authorized Field Service Facility** for technical troubleshooting assistance before you proceed.

POWER FEED 15M



Observe all Safety Guidelines detailed throughout this manual

PROBLEMS (SYMPTOMS)	POSSIBLE AREAS OF MISADJUSTMENTS	RECOMMENDED COURSE OF ACTION
Output Problems		
The feeder does power up - no display, no cold feed.	<ol style="list-style-type: none"> 1. The Power Feed 15M power switch is OFF. 2. The Power Wave power source is OFF. 3. The circuit breaker for the wire feeder on power source have tripped. 4. The control cable may be loose or damaged. 5. The power switch is damaged. 	<ol style="list-style-type: none"> 1. Turn the Power Feed 15M power switch ON. 2. Turn ON the Power Wave power source. 3. Reset the circuit breakers. 4. Tighten, repair or replace the control cable. 5. Replace the power switch.
No shielding gas.	<ol style="list-style-type: none"> 1. The gas supply is OFF or empty. 2. The gas hose is cut or crushed. 3. Dirt or debris is in the solenoid. 4. There is a loose solenoid connection or the solenoid has failed. 	<ol style="list-style-type: none"> 1. Verify the gas supply is ON and flowing. 2. Route the gas hose so it avoids sharp corners and make sure nothing is on top of it. Repair or replace damaged hoses. 3. Apply filtered shop at 80psi to the solenoid to remove dirt. 4. Remove the cover and check that all connections are in good condition.
Inconsistent wire feeding or wire not feeding but drive rolls turning.	<ol style="list-style-type: none"> 1. The gun cable is kinked and/or twisted 2. The wire is jammed in the gun and cable. 3. The gun liner is dirty or worn. 4. The electrode is rusty or dirty. 5. The contact tip is partially melted or has spatter. 6. Improper gun liner, tip, drive rolls and/or inner wire guide. 7. Incorrect tension arm pressure on the drive rolls. 8. Worn drive roll. 	<ol style="list-style-type: none"> 1. Keep the gun cable as straight as possible. Avoid sharp corners or bends in the cable. 2. Remove the gun from the wire feeder and pull the jammed wire out of the gun and cable. 3. Blow dirt out of the liner with low pressure (40psi or less). Replace the liner if worn. 4. Use only clean electrode. Use quality electrode, like L-50 or L-56 from Lincoln Electric. 5. Replace the contact tip. 6. Verify the proper parts are installed. 7. Adjust the tension arm per the Instruction Manual. Most electrodes feed well at a tension arm setting of "3". 8. Replace the drive rolls if worn or filled with dirt.

 **CAUTION**

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact your **Local Lincoln Authorized Field Service Facility** for technical troubleshooting assistance before you proceed.

