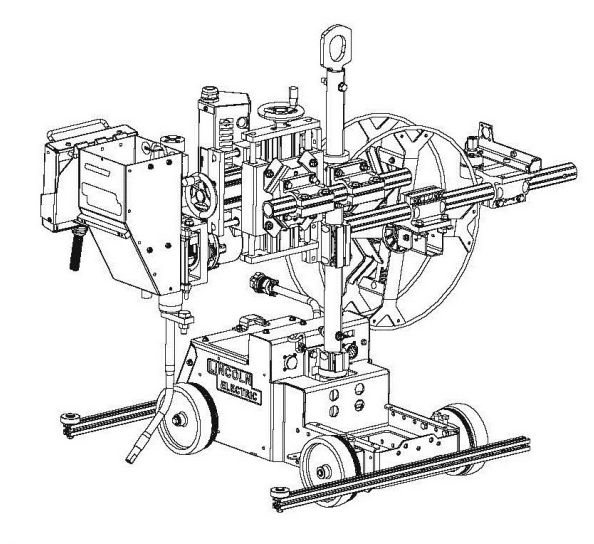


IM2077
06/2017
REV01

CRUISER™ CE

OPERATOR'S MANUAL



ENGLISH

LINCOLN®
ELECTRIC

Lincoln Electric Bester Sp. z o.o.
ul. Jana III Sobieskiego 19A, 58-263 Bielawa, Poland
www.lincolnelectric.eu

THE LINCOLN ELECTRIC COMPANY

EC DECLARATION OF CONFORMITY



Manufacturer and technical
documentation holder:

The Lincoln Electric Company

Address:

22801 St. Clair Ave.
Cleveland Ohio 44117-1199 USA

EC Company:

Lincoln Electric Europe S.L.

Address:

c/o Balmes, 89 - 8⁰ 2^a
08008 Barcelona
SPAIN

Hereby declare that welding equipment:

Cruiser

Product numbers:

K3048, K3083
(Product numbers may also contain prefixes and suffixes)

Is in conformity with Council Directives
and amendments:

Electromagnetic Compatibility (EMC) Directive 2014/30/EU
Low Voltage Directive (LVD) 2014/35/EU

Standards:

EN 60974-10: 2014 Arc Welding Equipment – Part 10:
Electromagnetic compatibility (EMC) requirements
EN 60974-5: 2013, Arc Welding Equipment – Part 5:
Wire Feeders

CE marking affixed in '11 (K3048)

A handwritten signature in black ink, appearing to read "Samir Farah", written over a horizontal line.

Samir Farah, Manufacturer
Compliance Engineering Manager
3 Feb 2017

A handwritten signature in black ink, appearing to read "Dario Gatti", written over a horizontal line.

Dario Gatti, European Community Representative
European Engineering Director Machines
8 Feb 2017

MCD320d

THANKS! For having chosen the **QUALITY** of the Lincoln Electric products.

- Please Examine Package and Equipment for Damage. Claims for material damaged in shipment must be notified immediately to the dealer.
- For future reference record in the table below your equipment identification information. Model Name, Code & Serial Number can be found on the machine rating plate.

Model Name:
Code & Serial number:
Date & Where Purchased:

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Technical Specifications

CRUISER™ (CE) (K3048-1)

Wire Feeders - Input Voltage and Current				
VOLTAGE		INPUT AMPERES		
40 VDC		8 AMPS		
Rated Output				
DUTY CYCLE		AMPERES		
100%		1000 AMPS		
Physical Dimensions (as shipped from the factory)* (Overall Size and Weight Dependent Upon Configuration)				
MODEL	HEIGHT	WIDTH	DEPTH	WEIGHT
K3048-1	736 mm	548 mm	914 mm	94 kg
Temperature Ranges				
Operating Temperature		(-40°C to +50°C)		
Storage Temperature		40°C to +85°C		
SAW				
GEARING	WFS Range		Wire Sizes	
57:1	1.3 to 12.5 m/min		1.6 to 2.4 mm	
95:1	0.4 to 7.5 m/min		1.6 to 2.4 mm	
142:1*	0.4 to 5.0 m/min		1.6 to 2.4 mm	

* = gearing installed in the wire drive as equipped from the factory.

IP23S

Electromagnetic Compatibility (EMC)

Conformance

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

Introduction

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

WARNING

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



Installation and Use

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

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

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

Assessment of Area

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

- a) other supply cables, control cables, signaling and telephone cables; above, below and adjacent to the welding equipment;
- b) radio and television transmitters and receivers;
- c) computer and other control equipment;
- d) safety critical equipment, e.g., guarding of industrial equipment;
- e) the health of the people around, e.g., the use of pacemakers and hearing aids;
- f) equipment used for calibration or measurement
- g) the immunity of other equipment in the environment. The user shall ensure that other equipment being used in the environment is compatible. This may require additional protection measures;
- h) the time of day that welding or other activities are to be carried out.

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

Methods of Reducing Emissions

Public Supply System

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

Maintenance of the Welding Equipment

The welding equipment should be routinely maintained according to the manufacturer's recommendations. All access

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

Welding Cables

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

Equipotential Bonding

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

Earthing of the Workpiece

Where the workpiece is not bonded to earth for electrical safety, not connected to earth because of its size and position, e.g., ships hull or building steelwork, a connection bonding the workpiece to earth may reduce emissions in some, but not all instances. Care should be taken to prevent the earthing of the workpiece increasing the risk of injury to users, or damage to other electrical equipment. Where necessary, the connection of the workpiece to earth should be made by a direct connection to the workpiece, but in some countries where direct connection is not permitted, the bonding should be achieved by suitable capacitance, selected according to national regulations.

Screening and Shielding












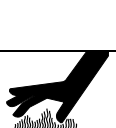
Selective screening and shielding of other cables and equipment in the surrounding area may alleviate problems of interference. Screening of the entire welding installation may be considered for special applications¹.

1 Portions of the preceding text are contained in EN 60974-10: "Electromagnetic Compatibility (EMC) product standard for arc welding equipment."



WARNING

This equipment must be used by qualified personnel. Be sure that all installation, operation, maintenance and repair procedures are performed only by qualified person. Read and understand this manual before operating this equipment. Failure to follow the instructions in this manual could cause serious personal injury, loss of life, or damage to this equipment. Read and understand the following explanations of the warning symbols. Lincoln Electric is not responsible for damages caused by improper installation, improper care or abnormal operation.

	WARNING: This symbol indicates that instructions must be followed to avoid serious personal injury, loss of life, or damage to this equipment. Protect yourself and others from possible serious injury or death.
	READ AND UNDERSTAND INSTRUCTIONS: Read and understand this manual before operating this equipment. Arc welding can be hazardous. Failure to follow the instructions in this manual could cause serious personal injury, loss of life, or damage to this equipment.
	ELECTRIC SHOCK CAN KILL: Welding equipment generates high voltages. Do not touch the electrode, work clamp, or connected work pieces when this equipment is on. Insulate yourself from the electrode, work clamp, and connected work pieces.
	ELECTRICALLY POWERED EQUIPMENT: Turn off input power using the disconnect switch at the fuse box before working on this equipment. Ground this equipment in accordance with local electrical regulations.
	ELECTRICALLY POWERED EQUIPMENT: Regularly inspect the input, electrode, and work clamp cables. If any insulation damage exists replace the cable immediately. Do not place the electrode holder directly on the welding table or any other surface in contact with the work clamp to avoid the risk of accidental arc ignition.
	ELECTRIC AND MAGNETIC FIELDS MAY BE DANGEROUS: Electric current flowing through any conductor creates electric and magnetic fields (EMF). EMF fields may interfere with some pacemakers, and welders having a pacemaker shall consult their physician before operating this equipment.
	CE COMPLIANCE: This equipment complies with the European Community Directives.
	ARTIFICIAL OPTICAL RADIATION: According with the requirements in 2006/25/EC Directive and EN 12198 Standard, the equipment is a category 2. It makes mandatory the adoption of Personal Protective Equipments (PPE) having filter with a protection degree up to a maximum of 15, as required by EN169 Standard.
	FUMES AND GASES CAN BE DANGEROUS: Welding may produce fumes and gases hazardous to health. Avoid breathing these fumes and gases. To avoid these dangers the operator must use enough ventilation or exhaust to keep fumes and gases away from the breathing zone.
	ARC RAYS CAN BURN: 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. Use suitable clothing made from durable flame-resistant material to protect you skin and that of your helpers. Protect other nearby personnel with suitable, non-flammable screening and warn them not to watch the arc nor expose themselves to the arc.
	WELDING SPARKS CAN CAUSE FIRE OR EXPLOSION: Remove fire hazards from the welding area and have a fire extinguisher readily available. Welding sparks and hot materials from the welding process can easily go through small cracks and openings to adjacent areas. Do not weld on any tanks, drums, containers, or material until the proper steps have been taken to insure that no flammable or toxic vapors will be present. Never operate this equipment when flammable gases, vapors or liquid combustibles are present.
	WELDED MATERIALS CAN BURN: Welding generates a large amount of heat. Hot surfaces and materials in work area can cause serious burns. Use gloves and pliers when touching or moving materials in the work area.

	SAFETY MARK: This equipment is suitable for supplying power for welding operations carried out in an environment with increased hazard of electric shock.
	CYLINDER MAY EXPLODE IF DAMAGED: 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. Always keep cylinders in an upright position securely chained to a fixed support. Do not move or transport gas cylinders with the protection cap removed. Do not allow the electrode, electrode holder, work clamp or any other electrically live part to touch a gas cylinder. Gas cylinders must be located away from areas where they may be subjected to physical damage or the welding process including sparks and heat sources.
	EQUIPMENT WEIGHT OVER 30kg: Move this equipment with care and with the help of another person. Lifting may be dangerous for your physical health.

The manufacturer reserves the right to make changes and/or improvements in design without upgrade at the same time the operator's manual.

Installation and Operator Instructions

Read this entire section before installation or operation of the machine.

General Physical Description

The CRUISER™ is a self propelled, modular platform for performing submerged arc welds. A unique tube and clamp design provides flexibility to mount the feeding components in any position.

Wire is fed to the arc with the proven wire drive. All of the drive rolls, nozzles, contact tips and wire straighteners are common between the MaxSA wire drives and the CRUISER™ wire drive. The wire drive rotates about two axes for setting torch drag/pull angle and torch tilt angle.

The wire drive is mounted to two heavy duty X-Y slides. The cross slides allow easy adjustment of the electrode stick-out and position of the wire in the joint.

The entire mast and arm structure separates from the base for portability and mobility purposes.

Driving the tractor is a permanent magnet DC motor with a 5 stage gear box built with all metal gears. A high resolution encoder keeps the tractor speed consistent even at slow speeds. The wheels are made of a high temperature rubber specially bonded to an aluminum core. Also mounted on the axle are guide wheels and a gear for operating on K396 track sections.

The tractor may be configured for 3 or 4 wheel operation. The flexible wheel configuration allows the tractor to be assembled in a manner for optimum balance while aligning the wheels for the tracking of the joint.

All of the controls are housed in a light weight pendant that connects to the tractor via an ArcLink cable. The pendant housing is fabricated from aluminum to resist impacts and high temperatures.

General Functional Description

The CRUISER™ is a modular platform for submerged arc welding.

Recommended Processes

- SAW (AC, DC+, DC-) up to 1000 amps.
- Tiny Twin

Process Limitations

- The CRUISER™ does not support open arc procedures.

Equipment Limitations

- Curved extension nozzle limited to 3/16" wire.
- Inductance of the electrode and work cables may affect arc performance. Do not coil excess cable.
- For robust digital communications, do not use more than 200 feet of control cable.
- The CRUISER™ operates on 40 VDC only.
- There is no 115 VAC in the tractor.
- The minimum turning radius of the CRUISER™ is 10 feet when assembled with 3 wheels.
- The minimum turning radius of the CRUISER™ is 20 feet when assembled with 4 wheels.
- The rubber wheels are rated to 500°F (260°C)
- The laser pointer mounting bracket is not compatible with the tiny twin nozzle or K148 nozzle.

Recommended Power Sources

- Power Wave AC/DC 1000

Design Features

Loaded with Standard Features

Arc Performance

- The CRUISER™ and Power Wave AC/DC 1000 combination provide for new levels of submerged arc productivity.

User Controls

- Light weight, hand-held pendant.
- Four memories for quick selection of common procedures.
- Full sequence control for tailoring the weld from start to end.
- All welding controls located at the pendant, including program selection.
- Laser pointer to aid in steering the CRUISER™.

Wire Drive

- Changeable gears for feeding small diameter wires at high speed and large diameter wires at low speed.
- High torque, permanent magnet DC motor with tachometer for accurate wire feed speed control.
- Three roll wire straightener included.
- Uses standard Lincoln submerged arc contact nozzles.

Tractor and Frame

- Configures to 3 or 4 wheels with patent pending design, for the best tracking and balancing.
- Permanent magnet DC motor with encoder for steady, accurate travel speeds.
- All steel gears for long life.
- Easily engaged travel clutch.
- Fully assembled for track use.
- High temperature rubber wheels for superior traction and heat resistance up to 500°F (260°C).
- Heavy duty slides for adjusting the electrode position in the joint.

Location



⚠ WARNING

ELECTRIC SHOCK can kill.

- Do not touch the wire drive, drive rolls, nozzle, wire coil, electrode or wire drive motor when welding output is ON.
- The tractor is an automatic piece of equipment that may be remotely controlled.
- Turn the input power OFF at the disconnect switch or fuse box before attempting to connect or disconnect input power lines, output cables or control cables.
- Do not operate with covers, panels or guards removed.
- Do not let the electrode or wire spool touch the tractor frame.
- Only qualified personnel should perform this installation.
- Insulate yourself from the work and ground.
- Always wear dry insulating gloves.

⚠ WARNING

MOVING PARTS can injure.

- Keep away from moving parts.
- Tractor parts may move suddenly when the bolts are loosened.
- All clamps and collars must be secured before operating.
- Configure the tractor for stable operation, with a full and empty flux hopper and a full and empty spool.

Maintain clearance between parts at electrode potential and all other tractor components. Parts that are at electrode potential are:

- Wire
- Wire spool
- Wire straightener rolls
- Brass Conduit bushing adapter
- 4 screw heads on back of the wire straightener
- Feed plate and drive rolls
- Contact nozzle assembly
- Nozzle extensions
- Contact Tip

Operate the CRUISER™ only on stable and dry surfaces.

