

Handymig 170i

For use with machine Code Numbers **10984**



This manual covers equipment which is no longer in production by The Lincoln Electric Co. Specifications and availability of optional features may have changed.

Safety Depends on You

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



OPERATOR'S MANUAL



Made exclusive for Australia



A Division of Lincoln Electric Company (Aust) Pty Ltd A.B.N. 36 000 040 308
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WARNING

ARC WELDING CAN BE HAZARDOUS. PROTECT YOURSELF AND OTHERS FROM POSSIBLE SERIOUS INJURY OR DEATH. KEEP CHILDREN AWAY. PACEMAKER WEARERS SHOULD CONSULT WITH THEIR DOCTOR BEFORE OPERATING.

For more detailed information it is strongly recommended that you purchase a copy of "Safety in Welding and Cutting - ANSI Standard Z49.1" and WTIA Technical Note 7. All WTIA publications and ANSI/AWS Standards are available from the Welding Technology Institute of Australia, PO Box 6165 Silverwater NSW 2128. For copies of various Australian Standards contact your local S.A.A. office.

BE SURE THAT ALL INSTALLATION, OPERATION, MAINTENANCE AND REPAIR PROCEDURES ARE PERFORMED ONLY BY QUALIFIED INDIVIDUALS.



FOR ENGINE powered equipment.

1.a. Turn the engine off before troubleshooting and maintenance work unless the maintenance work requires it to be running.



1.b. Operate engines in open, well-ventilated areas or vent the engine exhaust fumes outdoors.



1.c. Do not add the fuel near an open flame welding arc or when the engine is running. Stop the engine and allow it to cool before refueling to prevent spilled fuel from vaporizing on contact with hot engine parts and igniting. Do not spill fuel when filling tank. If fuel is spilled, wipe it up and do not start engine until fumes have been eliminated.



1.d. Keep all equipment safety guards, covers and devices in position and in good repair. Keep hands, hair, clothing and tools away from V-belts, gears, fans and all other moving parts when starting, operating or repairing equipment.

1.e. In some cases it may be necessary to remove safety guards to perform required maintenance. Remove guards only when necessary and replace them when the maintenance requiring their removal is complete. Always use the greatest care when working near moving parts.


1.f. Do not put your hands near the engine fan. Do not attempt to override the governor or idler by pushing on the throttle control rods while the engine is running.

1.g. To prevent accidentally starting gasoline engines while turning the engine or welding generator during maintenance work, disconnect the spark plug wires, distributor cap or magneto wire as appropriate.



1.h. To avoid scalding, do not remove the radiator pressure cap when the engine is hot.

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ELECTRIC AND MAGNETIC FIELDS may be dangerous

2.a. Electric current flowing through any conductor causes localized Electric and Magnetic Fields (EMF). Welding current creates EMF fields around welding cables and welding machines

2.b. EMF fields may interfere with some pacemakers, and welders having a pacemaker should consult their physician before welding.

2.c. Exposure to EMF fields in welding may have other health effects which are now not known.

2.d. All welders should follow safe practices that minimize their exposure to electric and magnetic fields (EMF).

2.e. For welders wearing implanted pacemakers, safe welding practices are particularly important and additional procedures should be followed by those who have decided to continue to weld. (Hopefully in keeping with a doctor's advice).

2.f. The following procedures will not eliminate exposure to EMF or the possibility of arc welding having an effect on a pacemaker, however if followed, they will significantly reduce exposure to electric and magnetic fields. Electric and magnetic fields are created any time electric current flows through a conductor, however it is not clear whether such exposure affects ones health.

2.g. Some researchers have reported that exposure to EMF may cause leukemia or other illnesses. These claims originally arose in relation to high voltage electric power lines and are very much in dispute in the medical and scientific arena, however the best advice is to minimize your exposure to EMF to protect your health should doctors eventually decide there is a risk.

2.h. There are four fundamental facts about EMF:

2.h.1 With direct current (DC), the field strength is relatively constant and does not change.

2.h.2 With alternating current (AC), the field strength constantly changes.

2.h.3 The greater the current flow, i.e. the higher the amps, the stronger the field created by the current

2.h.4 The closer the conductor or electrical device is to the body the greater the exposure to the field.

MINIMIZE EXPOSURE TO EMF

2.i. All welders should use the following procedures to minimize EMF exposure:

2.i.1 Route electrode or gun and work cables together. Secure them with tape if possible.

2.i.2 Never coil the electrode lead around your body.

2.i.3 Do not place your body between the electrode and work cables. If your electrode cable is on your right side the work cable should also be on your right side.

2.i.4 Connect the work cable to the work piece as close as possible to the area being welded. (This is also a good practice to eliminate a common problem on welding - a poor work connection.

2.i.5 Do not work next to the welding power source.

**ADDITIONAL PRECAUTIONS FOR
WELDERS WITH PACEMAKERS**

2.j. There is no question that the fields in arc welding can interfere with a pacemakers function. Generally the interference does not permanently damage the pacemaker. Once the wearer leaves the arc welding environment or stops welding, the pacemaker returns to normal functioning. The welding arc has little or no effect on the operation of some pacemakers, especially designs that are bi-polar or designed to filter out such interference.

2.k. For a welder or anyone working around electrical equipment the selection of a pacemaker is very important. Get a doctor's advice about which pacemaker is the least sensitive to interference from welding while still being medically suitable.

2.l. In addition to the normal safety precautions, the following additional procedures should be adopted by welders with pacemakers.

2.l.1 Use gas welding when the application is suitable.

2.l.2 Use the lowest current setting appropriate for the application. Do not exceed 400 amps. Low current (75-200 amps) direct current (DC) welding should be used if arc welding is necessary. Do not TIG weld with high frequency.

2.l.3 Do not use repeated, short welds. Wait about ten seconds between stopping one weld and starting the next. When having difficulty starting an electrode, do not re-strike the rod repeatedly.

2.l.4 If you feel light headed, dizzy or faint, immediately stop welding. Lay the electrode holder down so that it does not contact the work and move away from any welding being performed. Arrange your work in advance so that, if you become dizzy and drop the electrode holder it will not fall on your body or strike the work.

2.l.5 Do not work on a ladder or other elevated position or in a cramped, confined place.

2.l.6 Do not work alone. Work only in the presence of an individual who understands these precautions and the possible effect welding may have on your pacemaker.

2.l.7 Do not work near spot welding equipment.

2.l.8 If you have a pacemaker and wish to continue arc welding, discuss this and any other questions you may have with your physician and follow his or her advice. The doctor may wish to contact the pacemaker manufacturer for a recommendation. As mentioned before, the design of the pacemaker significantly affects the degree to which it is subject to interference from a welding circuit. Do not rely on the fact that you know another welder with a pacemaker who has welded for years without experiencing a problem. That welder and his or her pacemaker may be quite different from you and your pacemaker.



ELECTRIC SHOCK can kill.

- 3.a. The electrode and work (or ground) circuits are electrically "hot" when the welder is on. Do not touch these "hot" parts with your bare skin or wet clothing. Wear dry, hole-free gloves to insulate hands.
- 3.b. Insulate yourself from work and ground using dry insulation. Make certain the insulation is large enough to cover your full area of physical contact with work and ground.
- In addition to the normal safety precautions, if welding must be performed under electrically hazardous conditions (in damp locations or while wearing wet clothing; on metal structures such as floors, gratings or scaffolds; when in cramped positions such as sitting, kneeling or lying, if there is a high risk of unavoidable or accidental contact with the workpiece or ground) use the following equipment:**
- Semiautomatic DC Constant Voltage (Wire) Welder.
 - DC Manual (Stick) Welder.
 - AC Welder with Reduced Voltage Control.
- 3.c. In semiautomatic or automatic wire welding, the electrode, electrode reel, welding head, nozzle or semiautomatic welding gun are also electrically "hot".
- 3.d. Always be sure the work cable makes a good electrical connection with the metal being welded. The connection should be as close as possible to the area being welded.
- 3.e. Ground the work or metal to be welded to a good electrical (earth) ground.
- 3.f. Maintain the electrode holder, work clamp, welding cable and welding machine in good, safe operating condition. Replace damaged insulation.
- 3.g. Never dip the electrode in water for cooling.
- 3.h. Never simultaneously touch electrically "hot" parts of electrode holders connected to two welders because voltage between the two can be the total of the open circuit voltage of both welders.
- 3.i. When working above floor level, use a safety belt to protect yourself from a fall should you get a shock.
- 3.j. Also see Items 6.c. and 8.



ARC RAYS can burn.

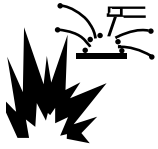
- 4.a. Use a shield with the proper filter and cover plates to protect your eyes from sparks and the rays of the arc when welding or observing open arc welding. Headshield and filter lens should conform to ANSI Z87.1 standards.
- 4.b. Use suitable clothing made from durable flame-resistant material to protect your skin and that of your helpers from the arc rays.
- 4.c. Protect other nearby personnel with suitable, non-flammable screening and/or warn them not to watch the arc nor expose themselves to the arc rays or to hot spatter or metal.



FUMES AND GASES can be dangerous.

- 5.a. Welding may produce fumes and gases hazardous to health. Avoid breathing these fumes and gases. When welding, keep your head out of the fume. Use enough ventilation and/or exhaust at the arc to keep fumes and gases away from the breathing zone. **When welding with electrodes which require special ventilation such as stainless or hard facing (see instructions on container or MSDS) or on lead or cadmium plated steel and other metals or coatings which produce highly toxic fumes, keep exposure as low as possible and below Threshold Limit Values (TLV) using local exhaust or mechanical ventilation. In confined spaces or in some circumstances, outdoors, a respirator may be required. Additional precautions are also required when welding on galvanized steel.**
- 5.b. Do not weld in locations near chlorinated hydrocarbon vapors coming from degreasing, cleaning or spraying operations. The heat and rays of the arc can react with solvent vapors to form phosgene, a highly toxic gas, and other irritating products.
- 5.c. Shielding gases used for arc welding can displace air and cause injury or death. Always use enough ventilation, especially in confined areas, to insure breathing air is safe.
- 5.d. Read and understand the manufacturer's instructions for this equipment and the consumables to be used, including the material safety data sheet (MSDS) and follow your employer's safety practices. MSDS forms are available from your welding distributor or from the manufacturer.
- 5.e. Also see item 1.b.

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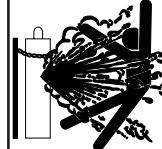


WELDING SPARKS can cause fire or explosion.

6.a. Remove fire hazards from the welding area. If this is not possible, cover them to prevent the welding sparks from starting a fire.

Remember that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas. Avoid welding near hydraulic lines. Have a fire extinguisher readily available.

- 6.b. Where compressed gases are to be used at the job site, special precautions should be used to prevent hazardous situations. Refer to "Safety in Welding and Cutting" (ANSI Standard Z49.1) and the operating information for the equipment being used.
- 6.c. When not welding, make certain no part of the electrode circuit is touching the work or ground. Accidental contact can cause overheating and create a fire hazard.
- 6.d. Do not heat, cut or weld tanks, drums or containers until the proper steps have been taken to insure that such procedures will not cause flammable or toxic vapors from substances inside. They can cause an explosion even though they have been "cleaned". For information, purchase "Recommended Safe Practices for the Preparation for Welding and Cutting of Containers and Piping That Have Held Hazardous Substances", AWS F4.1 from the American Welding Society (see address above).
- 6.e. Vent hollow castings or containers before heating, cutting or welding. They may explode.
- 6.f. Sparks and spatter are thrown from the welding arc. Wear oil free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes and a cap over your hair. Wear ear plugs when welding out of position or in confined places. Always wear safety glasses with side shields when in a welding area.
- 6.g. Connect the work cable to the work as close to the welding area as practical. Work cables connected to the building framework or other locations away from the welding area increase the possibility of the welding current passing through lifting chains, crane cables or other alternate circuits. This can create fire hazards or overheat lifting chains or cables until they fail.
- 6.h. Also see item 1.c.



