



Abicor Binzel, 650 MedImmune Court, Suite 110, Frederick, MD 21702
(301) 846-4497 • customerservice@abicorusa.com

Operation Manual



Model #: MA-400™ Air-Cooled
SpinArc® Welding Torch



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Patents Pending in multiple countries.*

MA-400 Air-Cooled, SpinArc® Welding Torch
Revision 19 1-17-2017



Thank You for Choosing SpinArc®

Thank you for selecting a Weld Revolution product. The SpinArc® welding torch you have purchased is a breakthrough in new technology that has been carefully assembled, thoroughly tested and is ready to weld. Each product goes through a series of quality tests; and every torch is weld tested prior to shipment to ensure the highest performance.

Before installing, compare the equipment received against the invoice to verify that the shipment is complete and undamaged. It is the responsibility of the purchaser to file all claims of damage or loss that may have occurred during transit with the carrier.

This Operation Manual contains general information, instructions, recommended operating ranges and preventative maintenance to maintain the product. Please read, understand and follow all safety precautions.

While every precaution has been taken to assure the accuracy of this Operation Manual, Weld Revolution assumes no responsibility for errors or omissions. Weld Revolution assumes no liability for damages resulting from the use of information contained herein. The information presented in this Operation Manual is accurate to the best of our knowledge at the time of printing.

Please reference www.weldrevolution.com for updated materials, how-to guides and videos.

Product Registration: www.weldrevolution.com/registration

Technical Support

(301) 846-4497
customerservice@abicorusa.com

Serial Number: _____

Date of Purchase: _____

Purchased From: _____

serial number is located on torch body

Subject to Change – The information presented in this manual is accurate to the best of our knowledge at the time of printing. Please visit www.weldrevolution.com for the most up-to-date information.

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SAFETY PRECAUTIONS – READ BEFORE USING

Welding is not particularly hazardous when certain safety practices are followed. Everyone using this equipment should be thoroughly trained in safe welding practices. Failure to observe safe practices may cause serious injury.

Handling welding torches presents no danger if the appropriate safety regulations are strictly adhered to. For example:

- Starting procedures must be reserved for those fully conversant with processes relating to arc welding equipment.
- Arc welding can prove damaging to eyes, skin, and hearing! It is therefore imperative that both management and operators understand and follow the ANSI Standard Z49.1, SAFETY IN WELDING AND CUTTING. All Personal Protective Equipment (PPE) shall be in place in accordance with this referenced specification and all other applicable and governing regulations.
- The operating data provided in the Specifications are maximum values. Overloading the welding torch will inevitably damage the product and void any and all warranties.
- Before changing any parts on the torch or Control Box, disconnect the torch from the welding power source and disconnect the Control Box input power source. Unplug the Control Box from the electrical outlet.
- The operating instructions for all other welding components - e.g. power source, wire feed and cooling unit must be followed per the manufacturer's recommendations.
- Never pull the cable assembly across sharp edges or set down on a hot surface.
- Never move the torch by pulling or dragging by the welding torch or cable.
- Curtains or partitions shall be installed to protect other workers or observers from arc radiation.
- When handling gas cylinders, consult the instructions issued by the manufacturers and the suppliers of the pressurized gas.
- Work pieces that have been degreased using chlorinated solvents must be sprayed down with clean water before welding starts to avoid the risk of phosgene forming. For the same reason, no degreasing baths containing chlorine must be placed close to the welding point.
- All vapors given off by metals can cause harm and a special warning is attached to lead, cadmium, copper, zinc, and beryllium. Take appropriate precautions to ensure that the legal maximum levels of toxic concentrations are not exceeded.

- Do not touch the welding torch with bare skin until it has had adequate time to cool down.
- Wait to adjust the rotation diameter until the torch has cooled to room temperature.

Fume and Gases



FUMES AND GASES can be hazardous. Welding and cutting produces fumes and gases. Breathing these fumes and gases can be hazardous to your health.

- Keep your head out of the fumes. Do not breathe the fumes.
- If inside, ventilate the area and/or use local forced ventilation at the arc to remove welding and cutting fumes and gases. The recommended way to determine adequate ventilation is to sample for the composition and quantity of fumes and gases to which personnel are exposed.
- If ventilation is poor, wear an approved air-supplied respirator.
- Read and understand the Safety Data Sheets (SDSs) and the manufacturer's instructions for adhesives, coatings, cleaners, consumables, coolants, degreasers, fluxes and metals.
- Work in a confined space only if it is well ventilated, or while wearing an air-supplied respirator. Always have a trained watch-person nearby. Welding fumes and gases can displace air and lower the oxygen level causing injury or death. Be sure the breathing air is safe.
- Do not weld or cut in locations near degreasing, cleaning, or spraying operations. The heat and rays of the arc can react with vapors to form highly toxic and irritating gases.
- Do not weld or cut on coated metals, such as galvanized, lead, or cadmium plated steel, unless the coating is removed from the weld area, the area is well ventilated, and while wearing an air-supplied respirator. The coatings and any metals containing these elements can give off toxic fumes if welded.

Arc Rays

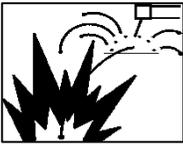


ARC RAYS can burn eyes and skin. Arc rays from welding and cutting processes produce intense visible and invisible (ultraviolet and infrared) rays that can burn eyes

and skin. Sparks fly off from the weld.

- Wear an approved welding helmet fitted with a proper shade of filter lenses to protect your face and eyes from arc rays and sparks when welding, cutting, or watching (see ANSI Z49.1 and Z87.1 listed in Safety Standards).
- Wear approved safety glasses with side shields under your helmet.
- Use protective screens or barriers to protect others from flash, glare and sparks; warn others not to watch the arc.
- Wear body protection made from durable, flame resistant material (leather, heavy cotton, wool). Body protection includes oil-free clothing such as leather gloves, heavy shirt, cuffless trousers, high shoes and a cap.

Welding and Cutting



Welding or cutting on closed containers such as tanks, drums or pipes, can cause them to blow up. Sparks can fly off from the welding or cutting arc. The flying sparks,

hot work piece and hot equipment can cause fires and burns. Accidental contact of electrode to metal objects can cause sparks, explosion, overheating or fire. Check and be sure the area is safe before doing any welding or cutting.

- Remove all flammables within 35 ft. (10.7 m) of the welding or cutting arc. If this is not possible, tightly cover them with approved covers.
- Do not weld or cut where flying sparks can strike flammable material.
- Protect yourself and others from flying sparks and hot metal.
- Be aware that welding sparks and hot materials from welding and cutting can easily go through small cracks and openings to adjacent areas.
- Watch for fire, and keep a fire extinguisher nearby.
- Be aware that welding or cutting on a ceiling, floor, bulkhead or partition can cause fire on the hidden side.
- Do not weld or cut on containers that have held combustibles, or on closed containers such as tanks, drums, or pipes unless they are properly prepared according to AWS F4.1 and AWS A6.0 (see Safety Standards).

- Do not weld or cut where the atmosphere may contain flammable dust, gas, or liquid vapors (such as gasoline).
- Connect work cable to the work as close to the welding or cutting area as practical to prevent welding or cutting current from traveling long, possibly unknown paths and causing electric shock, sparks and fire hazards.
- Do not use welder to thaw frozen pipes.
- Remove stick electrode from holder or cut off welding wire at contact tip when not in use.
- Remove any combustibles, such as a butane lighter or matches, from your person before doing any welding or cutting.
- After completion of work, inspect area to ensure it is free of sparks, glowing embers, and flames.
- Use only correct fuses or circuit breakers. Do not oversize or by-pass them.
- Follow requirements in OSHA 1910.252 (a) (2) (iv) and NFPA 51B for hot work and have a fire watcher and extinguisher nearby.
- Read and understand the Safety Data Sheets (SDSs) and the manufacturer's instructions for adhesives, coatings, cleaners, consumables, coolants, degreasers, fluxes and metals.

Electric Shock



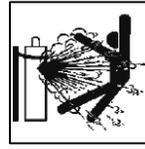
Touching live electrical parts can cause fatal shocks or severe burns. The electrode and work circuit is electrically live whenever the output is on. The input power circuit and machine internal circuits are also live when power is on. In gas metal arc welding (GMAW), the wire, wire reel, drive roll housing and all metal parts touching the welding wire are electrically live. Incorrectly installed or improperly grounded equipment is a hazard.

- Do not touch live electrical parts.
- Wear dry, hole-free insulated gloves and body protection.
- Insulate yourself from work and ground using dry insulating mats or covers big enough to prevent any physical contact with the work or ground.
- Do not use AC output in damp areas, if movement is confined, or if there is danger of falling.
- Use AC output ONLY if required for the welding or cutting process.
- If AC output is required, use remote output control if present on unit.
- Additional safety precautions are required when any of the following electrically hazardous

conditions are present: 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; or when there is a high risk of unavoidable or accidental contact with the workpiece or ground. For these conditions, use the following equipment in order presented: 1) a GMAW DC constant voltage (wire) welder, 2) a DC manual (stick) welder or 3) an AC welder with reduced open circuit voltage. In most situations, use of a DC, constant voltage wire welder is recommended. And, do not work alone!

- Disconnect input power or stop engine before installing or servicing equipment. Lockout/tagout input power according to OSHA 29 CFR 1910.147 (see Safety Standards).
- Properly install, ground, and operate this equipment according to its Owner's Manual and national, state/provincial and local codes.
- Always verify the supply ground – check and be sure that input power cord ground wire is properly connected to ground terminal in disconnect box or that cord plug is connected to a properly grounded receptacle outlet.
- When making input connections, attach proper grounding conductor first and double-check connections.
- Keep cords dry, free of oil and greases and protected from hot metal and sparks.
- Frequently inspect power cord for damage or bare wiring. Replace cord immediately if damaged. Bare wiring can kill.
- Turn off all equipment when not in use.
- Do not use worn, damaged, undersized or poorly spliced cables.
- Do not drape cables over your body.
- If earth grounding of the workpiece is required, ground it directly with a separate cable.
- Do not touch electrode if you are in contact with the work, ground or another electrode from a different machine.
- Do not touch electrode holders connected to two welding machines at the same time since double open circuit voltage will be present.
- Use only well-maintained equipment. Repair or replace damaged parts at once. Maintain unit according to manual.
- Wear a safety harness if working above floor level.
 - Keep all panels and covers securely in place.
- Clamp work cable with good metal-to-metal contact to workpiece or worktable as near the weld as practical.
- Insulate work clamp when not connected to workpiece to prevent contact with any metal object.
- Do not connect more than one electrode or work cable to any single weld output terminal. Disconnect cable for process when not in use.

Cylinders



Compressed gas cylinders contain gas under high pressure. If damaged, a cylinder can explode. Since gas cylinders are normally part of the welding process, be sure to treat them carefully.

