LINCOLN ELECTRIC

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.

STT-10 Head & Controls Boom Mount or Bench Models

For use with machines having Code Numbers:

STT-10 Control - Boom Mount Code 10447, 10832
10 Series Wire Drive - Boom Mount Code 10443, 10763, 10818
STT- Boom Package Code 10448
Synergic 7F Wire Drive Code 10190, 10191
STT-10 - Bench Model Code 10446, 10766, 10821
STT-10 - Zipline Boom Package Code 10499, 10500, 10773

SERVICE MANUAL

SVM243-A | Issue Date 14-Mar

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.

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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.

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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.

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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

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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."

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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 website: 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

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Figure E.1 - Block logic diagram

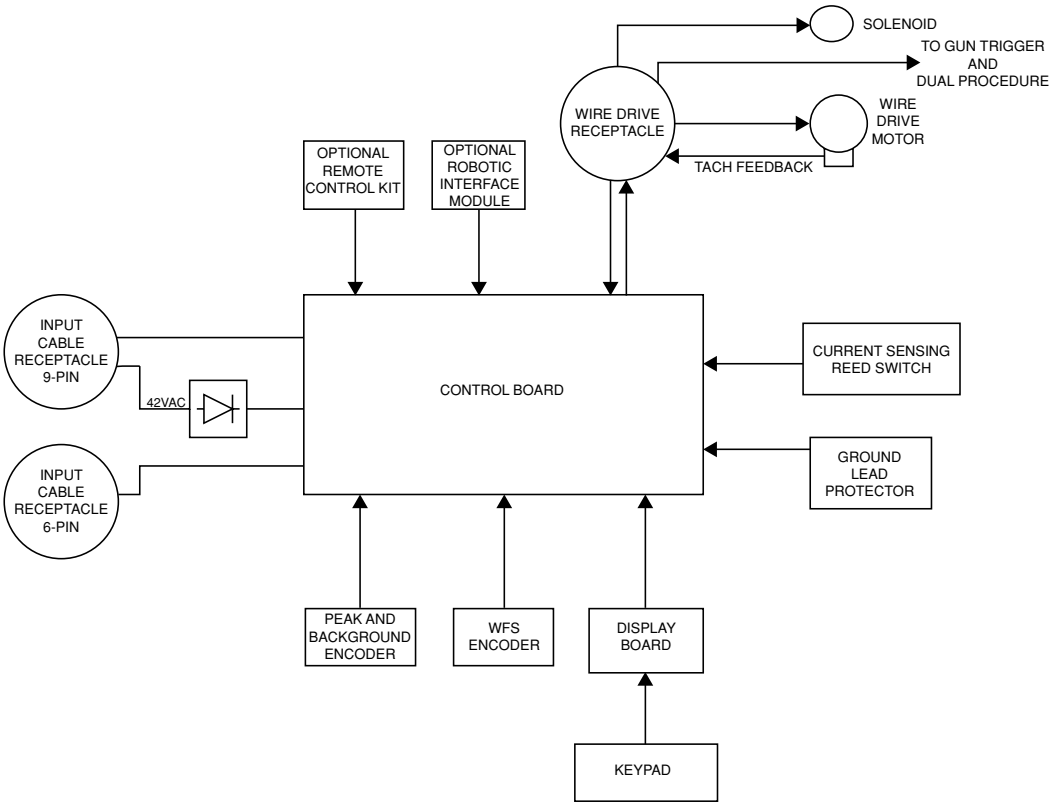
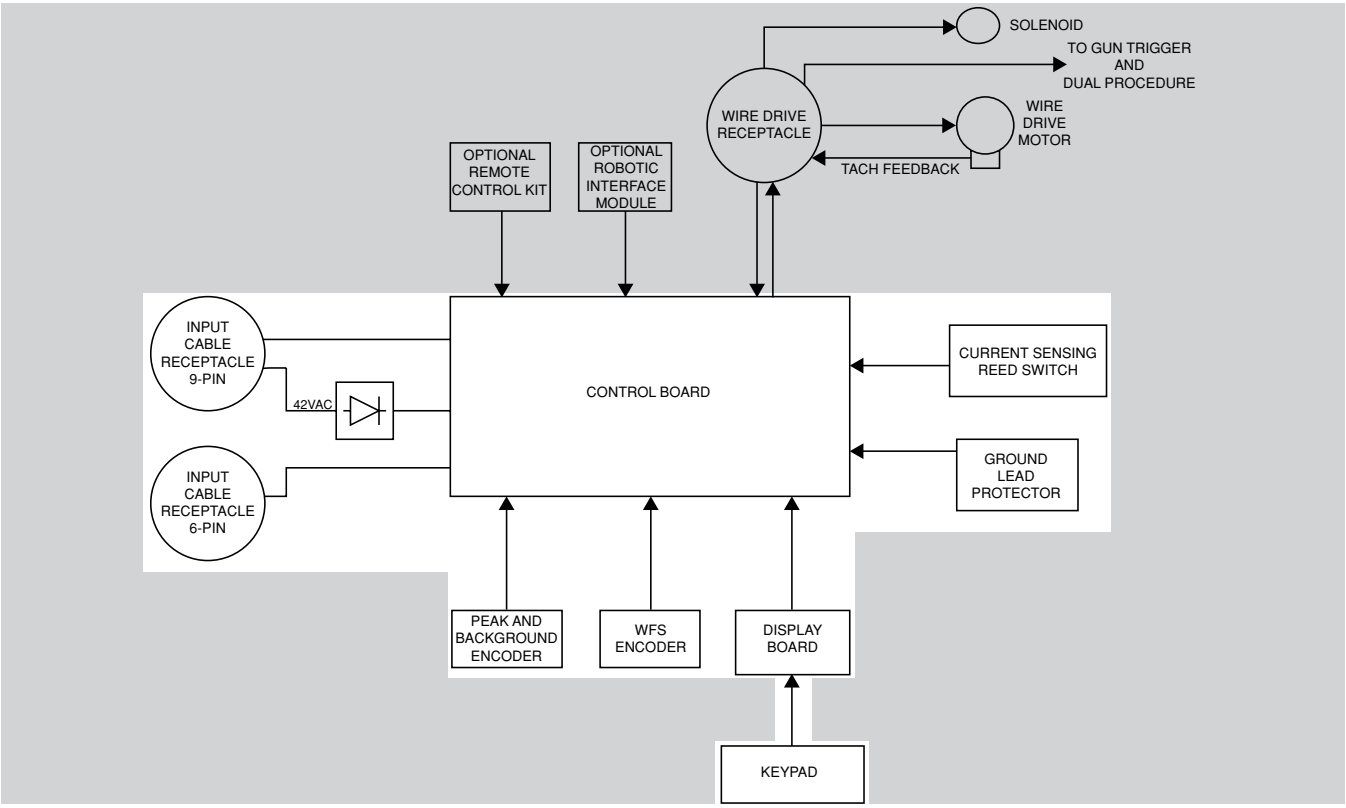


Figure E.2 - Input receptacles, control board and operator controls



INPUT RECEPTACLES, CONTROL BOARD AND OPERATOR CONTROLS

The 42 VAC input voltage is applied to the STT-10 through a 9-pin amphenol type receptacle. The trigger leads are also accessed through this 9-pin receptacle. The remote control is accessed through the 6-pin receptacle. The 42 VAC is rectified by a full wave bridge and sent to the control board where it is filtered. This filtered DC voltage is applied to a switching power supply. The switching power supply manufactures +12VDC and -12VDC regulated supplies for the control board circuitry. A +5VDC regulated supply is also developed for the control board circuitry.

The control board receives commands from the user operated controls such as the peak and background encoder, the wire feed speed (WFS) encoder and the keypad. It also receives feedback information from the wire feed head as to the wire feed speed. The control board compares the feedback information with the user command signals and generates the appropriate signals to control wire feed speed, arc voltage and gas flow.

The current sensing switch and ground lead protector are connected to the control board via plug J1. The current sensing reed switch closes when welding current is established. This closure signals the control board to change from the run-in welding parameters to the preset welding wire feed speed and arc voltage. If the ground lead protector is activated, the trigger circuit will be disabled and the WFS display will show “GLP”.

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

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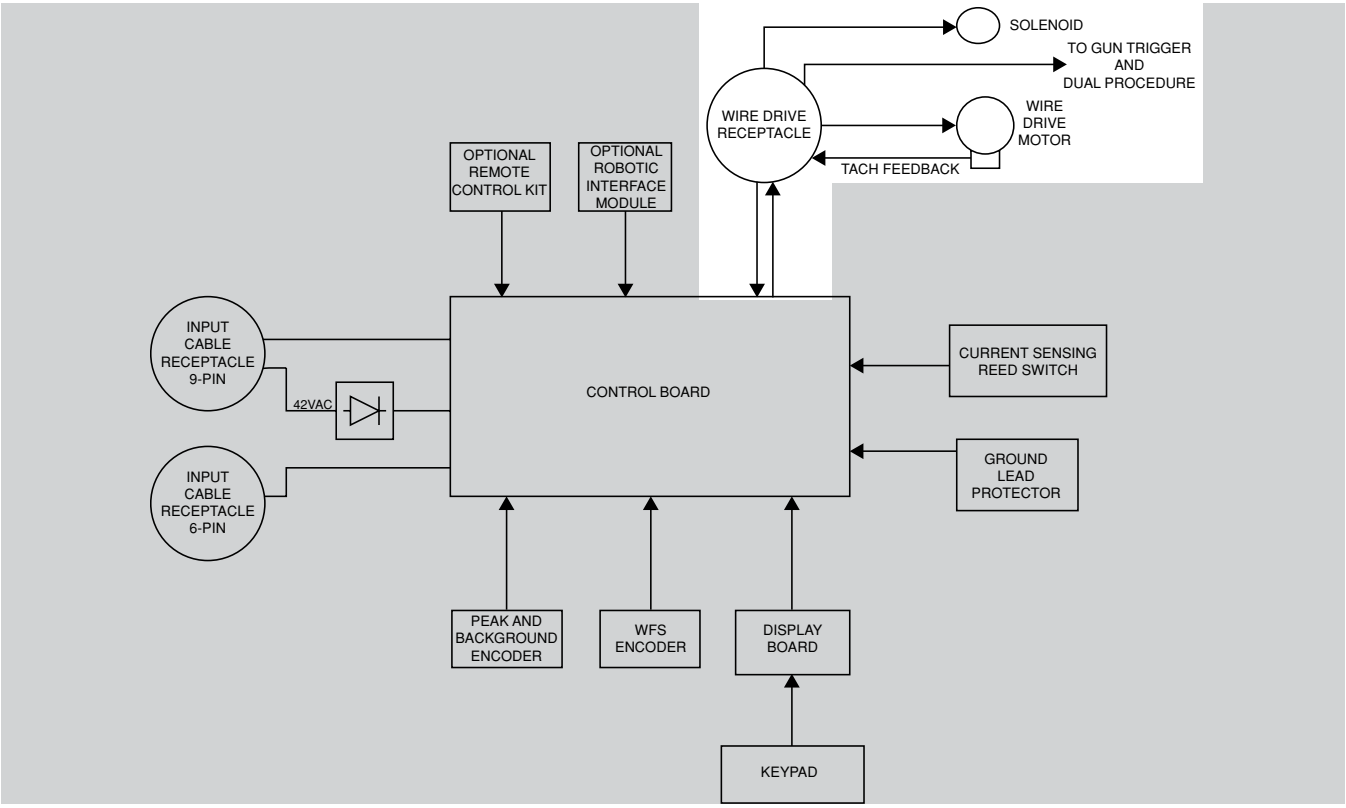
Figure E.3 - Wire feed head and receptacle



WIRE FEED HEAD AND RECEPTACLE

The leads to the drive motor, gas solenoid and the tach (hall effect device) are brought into the control box via the wire drive receptacle. This 14-pin receptacle also houses the gun trigger leads, the electrode voltage sense lead and the leads for the optional dual procedure switch. When the gun trigger is activated the control board energizes the gas solenoid, then the wire drive motor and welding power source. The control board receives tach feedback information and adjusts the motor armature voltage to match the preset wire feed speed.

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

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PROTECTION AND SHUTDOWN

WIRE FEED OVERLOAD PROTECTION

The STT-10 has solid-state overload protection of the wire drive motor. If the wire drive motor becomes overloaded for an extended period of time, the protection circuitry turns off the power source, wire feed and gas solenoid and then displays “H30” on the WFS display (with blank voltage display). This indicates the wire drive motor is overloaded and will remain shut down for about 30 seconds before the unit will automatically reset. The “H30” display decrements every seconds until it reaches “H00”. At that time, the unit resets automatically and the previous displays will return indicating the unit is ready to operate again. Overloads can result from improper tip size, liner, drive rolls, guide tubes, obstructions or bends in the gun cable. Feeding wire that is larger than the rated capacity of the feeder or any other factors that would impede normal wire feeding. See Avoiding Wire Feeding Problems in the ***Maintenance*** section.

GROUNDING LEAD PROTECTOR

The frame of the STT-10 control is grounded to the frame of the power source by a lead in the control cable. An overload protector prevents welding current from damaging this lead if the electrode circuit touches the wire feeder frame while the electrode is electrically hot.

If such a grounding lead fault occurs, the WFS display will show “GLP”, (with blank voltage display) and the trigger circuit will be disabled. To reset the circuit release the trigger, make sure that the electrode is not touching the wire feeder frame and then either press any key on the keypad or close the trigger. When the GLP circuit is reset, the “GLP” display is removed and the wire feeder is returned to normal operating mode.