POWER FEED 15M



Observe all Safety Guidelines detailed throughout this manual

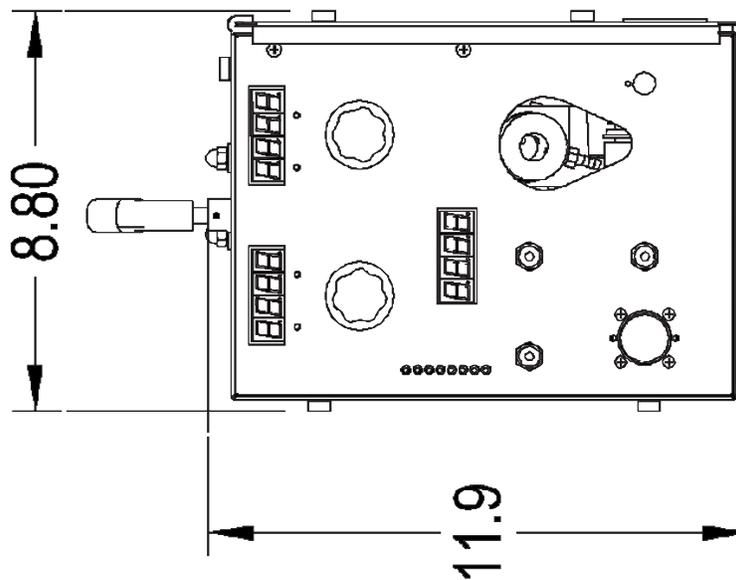
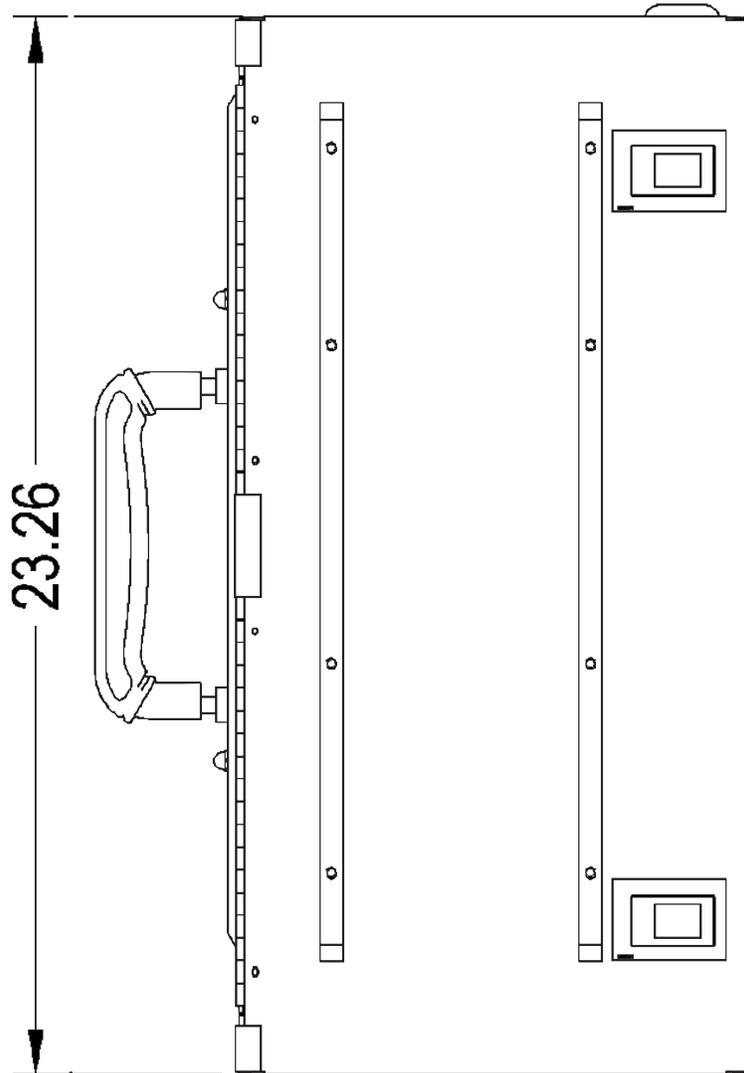
PROBLEMS (SYMPTOMS)	POSSIBLE AREAS OF MISADJUSTMENTS	RECOMMENDED COURSE OF ACTION
Output Problems		
Variable or "hunting" arc.	<ol style="list-style-type: none"> 1. Wrong size, worn and/or melted contact tip. 2. Worn work cable or poor work connection. 3. Wrong polarity. 4. The gas nozzle is extended beyond the contact tip or the wire stickout is too long. 5. Poor gas shielding on processes requiring gas. 	<ol style="list-style-type: none"> 1. Replace the contact tip. 2. Verify all work and electrode connections are tight and that the cables are in good condition. Clean/replace as necessary. 3. Adjust polarity to the recommended procedure. 4. Adjust the gas nozzle and shorten the stickout to 3/8 to 1/2 inches. 5. Check gas flow and mixture. Remove or block sources of drafts.
Poor arc starts with sticking or "blast-offs", weld porosity, narrow and rpy looking bead.	<ol style="list-style-type: none"> 1. Improper procedures or techniques. 	<ol style="list-style-type: none"> 1. See "Gas Metal Arc Welding Guide" (GS-100).
The wire feed speed/amperage and voltage/trim display work during pre-set but show nothing during welding.	<ol style="list-style-type: none"> 1. The software in the Power Feed 15M must be upgraded. 	<ol style="list-style-type: none"> 1. Contact the local authorized Lincoln Field Service Shop.