- Protect compressed gas cylinders from excessive heat, mechanical shocks, physical damage, slag, open flames, sparks and arcs.
- Install cylinders in an upright position by securing to a stationary support or cylinder rack to prevent falling or tipping.
- Keep cylinders away from any welding, cutting or other electrical circuits.
- Never drape a welding electrode or cutting torch over a gas cylinder.
- Never allow a welding electrode or cutting torch to touch any cylinder.
- Never weld on a pressurized cylinder – explosion will result.
- Use only the correct compressed gas cylinders, regulators, hoses and fittings designed for the specific application; maintain them and associated parts in good condition.
- Turn face away from valve outlet when opening cylinder valve. Do not stand in front of or behind the regulator when opening the valve.
- Keep protective cap in place over valve except when cylinder is in use or connected for use.
- Use the right equipment, correct procedures and sufficient number of persons to lift and move cylinders.
- Read and follow instructions on compressed gas cylinders, associated equipment, and Compressed Gas Association (CGA) publication P-1 listed in Safety Standards.

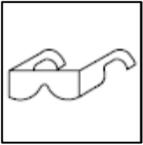
Additional Safety Warnings for Installation, Operation and Maintenance

HOT PARTS can burn



- Do not touch hot parts bare handed.
 - Allow cooling period before working on equipment.
- Do not attempt to adjust the rotation diameter setting until the torch is cool to the touch.
- While handling hot parts, use proper tools and/or wear heavy, insulated welding gloves and clothing to prevent burns.

FLYING METAL OR DIRT can injure or kill



- Welding, cutting, chipping, wire brushing and grinding cause sparks and flying metal. As welds cool, they can throw off slag.
- Wear approved safety glasses with side shields even under your welding helmet.

BUILDUP OF GAS can injure or kill



- Shut off compressed gas supply when not used.
- Always ventilate confined spaces or use approved air-supplied respirator.

ELECTRIC AND MAGNETIC FIELDS (EMF) can affect implanted Medical Devices



- Wearers of Pacemakers and other Implanted Medical Devices should keep away.
- Implanted Medical Device wearers should consult their doctor and the device manufacturer before going near arc welding, spot welding, gouging, plasma arc cutting or induction.

NOISE can damage hearing



- Noise from some processes or equipment can damage hearing.
- Wear approved ear protection if noise level is high.

FIRE OR EXPLOSION hazard



- Do not install or place unit on, over, or near combustible surfaces.
- Do not install unit near flammables. Do not overload building wiring – be sure power supply system is properly sized, rated and protected to handle this unit.

MOVING PARTS can injure



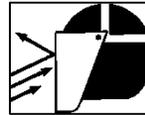
- Keep away from moving parts such as the rotating mechanism in the torch and the rotating contact tip. Keep away from moving fans.
- Keep all doors, panels, covers and guards closed and securely in place.



- Have only qualified persons remove doors, panels, covers or guards for maintenance and troubleshooting as necessary.

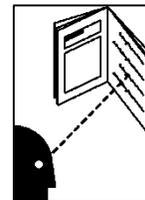
- Reinstall doors, panels, covers or guards when maintenance is finished and before reconnecting input power. Keep away from pinch points such as drive rolls.

FLYING SPARKS can injure



- Wear a face shield to protect eyes and face.
- Shape tungsten electrode only on grinder with proper guards in a safe location wearing proper face, hand and body protection.
- Sparks can cause fires – keep flammables away.

READ INSTRUCTIONS



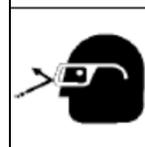
- Read and follow all labels and the Owner's Manual carefully before installing, operating, or servicing the unit.
- Read the safety information at the beginning of the manual and each section.
- Use only genuine replacement parts from the manufacturer.
- Perform maintenance and service according to the Owner's Manual, industry standards and national, state/provincial and local codes.

WELDING WIRE can injure



- Do not press gun trigger until instructed to do so.
- Do not point gun toward any part of the body, other people or any metal when threading welding wire.

COMPRESSED AIR can injure or kill



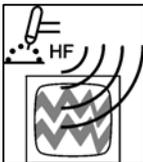
- Before working on compressed air system, turn off and lockout/tagout unit, release pressure and be sure air pressure cannot be accidentally applied.
- Relieve air pressure before disconnecting or connecting air lines.
- Check compressed air system components and all connections and hoses for damage, leaks and wear before operating unit.
- Do not direct air stream toward self or others.
- Wear protective equipment such as safety glasses, hearing protection, leather gloves, heavy shirt and trousers, high shoes, and a cap when working on compressed air system.
- Use soapy water or an ultrasonic detector to search for leaks – never use bare hands. Do not use equipment if leaks are found.

TRAPPED AIR PRESSURE AND WHIPPING HOSES can injure



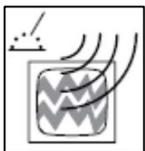
- Release air pressure from tools and system before servicing, adding or changing attachments or opening compressor oil drain or oil fill cap.

H.F. RADIATION can cause interference



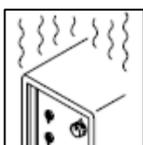
- High-frequency (H.F.) can interfere with radio navigation, safety services, computers and communications equipment.
- Have only qualified persons familiar with electronic equipment perform this installation. The user is responsible for having a qualified electrician promptly correct any interference problem resulting from the installation.
- Have the installation regularly checked and maintained.
- If notified by the FCC about interference, stop using the equipment at once.
- Keep high-frequency source doors and panels tightly shut, keep spark gaps at correct setting, and use grounding and shielding to minimize the possibility of interference.

ARC WELDING AND PLASMA CUTTING can cause interference



- Electromagnetic energy can interfere with sensitive electronic equipment such as computers and computer-driven equipment such as robots.
- Be sure all equipment in the welding area is electromagnetically compatible.
- To reduce possible interference, keep cables as short as possible, close together, and down low, such as on the floor.
- Locate welding or cutting operation 100 meters from any sensitive electronic equipment.
- Be sure welding machine or plasma cutter is installed and grounded according to its Owner's Manual.
- If interference still occurs, the user must take extra measures such as moving the welding or cutting machine using shielded cables, using line filters or shielding the work area.

OVERUSE CAN CAUSE OVERHEATING



- Allow cooling period; follow rated duty cycle.
- Reduce current or reduce duty cycle before starting to weld again.
- Do not block or filter air flow to unit.



IMPORTANT: Be sure to follow your facility's lock out / tag out procedures.

California Proposition 65 Warnings

Welding or cutting equipment produces fumes or gases that contain chemicals known to the State of California to cause birth defects and in some cases, cancer. (California Health & Safety Code Section 25249.5 et seq.) This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. Wash your hands after using.

EMF Information

Electric current flowing through any conductor causes localized electric and magnetic fields (EMF). The current from arc welding (and allied processes including spot welding, gouging, plasma arc cutting, and induction heating operations) creates an EMF field around the welding circuit. EMF fields may interfere with some medical implants, e.g. Pacemakers. Protective measures for persons wearing medical implants have to be taken. For example, restrict access for passersby or conduct individual risk assessment for welders. Welders should use the following procedures in order to minimize exposure to EMF fields from the welding circuit:

- Keep cables close together by twisting or taping them, or using a cable cover.
- Do not place your body between welding cables. Arrange cables to one side and away from the operator.
- Do not coil or drape cables around your body.
- Keep head and trunk as far away from the equipment in the welding circuit as possible.
- Connect work clamp to workpiece as close to the weld as possible.
- Do not work next to, sit or lean on the welding power source.
- Do not weld while carrying the welding power source wire feeder.

About Implanted Medical Devices:

Implanted Medical Device wearers should consult their doctor and the device manufacturer before performing or going near arc welding, spot welding, gouging, plasma arc cutting, or induction heating operations. If cleared by your doctor, then following the above procedures is recommended.

Safety Standards

- ANSI Standard Z49.1, SAFETY IN WELDING AND CUTTING, American Welding Society, 2501 N.W. 7th St., Miami, FL 33125. Free download at http://www.aws.org/technical/AWS_Z49.pdf
- ANSI Standard Z41.1, STANDARD FOR MEN'S SAFETY - TOE FOOTWEAR obtainable from the American National Standards Institute, 1430 Broadway, New York, NY 10018.
- ANSI Standard Z49.2, FIRE PREVENTION IN THE USE OF CUTTING AND WELDING PROCESSES obtainable from the American National Standards Institute, 1430 Broadway, New York, NY 10018.
- OSHA, SAFETY AND HEALTH STANDARDS, 29CFR 1910, obtainable from the U.S. Government Printing Office, Washington, D.C. 20402.
- OSHA, PERSONAL PROTECTIVE EQUIPMENT, OSH 3151-12R 2003. Free download at <https://www.osha.gov/Publications/osha3151.pdf>
- AWS Standard A6.0, WELDING AND CUTTING CONTAINERS WHICH HAVE HELD COMBUSTIBLES obtainable from the American Welding Society, 2501 N.W. 7th St., Miami, FL 33125.
- NFPA Standard 70-1978, NATIONAL ELECTRICAL CODE obtainable from the National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.
- ANSI Standard Z88.2, "Practice for Respiratory Protection" obtainable from the American National Standards Institute, 1430 Broadway, New York, NY 10018.
- ANSI Standard Z87.1, SAFE PRACTICES FOR OCCUPATION AND EDUCATIONAL EYE AND FACE PROTECTION obtainable from the American National Standards Institute, 1430 Broadway, New York, NY, 10018.
- NIOSH, SAFETY AND HEALTH IN ARC WELDING AND GAS WELDING AND CUTTING obtainable from the Superintendent of Documents, U.S. Printing Office, Washington, D.C. 20402.
- American Welding Society Standard AWSF4.1 "Recommended Safe Practices for the Preparation for Welding and Cutting of Containers and Piping That Have Held Hazardous Substances", obtainable from the American Welding Society, 2501 N.W. 7th St., Miami, FL 33125

Introduction

This manual provides basic instructions for Weld Revolution's MA-400™ Mechanized Air-Cooled Welding Torch. This product delivers the benefits of Weld Revolution's innovative and patented SpinArc® welding technology in a mechanized torch that can also be used semi-automatically with the optional hand welding kit.

This welding torch can be easily used with any modern welding power source and wire feeder. Simply select and install the appropriate power pin (wire feeder adapter) for the specific wire feeder. Refer to the list of power pins in the Spare Parts section of this manual.

How it Works

Weld Revolution's patented technology rotates the welding wire in a circular motion at a high rate of speed. Centrifugal force propels the molten droplets across the arc creating a consistent and sound weld bead. This enables high deposition rate welding for significant increases in productivity. The innovative torch design allows easy adjustment of the wire rotation diameter and rotational speed to optimize weld quality and performance.

What's Included

The MA-400 includes the following items:

- Cable Assembly
- Torch Body
- Control Box (CB-115CE)
- Control Cable (CC-6)
- Trigger Control Cable (TC-15)
- Flexure Nut Tool (PN 1087)

Additional Required Parts

The following items must also be purchased:

- Power Pin (specific to wire feeder)
- Contact Tips
- Nozzles
- Liner

Available Models

Table 1

Model #	Length, ft. (m)
MA-400-6	6 ft. (1.8 m)
MA-400-10	10 ft. (3.0 m)
MA-400-15	15 ft. (4.6 m)
MA-400-XX	XX ft. Special Order 3 - 20 ft. (1.8 - 6.1 m)

Optional Accessories

The following items are also available:

- Hand Welding Kit (PN HWK-1)
- Control Box Mounting Kit (PN CB-MK1)
- O-Ring Kit (PN K1750-3)

Consumables & Replacement Parts

Contact tips, shielding gas nozzles, wire liners, flexures and other maintenance parts are listed later in the manual. Additional contact tips, nozzles and power pins are available by special request through our Customer Service Team.