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

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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 three main categories: Function Problems, Feeding Problems and Welding Problems.

Step 2. PERFORM EXTERNAL TESTS. The second column, labeled "POSSIBLE AREAS OF MISADJUSTMENT(S)", lists the obvious external possibilities that may contribute to the machine symptom. Perform these tests/checks in the order listed. In general, these tests can be conducted without removing the case 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.

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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 drive motor does not turn when the gun trigger is activated. The displays are lit and the correct input voltage (42 VAC) is applied to the STT-10.	1. If an error message "HXX" appears on the wire feed display, the unit may be overloaded. The "XX" indicates the time remaining in seconds before the unit automatically resets. 2. A jumper plug or K1558-1 Remote Switch Interface Module must be properly installed into connector J5 on the control board.	1. Check for mechanical restrictions in the wire feed path. 2. For feeders using the Remote Switch Interface Module, make sure there is continuity (zero ohms) in the circuit connecting the two terminals marked 1A on the remote switch interface P.C. board. 3. Make sure the gun trigger circuit is working properly. See the Wiring Diagram. 4. Perform the ***Wire Drive Motor Test***. 5. The control board may be faulty.
The drive motor does not turn, although the arc voltage is present and the gas solenoid works when the gun trigger is activated.	1. Check the connections between the drive motor and the control board. See the Wiring Diagram.	1. Perform the ***Wire Drive Motor Test***. 2. The control board may be faulty.
There is NO control of wire feed speed. The motor turns, the gas solenoid operates and arc voltage is present. The WFS can be preset.	1. Check the tach leads between the tach (hall effect device) and the control board. See the Wiring Diagram.	1. Perform the ***Tach Adjustment and Feedback Test***. 2. Perform the ***Wire Drive Motor Test***. 3. The control 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.

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TROUBLESHOOTING GUIDE

PROBLEMS (SYMPTOMS)	POSSIBLE AREAS OF MISADJUSTMENT(S)	RECOMMENDED COURSE OF ACTION
FUNCTION PROBLEMS		
The wire feeds and the gas solenoid operates but no arc voltage is present.	1. Make certain the electrode and work cables are connected correctly. 2. Make certain the control cable between the STT-10 and the power source is in good working condition. 3. Make certain the power source is operating properly and capable of producing welding voltage and current. 4. Make certain the welding gun and cable are in good operating condition.	1. Check the continuity (zero ohms) of leads #2 and #4 between the input cable receptacle and plug J8 on the control board. See the Wiring Diagram. 2. The control board may be faulty.
The wire feed speed does not change when welding current is established.	1. The “run-in” and “weld” wire feed speeds may be set at the same value. 2. Check the current sensing reed switch leads and connectors for loose or faulty corrections. See the Wiring Diagram.	1. Adjust “Run-in” and “Weld” wire feed speeds. 2. Check the current sensing reed switch for proper operation. A. While not welding the voltage at pins 3J1 to 4J1 should be approximately 12 VDC. The reed switch should be open. If the 12 VDC is missing either the reed switch is stuck closed or the control board is defective. B. While welding current is flowing the voltage at pins 3J1 to 4J1 should be approximately 0 VDC. The reed switch should be closed. If the voltage is not at or near 0 VDC, the reed switch is faulty. 3. The control 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.

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PROBLEMS (SYMPTOMS)	POSSIBLE AREAS OF MISADJUSTMENT(S)	RECOMMENDED COURSE OF ACTION
FUNCTION PROBLEMS		
The "Cold Feed Forward" and/or the "Cold Feed Reverse" buttons do not function properly. The motor operates properly in other modes.	1. Check the connectors and wires between the display board and the control board for loose or faulty connections (J11 and J3). 2. Check the connector J10 between the keypad and the display board for loose connections.	1. Perform the ***Keypad Resistance Test***. 2. The display board may be faulty. 3. The control board may be faulty.
The "Gas Purge" button does not activate the gas solenoid. The gas solenoid operates properly in other modes.	1. Check the connectors and wires between the display board and the control board for loose or faulty connections (J11 and J3). 2. Check the connector J10 between the keypad and the display board for loose connections.	1. Perform the ***Keypad Resistance Test***. 2. The display board may be faulty. 3. The control board may be faulty.
Pressing the current key does not select between the peak and background current LED's.	1. One of the range selection LED's is lit or in the acceleration setting mode. 2. Check the connectors and wires between the display board and the control board for loose or faulty connections (J11 and J3). 3. Check the connector J10 between the keypad and the display board for loose connections.	1. When a range selection key is lit, the current key has no effect and the peak or background LED is lit based on the range that is being set. The current key is not used when in acceleration setting mode. 2. Perform the ***Keypad Resistance Test***. 3. The display board may be faulty. 4. The control 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.

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PROBLEMS (SYMPTOMS)	POSSIBLE AREAS OF MISADJUSTMENT(S)	RECOMMENDED COURSE OF ACTION
FUNCTION PROBLEMS		
The "Procedure" button does not function properly.	1. Check the connectors and wires between the display board and the control board for loose or faulty connections (J11 and J3). 2. Check the connector J10 between the keypad and the display board for loose connections.	1. Perform the ***Keypad Resistance Test***. 2. The display board may be faulty. 3. The control board may be faulty.
Pressing the trigger key has no effect while not welding.	1. Make certain the DIP switches on the control board are not set for the security mode. DIP switch S1 position 6 must be in the OFF position. See ***Security Mode Selection***. 2. Check the connectors and wires between the display board and the control board for loose or faulty connections (J11 and J3). 3. Check the connector J10 between the Keypad and the display board for loose connections.	1. Perform the ***Keypad Resistance Test***. 2. The display board may be faulty. 3. The control board may be faulty.
The "Range" or "Control" button does not function correctly.	1. Make certain the DIP switches on the control board are not set for the security mode. DIP switch S1 position 6 must be in the OFF position. See ***Security Mode Selection***. 2. Check the connectors and wires between the display board and the control board for loose or faulty connections (J11 and J3). 3. Check the connector J10 between the keypad and the display board for loose connections.	1. Perform the ***Keypad Resistance Test***. 2. The display board may be faulty. 3. The control 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.

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PROBLEMS (SYMPTOMS)	POSSIBLE AREAS OF MISADJUSTMENT(S)	RECOMMENDED COURSE OF ACTION
FUNCTION PROBLEMS		
One of the encoder control knobs functions but the other one does not.	1. The unit maybe in a mode that utilizes only one display. To check if this is a problem, make sure that both knobs change the display when both displays are showing a number. 2. Check the wiring and plug connections between the encoder boards and the control board (Plug J2). See the Wiring Diagram.	1. Perform the ***Encoder Board Test***. 2. The control board may be faulty.
Neither encoder control knob functions.	1. Check the wiring and plug connections between the encoder boards and the control board. (Plug J2) See the Wiring Diagram.	1. Perform the ***Encoder Board Test***. 2. The control board may be faulty.
The STT-10 is dead. The displays and LEDs on the keypad are off. The green and red LEDs on the control board are not lit.	1. Make sure the STT-10 is connected properly to the power source. 2. Make sure 42 VAC is being applied to the STT-10 at the input receptacle terminals A and B.	1. The input rectifier bridge may be faulty. Check for 42 VAC at the red leads. Also check for at least 42 VDC at leads #542(+) to #500(-). See the Wiring Diagram. 2. The control board may be faulty.
The displays and LEDs on the keypad are off. The green and red LEDs on the control board are both blinking normally at about one second intervals.	1. Check the wires and connectors (J11 and J3) between the display board and the control board for loose or faulty connections.	1. Check leads #512 (1J3) to #500 (3J3) for the presence of 12.8 VDC. If the 12.8 VDC is not present the control board may be faulty. 2. If the 12.8 VDC is present the display board may be faulty.
The displays and LEDs on the keypad are off. The green and/or red LEDs on the control board are blinking at a very fast or erratic rate.	1. Make sure the STT-10 is connected properly to the power source. 2. Make sure 42 VAC is being applied to the STT-10 at the input receptacle terminals A and B.	1. The control board may be defective.

⚠ 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.

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TROUBLESHOOTING GUIDE

PROBLEMS (SYMPTOMS)	POSSIBLE AREAS OF MISADJUSTMENT(S)	RECOMMENDED COURSE OF ACTION
FUNCTION PROBLEMS		
The wire feed is consistent and adjustable, but operates at the wrong speed.	1. Make certain the DIP switch S1 is correctly set for the wire drive and gear ratio. See ***Wire Drive Head Selection***.	1. The control board may be faulty.
The dual procedure switch is not functioning at the gun.	1. Make sure the dual procedure switch is installed and connected properly. 2. The "Remote LED" on the keypad must be lit and the toggle switch on the remote control (if present) must be in the gun position.	1. Check the resistance between pins E & M of the 14-pin Amphenol connector on the wire drive while the dual procedure switch is opened and closed. The resistance must change from an open to almost no resistance. If the resistance doesn't change when the switch is opened and closed, check leads #519 and #520 for a broken solder connection or wire. See the Wiring Diagram. 2. Check the resistance between leads #519 and #520 of the plug that goes into connector J7 on the control P.C. board. As the dual procedure switch is opened and closed, the resistance between leads #519 and #520 must change. If the resistance doesn't change, Check for a broken connection or wire in the #519 and #520 leads. See the Wiring Diagram. 3. The control 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.

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PROBLEMS (SYMPTOMS)	POSSIBLE AREAS OF MISADJUSTMENT(S)	RECOMMENDED COURSE OF ACTION
FUNCTION PROBLEMS		
The knobs do not control the complete range of wire feed speed, peak current or background current.	1. Limits may be set for wire feed speed or voltage. See ***Technical Specifications***. 2. DIP switch S1 may be incorrectly set for the wire drive or gear ratio. See ***Wire Drive Head Selection***.	1. Perform the ***Encoder Board Test***. 2. The control board may be faulty.
An "Er" message is displayed when the STT-10 is powered up.	1. This indicates an EEPROM error has been detected. Check all the settings to make sure they are within the acceptable ranges. If the "Er" message is still displayed remove the input power. While pressing the Range and Control keys, turn on the input power. The message "Ln" should be displayed. Leave on for 5 seconds. Remove the input power. **NOTE:** All the settings will be removed.	1. The control board may be faulty.
A "GLP" message is displayed.	1. The Ground Lead Protector circuit has activated due to excessive current flow in the wire feeder frame. This can be caused by the electrode coming in contact with the wire feeder frame or poor connections in the work cable circuit. The wire feeder will be disabled. Remedy the "grounding" problem and resume normal operations by releasing the gun trigger and then closing the gun trigger.	1. The GLP reed switch may be faulty. This switch is normally open and should only close when current is flowing through the green lead and wire feeder frame. It may be stuck closed. See the Wiring Diagram. 2. The control 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.

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PROBLEMS (SYMPTOMS)	POSSIBLE AREAS OF MISADJUSTMENT(S)	RECOMMENDED COURSE OF ACTION
FUNCTION PROBLEMS		
When the gun trigger is activated the wire feeds and arc voltage is present but gas does not flow.	1. Make sure the gas supply is adequate and connected correctly to the STT-10. 2. Inlet gas pressure exceeding 80 psi.	1. Perform the ***Gas Solenoid Test***. 2. The control board may be faulty. 3. Verify that the gas pressure regulator is operating properly.
The K1449-1 remote control is not functioning when the Procedure LED is in the REMOTE position.	1. Make certain the K1449-1 is connected properly to the STT-10. 2. The K1449-1 remote control may be faulty.	1. Check for continuity between the pins of the Amphenol connector on the left side of the bottom of the control box and the plug that goes into Molex connector J4 on the control P.C. board. See The Wiring Diagram. 2. The control 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.

TROUBLESHOOTING GUIDE

PROBLEMS (SYMPTOMS)	POSSIBLE AREAS OF MISADJUSTMENT(S)	RECOMMENDED COURSE OF ACTION
FEEDING PROBLEMS		
The wire is feeding rough or not feeding, but the drive rolls are turning.	1. Check for mechanical restrictions in the wire feed path. 2. Make sure the gun liner is correct for the electrode wire being used. 3. Check the contact tip. 4. Make sure the drive rolls are installed correctly. 5. Make sure the DIP switches on the control board are set correctly. See ***Wire Drive Head Selection***.	1. If the drive rolls are turning erratically perform the ***Wire Drive Motor Test and Tach Adjustment and Feedback Test***.
The contact tip seizes in the gun liner.	1. The tip may be overheated because of prolonged or excessive high current and/ or duty cycle.	1. Apply a light coating of high temperature anti-seize lubricant-graphite grease to the tip's threads.

⚠ 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 welding arc is variable or “hunting”.	1. The electrode or work cables may have faulty connections. 2. Make sure the welding procedures are correct for the process being used. 3. Make sure the DIP switches on the control board are set correctly. 4. The gas shielding may not be sufficient or contaminated. 5. The power source may be faulty.	1. If the drive rolls are turning erratically perform the ***Wire Drive Motor Test*** and ***Tach Adjustment and Feedback Test***.
Poor arc striking with sticking or “blast-offs”. The bead may be narrow, ropey and have porosity.	1. Make sure the welding procedures are correct for the process being used. 2. The gas shielding may not be sufficient or contaminated. 3. Make sure the set screw in the connector block is in place and tightened against the liner bushing. 4. Weld procedures and/or parameters incorrect for process being performed. 5. The power source may be faulty.	1. If the drive rolls are turning erratically perform the ***Wire Drive Motor Test*** and ***Tach Adjustment and Feedback Test***. 2. Make certain weld procedures and parameters are correct for the process being performed.