CYLINDER may explode if damaged.

7.a. Use only compressed gas cylinders containing the correct shielding gas for the process used and properly operating regulators designed for the gas and pressure used. All hoses, fittings, etc. should be suitable for the application and maintained in good condition.

- 7.b. Always keep cylinders in an upright position securely chained to an undercarriage or fixed support.
- 7.c. Cylinders should be located:
 - Away from areas where they may be struck or subjected to physical damage.
 - A safe distance from arc welding or cutting operations and any other source of heat, sparks, or flame.
- 7.d. Never allow the electrode, electrode holder or any other electrically "hot" parts to touch a cylinder.
- 7.e. Keep your head and face away from the cylinder valve outlet when opening the cylinder valve.
- 7.f. Valve protection caps should always be in place and hand tight except when the cylinder is in use or connected for use.
- 7.g. Read and follow the instructions on compressed gas cylinders, associated equipment, and CGA publication P-1, "Precautions for Safe Handling of Compressed Gases in Cylinders," available from the Compressed Gas Association 1235 Jefferson Davis Highway, Arlington, VA 22202.



FOR ELECTRICALLY powered equipment.

- 8.a. Turn off input power using the disconnect switch at the fuse box before working on the equipment.
- 8.b. Install equipment in accordance with the National Electrical Code, all local codes and the manufacturer's recommendations.
- 8.c. Ground the equipment in accordance with the National Electrical Code and the manufacturer's recommendations.

Mar '95

INSTRUCTIONS FOR ELECTRO-MAGNETIC COMPATIBILITY

Conformance

Products displaying the C-Tick mark are in conformity with Australian/New Zealand requirements for Electromagnetic Compatibility (EMC) according to standard (emission) AS/NZS 3652 "Electromagnetic Compatibility – Arc Welding Equipment".

Products displaying the CE mark are in conformity with European Community Council Directive 89/336/EEC requirements for EMC by implementing EN50199 "Electromagnetic Compatibility (EMC) – Product standard for arc welding equipment".

Products are:

- For use with other Lincoln Electric/LiquidArc equipment.
- Designed for industrial and professional use.

Introduction

All electrical equipment generates small amounts of electromagnetic emission. Electrical emission may be transmitted through power lines or radiated through space, similar to a radio transmitter. When emissions are received by other equipment, electrical interference may result. Electrical emissions may effect many kinds of electrical equipment: other nearby welding equipment, radio and TV transmitters and receivers, numerical controlled machines, telephone systems, computers, etc. Be aware that interference may result and extra precautions may be required when a welding power source is used in a domestic establishment.

Installation and Use

The purchaser/user is responsible for installing and using the welding equipment according to the manufacturer's instructions. If electromagnetic disturbances are detected then it shall be the responsibility of the purchaser/user of the welding equipment to resolve the situation with the technical assistance of the manufacturer. In some cases this remedial action may be as simple as earthing (grounding) the welding circuit (see note below). In other cases it could involve constructing an electromagnetic screen enclosing the power source and the work complete with associated input filters. In all cases electromagnetic disturbances must be reduced to the point where they are no longer troublesome.

Note: The welding circuit may or may not be earthed for safety reasons according to national codes. Changing the earthing arrangements should only be authorized by a person who is competent to assess whether the changes increase the risk of injury, eg. by allowing parallel welding current return paths which may damage the earth circuits of other equipment.

Assessment of Area

Before installing welding equipment the purchaser/user shall make an assessment of potential problems in the surrounding area.

The following shall be taken into account:

- Other supply cables, control cables, signalling and telephone cables above, below and adjacent to the welding equipment;
- Radio and television transmitters and receivers;
- Computer and other control equipment;
- Safety critical safety equipment, eg. guarding of industrial equipment;
- The health of people around, eg. the use of pacemakers and hearing aids;
- Equipment used for calibration or measurement;
- The immunity of other equipment in the environment. The purchaser/user shall ensure that other equipment being used in the environment is compatible. This may require additional protection measures;
- The time of the day that welding or other activities are to be carried out.

The size of the surrounding area to be considered will depend on the structure of the building and other activities that are taking place. The surrounding area may extend beyond the boundaries of the premises.

Methods of Reducing Emissions

Mains Supply

Welding equipment should be connected to the mains supply according to the manufacturer's recommendations. If interference occurs, it may be necessary to take additional precautions such as filtering the mains supply. Consideration should be given to shielding the supply cable of permanently installed welding equipment in metallic conduit or equivalent. Shielding should be electrically continuous throughout its length. The shielding should be connected to the welding power source so that good electrical contact is maintained between the conduit and the welding power source enclosure.

Maintenance of the Welding Equipment

The welding equipment should be routinely maintained according to the manufacturer's recommendations. All access and service doors and covers should be closed and properly fastened when the welding equipment is in operation. The welding equipment should not be modified in any way except for those changes and adjustment covered in the manufacturer's instructions. In particular, the spark gaps of arc initiation and stabilizing devices should be adjusted and maintained according to the manufacturer's recommendations.

Welding Cables

The welding cables should be kept as short as possible and should be positioned close together, running at or close to the floor level.

Equipotential Bonding

Bonding of all metallic components in the welding installation and adjacent to it should be considered. However, metallic components bonded to the work piece will increase the risk that the operator could receive a shock by touching these metallic components and the electrode at the same time. The operator should be insulated from all such bonded metallic components.

Earthing of the workpiece

Where the workpiece is not bonded to earth for electrical safety, nor connected to earth because of its size and position, eg. ship's hull or building steelwork, a connection bonding the workpiece to earth may reduce emissions in some, but not all instances. Care should be taken to prevent the earthing of work pieces increasing the risk of injury to users, or damage to other electrical equipment. Where necessary, the connection of the workpiece to earth should be made by direct connection to the workpiece, but in some countries where direct connection is not permitted, the bonding should be achieved by suitable capacitance, selected according to national regulations.

Screening and Shielding

Selective screening and shielding of other cables and equipment in the surrounding area may alleviate problems of interference. Screening of the entire welding installation may be considered for special applications.

Portions of the preceding text are extracted from:

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Thank You

for selecting a **QUALITY** product by Lincoln Electric. We want you to take pride in operating this Lincoln Electric Company product
 ... as much pride as we have in bringing this product to you!

Please Examine Carton and Equipment For Damage Immediately

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

Please record your equipment identification information below for future reference. This information can be found on your machine nameplate.

Product _____

Model Number _____

Code Number or Date Code _____

Serial Number _____

Date Purchased _____

Where Purchased _____

Whenever you request replacement parts or information on this equipment, always supply the information you have recorded above. The code number is especially important when identifying the correct replacement parts.

On-Line Product Registration

- Register your machine with Lincoln Electric either via fax or over the Internet.

- For faxing: Complete the form on the back of the warranty statement included in the literature packet accompanying this machine and fax the form per the instructions printed on it.
- For On-Line Registration: Go to our **WEB SITE at www.lincolnelectric.com**. Choose "Quick Links" and then "Product Registration". Please complete the form and submit your registration.

Read this Operators Manual completely before attempting to use this equipment. Save this manual and keep it handy for quick reference. Pay particular attention to the safety instructions we have provided for your protection. The level of seriousness to be applied to each is explained below:

WARNING

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

CAUTION

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

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TECHNICAL SPECIFICATIONS – Handymig 170i

INPUT – SINGLE PHASE ONLY				
<u>Standard Voltage/Frequency</u> 240V/50Hz		<u>AS1966.1</u> <u>Rated Input Current</u> 12.7 Amps		
RATED OUTPUT				
<u>Duty Cycle</u> 20%		<u>Amps</u> 130		<u>Volts at Rated Amperes</u> 20
OUTPUT				
<u>Welding Current Range</u> Rated DC Output: 30 – 170 amps		<u>Maximum Open Circuit Voltage</u> 33		<u>Auxiliary Power</u> N/A
RECOMMENDED INPUT CABLE AND FUSE SIZES				
Output Mode	Input Voltage	Fuse or Breaker Size	Input Amps	Power Cord
RATED	240V/50Hz	25 Super Lag	12.7	15Amp, 240V, Three Pin Plug

PHYSICAL DIMENSIONS			
<u>Height</u> 305 mm	<u>Width</u> 248 mm	<u>Depth</u> 419 mm	<u>Weight</u> 25.9 kg

SAFETY PRECAUTIONS

- Read entire installation section before starting installation.

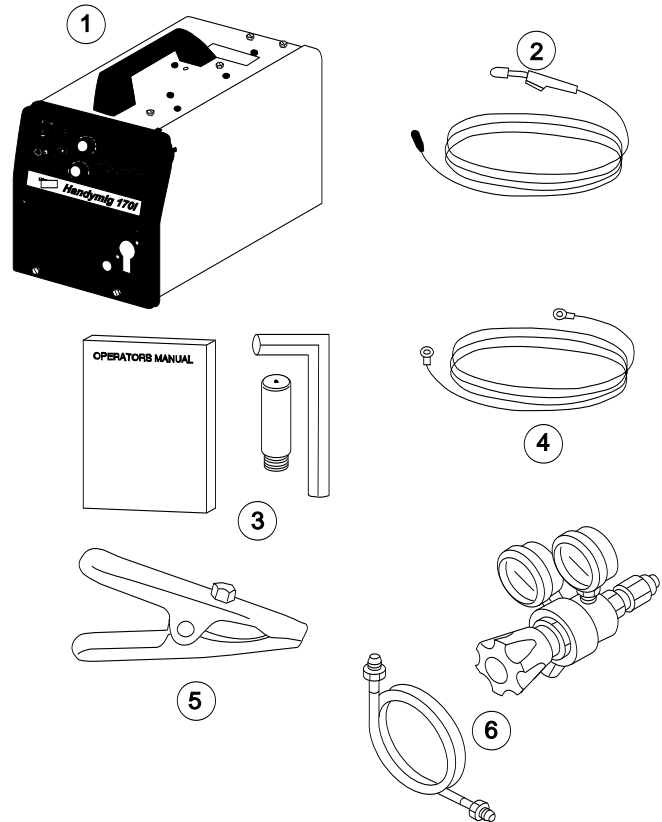
WARNING



ELECTRIC SHOCK can kill.

- Only qualified personnel should perform this installation.
- Only personnel that have read and understood the Handymig 170i Operating Manual should install and operate this equipment.
- Machine must be plugged into a receptacle which is grounded per any national, local or other applicable electrical codes.
- The Handymig 170i power switch is to be in the OFF ("O") position when installing work cable and gun and when connecting power cord to input power.

FIGURE A.1



IDENTIFY AND LOCATE COMPONENTS

If you have not already done so, unpack the Handymig 170i from its carton and remove all packing material around the Handymig 170i. Remove the following loose items from the carton (see Figure A.1):

1. Handymig 170i
2. Gun and cable assembly⁽¹⁾
3. Literature and miscellaneous includes:
 - a) This operating manual
 - b) A separate .030" (0.8 mm) contact tip
 - c) Hex key wrench for removal of drive roll.
4. 10 ft (3,0 m) work cable.
5. Work clamp.
6. Adjustable mixed-Gas Regulator & Hose.

