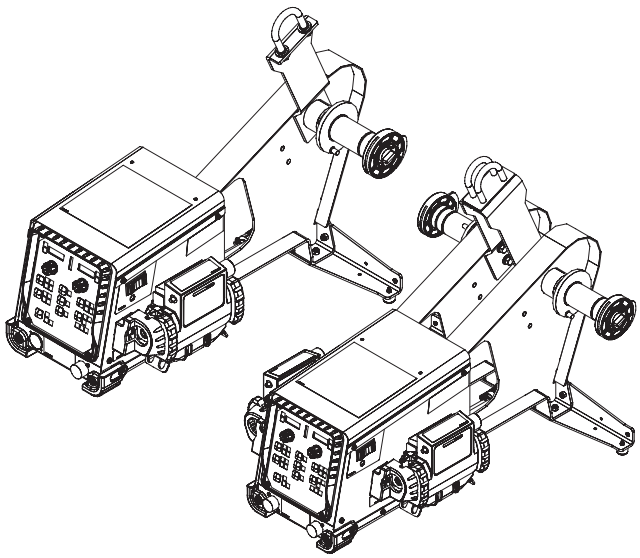
FLEX FEED™ 84, FLEX FEED™ 84 DUAL

For use with machines having Code Numbers:

Flex Feed 84: 12251, 12252, 12253, 12544
Flex Feed 84 Dual: 12259, 12262, 12545
Flex Feed 84 Control Box: 12271

SERVICE MANUAL



SVM270 | Issue Date 16-Oct

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

THANK YOU FOR SELECTING A QUALITY PRODUCT BY LINCOLN ELECTRIC.

PLEASE EXAMINE CARTON AND EQUIPMENT FOR DAMAGE IMMEDIATELY

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

SAFETY DEPENDS ON YOU

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

⚠ 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 Safety Data Sheet (SDS) and the warning label that appears on all containers of welding materials.

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

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

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

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

WEAR CORRECT EYE, EAR & BODY PROTECTION

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

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

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

IN SOME AREAS, protection from noise may be appropriate.

BE SURE protective equipment is in good condition.

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

SPECIAL SITUATIONS

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

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

Additional precautionary measures

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

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

REMOVE all potential fire hazards from welding area.

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

SECTION A: WARNINGS

CALIFORNIA PROPOSITION 65 WARNINGS

Diesel Engines

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

Gasoline Engines

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

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

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

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

FOR ENGINE POWERED EQUIPMENT.

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

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

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

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

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

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

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

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

ELECTRIC AND MAGNETIC FIELDS MAY BE DANGEROUS

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

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

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

2.d. All welders should use the following procedures in order to minimize exposure to EMF fields from the welding circuit:

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

ELECTRIC SHOCK CAN KILL.

3.a. The electrode and work (or ground) circuits are electrically “hot” when the welder is on. Do not touch these “hot” parts with your bare skin or wet clothing. Wear dry, hole-free gloves to insulate hands.

3.b. Insulate yourself from work and ground using dry insulation. Make certain the insulation is large enough to cover your full area of physical contact with work and ground.

In addition to the normal safety precautions, if welding must be performed under electrically hazardous conditions (in damp locations or while wearing wet clothing; on metal structures such as floors, gratings or scaffolds; when in cramped positions such as sitting, kneeling or lying, if there is a high risk of unavoidable or accidental contact with the workpiece or ground) use the following equipment:

- Semiautomatic DC Constant Voltage (Wire) Welder.
- DC Manual (Stick) Welder.
- AC Welder with Reduced Voltage Control.

3.c. In semiautomatic or automatic wire welding, the electrode, electrode reel, welding head, nozzle or semiautomatic welding gun are also electrically “hot”.

3.d. Always be sure the work cable makes a good electrical connection with the metal being welded. The connection should be as close as possible to the area being welded.

3.e. Ground the work or metal to be welded to a good electrical (earth) ground.

3.f. Maintain the electrode holder, work clamp, welding cable and welding machine in good, safe operating condition. Replace damaged insulation.

3.g. Never dip the electrode in water for cooling.

3.h. Never simultaneously touch electrically “hot” parts of electrode holders connected to two welders because voltage between the two can be the total of the open circuit voltage of both welders.

3.i. When working above floor level, use a safety belt to protect yourself from a fall should you get a shock.

3.j. Also see Items 6.c. and 8.

ARC RAYS CAN BURN.

4.a. Use a shield with the proper filter and cover plates to protect your eyes from sparks and the rays of the arc when welding or observing open arc welding. Headshield and filter lens should conform to ANSI Z87. I standards.

4.b. Use suitable clothing made from durable flame-resistant material to protect your skin and that of your helpers from the arc rays.

4.c. Protect other nearby personnel with suitable, non-flammable screening and/or warn them not to watch the arc nor expose themselves to the arc rays or to hot spatter or metal.

FUMES AND GASES CAN BE DANGEROUS.

5.a. Welding may produce fumes and gases hazardous to health. Avoid breathing these fumes and gases. When welding, keep your head out of the fume. Use enough ventilation and/or exhaust at the arc to keep fumes and gases away from the breathing zone. **When welding hardfacing (see instructions on container or SDS) 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 unless exposure assessments indicate otherwise. In confined spaces or in some circumstances, outdoors, a respirator may also 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.

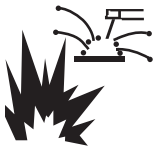
5.c. Do not weld in locations near chlorinated hydrocarbon vapors coming from degreasing, cleaning or spraying operations. The heat and rays of the arc can react with solvent vapors to form phosgene, a highly toxic gas, and other irritating products.

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 Safety Data Sheet (SDS) and follow your employer’s safety practices. SDS forms are available from your welding distributor or from the manufacturer.

5.f. Also see item 1.b.

WELDING AND CUTTING SPARKS CAN CAUSE FIRE OR EXPLOSION.



6.a. Remove fire hazards from the welding area. If this is not possible, cover them to prevent the welding sparks from starting a fire. Remember that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas. Avoid welding near hydraulic lines. Have a fire extinguisher readily available.

6.b. Where compressed gases are to be used at the job site, special precautions should be used to prevent hazardous situations. Refer to "Safety in Welding and Cutting" (ANSI Standard Z49.1) and the operating information for the equipment being used.

6.c. When not welding, make certain no part of the electrode circuit is touching the work or ground. Accidental contact can cause overheating and create a fire hazard.

6.d. Do not heat, cut or weld tanks, drums or containers until the proper steps have been taken to insure that such procedures will not cause flammable or toxic vapors from substances inside. They can cause an explosion even though they have been "cleaned". For information, purchase "Recommended Safe Practices for the Preparation for Welding and Cutting of Containers and Piping That Have Held Hazardous Substances", AWS F4.1 from the American Welding Society (see address above).

6.e. Vent hollow castings or containers before heating, cutting or welding. They may explode.

6.f. Sparks and spatter are thrown from the welding arc. Wear oil free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes and a cap over your hair. Wear ear plugs when welding out of position or in confined places. Always wear safety glasses with side shields when in a welding area.

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

6.h. Also see item 1.c.

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

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

CYLINDER MAY EXPLODE IF DAMAGED.

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

7.b. Always keep cylinders in an upright position securely chained to an undercarriage or fixed support.

7.c. Cylinders should be located:

- Away from areas where they may be struck or subjected to physical damage.
- A safe distance from arc welding or cutting operations and any other source of heat, sparks, or flame.

7.d. Never allow the electrode, electrode holder or any other electrically "hot" parts to touch a cylinder.

7.e. Keep your head and face away from the cylinder valve outlet when opening the cylinder valve.

7.f. Valve protection caps should always be in place and hand tight except when the cylinder is in use or connected for use.

7.g. Read and follow the instructions on compressed gas cylinders, associated equipment, and CGA publication P-I, "Precautions for Safe Handling of Compressed Gases in Cylinders," available from the Compressed Gas Association, 14501 George Carter Way Chantilly, VA 20151.

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.

