Bernard BTB MIG Guns

OWNER’S MANUAL
Thank you for selecting a Bernard 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, Bernard assumes no responsibility for errors or omissions. Bernard 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 Bernardwelds.com for updated material.

For customer support and special applications, please call the Bernard Customer Service Department at 1-855-MIGWELD (644-9353) (Canada & US) or 1-519-737-3000 (International) or fax 1-708-946-6726. Our trained Customer Service Team is available Monday to Friday between 8:00 a.m. and 4:30 p.m. CST, and will answer your product application or repair questions.

Bernard manufactures premium semi-automatic GMAW (MIG) and FCAW (flux-cored) welding guns, consumables, accessories and manual arc products. For more information on other premium Bernard products, contact your local Bernard distributor or visit us on the web at BernardWelds.com

For additional support materials such as spec sheets, troubleshooting information, how-to guides and videos, animations, online configurators and much more please visit BernardWelds.com
Scan this QR Code with your smart phone for immediate access to BernardWelds.com/TechnicalSupport
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>DECLARATION OF CONFORMITY</td>
<td>4</td>
</tr>
<tr>
<td>SECTION 1 - SAFETY PRECAUTIONS FOR GMAW WELDING GUNS - READ BEFORE USING</td>
<td>5</td>
</tr>
<tr>
<td>1-1 Symbol Usage</td>
<td>5</td>
</tr>
<tr>
<td>1-2 Arc Welding Hazards</td>
<td>5</td>
</tr>
<tr>
<td>1-3 Proposition 65 Warning</td>
<td>6</td>
</tr>
<tr>
<td>1-4 Principal Safety Standards</td>
<td>7</td>
</tr>
<tr>
<td>1-5 EMF Information</td>
<td>7</td>
</tr>
<tr>
<td>1-6 Commercial Warranty</td>
<td>7</td>
</tr>
<tr>
<td>SECTION 2 - SPECIFICATIONS</td>
<td>8</td>
</tr>
<tr>
<td>2-1 Specifications</td>
<td>8</td>
</tr>
<tr>
<td>2-2 Duty Cycle and Overheating</td>
<td>8</td>
</tr>
<tr>
<td>SECTION 3 - INSTALLATION</td>
<td>9</td>
</tr>
<tr>
<td>3-1 Installing to a Feeder with a Power Pin</td>
<td>9</td>
</tr>
<tr>
<td>3-2 Installing to a Feeder with a Euro or Bernard Power Pin</td>
<td>9</td>
</tr>
<tr>
<td>SECTION 4 - OPERATION</td>
<td>10</td>
</tr>
<tr>
<td>4-1 Pulling the Trigger</td>
<td>10</td>
</tr>
<tr>
<td>SECTION 5 - REPLACEMENT</td>
<td>11</td>
</tr>
<tr>
<td>5-1 Changing Consumables</td>
<td>11</td>
</tr>
<tr>
<td>5-2 Changing the Liner</td>
<td>12</td>
</tr>
<tr>
<td>5-3 Changing the Neck</td>
<td>14</td>
</tr>
<tr>
<td>5-4 Changing the Handle and Switch</td>
<td>15</td>
</tr>
<tr>
<td>5-5 Changing the Power Pin</td>
<td>17</td>
</tr>
<tr>
<td>SECTION 6 - PARTS LIST</td>
<td>19</td>
</tr>
<tr>
<td>SECTION 7 - CONSUMABLE PARTS</td>
<td>25</td>
</tr>
<tr>
<td>7-1 Centerfire™ Consumable Series</td>
<td>25</td>
</tr>
<tr>
<td>7-2 Quik Tip™ Consumable Series</td>
<td>26</td>
</tr>
<tr>
<td>7-3 Centerfire HD Consumable Series</td>
<td>27</td>
</tr>
<tr>
<td>7-4 Quik Tip HD Consumable Series</td>
<td>27</td>
</tr>
<tr>
<td>7-5 TOUGH LOCK™ Consumable Series</td>
<td>28</td>
</tr>
<tr>
<td>SECTION 8 - TROUBLESHOOTING</td>
<td>29</td>
</tr>
<tr>
<td>8-1 Troubleshooting Table</td>
<td>29</td>
</tr>
</tbody>
</table>

Subject to Change – The information presented in this owner’s manual is accurate to the best of our knowledge at the time of printing. Please visit BernardWelds.com for the most up-to-date information.
DECLARATION OF CONFORMITY
for European Community (CE marked) products.

