IM892-C

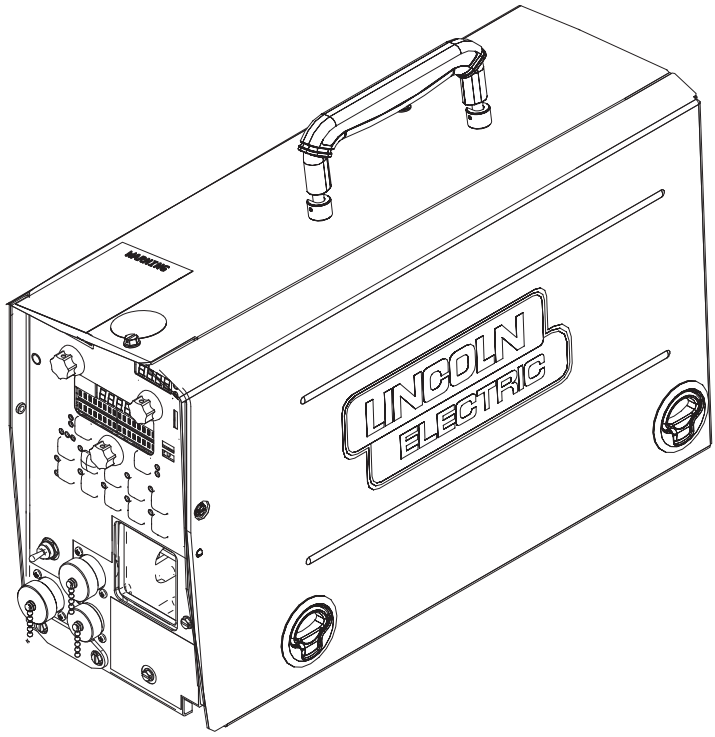
March, 2010

POWER FEED™ 25M

For use with machines having Code Number : 11313, 11456, 11557, 11714, 11715

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.



IP23

IEC 60974-5

OPERATOR'S MANUAL

LINCOLN ELECTRIC

• World's Leader in Welding and Cutting Products •

• Sales and Service through Subsidiaries and Distributors Worldwide •

Cleveland, Ohio 44117-1199 U.S.A. TEL: 216.481.8100 FAX: 216.486.1751 WEB SITE: www.lincolnelectric.com

⚠ 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.

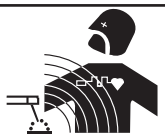
1.d. Keep all equipment safety guards, covers and devices in position and in good repair.Keep hands, hair, clothing and tools away from V-belts, gears, fans and all other moving parts when starting, operating or repairing equipment.

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. I standards.

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

4.c. Protect other nearby personnel with suitable, non-flammable screening and/or warn them not to watch the arc nor expose themselves to the arc rays or to hot spatter or metal.

FUMES AND GASES can be dangerous.

5.a. Welding may produce fumes and gases hazardous to health. Avoid breathing these fumes and gases. When welding, keep your head out of the fume. Use enough ventilation and/or exhaust at the arc to keep fumes and gases away from the breathing zone. **When welding 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 within applicable OSHA PEL and ACGIH TLV limits 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.**

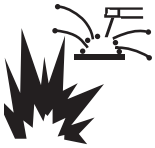
5. b. The operation of welding fume control equipment is affected by various factors including proper use and positioning of the equipment, maintenance of the equipment and the specific welding procedure and application involved. Worker exposure level should be checked upon installation and periodically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

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

5.d. Shielding gases used for arc welding can displace air and cause injury or death. Always use enough ventilation, especially in confined areas, to insure breathing air is safe.

5.e. Read and understand the manufacturer’s instructions for this equipment and the consumables to be used, including the 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.f. Also see item 1.b.



WELDING and CUTTING SPARKS can cause fire or explosion.

6.a. Remove fire hazards from the welding area. If this is not possible, cover them to prevent the welding sparks from starting a fire. Remember that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas. Avoid welding near hydraulic lines. Have a fire extinguisher readily available.

6.b. Where compressed gases are to be used at the job site, special precautions should be used to prevent hazardous situations. Refer to "Safety in Welding and Cutting" (ANSI Standard Z49.1) and the operating information for the equipment being used.

6.c. When not welding, make certain no part of the electrode circuit is touching the work or ground. Accidental contact can cause overheating and create a fire hazard.

6.d. Do not heat, cut or weld tanks, drums or containers until the proper steps have been taken to insure that such procedures will not cause flammable or toxic vapors from substances inside. They can cause an explosion even though they have been "cleaned". For information, purchase "Recommended Safe Practices for the Preparation for Welding and Cutting of Containers and Piping That Have Held Hazardous Substances", AWS F4.1 from the American Welding Society (see address above).

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

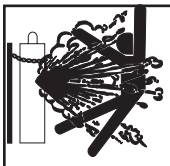
6.f. Sparks and spatter are thrown from the welding arc. Wear oil free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes and a cap over your hair. Wear ear plugs when welding out of position or in confined places. Always wear safety glasses with side shields when in a welding area.

6.g. Connect the work cable to the work as close to the welding area as practical. Work cables connected to the building framework or other locations away from the welding area increase the possibility of the welding current passing through lifting chains, crane cables or other alternate circuits. This can create fire hazards or overheat lifting chains or cables until they fail.

6.h. Also see item 1.c.

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

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



CYLINDER may explode if damaged.

7.a. Use only compressed gas cylinders containing the correct shielding gas for the process used and properly operating regulators designed for the gas and pressure used. All hoses, fittings, etc. should be suitable for the application and maintained in good condition.

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

7.c. Cylinders should be located:
- Away from areas where they may be struck or subjected to physical damage.
- A safe distance from arc welding or cutting operations and any other source of heat, sparks, or flame.

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

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

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

7.g. Read and follow the instructions on compressed gas cylinders, associated equipment, and CGA publication P-l, "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.

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

Jan '09

PRÉCAUTIONS DE SÛRETÉ

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

Sûreté Pour Soudage A L'Arc

1. Protegez-vous contre la secousse électrique:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

CUSTOMER ASSISTANCE POLICY

The business of The Lincoln Electric Company is manufacturing and selling high quality welding equipment, consumables, and cutting equipment. Our challenge is to meet the needs of our customers and to exceed their expectations. On occasion, purchasers may ask Lincoln Electric for advice or information about their use of our products. We respond to our customers based on the best information in our possession at that time. Lincoln Electric is not in a position to warrant or guarantee such advice, and assumes no liability, with respect to such information or advice. We expressly disclaim any warranty of any kind, including any warranty of fitness for any customer's particular purpose, with respect to such information or advice. As a matter of practical consideration, we also cannot assume any responsibility for updating or correcting any such information or advice once it has been given, nor does the provision of information or advice create, expand or alter any warranty with respect to the sale of our products.

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

Subject to Change – This information is accurate to the best of our knowledge at the time of printing. Please refer to www.lincolnelectric.com for any updated information.

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**.

TABLE OF CONTENTS

TECHNICAL SPECIFICATIONS – POWER FEED™ 25M K2536-1, -2, -3

INPUT VOLTAGE and CURRENT

INPUT VOLTAGE ± 10%	INPUT AMPERES
40 VDC	4A

RATED OUTPUT @ 104°F (40°C)

DUTY CYCLE	INPUT AMPERES
60% rating	500
100% rating	400

GEARING - WIRE FEED SPEED RANGE-WIRE SIZE

GEARING	GMAW		FCAW	
	WFS RANGE	WIRE SIZES	WFS RANGE	WIRE SIZES
Normal Speed (factory setting)	50 – 800 ipm (2.5 – 20.3m/min)	.023 – 1/16" (0.6 – 1.6mm)	50 – 800 ipm (2.5 – 20.3m/min)	.030 – 5/64" (0.8 – 2.0mm)
Extra torque	30 – 400 ipm (1.3 – 10.4m/min)	.023 – 1/16" (0.6 – 1.6mm)	30 – 400 ipm (1.3 – 10.4m/min)	.030 – 3/32" (0.8 – 2.4mm)

PHYSICAL DIMENSIONS

HEIGHT	WIDTH	DEPTH	WEIGHT
14.5 Inches (368 mm) Handle folded down	8.5 Inches (216 mm)	23.5 Inches (597 mm) Memory Panel Closed	35 lbs (15.9 kg)

TEMPERATURE RANGE

OPERATION:	-40°F to 122°F (-40°C to 50°C)
STORAGE:	-40°F to 185°F (-40°C to 85°C)

SAFETY PRECAUTIONS

⚠ 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.**
- **Welding power source must be connected to system ground per the National Electrical Code or any applicable local codes.**
- **Only qualified personnel should perform maintenance work.**

LOCATION

For best wire feeding performance, place the POWER FEED™ 25M on a stable and dry surface. Keep the wire feeder in a vertical position. Do not operate the wire feeder on an angled surface of more than 15 degrees.

Do not submerge the POWER FEED™ 25M.

The POWER FEED™ 25M is rated IP23 and is suitable for outdoor use.

The handle of the POWER FEED™ 25M is intended for moving the wire feeder about the work place only.

When suspending a wire feeder, insulate the hanging device from the wire feeder enclosure.

HIGH FREQUENCY PROTECTION

⚠ CAUTION

Locate the POWER FEED™ 25M away from radio controlled machinery. The normal operation of the POWER FEED™ 25M may adversely affect the operation of RF controlled equipment, which may result in bodily injury or damage to the equipment.

ARCLINK CONTROL CABLES

(See Figure A.3)
ArcLink Control Cables are available in two forms:

- K1543-xx series for most indoor or factory installations.
- K2683-xx series for outdoor use or when the equipment is frequently moved.

ArcLink/LincNet control cables are special high quality cables for digital communication. The cables are copper 5 conductor cable in a SO-type rubber jacket. There is one 20 gauge twisted pair for network communications. This pair has an impedance of approximately 120 ohms and a propagation delay per foot of less than 2.1 nanoseconds. There are two 12 gauge conductors that are used to supply 40VDC to the network. The fifth wire is 18 gauge and is used as an electrode sense lead.

Use of non-standard cables may lead to system shutdowns, poor arc starting and wire feeding problems.

The control cables connect the power source to the wire feeder, and the wire feeder to other wire feeders.

Control cables may be connected end to end to extend their length. Use a maximum of 200 ft. (61.0m) of control cable between components.

Figure A.3

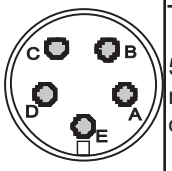
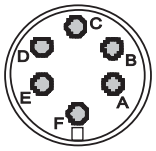
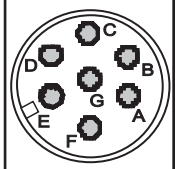
Power Source	
Pin	Function
A	ArcLink
B	ArcLink
C	"67" voltage sense
D	40 VDC
E	Common

Wire Feeder	
Pin	Function
A	ArcLink
B	ArcLink
C	"67" voltage sense
D	40 VDC
E	Common

CABLE CONNECTIONS

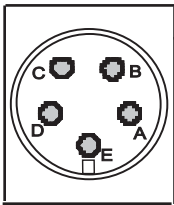
There are three circular connectors on the front of the POWER FEED™ 25M.
(See 5-pin, 6-pin and 7-pin- Figure A.1)

FIGURE A.1

	Function	PIN	Wiring
	5 pin trigger connector for push-only guns.	A B C D E	Trigger Not used Common Dual Procedure Selection Common
	6 pin connector for remote control or foot/hand amptrol.	A B C D E F	77 Remote potentiometer, 5K 75 Remote potentiometer, common 76 Remote potentiometer, wiper Switch, On/Off Switch, common Not used
	7 pin connector for push-pull guns	A B C D E F G	Motor - Motor + 77 Remote potentiometer, 5K 76 Remote potentiometer, wiper Switch, On/Off Switch, common 75 Remote potentiometer, common

There is one circular connector on the rear of the POWER FEED™ 25M. Maximum control cable length is 200 ft (61 m).

FIGURE A.2

	Function	PIN	Wiring
	5 pin ArcLink connector.	A B C D E	ArcLink ArcLink 67 Electrode Voltage Sense 40VDC Common

WELD CABLE SIZE

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.

COAXIAL WELD CABLE

(See Table A.2)

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™ wave shape. Inductance becomes more severe as the weld cables become longer.

Coaxial cables work best for high performance waveforms and when:

- long cables are present.
- the cables are housed in a metal tray.

A coaxial weld cable is constructed with multiple 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

To install:

1. Turn the input power off at the welding power source.
2. Connect one end of the center lead to the power source electrode connection, and the other end to the wire feeder electrode connection.
3. Connect the outer lead bundle to the power source work connection, and the other end to the work piece. Minimize the length of any work lead extension for best results.
4. Insulate all connections.

FIGURE A.5

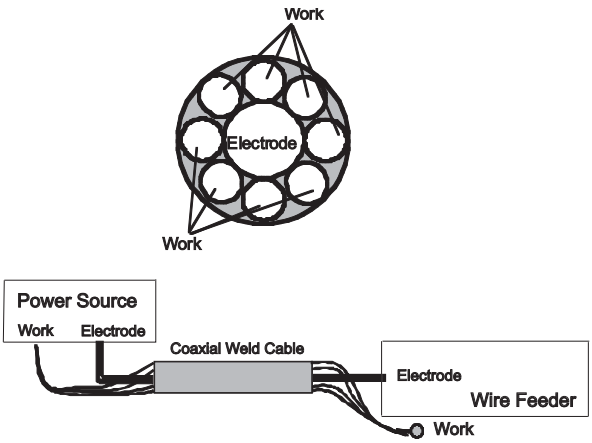


TABLE A.2

RECOMMENDED CABLE SIZES (RUBBER COVERED COPPER - RATED 75°C)**					
AMPERES	DUTY CYCLE	COAXIAL CABLE LENGTH			
		0 to 25Ft. (0 to7.6M)	25 to 50Ft. (7.6 to 15.2M)	50 to 75 Ft. (15.2 to 22.9M)	75 to 100 Ft. (22.9 to 30.5M)
250	100%	1	1	1	1
300	60%	1	1	1	1/0
350	60%	1/0	1/0	--	--

TABLE A.1

RECOMMENDED CABLE SIZES (RUBBER COVERED COPPER - RATED 167°F or 75°C)**						
AMPERES	PERCENT DUTY CYCLE	CABLE SIZES FOR COMBINED LENGTHS OF ELECTRODE AND WORK CABLES				
		0 to 50Ft. (0 to15M)	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).

ELECTRODE POLARITY

The wire feeder is factory set for Electrode Positive welding. Most GMAW welding procedures use Electrode Positive welding. Most GTAW and some Innershield procedures use Electrode Negative welding.

⚠ CAUTION

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

⚠ WARNING

ELECTRIC SHOCK CAN KILL.

- **Turn the input power OFF at the welding power source before changing electrode polarity.**
- **Do not touch electrically live parts.**
- **Only qualified personnel should perform maintenance work.**

Electrode Polarity	DIP switch #7 setting
Positive	OFF (Factory setting)
Negative	ON

Tools required:
- 5/16" nut driver

To change the DIP switch from Electrode Polarity:

1. Turn power off at the welding power source
2. Remove the spool of wire from the feeder.
3. Remove the 4 screws holding the cover. Lift the cover out of the feeder.
4. Move DIP switch #7 on the feed head board to the appropriate position.
5. Install the cover and secure with the screws.

SHIELDING GAS CONNECTION

⚠ WARNING

CYLINDER may explode if damaged.

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

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

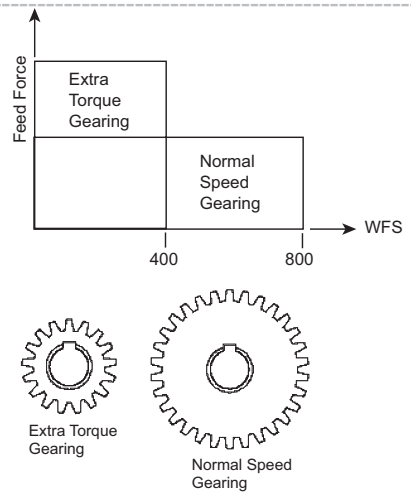
MAXIMUM INLET PRESSURE IS 100 PSI. (6.9 BAR.)
Install the shielding gas supply as follows:

1. Secure the cylinder to prevent it from falling.
2. Remove the cylinder cap. Inspect the cylinder valves and regulator for damaged threads, dirt, dust, oil or grease. Remove dust and dirt with a clean cloth. **DO NOT ATTACH THE REGULATOR IF OIL, GREASE OR DAMAGE IS PRESENT!** Inform your gas supplier of this condition. Oil or grease in the presence of high pressure oxygen is explosive.
3. Stand to one side away from the outlet and open the cylinder valve for an instant. This blows away any dust or dirt which may have accumulated in the valve outlet.
4. Attach the flow regulator to the cylinder valve and tighten the union nut(s) securely with a wrench. Note: if connecting to 100% CO_2 cylinder, insert regulator adapter between regulator and cylinder valve. If adapter is equipped with a plastic washer, be sure it is seated for connection to the CO_2 cylinder.
5. Attach one end of the inlet hose to the outlet fitting of the flow regulator. Attach the other end to the welding system shielding gas inlet. Tighten the union nuts with a wrench.
6. Before opening the cylinder valve, turn the regulator adjusting knob counterclockwise until the adjusting spring pressure is released.
7. Standing to one side, open the cylinder valve slowly a fraction of a turn. When the cylinder pressure gage stops moving, open the valve fully.
8. The flow regulator is adjustable. Adjust it to the flow rate recommended for the procedure and process being used before making a weld.

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" open end wrench
- 9/16" socket and ratchet wrench
- 7/16" nut driver
- 5/16" nut driver
- Phillips screw driver

1. Turn power off at the welding power source.

2. Remove the spool of electrode from the wire feeder.

3. Loosen the thumb screw at the wire drive and remove the welding gun.

4. Remove the outer wire guide, drive rolls and inner wire guide.

5. Use a 7/16" nut driver to remove the gear cover.

6. Use 9/16" socket and ratchet wrench to remove the lower drive roll hub retainer. Remove the lower drive roll hub.

7. With a Phillips screwdriver, remove the screw, washer and collar holding the pinion gear. Remove the pinion gear.

8. Remove the busbar by unscrewing the bolt using a 3/4" open end wrench.

9. 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.

10. With a 5/16" nut driver remove the five screws securing the wire drive panel. Lift out the wire drive panel and disconnect the molex connections.

11. Using a 5/16" nut driver, remove the four screws securing the cover.

12. With a Phillips screwdriver, 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 washer holding the wire drive motor.

15. Assemble the molex connections and place the wire drive assembly inside the wire feeder. Route the gas hose through the opening in the wire drive panel.

16. Move DIP switch #8 on the Feed head board to the appropriate position.

Gear Select	DIP Switch #8 Setting	Range
Normal Speed	ON	50 – 800 ipm
Extra Torque	OFF	30 – 400 ipm

17. 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.

18. Reassemble the busbar and tighten the mounting hardware with a 3/4" open end wrench.

19. Place the new gear on the motor shaft. Secure the gear to the motor shaft with the collar, washer and screw.

20. Reassemble the lower drive roll hub and lower drive roll hub retainer.

21. Reassemble the gear cover.

22. Reassemble the inner wire guide, drive rolls and outer wire guide.

23. Place the welding gun into the gun bushing and secure with the thumb screw.

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.**

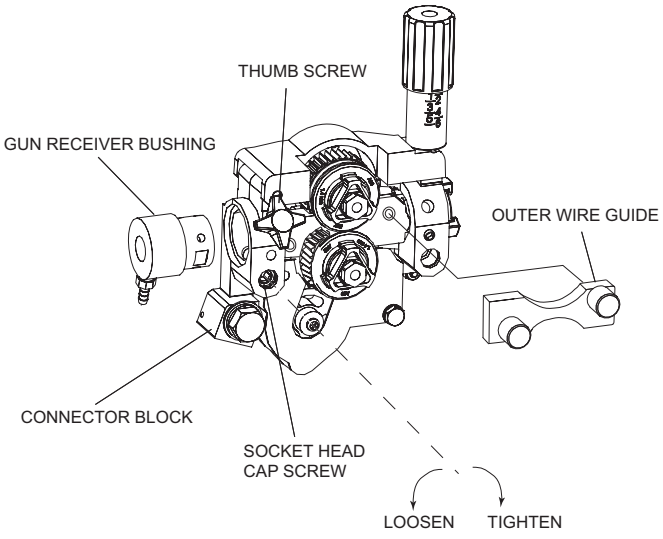
Tools required:

- 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.

FIGURE A-6



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

PROCEDURE TO INSTALL DRIVE ROLLS AND WIRE GUIDES

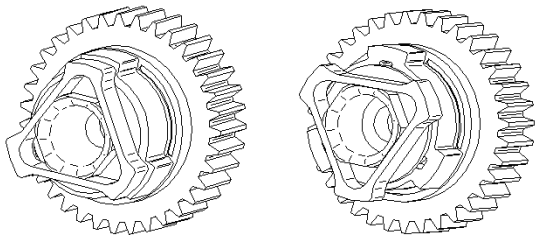
⚠ WARNING

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.**

---

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



UNLOCKED POSITION **LOCKED POSITION**

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

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.

LOADING SPOOLS OF WIRE

⚠ WARNING

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

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

A K468 spindle adapter is required for loading 2" (51mm) wide spools on 2" (51mm) spindles. Use a K468 spindle adapter for loading 2-1/2" (64mm) wide spools.

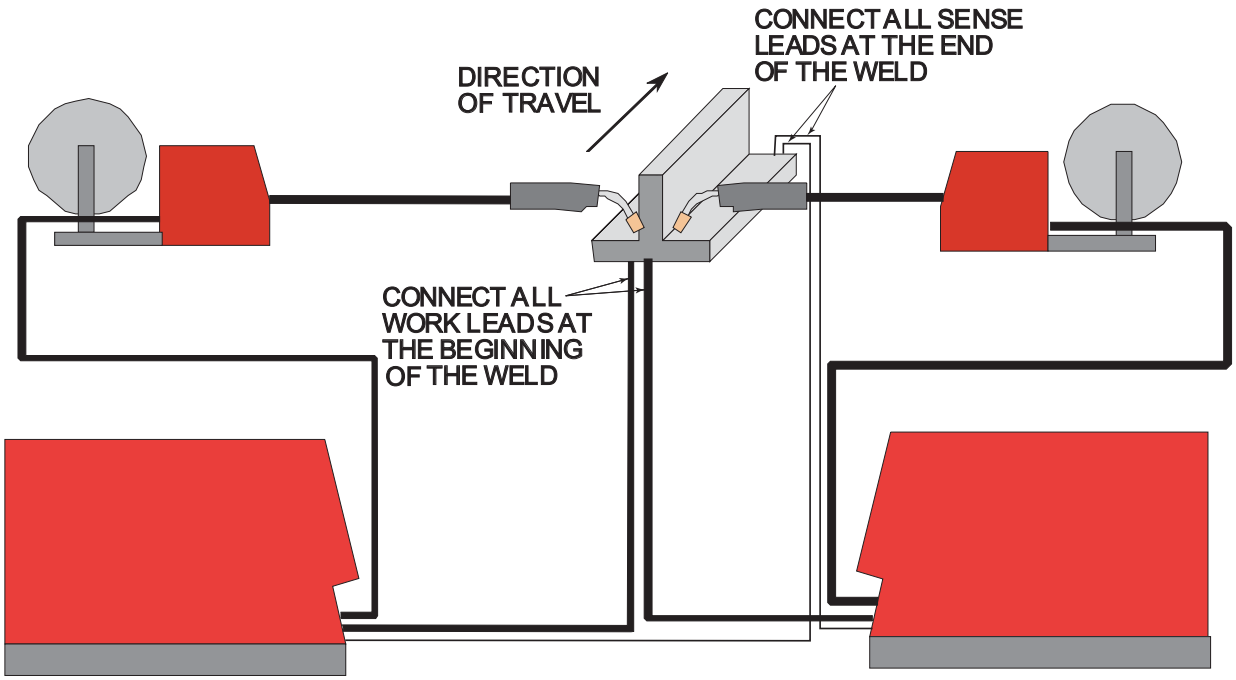
1. Squeeze the release bar on the retaining collar and remove it from the spindle.

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

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

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

FIGURE A.7



TYPICAL SYSTEM CONFIGURATIONS

Standard Features

Arc Performance
- Push-Pull ready for welding aluminum with Pulse and Pulse-on-Pulse™ waveforms.
- STT™ capable when used with STT™ equipped Power Waves.
- Waveform Control Technology™ for welds with good appearance and low spatter, even when welding nickel alloys.

User Controls
- (code 11313) 6 memories for easily selecting procedures.
- (code 11456 and higher) 8 memories for easily selecting procedures.
- MSP4 panel located behind the memory panel for protection.
- Full sequence control for tailoring the weld from start to end.
- All welding controls located at the wire feeder, including process selection

Wire Drive
Patented 2 roll drive system. MAXTRAC™ technology delivers great feeding because:
- Patent pending drive rolls improve traction on solid wire by up to 20%.
- The precision machined, rigid aluminum alloy frame results in maximum drive roll clamping pressure.
- Patented split wire guides fully support the wire and virtually eliminate birdnesting.
- No tools required to change the drive rolls and wire guides.
- Patented dual spring pressure arms have sensitivity for feeding soft wires without crushing them, and have plenty of compression force for feeding solid or stiff wires.
- All gear driven rolls for more feeding force.
- Changeable gun bushings easily accept guns from other manufacturers.
- Brass-to-brass connections between the electrode connection and the gun minimize voltage drop variations, resulting in consistent arc performance all day, every day.
- Powerful, quiet motor with integrated tachometer for accurate WFS regulation.

