TOUGH GUN™ CA3
Robotic Air-Cooled MIG Gun

OWNER’S MANUAL
Thank You for Choosing Tregaskiss

Thank you for selecting a Tregaskiss product. The MIG gun you have purchased has been carefully assembled and is ready to weld and factory tested prior to shipment to ensure high 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.

The owner’s manual contains general information, instructions and maintenance to help better maintain your MIG gun. Please read, understand and follow all safety precautions.

While every precaution has been taken to assure the accuracy of this owner’s manual, Tregaskiss assumes no responsibility for errors or omissions. Tregaskiss assumes no liability for damages resulting from the use of information contained herein. The information presented in this owner’s manual is accurate to the best of our knowledge at the time of printing. Please reference Tregaskiss.com for updated material.

For customer support and special applications, please call the Tregaskiss Customer Service Department at 1-855-MIGWELD (644-9353) (US & Canada) or +1-519-737-3000 (International) or fax 1-519-737-1530. Our trained Customer Service Team is available between 8:00 a.m. and 5:30 p.m. EST, and will answer your product application or repair questions.

Tregaskiss manufactures premium robotic MIG (GMAW) welding guns, peripherals and consumables. For more information on other premium Tregaskiss products, contact your local Tregaskiss distributor or visit us on the web at Tregaskiss.com.

For additional support materials such as spec sheets, troubleshooting information, how-to guides and videos, animations, online configurators and much more, please visit Tregaskiss.com.
Scan this QR Code with your smart phone for immediate access to Tregaskiss.com/TechnicalSupport
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DECLARATION OF CONFORMITY
for European Community (CE marked) products.

Tregaskiss, 2570 North Talbot Rd., Oldcastle, Ontario N0R 1L0 Canada declares that the product(s) identified in this declaration conform to the essential requirements and provisions of the stated Council Directive(s) and Standard(s).

Product/Apparatus Identification:

<table>
<thead>
<tr>
<th>Product</th>
<th>Stock Number</th>
</tr>
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<tbody>
<tr>
<td>Tregaskiss TOUGH GUN CA3 Series</td>
<td>RA1XXXXXXXXXX (Configurable #)</td>
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Council Directives:

- 2006/95/EC Low Voltage
- 2011/65/EU Restriction of the use of certain hazardous substances in electrical and electronic equipment

Standards:

- IEC 60974-7:2013 Arc welding equipment – Part 7: Torches

Signatory:

David A. Werba
MANAGER, PRODUCT DESIGN COMPLIANCE

March 22, 2017
Date of Declaration
1-1 Fume and Gas Hazards

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 and cutting 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.

1-2 Arc Rays and Welding Hazards

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 ANSIZ49.1 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.

- 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 alert 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.
- 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.
- 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 can kill

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 whenever 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.

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 CAN EXPLODE if damaged

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.

1-3 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.
- To handle 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 in use.
- Always ventilate confined spaces or use approved air-supplied respirator.

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

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.

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.

MOVING PARTS can injure
- Keep away from moving parts such as 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.

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.

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.

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 electro-magnetically 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.

1-4 California Proposition 65 Warnings

Welding or cutting equipment produces fumes or gases which 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, including lead, known to the State of California to cause cancer, and birth defects or other reproductive harm. Wash hands after use.

1-5 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. All welders should use the following procedures in order to minimize exposure to EMF fields from the welding circuit:

1. Keep cables close together by twisting or taping them, or using a cable cover.
2. Do not place your body between welding cables. Arrange cables to one side and away from the operator.
3. Do not coil or drape cables around your body.
4. Keep head and trunk as far away from the equipment in the welding circuit as possible.
5. Connect work clamp to workpiece as close to the work as possible.
6. Do not work next to, sit or lean on the welding power source.
7. 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.
1-6 Principal Safety Standards

**Safety in Welding, Cutting, and Allied Processes**, ANSI Standard Z49.1, is available as a free download from the American Welding Society at www.aws.org or purchased from Global Engineering Documents (phone: 1-877-413-5184, website: www.global.ihs.com)


**Safe Practice For Occupational And Educational Eye And Face Protection**, ANSI Standard Z87.1, from American National Standards Institute, 25 West 43rd Street, New York, NY 10036 (phone: 212-642-4900, website: www.ansi.org)


**Applications Manual for the Revised NIOSH Lifting Equation**, The National Institute for Occupational Safety and Health (NIOSH), 1600 Clifton Road, Atlanta, GA 30333 (phone: 1-800-232-4636, website: www.cdc.gov/NIOSH)

1-7 Commercial Warranty

Product is warranted to be free from defects in material and workmanship for the period specified below after the sale by an authorized Buyer.