⚠ 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.

WIRE DRIVE MOTOR 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

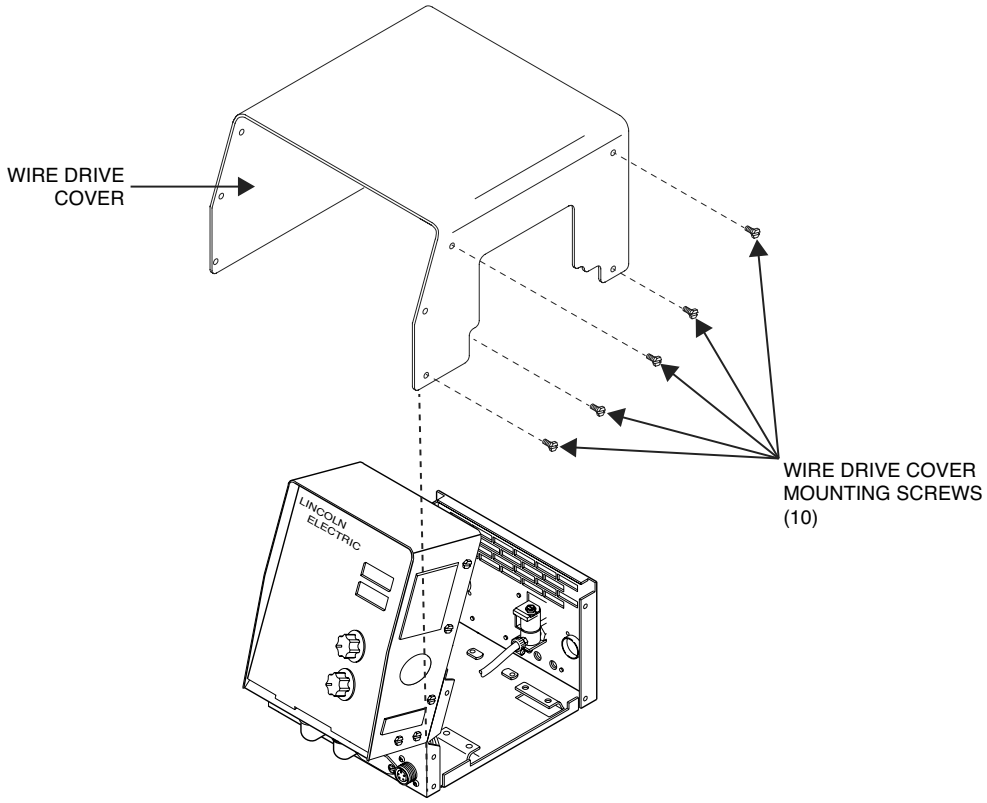
This test will help determine if the Wire Drive Motor is receiving the correct voltage and is capable of running properly.

MATERIALS NEEDED

5/16” Nutdriver
Volt/Ohmmeter
Wiring Diagram

WIRE DRIVE MOTOR TEST *(continued)*

Figure F.1 – Wire drive cover removal



PROCEDURE

1. Remove input power to the STT-10 unit.
2. Using a 5/16” nutdriver, remove the ten mounting screws securing the wire drive cover. See Figure F.1.
3. Locate the motor armature leads for the motor to be tested (one black (-) lead and one white (+) lead). Do not disconnect the leads. See ***Figure F.2***. See Wiring Diagram.
4. Apply the correct input power (42 VAC) to the STT-10. Activate the gun trigger. With the motor running, check the armature voltage at the black lead #541 (-) and white lead #539 (+). The normal voltage range is approximately 1 to 25 VDC depending on motor speed. When the armature voltage is increased the motor speed should also increase.
5. If the correct voltages are NOT present at the armature motor leads, check the associated leads and plugs for loose or faulty connections. See the Wiring Diagram. If the leads and connections are OK, the control board may be faulty.
6. If the correct voltages are present at the motor armature leads and the motor does not run and vary speed with changes in armature voltage, the motor or gear box may be faulty. See ***Wire Drive Motor and Gear Box Removal and Replacement***.
7. Install the wire drive cover.

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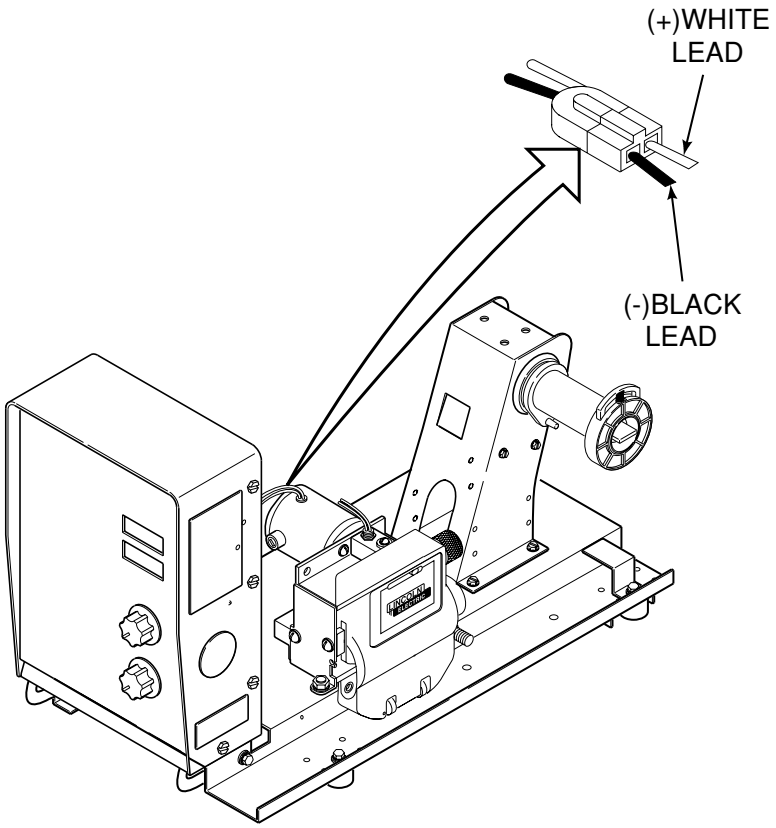
WIRE DRIVE MOTOR TEST *(continued)*

Figure F.2 – Wire drive motor test



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TACH ADJUSTMENT AND 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

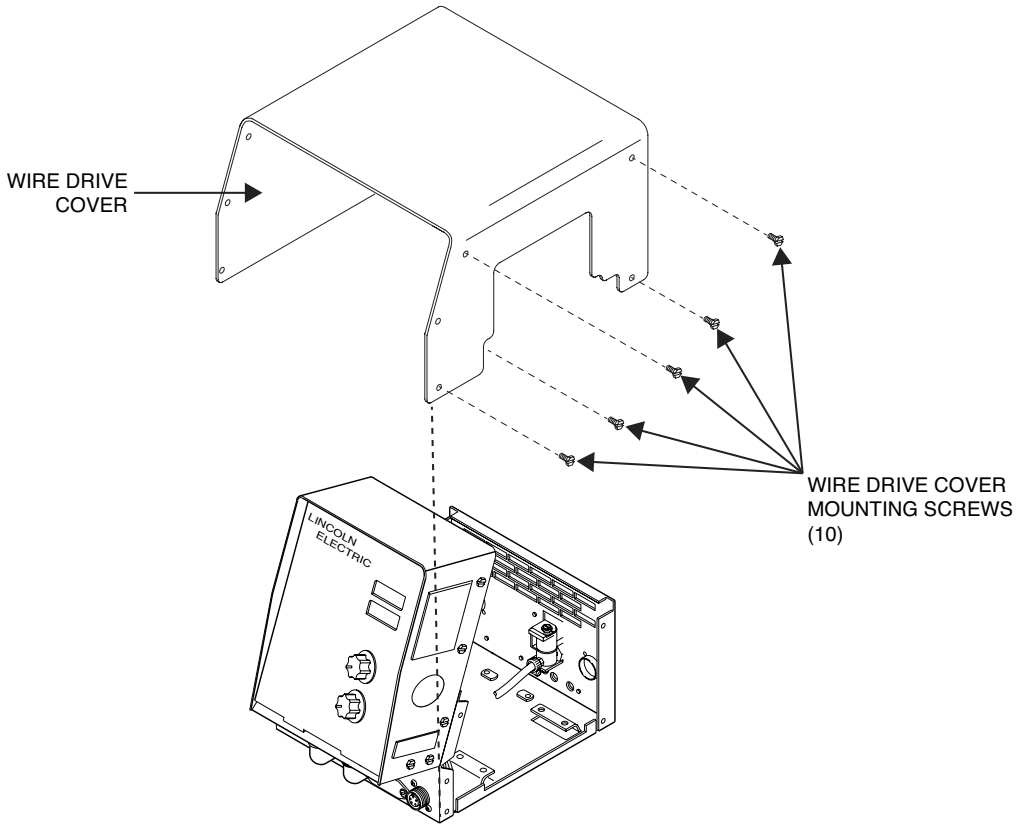
This test will determine if the Hall Effect Module (Tach) is functioning correctly.

MATERIALS NEEDED

5/16” Nutdriver
Volt/Ohmmeter
3/4” Nutdriver
Wiring Diagram

TACH ADJUSTMENT AND FEEDBACK TEST *(continued)*

Figure F.3 – Wire drive cover removal



PROCEDURE

1. Remove input power to the STT-10 unit.
2. Using a 5/16” nutdriver, remove the ten mounting screws securing the wire drive cover. See Figure F.3.
3. Locate the three hall effect leads (blue, red and black). See ***Figure F.4***. See Wiring Diagram.
4. Apply the correct input power (42 VAC) to the STT-10.
5. Check for approximately 12 VDC from red lead #512 (+) to black lead #500 (-). If the 12 VDC is NOT present or low, the control board or associated leads or plugs may be faulty. See the Wiring Diagram.
6. Activate the gun trigger. Make sure the motor is running. Check for the presence of approximately 5.0 VDC from blue lead #555 (+) to black lead #500 (-). The 5.0 VDC represents the correct feedback voltage from the hall effect device to the control board.
7. If the above voltage reading is not correct, the hall effect device may need to be adjusted or replaced. See ***Tach Adjustment Procedure***.

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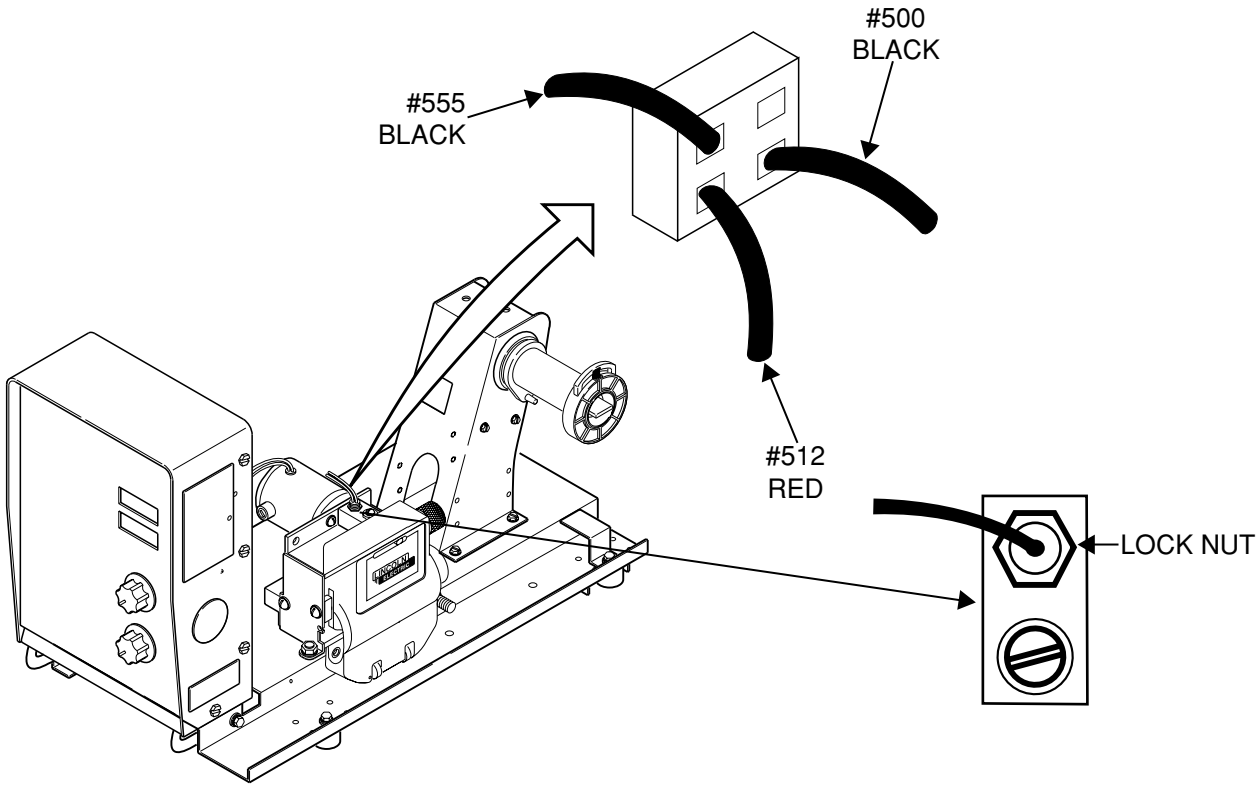
TACH ADJUSTMENT AND FEEDBACK TEST *(continued)*

Figure F.4 – Tach feedback test and module lock nut



TACH ADJUSTMENT PROCEDURE

Proper positioning of the module is critical to the proper operation the STT-10 wire feeder. If the device is not screwed in far enough the motor speed could be unstable or run at full speed with no control. If screwed in too far, it will rub a moving part inside the gearbox.