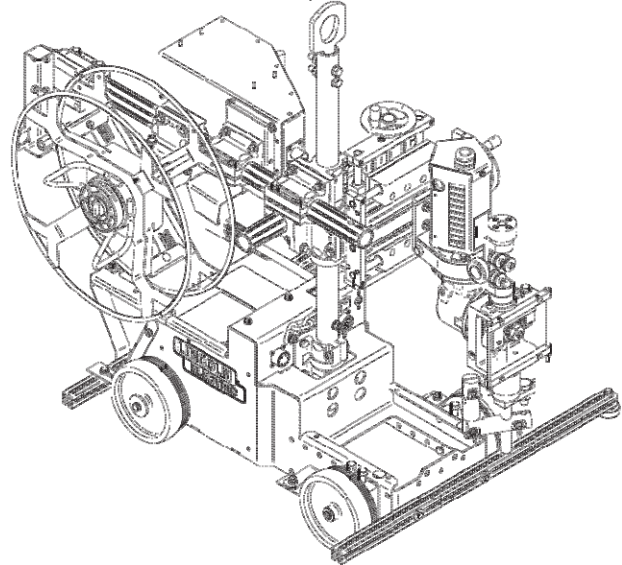
Operating the tractor on inclined surfaces requires adjusting and/or assembling the tractor differently than shipped from the factory.

Do not submerge the tractor.

It is the responsibility of the user/builder/operator to assemble the tractor to maintain safe electrical clearances and to be stable.

The tractor is rated for outdoor use (IP23S) with the wire reel enclosure installed.

Protect the CRUISER™ from preheat torches.



General Assembly



⚠ WARNING

ELECTRIC SHOCK can kill.

- Improperly secured clamps and collars may shift, causing parts at electrode potential to contact the tractor frame or other components.
- Only qualified personnel should install, use or service this equipment.



⚠ WARNING

FALLING EQUIPMENT can cause injury.

- Lift only with equipment of adequate capacity
- Be sure the machine is stable when lifting.
- Do not lift the machine if the lift bail is damaged.
- Do not operate machine while suspended from lift bail.
- Failure to properly secure the clamps, collars, chains and lift bail may result in physical injury.

Clamps

- Tighten clamp bolts to 25 ft-lbs (34 Nm).
- Use clamps with a key on horizontal tubes.

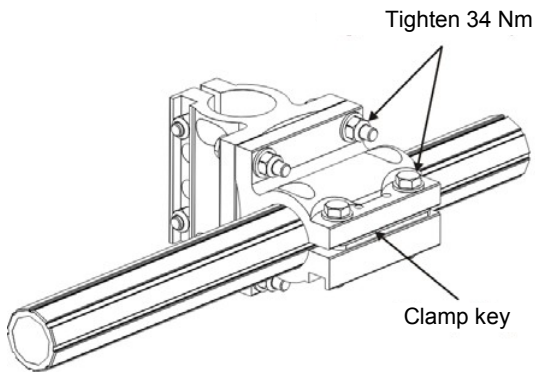


Figure 1

Collars

- Tighten collar screw to 42 in-lbs (0.3 Nm)

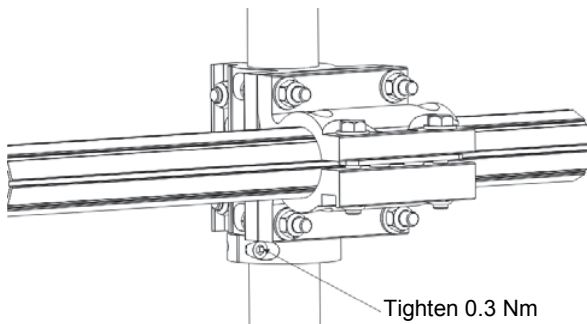


Figure 2

Lift Bail

- Tighten lift bail hardware to 24 in-lbs (0.17 Nm). Do not overtighten or the mast may become distorted.

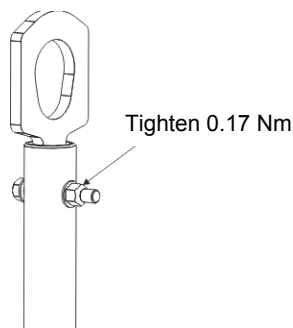


Figure 3

Chain and Mast Anchor

- The chain must be connected from the base to the mast before lifting.
- Tighten all hardware as shown.

Connect chain from base to mast

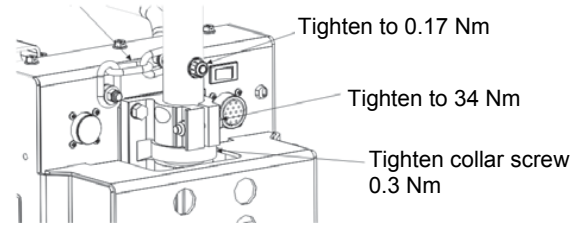


Figure 4

Front Wheels

In almost all configurations the front wheels must remain parallel with the Cruiser base and rear wheels (See Figure 5). Improper adjustment of the front wheels will cause inconsistent tracking of the joint, accelerate wheel wear, poor operation on K396 track and may lead to travel motor overload errors.

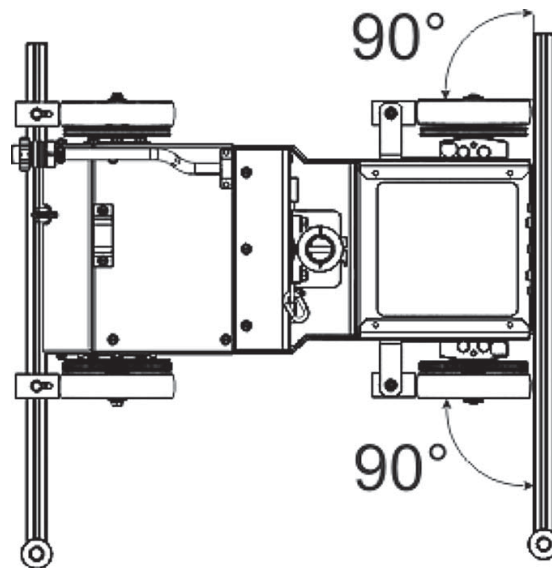


Figure 5: Front Wheels Configuration

Only adjust the front wheels when welding a round inside or outside seam 25 feet (7.6m) in diameter or smaller (See Figure 6). At all other times the front wheels must be set to 90°.

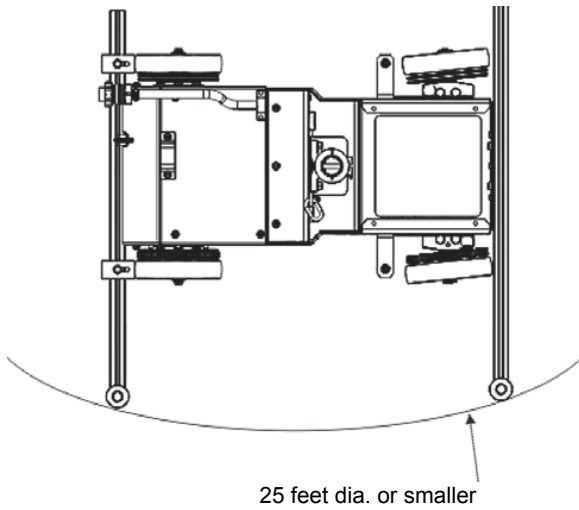


Figure 6: Round 25 Foot Dia. seam

See Figure 7. To steer the front wheel to the left, loosen bolt A and tighten bolt B to set the angle, then snug bolt A.

To steer the front wheel to the right, loosen bolt B and tighten bolt A to set the angle, then snug bolt B.

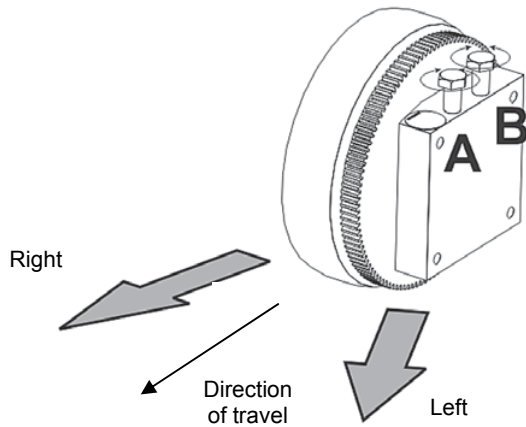


Figure 7: Setting the Angle

Outriggers

The outriggers “steer” the CRUISER™ along a vertical surface by driving it at a slight angle. Suggested offset between the front and rear outriggers is $\frac{1}{2}$ ” (12.7mm). Larger offsets increase the friction driving the CRUISER™ forward and may cause travel motor overcurrent errors and rapid wheel wear. When assembling the CRUISER™, adjust the cross slide to the middle position and position the wire in the joint. Then assemble the front and rear outriggers, and make fine adjustments to the wire position using the cross slide.

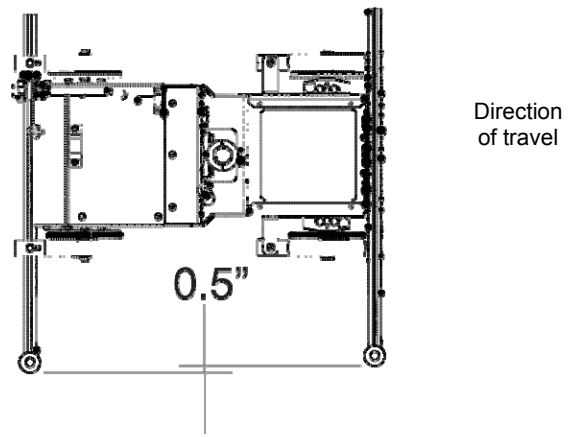
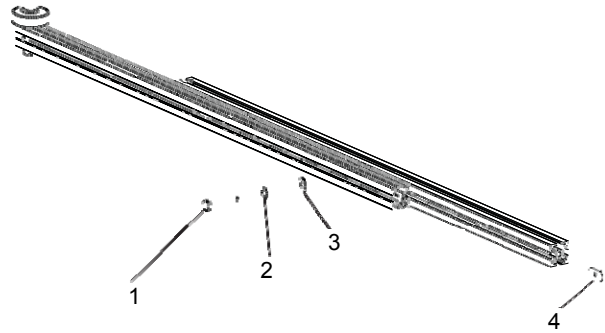


Figure 8

The outriggers may be stacked to gain extra length. Slide a T Nut (S28835) into the extrusion and then insert a $\frac{1}{4}$ -20 bolt through the outrigger slots.

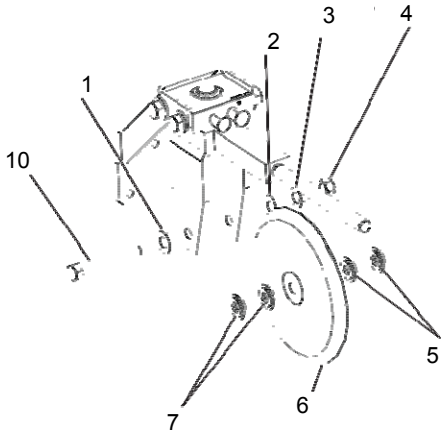


1. $\frac{1}{4}$ -20 Bolt
2. Lockwasher
3. Plain washer
4. T Nut (S28835)

Figure 9: Outriggers Extension

Manual Steering Mechanism, Assembly

As shipped from the factory, the manual steering mechanism is assembled with a guide wheel for tracking in a butt joint. The guide wheel may be replaced with a rubber wheel for manual steering.



1. Plain washer
2. Plain washer
3. Lock washer
4. Hex Nut
5. T1126-B Bushing
6. S7393-2 Guide wheel
7. T11267-B Bushing
8. S17073-5 Wheel
9. S17073-5A Bushing
10. 3/8-16 x 2.5 Bolt

Figure 10

Manual Steering Mechanism, Adjustment

To steer the CRUISER™ to the Right:

- Loosen bolt B
- Tighten bolt A to set the wheel angle.
- Snug bolt B

To steer the CRUISER™ to the Left:

- Loosen bolt A
- Tighten bolt B to set the wheel angle
- Snug bolt A

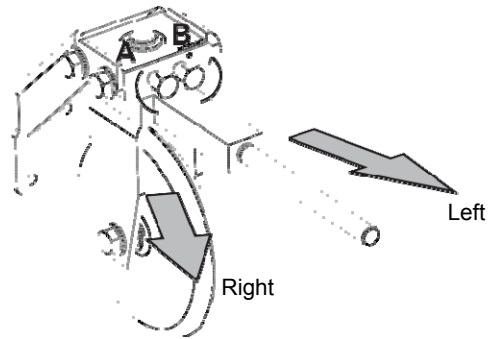
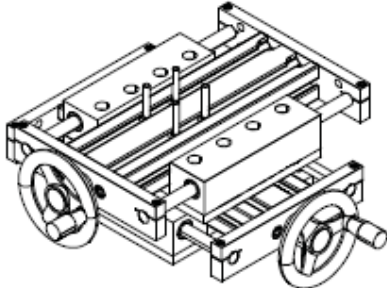


Figure 11: Adjustment

Cross Slide

Each slide has 4" (102mm) of travel. When assembling the CRUISER™, verify that no components at electrode potential contact the tractor frame and base. The slides may be disassembled and then positioned relative to each other.



Factory Position

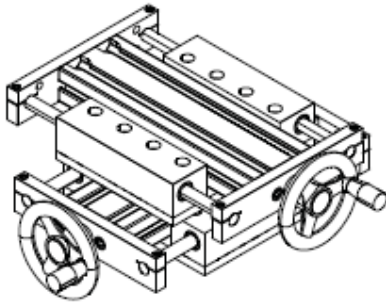
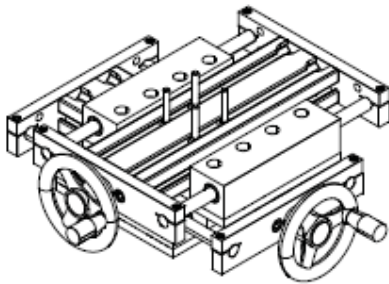


Figure 13: Several Possible Slide Configurations

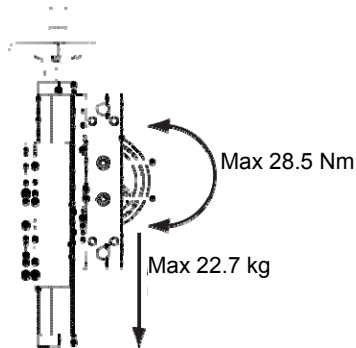


Figure 6: Load Limits

Wire Reel Spindle

- Position the wire reel spindle to prevent the reel and electrode from contacting the tractor frame and base.
- The wire reel spindle must be horizontal or oriented upwards.