Extras:
- Flowmeter with gas control valve
- Push-Pull ready.
- Remote control / Foot amptrol ready.
- Internal heater for keeping condensation off of the spool of wire.
- Internal lights for illuminating the wire drive compartment.

Options
- Water cooling kit for use with water cooled guns.

SAFETY PRECAUTIONS

READ AND UNDERSTAND ENTIRE SECTION BEFORE OPERATING MACHINE.

⚠ WARNING

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

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

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

ARC RAYS can burn.

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

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

GRAPHIC SYMBOLS THAT APPEAR ON THIS MACHINE OR IN THIS MANUAL

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

CAG
- Carbon Arc Gouging

GENERAL DESCRIPTION

General Physical Description
The POWER FEED™ 25M is a premium portable wire feeder for use with the Power Wave products. The wire feeder features a 2 roll MAXtrac™ drive coupled to a powerful motor for driving wire through difficult situations. The easy-to-use, MSP4 interface provides ready access to all welding modes in the Power Wave. A memory panel is included with the POWER FEED™ 25M and allows quick recall of favorite weld procedures. Two cases are available: An engineered aluminum case with replaceable skids, or an impact resistant polycarbonate plastic case.

The heart of the POWER FEED™ 25M is the MAXtrac™ drive. The patented features on the wire drive offer tool-less changing of the drive rolls and the wire guides for quick spool changes. Plus, the drive can be configured for extra torque when feeding large diameter flux cored electrodes.

The POWER FEED™ 25M continues Lincoln's lead role of environmental protection for electronics. P.C. boards are potted in epoxy and electrical connections are protected with dielectric grease. Noise suppression components protect the POWER FEED™ 25M from stray signals and keep the feeder from interfering with other digital equipment.

General Functional Description
The POWER FEED™ 25M is best suited for applications were quality welds are expected. Combined with a Power Wave power source, the POWER FEED™ 25M is great for aluminum, nickel, alloy and other difficult to weld materials. Easy to use controls make it a great feeder for consistent results with mild steel applications too.

DUTY CYCLE

The POWER FEED™ 25M is rated for 500 amps, 60% duty cycle and 400 amps, 100% duty. The duty cycle is based on a 10 minute cycle.

For example, when welding at 500 amps, the POWER FEED™ 25M may run continuously for 6 minutes and then must sit idle for 4 minutes.

RECOMMENDED PROCESSES

- GMAW (CV, Synergic CV, Pulse, STT™, Power, Pulse on Pulse™, Push-Pull)
- FCAW
- SMAW
- GTAW (Lift Start only)

- Solid wires .025" to 1/16"
- Cored wires .035" to 5/64"
- Cored wires .035" to 3/32" when configured for "extra torque"

EQUIPMENT LIMITATIONS

- Works only on ArcLink® or LincNet Power Wave power sources.
- When operating on LincNet power sources, not all features are available.
- Maximum gun length is 25ft.(7.6m) for push-only systems.
- Maximum gun length is 50ft.(15.2m) for push-pull systems.
- Spool guns do not work with the POWER FEED™ 25M.
- A remote control/foot amptrol and a push-pull gun may not be connected to the POWER FEED™ 25M simultaneously.
- Maximum spool size is 12 in. (305 mm) diameter
- Maximum spool weight is 44 lb (20 kg).
- Maximum control cable length is 200 ft (61 m).
- Other gun bushings are required for welding guns that do not have a Magnum (Tweco #2-#4 compatible) back end.
- No more than 2 wire feeders may be connected to one ArcLink power source at a time.

RECOMMENDED POWER SOURCES

- Power Wave® 355M
- Power Wave® 455M
- Power Wave® 455M/STT
- Power Wave® 655/R

CASE FRONT CONTROLS (CODE 11313)
(SEE FIGURE B.1)

1. Left DISPLAY window
Shows WIRE FEED SPEED or AMPERAGE.

2. Left KNOB
Adjusts values in left display.

3. Right Display window
Shows VOLTAGE or TRIM.

4. Right Knob
Adjusts values in the right display.

5. Status LED
Illuminates a steady green when communicating to the power source properly.

6. IR port
Used to transfer information to palm computers, etc.

7. MSP4 display window
Shows detailed welding and diagnostic information.

8. Left Button
Changes the MSP4 display to show the Weld Mode or Arc Control.

9. Right Button
Changes the MSP4 display to show Start Options or End Options.

10. Set Knob
Changes the value on the MSP4 display.

11. ON/OFF switch
Controls power to the POWER FEED™ 25M.

12. 5-pin connector
Trigger connector for a push-only gun.

13. 6-pin connector
Connector for a remote control.

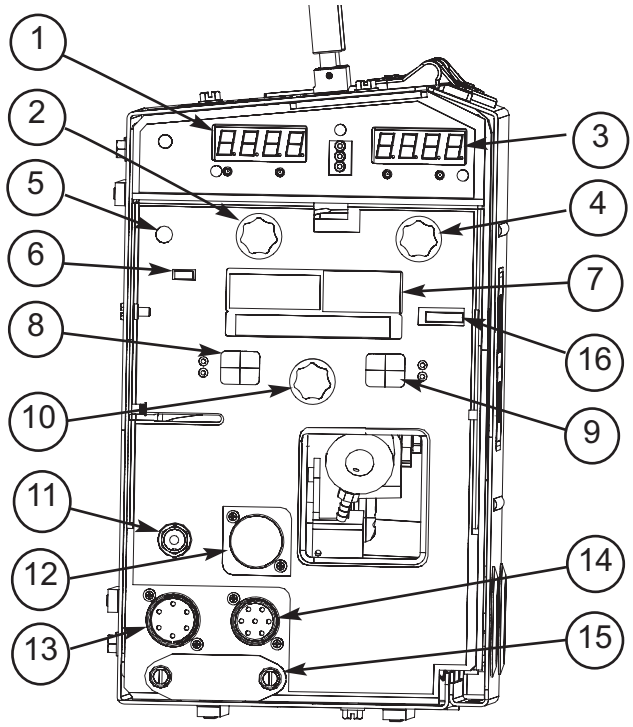
14. 7- pin connector
Connector for a push-pull gun.

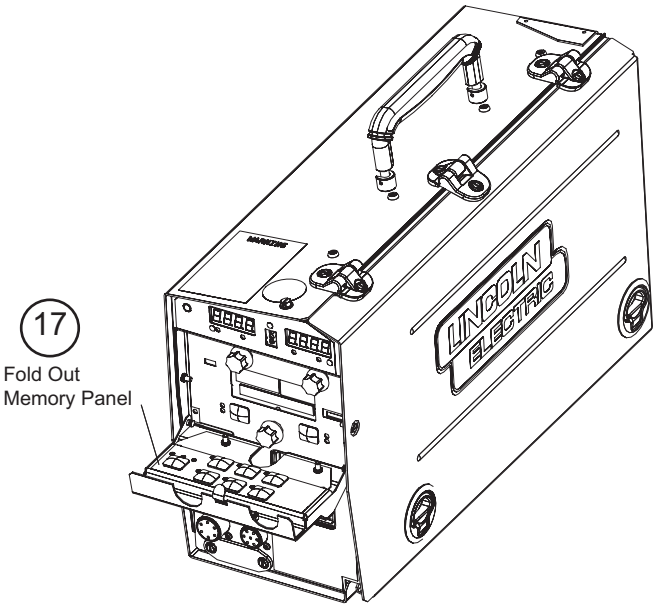
15. Cover
Covers location for optional water cooling line.

16. Set-Up
Lights when feeder is set-up.

17. Memory Panel Door
(See Memory Panel Operations in this Section)

FIGURE B.1





CASE FRONT CONTROLS (CODE 11456 and higher) (See Figure B.1a)

1. Left DISPLAY window
Shows WIRE FEED SPEED or AMPERAGE.

2. Left KNOB
Adjusts values in left display.

3. Status LED
Illuminates a steady green when communicating to the power source properly.

4. MSP4 display window
Shows detailed welding and diagnostic information.

5. Left Button
Changes the MSP4 display to show the Weld Mode or Arc Control.

6. Procedure Button
Selects A or B procedure, or gun control.

7. 2-Step/4-Step Button
Toggles between 2-step and 4-step trigger operation.

8. 5-pin connector
Trigger connector for a push-only gun.

9. ON/OFF switch
Controls power to the POWER FEED™ 25M.

10. 6-pin connector
Connector for a remote control.

11. Cover
Covers location for optional water cooling line.

12. 7- pin connector
Connector for a push-pull gun.

13. Right Display window
Shows VOLTAGE or TRIM.

14. Right Knob
Adjusts values in the right display.

15. Thermal
Lights when the drive overheats.

16. Set-Up
Lights when feeder is set-up

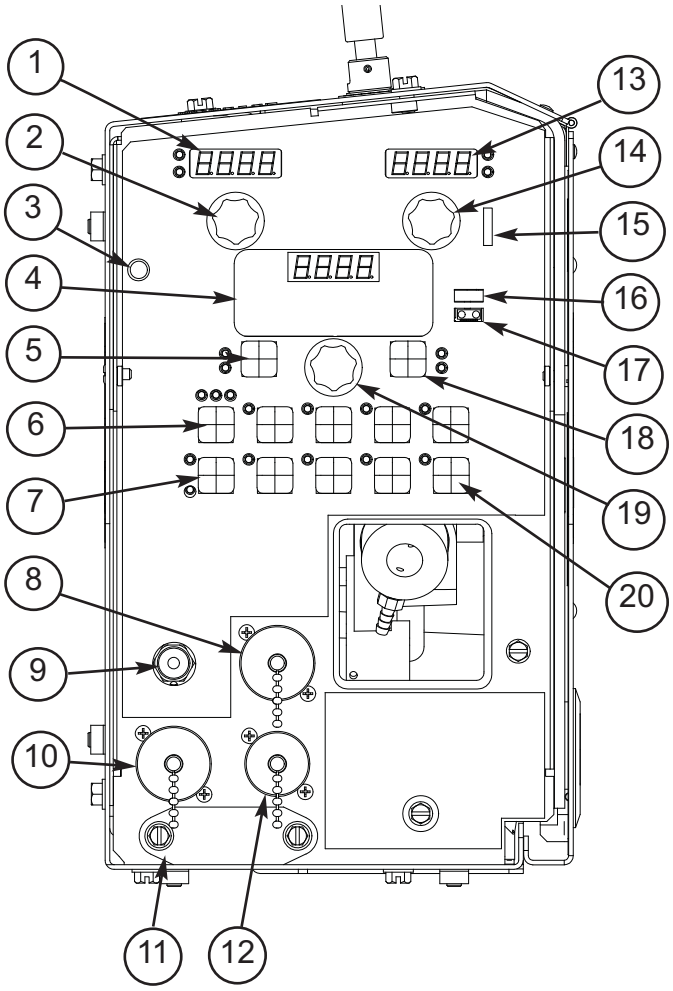
17. IR port
Used to transfer information to palm computers, etc.

18. Right Button
Changes the MSP4 display to show Start Options or End Options.

19. Set Knob
Changes the value on the MSP4 display.

20. Memory Buttons
(For selection of common procedures.)

FIGURE B.1a



11. ON-OFF SWITCH

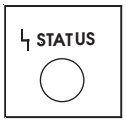
The On-Off Switch turns the wire feeder power on and off. It does not control the power to the welding power source.

⚠ 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.**
- **Welding power source must be connected to system ground per the National Electrical Code or any applicable local codes.**
- **Only qualified personnel should perform maintenance work.**

STATUS LED
(See Table B.1)



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.

TABLE B.1

LED condition	Definition
Steady green	System okay. The power source and wire feeder are communicating normally.
Blinking green.	Occurs during a reset and indicates the power source is identifying each component in the system. This is normal for up to 15 seconds after power-up, or if the system configuration is changed during operation.
Blinking green, fast	Indicates that one or more pieces of ArcLink equipment are not mapping properly. Check the DIP switch setting on the wire feeders.
Blinking green followed by blinking 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. Error codes are detailed in the Troubleshooting Section E. Individual code digits are flashed in red with a long pause between digits. After each error code the LED will flash green and codes will repeat. There may be more than one error code indicated. To clear the error, turn the power source OFF, and then back ON to reset. See Troubleshooting Section E.

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.

SMAW (STICK) WELDING

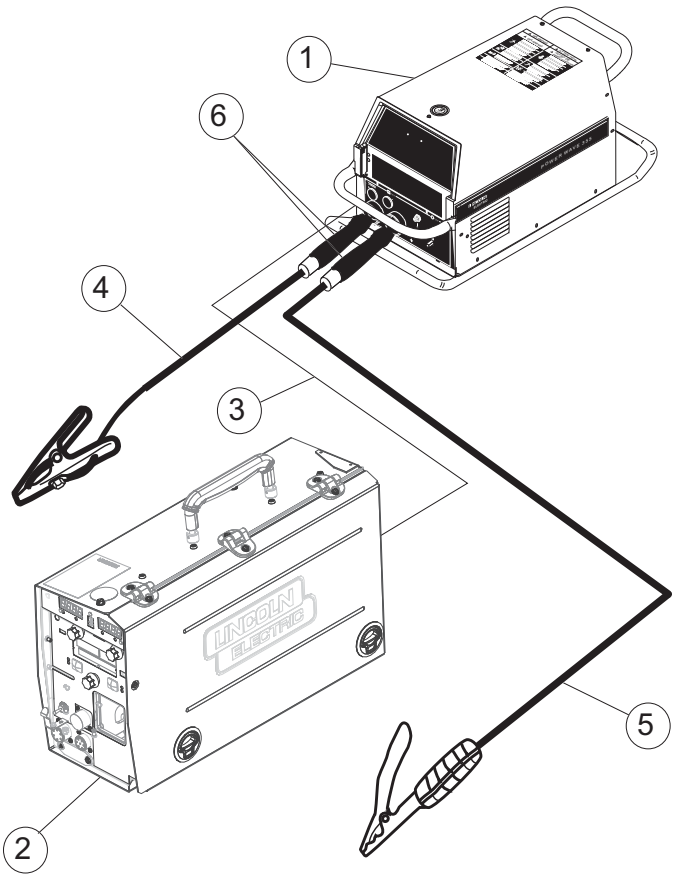
SMAW is most often used for outdoor construction, pipe welding and general repairs. The wire feeder controls Amperage, Output Control and Arc Force during SMAW welding.

During SMAW welding, the wire feeder sets the weld parameters and the wire drive remains idle.

The “Volts”-”Trim” control is used to turn the power Source Output ON or OFF. (See Figure B.3)

SMAW Welding (See Figure B.2)

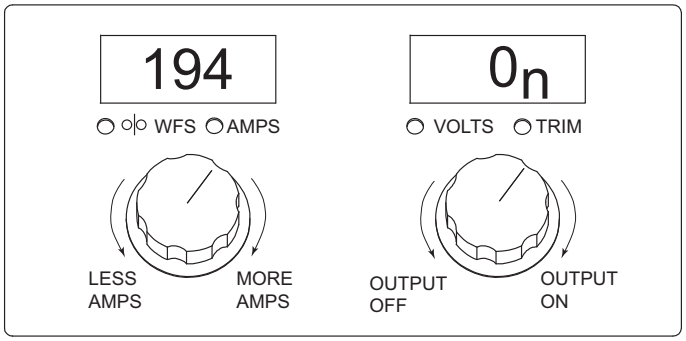
FIGURE B.2



1	K2368-1 K2202-1 K2203-1	Power Wave® 355M Power Wave® 455M Power Wave® 455M/STT
2 Bench	K2230-1 K2234-1 K2536-1,-2,-3	POWER FEED™ 10M, Bench Model POWER FEED™ 10M Dual, Model POWER FEED™ 25M
3	K1543-xx K2683-xx	Digital Control Cable
4	K1842-xx K910-xx	Weld Power Cable, Lug to Lug Ground Clamp
5	K909-xx	Electrode Holder
6	K2176-1	Twist-Mate to Lug Cable Adapter

SMAW (Stick) Welding Display

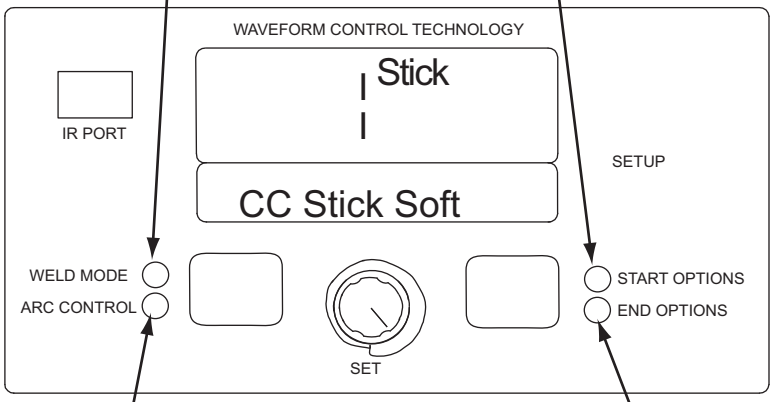
FIGURE B.3



MSP4 OPERATION

START OPTIONS	
START TIME:	FUNCTION
0 to 10 seconds	If no remote control is installed, this control sets the time for the weld output to ramp up or down from a preset Start current to the preset Weld current. Use the WFS/AMP knob to adjust Start current while the Start Options LED is displayed.

CC STICK MODES	
PROCESS	MODE
Stick Soft(7018)	1
Stick Crisp(6010)	2



ARC CONTROL	
ARC FORCE	DESCRIPTION
(Soft)-10.0 to (Crisp)+10.0	Lower values will provide less short circuit current and a softer arc. Higher settings will provide a higher short circuit current, a more forceful arc and possibly more spatter.

END OPTIONS
No arc ending options are active for SMAW (Stick) welding modes.

NON-SYNERGIC GMAW AND FCAW WELDING

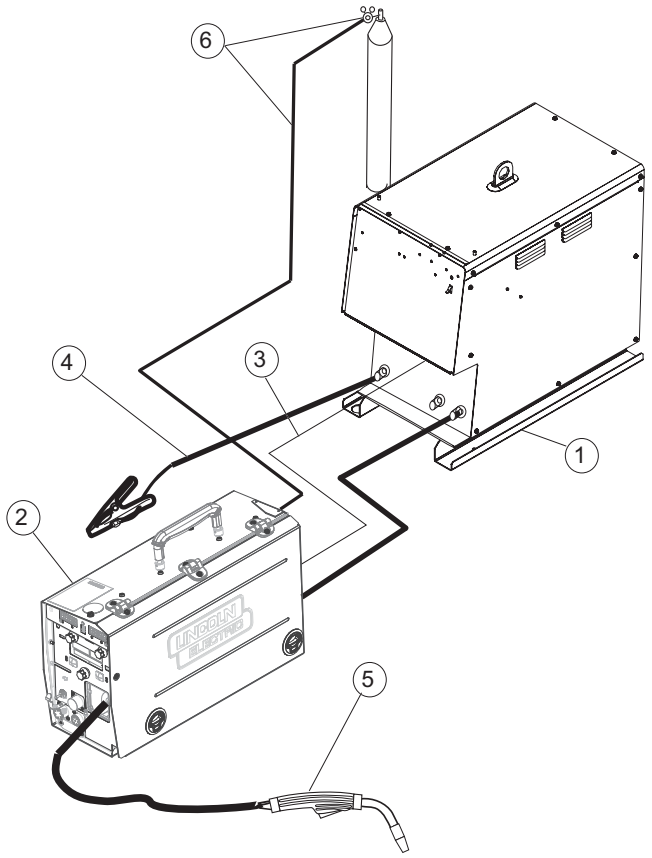
(See Figure B.4)

Non-synergic GMAW and FCAW welding mimics the welding controls of traditional welding power sources. Voltage and WFS are set as independent variables.

Three non-synergic welding modes are available.

Description	Mode	Used for:
GMAW, Standard CV	5	Best for traditional MIG welding.
GMAW, Power	40	Specialized GMAW mode.
FCAW	6	Best for self shielded electrodes like Innershield™.

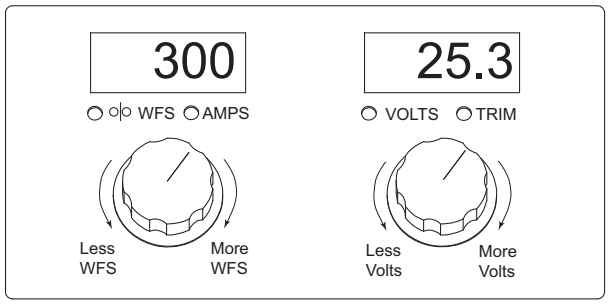
FIGURE B.4



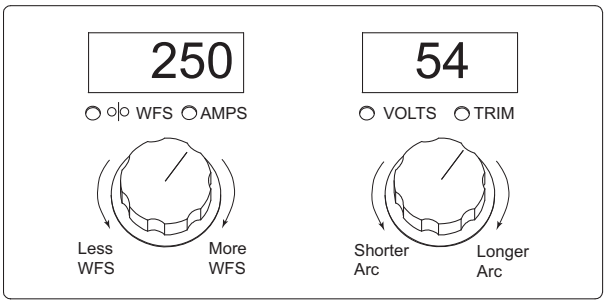
1	K2368-1 K2202-1 K2203-1	Power Wave® 355M Power Wave® 455M Power Wave® 455M/STT
2	K2230-1	POWER FEED™ 10M, Bench Model
	K2234-1	POWER FEED™ 10M Dual, Bench Model
	K2536-1,-2,-3	POWER FEED™ 25M
	KP1696-xx, KP1697-xx	Drive Roll Kit, 2 Roll Feeder
	KP1505-xx, KP1507-xx	Drive Roll Kit, 4 Roll Feeder
3	K1543-xx K2683-xx	Digital Control Cable
4	K1842-xx	Weld Power Cable, Lug to Lug
	K910-xx	Ground Clamp
5	See Magnum Literature	MIG gun
6	K586-1	Deluxe Regulator for Mixed Shielding Gases
		Shielding Gas Hose

Non-Synergic GMAW and FCAW Welding Display

Modes 5 and 6:



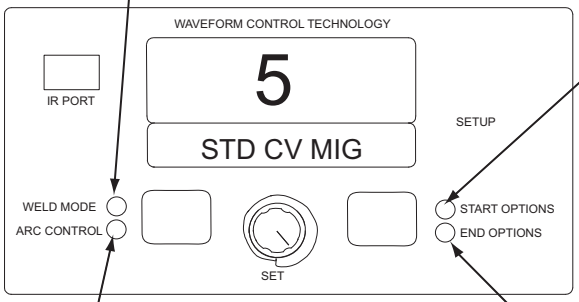
Mode 40:



MSP4 OPERATION

WELD MODE	
PROCESS	**WELD MODE**
GMAW, STANDARD CV	5
GMAW, POWER MODE	40
FCAW, STANDARD CV	6

START OPTIONS	
EFFECT / RANGE	DESCRIPTION
Preflow Time 0 - 25.0 seconds	Adjusts the time that shielding gas flows after the trigger is pulled and prior to feeding wire.
Run-In WFS: Off, 30 to150 in/min.	Run-In sets the wire feed speed from the time the trigger is pulled until an arc is established.
Start Procedure 0 - 10 seconds	The Start Procedure controls the WFS and Volts for a specified time at the beginning of the weld. During the start time, the machine will ramp up or down from the Start Procedure to the preset Welding Procedure.



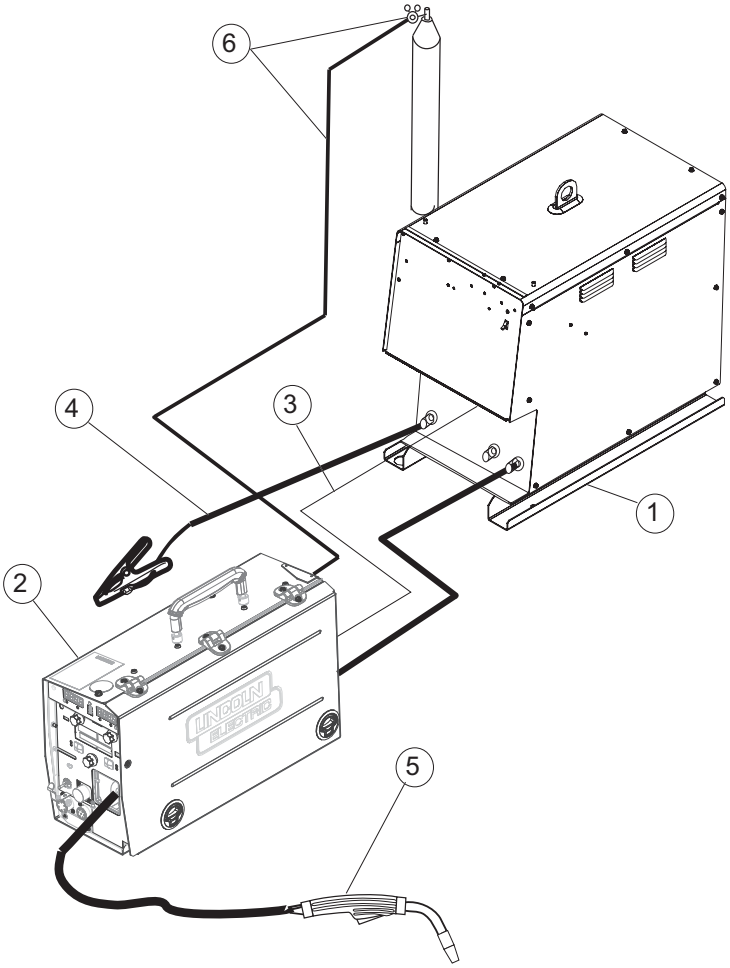
ARC CONTROL	
EFFECT / RANGE	DESCRIPTION
PINCH (Soft)-10.0 to (Crisp)+10.0	Pinch controls the arc characte--ristics when short-arc welding.