Specifications

Table 2

Max Amperage	400 Amp @ 100% duty cycle with 80/20 Ar/CO ₂ <i>Rating based on tests that comply with IEC/EN 60974-7 specifications</i>
Rotation Diameter	1 – 8 mm (0.039 - 0.315 in.) at the wire tip tool-free adjustability in increments of approximately 1 mm
Spin Direction	Clockwise & Counter-Clockwise
Spin Start Delay	0 – 5 seconds
Rotation Speed	200 – 5,500 rpm
Operating Environment	14 to 104 °F (-10 to 40 °C)
Wire Diameters	0.035 – 1/16" (0.90 - 1.6 mm)
Welding Processes	GMAW, GMAW-P, FCAW
Control Box Input Power	110 – 240 VAC, 50/60 Hz
Cable Length	Available in 6, 10 & 15 ft. (1.8, 3.0 and 4.6 m) Custom lengths available between 3 – 20 ft. (1.8 – 6.1 m)
Compliance	RoHS Compliant IP 51, Control Box IEC/EN 60974-7 

CE Declaration of Conformity on page 38.

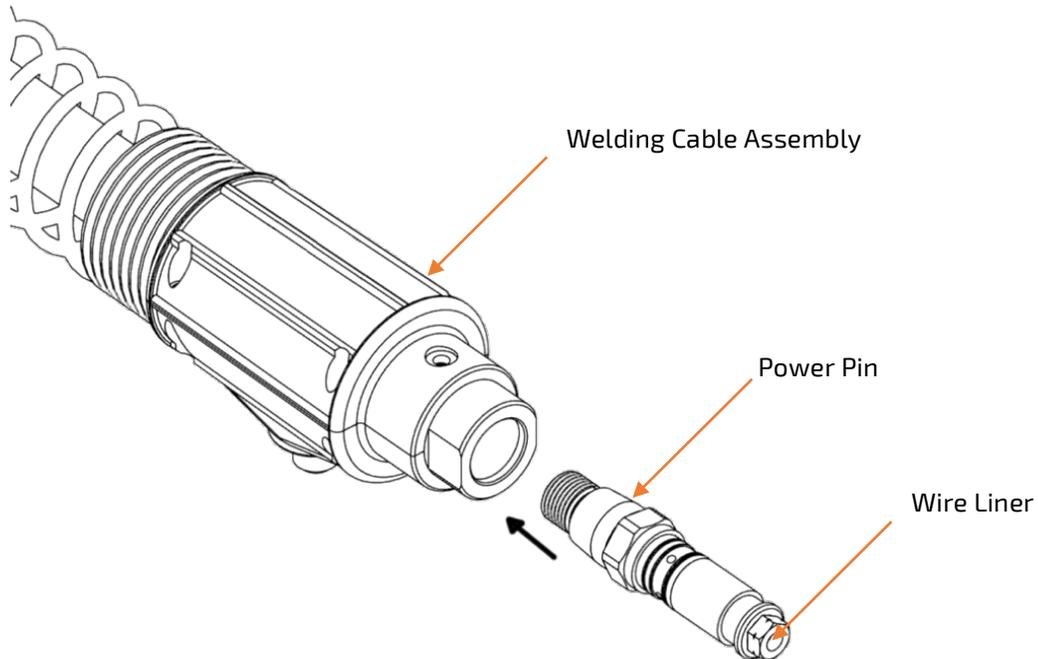
Also available for download at www.weldrevolution.com/support

For further information or help with Weld Revolution products, please visit our website at www.weldrevolution.com, or contact Customer Service at (301) 846-4497.

Installation

Step 1: Install Power Pin (detailed instructions with each power pin)

The power pin attaches to the feeder end of the cable. This required part enables the torch to connect to the specific wire feeder model in use. Power pins are sold separately (see Replacement Parts).



Contact Customer Service at +1-832-585-1244 for help selecting the right power pin.

Step 2: Install the Wire Liner (see also pg. 22)

The proper wire liner must be ordered separately. With the torch lying flat on the floor or table, unscrew the tip of the power pin and insert the liner. Insert the liner through the cable. The liner should be sticking out **1-1/4" (32 mm)** from the end of the brass end piece. Make sure the liner seats fully inside the torch and is flush inside the power pin. There may be a slight resistance as the liner enters the torch body. It is important that the liner is inserted fully and the back flange and O-ring are properly seated in the power pin.

Step 3: Connect Torch to Feeder

Insert the power pin into the wire feeder bushing and tighten the screw on the wire feeder. Make sure that the control cable connection on the torch is facing down to protect it.

Step 4: Mount the Torch

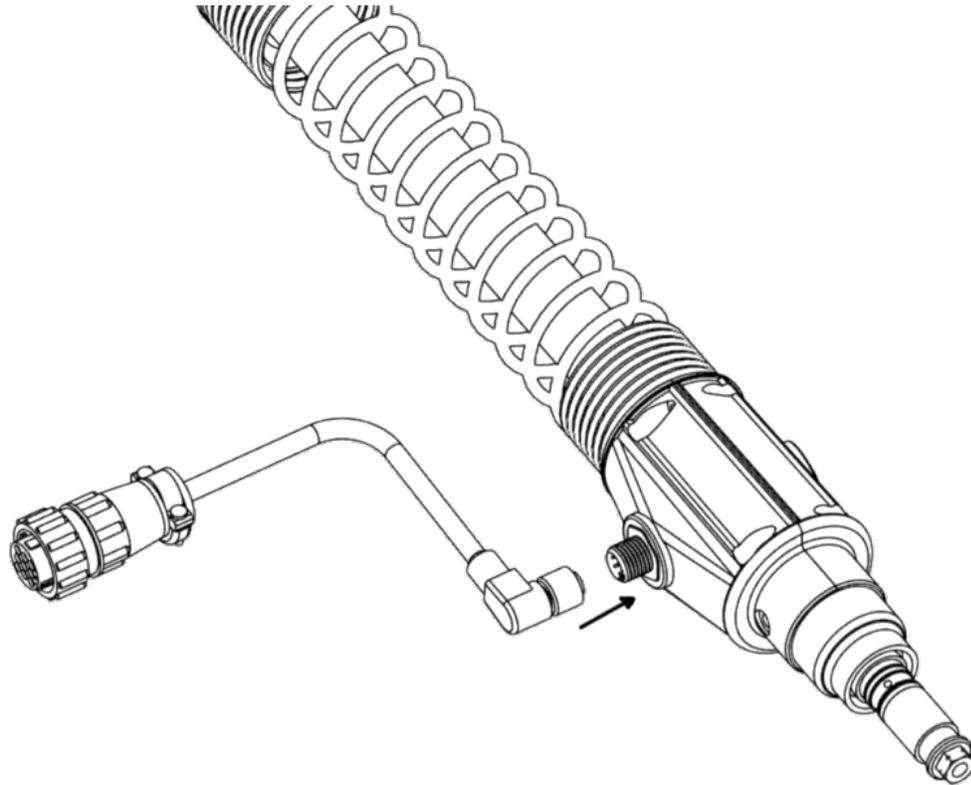
Mount the welding torch into existing mechanized systems by holding the middle section of the torch body. A hand welding kit (PN HWK-1 sold separately) is also available. This allows the torch to be used semi-automatically giving the welder greater flexibility to weld by hand.

Step 5: Mount the Control Box

The optional mounting kit (PN CB-MK1 sold separately) can be used to attach the Control Box to the wire feeder or other magnetic surface. There are also mounting tabs on the case. With the box secure and in the OFF position, plug it into a grounded input power circuit. Do not remove the grounding plug from the cable. Isolate the Control Box from all sources of high frequency.

Step 6: Control Cable

Connect the orange control cable to both the torch and the Control Box. Be careful to fully hand tighten both ends. Protect the cable from potential damage.



Step 7: Install Trigger Control Cable (TC-15) -- OPTIONAL

Details on the following two pages.

Step 8: Turn Control Box ON

First, make sure the spin switch is set to OFF. Verify the control cables and power cord are securely connected. Make sure the torch is mounted and connected to the wire feeder. Now, turn ON the Control Box. Verify the RPM readout is illuminated.

Step 9: Feed Wire

On the wire feeder, use the jog function to run the wire through the cable. As it approaches the torch, slow the wire speed down to ensure smooth feeding through the torch. HINT: It is helpful to turn ON the spin to about 1,000 rpm when feeding wire.

Step 10: Install Contact Tip

Two tools are needed to install or remove a contact tip. While holding the Contact Tip Extension with a 5/16" (8 mm) wrench or small adjustable wrench, use welding pliers to remove or tighten the contact tip.

NOTICE

Do not twist Spin Shaft. Damage to Flexure is possible.

Clip the wire to the desired wire stick out, which will be approximately the same as conventional MIG welding without rotation, and you're ready to weld.

Connecting Trigger Cable (TC-15) to wire feeder and/or aux equipment

The MA-400 can be connected to various wire feeders with the TC-15 wiring harness, included with the MA-400 system. This procedure allows the welder to trigger the arc and initiate spin remotely (e.g., on a Bug-O, side beam carriages and other automation). This cable goes between the aux. equipment and the feeder.

Connect TC-15 Cable

1. Connect cable end labelled **CONTROL** to the **AUX TRIGGER** plug on the Control Box.
2. The **FEEDER** end is 3 ft. (0.9 m) and has a Miller style Amphenol connector. Attach this end to wire feeder (may require optional Lincoln or Fronius style adaptor, see next page). You can also modify this end and install spade connectors if required.
3. Following the **welding bug manufacturer's instructions**, connect the leads on the longest end (15 ft., 4.5m) to the trigger closure circuit on the bug or other automation system.
4. Once connected, the arc start button on the bug will initiate the welding arc (close the trigger circuit in the wire feeder) and start the rotation on the SpinArc welding torch. Use the delay knob on the Control Box if you need to start the welding arc first, and then start the spin a few seconds later.



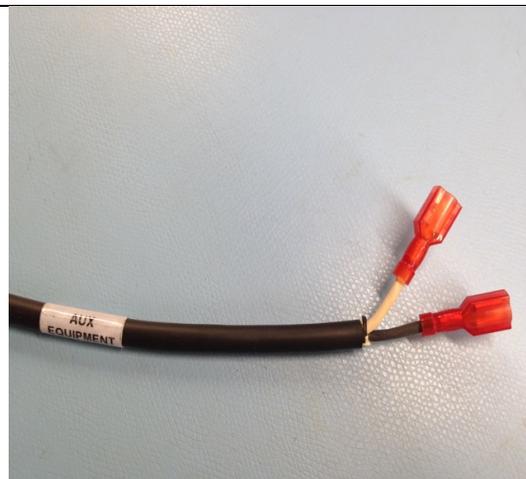
Step 1: TC-15 Control Box Connection



Step 2a: TC-15 Wire Feeder End



Step 2b: TC-15 Cable to Wire Feeder Plug



Step 3: TC-15 Cable to Bug-O Connection

Wire Feeder Trigger Connection Adaptors

The following adaptors are manufactured by the various welding equipment manufacturers and are available from your local welding distributor.



