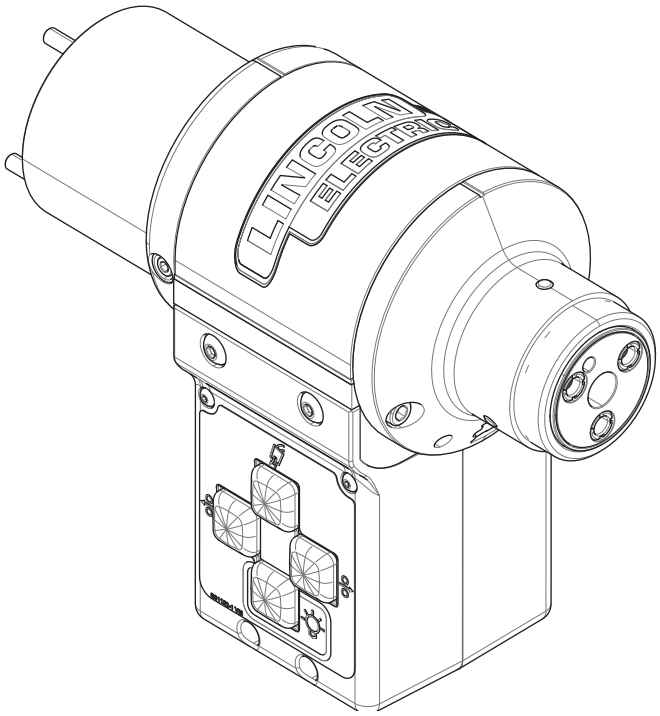
Operator's Manual

AutoDrive® SA Torch



For use with machines having Code Numbers:

12562 (K4128-5)

Register your machine:
www.lincolnelectric.com/register

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

Save for future reference

Date Purchased

Code: (ex: 10859)

Serial: (ex: U1060512345)

IM10206-A | Issue Date Mar-16

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

THANK YOU FOR SELECTING A QUALITY PRODUCT BY LINCOLN ELECTRIC.

PLEASE EXAMINE CARTON AND EQUIPMENT FOR DAMAGE IMMEDIATELY

When this equipment is shipped, title passes to the purchaser upon receipt by the carrier. Consequently, claims for material damaged in shipment must be made by the purchaser against the transportation company at the time the shipment is received.

SAFETY DEPENDS ON YOU

Lincoln arc welding and cutting equipment is designed and built with safety in mind. However, your overall safety can be increased by proper installation ... and thoughtful operation on your part. DO NOT INSTALL, OPERATE OR REPAIR THIS EQUIPMENT WITHOUT READING THIS MANUAL AND THE SAFETY PRECAUTIONS CONTAINED THROUGHOUT. And, most importantly, think before you act and be careful.

⚠ WARNING

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

⚠ CAUTION

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

KEEP YOUR HEAD OUT OF THE FUMES.

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

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

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

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

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

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

WEAR CORRECT EYE, EAR & BODY PROTECTION

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

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

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

IN SOME AREAS, protection from noise may be appropriate.

BE SURE protective equipment is in good condition.

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

SPECIAL SITUATIONS

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

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

Additional precautionary measures

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

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

REMOVE all potential fire hazards from welding area.

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

SECTION A: WARNINGS

CALIFORNIA PROPOSITION 65 WARNINGS

Diesel Engines

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

Gasoline Engines

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

ARC WELDING CAN BE HAZARDOUS. PROTECT YOURSELF AND OTHERS FROM POSSIBLE SERIOUS INJURY OR DEATH. KEEP CHILDREN AWAY. PACE-MAKER 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.

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.

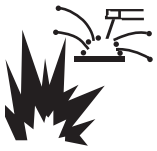
5.c. Do not weld in locations near chlorinated hydrocarbon vapors coming from degreasing, cleaning or spraying operations. The heat and rays of the arc can react with solvent vapors to form phosgene, a highly toxic gas, and other irritating products.

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

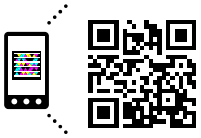
FOR ELECTRICALLY POWERED EQUIPMENT.

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.



Welding Safety Interactive Web Guide for mobile devices

Get the free mobile app at
http://gettag.mobi

Content/details may be changed or updated without notice. For most current Instruction Manuals, go to parts.lincolnelectric.com.

PRODUCT OVERVIEW

General Physical Description

The AutoDrive® SA Torch is one component in an advanced robotic welding system, part of Lincoln Electric's Aluminum Solutions product line.

The AutoDrive® SA Torch is a highly advanced welding torch which incorporates a servo motor and digital feedback to very precisely control wire feed speed and therefore tightly control weld parameters and bead appearance. The wire guide components on the AutoDrive® SA are optimized for aluminum welding to ease the feeding of the aluminum wire and replacement. Steel wire up to 0.045" can also be welded.

The AutoDrive® SA Torch is to be used only in conjunction with the AutoDrive® SA. The AutoDrive® SA is a robot arm mounted wire feeder. The two components used together create one of the most advanced aluminum feeding solutions on the market today. The result is superior wire feedability, fewer burn backs, and excellent bead appearance.

General Functional Description

The AutoDrive® SA torch features a dual channel, high resolution tachometer for precision wire feeding both forwards and in reverse.

The high resolution tachometer allows welding schedule's including Touch Retract, Low Frequency Pulse, and Heat Wave.

RECOMMENDED PROCESSES

- Aluminum GMAW (0.035", 3/64" and 1/16" wires)
- Steel GMAW (0.035", 0.040" and 0.045" wires)

PROCESS LIMITATIONS

- Maximum wire size = 1/16 (1.6mm) aluminum wire
- Maximum wire size = 0.045 (1.2mm) steel wire

LOCATION

This equipment is for industrial use only and it is not intended for use in residential locations where the electrical power is provided by the public low-voltage supply system. There can be potential difficulties in residential locations due to conducted as well as radiated radio-frequency disturbances. The EMC or RF classification of this equipment is Class A.

EQUIPMENT LIMITATIONS

Robots:

Activation limits are as follows:

- ABB IRB 1520ID: Axis 5 [± 135°], Axis 6 [± 200°]
- ABB IRB 1600ID: Axis 5 [+135°/–90°], Axis 6 [± 200°]
- ABB IRB 2600ID: Axis 5 [± 120°], Axis 6 [± 400°]
- FANUC (All): J5 Axis [± 90°], Axis 6 [± 270°]
- KUKA KR5-HW-2: A5 Axis [± 140°], Axis 6 [± 360°/ ∞]
- KUKA KR16-L8-HW: A5 Axis [± 140°], Axis 6 [± 360°/ ∞]
- KUKA KR16-HW: A5 Axis [± 130°], Axis 6 [± 360°/ ∞]

Torch K Number:

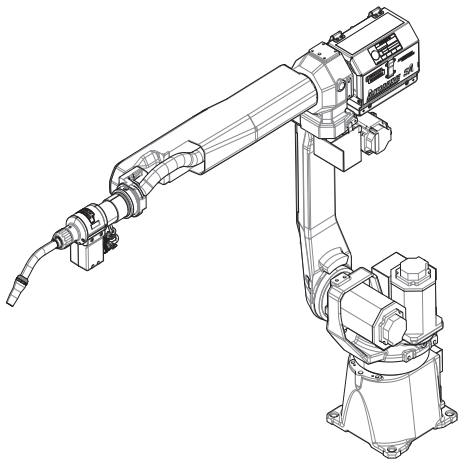
- K4128-5 AutoDrive SA Torch

Wirefeeders:

- Torches are designed only to work with AutoDrive S Feeder.
- It is not recommended that the torches be used with any non robot-mounted wirefeeder.

RECOMMENDED ROBOT ACTIVATION LIMITS*

ROBOT	AXIS	LIMITS
ABB IRB 1520ID	AXIS 5	± 90°
ABB IRB 1600ID	AXIS 5	± 90°
ABB IRB 2600ID	AXIS 5	± 90°
FANUC (ALL)	J5	± 90°
KUKA KR5-2	A5	± 90°
KUKA KR16-L8	A5	± 90°
KUKA KR16	A5	± 90°
MOTOMAN (ALL)	B	± 90°
ABB IRB 1520ID	AXIS 6	± 200°
ABB IRB 1600ID	AXIS 6	± 200°
ABB IRB 2600ID	AXIS 6	± 205°
FANUC (ALL)	J6	± 205°
KUKA KR5-2	A6	± 205°
KUKA KR16-L8	A6	± 205°
KUKA KR16	A6	± 205°
MOTOMAN (ALL)	T	± 205°



* On FANUC, J6 AXIS can be rotated to +/- 270°,but will accelerate torch cable wear.

On Motoman, T AXIS can be rotated to +/- 210°, but will accelerate torch cable wear.

On ABB IRB2600ID, Axis 6 can be rotated to +/- 270°, but will accelerate torch cable wear.

On KUKA, A6 can be rotated to +/- 270°, but will accelerate torch cable wear.

⚠ CAUTION

DO NOT rotate this axis past 270°!

On all arms, rotation of the 5th axis (J5, B, A5, Axis 5) beyond ± 90° is not recommended; any rotation beyond these limits, especially when the 6th axis (J6, A6, Axis 6) is rotated near and beyond recommended limits will greatly accelerate cable wear.

RECOMMENDED ACCESSORIES

Torch K Numbers

K4128-5

Feeder K Numbers

K4129-1

Cable Bundle K Numbers

K4130-1 FANUC® 100iC Approx. 29.00 in (73.6cm)
K4130-2 FANUC® 100iC-6L Approx. 37.50 in (95.3cm)
K4130-3 FANUC® 120iC Approx. 36.50 in (92.7cm)
K4130-4 FANUC® 120iC-10L Approx. 44.75 in (113.6cm)
K4130-5 Motoman® MA1440 Approx. 29.00 in (73.6cm)
K4130-6 Motoman® MA2010 Approx. 46.33 in (117.7cm)
K4130-8 ABB® IRB 1520ID Approx. 42.70 in (107.2cm)
K4130-9 ABB® IRB 1600ID Approx. 41.36 in (105.0cm)
K4130-10 ABB® IRB 2600ID Approx. 52.60 in (133.6cm)
K4130-11 KUKA® KRS-HW-2 Approx. 39.15 in (99.4cm)
K4130-12 KUKA® KR16-L8-HW Approx. 55.67 in (141.4cm)
K4130-13 KUKA® KR16-HW Approx. 40.41 in (102.6cm)

Control Cable K Numbers

K3390-1 FANUC® 100iC Control Cable Bundle
K3390-2 FANUC® 100iC-6L Control Cable Bundle
K3390-3 FANUC® 120iC / 10L Control Cable Bundle
K3390-4 Motoman® MA3120 Control Cable Bundle
K3390-5 ABB® IRB 1520ID / 1600ID Control Cable Bundle
K3390-6 ABB® IRB 2600ID Control Cable Bundle
K3390-7 KUKA® KR5-2 / KR16 Control Cable Bundle
K3390-8 KUKA® KR16-L8 Control Cable Bundle

Gun Tube KP Numbers

KP4125-22
KP4125-45
KP4125-I80

Breakaway Disk KP Numbers

KP2920-4 FANUC® and Motoman®
KP2920-5 KUKA® KR5-2 and KR16-18
KP2920-6 KUKA® KR16
KP2920-7 ABB® IRB 1520ID and 1600ID
KP2920-8 ABB® IRB 2600ID

- The AutoDrive® SA Torch is compatible with FANUC 100iC, 120iC, 100iC/6L, and 120iC/10L Fanuc robot arms. It is also compatible with select Yaskawa/Motoman, ABB and KUKA robot arms. See product literature for complete compatibility list.
- The AutoDrive® SA Torch is only to be used in conjunction with the AutoDrive® S wire feeder
- The AutoDrive® SA system is only compatible with Lincoln Electric PowerWave technology
- The AutoDrive® SA Torch does not come with a gooseneck, this is a separate K Number
- The AutoDrive® SA Torch does not come with a Thru The Arm cable bundle, this is a separate K Number
- AutoDrive® SA Torch comes installed with a 3/64” U-Groove drive roll. Other drive roll kits, including steel can be purchased as a KP number
- Robot and power source software will need to be updated to function with the AutoDrive® SA Torch.
- Numerous gooseneck and nozzle combinations exist
- The AutoDrive® SA has a 100% Duty Cycle at 350Amps for both Aluminum and steel
- The AutoDrive® SA is a water cooled welding torch. It cannot be air cooled.