END OPTIONS	
EFFECT / RANGE	DESCRIPTION
Spot Timer 0 to 120.0 Seconds	Adjust the time welding will continue even if the trigger is still pulled. This option has no effect in 4-Step Trigger Mode.
Postflow Time 0 to 25.0 seconds	Adjusts the time that shielding gas flows after the welding output turns off.
Crater Procedure 0 TO 10.0 SECONDS	Crater Procedure controls the WFS and Volts for a specified time at the end of the weld after the trigger is released. During the Crater time, the machine will ramp up or down from the Weld Procedure to the Crater Procedure.
Burnback: 0 to .25 Seconds	The burnback time is the amount of time that the weld output continues after the wire stops feeding. It prevents the wire from sticking in the puddle and prepares the end of the wire for the next arc start.

GMAW (MIG) SYNERGIC WELDING

Synergic welding allows for easy procedure setting. The WFS and Voltage change together to maintain an optimal arc length. During synergic welding , when the WFS (left) knob is rotated, the voltage is adjusted accordingly to maintain a similar arc length.

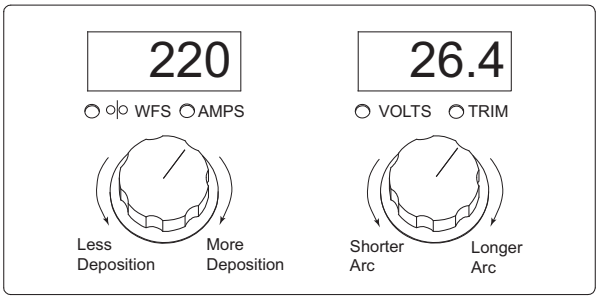
FIGURE B.5



1	K2368-1 K2202-1 K2203-1	Power Wave® 355M Power Wave® 455M Power Wave® 455M/STT
2	K2230-1	POWER FEED™ 10M, Bench Model
	K2234-1	POWER FEED™ 10M Dual, Bench Model
	K2536-1,-2,-3	POWER FEED™ 25M
	KP1696-xx, KP1697-xx	Drive Roll Kit, 2 Roll Feeder
	KP1505-xx, KP1507-xx	Drive Roll Kit, 4 Roll Feeder
3	K1543-xx K2683-xx	Digital Control Cable
4	K1842-xx	Weld Power Cable, Lug to Lug
	K910-xx	Ground Clamp
5	See Magnum® Literature	MIG gun
6	K586-1	Deluxe Regulator for Mixed Shielding Gases
		Shielding Gas Hose

GMAW (MIG) Synergic Welding Display

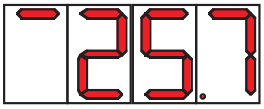
Synergic CV programs feature an ideal voltage best suited for most procedures. Use this voltage as a starting point and adjust if needed for personal preferences.



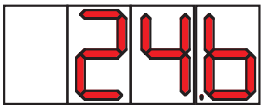
SYNERGIC CV VOLTAGE DISPLAY

When the voltage knob is rotated, the display will show an upper or lower bar indicating if the voltage is above or below the ideal voltage.

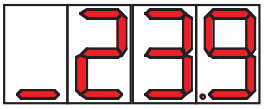
- Preset voltage above ideal voltage. (upper bar displayed)



- Preset voltage at ideal voltage. (no bar displayed)



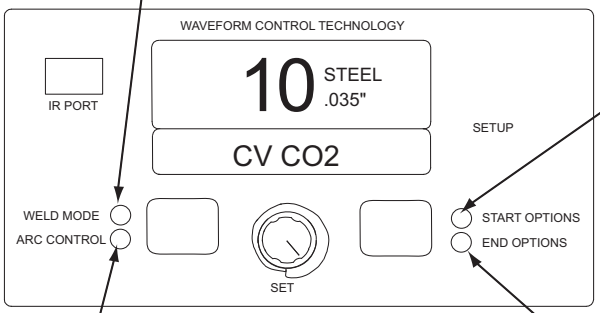
- Preset voltage below ideal voltage. (lower bar displayed)



MSP4 OPERATION

WELD MODE

ELECTRODE AND GAS		WIRE SIZE 0.030	0.035	0.045	0.052
Steel	CO_2	---	10	20	24
Steel	Ar(Mix)	94	11	21	25
Stainless	Ar(Mix)	61	31	41	---
Stainless	Ar/He/CO_2	63	33	43	---
Aluminum 4043	Ar	---	148	71	---
Aluminum 5356	Ar	---	151	75	---



START OPTIONS

EFFECT / RANGE	DESCRIPTION
Preflow Time 0 - 25.0 seconds	Adjusts the time that shielding gas flows after the trigger is pulled and prior to feeding.
Run-in WFS: Off, 30 to150 in/min.	Run-In sets the wire feed speed from the time the trigger is pulled until an arc is established.
Start Procedure	The Start Procedure controls the WFS, Volts at a specified time at the beginning of the weld. During the start time, the machine will ramp up or down from the Start Procedure to the preset Welding Procedure.

ARC CONTROL

EFFECT / RANGE	DESCRIPTION
PINCH EFFECT (-10.0 to +10.0)	Pinch controls the arc characte--ristics when short-arc welding.-

END OPTIONS

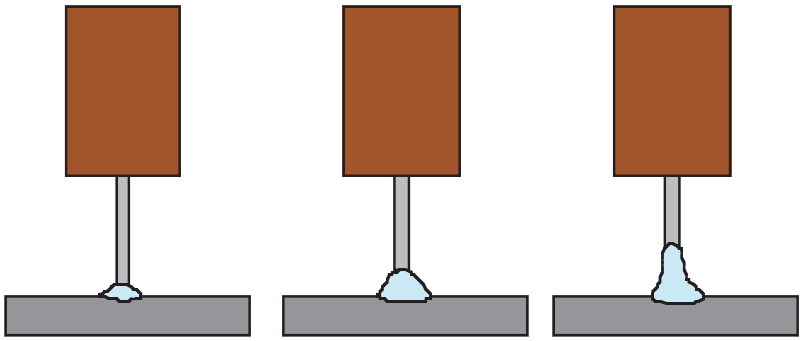
EFFECT / RANGE	DESCRIPTION
Spot Timer 0 to 120.0 Seconds	Adjust the time welding will continue even if the trigger is still pulled. This option has no effect in 4-Step Trigger Mode.
Postflow Time 0 to 25.0 seconds	Adjusts the time that shielding gas flows after the welding output turns off.
Burnback: 0 to .25 Seconds	The burnback time is the amount of time that the weld output continues after the wire stops feeding. It prevents the wire from sticking in the puddle and prepares the end of the wire for the next arc start.
Crater Procedure	Crater Procedure controls the WFS and volts for a specified time at the end of the weld after the trigger is released. During the Crater time, the machine will ramp up or down from the Weld Procedure to the Crater Procedure.

STEEL AND STAINLESS SYNERGIC GMAW-P (PULSED MIG) WELDING

Synergic GMAW-P (Pulsed MIG) welding is ideal for low spatter, out of position and reduced heat input applications. During pulse welding, the welding current continuously switches from a low level to a high level and then back again. Each pulse sends a small droplet of molten metal from the wire to the weld puddle.

Pulse welding controls the arc length with 'Trim' instead of voltage. When trim (arc length) is adjusted, the Power Wave automatically recalculates the voltage, current and time of each part of the pulse waveform for the best result. Trim adjusts the arc length and ranges from 0.50 to 1.50. Increasing the trim value increases the arc length, while decreasing the trim value decreases the arc length.

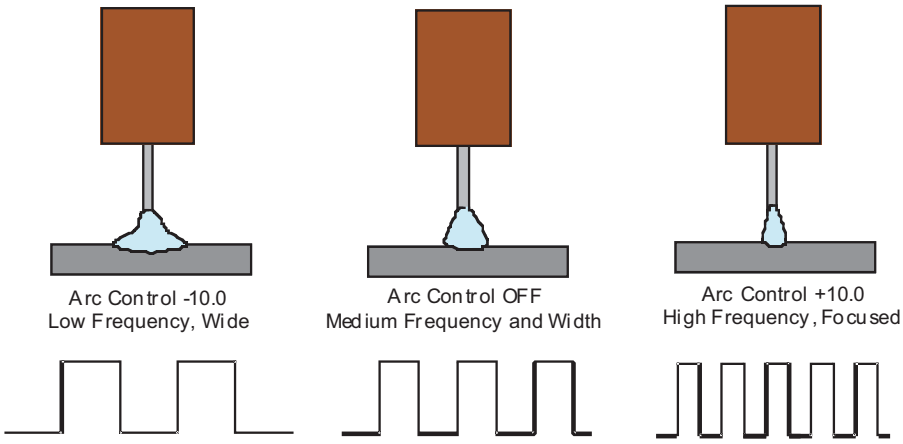
FIGURE B.6



ARC CONTROL

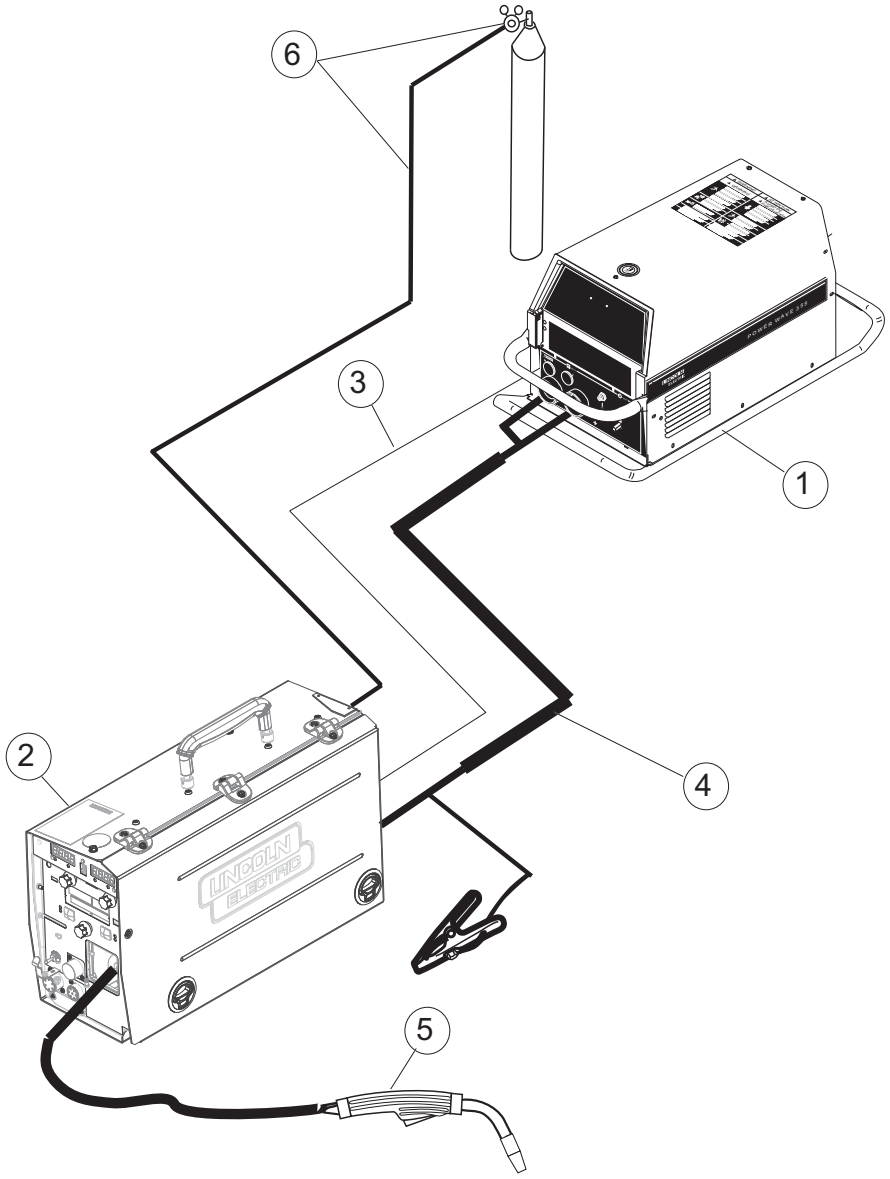
For steel and stainless pulse modes, Arc Control regulates the focus or shape of the arc. Arc Control values greater than 0.0 increase the pulse frequency while decreasing the background current, resulting in a tight, stiff arc best for high speed sheet metal welding. Arc Control values less than 0.0 decrease the pulse frequency while increasing the background current, for a soft arc good for out-of-position welding.

FIGURE B.7



STEEL AND STAINLESS SYNERGIC GMAW-P (PULSED MIG) WELDING

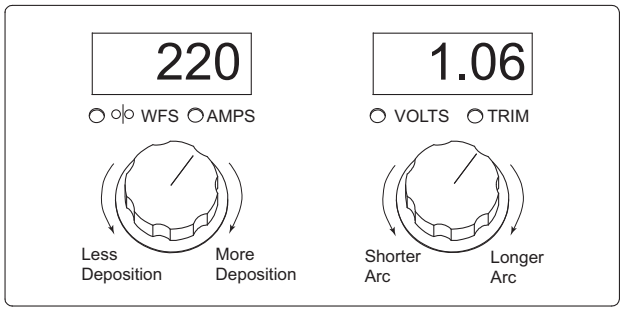
FIGURE B.8



1	K2368-1 K2202-1 K2203-1	Power Wave® 355M Power Wave® 455M Power Wave® 455M/STT
2	K2230-1	POWER FEED™ 10M, Bench Model
	K2234-1	POWER FEED™ 10M Dual, Bench Model
	K2536-1,-2,-3	POWER FEED™ 25M
	KP1696-xx, KP1697-xx	Drive Roll Kit, 2 Roll Feeder
	KP1505-xx, KP1507-xx	Drive Roll Kit, 4 Roll Feeder
3	K1543-xx, K2683-xx	Digital Control Cable
4	K1796-xx, K2593-xx	Coaxial Weld Power Cable, Lug to Lug
	K910-xx	Ground Clamp
5	See Magnum® Literature	MIG gun
6	K586-1	Deluxe Regulator for Mixed Shielding Gases
		Shielding Gas Hose

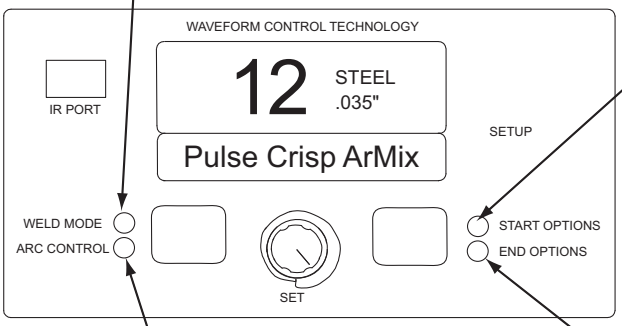
POWER FEED™ 25M

STEEL AND STAINLESS SYNERGIC GMAW-P (PULSED MIG) WELDING



MSP4 OPERATION

WELD MODE					
ELECTRODE AND GAS		WIRE SIZE			
		0.030	0.035	0.045	0.052
Steel(Crisp)	Ar(Mix)	95	12	22	201
Steel(Soft)	Ar(Mix)	---	14	19	28
Stainless	Ar/ CO_2	66	36	46	---
Stainless	Ar/ CO_2	62	32	42	---
Stainless	Ar/He/CO_2	---	34	44	---



START OPTIONS	
PREFLOW TIME	DESCRIPTION
0 - 25.0 seconds	Adjusts the time that shielding gas flows after the trigger is pulled and prior to feeding wire.
RUN-IN WFS: Off, 30 to150 in/min.	Run-in sets the wire feed speed from the time the trigger is pulled until an arc is established.
Start Procedure	The Start Procedure controls the WFS, Trim at a specified time at the beginning of the weld. During the start time, the machine will ramp up or down from the Start Procedure to the preset Welding Procedure.

ARC CONTROL	
ARC FOCUS	DESCRIPTION
-10.0 (SOFT to 10.0 (STIFF)	Arc Focus adjusts the arc from a wide, soft arc good for out of position work to a narrow, stiff arc preferred for faster travel speeds. The pulse frequency is lower with a soft arc and higher with a stiff arc.

END OPTIONS	
EFFECT / RANGE	FUNCTION
Spot Timer 0 to 120.0 Seconds	Adjust the time welding will continue even if the trigger is still pulled. This option has no effect in 4-Step Trigger Mode.
Postflow Time: 0 to 25.0 seconds	Adjusts the time that shielding gas flows after the welding output turns off.
Burnback: 0 to .25 Seconds	The burnback time is the amount of time that the weld output continues after the wire stops feeding. It prevents the wire from sticking in the puddle and prepares the end of the wire for the next arc start.
Crater Procedure	Crater Procedure controls the WFS and Trim for a specified time at the end of the weld after the trigger is released. During the Crater time, the machine will ramp up or down from the Weld Procedure to the Crater Procedure.

ALUMINUM SYNERGIC GMAW-P (PULSED MIG)AND GMAW-PP (PULSE ON PULSE) WELDING

The POWER FEED™ 25M and Power Wave welding power source combine to readily produce top quality aluminum welds with excellent appearance, little spatter and good bead shape. Push-pull guns are available for consistent feeding when welding a long distance away from the wire feeder.

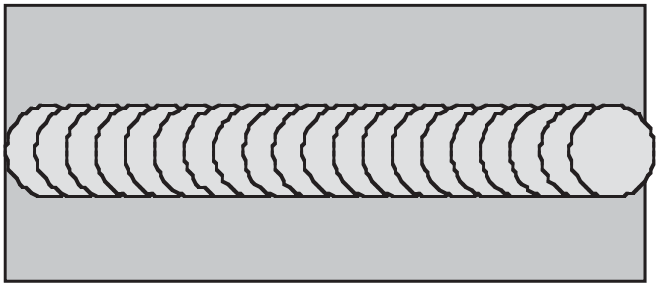
Pulse-on-Pulse Welding

The Power Wave system offers both traditional pulse and Pulse-on-Pulse™. Pulse-on-Pulse (GMAW-PP) is an exclusive waveform for aluminum welding. Use it to make welds with a "stacked dime" appearance, similar to GTAW welds.

FIGURE B.9

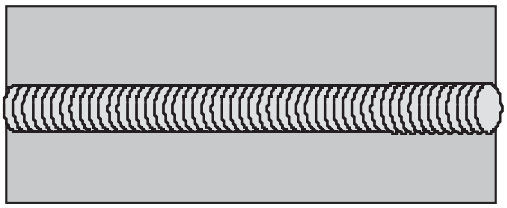
The pulsing frequency is adjustable. Changing the frequency modulation (or arc control) of the waveform changes the ripple spacing. Faster travel speeds may be achieved by using higher values of frequency modulation.

FIGURE B.10



Frequency Modulation = -10
Wide weld and ripple spacing, slow travel speed.

FIGURE B.11



Frequency Modulation = 10
Narrow weld and ripple spacing, fast travel speed.

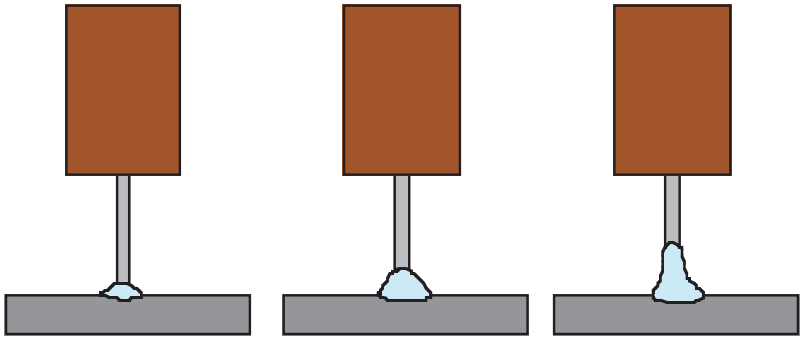
ALUMINUM GMAW-P AND GMAW-PP

ALUMINUM PULSE WELDING

Synergic GMAW-P (Pulsed MIG) welding is ideal for low spatter, out of position and reduced heat input applications. During pulse welding, the welding current continuously switches from a low level to a high level and then back again. Each pulse sends a small droplet of molten metal from the wire to the weld puddle.

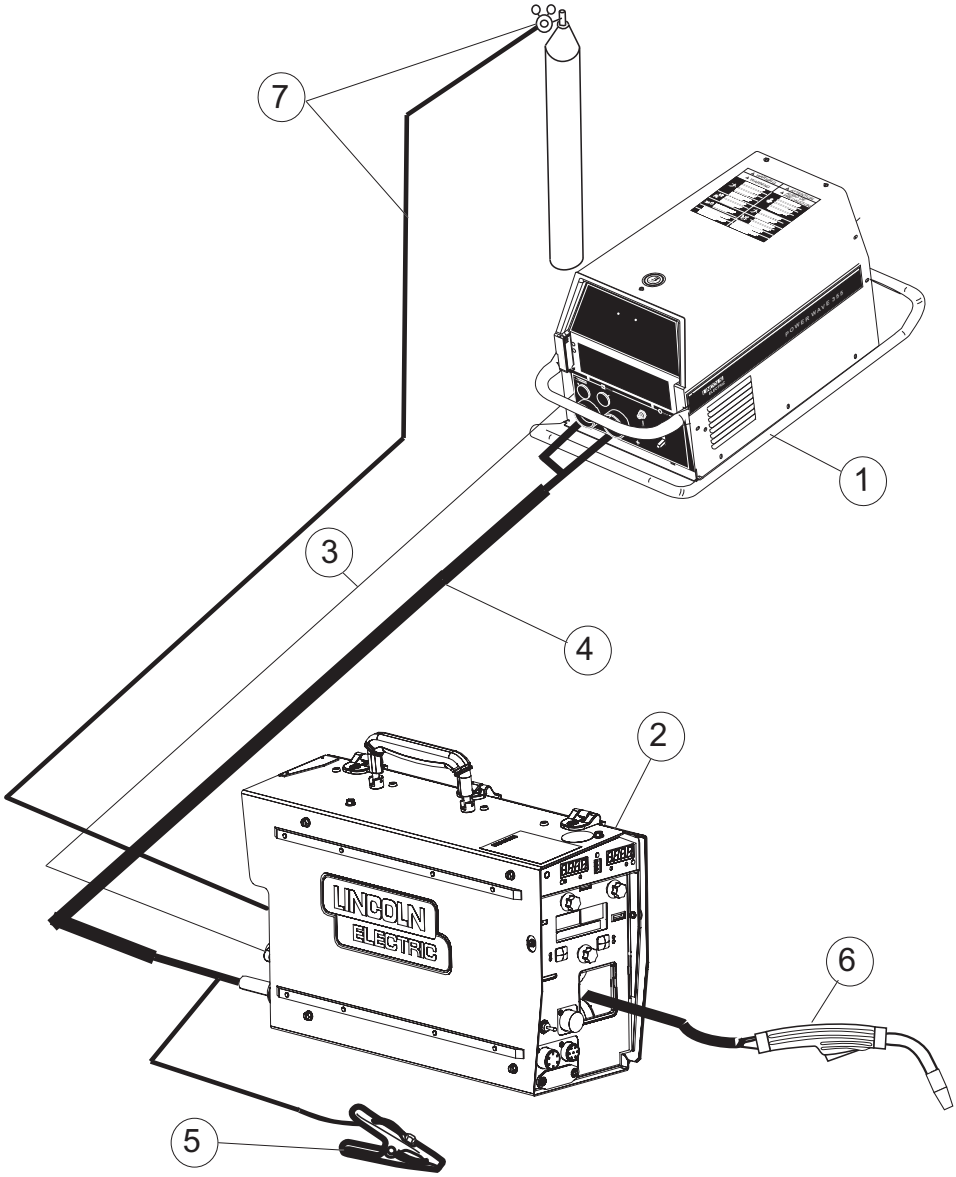
Pulse welding controls the arc length with 'Trim' instead of voltage. When trim (arc length) is adjusted, the Power Wave automatically recalculates the voltage, current and time of each part of the pulse waveform for the best result. Trim adjusts the arc length and ranges from 0.50 to 1.50. Increasing the trim value increases the arc length, while decreasing the trim value decreases the arc length.