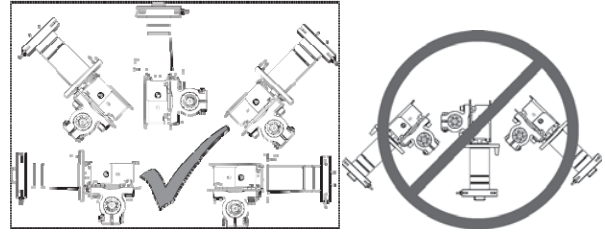
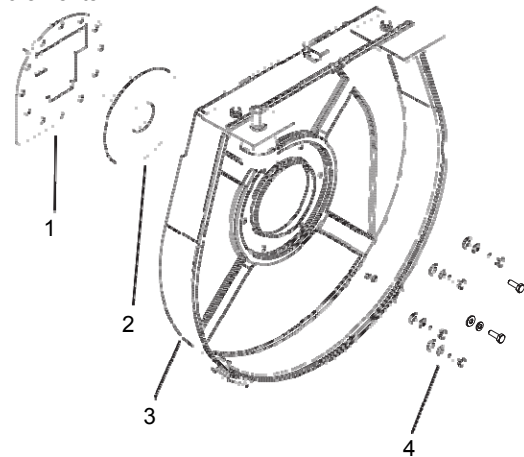


Figure 7

Wire Reel Enclosure Assembly for Codes Below 11947

1. Determine the angular orientation of the wire reel enclosure relative to the spindle clamp. To change the angle of the enclosure, remove the 6 bolts securing the enclosure back to the mounting bracket using a 7/16" wrench. Reassemble at the desired angle, keep the gasket centered relative to the enclosure back. Provisions are made to rotate the enclosure in 30° increments.



1. BRACKET
2. GASKET
3. ENCLOSURE BACK
4. HARDWARE

Figure 8: Enclose Assembly

2. Unscrew the spindle brake and remove the spindle brake parts and the spindle.

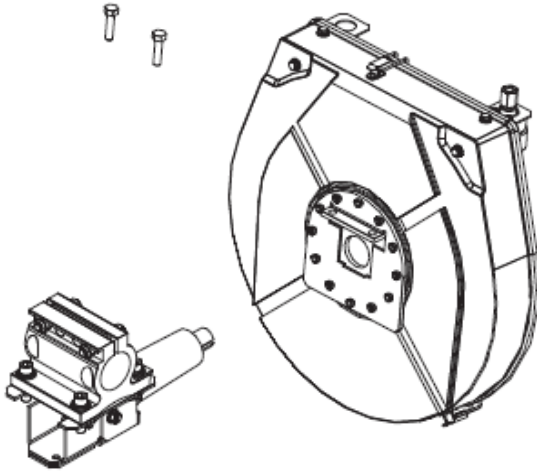
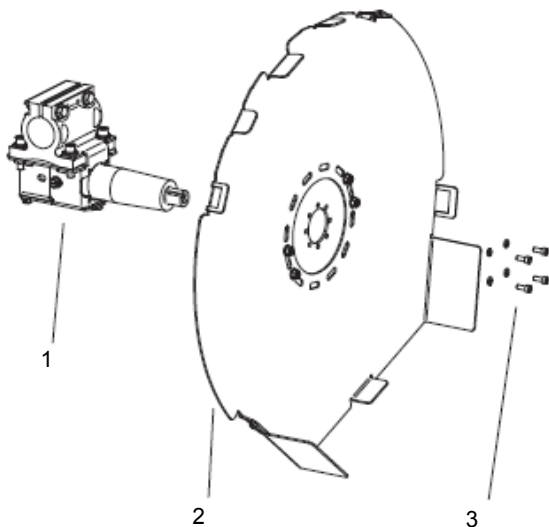


Figure 9: Enclosure Mounting

3. Remove two of the bolts from the spindle assembly using a 1/4" hex key. Assemble the enclosure back to the spindle assembly and tighten the bolts.

Wire Reel Enclosure Assembly for Code 11947 And Above

1. Remove the #10 screws and lockwashers from the spindle assembly using a 5/32" hex key.
2. Use the same hardware to fasten the enclosure backing plate to the assembly.
3. For correct wire feeding, the flat portion of the enclosure should be tilted toward the upright mast of the Cruiser.



1. SPINDLE ASSEMBLY
2. ENCLOSURE BACK
3. HARDWARE

Figure 10: Encloser Assembly

4. Reassemble the spindle parts as shown (all codes)

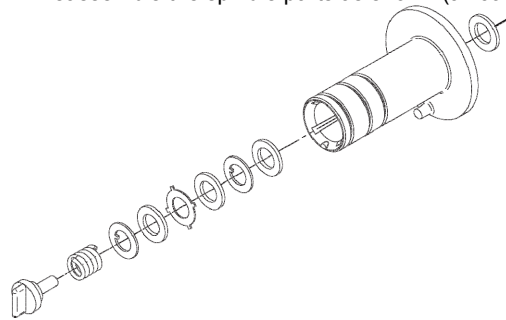


Figure 11: Spindle Parts

5. If required, swap the position of the ball bushing assembly. Use a 7/16" wrench to loosen and tighten the hardware.

6. Thread the conduit into the brass fitting on the ball bushing assembly. Then slide the boot along the conduit and over the brass fitting.

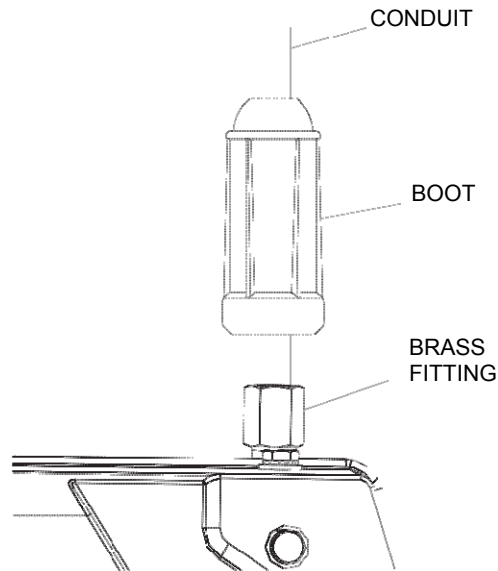


Figure 12: Conduit, Brass Fitting, Boot

7. When assembling the enclosure cover to the enclosure back, verify the cover is evenly seated all the way around.

Take-Off Arm

- Position the take off arm to prevent contact to the reel and electrode.
- Route the electrode through the conduit from the take off arm to the wire drive.

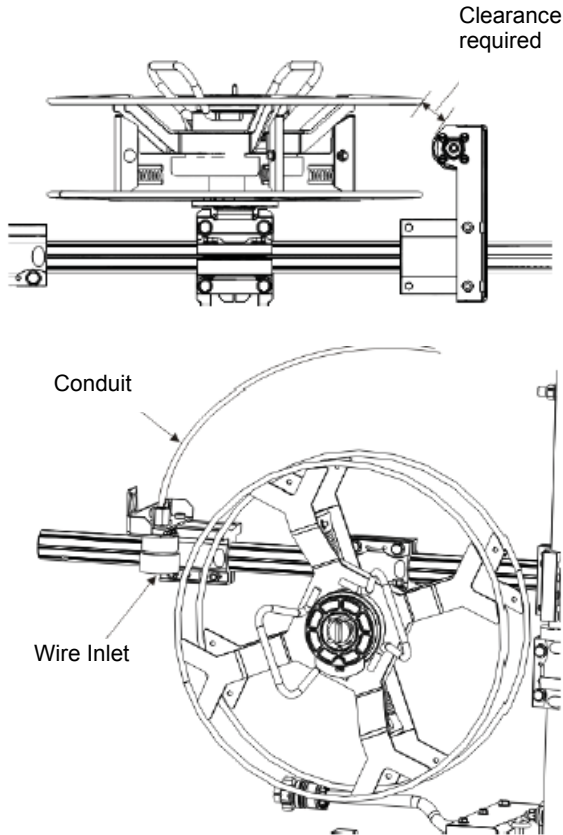


Figure 13

Wire Straightener Adjustment

The wire straightener controls the amount of cast (or "curve") in the wire. Excessive cast may effect alignment of the wire in the joint. Too little cast may result in insufficient wire contact in the contact tip.

To adjust the wire straightener:

1. Turn off power at the welding power source.
2. Loosen the two screws holding the wire straightener to the feed plate with a 1/4" hex key.

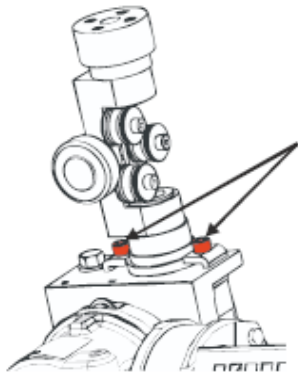


Figure 14: Wire Straightener Screws

3. Position the straightener as desired to remove or add cast to the wire.
4. Tighten the screws holding the wire straightener to the feed plate.
5. Turn power on at the welding power source.
6. Feed wire through the straightener. Adjust the amount of pressure on the wire with the straightener until the desired cast is achieved when the wire exits the tip.

NOTE: A slight curvature to the wire helps to maintain good electrical contact inside the contact tip.

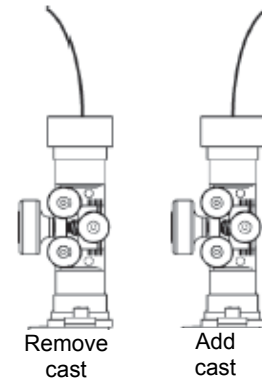


Figure 15: Wire Straightener

Feedplate Rotation

The feedplate of the wire drive may be rotated about the drive roll axis. Depending upon how the tractor is assembled, rotating the feed plate will change the tilt angle or the drag angle.

1. Turn off power at the welding power supply.
2. Loosen the set screw on the feedplate with a 5/16" hex key.
3. Rotate the feedplate to the new position. Do not allow surfaces at electrode potential to touch the frame, flux hopper, base or slides of the tractor.
4. Tighten the set screw to secure the feedplate.
5. As equipped from the factory, the tractor is set-up with "A" as the inlet and "B" as the outlet. To make "B" the inlet and "A" the outlet, see the SET-UP MENU.

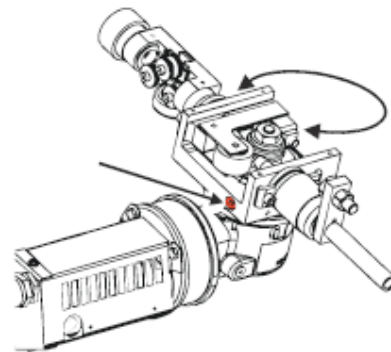


Figure 16

Flux Hopper

The flux hopper may be mounted on either a horizontal or vertical tube, or on the wire drive. For the best flow of flux, keep the hose from the hopper to the nozzle as vertical as possible.

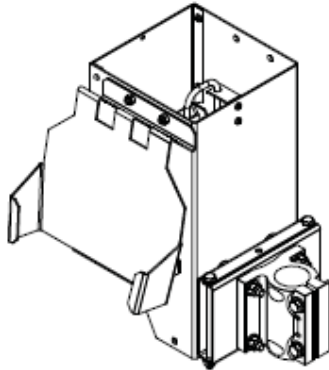


Figure 17: Vertical Tube Mounting

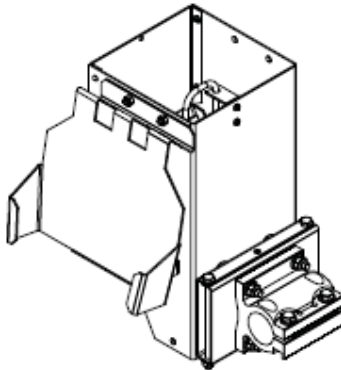


Figure 18: Horizontal Tube Mounting

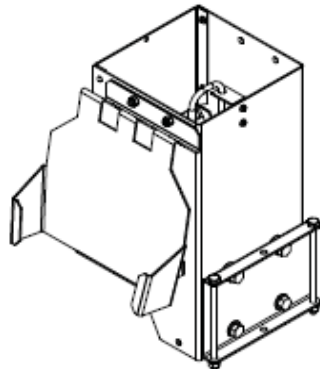


Figure 19: Wire Drive Mounting

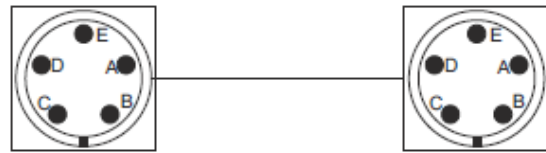
Cables

ArcLink Control Cables

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 feet (61 m) of control cable between components.



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

Figure 20: ArcLink Control Cables

Cable Connections

Weld Cable Sizes

Tabulated 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.

RECOMMENDED CABLE SIZES (RUBBER COVERED COPPER RATED 75°C)**						
Amperes	Percent Duty Cycle	CABLE SIZES FOR COMBINED LENGTHS OF ELECTRODE AND WORK CABLES				
		0 to 50 Ft.	50 to 100 Ft.	100 to 150 Ft.	150 to 200 Ft.	200 to 250 Ft.
600	60	3/0	3/0	3/0	4/0	2-3/0
600	80	2-1/0	2-1/0	2-1/0	2-2/0	2-3/0
600	100	2-1/0	2-1/0	2-1/0	2-2/0	2-3/0
650	60	3/0	3/0	4/0	2-2/0	2-3/0
650	80	2-1/0	2-1/0	2-1/0	2-2/0	2-3/0
700	100	2-2/0	2-2/0	2-3/0	2-3/0	2-4/0
800	80	3-1/0	3-1/0	3-1/0	2-3/0	2-4/0
800	100	2-3/0	2-3/0	2-3/0	2-3/0	2-4/0
1000	80	2-4/0	2-4/0	2-4/0	2-4/0	4-2/0
1000	100	3-3/0	3-3/0	3-3/0	3-3/0	3-3/0
1200	80	3-4/0	3-4/0	3-4/0	3-4/0	3-4/0
1200	100	4-4/0	4-4/0	4-4/0	4-4/0	4-4/0
1500	80	4-4/0	4-4/0	4-4/0	4-4/0	4-4/0
1500	100	5-4/0	5-4/0	5-4/0	5-4/0	5-4/0