- Robotic MIG Guns and Components: **1 year**
- Fixed Automatic MIG Guns: **1 year**
- Reamer: **1 year**
- Reamer when factory-equipped with Lubricator: **2 years**
- Reamer when factory-equipped with Lubricator and used only with Tregaskiss® TOUGH GARD® Anti-Spatter Liquid: **3 years**
- Robotic Peripherals (Clutch, Sprayer, Wire Cutter, Mounting Arms): **1 year**
- Low-Stress Robotic (LSR) Unicables: **2 years**

<table>
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<th>Axis</th>
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<tr>
<td>5</td>
<td>+/- 90°</td>
</tr>
<tr>
<td>4+6</td>
<td>+/- 270°</td>
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**NOTE:** Any articulation beyond these limits is considered abuse of the cable and will accelerate LSR Unicable wear.

Tregaskiss reserves the right to repair, replace, or refund the purchase price of non-conforming product. Product found not defective will be returned to the Buyer after notification by Customer Service.

Tregaskiss makes no other warranty of any kind, expressed or implied, including, but not limited to, the warranties of merchantability or fitness for any purpose. Tregaskiss shall not be liable under any circumstances to Buyer, or to any person who shall purchase from Buyer, for damages of any kind, including, but not limited to, any direct, indirect, incidental or consequential damages or loss of production or loss of profits resulting from any cause whatsoever, including, but not limited to, any delay, act, error or omission of Tregaskiss.

Genuine Bernard® or Tregaskiss® parts must be used for safety and performance reasons or the warranty becomes invalid. Warranty shall not apply if accident, abuse, or misuse damages a product, or if a product is modified in any way except by authorized Tregaskiss personnel.
2-1 System Components
Robotic MIG Gun for GMAW Welding
Duty Cycle Rating:
100%: 385 amps with Mixed Gases

For complete parts list, please see SECTION 6 – PARTS LIST
3-1 Installing Gun to Robot

A. Installing Disc to Robot
1. Bring robot to service position.
2. Align the dowel in the wrist with the dowel hole in the insulating disc and fully seat the disc on the robot wrist. **NOTE:** Dowel not provided.
3. Install the disc to the robot with fasteners using the supplied tightening pattern (see Figure 1). **IMPORTANT:** Do not use the fasteners to pull the face of the insulating disc to the face of the robot wrist, as damage will occur. **NOTE:** Fasteners are not provided since the size varies by robot.
4. Torque to 45 in.-lbs. (5 Nm).

B. Installing Mounting Arm to Disc
1. Align dowel on mounting arm with the dowel hole in insulating disc and seat it by hand.
2. Install the mounting arm to the disc on the robot with 6 mm SHCS (provided) using the supplied tightening pattern (see Figure 1). **IMPORTANT:** Do not use fasteners to pull the mounting arm to the face of the insulating disc, as damage will occur.
3. Torque to 45 in.-lbs. (5 Nm).

C. Installing Clutch or Solid Mount Clamp to Mounting Arm
1. Remove the fastener and the locking pin from the mounting arm.
2. Insert the clutch / solid mount stud into the mounting arm on the robot until it bottoms out.
3. Once the stud is fully seated in the mounting arm, reinstall the fastener and locking pin. **IMPORTANT:** The flat feature of the locking pin must interface with the flat feature on the clutch or solid mount stud to achieve proper locking and orientation as shown in Figure 2 (solid mount), Figure 3 (solid mount) and Figure 4 (clutch mount) on the next page.
4. Insert the 6 mm SHCS on the opposite side of the arm and screw it into the locking pin.
5. Torque 6 mm SHCS to 60 in.-lbs. (7 Nm).
For Solid Mount Models Only:
6. Insert 5 mm SHCS through solid mount clamp assembly and screw into the mounting arm as shown in Figure 3.
7. Torque 5 mm SHCS to 45 in.-lbs. (5 Nm).

D. Installing Gun to Gun Mount
1. Loosen clamp screws in mounting clamp.
2. Fully insert gun into the clamp, aligning the key on the gun with the keyway on the clamp.
3. Tighten the clamp screws to secure the gun in place.

