Thank You for Choosing Bernard

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) (US & Canada) or +1-519-737-3000 (International) or fax 1-708-946-6726. 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.

Bernard manufactures premium semi-automatic (GMAW) 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.

Subject to Change – The information presented in this 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.

Additional Material – 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
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DECLARATION OF CONFORMITY
for European Community (CE marked) products

Bernard, 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>
</tr>
</thead>
<tbody>
<tr>
<td>Bernard Clean Air MIG Gun – 300A</td>
<td>CL30XXXXXXXX (Configurable #)</td>
</tr>
<tr>
<td>Bernard Clean Air MIG Gun – 400A</td>
<td>CL40XXXXXXXX (Configurable #)</td>
</tr>
<tr>
<td>Bernard Clean Air MIG Gun – 500A</td>
<td>CL50XXXXXXXX (Configurable #)</td>
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<tr>
<td>Bernard Clean Air MIG Gun – 600A</td>
<td>CL60XXXXXXXX (Configurable #)</td>
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</tbody>
</table>

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

May 18, 2015
Date of Declaration
SECION 1 — SAFETY PRECAUTIONS — 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.

NOTICE — Indicates statements not related to personal injury.

— Indicates special instructions.

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 Principal Safety Standards section. 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.

Touching live electrical parts can cause fatal shocks or severe burns. The electrode and work circuit is electrically live whenever the output is on. The input power circuit and machine internal circuits are also live when power is on. In semi-automatic or automatic wire welding, 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 insulating 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 weld output in damp, wet, or confined spaces, or if there is a danger of falling.
- Use AC output ONLY if required for the welding 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 semi-automatic 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 this equipment. Lockout/tagout input power according to OSHA 29 CFR 1910.147 (see Principal Safety Standards).
- Properly install, ground, and operate this equipment according to its Owner’s Manual and national, state, 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 – double-check connections.
- Keep cords dry, free of oil and grease, and protected from hot metal and sparks.
- Frequently inspect input power cord and ground conductor for damage or bare wiring – replace immediately if damaged – bare wiring can kill.
• Turn off all equipment when not in use.
• Do not use worn, damaged, undersized, or repaired 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 not in use.
• Use GFCI protection when operating auxiliary equipment in damp or wet locations.

SIGNIFICANT DC VOLTAGE exists in inverter welding power sources AFTER removal of input power.

• Turn off unit, disconnect input power, and discharge input capacitors according to instructions in Manual before touching any parts.

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.

FUMES AND GASES can be hazardous.

Welding 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.
• Ventilate the work area and/or use local forced ventilation at the arc to remove welding 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, cleaners, consumables, coolants, degreasers, fluxes, and metals.
• Work in a confined space only if it is well ventilated, or while wearing an air-supplied respirator. Always have a trained watch-person nearby. Welding fumes and gases can displace air and lower the oxygen level causing injury or death. Be sure the breathing air is safe.
• Do not weld in locations near degreasing, cleaning, or spraying operations. The heat and the rays of the arc can react with vapors to form highly toxic and irritating gases.
• Do not weld on coated metals, such as galvanized, lead, or cadmium plated steel, unless the coating is removed from the weld area, the area is well ventilated, and while wearing an air-supplied respirator. The coatings and any metals containing these elements can give off toxic fumes if welded.

ARC RAYS 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 Principal Safety Standards).
• Wear approved safety glasses with side shields under your helmet.
• Use protective screens or barriers to protect others from flash, glare and sparks; warn others not to watch the arc.
• Wear body protection made from durable, flame-resistant material (leather, heavy cotton, wool). Body protection includes oil-free clothing such as leather gloves, heavy shirt, cuffless trousers, high shoes, and a cap.

WELDING can cause fire or explosion.

Welding on closed containers, such as tanks, drums, or pipes, can cause them to blow up. Sparks can fly off from the welding arc. The flying sparks, hot workpiece, and hot equipment can cause fires and burns. Accidental contact of electrode to metal objects can cause sparks, explosion, overheating, or fire. Check and be sure the area is safe before doing any welding.