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

System Set-Up

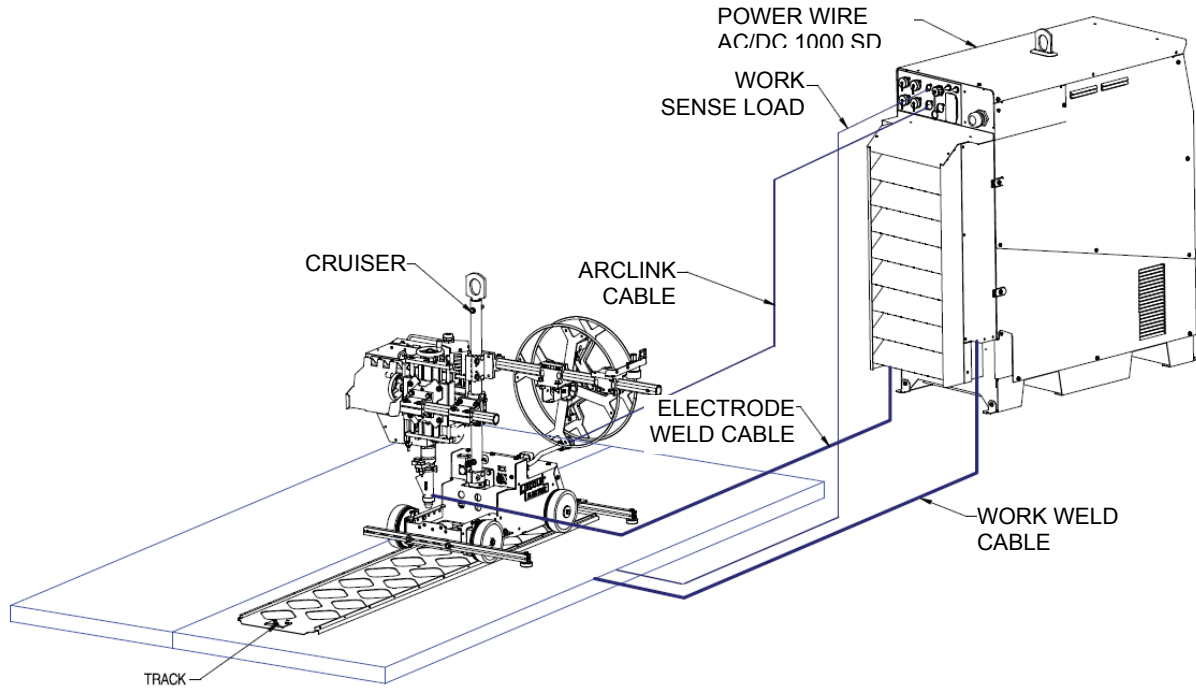
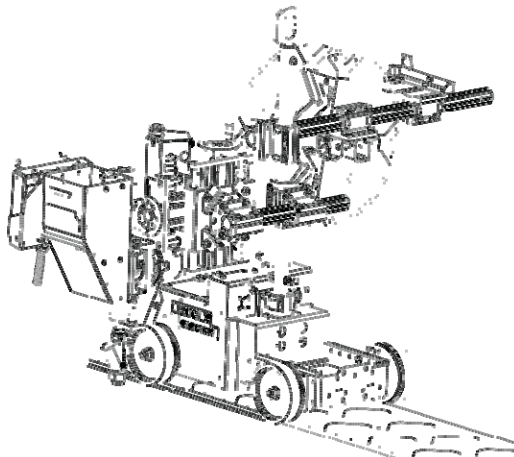


Figure 21; Syste, Set-Up

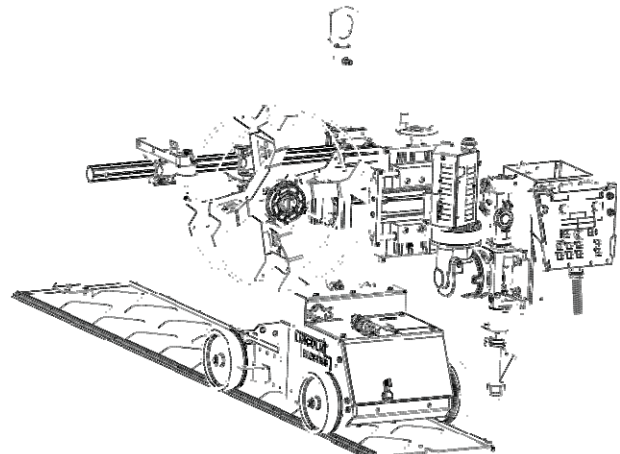
Butt Joints

Butt Joint, Track Welding

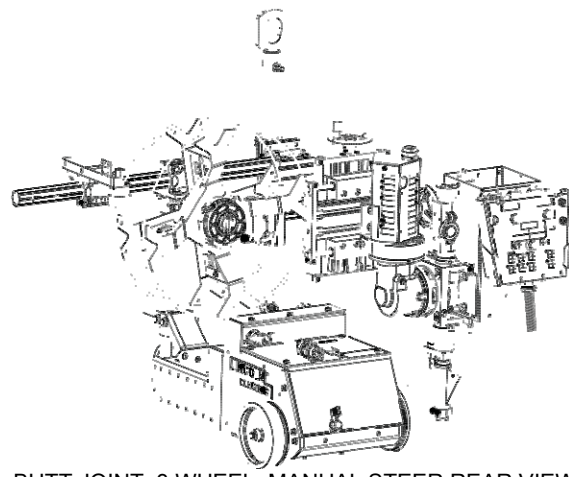
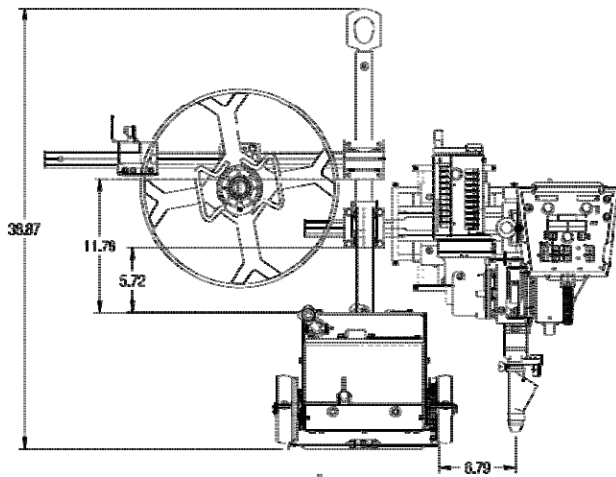
- When operating on K396 track, change the wheel calibration in the SET-UP menu to 5.65".



TRACK WELDING FRONT VIEW
Figure 22

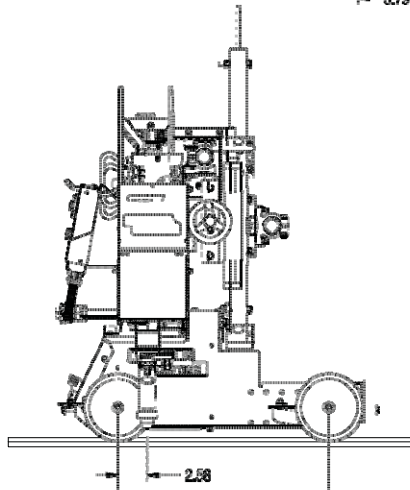


TRACK WELDING REAR VIEW
Figure 23



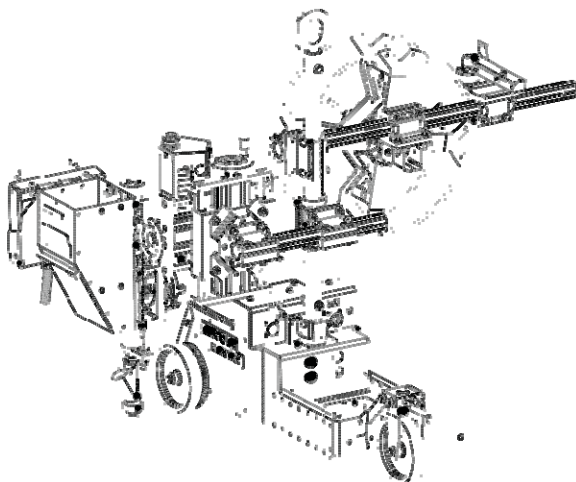
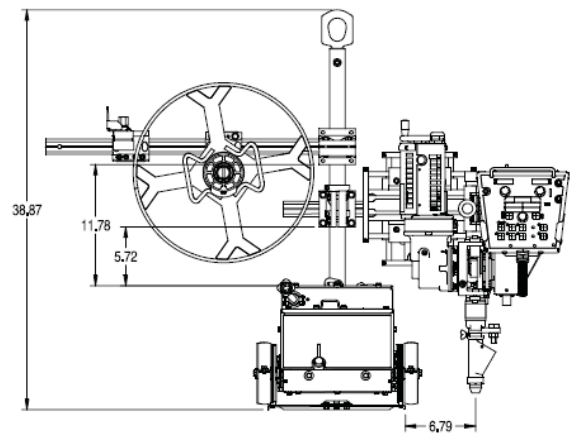
BUTT JOINT, 3 WHEEL, MANUAL STEER REAR VIEW

Figure 26



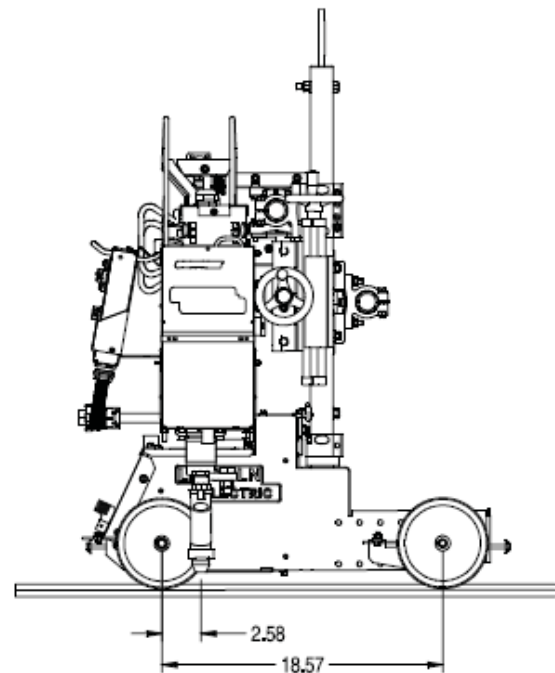
TRACK WELDING TOP VIEW

Figure 24



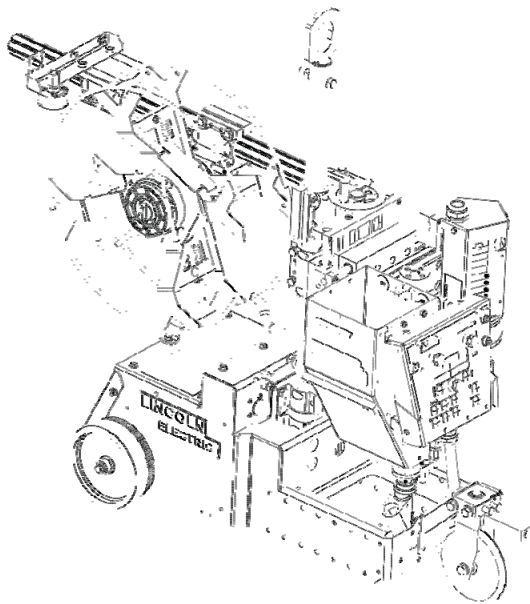
BUTT JOINT, 3 WHEEL, MANUAL STEER FRONT VIEW

Figure 25

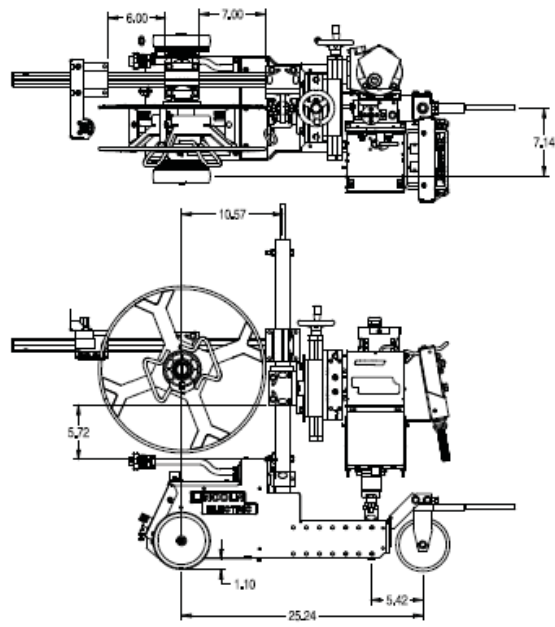


BUTT JOINT, 3 WHEEL, MANUAL STEER TOP VIEW

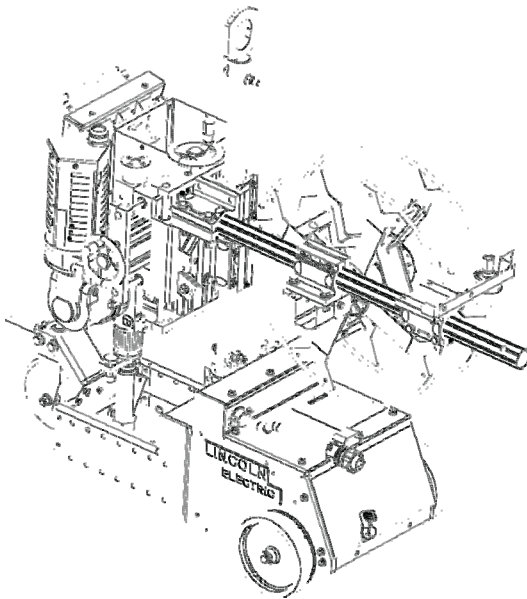
Figure 27



BUTT JOINT, 3 WHEEL, GUIDE WHEEL, FRONT VIEW
Figure 28



BUTT JOINT, 3 WHEEL, GUIDE WHEEL, TOP VIEW
Figure 30

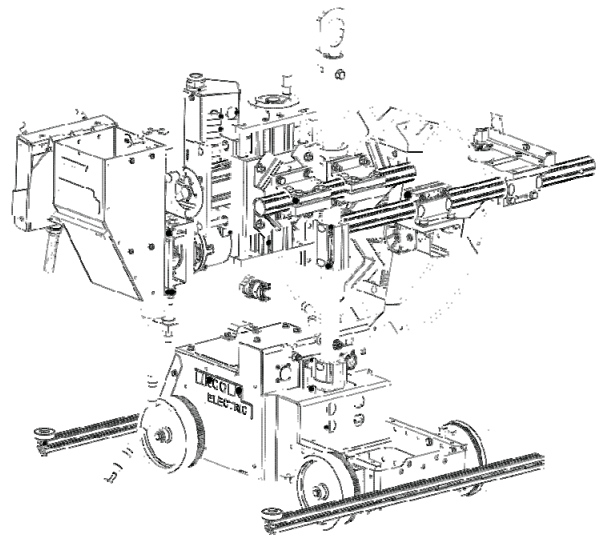


BUTT JOINT, 3 WHEEL, GUIDE WHEEL, REAR VIEW
Figure 29

Fillet Joints

Horizontal Fillet

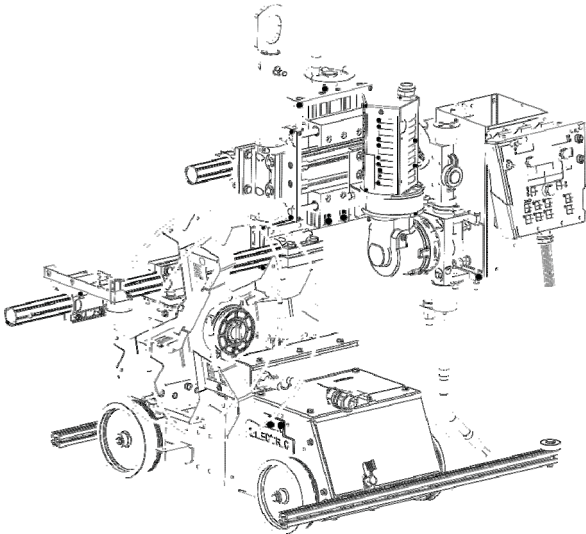
Uses KP2721-2 curved nozzle extension (45°).