FIGURE B.12



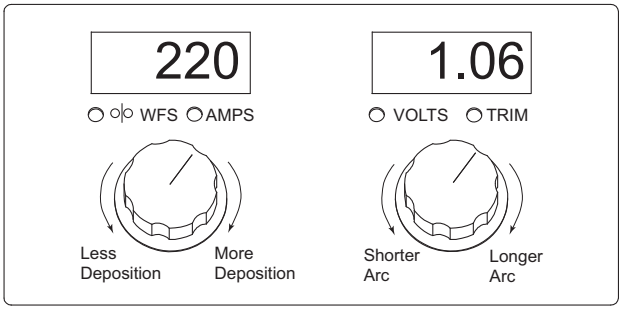
ALUMINUM GMAW-P AND GMAW-PP WELDING

FIGURE B.14



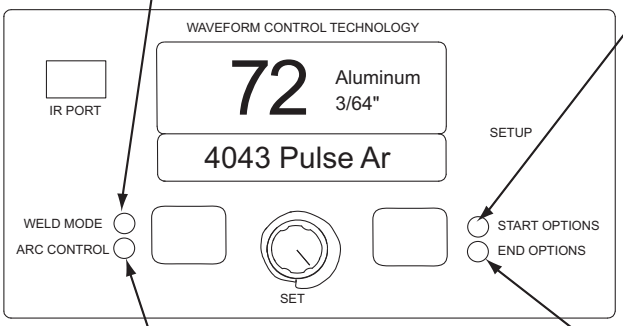
1	K2368-1 K2202-1 K2203-1	Power Wave® 355M Power Wave® 455M Power Wave® 455M/STT
2	K2230-1	POWER FEED™ 10M, Bench Model Requires K1634-1 Spool cover
	K2234-1	POWER FEED™ 10M Dual, Bench Model Requires K1634-1 Spool cover
	K2536-1,-2,-3	POWER FEED™ 25M
	KP1695-xx KP1507-xx	Drive Roll Kit, 2 Roll Feeder Drive Roll Kit, 4 Roll Feeder
3	K1543-xx, K2683-xx	Digital Control Cable
4	K1796-xx, K2593-xx	Coaxial Weld Power Cable, Lug to Lug
5	K910-xx	Ground Clamp
6	K2447-xx	Python Plus Gun, Air cooled
7	K586-1	Deluxe Regulator for Mixed Shielding Gases
		Shielding Gas Hose

Aluminum Pulse and Pulse-On-Pulse (Synergic) Weld Display



MSP4 OPERATION

WELD MODES		
ELECTRODE AND GAS	WIRE SIZE 0.035 3/64 1/16	
ALUMINUM 4043	Ar	149 72 74
ALUMINUM 4043	Ar	98 99 100
ALUMINUM 5356	Ar	152 76 78
ALUMINUM 5356	Ar	101 102 103



START OPTIONS	
PREFLOW TIME	DESCRIPTION
0 - 25.0 seconds	Adjusts the time that shielding gas flows after the trigger is pulled and prior to feeding wire.
RUN-IN WFS: Off, 30 to150 in/min.	Run-in sets the wire feed speed from the time the trigger is pulled until an arc is established.
Start Procedure	The Start Procedure controls the WFS. Trim at a specified time at the beginning of the weld. During the start time, the machine will ramp up or down from the Start Procedure to the preset Welding Procedure.

ARC CONTROL	
PULSE FREQUENCY:	DESCRIPTION
(Low)-10.0 to (High)+10.0	For Pulse modes, Arc Control changes the pulsing frequency. When the frequency changes, the Power Wave system automatically adjusts the background current to maintain a similar heat input into the weld. Low frequencies give more control over the puddle and high frequencies minimize spatter.
PULSE-ON-PULSE FREQ.MODULATION (Low)-10.0 to (High)+10.0	For Pulse -On-Pulse modes, Arc controls changes the frequency modulation. The freque--ncy modulation controls the spacing of the ripples in the weld. Use low values for slow travel speeds and wide welds, and high values for fast travel speeds and narrower welds.

END OPTIONS	
EFFECT / RANGE	FUNCTION
Spot Timer 0 to 120.0 Seconds	Adjust the time welding will continue even if the trigger is still pulled. This option has no effect in 4-Step Trigger Mode.
Postflow Time: 0 to 25.0 seconds	Adjusts the time that shielding gas flows after the welding output turns off.
Burnback: 0 to .25 Seconds	The burnback time is the amount of time that the weld output continues after the wire stops feeding. It prevents the wire from sticking in the puddle and prepares the end of the wire for the next arc start.
Crater Procedure	Crater Procedure controls the WFS and Trim for a specified time at the end of the weld after the trigger is released. During the Crater time, the machine will ramp up or down from the Weld Procedure to the Crater Procedure.

GMAW-STT™ WELDING

Surface Tension Transfer, or STT™ welding, is a break-through process offered exclusively by the Lincoln Electric Company. STT™ is a low heat, low spatter process created with Waveform Control Technology™. STT™ is the process of choice for open root welding, welding on thin materials or welding on parts with poor fit-up. Low spatter, even when using 100% CO_2 shielding gas, results in cost savings in gas and part clean-up.

Several sets of STT™ weld modes are available.

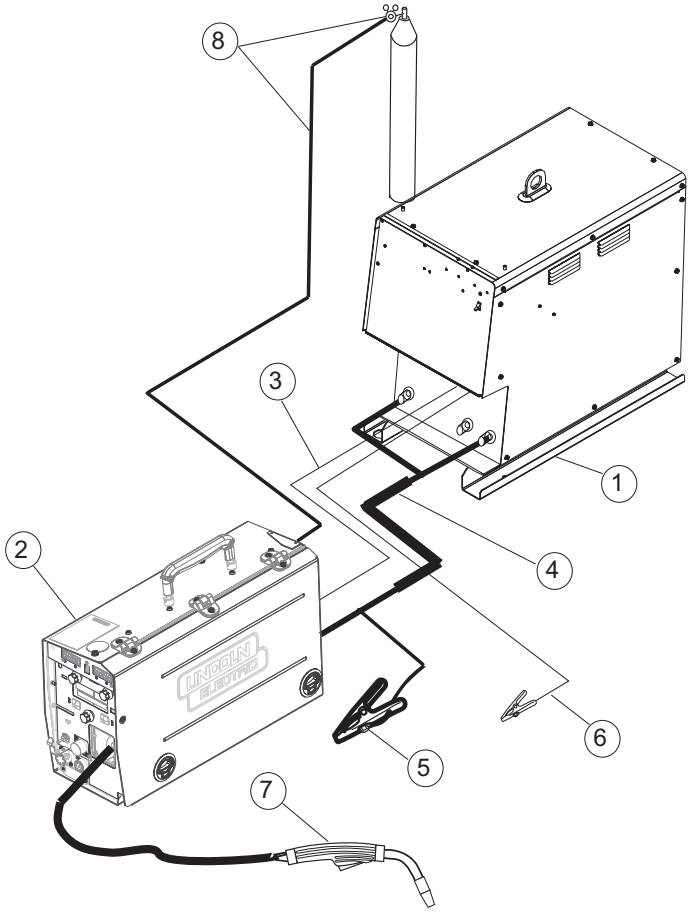
- Modes 110 and 126 provide individual control of peak current, background current and tail-out, and are most often used in robotic applications.
- Modes 123 and 124 include Hot Start and give total control of the arc.
- Synergic STT™ modes keep the arc characteristics the same when the wire feed speed is changed.

Note: STT™ is available only with specially equipped Power Wave power sources, like the Power Wave 455M/STT.

For best results:

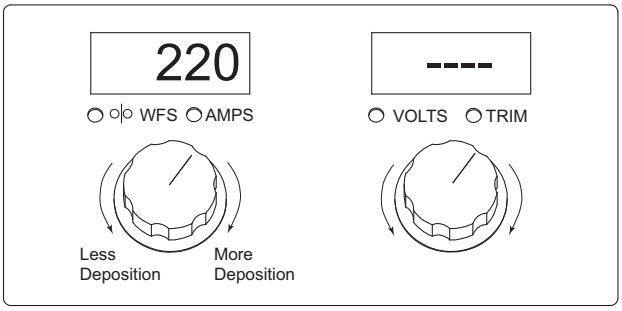
- Attach the work sense lead as close as possible to the welding arc.
- Use only solid steel, stainless steel or silicon bronze electrodes.

FIGURE B.15



1	K2203-1	Power Wave 455M/STT
2	K2230-1	POWER FEED™ 10M, Bench Model
	K2234-1	POWER FEED™ 10M Dual, Bench Model
	K2536-1,-2,-3	POWER FEED™ 25M
	KP1695-xx,	Drive Roll Kit, 2 Roll Feeder
	KP1507-xx	Drive Roll Kit, 4 Roll Feeder
3	K1543-xx K2683-xx	Digital Control Cable
4	K1796-xx, K2593-xx	Coaxial Weld Power Cable, Lug to Lug
5	K910-xx	Ground Clamp
6	K940-xx	Sense Lead Kit
7	See Magnum® Literature	MIG Gun
8	K586-1	Deluxe Regulator for Mixed Shielding Gases
		Shielding Gas Hose

GMAW-STT™



Waveform Control Technology™ maximizes the ability to modify the arc for the perfect weld. When **STT™** welding, the parameters to control are:

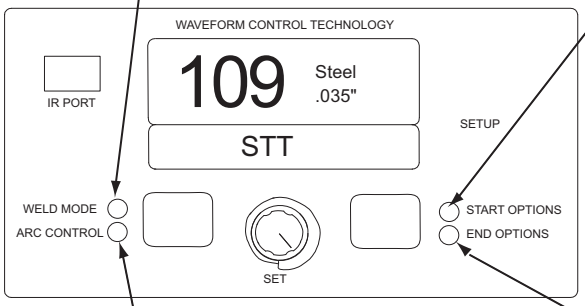
- Wire Feed Speed - sets the deposition rate.
- Peak Current - controls the arc length.
- Background Current - regulates the bead contour.
- Tail-out - provides additional power in the arc.

There is no Voltage control when **STT™** welding.

MSP4 OPERATION

WELD MODES

ELECTRODE AND GAS	WIRE SIZE 0.035	0.045	0.052
STEEL CO_2 Ar/CO_2	110	126	126
STAINLESS He/Ar/CO_2	110	126	126
(with Hot Start)			
STEEL CO_2 Ar/CO_2	123	124	124
STAINLESS He/Ar/CO_2	123	124	124
(SYNERGIC STT)			
STEEL CO_2	111	117	120
STEEL AR/CO_2	112	118	121
STAINLESS He/Ar/CO_2	127	129	---
STAINLESS Ar/CO_2	131	133	---
SYNERGIC STT, OPEN ROOT			
STEEL CO_2	113	119	122
STAINLESS He/Ar/CO_2	135	137	---



START OPTIONS

PREFLOW TIME	FUNCTION
0 - 25.0 seconds	Adjusts the time that shielding gas flows after the trigger is pulled and prior to feeding wire.
RUN-IN WFS: Off, 30 to150 in/min.	Run-in sets the wire feed speed from the time the trigger is pulled until an arc is established.
Start Procedure	The Start Procedure is not commonly used with STT procedures.

ARC CONTROL

EFFECT / RANGE	DESCRIPTION
PEAK CURRENT	Peak Current acts similar to an arc pinch control. Peak Current sets the arc length and promotes good fusion. Higher peak current levels will cause the arc to broaden momentarily while increasing arc length. If set too high, globular transfer may occur. Setting it too low may cause instability and wire stubbing. Best practice is to adjust for minimum spatter and puddle agitation.
BACKGROUND CURRENT	Background Current controls the overall heat input in the weld.
TAIL OUT (STT II MODES ONLY)	Tail out provides additional power without the molten droplet becoming too large. Increase as necessary to add heat input without increasing arc length. Often this results in faster travel speeds. Note that as tail out increases, the peak current and/or background current may need to be reduced.

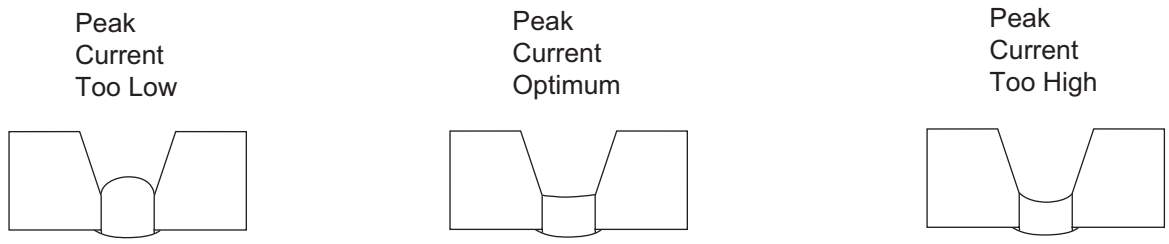
END OPTIONS

PARAMETER RANGE	FUNCTION
Spot Timer 0 to 120.0 Seconds	Adjust the time welding will continue even if the trigger is still pulled. This option has no effect in 4-Step Trigger Mode.
Postflow Time: 0 to 25.0 seconds	Adjusts the time that shielding gas flows after the welding output turns off.
Burnback: 0 to .25 Seconds	The burnback time is the amount of time that the weld output continues after the wire stops feeding. It prevents the wire from sticking in the puddle and prepares the end of the wire for the next arc start.
Crater Procedure	Crater is not commonly used in STT weld procedures.

PEAK CURRENT (Figure B.16)

Peak current controls the arc length, which also affects the shape of the root. When using 100% CO_2, the peak current will be higher than when welding with blended shielded gases. A longer arc length is required with CO_2 to reduce spatter.

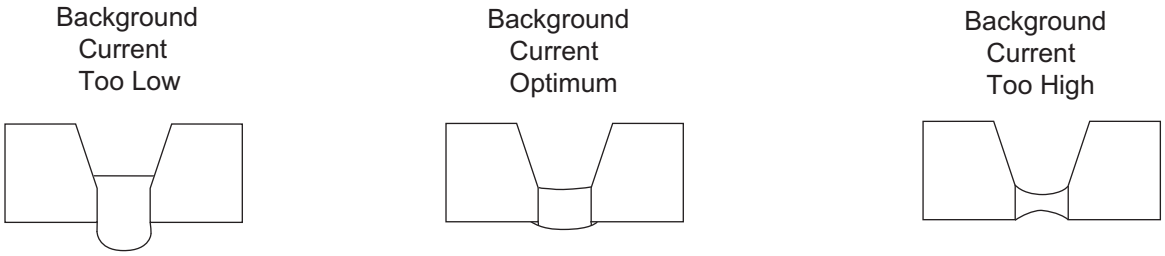
FIGURE B.16



BACKGROUND CURRENT (Figure B.17)

Background current adjusts the overall heat input into the weld. Changing the background current changes the shape of the back bead. 100% CO_2 requires less background current than when welding with blended shielding gases.

FIGURE B.17



TAILOUT

Tailout provides additional heat into the weld without increasing the arc length or the droplet size. Higher tailout values improve wetting and may give faster travel speeds.

GTAW (TIG) WELDING

The POWER FEED™ / Power Wave system is excellent for Touch Start TIG welding.

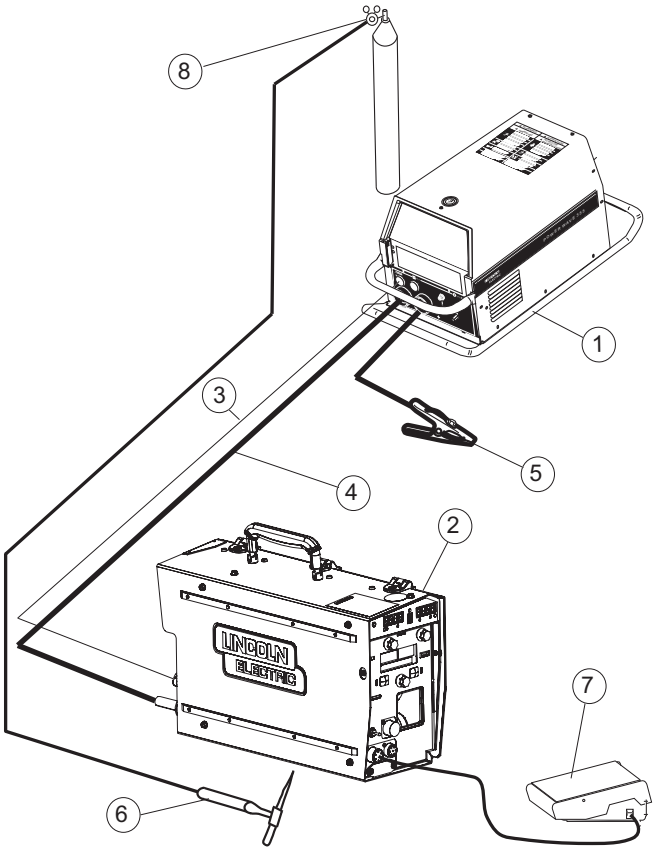
The system supports TIG torches with or without gas control valves. TIG torches with gas control valves connect directly to the gas flow regulator. For TIG torches without gas control valves, connect the output gas hose on the wire feeder to the TIG torch gas hose.

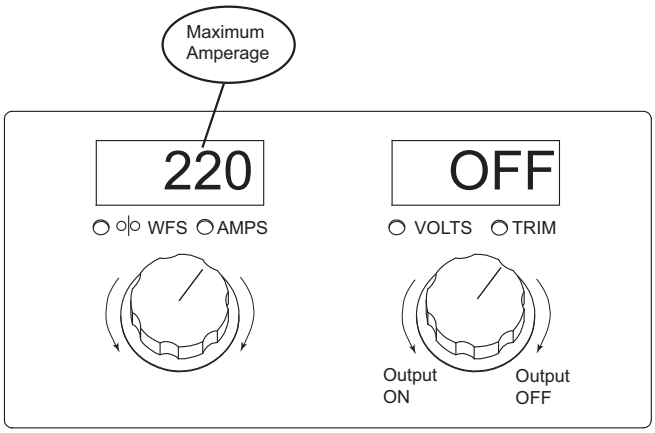
The wire feeder gas solenoid may be enabled or disabled by parameter P.8 in the set-up menu found in this operations section.

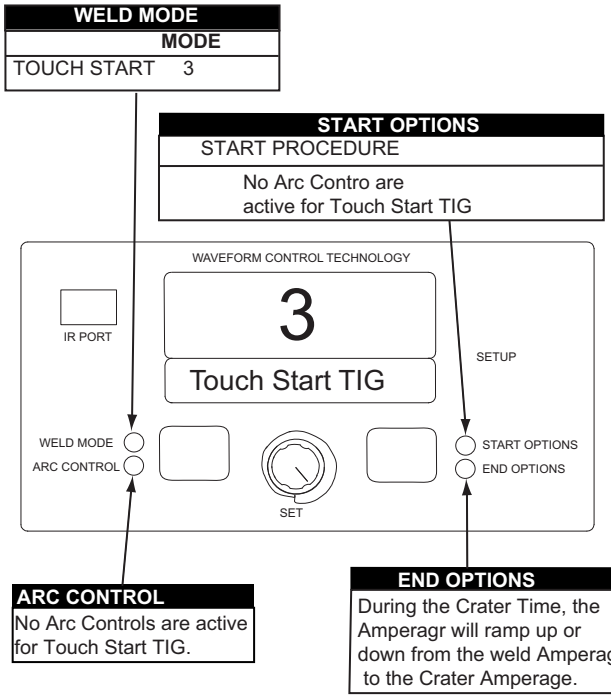
Touch Start TIG Weld Sequence	No Foot / Hand Amptrol	With Foot / Hand Amptrol
TIG torches without built-in Gas Valves.	1. Adjust the arc amperage with the left knob on the display panel. 2. Turn the right knob on the display panel until the Output Control is ON. Gas will start to flow. 3. Touch the tungsten to the work piece. 4. Lift the tungsten to create an arc and weld. 5. Stop welding by turning the Output Control to OFF, or by pulling away the tungsten from the work. 6. Gas flow will continue for a short time and then shut-off.	1. Adjust the maximum arc amperage with the left knob on the display panel. 2. Touch the tungsten to the work piece. 3. Press the foot pedal or slide the hand amptrol a slight amount. Gas will start to flow. 4. Lift the tungsten to create an arc. 5. Regulate the arc current with the foot pedal or hand amptrol. 6. Stop welding by releasing the foot pedal or hand amptrol, or by pulling the tungsten away from the work. 7. Gas will continue for a short time and then shut-off.
TIG torches with built-in Gas Valves.	1. Adjust the arc amperage with the left knob on the display panel. 2. Turn the right knob on the display panel until the Output Control is ON. 3. Open the gas valve on the TIG torch. 4. Touch the tungsten to the work piece. 5. Lift the tungsten to create an arc and weld. 6. Stop welding by turning the Output Control to OFF, or by pulling away the tungsten from the work. 7. Close the gas valve on the TIG torch.	1. Adjust the maximum arc amperage with the left knob on the display panel. 2. Touch the tungsten to the work piece. 3. Press the foot pedal or slide the hand amptrol a slight amount. 4. Open the gas valve on the TIG torch. 5. Lift the tungsten to create an arc. 6. Regulate the arc current with the foot pedal or hand amptrol. 7. Stop welding by releasing the foot pedal or hand amptrol, or by pulling the tungsten away from the work. 8. Close the gas valve on the TIG torch.

GTAW (TIG)WELDING (Figure B.17a)

FIGURE B.17a







1	K2368-1 K2202-1 K2203-1	Power Wave® 355M Power Wave® 455M Power Wave® 455M/STT
2	K2230-1 K2234-1 K2536-1,-2,-3	POWER FEED™ 10M, Bench Model POWER FEED™ 10M Dual, Bench Model POWER FEED™ 25M
3	K1543-xx, K2683-xx	Digital Control Cable
4		Electrode Cable
5	K910-xx	Ground Clamp
6	K1782-xx, K1783-xx	PTA-17, PTA-26 TIG torch (shown with valve)
7	K870	Foot Amptrol
8	3100211	Harris Argon Flow Regulator

SETUP MENU FEATURES

The Setup Menu gives access to the Setup Configuration. Stored in the setup configuration are user parameters that generally only need to be set at installation. The parameters are grouped as shown in the following table.

PARAMETER	DEFINITION
P.1 through **P.99** **P.101** through **P.199** **P.501** through **P.599**	Unsecured Parameters (always adjustable) Diagnostic Parameters (always read only) Secured Parameters (only accessible through a p.c. or palm application)

SET-UP FEATURES MENU

(See Figure B.17b and B.17c for specific Codes)

1. To access the set-up menu, press the **Right** and **Left** buttons of the **MSP4** panel simultaneously. **Note** that the set-up menu cannot be accessed if the system is welding, or if there is a fault (The status **LED** is not solid green).

   Change the value of the blinking parameter by rotating the **SET** knob.

2. After changing a parameter it is necessary to press the **Right** hand button to save the new setting. Pressing the **Left** button will cancel the change.

3. To exit the set-up menu at any time, press the **Right** and **Left** buttons of the MSP4 panel simultaneously. Alternately, 1 minute of inactivity will also exit the set-up menu.

FIGURE B.17b - SETUP MENU

(Only parameters below can be accessed in **Code 11313**)

P.0	P.7	P.100 thru P.107
P.1	P.8	
P.2	P.11	
P.3	P.12	
P.4	P.13	
P.5	P.80	
P.6	P.99	

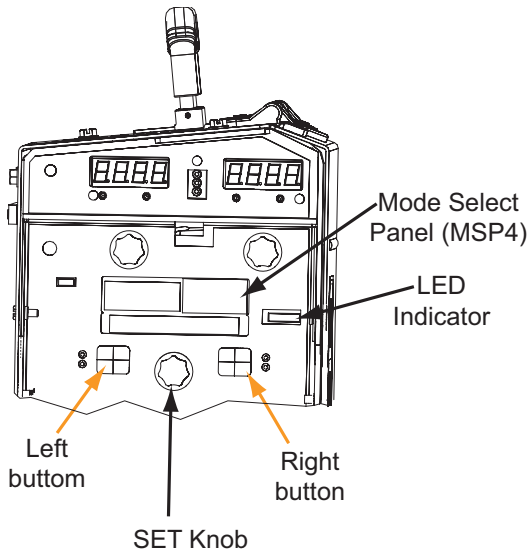
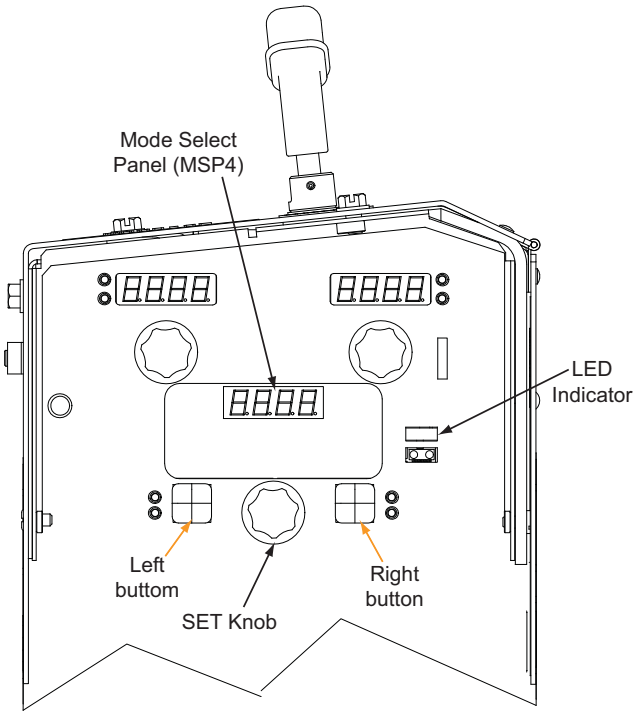


FIGURE B.17c - SETUP MENU

(All parameters can be accessed in **Code 11456 and higher**)



USER DEFINED PARAMETERS

Parameter	Definition
P.0	**Exit Setup Menu** This setup menu parameter can be used to exit the setup menu. When **P.0** is displayed, press the left Mode Select button to exit the setup menu.
P.1	**Wire Feed Speed Units** **P.1** selects which units wire feed speed will be displayed in. English = in/minute wire feed speed units (default). Metric = m/minute wire feed speed units.
P.2	**Arc Display Mode** P.2 selects what value will be shown on the upper left display while welding. Amps = The left display shows Amperage while welding (default). WFS = The left display shows Wire Feed Speed while welding.
P.3	**Display Energy** **P.3** selects whether or not energy is displayed on the MSP4 while welding. The total energy from the previous weld will persist on the MSP4 display until another weld is started, or a user interface control is changed. **P.3** will only show up in the list if the power source is capable of calculating energy (a power source software update may be necessary). When **P.3** = No, energy will not be displayed (default). When **P.3** = Yes, energy is displayed.
P.4	**Recall Memory with Trigger** Allows the operator to recall a memory by quickly pulling and releasing the gun trigger. To recall a memory, quickly pull and release the trigger the number of times that correspond to the memory number. For example, to recall memory 3, quickly pull and release the trigger 3 times. To recall memory 1, quickly pull and release the trigger the number of user memories plus 1. Memories cannot be recalled while the system is welding. A memory panel must be installed in order to use this feature. Disabled = The gun trigger cannot be used to recall user memories (default). Enabled = The gun trigger can be used to recall user memories.