⁽¹⁾ The gun is ready to feed .023" – .025" (0.6 mm) diameter wire.

SELECT SUITABLE LOCATION

Locate the welder in a dry location where there is free circulation of clean air into the louvers in the back and out the front of the unit. A location that minimizes the amount of smoke and dirt drawn into the rear louvers reduces the chance of dirt accumulation that can block air passages and cause overheating.

STACKING

Handymig 170i's cannot be stacked.

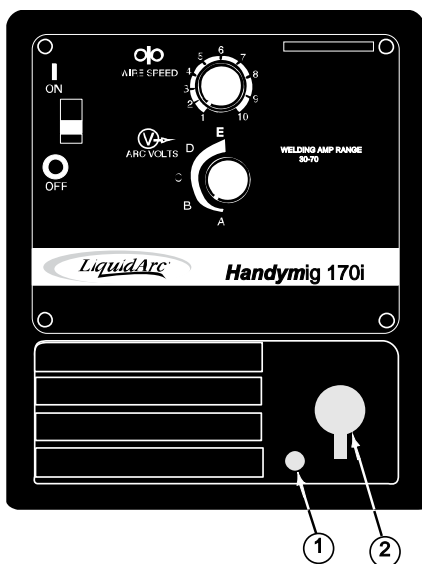
TILTING

Each machine must be placed on a secure, level surface, either directly or on the recommended cart. The machine may topple over if this procedure is not followed.

OUTPUT CONNECTIONS

Refer to Figure A.2.

1. Work Cable Access Hole.
2. Gun Cable and Control Lead Access Hole.
3. Connector Block.
4. Gun Trigger Lead Connectors.
5. Positive (+) and negative (-) output terminals.



6. Wire Feed Gearbox.
7. Cable Hanger.
8. Thumbscrew.

Work Clamp Installation

Attach the work clamp per the following: Refer to Figure A-3.

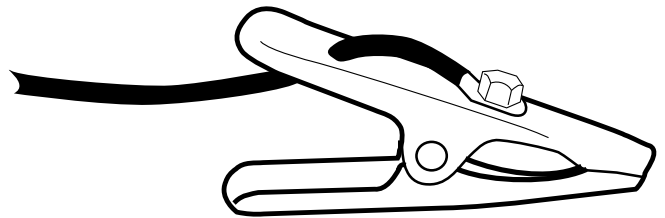
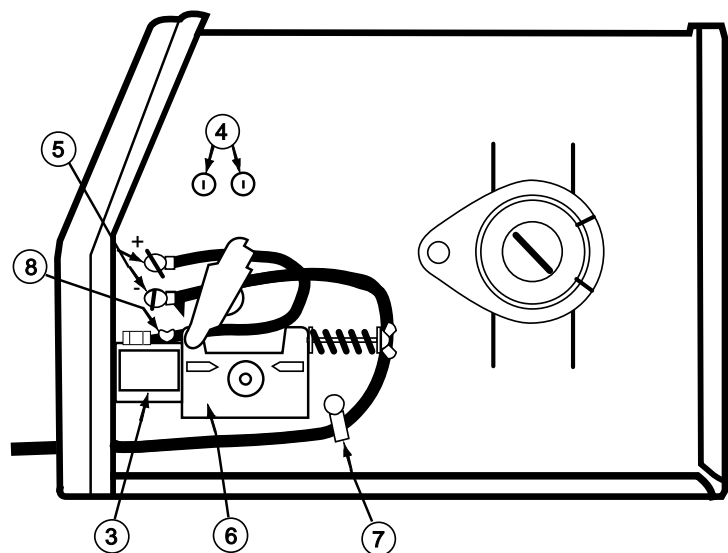


FIGURE A.3

1. Insert the work cable terminal lug with the larger hole through the strain relief hole in the work clamp as shown above.
2. Fasten securely with the bolt and nut provided.

FIGURE A.2



Handymig 170i

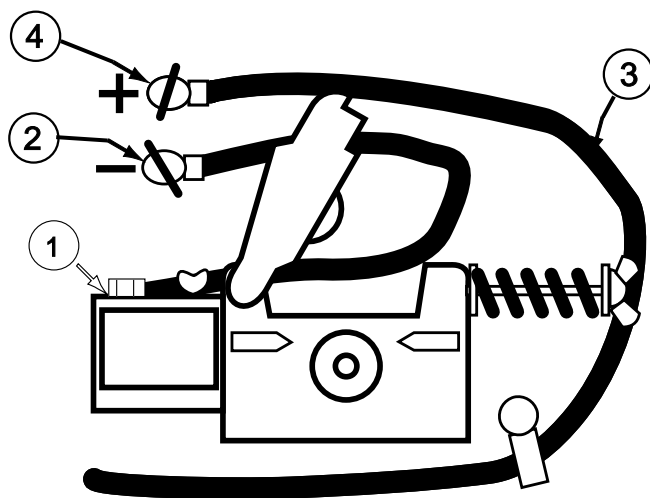


Work Cable Installation

Refer to Figure A.2.

1. Open the wire feed section door on the right side of the Handymig 170i.
2. Pass the end of the work cable that has the terminal lug with the smaller hole through the Work Cable Access Hole (1) in the case front.
3. Route the cable under and around the back of the Wire Feed Gearbox (6).
4. **For GMAW Only:** Refer to Figure A.2. As delivered, the machine is connected for positive electrode polarity. This is the appropriate configuration for the GMAW (MIG) process. To complete installation, use the provided wing nut to connect the work cable's terminal lug to the negative (-) output terminal (5) located above the Wire Feed Gearbox (6). Make sure that both wing nuts are tight.
5. **For Innershield Only:** Refer to Figure A.4. To wire for negative polarity (required for the Innershield process), connect the short cable attached to the connector block (1) to the negative (-) output terminal (2) and the work cable (3) to the positive (+) terminal (4).

FIGURE A.4



GUN INSTALLATION

As shipped from the factory, the Handymig 170i gun is ready to feed .023" – .025" (.6mm) solid wire. If .030"-.035" (0.8-.09 mm) solid wire is to be used, change the contact tip to the appropriate size. If .035" Flux-cored wire is to be used, change the contact tip and nozzle to the appropriate types and orient the drive roll to the appropriate groove size

NOTE: If .045" or 1.2 mm) Innershield flux-cored wire is to be used, the appropriate Innershield kit is required.

Connecting Gun Cable to the Handymig 170i.

1. Refer to Figure A.2. Unplug the machine or turn power switch to the OFF "O" position.
2. Pass the insulated terminals of the gun trigger control leads, one at a time, through the Gun Cable and Control Lead Access Slot (2) in the case front. The leads are to be routed up the inside of the case front, behind the gas line.
3. Insert the connector on the gun conductor cable through the Gun Cable Access Hole (2) in the Handymig 170i case front. Make sure the connector is all the way in the brass connector block to obtain proper gas flow. If the gun connector will not fully insert, unscrew the thumbscrew on the connector block a few turns. Rotate the connector so control leads are on the underside and tighten the Thumbscrew on the connector block.
4. Connect the gun trigger control lead terminals to the two insulated 1/4" (6,4 mm) tab terminal connector bushings located above the "Gun Trigger Connection" decal in the wire feed section (4). Either lead can go to either connector.

⚠ CAUTION

If the gun trigger switch being used is other than that supplied, the switch must be a normally open, momentary switch. The terminals of the switch must be insulated from the welding circuit. Malfunction of the Handymig 170i may result if this switch shorts to the Handymig 170i welding output circuit or is common to any electrical circuit other than the Handymig 170i trigger circuit.

GAS CONNECTION

The Handymig 170i is supplied with a mixed gas Regulator and a 3m gas hose. A cylinder of an appropriate shielding gas must be obtained from your gas distributor.

⚠ WARNING

CYLINDER may explode if damaged. Keep cylinder upright and chained to support

- Keep cylinder away from areas where it may be damaged.
- Never lift welder with cylinder attached.
- Never allow welding electrode to touch cylinder.
- Keep cylinder away from welding

⚠ WARNING

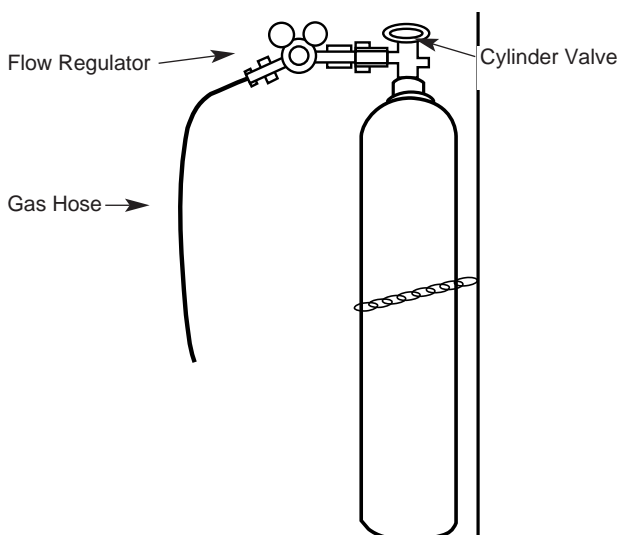
or other live electrical circuits.



BUILDUP OF SHIELDING GAS may harm health or kill.

- Shut off shielding gas supply when not in use.

1. Chain the cylinder to a wall or other stationary support to prevent the cylinder from falling over. Insulate the cylinder from the work circuit and earth ground. Refer to Figure A.5.

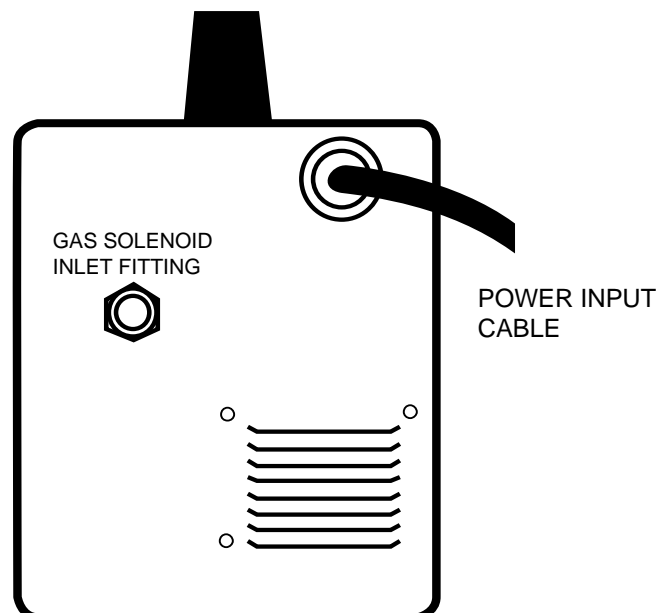
FIGURE A.5

2. With the cylinder securely installed, remove the cylinder cap. Stand to one side away from the outlet and open the cylinder valve very slightly for an instant. This blows away any dust or dirt which may have accumulated in the valve outlet.

⚠ WARNING

BE SURE TO KEEP YOUR FACE AWAY FROM THE VALVE OUTLET WHEN “CRACKING” THE VALVE. Never stand directly in front of or behind the flow regulator when opening the cylinder valve. Always stand to one side.

3. Attach the flow regulator to the cylinder valve and tighten the union nut securely with a wrench..
4. Refer to Figure A.6. Attach one end of inlet gas hose to the outlet fitting of the flow regulator and tighten the union nut securely with a wrench. Connect the other end to the Handymig 170i Gas Solenoid Inlet Fitting (5/8-18 female threads — for CGA — 032 fitting). Make certain the gas hose is not kinked or twisted.
5. Reinstall case side before connecting input power.