1. Remove input power to the STT-10 wire feeder.
2. Make sure the module is securely attached to the gearbox.
3. Using a 9/16” wrench, loosen the lock nut. See Figure F.4.
4. Gently screw the hall effect module into the mounting plate until it just touches and stops against the rotating part inside the gearbox. See Figure F.4.
5. Back the module out 1/2 turn. Using a 9/16” wrench, carefully snug the lock nut without rotating the module position. See Figure F.4.
6. Install the wire drive cover.

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Return to Master TOC
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KEYPAD RESISTANCE 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

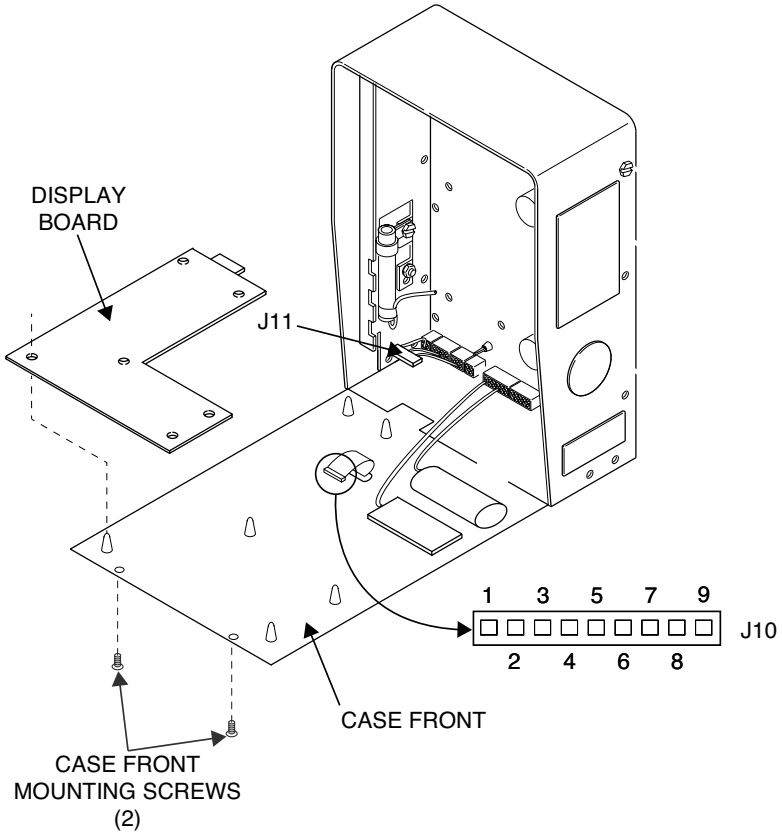
This test will determine if any key is not functioning properly.

MATERIALS NEEDED

5/16” Nutdriver
Analog Volt/Ohmmeter
Small Slotted Screwdriver
Wiring Diagram

KEYPAD RESISTANCE TEST *(continued)*

Figure F.5 – Keypad resistance test



PROCEDURE

1. Remove input power to the STT-10 unit.
2. Using a 5/16” nutdriver, remove the two mounting screws from the top of the case front. See Figure F.5.
3. Using a small slotted screwdriver, gently pry the top of the case front open. See Figure F.5.
4. Remove plug J11 from the display board. See Wiring Diagram.
5. Perform the ***Display Board Removal Procedure***.
6. Check the keypad resistances. See Figure F.5 and ***Table F.1***.
7. The resistances are checked at plug J10 on the keypad. See Figure F.5. See Wiring Diagram.
8. If any of the resistances are not correct, the keypad may be faulty.
9. When test is complete, carefully install the display board and connect plugs J10 and J11.
10. Using a 5/16” nutdriver, attach the two mounting screws securing the case front. See Figure F.5.

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KEYPAD RESISTANCE TEST *(continued)*

Table F.1 – Keypad resistance test

TEST POINTS			MAXIMUM ALLOWABLE RESISTANCE
FROM PIN	TO PIN	KEY PRESSED	(TYPICAL RESISTANCE)
1J10	2J10	CONTROL	100 OHMS (50 OHMS TYPICAL)
1J10	3J10	TIMER	100 OHMS (50 OHMS TYPICAL)
1J10	4J10	TRIGGER	100 OHMS (50 OHMS TYPICAL)
1J10	6J10	PROCEDURE	100 OHMS (50 OHMS TYPICAL)
1J10	7J10	COLD FEED FORWARD	100 OHMS (50 OHMS TYPICAL)
1J10	8J10	COLD FEED REVERSE	100 OHMS (50 OHMS TYPICAL)
1J10	9J10	GAS PURGE	100 OHMS (50 OHMS TYPICAL)

NOTE: There should not be continuity between pins until a key is pressed on the keypad.

ENCODER PC 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

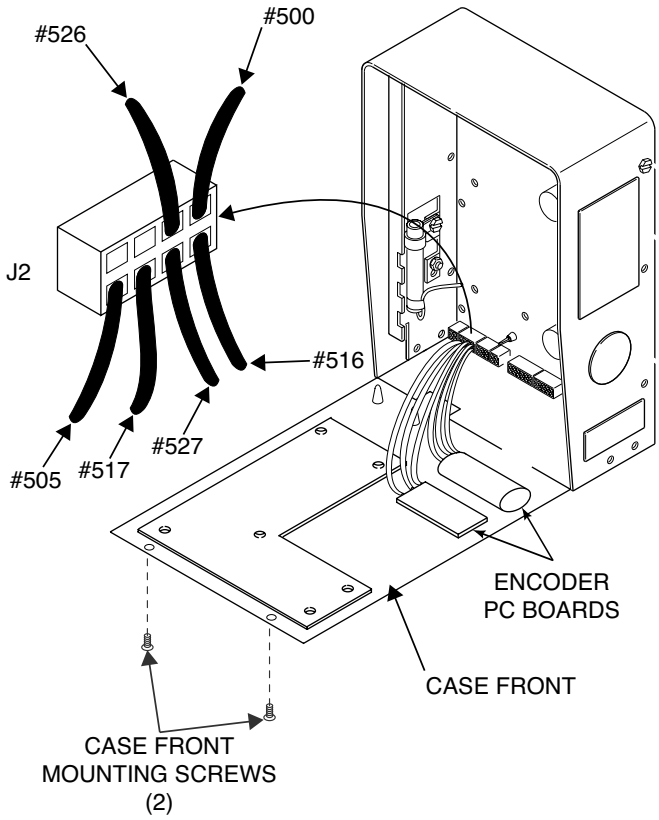
This test will help determine if the Encoder PC Boards are functioning properly.

MATERIALS NEEDED

5/16” Nutdriver
Volt/Ohmmeter (Analog Recommended)
Small Slotted Screwdriver
Wiring Diagram

ENCODER PC BOARD TEST *(continued)*

Figure F.6 – Encoder PC board test



PROCEDURE

1. Remove input power to the STT-10 unit.
2. Using a 5/16" nutdriver, remove the two mounting screws from the top of the case front. See Figure F.6.
3. Using a small slotted screwdriver, gently pry the top of the case front open. See Figure F.6.
4. Locate plug J2 on the control board. See Figure F.6. See Wiring Diagram. Do not remove the plug from the control board.
5. Apply the correct input power (42 VAC) to the STT-10 unit.
6. Carefully check for the presence of 5 VDC from 5J2 (lead #505) to 4J2 (lead #500). This is the supply voltage from the control board to both encoder boards (Current and WFS). If this voltage is missing or low the control board may be defective. Also make certain the 5 VDC supply is being applied to the encoder boards via leads #505 and #500. See the Wiring Diagram.
7. While slowly rotating the current control check for a "pulsing" 0 to 5 VDC signal from 8J2 (lead #516) to 6J2 (lead #517). If the 5 VDC supply IS present at the encoder board and the pulsing signal is NOT, the current encoder board may be faulty. Also check the lead and plug connections between the encoder board and the control board. See the Wiring Diagram.
8. While slowly rotating the WFS control check for a "pulsing" 0 to 5 VDC signal from 3J2 (lead #526) to 7J2 (lead #527). If the 5 VDC supply IS present at the encoder board and the pulsing signal is NOT, the WFS encoder board may be faulty. Also check the lead and plug connections between the encoder board and the control board. See the Wiring Diagram.

NOTE: "Pulsing" means that as the control is rotated the signal will fluctuate from 0 to 5 VDC.

9. Remove input power to the STT-10 unit.
10. Using a 5/16" nutdriver, attach the two mounting screws securing the case front. See Figure F.6.

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GAS SOLENOID 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

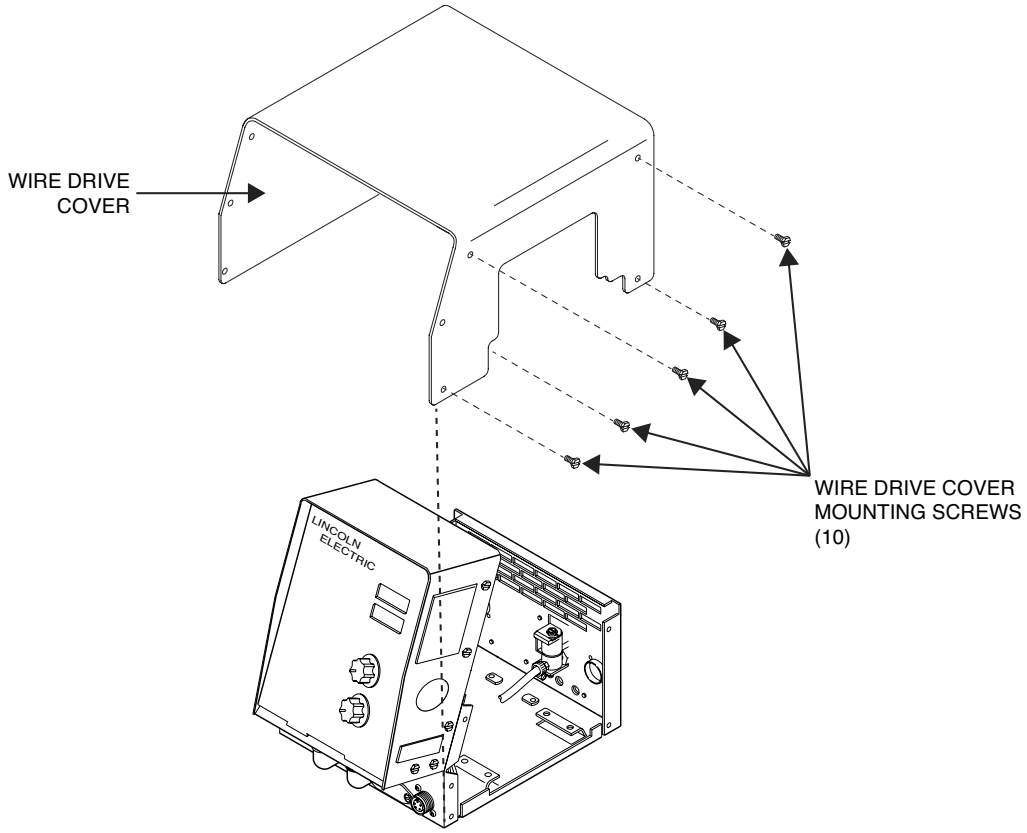
This procedure will help determine if the Gas Solenoid is receiving the correct voltage and if the Solenoid is functional.

MATERIALS NEEDED

5/16” Nutdriver
Volt/Ohmmeter
12 VDC @ 1 Amp Power Source
Wiring Diagram

GAS SOLENOID TEST *(continued)*

Figure F.7 – Wire drive cover removal



PROCEDURE

1. Remove input power to the STT-10 unit.
2. Using a 5/16” nutdriver, remove the ten mounting screws securing the wire drive cover. See Figure F.7.
3. Locate the gas solenoid and lead connection. See ***Figure F.8***. See Wiring Diagram. Do not disconnect the leads.
4. Apply the correct input power (42 VAC) to the STT-10 unit.
5. While pressing the gas purge button or activating the gun trigger, check for approximately 10 VDC at the solenoid leads. If the 10 VDC is present the gas solenoid should activate.
6. If the 10 VDC is missing or low, check the leads and connections between the solenoid and the control board. See the Wiring Diagram. If the leads and connections are OK the control board may be faulty.
7. If the 10 VDC is present at the solenoid leads and the solenoid does not activate the solenoid may be faulty. Normal solenoid coil resistance is approximately 22 ohms.
8. The solenoid can be further checked by disconnecting the solenoid leads from the STT-10 wiring harness and applying an external 12 VDC supply to the leads. If the solenoid does not activate the solenoid is faulty.
9. Reconnect all disconnected leads.
10. Install the wire drive cover.