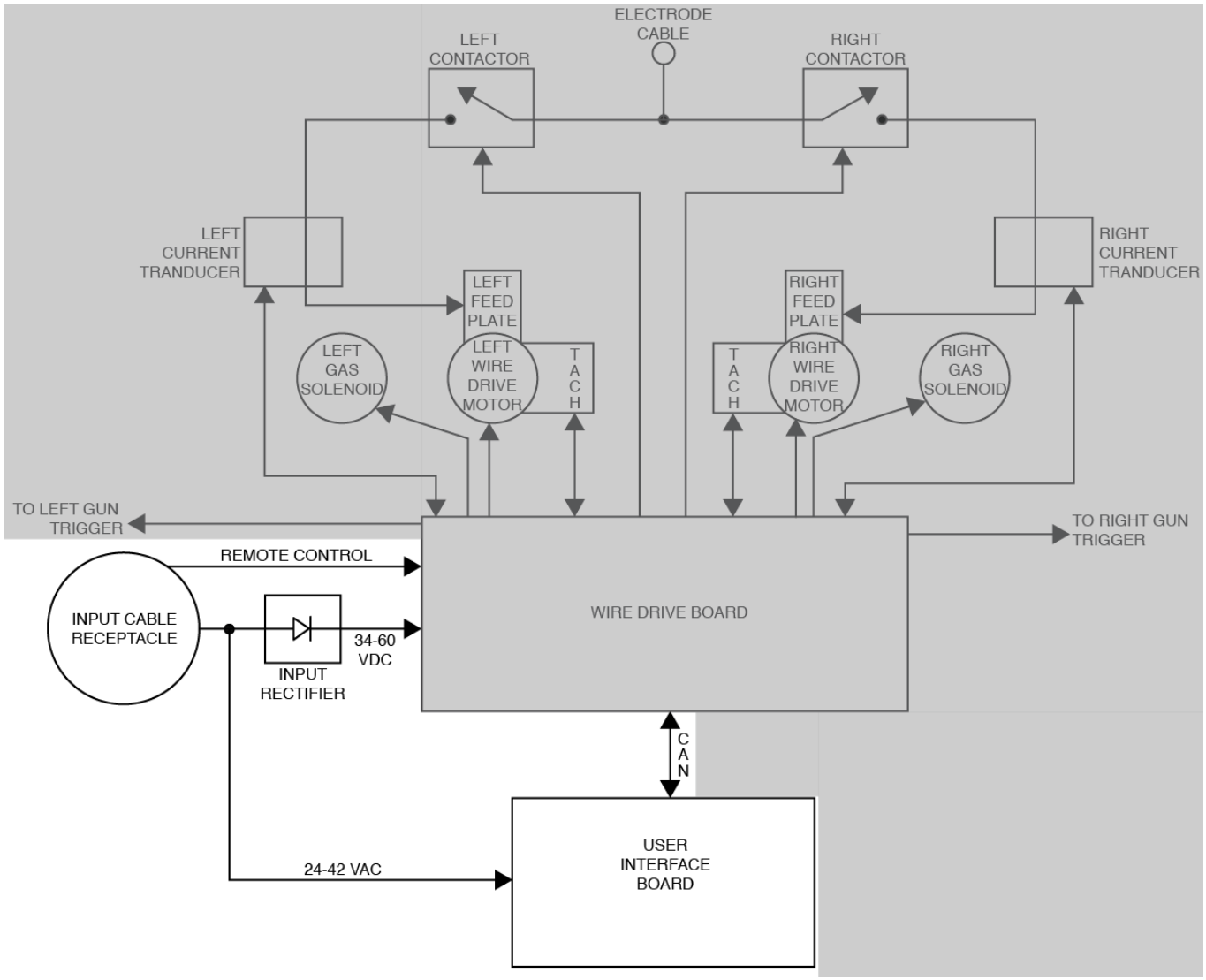
Flex Feed™ 84, Flex Feed™ 84 Dual

Service Manual

Last update: 2016/10/01

Theory of Operation

Figure E.1 – Input receptacle, input rectifier and user interface board



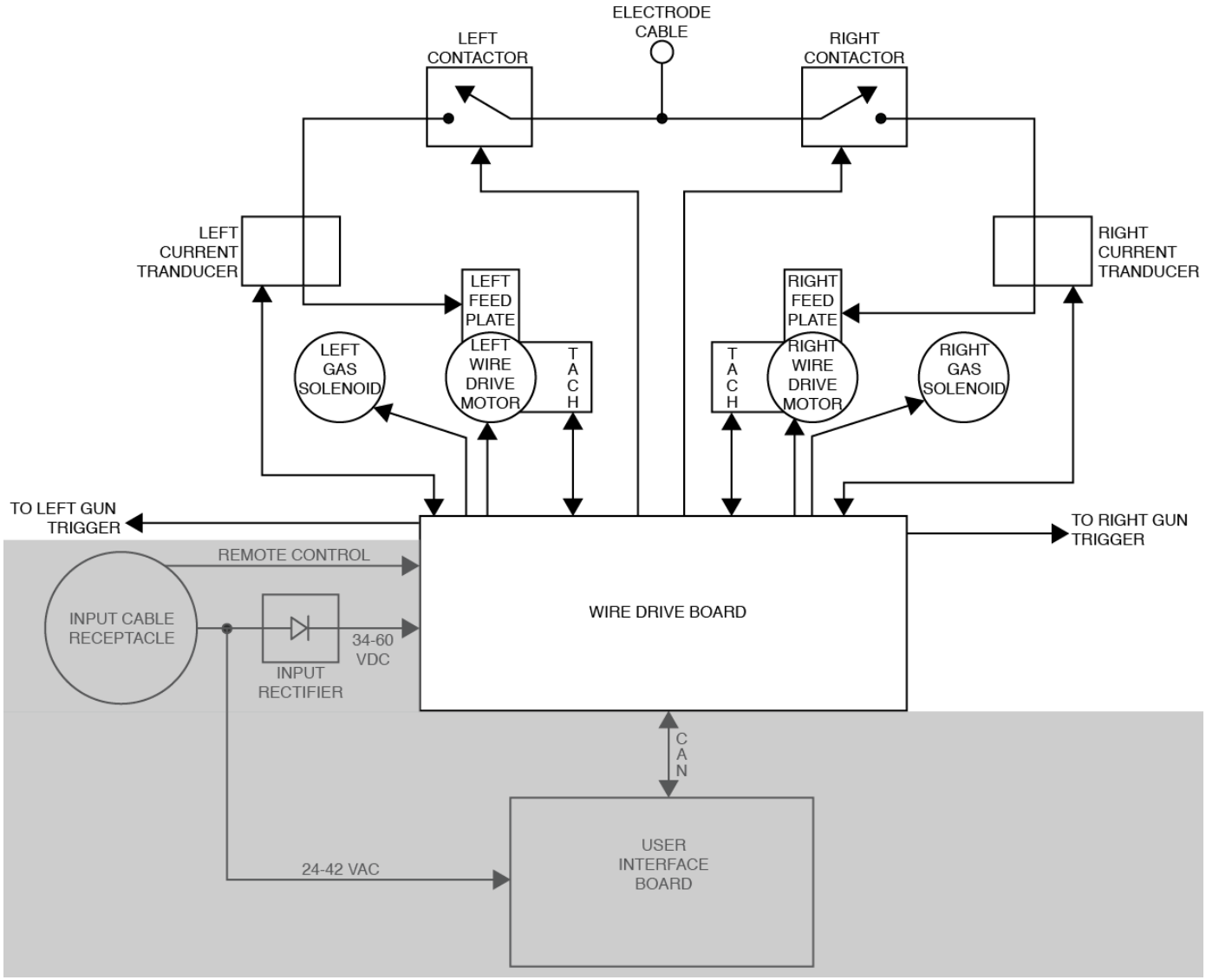
Input Receptacle, Input Rectifier and User Interface Board

When a 14-pin Amphenol cable is connected, from a compatible welding power source, to the input receptacle the input receptacle receives (24 – 42 VAC) from the welding power source to power the internal components of the Flex Feed 84 Dual wire feeder. The cable also contains the remote voltage control leads.

The 24 – 42 VAC is connected to the input rectifier and the resultant DC voltage is applied to the wire drive board. The 24 – 42 VAC is also applied to the user interface board.

The user interface board houses the two encoders for setting wire feed speed/current and volts/time. Two digital displays are also incorporated into the user interface board. The operator utilizes the user interface board to set welding procedures and processes. This preset information is sent to the wire drive board via a CAN digital communication network.

Figure E.2 – Wire drive board



Wire Drive Board

When the wire drive board receives the procedure and process information from the user interface board the wire drive board sends the appropriate armature voltage to the wire drive motor and energizes the gas solenoid that is being activated by the welding gun (either left or right). The actual welding current is monitored by the appropriate current transducer and the actual wire feed speed is monitored by the tachometer. This wire feed speed and welding current feedback information is sent to the wire feed board and then to the user interface board where it is shown on the digital displays. The wire feed board also adjusts the armature voltage to the drive motor to maintain a constant wire feed speed.

Troubleshooting & Repair

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 two main categories: Function Problems, and Error Codes.

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

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

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

⚠ CAUTION

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

PC BOARD TROUBLESHOOTING PROCEDURES

⚠ WARNING

ELECTRIC SHOCK can kill.

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

⚠ CAUTION

Sometimes machine failures appear to be due to PC board failures. These problems can sometimes be traced to poor electrical connections. To avoid problems when troubleshooting 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.

ATTENTION
Static-Sensitive Devices
Handle only at Static-Safe Workstations

Reusable Container
Do Not Destroy

• 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.

• 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.

Troubleshooting guide

Observe Safety Guidelines detailed in the beginning of this manual.		**TROUBLESHOOTING GUIDE**
PROBLEMS (SYMPTOMS)	**POSSIBLE AREAS OF MISADJUSTMENT(S)**	**RECOMMENDED COURSE OF ACTION**
FUNCTION PROBLEMS		
Major physical or electrical damage is evident when the sheet metal covers are removed.	1. Contact your local authorized Lincoln Electric Service Facility.	1. Contact the Lincoln Electric Service Department at 1-888-935-3877.
The unit does not power-up, unit appears to be “dead”.	1. Make sure the unit is receiving the correct input power (24 – 42 VAC). 2. The control cable may be loose or faulty. 3. Make sure the power source is functioning properly.	1. Check the wiring between the 14-pin amphenol receptacle and the diode bridge. See Wiring Diagram. 2. Perform the ***Input Rectifier Test Procedure***.
The wire feeds correctly but there is no shielding gas.	1. Make sure the gas supply is turned on. 2. Check the gas hose for damage or lose connections. 3. Make sure the gun is properly seated in the feeder.	1. Perform the ***Gas Solenoid(s) Test Procedure***.
The wire feeds at the correct speed but there is no welding output.	1. Make sure the power source is functioning correctly. 2. If a gouging switch kit is installed make sure the selector switch is in the welding position. 3. Check for loose or faulty connections in the welding cables. 4. Check the welding gun for loose or broken connections.	1. Perform the ***Optional Output Contactor(s) Test Procedure***.
⚠ CAUTION		
If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.		

Observe Safety Guidelines detailed in the beginning of this manual.		**TROUBLESHOOTING GUIDE**
PROBLEMS (SYMPTOMS)	**POSSIBLE AREAS OF MISADJUSTMENT(S)**	**RECOMMENDED COURSE OF ACTION**
FUNCTION PROBLEMS		
When the gun trigger is activated the drive rolls turn, wire feeds but there is no arc voltage present.	1. Make sure the power source is functioning properly. 2. Check for loose or faulty weld cables. 3. Check the control cable for loose connections or internal damage. 4. Check the welding gun for loose or broken connections.	1. If the unit is equipped with an output contactor, perform the ***Optional Output Contactor(s) Test Procedure***.
The wire continues to feed when the gun trigger is released.	1. The trigger menu may be set for 4-step operation. 2. Check to make sure the gun trigger is not stuck closed.	1. Check for shorted wires within the gun trigger assembly.
There is gas flow but the wire does not feed.	1. Check for restrictions in the wire feed path. 2. Verify the preflow time has not been set to a high value.	1. Perform the ***Wire Drive Motor(s) and Tach Feedback Test Procedure***. 2. Perform the ***Wire Drive Board Test Procedure***.
There is inconsistent wire feeding or the wire is not feeding. The drive rolls are turning.	1. Check for restrictions in the wire feeding path. 2. Check the gun liner and contact tip. 3. The electrode wire may be dirty or rusty. 4. The spindle brake may be too tight. 5. Check the pressure on the drive rolls.	1. Check the welding gun for kinks and restrictions. 2. Replace the drive rolls if necessary.

⚠ CAUTION

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

Observe Safety Guidelines detailed in the beginning of this manual.	**TROUBLESHOOTING GUIDE**	
PROBLEMS (SYMPTOMS)	**POSSIBLE AREAS OF MISADJUSTMENT(S)**	**RECOMMENDED COURSE OF ACTION**
FUNCTION PROBLEMS		
The wire feed speed consistently operates at the wrong value. The speed changes when the wire feed speed knob is adjusted.	1. The wrong gear may be installed in the wire drive. 2. Make sure the setup menu is configured for the pinion gear that is installed.	1. Perform the ***Wire Drive Motor(s) and Tach Feedback Test Procedure***.
The wire feed speed is stuck at 200 – 300 inches/minute. It does not change when the wire feed speed potentiometer is adjusted.	1. N/A.	1. Perform the ***Wire Drive Motor(s) and Tach Feedback Test Procedure***. 2. Perform the ***User Interface Board Test Procedure***. 3. Perform the ***Wire Drive Board Test Procedure***.
Variable or “hunting” arc.	1. Make sure the power source is functioning correctly. 2. Check for restrictions in the wire feeding path. 3. Improper gas shielding. 4. Make sure the electrode polarity is correct for the process being used. 5. Check the welding cables for damaged or loose connections.	1. Perform the ***Wire Drive Motor(s) and Tach Feedback Test Procedure***.
Poor arc starts with sticking or “blasts-offs”, weld porosity or narrow and ropy looking beads.	1. The procedure may be wrong for welding process.	1. See the Lincoln publication “Gas Metal Arc Welding Guide” (GS-100).
The cold inch/feed gas purge switch does not turn on the wire drive motor.	1. Make certain the cold/inch/feed gas purge switch is operating properly. 2. Check for loose or faulty leads between cold inch/feed gas purge switch and the wire drive PC board. See Wiring Diagram.	1. Perform the ***Cold Inch/Feed Gas Purge Switch Test Procedure***. 2. Perform the ***Wire Drive Board Test Procedure***.
The feeder is stuck in procedure B or D.	1. Make sure a dual procedure gun is being used with the dual procedure switch closed.	1. Change the position of the dual procedure switch.

