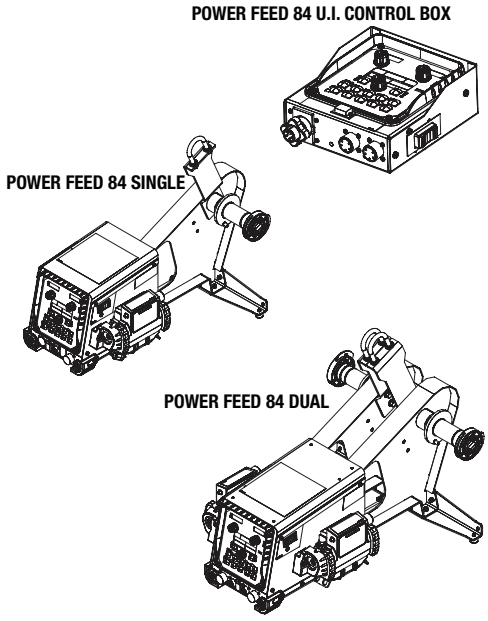
NOTE: This manual will cover most of the troubleshooting and repair procedures for the code numbers listed. Some variances may exist when troubleshooting/repairing later code numbers.

POWER FEED 84, POWER FEED 84 DUAL, POWER FEED 84 U.I. CONTROL BOX

For use with machines having Code Numbers:

Power Feed 84: 11986 thru 11991, 11993, 11994, 11996, 11997, 11998, 12274 thru 12284
Power Feed 84 Dual: 12108 thru 12113, 12115, 12116, 12285 thru 12292
Power Feed 84 U.I. Control Box: 12177, 12178, 12179

SERVICE MANUAL



SVM255 | Issue Date 14-Jun

THE LINCOLN ELECTRIC COMPANY
22801 St. Clair Avenue • Cleveland, OH • 44117-1199 • U.S.A.
Phone: +1.216.481.8100 • www.lincolnelectric.com

SAFETY DEPENDS ON YOU

Service and repair should be performed by only Lincoln Electric 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.

⚠ 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.

KEEP YOUR HEAD OUT OF THE FUMES.

DON'T get too close to the arc. Use corrective lenses if necessary to stay a reasonable distance away from the arc.

READ and obey the Material Safety Data Sheet (MSDS) and the warning label that appears on all containers of welding materials.

USE ENOUGH VENTILATION or exhaust at the arc, or both, to keep the fumes and gases from your breathing zone and the general area.

IN A LARGE ROOM OR OUTDOORS, natural ventilation may be adequate if you keep your head out of the fumes (See below).

USE NATURAL DRAFTS or fans to keep the fumes away from your face.

If you develop unusual symptoms, see your supervisor. Perhaps the welding atmosphere and ventilation system should be checked.

WEAR CORRECT EYE, EAR & BODY PROTECTION

PROTECT your eyes and face with welding helmet properly fitted and with proper grade of filter plate (See ANSI Z49.1).

PROTECT your body from welding spatter and arc flash with protective clothing including woolen clothing, flame-proof apron and gloves, leather leggings, and high boots.

PROTECT others from splatter, flash, and glare with protective screens or barriers.

IN SOME AREAS, protection from noise may be appropriate.

BE SURE protective equipment is in good condition.

Also, wear safety glasses in work area AT ALL TIMES.

SPECIAL SITUATIONS

DO NOT WELD OR CUT containers or materials which previously had been in contact with hazardous substances unless they are properly cleaned. This is extremely dangerous.

DO NOT WELD OR CUT painted or plated parts unless special precautions with ventilation have been taken. They can release highly toxic fumes or gases.

Additional precautionary measures

PROTECT compressed gas cylinders from excessive heat, mechanical shocks, and arcs; fasten cylinders so they cannot fall.

BE SURE cylinders are never grounded or part of an electrical circuit.

REMOVE all potential fire hazards from welding area.

ALWAYS HAVE FIRE FIGHTING EQUIPMENT READY FOR IMMEDIATE USE AND KNOW HOW TO USE IT.

SECTION A: WARNINGS

CALIFORNIA PROPOSITION 65 WARNINGS

Diesel Engines

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

Gasoline Engines

The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

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.

Read and understand the following safety highlights. For additional safety information, it is strongly recommended that you purchase a copy of "Safety in Welding & Cutting - ANSI Standard Z49.1" from the American Welding Society, P.O. Box 351040, Miami, Florida 33135 or CSA Standard W117.2-1974. A Free copy of "Arc Welding Safety" booklet E205 is available from the Lincoln Electric Company, 22801 St. Clair Avenue, Cleveland, Ohio 44117-1199.

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.

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 use the following procedures in order to minimize exposure to EMF fields from the welding circuit:

- 2.d.1. Route the electrode and work cables together - Secure them with tape when possible.
- 2.d.2. Never coil the electrode lead around your body.
- 2.d.3. Do not place your body between the electrode and work cables. If the electrode cable is on your right side, the work cable should also be on your right side.
- 2.d.4. Connect the work cable to the workpiece as close as possible to the area being welded.
- 2.d.5. Do not work next to welding power source.

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. I 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 within applicable OSHA PEL and ACGIH TLV limits 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. The operation of welding fume control equipment is affected by various factors including proper use and positioning of the equipment, maintenance of the equipment and the specific welding procedure and application involved. Worker exposure level should be checked upon installation and periodically thereafter to be certain it is within applicable OSHA PEL and ACGIH TLV limits.

5.c. 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.d. 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.e. 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.f. Also see item 1.b.

WELDING AND CUTTING 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.

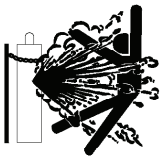
6.g. Connect the work cable to the work as close to the welding area as practical. Work cables connected to the building framework or other locations away from the welding area increase the possibility of the welding current passing through lifting chains, crane cables or other alternate circuits. This can create fire hazards or overheat lifting chains or cables until they fail.

6.h. Also see item 1.c.

6.I. Read and follow NFPA 51B " Standard for Fire Prevention During Welding, Cutting and Other Hot Work", available from NFPA, 1 Batterymarch Park, PO box 9101, Quincy, Ma 022690-9101.

6.j. Do not use a welding power source for pipe thawing.

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-I, "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 U.S. National Electrical Code, all local codes and the manufacturer's recommendations.

8.c. Ground the equipment in accordance with the U.S. National Electrical Code and the manufacturer's recommendations.

Refer to http://www.lincolnelectric.com/safety for additional safety information.

Welding Safety Interactive Web Guide for mobile devices

ELECTROMAGNETIC COMPATABILITY (EMC)

CONFORMANCE

Products displaying the CE mark are in conformity with European Community Council Directive of 3 May 1989 on the approximation of the laws of the Member States relating to electromagnetic compatibility (89/336/EEC). It was manufactured in conformity with a national standard that implements a harmonized standard: EN 60974-10 Electromagnetic Compatibility (EMC) Product Standard for Arc Welding Equipment. It is for use with other Lincoln Electric equipment. It is 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 affect many kinds of electrical equipment; other nearby welding equipment, radio and TV reception, 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 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 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. In other cases it could involve construction of 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 access whether the changes will increase the risk of injury, e.g., by allowing parallel welding current return paths which may damage the earth circuits of other equipment.

ASSESSMENT OF AREA

Before installing welding equipment the user shall make an assessment of potential electromagnetic problems in the surrounding area. The following shall be taken into account:

a. other supply cables, control cables, signaling and telephone cables; above, below and adjacent to the welding equipment;

b. radio and television transmitters and receivers;

c. computer and other control equipment;

d. safety critical equipment, e.g., guarding of industrial equipment;

e. the health of the people around, e.g., the use of pacemakers and hearing aids;

f. equipment used for calibration or measurement

g. the immunity of other equipment in the environment. The user shall ensure that other equipment being used in the environment is compatible. This may require additional protection measures;

h. the time of 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 of 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 adjustments covered in the manufacturers instructions. In particular, the spark gaps of arc striking 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 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, not connected to earth because of its size and position, e.g., ships 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 the work piece 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 a direct connection to the work piece, 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.

[1] Portions of the preceding text are contained in EN 60974-10: "Electromagnetic Compatibility (EMC) product standard for arc welding equipment."

As a rule of thumb, for many mild steel electrode, if the air is visibly clear and you are comfortable, then the ventilation is generally adequate for your work. The most accurate way to determine if the worker exposure does not exceed the applicable exposure limit for compounds in the fumes and gases is to have an industrial hygienist take and analyze a sample of the air you are breathing. This is particularly important if you are welding with stainless, hardfacing or Special Ventilation products. All Lincoln MSDS have a maximum fume guideline number. If exposure to total fume is kept below that number, exposure to all fume from the electrode (not coatings or plating on the work) will be below the TLV.

There are steps that you can take to identify hazardous substances in your welding environment. Read the product label and material safety data sheet for the electrode posted in the work place or in the electrode or flux container to see what fumes can be reasonably expected from use of the product and to determine if special ventilation is needed. Secondly, know what the base metal is and determine if there is any paint, plating, or coating that could expose you to toxic fumes and/or gases. Remove it from the metal being welded, if possible. If you start to feel uncomfortable, dizzy or nauseous, there is a possibility that you are being overexposed to fumes and gases, or suffering from oxygen deficiency. Stop welding and get some fresh air immediately. Notify your supervisor and co-workers so the situation can be corrected and other workers can avoid the hazard. Be sure you are following these safe practices, the consumable labeling and MSDS to improve the ventilation in your area. Do not continue welding until the situation has been corrected.

NOTE: The MSDS for all Lincoln consumables is available on Lincoln's web-site: www.lincolnelectric.com

Before we turn to the methods available to control welding fume exposure, you should understand a few basic terms:

Natural Ventilation is the movement of air through the workplace caused by natural forces. Outside, this is usually the wind. Inside, this may be the flow of air through open windows and doors.

Mechanical Ventilation is the movement of air through the workplace caused by an electrical device such as a portable fan or permanently mounted fan in the ceiling or wall.

Source Extraction (Local Exhaust) is a mechanical device used to capture welding fume at or near the arc and filter contaminants out of the air.

The ventilation or exhaust needed for your application depends upon many factors such as:

- Workspace volume
- Workspace configuration
- Number of welders
- Welding process and current
- Consumables used (mild steel, hardfacing, stainless, etc.)
- Allowable levels (TLV, PEL, etc.)
- Material welded (including paint or plating)
- Natural airflow

Your work area has adequate ventilation when there is enough ventilation and/or exhaust to control worker exposure to hazardous materials in the welding fumes and gases so the applicable limits for those materials is not exceeded. See chart of TLV and PEL for Typical Electrode Ingredients, the OSHA PEL (Permissible Exposure Limit), and the recommended guideline, the ACGIH TLV (Threshold Limit Value), for many compounds found in welding fume.

Ventilation

There are many methods which can be selected by the user to provide adequate ventilation for the specific application. The following section provides general information which may be helpful in evaluating what type of ventilation equipment may be suitable for your application. When ventilation equipment is installed, you should confirm worker exposure is controlled within applicable OSHA PEL and/or ACGIH TLV. According to OSHA regulations, when welding and cutting (mild steels), natural ventilation is usually considered sufficient to meet requirements, provided that:

1. The room or welding area contains at least 10,000 cubic feet (about 22' x 22' x 22') for each welder.
2. The ceiling height is not less than 16 feet.
3. Cross ventilation is not blocked by partitions, equipment, or other structural barriers.
4. Welding is not done in a conned space.

Spaces that do not meet these requirements should be equipped with mechanical ventilating equipment that exhausts at least 2000 CFM of air for each welder, except where local exhaust hoods or booths, or air-line respirators are used.

Important Safety Note:

When welding with electrodes which require special ventilation such as stainless or hardfacing (see instructions on container or MSDS) or on lead or cadmium plated steel and other metals or coatings which produce hazardous fumes, keep exposure as low as possible and below exposure limit values (PEL and TLV) for materials in the fume using local exhaust or mechanical ventilation. In conned spaces or in some circumstances, for example outdoors, a respirator may be required if exposure cannot be controlled to the PEL or TLV. (See MSDS and chart of TLV and PEL for Typical Electrode Ingredients.) Additional precautions are also required when welding on galvanized steel.

BIBLIOGRAPHY AND SUGGESTED READING

ANSI Z87.1, Practice for Occupational and Educational Eye and Face Protection, American National Standards Institute, 11 West 42nd Street, New York, NY 10036.

Arc Welding and Your Health: A Handbook of Health Information for Welding. Published by The American Industrial Hygiene Association, 2700 Prosperity Avenue, Suite 250, Fairfax, VA 22031-4319.

NFPA Standard 51B, Cutting and Welding Processes, National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9146, Quincy, MA 02269-9959.

OSHA General Industry Standard 29 CFR 1910 Subpart Q. OSHA Hazard Communication Standard 29 CFR 1910.1200. Available from the Occupational Safety and Health Administration at http://www.osha.org or contact your local OSHA office.

The following publications are published by The American Welding Society, P.O. Box 351040, Miami, Florida 33135. AWS publications may be purchased from the American Welding society at http://www.aws.org or by contacting the AWS at 800-443-9353.

ANSI, Standard Z49.1, Safety in Welding, Cutting and Allied Processes. Z49.1 is now available for download at no charge at http://www.lincolnelectric.com/community/safety/ or at the AWS website http://www.aws.org.

AWS F1.1, Method for Sampling Airborne Particulates Generated by Welding and Allied Processes.

AWS F1.2, Laboratory Method for Measuring Fume Generation Rates and Total Fume Emission of Welding and Allied Processes.

AWS F1.3, Evaluating Contaminants in the Welding Environment: A Strategic Sampling Guide.

AWS F1.5, Methods for Sampling and Analyzing Gases from Welding and Allied Processes.

AWS F3.2, Ventilation Guide for Welding Fume Control.

AWS F4.1, Recommended Safe Practices for the Preparation for Welding and Cutting of Containers and Piping That Have Held Hazardous Substances.

AWS SHF, Safety and Health Facts Sheets. Available free of charge from the AWS website at http://www.aws.org.

LISTED BELOW ARE SOME TYPICAL INGREDIENTS IN WELDING ELECTRODES AND THEIR TLV (ACGIH) GUIDELINES AND PEL (OSHA) EXPOSURE LIMITS

INGREDIENTS	CAS No.	TLV mg/m3	PEL mg/m3
Aluminum and/or aluminum alloys (as Al)*****	7429-90-5	10	15
Aluminum oxide and/or Bauxite*****	1344-28-1	10	5**
Barium compounds (as Ba)*****	513-77-9	****	****
Chromium and chromium alloys or compounds (as Cr)*****	7440-47-3	0.5(b)	.005(b)
Fluorides (as F)	7789-75-5	2.5	2.5
Iron	7439-89-6	10*	10*
Limestone and/or calcium carbonate	1317-65-3	10	15
Lithium compounds (as Li)	554-13-2	10*	10*
Magnesite	1309-48-4	10	15
Magnesium and/or magnesium alloys and compounds (as Mg)	7439-95-4	10*	10*
Manganese and/or manganese alloys and compounds (as Mn)*****	7439-96-5	0.2	5.0(c)
Mineral silicates	1332-58-7	5**	5**
Molybdenum alloys (as Mo)	7439-98-7	10	10
Nickel*****	7440-02-0	1.5	1
Silicates and other binders	1344-09-8	10*	10*
Silicon and/or silicon alloys and compounds (as Si)	7440-21-3	10*	10*
Strontium compounds (as Sr)	1633-05-2	10*	10*
Zirconium alloys and compounds (as Zr)	12004-83-0	5	5

Supplemental Information:

(*) Not listed. Nuisance value maximum is 10 milligrams per cubic meter. PEL value for iron oxide is 10 milligrams per cubic meter. TLV value for iron oxide is 5 milligrams per cubic meter.

(**) As respirable dust.

(*****) Subject to the reporting requirements of Sections 311, 312, and 313 of the Emergency Planning and Community Right-to-Know Act of 1986 and of 40CFR 370 and 372.

(b) The PEL for chromium (VI) is .005 milligrams per cubic meter as an 8 hour time weighted average. The TLV for water-soluble chromium (VI) is 0.05 milligrams per cubic meter. The TLV for insoluble chromium (VI) is 0.01 milligrams per cubic meter.

c) Values are for manganese fume. STEL (Short Term Exposure Limit) is 3.0 milligrams per cubic meter. OSHA PEL is a ceiling value.

(****) There is no listed value for insoluble barium compounds. The TLV for soluble barium compounds is 0.5 mg/m3.

TLV and PEL values are as of April 2006. Always check Material Safety Data Sheet (MSDS) with product or on the Lincoln Electric website at http://www.lincolnelectric.com

MASTER TABLE OF CONTENTS FOR ALL SECTIONS

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- THEORY OF OPERATION SECTION -

Figure E.1 - Block logic diagram

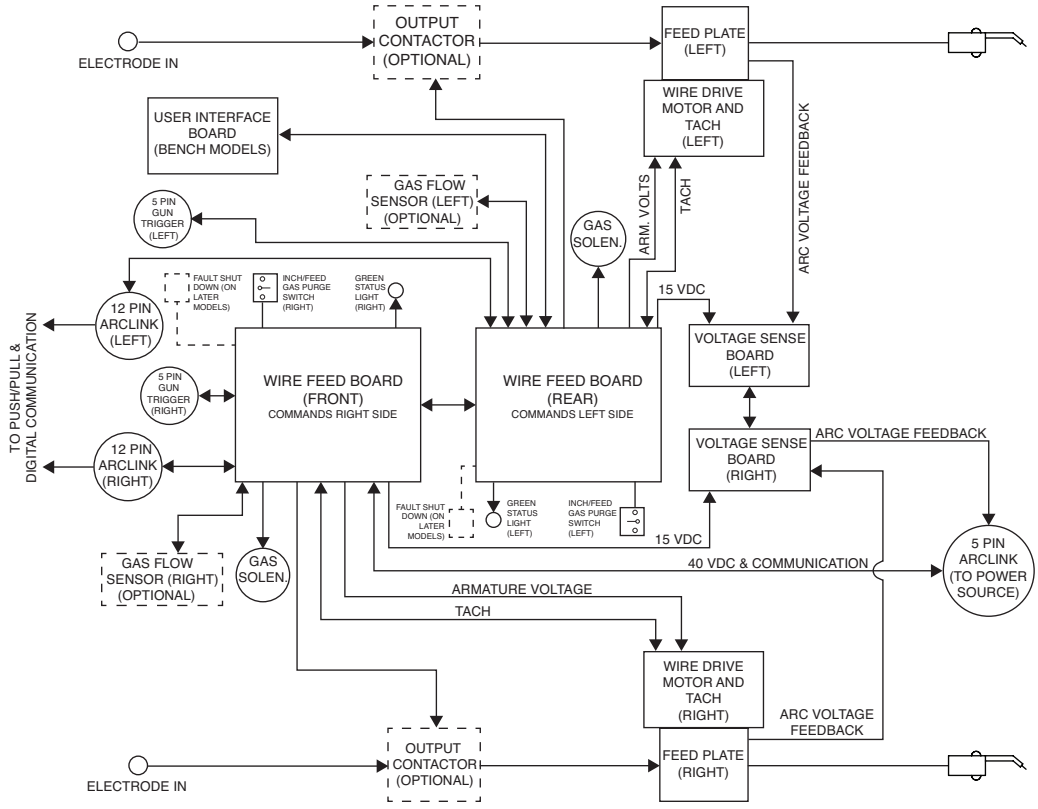
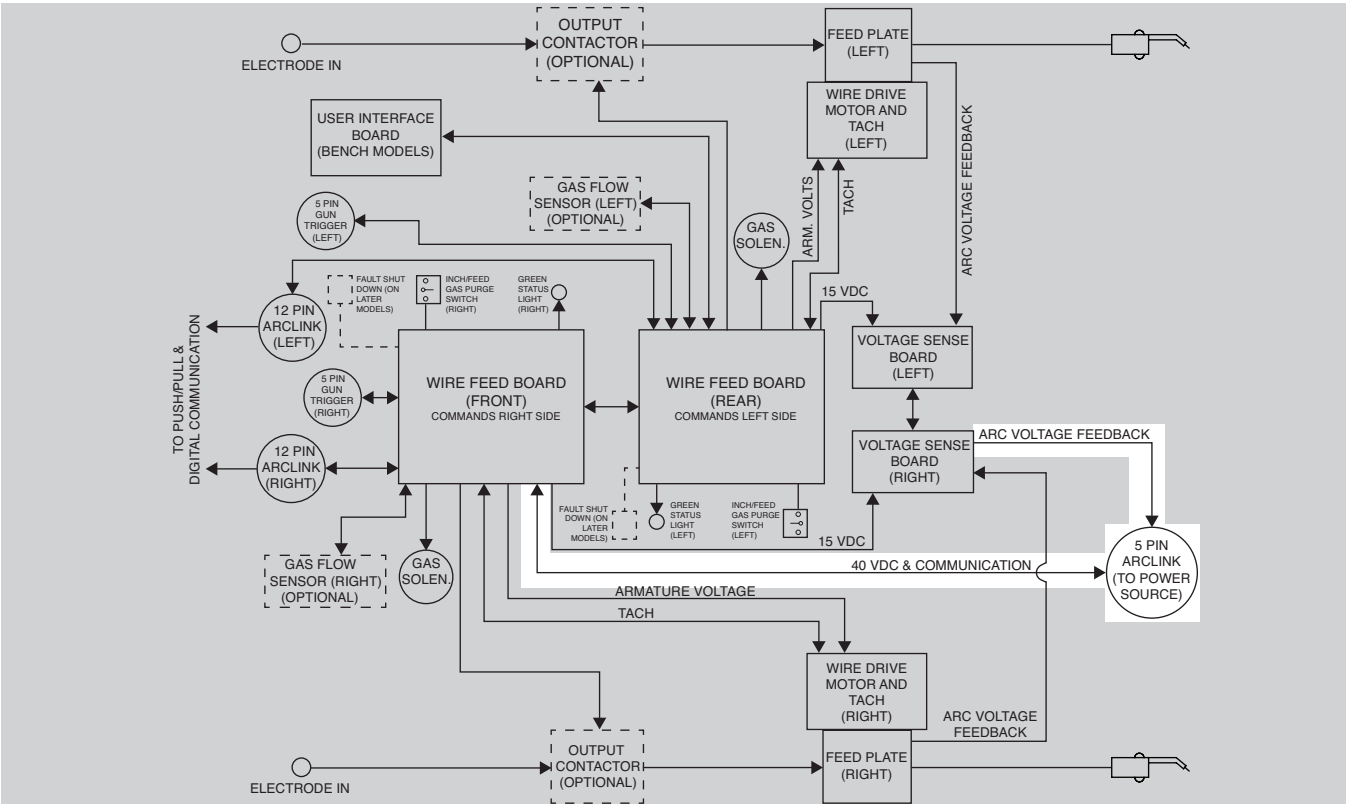


Figure E.2 - Power feed 84 dual function and input

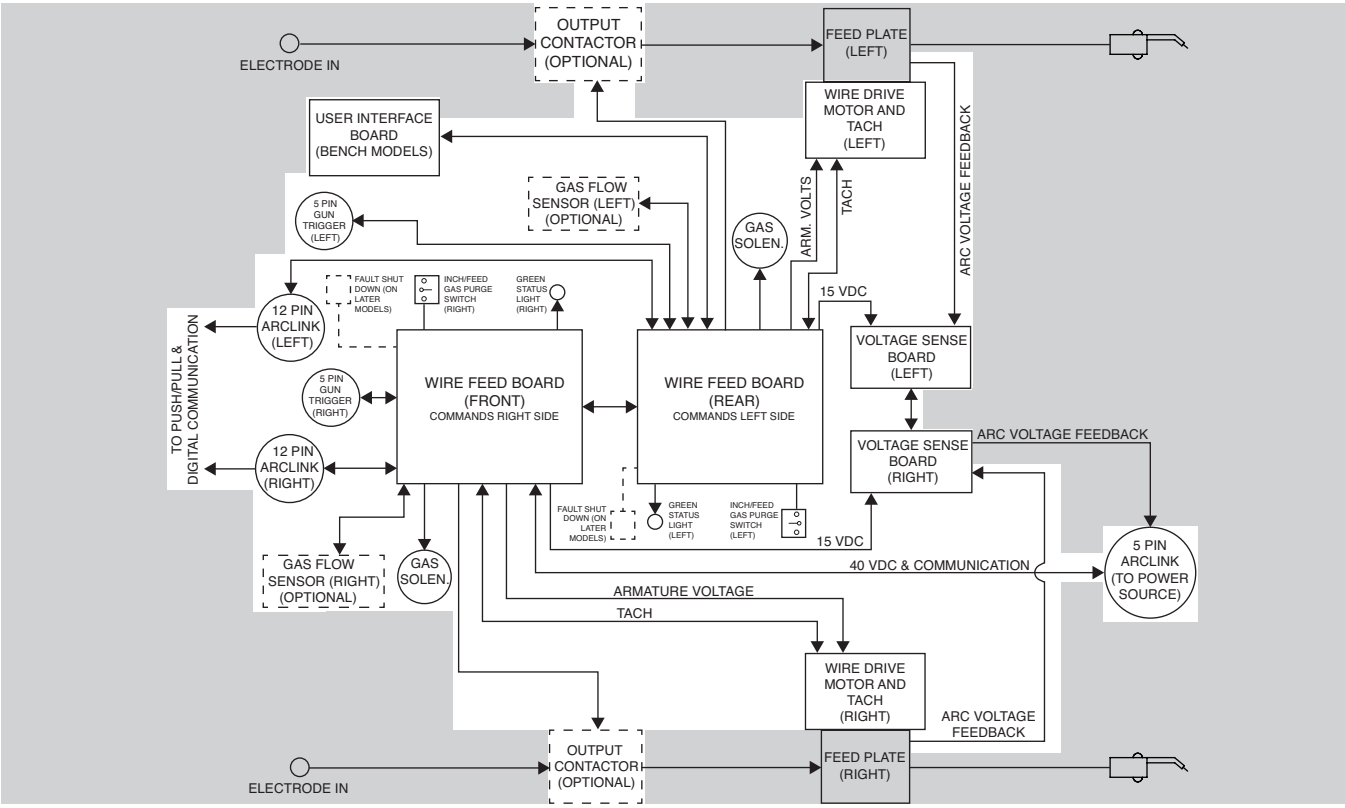


POWER FEED 84 DUAL FUNCTION AND INPUT

The Power Feed 84 is a four drive roll, digitally controlled, modular wire feeder that operates on 40 VDC input power. Network communications (Arclink CAN), PC board power (40 VDC) and electrode voltage feedback (LED 67) are all transmitted and received through the five pin Arclink receptacle located on the right side of the machine. The five lead Arclink cable is connected to a compatible Lincoln Power Wave power source.

NOTE: Unshaded areas of Block Logic Diagram are the subject of discussion.

Figure E.3 - Wire drive PC boards and voltage sense boards



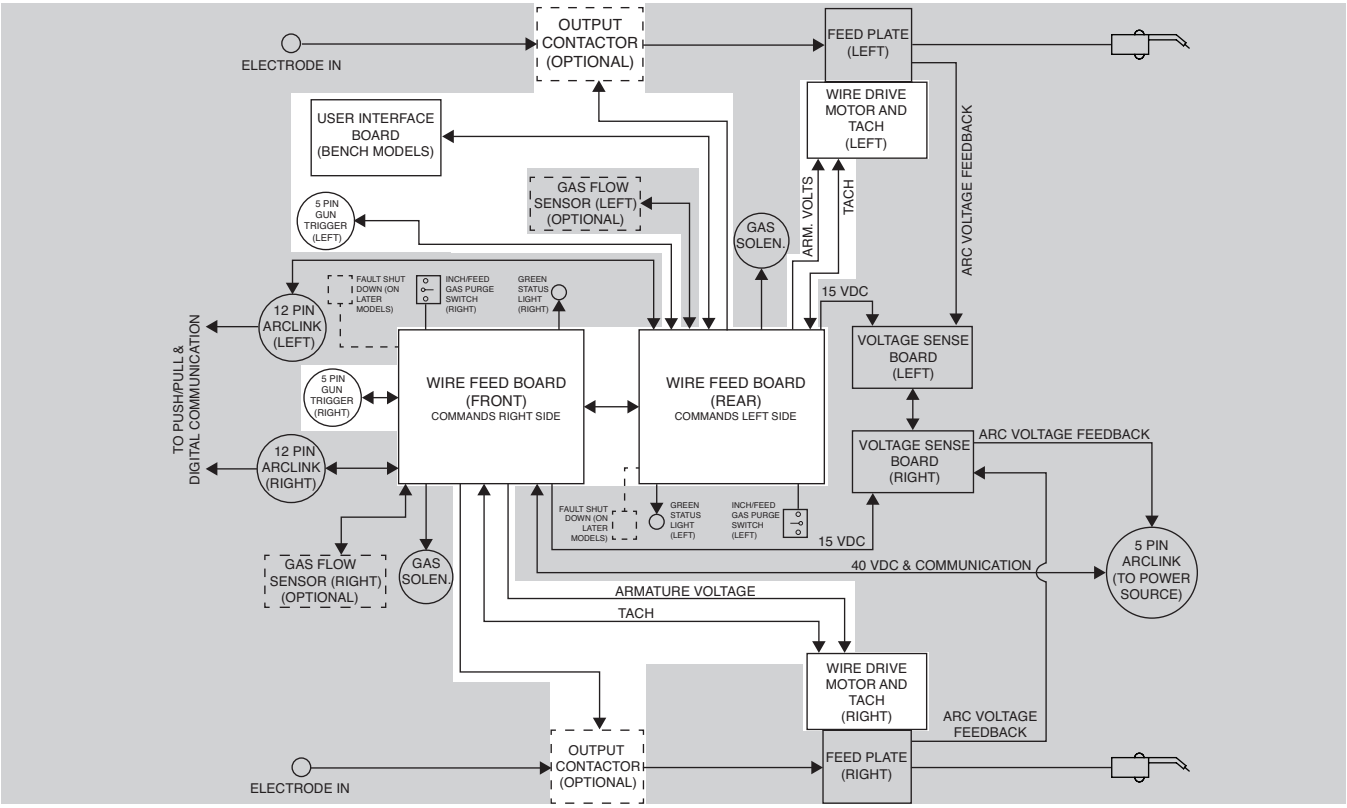
WIRE DRIVE PC BOARDS AND VOLTAGE SENSE BOARDS

The Arclink digital communication and 40 VDC are applied to the wire drive PC boards. The electrode voltage feedback leads (67) are connected to the voltage sense boards. The wire drive PC boards process the various commands they receive from the various switches, the 12 pin push-pull receptacles, the optional gas flow pressure sensors and the user interface board. The wire drive PC boards then activate and control the wire drive motors, the gas solenoids, the optional output contactors and the appropriate voltage sense boards. Dependent on which gun trigger is activated either the left or right voltage sense board is enabled. Not both at the same time. The wire drive PC boards also control the green status lights and flash out error codes if a problem should arise.

On later models a user activated shutdown circuit is included in the wiring harness.

NOTE: Unshaded areas of Block Logic Diagram are the subject of discussion.