Return to Section TOC
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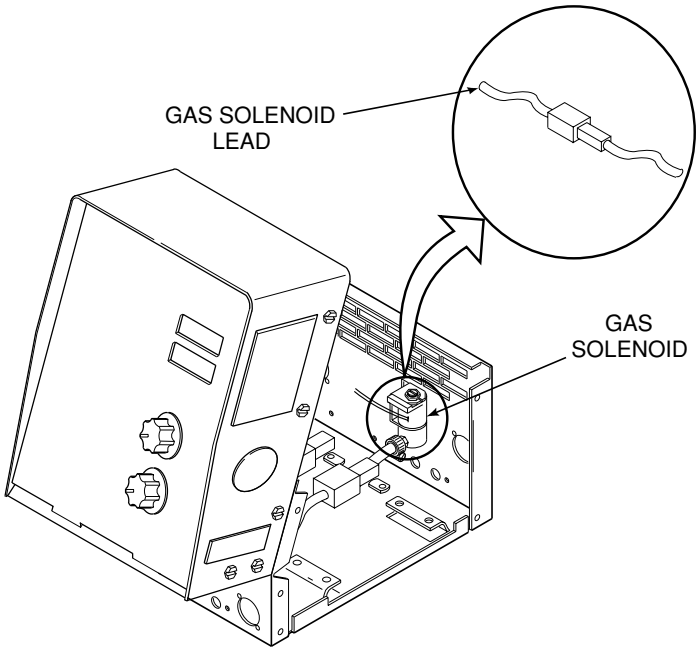
GAS SOLENOID TEST *(continued)*

Figure F.8 – Gas solenoid and lead locations



NOTE: WIRE FEEDER SHOWN WITH DRIVE MOTOR ASSEMBLY REMOVED FOR CLARITY

DISPLAY 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 Display Board.

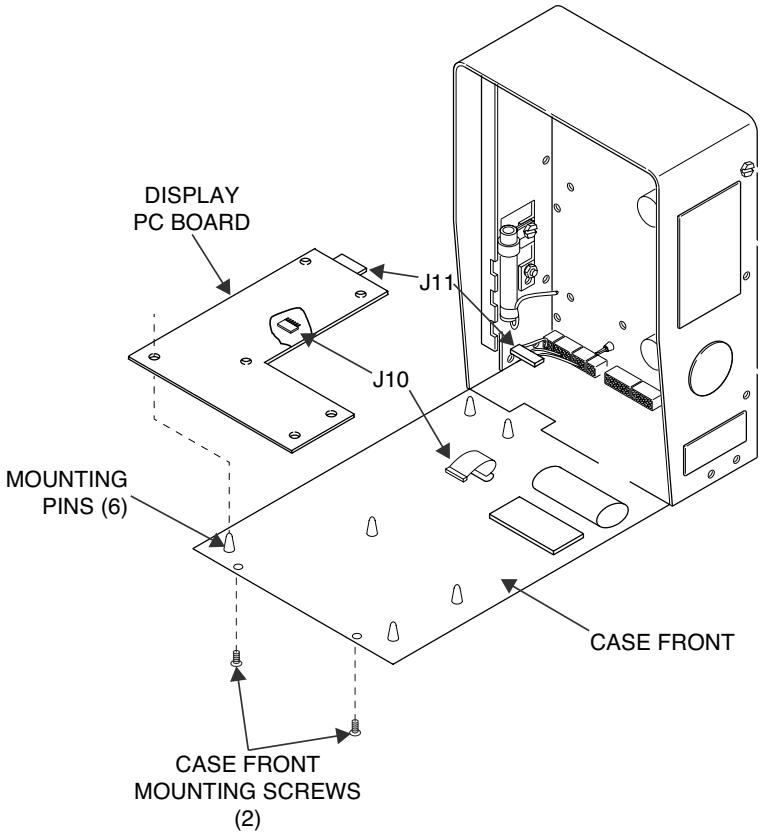
MATERIALS NEEDED

5/16” Nutdriver
Small Slotted Screwdriver
Wiring Diagram

DISPLAY BOARD

REMOVAL AND REPLACEMENT PROCEDURE *(continued)*

Figure F.9 – Display board removal



REMOVAL PROCEDURE

1. Remove input power to the STT-10 unit.
2. Using a 5/16” nutdriver, remove the two mounting screws from the top of the case front. See Figure F.9.
3. Using a small slotted screwdriver, gently pry the top of the case front open. See Figure F.9.
4. Label and remove plug J11 from the display board. Observe static electricity precautions. See Figure F.9. See Wiring Diagram.
5. Carefully pry the display board from the six mounting pins. Note that the keypad is still attached to the display board via plug J10. See Figure F.9. See Wiring Diagram.
6. Label and remove plug J10 from the display board. See Wiring Diagram. See Figure F.9.

DISPLAY BOARD
REMOVAL AND REPLACEMENT PROCEDURE *(continued)*

REPLACEMENT PROCEDURE

1. Connect the previously removed plug J10 to the new display board. See Wiring Diagram.
2. Carefully attach the display board to the six mounting pins.
3. Connect the previously removed plug J11 to the new display board. See Wiring Diagram.
4. Close the case front.
5. Using a 5/16” nutdriver, attach the two mounting screws securing the case front.

GAS SOLENOID
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.

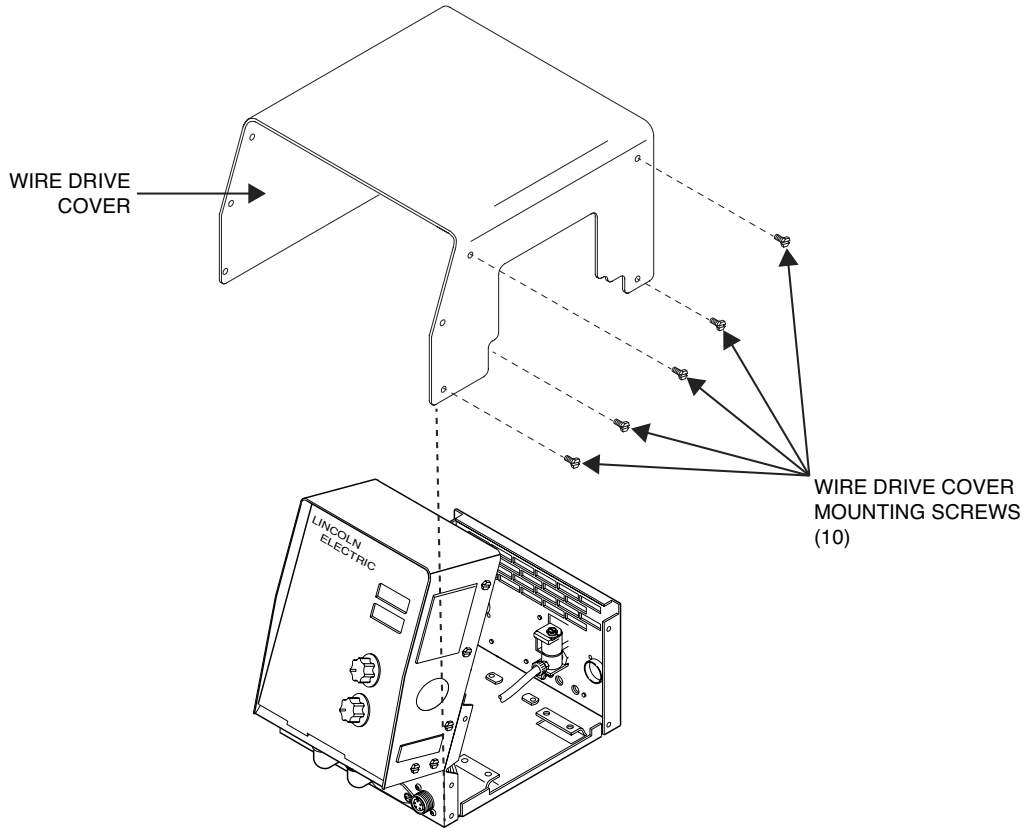
MATERIALS NEEDED

5/16” Nutdriver
5/16” Socket
Pliers
Phillips Screwdriver
Wiring Diagram

GAS SOLENOID

REMOVAL AND REPLACEMENT PROCEDURE *(continued)*

Figure F.10 – Wire drive cover removal



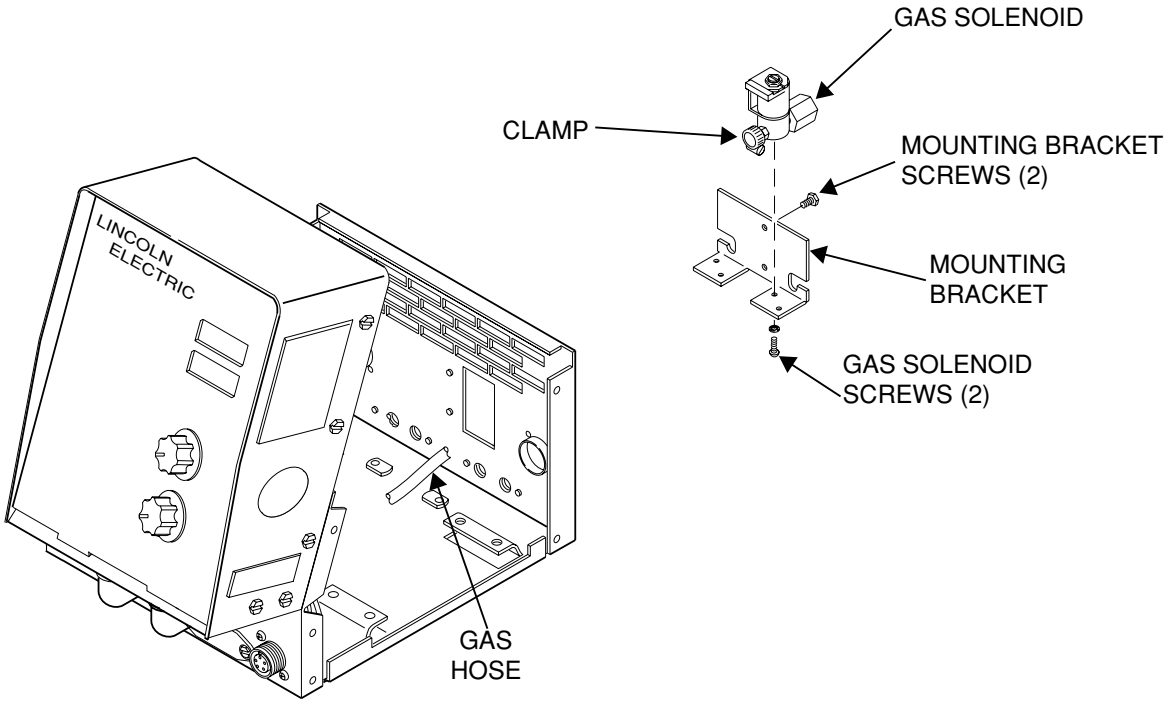
REMOVAL PROCEDURE

1. Remove input power to the STT-10 unit.
2. Using a 5/16” nutdriver, remove the ten screws securing the wire drive cover. See Figure F.10.
3. Using pliers, gently remove the rubber gas hose and clamp from the gas solenoid. See ***Figure F.11***. Be careful not to damage the rubber hose.
4. Label and disconnect leads 512 and 522 from the gas solenoid. See Wiring Diagram.
5. Using a 5/16” socket, remove the two screws securing the mounting bracket to the rear panel of the wire feeder. See ***Figure F.11***.
6. Remove the gas solenoid and mounting bracket from the STT-10 unit. See ***Figure F.11***.
7. Using a phillips screwdriver, remove the two screws securing the gas solenoid to the mounting bracket. Note washer placement for reassembly. See ***Figure F.11***.
8. Remove the solenoid.

GAS SOLENOID

REMOVAL AND REPLACEMENT PROCEDURE *(continued)*

Figure F.11 – Gas solenoid removal



NOTE: WIRE FEEDER SHOWN WITH DRIVE MOTOR ASSEMBLY REMOVED FOR CLARITY

REPLACEMENT PROCEDURE

1. Using the two previously removed screws and washers, mount the new solenoid onto the mounting bracket.
2. Using a 5/16” socket, attach the two screws securing the gas solenoid and mounting bracket to the machine.
3. Connect leads 512 and 522 to the gas solenoid. See Wiring Diagram.
4. Using pliers, gently attach the rubber hose and clamp to the gas solenoid. Be careful not to damage the rubber hose.
5. Using a 5/16” nutdriver, attach the ten screws securing the wire drive cover to the machine.

ENCODER 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 WFS or Volts Control Encoder Boards.