Bernard Welding, 449 West Corning Rd., Beecher, IL 60401 U.S.A. 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>
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<tbody>
<tr>
<td>Bernard Q20 Series – 200A</td>
<td>Q20XXXXXXX (Configurable #)</td>
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<tr>
<td>Bernard Q30 Series – 300A</td>
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<tr>
<td>Bernard Q40 Series – 400A</td>
<td>Q40XXXXXXX (Configurable #)</td>
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<tr>
<td>Bernard Q50 Series – 500A</td>
<td>Q50XXXXXXX (Configurable #)</td>
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<td>Bernard Q60 Series – 600A</td>
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<td>Bernard S40 Series – 400A</td>
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<td>Bernard S50 Series – 500A</td>
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<tr>
<td>Bernard S60 Series – 600A</td>
<td>S60XXXXXXX (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

Date of Declaration
May 16, 2014
SECTION 1 - SAFETY PRECAUTIONS FOR GMAW WELDING GUNS - READ BEFORE USING

Protect yourself and others from injury — read, follow, and save these important safety precautions and operating instructions.

1-1 Symbol Usage

DANGER! – Indicates a hazardous situation which, if not avoided, will result in death or serious injury. The possible hazards are shown in the adjoining symbols or explained in the text.

Indicates a hazardous situation which, if not avoided, could result in death or serious injury. The possible hazards are shown in the adjoining symbols or explained in the text.

This group of symbols means Warning! Watch Out! ELECTRIC SHOCK, MOVING PARTS, and HOT PARTS hazards. Consult symbols and related instructions below for necessary actions to avoid the hazards.

1-2 Arc Welding Hazards

The symbols shown below are used throughout this manual to call attention to and identify possible hazards. When you see the symbol, watch out, and follow the related instructions to avoid the hazard. The safety information given below is only a summary of the more complete safety information found in the welding power source Owner’s Manual. Read and follow all Safety Standards.

Only qualified persons should install, operate, maintain, and repair this equipment. A qualified person is defined as one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training and experience, has successfully demonstrated ability to solve or resolve problems relating to the subject matter, the work, or the project and has received safety training to recognize and avoid the hazards involved.

During operation, keep everybody, especially children, away.

ELECTRIC SHOCK can kill.

- Always wear dry insulating gloves.
- Insulate yourself from work and ground.
- Do not touch live electrode or electrical parts.
- Replace worn, damaged, or cracked guns or cables.
- Turn off welding power source before changing contact tip or gun parts.
- Keep all covers and handle securely in place.

FUMES AND GASES can be hazardous.

- Keep your head out of the fumes.
- Ventilate area, or use breathing device. The recommended way to determine adequate ventilation is to sample for the composition and quantity of fumes and gases to which personnel are exposed.
- Read and understand the Safety Data Sheets (SDSs) and the manufacturer’s instructions for adhesives, coatings, cleaners, consumables, coolants, degreasers, fluxes, and metals.

MOVING PARTS can injure.

- Keep away from moving parts.
- Keep away from pinch points such as drive rolls.

WELDING can cause fire or explosion.

- Do not weld near flammable material.
- Do not weld 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).
- Watch for fire; keep 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.
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.

ARC RAYS can burn eyes and skin.
Arc rays from the welding process 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 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.

HOT PARTS can burn.
- Allow gun to cool before touching.
- Do not touch hot metal.
- Protect hot metal from contact by others.

NOISE can damage hearing.
Noise from some processes or equipment can damage hearing.
- Check for noise level limits exceeding those specified by OSHA.
- Use approved ear plugs or ear muffs if noise level is high.
- Warn others nearby about noise hazard.

WELDING WIRE can injure.
- Keep hands and body away from gun tip when trigger is pressed.

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

1-3 Proposition 65 Warnings

WARNING: This product can expose you to chemicals including lead, which are known to the state of California to cause cancer and birth defects or other reproductive harm.

For more information, go to www.P65Warnings.ca.gov.
1-4 Principal Safety Standards


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 must be taken. For example, restrict access for passers-by 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 weld 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 or 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 Commercial Warranty

Product is warranted to be free from defects in material and workmanship for 1 Year after the sale by an authorized Buyer. Straight handles, straight handle switches and rear strain relief are covered by a lifetime warranty. Bernard 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.

Bernard makes no other warranty of any kind, expressed or implied, including, but not limited to the warranties of merchantability or fitness for any purpose.

Bernard 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 Bernard. Genuine Bernard 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 Bernard personnel.
### 2-1 Specifications