⚠ CAUTION

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

Observe Safety Guidelines detailed in the beginning of this manual.	**TROUBLESHOOTING GUIDE**	
PROBLEMS (SYMPTOMS)	**POSSIBLE AREAS OF MISADJUSTMENT(S)**	**RECOMMENDED COURSE OF ACTION**
FUNCTION PROBLEMS		
The LED on the side of the wire drive flashes on and off 0.5 seconds.	1. The wire drive is not connected to a control box.	1. Verify that all cables are properly connected. 2. If the installation is a hard automation setup that does not require a control box, temporarily connect a control box and use the set-up menu to set the wire drive for "automatic" control.
Unable to select Spot Time from the Trigger menu.	1. The Spot Time has been set to OFF (zero). 2. Start and/or Crater are ON.	1. Go to the Timer menu and set the Spot Timer to a value other than OFF (zero). 2. Using the Sequence Menu, set the Start Time and Crater Timer to OFF (zero).
The actual welding current is not being displayed correctly on the user interface board.	1. N/A.	1. Perform the ***Current Transducer(s) Test Procedure***.
The user interface board is not functioning correctly.	1. N/A.	1. Perform the ***User Interface Board Test Procedure***. 2. Perform the ***Fan Motor Test Procedure***.
The wire feed speed does not change when welding current is established. The WFS stays at the run-in-speed. The STATUS LED's are steady green.	1. The run in and weld wire feed speeds may be set to the same value. Set run in speed to a value that gives best starting results.	1. Perform the ***Current Transducer(s) Test Procedure***. 2. If the run in wire feed speed cannot be adjusted, perform the ***Wire Drive Motor(s) And Tach Feedback Test Procedure***. 3. Perform the ***Wire Drive Board Test Procedure***.
The ammeter on the control box does not function properly even though the STATUS LED's are steady green.	1. N/A.	1. Perform the ***Current Transducer(s) Test Procedure***. 2. The user interface 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.

PROBLEMS (SYMPTOMS)		POSSIBLE AREAS OF MISADJUSTMENT(S)	RECOMMENDED COURSE OF ACTION
ERROR CODES			
PASS Clr	PASS CODE RESET	DIP SWITCH #4 OF WIRE DRIVE 1 HAS BEEN SET TO ON TO RESET THE PASS CODE.	1. TURN POWER OFF, SET DIP SWITCH #4 TO OFF AND THEN POWER ON. THE PASS CODE FOR THE SETUP MENU WILL BE CLEARED.
Gun On	GUN TRIGGER DEPRESSED AT POWER UP	THE TRIGGER OF THE GUN HAS BEEN ACTIVATED WHEN THE WIRE FEEDER POWERS UP.	1. RELEASE THE GUN TRIGGER.
gAS On	GAS PURGE ACTIVATED AT POWER UP	THE GAS PURGE ROCKER SWITCH IS ACTIVATED WHEN THE WIRE FEEDER POWERS UP.	1. RELEASE THE GAS PURGE SWITCH.
FEEd On	COLD FEED ACTIVATED AT POWER UP	THE COLD FEED ROCKER SWITCH IS ACTIVATED WHEN THE WIRE FEEDER POWERS UP.	1. RELEASE THE COLD FEED SWITCH.
Goug ON	GOUGING ACTIVATED AT POWER UP	THE GOUGING/WIRE FEED SWITCH IS IN THE GOUGING POSITION AT POWER UP.	1. PLACE THE GOUGING/WIRE FEED SWITCH IN THE WIRE FEED POSITION.
Err n, where n represent a number 1-8	BUTTON STUCK	DURING POWER UP, ONE OF THE USER INTERFACE BUTTONS WAS DEPRESSED.	1. INSPECT THE USER INTERFACE PANEL TO SEE IF ANY OF THE BUTTONS ARE LOOSE, IMPROPERLY INSERTED. 2. REMOVE USER INTERFACE PANEL, REMOVE THE UI BOARD AND CHECK THAT THE BUTTONS ARE ASSEMBLED PROPERLY ON THE INSIDE SURFACE.
Err Conf	CONFIGURATION ERROR	1. MORE THAN 1 USER INTERFACE IS PRESENT; MORE THAN TWO WIRE DRIVES ARE PRESENT; TWO SINGLE WIRE DRIVES ARE CONNECTED AND BOTH HAVE THE SAME ID SET IN THE DIP SWITCH. 2. THERE IS NO COMMUNICATION BETWEEN THE USER INTERFACE AND WIRE DRIVE.	1. ASSEMBLE THE USER INTERFACE AND WIRE DRIVE IN A VALID CONFIGURATION. 2. VERIFY THE DIP SWITCHES ARE SET PROPERLY ON THE WIRE DRIVE BOARD. 3. CHECK CABLES FOR A BAD CONNECTION.
Err goug	WIRE FEED / GOUGING SWITCH ERROR	1. THE WIRE/FEED GOUGING ROCKER SWITCH WAS THROWN WHILE AN ARC WAS ESTABLISHED.	1. WAIT FOR WELDING OR GOUGING TO FINISH BEFORE CHANGING THE SWITCH POSITION.

		2. IF TWO SINGLE WIRE DRIVES ARE CONNECTED TO ONE USER INTERFACE AND BOTH HAVE A GOUGING KIT, BOTH ROCKER SWITCHES MAY BE IN THE "GOUGE" POSITION.	2. PLACE BOTH SWITCHES IN THE "WIRE FEED" AND THEN SELECT ONE SWITCH FOR GOUGING.
Err FL	FAULT SWITCH ERROR	THE FAULT SWITCH CIRCUIT IS OPEN.	1. VERIFY THAT THE FAULT SWITCH CIRCUIT IS CLOSED. A COMMON ITEM WIRED INTO THE FAULT SWITCH IS A WATER FLOW SENSOR.
Err 81	MOTOR OVERLOAD, LONG TERM.	THE WIRE DRIVE MOTOR HAS OVERHEATED.	1. CHECK THAT THE ELECTRODE SLIDES EASILY THROUGH THE GUN AND CABLE. 2. REMOVE TIGHT BENDS FROM THE GUN AND CABLE. 3. CHECK THAT THE SPINDLE BRAKE IS NOT TOO TIGHT. 4. VERIFY A HIGH QUALITY ELECTRODE IS BEING USED. 5. WAIT FOR THE ERROR TO RESET AND THE MOTOR TO COOL (APPROXIMATELY 1 MINUTE).
Err 82	MOTOR OVERLOAD, SHORT TERM.	THE WIRE DRIVE MOTOR CURRENT DRAW HAS EXCEEDED LIMITS, USUALLY BECAUSE THE MOTOR IS IN A LOCKED ROTOR STATE.	1. CHECK THAT MOTOR CAN TURN FREELY WHEN IDLE ARM IS OPEN. 2. VERIFY THAT THE GEARS ARE FREE OF DEBRIS AND DIRT.

⚠ CAUTION

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

Test Procedures

CASE COVER REMOVAL AND REPLACEMENT PROCEDURE

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 or machine operator and will invalidate your factory warranty. For your safety and to avoid electrical shock, please observe all safety notes and precautions detailed throughout this manual. If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

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

MATERIALS NEEDED

5/16” Nutdriver
Wiring Diagram

REMOVAL PROCEDURE

1. Remove the input power from the Flex Feed 84 wire feeder.
2. Using a 5/16” nutdriver, remove the four screws securing the roof to the machine. See ***Figures F.1***. Do not fully remove the roof panel until all plugs have been disconnected from the wire drive PC board.
3. Carefully tilt roof panel to allow for the plugs to be disconnected.
4. Label and disconnect, plugs J81, J82, J83, J84, J85, J86 and J87 from the wire drive board. See ***Figure F.2***. See Wiring Diagram.
5. The roof panel can now be completely removed.
6. If replacing a damaged roof panel, perform the ***Wire Drive Board Removal Procedure***.
7. Using a 5/16” nutdriver, remove the two screws securing the left case side to the machine. See ***Figure F.3***.
8. Using a 5/16” nutdriver, remove the two screws securing the right case side to the machine. See ***Figure F.3***.
9. Perform any tests / replacement procedure.

REPLACEMENT PROCEDURE

1. Using a 5/16” nutdriver, attach the two screws securing the left case side.
2. Using a 5/16” nutdriver, attach the two screws securing the right case side.
3. Carefully position the roof panel close to the top of the machine. This will allow the previously removed plugs to be attached.

4. Connect plugs J81, J82, J83, J84, J85, J86 and J87 to the wire drive board. See Wiring Diagram. Repeat for each wire drive PC board.
5. Using a 5/16” nutdriver, attach the four screws securing the roof panel to the machine.