INPUT CONNECTIONS**FIGURE A.6**

Refer to Figure A.6.

ELECTRICAL INPUT CONNECTION FOR RATED OUTPUT

WARNING



ELECTRIC SHOCK can kill.

- **Disconnect input power by removing plug from receptacle before working inside Handymig 170i.**
 - **Use only grounded receptacle.**
 - **Do not touch electrically “hot” parts inside Handymig 170i.**
 - **Have qualified personnel do the maintenance and troubleshooting work.**
-

Line Cord Connection

A three conductor line cord with a 15 amp, 240 volt, three pin plug is factory installed. Connect this plug to a mating grounded receptacle which is connected to an appropriate power supply per the Wiring Rules and any applicable local codes.

WARNING

- **This welding machine must be connected to a power source in accordance with applicable electrical codes.**
 - **If there is any question about the installation meeting applicable electrical code requirements, consult a qualified electrician.**
-

SAFETY PRECAUTIONS

WARNING



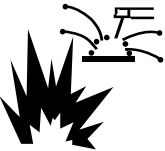
ELECTRIC SHOCK can kill.

- Do not touch electrically live parts or electrode with skin or wet clothing. Insulate yourself from work and ground.
- Always wear dry insulating gloves.



FUMES AND GASES can be dangerous.

- Keep your head out of fumes.
- Use ventilation or exhaust to remove fumes from breathing zone.



WELDING SPARKS can cause fire or explosion.

- Keep flammable material away.
- Do not weld on closed containers.



ARC RAYS can burn eyes and skin.

- Wear eye, ear and body protection.

See additional warning information at front of this operator's manual.

GENERAL DESCRIPTION

The Handymig 170i is a complete semiautomatic constant voltage DC portable arc welder. Included is a tap-switch controlled, single phase constant voltage transformer/rectifier power source and a wire feeder with welding gun for feeding .023" (0.6 mm) through .030" (0.8 mm) solid steel electrode. Optional kits are available for .035" (0.9 mm) and .045" (1.2 mm) Innershield® NR-211-MP.

It is ideally suited for individuals having access to 240 volts 50 Hz AC input power and want the ease of use, quality and dependability of both gas metal arc welding or GMAW (also known as MIG welding) and the Innershield® process (self-shielded flux-cored or FCAW). A convenient chart is mounted inside the wire feed section door for setting welding procedures for 24 gauge (.60 mm) through 5/16" (8.0 mm) mild steel. The machine is rugged and reliable and has designed for dependable service and long life.

RECOMMENDED PROCESSES

The Handymig 170i can be used for welding mild steel using the GMAW, single pass, process which requires a supply of shielding gas or it can be used with the self-shielded, Innershield® process (FCAW).

OPERATIONAL FEATURES AND CONTROLS

The Handymig 170i has the following controls as standard: Power ON/OFF Switch, Voltage Control, Wire Speed Control, Trigger Switch, and a Circuit Breaker.

DESIGN FEATURES AND ADVANTAGES

- "Cold electrode" until gun trigger is pressed for an added measure of safety.
- Overload protection — incorporates both a thermostat and a circuit breaker.
- Quality wire drive with electronic overload protection.
- "Quick Release" idle roll pressure arm is easily adjusted.
- Reversible, dual groove drive roll, shipped ready to feed .023"/.025" (0.6 mm) diameter wire. The drive roll is easily reversed to feed .030" (0.8 mm) diameter solid wire and .035" (0.9 mm) flux-cored diameter wire. Optional drive roll included in .045" (1.2 mm) Innershield® welding kit must be installed to feed .045" (1.2 mm) flux-cored wire.
- No external shielding gas is required when used with Liquid Arc steelcore 71T-GS electrode.
- Spindle accommodates both 8 in. (200 mm) diameter and 4 in. (100 mm) diameter spools of wire.

WELDING CAPABILITY

The Handymig 170i is rated at 130 amps, 20 volts, at 20% duty cycle on a ten minute basis. It is capable of higher output currents at lower duty cycles. .

LIMITATIONS

Arc Gouging cannot be performed with the Handymig 170i. The Handymig 170i is not recommended for pipe thawing or TIG welding.

CONTROLS AND SETTINGS

Refer to Figure B.1a.

1. Power ON/OFF Switch — When the power is on the fan motor will run and air will be exhausted out the louvers in the front of the machine. The welding output and wire feeder remain off until the gun trigger is pressed.



2. Wire Speed Control — Controls the wire feed speed from 50 – 400 in/min (1.2 – 10.2 m/min). The control can be preset on the dial to the setting specified on the Handymig 170i Application Chart located on the inside of the wire feed section door.



3. Voltage Control — A 5-position tap selector switch gives full range adjustment of power source output voltage. Do not switch while welding.



4. Circuit Breaker – Protects machine from damage if maximum output is exceeded. Button will extend out when tripped (Manual reset). Refer to Figure B.1b.

FIGURE B.1a

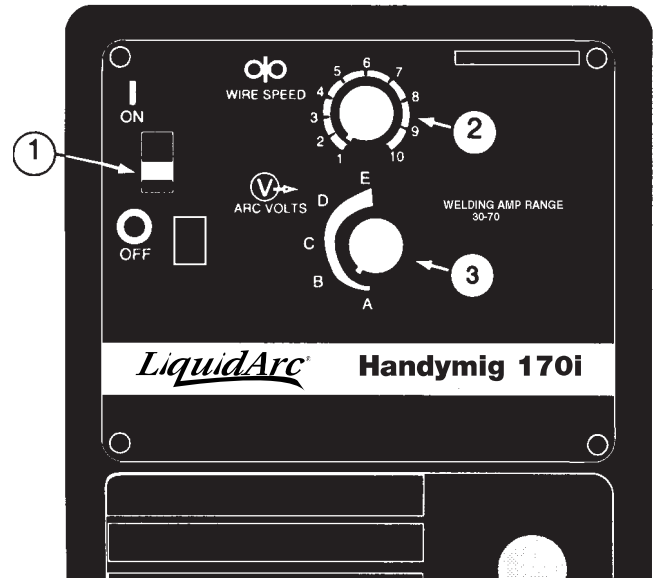
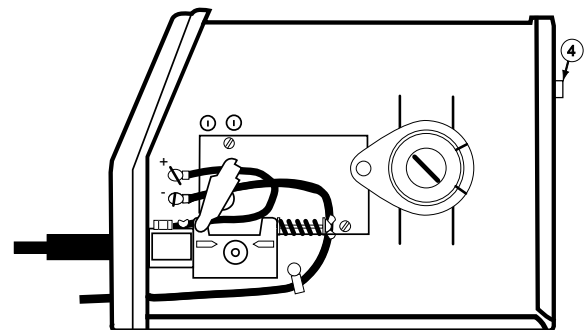


FIGURE B.1b



WELDING OPERATIONS

SEQUENCE OF OPERATION

Wire Loading

Refer to Figure B.2 and B.3.

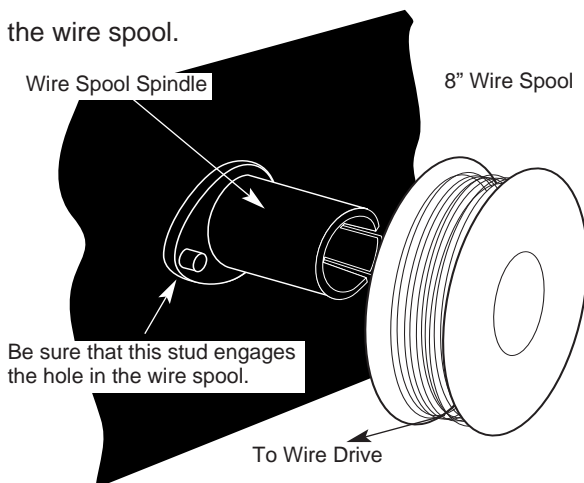
The machine power switch should be turned to the OFF ("O") position before working inside the wire feed enclosure.

The machine is shipped from the factory ready to feed 8" (200 mm) diameter spools [2.2" (56 mm) max. width]. These spools fit on a 2" (50 mm) diameter spindle that has a built-in adjustable friction brake to prevent overrun of the spool and excess slack in the wire.

Note: When loading and removing the 8" Spools make sure that the wing nut (inside the wire spool spindle hub) is turned 90° from the wire spool spindle locking tab. If the wing nut is positioned in line with the locking tab, the tab cannot be depressed to load or unload

FIGURE B.2

the wire spool.

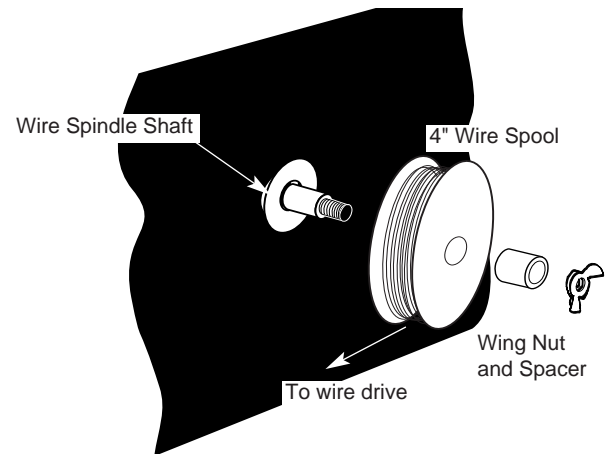


Wire Spool must be pushed all the way on the spindle so that the spindle's tab will hold it in place. The Wire Spool will rotate clockwise when wire is dereeled.

Load an 8" (200 mm) diameter spool on the wire spool spindle shown in Figure B.2.

To use 4" (100 mm) diameter spools, the 2" (50 mm) diameter spindle must be removed (See Figure B.3). Remove the wing nut and spacer at the end of the shaft and remove the outside plastic wire spool spindle. The spindle can be stored in the wire feed compartment. A 4" (100 mm) diameter spool is mounted directly on the 5/8" (16 mm) diameter shaft and held in place with the previously removed hardware. Also make certain the start end of the wire, which may protrude through the side of the spool does not contact any metallic case parts.

FIGURE B.3



Note: The brake should be adjusted with a spool of wire installed. When properly adjusted it should move freely but not coast.

⚠ CAUTION

Some spools can have the start wire protruding from the side of the spool. This must be insulated from internal metal components otherwise electrical grounding faults will result and the machine will be seriously damaged.

Friction Brake Adjustments

1. With wire spool installed, check free movement and coast of the spool.
2. To tighten the brake turn the wing nut clockwise in 1/4 turn increments until coasting stops.
3. To loosen the brake turn the wing nut counter-clockwise in 1/4 turn increments until the wire spool moves freely without coasting.