3-2 Installing Gun to Wire Feeder

1. Plug gun into feeder and lock in place (see your feeder manual for details). Connect external gas if required.
2. **OPTIONAL:** Connect voltage sense lead (see your feeder manual for details) on the replaceable unicable with the male connector on the power jumper cable.
3. **FOR CLUTCH INSTALLATIONS:** Connect clutch cable with either the provided connections (cut and splice required) or one of our jumper cables (sold separately and available only for select robot models).
   **NOTE:** Be sure to align any features to allow for proper installation.
3-3 Installing Clutch Cable to Gun

1. Connect cable supplied with clutch mount to the receptacle on the gun body.
2. Tighten securely by hand.

3-4 Connecting Wire Brake and/or Air Blast

A. Wire Brake
1. Route wire brake air line to designated control valve in your facility (not provided).
2. 40-60 psi air supply required for proper operation.

B. Air Blast
1. Route air blast air line to designated control valve in your facility (not provided).
2. 80-100 psi air supply required for proper operation.
4-1 Changing Consumables

**IMPORTANT NOTES:**
- Neck insulator MUST be in place before welding to properly insulate gun.
- Check all parts to ensure that connections are tight before welding.
- The retaining head MUST be tightened with a 5/8” (16 mm) wrench to prevent the contact tip from overheating.
- DO NOT use pliers to remove or tighten the retaining head or scoring may result.

**Changing the Nozzle**
1. Pull slip-on nozzles off with a twisting motion.
2. When installing the nozzle, ensure that it is fully seated.

**Changing the Contact Tip**
1. Thread the contact tip into the retaining head.
2. Torque to 30 in.-lbs. (3.5 Nm)
3. The Tregaskiss Tip Tool (part #450-18; for heavy duty tips) or a pair of weld pliers are the optimal tools for contact tip installation.

**Changing the Retaining Head**
1. Thread the retaining head onto neck with a 5/8” (16 mm) wrench.
2. Torque to 80 in.-lbs. (9 Nm).
   **IMPORTANT:** DO NOT use pliers to remove or tighten the heavy duty retaining head or scoring may result.

**Changing the Neck Insulator**
1. Remove front-end consumables.
2. The neck insulator is pressed onto the neck by hand with the aluminum side towards the neck and the black insulation towards the nozzle.
3. Reinstall front-end consumables.
4-2 Changing the Neck

1. Remove front-end consumables (see Section 4-1 Changing Consumables).
2. Remove liner (see Section 4-4 Changing the Liner).
3. Using a 5 mm Allen wrench, loosen screw 1/4 turn to remove the neck.
4. Pull neck directly out of the connector housing.
5. Insert replacement neck into the connector housing, ensuring the key on the neck is lined up with the keyway on the gun.
6. Tighten screw to 60 in.-lbs. (7 Nm) using a 5 mm Allen wrench.
7. Install and trim liner if required.
8. Reinstall consumables.

4-3 Changing TOUGH GUN I.C.E. Components

1. Remove front-end consumables (see Section 4-1 Changing Consumables).
2. Remove screw and remove water line bracket.
3. Disconnect both water lines at quick connect couplers.
4. Loosen neck bolt (see Section 4-2 Changing the Neck).
5. Remove TOUGH GUN I.C.E. components / neck assembly.
   **NOTE:** If existing clamping device on arm has 2 bolts, remove only the front bolt and snug the rear bolt.
7. Tighten neck bolt to torque specification of 60 in.-lbs. (7 Nm).

8. Connect water lines with quick connect couplers.
9. Fasten water line bracket with bolt (bracket and bolt included with TOUGH GUN I.C.E. assembly).
   **NOTE:** Ensure both bolts are tightened on the mounting clamp.
10. Reinstall front-end consumables.

### 4-4 Changing the Liner

A. Changing QUICK LOAD™ Liner
   **NOTE:** Ensure power supply is off before proceeding.

1. Remove consumables (nozzle, contact tip and retaining head) *(see Section 4-1 Changing Consumables).*

2. Remove existing QUICK LOAD Liner by pulling it out from the neck.
3. Insert the new QUICK LOAD Liner through the neck using the welding wire as a guide (short strokes will prevent kinking).
4. Once liner stops feeding, give it an extra push until it bottoms out in the liner retainer in the power pin to ensure it is inserted completely.
5. Push liner back into gun and hold in place. Using liner gauge, trim liner to a 3/4” stick-out.
HELPFUL HINT: Before cutting liner, make a mark after the gauge and pull it back out past the end of the welding wire; then cut it and push the liner back into place securely. This will help with feeding the wire through the contact tip afterwards.
6. Remove any burr that may obstruct wire feed.
7. Reinstall consumables onto neck.