Figure E.4 - Output contactors and wire drive motors

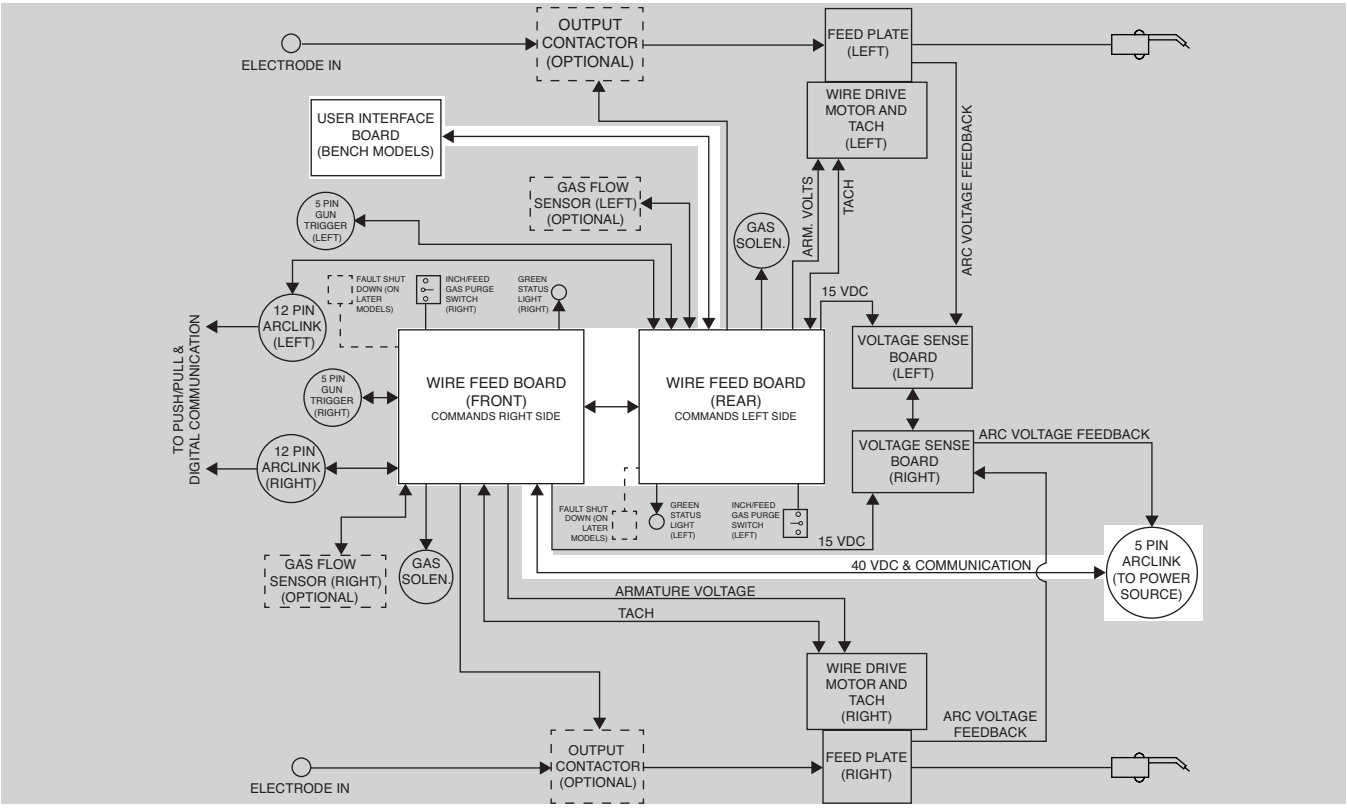


OUTPUT CONTACTORS AND WIRE DRIVE MOTORS

When either the left or right gun trigger is pulled the appropriate wire drive motor is supplied with an armature voltage from either the left or right wire drive PC board. Also, the correct optional output contractor is energized to complete the welding current path to the welding gun. Attached to the wire drive motors are tachometer feedback units. These devices send a pulsed feedback signal to the wire drive PC boards. The wire drive PC boards then determine the motor RPM and control the motor speed to provide the correct wire feed speed dictated by the user interface board.

NOTE: Unshaded areas of Block Logic Diagram are the subject of discussion.

Figure E.5 - User interface board



USER INTERFACE BOARD

Through the Arclink (CAN) communications network the user interface board communicates to the wire drive PC boards and to the compatible Lincoln Power Wave power source. The user interface allows the user to select many welding processes and parameters such as wire feed speed, gun trigger options, arc volts, amps, trim, and store in memory the selected welding procedures. The LED displays are also included in the user interface board. There is one DIP switch on the user interface board. It is labeled S1 and is used to determine single or dual feed head operation.

NOTE: Unshaded areas of Block Logic Diagram are the subject of discussion.

CONTROL BOX (USER INTERFACE)

BOOM MODELS ONLY

The system Control Box is the main entry point for all system parameters, and from it the user can control both power source and wire feeder functions. The user interface motherboard is the heart of the Control Box. Dependent upon the option panels and the information received through the network cable, it directs the entire system as to the options, wire feed speed, and weld cycle requirements and parameters.

The options are divided into two physical size categories. The smaller option, typically installed in the middle section of the control box, is dedicated to dual procedure, head selection, and memory related functions. The larger, or bottom section, is reserved for control of the setup functions for the power source (Power Wave) and wire drive (Power Feeder 84) such as mode, arc control, run in and timer set up.

In addition to the large and smaller size options, there is a Display Panel which is standard on the Control Box unit. The Display Panel is typically installed in the upper position of the Control Box assembly and the STATUS LED. The controls are used to adjust the wire feed speed, current, voltage and trim parameters. The STATUS LED is designed to blink a green code if a fault should occur.

The Power Feed 84 single bench and the Power Feed 84 dual bench do not have User Interface Boards in the control box. On these models the User Interface Board circuitry is on the feed head board located in the wire drive box.

TABLE OF CONTENTS
- TROUBLESHOOTING AND REPAIR SECTION -

HOW TO USE TROUBLESHOOTING GUIDE

⚠ WARNING

Service and repair should be performed by only Lincoln Electric 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 six main categories: Function Problems, Welding Problems, Output Problems, Wire Feeding Problems, Error Codes and Arclink System Error Codes.

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 cover.

Step 3. PERFORM COMPONENT TESTS. The last column, labeled "Recommended Course of Action" lists the most likely components that may have failed in your machine. It also specifies the appropriate test procedure to verify that the subject component is either good or bad. If there are a number of possible components, check the components in the order listed to eliminate one possibility at a time until you locate the cause of your problem.

All of the referenced test procedures referred to in the Troubleshooting Guide are described in detail at the end of this section. Refer to the Troubleshooting and Repair Table of Contents to locate each specific Test Procedure. All of the referred to test points, components, terminal strips, etc., can be found on the referenced electrical wiring diagrams and schematics. Refer to the Electrical Diagrams Section Table of Contents to locate the appropriate diagram.

⚠ CAUTION

If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

PC BOARD TROUBLESHOOTING PROCEDURES

⚠ WARNING

ELECTRIC SHOCK can kill.

- **Have an electrician install and service this equipment. Turn the input power OFF at the fuse box before working on equipment. Do not touch electrically hot parts.**

⚠ CAUTION

Sometimes machine failures appear to be due to PC board failures. These problems can sometimes be traced to poor electrical connections. To avoid problems when trouble-shooting and replacing PC boards, please use the following procedure:

1. Determine to the best of your technical ability that the PC board is the most likely component causing the failure symptom.
2. Check for loose connections at the PC board to assure that the PC board is properly connected.
3. If the problem persists, replace the suspect PC board using standard practices to avoid static electrical damage and electrical shock. Read the warning inside the static resistant bag and perform the following procedures:

PC board can be damaged by static electricity.

- Remove your body's static charge before opening the static-shielding bag. Wear an anti-static wrist strap. For safety, use a 1 Meg ohm resistive cord connected to a grounded part of the equipment frame.
- If you don't have a wrist strap, touch an un-painted, grounded, part of the equipment frame. Keep touching the frame to prevent static build-up. Be sure not to touch any electrically live parts at the same time.

ATTENTION

Static-Sensitive Devices Handle only at Static-Safe Workstations

Reusable Container Do Not Destroy

- Tools which come in contact with the PC board must be either conductive, anti-static or static-dissipative.
- Remove the PC board from the static-shielding bag and place it directly into the equipment. Don't set the PC board on or near paper, plastic or cloth which could have a static charge. If the PC board can't be installed immediately, put it back in the static-shielding bag.
- If the PC board uses protective shorting jumpers, don't remove them until installation is complete.
- If you return a PC board to The Lincoln Electric Company for credit, it must be in the static-shielding bag. This will prevent further damage and allow proper failure analysis.

4. Test the machine to determine if the failure symptom has been corrected by the replacement PC board.

NOTE: It is desirable to have a spare (known good) PC board available for PC board troubleshooting.

NOTE: Allow the machine to heat up so that all electrical components can reach their operating temperature.

5. Remove the replacement PC board and substitute it with the original PC board to recreate the original problem.
    a. If the original problem does not reappear by substituting the original board, then the PC board was not the problem. Continue to look for bad connections in the control wiring harness, junction blocks and terminal strips.
    b. If the original problem is recreated by the substitution of the original board, then the PC board was the problem. Reinstall the replacement PC board and test the machine.
6. Always indicate that this procedure was followed when warranty reports are to be submitted.

NOTE: Following this procedure and writing on the warranty report, "INSTALLED AND SWITCHED PC BOARDS TO VERIFY PROBLEM," will help avoid denial of legitimate PC board warranty claims.

Observe Safety Guidelines detailed in the beginning of this manual.

TROUBLESHOOTING GUIDE

PROBLEMS (SYMPTOMS)	POSSIBLE AREAS OF MISADJUSTMENT(S)	RECOMMENDED COURSE OF ACTION
FUNCTION PROBLEMS		
Major physical or electrical damage is evident when the sheet metal cover(s) are removed.	1. Contact your local authorized Lincoln Electric Field Service Facility for assistance.	1. Contact the Lincoln Electric Service Department, 1-888-935-3877.
No wire feed, solenoid or arc voltage. The STATUS LED's are steady green.	1. The gun trigger may be faulty. Check or replace. 2. Make certain the user interface is configured for a wire feeding mode. 3. Check option panel connections and switch(s) for proper operations.	1. Check the continuity of leads from the gun trigger receptacle to plug J85. See wire drive Wiring Diagram. 2. The wire drive PC board may be faulty.
The wire feed speed does not change when welding current is established. The WFS stays at the run-in-speed. The STATUS LED's are steady green.	1. The run in and weld wire feed speeds may be set to the same value. Set run in speed to a value that gives best starting results.	1. Perform the Current Transducer Test in Power Wave (power source) Service Manual. 2. If the run in wire feed speed cannot be adjusted, perform the ***Tach Feedback Test*** and also the ***Wire Drive Motor(s) Test***. 3. The wire drive PC board may be faulty.
The purge switch on the wire drive unit does not activate the gas solenoid. The gun trigger closure in the MIG or pulse modes does activate the solenoid. The LED's are steady green on the power source, control box and wire drive unit.	1. Make certain the cold inch/feed gas purge switch is operating properly. 2. Check for loose or faulty leads between cold inch/feed gas purge switch and the wire drive PC board. See Wiring Diagram.	1. If the cold inch/feed gas purge switch is operating correctly and the associated leads are OK. The wire drive PC board may be faulty.
The cold inch/feed gas purge switch does not turn on the wire drive motor. The gun trigger closure in the MIG or Pulse modes does activate the wire drive motor. The LED's are steady green on the power source, control box and wire drive unit.	1. Make certain the cold inch/feed gas purge switch is operating properly. 2. Check for loose or faulty leads between cold inch/feed gas purge switch and the wire drive PC board. See Wiring Diagram.	1. If the cold inch/feed gas purge switch is operating correctly and the associated leads are OK, the wire drive PC board may be faulty. 2. Perform the ***Cold Inch/Feed Gas Purge Switch Test***.

⚠ CAUTION

If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

Observe Safety Guidelines detailed in the beginning of this manual.

TROUBLESHOOTING GUIDE

PROBLEMS (SYMPTOMS)	POSSIBLE AREAS OF MISADJUSTMENT(S)	RECOMMENDED COURSE OF ACTION
FUNCTION PROBLEMS		
The voltmeter on the control box does not function properly even though the STATUS LED's are steady green.	1. Check the #67 lead on the wire drive unit. Make sure it is connected to the motor gear box and also the voltage sense PC board. See Wiring Diagram. 2. Check the work sensing leads on the Power Wave power source. See Power Wave Wiring Diagram.	1. Check leads #513 and #514 from J86 on the wire drive PC board to the voltage sense PC board (+15 VDC). See Wiring Diagram. 2. Perform the ***Voltage Sense Board(s) Test***. 3. The user interface board may be faulty. 4. The wire drive PC board may be faulty.
The ammeter on the control box does not function properly even though the STATUS LED's are steady green.	1. N/A.	1. Perform the Current Transducer Test, located in the Power Wave (power source) Service Manual. 2. The user interface board may be faulty.
The mode and/or settings change while welding under normal conditions.	1. Contact the Lincoln Electric Service Department for possible software updates (Please reference your current software number).	1. N/A.
The displays are blank (not lit). The wire feeds when the gun trigger is activated.	1. Check for loose plugs or faulty connections at the user interface board and the wire drive PC board. See Wiring Diagram.	1. Check for 40 VDC at J31 pins 3 (com) and 4 on the user interface board. If 40 VDC is present, then the user interface board may be faulty. 2. If the 40 VDC is low or not present, check for loose or faulty connections between the USB board, user interface board and the wire drive PC board. See machine schematic. 3. The wire drive PC board may be faulty. 4. Perform the ***User Interface And USB Board Test***.
When in CC modes the output does not energize.	1. Rotate Volts/Trim encoder knob at least 45 degrees clockwise. This is normal. See ***Operation*** section of operator's manual for detailed operation.	1. Perform the ***Wire Drive PC Board(s) Test***.

⚠ CAUTION

If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

Observe Safety Guidelines detailed in the beginning of this manual.

TROUBLESHOOTING GUIDE

PROBLEMS (SYMPTOMS)	POSSIBLE AREAS OF MISADJUSTMENT(S)	RECOMMENDED COURSE OF ACTION
FUNCTION PROBLEMS		
The feeder does not power up - no display, no cold feed.	1. The Power Wave power source is OFF. Turn ON the Power Wave power source. 2. The circuit breaker for the wire feeder on power source has tripped. Reset the circuit breaker. 3. The control cable may be loose or damaged. Tighten, repair or replace the control cable.	1. Check for 40 VDC at J83 leads #540 and #500 on the wire drive PC board. If voltage is present, replace PC board. If voltage is not present, check leads from J83 on board to 5 pin Arclink receptacle. See Machine Schematic. 2. Perform the ***Wire Drive PC Board(s) Test***.
No shielding gas.	1. The gas supply is OFF or empty. Verify the gas supply is ON and flowing. 2. The gas hose is cut or crushed. Route the gas hose so it avoids sharp corners and make sure nothing is on top of it. Repair or replace damaged hoses. 3. Dirt or debris is in the solenoid. Apply filtered shop air at 80psi to the solenoid to remove dirt. 4. There is a loose solenoid connection. Remove the cover and check that all connections are in good condition. 5. The solenoid has failed.	1. Check for 6.5 VDC with trigger pulled at J86 leads #553 and #552. If voltage is present replace solenoid. If voltage is not present replace PC board. See Machine Schematic. 2. Perform the ***Gas Solenoid(s) Test***.

⚠ CAUTION

If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

Observe Safety Guidelines detailed in the beginning of this manual.

TROUBLESHOOTING GUIDE

PROBLEMS (SYMPTOMS)	POSSIBLE AREAS OF MISADJUSTMENT(S)	RECOMMENDED COURSE OF ACTION
WELDING PROBLEMS		
The gun tip seizes in diffuser.	1. The tip may be overheating due to prolonged or excessive high current and/or duty cycle. Do not exceed the current and duty cycle rating of the gun. 2. A light application of high temperature anti-seize lubricant (such as Graphite Grease) may be applied to tip threads.	1. Contact the Lincoln Electric Service Department at 1.888.935.3877.
Poor arc striking with sticking or "blast-offs". The weld bead may be narrow and ropy with weld porosity.	1. Make sure the weld procedures are correct for the process being used. Check gas, wire feed, speed and arc voltage. 2. Remove the gun liner and check the rubber seal for any sign of deterioration or damage. Be sure the set screw in the connector block is in place and tightened against the liner bushing. 3. Check the welding cables for loose or faulty connections.	1. Contact the Lincoln Electric Service Department at 1.888.935.3877.
The arc is variable and/or hunting. The power source, control box and drive units seem to be operating properly.	1. Check the contact tip. It may be worn or the wrong size for the electrode wire being used. 2. Check for loose or faulty welding cables and connections. 3. Make sure the procedures are correct for the process being used. Check gas, wire feed speed and arc voltage.	1. Contact the Lincoln Electric Service Department at 1.888.935.3877.

⚠ CAUTION

If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

Observe Safety Guidelines detailed in the beginning of this manual.

TROUBLESHOOTING GUIDE

PROBLEMS (SYMPTOMS)	POSSIBLE AREAS OF MISADJUSTMENT(S)	RECOMMENDED COURSE OF ACTION
OUTPUT PROBLEMS		
No welding arc voltage when the gun trigger is activated. The wire feeds normally and the gas solenoid functions properly.	1. The power source may be unable to produce welding output due to a thermal fault or other malfunction. Check STATUS LED on the Power Feed 84 and power source. 2. The gun may be faulty.	1. Make certain the Power Feed 84 power source is functioning correctly. 2. The wire drive PC board may be faulty. 3. Perform the ***Optional Output Contactor Tests***.

⚠ CAUTION

If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

Observe Safety Guidelines detailed in the beginning of this manual.

TROUBLESHOOTING GUIDE

PROBLEMS (SYMPTOMS)	POSSIBLE AREAS OF MISADJUSTMENT(S)	RECOMMENDED COURSE OF ACTION
WIRE FEEDING PROBLEMS		
The wire feed speed is consistent and adjustable, but runs at the wrong speed.	1. The wire drive unit may **not** be set for the correct gear ratio. See the ***Installation*** section of the operator's manual. 2. The drive motor may be overloaded due to a mechanical restriction in the wire feeding path. See ***Operation*** section of the operator's manual.	1. Perform the ***Wire Drive PC Board(s) Test***. 2. The wire drive PC board may be faulty. 3. If there are no restrictions in the wire feeding path, the drive motor or gear box may be faulty.
When the gun trigger is activated, the drive rolls do not turn. The arc voltage is present and the solenoid is energized. The STATUS LED's are steady green.	1. Check plug J84 on the wire drive PC board and leads #550 and #551 for loose or faulty connections. See Wiring Diagram.	1. Perform the ***Wire Drive Motor(s) Test***. 2. Perform the ***Wire Drive PC Board(s) Test***.
The wire is feeding rough or not feeding at all, but the drive rolls are turning.	1. The drive roll pressure may be incorrect. Set drive roll pressure. See ***Operation*** section of the operator's manual. 2. Check for dirty or rusty electrode wire. 3. Make sure the drive rolls and wire guides are positioned and installed correctly. See ***Operation*** section of the operator's manual. 4. Check for mechanical restrictions in the wire feeding path.	1. Contact the Lincoln Electric Service Department at 1.888.935.3877.
No control of wire feed speed. All STATUS LED's are steady green. The preset wire feed speed is adjustable on the user interface.	1. Check for a mechanical restriction in the wire feed path.	1. Perform the ***Tach Feedback Test***. 2. The wire drive PC board may be faulty.

⚠ CAUTION

If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

Observe Safety Guidelines detailed in the beginning of this manual.

Error Codes for the Power Wave Power Sources

NOTE: For any Err# listed write down the error number for reference and try cycling power to see if the error clears itself. If not, refer to the Recommended Course Of Action column for the given Err.

ERROR CODE DISPLAY SHOWS ANY OF THE FOLLOWING:	POSSIBLE AREAS OF MISADJUSTMENT(S)	RECOMMENDED COURSE OF ACTION
ERROR CODES		
Err 100	The Power Source issued a shut down command for some reason.	See 'Recommended Course Of Action' for Err 006.
Err 200	No heart beat response from the power source.	See 'Recommended Course Of Action' for Err 006.
Err 201	No heart beat response from an object.	If this occurs while welding, the status LED should be flashing red on the object that lost heart beat. Otherwise, look for any nodes that are flashing green. This indicates they have not been recognized and there is a power source problem (see power source Troubleshooting section). If the status LED is either flashing or solid red, there may be a problem with continuity in the communication lines. Check the lines for continuity, in the cable and harnessing (refer to wiring diagram).
Err 210	EEPROM error.	Parameter recalled at power up was out of range. Rotate encoder knob to reset. Check all settings before proceeding to weld. If this condition persists then perform the ***Wire Drive PC Board(s) Removal And Replacement Procedure***.

⚠ CAUTION

If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

Observe Safety Guidelines detailed in the beginning of this manual.

Error Codes for the Power Wave Power Sources

NOTE: For any Err# listed write down the error number for reference and try cycling power to see if the error clears itself. If not, refer to the Recommended Course Of Action column for the given Err.

ERROR CODE DISPLAY SHOWS ANY OF THE FOLLOWING:	POSSIBLE AREAS OF MISADJUSTMENT(S)	RECOMMENDED COURSE OF ACTION
ERROR CODES		
Err 211	Microprocessor RAM error in control box.	Turn Power off at power source. Wait 5 seconds. Turn power back on. If Err 211 is displayed again, then replace wire drive PC board.
Err 212	Microprocessor RAM Error in object board other than control box (Such as feed head).	Cycle power as in Err 211. If Err 212 is still displayed, then replace the PC board in the object with the fault. The object with the fault should be solid red on its status LED.
--- (three dashes)	Appears on right display of user interface board that contains the status LED.	This is an indication that a constant current such as stick or gauge mode has been selected. Turning the right encoder clockwise when in this state will activate output to Power Source. Turning the right encoder counterclockwise will deactivate output.
Err 18 Configuration error.	The DIP switch setting for the user interface does not match the wire drives. The user interface is set for “single” with a “dual” wire drive or the user interface is set for “dual” with a “single” wire drive.	Verify the user interface DIP is in the correct position.
Err 81 Motor overload, long term.	The wire drive motor has overheated.	1. Check that the electrode slides easily through the gun and cable. 2. Remove tight bends from the gun and cable. 3. Check that the spindle brake is not too tight. 4. Verify a high quality electrode is being used. 5. Wait for the error to reset and the motor to cool (approximately 1 minute).
Err 82 Motor overload, short term.	The wire drive motor current draw has exceeded limits, usually because the motor is in a locked rotor state.	1. Check that motor can turn freely when idle arm is open. 2. Verify that the gears are free of debris and dirt.

⚠ CAUTION

If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

Observe Safety Guidelines detailed in the beginning of this manual.

TROUBLESHOOTING GUIDE

PROBLEMS (SYMPTOMS)	POSSIBLE AREAS OF MISADJUSTMENT(S)	RECOMMENDED COURSE OF ACTION
ARCLINK SYSTEM ERROR CODES		
Err 53 Voltage sense loss.	1. The system detected that one of the voltage sense lead cables was disconnected from the welding circuit during a weld.	1. Verify that leads 67 and 21 are enabled and connected.
Err 95 Spool gun or pull gun motor overload.	1. The drive motor in the spool gun or push-pull gun is drawing too much current.	1. Check spool gun brake or feeding for binding. Replace spool gun circuit board.
Err 263 No usable weld modes.	1. The power source does not have any welding programs loaded. Required configuration could not be found.	1. Make sure the status of all devices is connected correctly to the machine. Reflash system software.

⚠ CAUTION

If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

CASE COVER REMOVAL AND REPLACEMENT PROCEDURE

⚠ WARNING

Service and repair should be performed only by Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment may result in danger to the technician or 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.

If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

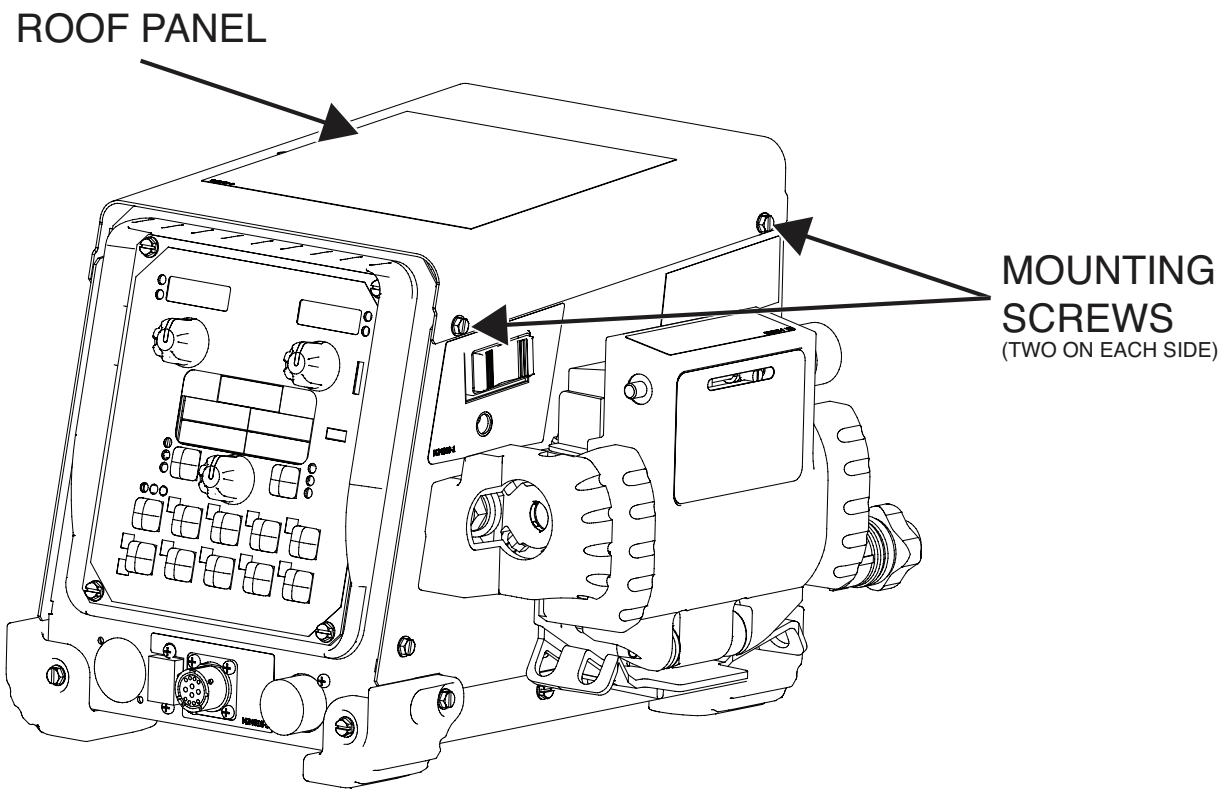
This procedure will aid the technician in the removal and replacement of the Case Covers.

MATERIALS NEEDED

5/16” Nutdriver
Needle-nose
Wiring Diagram

CASE COVER REMOVAL AND REPLACEMENT PROCEDURE *(continued)*

Figure F.1 – Roof panel mounting screws



REMOVAL PROCEDURE

1. Remove input power from the Power Feed 84 wire feeder.
2. Using a 5/16” nutdriver, remove the four screws securing the roof. Do not fully remove the roof panel until all plugs have been disconnected from the wire drive PC boards. See Figure F.1.
3. Tilt roof panel to allow for the leads to be disconnected.
4. Label and disconnect plugs J81, J82, J83, J84, J85, J86, J87 and J88 from the wire drive PC board. See ***Figure F.2***. See Wiring Diagram. Repeat steps for each wire drive PC board.

NOTE: To completely disconnect plugs J83 from the rear board and/ or J83 from the front board it will be necessary to disconnect the threaded terminal connecting the bypass capacitor to the roof panel.

5. To completely disconnect plug J83 on the rear wire drive PC board, disconnect plug J82 from the front wire drive PC board then disconnect plug J83 from the rear wire drive PC board. The bypass capacitor will still be connected to the roof panel via a threaded terminal. See ***Figure F.3***. See Wiring Diagram.
6. Using needle-nose pliers, disconnect the threaded terminal by rotating the cables at the same time as the terminal. This will help to ensure the capacitor lead connected to the threaded terminal is not broken. See ***Figure F.3***. See Wiring Diagram.
7. To completely remove plug J83 from the front board, disconnect plug J83 from the front board. The bypass capacitor will still be connected to the roof panel by a threaded terminal. See ***Figure F.3***. See Wiring Diagram.
8. Using needle-nose pliers, disconnect the threaded terminal by holding the threaded terminal with the needle-nose pliers and rotating the entire roof panel until the threaded terminal becomes free. This will help to ensure the capacitor lead is not broken. See ***Figure F.3***. See Wiring Diagram.
9. The roof panel can now be completely removed.
10. If replacing a damaged roof panel, perform the ***Wire Drive PC Board(s) Removal Procedure***.
11. Using a 5/16” nutdriver, remove the two screws securing the right case side. See ***Figure F.4***.
12. Using a 5/16” nutdriver, remove the two screws securing the left case side. See ***Figure F.4***.