<table>
<thead>
<tr>
<th>Air-Cooled MIG Guns for GMAW Welding</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>200 amp gun feeds maximum wire size of 1/16” (1.6 mm)</strong></td>
</tr>
<tr>
<td><strong>Duty Cycle Rating:</strong></td>
</tr>
<tr>
<td>100%: 200 Amp with CO₂ Shielding gas</td>
</tr>
<tr>
<td>60%: 200 Amp with Mixed Gases</td>
</tr>
<tr>
<td><strong>300 amp gun feeds maximum wire size of 5/64” (2.0 mm)</strong></td>
</tr>
<tr>
<td><strong>Duty Cycle Rating:</strong></td>
</tr>
<tr>
<td>100%: 300 Amp with CO₂ Shielding Gas</td>
</tr>
<tr>
<td>60%: 300 Amp with Mixed Gases</td>
</tr>
<tr>
<td><strong>400 amp gun feeds maximum wire size of 5/64” (2.0 mm)</strong></td>
</tr>
<tr>
<td><strong>Duty Cycle Rating:</strong></td>
</tr>
<tr>
<td>100%: 400 Amp with CO₂ Shielding Gas</td>
</tr>
<tr>
<td>60%: 400 Amp with Mixed Gases</td>
</tr>
<tr>
<td><strong>500 amp gun feeds maximum wire size of 3/32” (2.4 mm)</strong></td>
</tr>
<tr>
<td><strong>Duty Cycle Rating:</strong></td>
</tr>
<tr>
<td>100%: 500 Amp with CO₂ Shielding Gas</td>
</tr>
<tr>
<td>60%: 500 Amp with Mixed Gases</td>
</tr>
<tr>
<td><strong>600 amp gun feeds maximum wire size of 1/8” (3.2 mm)</strong></td>
</tr>
<tr>
<td><strong>Duty Cycle Rating:</strong></td>
</tr>
<tr>
<td>100%: 600 Amp with CO₂ Shielding Gas</td>
</tr>
<tr>
<td>60%: 600 Amp with Mixed Gases</td>
</tr>
</tbody>
</table>

### 2-2 Duty Cycle and Overheating

Duty Cycle is percentage of 10 minutes that unit can weld at rated load without overheating.

Using mixed gases other than CO₂ reduces duty cycle ratings 10-50% depending on gas mixture and welding parameters.

Please reference chart above for duty cycle ratings by amperage.
3-1 Installing to a Feeder with a Power Pin

1. Insert power pin to shoulder and secure tightly.
2. Insert control plug into feeder.
3. Feed welding wire into power pin by hand and tighten drive rolls.

3-2 Installing to a Feeder with a Euro or Bernard Power Pin

1. Insert the Euro power pin to face of receptacle. Thread Euro hand nut clockwise to tighten.

1. Insert the Bernard power pin to face of receptacle. Engage and rotate locking sleeve to tighten.
4-1 Pulling the Trigger

1. Trigger - When pressed, energized wire feeds and shielding gas flows.
SECTION 5 - REPLACEMENT

5-1 Changing Consumables

A. Changing Quik Tip™ Consumables

1. Remove threaded nozzle by turning in a counterclockwise direction. Slip-on nozzle can be removed with a slipping and pulling motion.
2. Cut electrode and remove all burrs before removing contact tip. Remove the Quik Tip contact tip from the gas diffuser with a 1/4 turn counterclockwise. To replace slide the contact tip over electrode into gas diffuser and lock with a 1/4 turn clockwise rotation.
3. Gas diffuser may be removed with an appropriate wrench in a counterclockwise rotation. To install firmly secure gas diffuser with an appropriate wrench in a clockwise rotation, torque to 144 in.-lbs.

B. Changing Centerfire™ Consumables

1. Cut electrode and remove all burrs before removing contact tip. Remove threaded nozzle by turning in a counterclockwise direction.
2. Pull the Centerfire contact tip from the gas diffuser. To replace slide the contact tip over electrode into gas diffuser and lock by installing nozzle onto gas diffuser. Nozzle is used to secure contact tip.
3. Retaining head may be removed with an appropriate wrench in a counterclockwise rotation. To install firmly secure gas diffuser with an appropriate wrench in a clockwise rotation, torque to 144 in.-lbs.

C. Changing TOUGH LOCK™ Consumables

1. Remove the slip-on nozzle with a twisting and pulling motion.
2. Cut electrode and remove all burrs before removing contact tip. Remove the TOUGH LOCK contact tip from the retaining head with a counterclockwise turn. To replace slide the contact tip over electrode into gas diffuser and lock with a clockwise rotation.
3. Retaining head may be removed with an appropriate wrench in a counterclockwise rotation. To install firmly secure gas diffuser with an appropriate wrench in a clockwise rotation, torque to 144 in.-lbs.
A. Changing Universal Conventional Liner

1. Remove nozzle, contact tip, and gas diffuser/retaining head and lay cable straight. Using a 10 mm wrench, turn liner lock counterclockwise until it is free from the power pin. Remove liner from gun assembly.

2. With cable laying straight, insert new liner into power pin and feed through gun using short strokes to prevent kinking. Twist liner clockwise if necessary. Use a 10 mm wrench to turn liner lock clockwise to tighten into power pin.

3. Trim to dimensions shown in the liner chart below. Remove all burrs from end of liner and replace gas diffuser/retaining head, contact tip and nozzle.