HORIZONTAL FILLET, CURVED NOZZLE
EXTENTION, FRONT VIEW
Figure 31

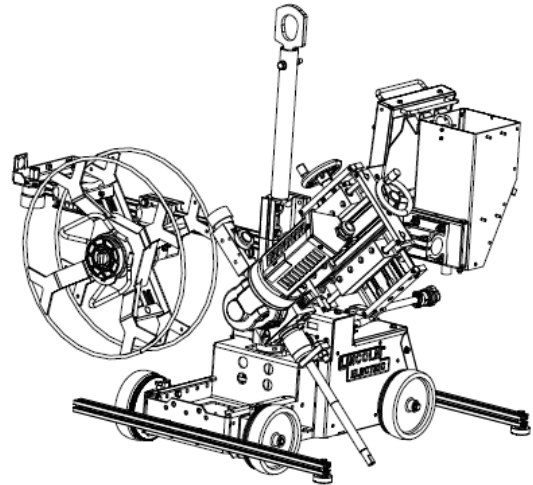
HORIZONTAL FILLET

Uses KP2721-1 straight nozzle extensions.



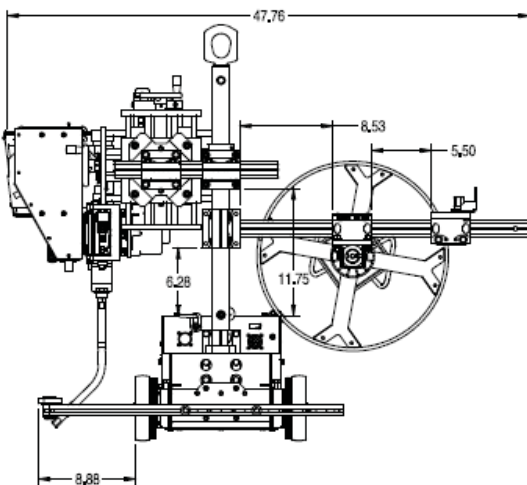
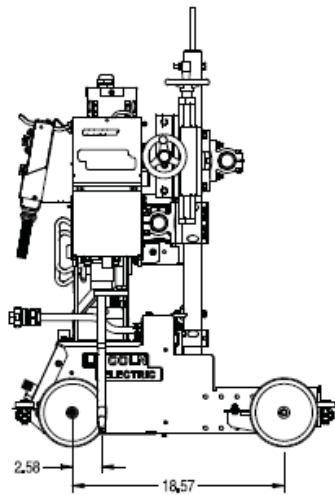
HORIZONTAL FILLET, CURVED NOZZLE
EXTENTION, REAR VIEW

Figure 32



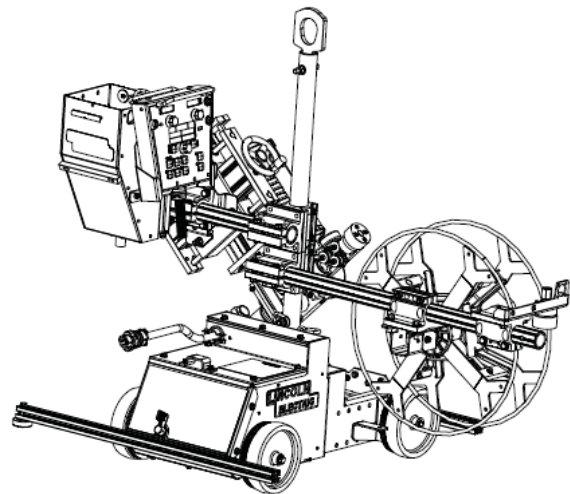
HORIZONTAL FILLET, STRAIGHT NOZZLE
EXTENTION, FRONT VIEW

Figure 34



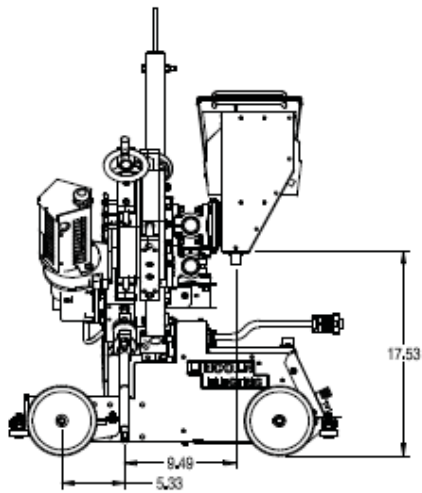
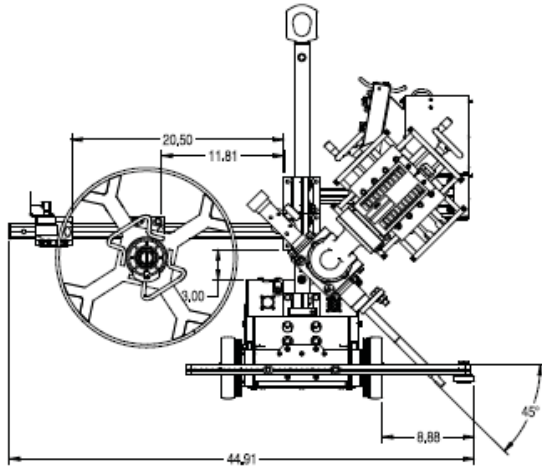
HORIZONTAL FILLET, CURVED NOZZLE
EXTENTION, TOP VIEW

Figure 33



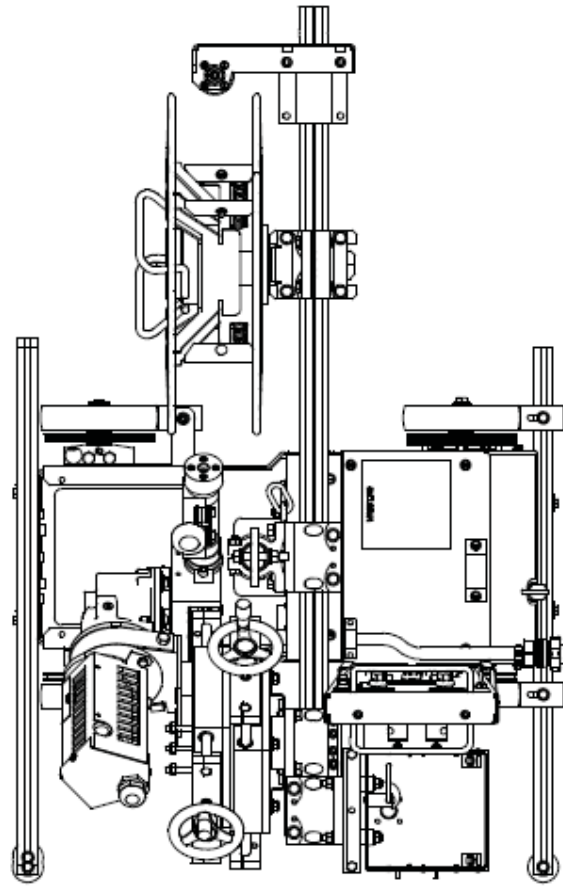
HORIZONTAL FILLET, STRAIGHT NOZZLE
EXTENTION, REAR VIEW

Figure 35



HORIZONTAL FILLET, STRAIGHT NOZZLE
EXTENTION, TOP VIEW

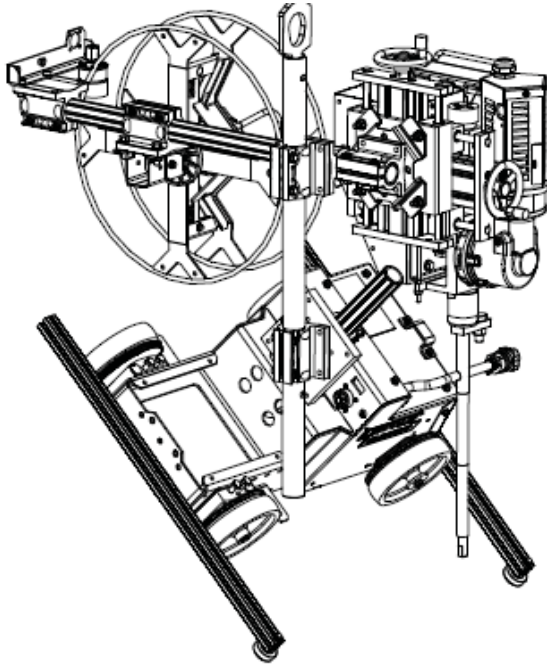
Figure 36



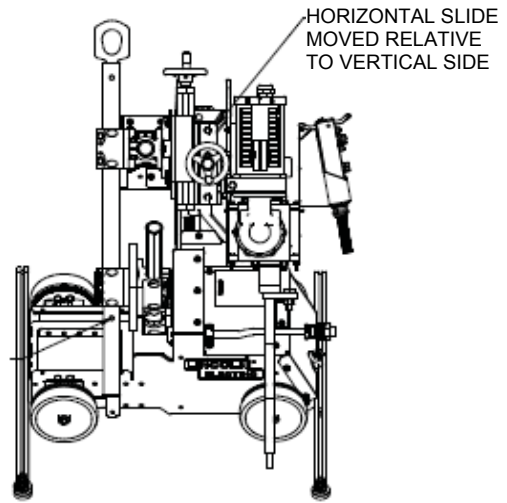
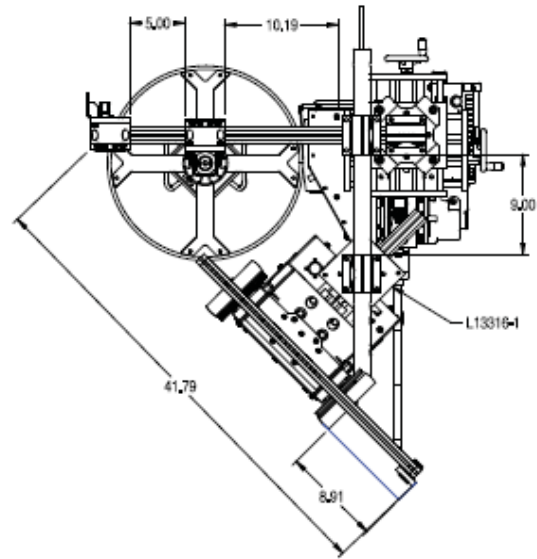
HORIZONTAL FILLET TOP VIEW

Figure 37

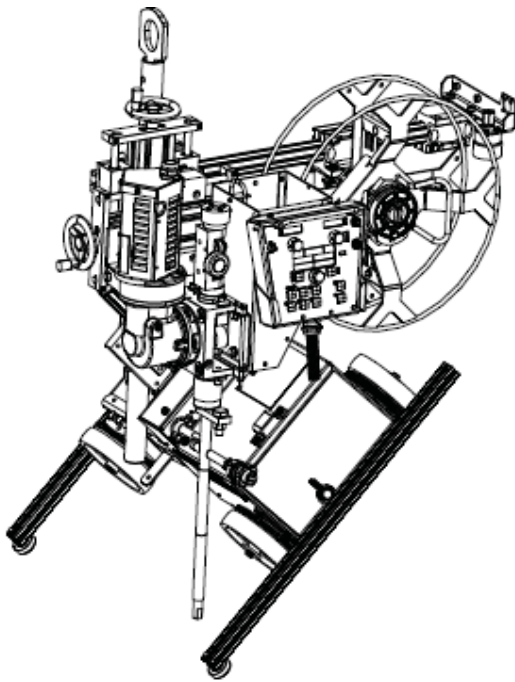
FLAT FILLET (TROUGH)



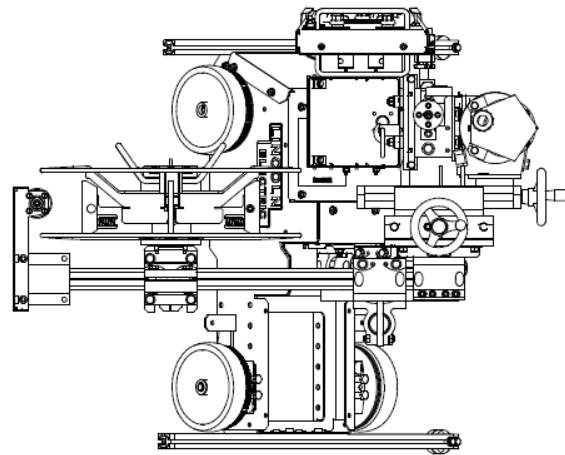
FLAT FILLET (TROUGH) FRONT VIEW
Figure 38



FLAT FILLET TOP VIEW
Figure 40



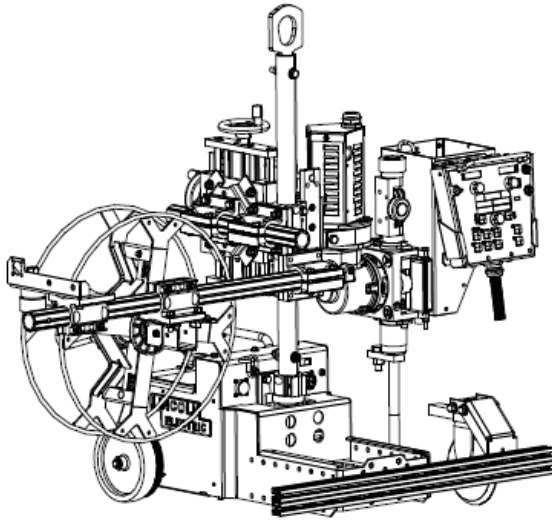
FLAT FILLET (TROUGH) REAR VIEW
Figure 39



FLAT FILLET TOP VIEW
Figure 41

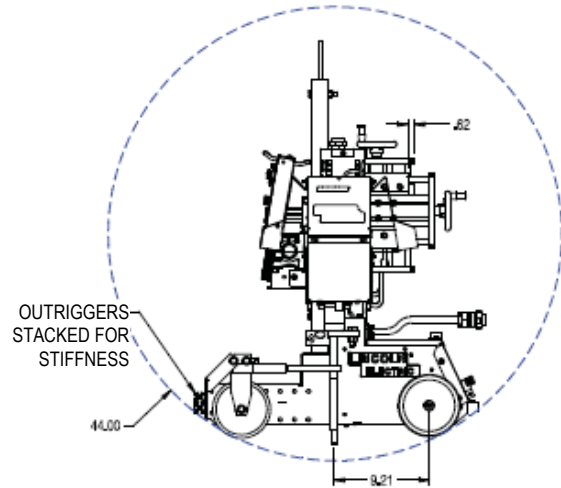
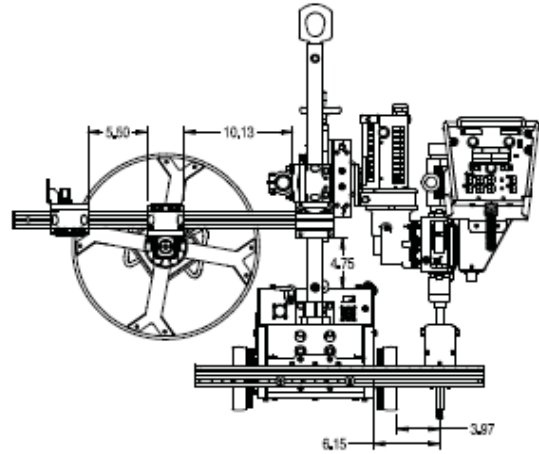
Pipe Welding

Internal inner diameter welds. The CRUISER™ may be assembled to fit inside pipes with a 44" (1.1m) inner diameter.