RECOMMENDED POWER SOURCES

- Power Wave i400
- Power Wave R350
- Power Wave R500
- Power Wave S350
- Power Wave S500
- Power Wave S700

TECHNICAL SPECIFICATIONS

AUTODRIVE SA TORCH	
TORCH	K4128-5
CABLE BUNDLE	K4130-1 (FANUC® 100iC) K4130-2 (FANUC® 100iC-6L) K4130-3 (FANUC® 120iC) K4130-4 (FANUC® 120iC-10L) K4130-5 (Motoman® MA1440) K4130-6 (Motoman® MA2010) K4130-8 (ABB® IRB 1520ID) K4130-9 (ABB® IRB 1600ID) K4130-10 (ABB® IRB 2600ID) K4130-11 (KUKA® KRS-HW-2) K4130-12 (KUKA® KR16-L8-HW) K4130-13 (KUKA® KR16-HW)
CONTROL CABLE BUNDLE	K3390-1 FANUC® 100iC K3390-2 FANUC® 100iC-6L K3390-3 FANUC® 120iC / 10L K3390-4 Motoman® MA3120 K3390-5 ABB® IRB 1520ID / 1600ID K3390-6 ABB® IRB 2600ID K3390-7 KUKA® KR5-2 / KR16 K3390-8 KUKA® KR16-L8
GOOSENECK	K4125-22 KP4125-45 KP4125-180

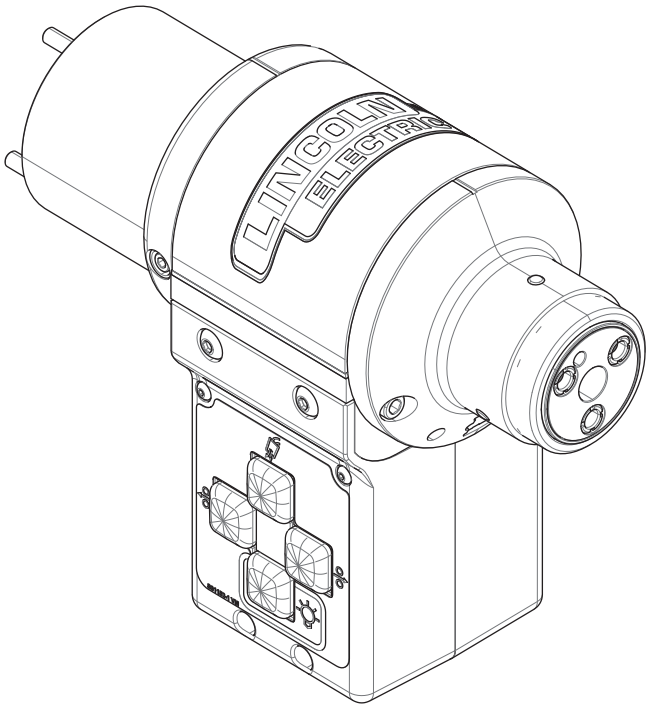
RATINGS	
WIREFEED SPEED	30 - 800 IPM (0.8 - 30.5M/MIN.)
WIRES SIZES, SOLID ALUMINUM	.035 - 1/16” (0.9 - 1.6mm)
WIRES SIZES, SOLID STEEL	.035 - .045” (0.9 - 1.2mm)
WELDING CURRENT	350 AMPS @ 100%
WELDING SHIELDING GAS	100% ARGON (ALUMINUM) MIXED AR/CO_2 (STEEL)
INPUT VOLTAGE	40 VDC
INPUT CURRENT	10 A MAX
MOTOR POWER	220 WATT
CABLE CONNECTION	14 PIN, 6 PIN AMPHENOL NOTE: ALL INPUTS COME THROUGH ARCLINK CABLE FROM WIRE FEEDER

PHYSICAL DIMENSIONS	
LENGTH (WITH GOOSENECK)	17.5 IN. (445mm)
WIDTH (B)	3.27 IN. (83mm)
HEIGHT (C)	6.50 IN. (165mm)
WEIGHT	7 LBS. (3.18 KGS)
COMPATIBLE ROBOTS	FANUC 100iC FANUC 100iC/6L FANUC 120iC FANUC 120iC/6L SELECT YASKAWA/MOTOMAN SELECT ABB SELECT KUKA
REPLACEABLE MOTOR	YES

COOLING REQUIREMENTS	
MINIMUM FLOW RATE	.32 GAL / MIN (1.5L / MIN) (WITH GOOSENECK INSTALLED)
MINIMUM INLET PRESSURE	50 PSI (345KPA)
MAXIMUM INLET PRESSURE	70 PSI (483KPA)
MINIMUM COOLING POWER	0.30KW (1023 BTU/HR) @ 1.5L / MIN

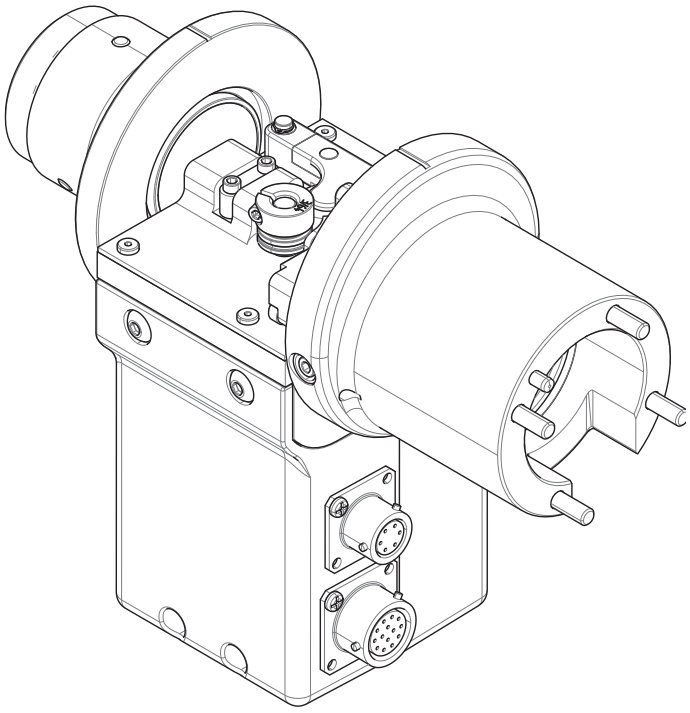
APPROVALS AND MARKINGS	
CSAC/US	CAN/CSA-E60974-7, ANSI/IEC60974-7
CE	EN 60974-7, EN60974-10
GB15579.7-2013	YES
CCC	YES
IP RATING	NA

FRONT



BACK

Wire drive cover not shown



COMPONENTS

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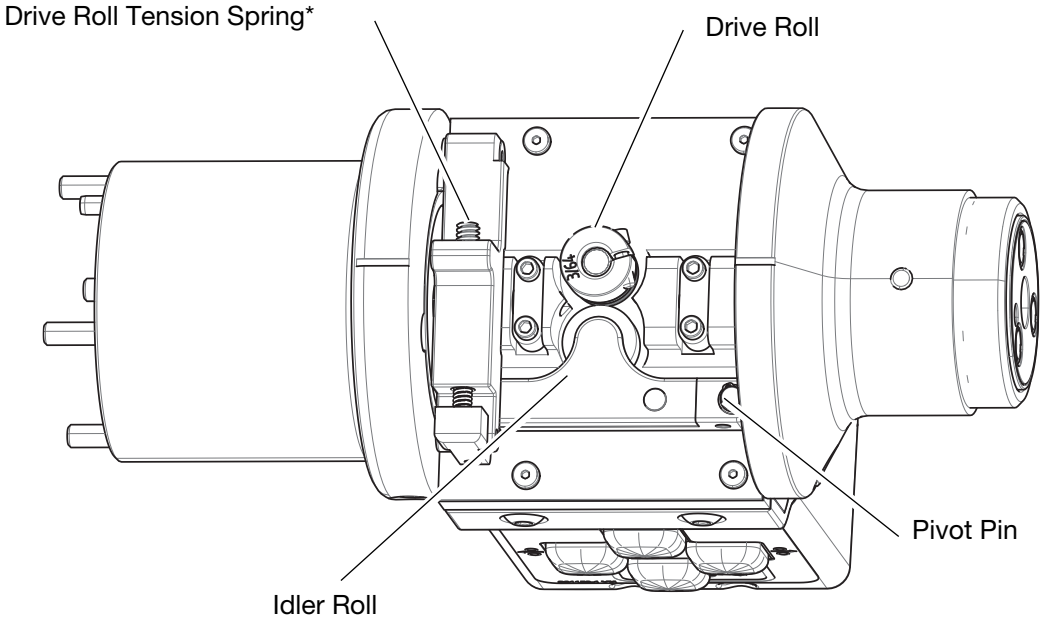


*Drive roll tension set at the factory. There should be no reason for the user to change this setting.

Figure 1: Three pins on the gooseneck plug into the front of the torch. Two of these pins open small valves inside the torch to allow water to flow when the gooseneck is installed and prohibit the flow of water when the gooseneck is removed.

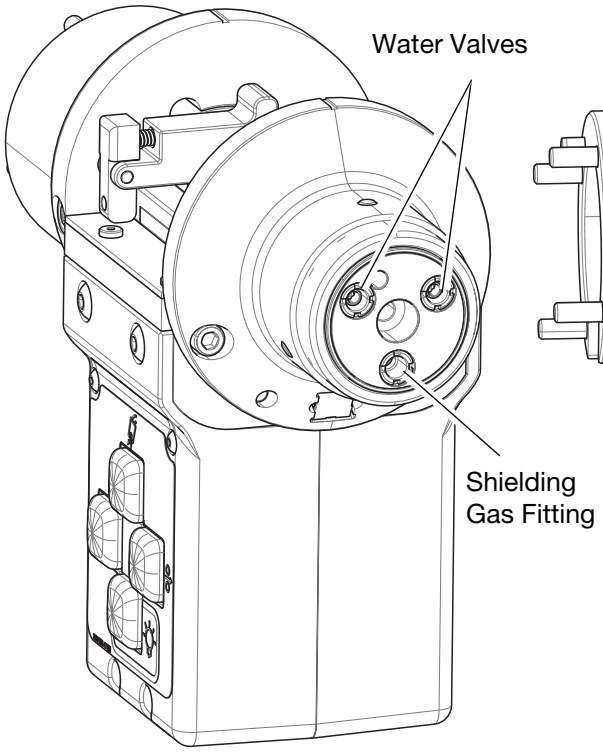
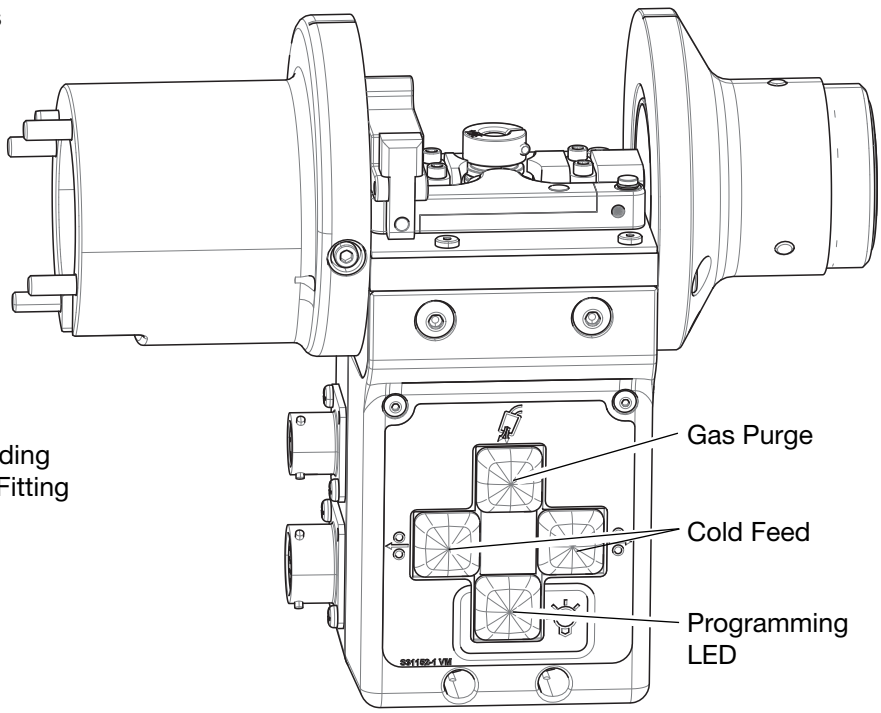


Figure 2: Four buttons are installed on the side of the torch. These buttons are used when the operator is programming the robot. The buttons can cold feed wire in the + or – direction, gas purge, and toggle the programming LED on/off.