<table>
<thead>
<tr>
<th>New Liner Trim Lengths</th>
</tr>
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<tbody>
<tr>
<td><strong>Centerfire</strong>™ Diffuser Part Number</td>
</tr>
<tr>
<td>D-1</td>
</tr>
<tr>
<td>D-1T</td>
</tr>
<tr>
<td>D-1T-5</td>
</tr>
<tr>
<td>DS-1</td>
</tr>
<tr>
<td>DS-1T</td>
</tr>
<tr>
<td>DW-1</td>
</tr>
<tr>
<td><strong>Quik Tip™</strong> Diffuser Part Number</td>
</tr>
<tr>
<td>D114</td>
</tr>
<tr>
<td>D114Q</td>
</tr>
<tr>
<td>D118</td>
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<tr>
<td>D118Q</td>
</tr>
<tr>
<td>D118QLL</td>
</tr>
<tr>
<td>D1FQ</td>
</tr>
<tr>
<td>D218</td>
</tr>
<tr>
<td><strong>TOUGH LOCK™</strong> Retaining Head Part Number</td>
</tr>
<tr>
<td>ALL</td>
</tr>
</tbody>
</table>
C. Changing a Jump Liner

1. Remove the nozzle, contact tip, gas diffuser and neck. Remove used jump liner from the back end of neck.
2. Insert new jump liner making sure the liner stop is fully seated at the back of the neck.
3. Take the tapered end of the neck and insert into end fitting of the gun handle. Install the neck.
4. Trim jump liner to dimensions shown on ‘New Liner Trim Lengths’ chart on pg. 9. Deburr the jump liner past the nozzle end of the neck.
5. Install gas diffuser, contact tip and nozzle.

B. Changing QUICK LOAD™ Liner

1. Remove the nozzle, contact tip and gas diffuser and lay cable straight. Pull the QUICK LOAD Liner from the end of the neck using pliers.
2. Remove the protective cap from the new QUICK LOAD Liner and insert it through the neck using the wire as a guide. Feed the liner through the gun using short strokes to prevent kinking.
3. Once the liner stops feeding, give it an extra push to ensure it is seated correctly. Push liner into gun and trim to dimensions shown on ‘New Liner Trim Lengths’ chart on pg. 12.
Remove all burrs from end of liner and replace gas diffuser, contact tip and nozzle.

---

New Liner Trim Lengths

<table>
<thead>
<tr>
<th>Centerfire™ Diffuser</th>
<th>Liner Trim Length</th>
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<tbody>
<tr>
<td>D-1</td>
<td>9/16&quot; 14.3 mm</td>
</tr>
<tr>
<td>D-1T</td>
<td>13/16&quot; 20.6 mm</td>
</tr>
<tr>
<td>D-1T-5</td>
<td>13/16&quot; 20.6 mm</td>
</tr>
<tr>
<td>DS-1</td>
<td>9/16&quot; 14.3 mm</td>
</tr>
<tr>
<td>DS-1T</td>
<td>5/8&quot; 15.9 mm</td>
</tr>
<tr>
<td>DW-1</td>
<td>1/4&quot; 6.4 mm</td>
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Quik Tip™ Diffuser

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Liner Trim Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>D114</td>
<td>5/8&quot; 15.9 mm</td>
</tr>
<tr>
<td>D114Q</td>
<td>9/16&quot; 14.3 mm</td>
</tr>
<tr>
<td>D118</td>
<td>3/4&quot; 19.1 mm</td>
</tr>
<tr>
<td>D118Q</td>
<td>3/4&quot; 19.1 mm</td>
</tr>
<tr>
<td>D118QLL</td>
<td>1-5/16&quot; 33.3 mm</td>
</tr>
<tr>
<td>D1FQ</td>
<td>7/8&quot; 22.2 mm</td>
</tr>
<tr>
<td>D218</td>
<td>7/8&quot; 22.2 mm</td>
</tr>
</tbody>
</table>

TOUGH LOCK™ Retaining Head

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Liner Trim Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALL</td>
<td>3/4&quot; 19.1 mm</td>
</tr>
</tbody>
</table>
### A. Changing the Neck - Rotatable
1. To remove neck, grasp lock nut and rotate counterclockwise. Rotation will free neck from end fitting. To install the neck, perform the above instructions in reverse order and torque to 38 in.-lbs.
2. Liner may need to be changed if switching to a neck of a different bend angle or length.

### B. Changing the Neck - Fixed with Curved Handle
1. To remove neck, remove the nut insulator.
2. Using a wrench, rotate brass nut counterclockwise, rotation will free neck from end fitting.
3. To install the neck, perform the above instructions in reverse order and tighten lock nut to 16 ft.-lbs. (21.7 Nm). Be sure nut insulator is in place.
4. Liner may need to be changed if switching to a neck of a different bend angle or length.

### C. Changing the Neck - Fixed with T Series Large Straight Handle
1. Place neck in vise. Remove both switch housing mounting screws with an 8 mm nut driver.
2. Slide handle back exposing the cable connection. Loosen the cable/neck connection using a 7/8” wrench.
3. Remove from vise and unthread neck by hand.
4. Thread the neck into the cable connection (hand tighten). Place neck in vise and tighten with a wrench to within 1/8” (3.2 mm) spacing between the cable connection and neck.
5. Install the switch and reposition handle and switch housing.
6. Reinstall switch housing mounting screws.
7. Liner may need to be changed if switching to a neck of a different bend angle or length.