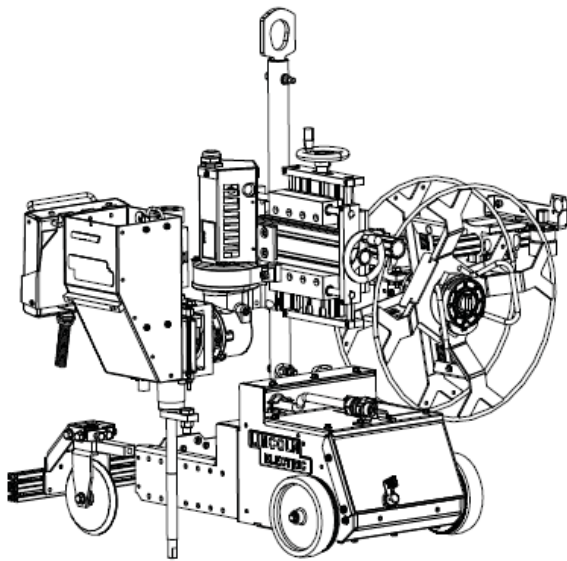
PIPE WELDING FRONT VIEW

Figure 42



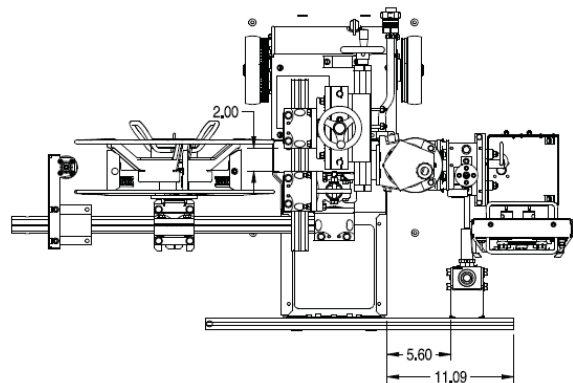
PIPE WELDING TOP VIEW

Figure 44



PIPE WELDING REAR VIEW

Figure 43

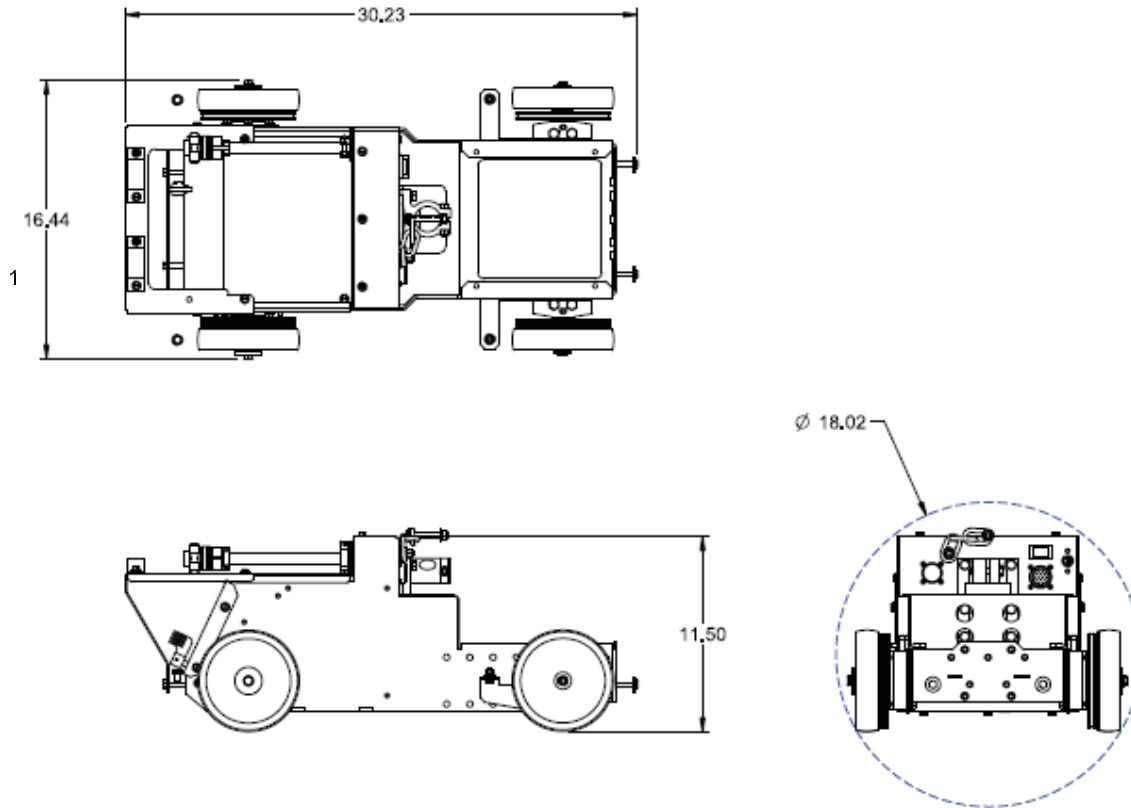


PIPE WELDING TOP VIEW

Figure 45

Base Dimensions Only

Figure 49



Safety Precautions, Operation



⚠ 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.
- Do not allow parts at electrode potential to touch the tractor frame, cress slides, base flux hopper or other parts.
- Disengaging the clutch does not stop the welding arc.
- Always wear dry insulating gloves.



⚠ WARNING

MOVING PARTS can injure.


















- Do not leave the tractor unattended while it is welding or traveling.
- Electrode reel, drive rolls and wire straightener rolls turn during welding or

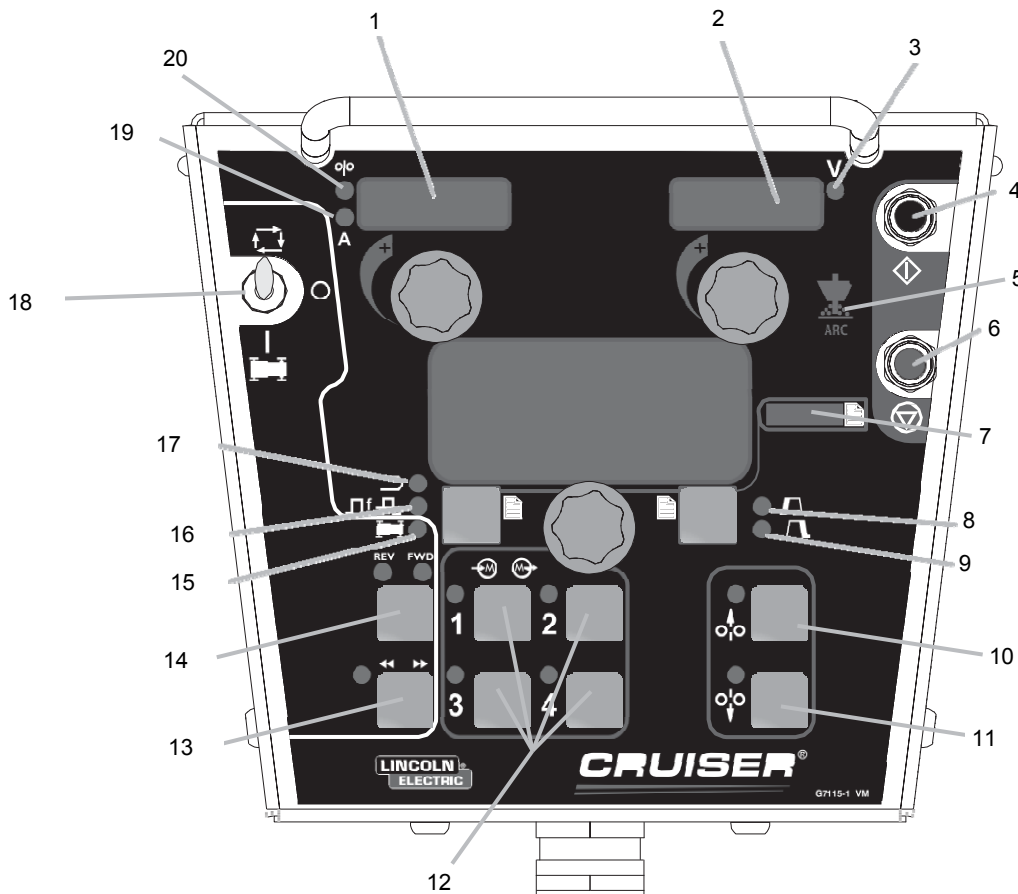
inching.

- Keep gloved hands away from rotating parts.
- Keep away from pinch points.
- Do not place the tractor on inclined surfaces with the clutch disengaged.
- Only qualified personnel should install, use or service this equipment.

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.

Graphic Symbols

	Arc Link Connector		Start Weld Sequence
	Automatic Operation		End Weld Sequence
	Off		Cruiser Tractor
	On		Clutch Engaged
	Jog		Memory Store
	Feed wire up		Memory Recall
	Feed Wire Down		Arc Start Options
	Finger crush warning		Arc End Options
			



- | | |
|-------------------------|--------------------------------|
| 1. WFS/Amps Display | 11. Inch Down |
| 2. Voltage/Trim Display | 12. Memories |
| 3. Volts LED | 13. Jog |
| 4. Start Pushbutton | 14. Travel Direction |
| 5. Arc Status | 15. Travel Menu |
| 6. Stop Pushbutton | 16. Frequency and Balance |
| 7. Set-Up menu | 17. Weld Mode Selection |
| 8. Arc Start Options | 18. Auto / OFF / Manual Travel |
| 9. Arc End Options | 19. AMPS LED |
| 10. Inch Up | 20. WFS LED |

Figure 46

Moving The Tractor

The tractor will not travel unless the clutch is engaged. To engage the clutch, rotate the handle upwards. To disengage the clutch, rotate the handle to the 3 o'clock position.

The travel speed is adjustable from 7 to 100 in/min (1.78 to 2.54 m/min). From 7 to 20 in/min, the travel speed may be set in 0.5 inch/min increments. Above 20 in/min, the travel speed adjusts at 1.0 inch/min increments.

To drive the tractor without welding:

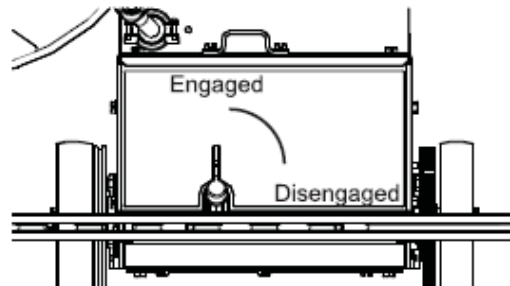


Figure 47

1. Engage the clutch at the rear of the tractor.

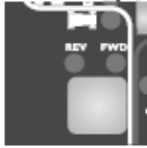


Figure 48: Travel Direction

2. Select either forward or reverse travel on the pendant.

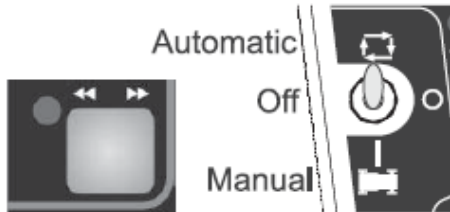


Figure 49: Job Button, Toggle Switch

3. Press and hold the jog button, or place the toggle switch in the MANUAL travel position.

Laser Pointer

⚠ CAUTION

- Class II laser radiation present. Do not stare into laser beam or view directly with optical instruments.

Laser pointer is used to aid in guiding the CRUISER™. The laser pointer mounts to the nozzle or nozzle extensions. Align the wire in the joint, then position the laser pointer approximately 3" (76mm) in front of the wire, also pointing into the joint.

Turn the laser off when not welding.

Touch Sense

⚠ WARNING



ELECTRIC SHOCK can kill.

- If the Touch Sense is enabled, the Power Source output is ON as long as the Feed Forward button is held. Avoid touching any portion of the weld circuit

while feeding.

The touch sense option, when enabled, allows the operator to feed the wire forward until it touches the workpiece. When contact to the work is made, the wire will stop.

If the touch sense option is disabled, the wire is "cold" during the Feed Forward time. It will not stop when it touches the work.

Power-Up Sequence

When power is first applied to the CRUISER™ the MODE SELECT Display reads "CRUISER™ Initializing...". Once the Power Wave AC/DC has initialized (20 to 60 seconds) a "lamp test" is performed.

- All discrete LED's, seven segment displays and alpha numeric displays will be turned ON for 2 seconds.
- After 2 seconds all displays are turned OFF again and the MSP Display will show:

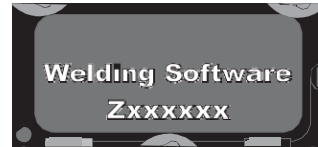


Figure 50: MSP Display

After initialization is complete, the MSP Display will show the weld mode. The upper displays will show the parameters that were selected when the machine was last powered down and the WELD MODE Indicator will be ON.

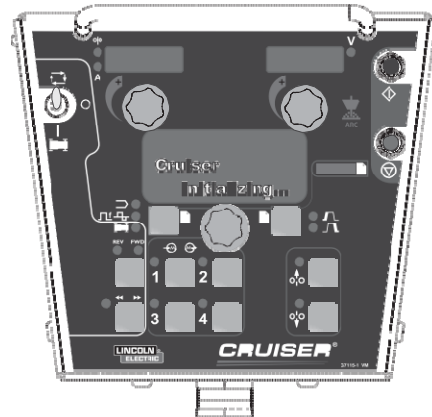


Figure 51: Weld Mode Indicator

Wire Feeder Setup

⚠ WARNING



ELECTRIC SHOCK can kill.

- Prior to inserting the wire, disable "Touch Sense" (P.15 in the Setup Menu).

Use the FEED FORWARD pushbutton to insert wire into the feed mechanism.

While pressing either the FEED FORWARD or FEED REVERSE pushbutton the MSP Display will read as shown and the preset wire feed speed will be displayed on the left (AMPS/WFS) display.

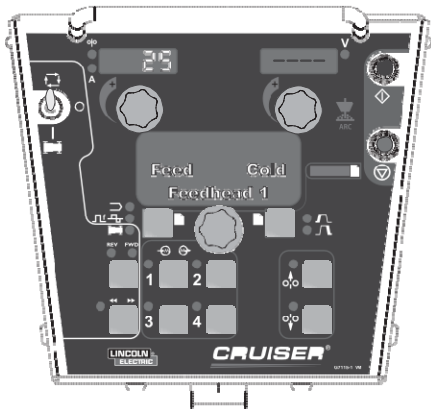


Figure 52: Feed Speed Display

The feed speed can be changed by adjusting the control knob below the display while pressing either button. Use FEED REVERSE to retract the wire from the feed mechanism. FEED FORWARD feeds the wire downward toward the work piece.