DESIGN FEATURES

STANDARD Features

- High-resolution tachometer for precise low wire feed speed control and fast dynamic response.
- Optimized wire guides for feeding aluminum wire with minimal friction
- Quick change gooseneck liner as well as thru-the-arm polymer liner
- Direct drive servo motor to deliver wire for advanced feeding applications such as low frequency pulse and touch retract starting.
- Water-cooled gooseneck and power cable to keep consumables cool.
- Auto shutoff water-cooled valves for quick change of gooseneck and liner without turning off power to the water cooler.
- Ability to use Magnum® PRO 350A or 550A contact tips and various nozzle configurations for hard to reach joints.
- Preset drive roll tensions.

SPECIAL FEATURES

- Four torch mounted buttons to control cold inch +/-, gas purge, and LED light
- LED light to illuminate welding area for programming

INSTALLATION

PRE-INSTALLATION NOTE:

The AutoDrive® SA Torch comes completely assembled with hardware included in the assembly. The scope of the torch install is to un-assemble parts of the Torch and then re-assemble the torch on the robot arm. The torch needs to first be disassembled (partially) in order to install components and reveal required hardware. See the below instructions and photos to disassemble properly. Replacement hardware can be ordered from the parts page.

TORCH DISASSEMBLY (PREPARATION FOR ROBOT ASSEMBLY)

1.) To get the Torch in a state where it can be mounted on the robot the rear Aluminum Housing must be removed from the torch. Start by removing the two radial screws as seen in the Figure A.2.

2.) After those are removed then remove the two long bolts that hold the Torch together, as seen in the Figure A.3.

3.) At this point pivot up the tension lever arm to allow clearance for the rear Aluminum Housing to be removed. Carefully pivot and remove the rear Aluminum Housing, Figure A.4, A.5.

4.) This completes the Torch disassembly, the Torch is now ready to be mounted to a robot arm.

FIGURE A.1 Torch assembly as it comes shipped from Lincoln Electric

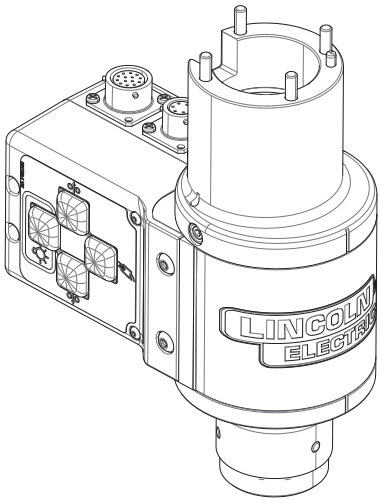


FIGURE A.2 Remove radial screws.

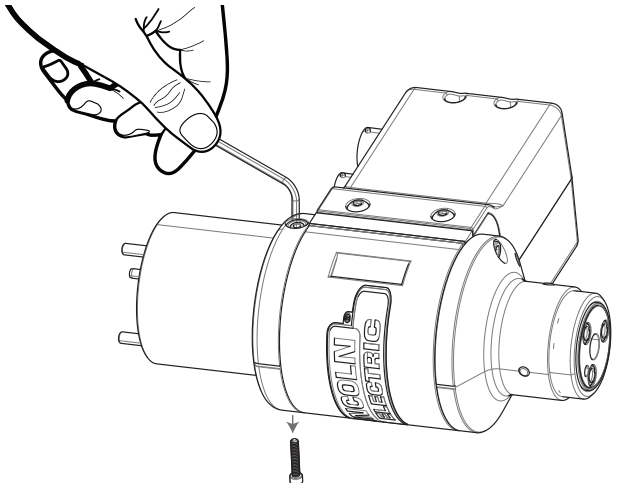


FIGURE A.3 Remove 2 long bolts.

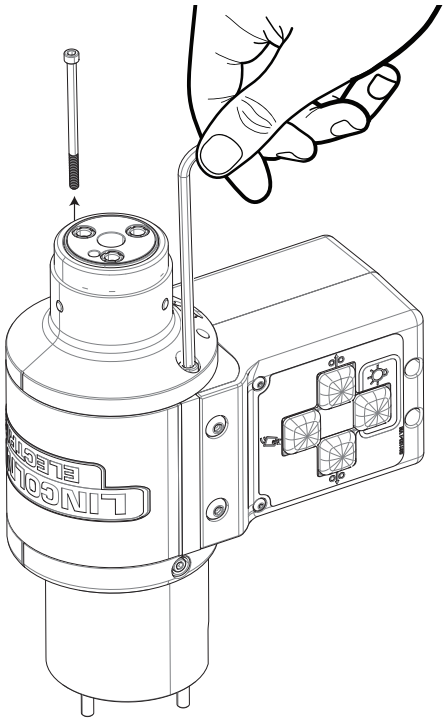


FIGURE A.4 Pivot up the tension lever arm.

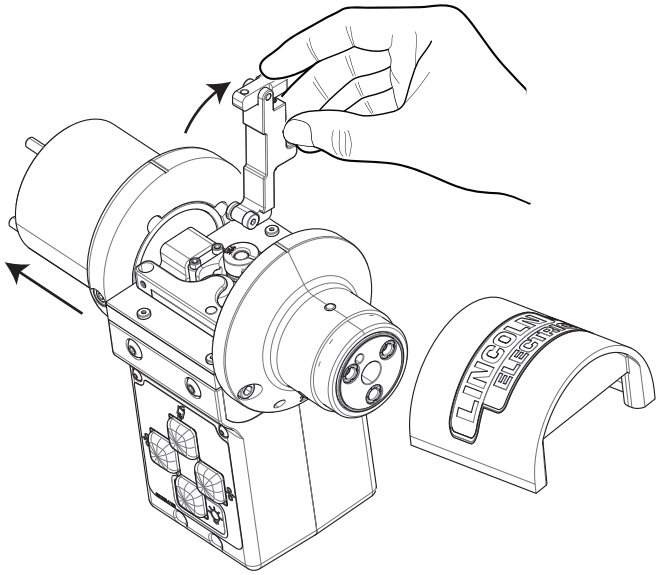
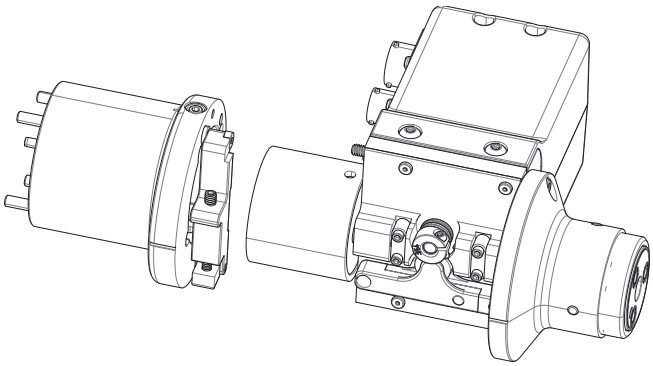


FIGURE A.5 The torch with the aluminum housing removed.



TORCH ASSEMBLY

1.) Install breakaway disk (sold separately))

a.) Use screws provided with breakaway disk to assemble onto mounting face of the robot arm by aligning the locating pin on the disk with the locating hole on the robot arm mounting face. The disk will only install one way. Figure A-8

FIGURE A.7 Break Away Dish and rear housing prior to installation.

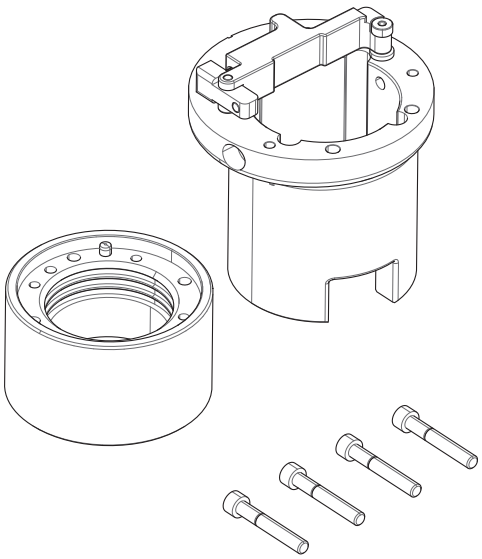
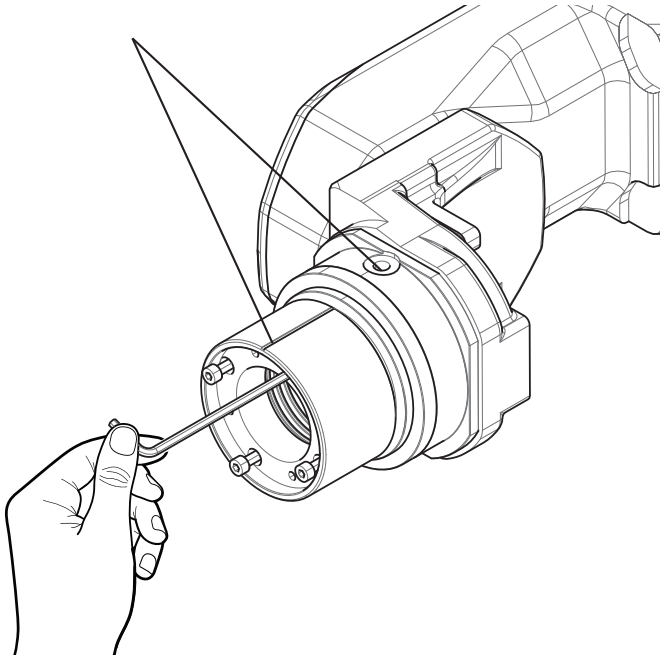


FIGURE A.8 Install breakaway disk (sold separately) with provided screws onto mounting face of robot arm. Line up locating dowel on breakaway disk with locating hole on mounting face.

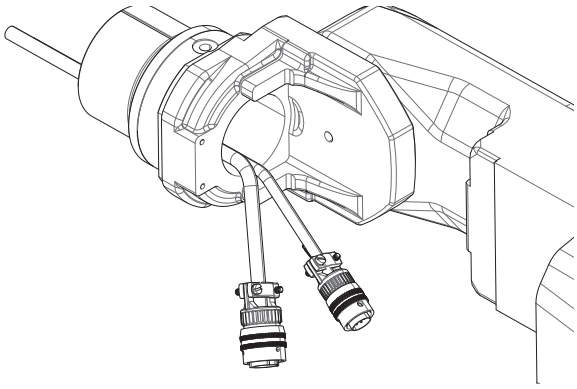


2.) Feed Control Cables back thru Breakaway Disk

a) Position the robot arm so that the arm is horizontal.

b) Feed the two control cables (sold separately) for the specific robot arm thru the breakaway disk one at a time. As the cables are reversible, orientation does not matter. Continue feeding the control cables back thru the arm until they are completely thru. Do not cross the control cables, they should be positioned so that they are straight thru the arm without crossing, kinked, or knotted.

FIGURE A.9 Feed the control cables thru the breakaway disk and arm.



3.) Install the rear Aluminum Housing

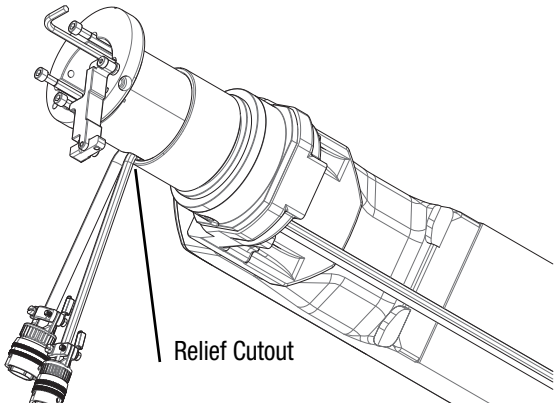
a) Position the rear aluminum housing so that the 2 control cables will be sitting in the cutout on the bottom. Line up the scribe mark on the housing (on large face) with the scribe mark on the breakaway disk.

b) With the 2 control cables positioned within the cutout on the bottom of the rear aluminum housing, press the housing into the breakaway disk. Do not pinch or cross the control cables.

c) Adjust the control cable lengths through the cutout. The smaller cable should be approximately 5.5” from the cutout in the housing, and the larger cable should be approximately 6.5”.

d) Insert the supplied socket head cap screws and secure the rear aluminum housing to the breakaway disk.

FIGURE A.10 The scribe marks have been lined up and the rear aluminum housing has been pressed into the breakaway disk. Note that the control cables are passing thru the cutout on the bottom of the rear aluminum housing and screws being tightened.



4.) Passing Water/Power Cable, Water Return and Gas Lines, and Conduit Tube through Robot Arm

a) Pass all 4 lines through the central bore of the rear aluminum housing and breakaway disk. Ensure that the hoses are not crossed. The Water/Power Cable and Conduit Tube are reversible. The Water Return and Gas Lines are identical but NOT reversible; each of these lines will have a fitting with a large head and grooves on the barrel on one end and a fitting with small head without grooves on the other end. Install one of these lines such that the fitting with the smaller head is protruding from the rear aluminum housing. This one will be placed on the left when looking into the robot arm. The 2nd line is then installed on the right, with the fitting with the larger head protruding from the rear aluminum housing.

b) Press the conduit tube into the Brass Cable Connector until fully seated. Install the other 3 hoses into their respective slots, with the water/power cable in the bottom center. The water return line and gas line can be installed only one way.

c) Apply a film of silicone grease to the o-rings to ensure ease of assembly.