 **CAUTION**

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact your **Local Lincoln Authorized Field Service Facility** for technical troubleshooting assistance before you proceed.

POWER FEED 15M





POWER FEED 15M



NOTES

POWER FEED 15M



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POWER FEED 15M



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POWER FEED 15M



NOTES

POWER FEED 15M



WARNING	<ul style="list-style-type: none"> ● Do not touch electrically live parts or electrode with skin or wet clothing. ● Insulate yourself from work and ground. 	<ul style="list-style-type: none"> ● Keep flammable materials away. 	<ul style="list-style-type: none"> ● Wear eye, ear and body protection.
Spanish AVISO DE PRECAUCION	<ul style="list-style-type: none"> ● No toque las partes o los electrodos bajo carga con la piel o ropa mojada. ● Aíslese del trabajo y de la tierra. 	<ul style="list-style-type: none"> ● Mantenga el material combustible fuera del área de trabajo. 	<ul style="list-style-type: none"> ● Protéjase los ojos, los oídos y el cuerpo.
French ATTENTION	<ul style="list-style-type: none"> ● 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. 	<ul style="list-style-type: none"> ● Gardez à l'écart de tout matériel inflammable. 	<ul style="list-style-type: none"> ● Protégez vos yeux, vos oreilles et votre corps.
German WARNUNG	<ul style="list-style-type: none"> ● Berühren Sie keine stromführenden Teile oder Elektroden mit Ihrem Körper oder feuchter Kleidung! ● Isolieren Sie sich von den Elektroden und dem Erdboden! 	<ul style="list-style-type: none"> ● Entfernen Sie brennbares Material! 	<ul style="list-style-type: none"> ● Tragen Sie Augen-, Ohren- und Körperschutz!
Portuguese ATENÇÃO	<ul style="list-style-type: none"> ● Não toque partes elétricas e electrodos com a pele ou roupa molhada. ● Isole-se da peça e terra. 	<ul style="list-style-type: none"> ● Mantenha inflamáveis bem guardados. 	<ul style="list-style-type: none"> ● Use proteção para a vista, ouvido e corpo.
Japanese 注意事項	<ul style="list-style-type: none"> ● 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。 	<ul style="list-style-type: none"> ● 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。 	<ul style="list-style-type: none"> ● 目、耳及び身体に保護具をして下さい。
Chinese 警告	<ul style="list-style-type: none"> ● 皮膚或濕衣物切勿接觸帶電部件及鎢條。 ● 使你自己與地面和工件絕緣。 	<ul style="list-style-type: none"> ● 把一切易燃物品移離工作場所。 	<ul style="list-style-type: none"> ● 佩戴眼、耳及身體勞動保護用具。
Korean 위험	<ul style="list-style-type: none"> ● 전도체나 용접봉을 젖은 헝겊 또는 피부로 절대 접촉치 마십시오. ● 모재와 접지를 접촉치 마십시오. 	<ul style="list-style-type: none"> ● 인화성 물질을 접근시키지 마십시오. 	<ul style="list-style-type: none"> ● 눈, 귀와 몸에 보호장구를 착용하십시오.
Arabic تحذير	<ul style="list-style-type: none"> ● لا تلمس الاجزاء التي يسري فيها التيار الكهربائي أو الألكترود بجسد الجسم أو بالملابس المبللة بالماء. ● ضع عازلا على جسمك خلال العمل. 	<ul style="list-style-type: none"> ● ضع المواد القابلة للاشتعال في مكان بعيد. 	<ul style="list-style-type: none"> ● 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.