USER DEFINED PARAMETERS

Parameter	Definition
P.5	**Procedure Change Method** Selects how remote procedure selection (A/B) will be made. The selected procedure can be changed locally at the user interface by pressing the 'A-Gun-B' button. The following methods can be used to remotely change the selected procedure: • Use an external switch wired to the procedure select input. • Quickly releasing and re-pulling the gun trigger. • Using a dual-schedule gun which incorporates a procedure select switch in the trigger mechanism (pulling the trigger more than half way changes the procedure from A to B). The possible values for this parameter are: • External Switch = Procedure selection may only be performed at the memory panel or an external switch (e.g. K683). • Quick Trigger = The selected procedure can be changed remotely by releasing and re-pulling the trigger quickly while welding. This feature is disabled in 4-Step trigger mode. The external procedure switch is disabled. To operate: 1. Select "GUN" on the memory panel. 2. Start the weld by pulling the gun trigger. The system will weld with procedure A settings. 3. While welding, quickly release then pull the gun trigger once. The system will switch to procedure B settings. Repeat to switch back to procedure A settings. The procedure can be changed as many times as needed during the weld. Release the trigger to stop welding. The system will automatically return to procedure A settings. • Integral TrigProc = When using a Magnum DS dual-schedule gun (or similar) that incorporates a procedure switch in the gun trigger mechanism. While welding in 2-step, machine operation is identical to the "External Switch" selection. When welding in 4-step, additional logic prevents procedure A from being re-selected when the trigger is released at step 2 of the 4-step weld sequence. The machine will always operate in 2-step if a weld is made exclusively in procedure A, regardless of the 2/4 step switch position (this is intended to simplify tack welding when using a dual-schedule gun in 4-step).
P.6	**Stall Factor Adjustment** Allows the adjustment of the stall factor in Push/Pull operation. The stall factor controls the stall torque of the push motor when using a push-pull gun. The wire feeder is factory-set to not stall unless there is a large resistance to feeding wire. The stall factor can be reduced to stall more easily and possibly prevent bird nesting. However, low stall factors can cause motor stalling during normal welding conditions, which results in the wire burning back to the tip or rapid tack welds. If you are experiencing bird nests, check for other feeding problems before adjusting the stall factor. The default value for the stall factor is 75, with a range of 5 to 100.

USER DEFINED PARAMETERS

Parameter	Definition
P.7	**Gun Offset Adjustment** **Range:** -30 to 30 (default = 0) Adjusts the wire feed speed calibration of the pull motor of a push-pull gun. This should only be performed when other possible corrections do not solve any push-pull feeding problems. An rpm meter is required to perform the pull gun motor offset calibration. To perform the calibration procedure do the following: • Release the pressure arm on both the pull and push wire drives. • Set the wire feed speed to 200 ipm. • Remove wire from the pull wire drive. • Hold an 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.
P.8	**TIG Gas Control** Allows control over which gas solenoid actuates while TIG welding. • Valve (manual) = No MIG solenoid will actuate while TIG welding, gas flow is manually controlled by an external valve. • Feeder Solenoid = The internal (feeder) MIG solenoid will turn on and off automatically while TIG welding. • Power source Solenoid = Any gas solenoid connected to the power source will turn on and off automatically while TIG welding. **Notes:** • Preflow is not available while TIG welding. • Postflow is available - the same postflow time will be used in MIG and TIG. • When machine output on/off is controlled via the upper right knob, gas flow will not start until the tungsten touches the work. Gas flow will continue when the arc is broken until the Postflow time expires. • When machine output on/off is controlled via an arc start switch or foot Amptrol, gas will begin flowing when the output is turned on and will continue flowing until the output is turned off and the Postflow time expires.
P.9	**Crater Delay** **Range:** Off to 10.0 seconds (default = Off) Used to skip the Crater sequence when making short tack welds. If the trigger is released before the timer expires, Crater will be bypassed and the weld will end. If the trigger is released after the timer expires, the Crater sequence will function normally (if enabled).
P.14	**Reset Consumable Weight** Only appears in the list with systems using Production Monitoring. Use this option to reset the initial weight of the consumable package. Press the right Mode Select Button to reset the consumable weight.

USER DEFINED PARAMETERS

Parameter	Definition
P.16	**Push-Pull Gun Knob Behavior** Determines how the potentiometer on the Push/Pull torch will behave. • Gun Pot Enabled = The welding wire feed speed is always controlled by the potentiometer on the push-pull gun (default). The left front panel knob is only used to adjust Start and Crater wire feed speed. • Gun Pot Disabled = The wire feed speed is always controlled by the left front panel knob. This setting is useful when the operator wishes to have wire feed speed settings recalled from memories and not have the potentiometer "overwrite" the setting. • Gun Pot Procedure A = When in procedure A, the welding wire feed speed is controlled by the potentiometer on the push-pull gun. When in procedure B, the welding wire feed speed is controlled by the left front panel knob. This setting allows a fixed wire feed speed to be selected in procedure B and not have the potentiometer "overwrite" the setting when procedure changes.
P.80	**Sense From Studs** Use this option for diagnostic purposes only. When power is cycled, this option is automatically reset to False. • False = Voltage sensing is determined by the DIP switch configuration and the selected weld mode (default). • True = Voltage sensing is forced to "studs" regardless of the DIP switch configuration and selected weld mode.
P.99	**Show Test Modes** Most power sources contain weld modes used for calibration and test purposes. By default, the machine does not include test weld modes in the list of weld modes that are available to the operator. To manually select a test weld mode, set this option to "Yes". When the power source is turned off and back on again, the test modes will no longer appear in the mode list. Test weld modes typically require the machine output to be connected to a grid load and cannot be used for welding.
P.100	**View Diagnostics** Diagnostics are only used for servicing or troubleshooting the Power Wave system. Select "Yes" to access the diagnostic options in the menu. Additional parameters will now appear in the setup menu (P.101, P.102, etc).
P.101	**View Event Logs** Used for viewing all the system event logs. Press the right MSP Button to enter the option. Rotate Set knob to select the desired system log to read. Press the right button again to enter the selected log. Rotating the Set knob will scroll through the event log, displaying the log index number, event code and some other data. Press the left button to back out to select another log. Press the left button again to exit this option.
P.102	**View Fatal Logs** Used for viewing all the system fatal logs. Press the right MSP Button to enter the option. Rotate Set knob to select the desired log to read. Press the right button again to enter that log. Rotating the Set knob will scroll through the log, displaying the log index number and fatal code. Press the left button to back out to select another log. Press the left button again to exit this option.

USER DEFINED PARAMETERS

Parameter	Definition
P.103	**View Software Version Information** Used for viewing the firmware versions for each board in the system. Press the right MSP Button to enter the option. Rotate Set knob to select the desired board to read. Press the right button again to read the firmware version. Press the left button to back out to select another board. Rotate the SET knob to select another board, or press the left button to exit this option.
P.104	**View Hardware Version Information** Used for viewing the hardware version for each board in the system. Press the right MSP Button to enter the option. Rotate Set knob to select the desired board to read. Press the right button again to read the hardware version. Press the left button to back out to select another board. Press the left button again to exit this option.
P.105	**View Welding Software Information** Used for viewing the Weld Set in the Power Source. Press the right MSP Button to read the Weld Set version. Press the left button to back out and exit this option.
P.106	**View Ethernet IP Address** Used for viewing the Ethernet Network IP address if there is an Ethernet board present in the system. Press the right MSP Button to read the IP Address. Press the left button to back out and exit this option. The IP address cannot be changed using this option.
P.107	**View Power Source Protocol** Used for viewing the type of power source the feeder is connected to. Press the right MSP Button to identify the power source as either LincNet or ArcLink. Press the left button to back out and exit this option.
P.500	**View Lockout Parameters** Originally used to prevent inadvertent changes of secure setup parameters, P.500 was previously used as a gateway to these parameters. Presently, this option does not exist in any setup menu.
P.501	**Encoder Lockout** Locks one or both of the upper knobs (encoders), preventing the operator from changing wire feed speed, amps, volts or trim. The function of each upper knob depends on the selected weld mode. When a constant current weld mode is selected (e.g. Stick, TIG, Gouge), the upper right knob will always function as an on/off switch. This parameter can only be accessed using Weld Manager or Power Wave Manager software.
P.502	**Memory Change Lockout** Determines if the memories can be overwritten with new contents. • No = Memories can be saved and limits can be configured (default). • Yes = Memories cannot be changed - saving is prohibited and limits cannot be re-configured. This parameter can only be accessed using Power Wave Manager.

USER DEFINED PARAMETERS

Parameter	Definition
P.503	**Memory Button Disable** Disables the specified memory button(s). When a memory is disabled, welding procedures cannot be restored from or saved to that memory. If an attempt is made to save or restore a disabled memory, a message will be displayed on the Mode Select Panel indicating the memory number is disabled. In multi-head systems, this parameter disables the same memory buttons on both feed heads. This parameter can only be accessed using Weld Manager or Power Wave Manager software.
P.504	**Mode Select Panel Lock** Selects between several Mode Select Panel lockout preferences. When a Mode Select Panel selection is locked and an attempt is made to change that parameter, a message will be displayed on the Mode Select Panel indicating the parameter is locked. • All MSP Options Unlocked = All adjustable parameters on the Mode Select Panel are unlocked. • All MSP Options Locked = All knobs and buttons on the Mode Select Panel are locked. • Start & End Options Locked = The Start and End parameters on the Mode Select Panel are locked, all others are unlocked. • Weld Mode Option Locked = The weld mode cannot be changed from the Mode Select Panel, all others Mode Select Panel settings are unlocked. • Wave Control Options Locked = The Wave Control parameters on the Mode Select Panel are locked, all others are unlocked. • Start, End, Wave Options Locked = The Start, End and Wave Control parameters on the Mode Select Panel are locked, all others are unlocked. • Start, End, Mode Options Locked = The Start, End and Weld Mode Select parameters on the Mode Select Panel are locked, all others are unlocked. This parameter can only be accessed using Power Wave Manager.
P.505	**Setup Menu Lock** Determines if the setup parameters can be modified by the operator without entering a passcode. • No = The operator can change any set menu parameter without first entering the passcode even if the passcode is non-zero (default). • Yes = The operator must enter the passcode (if the passcode is non-zero) in order to change any setup menu parameters. This parameter can only be accessed using Power Wave Manager.
P.506	**Set User Interface Passcode** Prevents unauthorized changes to the equipment. The default passcode is zero which allows full access. A nonzero passcode will prevent unauthorized: • changes to memory limits • saving to memory (if P.502 = Yes) • changes to setup parameters (if P.505 = Yes) This parameter can only be accessed using Power Wave Manager.

USER DEFINED PARAMETERS

Parameter	Definition
P.507	**UI Clear All Memories** Allows the operator to quickly set all memories to the default weld mode and welding parameters. Presently, this option does not exist in any setup menu.
P.509	**UI Master Lockout** Locks all user interface controls, preventing the operator from making any changes. This parameter can only be accessed using Power Wave Manager.

PROCEDURE/MEMORY PANEL OPERATION

(For Code 11313):

The Dual Procedure/Memory Panel performs three functions:

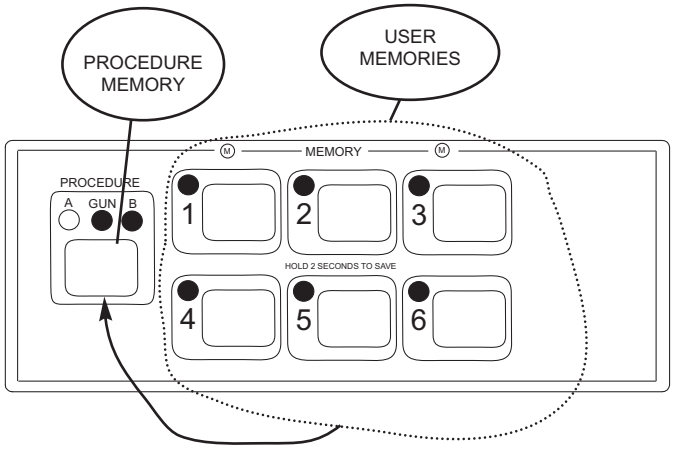
- **Weld procedure selection**
- **Memory save and recall**
- **Limits setting**

There are two procedure memories (A and B) and six user memories (1-6).

Procedure Memory vs. User Memory

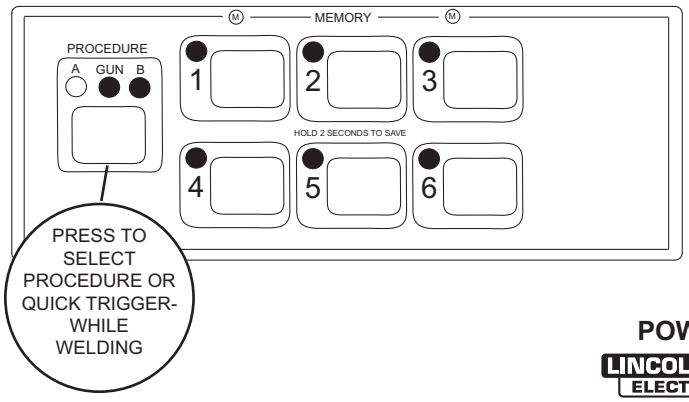
Procedure memory is used while welding. Changes to the weld procedure (WFS, voltage, arc control, etc.) immediately change the contents inside the selected procedure memory.

User memories work by copying the weld procedure from one of the six memories into either the A or B procedure. Weld procedures are saved into the memories only when the operator chooses.



Using Procedure Memories

Procedure memories can be selected by choosing either "A" or "B" procedure directly with the memory panel, or by selecting "GUN" and using a dual procedure gun to select between procedure "A" and "B". When selecting procedures with the gun switch, "A" or "B" will flash to show which procedure is active.



USER MEMORIES

Recall a memory with memory buttons

To recall a user a memory, press one of the six user memory buttons. The memory is recalled when the button is released. Do not hold the button for more than two seconds when recalling a user memory.

Recall a memory with the gun trigger

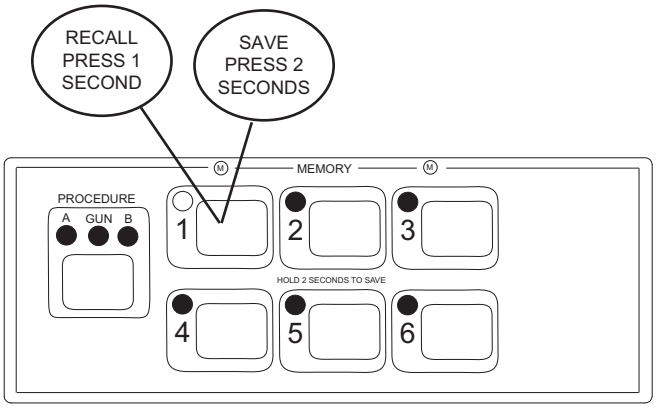
If desired, memories 2 through 6 can be recalled with the gun trigger. For example, to recall memory 3, quickly pull and release the gun trigger 3 times without welding.

Note: the POWER FEED™ Wire Feeders are factory set with this feature disabled. Use the SETUP menu and change P.4 to enable memory recall with the gun trigger.

Save a memory with memory buttons

To save a memory, press and hold the desired memory button for two seconds. When the button is initially pressed, the corresponding LED will illuminate. After two seconds, the LED will turn off. Do not hold the button for more than 5 seconds when saving a user memory.

Note: that memories may be locked using Weld Manager from a P.C. or Palm application to prevent accidental overwrite of the memories. If an attempt is made to save a memory when memory saving is locked, the message "Memory save is Disabled!" will appear briefly in the MSP4 display.



LIMITS

Limits allow the welder to adjust the welding procedure only within a defined range.

Each user memory may have a different set of limits. For example, memory 1 can be set to limit the WFS to 200 through 300 in/min, and memory 2 can be set to limit the WFS to 275 through 310 in/min, while memory 3 may not have any WFS limits.

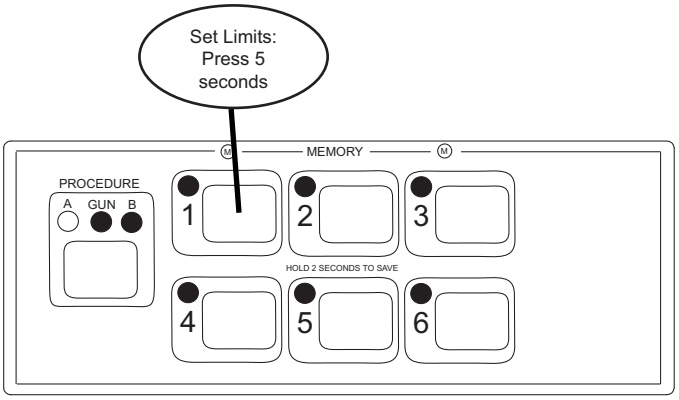
Parameters are always constrained by machine limits. When memory limits are enabled, the parameter will flash whenever an attempt is made to exceed the memory limit value. The parameter will not flash if an attempt is made to exceed the machine limit.

Machine limits are:

Parameter	Range	Units
Wire Feed Speed	Weld mode dependent and gear box ratio dependent	in/min
Voltage	Weld mode dependent	Volts
Trim	0.50 to 1.50	--

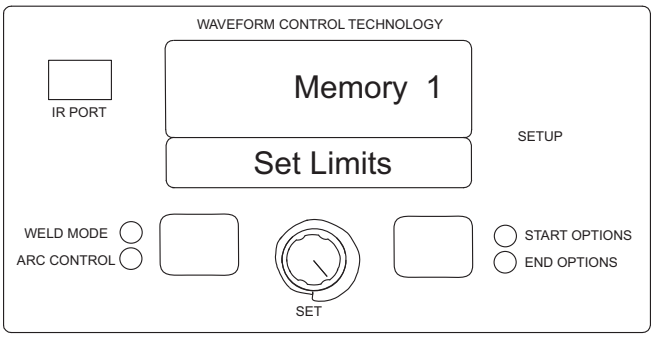
Limits may be set for:
- Wire Feed Speed/Amperage
- Voltage/Trim
- Arc Control

Weld modes cannot be selected through the Limits Setup memu, and must be chosen and saved to memory before entering the Limits Setup Menu.

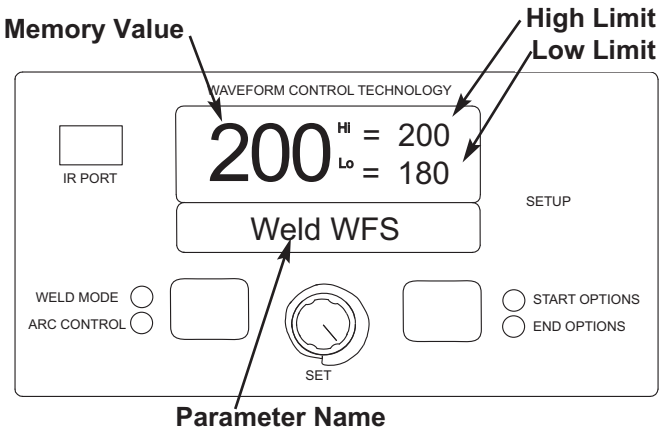


To set limits, press the desired memory button 1-6 and hold for 5 seconds. Release the memory button when the LED begins to blink rapidly and the MSP4 displays "Memory X Set Limits" as shown below.

MSP4 DISPLAY



If the passcode does not equal zero (0000), enter the passcode now. If the passcode has been forgotten, a p.c. computer application or Palm O.S. application is required to change the passcode



If the passcode has been set to zero (0000), SETUP will illuminate on the MSP4 panel and the display will show the following:

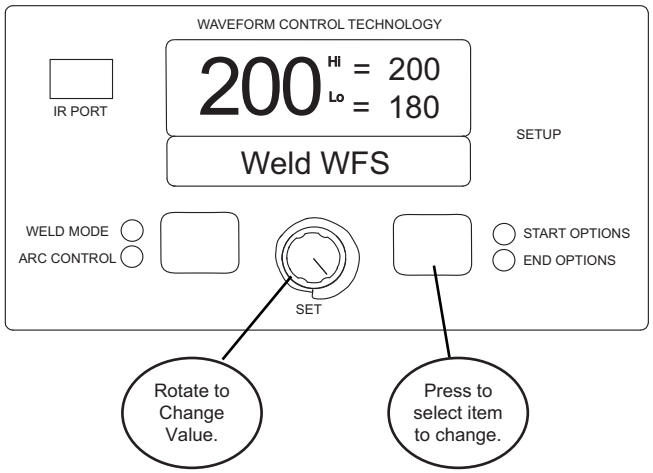
Four items show on the MSP4 panel.

- Memory Value
- High Limit
- Low Limit
- Parameter Name

One of these items will flash to indicate which item will change when the MSP4 encoder is rotated. Press the right button on the MSP4 panel to select the item to change.

The Limits Setup menu shows a list of all parameters available for the weld mode stored in the memory chosen. For example, if limits are being set for a stick (SMAW) mode, parameters such as Run-in WFS and Postflow will not appear.

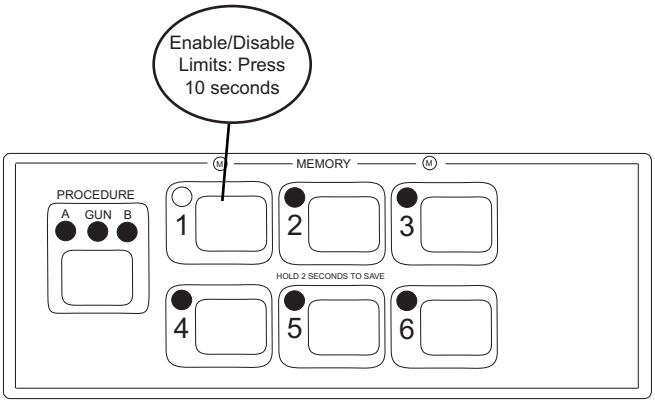
To lock a parameter to a specific value that cannot be changed, set the high and low limits to the same value.



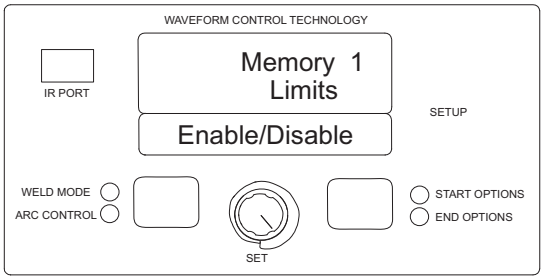
The memory value must always be less than or equal to the high limit, and greater than or equal to the low limit.

After setting limits, press the memory button with the flashing LED. The MSP4 will ask to save or discard the limit changes just made. Press the left MSP4 for button (YES) to save and enable the limits and exit. Press the right MSP4 button (NO) to exit and leave limits unchanged.

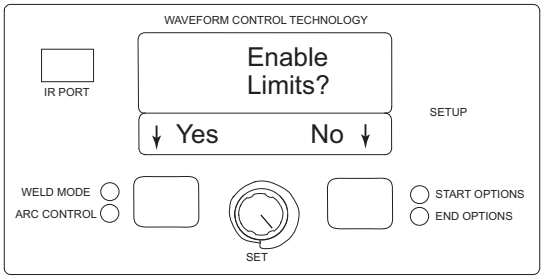
Enabling/Disabling Limits



Limits for each memory may be enabled or disabled by pressing and hold the appropriate memory button for 10 seconds. Release the memory button when the MSP4 display shows the following:



If the passcode does not equal zero, enter the passcode now. If the passcode is zero (0000), SETUP will light and the MSP4 displays the following:



Press the left MSP4 button (YES) to enable limits or the right MSP4 button (NO) to disable limits. Disabling limits does not change any limits values that may have been previously set.

DUAL PROCEDURE/MEMORY OPERATION

(For Code 11456 and Higher)

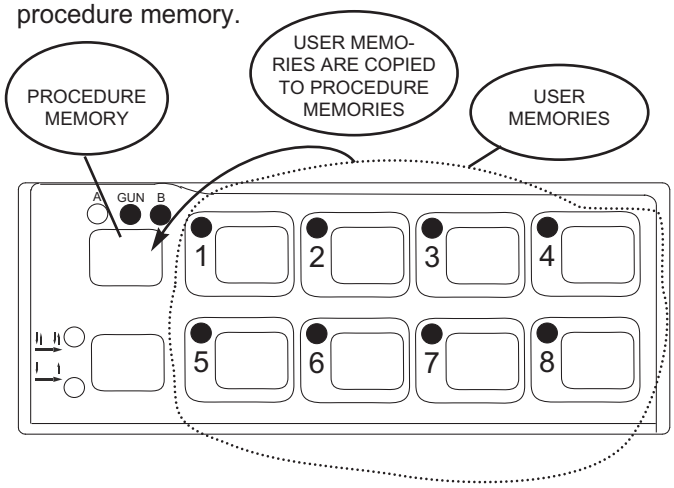
The Dual Procedure/Memory buttons performs three functions:

- Weld procedure selection
- Memory save and recall
- Limits setting

There are two procedure memories (A and B) and eight user memories (1-8).