CASE COVER REMOVAL AND REPLACEMENT PROCEDURE *(continued)*

Figure F.2 – Wire drive PC board plug locations

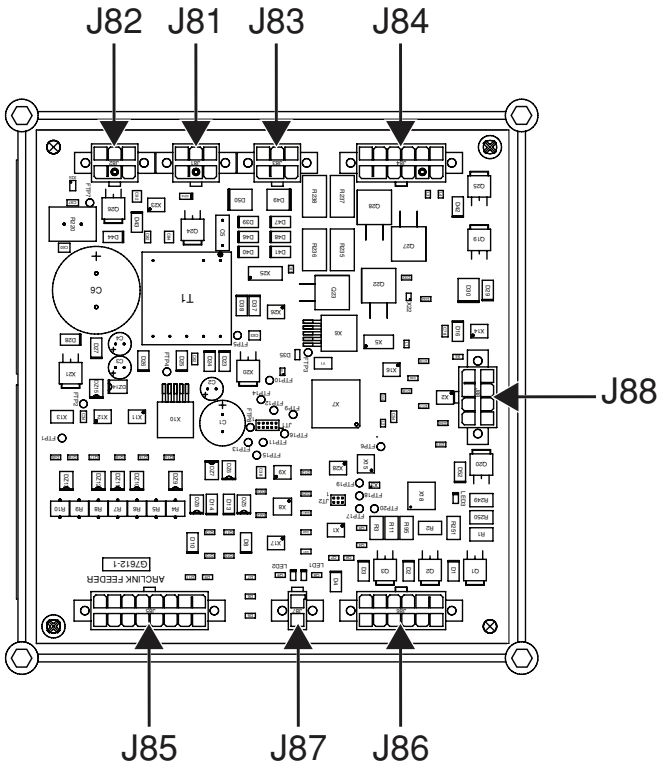
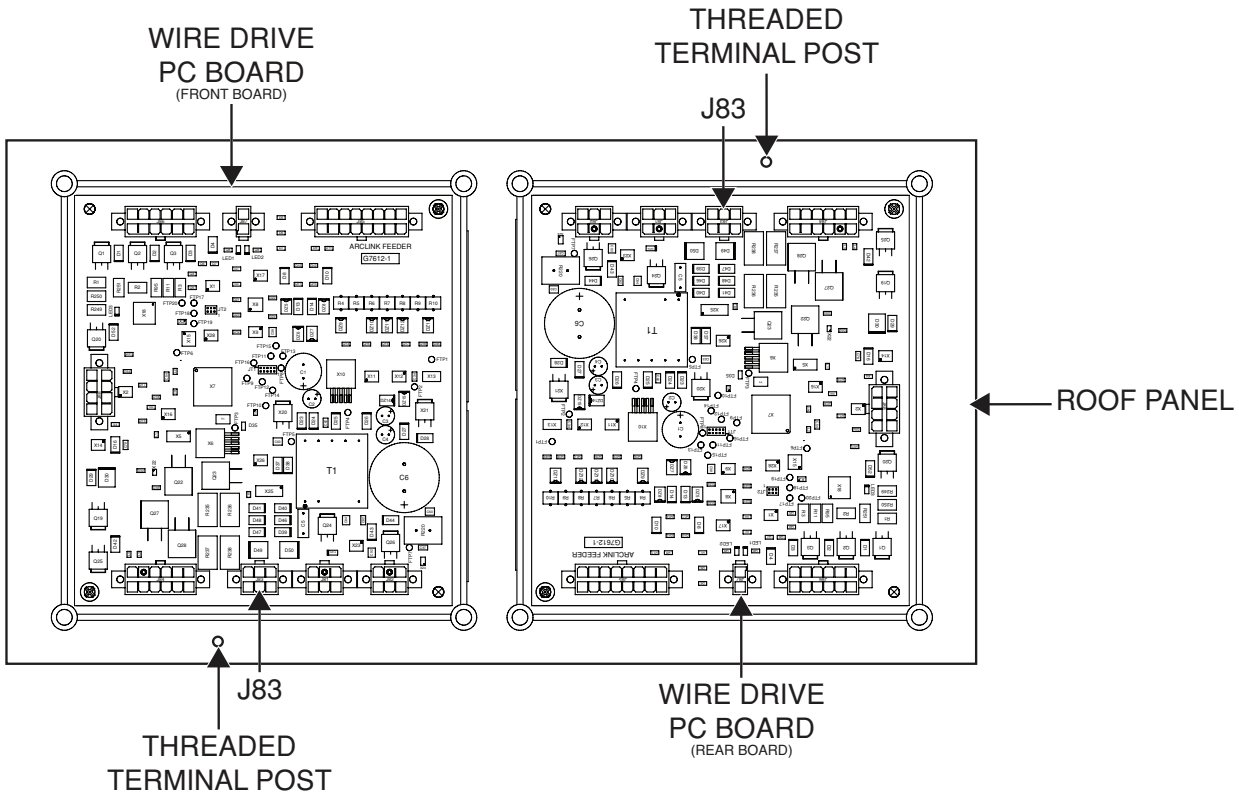
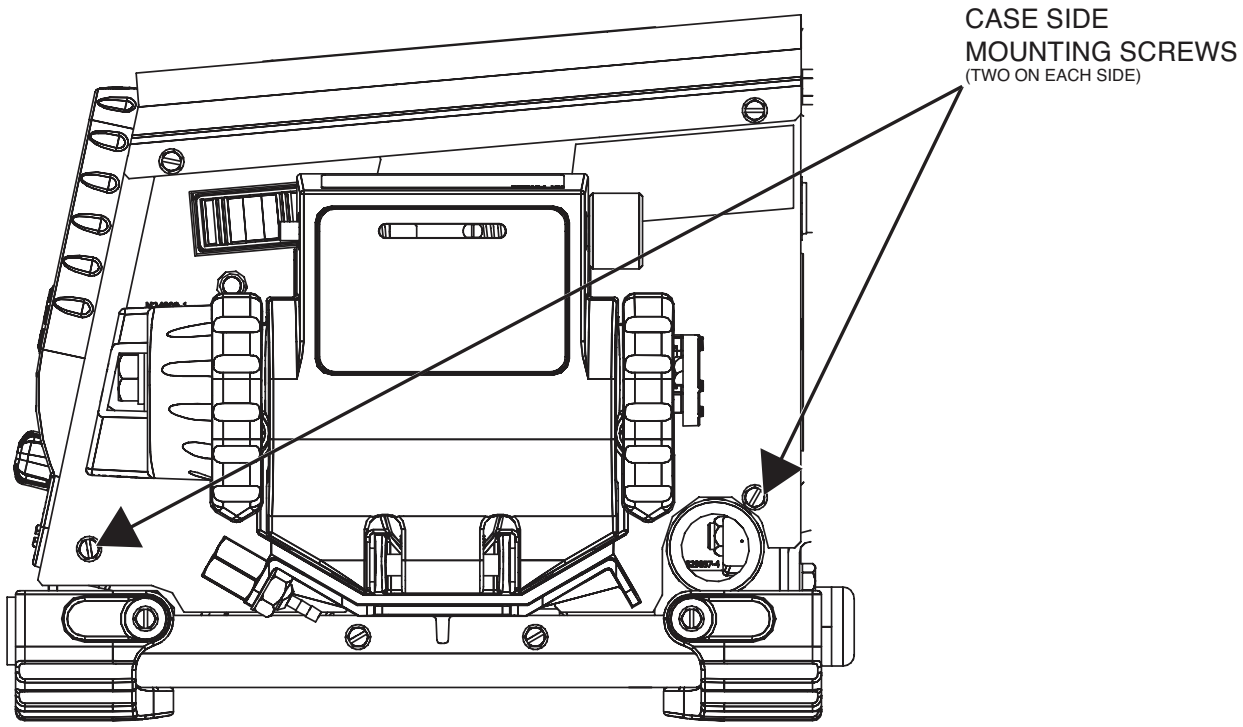


Figure F.3 – Threaded terminals location



CASE COVER REMOVAL AND REPLACEMENT PROCEDURE *(continued)*

Figure F.4 – Case side mounting screws



REPLACEMENT PROCEDURE

1. Using a 5/16” nutdriver, attach the two screws securing the left case side.
2. Using a 5/16” nutdriver, attach the two screws securing the right case side.
3. Carefully position the roof panel close to the top of the machine. This will allow the previously removed plugs to be attached.
4. Connect plugs J81, J82, J83, J84, J85, J86, J87 and J88 to the wire drive PC board(s). See Wiring Diagram. Repeat for each wire drive PC board.
5. Attach the bypass capacitors threaded terminal to the threaded terminal post on the roof panel by firmly pressing until it is seated.
6. Using a 5/16” nutdriver, attach the four screws securing the roof panel to the machine.

TACH FEEDBACK TEST

⚠ WARNING

Service and repair should be performed only by Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment may result in danger to the technician or 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.

If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

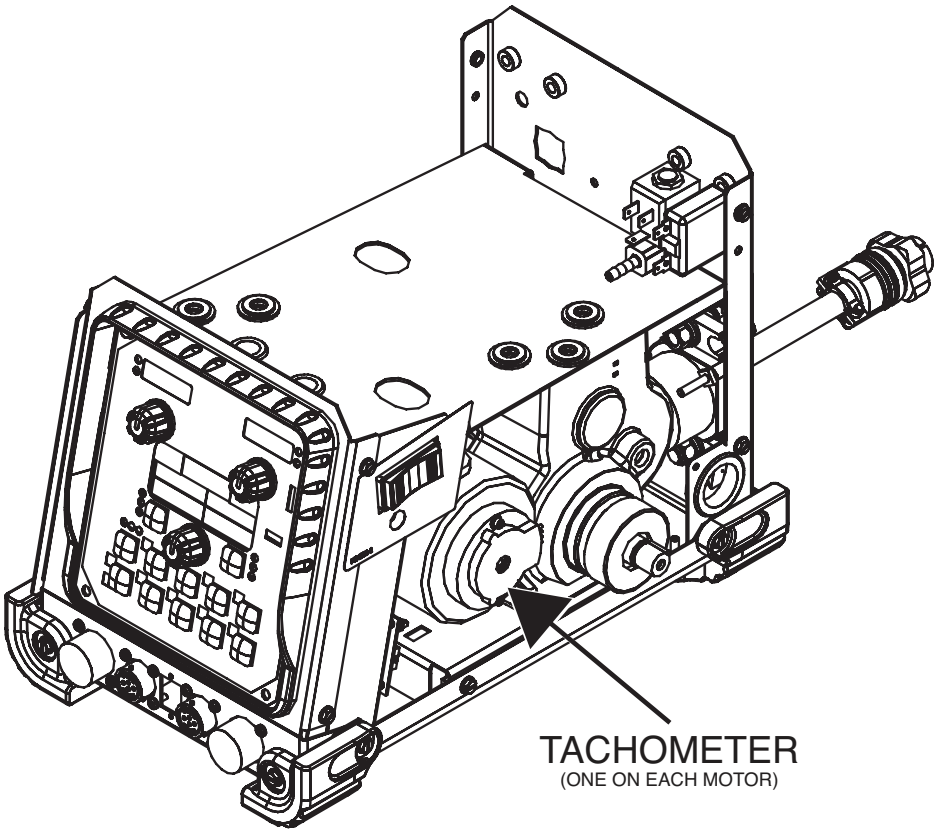
This test will determine if the Tach Unit is receiving the correct supply voltage from the Control Board and also if the Tach Unit is sending feedback information to the Control Board.

MATERIALS NEEDED

Volt/Ohmmeter
Wiring Diagram

TACH FEEDBACK TEST *(continued)*

Figure F.5 – Tachometer location



PROCEDURE

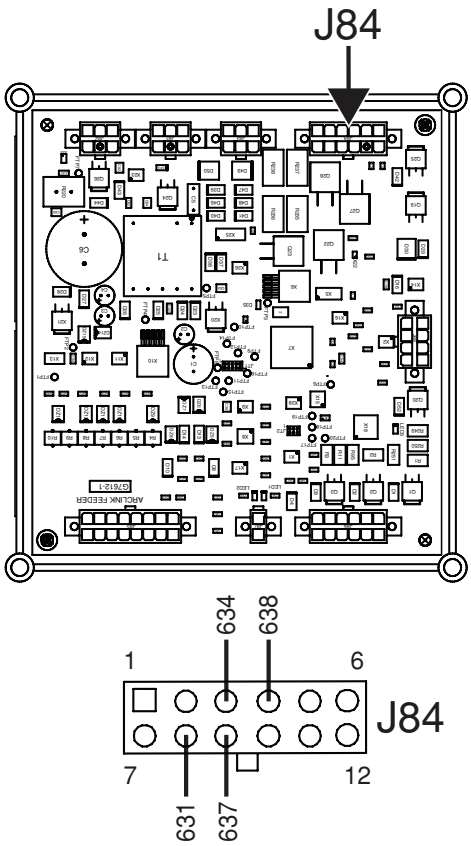
1. Remove input power from the Power Feed 84 wire feeder.
2. Perform the ***Case Cover Removal Procedure***, for case sides.
3. Locate the tachometer. See Figure F.5.

NOTE: There are two tachometers, one on each side of the machine. Test each tachometer separately.

4. Carefully apply input power to the machine.
5. Check for 5 VDC from the red wire (631+) to the black wire (634-). This is the supply voltage from the wire drive PC board.
6. If 5 VDC is not present, the wire drive PC board may be faulty. Also check for loose or faulty wires and connections.
7. With the gun trigger activated and the motor running, check for feedback voltage of approximately 2 VDC at plug J84 from blue wire (637+) to the black wire (634-). If the correct supply voltage is present and the feedback voltage is missing, the tachometer may be faulty. See ***Figure F.6***.
8. Remove input power to the machine.
9. Perform the ***Case Cover Replacement Procedure***.

TACH FEEDBACK TEST *(continued)*

Figure F.6 – Plug J84 on wire drive PC board



COLD INCH/FEED GAS PURGE SWITCH TEST

⚠ WARNING

Service and repair should be performed only by Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment may result in danger to the technician or 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.

If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

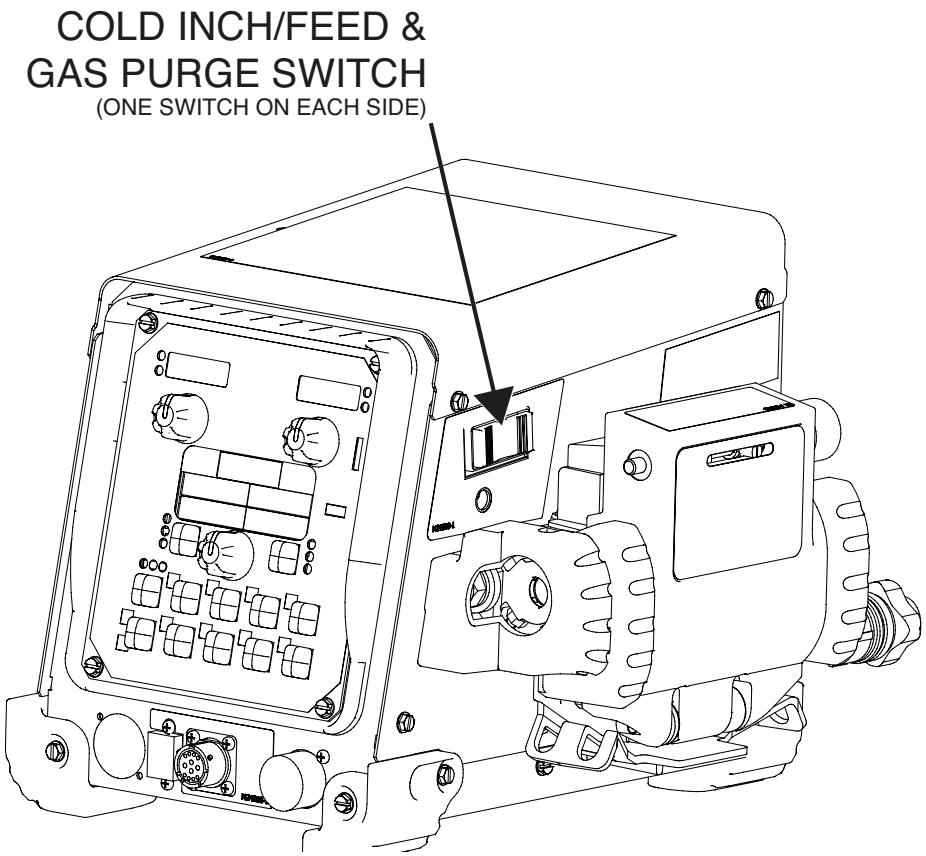
This test will help determine if the Cold Inch/Feed Gas Purge Switch is functioning properly.

MATERIALS NEEDED

Volt/Ohmmeter
Wiring Diagram

COLD INCH/FEED GAS PURGE SWITCH TEST *(continued)*

Figure F.7 – Cold inch/feed gas purge switch



PROCEDURE

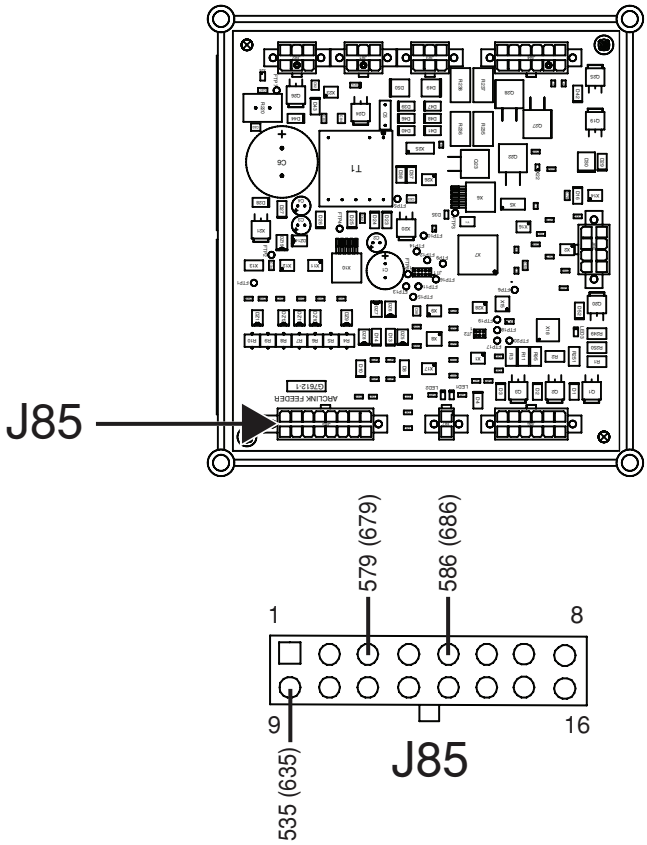
1. Remove input power from the Power Feed 84 wire feeder.
2. Perform the ***Case Cover Removal Procedure***, for case sides.
3. Locate the cold inch/feed gas purge switch. See Figure F.7.

NOTE: There are two cold inch/feed gas purge switches, one on each side of the machine. Test separately.

4. Label and disconnect leads 586, 535 and 579 (or leads 686, 635 and 679) from the cold inch/feed gas purge switch to be tested. See ***Figure F.8***. See Wiring Diagram.
5. While pressing the rocker switch forward or back, perform continuity checks from lead 586 (686) to 535 (635) and from 586 (686) to 579 (679). If continuity test fails, the cold inch/feed gas purge switch may need replaced. See Wiring Diagram.
6. If necessary, perform the ***Cold Inch/Feed Gas Purge Switch Removal and Replacement Procedure***.
7. Reconnect any previously removed leads. See Wiring Diagram.
8. If necessary, perform the appropriate ***Wire Drive PC Board(s) Test***.
9. Perform the ***Case Cover Replacement Procedure***.

COLD INCH/FEED GAS PURGE SWITCH TEST *(continued)*

Figure F.8 – Wire drive PC board leads



VOLTAGE SENSE BOARD(S) TEST

⚠ WARNING

Service and repair should be performed only by Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment may result in danger to the technician or 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.

If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

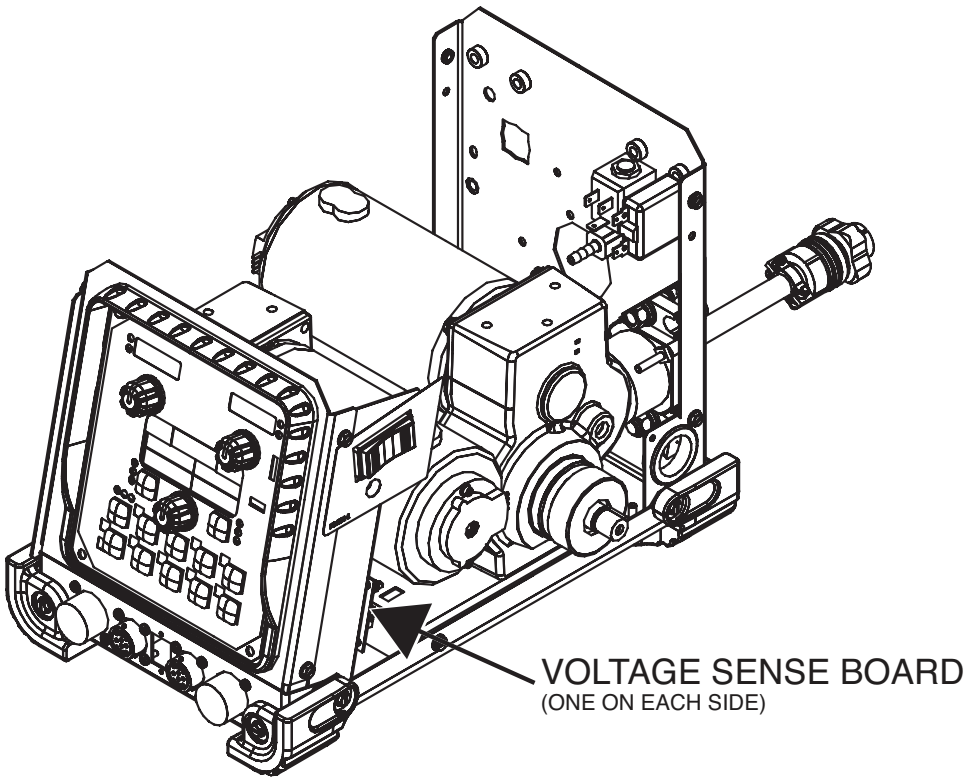
This test will help determine if the Voltage Sensing Board is receiving the correct activation signal from the Control Board and also if the Voltage Sensing Board is processing arc voltage sensing information.

MATERIALS NEEDED

3/4" Nutdriver
Phillips Screwdriver
Volt/Ohmmeter
Wiring Diagram

VOLTAGE SENSE BOARD(S) TEST *(continued)*

Figure F.9 – Voltage sense board location



PROCEDURE

1. Remove input power from the Power Feed 84 wire feeder.
2. Perform the ***Case Cover Removal Procedure***, for case sides.
3. Locate the voltage sense board. See Figure F.9.

NOTE: There are two voltage sense boards, one on each side of the machine. Test separately.

4. To gain access to the voltage sense board(s). Using a phillips screwdriver, remove the screw and associated washer securing the appropriate gun adapter cover (one on each side of machine). See ***Figure F.10***.
5. Remove the gun adapter cover.
6. Using a 3/4" nutdriver, remove the heavy black lead and associated washers to gain access to the voltage sense board. See Figure F.9.
7. Locate plugs J1 and J2 on the voltage sense board. See ***Figure F.11***.
8. Carefully apply input power to the machine.
9. With the gun trigger activated (or jumpering leads A and C at the gun cable receptacle) check for 15 VDC at leads 613 (or 513) and 614 (or 514) on plug J1. See ***Figure F.11***. See Wiring Diagram.
10. If 15 VDC is not present, the wire drive PC board may be faulty. Also check for loose or faulty wires and connections between the wire drive PC board and the voltage sense board. See Wiring Diagram.
11. Check the continuity of lead 67 from the conductor block to plug J1 pin 3 on the voltage sense board. See ***Figure F.11***. See Wiring Diagram.
12. With the voltage sense board activated with 15VDC at plug J1 pin 1(+) to plug J1 pin 4(-). There should be continuity between J1 pin 3 to J2 pin 2. See Wiring Diagram.
13. Remove all input power from the machine.
14. Using a 3/4" nutdriver, reconnect the heavy black lead previously removed. See Wiring Diagram.
15. Using a phillips screwdriver, secure the gun adapter cover previously removed.
16. Perform the ***Case Cover Replacement Procedure***.

VOLTAGE SENSE BOARD(S) TEST *(continued)*

Figure F.10 – Gun adapter cover removal

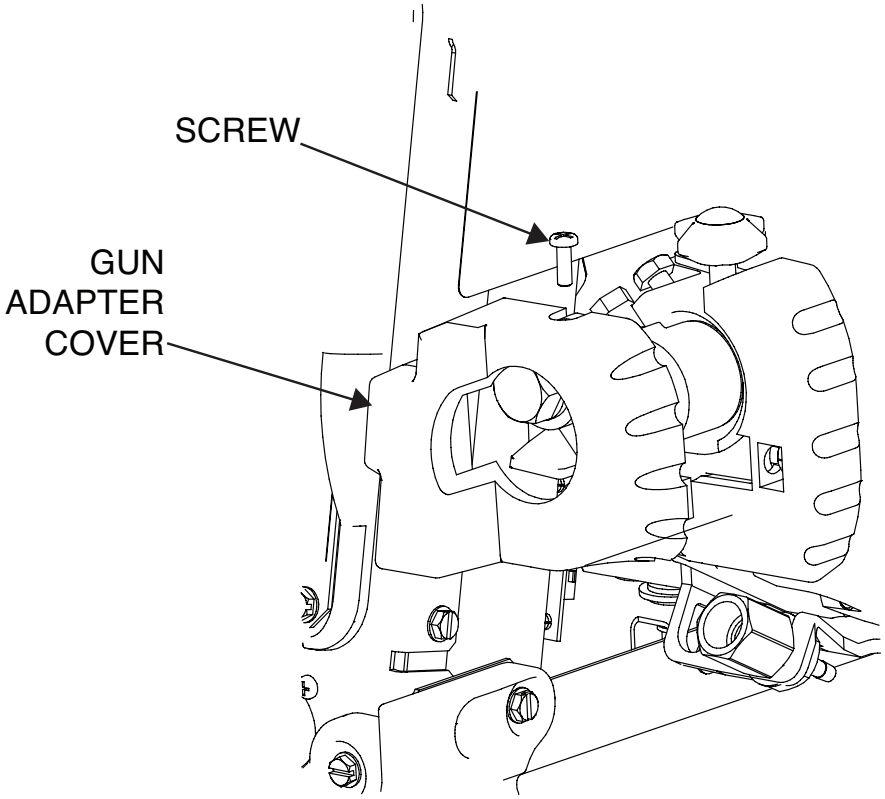
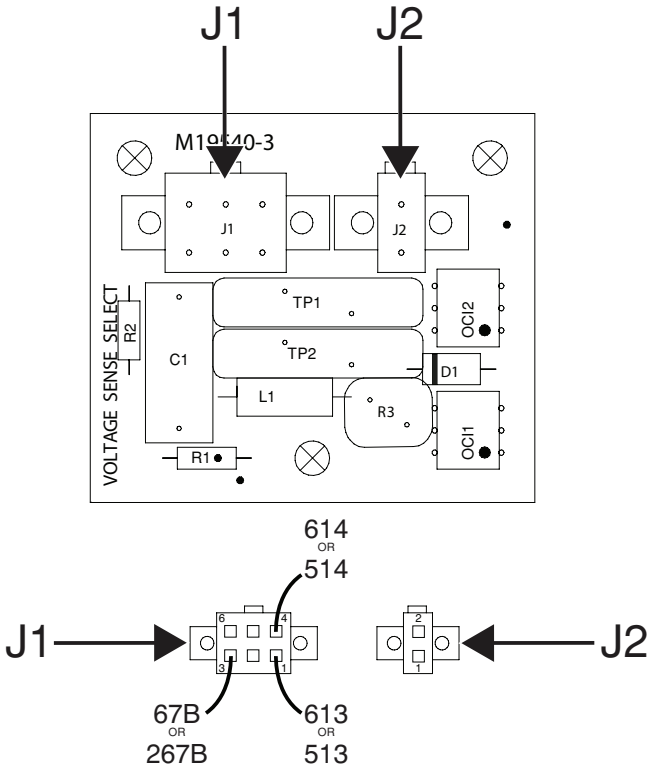


Figure F.11 – Voltage sense board plugs



GAS SOLENOID(S) TEST

⚠ WARNING

Service and repair should be performed only by Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment may result in danger to the technician or 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.

If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

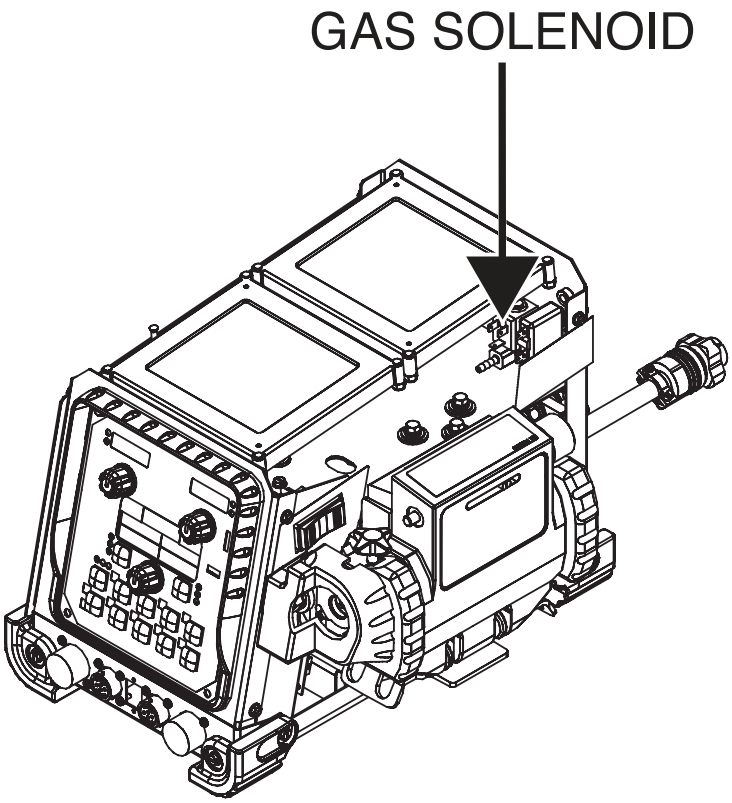
This test will help determine if the Gas Solenoids are functioning properly.

MATERIALS NEEDED

Volt/Ohmmeter
Wiring Diagram

GAS SOLENOID(S) TEST *(continued)*

Figure F.12 – Gas solenoid location



PROCEDURE

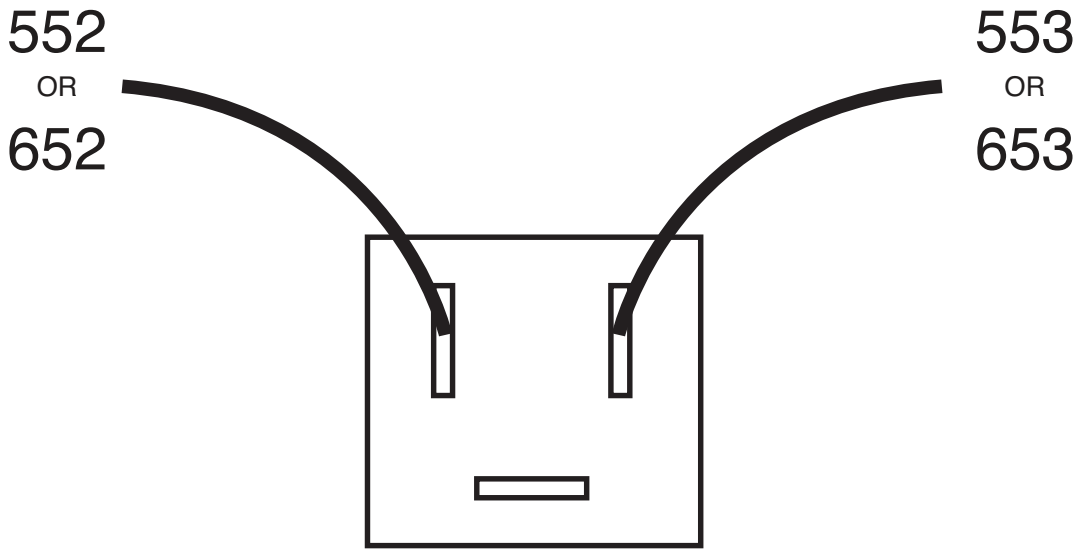
1. Remove input power from the Power Feed 84 wire feeder.
2. Perform the ***Case Cover Removal Procedure***.
3. Locate the gas solenoid to be tested. See Figure F.12.

NOTE: There are two gas solenoids, one on each side of the machine. Test separately.