Figure F.1 – Roof mounting screw locations

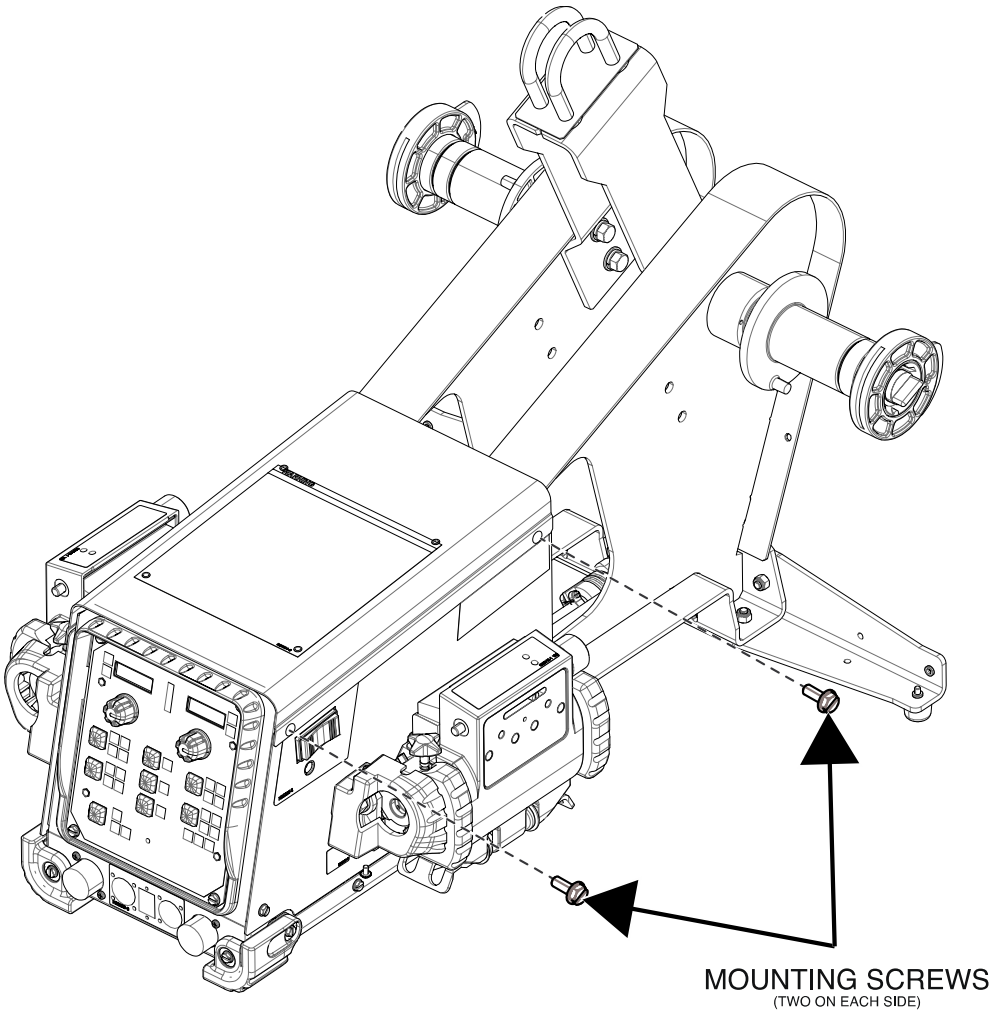


Figure F.2 – Wire drive board plug locations

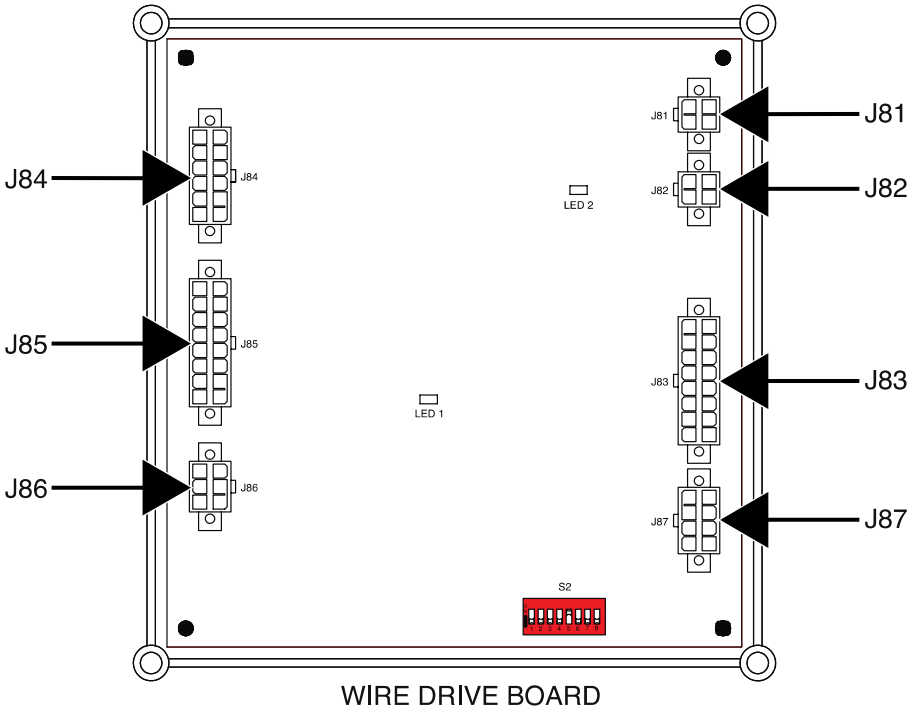
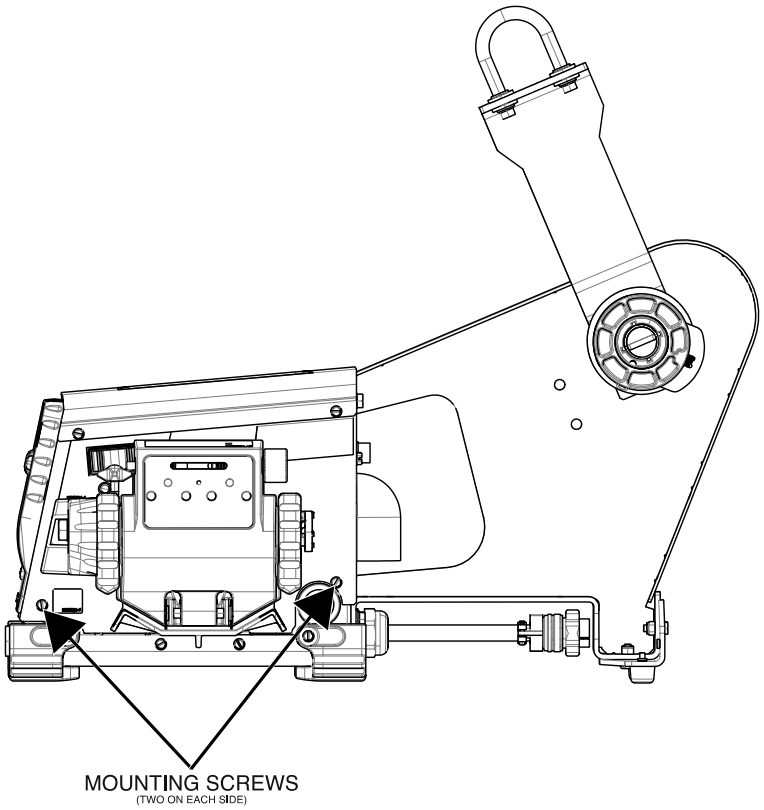


Figure F.3 – Case side panel mounting screw locations



COLD INCH/FEED GAS PURGE SWITCH TEST PROCEDURE

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 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 Cold Inch/Feed Gas Purge Switch is functioning properly.

MATERIALS NEEDED

Volt/Ohmmeter
Wiring Diagram

TEST PROCEDURE

1. Remove the input power from the Flex Feed 84 wire feeder.
2. Perform the ***Case Cover Removal Procedure***.
3. Locate the cold inch/feed gas purge switch. See ***Figure F.4***. See Wiring Diagram.
   NOTE: There are two cold inch/feed gas purge switches, one on each side of the machine.
4. Label and disconnect leads 558, 559, 515 and 515A (or leads 635, 522 and 679) from the cold inch/feed gas purge switch(s) to be tested. See ***Figure F.5***. See Wiring Diagram.
5. While pressing the rocker switch forward or back, perform continuity checks from terminal 8 to terminal 2 and from terminal 3 to terminal 2. If continuity fails, the cold inch/feed gas purge switch may be faulty. See ***Figure F.6***. See Wiring Diagram.
6. If faulty, perform the ***Cold Inch/Feed Gas Purge Switch Removal And Replacement Procedure***.
7. Reconnect any previously removed leads. See Wiring Diagram.
8. Perform the ***Case Cover Replacement Procedure***.