Wire Threading

Refer to Figure B.4

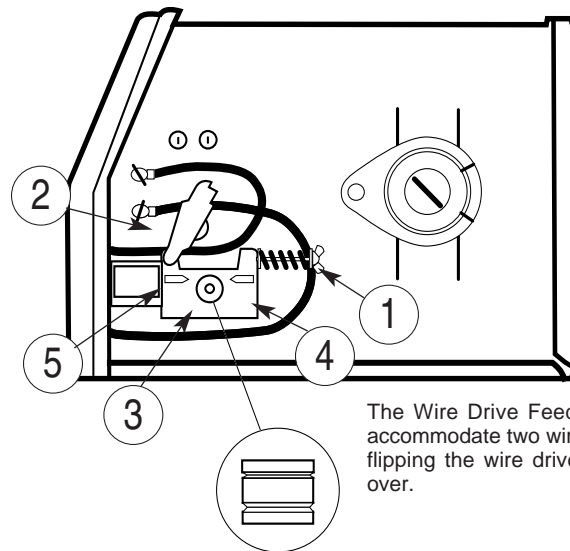
1. Release the Spring Loaded Pressure Arm (1) rotate the Idle Roll Arm (2) away from the Wire Feed Drive Roll (3). Ensure that the groove size in the feeding position on the drive roll matches the wire size being used. See Maintenance section for further information.
2. Carefully detach the end of the wire from the spool. To prevent the spool from unwinding, maintain tension on the wire until after step 5.
3. Cut the bent portion of wire off and straighten the first 4" (100 mm).
4. Thread the wire through the incoming guide tube (4), over the drive roll (3), and into the outgoing guide tube (5).
5. Close the idle roll arm and latch the spring loaded pressure arm (2) in place. Rotate the spool counterclockwise if required to take up extra slack in the wire.
6. The idle roll pressure adjustment wing nut is normally set for mid-position on the pressure arm threads. If feeding problems occur because the wire is flattened excessively, turn the pressure adjustment counter-clockwise to reduce distortion of the wire. Slightly less pressure may be required when using 0.023 – 0.025" (0,6 mm) wire. If the drive roll slips while feeding wire, the pressure should be increased until the wire feeds properly.

WARNING

When inching the welding wire, the drive rolls, the gun connector block and the gun contact tip are electrically energized relative to work and ground and remain energized for several seconds after the gun trigger is released.

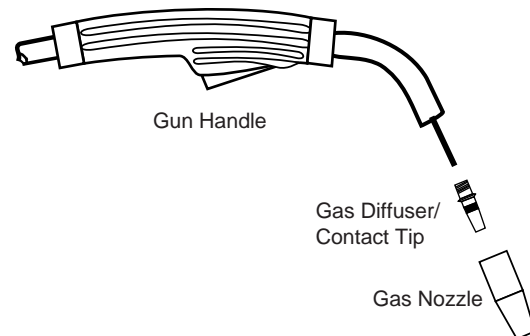
7. Refer to Figure B.5. Remove gas nozzle and contact tip from end of gun.

FIGURE B.4



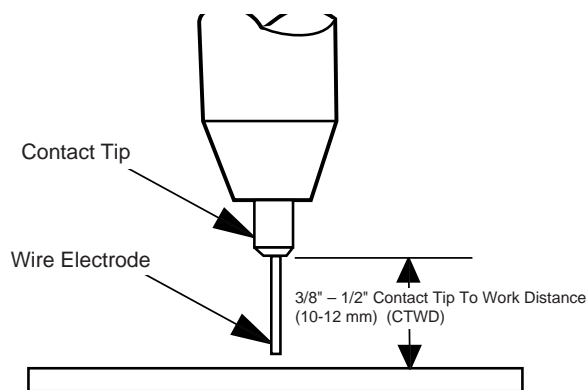
8. Turn the Handymig 170i ON ("I").
9. Straighten the gun cable assembly.
10. Depress the gun trigger switch and feed welding wire through the gun and cable. (Point gun away from yourself and others while feeding wire.) Release gun trigger after wire appears at end of gun.
11. Turn the Handymig 170i OFF ("O").

FIGURE B.5



12. Replace contact tip and gas nozzle.
13. Refer to Figure B-6. Cut the wire off 3/8" – 1/2" (10 – 12 mm) from the end of the tip. The Handymig 170i is now ready to weld.

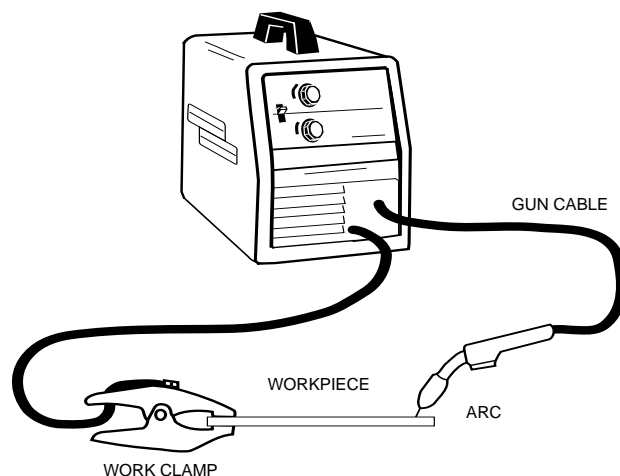
FIGURE B.6



Making A Weld

1. See "Process Guidelines" in this section for selection of welding wire and shielding gas and for range of metal thicknesses that can be welded.
2. See the Application chart on the inside of the wire feed compartment door for information on setting the Handymig 170i controls. Refer to Table B.1 for aluminum and stainless wire.
3. Set the Voltage ("V") and Wire Speed ("olo") controls to the settings suggested for the welding wire and base metal thickness being used, refer to Applications chart on the inside of the wire drive compartment door.
4. Check that the polarity is correct for the welding wire being used and that the gas supply, if required, is turned on.
5. When using Innershield electrode, remove the gas nozzle and install the gasless nozzle. This will improve visibility of the arc and protect the gas diffuser from weld spatter. Refer to the MAINTENANCE section for details on nozzle replacement.
6. Refer to Figure B.7. Connect work clamp to metal to be welded. Work clamp must make good electrical contact to the workpiece. The workpiece must also be grounded as stated in "Arc Welding Safety Precautions" in the beginning of this manual.
7. Position gun over joint. End of wire may be lightly touching the work.
8. Lower welding helmet, close gun trigger, and begin welding. Hold the gun so the contact tip to work distance is about 3/8 inch (10 mm).
9. To stop welding, release the gun trigger and then pull the gun away from the work after the arc goes out.

FIGURE B.7



10. When no more welding is to be done, close valve on gas cylinder (if used), momentarily operate gun trigger to release gas pressure, and turn off the Handymig 170i.

Cleaning Tip And Nozzle

Clean the contact tip and nozzle to avoid arc bridging between the nozzle and contact tip which can result in a shorted nozzle, poor welds and an overheated gun. Hint: Anti-stick spray or gel, available from a welding supply distributor, may reduce buildup and aid in spatter removal.

PROCESS GUIDELINES

The Handymig 170i can be used for welding mild steel using the GMAW, single pass, process which requires a supply of shielding gas or it can be used for the self-shielded, Innershield® process (FCAW).

The recommended gases and electrodes for GMAW are welding grade CO₂ gas or an argon-CO₂ blended gas (75 to 80% argon and 25 to 20% CO₂) and .025" (0.6 mm) diameter Liquid Arc S6 mild-steel welding wire, supplied on 12-1/2 lb (5 kg) spools. The blended gas is recommended for welding on heavier steel, 14 gauge (2.0 mm), for example.

The recommended electrode for the self-shielded process is Liquid Arc steelcore 71T-GS on 10 lb (4.5 kg) spools. This electrode is available as .035" (0.9 mm) and .045" (1.2 mm) NR-211-MP for all position welding of 18 gauge (1.2 mm) through 5/16" (8.0 mm) steel. Thickness of 1/4" (6.4 mm) and 5/16" (7.9 mm) require multiple passes. both wire sizes can also be used for the welding of galvanized coated sheet metal.

The Handymig 170i is suitable for .035" (0.9mm) aluminum wire and .023"–.035" (0.6–0.9mm) stainless wire. Refer to Table B.1 for recommended procedure settings. (Requires K664-2 Aluminum - Stainless Feeding Kit.)

⚠ CAUTION

It is important when changing between welding with steel wire and aluminum to exchange feeding components due to the lubricant applied to steel wire. Failure to do so may result in contaminated welds when welding aluminum.

TABLE B.1 — Handymig 170i

Process	Welding Wire	Shielding Gas	Voltage/Wire Speed					
			22 ga	16 ga	12 ga	1/8"	3/16"	1/4"
MIG DC+	.035 Dia (0.9mm) 4043 Aluminum Wire	100% Argon	A-4.5	B-6.5	D-8.5	D-10	E-10	E10*
	.030 Dia 308L Stainless Steel Wire	98% Argon/ 2% Oxygen	A-2	B-3	C-5	D-7	E-10	

NOTES:

* Test assembly preheated to 250°F (121°C)

CHANGING MACHINE OVER TO FEED OTHER WIRE SIZES

The Handymig 170i is shipped from the factory ready to feed 0.023" – .025" (0.6 mm) diameter wire. To operate the Handymig 170i with other sizes of wire, it maybe necessary to change the contact tip, change drive roll and gun liner configuration. Refer to the MAINTENANCE section, for component configuration and replacement procedures.

WELDING WITH GMAW (MIG)

Shielding Gas

When using the GMAW process, install a gas regulator and hose kit.

- For CO₂, open the cylinder very slowly. For argon-mixed gas, open cylinder valve slowly a fraction of a turn. When the cylinder pressure gauge pointer stops moving, open the valve fully.
- If using a regulator with an adjustable flow meter, close the gun trigger and adjust the flow to give 15 – 20 cubic ft per hour (CFH) (7 – 10 l/min) [use 20 – 25 CFH (10 – 12 l/min) when welding out of position or in a drafty location.
- Keep the cylinder valve closed, except when using the Handymig 170i. When finished welding:
- Close the cylinder valve to stop gas flow.

- Depress the gun trigger briefly to release the pressure in the gas hose.
- Turn off the Handymig 170i.

WELDING WITH FCAW (Innershield)

When using the FCAW process, the correct drive roll and electrode polarity must be used. See Work Cable Installation in INSTALLATION section for changing the polarity.

Use optional Innershield welding kit K549-1 (for 0.9 mm) or K549-2 (for 1.2 mm), as appropriate.

- **K549-1 0.9mm (.035") Innershield® Welding Kit**— Includes a contact tip, a gasless nozzle and a 0.9–1.2mm cable liner to permit the Magnum™ 100L gun and cable to use 0.9mm diameter flux-cored electrode. The fitting on the end of the liner is stencilled with the maximum rated wire size (.045"/1.2mm). Also included is a spool of 0.9mm Innershield® NR-211-MP.
- **K549-2 1.2mm (.045") Innershield® Welding Kit**— Includes a contact tip, a gasless nozzle and a 0.9–1.2mm cable liner to permit Magnum™ 100L gun and cable to use 1.2mm diameter flux-cored electrode. The fitting on the end of the liner is stencilled with the maximum rated wire size (.045"/1.2mm). Also included is a spool of 1.2mm Innershield® NR-211-MP and a knurled drive roll.

Several changes are needed to convert the unit for operation with the Innershield (FCAW) process. The K549-1 or K549-2 Innershield Kits include all the necessary accessories for this conversion and are provided for this purpose. The following conversions should be made using the contents of this kit:

- Change the output polarity to DC(-). See "Work Cable Installation" in Installation Section for details.
- Install proper drive roll for wire size selected. See "Changing Drive Roll" in Maintenance Section for details.
- Install the proper gun liner and tip for the wire size selected. See "Component Replacement" in the Maintenance Section for details.
- Remove gas nozzle (if installed) and install gasless nozzle. To remove, simply unscrew.
- Load wire into machine and thread into gun and cable per "Welding Wire Loading" section.