FIGURE A.12 These are the 4 hoses and one of the Brass Cable Connectors which are supplied with the robot arm specific Cable Bundle. Note the large fitting and the small fittings on the water return and gas lines. Be sure to not cross hoses as they are passed thru the robot arm.

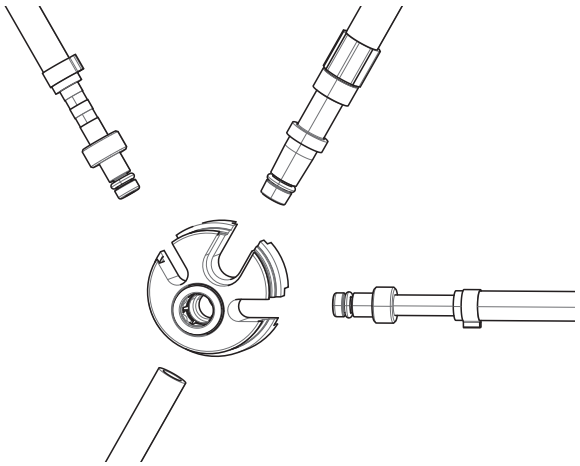


FIGURE A.13 The hoses have been inserted through the rear aluminum housing, passing through the robot arm.

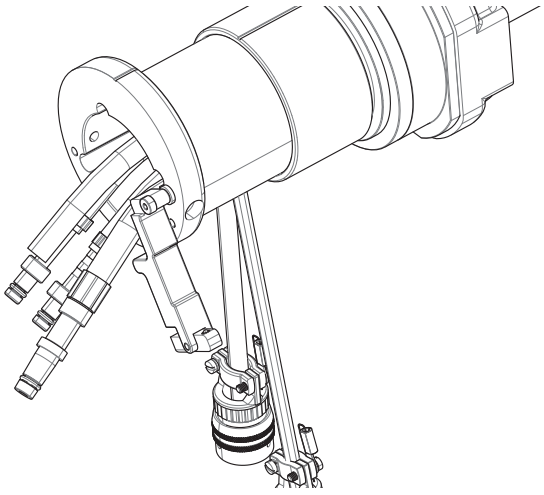


FIGURE A.14 The fittings have been installed into the brass cable connector. To install the fittings, simply press the fittings into the slots as shown. The fittings will only install in one position.

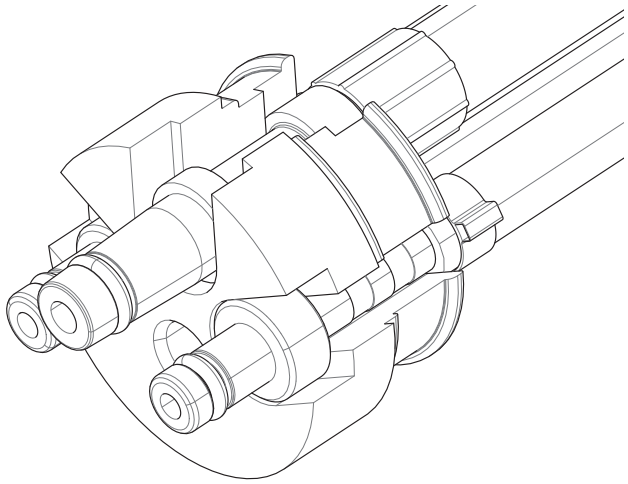
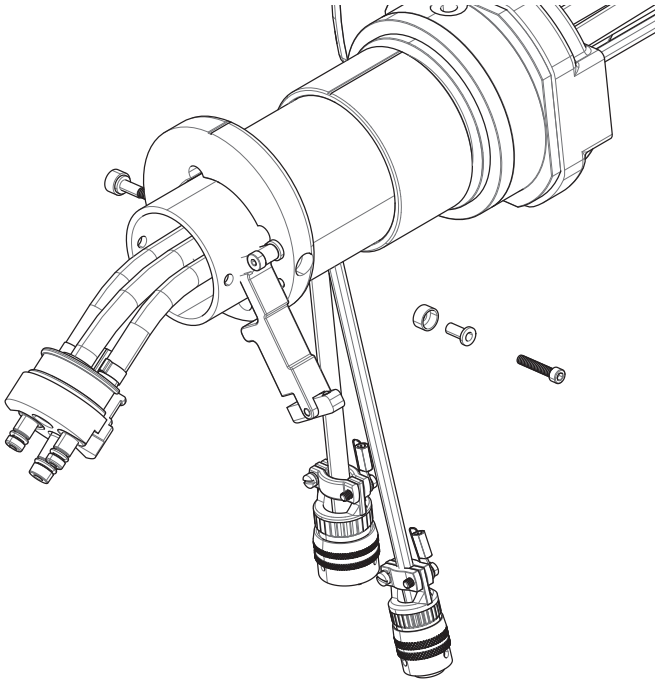


FIGURE A.15 Insert the black insulating cylinder back into the rear aluminum housing. The two side holes are closest to the front of the rear aluminum housing. Once seated, push the 2 radial screws and insulators removed from the torch (shown in FIGURE A.2) so that they are engaging the black insulating cylinder but not protruding past the inside face.



Couple the Torch to the Cable Assembly

a) Position the Torch in front and in line with the Cable Bundle, which will only mate one way. Line up the 3 fittings on the cable bundle with their respective holes in the Torch and press them together while rotating the locking collar on the torch, engaging the threads.

b) Continue to thread the locking collar Use the spanner wrench included with the AutoDrive SA feeder (9SM25621) to draw the components together. Use the spanner wrench to further tighten the locking collar until tight. The Water/Power cable and its' mating port on the torch have a tapered fit. DO NOT use any additional tools or lengthening arms to force additional torque.

NOTE: Even though threads may be visible, the locking collar will be threaded down completely when the spanner wrench cannot move from further hand force. Also, the Water/Power cable will be locked so that it cannot be rotated. This can be checked by grasping the Water/Power cable and attempting to rotate. If it does rotate, apply additional tightening until it does not rotate.

FIGURE A.16 Insert the Brass Cable Connector with fittings installed into the Torch Locking Collar and engage the threads by hand.

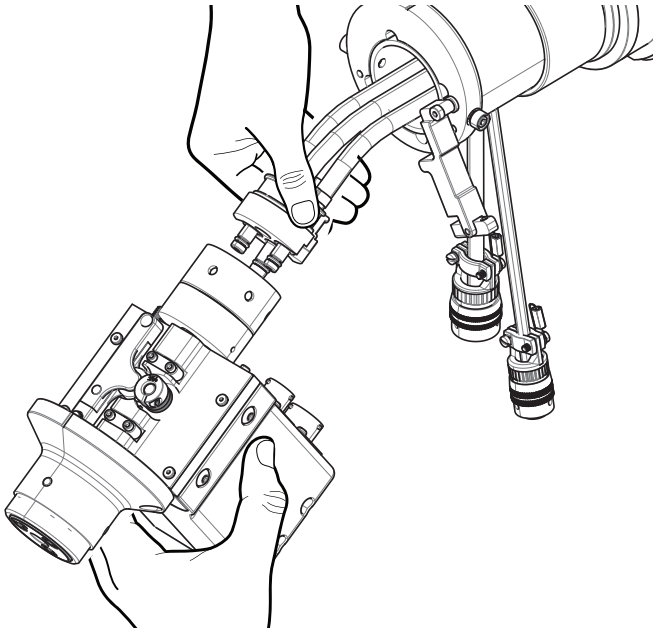


FIGURE A.17 Use the Spanner Wrench (supplied in AutoDrive SA Feeder, 9SM25621) to tighten the Locking Collar. This will allow the user to apply more tightening and lock the tapers on the Water/Power Cable.

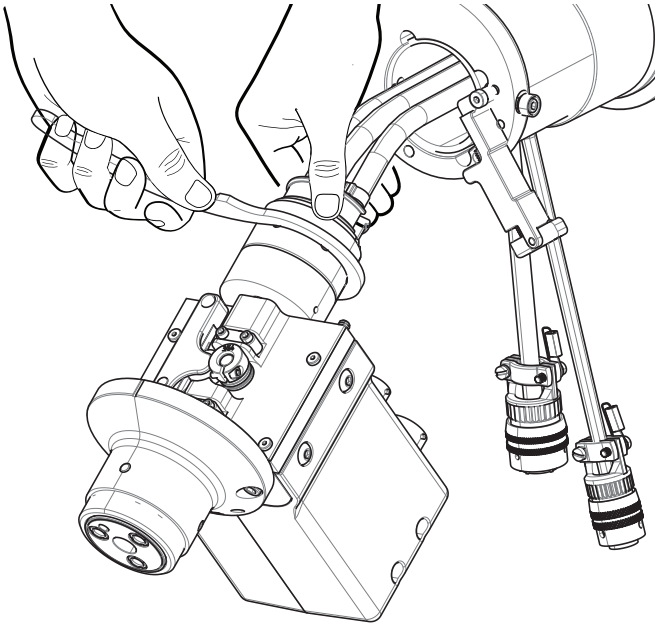
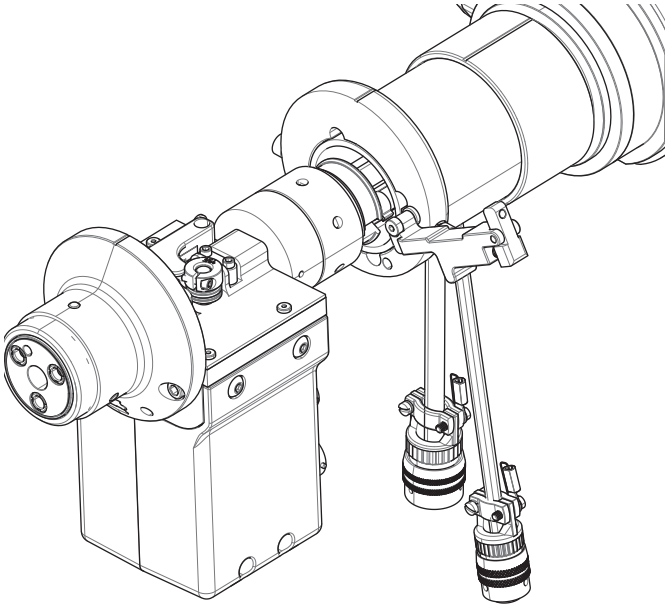


FIGURE A.18 When assembled correctly, the assembly will appear as shown. Note that the hoses are straight and not crossed or kinked. Also note that some threads on the Brass Cable Connector might still be visible, which is OK provided the taper on the Water/Power Cable is locked.



Final Torch Installation

a) Carefully push the torch into the Rear Aluminum Housing without disturbing the Control Cables until the Torch is fully seated. Do not allow the Control Cables to become crossed, pinched, or kinked. Any visible gaps between the torch and housing will be closed when the two long socket head cap screws are reinstalled and tightened (see next step).

b) Install and tighten the two long socket head cap screws alternately until tight. Finish installing and tighten the two side screws installed thru the rear aluminum housing previously.

c) Install both connectors on the Control Cables to their respective connections on the torch. Adjust the remaining cable lengths passing into the housing to remove as much slack as needed to have a smooth curve into the housing. This can be accomplished by slightly lifting on the Cable Bundle hoses where they pass out of the wrist area on the robot arm and adjusting each cable separately. This minimizes cable overhang between the torch housing and robot arm.

d) Install the Drive Roll Cover

e) Plug in the gooseneck (separate KP number) Line up dowel pin on gooseneck with hole in torch, wiggling gooseneck slightly to engage the gas and water ports on the torch. Tighten black nut to make good electrical contact between the back of the gooseneck and torch face.

FIGURE A.19 Tighten the two long socket head cap screws once the torch has been pushed into the housing.