B. Changing QUICK LOAD Liner in the AutoLength System
NOTE: Ensure power supply is off before proceeding.
1. Remove consumables (nozzle, contact tip and retaining head) (see Section 4-1 Changing Consumables).
2. Remove existing QUICK LOAD Liner by pulling it out from the neck.
3. Insert the new QUICK LOAD Liner through the neck using the welding wire as a guide (short strokes will prevent kinking).
4. Feed liner into the gun until it engages with the retainer inside the AutoLength Pin. Place the liner gauge onto the end of the QUICK LOAD Liner and press flush with the end of the neck.
5. Push the QUICK LOAD Liner into the gun until the liner will not go forward any further. NOTE: Liner will be pushed in by approximately one additional inch.
6. Using the liner gauge, trim the liner with 3/4” (20 mm) stick out. NOTE: After trimming, the liner will stick out of the neck by approximately 1 3/4”. This is normal, as the liner will be pushed back into the neck when the consumables are installed.
7. Feed wire through the MIG gun.
8. Reinstall consumables.

4-5 Changing the Power Pin or AutoLength™ Pin

IMPORTANT: The thread-in two-piece power pin incorporates a taper to seat and lock the power pin into the rear handle block. Make sure power pin is tightened in the block with a wrench to ensure pin is secure and will not come loose.
NOTE: The rear handle and screws do not have to be removed when installing the two-piece power pins.

1. Thread power pin into rear handle block.
2. Tighten the power pin into the rear block using a wrench on the rear block and a wrench on the power pin.
3. Install liner (see 4-4 Changing the Liner).
4. Install gun to feeder (see below):

Miller® Power Pin and Lincoln® Power Pin
- Insert power pin to shoulder and secure.
- Insert control plug to control housing of gun.
- Insert control plug into feeder.
- Feed welding wire into power pin by hand and tighten drive rolls.
- On Lincoln, it is necessary to connect gas hose to gas fitting on power pin.

ESAB® Power Pin (Non Euro Style)
- Insert power pin into shoulder and secure.
- Feed welding wire into power pin by hand and tighten.

Bernard™ Style and Euro-Connector
- Feed welding wire through female adaptor by hand and tighten drive rolls.
- Guide welding wire into connector on the gun, carefully insert connector into female adaptor and tighten Euro hand nut or Bernard style locking collar.
4-6 Changing the Replaceable Unicable

1. Remove nozzle, retaining head and liner.
2. **FOR CLUTCH MODELS ONLY:** Disconnect external clutch cable from the clutch connector housing.
3. Loosen cable guide.

4. **FOR CLUTCH MODELS ONLY:** Remove clutch connector housing and disconnect internal wiring (see Figure 2).
5. Turn connector counterclockwise to “UNLOCK” position (indicated by an “UNLOCK” position icon on the sticker) and slide away from the front housing to expose cable lock screw.

6. Unlock power connection between the cable and front housing using a 5 mm Allen wrench (see Figure 3).

7. Release cable assembly by turning a 1/4 turn counterclockwise (see Figure 4).
8. Remove unicable.
9. Remove connector from cable assembly. Connector should be kept for the replacement unicable.
10. Remove power pin from unicable.
11. Discard old unicable and liner. **NOTE:** You will need to install a new liner to avoid discrepancies between the new unicable length and the length of the liner.
12. Reinstall power pin onto new cable.
13. Slide the connector that was removed from the old unicable over the front housing of the new unicable assembly.
14. **FOR CLUTCH MODELS ONLY:** Connect internal clutch wiring and snap clutch connector housing into the connector.

15. **FOR CLUTCH MODELS ONLY:** Thread cable guide onto connector while holding the clutch connector housing in place. There is an undercut on the connector that allows the cable guide to hold this housing in place when installed properly.

16. Slide the unicable assembly onto the connector stud (on the back of the connector) and turn a 1/4 turn clockwise. Fasten the 5 mm SHCS to lock the unicable into place.

17. Slide the connector into place and turn a 1/4 turn clockwise to lock it into place.

18. **FOR CLUTCH MODELS ONLY:** Reconnect the external clutch cable.

---

### 4-7 Replacing the Wire Brake

1. Remove power pin from feeder.
2. Trim and remove excess wire.
3. Remove front-end consumables and neck, including jump liner.
4. Shut off and disconnect 1/8" air supply at the wire brake pushing unit (see Figure 1).
5. Loosen two bolts and pull the gun assembly (see Figure 2).