**LINCOLN®
ELECTRIC**





**SUGGESTED SETTINGS FOR WELDING
FOR STAINLESS STEEL AND ALUMINUM SETTINGS - SEE MANUAL**

**LINCOLN®
ELECTRIC**

PROCESS	WELDING WIRE	SHIELDING GAS	STEEL THICKNESS									
			24 ga/ .024 in. 0.60 mm	22 ga/ .030 in. 0.80 mm	20 ga/ .036 in. 1.0 mm	18 ga/ .048 in. 1.2 mm	16 ga/ .060 in. 1.6mm	14 ga/ .075 in. 2.0 mm	12 ga/ .105 in. 2.5 mm	10 ga/ .135 in. 3.5 mm		
MIG DC(+)	.025 in. (0.6 mm) DIA. SOLID STEEL WIRE LINCOLN WELD® L-56	CO ₂	A-2	B-3	B-3	C-4	C-4	D-6	E-8		1/4 in. 6.0 mm	5/16 in. 8.0 mm
		C20 or C25 (75 - 80% Argon, 25 - 20 % CO ₂)	A-2	B-3	B-3	C-4.5	C-4.5	D-7	E-10			
GASLESS FLUX- CORED DC(-)	.030 in. (0.8 mm) DIA. SOLID STEEL WIRE LINCOLN WELD® L-56	CO ₂		B-2	B-2	C-2.5	C-2.5	D-4	E-6			
		C20 or C25 (75 - 80% Argon, 25 - 20 % CO ₂)		A-2	B-2.5	C-3.5	C-2.5	D-5.5	E-7.5	C-2.5	C-1.5	D-2
	.035 in. (0.9 mm) DIA. INNERSHIELD® NR® - 211- MP	NONE				A-1.5	A-1.5	B-2	C-2.5	C-1.5	D-2	E-2.5*
		NONE				A-1.5	A-1.5	B-1.5	B-1.5	C-1.5	C-1.5	D-2

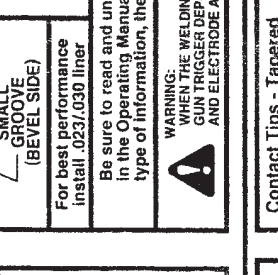
*Multiple passes req'd.

DRIVE ROLL ORIENTATION

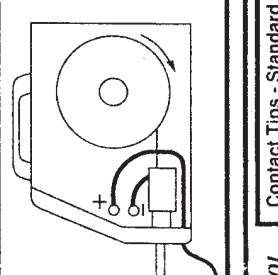
ALIGN GROOVE WITH CENTER OF GUIDE TUBES; SECURE DRIVE ROLL WITH SET SCREW CENTERED ON FLAT		GASLESS FLUX-CORED DC(-)	
MIG DC(+)	.025 (0.6 mm) DIA. SOLID STEEL WIRE	.030 (0.8 mm) DIA. SOLID STEEL WIRE	.035 (0.9 mm) DIA. INNERSHIELD NR® -211-MP
			
For best performance install .023/.030 liner			Optional Knurled drive roll for .035 and .045 wire included in the .045 (1.2 mm) Innershield Kit.
Be sure to read and understand the warnings on this welding machine and the section on ARC WELDING SAFETY PRECAUTIONS in the Operating Manual. Because design, fabrication, assembly and welding variables affect the results obtained in applying this type of information, the serviceability of a product or assembly is the responsibility of the builder / user.			
<p>WARNING: WHEN THE WELDING POWER SOURCE IS ON AND THE GUN TRIGGER DEPRESSED, FEED ROLLS, WIRE REEL AND ELECTRODE ARE ELECTRICALLY HOT.</p> <p>AVERTISSEMENT: LORSQUE LE POSTE DE SOUDAGE EST BRANCHE ET QUE LA DETENTE DU PISTOLET EST ENFORCEE, LES ROULEAUX D'ENTRAÎNEMENT, LE DEVIDOIR ET L'ELECTRODE SONT MIS SOUS TENSION.</p>			

OUTPUT POLARITY

MIG
DC(+)



GASLESS
FLUX-CORED
DC(-)



MAGNUM™ 100L
gun and cable
**Consumable
Parts**

Part No.	For Wire Size
S19726-1	.025 in. (0.6mm)
-2	.030 in. (0.8mm)
-3	.035 in. (0.9mm)
-4	.045 in. (1.2mm)

Part No.	Opening I.D.
M16684-1	3/8 in. (9.5mm)
M16684-2	1/2 in. (12.7mm)
M16684-1	1/2 in. (12.7mm)
M16684-2	5/8 in. (15.9mm)

Part No.	Gas Nozzle - Tip Flush
M16294	Opening I.D. 1/2 in. (12.7mm)

Part No.	Gasless Nozzle
M16418	Part No. M16418

SAFETY PRECAUTIONS



WARNING

ELECTRIC SHOCK can kill.



- **Disconnect input power by removing plug from receptacle before working inside Handymig 170i. Use only grounded receptacle. Do not touch electrically “hot” parts inside Handymig 170i.**
- **Have qualified personnel do the maintenance and trouble shooting work.**

ROUTINE MAINTENANCE

POWER SOURCE COMPARTMENT

In extremely dusty locations, dirt may clog the air passages causing the welder to run hot. Blow dirt out of the welder with low pressure air at regular intervals to eliminate excessive dirt and dust build-up on internal parts.

WIRE FEED COMPARTMENT

- When necessary, vacuum accumulated dirt from gearbox and wire feed section.
- Occasionally inspect the incoming guide tube and clean inside diameter if necessary.
- Motor and gearbox have lifetime lubrication and require no maintenance.

FAN MOTOR

Has lifetime lubrication — requires no maintenance.

WIRE REEL SPINDLE

Requires no maintenance. Do **not** lubricate shaft.

GUN AND CABLE MAINTENANCE

FOR MAGNUM™ 100L GUN

Gun Cable Cleaning

Clean cable liner after using approximately 300 lbs (136 kg) of solid wire or 50 lbs (23 kg) of flux-cored wire. Remove the cable from the wire feeder and lay it out straight on the floor. Remove the contact tip from the gun. Using low pressure air, gently blow out the cable liner from the gas diffuser end.



CAUTION

Excessive pressure at the start may cause the dirt to form a plug.

Flex the cable over its entire length and again blow out the cable. Repeat this procedure until no further dirt comes out.

Contact Tips, Nozzles, and Gun Tubes

- Dirt can accumulate in the contact tip hole and restrict wire feeding. After each spool of wire is used, remove the contact tip and clean it by pushing a short piece of wire through the tip repeatedly. Use the wire as a reamer to remove dirt that may be adhering to the wall of the hole through the tip.
- Replace worn contact tips as required. A variable or “hunting” arc is a typical symptom of a worn contact tip. To install a new tip, choose the correct size contact tip for the electrode being used (wire size is stenciled on the side of the contact tip) and screw it snugly into the gas diffuser.
- Remove spatter from inside of gas nozzle and from tip after each 10 minutes of arc time or as required.
- Be sure the gas nozzle is fully screwed onto the diffuser for gas shielded processes. For the Innershield® process, the gasless nozzle should be screwed onto the diffuser.

COMPONENT REPLACEMENT PROCEDURES

CHANGING THE CONTACT TIP

1. Refer to Figure D.2. Remove the gas nozzle from the gun by unscrewing counter-clockwise.
2. Remove the existing contact tip from the gun by unscrewing counter-clockwise.
3. Insert and hand tighten desired contact tip.
4. Replace gas nozzle.

CHANGING DRIVE ROLL

The drive roll has two grooves; one for .023" – .025" (0.6 mm) solid steel electrode and a larger groove for .030" (0.8 mm) solid and .035" (0.9 mm) flux-cored steel electrode. As shipped, the drive roll is installed in the .023"- .025" (0.6 mm) position.

If .030"/.035" (0.8/0.9 mm) wire is to be used, the drive roll must be reversed as follows:

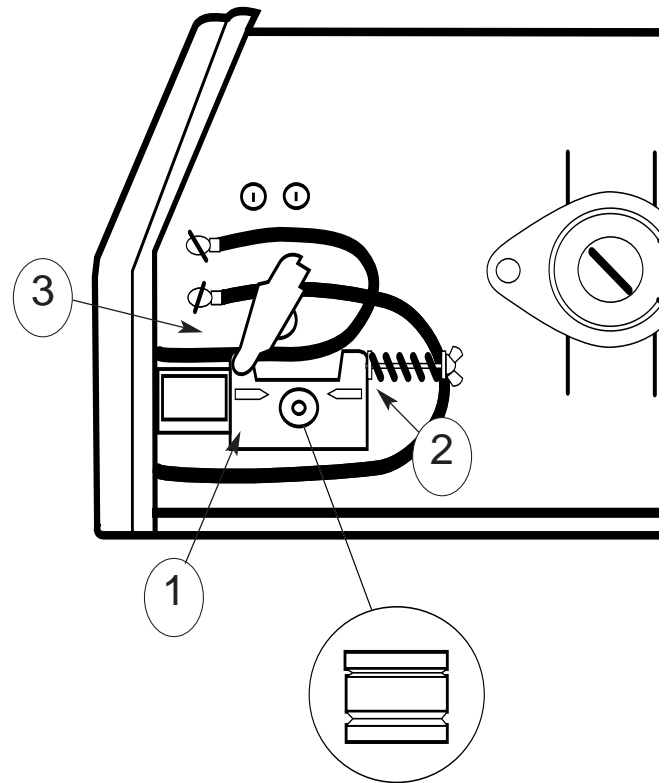
1. Connect the machine to its rated input power per instructions in Installation section.
2. Release the spring-loaded pressure arm and lift the idle roll arm away from the drive roll.
3. Turn the power switch to ON (marked "I").
4. Set the wire speed to minimum and jog the drive unit with the trigger switch until the drive roll set screw is facing up.

CAUTION

When inching the welding wire, the drive rolls, gun connector block, and gun contact tip are energized relative to work and ground and remain energized for several seconds after the gun trigger is released.

5. Turn the power switch to OFF (marked "O").
6. Loosen the drive roll set screw with the 5/64" (2.0 mm) hex wrench supplied.
7. Remove the drive roll, flip over and reinstall with the .030"/.035" (0.8/0.9 mm) groove (the larger groove) closest to the gearbox.

8. Push a length of straightened welding wire through the wire feeder guide tubes and adjust the position of the drive roll so that the groove is centered on the wire. Make certain the set screw is located on the flat portion of the shaft and tighten.



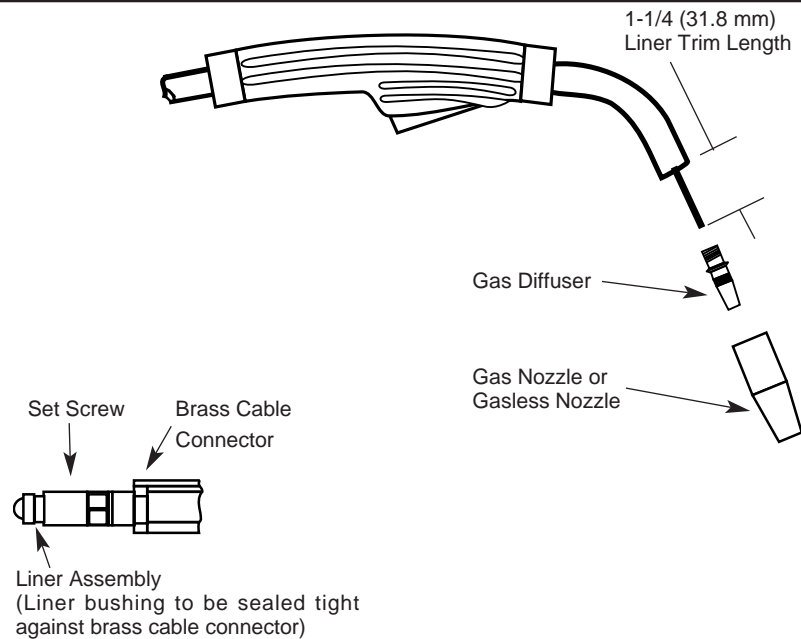


FIGURE D.2
Liner trim length

CHANGING LINER

NOTICE: The variation in cable lengths prevents the interchangeability of liners. Once a liner has been cut for a particular gun, it should not be installed in another gun unless it can meet the liner cutoff length requirement. Refer to Figure D.2.