### D. Changing the Neck - Fixed with T Series Small Straight Handle
1. Loosen and remove locking collar.
2. Place neck in vise, twist handle lock nut counterclockwise and pull away from handle.
3. Remove screw from handle. Separate handle halves exposing jam nut and front of unicable.
4. Loosen jam nut using two 19 mm wrenches and unthread neck. Remove from vise and unthread neck by hand.
5. Thread jam nut onto new neck. Thread neck into unicable to desired orientation. Place neck in vise, tighten unicable and jam nut.
6. Reposition switch and handle. Reinstall handle lock nut, locking collar and screw.
7. Liner may need to be changed if switching to a neck of a different bend angle or length.
E. Changing the Neck - Fixed with C Series Large Straight Handle

1. Place neck in vise. Remove both switch housing mounting screws with a Phillips screwdriver.
2. Remove both the top and bottom pods from handle.
3. Slide handle back, exposing the cable connection. Loosen the cable/neck connection using a 7/8” wrench.
4. Remove from vise and unthread neck by hand.
5. Thread the new neck into the cable connection (hand tighten). Place neck in vise and tighten with a wrench to within 1/8” (3.2 mm) spacing between the cable connection and neck.
6. Install the switch and reposition handle and switch housing.
7. Reinstall switch housing mounting screws.
8. Liner may need to be changed if switching to a neck of a different bend angle or length.

A. B Series Small and Large Curved Handle

1. Remove screws and post fasteners from handles.
2. Separate handle halves and remove trigger. Remove switch lead connectors with needle nose pliers.
3. To replace trigger, connect switch lead connectors onto terminals of new switch. Position handle half and trigger on cable so trigger leads are not pinched and movement of the trigger is not impaired.
4. Position the remaining handle half in place. Reinstall post fasteners and screws; torque to 10 in.-lbs. (1.1 Nm).

B. O Series Small and Large Curved Handle

1. Loosen screws, but do not fully remove.
2. Pry open bottom side of handle halves with a flat blade screw driver. Trigger should be able to be removed.
3. To replace trigger, install into handle halves with pivot posts inserted into handle cavities so movement is not impaired. Tighten screws; torque to 10 in.-lbs. (1.1 Nm).
C. T Series Small Straight Handle

1. Loosen and remove locking collar.
2. Twist handle lock nut counterclockwise. Slide handle lock nut away from handle.
3. Remove screw from handle and separate handle halves.
4. Remove switch from switch lead connectors with needle nose pliers.
5. Connect switch lead connectors firmly onto new switch terminals with needle nose pliers.
6. Place gun assembly into handle half positioning neck in desired position. Fit switch into switch nest on handle (switch lead must lie parallel). Reinstall second handle half.
7. Reinstall handle lock nut and locking collar on handle.
8. Insert screw and tighten.

D. T Series Large Straight Handle (Switch Only)

1. Remove both housing screws with an 8 mm nut driver.
2. Ease switch out of switch housing with needle nose pliers to grip switch. Remove switch from switch lead connectors with needle nose pliers.
3. Push switch lead connectors firmly onto new switch terminals with needle nose pliers.
4. Depress switch housing into nest on handle (switch leads must lie parallel). Align housing holes with threaded holes in body and insert mounting screws first before tightening with 8 mm nut driver to even alignment.

E. C Series Large Straight Handle (Switch Only)

1. Remove both switch mounting housing screws with a Phillips screwdriver.
2. Remove both the top and bottom pods from handle.
3. Ease switch out of switch housing with needle nose pliers. Remove switch from switch lead connectors with needle nose pliers.
5. Depress switch housing into nest on handle (switch leads must lie parallel). Align the holes of body housing with the holes in the handle and start screws by hand. Finish tightening with a Phillips screwdriver.
5-5 Changing the Power Pin

A. Universal Power Pin

1. Remove the liner by following the steps listed in the ‘Changing the Liner’ section.
2. Use wrenches and rotate power pin in a counterclockwise direction to remove it from the adaptor block.
3. Thread new power pin into adaptor block and use wrenches in a clockwise direction to thread power pin into adaptor block. Torque to 18 ft.-lbs. (24 Nm).
4. Reinstall liner by following the steps listed in the ‘Changing the Liner’ section.