6. Unthread and remove the wire brake pushing unit to allow the wire guide to be released (see Figure 3).

7. Carefully slide the wire guide using the wire guide tool out of the gun body (see Figure 4 on following page).
8. Inspect for wear and swap for proper wire size as required. **NOTE:** 0.035"-0.045" with one guide, 0.052"-1/16" with another.

9. Reinstall appropriate wire guide using the wire guide tool with the flats oriented (see Figure 4 on following page). Align the hole with the pushing unit pin (see Figure 3). Thread in the pushing unit.

10. Reinstall power pin to feeder. Reinstall consumables and neck, including the jump liner.
11. Feed wire through the gun.
12. Reinstall the wire brake pushing unit by threading it in until it stops, and then reconnect the air lines and turn on the air pressure.

13. Disconnect drive rolls to allow wire to be pulled through the gun. Pull 6'-8' out of the gun. **NOTE:** The wire should pull through the gun easily. If the wire binds, double check the wire guide to ensure it’s the proper size. Trim to proper stick out.

14. Activate wire brake via robot controller and attempt to pull additional wire out from gun. **NOTE:** The wire should no longer move.

---

**SECTION 5 - TECHNICAL DATA**

**5-1 Wiring Diagram**

<table>
<thead>
<tr>
<th>1. White +24 VDC (Input)</th>
<th>5. Green (Not Used)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Brown +24 VDC (Output)</td>
<td>6. Red (Not Used)</td>
</tr>
<tr>
<td>3. Yellow (Voltage Sense)</td>
<td>7. Pink (Not Used)</td>
</tr>
<tr>
<td>4. Blue 0 Volts DC (Common)</td>
<td>8. Gray (Not Used)</td>
</tr>
</tbody>
</table>
# 5-2 Center of Mass Coordinates

### Standard Configurations - Clutch

<table>
<thead>
<tr>
<th>Degree</th>
<th>X</th>
<th>Y</th>
<th>Z</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>22</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>316 mm TCP (405-22QC + CA2201)</td>
<td>-0.50 mm</td>
<td>150.30 mm</td>
<td>6.47 mm</td>
<td>2.98 kg</td>
</tr>
<tr>
<td>350 mm TCP (405-22QCL + CA2202)</td>
<td>-0.46 mm</td>
<td>165.80 mm</td>
<td>-0.26 mm</td>
<td>3.09 kg</td>
</tr>
<tr>
<td>400 mm TCP (405-22QCL + CA2203)</td>
<td>-0.48 mm</td>
<td>165.34 mm</td>
<td>44.19 mm</td>
<td>3.11 kg</td>
</tr>
<tr>
<td>45</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>350 mm TCP (405-45QCL + CA4501)</td>
<td>-0.50 mm</td>
<td>91.35 mm</td>
<td>5.73 mm</td>
<td>3.01 kg</td>
</tr>
<tr>
<td>400 mm TCP (405-45QCL1 + CA4502)</td>
<td>-0.49 mm</td>
<td>92.12 mm</td>
<td>11.54 mm</td>
<td>3.07 kg</td>
</tr>
<tr>
<td>180</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>294 mm TCP (405-180QC + CA1801)</td>
<td>-0.49 mm</td>
<td>206.24 mm</td>
<td>40.08 mm</td>
<td>3.04 kg</td>
</tr>
</tbody>
</table>

### Standard Configurations - Solid Mount

<table>
<thead>
<tr>
<th>Degree</th>
<th>X</th>
<th>Y</th>
<th>Z</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>22</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>316 mm TCP (405-22QC + CA2201)</td>
<td>-0.49 mm</td>
<td>156.75 mm</td>
<td>-1.62 mm</td>
<td>2.71 kg</td>
</tr>
<tr>
<td>350 mm TCP (405-22QCL + CA2202)</td>
<td>-0.47 mm</td>
<td>171.31 mm</td>
<td>-6.87 mm</td>
<td>2.82 kg</td>
</tr>
<tr>
<td>400 mm TCP (405-22QCL + CA2203)</td>
<td>-0.46 mm</td>
<td>170.78 mm</td>
<td>37.07 mm</td>
<td>2.83 kg</td>
</tr>
<tr>
<td>45</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>350 mm TCP (405-45QCL + CA4501)</td>
<td>-0.48 mm</td>
<td>94.14 mm</td>
<td>-4.24 mm</td>
<td>2.74 kg</td>
</tr>
<tr>
<td>400 mm TCP (405-45QCL1 + CA4502)</td>
<td>-0.51 mm</td>
<td>94.94 mm</td>
<td>2.84 mm</td>
<td>2.79 kg</td>
</tr>
<tr>
<td>180</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>294 mm TCP (405-180QC + CA1801)</td>
<td>-0.48 mm</td>
<td>214.37 mm</td>
<td>35.19 mm</td>
<td>2.76 kg</td>
</tr>
</tbody>
</table>
### 6-1 Exploded View and Parts List