Miller Control Plug (Miller PN 419-4)



Fronius Harness (PN 43,0004,1257)



**Lincoln Gun Connector
(Lincoln PN 9SM15608)**



**Lincoln Trigger Adaptor
Weld Revolution PN 1108**

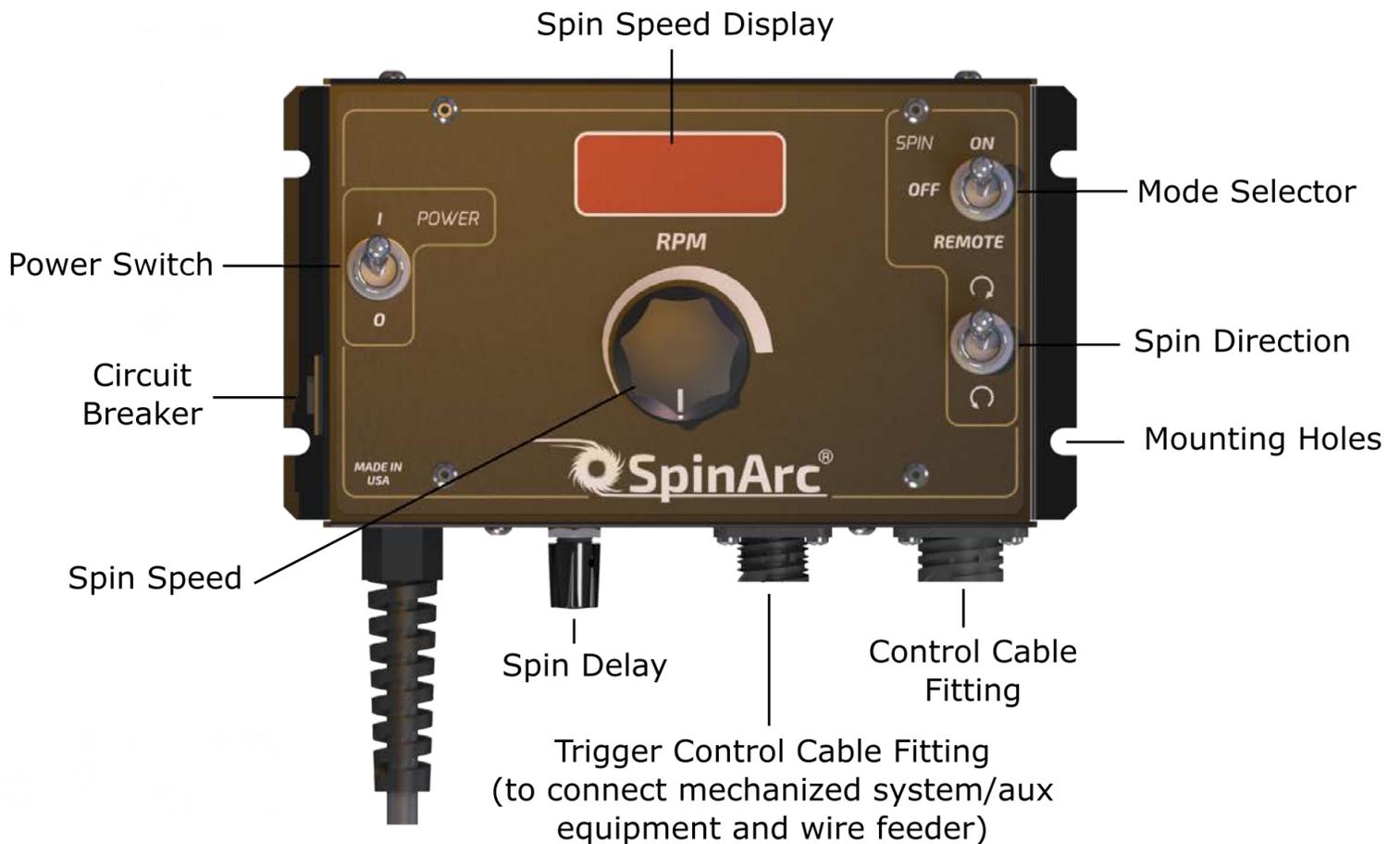
Operation

Control Box Settings

The Control Box is an integral part of the MA-400 SpinArc® Welding System. This is the user interface for setting the **Mode Setting**, **Spin Speed** (RPM), the **Spin Direction** (CW or CCW) and the **Spin Start Delay** (0 – 5 seconds). The desired RPM is shown prior The actual spin speed is displayed while rotating.

Mode Setting (ON, OFF, REMOTE)

- ON/OFF: Set the 3-position mode selector switch to either OFF, ON or AUTO. In the ON position, the contact tip rotates. Toggle between the OFF (center toggle position) and ON position to manually enable rotation. **NOTE: Remember to turn off the spin when not welding.**
- REMOTE: The REMOTE mode is used to remotely start the wire rotation. This feature is helpful when using the torch in other mechanized/robotic systems and with the Optional Hand Welding Kit. A third-party system can initiate the arc start and rotation start simultaneously. For this mode, install the Trigger Control Cable (TC-15) between the box and the wire feeder trigger connection. The TC-15 has two flying leads to enable the user to attach the appropriate Amphenol or other connector to the wire feeder trigger connection. Note: When the optional Hand Welding Kit is used, set the Mode to REMOTE, and install the Trigger Control Cable (TC-15).



Spin Direction (CC/CCW)

The spin direction is determined from the welder's perspective while it is welding. The clockwise (CW) or counterclockwise (CCW) rotation is orientated looking down at the weld from the torch. In other words, looking into the shielding gas nozzle would be opposite of the spin direction setting.

The spin direction may be arbitrary in many situations. However, there may be particular applications where the direction of rotation is important. For example, in a horizontal fillet weld the relative direction of the arc may be important. If traveling from left to right with a CW spin, the arc traverses from the top leading edge to the bottom. Changing to CCW in this case, puts the arc on the bottom edge first. This may or may not affect the final results; however, it is a factor to consider.

Spin Start Delay

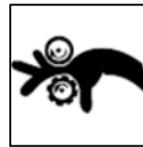
The Spin Start Delay knob is located on the bottom of the unit. This can be used to delay the start of the rotation, which may be helpful in certain applications. This feature works in both the ON and Auto modes. Verify that the knob is fully turned to the left (counter clockwise) direction if an immediate rotation is desired.

Torch Adjustments

Spin Diameter



HOT SURFACES can burn. Do not attempt to adjust the rotation diameter setting until the torch is cool to the touch.



MOVING PARTS can injure. Turn OFF the Control Box before opening the torch and attempting to adjust the spin diameter

The spin diameter is easily adjusted by changing the "gear" position on the crank assembly. This is accessible by removing the lower cap and nozzle together, exposing the crank window. There are eight diameter settings for a range of approximately 0.10 – 0.33 in. (1 to 8 mm).

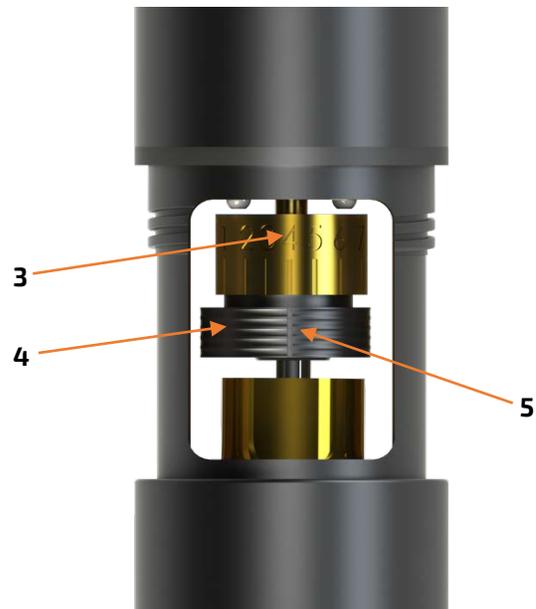
Changing Spin Diameter

To change the spin diameter, first verify that the torch is cool to the touch and is able to be handled without gloves. Then,

- (1) Unlock lower cap – twist left (1/4 turn)
- (2) Slide the cap down



- (3) Hold the numbered part stationary
- (4) Turn the aluminum piece using the thumb and forefinger of the other hand
- (5) Align the position indicator with the desire setting on the brass part

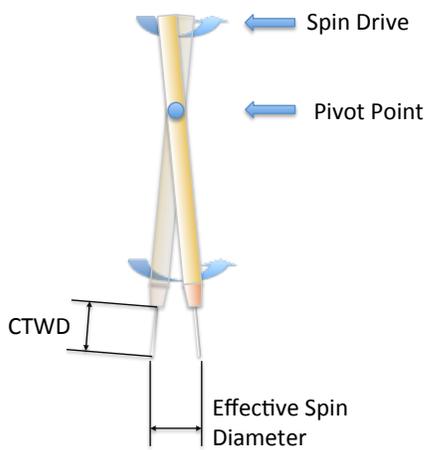


When using a standard contact tip and flush contact tip extension (PN 1043-BZ3), the spin diameter increases by approximately 0.039 in. (1.0 mm) with each setting (1 to 8).

Due to the design of the spinning mechanism, the spin diameter at the end of the electrode will be larger than the spin diameter at the contact tip. As shown in the figure below, the contact tube assembly has a fixed pivot point and the tube is driven in a circular motion by an eccentric rotational drive system.

The effective spin diameter is considered to be the outside rotational diameter of the electrode. The effective spin diameter is a function of the contact tip-to-work distance (CTWD), electrode wire stiffness, and rotational speed. For example, simply increasing the rotational speed for a given CTWD and electrode will increase the effective spin diameter due to centrifugal forces on the wire.

The table below is an example of effective spin diameter at different crank positions using a teach tip with 1 in. (25 mm) CTWD rotating at 1,000 RPM. These are approximate dimensions.



Effective Spin Diameter with 1 in. (25 mm) CTWD at 1,000 rpm

Table 3

Crank Position	Approx. Spin Diameter, mm
1	0.5 – 1.5
2	1.5 – 2.5
3	2.5 – 3.5
4	3.5 – 4.5
5	4.5 – 5.5
6	5.5 – 6.5
7	6.5 – 7.5
8	7.5 – 8.5

Measuring the effective spin diameter is outlined in the following section.

For multiple pass groove welds, different spin diameters can be utilized. For example, a smaller spin diameter may work better on the root and first fill passes. The spin diameter can be increased for the fill and cap passes.

Measuring Effective Spin Diameter

Use the welding electrode for the given welding procedure. Extend the wire to the desired Contact-Tip-To-Work distance (CTWD). Measure the outside diameter of the wire rotation at the specified CTWD with a set of high quality calipers.

Application Notes

The following are some important items to consider when developing welding procedures with SpinArc®.

Weld Bead Width

There are several variables that can affect the width of the deposited weld bead, including:

- Spin Diameter Setting
- Spin Speed (RPM)
- Contact Tip-to-Work Distance (CTWD)
- Welding Wire Diameter and Wire Stiffness
- Welding Voltage

Travel Speed

The travel speed is a function of welding position, electrode type/size, amperage, voltage, joint type, spin speed and targeted heat input needed to achieve the required mechanical properties.