MATERIALS NEEDED

5/16” Nutdriver
5/64” Allen Wrench
1/2” Deep Well Socket
Needle Nose Pliers

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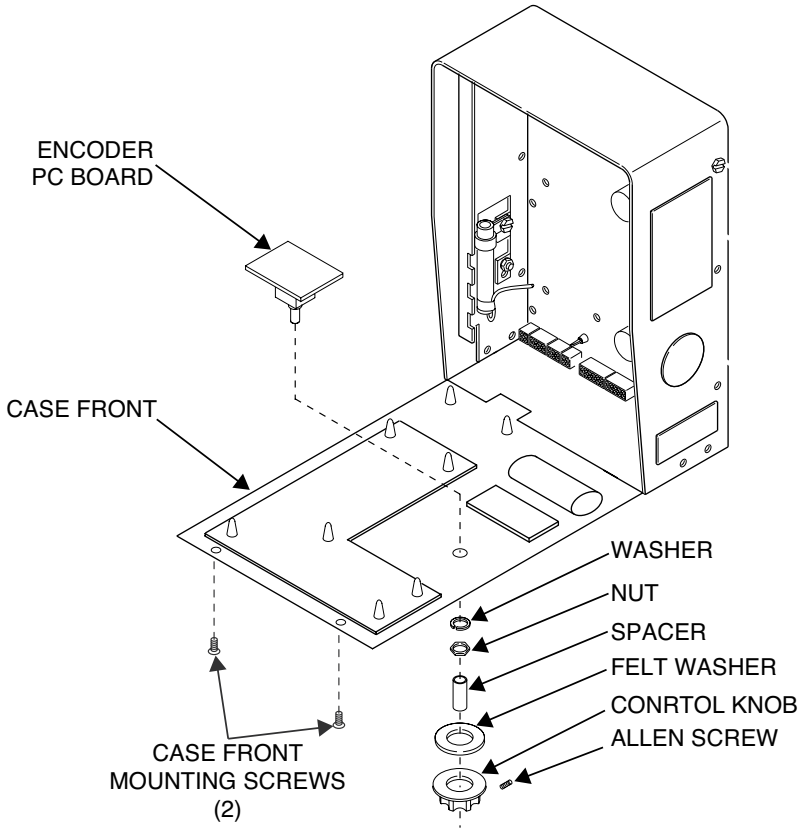
ENCODER PC BOARD
REMOVAL AND REPLACEMENT PROCEDURE *(continued)*

Figure F.12 – Encoder PC board removal



REMOVAL PROCEDURE

1. Remove input power to the STT-10 unit.
2. Using a 5/16” nutdriver, remove the two mounting screws from the top of the case front. See Figure F.12.
3. Using a small slotted screwdriver, gently pry open the case front. See Figure F.12.
4. Using a 5/64” allen wrench, remove the control knob and felt washer from the encoder board that is to be removed. See Figure F.12.
5. Using needle nose pliers, gently remove the spacer. See Figure F.12.
6. Using a 1/2” deep well socket, remove the nut and washer from the control shaft. Note washer placement for reassembly. See Figure F.12.
7. Carefully remove the encoder PC board from the case front. See Figure F.12.
8. Label and disconnect harness plug J17 from the encoder PC board. See Wiring Diagram.

ENCODER PC BOARD
REMOVAL AND REPLACEMENT PROCEDURE *(continued)*

REPLACEMENT PROCEDURE

1. Connect previously removed harness plug J17 into the new encoder PC board. See Wiring Diagram.
2. Carefully position new encoder pc board into machine.
3. Using 1/2" deep well socket, attach the nut and washer to the control shaft securing the encoder pc board to the machine.
4. Place previously removed spacer into position.
5. Using a 5/64" allen wrench, secure the felt washer and control knob to the encoder board.
6. Close the case front.
7. Using a 5/16" nutdriver, attach the two screws securing the case front.

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WIRE DRIVE MOTOR AND GEAR BOX 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/or Gear Box.

MATERIALS NEEDED

Pliers
5/16” Nutdriver
3/16” Allen Wrench
7/16” Socket Wrench And Extension
3/4” Wrench
5/16” Open End Wrench
Slotted Screwdriver
Wiring Diagram

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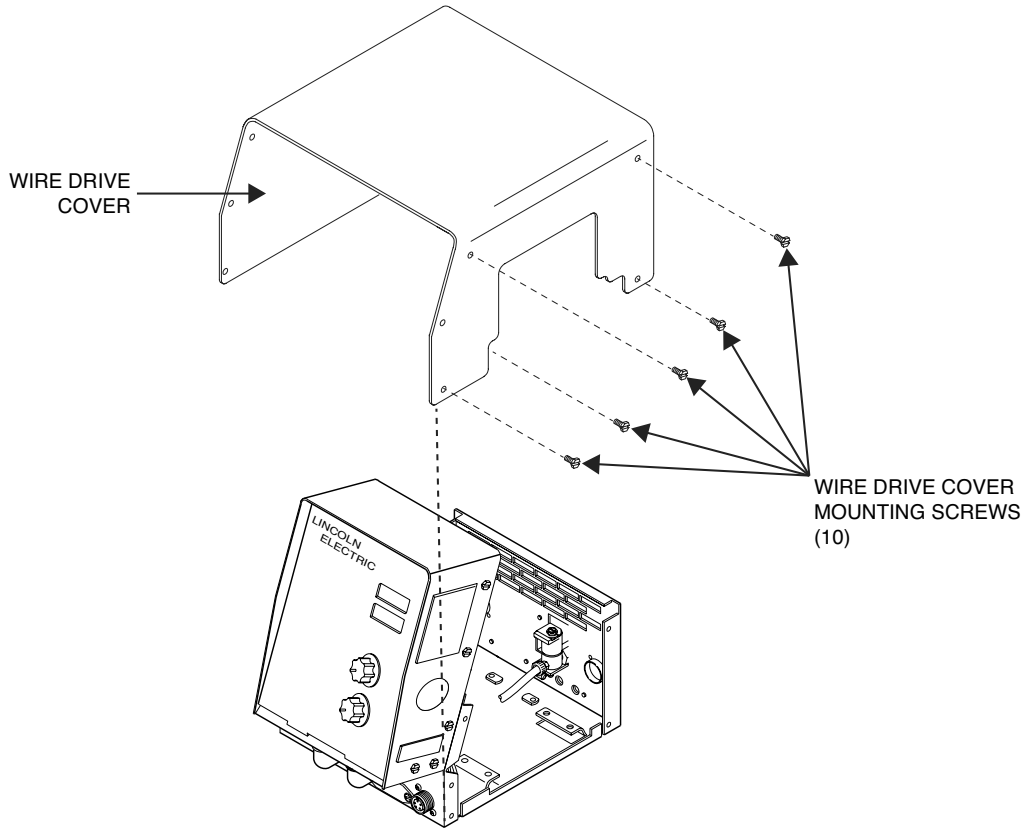
WIRE DRIVE MOTOR AND GEAR BOX
REMOVAL AND REPLACEMENT PROCEDURE *(continued)*

Figure F.13 – Wire drive cover mounting screw location



REMOVAL PROCEDURE

1. Remove input power to the STT-10 unit.
2. Remove the electrode wire from the wire drive.
3. Using a 5/16" nutdriver, remove the ten mounting screws securing the wire drive cover. See Figure F.13.
4. Label and disconnect the lead #67 at the quick connect. See ***Figure F.14***. See Wiring Diagram.
5. Using pliers, gently remove the rubber gas hose and clamp from the brass gun connector. See ***Figure F.14***. Be careful not to damage the rubber hose.
6. Label and disconnect the tach (hall effect device) leads. See Wiring Diagram. See ***Figure F.14***.
7. Label and disconnect the motor armature leads. See Wiring Diagram. See ***Figure F.14***.
8. Remove any necessary cable ties.
9. Using a 3/4" wrench, remove the bolt securing the electrode cable to the wire feed assembly. See ***Figure F.15***. Note washer placement for reassembly.
10. Using a 7/16" socket wrench and extension, remove the four mounting screws, lock washers and flat washers securing the motor, gearbox and feed head assembly. See ***Figure F.14***. Note washer placement for reassembly. The motor, gear box and feed head assembly are now free from the STT-10 unit. Note RTV sealant placement for reassembly.

TO REMOVE THE DRIVE MOTOR FROM THE GEAR BOX

1. Using a slotted screwdriver and 7/16" wrench, remove the three screws securing the gear box inspection cover nearest to the drive motor. See ***Figure F.16***.

NOTE: Slotted screwdriver may be necessary to gently pry open inspection cover.

2. Using a 5/16" open end wrench, remove the motor mounting screw located inside the gear box. See ***Figure F.16***.
3. Using a slotted screwdriver, remove the two screws mounting the "top" of the motor to the gear box. See ***Figure F.16***.
4. Carefully remove the drive motor from the gear box assembly. Note motor lead placement for reassembly.

TO REMOVE THE WIRE DRIVE ASSEMBLY FROM THE GEAR BOX

1. Using a 3/16" allen wrench, loosen the two allen screws located at the bottom of the wire drive unit. See ***Figure F.16***.
2. Label and remove lead #67 from the conductor block. See Wiring Diagram. See ***Figure F.16***.
3. Carefully remove the wire drive assembly from the gear box assembly.

WIRE DRIVE MOTOR AND GEAR BOX
REMOVAL AND REPLACEMENT PROCEDURE *(continued)*

Figure F.14 – Wire feed assembly removal

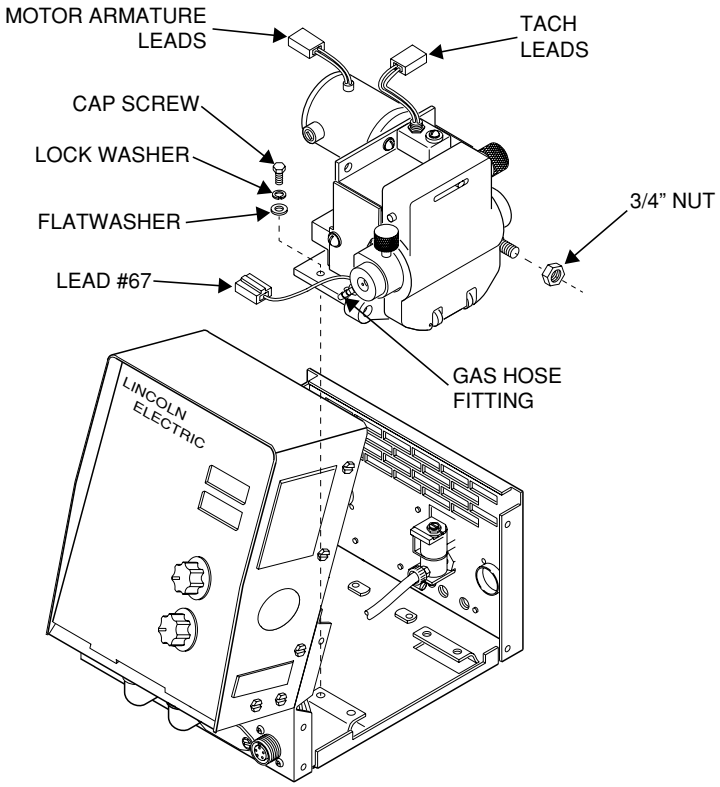
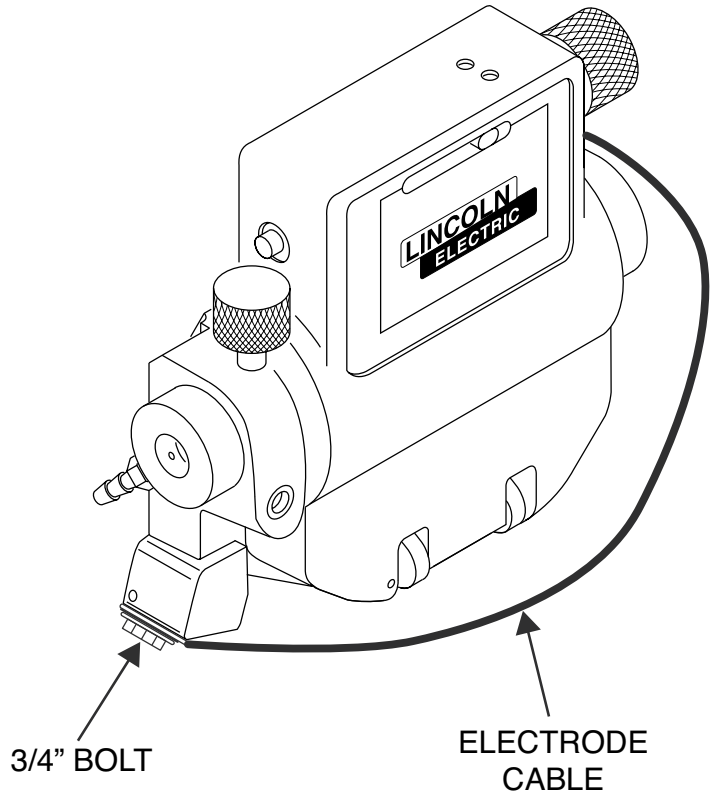
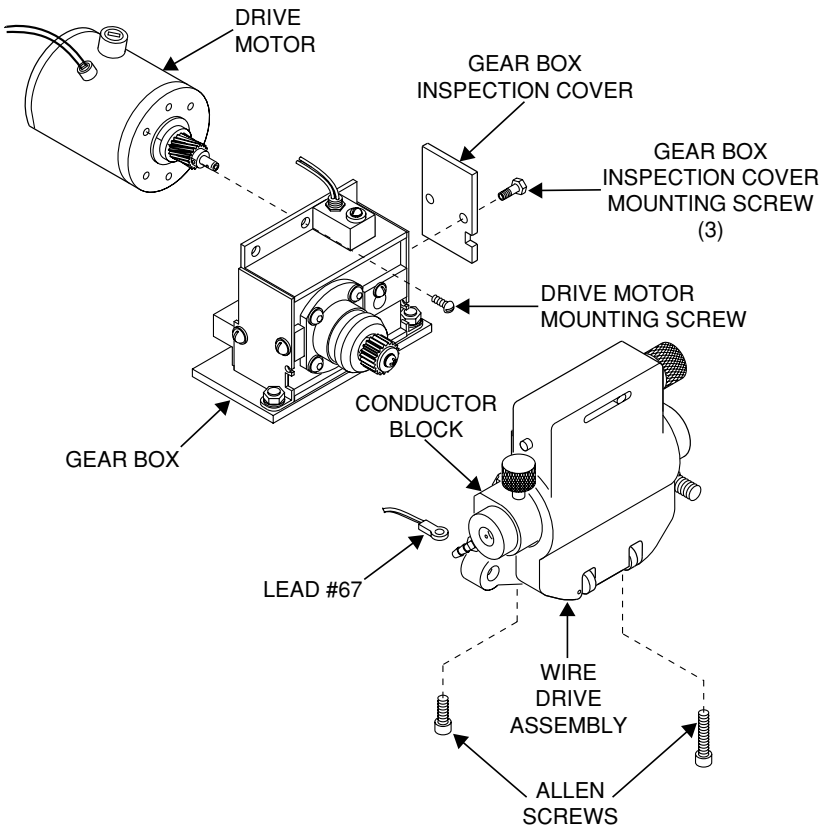


Figure F.15 – Electrode cable location



WIRE DRIVE MOTOR AND GEAR BOX
REMOVAL AND REPLACEMENT PROCEDURE *(continued)*

Figure F.16 – Drive motor and wire drive assembly removal



REPLACEMENT PROCEDURE

1. Carefully join wire drive assembly and gear box together.
2. Using a 3/16” allen wrench, tighten the two allen screws at the bottom of the wire drive unit.
3. Attach previously disconnected lead #67 to the conductor block. See Wiring Diagram.
4. Carefully slide the drive motor into the gear box assembly. Be sure to position the motor leads so that they can be properly connected. See ***Figure F.14***.
5. Using a slotted screwdriver, attach the mounting screws securing the “top” of the drive motor to the gear box.
6. Using a 5/16” open end wrench, install the mounting screw located inside the gear box.
7. Using a slotted screwdriver and a 7/16” wrench, attach the screws, nut and washers previously removed securing the gear box inspection cover. Seal with silicone rubber RTV sealant.
8. Carefully place the entire assembly into the STT-10 unit. Align the mounting holes with wire feeder base.
9. Using a 7/16” socket wrench and extension, attach the previously removed four mounting screws, lock washers and flat washers securing the assembly to the wire feeder base.
10. Using pliers, gently attach the rubber gas hose and clamp to the brass gun connector. Be careful not to damage the rubber hose.
11. Connect the previously removed motor armature leads. See Wiring Diagram.
12. Connect the previously removed tach (hall effect device) leads. See Wiring Diagram.
13. Using a 3/4” wrench, attach the electrode cable and washer to the wire feed assembly.
14. Replace any cut or removed cable ties.
15. Using a 5/16” nutdriver, attach the ten mounting screws securing the wire drive cover.