The CRUISER™ has an option in the Setup Menu (P.15) to enable the “Touch Sense” circuitry. See the Setup Menu. When P.15 is enabled and the FEED FORWARD button is pressed, the MSP Display will read:

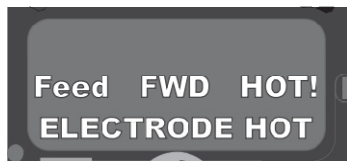


Figure 53: Hot Feed Feature

⚠ WARNING

This “Hot Feed” feature enables the output of the power source and there is voltage on the wire while feeding down. Avoid touching any exposed parts as defined in the SAFETY PRECAUTIONS.

Changing And Setting Weld Modes

To select a weld mode, press the WELD MODE SELECTOR button until the WELD MODE indicator comes ON (it may already be lit by default at power up). Turn the control knob to select the desired mode. After about 1 second, the parameters for the new mode will be displayed. These parameters can be adjusted with the control knobs below each display.

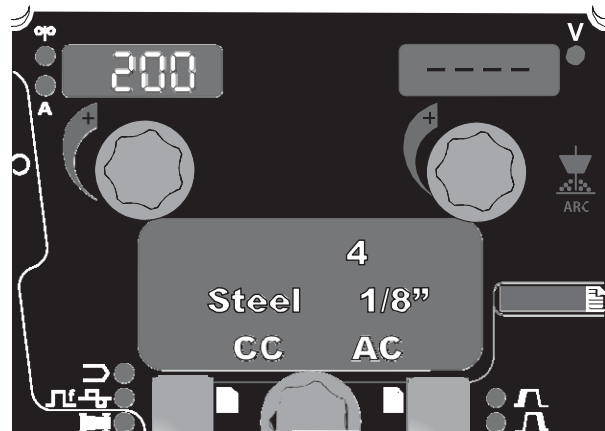


Figure 54: Setting Weld Modes

NOTE: CC Modes will show AMPS in the upper left display. CV Modes will show wire feed speed and the WFS indicator will be lit.

Frequency

Press the WELD MODE selector until the FREQUENCY/BALANCE indicator comes ON and the MSP Display reads “Frequency”. If the selected mode allows for frequency adjustment, the Control Knob can be used to select the desired frequency between 10 and 100hz.

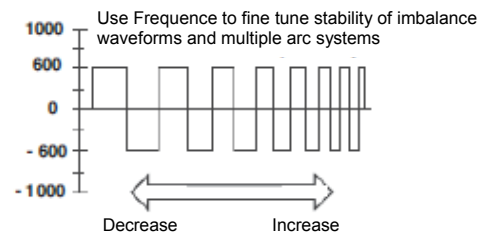


Figure 55: Frequency

Frequency adjustment can be used to fine tune stability of imbalanced waveforms and multiple arc system.

Balance Adjust

Press the WELD MODE selector until the MSP Display reads "Balance". If the selected mode allows for balance adjustment, the Control Knob can be used to select the desired wave balance through a range of 25% to 75%.

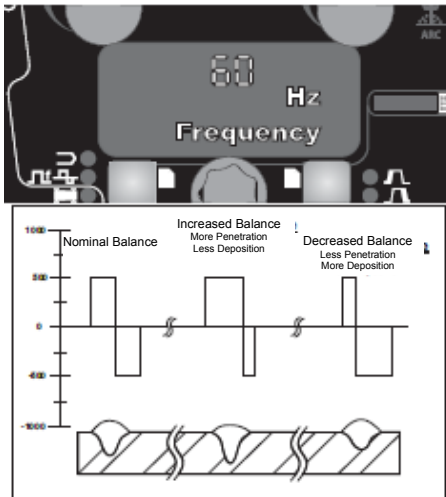


Figure 56: Balance Adjust

Adjusting the Balance (the ratio between Positive and Negative half cycle 'on time') changes the deposition for more efficient welding.

Offset Adjust

Press the WELD MODE selector until the MSP Display reads "Offset". If the selected mode allows for offset adjustment, the Control Knob can be used to select the desired offset. The amount of offset allowed is determined by the selected weld mode. Independent control of the Positive and Negative cycles allows for more precise control of penetration and deposition.

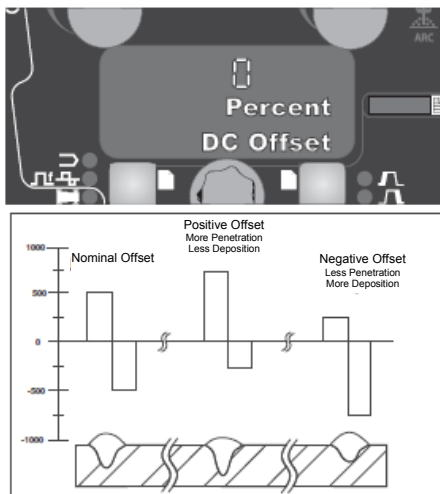


Figure 57: Offset Adjust

Weld Sequence

The weld sequence defines the weld procedure from beginning to end. All adjustments are made through the user interface.

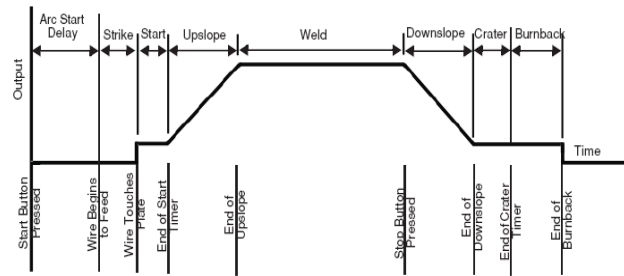


Figure 58: Weld Sequence

Start Options

The delay, strike, start and upslope parameters are used at the beginning of the weld sequence to establish a stable arc and provide a smooth transition to the welding parameters. They are described in the following:

- **ARC DELAY** inhibits the wire feed for up to 5 seconds to provide an accurate weld start point. Typically used in multi-arc systems.
- **STRIKE** settings are valid from the beginning of the sequence (Start) until the arc is established. They control run-in (speed at which the wire approaches the workpiece) and provide the power to establish the arc. Typically output levels are increased, and WFS is reduced during the strike portion of the weld sequence.
- **START** values allow the arc to become stabilized once it is established. Extended start times or improperly set parameters can result in poor starting.
- **UPSLOPE TIME** determines the amount of time it takes to ramp from the start parameters to the weld parameters. The transition is linear and may be up or down depending on the relationship between the start and weld settings.

Start Options Operation

Pressing the **Arc Start/End Options** pushbutton will illuminate the START OPTIONS LED and the Arc Delay Time parameter will show on the MSP Display.



Figure 59: Start Options Operation

Use the **Mode Select Panel Control** to select the desired delay time. Press the **Weld Mode Selector** to exit the Start parameters. Repeated pressing of the **Arc Start/End Options** pushbutton will scroll through the parameters. Turning the **Mode Select Panel Control**, while on a parameter will change its value. When a Start Option is set to a value other than OFF, the START OPTIONS LED will blink synchronous with the WFS or Amps and/or the Volts LED located on the Dual Display Panel prompting the user to enter these parameters. The parameters that can be set by the user in the START

OPTIONS will be as follows:

ARC DELAY TIME
STRIKE WFS
STRIKE TIME
START WFS/AMPS
START VOLTS
START TIME
UPSLOPE TIME

End Options

The downslope, crater, and burnback parameters are used to define the end of the weld sequence. They are defined in the following:

- **DOWNSLOPE** determines the amount of time it takes to ramp from the weld parameters to the crater parameters. The transition is linear and may be up or down depending on the relationship between the weld and crater settings.
- **CRATER** parameters are typically used to fill the crater at the end of the weld and include both time and output settings.
- **BURNBACK** defines the amount of time the output remains on after the wire has stopped. This feature is used to prevent the wire from sticking in the weld puddle and to condition the end of the wire for the next weld. A burnback time of 0.4 second is sufficient in most applications.
- **RESTRIKE TIME** determines how long the system will try to re-establish the arc in the event of a poor start or if the arc goes out for any reason (short circuit or open circuit). During restrike, the WFS and outputs are driven in an attempt to re-establish the arc.
 - A restrike time of 1 to 2 seconds is sufficient in most applications.
 - A restrike time of 0 seconds allows the restrike function to continue indefinitely.

End Options Operation

Pressing the **Arc Start/End Options** pushbutton after scrolling through the Start Options will illuminate the END OPTIONS LED and the Downslope Time parameter will show on the MSP Display.



Figure 60: End Options Operation

Use the **Mode Select Panel Control** to select the desired delay time. Press the **Weld Mode Selector** to exit the End parameters. Repeated pressing of the **Arc Start/End Options** pushbutton will toggle through the parameters. Turning the **Mode Select Panel Control** while on a parameter will change its value. When the Crater Time is set to a value other than OFF, the END OPTIONS LED will blink synchronous with the WFS or Amps LED (depending on CC or CV Weld Modes) and with the Volts LED located on the Dual Display Panel prompting the user to enter these parameters. The parameters that can be set by the user in the END

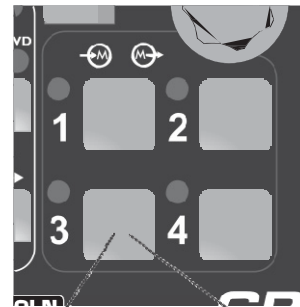
OPTIONS will be as follows:

DOWNSLOPE TIME
CRATER WFS/AMPS
CRATER VOLTS
CRATER TIME
BURNBACK TIME
RESTRIKE TIME

Memories

The CRUISER™ has 4 memories. Each memory stores :

- Weld Mode
- Amperage (or WFS)
- Voltage
- Travel Speed
- Frequency
- Balance
- DC Offset
- Arc Start Options
- Arc End Options



Recall a memory:
Press 1 second

Save a memory:
Press 2 seconds

Figure 61: Memories

Recall a memory with memory buttons

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

Save a memory with memory buttons

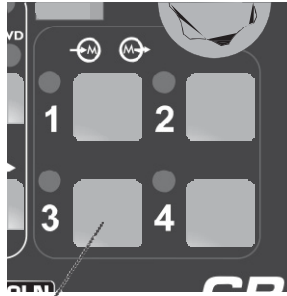
To save a memory, press and hold the desired memory button for two seconds. When the button is initially pressed, the corresponding LED will illuminate. After two seconds, the LED will turn off. Do not hold the button for more than 5 seconds when saving a user memory. Note that memories may be locked 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 memory may have a different set of limits. For example, memory 1 may limit the WFS to 100 through 120 in/min, and memory 2 may limit the WFS to 140 through 160 in/min, while memory 3 may have no WFS limits.

Parameters are constrained by machine limits, or by setting memory 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.



Set Limits:
Press 5 seconds

Figure 62: Limits

Limits may be set for:

- Wire Feed Speed
- Voltage
- Amperage
- Travel Speed
- Frequency
- Balance
- DC Offset
- Arc Start Options
- Arc End Options

Weld modes cannot be selected through the Limits Setup menu, 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.

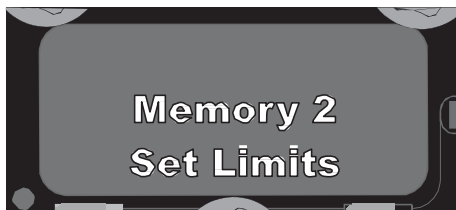


Figure 63: Memory Set Limits

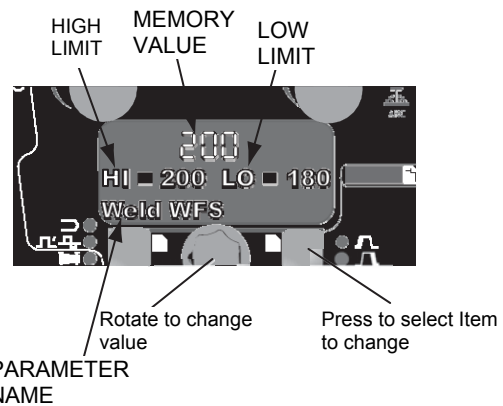


Figure 64: Memory Set Limit Display

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.

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.

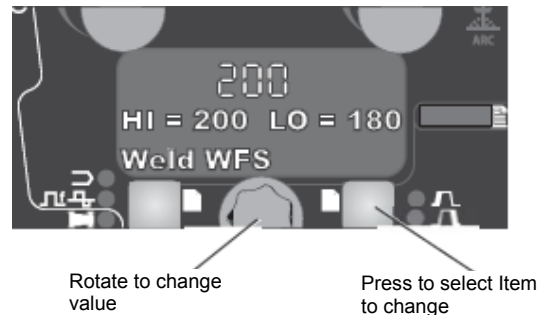


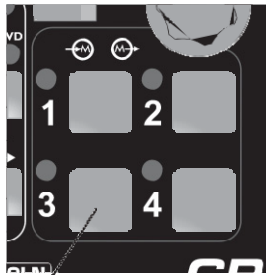
Figure 65: MSP4 Panel

The Limits Setup menu shows a list of all parameters available for the weld mode stored in the memory chosen

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 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



Enable Limits:
Press 10seconds

Figure 66: Enabling Limits

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



Figure 67: Enable/Disable Limits

SETUP will light and the MSP4 displays the following:

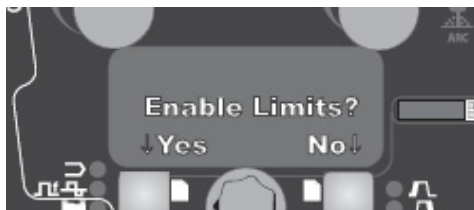


Figure 68: Enable/Disable Limits Display

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.

Dip Switches

The DIP switches on the pc boards are set at the factory and do not require adjustment.

Travel Board DIP Switches

All the DIP switches are in the OFF position.

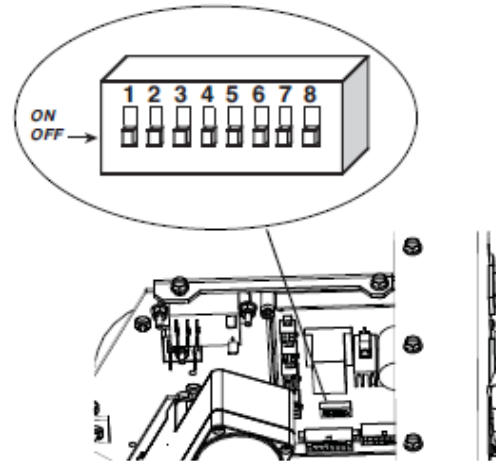


Figure 69

Wire Drive Board DIP Switches

All the DIP switches are in the OFF position.