<table>
<thead>
<tr>
<th>ITEM</th>
<th>PART #</th>
<th>DESCRIPTION</th>
</tr>
</thead>
</table>
| 1    | See TOUGH GUN™ CA3 MIG Gun Spec Sheet | Nozzle, Heavy Duty  
Nozzle, Standard Duty  
Nozzle, TOUGH ACCESS™ |
| 2    | See TOUGH GUN CA3 MIG Gun Spec Sheet | Contact Tip, TOUGH LOCK™ |
| 3    | See TOUGH GUN CA3 MIG Gun Spec Sheet | Retaining Head, TOUGH LOCK  
Retaining Head, TOUGH ACCESS |
|      | 405-22QC | Neck, 22 degree, short length |
|      | 405-22QCL | Neck, 22 degree, medium length |
|      | 405-45QC | Neck, 45 degree, short length |
|      | 405-45QCL | Neck, 45 degree, medium length |
|      | 405-45QCL1 | Neck, 45 degree, long length |
|      | 405-180QC | Neck, 180 degree, medium length |
| 4    | See TOUGH GUN CA3 MIG Gun Spec Sheet | Neck, TOUGH GUN I.C.E.™ assembly |
| 5    | 590-9 | Water Line Bracket (TOUGH GUN I.C.E. assembly component) |
| 6    | 590-8 | Water Line Fittings, Male |
| 7    | 810-10-5 | Water Line Fittings, Female (x2) + clamps (x2) (included in ITEM 9) |
| 8    | 590-4 | TOUGH GUN I.C.E. Water Lines – 15 ft. |
|      | 590-5 | TOUGH GUN I.C.E. Water Lines – 20 ft. |
| 9    | 658-2 | Quick Connect Brass Fittings, Male (x2) + clamps (x2) (included in ITEM 9) |
| 10   | CACM | Clutch Mount |
| 11   | CACM21 | Power Cord, Clutch Mount |
| 11a  | AS-715-9 | Switch Assembly, Clutch Mount |
| 11b  | AS-715-17 | Adjusting Sleeve Wrench, Clutch Mount |
| 11c  | AS-715-11 | Dust Boot, Clutch Mount |
| 11d  | CASM | Solid Mount |
| 12   | Not Sellable | 16 mm M6 SHCS |
| 13   | CA2201 | Mounting Arm for 22 degree short length neck (part #405-22QC) |
|      | CA2202 | Mounting Arm for 22 degree medium length neck (part #405-22QCL) |
|      | CA2203 | Mounting Arm for 22 degree medium length neck (part #405-22QCL) |
|      | CA4501 | Mounting Arm for 45 degree medium length neck (part #405-45QCL) |
|      | CA4502 | Mounting Arm for 45 degree long length neck (part #405-45QCL1) |
|      | CA1801 | Mounting Arm for 180 degree medium length neck (part #405-180QC) |
| 14   | See TOUGH GUN CA3 MIG Gun Spec Sheet | Insulating Disc |
| 15   | 508-400 | Connector Housing |
|      | 508-400W | Connector Housing (for guns equipped w/wire brake) |
| 16   | 610-406A | Gun Housing for Clutch Mount |
| 17a  | 610-400-8 | Clutch Connector Housing |
| 17b  | 610-406B | Gun Housing for Solid Mount |
|      | CAS3UXX | Replaceable Uncable, Clutch |
|      | ECA3UXX | Replaceable Uncable (Euro), Clutch |
|      | CAS3UXS | Replaceable Uncable, Solid Mount |
|      | ECA3UXS | Replaceable Uncable (Euro), Solid Mount |
| 19   | Not Sellable | Cable Guide (included with ITEM 17) |
| 20   | 414-600 | Adaptor (included with ITEM 17) |
| 21   | See TOUGH GUN CA3 MIG Gun Spec Sheet | QUICK LOAD™ Liner |
| 22   | Conventional Liner (for guns equipped with wire brake) |
| 23   | QUICK LOAD Liner Retainer |
| 24   | See TOUGH GUN CA3 MIG Gun Spec Sheet | Control Cable |
| 25   | See TOUGH GUN CA3 MIG Gun Spec Sheet | Power Pin or AutoLength™ Pin |
| 26   | 508-A | Air Blast Kit Option |
| 27   | WB-599-045** | Wire Brake Kit for 0.045" wire |
|      | WB-599-116** | Wire Brake Kit for 1/16" wire |