1. Remove the gas nozzle from the gun by unscrewing counter-clockwise.
2. Remove the existing contact tip from the gun by unscrewing counter-clockwise.
3. Remove the gas diffuser from the gun tube by unscrewing counter-clockwise.
4. Lay the gun and cable out straight on a flat surface. Loosen the set screw located in the brass connector at the wire feeder end of the cable. Pull the liner out of the cable.
5. Insert a new untrimmed liner into the connector end of the cable. Be sure the liner bushing is stenciled appropriately for the wire size being used.
6. Fully seat the liner bushing into the connector. Tighten the set screw on the brass cable connector. At this time, the gas diffuser should not be installed onto the end of the gun tube.
7. With the gas nozzle and diffuser removed from the gun tube, be sure the cable is straight, and then trim the liner to the length shown in the Figure D.2. Remove any burrs from the end of the liner.

8. Screw the gas diffuser onto the end of the gun tube and securely tighten.
9. Replace the contact tip and nozzle.

GUN HANDLE PARTS

The gun handle consists of two halves that are held together with a collar on each end. To open up the handle, turn the collars approximately 60 degrees counter-clockwise until the collar reaches a stop. Then pull the collar off the gun handle. If the collars are difficult to turn, position the gun handle against a corner, place a screwdriver against the tab on the collar and give the screwdriver a sharp blow to turn the collar past an internal locking rib. See Figure D-3.

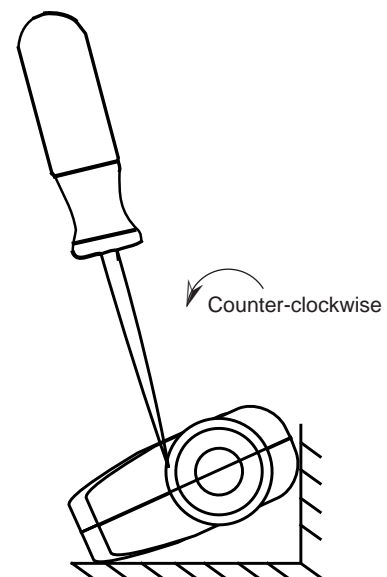


FIGURE D.3


WARNING


WARNING ELECTRIC SHOCK can kill

WARNING: This procedure is only suitable for applications using DC mega testers up to 500V.

Note: This procedure is for 'machines as built' many modifications could have taken place over the life of a particular machine, so details of this procedure may need to be 'adjusted' to suit these modifications.

For prompt service contact your local authorized Liquid Arc Field Service shop.

The insulation resistance values listed below are from Australian Standard AS1966.1.

- Disconnect input power by removing plug from mains supply.
 - Remove welding leads (gun and work lead) from the machine before any tests are carried out.
 - Remove plug from PCB, install a shorting socket into the harness plug. (The shorting socket is to have pins 4 & 5 jumpered together and all other pins jumpered together separately and insulated.)
 - Connect a shorting jumper across the connections to the capacitor and from the capacitor to each rectifier heat sink plate.
 - Set power switch to 'on' position.
 - Input circuit test: Connect one lead of the mega tester to the frame of the machine and the other lead to both the 'active' & 'neutral' terminals of the 240V input plug. Apply the test. (Minimum resistance 1M•)
 - Welding circuit test: Connect one lead of the mega tester to the frame of the machine and the other lead to the positive output stud. Apply the test. (Minimum resistance 1M•)
 - Auxiliary circuit test: Connect one lead of the mega tester to the frame of the machine and the other lead to jumper on pins 4 & 5 in the shorting socket. Apply the test. (Minimum resistance 1M•)
 - Input circuit to welding circuit test: Connect one lead of the mega tester to both the 'active' & 'neutral' terminals of the 240V input plug and the other to the positive output stud. Apply the test(s). (Minimum resistance 10M•)
 - Input circuit to auxiliary circuit test: Connect one lead of the mega tester to both the 'active' & 'neutral' terminals of the 240V input plug and the other to the jumper on pins 4 & 5 in the shorting socket. Apply the test. (Minimum resistance 1M•)
- Welding circuit to auxiliary circuit test: Connect one lead of the mega tester to the positive output stud and the other to the jumper on pins 4 & 5 in the shorting socket. Apply the test. (Minimum resistance 1M•)
 - Wire drive test: Connect one lead of the mega tester to the positive output stud and the other to the drive roll shaft. Apply the test. (Minimum resistance 1M•)
 - Remove all harness shorting plugs and connect all plug and leads to PCB. Remove all shorting jumpers. If any problems are encountered, refer to your nearest authorized Liquid Arc Field Service Shop.

HOW TO USE TROUBLESHOOTING GUIDE

WARNING

Service and Repair should only be performed by Liquid Arc Factory Trained Personnel. Unauthorized repairs performed on this equipment may result in danger to the technician and machine operator and will invalidate your factory warranty. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions detailed throughout this manual.

This Troubleshooting Guide is provided to help you locate and repair possible machine malfunctions. Simply follow the three-step procedure listed below.

Step 1. LOCATE PROBLEM (SYMPTOM). Look under the column labeled “PROBLEM (SYMPTOMS)”. This column describes possible symptoms that the machine may exhibit. Find the listing that best describes the symptom that the machine is exhibiting.

Symptoms are grouped into three main categories: output problems, function problems, welding problems.

Step 2. PERFORM EXTERNAL TESTS.

The second column labeled “POSSIBLE AREAS OF MISADJUSTMENT(S)” lists the obvious external possibilities that may contribute to the machine symptom. Perform these tests/checks in the order listed. In general, these tests can be conducted without removing the case wrap-around cover.

Step 3. PERFORM COMPONENT TESTS. If you have exhausted all of the recommended tests in Step 2, Consult your Local Authorized Field Service Facility.

CAUTION

If for any reason you do not understand the test procedures or are unable to perform the tests safely, contact your **LOCAL AUTHORIZED LIQUID ARC FIELD SERVICE FACILITY** for assistance before you proceed.

TROUBLESHOOTING GUIDE

Observe Safety Guidelines detailed in the beginning of this manual.

PROBLEMS (SYMPTOMS)	POSSIBLE CAUSE	RECOMMENDED COURSE OF ACTION
OUTPUT PROBLEMS		
Major physical or electrical damage is evident.	None Contact your local Authorized Field Service Facility.	If all recommended possible areas of misadjustments have been checked and the problem persists, contact your local Liquid Arc Authorized Field Service Facility.
No wire feed, weld output or gas flow when gun trigger is pulled. Fan does NOT operate.	<ol style="list-style-type: none"> 1. Make sure correct voltage is applied to the machine. See Installation section, "Electrical Connections". 2. Make certain that power switch is in the ON position. 3. Make sure circuit breaker is reset. 	
No wire feed, weld output or gas flow when gun trigger is pulled Fan operates normally.	<ol style="list-style-type: none"> 1. The thermostat may be tripped due to overheating. Let machine cool. Weld at lower duty cycle. 2. Check for obstructions in air flow. 3. Check Gun Trigger connections. See Installation section. 4. Gun trigger may be faulty. 	

 **CAUTION**

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact your **LOCAL AUTHORIZED LIQUID ARC FIELD SERVICE FACILITY** for assistance before you proceed.

Handymig 170i



Observe Safety Guidelines detailed in the beginning of this manual.

TROUBLESHOOTING GUIDE

PROBLEMS (SYMPTOMS)	POSSIBLE CAUSE	RECOMMENDED COURSE OF ACTION
FEEDING PROBLEMS		
No wire feed when gun trigger is pulled. Fan runs, gas flows and machine has correct open circuit voltage (33 vcd maximum) – weld output.	<ol style="list-style-type: none"> 1. If the wire drive motor is running make sure that the correct drive rolls are installed in the machine. 2. Check for clogged cable liner or contact tip. 3. Check for proper size cable liner and contact tip. 	If all recommended possible areas of misadjustments have been checked and the problem persists, contact your local Liquid Arc Authorized Field Service Facility.
GAS FLOW PROBLEMS		
Low or no gas flow when gun trigger is pulled. Wire feed, weld output and fan operate normally.	<ol style="list-style-type: none"> 1. Check gas supply, flow regulator and gas hoses. 2. Check gun connection to machine for obstruction or leaky seals. 	

CAUTION

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact your **LOCAL AUTHORIZED LIQUID ARC FIELD SERVICE FACILITY** for assistance before you proceed.

TROUBLESHOOTING GUIDE

Observe Safety Guidelines detailed in the beginning of this manual.

PROBLEMS (SYMPTOMS)	POSSIBLE CAUSE	RECOMMENDED COURSE OF ACTION
WELDING PROBLEMS		
Arc is unstable – Poor starting	<ol style="list-style-type: none"> 1. Check for correct input voltage to machine. See Installation section, “Electrical Input Connections”. 2. Check for proper electrode polarity for process. 3. Check gun tip for wear or damage and proper size – Replace. 4. Check for proper gas and flow rate for process. (For MIG only.) 5. Check work cable for loose or faulty connections. 6. Check gun for damage or breaks. 7. Check for proper drive roll orientation and alignment. 8. Check liner for proper size. 	<p>If all recommended possible areas of misadjustments have been checked and the problem persists, contact your local Liquid Arc Authorized Field Service Facility.</p>

 **CAUTION**

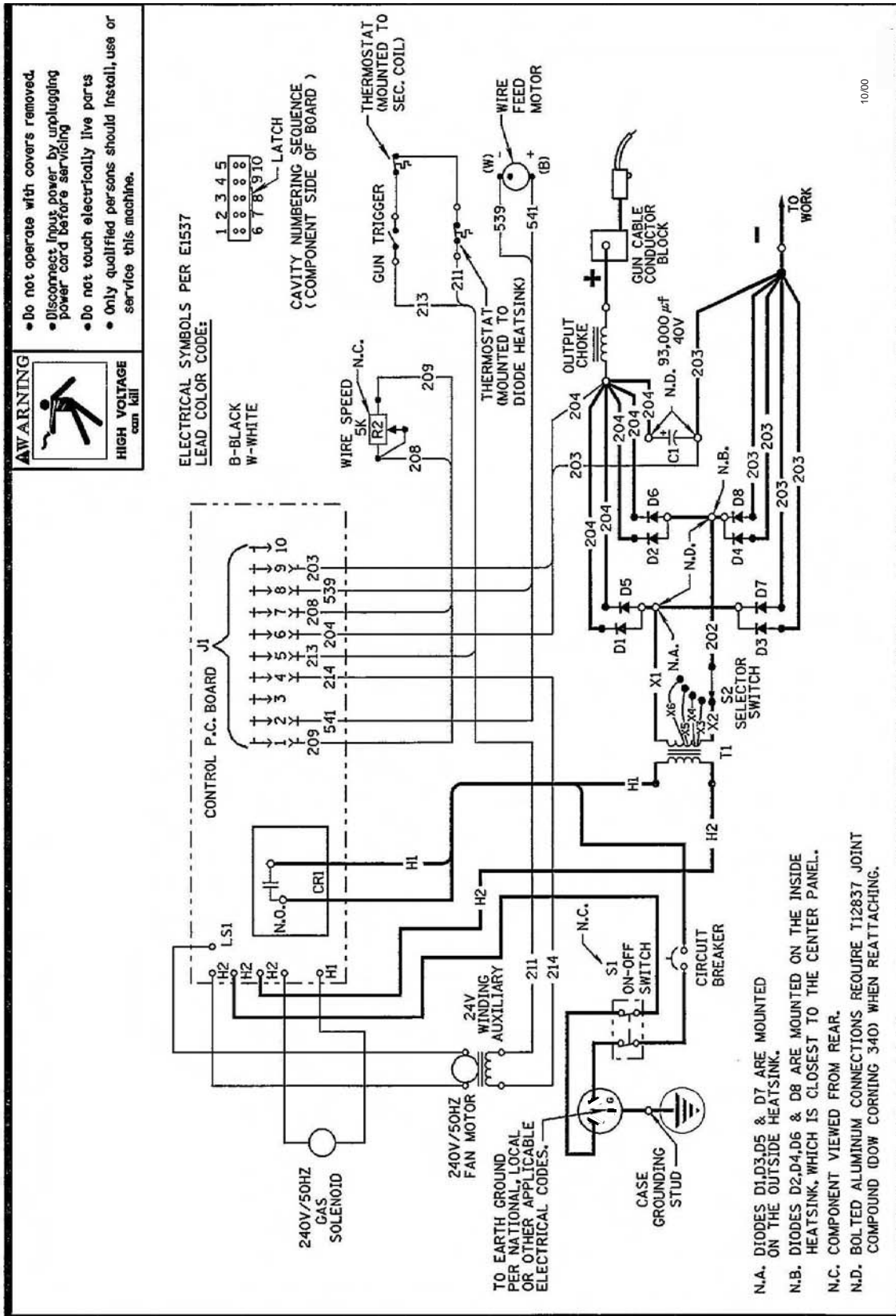
If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact your **LOCAL AUTHORIZED LIQUID ARC FIELD SERVICE FACILITY** for assistance before you proceed.