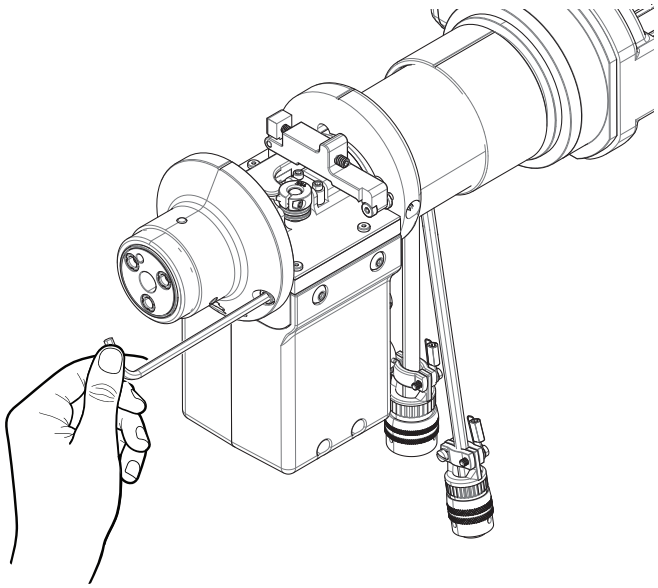


FIGURE A.20 Once the two long screws are tightened, finish installing the side screws and tighten.

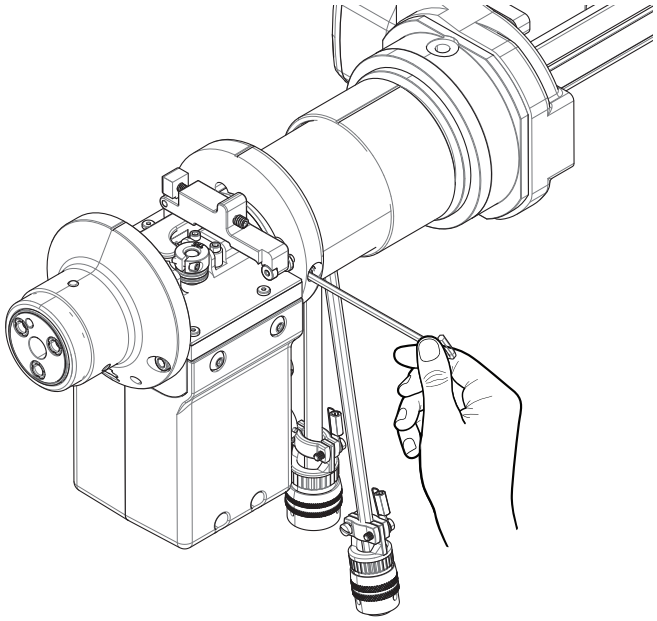
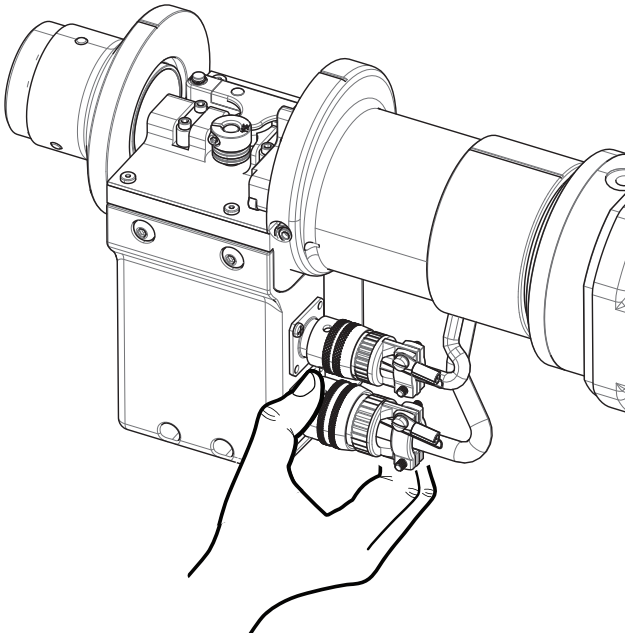


FIGURE A.21 Connect the two control cable connections and remove slack from the wires to remove excess overhang.



Gooseneck Installation

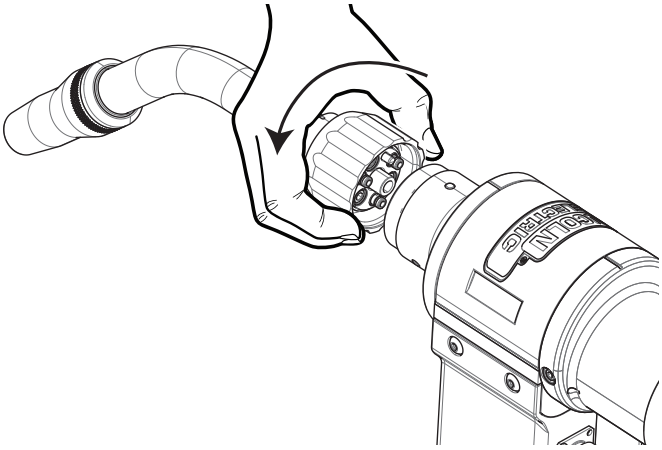
a. Be sure to rub a film of silicone grease on all the o-rings on the mating end of the gooseneck. This will ensure a proper seal of the o-rings and prevent water leaks.

b. Line up the scribe on the vertical axis of the gooseneck with the vertical scribe on the torch. You can also line up the locating dowel pin with the hole on the Torch interface.

c. Simply press the gooseneck onto the torch body lightly rocking the connection back and forth until the fittings are mating.

d. Thread down the black locking ring. Provide significant torque to create a solid connection between gooseneck and torch.

FIGURE A.21 Install drive roll cover. Insert gooseneck into torch as shown. Tighten black locking nut to lock the gooseneck to the torch.



CABLES

Feeder to Torch Cables (supplied separately, see cable list)

Feeder to Torch cables are used to connect the AutoDrive® SA Wire Feeder to the Torch. There are two multi conductor electrical cables that communicate between the Torch and Feeder.

One cable has a 14 pin connector at each end. Both ends of the cable have a collar and the cables cannot be “daisy chained” to make a longer cable.

FIGURE A.1
TORCH POWER

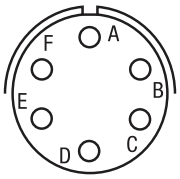


FIGURE A.2
TORCH FEEDBACK

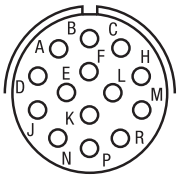


TABLE A.3 TORCH POWER

POWER SOURCE/ CONTROL BOX	
PIN	FUNCTION
A	MOTOR PHASE 1
B	MOTOR PHASE 2
C	MOTOR PHASE 3
D	LED
E	LED
F	RESERVED

TABLE A.4 TORCH FEEDBACK

WIRE FEEDER	
PIN	FUNCTION
A	BUTTON FEED FWD
B	BUTTON FEED REV
C	BUTTON TOGGLE LIGHT
D	BUTTON GAS PURGE
E	+24 VDC
F	+5 VDC
H	COMMON
J	ENCODER B-
K	ENCODER B+
L	ENCODER A-
M	ENCODER A+
N	HALL U
P	HALL V
R	HALL W

WIRE DRIVE CONFIGURATION

⚠ WARNING

ELECTRIC SHOCK can kill.

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

Procedure to Replace Drive Roll

The Drive Rolls supplied with the AutoDrive® SA Torch are specially designed stainless steel rolls to optimize the feeding of aluminum welding wire. These rolls have a "U" Groove profile to hug the wire while not deforming the wire (See Section on Drive Roll Tension). The Torch drive rolls are designed to last at least 6 months of production welding before they wear out and loose enough feeding force to merit a replacement. The aluminum oxide that flakes off the aluminum wire is a very hard substance that deteriorates the drive roll over time. See M21544-1 for customer supplied instruction sheet.

Drive Rolls for welding steel, 0.035 - 0.045 are available separately.

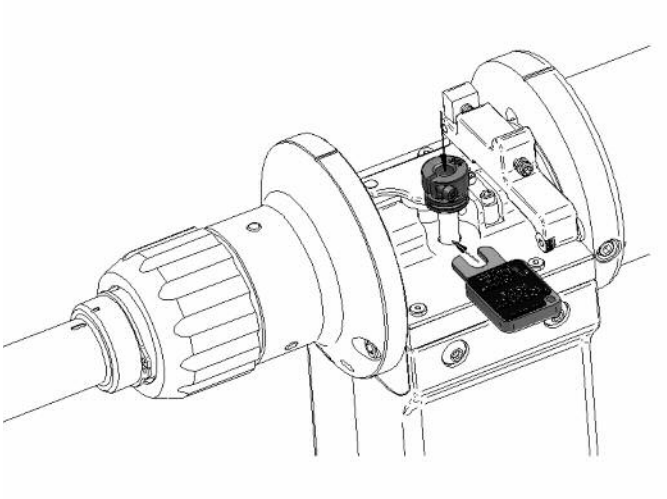
To remove drive roll:

1. Turn power off at the welding power source.
2. Open the idler arm
3. Rotate drive roll to allow access to Torx screw
4. Use supplied Torx Key (T10) to loosen drive roll and pull off motor shaft

To install drive roll:

1. Turn off power at the welding power source.
2. Open the idler arm.
3. Place the Drive Roll Height Gauge (included with new drive roll kit) on the base of the torch
4. Slide drive roll on to motor shaft and allow the roll to bottom out on the height gauge. This will position the drive roll groove in the center of the wire path.
5. Tighten Torx screw with supplied Torx key until snug (do not over tighten)
6. Remove drive roll height gauge

FIGURE A.22 Removal and installation of the Torch drive roll. See M21544-1 for customer supplied instruction sheet.



1.) Start by loosening the two socket head cap screws that hold the conduit liner clamp in place

PROCEDURE TO REPLACE IDLER ARM ASSEMBLY

The Idler Arm Assembly kit contains the parts to replace the entire pivoting idler assembly. This assembly contains a sealed idler bearing that should last significantly longer than a drive roll. In the case of a failed idler bearing the following procedure should be followed to replace the Idler Arm assembly. There is a small retaining ring that needs to be removed to replace the Idler Arm assembly. A small set of retaining ring pliers is required to replace this assembly. Please see M21544-2 for customer supplied installation instructions.

FIGURE A.23 The Idler Arm Assembly kit contains the Idler Arm, Bearing, and retaining ring that holds the assembly onto the pivot pin.

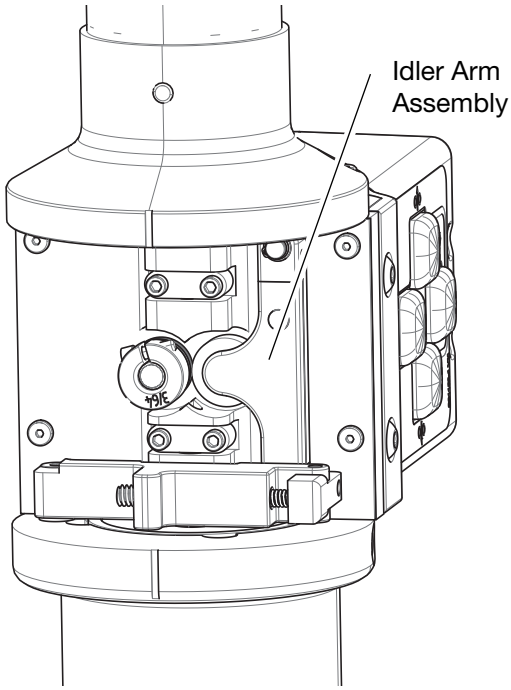
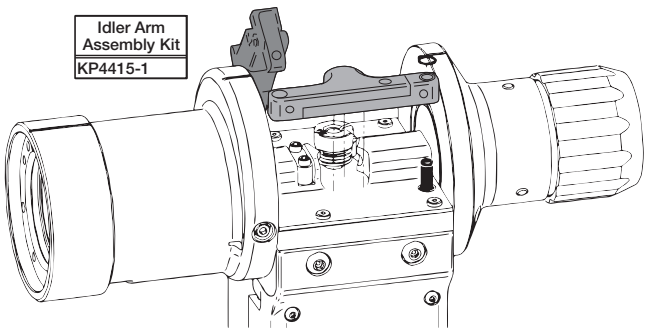


FIGURE A.24 The Idler Arm Assembly is pictured here with the retaining ring. See M21544-2 for full instructions.