*XX = cable length (see TOUGH GUN CA3 MIG Gun Spec Sheet)  
**508-400W (see 16 above) required if retrofitting wire brake
## SECTION 7 - TROUBLESHOOTING

### 7-1 Troubleshooting Table

<table>
<thead>
<tr>
<th>PROBLEM</th>
<th>POSSIBLE CAUSE</th>
<th>CORRECTIVE ACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2. Broken control lead.</td>
<td>2. a. Test and connect spare control lead.</td>
</tr>
<tr>
<td></td>
<td>3. Poor adaptor connection.</td>
<td>b. Install new cable.</td>
</tr>
<tr>
<td></td>
<td>4. Improper / worn drive roll.</td>
<td>3. Test and replace leads and/or contact pins.</td>
</tr>
<tr>
<td></td>
<td>5. Drive roll tension misadjusted.</td>
<td>4. Replace drive roll.</td>
</tr>
<tr>
<td></td>
<td>6. Burn back to contact tip.</td>
<td>5. Adjust tension at feeder.</td>
</tr>
<tr>
<td></td>
<td>7. Wrong size liner.</td>
<td>6. See ‘Contact tip burn back’.</td>
</tr>
<tr>
<td></td>
<td>8. Buildup inside of liner.</td>
<td>7. Replace with correct size.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8. Replace liner or clean out with compressed air, check condition of electrode.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. a. Test and connect spare control lead.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>b. Install new cable.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Test and replace leads and/or contact pins.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Replace drive roll.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. Adjust tension at feeder.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6. See ‘Contact tip burn back’.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7. Replace with correct size.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8. Replace liner or clean out with compressed air, check condition of electrode.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. a. Test and connect spare control lead.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>b. Install new cable.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Test and replace leads and/or contact pins.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Replace drive roll.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. Adjust tension at feeder.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6. See ‘Contact tip burn back’.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7. Replace with correct size.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8. Replace liner or clean out with compressed air, check condition of electrode.</td>
</tr>
<tr>
<td>2. Contact tip burn back.</td>
<td>1. Improper voltage and/or wire feed speed.</td>
<td>1. Adjust parameters.</td>
</tr>
<tr>
<td></td>
<td>2. Erratic wire feeding.</td>
<td>2. See ‘Erratic wire feeding’.</td>
</tr>
<tr>
<td></td>
<td>3. Improper tip stickout.</td>
<td>3. Adjust nozzle / tip relationship.</td>
</tr>
<tr>
<td></td>
<td>4. Improper electrode stickout.</td>
<td>4. Adjust wire stickout.</td>
</tr>
<tr>
<td></td>
<td>5. Faulty ground.</td>
<td>5. Replace cables and/or connections.</td>
</tr>
<tr>
<td>3. Tip disengages from the gas diffuser.</td>
<td>1. Worn gas diffuser/retaining head.</td>
<td>1. Replace tip and/or gas diffuser / retaining head.</td>
</tr>
<tr>
<td></td>
<td>2. Improper tip installation.</td>
<td>2. Install as per ‘4-1 Changing Consumables’.</td>
</tr>
<tr>
<td></td>
<td>3. Extreme heat or duty cycle.</td>
<td>3. Replace with heavy duty consumables. See appropriate Spec Sheet for details.</td>
</tr>
<tr>
<td>4. Short contact tip life.</td>
<td>1. Contact tip size.</td>
<td>1. Replace with proper size.</td>
</tr>
<tr>
<td></td>
<td>2. Electrode eroding contact tip.</td>
<td>2. Inspect and/or change drive rolls.</td>
</tr>
<tr>
<td></td>
<td>3. Exceeding duty cycle.</td>
<td>3. Replace with properly rated Tregaskiss MIG Gun.</td>
</tr>
<tr>
<td>5. Erratic arc.</td>
<td>1. Worn contact tip.</td>
<td>1. Replace contact tip.</td>
</tr>
<tr>
<td></td>
<td>2. Buildup inside of liner.</td>
<td>2. Replace liner, check condition of electrode.</td>
</tr>
<tr>
<td></td>
<td>3. Wrong tip size.</td>
<td>3. Replace with correct tip size.</td>
</tr>
<tr>
<td></td>
<td>2. Wrong size liner.</td>
<td>2. Replace with new liner of proper size.</td>
</tr>