B. Euro Power Pin

1. Remove liner, strain relief cap/spring, strain relief top half, screw cover and the screw that attaches the strain relief to the Euro block.
2. Slide strain relief bottom toward cable, exposing Euro block.
3. Remove Euro block from end fitting using appropriate wrenches in a counterclockwise rotation.
4. Disconnect the Euro block control leads from the gun by cutting as close as possible on both sides of the butt connectors to preserve wire length for later re-termination.
5. Remove Adaptor Nut and install onto new Euro block.
6. Assemble Euro block onto end fitting in a clockwise rotation using appropriate wrenches. Torque to 18 ft.-lbs. (24 Nm). Adaptor Nut should rotate freely.
7. Strip the cable control leads 1/4” (6.5 mm) and re-terminate with appropriate butt connectors.
8. Align strain relief bottom with threaded hole in Euro block and install screw, assemble strain relief and liner.
C. Bernard Quick Disconnect

1. Remove liner from gun assembly. Viewing quick disconnect from cable end, align wave spring and large snap ring with opening access slot. Compress large snap ring with internal snap ring pliers and remove locking sleeve. Remove small external snap ring with external snap ring pliers from power pin.

2. Remove the control leads from the rigid strain relief by compressing the locking tabs on the contact pins with needle nose pliers and pulling the lead wire to unseat cap and sleeve assembly.

3. Unthread power pin from end fitting with appropriate wrenches in a counterclockwise rotation. The gas pin may be disassembled by removing the small retaining ring and pulling the pin from the rigid strain relief. Reinstall contact pins and gas pin if necessary.

4. Test contact pins for continuity when trigger is engaged.

5. Inspect all components for cracks, debris, excessive wear and breakage. Replace with new components if safety or performance of product is compromised.

6. Thread power pin onto cable end fitting and torque to 18 ft.-lbf. (24 Nm) minimum.
## SECTION 6 - PARTS LIST

### 6-1 Replacement Parts 200, 300, 400 amp with B Series Small and Large Curved Handles with yellow trigger

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*Scan this code for immediate access to the SP-BTB Spec Sheet*
**6-2 Replacement Parts 200, 300, 400 amp with 0 Series Small Curved Handle with blue trigger**

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*Scan this code for immediate access to the SP-BTB Spec Sheet*
6-3 Replacement Parts 400, 500, 600 amp with O Series Large Curved Handles with blue trigger

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<td>4992</td>
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<td>Switch Connector (4 Req’d)</td>
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<td>Trigger Assembly</td>
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<td>310-1-6</td>
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<td>320-6</td>
<td>Handle Collar</td>
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<td>15</td>
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<td>16</td>
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<td>Handle Cap, Locking, Rear</td>
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<td>21</td>
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<td>22</td>
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<td>Power Pin Insulator</td>
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<td>23</td>
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<td>Trigger Control Plug Assembly</td>
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*Scan this code for immediate access to the SP-BTB Spec Sheet*
6-5 Replacement Parts 300, 400, 500, 600 amp with T Series Large Straight Handles with silver trigger

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<td>Contact Tip, Centerfire</td>
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<td>Contact Tip, Quik Tip</td>
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<td>Switch</td>
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<td>Spring, Strain Relief</td>
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*Scan this code for immediate access to the SP-BTB Spec Sheet*
6-6 Replacement Parts 300, 400, 500 amp with C Series Large Straight Handles with black trigger

*Scan this code for immediate access to the SP-BTB Spec Sheet*
SECTION 7 - CONSUMABLE PARTS

7-1 Centerfire™ Consumable Series

Small Centerfire Gas Diffusers and Nozzles

- NS-5800C (5/8" I.D., Flush, Copper)
- NS-5818C (5/8" I.D., 1/8" Rec., Copper)
- NS-5800B (5/8" I.D., Flush, Brass)
- NS-5818B (5/8" I.D., 1/8" Rec., Brass)
- NS-1200B (1/2" I.D., 1/8" Rec., Copper)
- NS-1218B (1/2" I.D., 1/8" Rec., Brass)
- NST-3800B (3/8" I.D., Flush, Brass)
- NST-3818B (3/8" I.D., 1/8" Rec., Brass)
- NST-38XTB (3/8" I.D., 1/8" Extension, Brass)

Large Centerfire Gas Diffusers and Nozzles

- N-3400C (3/4" I.D., Flush, Copper)
- N-3418C (3/4" I.D., 1/8" Rec., Copper)
- N-3414C (3/4" I.D., 1/4" Rec., Copper)
- N-3418B (3/4" I.D., 1/8" Rec., Brass)
- N-3414B (3/4" I.D., 1/4" Rec., Brass)
- N-5800C (5/8" I.D., Flush, Copper)
- N-5818C (5/8" I.D., 1/8" Rec., Copper)
- N-5814C (5/8" I.D., 1/4" Rec., Copper)
- N-5818B (5/8" I.D., 1/8" Rec., Brass)
- N-5814B (5/8" I.D., 1/4" Rec., Brass)
- NT-3800C (3/8" I.D., Flush, Copper)