Procedure Memory vs. User Memory

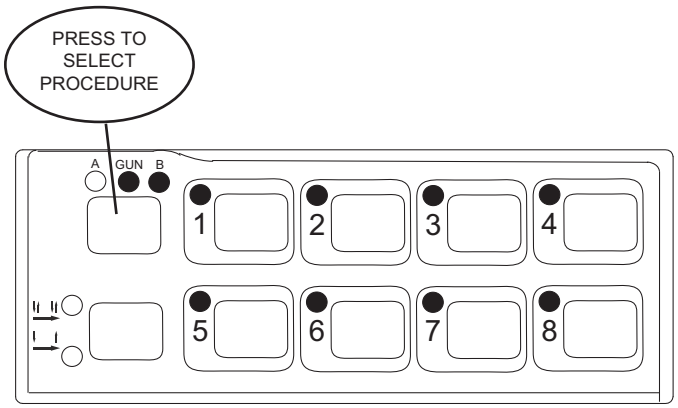
Procedure memory is used while welding. Changes to the weld procedure (WFS, voltage, arc control, etc.) immediately change the contents inside the selected procedure memory.



User memories work by copying the weld procedure from one of the eight memories into either the A or B procedure. Weld procedures are saved into the memories only when the operator chooses.

Using Procedure Memories

Procedure memories can be selected by choosing either "A" or "B" procedure directly with the memory panel, or by selecting "GUN" and using a dual procedure gun to select between procedure "A" and "B". When selecting procedures with the gun switch, "A" or "B" will flash to show which procedure is active.



USER MEMORIES

Recall a memory with memory buttons

To recall a user a memory, press one of the six user memory buttons. The memory is recalled when the button is released. Do not hold the button for more than two seconds when recalling a user memory.

Recall a memory with the gun trigger

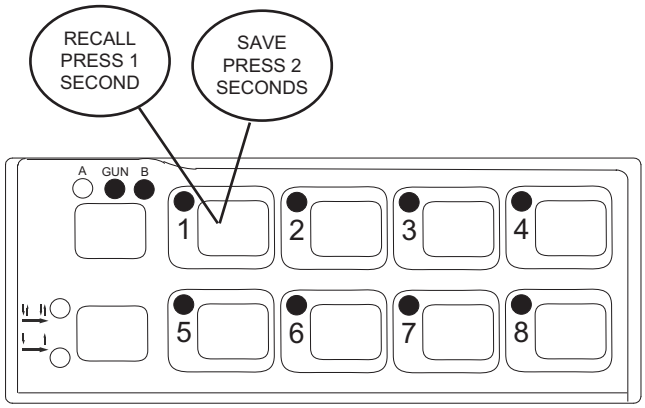
If desired, memories 2 through 8 can be recalled with the gun trigger. For example, to recall memory 3, quickly pull and release the gun trigger 3 times without welding.

Note: the wire feeder is factory set with this feature disabled. Use the SETUP menu and change P.4 to enable memory recall with the gun trigger.

Save a memory with memory buttons

To save a memory, press and hold the desired memory button for two seconds. When the button is initially pressed, the corresponding LED will illuminate. After two seconds, the LED will turn off. Do not hold the button for more than 5 seconds when saving a user memory.

Note: that memories may be locked in the set-up menu to prevent accidental overwrite of the memories. If an attempt is made to save a memory when memory saving is locked, the message "Memory save is Disabled!" will appear briefly in the MSP4 display.



LIMITS

Limits allow the welder to adjust the welding procedure only within a defined range.

Each user memory may have a different set of limits. For example, memory 1 can be set to limit the WFS to 200 through 300 in/min, and memory 2 can be set to limit the WFS to 275 through 310 in/min, while memory 3 may not have any WFS limits.

Parameters are always constrained by machine limits. When memory limits are enabled, the parameter will flash whenever an attempt is made to exceed the memory limit value. The parameter will not flash if an attempt is made to exceed the machine limit.

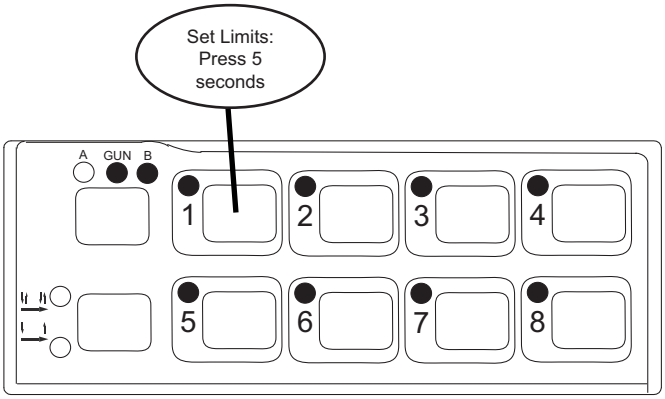
The system machine limits are:

Parameter	Range	Units
Wire Feed Speed	Weld mode and wire feeder dependent.	in/min
Voltage	Weld mode dependent	Volts
Trim	0.50 to 1.50	--
Arc Control	-10.0 to 10.0	Weld mode dependent
Preflow	0.0 to 2.5	Seconds
Start Time	0.0 to 10.0	Seconds
Run-In WFS	Off, 50 to 150	in/min
Crater Time	0.0 to 10.0	Seconds
Burnback Time	0.00 to 0.25	Seconds
Postflow Time	0.0 to 10.0	Seconds

Limits may be set for:

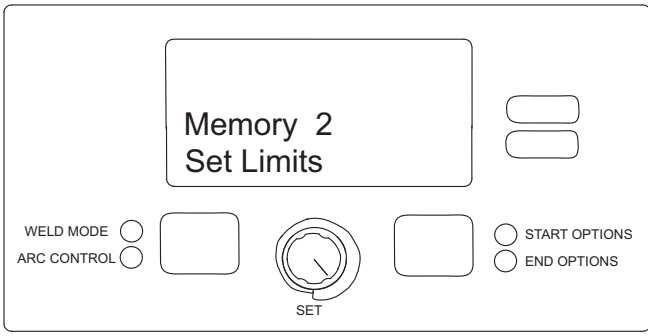
- Wire Feed Speed/Amperage
- Voltage/Trim
- Arc Control
- Preflow Time
- Run-In Speed
- Start Wire Feed Speed
- Start Voltage/Trim
- Start Time
- Burnback Time
- Crater Wire Feed Speed
- Crater Voltage/Trim
- Crater Time
- Postflow Time

Weld modes cannot be selected through the Limits Setup memu, and must be chosen and saved to memory before entering the Limits Setup Menu.

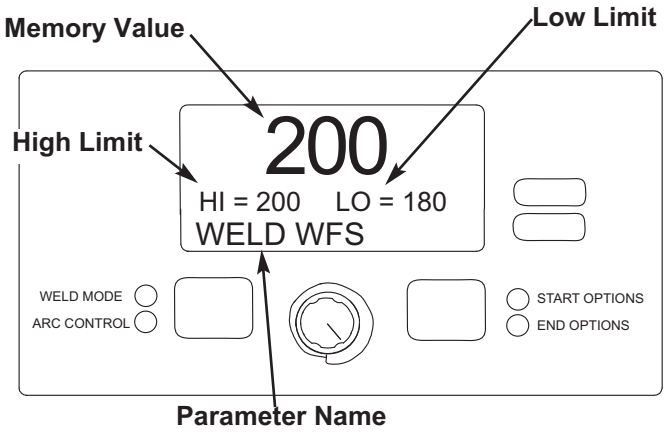


To set limits, press the desired memory button 1-8 and hold for 5 seconds. Release the memory button when the LED begins to blink rapidly and the MSP4 displays "Memory X Set Limits" as shown below.

MSP4 DISPLAY



If the passcode does not equal zero (0000), enter the passcode now. If the passcode has been forgotten, a p.c. computer application or Palm O.S. application is required to change the passcode

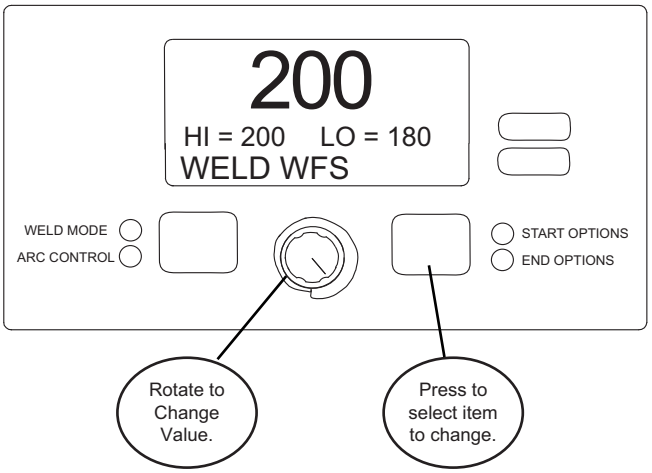


If the passcode has been set to zero (0000), SETUP will illuminate on the MSP4 panel and the display will show the following:

Four items show on the MSP4 panel.

- Memory Value
- High Limit
- Low Limit
- Parameter Name

One of these items will flash to indicate which item will change when the MSP4 encoder is rotated. Press the right button on the MSP4 panel to select the item to change.



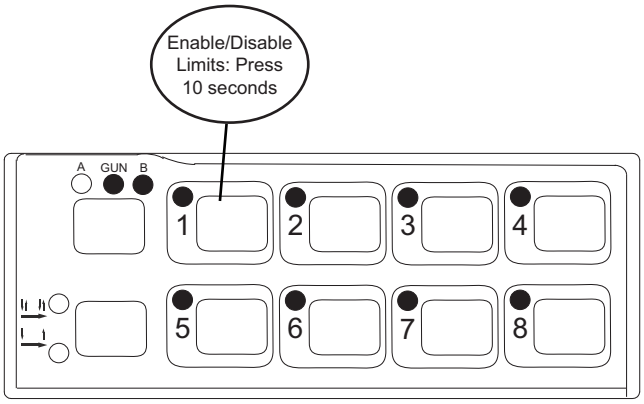
The Limits Setup menu shows a list of all parameters available for the weld mode stored in the memory chosen. For example, if limits are being set for a stick (SMAW) mode, parameters such as Run-in WFS and Postflow will not appear.

To lock a parameter to a specific value that cannot be changed, set the high and low limits to the same value.

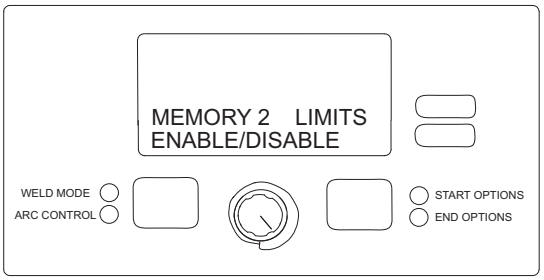
The memory value must always be less than or equal to the high limit, and greater than or equal to the low limit.

After setting limits, press the memory button with the flashing LED. The MSP4 will ask to save or discard the limit changes just made. Press the left MSP4 for button (YES) to save and enable the limits and exit. Press the right MSP4 button (NO) to exit and leave limits unchanged.

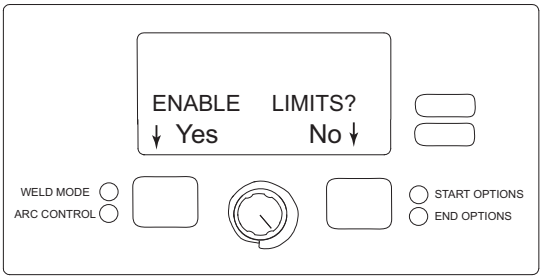
Enabling/Disabling Limits



Limits for each memory may be enabled or disabled by pressing and hold the appropriate memory button for 10 seconds. Release the memory button when the MSP4 display shows the following:

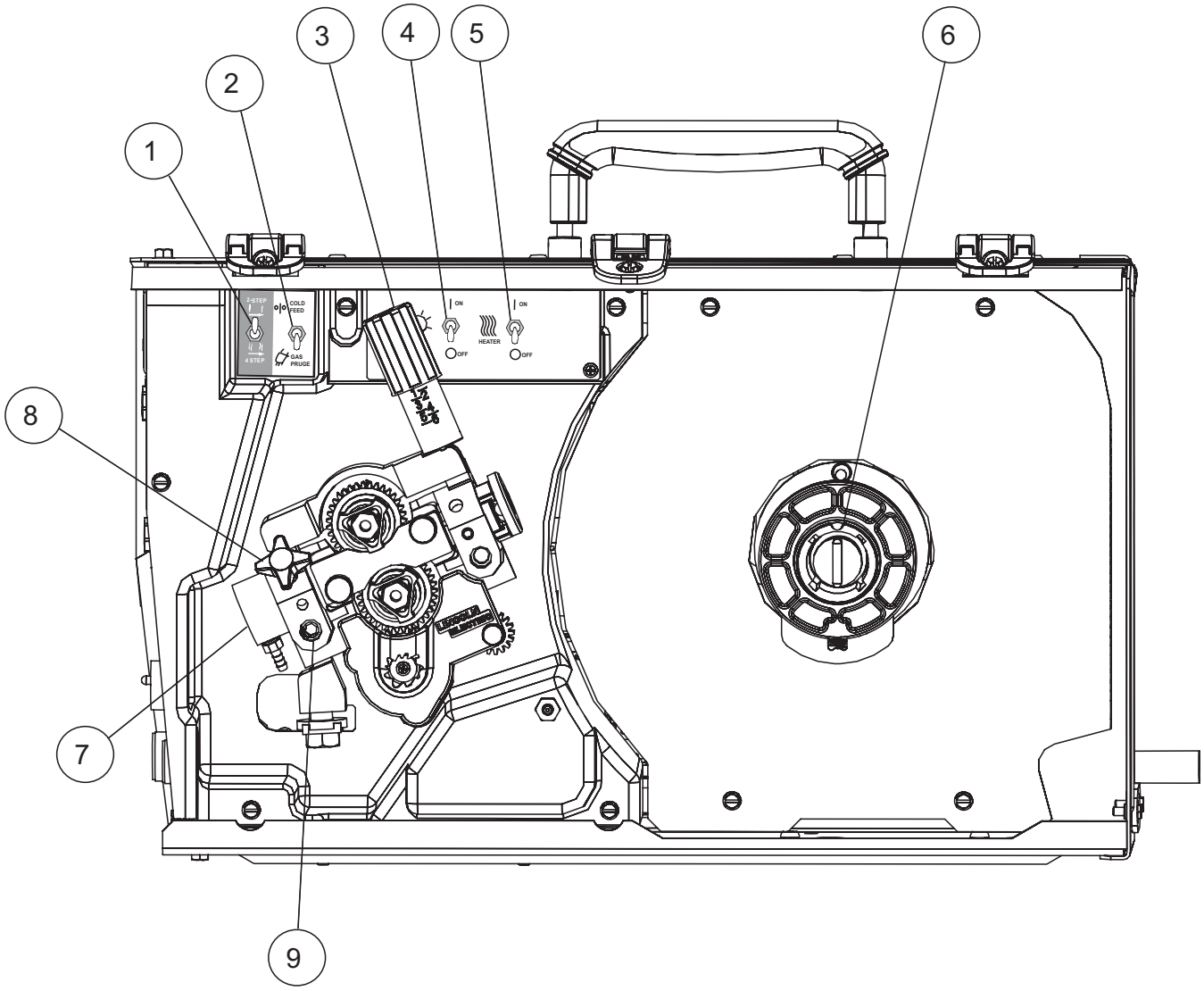


If the passcode does not equal zero, enter the passcode now. If the passcode is zero (0000), SETUP will light



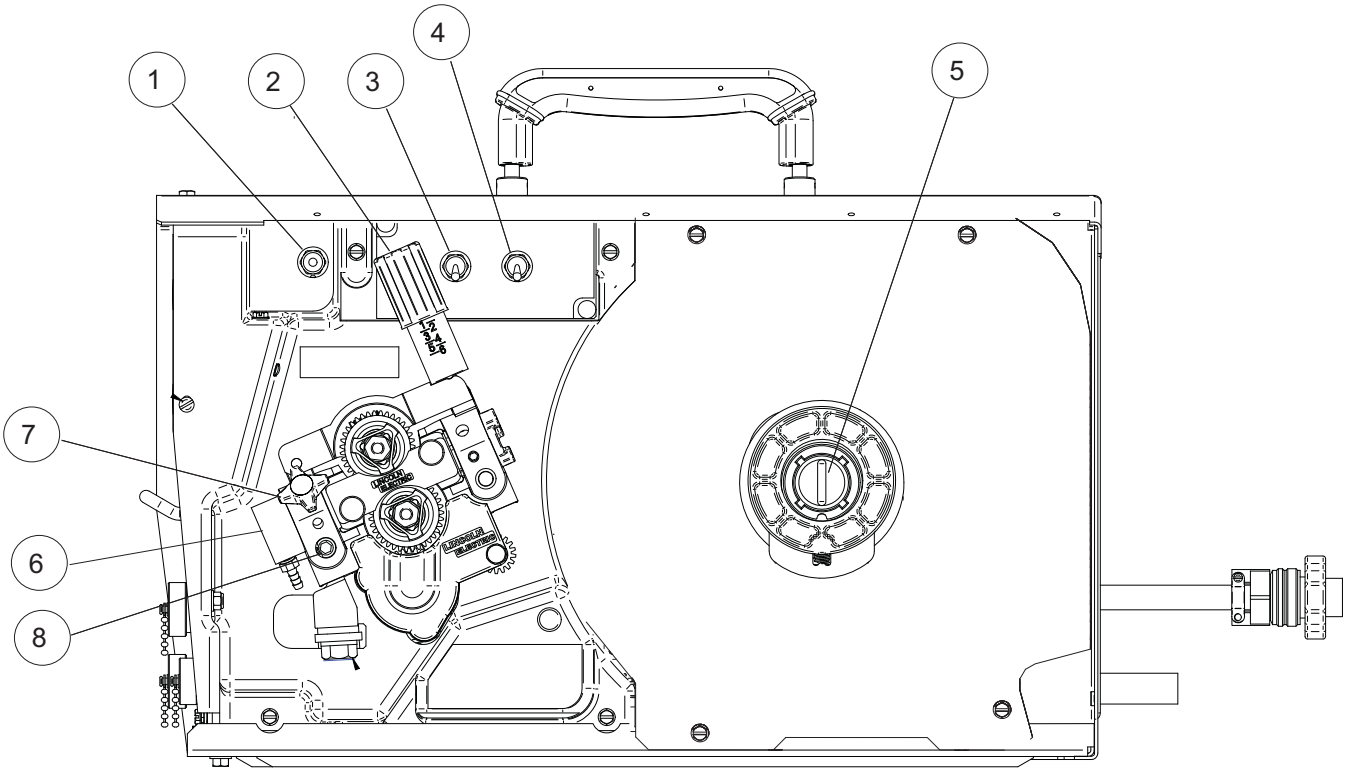
and the MSP4 displays the following:
Press the left MSP4 button (YES) to enable limits or the right MSP4 button (NO) to disable limits. Disabling limits does not change any limits values that may have been previously set.

INTERNAL CONTROLS (FOR CODE 11312)



ITEM	DESCRIPTION
1	2 Step / 4 Step Trigger Switch
2	Cold Feed / Purge Switch
3	Wire Drive Pressure Arm
4	Internal Light Switch
5	Internal Heater Switch
6	Spindle Brake
7	Gun Bushing
8	Thumb Screw for securing the welding Gun
9	Socket Head Cap Screw for securing the Gun Bushing

INTERNAL CONTROLS (FOR CODE 11456 and higher)



ITEM	DESCRIPTION
1	Cold Feed / Purge Switch
2	Wire Drive Pressure Arm
3	Internal Light Switch
4	Internal Heater Switch
5	Spindle Brake
6	Gun Bushing
7	Thumb Screw for securing the welding Gun
8	Socket Head Cap Screw for securing the Gun Bushing

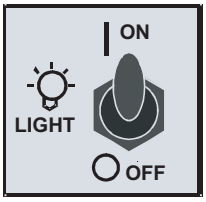
COLD FEED/GAS PURGE SWITCH

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.

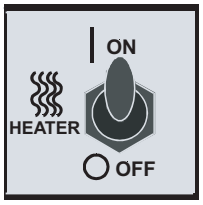
Hold with toggle switch in the **DOWN** position to activate Gas Purge and let the shielding gas flow. The gas solenoid valve will energize but neither the power source output nor the drive motor will be turned on. The Gas Purge switch is useful for setting the proper flow rate of shielding gas. Flow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

LIGHT SWITCH



Turn the internal light switch **ON** to illuminate the inside of the POWER FEED™ 25M.

HEATER SWITCH



Turn the heater switch **ON** to warm the inside of the POWER FEED™ 25M. The heater is useful for reducing condensation build-up on the spool of wire. The heater is thermostatically protected.

PRESSURE ARM ADJUSTMENT

ELECTRIC SHOCK can kill.

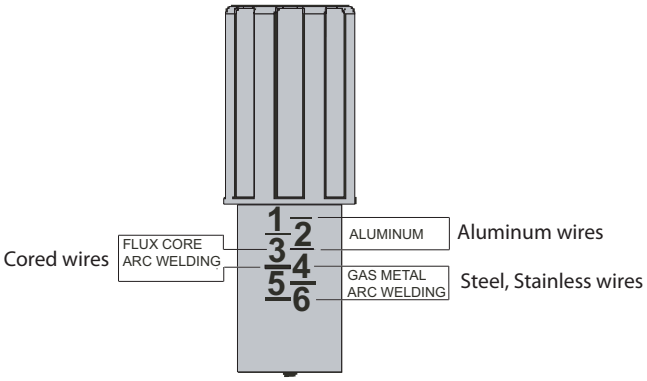
- **Turn the input power OFF at the welding power source before installation or changing drive rolls and/or guides.**
- **Do not touch electrically live parts.**
- **When inching with the gun trigger, electrode and drive mechanism are "hot" to work and ground and could remain energized several seconds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

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.

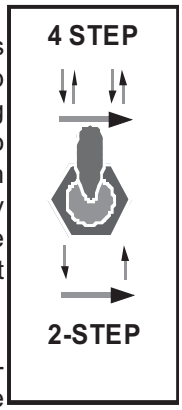
Set the pressure arm as follows (See Figure B.18):

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

FIGURE B.18



2 STEP - 4 STEP - TRIGGER OPERATION
(For Code 11313)



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 UP position for 4 Step operation and in the DOWN position for 2 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

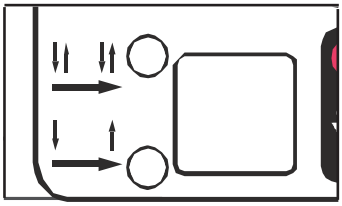
4 Step trigger operation gives the welder additional control in the welding sequence. 4 step trigger allows the welder to choose the arc start, weld and arc end time. It may also be set-up to work as a trigger interlock.

2- STEP 4- STEP- TRIGGER OPERATION
Code 11456 and higher:

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.

Press the push button on the case front to toggle between 2-Step and 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.19)

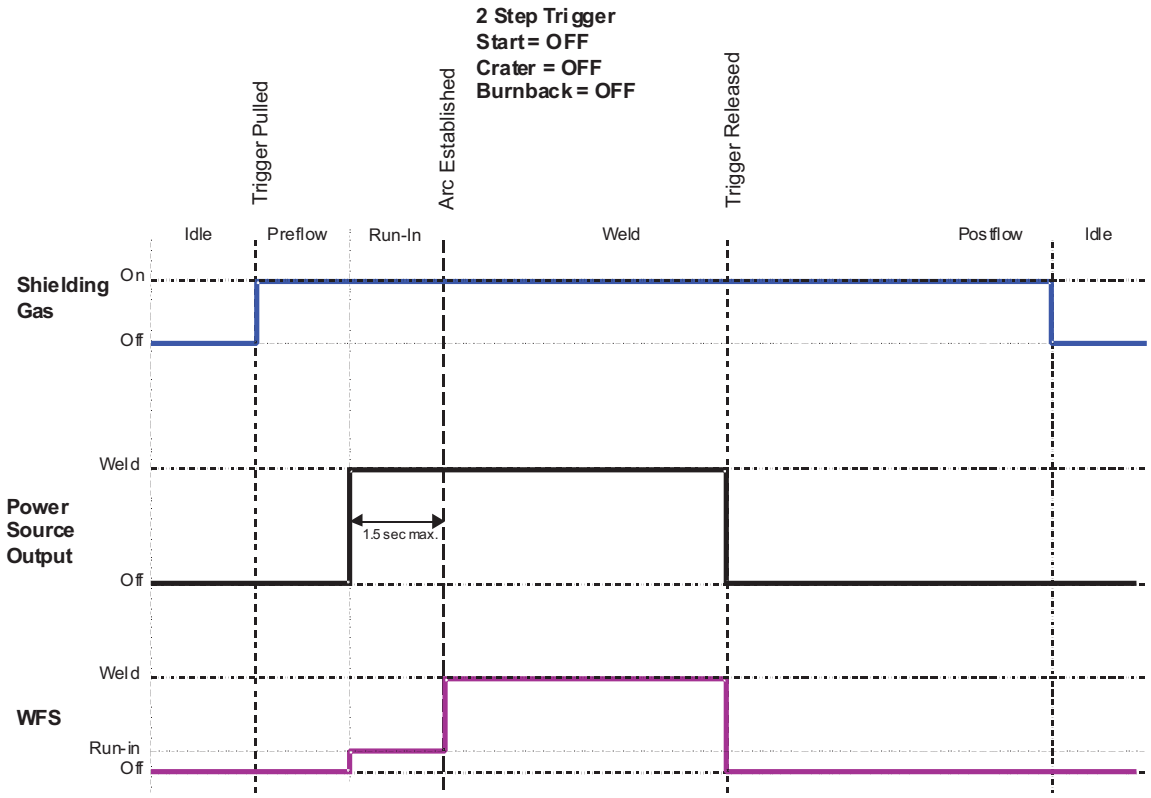
For this sequence,
PREFLOW:
Shielding gas begins to flow immediately when the gun trigger is pulled.