Figure F.4 – Cold inch/feed gas purge switch locations

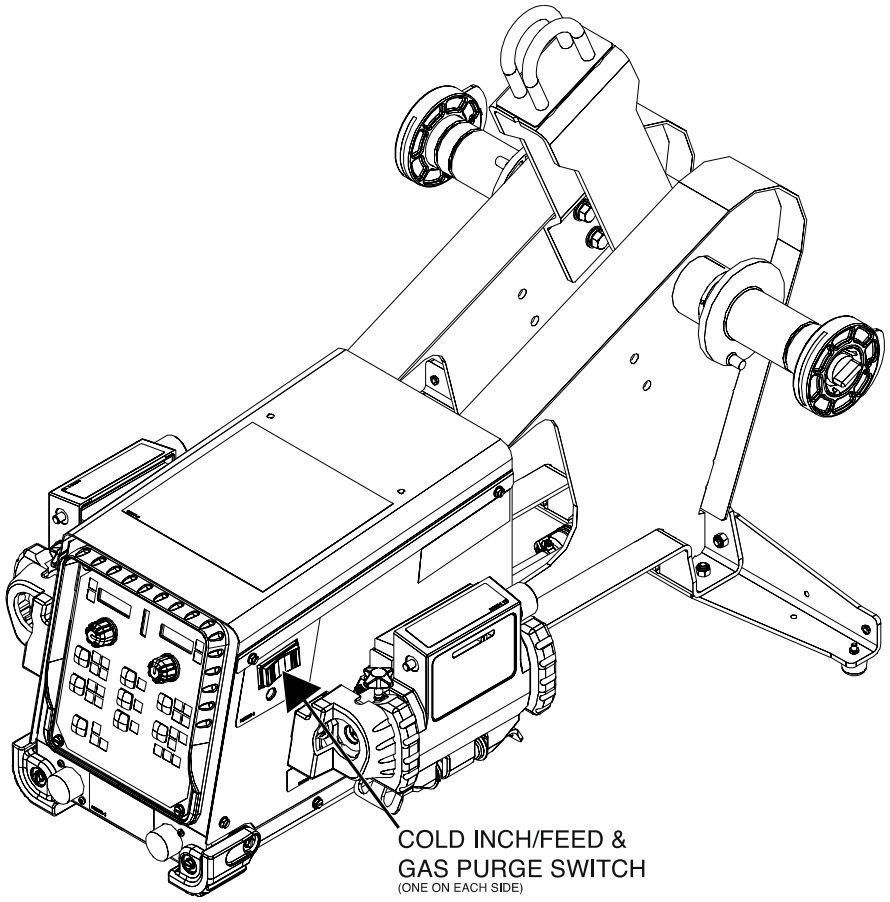


Figure F.5 – Cold inch/feed gas purge switch lead location

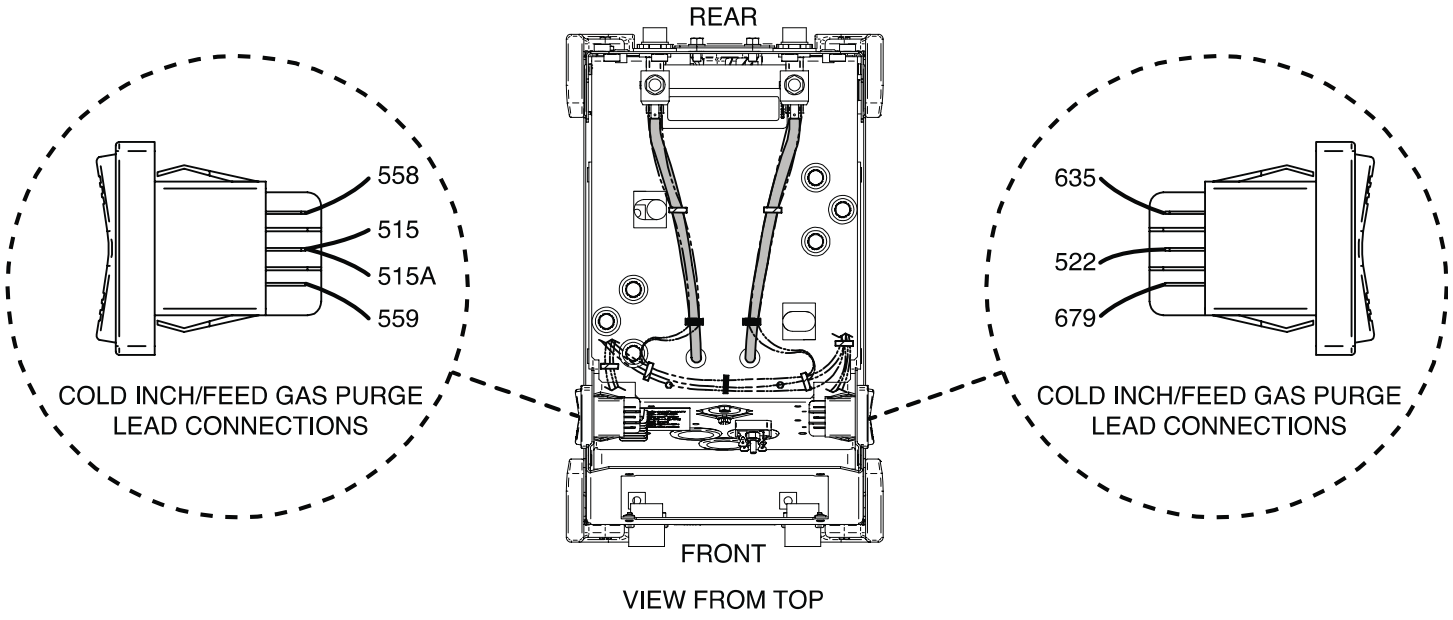
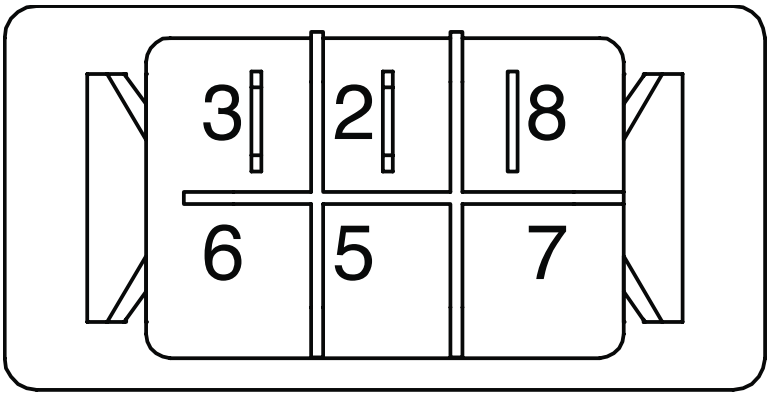


Figure F.6 – Cold inch/feed gas purge switch terminal location



VIEWED FROM REAR

GAS SOLENOID(S) TEST PROCEDURE

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 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(s) are functioning properly.

MATERIALS NEEDED

Volt/Ohmmeter
12 VDC Power Supply
Wiring Diagram

TEST PROCEDURE

1. Remove the input power from the Flex Feed 84 wire feeder.
2. Perform the ***Case Cover Removal Procedure***.
3. Locate the gas solenoid to be tested. See ***Figure F.7***. See Wiring Diagram.
   NOTE: There are two gas solenoids, one on each side of the machine.
4. Label and disconnect leads 552 or 652 and 553 or 653 from the gas solenoid. See ***Figure F.8***. See Wiring Diagram.
5. Check the resistance between the two input terminals. Normal resistance should be approximately 21 ohms.
6. Using a 12 VDC power supply, carefully apply 12 VDC to the top two terminals where leads were attached. The gas solenoid should open. If the gas solenoid does not open, it may be faulty.
7. If faulty, perform the ***Gas Solenoid(s) Removal And Replacement Procedure***.
8. If the gas solenoid does open with 12 VDC applied to the terminals, check the condition of the leads from the gas solenoid to the associated wire drive PC board. If the leads are intact, the wire drive PC board may be faulty. Perform the ***Wire Drive Board Test Procedure***.
9. Remove input power to the machine.
10. Perform the ***Case Cover Replacement Procedure***.

Figure F.7 – Gas solenoid locations

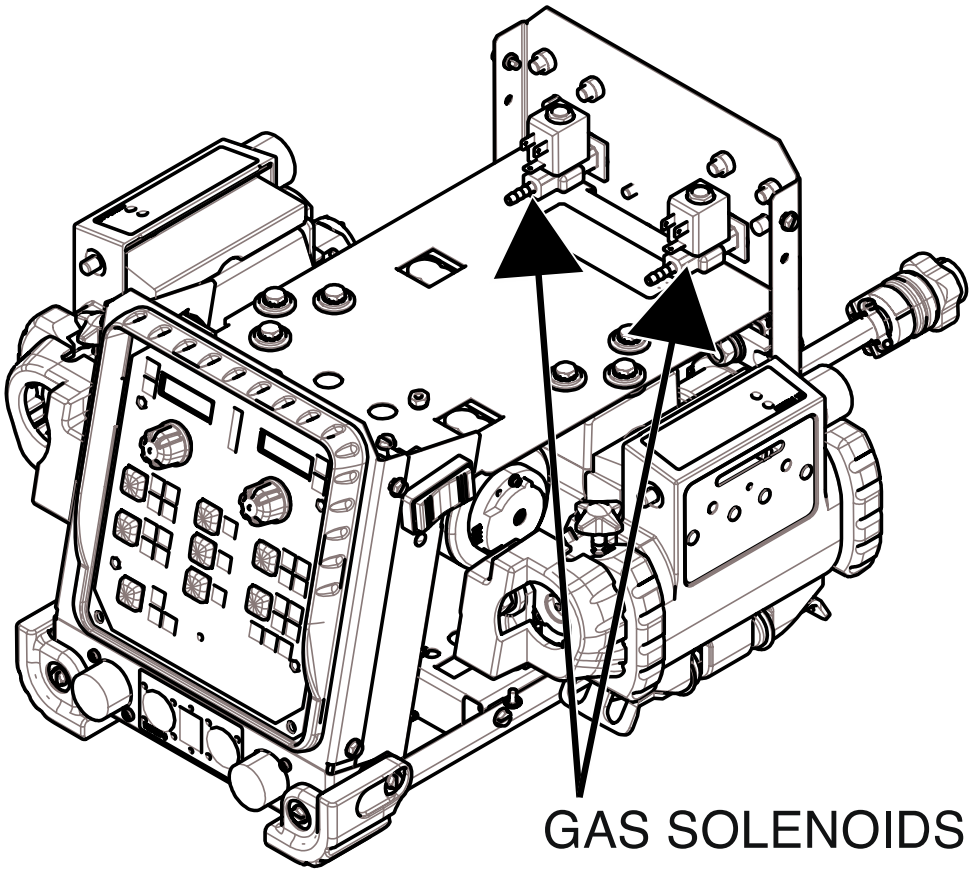
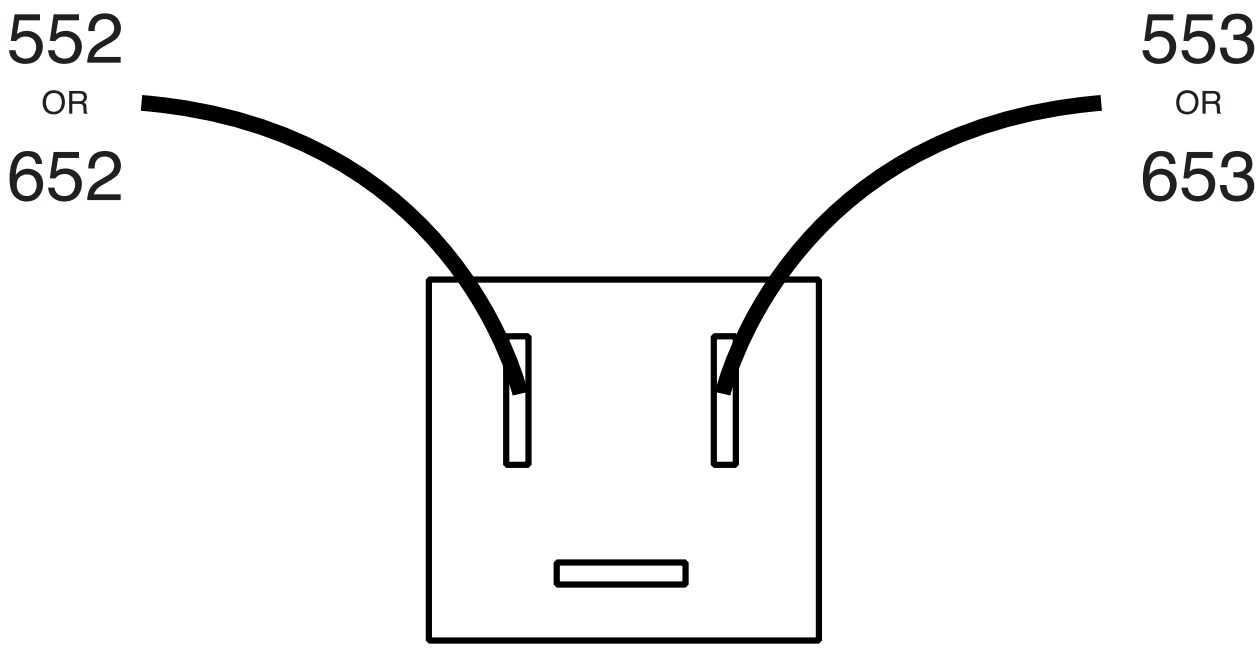


Figure F.8 – Gas solenoid lead locations



WIRE DRIVE MOTOR(S) AND TACH FEEDBACK TEST PROCEDURE

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 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 Wire Drive Motor is recovering the correct voltage and if it is capable of running properly. It will also determine if the Tach Sensor is receiving the correct input from the Wire Drive Board and is sending back the correct signal.

MATERIALS NEEDED

32 VDC Variable Power Supply
Volt/Ohmmeter
Wiring Diagram

TEST PROCEDURE

1. Remove the input power from the Flex Feed 84 wire feeder.
2. Perform the ***Case Cover Removal Procedure***.
   NOTE: Make certain that plugs J83, J84 and J85 are connected to the wire drive board before performing this test.
3. Locate the motor and tach leads on the right side of the machine. See ***Figure F.9***. See Wiring Diagram.
   NOTE: There are two wire drive motors, one on each side of the machine. Test separately.
4. Apply input voltage (42 VAC) to the unit via pins I and K on the 14-pin connection cable. See ***Figure F.10***. See Wiring Diagram.
5. With the trigger activated and the motor running check for 2.5 VDC (minimum) to 32 VDC (maximum), between the black(-) and white (+) motor leads. See ***Figure F.11***. See Wiring Diagram. The motor speed should increase when the armature voltage is increased.
6. Remove input power and disconnect plug P9 (or plug P7 when testing the left side). Check for 1 and 2 ohms of resistance between the black and white motor armature leads. Also make sure there is at least 500k ohms of resistance between the armature leads and the motor shell. See ***Figure F.10***.
7. Connect plug P9 (P7 for the left side). See Wiring Diagram.
8. With the trigger activated and the motor running check for 5 VDC input on the black and red tach leads. Check for .7 VDC to .85 VDC on the black and blue return leads. See ***Figure F.11***.
9. For further testing of the drive motor you can use an isolated power source and apply between 1 and 31 VDC to the black and white motor leads.