4. Label and disconnect leads 552 or 652 and 553 or 653 from the gas solenoid. See ***Figure F.13***. See Wiring Diagram.
5. Check the resistance between the two input terminals. Normal resistance should be approximately 21 ohms.
6. Carefully apply 12 VDC to the top two terminals where leads were attached. The gas solenoid should open. If the gas solenoid does not open, it may be faulty.
7. If faulty, perform the ***Gas Solenoid(s) Removal and Replacement Procedure***.
8. If the gas solenoid does open with 12 VDC applied to the terminals, check the condition of the leads from the gas solenoid to the associated wire drive PC board. If the leads are intact, the wire drive PC board may be faulty. Perform the ***Wire Drive PC Board(s) Test***.
9. Remove input power to the machine.
10. Perform the ***Case Cover Replacement Procedure***.

GAS SOLENOID(S) TEST *(continued)*

Figure F.13 – Gas solenoid leads



USER INTERFACE AND USB BOARD TEST

⚠ WARNING

Service and repair should be performed only by Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment may result in danger to the technician or 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.

If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

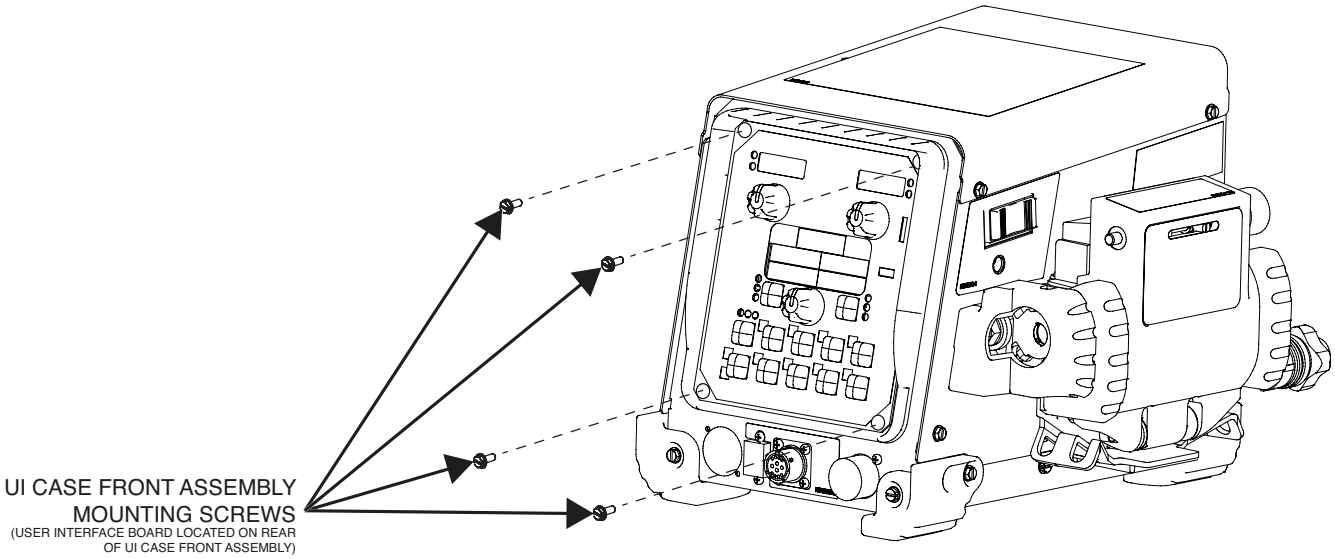
This procedure will help determine if the User Interface and Optional USB Board are receiving the correct voltages.

MATERIALS NEEDED

5/16” Nutdriver
Volt/Ohmmeter
Wiring Diagram

USER INTERFACE AND USB BOARD TEST *(continued)*

Figure F.14 – User interface board location



PROCEDURE

1. Remove input power from the Power Feed 84 wire feeder.
2. Using a 5/16” nutdriver, remove the four screws securing the UI case front assembly to the machine. See Figure F.14.
3. Locate the user interface board and the USB board both located behind the case front. See Figure F.14 and ***Figure F.15***.
4. Carefully apply input power to the machine.
5. Using a volt/ohmmeter, perform voltage tests outlined in ***Table F.1***. and ***Table F.2***. See ***Figure F.16*** and ***F.17***.
6. If any one of these voltage tests fails, check all leads for loose or faulty connections. If all leads are in good condition, the board in question may be faulty.
7. Remove input power to the machine.
8. Perform ***User Interface Board Removal and Replacement Procedure*** and/or the ***USB Board Removal and Replacement Procedure***.
9. Using a 5/16” nutdriver, attach the four screws securing the UI case front assembly to the machine.

USER INTERFACE AND USB BOARD TEST *(continued)*

Figure F.15 – Optional USB PC board location

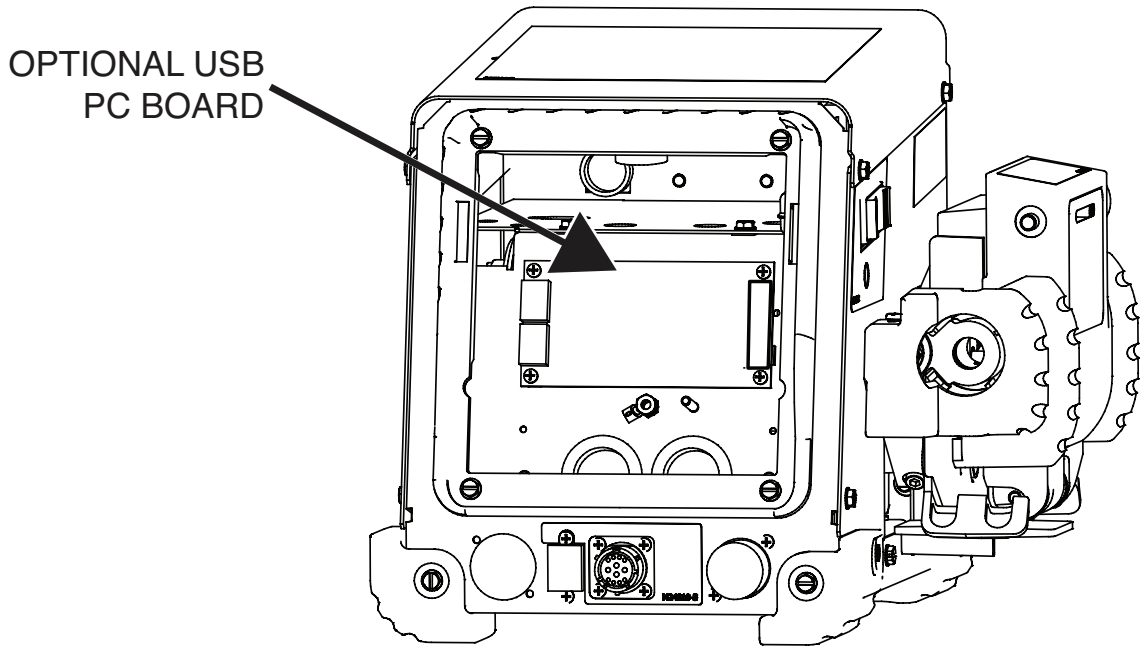


Table F.1 – User interface board test points

DESCRIPTION	TEST POINTS	LEAD NUMBERS	EXPECTED READING	CONDITIONS
INPUT POWER SUPPLY	J31 PIN 4(+) TO J31 PIN 3(–)	540C(+) 500C(–)	40 VDC	INPUT POWER APPLIED TO POWER FEED 84
CAN LINES	J31 PIN 1(+) TO J31 PIN 2(–)	541C(+) 542C(–)	2 VDC	INPUT POWER APPLIED TO POWER FEED 84

Table F.2 – Optional USB board test points

DESCRIPTION	TEST POINTS	LEAD NUMBERS	EXPECTED READING	CONDITIONS
INPUT POWER SUPPLY	J2 PIN 4(+) TO J2 PIN 3(–)	540G(+) 500G(–)	40 VDC	INPUT POWER APPLIED TO POWER FEED 84
CAN LINES	J2 PIN 1(+) TO J2 PIN 2(–)	541G(+) 542G(–)	2 VDC	INPUT POWER APPLIED TO POWER FEED 84
POWER SUPPLY TO USER INTERFACE BOARD	J1 PIN 4(+) TO J1 PIN 3(–)	540H(+) 500H(–)	40 VDC	INPUT POWER APPLIED TO POWER FEED 84
CAN LINES	J1 PIN 1(+) TO J1 PIN 2(–)	541H(+) 542H(–)	2 VDC	INPUT POWER APPLIED TO POWER FEED 84

USER INTERFACE AND USB BOARD TEST *(continued)*

Figure F.16 – User interface board lead locations

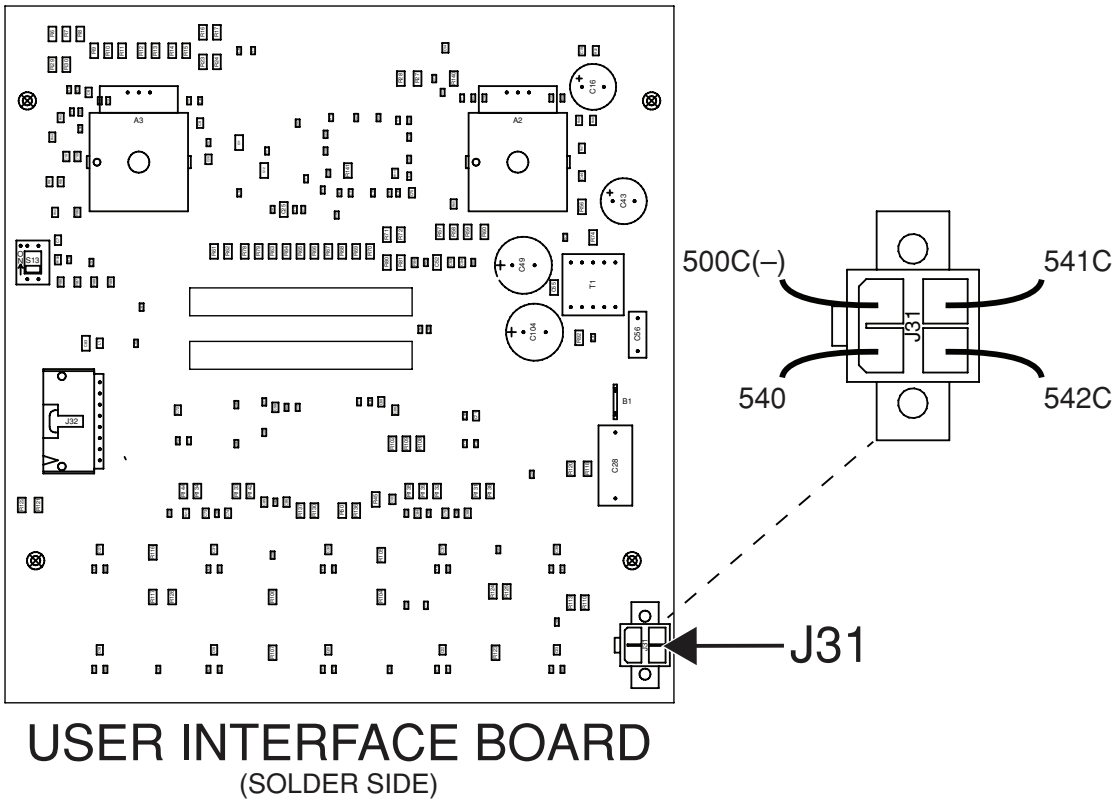
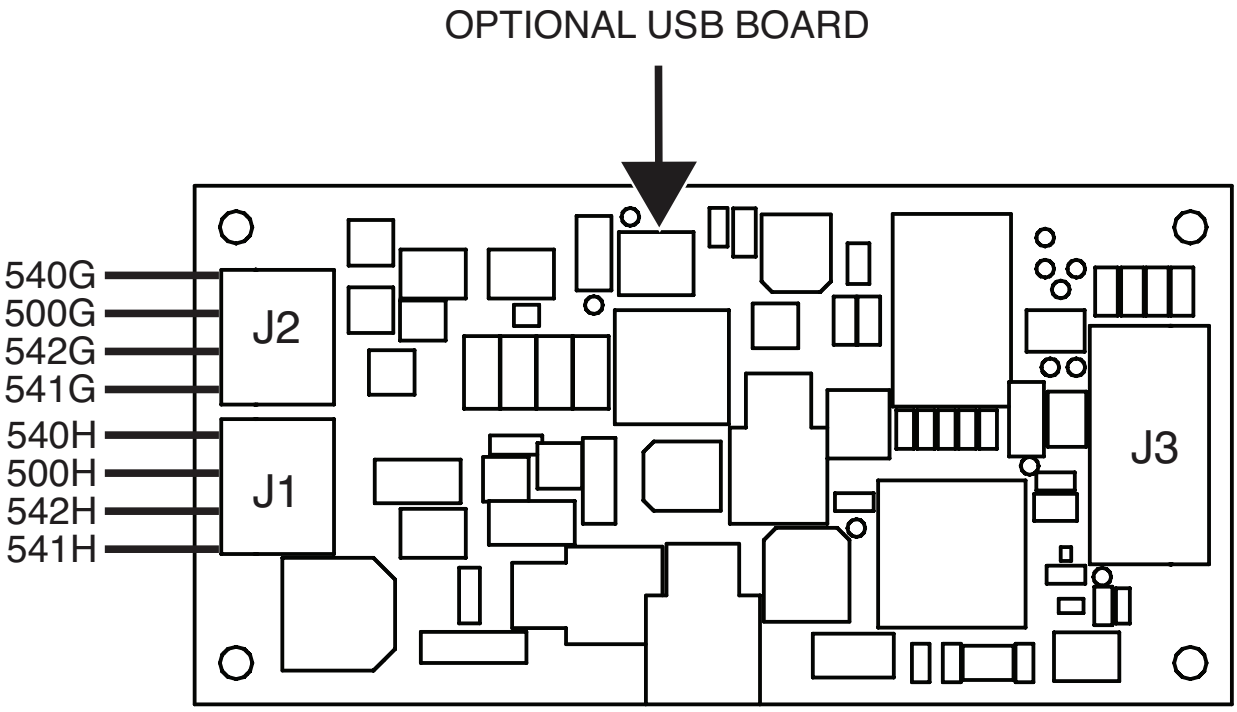


Figure F.17 – Optional USB board lead locations



WIRE DRIVE PC BOARD(S) TEST

⚠ WARNING

Service and repair should be performed only by Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment may result in danger to the technician or 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.

If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

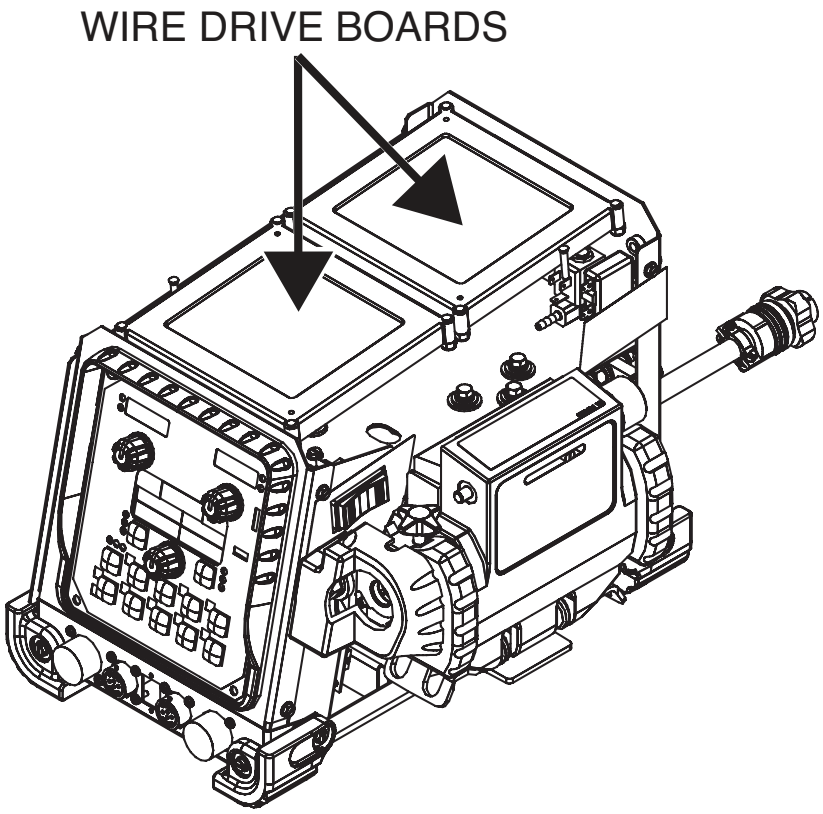
This test will help determine if the Wire Drive PC Board(s) are functioning properly.

MATERIALS NEEDED

Volt/Ohmmeter
Wiring Diagram

WIRE DRIVE PC BOARD(S) TEST *(continued)*

Figure F.18 – Wire drive PC board location



PROCEDURE

1. Remove input power from the Power Feed 84 wire feeder.
2. Perform the ***Case Cover Removal Procedure***.
3. Locate the wire drive PC board. See Figure F.18.

NOTE: Leave wire drive PC boards connected to roof and associated wiring. There are two wire drive PC boards, both located on the inside of the case roof. The board near the front of the machine controls the components on the right side of the Power Feed 84 while the board toward the rear controls components on the left side. Always test separately. See Figure F.18.

4. Carefully apply input power to the machine.
5. Using a volt/ohmmeter, perform voltage test outlined in ***Table F.3***. See ***Figure F.19*** and ***Figure F.20***. See Wiring Diagram.
6. If any one of these voltage tests fails, check all leads for loose or faulty connections. If all leads are in good condition, the wire drive PC board in question may be faulty.
7. Remove input power to the machine.
8. If faulty, perform the ***Wire Drive PC Board(s) Removal and Replacement Procedure***.
9. Perform the ***Case Cover Replacement Procedure***.

WIRE DRIVE PC BOARD(S) TEST *(continued)*

Table F.3 – Wire drive PC board test points

DESCRIPTION	TEST POINTS	LEAD NUMBERS		EXPECTED READING	CONDITIONS
		FRONT BOARD	REAR BOARD		
ARCLINK SUPPLY	J83 PIN 4(+) TO J83 PIN 3(–)	540A 500A	540DUAL 500DUAL	40 VDC	INPUT POWER APPLIED TO POWER FEED 84 FROM ARCLINK RECEPTACLE
CAN LINES	J83 PIN 1(+) TO J83 PIN 2(–)	541A 542A	541DUAL 542DUAL	2 VDC	INPUT POWER APPLIED TO POWER FEED 84 FROM ARCLINK RECEPTACLE
POWER SUPPLY TO USER INTERFACE/USB BOARD	J82 PIN 4(+) TO J82 PIN 3(–)	540C 500C	540C 500C	40 VDC	INPUT POWER APPLIED TO POWER FEED 84 FROM ARCLINK RECEPTACLE
CAN LINES TO USER INTERFACE	J82 PIN 1(+) TO J82 PIN 2(–)	541C 542C	541C 542C	2 VDC	INPUT POWER APPLIED TO POWER FEED 84 FROM ARCLINK RECEPTACLE
RELAY SUPPLY TO VOLTAGE SENSE PC BOARD	J86 PIN 5(+) TO J83 PIN 3(–)	513 500A	613 500DUAL	15 VDC	INPUT POWER APPLIED TO POWER FEED 84 FROM ARCLINK RECEPTACLE
15 VDC TO COLD FEED SWITCH	J85 PIN 5(+) TO J83 PIN 3(–)	586 500A	686 500DUAL	15 VDC	INPUT POWER APPLIED TO POWER FEED 84 FROM ARCLINK RECEPTACLE
RIGHT FEED HEAD CONTACTOR COIL	J86 PIN 9(+) TO J86 PIN 11(–)	549 548	649 648	32 VDC	INPUT POWER APPLIED TO POWER FEED 84, GUN TRIGGER PULLED
LEFT FEED HEAD CONTACTOR COIL	J86 PIN 9(+) TO J86 PIN 11(–)	549 548	649 648	32 VDC	INPUT POWER APPLIED TO POWER FEED 84, GUN TRIGGER PULLED
RIGHT SIDE TACH SUPPLY	J84 PIN 8(+) TO J84 PIN 3(–)	531 534	631 634	5 VDC	INPUT POWER APPLIED TO POWER FEED 84 FROM ARCLINK RECEPTACLE
LEFT SIDE TACH SUPPLY	J84 PIN 8(+) TO J84 PIN 3(–)	531 534	631 634	5 VDC	INPUT POWER APPLIED TO POWER FEED 84 FROM ARCLINK RECEPTACLE
TACH FEEDBACK CHANNEL A	J84 PIN 9(+) TO J84 PIN 3(–)	537 534	637 634	2.5 VDC 900 Hz. @ Min WFS, 2.5 VDC	INPUT POWER APPLIED TO POWER FEED 84 TRIGGER PULLED MOTOR RUNNING
TACH FEEDBACK CHANNEL B	J84 PIN 4(+) TO J84 PIN 3(–)	538 534	638 634	2.5 VDC 900 Hz. @ Min WFS, 2.5 VDC	INPUT POWER APPLIED TO POWER FEED 84 TRIGGER PULLED MOTOR RUNNING
GAS SOLENOID SUPPLY	J86 PIN 8(+) TO J86 PIN 7(–)	552 553	652 653	3.5 VDC GAS FLOWING, 40 VDC GAS NOT FLOWING	INPUT POWER APPLIED TO POWER FEED 84 TRIGGER PULLED MOTOR RUNNING
RIGHT MOTOR ARMATURE VOLTAGE	J84 PIN 1(+) TO J84 PIN 6(–)	550 551	650 651	APPROXIMATELY 2.5 - 32 VDC (DEPENDANT ON WIRE FEED SPEED)	INPUT POWER APPLIED TO POWER FEED 84 TRIGGER PULLED MOTOR RUNNING
LEFT MOTOR ARMATURE VOLTAGE	J84 PIN 1(+) TO J84 PIN 6(–)	550 551	650 651	APPROXIMATELY 2.5 - 32 VDC (DEPENDANT ON WIRE FEED SPEED)	INPUT POWER APPLIED TO POWER FEED 84 TRIGGER PULLED MOTOR RUNNING

WIRE DRIVE PC BOARD(S) TEST *(continued)*

Figure F.19 – Wire drive PC board leads

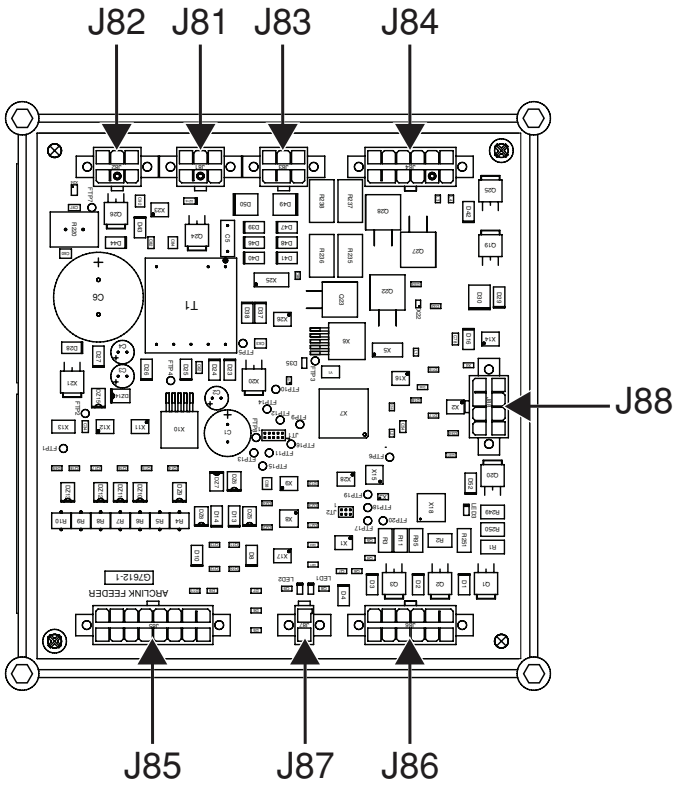
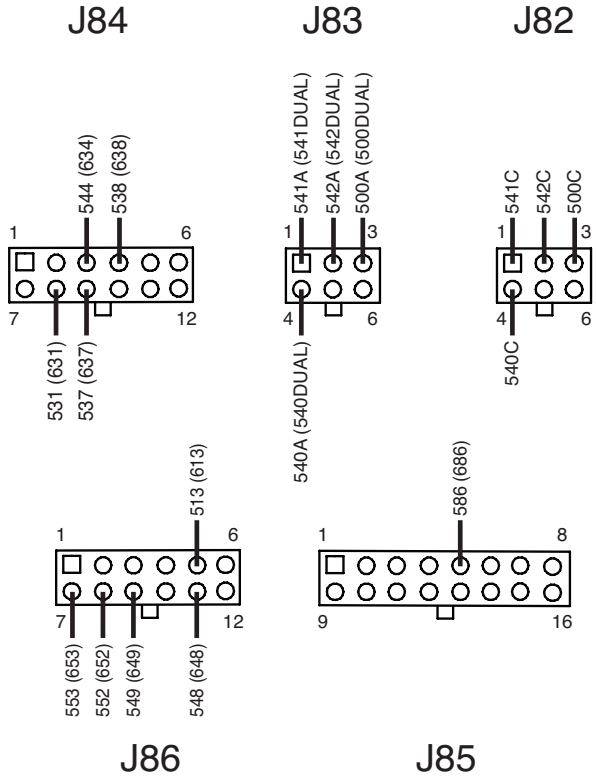


Figure F.20 – Wire drive PC board lead locations



WIRE DRIVE MOTOR(S) TEST

⚠ WARNING

Service and repair should be performed only by Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment may result in danger to the technician or 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.

If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

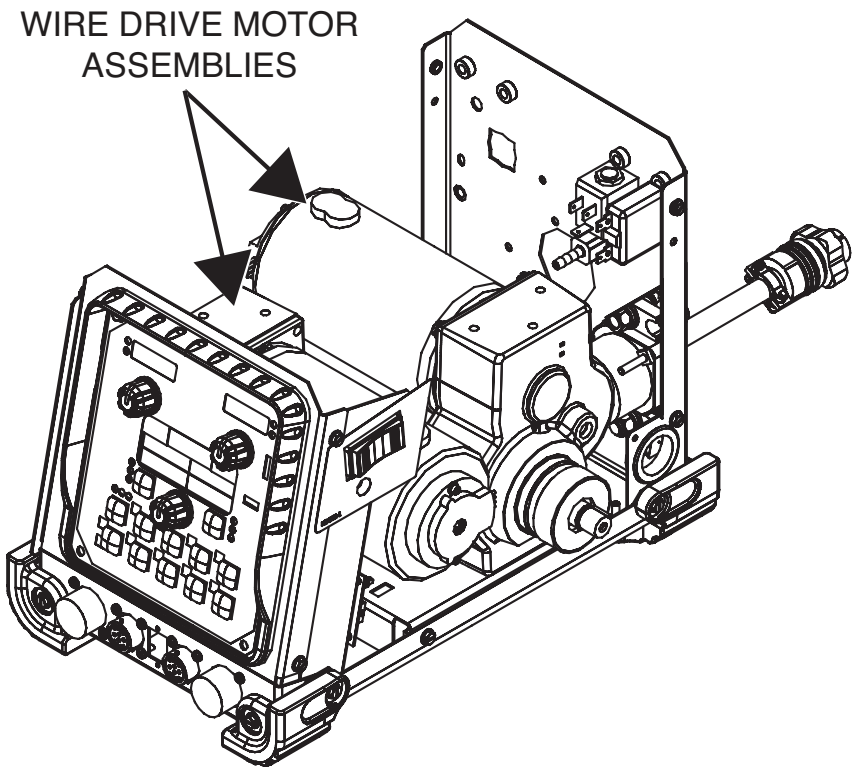
This test will determine if the Wire Drive Motor is recovering the correct voltage, and if it is capable of running properly.

MATERIALS NEEDED

Volt/Ohmmeter
Wiring Diagram

WIRE DRIVE MOTOR(S) TEST *(continued)*

Figure F.21 – Wire drive motor location



PROCEDURE

1. Remove input power from the Power Feed 84 wire feeder.
2. Perform the ***Case Cover Removal Procedure***, for case sides.
3. Locate the drive motor to be tested. See Figure F.21.

NOTE: There are two wire drive motors, one on each side of the machine. Test separately.

4. Locate plug P9 or P19. See Wiring Diagram.
5. Carefully apply input power to the machine.
6. Activate the gun trigger.
7. With the motor running, check for 1 VDC to 32 VDC from white lead (550+ or 650+) to black lead (551- or 651-). See Wiring Diagram.

NOTE: Voltage should vary with motor speed. Motor speed should vary with motor armature voltage.

8. If the correct voltage range is NOT present at the motor leads, check associated leads between the motor being tested and plug J84 on the associated wire drive PC board. See Wiring Diagram. If the leads are intact, the wire drive PC board may be faulty. Perform the ***Wire Drive PC Board(s) Test***.

NOTE: There are two wire drive PC boards. Make certain you are checking leads from the wire drive motor in question to the associated wire drive PC board.

9. If the correct voltages are present at the motor leads and the motor does not run or vary in speed with changes in armature voltage, the wire drive motor may be faulty.
10. Remove input power to the machine.
11. If faulty, perform the ***Wire Drive Motor(s) Removal and Replacement Procedure***.
12. Perform ***Case Cover Replacement Procedure***.

OPTIONAL OUTPUT CONTACTOR TESTS (ELECTRODE TO FEEDPLATE AND GOUGING TO OUTPUT TERMINAL)

⚠ WARNING

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If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

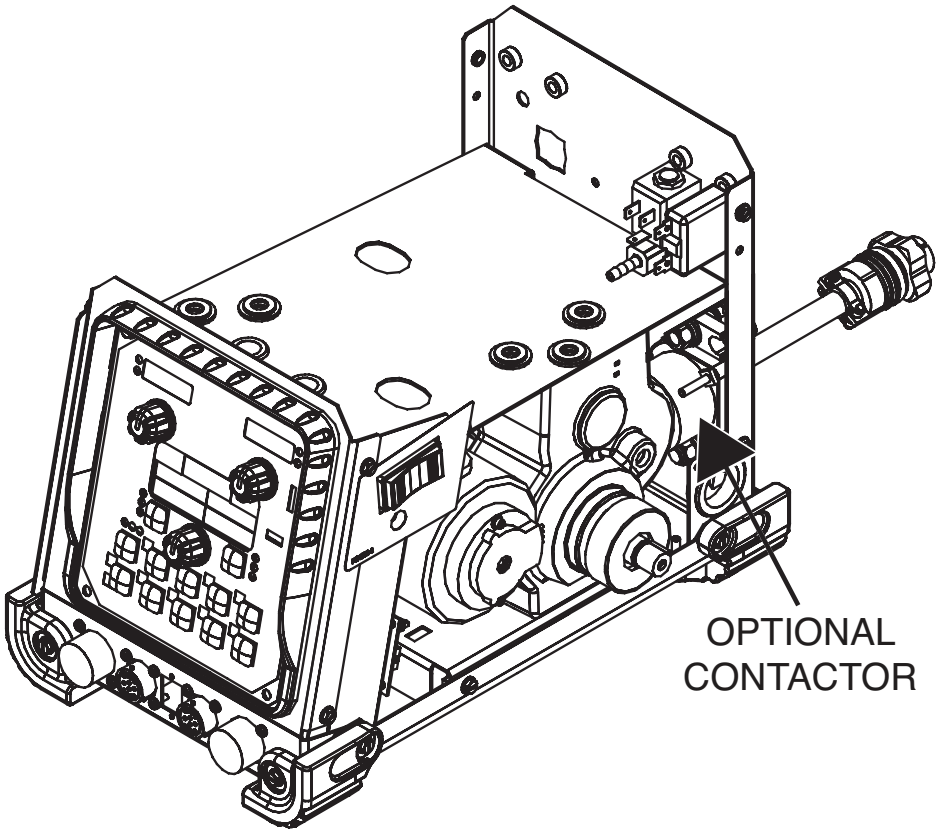
This test will help determine if the Contactor Coils are receiving the correct DC voltage and if the Contacts are closing and opening.