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

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

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

FIGURE B.19



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.20)

For this sequence,

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

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

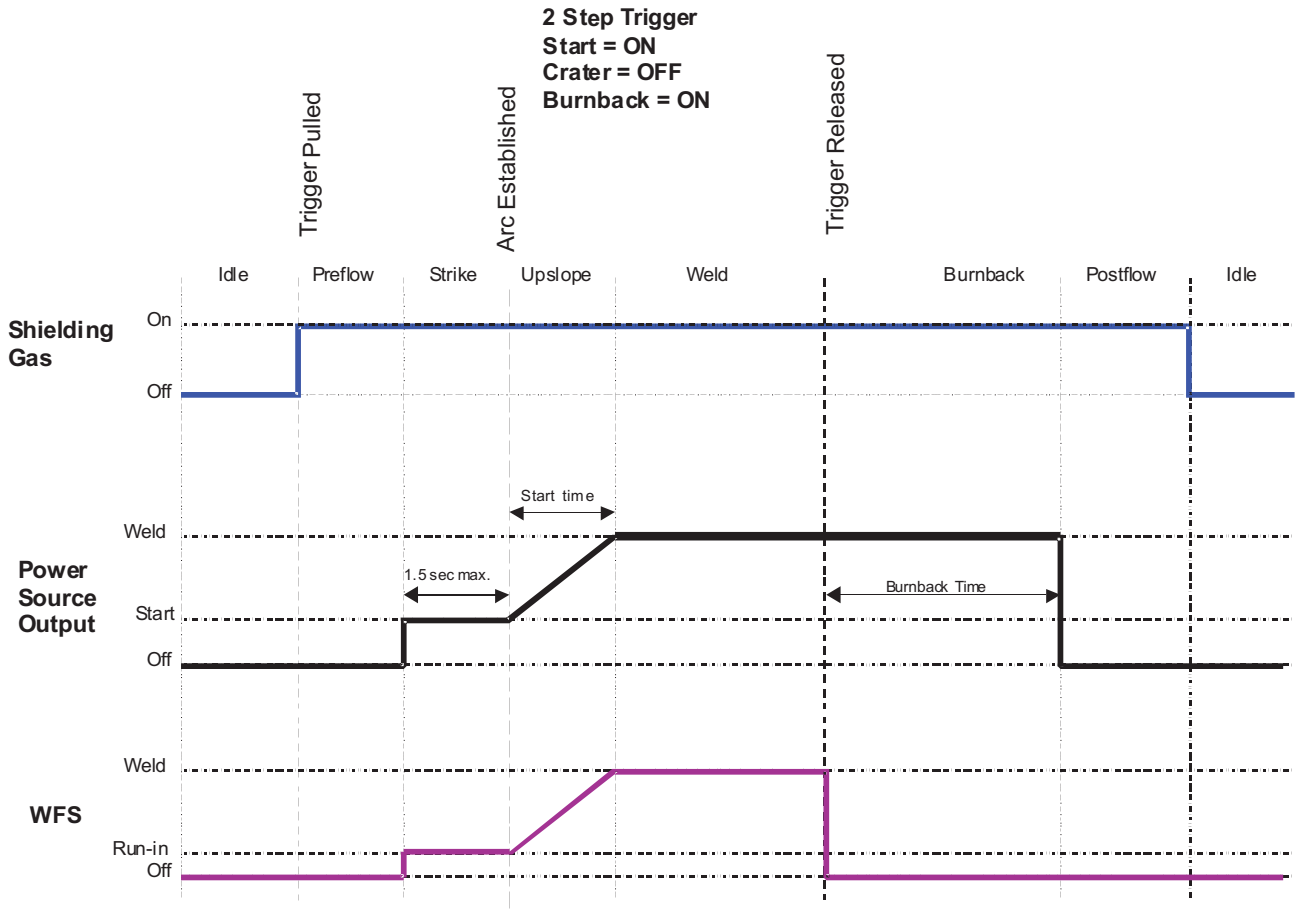
UPSLOPE:
Once the wire touches the work and an arc is established, both the machine output and the wire feed speed ramp to the weld settings throughout the start time. The time period of ramping from the start settings to the weld settings is called UPSLOPE.

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

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.20



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

For this sequence,

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

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

START & UPSLOPE:
As soon as the trigger is 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.

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

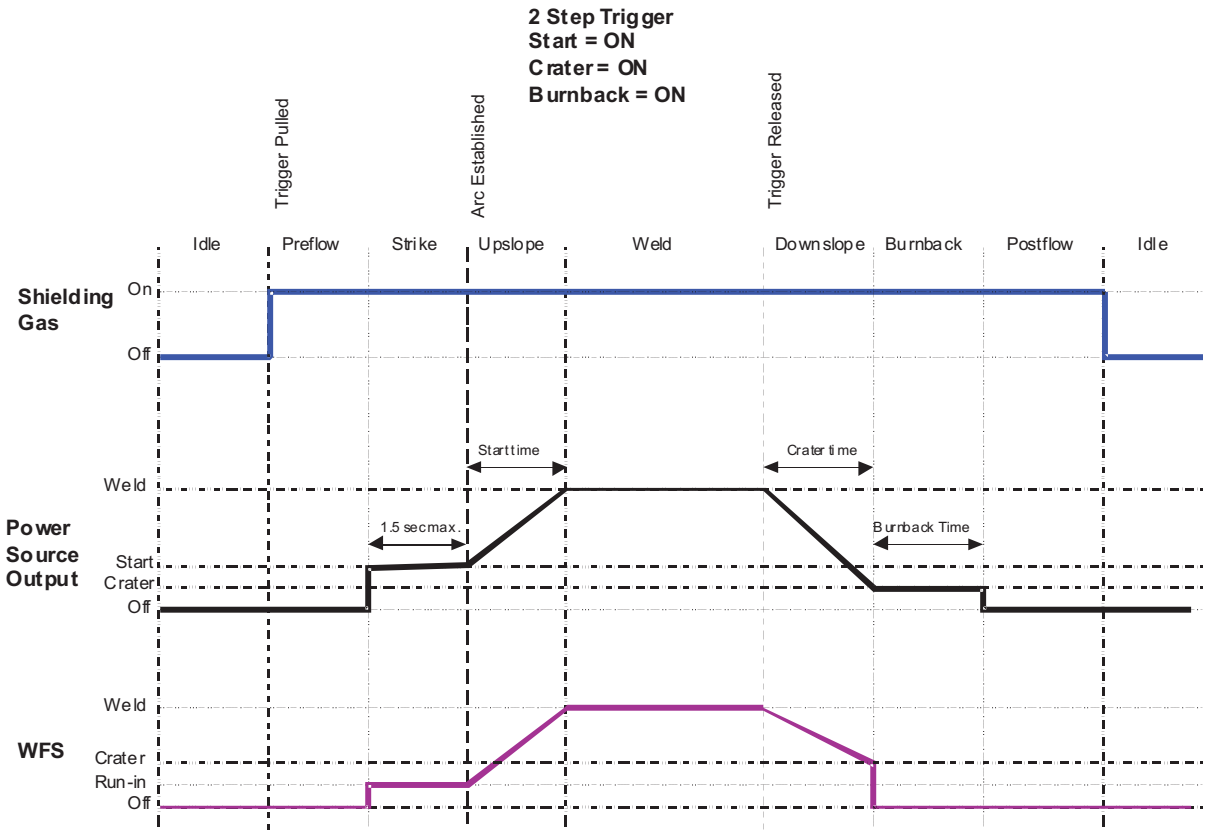
CRATER:
As soon as the trigger is released, the wire feed speed and power source output ramp to the crater settings throughout the crater time. The time period of ramping from the weld settings to the crater settings is called DOWNSLOPE.

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

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.21



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.22)

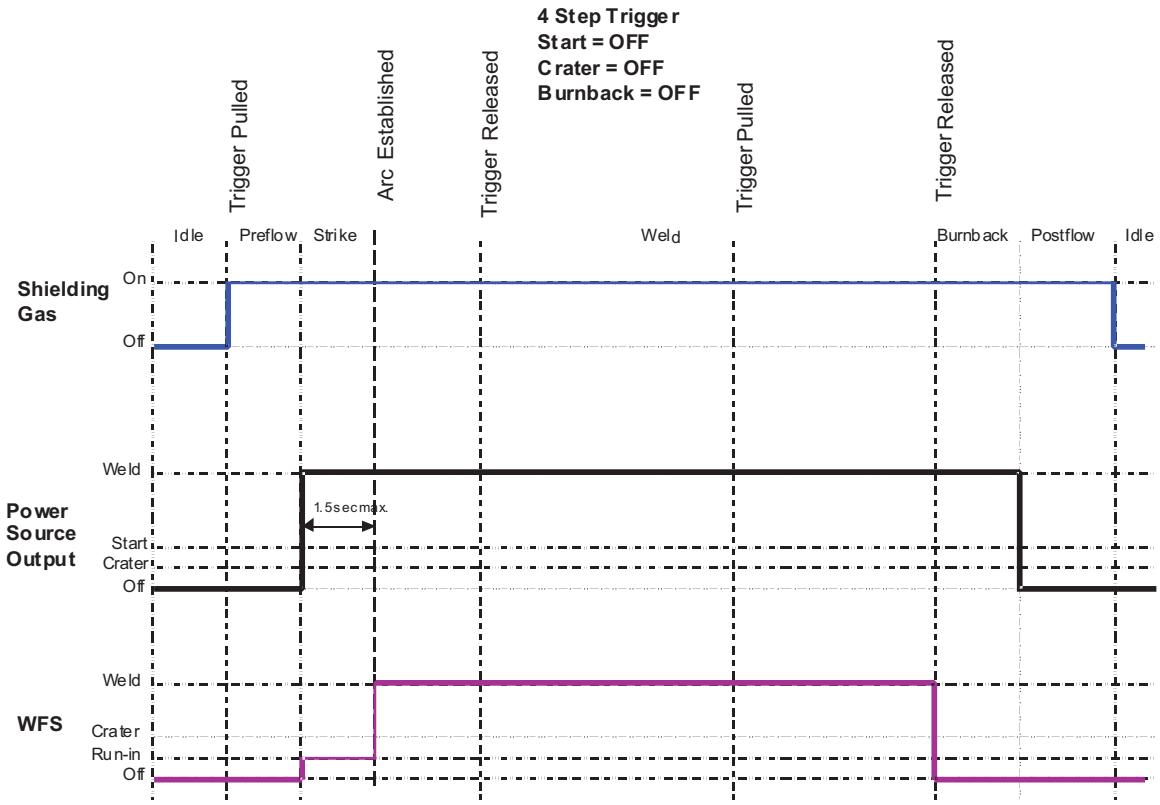
For this sequence,
PREFLOW:
Shielding gas begins to flow immediately when the gun trigger is pulled.

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

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

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

FIGURE B.22



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.23)

In this sequence,

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

RUN-IN:
After preflow time expires, the power source regulates to the start output and wire is advanced towards the work piece at the run-inWFS. 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.

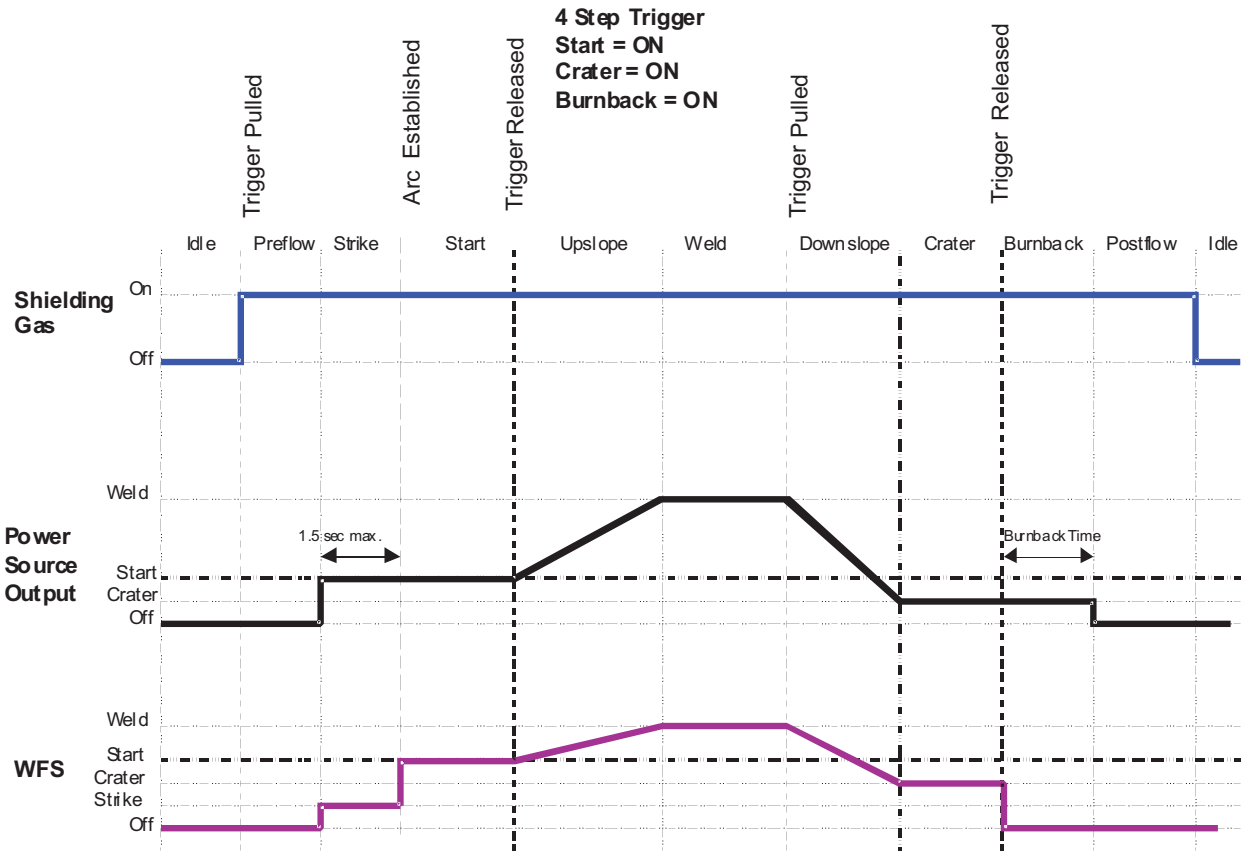
DOWNSLOPE:
As soon as the trigger is released, the wire feed speed and power source output ramp to the crater settings throughout the crater time. The time period of ramping from the weld settings to the crater settings is called DOWNSLOPE.

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

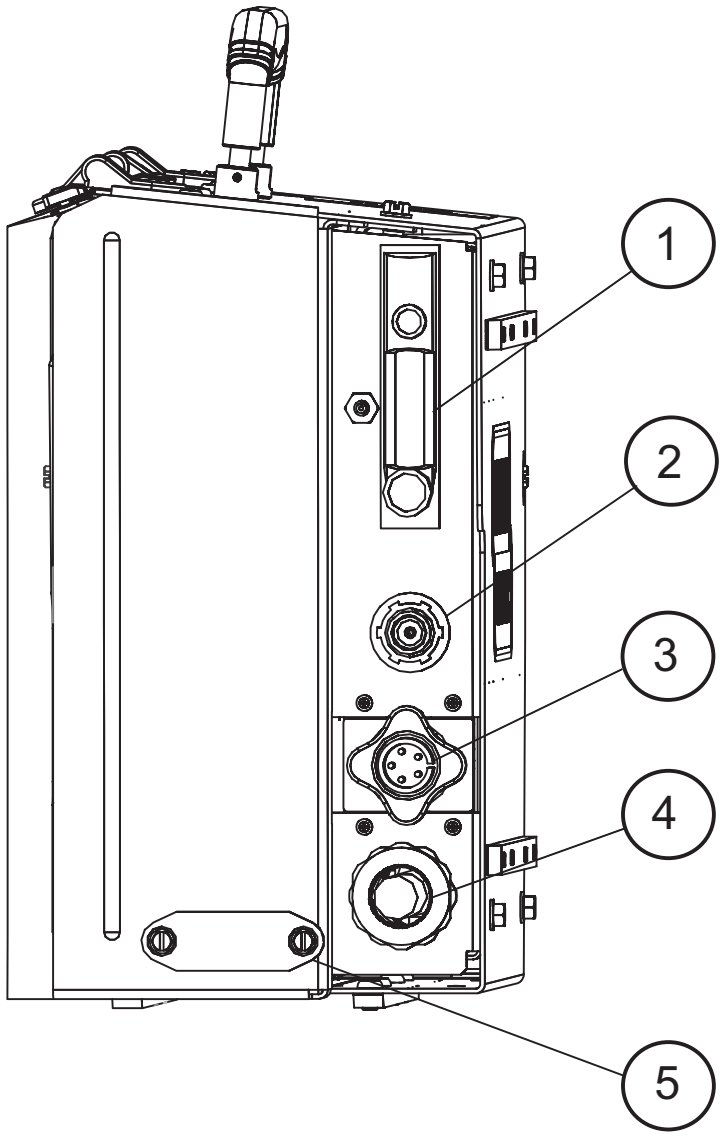
BURNBACK:
When the trigger is released, the wire feed speed is turned OFF and the machine output continues for the burnback time.

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

FIGURE B.23



REAR CONTROLS:



ITEM	DESCRIPTION
1	Flow Meter
2	Shielding Gas Inlet
3	5-Pin Arclink Cable Connector
4	Electrode Cable
5	Cover for Optional Water Line Connector

FLOW METER

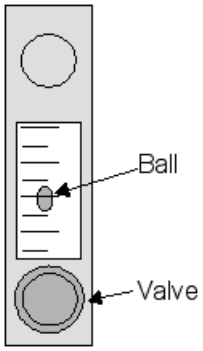
The flowmeter shows the flow rate of shielding gas and has a valve to adjust the flow. The flow meter is scaled for CO_2, Ar, and CO_2/Ar blends. It is not calibrated and is for reference purposes only. The middle of the ball indicates the flow rate of shielding gas.

Adjust the flow rate while depressing the GAS PURGE switch 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.

When using a wire feeder with a flow meter, adjust the regulator at the shield gas bottle or supply to a flow rate that is higher than the flow rate indicated on the feeder flow meter. Note that most regulators are calibrated based upon having low restrictions on the outlet. The valve on the feeder flow meter creates a high restriction and may cause errors in the readings at the supply regulator. Set the gas flow rate using the feeder flow meter reading and not the supply regulator reading.

Only use a pressure regulator (like K586-1) at the gas bottle or supply. Do not use a flow regulator.

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



OPERATION ON LINCNET POWER SOURCES

The POWER FEED™ 25M is an ArcLink wire feeder and is designed for operating on ArcLink Power Wave power sources. It is also capable of operating on older LincNet Power Wave power sources though not all of the features will be active.

When operating with a LincNet power source,

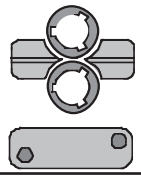
- Limits and Lock-outs are not available.
- The weld mode description is not displayed when choosing weld modes.
- When the weld mode is changed, any Arc Control values will remain as set for the previous weld mode.
- Push-Pull guns will not function.
- The IR port will not operate.
- Error codes will by displayed as "ERR100". Error codes are deciphered by the flashing of the Status LED.
- In the Set-Up menu, only parameters P.0 to P.99 are available.

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 KP1696-1 KP1696-2	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) 3/32" (2.4mm)	KP1697-035C KP1697-045C KP1697-052C KP1697-1/16C KP1697-068 KP1697-5/64 KP1697-3/32	Includes: 2 Knurled drive rolls and inner wire guide.	
Aluminum Wires:	.035" (0.9 mm) .040" (1.0mm) 3/64" (1.2mm) 1/16" (1.6mm)	KP1695-035A KP1695-040A KP1695-3/64A KP1695-1/16A	Includes: 2 polished U groove drive rolls, outer wire guide and inner wire guide.	

K2429-1	ArcLink "T" Cable Adapter	Includes: 1 "T" adapter for connecting two wire feeders to one power source.	
K857	Remote Output Control	Includes: 1 remote output control pendant with a 25' cable. Used most often with SMAW welding.	
K857-1	Remote Output Control	Includes: 1 remote output control pendant with a 100' cable. Used most often with SMAW welding.	
K2596-1	Aluminum Case	Includes: a complete aluminum case. Decals, skids, insulation and latches are all preassembled.	
K2596-2	Plastic Case	Includes: a complete engineered plastic case. Decals and latches are all preassembled.	
K2593-xx	#1 Co-Axial Power Cable	Includes: AWG #1 Coaxial weld cable of length "xx". Ends of the weld cable have lug connections. Use for Pulse or STT™ welding.	
K1796-xx	1/0 Co-Axial Power Cable	Includes: 1/0 Coaxial weld cable of length "xx". Ends of the weld cable have lug connections. Use for Pulse or STT™ welding.	
K1803-1	Work and Feeder Cables Package	Includes: 1/0 Coaxial weld cable of length "xx". Ends of the weld cable have lug connections. Use for Pulse or STT™ welding.	
K1840-xx	Weld Power Cable, Twist-Mate to Lug	Includes: Twist-Mate to Lug 2/0 cable 14' (1.2m) long with Ground Clamp, and Twist-Mate to Lug 2/0 Cable 9' (2.7m) long.	
K1842-xx	Weld Power Cable, Lug to Lug	Includes: Twist-Mate to Lug, 1/0 cable of length "xx".	

K1543-xx	Digital Control Cable	Includes: 5 pin to 5 pin wire feeder to power source control cable. Cables may be connected end-to-end to make a longer cable.	
K2683-xx	Heavy Duty ArcLink Control Cable	Includes: 5 pin to 5 pin wire feeder power source to control cable. Cables may be connected end-to-end to make a longer cable. The male connector is stainless steel and the female connector is brass. Recommended for outdoor applications.	
K910-1	Ground Clamp	Includes: One 300 Amp Ground Clamp.	
K910-2	Ground Clamp	Includes: One 500 Amp Ground Clamp.	
K1500-1	Gun Receiver Bushing (for guns with K466-1 Lincoln gun connectors; Innershield® and Subarc guns)	Includes: Gun receiver bushing, set screw and hex key wrench.	
K1500-2	Gun Receiver Bushing (for guns with K466-2, K466-10 Lincoln gun connectors; Magnum® 200/300/400 guns and compatible with Tweco® #2-#4)	Includes: Gun receiver bushing with hose nipple, set screw and hex key wrench.	
K1500-3	Gun Receiver Bushing (for guns with K613-7 Lincoln gun connectors; Magnum® 550 guns and compatible with Tweco® #5)	Includes: Gun receiver bushing with hose nipple, set screw and hex key wrench.	
K1500-4	Gun Receiver Bushing (for gun with K466-3 Lincoln gun connectors; compatible with Miller® guns.)	Includes: Gun receiver bushing with hose nipple, set screw and hex key wrench.	

K1500-5	Gun Receiver Bushing (compatible with Oxo® guns.)	Includes: Gun receiver bushing with hose nipple, 4 guide tubes, set screw and hex key wrench.	
K489-7	Gun Receiver Bushing (for Lincoln Fast-Mate guns.)	Includes: Gun receiver bushing with trigger connector.	
K2339-1	Push-Pull Gun Connection Kit	Used with K2211-xx and K2212-xx Python Guns. Includes: Push-Pull gun bushing, fittings, valve removal tool, modified gas bypass valve and control cable extension.	
K590-6	Water Connection Kit	Includes: 2 hoses with female quick connectors at each end, 2 male connectors for 3/16" ID hose, 2 male connectors for 1/4" ID hose, and mounting hardware.	
K435	Spindle Adapter, for mounting 14 lb. (6.4 kg) Innershield Coils on 2 in (51 mm) spindles.	Includes: Spindle Adapter made from 2 coil retainers. (Electrode not included.)	
K468	Spindle Adapter, for mounting 8in (203mm) diameter spools on 2 in (51 mm) spindles.	Includes: 2 Spindle Adapters, one for 2" wide spools and the other for 3" wide spools.	
K659-1	Gas Guard Regulator	Includes: Gas Guard Regulator and adjustment key.	
3000290	Adjustable Gas Regulator	Includes: Gas Regulator for Mixed Gases and 10' (3.0m) Hose.	
K586-1	Deluxe Adjustable Gas Regulator	Includes: Deluxe Gas Regulator for Mixed Gases, Adapter for CO2 and 10' (3.0m) Hose.	