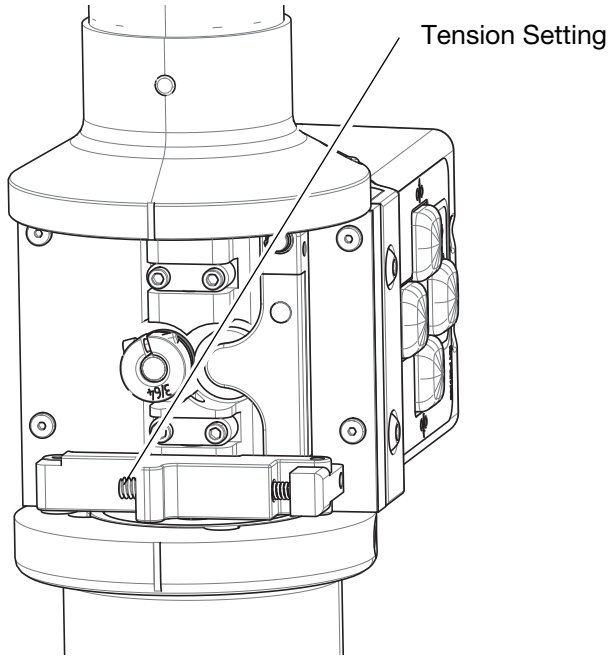
PROPER TORCH DRIVE ROLL TENSION

Significant time has been spent determining an ideal tension setting for the AutoDrive® SA torch. There is an ideal setting to be able to feed aluminum wire successfully without too much tension (which deforms the wire) or too little tension (which causes the drive roll to slip on the wire). The ideal tension setting has been set at Lincoln Electric when the AutoDrive® SA Torch was assembled. It is understood that not all end user situations are the same and the tension setting may need to be adjusted in the field. If the customer does need to adjust the tension setting please follow the below instructions.

There is a set screw and spring configuration in the Tension Arm. The amount the set screw is threaded into the Tension Arm determines the amount the spring is compressed, and therefore the amount of tension that is applied to the wire. The Tension Arm has been designed such that the ideal tension setting is when the head of the set screw is flush with the face of the Tension Arm.

Since the AutoDrive® SA Torch is only to be used in conjunction with an AutoDrive® SA Wire Feeder the amount of wire the Torch will be feeding is always known. Therefore the amount of tension that is needed to feed wire from the Wire Feeder to the Torch is always known. This is why the Torch Drive Roll Tension is set at the factory and ideally does not need to be adjusted.

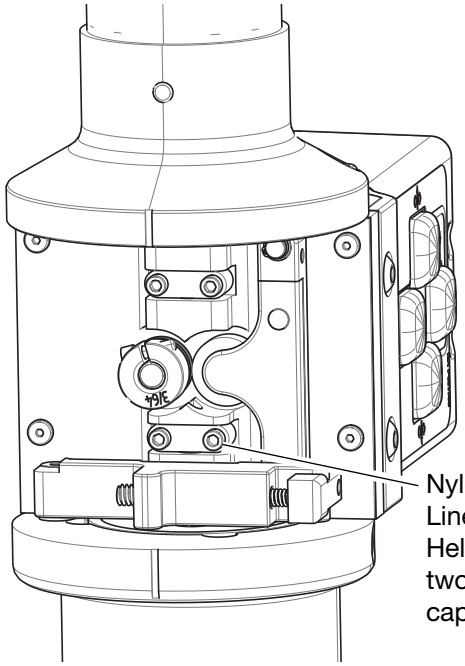
FIGURE A.25 Drive Roll Tension is set by adjusting the set screw indicated in the image above. By tightening the set screw more tension is being applied to the wire.



CONDUIT INSTALLATION, ALUMINUM

The conduit liner that runs from the torch to the feeder should be replaced from the feeder end. There is a small space to pull out the old liner and replace with a new liner. The conduit liner is held in place at the torch with a small aluminum clamp. The back end of the conduit is free to move with the motion of the robot arm. The conduit liner should terminate to within 0.12" of the torch drive roll. The goal is to support the wire for as much of the distance as possible to prevent bird nesting of the wire.

FIGURE A.26 The 3/16" OD Nylon conduit liner for aluminum extends from the AutoDrive® SA Wire Feeder to the Torch. The liner is only held in place by the Liner Clamp pictured above. The liner should be held as close to the Drive Roll and Idler Roll as possible without rubbing, this supports the wire as much as possible to minimize birds nesting.



The Gooseneck jump liner can be installed two different ways. Either way is effective. The conduit liner should terminate to within 0.12" of the torch drive roll. The goal is to support the wire for as much of the distance as possible to prevent bird nesting of the wire. The gooseneck liner is made of a slippery Teflon material. Due to geometrical differences the length of the gooseneck liner is different if the customer is using 350Amp or 550Amp front end consumables. There will be one size replacement Teflon liner package's sold, the customer will need to cut the liner to the length they require. The liner is secured at the drive roll end with a clamp. Loosen both screws prior to liner removal.

1.) The preferred method is to remove the contact tip and contact tip holder and pull out the used liner. The user can then cut a new liner to exact length of the old liner and reinstall.

2.) Another method is to remove the gooseneck from the torch and replace the liner from the other end. Pull the liner out, cut to length and reinstall. This eliminates removing the contact tip and contact tip holder.

Water Fitting Valve Replacement

Tools Required:

• K4214-1 Valve Fitting Tool

Valve Removal and Replacement:

1.) Ensure that robot and power source are deenergized.

2.) Disconnect SA torch from water cooler to prevent water flow during valve replacement.

3.) Remove gooseneck assembly by loosening lock nut and pulling gooseneck from torch.

4.) Remove SA torch body from robot face and hoses per installation instructions.

5.) Lightly depress each check valve and release, to ensure that water pressure has been relieved.

6.) Place torch on body on flat work surface so that front face / gooseneck mating surface is vertical.

Valve removal:

1.) Using K4214-1 Valve Fitting Tool, remove Slotted Hollow Set Screw with o-ring installed.

2.) Remove Water Pin with o-ring installed.

3.) Remove spring.

4.) Verify that Spring Plug is installed into water valve port on SA torch. This part is not normally replaced, but is included with kit if needed. If replacement is necessary, install Spring Plug with taper inwards and spring seat outwards.

Valve Installation:

1.) Install Spring into SA torch, seating into spring seat on Spring Plug.

2.) Install small o-ring onto Water Pin, pushed up against front face so that o-ring is not blocking water holes.

3.) Insert Water Pin with o-ring installed onto Spring.

4.) Install large o-ring onto Slotted Hollow Set Screw. Apply a thin film of silicone based o-ring lubricant onto o-ring.

5.) Install Slotted Hollow Set Screw into SA torch. Use K4214 Valve Fitting Tool to tighten Slotted Hollow Set Screw until snug. DO NOT OVERTIGHTEN.

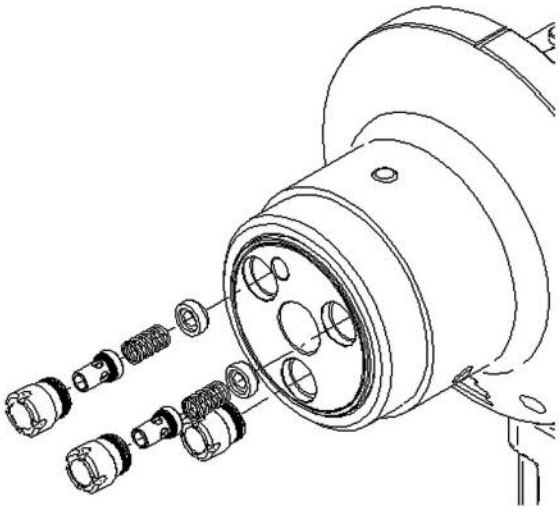


FIGURE A.27 Water Valve removal and replacement.

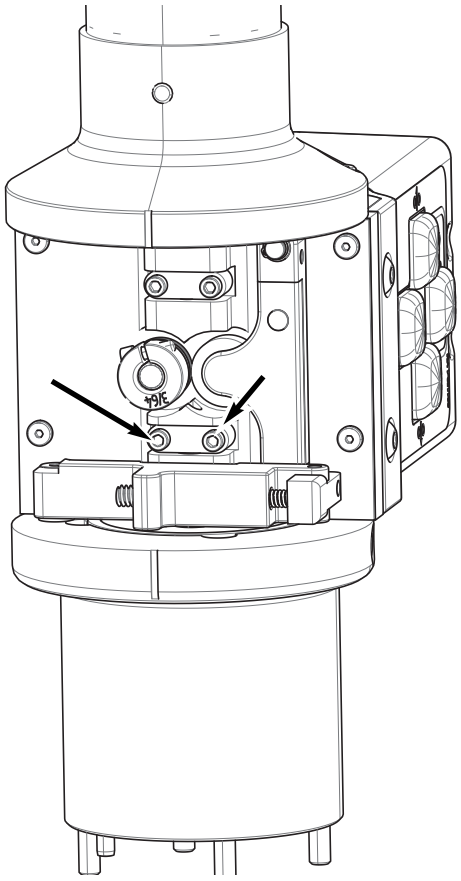
ALUMINUM LINER REPLACEMENT

Procedure:

1.) Position arm to be straight from feeder to torch.

2.) Loosen the front torch locking screws. If present, remove long liner guide set screw from liner guide in feeder.(See Figure A.28)

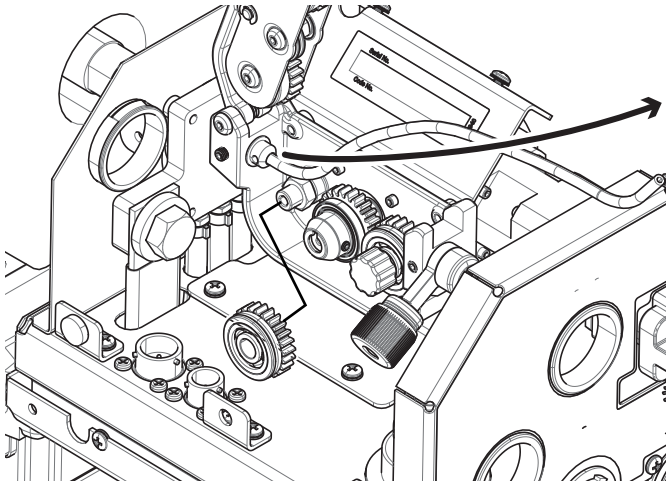
FIGURE A.28



3.) Unlatch feeder idler rolls and flip up out of the way. remove drive roll cover and front drive roll from feeder.

4.) Slide the liner out from the feeder. (See Figure A.29)

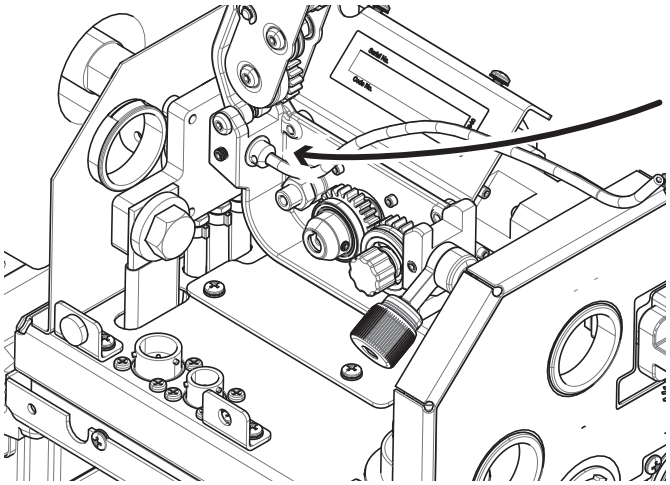
FIGURE A.29



5.) Install replacement plastic liner. (See Figure A.30)

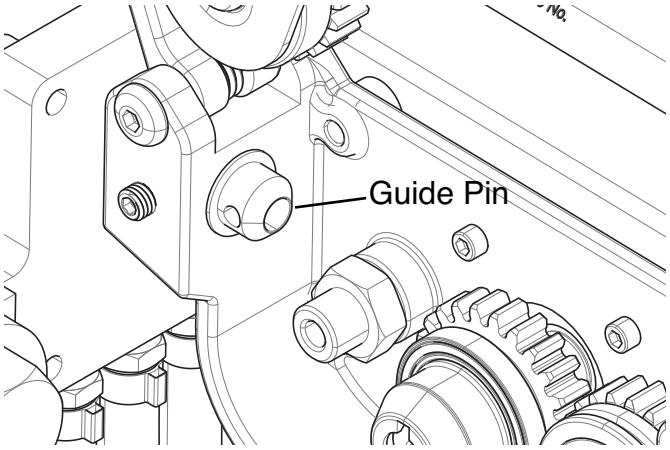
6.) Adjust so that liner is close to the torch drive rolls but not touching.

FIGURE A.30



7.) Tighten screws in front torch to lock liner in position (see Figure A.28).

FIGURE A.31



8.) Trim excess liner in the rear so that it is flush with the guide pin.

DO NOT REINSTALL THE SET SCREW

9.) Reinstall front drive roll and drive roll cover. Relatch idler rolls.