Centerfire Contact Tips

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<th>&quot;T&quot; Series Tip</th>
<th>&quot;TT&quot; Series Tip</th>
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<td>T-023 .023&quot; (.6 mm)</td>
<td>TT-023 .023&quot; (.6 mm)</td>
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<td>T-030 .030&quot; (.8 mm)</td>
<td>TT-030 .030&quot; (.8 mm)</td>
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<td>T-035 .035&quot; (.9 mm)</td>
<td>TT-035 .035&quot; (.9 mm)</td>
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<td>T-039 .039&quot; (1.0 mm)</td>
<td>TT-039 .039&quot; (1.0 mm)</td>
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<tr>
<td>T-045 .045&quot; (1.2 mm)</td>
<td>TT-045 .045&quot; (1.2 mm)</td>
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<tr>
<td>T-052 .052&quot; (1.4 mm)</td>
<td>TT-052 .052&quot; (1.4 mm)</td>
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<td>T-062 1/16&quot; (1.6 mm)</td>
<td>TT-062 1/16&quot; (1.6 mm)</td>
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<td>TT-072 .072&quot; (1.8 mm)</td>
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<td>T-075 5/64&quot; (2.0 mm)</td>
<td>TT-075 5/64&quot; (2.0 mm)</td>
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<tr>
<td>T-094 3/32&quot; (2.4 mm)</td>
<td>TT-094 3/32&quot; (2.4 mm)</td>
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<tr>
<td>T-109 7/64&quot; (2.8 mm)</td>
<td>TT-109 7/64&quot; (2.8 mm)</td>
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<tr>
<td>T-125 1/8&quot; (3.2 mm)</td>
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Quik Tip™ Consumable Series

Quik Tip Gas Diffusers and Nozzles

Series 1 Tip

-**see chart**

-**D114Q** 1/4" Recess
-**D118Q** 1/8" Recess
-**D1FO** Flush

Series 2 Tip

-**see chart**

-**D218** 1/8" Recess

4423R Insulator

DS-QT

4323R Insulator

Series 2 Tip

-**see chart**

-**N1C34HQ** Plated Copper, 3/4" Heavy Duty
-**N1C58HQ** Plated Copper, 5/8" Heavy Duty
-**N1C34Q** Plated Copper, 3/4" Heavy Duty
-**N1B34Q** Brass, 3/4"
-**N1C58Q** Plated Copper, 5/8"
-**N1B58Q** Brass, 5/8"
-**N1C12Q** Plated Copper, 1/2"
-**N2C12HQ** Plated Copper, 1/2"
-**N2C38HQ** Plated Copper, 3/8"
-**N1C34HD** Plated Copper, 3/4", Heavy Duty
-**N1C58HD** Plated Copper, 5/8", Heavy Duty
-**N1C34** Copper, 3/4"
-**N1C58** Copper, 5/8"
-**N1C12** Copper, 1/2"
-**N2C12** Copper, 1/2"
-**N2C38** Copper, 3/8"
-**NSQT-1200** Copper, 1/2" I.D., Flush
-**NSQT-1218** Copper, 1/2" I.D., 1/8" Rec.

Quik Tip Contact Tips

**Series 1 Tip**

| T1023 | .023" (.6 mm) |
| T1030 | .030" (.8 mm) |
| T1035 | .035" (1.0 mm) |
| T1039 | .039" (1.0 mm) |
| T1045 | .045" (1.2 mm) |
| T1052 | .050" (1.4 mm) |
| T1116 | .064" (1.6 mm) |
| T1068 | .068" (1.7 mm) |
| T1072 | .072" (1.9 mm) |
| T1064 | .084" (2.0 mm) |
| T1332 | .5/64" (2.0 mm) |
| T1164 | .7/64" (2.8 mm) |
| T1118 | 1/8" (.5 mm) |
| T1894 | .5/64" (1.2 mm) |

**Series 2 Tip**

| T2023 | .023" (.6 mm) |
| T2030 | .030" (.8 mm) |
| T2035 | .035" (1.0 mm) |
| T2045 | .045" (1.2 mm) |
| T2364 | .3/64" (1.2 mm) |
| T2050 | .052" (1.4 mm) |
| T2116 | .1/16" (1.6 mm) |
7-3 Centerfire™ HD Consumable Series
Centerfire HD Consumable Series is not configurable and will need to be ordered separately. Couple the Centerfire HD nozzle body with a Centerfire HD nozzle cone to form a complete Centerfire HD nozzle.