MATERIALS NEEDED

Volt/Ohmmeter
Wiring Diagram
42 VAC Supply

OPTIONAL OUTPUT CONTACTOR TESTS (ELECTRODE TO FEEDPLATE AND GOUGING TO OUTPUT TERMINAL) *(continued)*

Figure F.22 – Contactor location

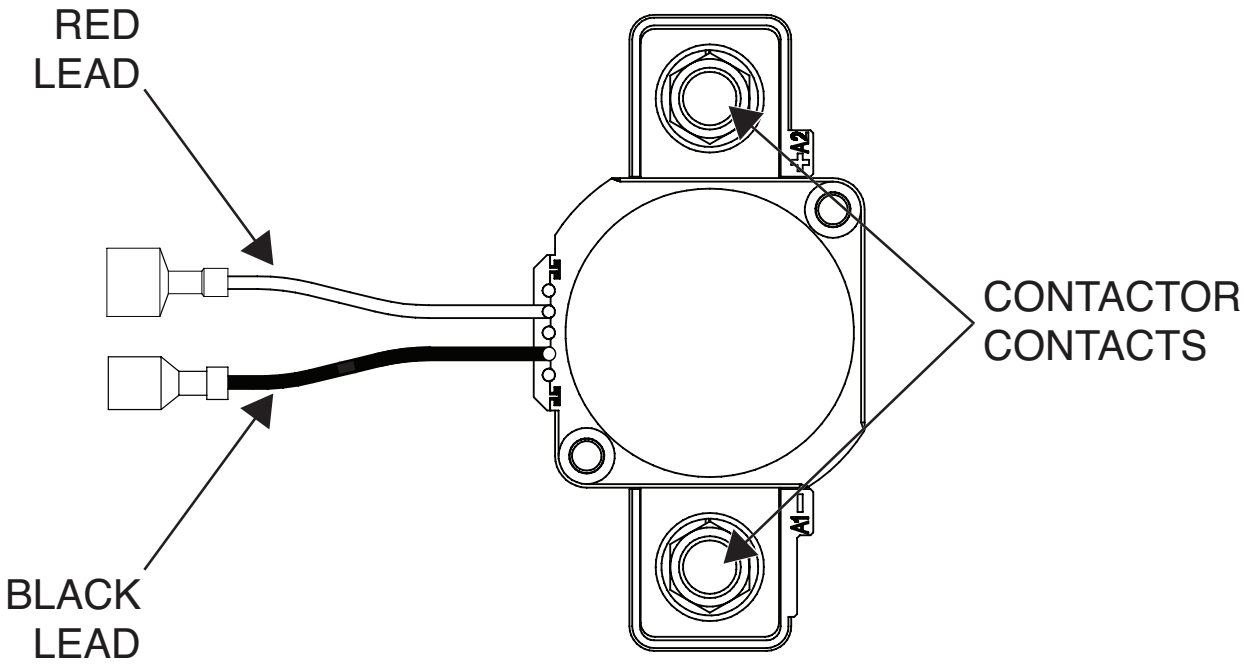


PROCEDURE

1. Remove input power from the Power Feed 84 wire feeder.
2. Perform the ***Case Cover Removal Procedure***, for case sides.
3. Locate the contactor to be tested (electrode to feedplate or gouging to terminal). See Figure F.22.
4. Locate the red and black contactor coil leads (549 or 649 - 548 or 648). See ***Figure F.23***. See Wiring Diagram.
5. Disconnect the red and black leads from the harness at the spade connections.
6. Using a volt/ohmmeter, check the contactor coil resistance. Normal is approximately 80 ohms. Reconnect the red and black contactor coil leads.
7. Carefully apply the correct input power (40 VDC) to the Power Feed 84 wire feeder. With the contactor energized, there should be approximately 32 VDC at the red and black leads. If 40 VDC is measured the contactor coil is open.
8. If the voltage is not present, check the associated leads between the wire drive boards and the contactor coil. See the Wiring Diagram.
9. If the contactor does not activate with the correct DC voltage applied, the contactor may be faulty.
10. With the contactor activated there should be less than one ohm of resistance across the contactor terminals. See Wiring Diagram.
11. When the contactor is not activated, there should be very high resistance across the contactor terminals - more than 500,000 ohms.
12. Reconnect all previously removed leads.
13. Perform the ***Case Cover Replacement Procedure***.

OPTIONAL OUTPUT CONTACTOR TESTS (ELECTRODE TO FEEDPLATE AND GOUGING TO OUTPUT TERMINAL) *(continued)*

Figure F.23 – Red and black contactor leads



COLD INCH/FEED GAS PURGE SWITCH REMOVAL AND REPLACEMENT PROCEDURE

⚠ WARNING

Service and repair should be performed only by Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment may result in danger to the technician or 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.

If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

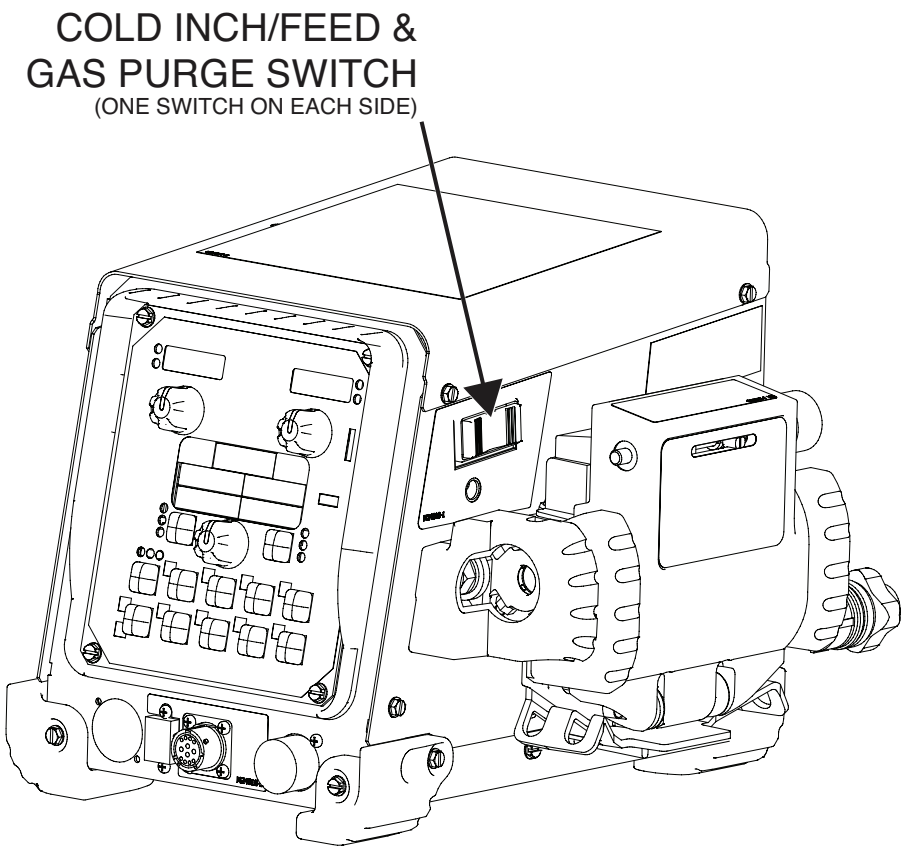
This procedure will aid the technician in the removal and replacement of the Cold Inch/Feed Gas Purge Switch(s).

MATERIALS NEEDED

Wiring Diagram

COLD INCH/FEED GAS PURGE SWITCH REMOVAL AND REPLACEMENT PROCEDURE *(continued)*

Figure F.24 – Cold inch/feed gas purge switch location

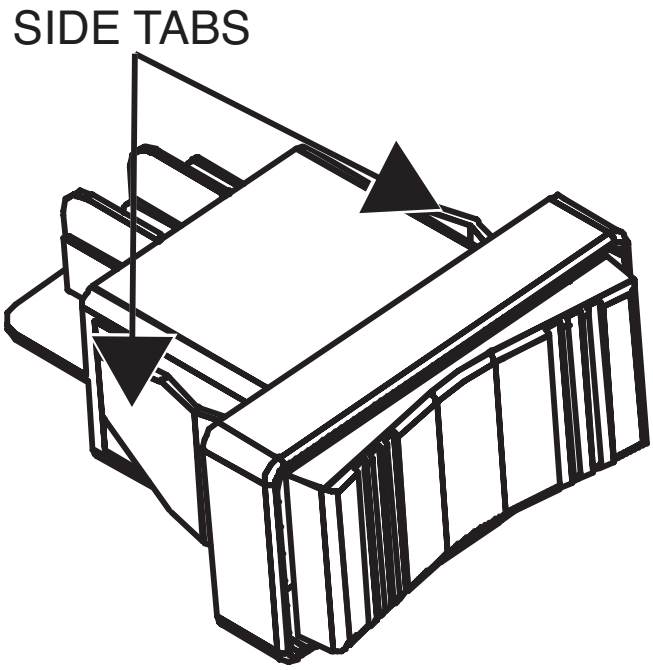


REMOVAL PROCEDURE

1. Remove input power from the Power Feed 84 wire feeder.
2. Perform the ***Case Cover Removal Procedure***.
3. Locate the cold inch/feed gas purge switch. See Figure F.24.
4. Label and disconnect leads 535, 586 and 579 from the right side cold inch/feed gas purge switch or leads 635, 686 and 679 from the left side cold inch/feed gas purge switch. See Wiring Diagram.
5. Squeeze the side tabs of the switch and push the switch outward and away from the machine. See ***Figure F.25***.
6. The cold inch/feed gas purge switch(s) can now be replaced.

COLD INCH/FEED GAS PURGE SWITCH REMOVAL AND REPLACEMENT PROCEDURE *(continued)*

Figure F.25 – Cold inch/feed gas purge switch removal



REPLACEMENT PROCEDURE

1. Carefully position new switch in machine and press firmly to seat switch in it's mount.
2. Connect leads 535, 586 and 579 to the right side cold inch/feed gas purge switch and/or leads 635, 686 and 679 to the left side cold inch/feed gas purge switch. See Wiring Diagram.
3. Perform the ***Case Cover Replacement Procedure***.

VOLTAGE SENSE BOARD(S) REMOVAL AND REPLACEMENT PROCEDURE

⚠ WARNING

Service and repair should be performed only by Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment may result in danger to the technician or 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.

If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

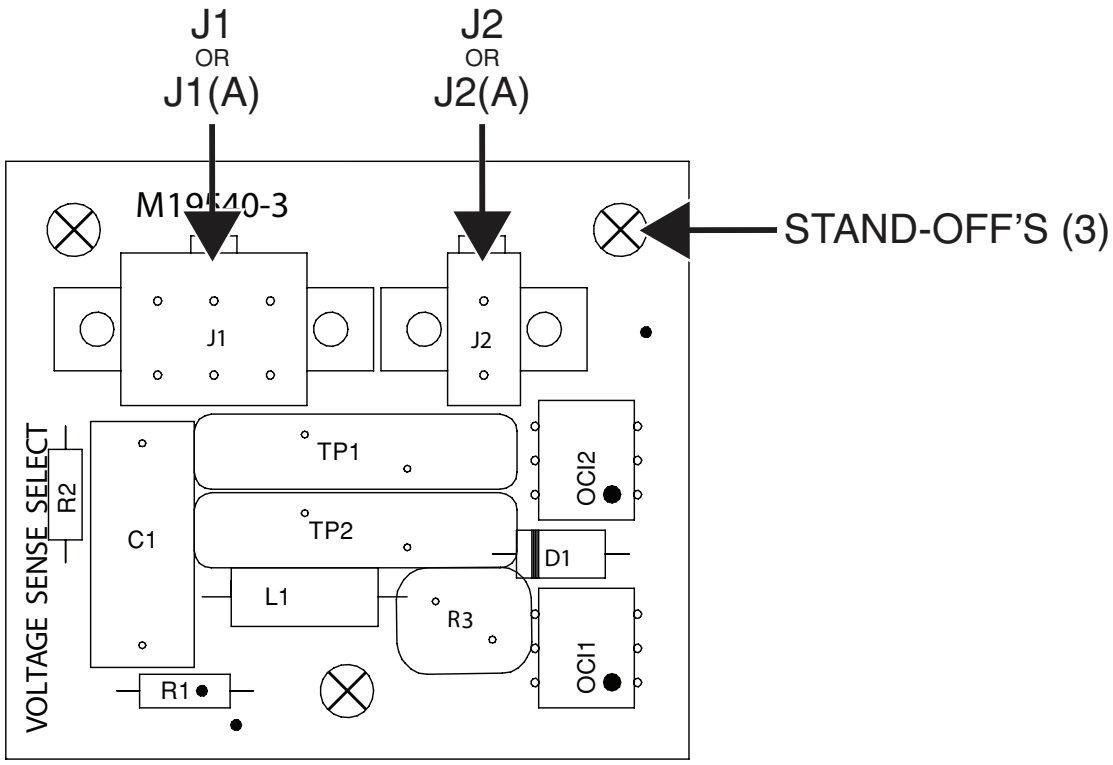
This procedure will aid the technician in the removal and replacement of the Voltage Sense Board(s).

MATERIALS NEEDED

Wiring Diagram

VOLTAGE SENSE BOARD(S) REMOVAL AND REPLACEMENT PROCEDURE *(continued)*

Figure F.26 – Voltage sense board leads

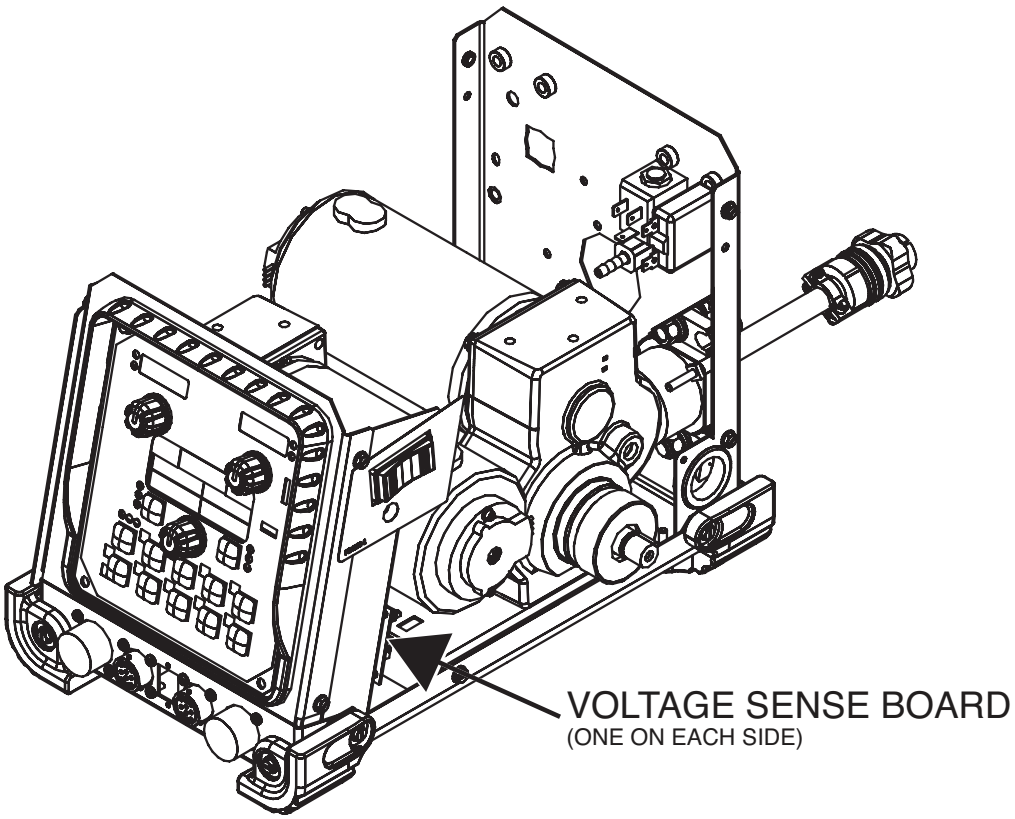


REMOVAL PROCEDURE

1. Remove input power from the Power Feed 84 wire feeder.
2. Perform the ***Case Cover Removal Procedure***.
3. Label and disconnect plugs J1 and J2 from the right voltage sense board and/or plugs J1(A) and J2(A) from the left voltage sense board. See Figure F.26. See Wiring Diagram.
4. Carefully remove the voltage sense board from the three stand-offs securing the board to the machine. See ***Figure F.27***.

VOLTAGE SENSE BOARD(S)
REMOVAL AND REPLACEMENT PROCEDURE *(continued)*

Figure F.27 – Voltage sense board location



REPLACEMENT PROCEDURE

1. Carefully position new voltage sense board in machine and press firmly to mount on the three stand-offs.
2. Connect plugs J1 and J2 to the right voltage sense board and/or plugs J1(A) and J2(A) to the left voltage sense board. See Wiring Diagram.
3. Perform the ***Case Cover Replacement Procedure***.

GAS SOLENOID(S)
REMOVAL AND REPLACEMENT PROCEDURE

⚠ WARNING

Service and repair should be performed only by Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment may result in danger to the technician or 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.

If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

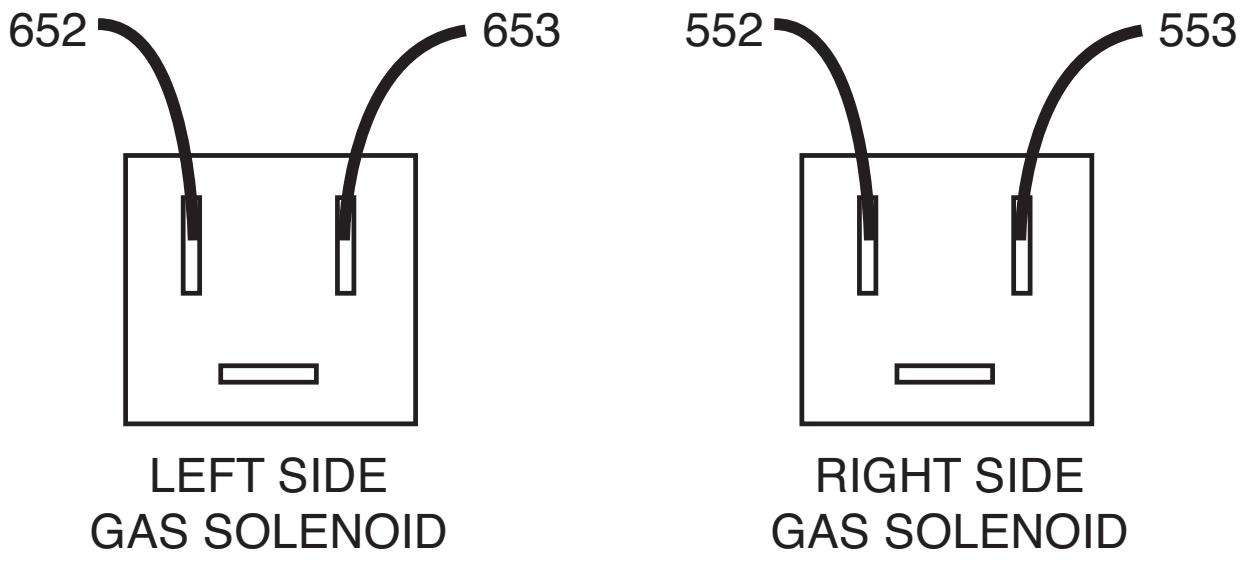
This procedure will aid the technician in the removal and replacement of the Gas Solenoid(s).

MATERIALS NEEDED

Slotted Screwdriver
Hammer
Needle-nose Pliers
Wiring Diagram

GAS SOLENOID(S)
REMOVAL AND REPLACEMENT PROCEDURE *(continued)*

Figure F.28 – Gas solenoid leads

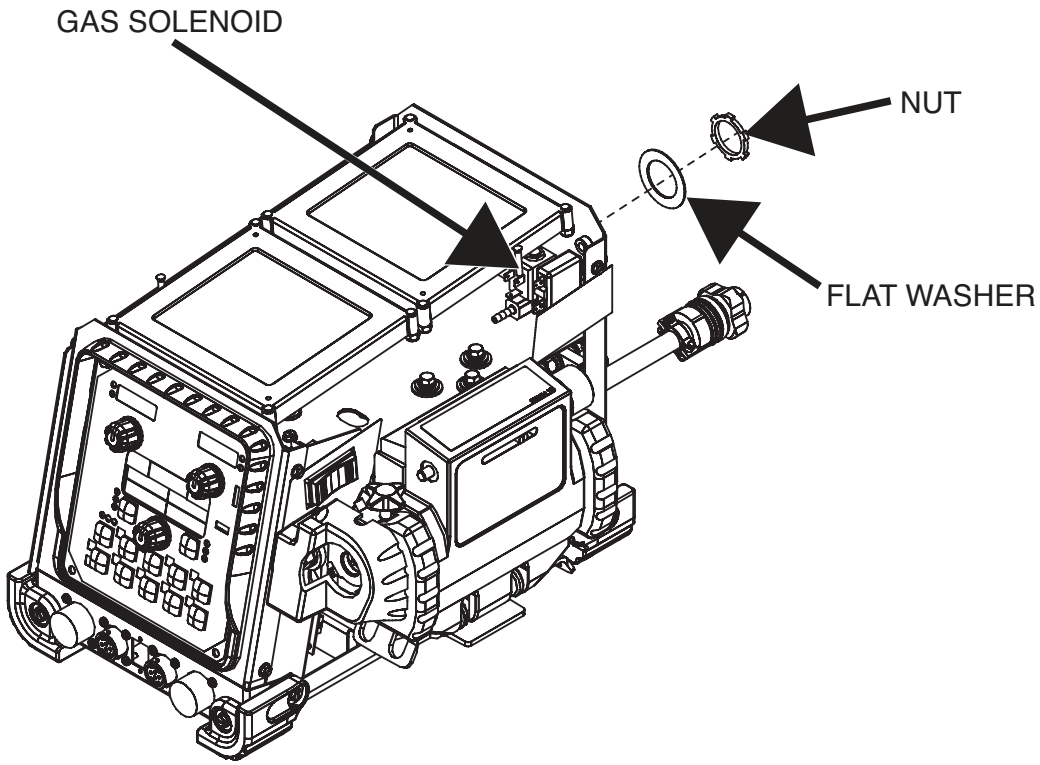


REMOVAL PROCEDURE

1. Remove input power from the Power Feed 84 wire feeder.
2. Perform the ***Case Cover Removal Procedure***.
3. Label and disconnect leads from the gas solenoid (652 and 653 for left gas solenoid, 552 and 553 for right gas solenoid). See Figure F.28. See Wiring Diagram.
4. Using a slotted screwdriver and a hammer, remove the nut and flat washer securing the gas solenoid to the rear of the machine. See ***Figure F.29***. Repeat procedure for second gas solenoid if necessary.
5. Using needle-nose pliers, loosen the hose clamp and disconnect the gas hose from the gas solenoid. See ***Figure F.29***. Repeat procedure for second gas solenoid if necessary.
6. The gas solenoid(s) can now be removed and replaced.

GAS SOLENOID(S)
REMOVAL AND REPLACEMENT PROCEDURE *(continued)*

Figure F.29 – Gas solenoid removal



REPLACEMENT PROCEDURE

1. Carefully position the new gas solenoid(s) into the rear panel of the machine.
2. Attach the nut and flat washer securing the gas solenoid to the rear panel of the machine.
3. Attach the gas hose and secure the hose clamp to the gas solenoid.
4. Connect leads to the gas solenoid (652 and 653 for left gas solenoid, 552 and 553 for right gas solenoid). See Wiring Diagram.
5. Perform the ***Case Cover Replacement Procedure***.

USER INTERFACE BOARD REMOVAL AND REPLACEMENT PROCEDURE

⚠ WARNING

Service and repair should be performed only by Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment may result in danger to the technician or 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.

If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

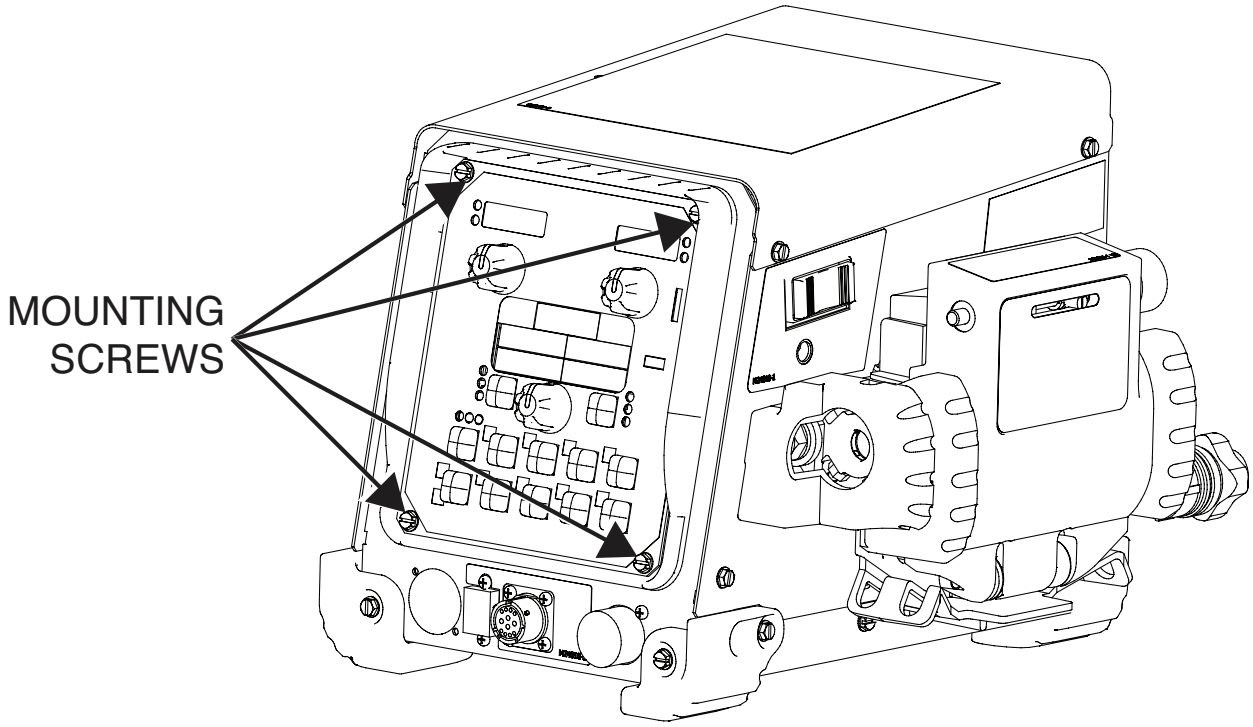
This procedure will aid the technician in the removal and replacement of the User Interface Board.

MATERIALS NEEDED

5/16” Nutdriver
5/64” Allen Wrench
Phillips Screwdriver
Wiring Diagram

USER INTERFACE BOARD
REMOVAL AND REPLACEMENT PROCEDURE *(continued)*

Figure F.30 – UI case front assembly mounting screws



REMOVAL PROCEDURE

1. Remove input power from the Power Feed 84 wire feeder.
2. Using a 5/16” nutdriver, remove the four screws securing the UI case front assembly to the machine. See Figure F.30.
3. Label and disconnect plug J31 from the user interface board. See ***Figure F.31***. See Wiring Diagram.
4. Using a 5/64” allen wrench, loosen the set screw and remove the three knobs. Note felt washer placement for reassembly (top two knobs only). See ***Figure F.32***.
5. Using a phillips screwdriver, remove the four screws and washers securing the user interface board to the nameplate. See ***Figure F.31***.
6. The user interface board can now be removed and replaced.