INSTALLATION OF THE K590-6 WATER COOLING KIT

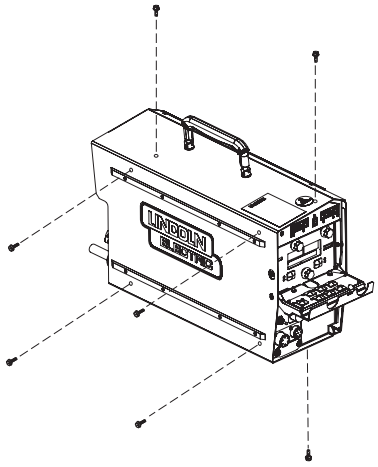
⚠ WARNING

ELECTRIC SHOCK can kill.
- **Turn the input power OFF at the disconnect switch before working on this equipment.**
- **Do not touch electrically hot parts.**
- **Only qualified personnel should install, use or service this equipment.**

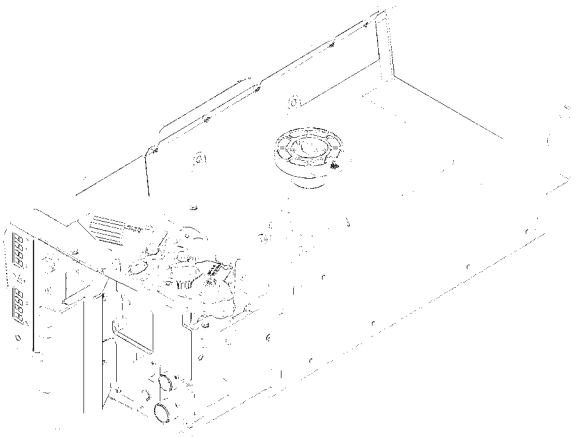
The K590-6 components are rated up to 70 psi (5 bar) and 158°F (70°C). Use a coolant fluid that is compatible with the water cooler and the gun.

Tools required:
- 3/8" wrench
- 5/16" nut driver
- medium flat bladed screw driver
- cutting tool

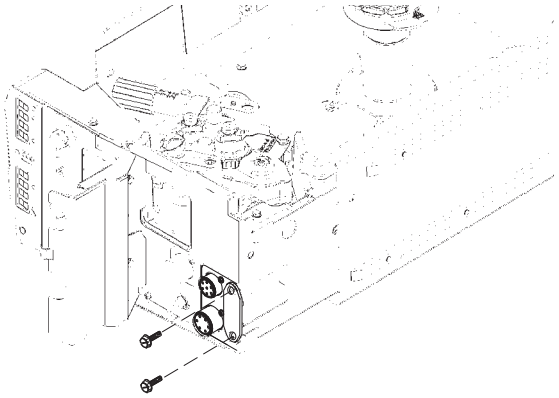
1. Turn power off at the welding power source.
2. Remove the screws securing the case to the inner module using a 3/8" wrench.



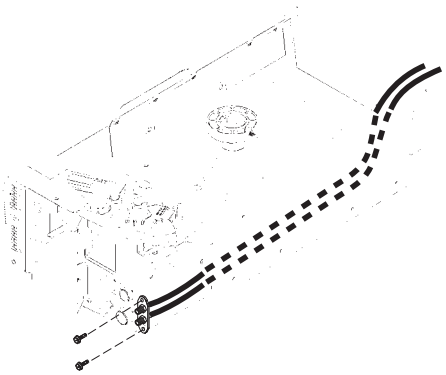
3. Remove the module from the case by lifting the front of the module approximately .25" (6 mm) and then sliding forward.



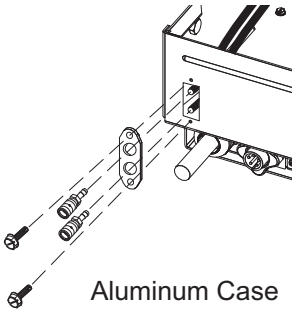
4. Use a 5/16" nut driver to remove the screws holding the water cooling cover on the case front of the inner module and on the rear of the case.



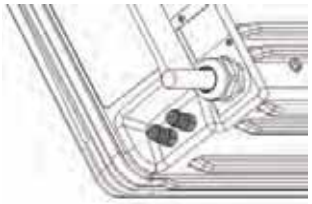
5. Install the fitting and hose assembly to the case front. Route the hoses along the bottom of the inner module and out through the cutout of the cover. Slide the module back into the case.



6. Secure the module to the case with the screws. (Shown in Step 2)
7. Install the fitting assembly to the rear of the case.

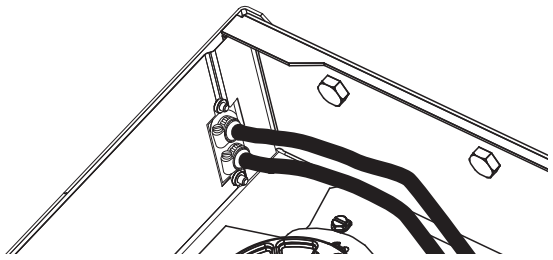


Aluminum Case



Plastic Case

8. Slide the hose clamps on to the hoses. Trim the hoses to length so that they lay flat on the case bottom. Slide the hoses on to the fittings on the case rear and secure with the hose clamps.



WATER COOLED GUNS

⚠ WARNING

ELECTRIC SHOCK can kill.
- **Turn the input power OFF at the disconnect switch before working on this equipment.**
- **Do not touch electrically hot parts.**
- **Only qualified personnel should install, use or service this equipment.**

Python Water Cooled Guns

K2212-xx push-pull guns require both the K590-6 water connection kit and the K2339-1 push-pull gun connection kit. The hoses from the water connection kit assemble directly to the push-pull gun bushing as shown below. Secure the conduit from the python gun in the gun bushing by using the thumb screw.

To install the K2339-1 Push-Pull Gun Connection Kit in the POWER FEED™ 25M:

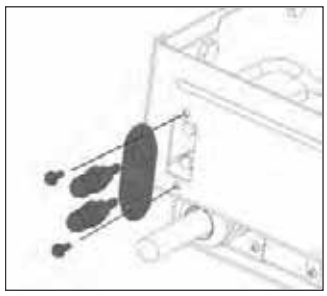
1. Turn power off at the welding power source.

2. Remove the gun from the wire feeder, if attached.

3. Remove the wire spool from the feeder, if present.

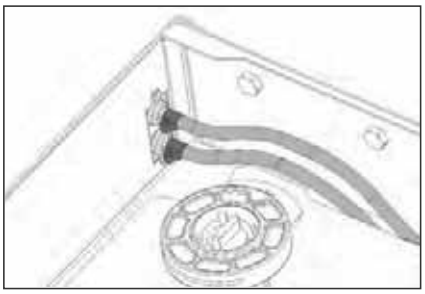
4. Loosen the socket head cap screw that holds the connector bar against the gun bushing. Important: Do not attempt to completely remove the socket head cap screw.

5. 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.



6. Disconnect the shielding gas hose from the gun bushing, if required.

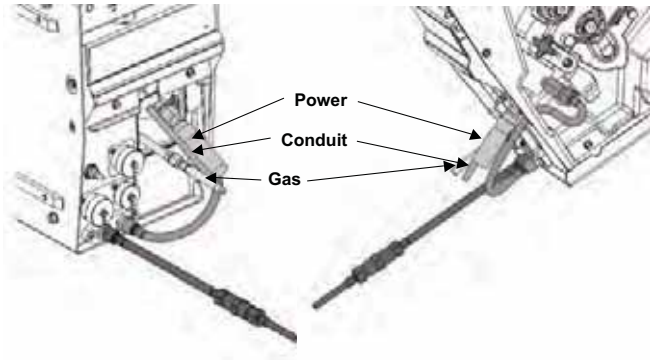
7. For water cooled guns:
   a. Install the hose assembly from K590-6 to the rear of the POWER FEED™ 25M case.
   b. Remove the rear panel of the POWER FEED™ 25M. Route the water hoses from the rear of the case in between the inner module and the case. Assemble the rear panel, with the water hoses routed in the bottom cut-out of the panel.
   c. Install Adapter, 5/8" L.H. Fitting to the Push-Pull Bushing.



8. Slide the Push-Pull Bushing into the wire drive. Align the thumb screw with one of the threaded holes on the bushing.

9. Insert the conduit from the push-pull gun into the push-pull bushing until the conduit is flush to the inner wire guide. Secure the conduit with the thumb screw.

10. Tighten the socket head cap screw to hold the push-pull bushing tightly to the wire drive.



11. Assemble Adapter Fitting to the front of the push-pull bushing. Attach the electrode cable from gun to the adapter fitting.

12. Use the adapter fittings to attach one of the water hoses to the adapter.

13. Attach the other water hose to the water hose of the of push-pull gun using the Hose Nipple.

14. Connect the control cable from the push-pull gun to the 7 pin circular connector on the front of the POWER FEED™ 25M.

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™ 25M.

To verify the wire feed speed:

- Assemble a .045 (1.2mm) drive roll kit into the POWER FEED™ 25M.
- 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 FEED 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™ 25M to a CV procedure that gives steady "spray" transfer in the arc.
- While a weld is being made, measure the voltage from the feed plate to work with a calibrated volt meter.
- The displayed voltage on the POWER FEED™ 25M should be within 2% of the measured value.

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 CAUSE	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.	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 53	Voltage sense loss.		
Err 81	Motor overload, long term.	1. The wire drive motor has overheated.	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.	1. The wire drive motor current draw has exceeded limits, usually because the motor is in a locked rotor state.	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.	1. The drive motor in the spool gun or push-pull gun is drawing too much current.	1. Check that the wire moves freely through the gun when the gun is straight. 2. Verify the correct size contact tip is installed in the gun.
Err 263	No usable weld modes.	1. The power source does not have any welding programs loaded.	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.

Observe all Safety Guidelines detailed throughout this manual

PROBLEMS (SYMPTOMS)	POSSIBLE CAUSE	RECOMMENDED COURSE OF ACTION
Output Problems		
The feeder does power up - no display, no cold feed.	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.	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.	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. 5. The solenoid has failed.	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. 5. Replace the solenoid.
Inconsistent wire feeding or wire not feeding but drive rolls turning.	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.	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.

Observe all Safety Guidelines detailed throughout this manual

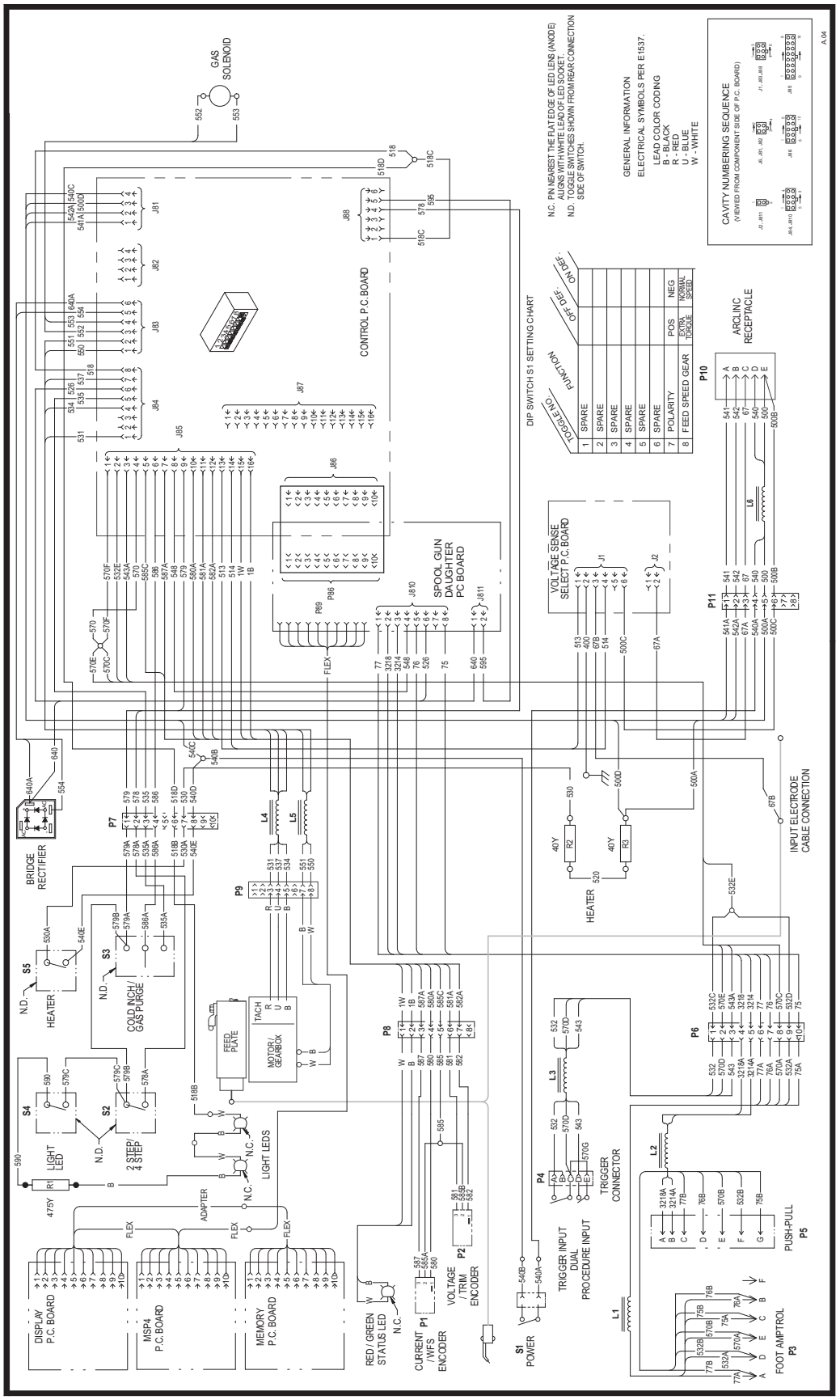
PROBLEMS (SYMPTOMS)	POSSIBLE CAUSE	RECOMMENDED COURSE OF ACTION
Output Problems		
Wire feed speed consistently operates at the wrong value.	1. The wire feeder gear setting is not properly set.	1. Verify the POWER FEED™-15 software setting matches the gear mounted. See the Instruction Manual for setting the gear speed.
Variable or "hunting" arc.	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.	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 ropy looking bead.	1. Improper procedures or techniques.	1. See "Gas Metal Arc Welding Guide". (GS-100).
The wire feed speed/amperage and voltage/trim display work during preset but show nothing during welding.	1. The software in the POWER FEED™ 25M must be upgraded.	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.

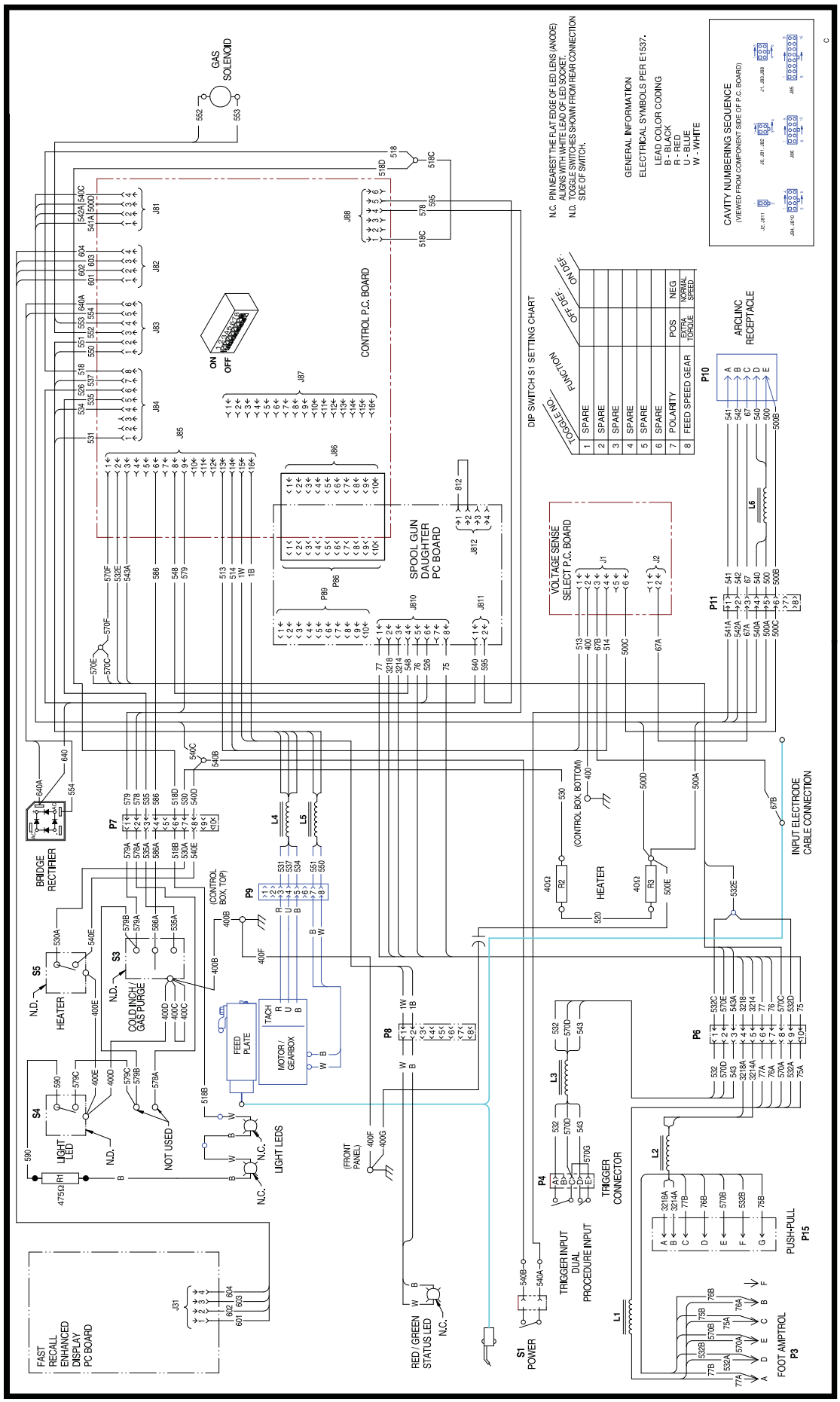
Wiring Diagram for Code 11313

WIRING DIAGRAM - POWER FEED 25M



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

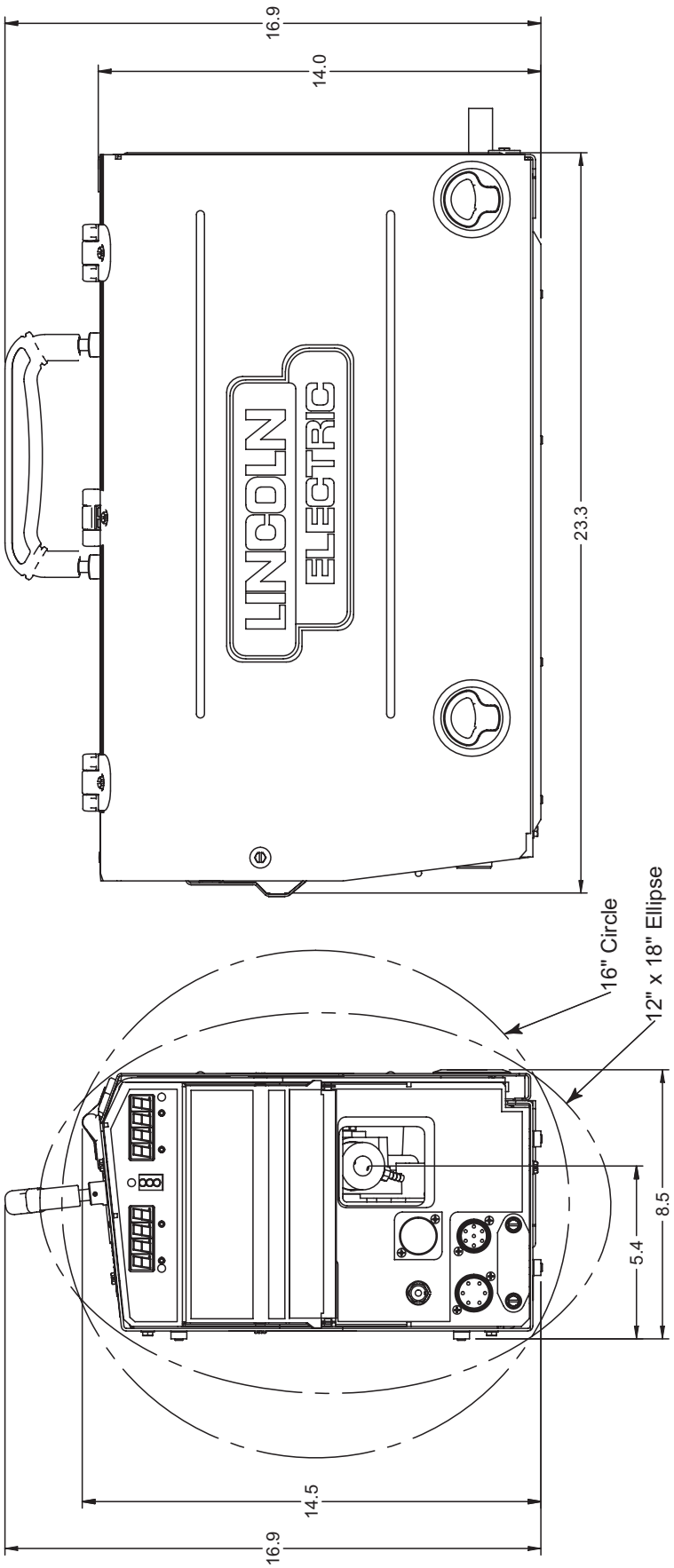
WIRING DIAGRAM - POWER FEED 25M FOR CODES 11456, 11557, 11714, 11715



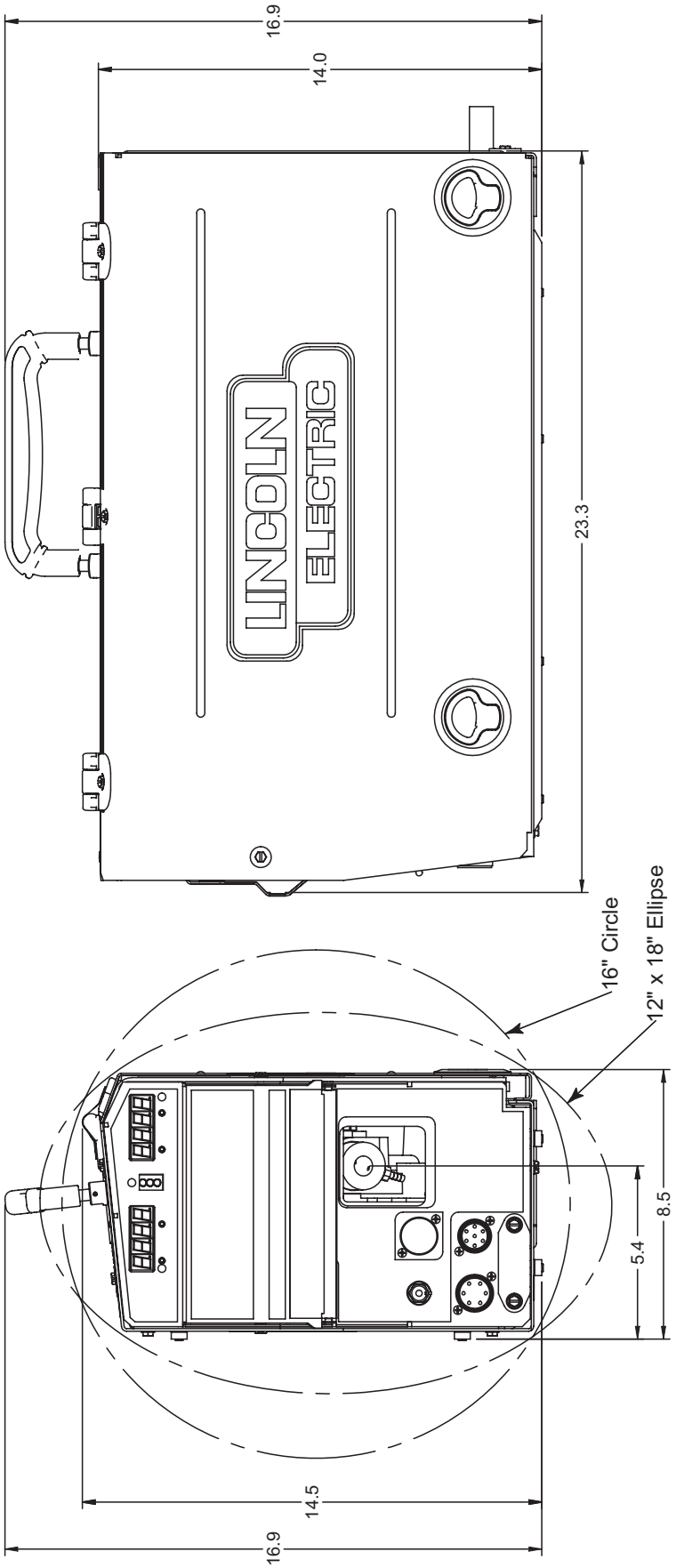
NOTE: This diagram is for reference only. It may not be accurate for all machines covered by this manual. The specific diagram for a particular code is pasted inside the machine on one of the enclosure panels. If the diagram is illegible, write to the Service Department for a replacement. Give the equipment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

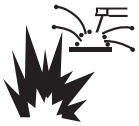
DIMENSION PRINT

Dimensions for Code 11313



Dimensions for Codes 11456, 11557



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

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

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

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

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

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

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

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

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

이 제품에 동봉된 작업지침서를 숙지하시고 귀사의 작업자 안전수칙을 준수하시기 바랍니다.

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

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