10. If the armature voltage is not present (step 5) and the motor operates normally when an isolated power source is applied, the wire drive board may be faulty.
11. Connect any previously disconnected leads and plugs.
12. Repeat the tests for the left side motor and tach.
13. Perform the ***Case Cover Replacement Procedure***.

Figure F.9 – Wire drive motor assembly and plug locations

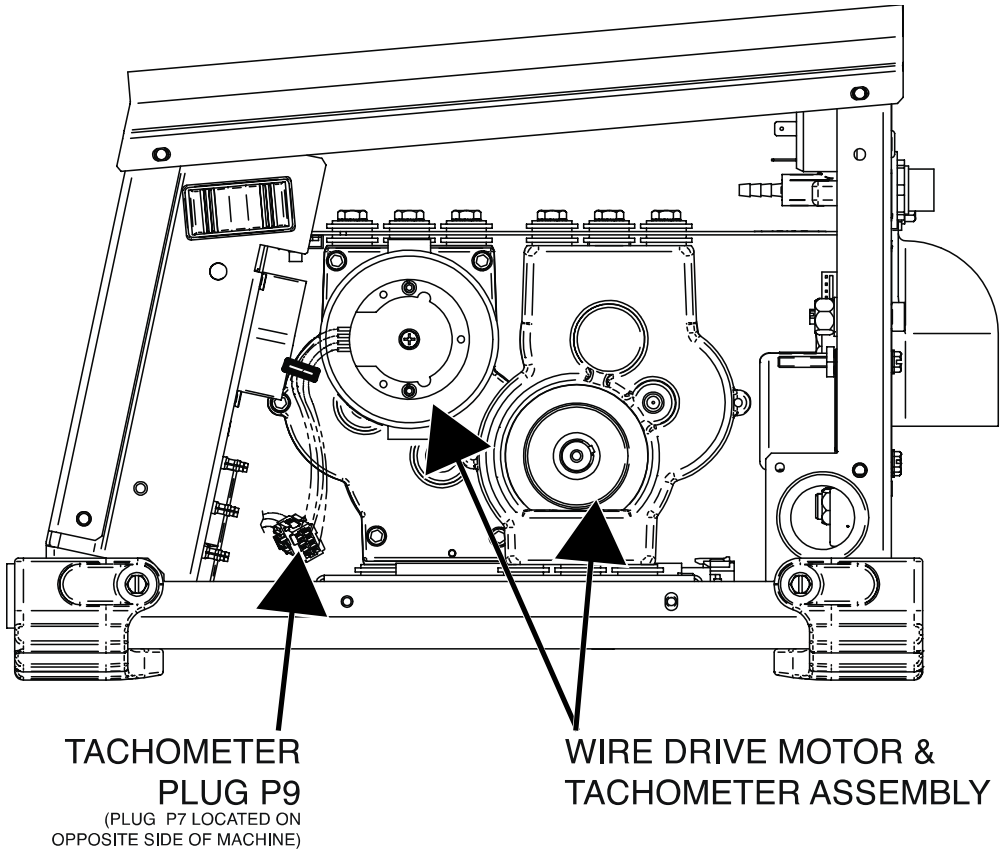


Figure F.10 – 14-pin connection cable pin locations

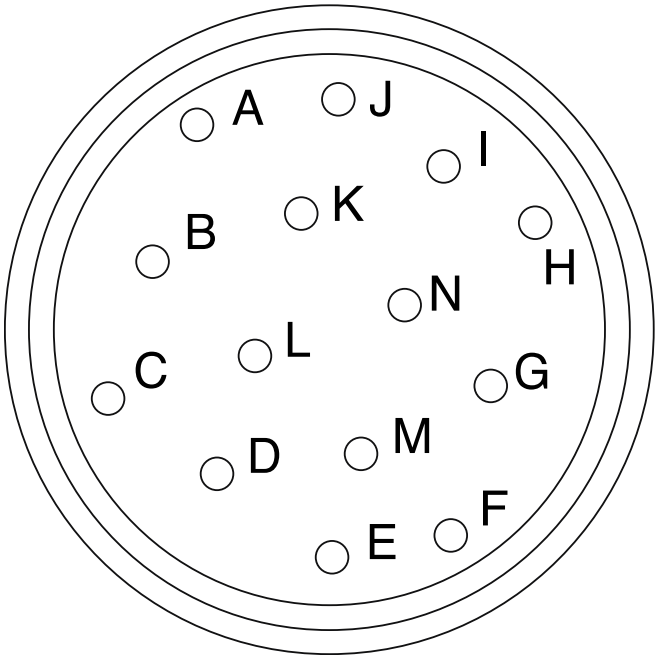
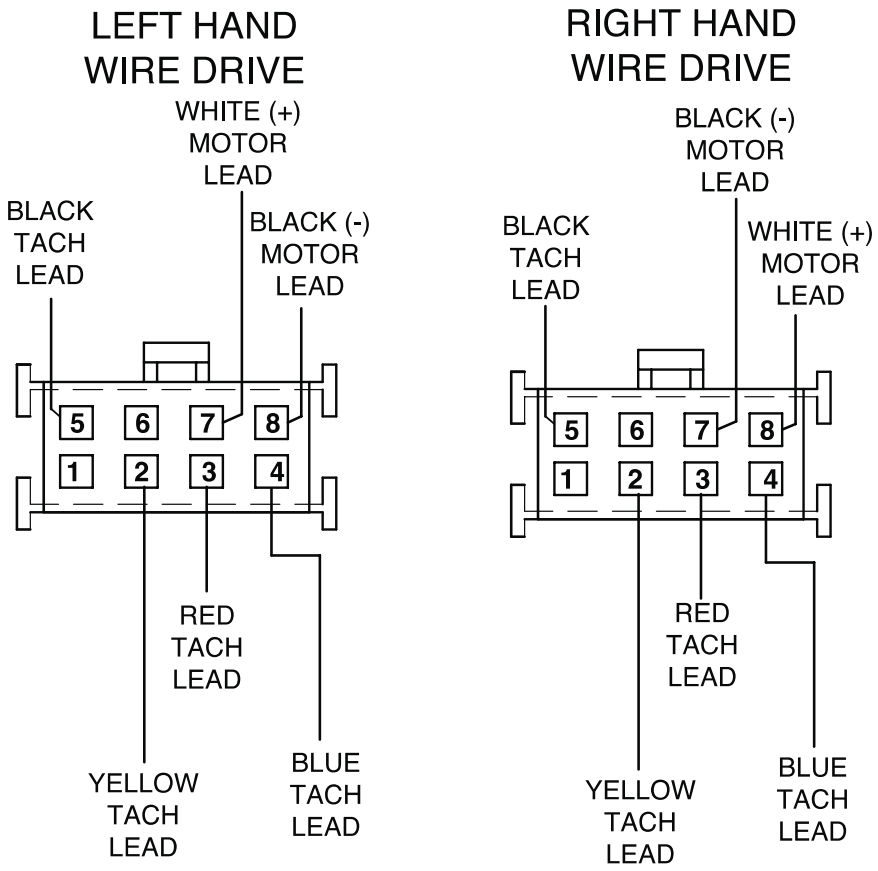


Figure F.11 – Tach lead locations



OPTIONAL OUTPUT CONTACTOR(S) TEST PROCEDURE

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 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 Contactor Coils are receiving the correct DC voltage and if the Contacts are closing and opening.

MATERIALS NEEDED

Volt/Ohmmeter
42 VAC Power Supply
Wiring Diagram

TEST PROCEDURE

1. Remove the input power from the Flex Feed 84 wire feeder.
2. Perform the ***Case Cover Removal Procedure***.
3. Locate the contactor(s) to be tested. See ***Figure F.12***. See Wiring Diagram.
   NOTE: There are two contactors, test separately.
4. Locate the red and black contactor coil leads (548/648 or 549A/549B). See ***Figure F.13***. See Wiring Diagram.
5. Disconnect the red and black leads from the harness at the spade connections.
6. Using a volt/ohmmeter, check the contactor coil resistance. Normal is approximately 80 ohms. Reconnect the red and black contactor coil leads.
7. Carefully apply the correct input power (42 VAC) to the Flex Feed 84 wire feeder. With the contactor energized, there should be approximately 32 VDC at the red and black leads. If 40 VDC is measured the contactor coil is open.
8. If the voltage is not present, check the associated leads between the wire drive boards and the contactor coil. See the Wiring Diagram.
9. If the contactor does not activate with the correct DC voltage applied, the contactor may be faulty.
10. With the contactor activated there should be less than one ohm of resistance across the contactor terminals. See Wiring Diagram.
11. When the contactor is not activated, there should be very high resistance across the contactor terminals – more than 500,000 ohms.
12. If any of the tests fail, the contactor may be faulty.
13. If faulty, perform the ***Optional Output Contactor(s) Removal And Replacement Procedure***.
14. Reconnect all previously removed leads.