• Remove all flammables within 35 ft (10.7 m) of the welding arc. If this is not possible, tightly cover them with approved covers.
• Do not weld 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 can easily go through small cracks and openings to adjacent areas.
• Watch for fire, and keep a fire extinguisher nearby.
• Be aware that welding on a ceiling, floor, bulkhead, or partition can cause fire on the hidden side.
• Do not cut or weld on tire rims or wheels. Tires can explode if heated. Repaired rims and wheels can fail. See OSHA 29 CFR 1910.177 listed in Principal Safety Standards.
• 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 Principal Safety Standards).
• Do not weld where the atmosphere can contain flammable dust, has, or liquid vapors (such as gasoline).
• Connect work cable to the work as close to the welding area as practical to prevent welding 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.
• 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 bypass 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.

**FLYING METAL or DIRT can injure eyes.**

- Welding, 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.**

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

**NOISE can damage hearing.**

Noise from some processes or equipment can damage hearing.

- Wear approved ear protection if noise level is high.

**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 or other electrical circuits.
- Never drape a welding torch over a gas cylinder.
- Never allow a welding electrode to touch any cylinder.
- Never weld on a pressurized cylinder – explosion will result.
- Use only 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 proper equipment, correct procedures, and sufficient number of persons to lift, move, and transport cylinders.
- Read and follow instructions on compressed gas cylinders, associated equipment, and Compressed Gas Association (CGA) publication P-1 listed in Principal Safety Standards.
1-3 Additional Symbols For Installation, Operation, And Maintenance

**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.

**FALLING EQUIPMENT** can injure.
- Use lifting eye to lift unit only, NOT running gear, gas cylinders, or any other accessories.
- Use correct procedures and equipment of adequate capacity to lift and support unit.
- If using fork lifts to move unit, be sure forks are long enough to extend beyond the opposite side of unit.
- Keep equipment (cables and cords) away from moving vehicles when working from an aerial location.
- Follow the guidelines in the Applications Manual for the Revised NIOSH Lifting Equation (Publication No. 94-110) when manually lifting heavy parts or equipment.

**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 airflow to unit.

**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.

**STATIC (ESD)** can damage PC boards.
- Put on grounded wrist strap BEFORE handling boards or parts.
- Use proper static-proof bags and boxes to store, move, or ship PC boards.

**MOVING PARTS** can injure.
- Keep away from moving parts.
- Keep away from pinch points such as drive rolls.

**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.

**BATTERY EXPLOSION** can injure.
- Do not use welder to charge batteries or jump start vehicles unless it has a battery charging feature designed for this purpose.

**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.

**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 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.
- Reinstall doors, panels, covers, or guards when servicing is finished and before starting unit.
- If ANY air is injected into the skin or body, seek medical help immediately.
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.

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.
- If notified by the FCC about interference, stop using the equipment at once.
- Have the installation regularly checked and maintained.
- 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 can cause interference.

- Electromagnetic energy can interfere with sensitive electronic equipment such as computers and computer-driven equipment such as robots.
- Be sure all equipment in the welding area is electromagnetically compatible.
- To reduce possible interference, keep weld cables as short as possible, close together, and down low, such as on the floor.
- Locate welding operation 100 meters from any sensitive electronic equipment.
- Be sure the welding machine is installed and grounded according to the Manual.
- If interference still occurs, the user must take extra measures such as moving the welding machine, using shielded cables, using line filters, or shielding the work area.
1-4 California 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](http://www.P65Warnings.ca.gov).

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 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 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


**National Electrical Code**, NFPA Standard 70, from National Fire Protection Association, Quincy, MA 02269 (phone: 1-800-344-3555, website: [www.nfpa.org](http://www.nfpa.org) and [www.sparky.org](http://www.sparky.org)).


**Applications Manual for the Revised NIOSH Lifting Equation**, The National Institute for Occupational Safety and Health (NIOSH), 1600 Clifton Rd, Atlanta, GA 30329-4027 (phone: 1-800-232-4636, website: [www.cdc.gov/NIOSH](http://www.cdc.gov/NIOSH)).
1-7 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 of a product, or if a product is modified in any way except by authorized Bernard personnel.
2-1 Specifications