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Return to Master TOC

CURRENT SENSING REED 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 Current Sensing Reed Switch.

MATERIALS NEEDED

3/4” Deep Well Socket
Slotted Screwdriver

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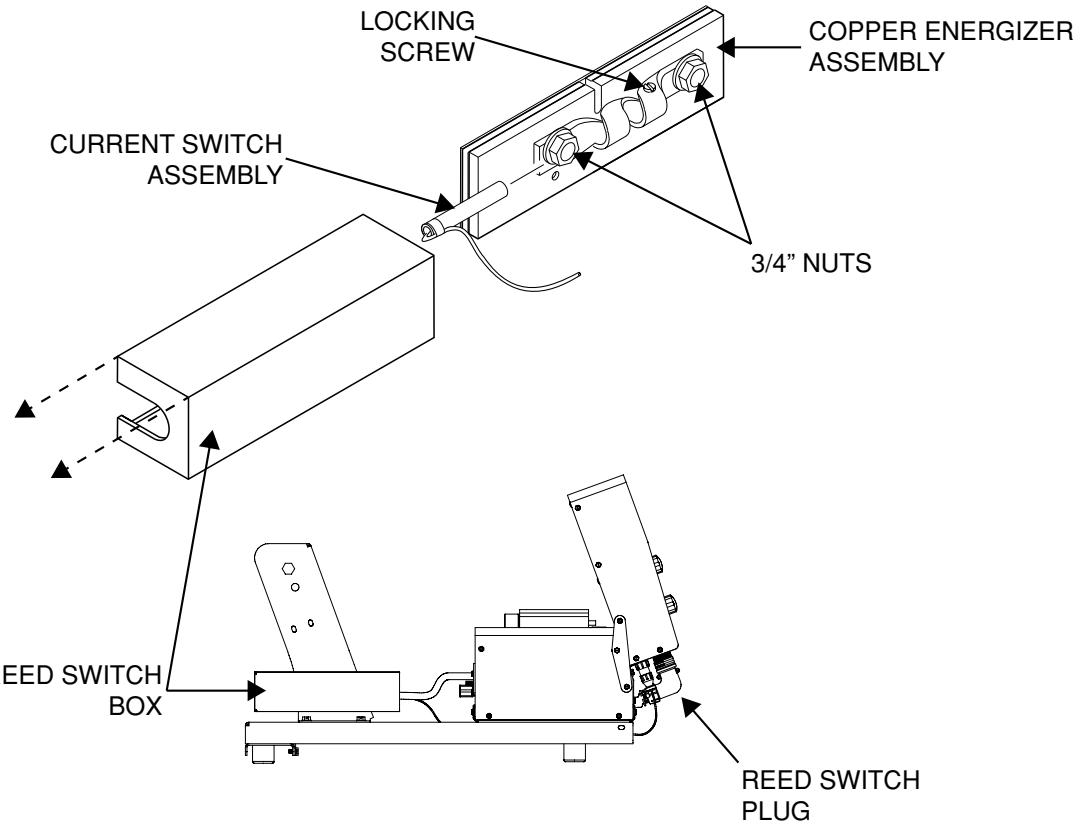
CURRENT SENSING REED SWITCH
REMOVAL AND REPLACEMENT PROCEDURE *(continued)*

Figure F.17 – Current sensing reed switch / plug location



REMOVAL PROCEDURE

1. Remove input power to the STT-10 unit.
2. Disconnect the reed switch plug from the front of the machine. See Figure F.17.
3. Remove the reed switch box by pulling rearward on the box until it is free from the machine. See Figure F.17.
4. Using a 3/4" deep well socket, remove the two nuts securing the copper energizer to the machine. See Figure F.17.
5. Using a slotted screwdriver, loosen the locking screw and remove the current switch assembly from the energizer. Note lead routing for reassembly. See Figure F.17.

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CURRENT SENSING REED SWITCH REMOVAL AND REPLACEMENT PROCEDURE *(continued)*

REPLACEMENT PROCEDURE

1. Position the new reed switch in the copper energizer.
2. Using a slotted screwdriver, tighten the locking screw securing the reed switch to the copper energizer.
3. Using a 3/4” deep well socket, attach the two nuts securing the copper energizer to the machine.
4. Carefully slide the reed switch box into position on the machine.
5. Connect the previously removed reed switch plug to the front of the machine.

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RETEST AFTER REPAIR

If a failed test indicates that any mechanical part which could affect the machine's electrical characteristics must be replaced or if any electrical components are repaired or replaced, the machine must be retested and meet the following standards.

Apply the correct input power (42 VAC) to the STT-10 unit. The following checks should be performed.

1. Press the Purge key. The gas solenoid should activate, then deactivate when the key is released.
2. Press the Cold Feed Forward key. Check that the direction of rotation of the drive roll is correct to feed wire out of the front of the machine. Check that the drive roll shaft stops abruptly when the key is released.
3. Press the Cold Feed Reverse key. Check that the direction of rotation of the drive roll is correct to retract the electrode wire back into the machine. Check that the drive roll shaft stops abruptly when the key is released.

Check the Feeder selection and Procedure keys for proper operation.

1. Press the Trigger key. The LEDs should toggle through the various trigger selections as the key is pressed and released.
2. Press the Range key. The "Peak Max" LED above the Range key must light up. Keep pressing until the "WFSMIN" LED turns on. Press the Range key again, the LED's above the Range key must turn off.
3. Press the Control key until the "Preflow" LED illuminates. Decrease the preflow time to 0.0 seconds using the current knob. Keep pressing the Control key until the "Postflow" LED illuminates. Decrease the Postflow time to 0.0 seconds using the current knob.

The WFS controls must function and change the appropriate display.

CHECK WIRE FEED SPEED RANGE

STT-10 with low speed gear installed:

35-500 IPM

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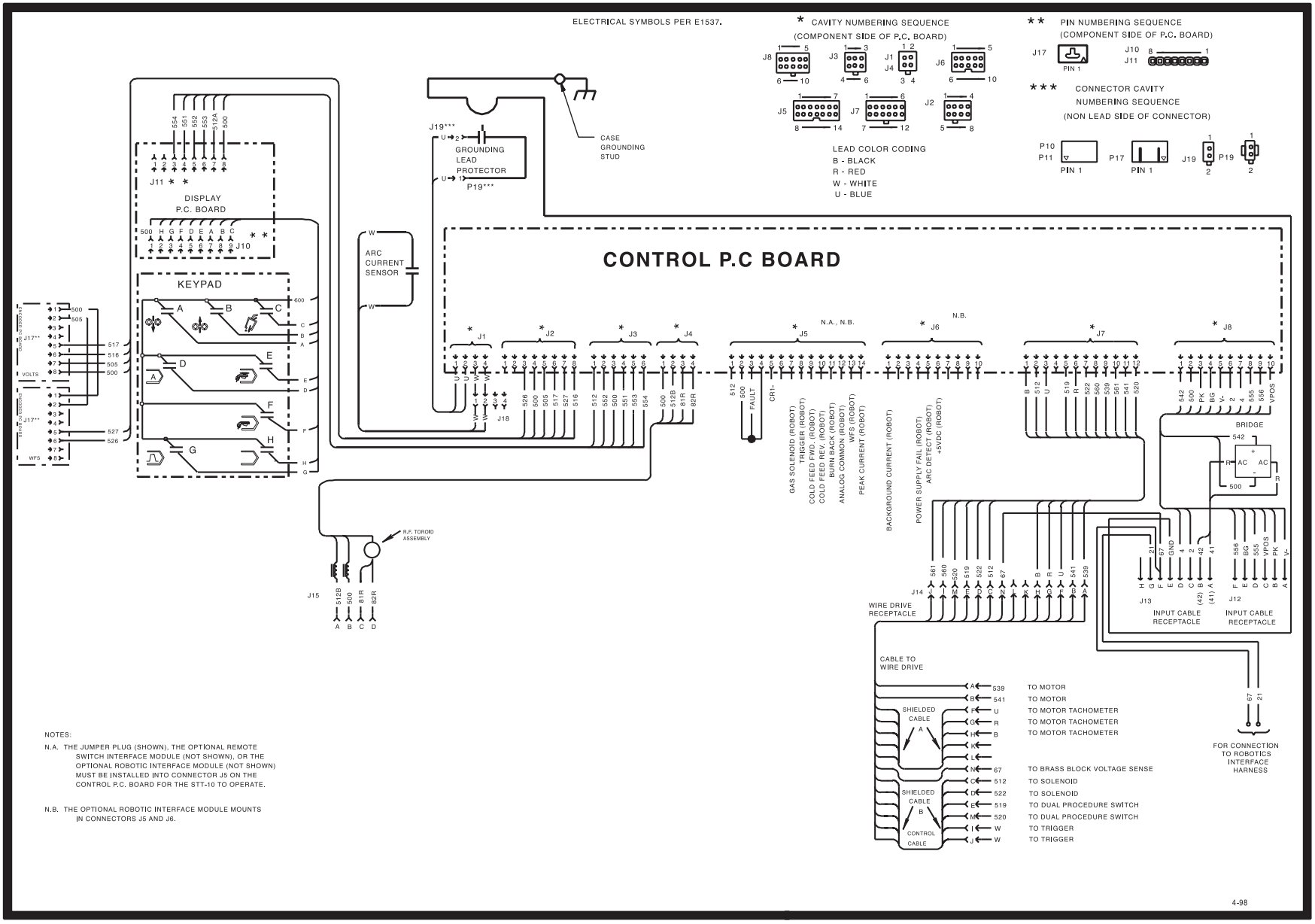
WIRING DIAGRAM (STT-10 CONTROL)