<tr>
<td></td>
<td>3. Improper drive roll size.</td>
<td>3. Replace with properly size drive roll.</td>
</tr>
<tr>
<td></td>
<td>4. Worn drive roll.</td>
<td>4. a. Replace with new drive roll.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>b. Repair worn drive roll.</td>
</tr>
<tr>
<td></td>
<td>5. Improper guide tube relationship.</td>
<td>5. a. Adjust / replace guide as close to drive rolls as possible.</td>
</tr>
<tr>
<td></td>
<td>6. Improper wire guide diameter.</td>
<td>b. Eliminate all gaps in electrode path.</td>
</tr>
<tr>
<td></td>
<td>8. Feeder malfunction.</td>
<td>7. a. Replace with new liner, trimming as per ‘4-4 Changing the Liner’.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>b. Replace guide tube / liner, trim as close to mating component as possible.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8. Consult feeder manufacturer.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>9. Inspect and replace.*</td>
</tr>
<tr>
<td>PROBLEM</td>
<td>POSSIBLE CAUSE</td>
<td>CORRECTIVE ACTION</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>3. Improper shielding gas coverage.</td>
<td>3. a. Verify shielding gas coverage.</td>
</tr>
<tr>
<td></td>
<td>4. Contaminated wire or workpiece.</td>
<td>b. Verify gas mixture.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Clean wire and workpiece.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. Gas diffuser damaged.</td>
<td>2. Replace gas diffuser or o-rings.</td>
</tr>
<tr>
<td></td>
<td>3. Extreme heat or duty cycle.</td>
<td>3. Replace with heavy duty consumables.</td>
</tr>
<tr>
<td></td>
<td>4. Solenoid faulty.</td>
<td>4. Replace solenoid.</td>
</tr>
<tr>
<td></td>
<td>5. No gas.</td>
<td>5. a. Install full tanks.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>b. Check supply.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>c. Check for hose leaks.</td>
</tr>
<tr>
<td></td>
<td>7. Gas ports plugged.</td>
<td>7. a. Clean or replace gas diffuser.</td>
</tr>
<tr>
<td></td>
<td>9. Control circuit loss.</td>
<td>8. Repair or replace cable or line.</td>
</tr>
<tr>
<td></td>
<td>10. Worn, cut or missing o-rings.</td>
<td>9. See ‘Electrode does not feed’.</td>
</tr>
<tr>
<td></td>
<td>11. Loose fittings.</td>
<td>10. Replace o-rings.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>11. Tighten gun and cable connections to specified torque.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>See ‘<strong>SECTION 4 – REPLACEMENT</strong>’.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. Loose or poor power connection.</td>
<td>b. Decrease parameters to within gun rating.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. a. Clean, tighten or replace cable grounding connection.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>b. Tighten gun and cable connections to specified torque.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>See ‘<strong>SECTION 4 – REPLACEMENT</strong>’.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Liner is discolored.</td>
<td>1. Short circuit to electrode.</td>
<td>1. Isolate electrode reel from feeder and drive block. Consult feeder manufacturer’s manual.</td>
</tr>
<tr>
<td></td>
<td>2. Broken copper stranding in power cable.</td>
<td>2. Replace unicable.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Sporadic feeding of aluminum electrode.</td>
<td>1. Tip galling.</td>
<td>1. Inspect and replace the contact tip.*</td>
</tr>
<tr>
<td></td>
<td>2. Synthetic liner melting.</td>
<td>2. a. Replace liner.</td>
</tr>
<tr>
<td></td>
<td>3. Wire deformed by feeder rolls.</td>
<td>b. Replace with composite liner.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>c. Replace the neck and jump liner.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Adjust drive rolls as per feeder manufacturer’s manual.</td>
</tr>
</tbody>
</table>

*In some cases with aluminum and mild steels, it may be necessary to use a contact tip with either a larger or smaller bore size.*
For additional support materials such as Spec Sheets, troubleshooting information, how-to guides and videos, animations, online configurators and much more, please visit Tregaskiss.com. Scan the QR Code with your smart phone for immediate access to Tregaskiss.com/TechnicalSupport.