USER INTERFACE BOARD
REMOVAL AND REPLACEMENT PROCEDURE *(continued)*

Figure F.31 – User interface board (solder side)

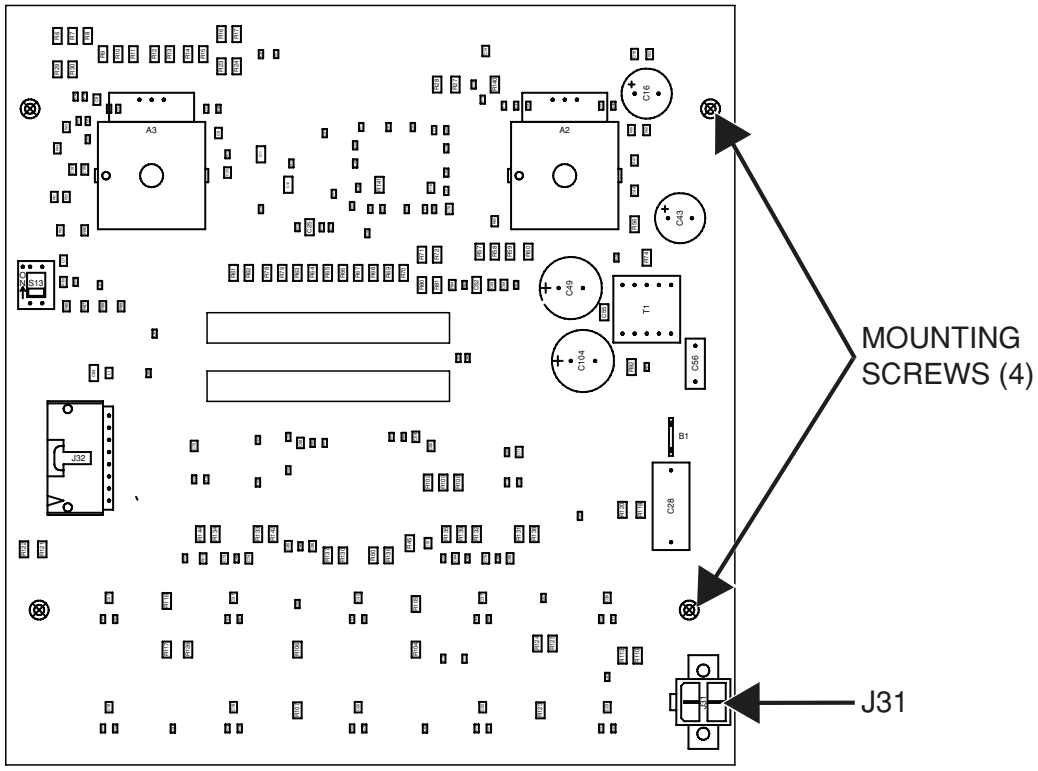
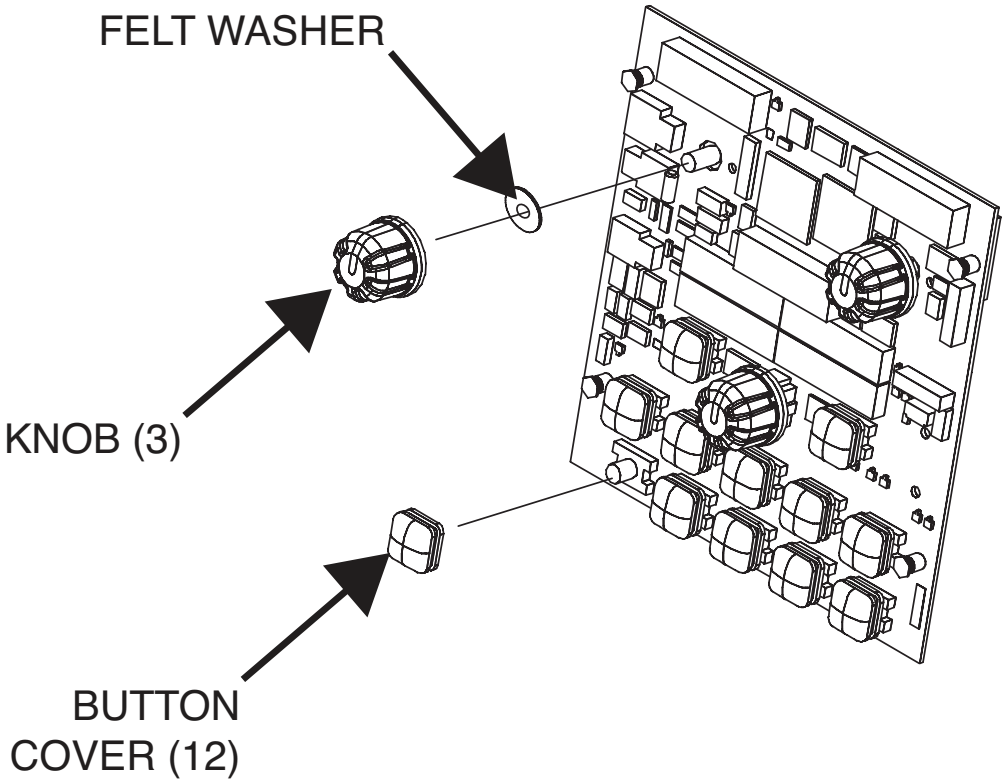


Figure F.32 – Knob removal



USER INTERFACE BOARD
REMOVAL AND REPLACEMENT PROCEDURE *(continued)*

REPLACEMENT PROCEDURE

1. Carefully position new user interface board on back of nameplate.
2. Using a phillips screwdriver, attach the four screws and washers securing the user interface board to the nameplate.
3. Place felt washer onto knob shaft for the top two knobs to be secured.
4. Using a 5/64" allen wrench, attach knobs and tighten the set screw. Repeat for each of the three knobs.
5. Connect plug J31 to the user interface board. See Wiring Diagram.
6. Using a 5/16" nutdriver, attach the four screws securing the UI case front assembly to the machine.

OPTIONAL USB PC BOARD REMOVAL AND REPLACEMENT PROCEDURE

⚠ WARNING

Service and repair should be performed only by Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment may result in danger to the technician or 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.

If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

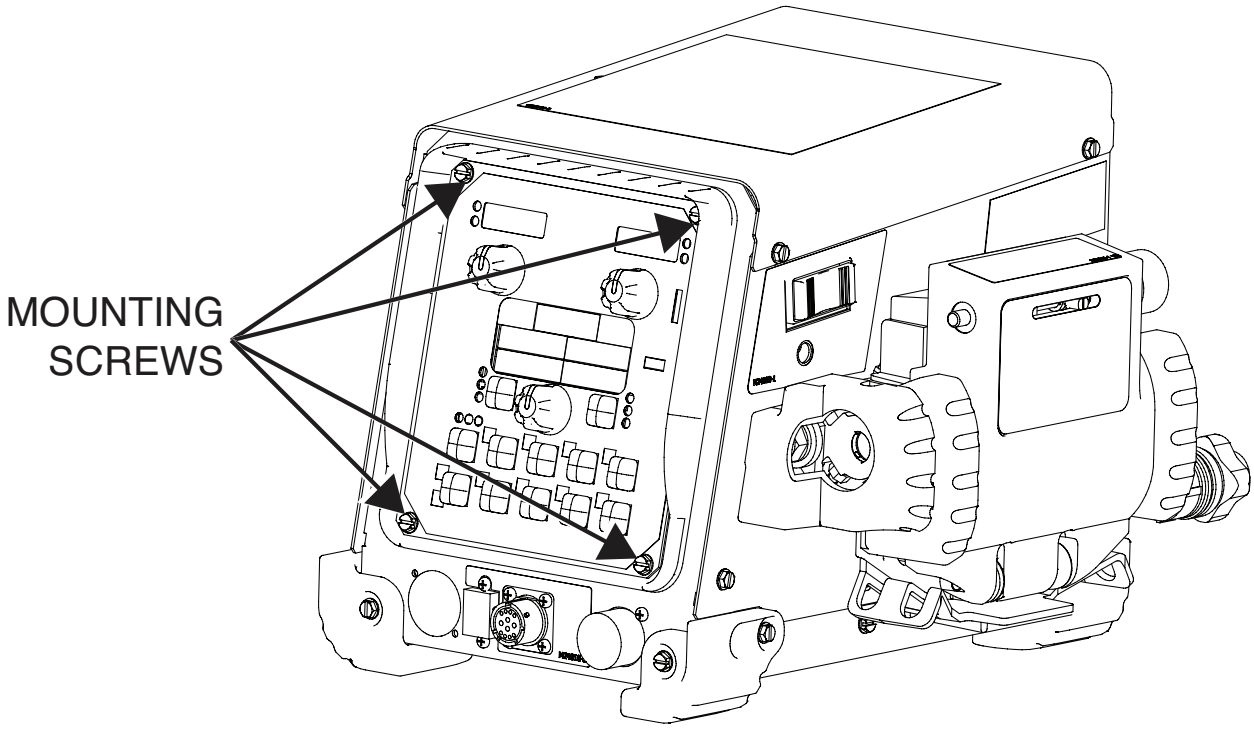
This procedure will aid the technician in the removal and replacement of the Optional USB PC Board.

MATERIALS NEEDED

5/16” Nutdriver
Phillips Screwdriver
Wiring Diagram

OPTIONAL USB PC BOARD REMOVAL AND REPLACEMENT PROCEDURE *(continued)*

Figure F.33 – UI case front assembly mounting screws

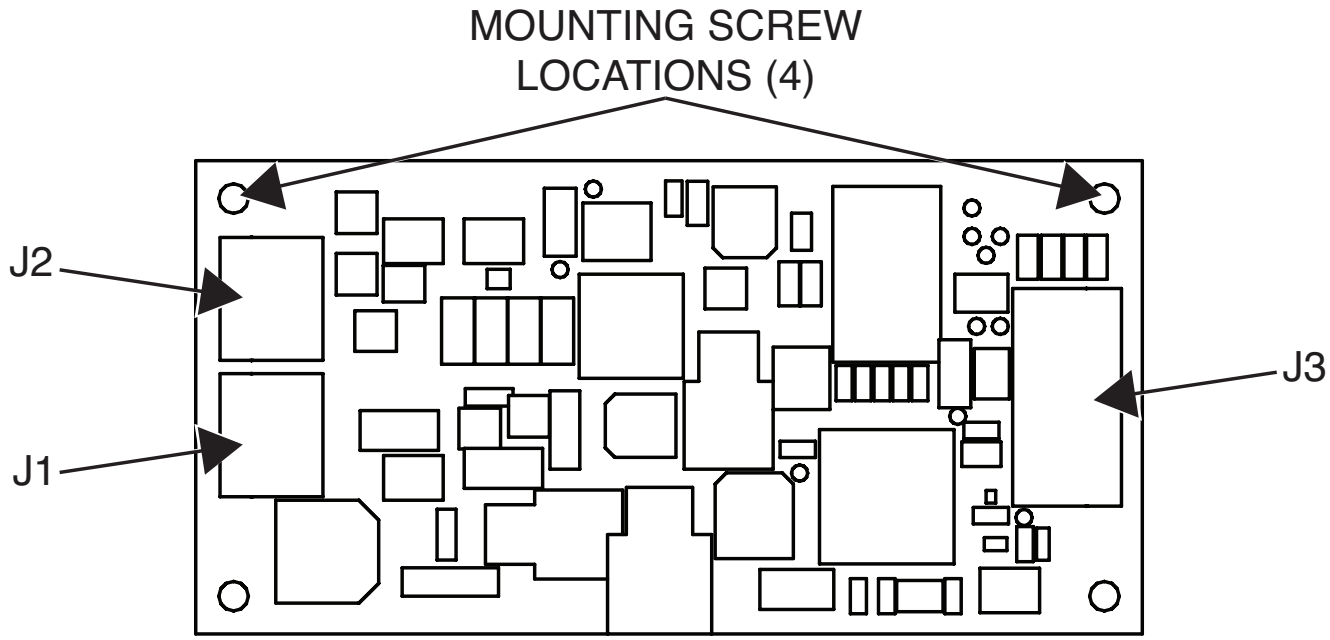


REMOVAL PROCEDURE

1. Remove input power from the Power Feed 84 wire feeder.
2. Using a 5/16” nutdriver, remove the four screws securing the UI case front assembly to the machine. See Figure F.33.
3. Label and disconnect plugs J1, J2 and J3 from the optional USB PC board. See ***Figure F.34***. See Wiring Diagram.
4. Using a phillips screwdriver, remove the four screws and washers securing the optional USB PC board to the machine. See ***Figure F.34***.
5. The optional USB PC board can now be removed and replaced.

OPTIONAL USB PC BOARD REMOVAL AND REPLACEMENT PROCEDURE *(continued)*

Figure F.34 – USB PC board plug locations



REPLACEMENT PROCEDURE

1. Carefully place new optional USB PC board into machine.
2. Using a phillips screwdriver, attach the four screws and washers securing the optional USB PC board to the machine.
3. Connect plugs J1, J2 and J3 to the optional USB PC board. See Wiring Diagram.
4. Using a 5/16” nutdriver, attach the four screws securing the UI case front assembly to the machine.

WIRE DRIVE PC BOARD(S) REMOVAL AND REPLACEMENT PROCEDURE

⚠ WARNING

Service and repair should be performed only by Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment may result in danger to the technician or 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.

If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

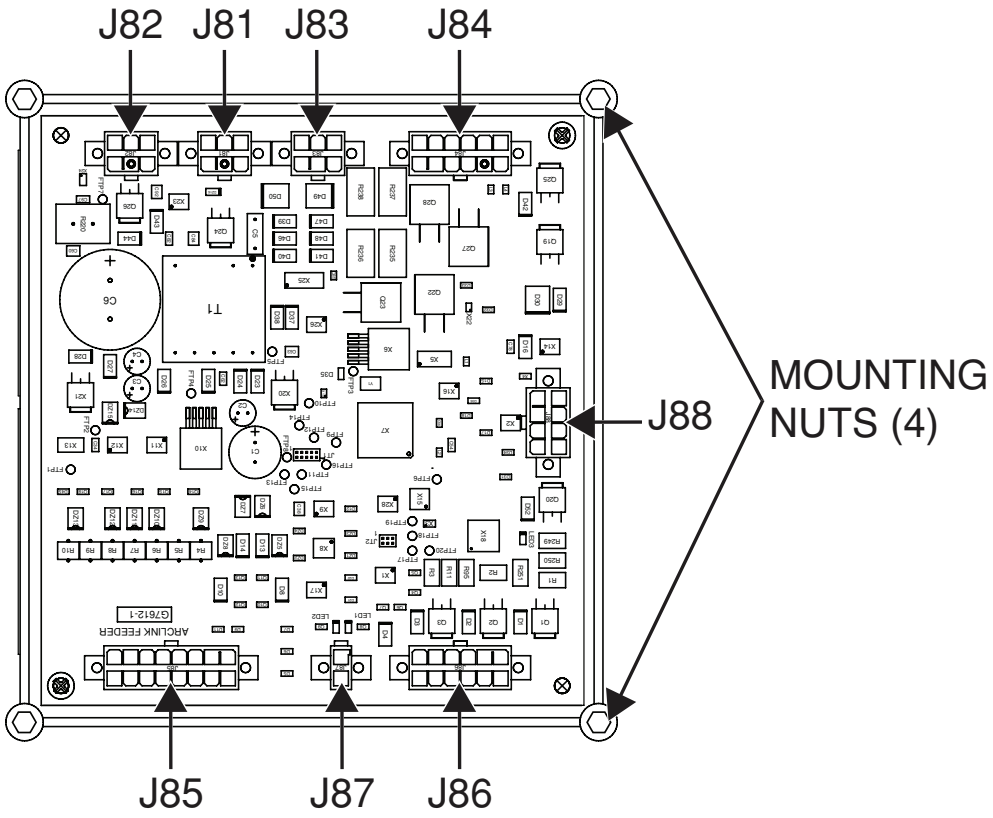
This procedure will aid the technician in the removal and replacement of the Wire Drive PC Board(s).

MATERIALS NEEDED

3/8” Nutdriver
Needle-nose Pliers
Wiring Diagram

WIRE DRIVE PC BOARD(S) REMOVAL AND REPLACEMENT PROCEDURE *(continued)*

Figure F.35 – Wire drive PC board lead locations



REMOVAL PROCEDURE

1. Remove input power from the Power Feed 84 wire feeder.
2. Perform the ***Case Cover Removal Procedure***.
3. Using a 3/8” nutdriver, remove the four nuts securing the wire drive PC board to the roof panel. Repeat step for the other board. Note position for reassembly. See Figure F.35.
4. The boards can now be removed and replaced.

WIRE DRIVE PC BOARD(S) REMOVAL AND REPLACEMENT PROCEDURE *(continued)*

REPLACEMENT PROCEDURE

1. Carefully position the new wire drive PC board on the roof panel in the proper position.
2. Using a 3/8" nutdriver, attach the four screws securing the wire drive PC board to the roof panel.
3. Perform the ***Case Cover Replacement Procedure***.

PAIRING PROCEDURE

All wire drive PC boards are the same. They are not set as "single" or "dual" wire drives, they are just wire drive PC boards and all have the same software. So a wire drive PC board from a single power feed 84 can be put into a dual power feed 84 and vice versa.

As for pairing in the field, most of it is automatic and does not require user intervention.

1. **For auto-pairing to occur, the user interface on the power feed 84 must be the only user interface in the system** (Stick/TIG user interfaces on the S-Series machines do not count). So no other feeders or MAXsa pendants should be connected via ArcLink.
2. Most pairing will happen automatically in the field without user intervention. You may see the feeder display "Configuration Changed" and restart once or twice:
    - If you replace one wire drive PC board in a single power feed 84, it will re-pair itself automatically with the new wire drive.
    - If you replace one wire drive PC board in a power feed 84 dual, it will re-pair itself automatically with the new wire drive and link the new wire drive with the Head that was just replaced. So, if you replace the wire drive PC board for head 1, the user interface will pair with the new wire drive PC board and automatically link it to Head 1.
3. The only manual pairing occurs if you replace both wire drive PC boards in a power feed 84 dual:
    - The user interface will come up and ask the operator to pair the wire drive PC boards. It will blink the status LED of one of the boards and say "Is this Head 1". If it is, the operator says yes and the user interface pairs the wire drive PC boards accordingly and links them to the correct head.
4. The user interface will always remember the last wire drive PC board it was paired with. It will not "forget" it until it is paired with another wire drive PC board.
5. The power feed 84 user interface also pairs with the USB board, if installed. This works the same way as pairing with a single wire drive.

As long as you are replacing one board at a time, you should never run into a problem. Just remember to only have one feeder (the one you replaced the boards in) connected to the power source via ArcLink the next time you power up so that the user interface can run its auto-pairing routine. If you replace both wire drive PC boards at once, it requires some user intervention, but its simple and the user interface will walk you through it.

MOTOR AND GEAR BOX ASSEMBLY REMOVAL AND REPLACEMENT PROCEDURE

⚠ WARNING

Service and repair should be performed only by Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment may result in danger to the technician or 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.

If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

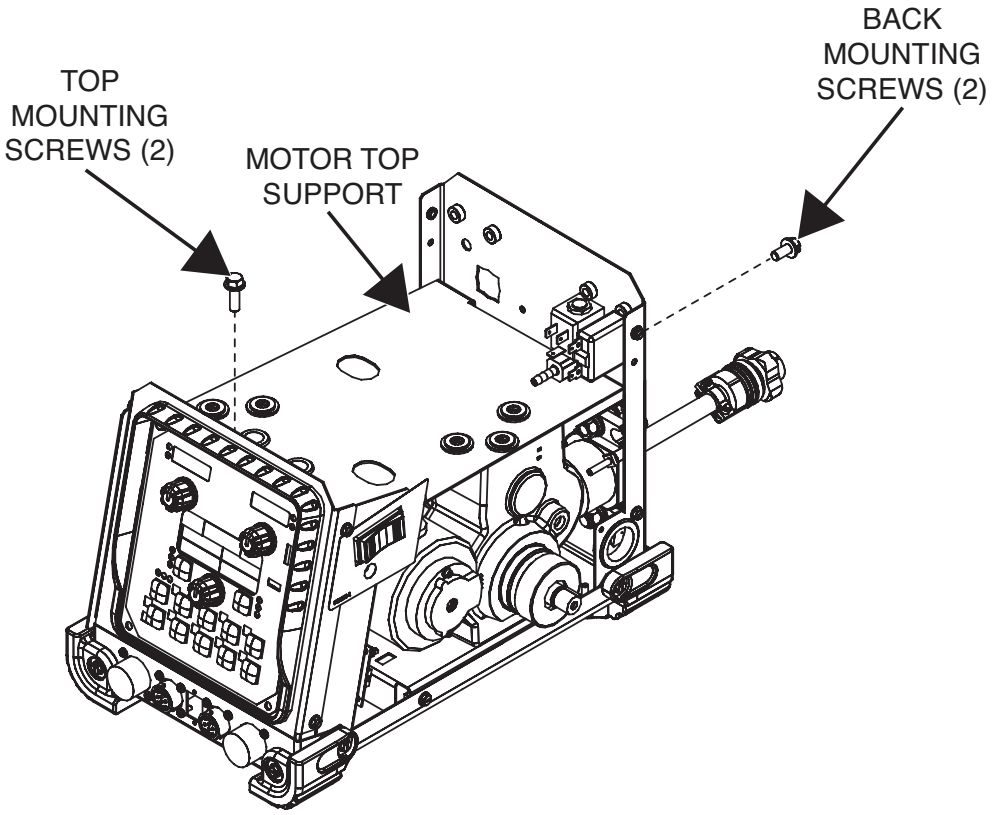
This procedure will aid the technician in the removal and replacement of the Motor And Gear Box Assembly.

MATERIALS NEEDED

7/16” Nutdriver
5/16” Nutdriver
Phillips Screwdriver
3/4” Nutdriver
Needle-nose Pliers
5/32” Allen Wrench
3/16” Allen Wrench
3/32” Allen Wrench
Wiring Diagram

MOTOR AND GEAR BOX ASSEMBLY REMOVAL AND REPLACEMENT PROCEDURE *(continued)*

Figure F.36 – Motor top support mounting screws



REMOVAL PROCEDURE

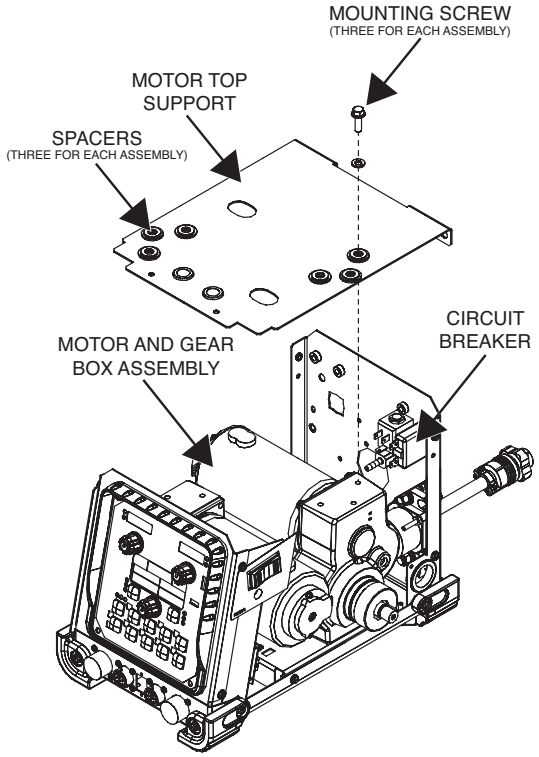
1. Remove input power from the Power Feed 84 wire feeder.
2. Perform the ***Case Cover Removal Procedure***.
3. Perform the ***Gas Solenoid(s) Removal Procedure***.
4. Label and disconnect leads 600B and 600S from the left circuit breaker and leads 500B and 500S from the right circuit breaker. See ***Figure F.37***. See Wiring Diagram.
5. Using a 5/16" nutdriver, remove the four screws (two on top and two on the back) securing the motor top support to the machine. See Figure F.36.
6. Using a 7/16" nutdriver, remove the six bolts and washers securing the motor top support to the motor and gear box assembly. Note spacer placement for reassembly. See ***Figure F.37***.
7. The motor top support can now be moved to allow access to components below.
8. Using a phillips screwdriver, remove the screw and washer securing the gun adapter cover to the gear box assembly. See ***Figure F.38***. Repeat this step for each motor and gear box assembly if necessary.
9. Using a 3/4" nutdriver, remove the bolt and washers securing the heavy black lead to the gun adapter. See ***Figure F.39***. See Wiring Diagram. Repeat this step for each motor and gear box assembly if necessary.
10. Label and disconnect plug 19 from the left tachometer and plug 9 from the right tachometer. See Wiring Diagram.
11. Using needle-nose pliers, loosen hose clamp securing gas hose to gun adapter. See ***Figure F.40***. Repeat this step for each motor and gear box assembly if necessary.
12. Disconnect the gas hose from the gun adapter. See ***Figure F.41***. Repeat this step for each motor and gear box assembly if necessary.
13. Using a phillips screwdriver, label and disconnect the screw and washer securing lead #167B from the left gun adapter and lead #67B from the right gun adapter. See ***Figure F.42***. See Wiring Diagram.
14. Using a 5/16" nutdriver, remove the four screws (two on each side) securing the motor bottom support to the machine. See ***Figure F.43***.
15. Carefully maneuver and remove entire motor and gear box assembly out of the machine.

NOTE: It may be necessary to route gas hoses out of the way to allow for the removal of the motor and gear box assembly.

16. Using a 7/16" nutdriver, remove the three bolts and washers securing the motor bottom support to the motor and gear box assembly. See ***Figure F.44***. Repeat this step for each motor and gear box assembly if necessary.

MOTOR AND GEAR BOX ASSEMBLY REMOVAL AND REPLACEMENT PROCEDURE *(continued)*

Figure F.37 – Top motor support and circuit breaker location



REMOVING DRIVE MOTOR FROM THE GEAR BOX

17. Using a 5/32” allen wrench, remove the six allen type screws and washers securing the drive motor to the gear box. Note gasket placement for reassembly. See ***Figure F.45***.

REMOVING THE WIRE DRIVE ASSEMBLY FROM THE GEAR BOX

18. Using a 3/16” allen wrench, remove the two allen type screws at the bottom of the wire drive unit. See ***Figure F.46***.
19. Carefully maneuver and remove the wire drive assembly from the gear box assembly.

REMOVING THE TACHOMETER FROM THE MOTOR

20. Using a 3/32” allen wrench, remove the two allen type screws securing the tachometer to the motor. See ***Figure F.47***.
21. Label and disconnect the blue, red, yellow and black leads from plug P9/P19. Note lead placement for reassembly. See Wiring Diagram.

MOTOR AND GEAR BOX ASSEMBLY
REMOVAL AND REPLACEMENT PROCEDURE *(continued)*

Figure F.38 – Gun adapter cover removal

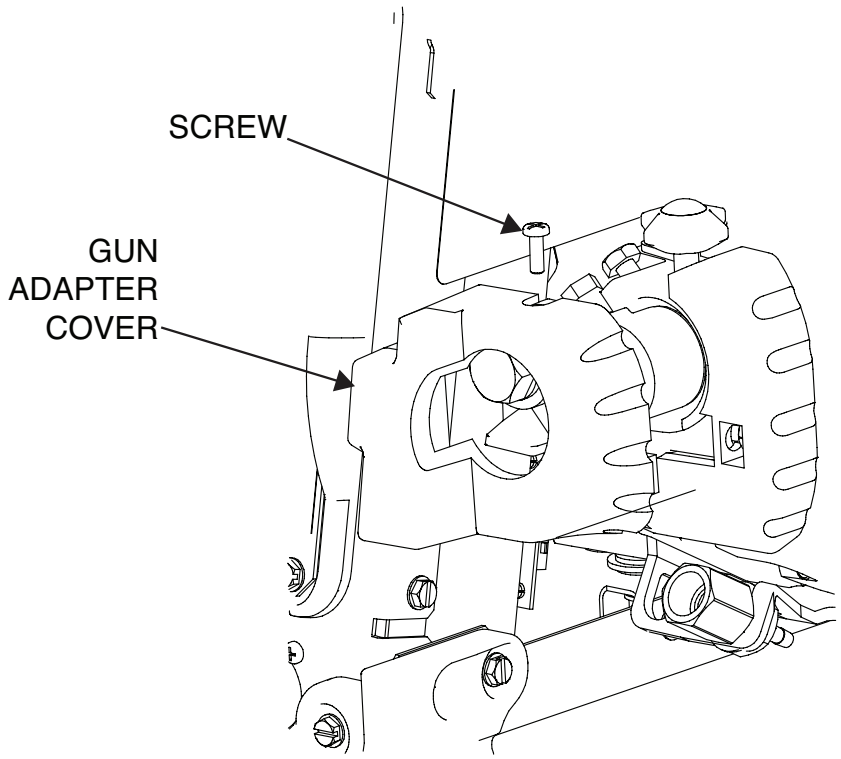
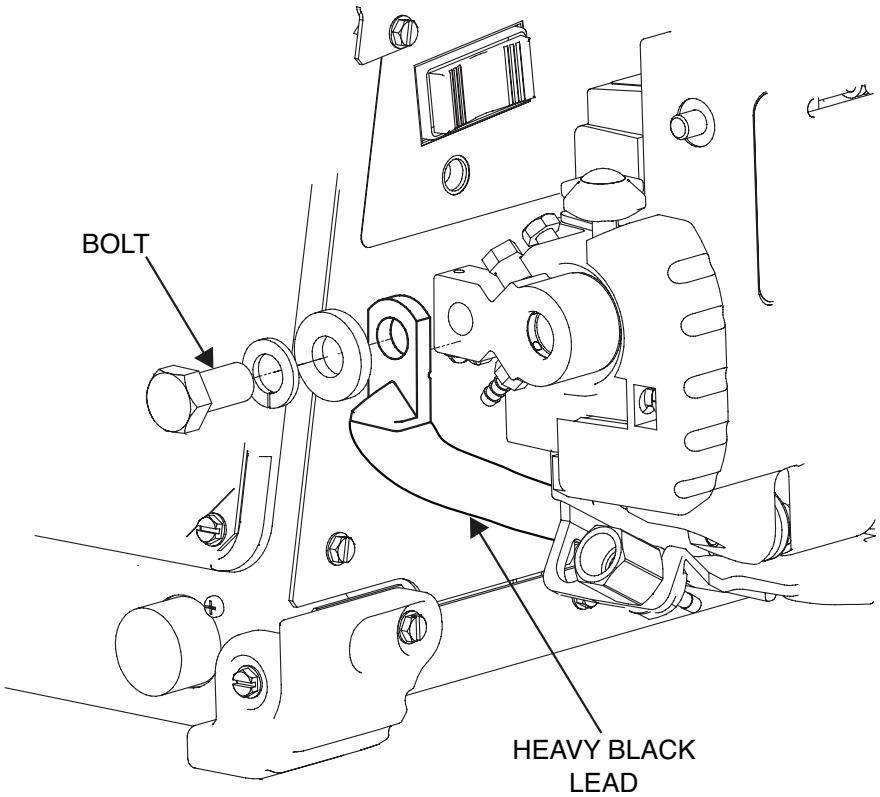


Figure F.39 – Heavy black lead removal



MOTOR AND GEAR BOX ASSEMBLY
REMOVAL AND REPLACEMENT PROCEDURE *(continued)*

Figure F.40 – Gas hose location

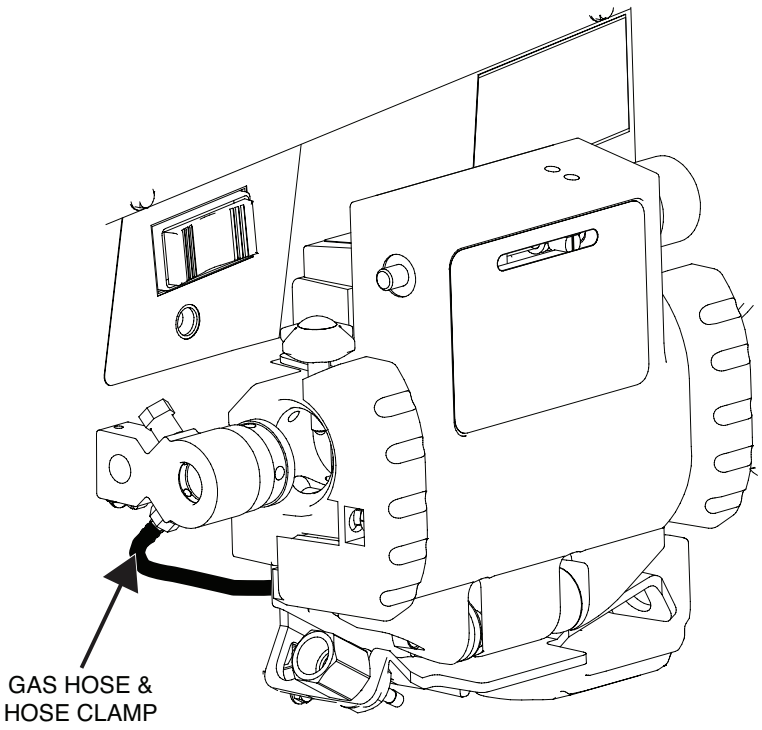
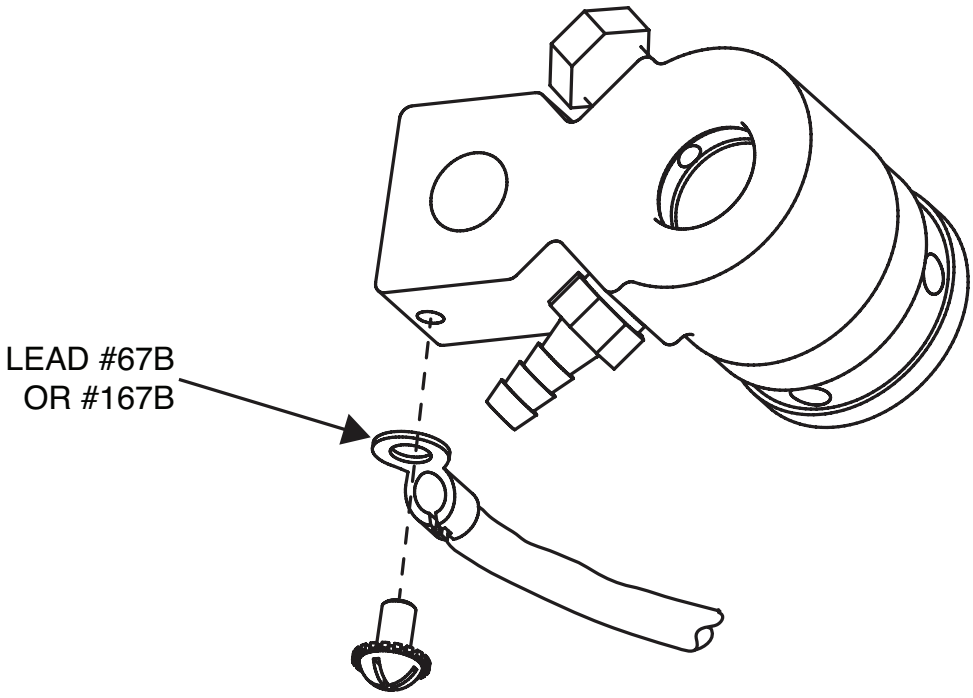