Vertical Welding Progression

In general, the SpinArc® welding process is better suited for vertical down welding.

Gas Nozzles & Joint Geometry

The gas nozzle must be selected in relation to the weld joint details. For example, in a narrow gap joint it may prove favorable to use a contact tip that is extended beyond the end of the nozzle. This extension can be obtained by using the contact tip extension (PN 1043-BZ3) or by using a shortened nozzle. Additionally, a joint with a compound bevel can enable the nozzle to be inserted into the joint for thicker materials.

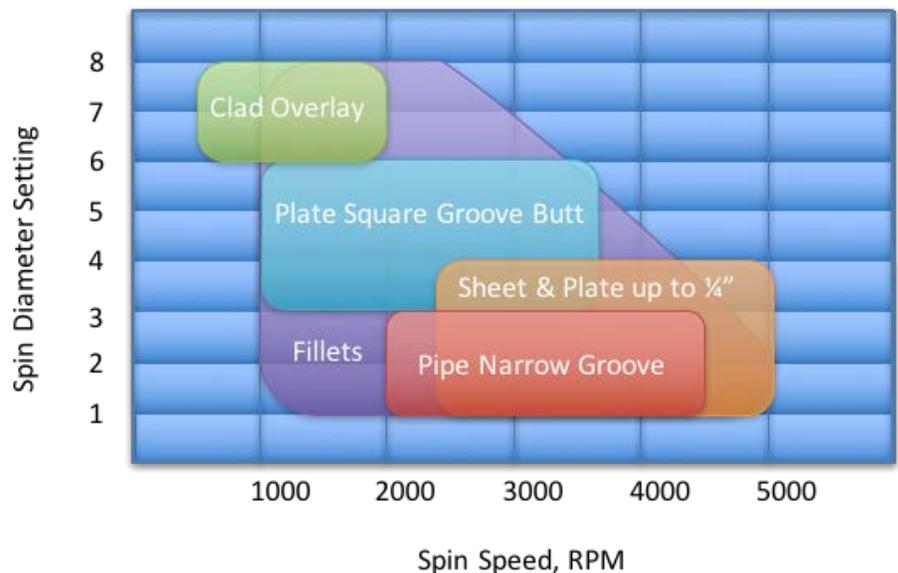
Nozzles with narrow openings can also be used with relatively small spin diameters to avoid crashing the Contact Tip into the Nozzle.

NOTICE

After opening the lower cap, it is good practice to purge it with shielding gas for several seconds prior to welding.

Typical Spin Settings

This chart shows typical spin settings for welding and overlay applications on mild steel. There is a relationship between crank position and rpm. These are starting points and may vary with different applications.



Recommended Maximum RPM

Operating within the recommendations in Table 4 below will provide optimum life of the Flexure. Some applications may require higher RPM values, which may reduce the operating life of the flexure. Inspection and replacement of the Flexure is outline in the recommended maintenance schedule on page 23.

Table 4

Crank Position	1	2	3	4	5	6	7	8
Max RPM	5500	5500	5500	4500	3500	2750	2000	1200

Consumables

Contact Tips

Table 5

Wire Dia.	Tapered CZ	CZ Heavy Duty	CZ Silver Plated	HDS Silver
.035" (0.9 mm)	140.1207	140.0217	147.0217	-
0.040" (1.0 mm)	140.0939	140.0316	147.0316	147.5316
0.045" (1.1 mm)	140.0453	140.0445	147.0445	147.5445
0.045" tight tolerance	-	140.1224	147.1224	-
0.052" (1.3 mm)	140.0958	140.0536	147.0536	147.5536
0.062" (1.6 mm)	140.0964	140.0590	147.0590	147.5590

Sold in bags of 25



Nozzles

Table 6

Part #	Description
145.D381	HD Nozzle, 3/4 in. (19 mm) Bore - 1/8 in. (3 mm) Recessed

Sold in bags of 5



Wire Liners

Table 7

Wire Dia.	Part #	Length
0.035 – 0.045 in. (0.9 – 1.1 mm)	L3A-10	10 ft. (3 m)
	L3A-15	15 ft. (4.6 m)
	L3A-25	25 ft. (7.6 m)
0.045 – 1/16 in. (1.1 – 1.6 mm)	L4A-10	10 ft. (3 m)
	L4A-15	15 ft. (4.6 m)
	L4A-25	25 ft. (7.6 m)
Steel Wrapped Nylon (for aluminum) .045 – 1/16 in. (1.1 – 1.6 mm)	L415-116-2	15 ft. (4.6 m)

Replacement Parts

The following parts can be ordered by calling our Customer Service Team at (301) 846-4497.

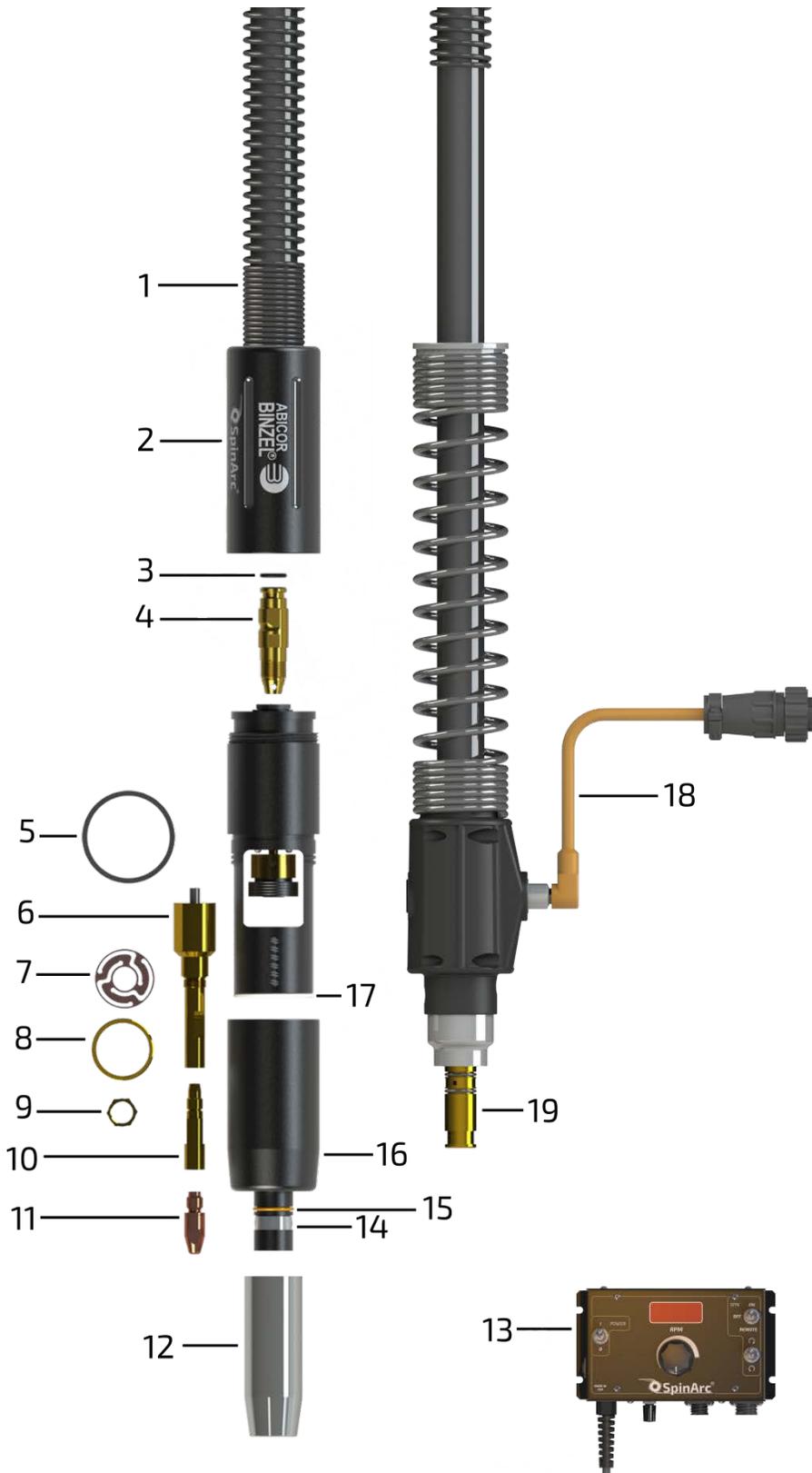


Table 8

Item	Description	Part #
1	Cable Assembly	CA-6 (6 ft.)
		CA-10 (10 ft.)
		CA-15 (15 ft.)
2	Upper Cap	1028
3	O-Ring, Power Stud	1037
4	Power Stud	1053
5	O-Ring, Outer Body	1099
6	Spin Shaft Assembly	A1554
7	Flexure	1032
8	Flexure Nut, Outer	1034
9	Flexure Nut, Inner	1033
10	Contact Tip Extension	See below
11	Contact Tip	See Consumables
12	Shielding Gas Nozzle	See Consumables
13	Control Box	CB-115CE
14	Nozzle Retaining Ring	001.9029
15	O-Ring, Cap	165.9012
16	Cap	1012BZ
17	Lower Insulator	1007
18	Control Cable	See below
19	Power Pin	See below

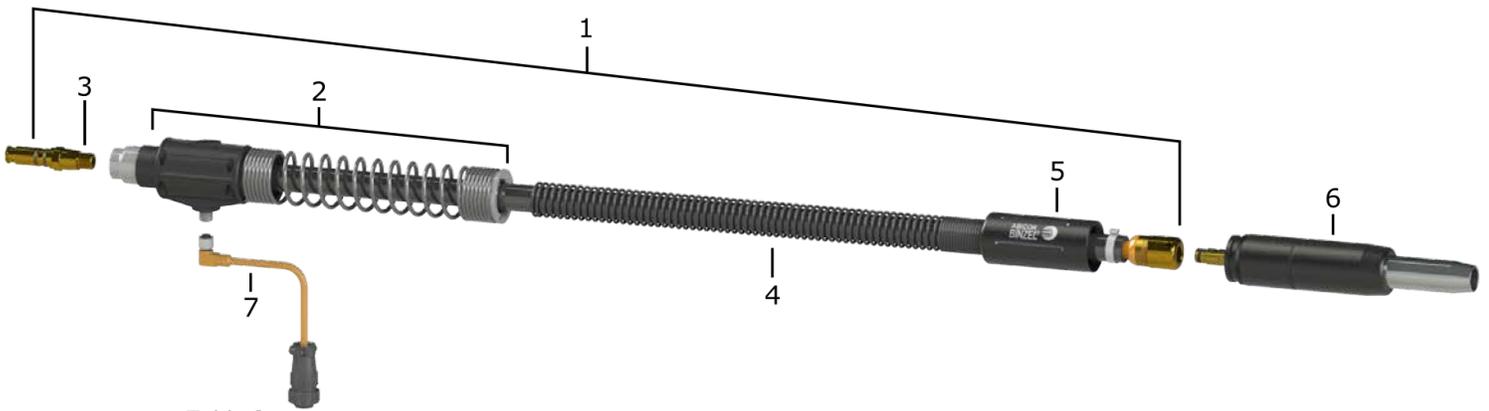


Table 9

PN: MA-400-XX (see note below)		MA-400 SpinArc® Welding System	
ITEM	PART #	DESCRIPTION	QTY.
1	CA-XX	Cable Assembly	1
2	WR-K1	Cable Kit	1
3	Refer Table below	Power Pin	1
4	WR-K1	Strain Relief	1
5	1028	Upper Cap	1
6	MA-400-TB	Replacement MA-400 Torch Body	1
7	CC-6	Control Cable	1

XX denotes the length of the weld cable in feet.