15. Perform the ***Case Cover Replacement Procedure***.

Figure F.12 – Contactor location

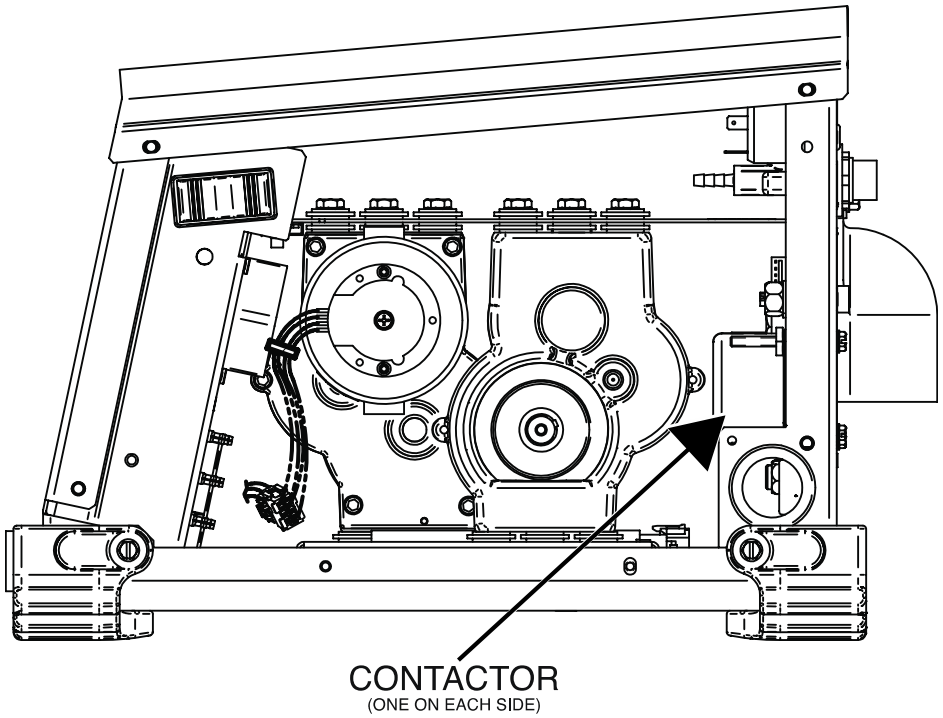
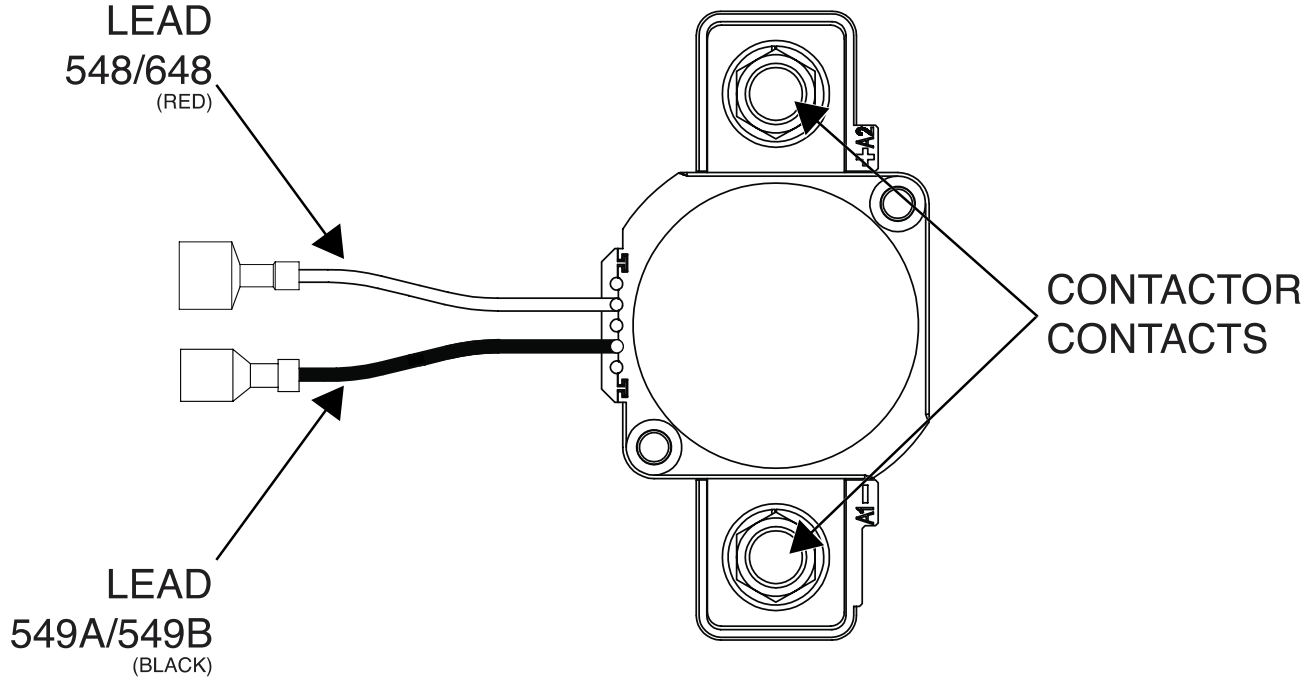


Figure F.13 – Red and black contactor lead locations



USER INTERFACE BOARD TEST PROCEDURE

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 or machine operator and will invalidate your factory warranty. For your safety and to avoid electrical shock, please observe all safety notes and precautions detailed throughout this manual. If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

This procedure will help determine if the User Interface Board is functioning properly.

MATERIALS NEEDED

5/16” Nutdriver
Volt/Ohmmeter
Wiring Diagram

TEST PROCEDURE

1. Remove the input power from the Flex Feed 84 wire feeder.
2. Using a 5/16” nutdriver, remove the four screws securing the front panel to the case. See ***Figure F.14***. See Wiring Diagram.
3. Carefully apply 42 VAC to the Flex Feed 84 from a Lincoln power source.
4. Locate the user interface board, on the rear of the front panel. See ***Figure F.14***. See Wiring Diagram.
5. Using a volt/ohmmeter, check for 42 VAC at plug J3 pin 3 (lead 41A) on the user interface board. This is the input power to the user interface board. See ***Figure F.15***. See Wiring Diagram.
6. Using a volt/ohmmeter, check for approximately 2.1 VDC from plug J3 pin 1 (lead 81A) to plug J3 pin 2 (lead 82A) on the user interface board. See ***Figure F.15***. See Wiring Diagram. This is the digital communication network between the user interface board and the wire drive board.
7. If the correct input voltage is being applied to the user interface board and the digital communications network is functioning the next step would be to check the functions of the user interface board referencing the detailed instructions in the Operation section of the Instruction manual.
8. Using a 5/16” nutdriver, attach the four screws securing the front panel to the case.
9. If any of the tests fail, the user interface board may be faulty.
10. If faulty, perform the ***User Interface Board Removal And Replacement Procedure***.

Figure F.14 – Front panel mounting screws and user interface board location

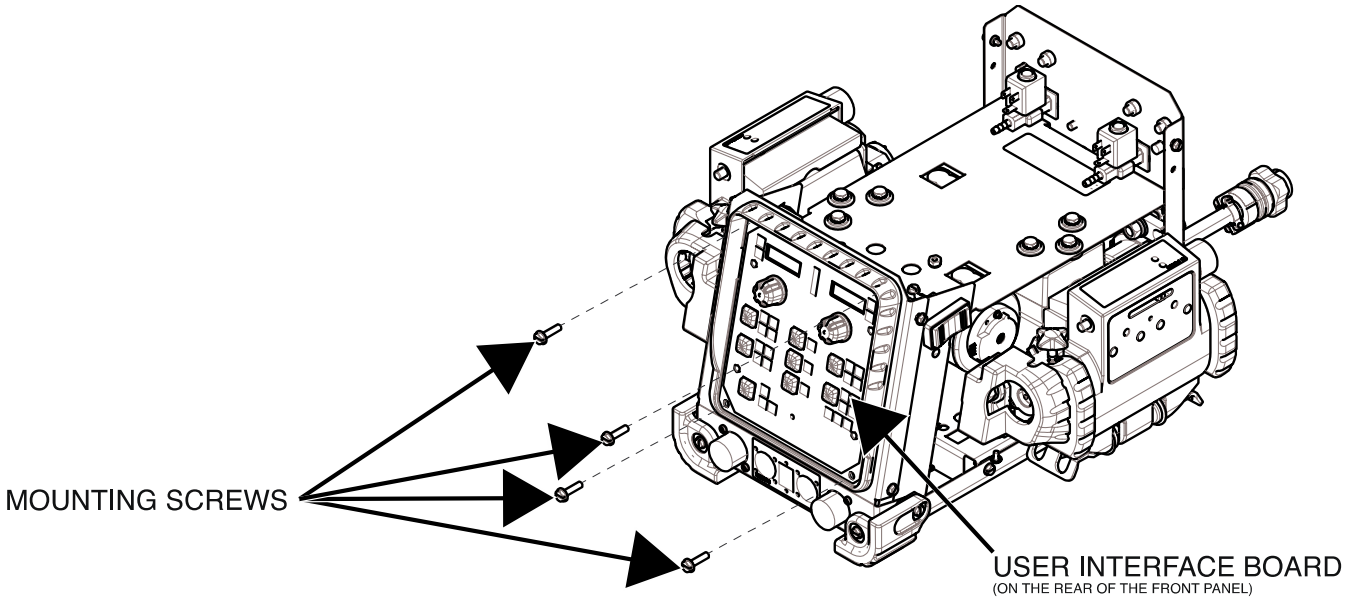
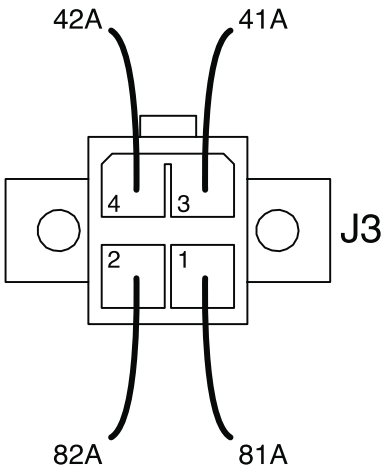
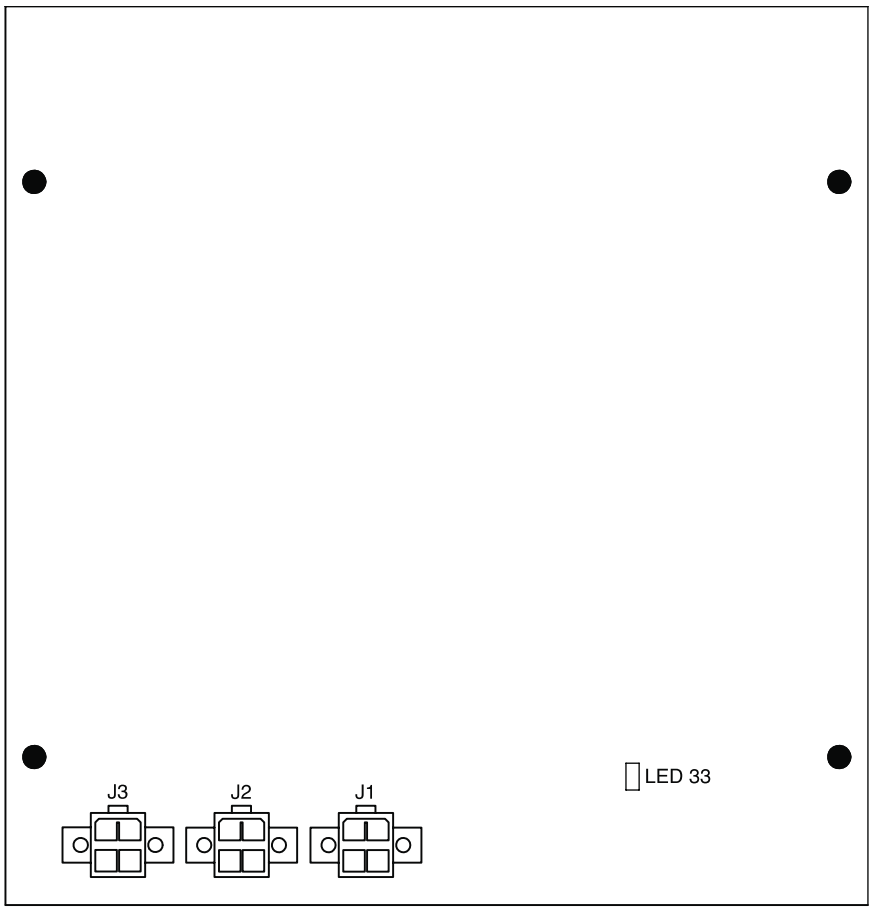


Figure F.15 – User interface board plug and lead locations





WIRE DRIVE BOARD TEST PROCEDURE

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 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 Wire Drive Board is receiving the correct input power and is functioning properly.