7-4 Quik Tip™ HD Consumable Series
Quik Tip HD Consumable Series is not configurable and will need to be ordered separately. Couple the Quik Tip HD nozzle body with a Quik Tip HD nozzle cone to form a complete Quik Tip HD nozzle.
### 7-5 TOUGH LOCK™ Consumable Series

#### TOUGH LOCK™ CONTACT TIP PART NUMBERS

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<th>Wire Size</th>
<th>Standard Duty</th>
<th>Heavy Duty</th>
<th>Heavy Duty Tapered</th>
<th>Extended Life Heavy Duty</th>
<th>Extra Heavy Duty</th>
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<td>403-20-30</td>
<td>403-21-30</td>
<td>403-27-30</td>
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<td>403-21-35</td>
<td>403-27-35</td>
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<td>403-20-1.0</td>
<td>403-21-1.0</td>
<td>403-27-1.0</td>
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<td>0.045” (1.2 mm)</td>
<td>403-14-45</td>
<td>403-20-45</td>
<td>403-21-45</td>
<td>403-27-45</td>
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#### TOUGH LOCK RETAINING HEAD PART NUMBERS

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#### THREAD-ON RETAINING HEADS FOR NEW STYLE THREAD-ON NOZZLES

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#### TOUGH LOCK NOZZLE PART NUMBERS

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<td>B</td>
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<td>A</td>
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<td>2.76&quot;</td>
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<td>B</td>
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<td>3.00&quot;</td>
<td>1/4&quot; Recess</td>
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<td>B</td>
<td>Copper</td>
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<td>2.88&quot;</td>
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<td>Brass</td>
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<td>2.88&quot;</td>
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<td>1/8&quot; Stick-Out</td>
<td>10</td>
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<td>1.162&quot;</td>
<td>3.00&quot;</td>
<td>1/4&quot; Recess</td>
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<td>401-4-75</td>
<td>Standard Duty</td>
<td>3/4&quot;</td>
<td>C</td>
<td>Copper</td>
<td>0.938&quot;</td>
<td>2.88&quot;</td>
<td>1/8&quot; Recess</td>
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</tbody>
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**A. BOTTLNECK**

**B. TAPER**

**C. STRAIGHT**
<table>
<thead>
<tr>
<th>PROBLEM</th>
<th>POSSIBLE CAUSE</th>
<th>CORRECTIVE ACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Electrode does not feed</td>
<td>1. Feeder relay.</td>
<td>1. Consult feeder manufacturer.</td>
</tr>
<tr>
<td></td>
<td>2. Broken control lead.</td>
<td>2 a. Test &amp; 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. Worn or broken switch.</td>
<td>3. Test &amp; replace leads and/or contact pins.</td>
</tr>
<tr>
<td></td>
<td>5. Improper drive roll size.</td>
<td>4. Replace.</td>
</tr>
<tr>
<td></td>
<td>6. Drive roll tension misadjusted.</td>
<td>5. Replace with proper size.</td>
</tr>
<tr>
<td></td>
<td>7. Burn back to contact tip.</td>
<td>6. Adjust tension at feeder.</td>
</tr>
<tr>
<td></td>
<td>8. Wrong size liner.</td>
<td>7. See ‘Contact Tip Burn Back’.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>9. Replace liner, 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. Set 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 gun to base metal relationship.</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 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 ‘Changing Consumables’ (Section 5 pg. 11).</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>5. Erratic arc</td>
<td>1. Worn contact tip.</td>
<td>1. Replace.</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 size tip.</td>
</tr>
<tr>
<td></td>
<td>4. Not enough bend in neck.</td>
<td>4. Replace with 45º or 60º neck.</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 proper 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>6. Improper wire guide diameter.</td>
<td>5 a. Adjust/replace guide as close to drive rolls as possible.</td>
</tr>
<tr>
<td></td>
<td>7. Gaps at liner junctions.</td>
<td>b. Eliminate all gaps in electrode path.</td>
</tr>
<tr>
<td></td>
<td>8. Feeder malfunction.</td>
<td>6. Replace with proper guide diameter.</td>
</tr>
<tr>
<td></td>
<td>9. Contact tip.</td>
<td>7 a. Replace with new liner trimming as per ‘Changing the Liner’ (Section 5, pg. 11).</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>9. Gun running hot</td>
<td>1. Exceeding duty cycle. &lt;br&gt;2. Loose or poor power connection.</td>
<td>1. a. Replace with properly rated Bernard MIG Gun. &lt;br&gt;   b. Decrease parameters to within gun rating. &lt;br&gt;2. a. Clean, tighten or replace cable grounding connection. &lt;br&gt;   b. Tighten gun &amp; cable connections to specified torque. See ‘Replacement’ (Section 5).</td>
</tr>
<tr>
<td>10. Liner is discolored full length</td>
<td>1. Short circuit to electrode. &lt;br&gt;2. Broken copper stranding in power cable.</td>
<td>1. Isolate electrode reel from feeder and drive block. Consult feeder manufacturer’s manual. &lt;br&gt;2. Replace MIG gun.</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 BernardWelds.com. Scan this QR Code with your smart phone for immediate access to BernardWelds.com/TechnicalSupport

Scan to view BTB MIG Gun Spec Sheet .................................................................

Scan to view Centerfire™ Consumables Spec Sheet ..............................................

Scan to view TOUGH LOCK™ Consumables Spec Sheet ......................................

Scan to view Quik Tip™ Consumables Spec Sheet ..............................................

Scan to view QUICK LOAD™ Liners & AutoLength™ Pins Spec Sheet ................