Control Cables

The CC-6 cable connects the torch to the Control Box.

NOTICE

Do not extend the orange control cable beyond 15 ft. (4.6 m).

The TC-15 is used to close the wire feeder trigger circuit for arc start. This is required when running in the "REMOTE" mode as described in the Operation section of this manual. It is also included in the optional Hand Welding Kit (HWK-1). The cable has an Amphenol connection on one end (connects to the Control Box) and two spade connections on the other end for connecting to the wire feeder trigger connection.

Table 10

Part #	Description
CC-6	Control Cable, 6 ft. (1.8 m)
CC-15	Control Cable, 15 ft. (4.6 m)
TC-15	Trigger Cable, 15 ft. (3.0 m)



Control Cable
CC-15 or CC-6

Replacement Cable Assembly

In the event the cable is damaged it can be replaced by ordering a replacement from our Customer Service Team by calling +1-832-585-1244.

Table 11

Part #	Description
CA-6	Replacement Cable Assembly, 6 ft. (1.8 m)
CA-10	Replacement Cable Assembly, 10 ft. (3.0 m)
CA-15	Replacement Cable Assembly, 15 ft. (4.6 m)
CA-XX	Replacement Cable Assembly, designate length of cable at time of order (3 – 20 ft., 0.9 – 6.1 m)

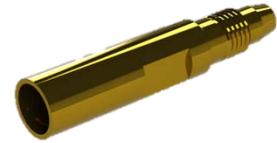
Note: This does not include the Power Pin, Wire Liner or Torch Body.

Contact Tip Extension

The Contact Tip Extension is a consumable item connecting the Contact Tip to the Spinning Shaft. These are available in three different lengths.

Table 12

Part #	Description
1043-BZ1	1/4 in. (6 mm) Recessed
1043-BZ2	1/8 in. (3 mm) Recessed
1043-BZ3	Flush



Power Pins

The correct power pin (wire feeder adaptor) is required to connect the torch to the wire feeder. Below is a list of the most common feeders and corresponding power pin part number.



Table 13

Part #	Wire Feeder Manufacturer	Description
PP-TW4	Lincoln & Others	Tweco #2 & #4
PP-L4	Lincoln Electric	PowerWave 4R Series
PP -M1	Miller	Miller Feeders
PP-F3	Fronius	Fronius F++
PP-EURO with Fronius' Euro Kit (Fronius PN 4,100,617,U)*		Fronius Special Connector ("FSC"); TPS/i machines WF25 i feeder
PP-EURO	Various	Euro Style Connector

Additional power pins may be available by special request through our Customer Service Team by calling +1-832-585-1244.

* Must be purchased from Fronius

Maintenance

Preventative Maintenance Schedule

At a minimum, these items must be inspected and replaced according the following schedule. In demanding applications or severe environments, increase the frequency of inspection and service. These should be done by the welder and/or shop maintenance. Details for each item follow.

Table 14

Item	Hourly	Daily	Weekly	Monthly
Contact Tip	I	R		
Gas Nozzle	I		R	
Cables		I		
Weld & Work Cable		I		
Contact Tip Extension		I		
Torch Body O-ring		I		
Spin Shaft		I		
Wire Liner			R	
Cap			I	
Crank			I	
Control Box			I	
Flexure			I	R
Power Stud				I
Power Pin				I

I = Inspect and replace if necessary
R = Replace

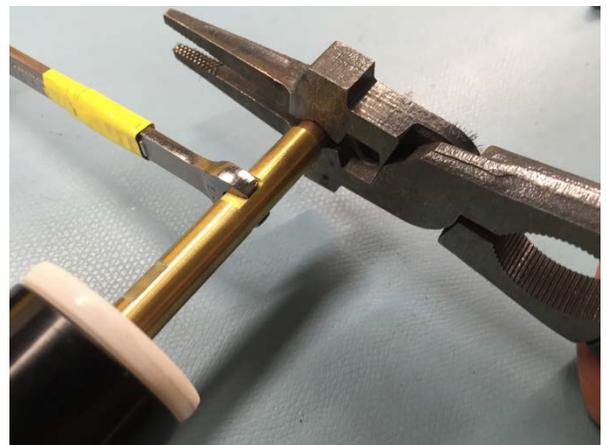
Contact Tips

NOTICE

Make sure Contact Tip is tight. It is possible to damage the Flexure while changing the Contact Tip.

Change Contact Tip

1. Hold Contact Tip Extension with a 5/16" (8 mm) wrench
2. Use welding pliers to replace the Contact Tip



Shielding Gas Nozzles

NOTICE

It is important to keep the gas nozzle clear from weld spatter. If spatter is allowed to build up inside the nozzle, this can interfere with the rotation. As needed, remove the nozzle and use welding plyers to clear any weld spatter buildup.

Control Cables

1. Check Control Cable (CC-6) and trigger cable (TC-15) for any damage
2. Check all connectors and pins for damage or debris

Weld & Work Cable

1. Check weld cable plastic housing and electrical pins at feeder end for damage
2. Inspect ground cable (work lead) and welding cable for damaged insulation, verify no exposed copper
3. Verify that all connections are tight, e.g. ground clamp and weld cable lugs

Contact Tip Extension

NOTICE

Make sure Contact Tip Extension is tight. It is possible to damage the Flexure while changing the Contact Tip Extension.

Replace Contact Tip Extension

1. Hold Spin Shaft with 5/16" (8 mm) wrench
2. Remove Contact Tip Extension with a second 5/16" (8mm) wrench
3. Hold the Spin Shaft stationary to avoid damaging the Flexure
4. Tighten new Contact Tip Extension



Torch Body O-ring

1. Remains seated in the O-ring groove
2. Not deformed, cracked, or cut
3. Check for positive seal and no gas leaks

Spin Shaft

1. Visually inspect that it is mated properly with Crank Assembly
2. Clean of welding spatter
3. Hand twist to verify Spin Shaft does not rotate in Flexure

NOTICE

Spin Shaft is held by the Flexure and nuts. Check that Flexure is secure by twisting Spin Shaft by hand, it should not twist. Do not force the Spin Shaft to twist as this will damage the Flexure

1. Replace Spin Shaft if it is bent or damaged
2. Verify Contact Tip Extension threads and seats securely
3. Make sure it is properly mated with the Crank Assembly. The Spin Shaft bushing should be inserted into the inner Bearing with approx. 1/8" (3.2 mm) gap between the body of the Spin Shaft & body of the Crank.



1/8" (3.2 mm)



Spin Shaft Replacement Procedure

If the Spin Shaft damage is suspected, it can be replaced.

1. Remove Contact Tip Extension (see above)
2. Use Flexure Nut Tool to remove Outer Flexure Nut
3. Remove the Spin Shaft Assembly by dis-lodging it from the Crank (it should slide out the front end of the torch easily)
4. Remove Inner Flexure Nut; discard used Flexure
5. Mount Flexure on new Spin Shaft and torque nuts to 25 in lbs. (2.82 Nm)
6. Ensure that Flexure seats securely onto Spin Shaft.
7. With Flexure mounted on Spin Shaft, slide Spin Shaft Assembly into place and tighten Outer Flexure Nut with provided tool.
8. Helpful hint: Use caution - Do not cross thread the nut. Make sure Flexure seats into place as the nut is tightened by holding Spin Shaft in place with index finger and thumb while tightening nut with custom Tool. Slightly rotate Spin Shaft between fingers, allowing Flexure to seat in place while tightening Outer Flexure Nut with custom tool. You will notice when the nut seats against the Flexure because it will stop twisting. This will ensure the Flexure is fully seated in the designated spot. Complete this operation by mating Contact Tip Extension with Spin Shaft



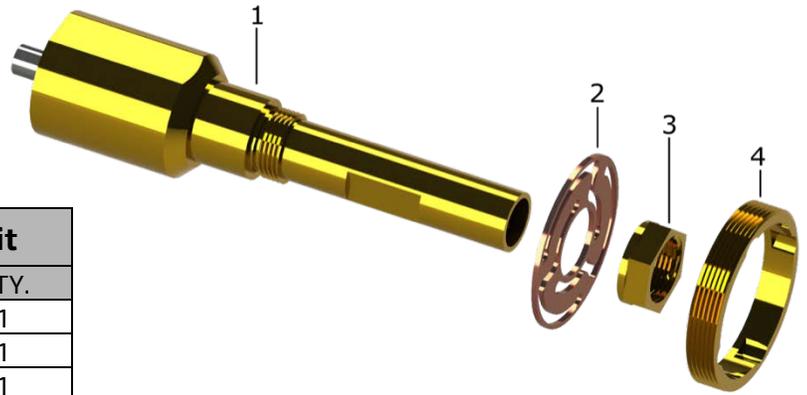
Inspection Procedure

- After completing the operation, ensure the Spin Shaft is seated properly by trying to twist the Spin Shaft by using your fingers to see if it spins (it should not spin by hand).
- Spin the Crank by hand and ensure that it rotates freely



Table 15

PN: K1752 Spin Shaft Replacement Kit			
ITEM	PART #	DESCRIPTION	QTY.
1	A1554	Spin Shaft Assembly	1
2	1032	Flexure	1
3	1034	Flexure Clamp, Spin Shaft	1
4	1033	Flexure Clamp, Body	1



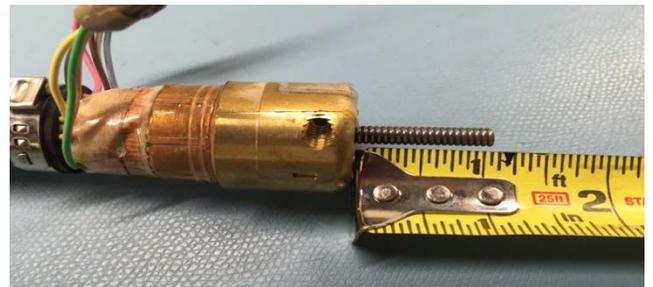
Wire Liners

NOTICE

The liner runs through the welding cable. Having a properly functioning liner is critical to good wire feeding and acceptable welding performance. It's important to replace the liner as needed, depending on the amount and type of welding electrodes used. In some cases, this is daily or multiple times per day. Throughout the day, liners collect debris and restrict the wire from moving smoothly through the cable. This restriction leads to wire feeding issues, including burning back the wire to the contact tip if not addressed in time.