Fume Extraction MIG (GMAW) Welding Gun

<table>
<thead>
<tr>
<th>Ampereage</th>
<th>Wire Size</th>
<th>Duty Cycle Rating</th>
<th>Gas Type</th>
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</thead>
<tbody>
<tr>
<td>300</td>
<td>5/64&quot; (2.0 mm)</td>
<td>100%: 300 amp with CO₂ Shielding Gas</td>
<td>60%: 300 amp with Mixed Gases</td>
</tr>
<tr>
<td>400</td>
<td>5/64&quot; (2.0 mm)</td>
<td>100%: 400 amp with CO₂ Shielding Gas</td>
<td>60%: 400 amp with Mixed Gases</td>
</tr>
<tr>
<td>500</td>
<td>3/32&quot; (2.4 mm)</td>
<td>100%: 500 amp with CO₂ Shielding Gas</td>
<td>60%: 500 amp with Mixed Gases</td>
</tr>
<tr>
<td>600</td>
<td>1/8&quot; (3.2 mm)</td>
<td>100%: 600 amp with CO₂ Shielding Gas</td>
<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 Section 2 — Specifications on page 8 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.

Figure 3-A

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

A. Euro Power Pin

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

Figure 3-B
B. Bernard Power Pin

1. Insert the Bernard power pin to face of receptacle.
2. Engage and rotate locking sleeve to tighten.

3-3 Installing to a Fume Extraction Unit

1. Thread coupler into hose connected to fume extraction unit.
2. Slide coupler onto fume port on rear strain relief and secure by tightening clamp.
SECTION 4 — OPERATION

4-1 Pulling the Trigger

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

4-2 Adjusting the Vacuum Chamber

1. Vacuum chamber - The vacuum chamber can be adjusted to any of four set positions.
2. Adjust the vacuum chamber by pulling it back or pushing it forward until it locks into the desired position.
4-3 Adjusting the Vacuum Control Knob

1. Vacuum control knob - The vacuum control knob can be used to adjust the amount of vacuum at the front of the gun.
2. Rotate clockwise to increase vacuum and counterclockwise to decrease vacuum.
5-1 Changing Consumables

A. Changing Quik Tip™ Consumables
1. Remove vacuum chamber.
2. Remove threaded nozzle by turning in a counterclockwise direction.
3. Cut electrode and remove all burrs before removing the contact tip. Remove Quik Tip contact tip from the gas diffuser with a counterclockwise turn. To replace, slide the contact tip over electrode into gas diffuser and lock with a turn in clockwise rotation.
4. 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 and torque to 144 in-lbs.

B. Changing Centerfire™ Consumables
1. Remove vacuum chamber.
2. Remove threaded nozzle by turning in a counterclockwise direction.
3. Cut electrode and remove all burrs before removing the contact tip.
4. 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.
5. 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 counterclockwise rotation. Torque to 144 in-lbs.

C. Changing TOUGH LOCK® Consumables
1. Remove the vacuum chamber.
2. Remove the slip-on nozzle with a twisting and pulling motion.
3. Cut electrode and remove all burrs before removing the 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 retaining head and lock with a clockwise rotation.
4. Retaining head may be removed with an appropriate wrench in a counterclockwise rotation. To install, firmly secure retaining head with an appropriate wrench in a clockwise rotation. Torque to 144 in-lbs.
5-2 Changing the Liner

A. Changing Conventional Liner

1. Remove front-end consumables and lay cable straight.
2. Using a 10 mm wrench, turn liner counterclockwise until it is free from the power pin. Remove liner from gun assembly.
3. 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.
4. Use a 10 mm wrench to turn liner lock clockwise to tighten into power pin.
5. Push liner through front of gun and trim to dimensions shown in the New Liner Trim Lengths chart shown below.
6. Remove all burrs from end of liner and replace front-end consumables.

<table>
<thead>
<tr>
<th>New Liner Trim Lengths</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Centerline Diffuser Part Number</strong></td>
</tr>
<tr>
<td>D-1</td>
</tr>
<tr>
<td>DS-1</td>
</tr>
<tr>
<td><strong>Quik Tip Diffuser Part Number</strong></td>
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Figure 5-B
B. Changing QUICK LOAD® Liner

1. Remove the front-end consumables and lay the cable straight.
2. Pull the QUICK LOAD Liner from the end of the neck using pliers.
3. Remove the protective cap from the new QUICK LOAD Liner and insert it through the neck using the wire as a guide.
4. With cable laying straight, feed the liner through the gun using short strokes to prevent kinking.
5. Once the liner stops feeding, give it an extra push to ensure it is seated correctly.
6. Push liner into gun. You should feel the o-rings click into the retainer. Trim to dimensions shown in **New Liner Trim Lengths** chart above.
7. Remove all burrs from end of liner and replace front-end consumables.
5-3 Changing the Neck and Switch