Handymig 170i



Handymig 170i WIRING DIAGRAM: Code 10984

Handymig 170i WIRING DIAGRAM



10.00

M8726

NOTE: This diagram is for reference only. It may not be accurate for all machines covered by this manual. The specific diagram for a particular code is pasted inside the machine on one of the enclosure panels.

NOTES

NOTES

WARNING	<ul style="list-style-type: none"> ● Do not touch electrically live parts or electrode with skin or wet clothing. ● Insulate yourself from work and ground. 	<ul style="list-style-type: none"> ● Keep flammable materials away. 	<ul style="list-style-type: none"> ● Wear eye, ear and body protection.
Spanish AVISO DE PRECAUCION	<ul style="list-style-type: none"> ● No toque las partes o los electrodos bajo carga con la piel o ropa mojada. ● Aíslese del trabajo y de la tierra. 	<ul style="list-style-type: none"> ● Mantenga el material combustible fuera del área de trabajo. 	<ul style="list-style-type: none"> ● Protéjase los ojos, los oídos y el cuerpo.
French ATTENTION	<ul style="list-style-type: none"> ● Ne laissez ni la peau ni des vêtements mouillés entrer en contact avec des pièces sous tension. ● Isolez-vous du travail et de la terre. 	<ul style="list-style-type: none"> ● Gardez à l'écart de tout matériel inflammable. 	<ul style="list-style-type: none"> ● Protégez vos yeux, vos oreilles et votre corps.
German WARNUNG	<ul style="list-style-type: none"> ● Berühren Sie keine stromführenden Teile oder Elektroden mit Ihrem Körper oder feuchter Kleidung! ● Isolieren Sie sich von den Elektroden und dem Erdboden! 	<ul style="list-style-type: none"> ● Entfernen Sie brennbares Material! 	<ul style="list-style-type: none"> ● Tragen Sie Augen-, Ohren- und Körperschutz!
Portuguese ATENÇÃO	<ul style="list-style-type: none"> ● Não toque partes elétricas e electrodos com a pele ou roupa molhada. ● Isole-se da peça e terra. 	<ul style="list-style-type: none"> ● Mantenha inflamáveis bem guardados. 	<ul style="list-style-type: none"> ● Use proteção para a vista, ouvido e corpo.
Japanese 注意事項	<ul style="list-style-type: none"> ● 通電中の電気部品、又は溶材にヒフやぬれた布で触れないこと。 ● 施工物やアースから身体が絶縁されている様にして下さい。 	<ul style="list-style-type: none"> ● 燃えやすいものの側での溶接作業は絶対にしてはなりません。 	<ul style="list-style-type: none"> ● 目、耳及び身体に保護具をして下さい。
Chinese 警告	<ul style="list-style-type: none"> ● 皮膚或濕衣物切勿接觸帶電部件及鎢條。 ● 使你自已與地面和工件絕緣。 	<ul style="list-style-type: none"> ● 把一切易燃物品移離工作場所。 	<ul style="list-style-type: none"> ● 佩戴眼、耳及身體勞動保護用具。
Korean 위험	<ul style="list-style-type: none"> ● 전도체나 용접봉을 젖은 헝겍 또는 피부로 절대 접촉치 마십시오. ● 모재와 접지를 접촉치 마십시오. 	<ul style="list-style-type: none"> ● 인화성 물질을 접근시키지 마십시오. 	<ul style="list-style-type: none"> ● 눈, 귀와 몸에 보호장구를 착용하십시오.
Arabic تحذير	<ul style="list-style-type: none"> ● لا تلمس الاجزاء التي يسري فيها التيار الكهربائي أو الألكترود بجسد الجسم أو بالملابس المبللة بالماء. ● ضع عازلا على جسمك خلال العمل. 	<ul style="list-style-type: none"> ● ضع المواد القابلة للاشتعال في مكان بعيد. 	<ul style="list-style-type: none"> ● ضع أدوات وملابس واقية على عينيك وأذنيك وجسمك.

READ AND UNDERSTAND THE MANUFACTURER'S INSTRUCTION FOR THIS EQUIPMENT AND THE CONSUMABLES TO BE USED AND FOLLOW YOUR EMPLOYER'S SAFETY PRACTICES.

SE RECOMIENDA LEER Y ENTENDER LAS INSTRUCCIONES DEL FABRICANTE PARA EL USO DE ESTE EQUIPO Y LOS CONSUMIBLES QUE VA A UTILIZAR, SIGA LAS MEDIDAS DE SEGURIDAD DE SU SUPERVISOR.

LISEZ ET COMPRENEZ LES INSTRUCTIONS DU FABRICANT EN CE QUI REGARDE CET EQUIPMENT ET LES PRODUITS A ETRE EMPLOYES ET SUIVEZ LES PROCEDURES DE SECURITE DE VOTRE EMPLOYEUR.

LESEN SIE UND BEFOLGEN SIE DIE BETRIEBSANLEITUNG DER ANLAGE UND DEN ELEKTRODENEINSATZ DES HERSTELLERS. DIE UNFALLVERHÜTUNGSVORSCHRIFTEN DES ARBEITGEBERS SIND EBENFALLS ZU BEACHTEN.

			
<ul style="list-style-type: none"> ● Keep your head out of fumes. ● Use ventilation or exhaust to remove fumes from breathing zone. 	<ul style="list-style-type: none"> ● Turn power off before servicing. 	<ul style="list-style-type: none"> ● Do not operate with panel open or guards off. 	WARNING
<ul style="list-style-type: none"> ● Los humos fuera de la zona de respiración. ● Mantenga la cabeza fuera de los humos. Utilice ventilación o aspiración para gases. 	<ul style="list-style-type: none"> ● Desconectar el cable de alimentación de poder de la máquina antes de iniciar cualquier servicio. 	<ul style="list-style-type: none"> ● No operar con panel abierto o guardas quitadas. 	Spanish AVISO DE PRECAUCION
<ul style="list-style-type: none"> ● Gardez la tête à l'écart des fumées. ● Utilisez un ventilateur ou un aspirateur pour ôter les fumées des zones de travail. 	<ul style="list-style-type: none"> ● Débranchez le courant avant l'entretien. 	<ul style="list-style-type: none"> ● N'opérez pas avec les panneaux ouverts ou avec les dispositifs de protection enlevés. 	French ATTENTION
<ul style="list-style-type: none"> ● Vermeiden Sie das Einatmen von Schweißrauch! ● Sorgen Sie für gute Be- und Entlüftung des Arbeitsplatzes! 	<ul style="list-style-type: none"> ● Strom vor Wartungsarbeiten abschalten! (Netzstrom völlig öffnen; Maschine anhalten!) 	<ul style="list-style-type: none"> ● Anlage nie ohne Schutzgehäuse oder Innenschutzverkleidung in Betrieb setzen! 	German WARNUNG
<ul style="list-style-type: none"> ● Mantenha seu rosto da fumaça. ● Use ventilação e exaustão para remover fumo da zona respiratória. 	<ul style="list-style-type: none"> ● Não opere com as tampas removidas. ● Desligue a corrente antes de fazer serviço. ● Não toque as partes elétricas nuas. 	<ul style="list-style-type: none"> ● Mantenha-se afastado das partes moventes. ● Não opere com os painéis abertos ou guardas removidas. 	Portuguese ATENÇÃO
<ul style="list-style-type: none"> ● ヒュームから頭を離すようにして下さい。 ● 換気や排煙に十分留意して下さい。 	<ul style="list-style-type: none"> ● メンテナンス・サービスに取りかかる際には、まず電源スイッチを必ず切ってください。 	<ul style="list-style-type: none"> ● パネルやカバーを取り外したまま機械操作をしないで下さい。 	Japanese 注意事項
<ul style="list-style-type: none"> ● 頭部遠離煙霧。 ● 在呼吸區使用通風或排風器除煙。 	<ul style="list-style-type: none"> ● 維修前切斷電源。 	<ul style="list-style-type: none"> ● 儀表板打開或沒有安全罩時不準作業。 	Chinese 警告
<ul style="list-style-type: none"> ● 얼굴로부터 용접가스를 멀리하십시오. ● 호흡지역으로부터 용접가스를 제거하기 위해 가스제거기나 통풍기를 사용하십시오. 	<ul style="list-style-type: none"> ● 보수전에 전원을 차단하십시오. 	<ul style="list-style-type: none"> ● 판넬이 열린 상태로 작동치 마십시오. 	Korean 위험
<ul style="list-style-type: none"> ● ابعد رأسك بعيداً عن الدخان. ● استعمل التهوية أو جهاز ضغط الدخان للخارج لكي تبعد الدخان عن المنطقة التي تتنفس فيها. 	<ul style="list-style-type: none"> ● أقطع التيار الكهربائي قبل القيام بأية صيانة. 	<ul style="list-style-type: none"> ● لا تشغيل هذا الجهاز اذا كانت الاغطية الحديدية الواقية ليست عليه. 	Arabic تحذير

LEIA E COMPREENDA AS INSTRUÇÕES DO FABRICANTE PARA ESTE EQUIPAMENTO E AS PARTES DE USO, E SIGA AS PRÁTICAS DE SEGURANÇA DO EMPREGADOR.

使う機械や溶材のメーカーの指示書をよく読み、まず理解して下さい。そして貴社の安全規定に従って下さい。

請詳細閱讀並理解製造廠提供的說明以及應該使用的銀焊材料，並請遵守貴方的有閣勞動保護規定。

이 제품에 동봉된 작업지침서를 숙지하시고 귀사의 작업자 안전수칙을 준수하시기 바랍니다.

اقرأ بتمعن وافهم تعليمات المصنع المنتج لهذه المعدات والمواد قبل استعمالها واتبع تعليمات الوقاية لصاحب العمل.



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