Figure F.41 – Lead location



MOTOR AND GEAR BOX ASSEMBLY REMOVAL AND REPLACEMENT PROCEDURE *(continued)*

Figure F.42 – Motor and gear box assembly mounting screws

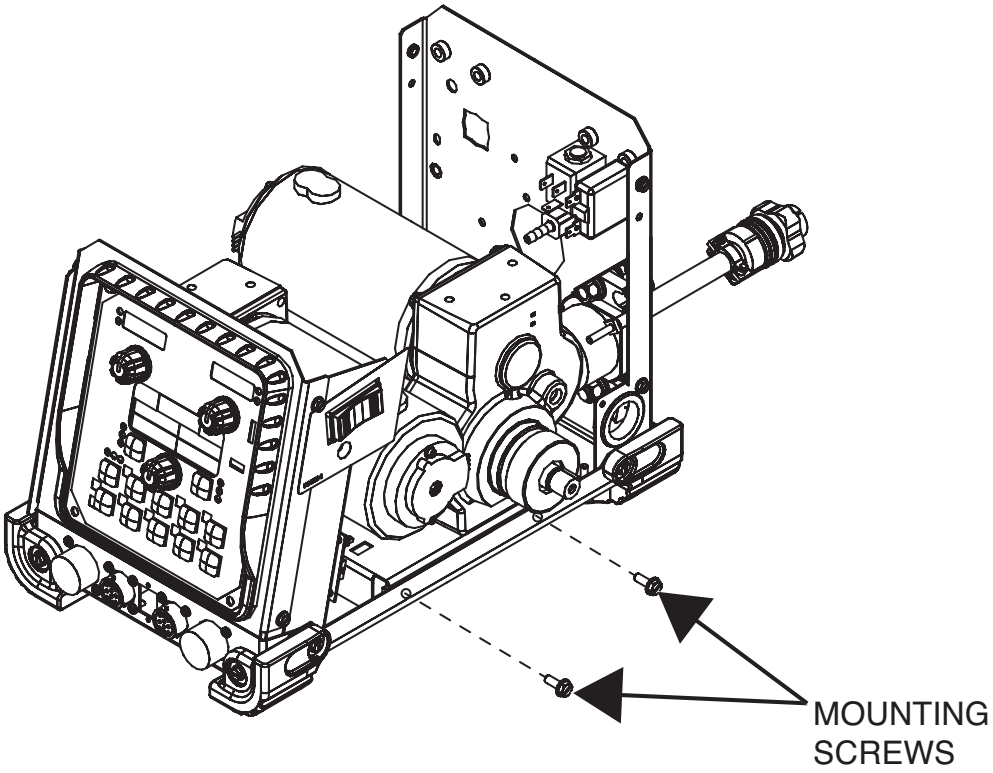
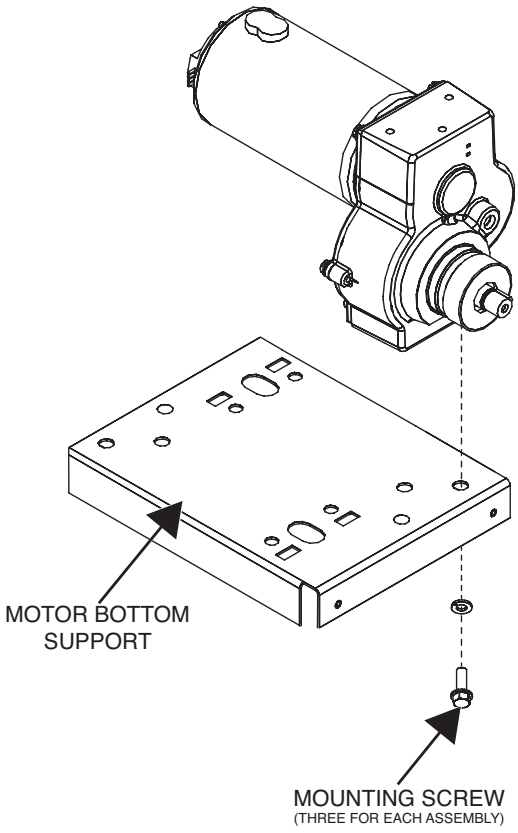


Figure F.43 – Motor and gear box assembly mounting screws



MOTOR AND GEAR BOX ASSEMBLY
REMOVAL AND REPLACEMENT PROCEDURE *(continued)*

Figure F.44 – Removing drive motor from gearbox

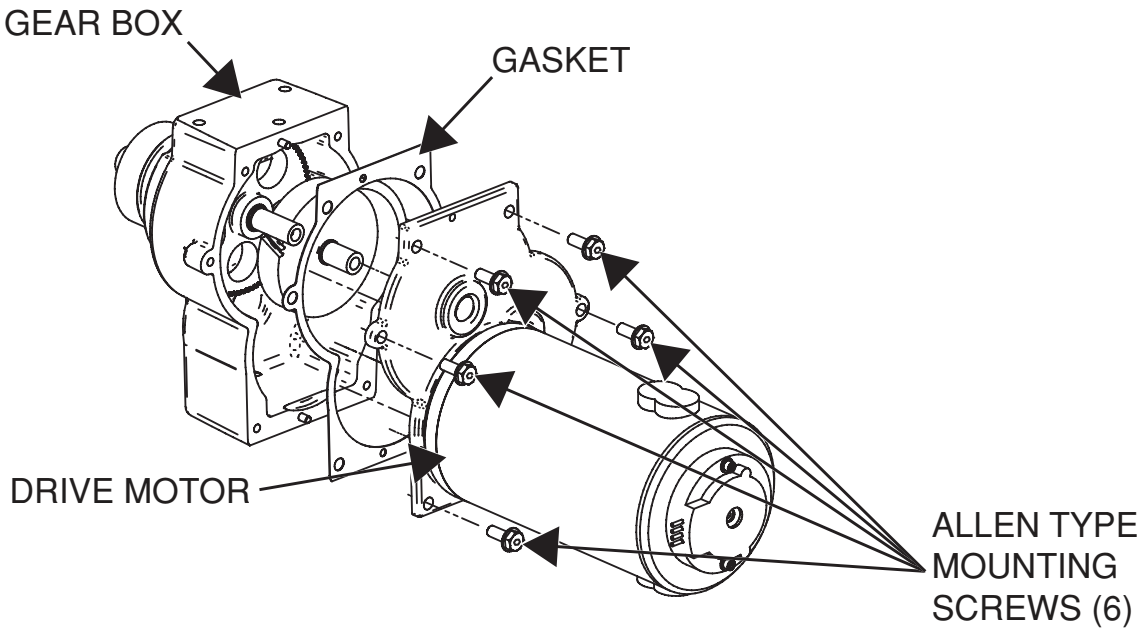
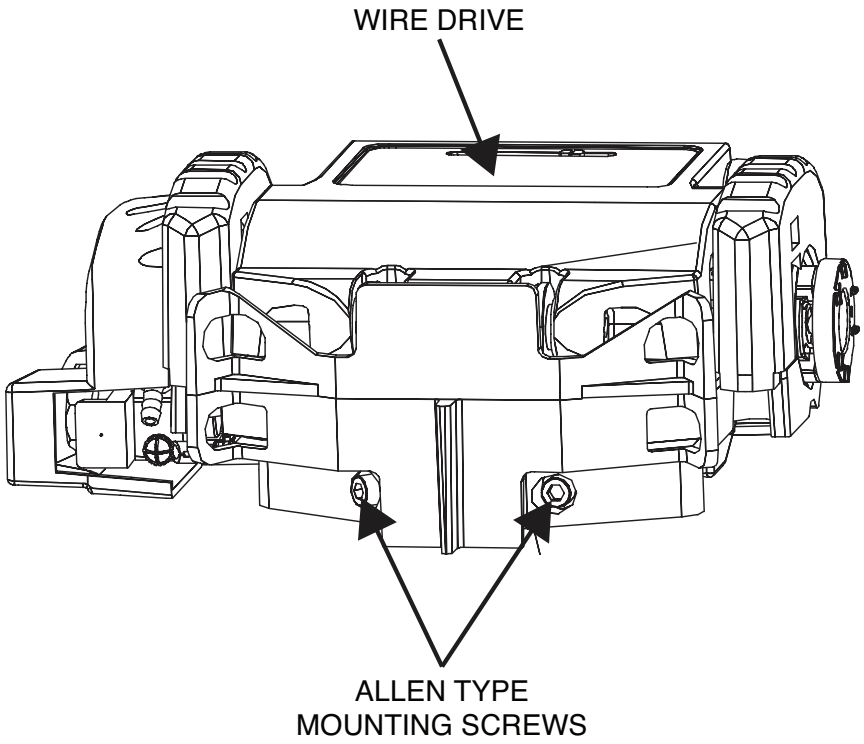
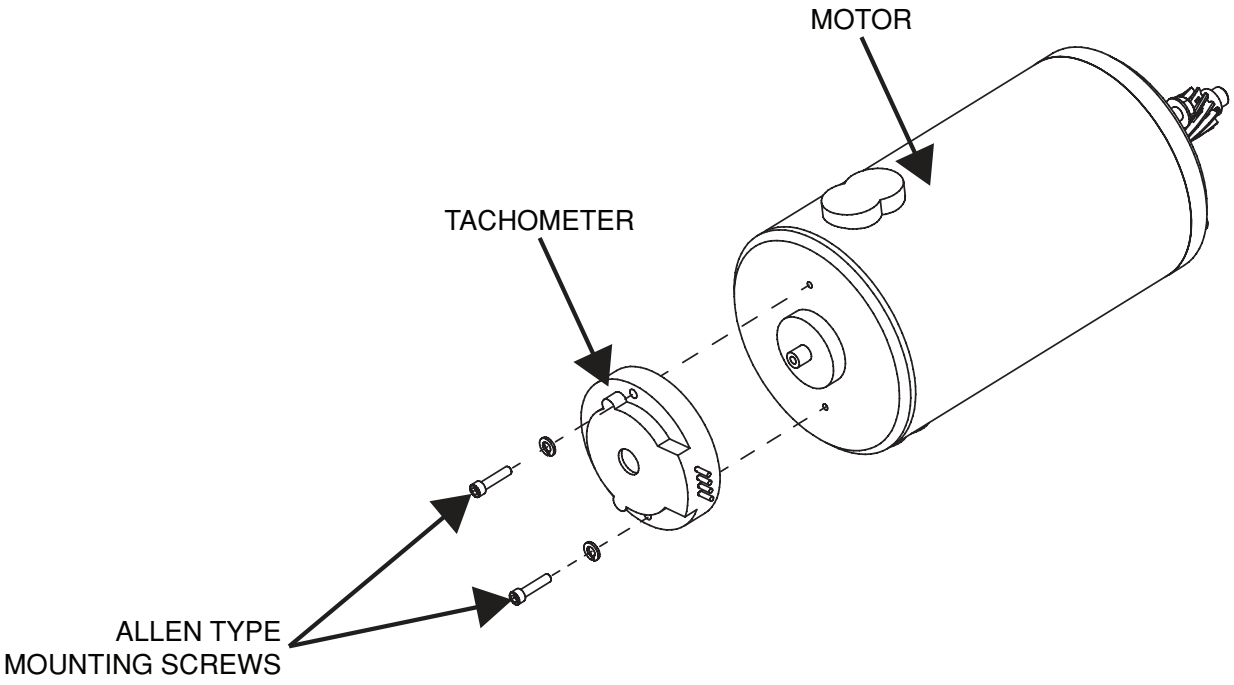


Figure F.45 – Removing wire drive from gear box



MOTOR AND GEAR BOX ASSEMBLY
REMOVAL AND REPLACEMENT PROCEDURE *(continued)*

Figure F.46 – Removing tachometer from motor



MOTOR AND GEAR BOX ASSEMBLY REMOVAL AND REPLACEMENT PROCEDURE *(continued)*

REPLACEMENT PROCEDURE

1. Connect the blue, red, yellow and black leads to plug P9/P19. See Wiring Diagram.
2. Using a 3/32" allen wrench, attach the two allen type screws securing the tachometer to the motor.
3. Carefully position the wire drive assembly to the gear box assembly.
4. Using a 3/16" allen wrench, attach the two allen type screws to the bottom of the wire drive unit. The wire drive unit is now attached to the gear box.
5. Using a 5/32" allen wrench, attach the six allen type screws and washers securing the drive motor to the gear box. Note gasket placement during reassembly.
6. Using a 7/16" nutdriver, attach the three bolts and washers securing the motor bottom support to the motor and gear box assembly. Repeat this step for each motor and gear box assembly if necessary.
7. Carefully position the motor and gear box assembly in the machine.

NOTE: It may be necessary to route gas hoses and wiring out of the way to allow for the replacement of the motor and gear box assembly.

8. Using a 5/16" nutdriver, attach the four screws (two on each side) securing the motor bottom support to the machine.
9. Using a phillips screwdriver, attach the screw and washer securing lead #167B to the left gun adapter and lead #67B to the right gun adapter. See Wiring Diagram.
10. Connect the gas hose to the gun adapter. Repeat this step for each motor and gear box assembly if necessary.
11. Using needle-nose pliers, tighten the hose clamp securing the gas hose to the gun adapter. Repeat this step for each motor and gear box assembly if necessary.
12. Connect plug 19 to the left tachometer and plug 9 to the right tachometer. See Wiring Diagram.
13. Using a 3/4" nutdriver, attach the bolt and washers securing the heavy black lead to the gun adapter. See Wiring Diagram. Repeat this step for each motor and gear box assembly if necessary.
14. Using a phillips screwdriver, attach the screw and washer securing the gun adapter cover to the gear box assembly. Repeat this step for each motor and gear box assembly if necessary.
15. Carefully position the motor top support in the machine.
16. Using a 7/16" nutdriver, attach the six bolts and washers securing the motor top support to the motor and gear box assembly.
17. Using a 5/16" nutdriver, attach the four screws (two on top and two on the back) securing the motor top support to the machine.
18. Connect leads 600B and 600S to the left circuit breaker and leads 500B and 500S to the right circuit breaker. See Wiring Diagram.
19. Perform the ***Gas Solenoid(s) Replacement Procedure***.
20. Perform the ***Case Cover Replacement Procedure***.

OPTIONAL OUTPUT CONTACTOR(S) REMOVAL AND REPLACEMENT PROCEDURE

⚠ WARNING

Service and repair should be performed only by Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment may result in danger to the technician or 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.

If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

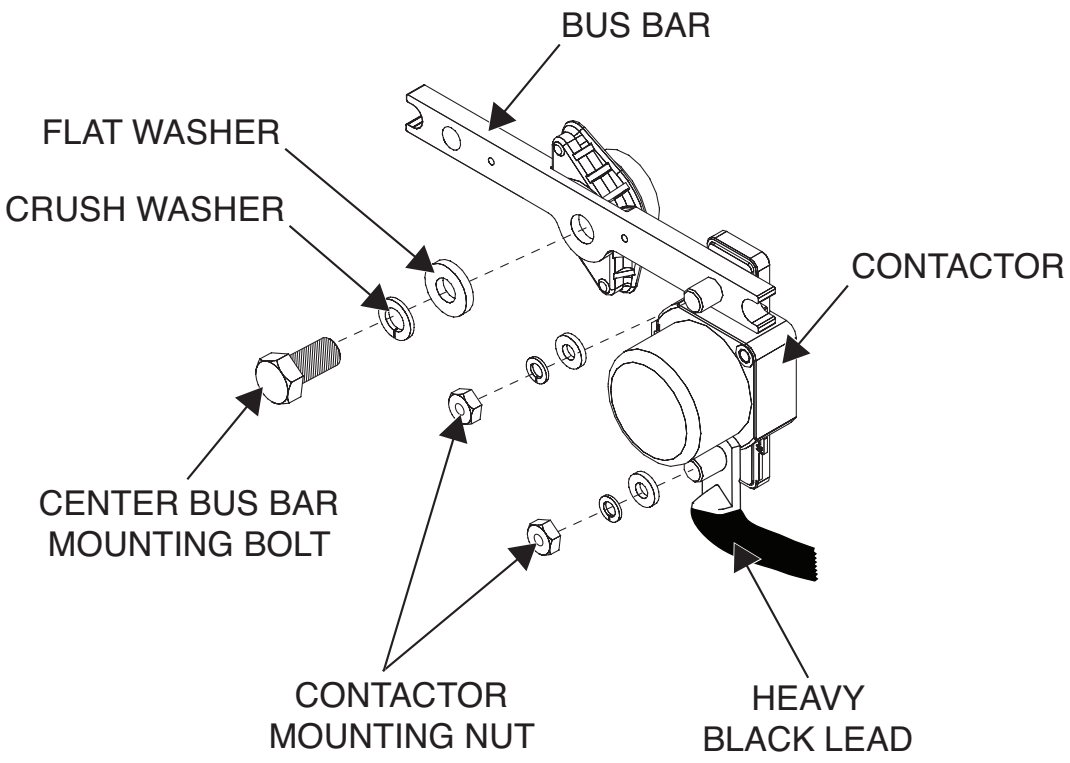
This procedure will aid the technician in the removal and replacement of the Optional Output Contactor(s).

MATERIALS NEEDED

5/16” Nutdriver
3/4” Nutdriver
11/16” Nutdriver
Wiring Diagram

OPTIONAL OUTPUT CONTACTOR(S) REMOVAL AND REPLACEMENT PROCEDURE *(continued)*

Figure F.47 – Contactor mounting nuts and bolts



REMOVAL PROCEDURE

1. Remove input power from the Power Feed 84 wire feeder.
2. Perform the ***Case Cover Removal Procedure***.
3. Perform the ***Motor and Gear Box Assembly Removal Procedure,*** to remove both motor and gear box assemblies.
4. Using a 3/4" nutdriver, remove the bolt from the center of the bus bar. Note washer placement for reassembly. See Figure F.47.
5. Using a 11/16" nutdriver, remove the nut and associated washers attached to the top post of each contactor. Note washer placement for reassembly. See Figure F.47.
6. The copper bus bar can now be removed.
7. Using a 11/16" nutdriver, remove the nut and washers securing the heavy black lead to the bottom post of each contactor. Note washer placement for reassembly. See Figure F.47. See Wiring Diagram.
8. Label and disconnect red and black leads from contactor. See ***Figure F.48***. See Wiring Diagram.
9. Using a 5/16" nutdriver, remove the two bolts and washers securing contactor to rear panel while holding square nut in place. See ***Figure F.49***.
10. The contactor can now be removed and replaced.

OPTIONAL OUTPUT CONTACTOR(S) REMOVAL AND REPLACEMENT PROCEDURE *(continued)*

Figure F.48 – Contactor leads

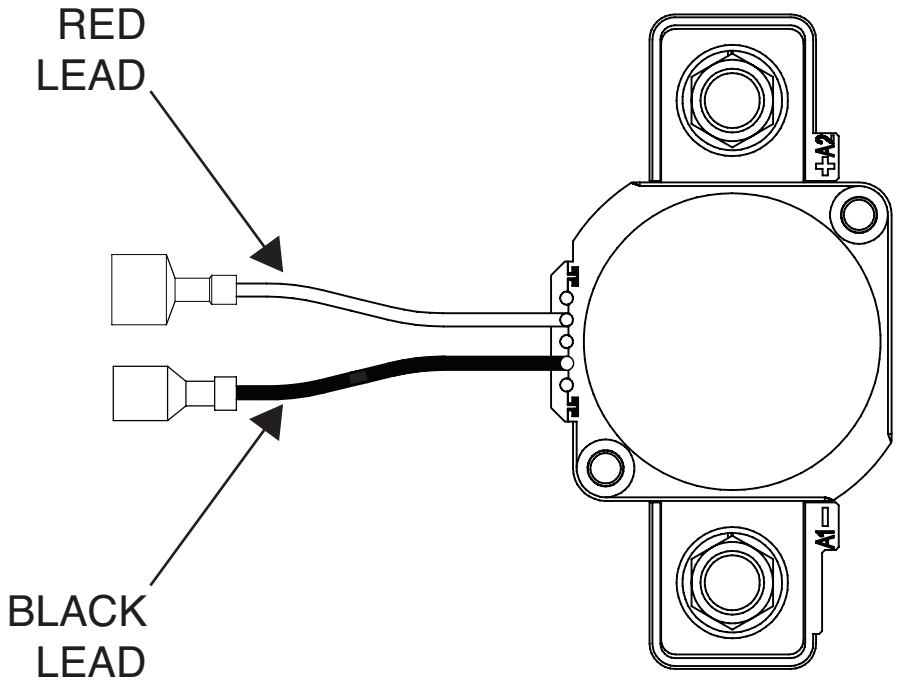
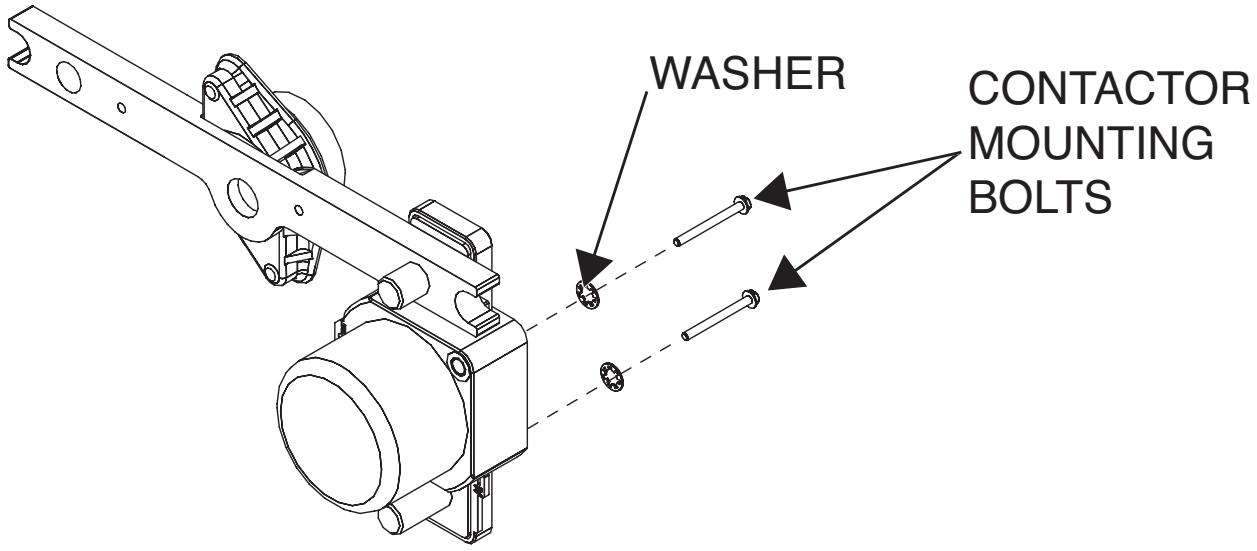


Figure F.49 – Contactor mounting bolts



OPTIONAL OUTPUT CONTACTOR(S) REMOVAL AND REPLACEMENT PROCEDURE *(continued)*

REPLACEMENT PROCEDURE

1. Carefully position new contactor into machine.
2. Using a 5/16" nutdriver, attach the two bolts and washers securing contactor to rear panel while holding square nut in place.
3. Connect red and black leads to contactor. See Wiring Diagram.
4. Using a 11/16" nutdriver, attach the nut and washers securing the heavy black lead to the bottom post of each contactor. See Wiring Diagram.
5. Carefully position copper bus bar into machine.
6. Using a 11/16" nutdriver, attach the nut and associated washers to the top post of each contactor.
7. Using a 3/4" nutdriver, attach the bolt and washers to the center of the bus bar.
8. Perform the ***Motor and Gear Box Assembly Replacement Procedure***.
9. Perform the ***Case Cover Replacement Procedure***.

RETEST AFTER REPAIR

RETEST A MACHINE

- If it is rejected under test for any reason that requires you to remove any part which could affect the machine's electrical characteristics.

OR

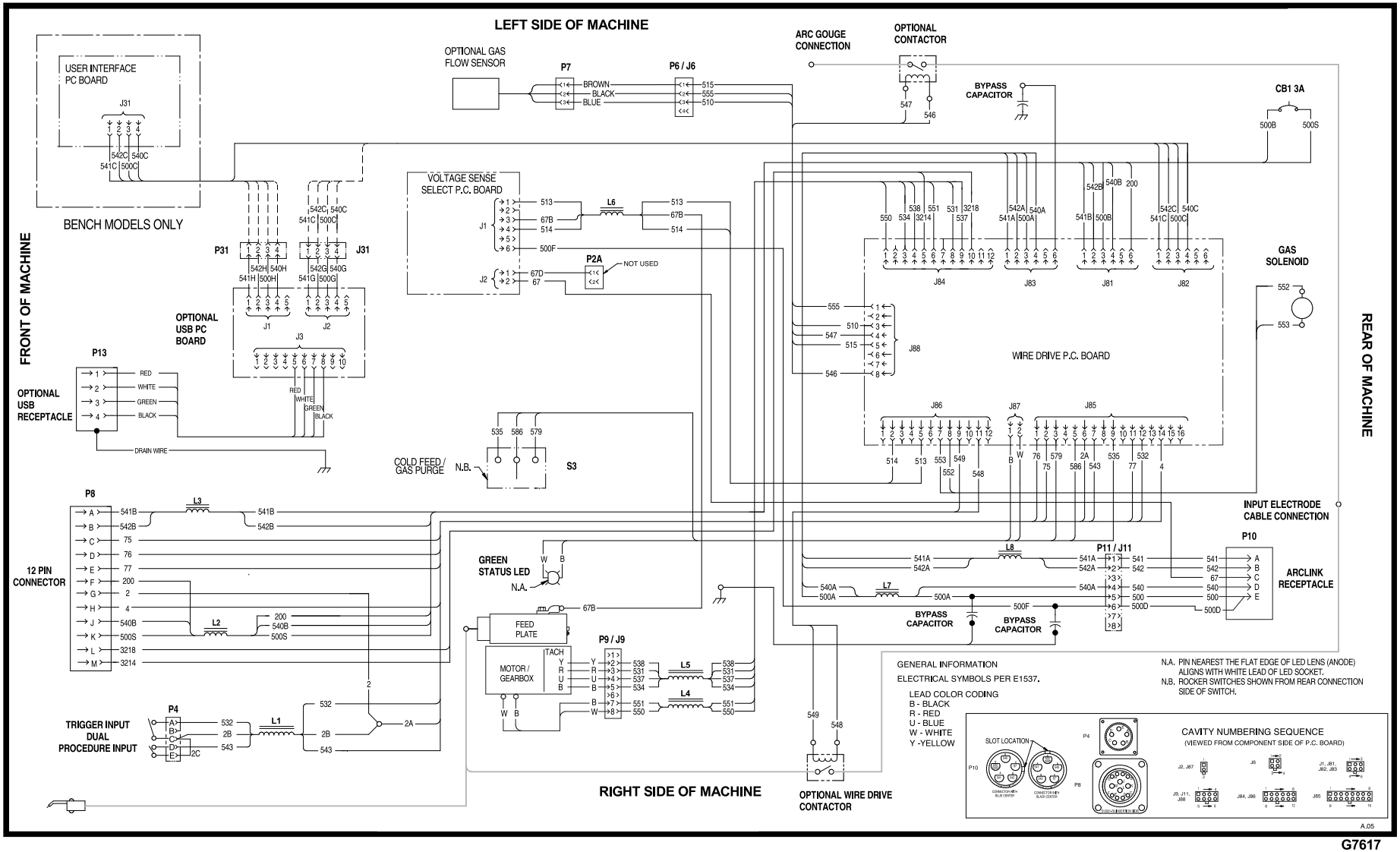
- If you repair or replace any electrical components.

SET UP

1. Once the repairs have been completed, the feeder must be connected to a Powerwave power source.
2. Make certain the wire feeds and the speed is adjustable.
3. Make sure the Power Feed 84 communicates with the compatible Powerwave power source.