Replace Wire Liner

1. Remove Contact Tip and back out welding wire
2. Remove the cable assembly from the feeder
3. Lay the cable out straight on a flat surface
4. Remove liner Cap (if applicable) and remove old liner
5. Cut new liner to same length as old liner
6. Insert new liner
7. The liner should extend 1" to 1.25" (25 - 32 mm) from the end of the welding cable
8. reinstall the liner Cap (if applicable)



Cap

1. Verify Cap slides on/off smoothly
2. Clean threads with compressed air or wire brush
3. Check nozzle O-ring



Crank

1. Snaps in each of the eight positions
2. Stays in the set position while spinning and after stopping
3. Clean as needed with compressed air
4. Spins freely



Control Box

1. Verify CW & CCW operation
2. Inspect power cable for damage, replace if required
3. Replace power cable if earth ground pin is damaged or missing
4. Confirm full RPM range (Off and 200 to 5,500)



Flexure Nuts

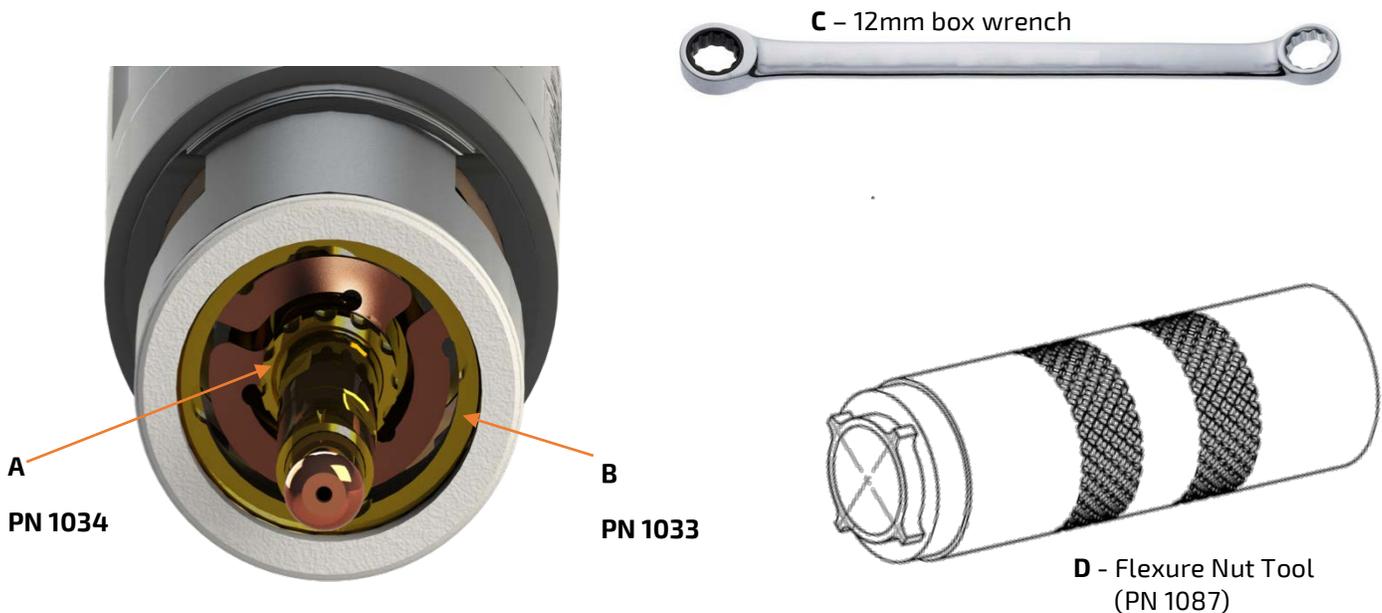
NOTICE

It is important that both flexure nuts remain tight. These keep the flexure from rotating, which is key to efficient power transfer and a stable welding arc.

Flexure Nut Inspection & Tightening Procedure

1. Gently grab the contact tip holder and try to spin it about its centerline axis
2. If the flexure rotates, then the flexure nuts must be tightened
3. Remove Contact Tip Extension (see above)
4. Use Flexure Nut Tool to remove Outer Flexure Nut
5. Remove the Spin Shaft Assembly by dis-lodging it from the Crank (it should slide out the front end of the torch easily)
6. Hold Spin Shaft with 19mm wrench or non-marring vice
7. Tighten inner nut to 25 in-lbs (2.82 Nm) with 12 mm wrench
8. Slide Spin Shaft Assembly back into torch body
9. Using the Flexure Nut Tool (PN 1087), hand tighten nut while slightly rotating Spin Shaft between fingers, allowing Flexure to seat in place while tightening Outer Flexure Nut
10. Use caution. Do not cross thread the nut

Ensure that the flexure is not bend or twist, as this will dramatically reduce the useful life of this part. Also, verify that there is equal space between the flexure leaves and not distorted in any way.



Flexure

NOTICE

The flexure (PN 1032) should be inspected and included in the preventive maintenance program. Part life depends on the crank setting and spin speed (see Table 4 on page 18 for recommended maximum settings).

Operating within the recommendations below will provide optimum life and performance of the flexure and torch, while operating above these RPMs will reduce part life.

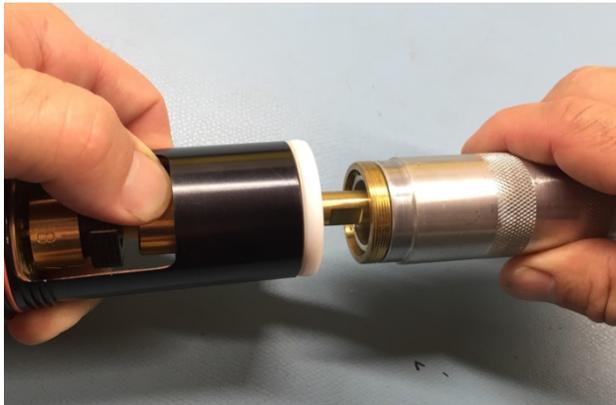


Note: The flexure is not covered under warranty and is considered a standard maintenance part.

1. Visually inspect Flexure for deformation and cracking at the inner radii
2. Verify it is fully seated on the Spin Shaft and secured by the Inner Flexure Nut
3. Confirm Outer Flexure Nut is tight
4. If damaged, remove and replace

Flexure Replacement

1. Remove Spin Shaft Assembly (*see previous section*)
2. Hold Spin Shaft with 19mm wrench or non-marring vice
3. Remove Inner Flexure Nut using 12 mm, deep socket (12-point socket type required) Serial #s above B41444 require a 13mm wrench or socket
4. Discard old Flexure and install new Flexure, tightening inner nut to 25 in-lbs (2.82 Nm)
5. Slide Spin Shaft Assembly back into torch body
6. Using the Flexure Nut Tool (PN 1087), hand tighten nut while slightly rotating Spin Shaft between fingers, allowing Flexure to seat in place while tightening Outer Flexure Nut.
7. Use caution. Do not cross thread the nut



Power Stud

1. Make sure Power Stud is tight
2. Inspect O-ring and replace if needed
3. Ensure cable clamp is tight on the Power Stud

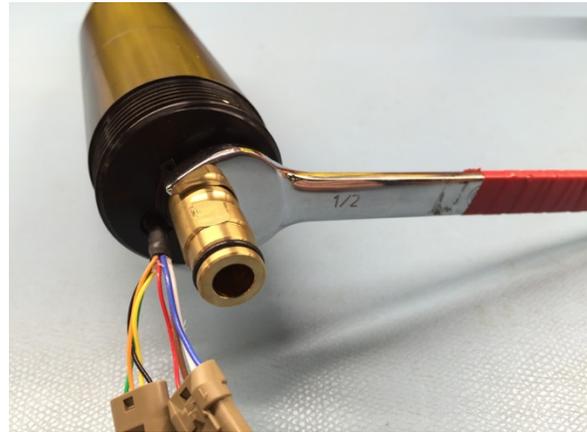
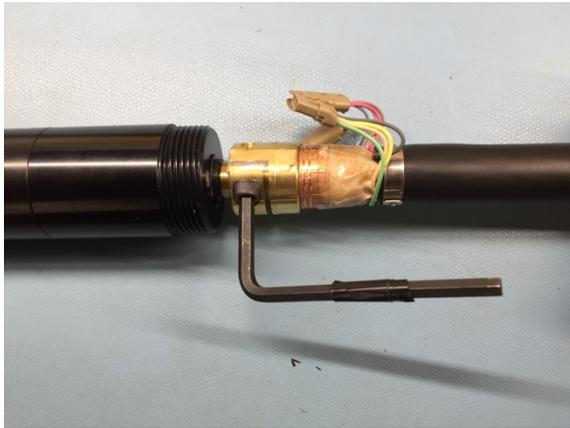


Table 16

PN: A1552 Power Stud Assembly			
ITEM	PART #	DESCRIPTION	QTY.
1	1053	Power Stud	1
2	1037	O-ring, Power Stud	1

Power Pin

1. Inspect O-rings for wear and replace as needed
2. If a gas leak is suspected, replace O-rings on the Power Pin
3. See Appendix 4 for O-ring part numbers
4. Inspect the Power Pin for damage

How to replace Power Pin:

- a) Remove the existing Wire Liner
- b) Remove the Power Pin with adjustable wrench
- c) Install and tighten new Power Pin
- d) Install new Wire Liner



Optional Accessories & Parts

Hand Welding Kit

The mechanized torch can be used by hand with the optional Hand Welding Kit. **Part # HWK-1**

Part # HWK-1



Control Box Mounting Kit

The Control Box can be easily attached to existing welding equipment, carts, or other parts with our mounting kit. Includes heavy-duty magnetic base. **Part # CB-MK1**

Part # CB-MK1



Control Box Bump Guard

The bump guard is designed to protect the Control Box. **Part # CB-BG1**

Part # CB-BG1



Troubleshooting

Problem	Possible Cause	Corrective Action
1. Wire feeding problems (chatter, bird's nest, burn back, arc flaring)	1. Improper or worn drive rolls	1. Replace drive rolls
	2. Incorrect drive roll tension	2. Adjust tension at feeder
	3. Wrong size liner	3. Replace with correct size
	4. Buildup inside liner	4. Replace liner
	5. Incorrect Contact Tip	5. Replace with correct Contact Tip size
	6. Improper drive roll guide tube	6. (a) Replace and adjust guides (b) Eliminate all gaps in electrode path
	7. Tight weld cable bend	7. Provide a larger radius for the wire to feed through
	8. Cable assembly is too long	8. Replace with shorter cable assembly, especially important with alloy and stainless wires
2. Contact tip burn back	1. Long arc length	1. Adjust voltage or wire feed speed
	2. Short stickout	2. Increase wire stickout
3. Broken Flexure	1. Exceeded design life	1. Replace Flexure; See Table 4 for max rpm settings
	2. Operating above max RPM	2. Inspect components for damage, replace Flexure, and limit spin speed to the maximum rpm shown in the Operations Manual for each spin dia. Setting.
	3. Improper Flexure installation	3. Replace Flexure
	4. Worn Bearing Assembly	4. Service required by Authorized Repair Facility
4. Short contact tip life	1. Loose contact tip	1. Tighten contact tip
	2. Improper contact tip size	2. Replace with proper size
	3. Overheating tips	3. Replace with heavy duty contact tips