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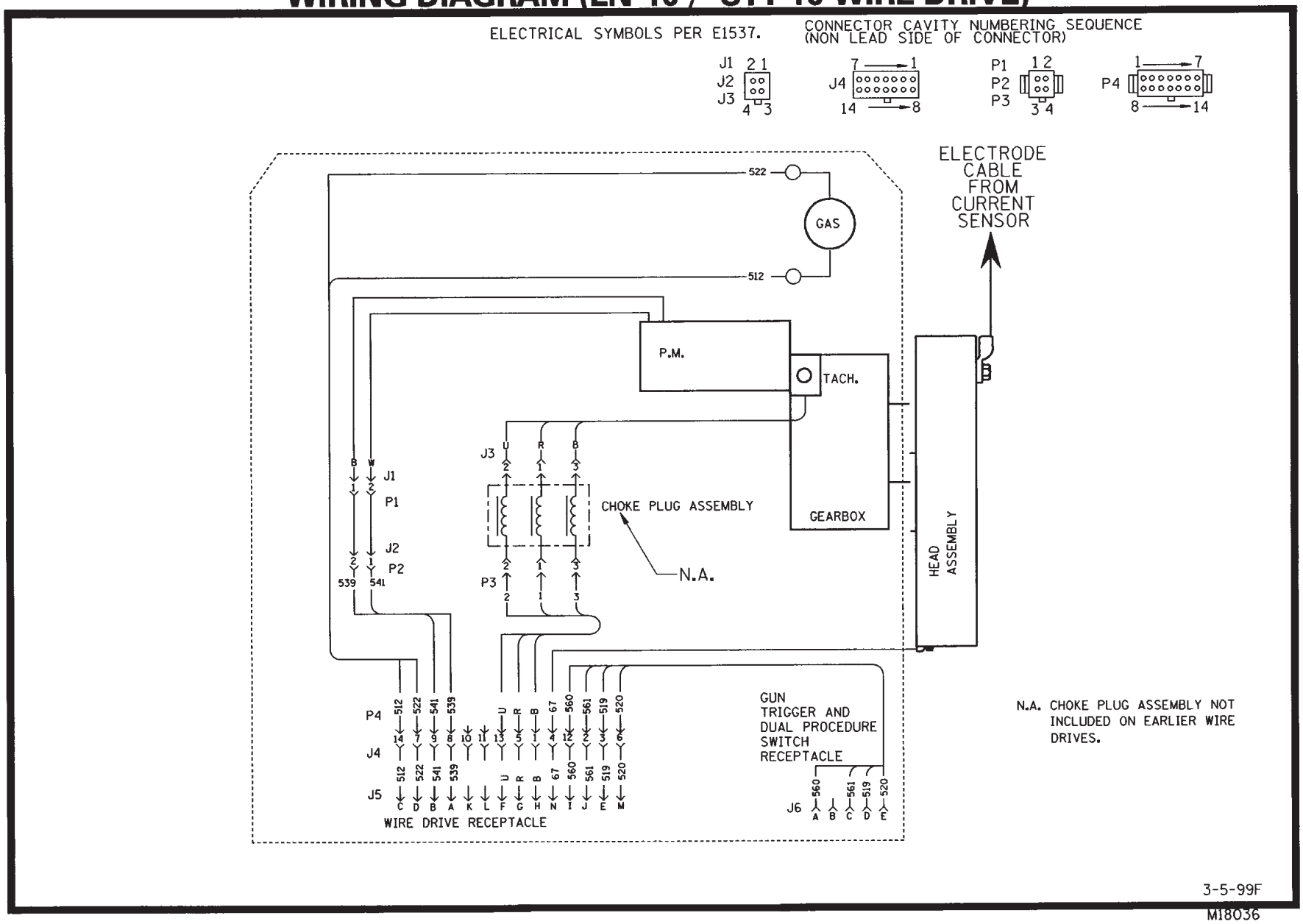
NOTE: This diagram is for reference only. It may not be accurate for all machines covered by this manual. The specific diagram for a particular code is pasted inside the machine on one of the enclosure panels. If the diagram is illegible, write to the Service Department for a replacement. Give the equipment code number..

WIRING DIAGRAM (LN-10 / STT-10 WIRE DRIVE)



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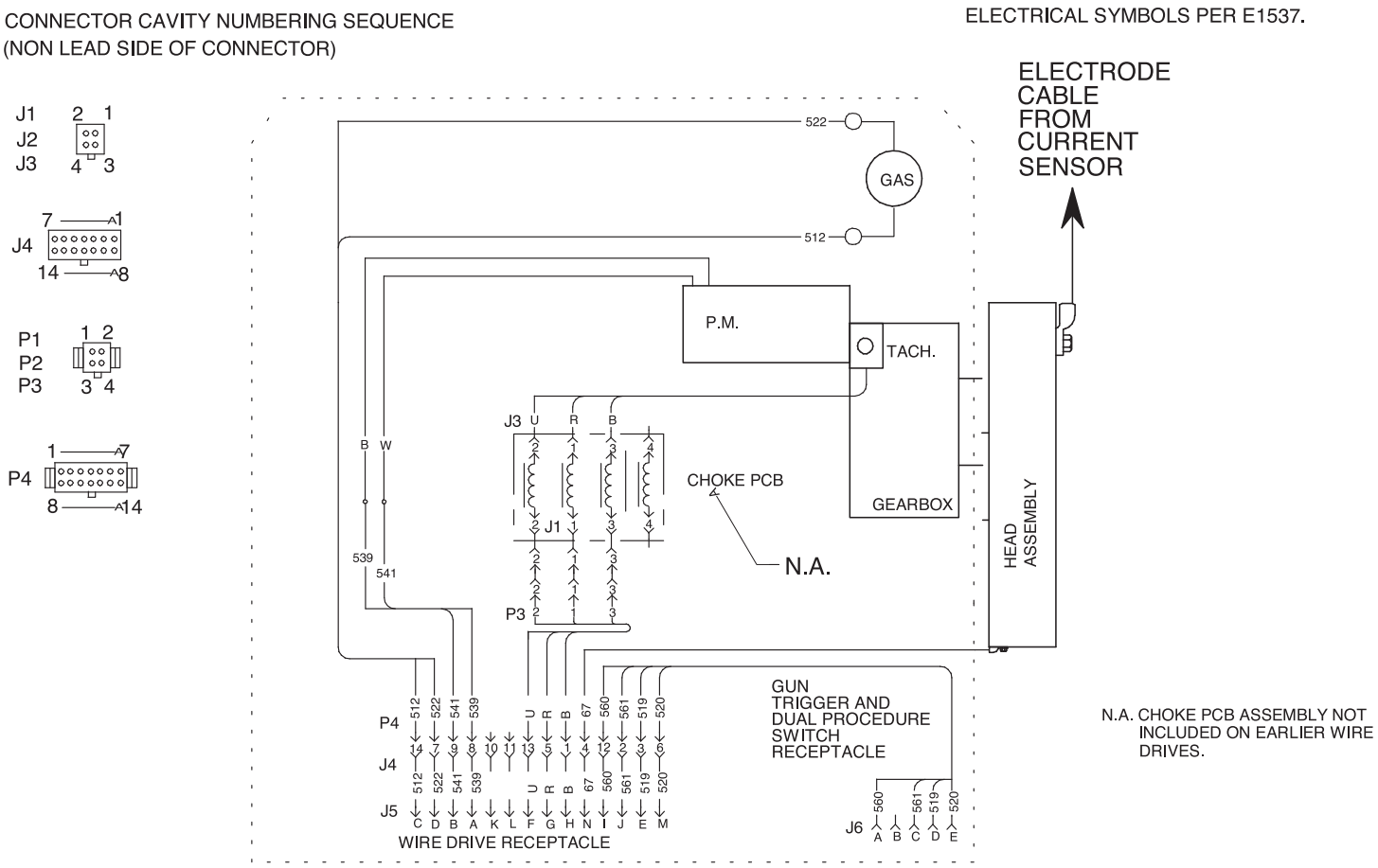
WIRING DIAGRAM (LN-10/ STT-10 WIRE DRIVE)



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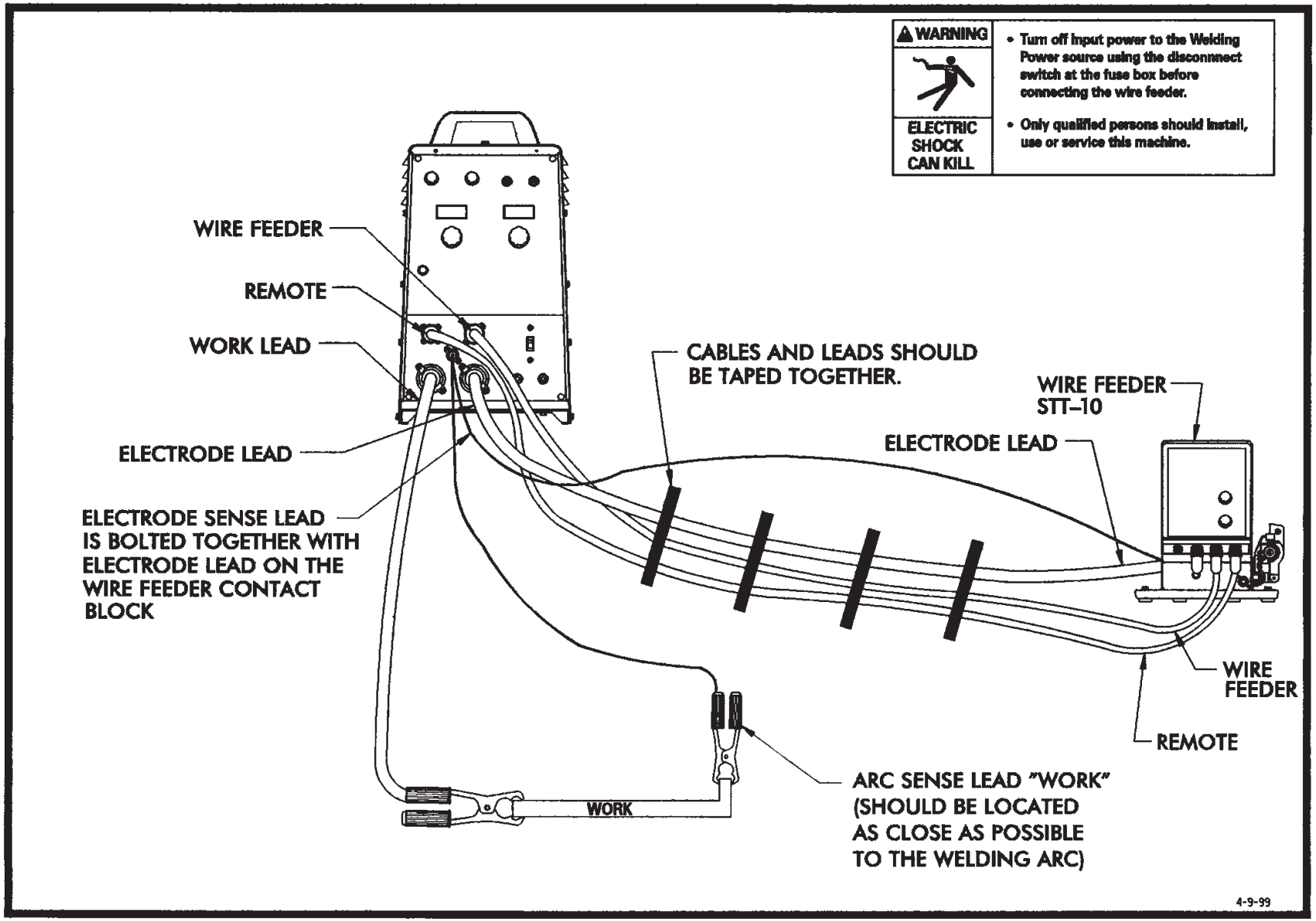
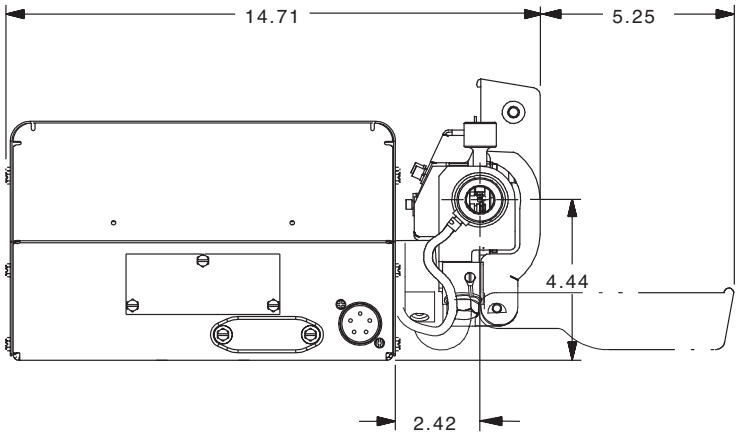
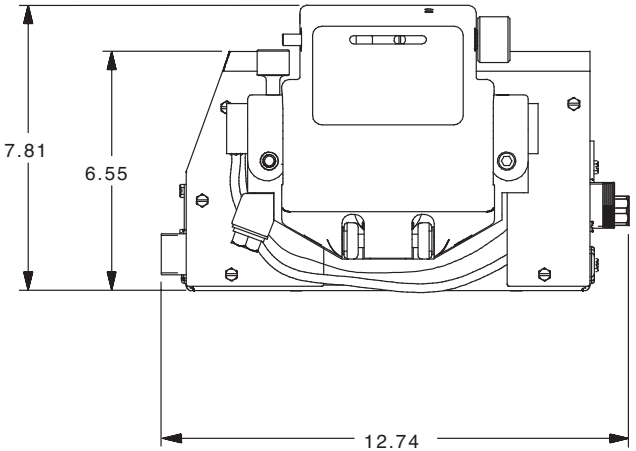
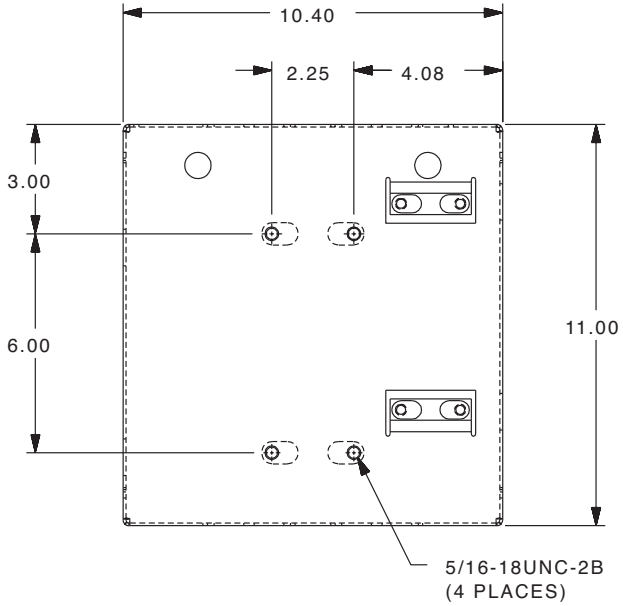
NOTE: This diagram is for reference only. It may not be accurate for all machines covered by this manual. The specific diagram for a particular code is pasted inside the machine on one of the enclosure panels. If the diagram is illegible, write to the Service Department for a replacement. Give the equipment code number..

CONNECTION DIAGRAM - INVERTEC STT II









WIRE DRIVE DIMENSION PRINT

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