TABLE OF CONTENTS
- DIAGRAMS SECTION -

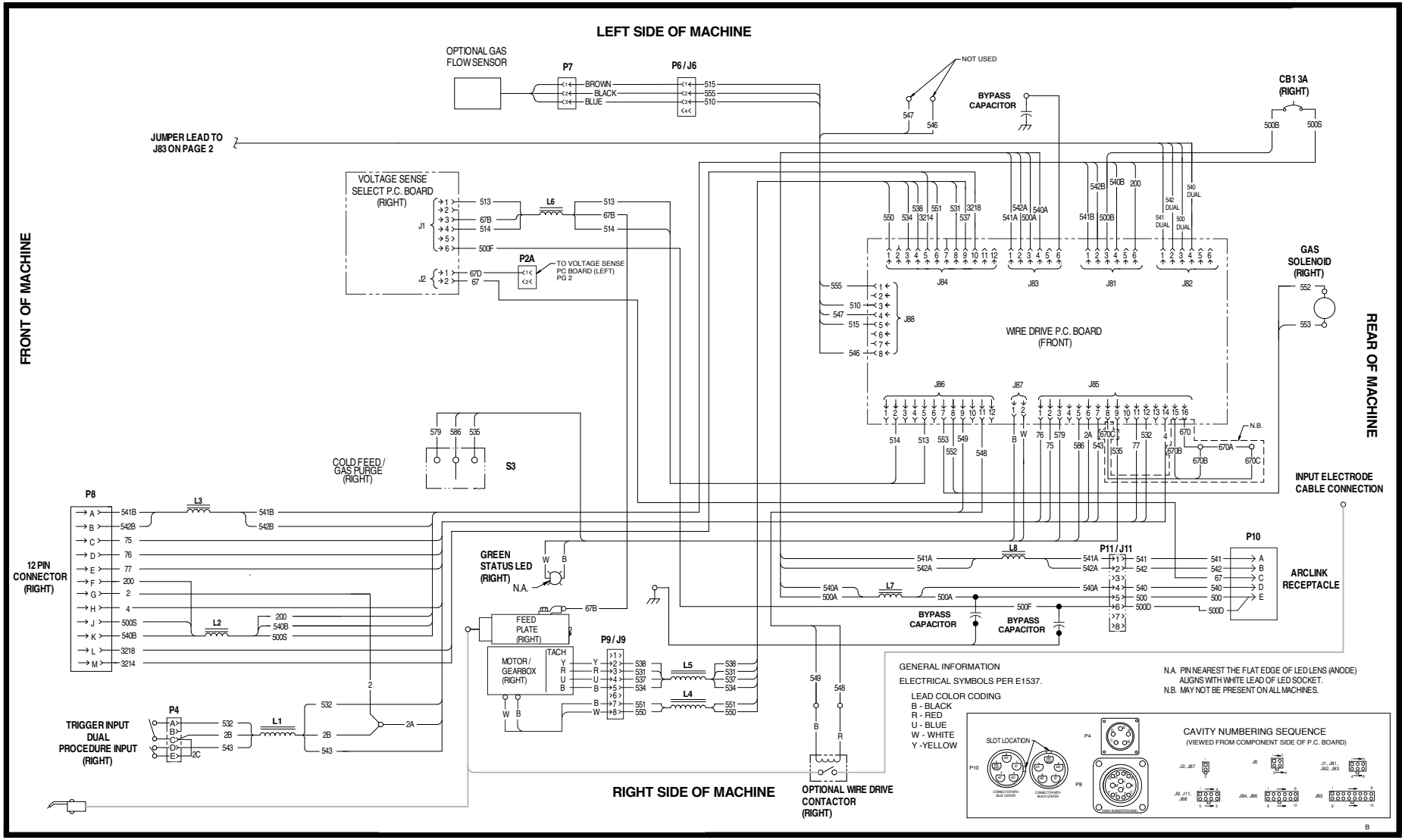
WIRING DIAGRAM - POWER FEED 84 WIRE DRIVE - SINGLE FOR CODES 11986, 11987, 11988, 11890, 11991, 11993, 11994, 11996, 11997, 11998



G7617

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. If the diagram is illegible, write to the Service Department for a replacement. Give the equipment code number.

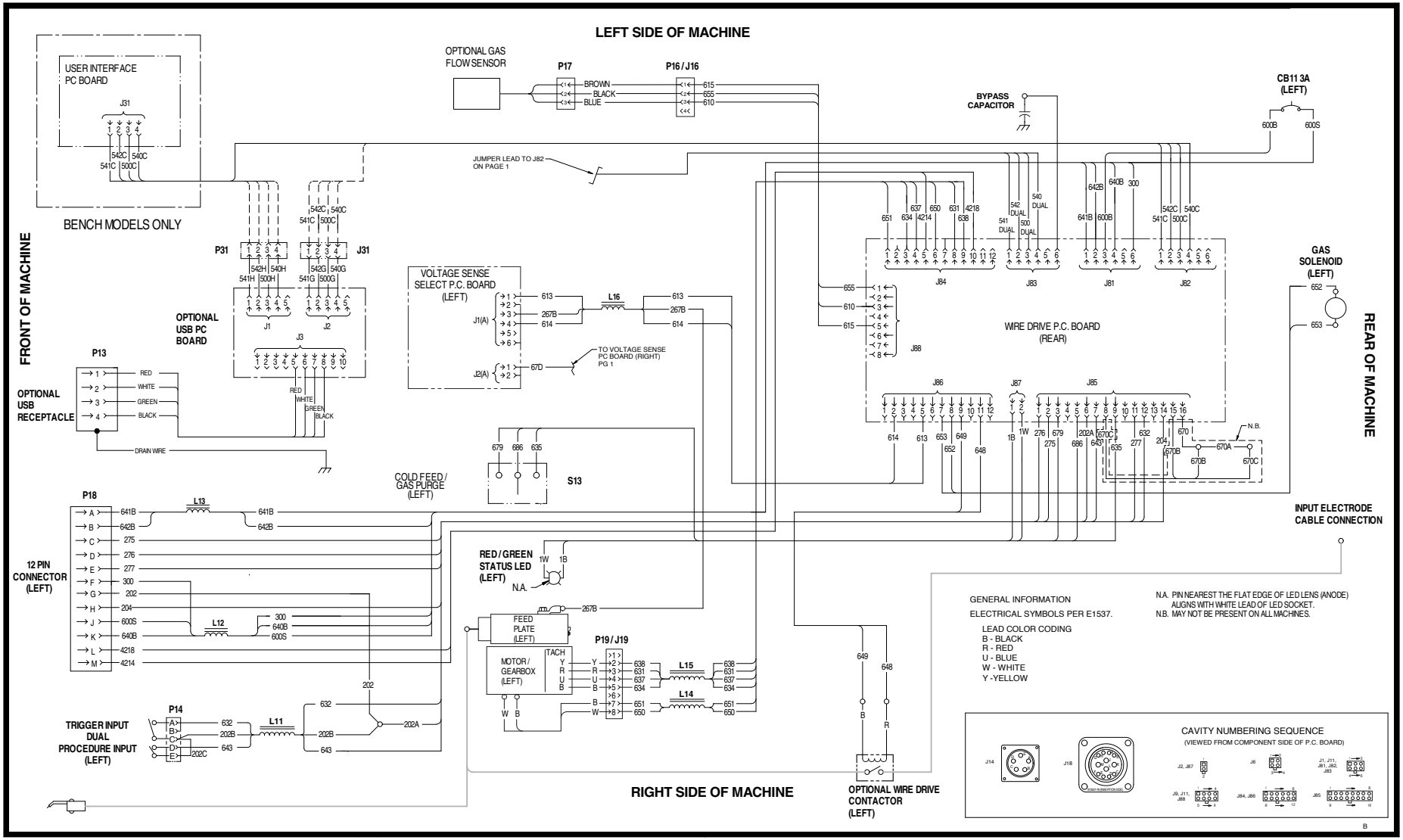
WIRING DIAGRAM - POWER FEED 84 -WIRE DRIVE 1 DUAL FOR CODES 12285, 12286, 12287, 12288, 12289, 12290, 12291, 12292



G7619-1 SHEET 1 OF 2

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. If the diagram is illegible, write to the Service Department for a replacement. Give the equipment code number.

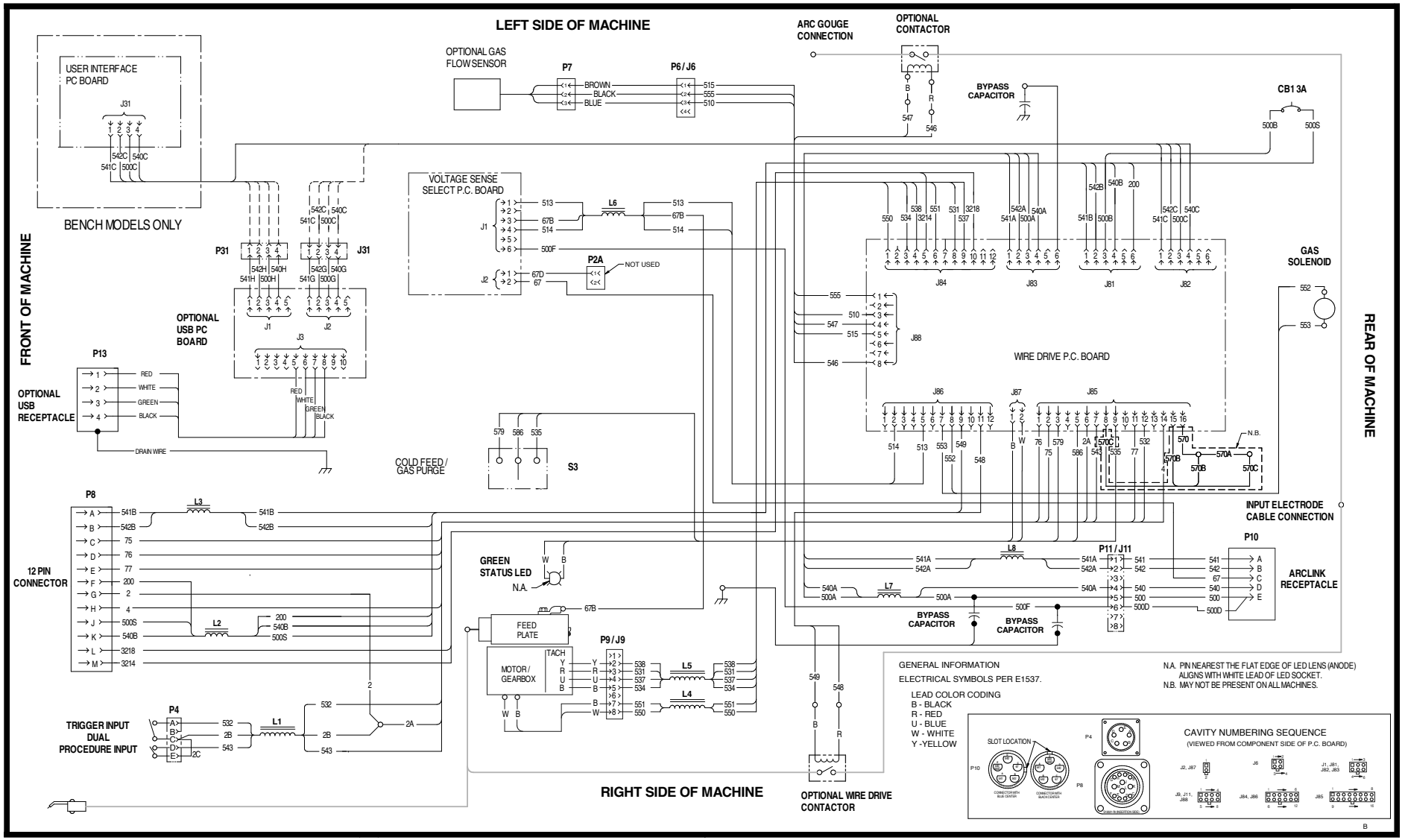
WIRING DIAGRAM - POWER FEED 84 -WIRE DRIVE 2 DUAL FOR CODES 12285, 12286, 12287, 12288, 12289, 12290, 12291, 12292



G7619-1 SHEET 2 OF 2

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. If the diagram is illegible, write to the Service Department for a replacement. Give the equipment code number.

WIRING DIAGRAM - POWER FEED 84 WIRE DRIVE - SINGLE FOR CODES 12274, 12275, 12276, 12277, 12278, 12279, 12280, 12281, 12282, 12283, 12284



G7617-1

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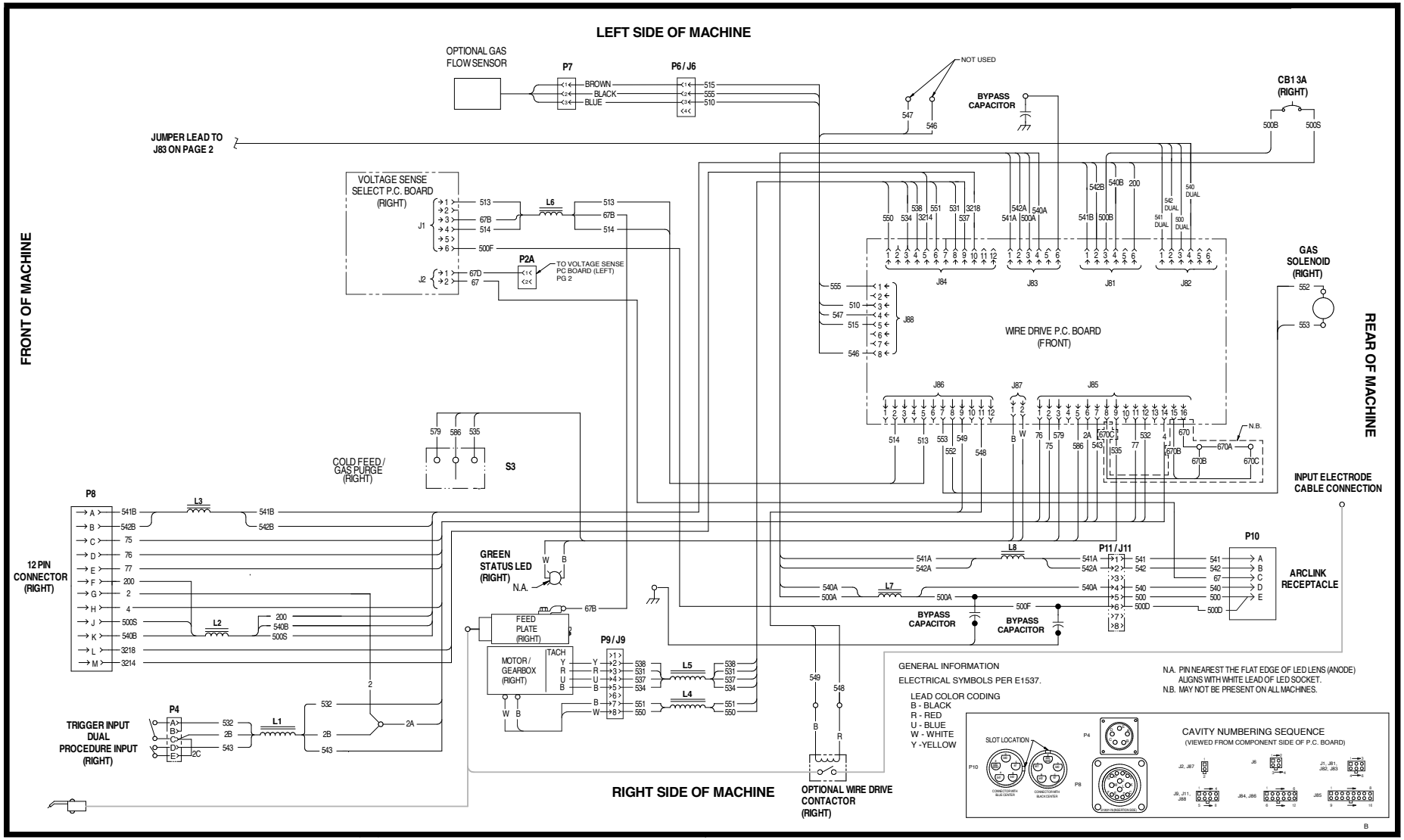
WIRING DIAGRAM - POWER FEED 84 -WIRE DRIVE 1 DUAL FOR CODES 12285, 12286, 12287, 12288, 12289, 12290, 12291, 12292



G7619-1 SHEET 1 OF 2

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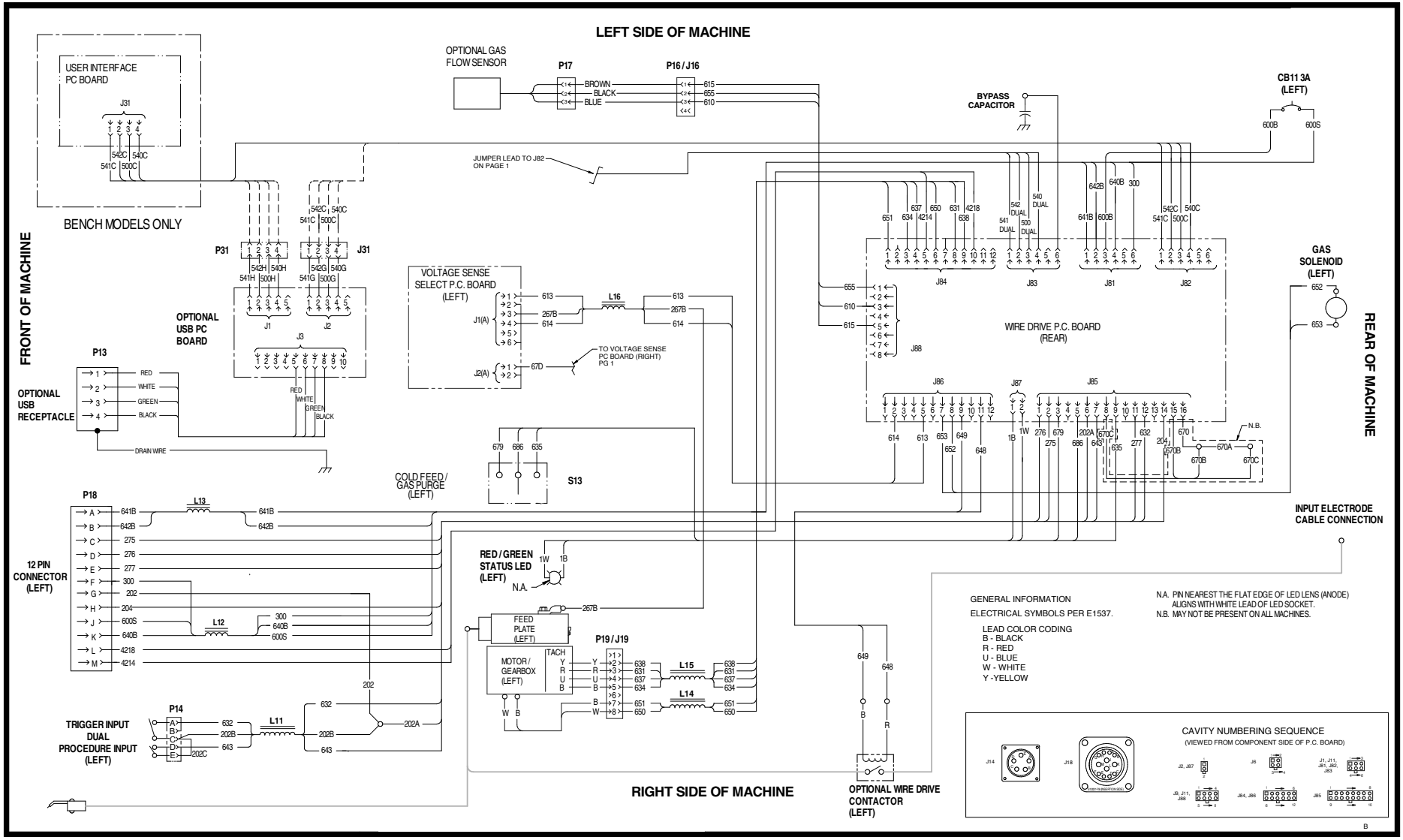
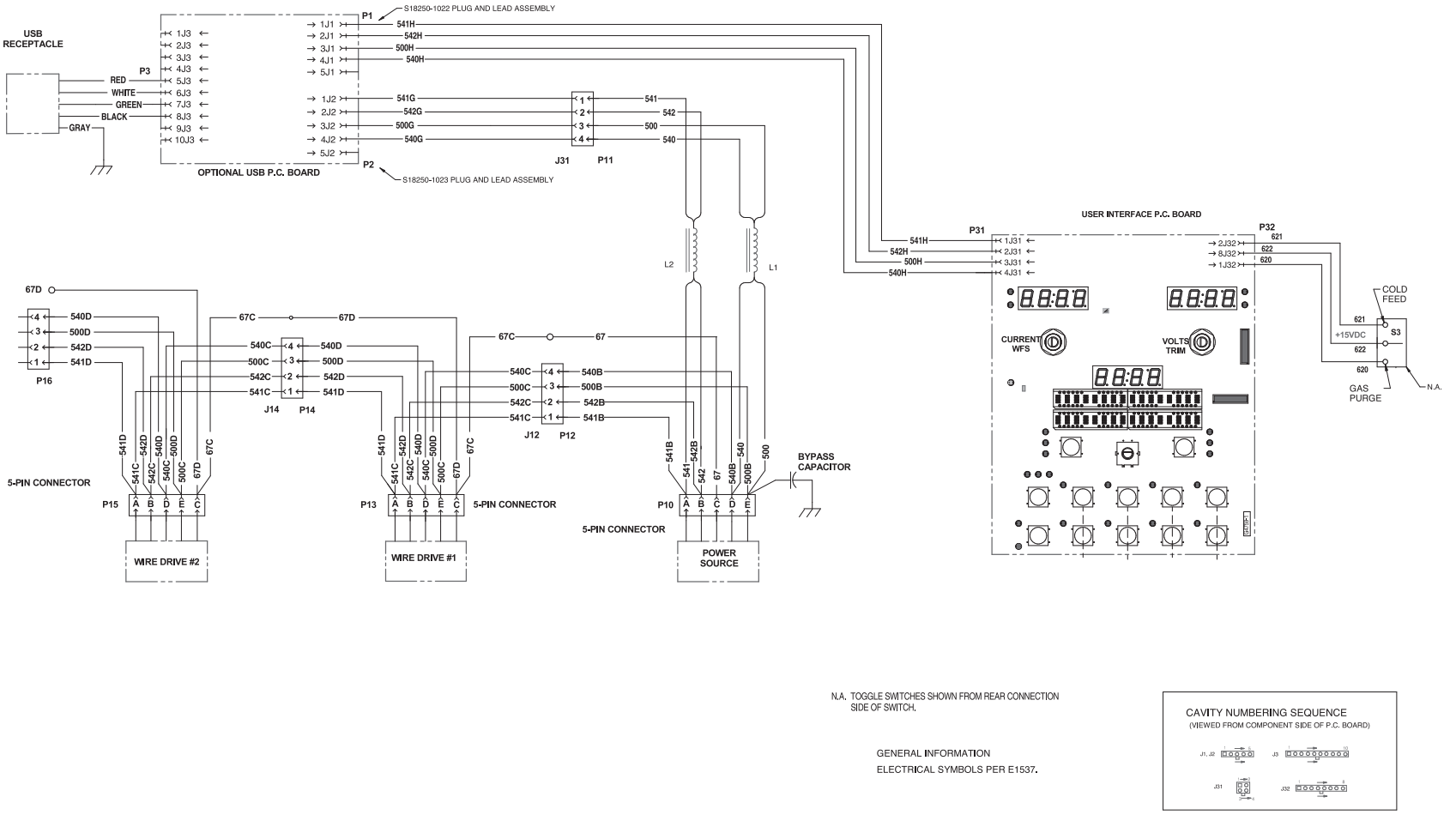


G7619-1 SHEET 2 OF 2

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. If the diagram is illegible, write to the Service Department for a replacement. Give the equipment code number.

WIRING DIAGRAM - POWER FEED 84 CONTROL BOX WITH USB FOR CODES 12177, 12178, 12179



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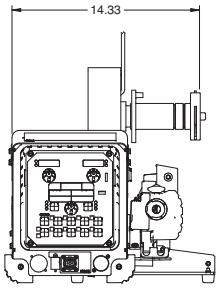
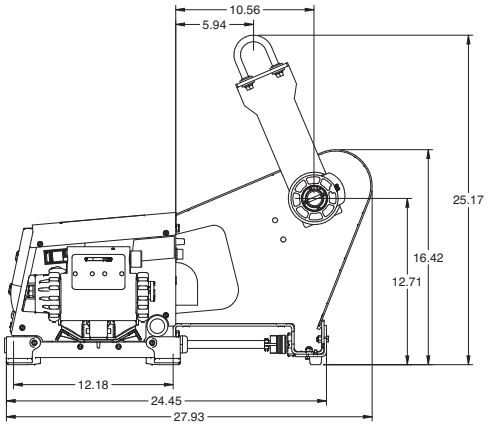
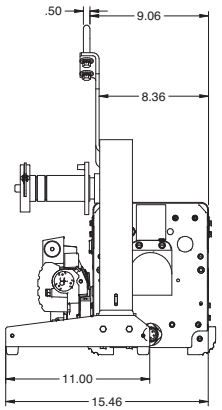
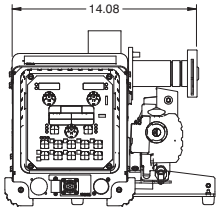
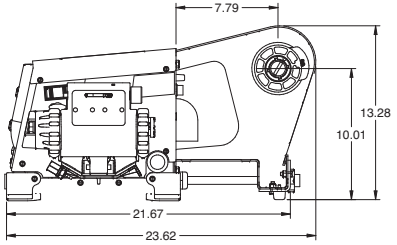


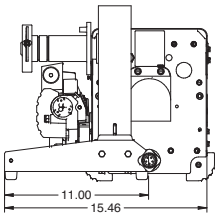




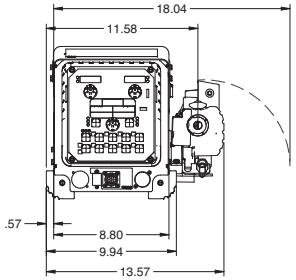
HEAVY DUTY WIRE REEL STAND

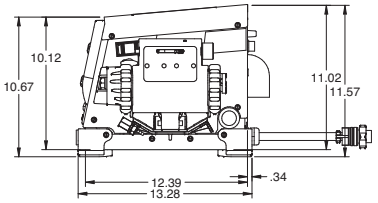


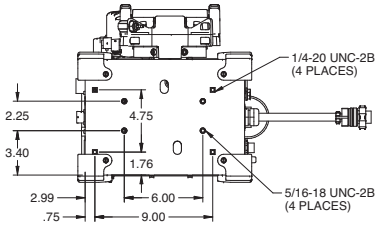


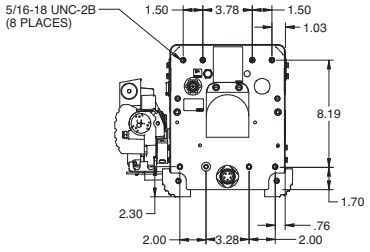


STANDARD DUTY WIRE REEL STAND





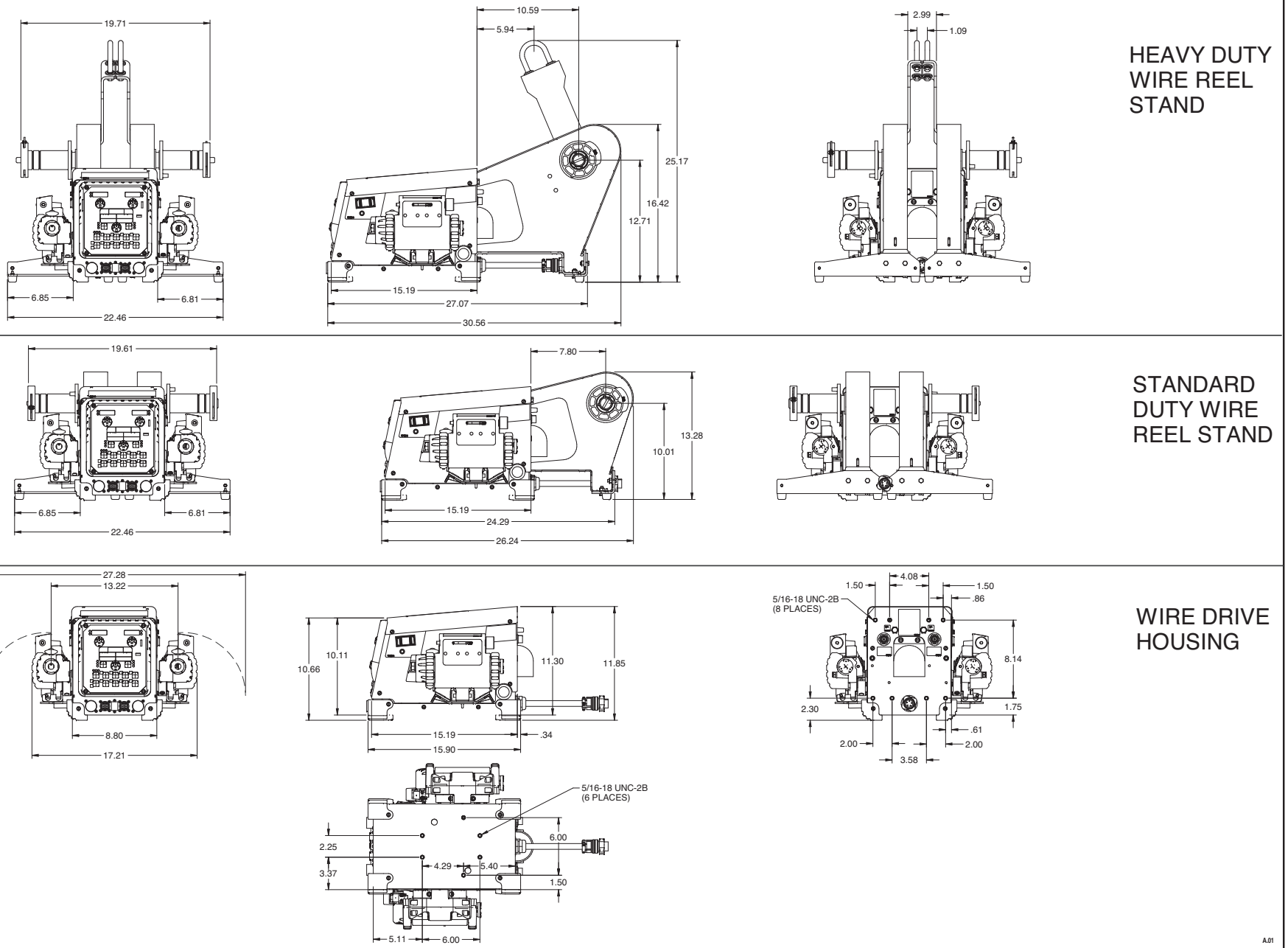




WIRE DRIVE HOUSING

A.03

M24854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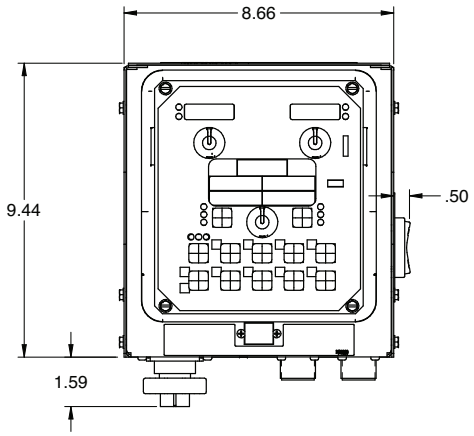
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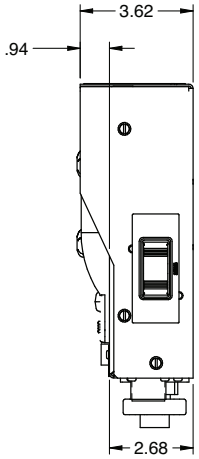
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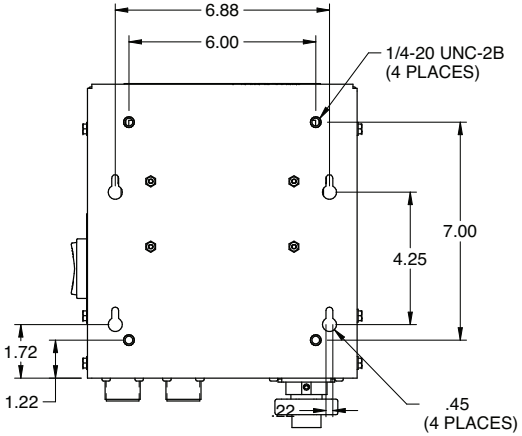
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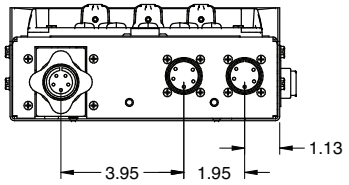
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