Problem	Possible Cause	Corrective Action
5. Weld Porosity	1. Incorrect gas flow	1. Adjust gas flow rate (could be too high or too low)
	2. No shielding gas	2. Install full tanks, check for hose leaks, check regulator/flowmeter for proper function
	3. Poor gas flow	3. Replace nozzle, check for gas, check regulator/flowmeter for proper function
	4. Damaged gas hose	4. Replace or repair the line or hoses
	5. Worn, cut or missing O-rings	5. Replace O-rings on the torch body, Cap, Power Pin, and Power Stud
	6. Loose fittings	6. Tighten Cap on torch body, Power Stud, and cable connections
	7. Torch Power Pin not fully seated in wire feeder	7. Reseat Power Pin and check O-rings
	8. Gas flow restrictor in place at feeder, limits flow rate	8. Remove gas flow restrictor, if present
6. Control Box not working	1. No input power	1. Check to make sure the power cord is plugged in to 110 or 240 VAC and is in good working condition
	2. Circuit breaker tripped	2. Reset the circuit breaker on the Control Box. If it trips again, discontinue using the Control Box and contact an Authorized Service Facility
	3. Internal component failure	3. Contact Weld Revolution. <u>Opening Control Box voids warranty</u>
7. Motor does not spin	1. Clogged nozzle	1. Clean or replace Gas Nozzle
	2. Spin Delay set	2. Check spin delay setting
	3. Mechanical interference	3. Check for obstruction, clear service may be required by Authorized Repair Facility
	4. Aux equipment (i.e.: Bug, Robot) not connected properly	4. Confirm proper setup with mode switch on Control Box, trigger and control cables
	5. Control Cable not fully locked into Control Box	5. Tighten Control Cable Amphenol nut at Control Box
	6. Faulty electrical connection	6. Service required by Authorized Repair Facility
	7. Motor Failure	7. Service required by Authorized Repair Facility

Problem	Possible Cause	Corrective Action
8. Erratic Spin (off center, slow start, intermittent)	1. Electrical interference	1. (a) Move Control Box and weld cable away from sources of electrical noise, e.g. high frequency TIG (b) Use short Control Cable, don't exceed 15 ft. (3m) (c) use shorter welding cable (d) verify grounding pin in place on Control Box input power cable
	2. Loose Flexure nuts	2. Tighten Inner and Outer Flexure Nuts
	3. Damaged Flexure	3. Replace the Flexure
	4. Control Cable not fully locked into Control Box	4. Tighten Control Cable Amphenol nut at Control Box
	5. Faulty electrical connection	5. Service by Authorized Repair Facility
9. Arc does not start	1. Faulty trigger cable or connection	1. (a) Replace the TC-15 trigger cable, if in use (b) Test welder with manual gun to verify welding power source and wire feeder (c) Service by Authorized Repair Facility
10. Excessive vibration or noise	1. Damaged Flexure	1. Replace Flexure
	2. Improper Flexure Installation	2. Replace Flexure
	3. Worn Bearing Assembly	3. Service by Authorized Service Facility
	4. Bend Motor shaft	4. Service by Authorized Service Facility
11. Spin Start issue (delayed or hesitant)	1. Damaged Flexure	1. Replace Flexure
	2. Spin delay knob set high	2. Set to zero for no delay
	3. Faulty electrical connection	3. Service by Authorized Repair Facility
	4. Worn Bearing Assembly	4. Service by Authorized Repair Facility
12. Spin Diameter variation	1. Excessive wire cast	1. Install wire straightener at feeder wire inlet
	2. Damaged Flexure	2. Replace Flexure
	3. Bent Spin Shaft	3. Replace Spin Shaft Assembly
	4. Loose Spin Shaft bushing	4. Replace Spin Shaft Assembly
	5. Worn Bearing Assembly	5. Service by Authorized Service Facility
	6. Bent Motor shaft	6. Service by Authorized Service Facility

Problem	Possible Cause	Corrective Action
13. Arc initiates and stops abruptly	1. Wire feeding issue	1. See #1 above
	2. Trigger circuit closed by auxiliary equipment (e.g., bug) or during power up of weld power source	2. On Aux. equipment, turn weld start to OFF. Turn OFF welding power source. Restart welder.
	3. Welding power source equipment failure	3. Contact welding power source manufacturer

Any service beyond the routine maintenance defined in this manual must be performed at the factory or by an Authorized Service Facility. Disassembly of the torch or opening the Control Box voids the warranty. Please contact our Customer Service Team at +1-832-585-1244 for assistance.

FAQ

On warranty repairs, who pays for shipping?

Weld Revolution will cover freight costs within the United States for the torch body and/or Control Box if the warranty claim is approved. Shipment of welding cable is not included and is not covered by warranty. Authorization and an RMA is required (see "Freight Costs" under warranty section).

Can I replace the Power Stud without disassembly?

Yes, it unscrews from the outside using a ½" (12 mm) box end wrench.

Can I replace the Bearings only in the Crank?

The Crank is designed to have the Bearing Assembly replaced by an Authorized Service Facility.

Is the Flexure a consumable item?

Yes, the Flexure (Part # 1032) is a consumable item that will wear over time. It must be replaced if cracked, damaged, or bent.

Should I cycle power off when disconnecting the torch from the weld cable?

It is recommended to cycle power off when disconnecting the torch Control Cable, but the Control Box will recognize the disconnection and protect itself, however, the spin toggle switch must be cycled to the off position before spinning again.

Can I weld without spinning?

Yes. There are two different scenarios that make this possible. If you are not using the aux cable circuit to trigger arc start, you can place the spin toggle switch to off and weld. If you are using the aux circuit to initiate arc start, then place the spin toggle in the remote position and turn the RPM control knob to zero before welding. This will enable the Control Box to activate arc start without spinning.

Can I spin and weld without connecting the aux equip cable?

Yes. Place the spin toggle switch to "Spin" and the torch will start spinning. This is effectively putting the control in manual mode. Note: Arc start must be initiated by other means while unit is in manual mode and the spinning action will continue until the toggle switch is turned off.

Limited Warranty

Statement of Limited Liability

Weld Revolution LLC warrants to the end user of all new products that it will be free of defects in workmanship and material. This warranty is void if the equipment has been subjected to improper installation, improper care or abnormal operations. The Control Box warranty is void if enclosure has been opened.

Warranty Period

Weld Revolution will assume both the parts and labor expense of correcting defects during the warranty period. The warranty period starts from the date of purchase to the end-user or from the date of manufacture if proof of purchase is not available and is as follows:

180 Days

- All SpinArc® welding systems, including the MA-400. This includes the originally supplied Control Box and torch body.
- Consumables, welding cable, control cables and replacement parts are NOT COVERED under this warranty. This includes contact tips, nozzles, O-rings, grommets, liners, bolts, nuts, flexure and all other replacement parts.

Conditions of Warranty to Obtain Warranty Coverage

The purchaser must contact Welding Revolution directly at +1-832-585-1244. An authorized RMA is required. Do not return the product without written approval via Weld Revolution's RMA form.

Warranty Repair

If Weld Revolution or an authorized service facility confirms the existence of a defect covered by this warranty, the defect will be corrected by repair or replacement at Weld Revolution's option. At Weld Revolution's request, the purchaser must return, to Weld Revolution any "Goods" claimed defective under Weld Revolution's warranty.

Freight Costs

Weld Revolution will cover freight costs within the United States for the torch body and/or Control Box if the warranty claim is approved. A warranty claim and written authorization is required prior to any authorized warranty repairs. A RMA issued by Weld Revolution is required prior to the return of any product for any reason. Shipment of welding cable is not included and is not covered by warranty.

WARRANTY LIMITATIONS

WELD REVOLUTION WILL NOT ACCEPT RESPONSIBILITY OR LIABILITY FOR REPAIRS MADE OUTSIDE OF A WELD REVOLUTION AUTHORIZED SERVICE FACILITY. WELD REVOLUTION'S LIABILITY UNDER THIS WARRANTY SHALL NOT EXCEED THE COST OF CORRECTING THE DEFECT OF THE WELD REVOLUTION PRODUCT. WELD REVOLUTION WILL NOT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES (SUCH AS LOSS OF BUSINESS, ETC.) CAUSED BY THE DEFECT OR THE TIME INVOLVED TO CORRECT THE DEFECT. THIS WRITTEN WARRANTY IS THE ONLY EXPRESS WARRANTY PROVIDED BY WELD REVOLUTION WITH RESPECT TO ITS PRODUCTS. WARRANTIES IMPLIED BY LAW SUCH AS THE WARRANTY OF MERCHANTABILITY ARE LIMITED TO THE DURATION OF THIS LIMITED WARRANTY FOR THE EQUIPMENT INVOLVED. THIS WARRANTY GIVES THE PURCHASER SPECIFIC LEGAL RIGHTS. THE PURCHASER MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE.

Service

Any service beyond the routine maintenance or troubleshooting defined in this manual must be performed at the factory or by a factory authorized service facility. Disassembly of the torch beyond removing the upper or lower end caps voids the warranty. Opening the Control Box voids the warranty. Please contact our Customer Service Team at 301-846-4497 or customerservice@abicorusa.com for assistance.

Customer Assistance Policy

Weld Revolution LLC does not warrant or guarantee or assume any liability with respect to any information or advice given. Our employees are not in a position to verify the information provided or to evaluate the engineering requirements for any customer. Additionally, the provision of any information or advice does not create, expand, or alter any warranty on our products. Any express or implied warranty that might arise from the information or advice, including any implied warranty of merchantability or any warranty of fitness for any customers' particular purpose is specifically disclaimed. The selection and use of specific products sold by the Company is solely within the control of, and remains the sole responsibility of the customer. Many variables beyond the control of the Company affect the results obtained in applying these types of fabrication methods and service requirements.

Warranty Authorization

All warranty repairs must be conducted by Weld Revolution or an Authorized Warranty Repair Facility. All warranty work requires written authorization from Weld Revolution prior the commencement of any repair or replacement of parts. Contact the Weld Revolution Service Department to submit a Warranty Claim Form.



EU Declaration of Conformity

Original EU Declaration of Conformity

This declaration of conformity is issued under the sole responsibility of the manufacturer.

Manufacturer:

Weld Revolution LLC
19511 Wied Road, Suite E
Spring, TX 77388 USA

Product Name: MA-400™ SpinArc® Welding System

The object of the declaration described above is in conformity with the relevant Union harmonization legislation:

- Low Voltage Directive 2014/35/EU (OJ L96, 29.3.2014)
- Electromagnetic Compatibility (EMC) Directive 2014/30/EU (OJ L96, 29.3.2014)
- Restriction of Hazardous Substances (RoHS) Directive 2011/65/EU (OJ L174, 1.7.2011)

References to the relevant harmonized standards used or references to the other technical specifications in relation to which conformity is declared:

- Degrees of Protection Provided by Enclosure (IP Code), IEC 60529 Ed. 2.1
- Arc Welding Equipment – Part 10: Electromagnetic Compatibility (EMC) Requirements, IEC 60974-10, Edition 3.1, 2015-06
- Arc Welding Equipment – Part 7: Torches. IEC 60974-7, Edition 3.0, 2013-01

This declaration ceases to be valid in case of a modification of the device without our authorization.

A handwritten signature in blue ink, appearing to read "S. Funderburk", is written over a horizontal line.

Scott Funderburk
Chief Operating Officer
September 1, 2016

Abicor Binzel

650 MedImmune Court Suite 110

Frederick, MD 21702 USA

Phone: 301-846-4497

Fax: 301-698-1287