<ul style="list-style-type: none"> ● Keep your head out of fumes. ● Use ventilation or exhaust to remove fumes from breathing zone. 	<ul style="list-style-type: none"> ● Turn power off before servicing. 	<ul style="list-style-type: none"> ● Do not operate with panel open or guards off. 	WARNING
<ul style="list-style-type: none"> ● Los humos fuera de la zona de respiración. ● Mantenga la cabeza fuera de los humos. Utilice ventilación o aspiración para gases. 	<ul style="list-style-type: none"> ● Desconectar el cable de alimentación de poder de la máquina antes de iniciar cualquier servicio. 	<ul style="list-style-type: none"> ● No operar con panel abierto o guardas quitadas. 	Spanish AVISO DE PRECAUCION
<ul style="list-style-type: none"> ● Gardez la tête à l'écart des fumées. ● Utilisez un ventilateur ou un aspirateur pour ôter les fumées des zones de travail. 	<ul style="list-style-type: none"> ● Débranchez le courant avant l'entretien. 	<ul style="list-style-type: none"> ● N'opérez pas avec les panneaux ouverts ou avec les dispositifs de protection enlevés. 	French ATTENTION
<ul style="list-style-type: none"> ● Vermeiden Sie das Einatmen von Schweißrauch! ● Sorgen Sie für gute Be- und Entlüftung des Arbeitsplatzes! 	<ul style="list-style-type: none"> ● Strom vor Wartungsarbeiten abschalten! (Netzstrom völlig öffnen; Maschine anhalten!) 	<ul style="list-style-type: none"> ● Anlage nie ohne Schutzgehäuse oder Innenschutzverkleidung in Betrieb setzen! 	German WARNUNG
<ul style="list-style-type: none"> ● Mantenha seu rosto da fumaça. ● Use ventilação e exaustão para remover fumo da zona respiratória. 	<ul style="list-style-type: none"> ● Não opere com as tampas removidas. ● Desligue a corrente antes de fazer serviço. ● Não toque as partes elétricas nuas. 	<ul style="list-style-type: none"> ● Mantenha-se afastado das partes moventes. ● Não opere com os painéis abertos ou guardas removidas. 	Portuguese ATENÇÃO
<ul style="list-style-type: none"> ● 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。 	<ul style="list-style-type: none"> ● 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して下さい。 	<ul style="list-style-type: none"> ● パネルやカバーを取り外したまま機械操作をしないで下さい。 	Japanese 注意事項
<ul style="list-style-type: none"> ● 頭部遠離煙霧。 ● 在呼吸區使用通風或排風器除煙。 	<ul style="list-style-type: none"> ● 維修前切斷電源。 	<ul style="list-style-type: none"> ● 儀表板打開或沒有安全罩時不準作業。 	Chinese 警告
<ul style="list-style-type: none"> ● 얼굴로부터 용접가스를 멀리하십시오. ● 호흡지역으로부터 용접가스를 제거하기 위해 가스제거기나 통풍기를 사용하십시오. 	<ul style="list-style-type: none"> ● 보수전에 전원을 차단하십시오. 	<ul style="list-style-type: none"> ● 판넬이 열린 상태로 작동치 마십시오. 	Korean 위험
<ul style="list-style-type: none"> ● ابعد رأسك بعيداً عن الدخان. ● استعمل التهوية أو جهاز ضغط الدخان للخارج لكي تبعد الدخان عن المنطقة التي تتنفس فيها. 	<ul style="list-style-type: none"> ● أقطع التيار الكهربائي قبل القيام بأية صيانة. 	<ul style="list-style-type: none"> ● لا تشغيل 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說明以及應該使用的銀焊材料，並請遵守貴方的有閣勞動保護規定。

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.



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