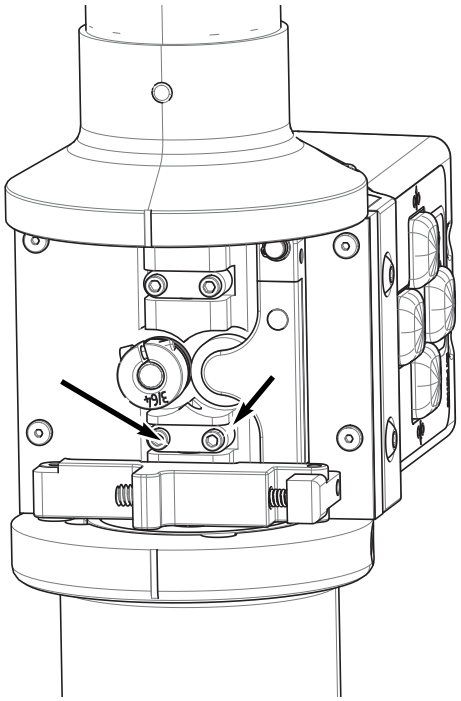
STEEL LINER REPLACEMENT

Procedure:

1.) Position arm to be straight from feeder to torch.

2.) Remove the front torch locking screws; remove clamp. Loosen set screw in liner guide insider feeder from liner guide in feeder. (See Figure A.32)

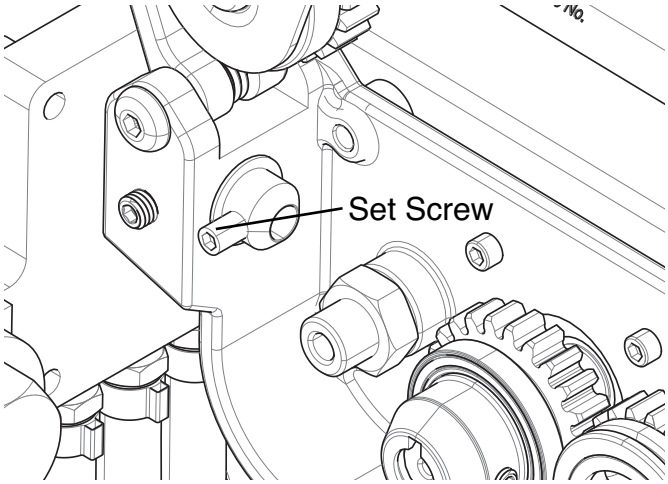
FIGURE A.32



3.) Unlatch feeder idler rolls and flip up out of the way. Remove drive roll cover and front drive roll from feeder.

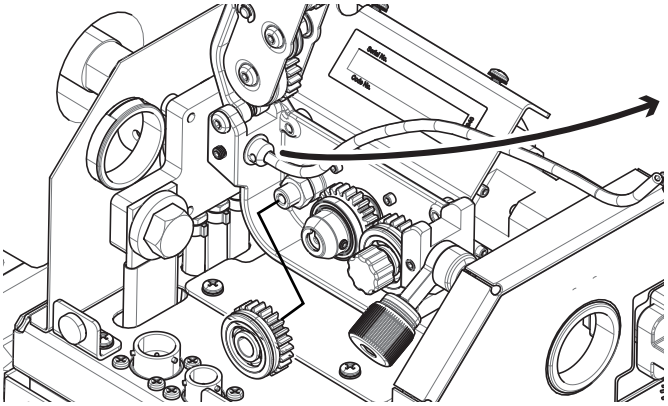
4.) Push liner back from front torch. Grip liner at feeder and remove. (See Figure A.33)

FIGURE A.33



5.) Install replacement steel liner. (See Figure A.34)

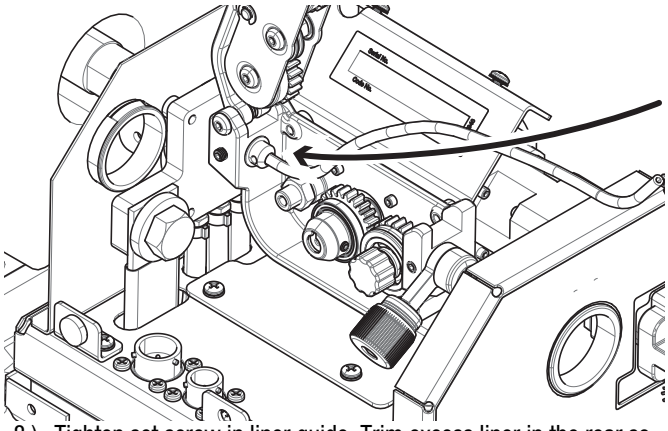
FIGURE A.34



6.) Adjust so that liner is close to the torch drive rolls but not touching.

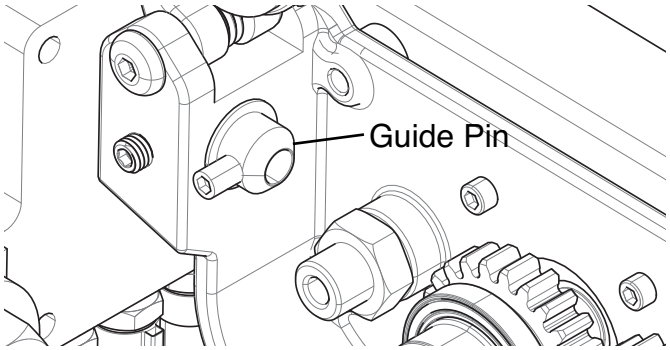
7.) Reinstall clamp and screws in front of torch; tighten screws to lock liner in position. (See Figure A.32).

FIGURE A.35



8.) Tighten set screw in liner guide. Trim excess liner in the rear so that it is flush with the guide pin.

9.) Reinstall front drive roll and drive roll cover. Relatch idler rolls.



⚠ NOTE

DRIVE ROLL TENSION ADJUSTMENT SHOULD NOT BE CHANGED

Default setting is two marking lines with wire installed

SYSTEM SET-UP

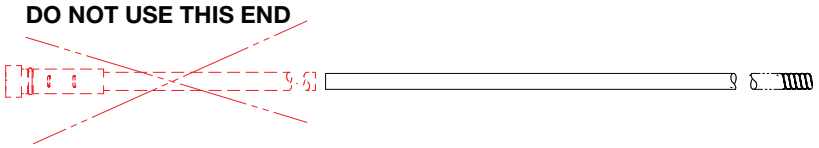
New Arms

Please refer to Installation Section A and follow the provided steps, and Operation Section B for basic operation.

CONDUIT INSTALLATION STEEL

Cut off brass ferrule and liner section that is covered with heat shrink. Remove any heat shrink on liner section. Pre-cut liner section being used in robot arm per following chart:

ROBOT ARM	CUSTOMER PRE CUT LENGTH
ABB IRB 1520ID	50”
ABB IRB 1600ID	49”
ABB IRB 2600ID	60”
FANUC 100iC	37”
FANUC 100iC/6L	45”
FANUC 120iC	44”
FANUC 120iC/10L	53”
KUKA KR5-HW-2	47”
KUKA KR16-HW	48”
KUKA KR16-L8-HW	64”
MOTOMAN MA1440	37”
MOTOMAN MA2010	54”



OPERATION

The AutoDrive® SA Wire Feeder and Torch are fully controlled and operated by a robot, control box or user interface on the power source. The AutoDrive® SA system requires a Generation III Power Wave® Power Source. A software update may be required prior to use.

However, there are four buttons on the AutoDrive® SA- Torch. These four buttons are only functional when the robot is not welding.

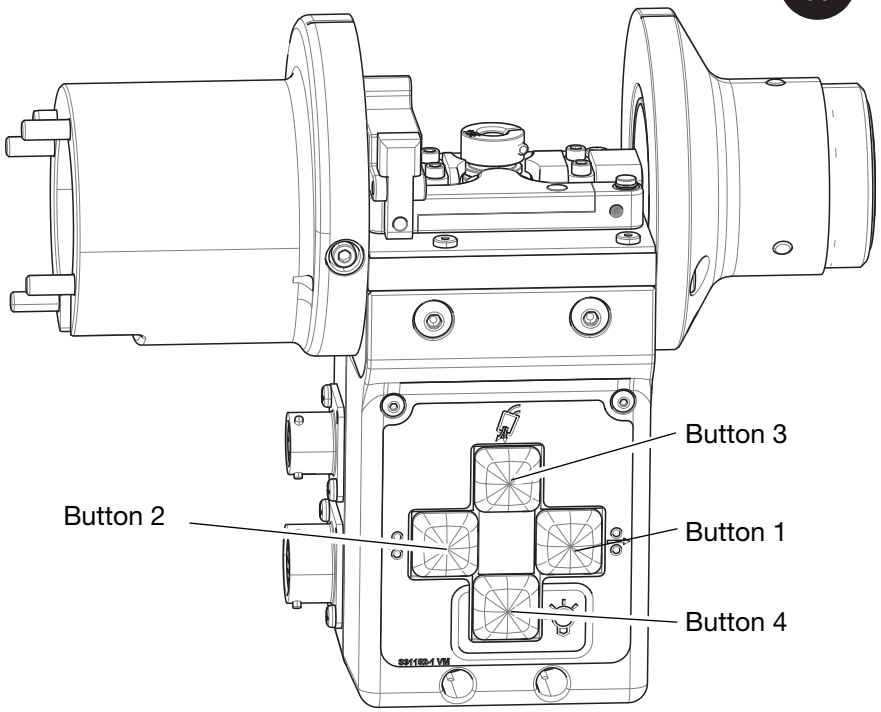
BUTTON 1	COLD INCH FORWARD
BUTTON 2	COLD INCH REVERSE
BUTTON 3	GAS PURGE
BUTTON 4	LED LIGHT ON/ OFF

Cold Inch Forward/ Reverse: This button is to cold inch wire in/out of the contact tip to set a CTWD or feed wire through the torch. The speed the wire advances at is set in the Teach Pendant from the robot. It will only feed at the Cold Inch Slow Speed in the Teach Pendant. The wire will not increase to a Fast Cold Inch Speed like if wire was inched from the Pendant.

Gas Purge: The Gas Solenoid will open in the wire feeder for as long as this button is pressed.

LED Light: The bright light on the nosecone of the torch can be toggled on or off with this button. This button will often be used for programming purposes only and switched off when the robot is welding.

FIGURE B.1 Image showing button orientation.



GRAPHIC SYMBOLS THAT APPEAR ON THE AUTODRIVE® SA TORCH OR WIRE FEEDER OR IN THIS MANUAL

WARNING OR CAUTION

WIRE FEEDER

COLD FEED + & -

GAS PURGE

SHIELDING GAS INLET

I_1 **INPUT CURRENT**

I_2 **OUTPUT CURRENT**

LIQUID INLET

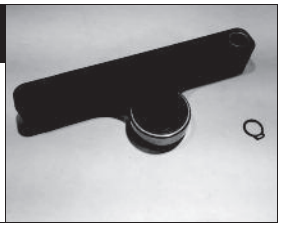
LIQUID OUTLET

OPTIONAL KITS AND ACCESSORIES

Drive Roll Kits, 4 Roll Drive

DRIVE ROLL KITS, ALUMINUM & STEEL WIRE			
KP4413-035A	0.035	Includes: 1 U-Groove Drive roll, Torx Key, and Drive Roll Height Gauge	
KP4413-364A	3/64"		
KP4413-116A	1/16"		
KP4413-035S KP4413-040S KP4413-045s	0.035" 0.040" 0.045"	1 V-Groove Drive roll, Torx Key, and Drive Roll Height Gauge	

Idler Roll Assembly

IDLER ROLL KIT			
KP4415-1	ALL WIRE SIZES	Includes: 1 Idler Roll Assembly, Retaining Ring	

Tip Holders

TIP HOLDERS			
KP4122-1	TIP HOLDER - 350A	Includes: 1 tip holder, or 25 if a bulk pack	
KP4122-1-B25	TIP HOLDER -350A (25x BULK PACK)		
KP4123-1	TIP HOLDER - 550A		
KP4123-1-B25	TIP HOLDER - 550A (25x BULK PACK)		

Goosenecks

GOOSENECKS			
KP4125-22	22 Degree Gooseneck	Includes: 1 gooseneck	
KP4125-45	45 Degree Gooseneck		
KP4125-180	180 Degree Gooseneck		

Diffuser Cap

DIFFUSER CAP			
KP4124-1	DIFFUSER CAP	Includes: 1 diffuser cap, or 25 if a bulk pack	
KP4124-1-B25	DIFFUSER CAP (25X BULK PACK)		

See product information sheet for latest nozzle and contact tip offering.