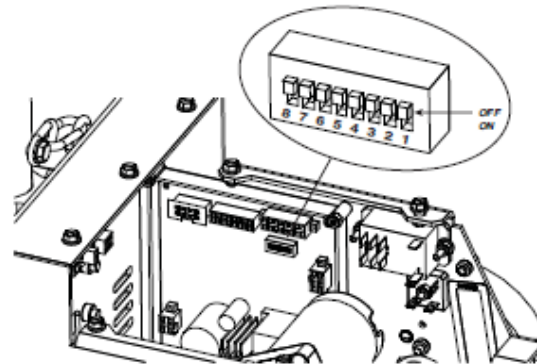


Figure 70

Set-Up Features Menu

The Setup Menu gives access to the set-up configuration. Stored in the set-up configuration are user parameters that generally need to be set only at installation. The parameters are grouped as follows:

PARAMETER	DEFINITION
P.1 through P.99	Unsecured Parameters (always adjustable)
P.101 through P.199	Diagnostic Parameters (always read only)
P.501 through P.599	Secured Parameters (only accessible with Weld Manager)

To access the set-up menu, press the right and left buttons of the MSP4 panel simultaneously. Note that the setup 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.

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.

PARAMETER	DEFINITION
P.0	Press the left button to exit the set-up menu.
P.1	WFS units Metric = m/min wire feed speed units English = in/min wire feed speed units (default)
P.2	Arc Display Mode Amps = The left display shows Amperage while welding. (default) WFS = The left display shows Wire Feed Speed while welding.
P.3	Display Options This setup parameter was previously named "Display Energy" If the previous software revision had this parameter set to display energy, that selection will remain. This option selects the information displayed on the alphanumeric displays while welding. Not all P.3 selections will be available on all machines. In order for each selection to be included in the list, the power source must support that feature. A software update of the power source may be needed to include the features. Standard Display = The lower displays will continue to show preset information during and after a weld (default). Show Energy = Energy is displayed, along with time in HH:MM:SS format. Show Weld Score = The accumulative weld score result is shown.
P.12	Travel Options This menu is used to change the travel options for a travel carriage, including wheel size and starting and ending functions. Press the right MSP4 button to enter the Travel Options menu and rotate the encoder to select either wheel size, starting or ending options. Press the right MSP4 button to select the option. Press the left MSP4 button to set the value and exit. Rotate the encoder to select other options, or press the left MSP4 button to exit the menu. Travel Start Options Start Button = Travel begins with the start button (default) Arc Strike = Travel begins with arc strike. Travel End Options Stop Button = Travel ends with the stop button. (default) Arc Out = Travel ends when the arc extinguishes. Wheel Size default value = 6.0" wheel size for track welding = 5.65" range = 3.0" to 12.0"
P.14	Reset Consumable Weight This parameter only appears with systems using Production Monitoring. Use this parameter to reset the initial weight of the consumable package.
P.15	Cold-Inch Touch Sense Option Enabled = touch sense is active when inching wire forward. Disabled = touch sense is inactive when inching wire forward. (default)
P.18	Wire Drive Gear Ratio. Set this parameter to match the gear ratio of the wire drive. 142:1 (default) 95:1 57:1

PARAMETER	DEFINITION
P.19	<p>Wire Drive Direction</p> <p>The feed plate of the wire drive is reversible and the wire straightener and the nozzle assembly may be swapped. The feed plate can feed from A (inlet) to B (outlet); or B (inlet) to A (outlet).</p> <p>Set this parameter to match the "Forward" direction of wire feeding.</p> <p>A → B (Default) B → A</p>
P.21	<p>Shutdown 2 Function Select</p> <p>This option allows selection of the Shutdown 2 input function on the control box.</p> <p>Normal Shutdown = The Shutdown 2 input functions as a standard shutdown input that locks out all input buttons (default)</p> <p>Output Disable = The Shutdown 2 input functions as a machine output lockout to disable the welding circuit but still allow cold feeding of the wire.</p>
P.23	<p>Trigger Fan-Out</p> <p>For Sub-Arc Lead Arc machines only. Allows the Lead Arc User Interface to control all machine triggers in a multi-arc system.</p> <p>No = Only the machine connected to the User Interface can be triggered on and off (default).</p> <p>Yes = All machines in the system can be triggered on and off simultaneously.</p>
P.80	<p>Sense from Studs.</p> <p>Use this parameter for diagnostic purposes only. When power is cycled, P.80 is automatically reset to False.</p> <p>False = Sensing for the electrode (67) and work (21) is determined by the DIP switches of the system.</p> <p>True = Sensing for the electrode (67) and work (21) is measured at the studs of the power source and the DIP switch settings are overridden.</p>
P.99	<p>Show Test Modes</p> <p>Many weld tables include special modes for testing and servicing the welding system. Set this parameter to YES to show all test modes.</p> <p>When the power source is turned off, the Show Test Modes parameter automatically reverts back to "NO".</p>
P.100	<p>View Diagnostics</p> <p>Diagnostics are only used for servicing the Power Wave system. Yes = Shows P.101 through P.500 in the SETUP menu.</p> <p>No = Only P.0 through P.100 are shown in the SETUP menu.</p>
P.101	<p>Event Logs</p> <p>Press the right MSP4 button to view the Event Logs. Rotate the encoder to select the object to read and then press the right MSP4 button. Various software information will appear about key system events.</p> <p>Press the left MSP4 button to exit.</p>
P.102	<p>Fatal Logs</p> <p>Press the right MSP4 button to view the Fatal Logs. Rotate the encoder to select the module to read and then press the right MSP4 button. Various software information will appear about critical module actions.</p> <p>Press the left MSP4 button to exit.</p>
P.103	<p>Software Version</p> <p>Press the right MSP4 button to view the software loaded into each module (p.c. board). Rotate the encoder to select the module to read and then press the right MSP4 button. The panel will display the main software version loaded into the module. Press the left MSP4 button to exit.</p>

PARAMETER	DEFINITION
P.104	Hardware Version Press the right MSP4 button to view the hardware version of each module (p.c. board). Rotate the encoder to select the module to read and then press the right MSP4 button. The panel will display the main hardware version loaded into the module. Press the left MSP4 button to exit.
P.105	Welding Software Press the right MSP4 button to view the welding software version inside the power source. Press the left MSP4 button to exit.
P.106	Ethernet IP Address Press the right MSP4 button to view the IP address of the Ethernet board. If no Ethernet Board is installed, the display shows "No Enet Found." Press the left MSP4 button to exit.
P.107	Power Source Press the right MSP4 button to view the type of power source connected to the control box. Press the left MSP4 button to exit.
P.500	Parameters that are P.500 and higher are only accessible with Weld Manager. See Weld Manager documentation for details.

Maintenance

Routine Maintenance

Blow out the slides

Periodic Maintenance

Check wire drive motor brushes
Lube gearbox for wire drive

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.

WEEE

07/06

English



Do not dispose of electrical equipment together with normal waste!

In observance of European Directive 2012/19/EC on Waste Electrical and Electronic Equipment (WEEE) and its implementation in accordance with national law, electrical equipment that has reached the end of its life must be collected separately and returned to an environmentally compatible recycling facility. As the owner of the equipment, you should get information on approved collection systems from our local representative.

By applying this European Directive you will protect the environment and human health!

Spare Parts

12/05

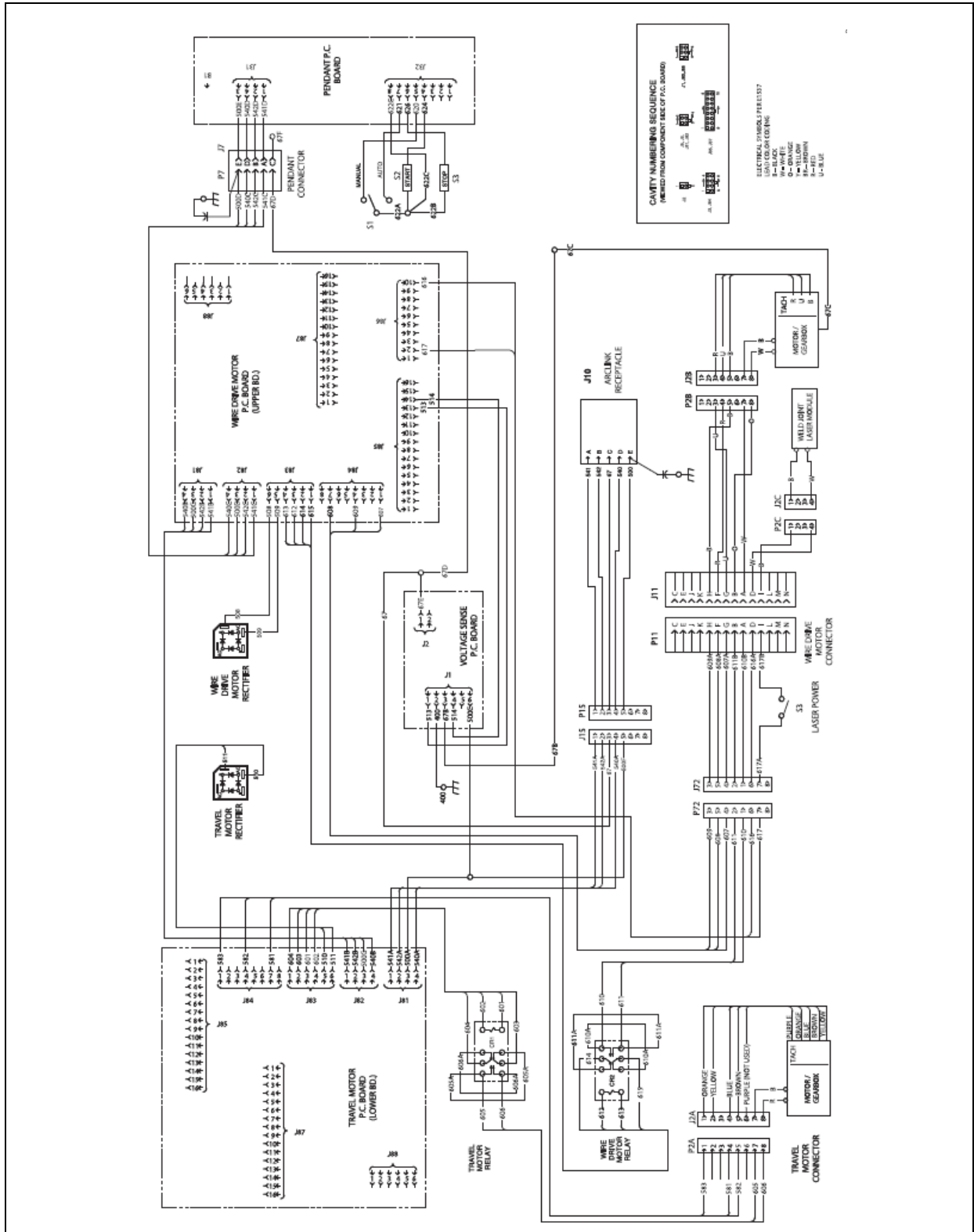
For Spare Parts references visit the Web page : <https://www.lincolnelectric.com/LEExtranet/EPC/>

Authorized Service Shops Location

09/16

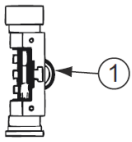
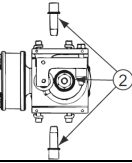
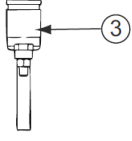
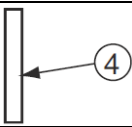
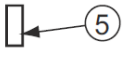
- The purchaser must contact a Lincoln Authorized Service Facility (LASF) about any defect claimed under Lincoln's warranty period.
- Contact your local Lincoln Sales Representative for assistance in locating a LASF or go to www.lincolnelectric.com/en-gb/Support/Locator.

Electrical Schematic



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.

Suggested Accessories

ITEM	K#	DESCRIPTION
	K1733-5	Wire Straightener
	KP1899-1	Drive Roll/ Guide Tube Kit, 3/32-7/32
	KP1899-2	Drive Roll/ Guide Tube Kit, 1/16, 5/64, 3/32
	KP1899-3	Drive Roll/ Guide Tube Kit, 035, 045, 052
	KP1899-4	Drive Roll/ Guide Tube Kit, 045, 052 cored
	K231-5/64	Contact Nozzle Assembly, 5/64 (2.0mm)
	K231-3/32	Contact Nozzle Assembly, 3/32 (2.4mm)
	K231-1/8	Contact Nozzle Assembly, 1/8 (3.2mm)
	K231-5/32	Contact Nozzle Assembly, 5/32 (4.0mm)
	K231-3/16	Contact Nozzle Assembly, 3/16 (4.8mm)
	K231-7/32	Contact Nozzle Assembly, 7/32 (5.6mm)
	KP2721-1	Nozzle Extension, 5"
	KP2721-2	Nozzle Extension, 45° Curved
	T12929	Flux Hose Clamp
	T11807	Nozzle Extension Insulator
	KP1962-3B1	Contact Tip, 3/32
	KP1962-1B1	Contact Tip, 1/8
	KP1962-4B1	Contact Tip, 5/32
	KP1962-2B1	Contact Tip, 3/16
	KP1962-5B1	Contact Tip, 7/32
	K148A or K148B	Positive Contact Nozzle Assembly
	K285	Concentric Flux Cone Assembly to use with K148A or K148B

K231 nozzles are rated up to 600 Amps
 K148 nozzles are rated up to 1000 Amps

K3090-1	Tube and clamp kit	Includes: one 30" aluminum splined tube; one 15" aluminum splined tube; one 30" steel tube; 8 clamp assemblies with keys; 2 outrigger assemblies; hardware.
K3089-1	Cross Slide Assembly	Includes: two slides with 4 inches of travel. (1 cross slide assembly included with each tractor.)
K1733-5	Wire Straightener	Includes: A three roll wire straightener with adjustable pressure. (1 included with each tractor)
K396	Track Section	Includes: a single section of 70 in (1.8m) of track.
K3070-1	Tiny Twin Kit for the tractor	Includes: 2 ndspindle, drive rolls, 57:1 gears.
K1543-xx	ArcLink Control Cable	Includes: 5 pin to 5 pin tractor to power source control cable. Cables may be connected end-to-end to make a longer cable. Connectors are black anodized aluminum.
K2683-xx	ArcLink Control Cable, Heavy Duty	Includes: 5 pin to 5 pin tractor to power source control cable. Cables may be connected end-to-end to make a longer cable. Female connector is a brass spin nut. Male connector is made from stainless.
K1504-1	60 lb Coil Adapter	Includes: one coil adapter for use with 2" spindles.

Accessories Included with the CRUISER™:

Conduit Tubing, 5 feet (1.5 m)
5/32" 600 Amp contact nozzle assembly
5/32" contact tip
Nozzle extension, 5 inches long (127 mm)
Nozzle extension insulator
Nozzle extension, 45° Curved
Flux tubing
Flux Hose Clamps
Wire Reel Assembly
Wheels for track operation
Manually guide steering wheel (LT-7 like)
Front and Rear outriggers
Wire Reel Enclosure
Does not include a control cable.