A. Changing the Neck - Straight Handle Model

1. Remove the two top pods screws (see 'A' in Figure 5-D) on the side of the gun.
2. Slide the top pod (see 'B' in Figure 5-D) up and back toward the rear of the handle and pull the trigger (see 'C' in Figure 5-D) down.
3. Remove the two handle screws (see 'D' in Figure 5-D) and rotate the handle locking cap 1/4 turn counterclockwise to open the handle.
4. After removing the vacuum chamber and front-end consumables, the vacuum tube (see 'E' in Figure 5-D) will slide forward.
5. Hold the neck (see 'F' in Figure 5-D) snug in a vise (be careful not to damage the neck by over tightening) and loosen cable/neck connection using a wrench.
6. Remove from vise and unthread neck by hand.
7. Thread new neck into cable end fitting and tighten by hand.
8. Hold neck in vise and secure cable/neck connection using a wrench. Torque to 13 ft-lbs (17.6 Nm).
9. Position neck, vacuum tube, and handle swivel into handle. Make sure trigger wires are located in cutout at the bottom of the handle.
10. Close handle halves and secure by rotating the handle locking cap clockwise 1/4 turn. Secure handle halves with the two handle screws and post fasteners.

B. Changing the Switch - Straight Handle Model

1. If replacing the trigger, disconnect the two terminals from the switch and then connect the new trigger.
2. Position trigger onto bottom of handle, slide top pod down over the top of the handle and lock into place.
3. Secure with two screws and reassemble front-end consumables and vacuum chamber.
C. Changing the Neck - Curved Handle Model

1. Remove the vacuum chamber and front-end consumables (see 'A' in Figure 5-E).
2. Remove the screws (see ‘B’ in Figure 5-E) to remove the vacuum tube (see ‘C’ in Figure 5-E).
3. Remove screws and nuts (see ‘F’ in Figure 5-E) and gently spread the handle (see ‘E’ in Figure 5-E) apart, keeping hold of the trigger (see ‘G’ in Figure 5-E).
4. Remove the trigger and left side of handle, then gently pry the wire ends off of the right side handle (see Figure 5-F) and remove.
5. Place the neck (see ‘D’ in Figure 5-E) snug in a vise (be careful not to damage the neck by over tightening) and use a wrench to loosen the cable connection to the neck. Remove from vise and unthread by hand.
6. To replace the neck, thread into the cable end fitting and tighten by hand. Secure the neck in a vise, then torque cable/neck connection to 13 ft-lbs (17.6Nm).
7. Position the neck, vacuum tube and handle swivel (see ‘H’ in Figure 5-E) into the handle. Make sure the trigger wires are located at the bottom cutouts in the handle, then push the wire ends into the right side handle (see Figure 5-F).
8. Place the trigger between handle halves with the pivot posts inserted into the cavities, and reassemble with screws and nuts (see ‘F’ in Figure 5-E). Torque to 10 in-lbs (1.1Nm).
9. Reassemble the vacuum tube with screws (see ‘B’ in Figure 5-E), and reinstall the front-end consumables and vacuum chamber.

D. Changing the Switch - Curved Handle Model

1. If replacing the trigger, loosen the screws but do not fully remove.
2. Pry open the bottom side of the handle halves and remove the trigger.
3. Install new trigger into the handle halves with the pivot posts inserted into the handle cavities so movement is not impaired, then tighten screws and torque to 10 in-lbs (1.1Nm).
5-4 Changing the Vacuum Hose

A. Vacuum Hose on Straight Handle Model

1. Open the handle and remove the neck and trigger by following the steps listed in steps A. and B. in section 5-3 Changing the Neck and Switch on page 16.
2. With a 1/4 counterclockwise rotation, remove the vacuum hose rear cap from the rear strain relief.
3. Slide the old vacuum hose forward and remove from cable.
4. Slide the new vacuum hose over the cable and secure the vacuum hose rear cap to the rear strain relief with a 1/4 clockwise rotation.
5. Reassemble the handle and front-end components by following the steps listed in steps A. and B. in section 5-3 Changing the Neck and Switch on page 16.