OPTIONAL KITS AND ACCESSORIES		
KP3376-2	GOOSENECK LINER	INCLUDES: 5X TEFLON LINER PIECES (CUSTOMER TO CUT TO LENGTH)
KP3364-4	.035 / .045 JUMP LINER	INCLUDES: 1 X 20" LONG STEEL LINER (CUSTOMER TO CUT TO LENGTH)
KP3991-6	CONDUIT LINER, ALUMINUM	INCLUDES: 1X 4' LONG TEFLON CONDUIT LINER (CUSTOMER TO CUT TO LENGTH)
KP44-3545-15	CONDUIT LINER, STEEL	INCLUDES: 1X 15' LONG TEFLON CONDUIT LINER (CUSTOMER TO CUT TO LENGTH)
K4214-1	WATER FITTING TOOL	INCLUDES: 1 TOOL
KP4215-1	WATER FITTING REPAIR (K4214-1 TOOL REQUIRED)	INCLUDES: FITTINGS, O-RINGS, SPRINGS
KP4216-1	GOOSENECK O-RING KIT	INCLUDES: 2 SETS OF GOOSENECK O-RINGS
9SM25261	CABLE REMOVAL TOOL (SPANNER WRENCH)	INCLUDES: 1 TOOL

ROUTINE MAINTENANCE

⚠ WARNING

Before carrying out service, maintenance and/or repair jobs, fully disconnect power to the machine.

Use Personal Protective Equipment (PPE), including safety glasses, dust mask and gloves to avoid injury. This also applies to persons who enter the work area.

MOVING PARTS can injure.
- **Do not operate with doors open or guards off.**
- **Keep away from moving parts.**

Have qualified personnel do all maintenance and troubleshooting work.

CALIBRATION SPECIFICATION

Calibration of the AutoDrive® SA is critical to its operation. Once the unit has been calibrated after installation, it generally will not need adjustment. However, neglected or improperly calibrated machines may not yield satisfactory weld performance. To ensure optimal performance, it is recommended that the calibration of wire feed speed be checked yearly.

The calibration procedure itself requires the use of a certified actual meter for wire feed speed. The accuracy of calibration will be directly affected by the accuracy of the measuring equipment you use. When the unit is first installed, or if the welding performance changes, use the calibration section of the Power Wave Manager utility to make the appropriate adjustments. The utility and its instruction manual, which includes detailed instructions for carrying the calibration procedure, are available at www.powerwavesoftware.com.

ALUMINUM WIRE	
DRIVE ROLLS	The custom drive rolls manufactured for use on the AutoDrive® SA-Torch are designed to last around 7000lbs of wire. Please see the table on page C-1 with replacement drive rolls.
GOOSENECK AND CONDUIT LINERS	The Teflon liners in the gooseneck and conduit are meant to create a smooth surface for the aluminum wire to glide over. These surfaces are going to wear over time. Please see the table on page C-3 with replacement Teflon liners.
ALUMINUM OXIDE SHAVINGS	Over time aluminum oxide breaks off the surface the aluminum wire. This oxide builds up below drive rolls and wear surfaces. It is important to periodically blow out these areas with compressed air to avoid the buildup of aluminum oxide which can contribute to feeding issues.

STEEL WIRE	
GOOSENECK AND CONDUIT LINERS	Gooseneck liners replace as necessary. Conduit liner: Clean cable liner after using approximately 300 pounds (136kg) of electrode. Remove liner from system and lay it out straight on a table. Using an air hose supply in low pressure, gently blow out from the torch end.

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

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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.

⚠ WARNING

- **Turn the input power OFF at the welding power source before installation or changing drive rolls and/or guides.**
- **Do not touch electrically live parts.**
- **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.**

Observe all additional Safety Guidelines detailed throughout this manual.

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

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Observe all Safety Guidelines detailed throughout this manual

PROBLEMS (SYMPTOMS)	POSSIBLE CAUSE	RECOMMENDED COURSE OF ACTION
The torch does not feed wire and the drive rolls do not spin.	1. Verify the power source is turned on. 2. Verify the circuit breaker for the wire feeder on the power source has not tripped. 3. Verify the two electrical cables that run from the torch to the feeder are plugged in and secured in the wire feeder 4. Verify power is being supplied to the wire feeder.	
The wire feeds erratically.	1. Verify the correct drive rolls and inner wire guide are installed in the wire drive. 2. Check for sharp bends in the gun liner or conduit. 3. Examine the contact tip for wear and proper size. Replace as necessary. 4. Check the gun liner and conduit. The welding electrode should slide easily through both. 5. Verify the proper gun liner is installed. 6. Verify the pressure arms are set properly. Too much pressure may crush the wire. 7. Inspect the motor rotation with no wire installed. If rotation is smooth then wire path is most likely compromised.	If all recommended possible areas of misadjustment have been checked and the problem persists, **Contact your local Lincoln Authorized Field Service Facility.**
No shielding gas	1. Verify the gas supply is turned on and not empty. 2. Check the gas hose for cuts. Make sure it is not crushed. 3. Verify the shielding gas hose is connected to the back of the wire feeder.	
Variable or "hunting" arc.	1. Check for proper size contact tip. Make sure the contact tip is not worn, free of spatter and not melted. 2. Clean and tighten all electrode and work connections. 3. Verify the proper polarity is being used for the weld procedure. 4. Make sure the proper electrode stick-out is being maintained. 5. Check the gas flow rate and mixture. 6. Verify the cable pack assembly is tight at the torch and wire feeder. 7. Verify the electrode lead is connected to the proper connection block on the feed head.	

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

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Observe all Safety Guidelines detailed throughout this manual

PROBLEMS (SYMPTOMS)	POSSIBLE CAUSE	RECOMMENDED COURSE OF ACTION
The motor overload errors occur.	1. Check for sharp bends in the gun liner and conduit. 2. Examine the contact tip for wear and proper size. Replace as necessary. 3. Check the gun liner and conduit. The welding electrode should slide easily through both. 4. Verify the proper gun liner is installed. 5. Reduce the pressure arm setting at wire feeder.	If all recommended possible areas of mis-adjustment have been checked and the problem persists, **Contact your local Lincoln Authorized Field Service Facility.**
Leaking Water or Shielding Gas.	1. O-rings at torch/gooseneck interface. 2. O-rings at torch/cable interface.	1. Buy Gooseneck O-Ring Kit (KP4216-1). 2. Buy as parts from Parts Pages.

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

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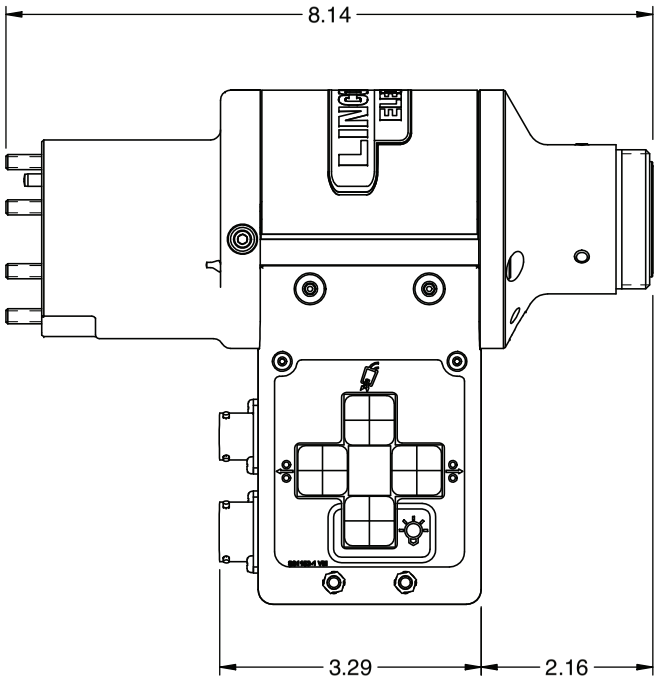
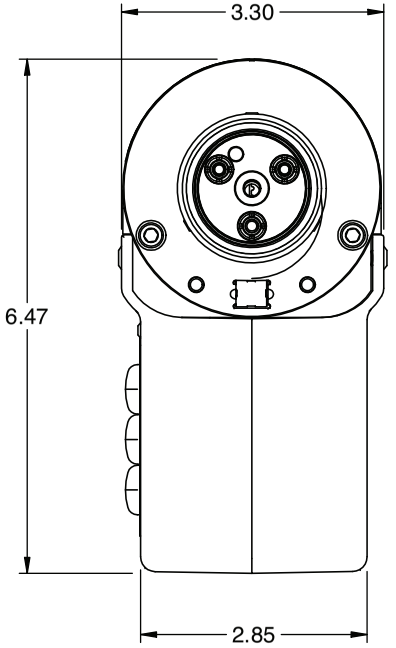
TORCH DIMENSION PRINT

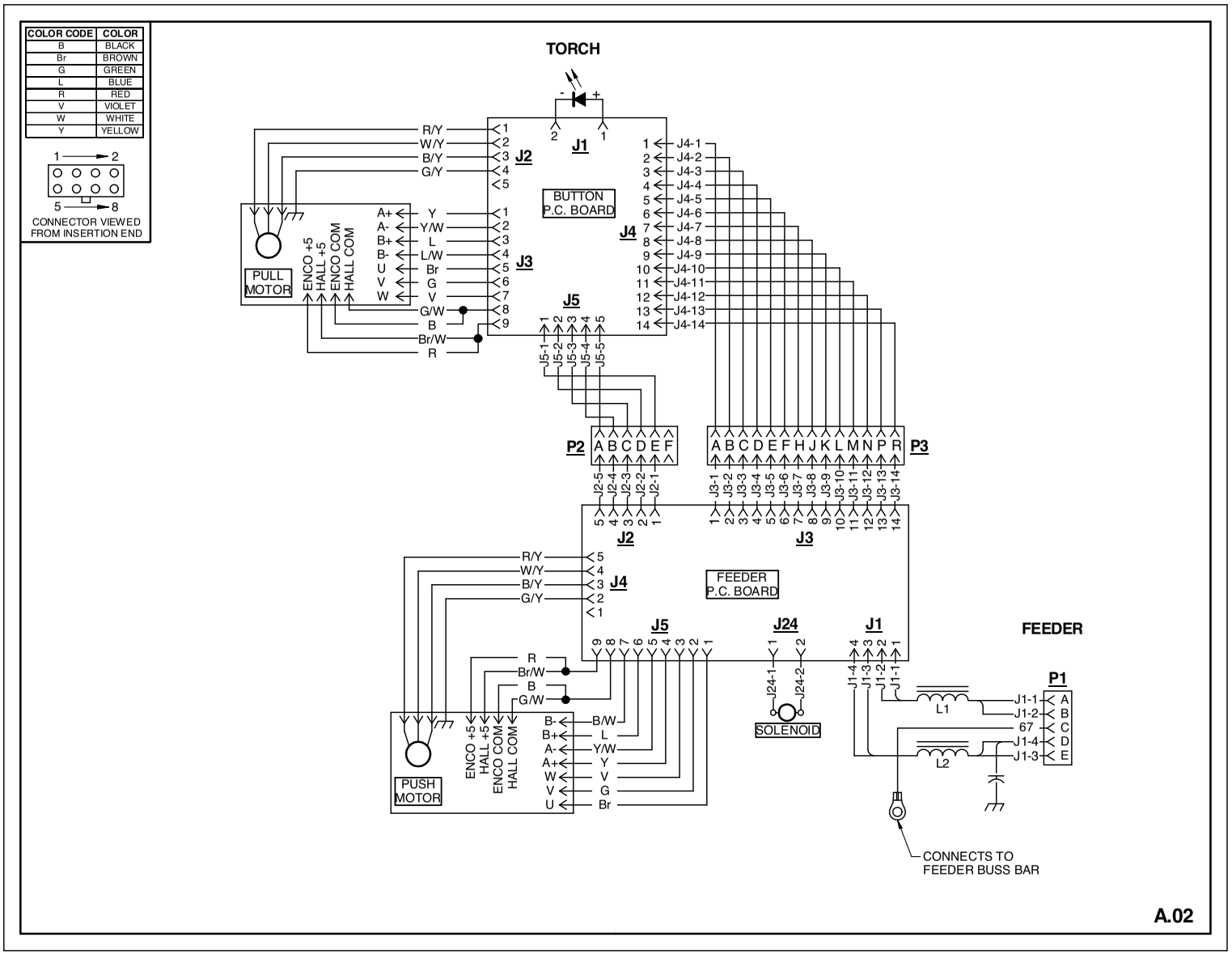




M25389-5 A.01

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.

SCHEMATIC



M25369PRINT

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.

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		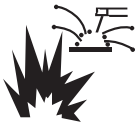	
WARNING	● Do not touch electrically live parts or electrode with skin or wet clothing. ● Insulate yourself from work and ground.	● Keep flammable materials away.	● Wear eye, ear and body protection.
Spanish **AVISO DE PRECAUCION**	● No toque las partes o los electrodos bajo carga con la piel o ropa mojada. ● 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	● Entfernen Sie brennbarres Material!	● Tragen Sie Augen-, Ohren- und Körperschutz!
Portuguese **ATENÇÃO**		● 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	● 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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