B. Vacuum Hose on Curved Handle Model

1. Open the handle and remove the neck. Follow the steps listed in C. and D. in section 5-3 Changing the Neck and Switch on page 16.
2. With 1/4 counterclockwise rotation, remove the vacuum hose rear cap from the rear strain relief.
3. Slide the old vacuum hose forward and remove from the cable.
4. Slide the new vacuum hose over the cable. Secure vacuum hose to the rear strain relief with a 1/4 turn clockwise.
5. Reassemble the handle and front-end components by following the steps listed in C. and D. in section 5-3 Changing the Neck and Switch on page 16.
5-5 Changing the Power Pin

A. Universal Power Pin

1. Remove the liner by following the steps listed in section 5-2 Changing the Liner on page 14.
2. Remove the screw and vacuum hose from rear strain relief and slide rear strain relief back over power pin. Position control lead wires as necessary as not to damage them.
3. Use wrenches and rotate power pin in a counterclockwise direction to remove it from the adaptor block.
4. 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).
5. Slide rear strain relief over power pin and locate onto adaptor block, aligning flats and screw hole.
7. Position control lead wires in cutout on side of strain relief.
8. Close strain relief top and secure with vacuum hose by rotating clockwise 1/4 turn.
9. Reinstall liner by following the steps listed in section 5-2 Changing the Liner on page 14.

B. Euro Power Pin

1. Remove the liner by following the steps listed in section 5-2 Changing the Liner on page 14. Remove the screw and vacuum hose from rear strain relief.
2. Disconnect Euro block leads from gun by cutting as close as possible on both sides of the butt connectors in order to preserve wire for later re-termination.
3. Slide adaptor nut toward cable, thus exposing the Euro block.
4. Remove Euro block from end fitting using appropriate wrenches in a counterclockwise rotation.
5. Test lead wires for continuity when trigger is engaged.
6. Slide adaptor nut over cable with internal threads facing toward rear of the gun.
7. Assemble Euro block into adaptor block in a clockwise rotation using appropriate wrenches. Torque to 18 ft-lbs (24 Nm).
9. Strip the control leads 1/4" (6.5 mm) and re-terminate with appropriate butt connectors.
10. Install strain relief and vacuum hose.
11. Reinstall liner by following the steps listed in section 5-2 Changing the Liner on page 14.
C. Bernard Quick Disconnect

1. Remove the liner by following the steps listed in section 5-2 Changing the Liner on page 14.
2. Remove vacuum hose.
3. Viewing quick disconnect from cable end, align wave spring and large snap ring with opening access slot.
4. Compress large snap ring with internal snap ring pliers and remove locking sleeve.
5. Remove small external snap ring from power pin with external snap ring pliers.
6. 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.
7. 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.
8. Test contact pins for continuity when trigger is engaged.
9. Inspect all components for cracks, debris, excessive wear and breakage. Replace with new components if safety or performance of product is compromised.
10. Thread power pin into adaptor block and torque to 18 ft-lbs (24 Nm).
11. Install locking sleeve components and vacuum hose.
12. Reinstall liner by following the steps listed in section 5-2 Changing the Liner on page 14.
6-1 Optimizing Fume Capture

Follow the diagram below for optimizing the efficiency of fume capture from your fume extraction MIG gun. The joints and positions of welds will affect the efficiency of fume capture.

Optimal capture efficiency is achieved when fume gun is positioned directly above the weld puddle.
SECTION 7 — PARTS LIST

7-1 Straight Handle Model - 300, 400, 500, 600 amp
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For additional support materials such as Spec Sheets, troubleshooting information, how-to guides and videos, animations, online configurators and much more, please visit Bernard. Scan the QR Code with your smart phone for immediate access to BernardWelds.com/TechnicalSupport.

Scan to view the Clean Air™ Fume Extraction MIG Gun Owner’s Manual

Scan to view the Clean Air Fume Extraction MIG Gun Spec Sheet

Scan to view the Centerfire™ Consumables Spec Sheet

Scan to view the Quik Tip™ Consumables Spec Sheet

Scan to view the TOUGH LOCK® Consumables Spec Sheet

Scan to view the QUICK LOAD® Liner and AutoLength™ Pins Spec Sheet

Scan to view additional Bernard® Owner’s Manuals and Spec Sheets