MATERIALS NEEDED

Volt/Ohmmeter
Wiring Diagram

TEST PROCEDURE

1. Remove the input power from the Flex Feed 84 wire feeder.
2. Perform the ***Case Cover Removal Procedure***.
3. Locate the wire drive board, on the underside of the roof. See ***Figure F.16***. See Wiring Diagram. **NOTE:** Do not disconnect plugs from the wire drive board, all plugs and leads must be connected for testing.
4. Carefully apply 42 VAC to the Flex Feed 84 from a Lincoln power source.
5. Visually inspect LED 1. LED 1 should be illuminated; indicating that +3.3 VDC is present on the board. See ***Figure F.17***.
6. Visually inspect LED 2. LED 2 should be illuminated; indicating that +5 VDC is present for CAN communication circuitry. See ***Figure F.17***.
7. Verify that the S2 dip switch is configured properly. See Operators Manual.
8. Using a volt/ohmmeter, perform the voltage tests outlined in ***Table F.1***. See ***Figures F.17*** and ***F.18***. See Wiring Diagram.
9. If any of the tests fail, check all leads and plugs for loose or faulty connections. If all leads and plug connections are good the wire drive board may be faulty.
10. If faulty, perform the ***Wire Drive Board Removal And Replacement Procedure***.
11. When testing is complete, remove input power to the machine.
12. Perform the ***Case Cover Replacement Procedure***.

Table F.1 – Wire drive board voltage tests

DESCRIPTION	TEST POINTS	LEAD NUMBERS	EXPECTED READING	CONDITIONS
INPUT POWER	J82 PIN 4 (+) TO J82 PIN 3 (-)	542 580	34 – 69 VDC	CORRECT INPUT VOLTAGE APPLIED TO MACHINE.
DIGITAL COMMUNICATION CAN LINES	J82 PIN 1 (+) TO J82 PIN 2 (-)	81B 82B	2 VDC	CORRECT INPUT VOLTAGE APPLIED TO MACHINE.
CAN LINES TO USER INTERFACE BOARD	J81 PIN 1 (+) TO J81 PIN 2 (-)	81A 82A	2 VDC	CORRECT INPUT VOLTAGE APPLIED TO MACHINE.
RIGHT GUN TRIGGER VOLTAGE	J83 PIN 1 (+) TO J83 PIN 2 (-)	670 643	+15 VDC	CORRECT INPUT VOLTAGE APPLIED TO MACHINE AND RIGHT SIDE GUN TRIGGER OPEN.
LEFT GUN TRIGGER VOLTAGE	J85 PIN 1 (+) TO J85 PIN 2 (-)	570 543	+15 VDC	CORRECT INPUT VOLTAGE APPLIED TO MACHINE AND LEFT SIDE GUN TRIGGER OPEN.
RIGHT CURRENT TRANSDUCER POWER	J83 PIN 4 (+) TO J83 PIN 14 (-)	905 902	+15 VDC	CORRECT INPUT POWER TO MACHINE.
LEFT CURRENT TRANSDUCER POWER	J85 PIN 4 (+) TO J85 PIN 14 (-)	805 802	+15 VDC	CORRECT INPUT POWER TO MACHINE.
RIGHT SIDE 15 VDC SUPPLY FROM WIRE DRIVE BOARD	J83 PIN 5 (+) TO J83 PIN 14 (-)	522 902	+15 VDC	CORRECT INPUT VOLTAGE APPLIED TO MACHINE.
LEFT SIDE 15 VDC SUPPLY FROM WIRE DRIVE BOARD	J85 PIN 5 (+) TO J85 PIN 14 (-)	515 802	+15 VDC	CORRECT INPUT VOLTAGE APPLIED TO MACHINE.
RIGHT GAS PURGE SWITCH VOLTAGE	J83 PIN 5 (+) TO J83 PIN 7 (-)	522 679	+15 VDC	CORRECT INPUT VOLTAGE APPLIED TO MACHINE AND GAS PURGE SWITCH OPEN.
LEFT GAS PURGE SWITCH VOLTAGE	J85 PIN 5 (+) TO J85 PIN 7 (-)	515 559	+15 VDC	CORRECT INPUT VOLTAGE APPLIED TO MACHINE AND GAS PURGE SWITCH OPEN.
RIGHT GAS PURGE SWITCH VOLTAGE	J83 PIN 5 (+) TO J83 PIN 7 (-)	522 679	0 VOLTS	CORRECT INPUT VOLTAGE APPLIED TO MACHINE AND GAS PURGE SWITCH CLOSED.
LEFT GAS PURGE SWITCH VOLTAGE	J85 PIN 5 (+) TO J85 PIN 7 (-)	515 559	0 VOLTS	CORRECT INPUT VOLTAGE APPLIED TO MACHINE AND GAS PURGE SWITCH CLOSED.
RIGHT SIDE CURRENT TRANSDUCER POWER	J83 PIN 8 (+) TO J83 PIN 14 (-)	904 902	-15 VDC	CORRECT INPUT VOLTAGE APPLIED TO MACHINE.
LEFT SIDE CURRENT	J85 PIN 8 (+) TO	804	-15 VDC	CORRECT INPUT VOLTAGE

TRANSDUCER POWER	J85 PIN 14 (-)	802		APPLIED TO MACHINE.
RIGHT SIDE TACH INPUT POWER	J83 PIN 9 (+) TO J83 PIN 12 (-)	631 634	+5 VDC	CORRECT INPUT VOLTAGE APPLIED TO MACHINE.
LEFT SIDE TACH INPUT POWER	J85 PIN 9 (+) TO J85 PIN 12 (-)	531 534	+5 VDC	CORRECT INPUT VOLTAGE APPLIED TO MACHINE.
RIGHT SIDE GAS SOLENOID POWER	J84 PIN 9 (+) TO J84 PIN 7 (-)	653 652	+8 VDC	CORRECT INPUT VOLTAGE APPLIED TO MACHINE AND GAS PURGE SWITCH ACTIVATED.
LEFT SIDE GAS SOLENOID POWER	J84 PIN 3 (+) TO J84 PIN 1 (-)	553 552	+8 VDC	CORRECT INPUT VOLTAGE APPLIED TO MACHINE AND GAS PURGE SWITCH ACTIVATED.
RIGHT SIDE CONTACTOR POWER	J84 PIN 2 (+) TO J84 PIN 4 (-)	648 549B	+32 VDC	CORRECT INPUT VOLTAGE APPLIED TO MACHINE AND GUN TRIGGER ACTIVATED.
LEFT SIDE CONTACTOR POWER	J84 PIN 8 (+) TO J84 PIN 10 (-)	548 549A	+32 VDC	CORRECT INPUT VOLTAGE APPLIED TO MACHINE AND GUN TRIGGER ACTIVATED.
RIGHT SIDE DRIVE MOTOR POWER	J84 PIN 12 (+) TO J84 PIN 11 (-)	650 651	2.5 – 32 V DEPENDENT ON WIRE SPEED SETTING	CORRECT INPUT VOLTAGE APPLIED TO MACHINE AND GUN TRIGGER ACTIVATED.
LEFT SIDE DRIVE MOTOR POWER	J84 PIN 6 (+) TO J84 PIN 5 (-)	550 551	2.5 – 32 V DEPENDENT ON WIRE SPEED SETTING	CORRECT INPUT VOLTAGE APPLIED TO MACHINE AND GUN TRIGGER ACTIVATED.
LEFT SIDE TACH CHANNEL A	J83 PIN 10 (+) TO J83 PIN 12 (-)	637 634	2.5 VDC @ 900 HZ MIN WFS	CORRECT INPUT VOLTAGE APPLIED TO MACHINE AND GUN TRIGGER ACTIVATED.
LEFT SIDE TACH CHANNEL B	J83 PIN 11 (+) TO J83 PIN 12 (-)	638 634	2.5 VDC @ 900 HZ MIN WFS	CORRECT INPUT VOLTAGE APPLIED TO MACHINE AND GUN TRIGGER ACTIVATED.
RIGHT SIDE TACH CHANNEL A	J85 PIN 10 (+) TO J85 PIN 12 (-)	537 534	2.5 VDC @ 900 HZ MIN WFS	CORRECT INPUT VOLTAGE APPLIED TO MACHINE AND GUN TRIGGER ACTIVATED.
RIGHT SIDE TACH CHANNEL B	J85 PIN 11 (+) TO J85 PIN 12 (-)	538 534	2.5 VDC @ 900 HZ MIN WFS	CORRECT INPUT VOLTAGE APPLIED TO MACHINE AND GUN TRIGGER ACTIVATED.

Figure F.16 – Wire drive board location

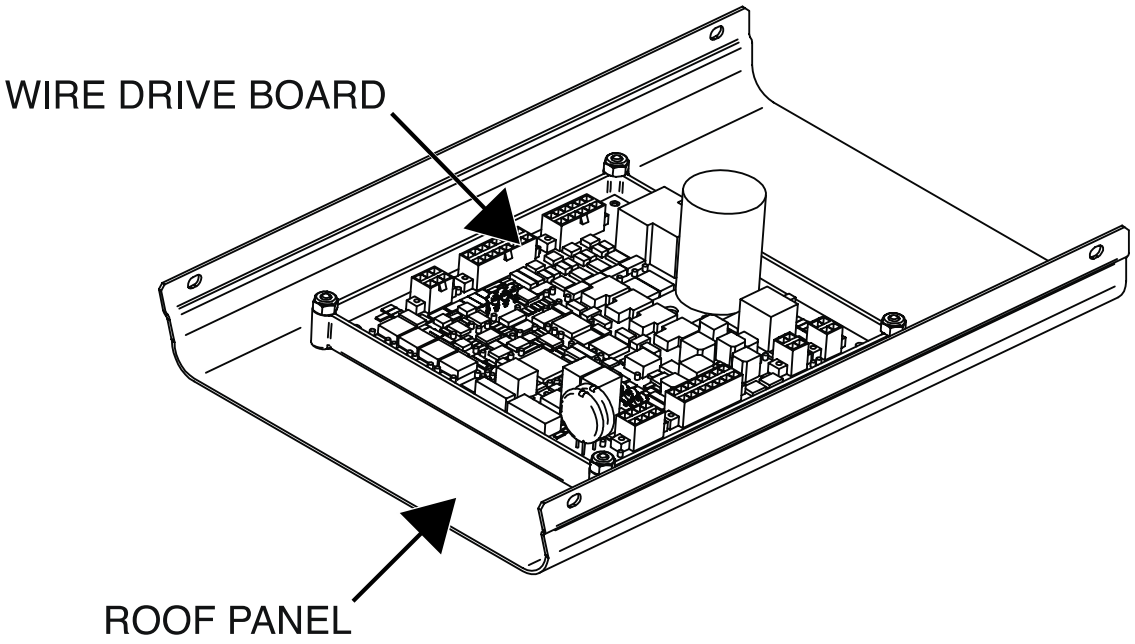


Figure F.17 – Wire drive board plug and LED locations

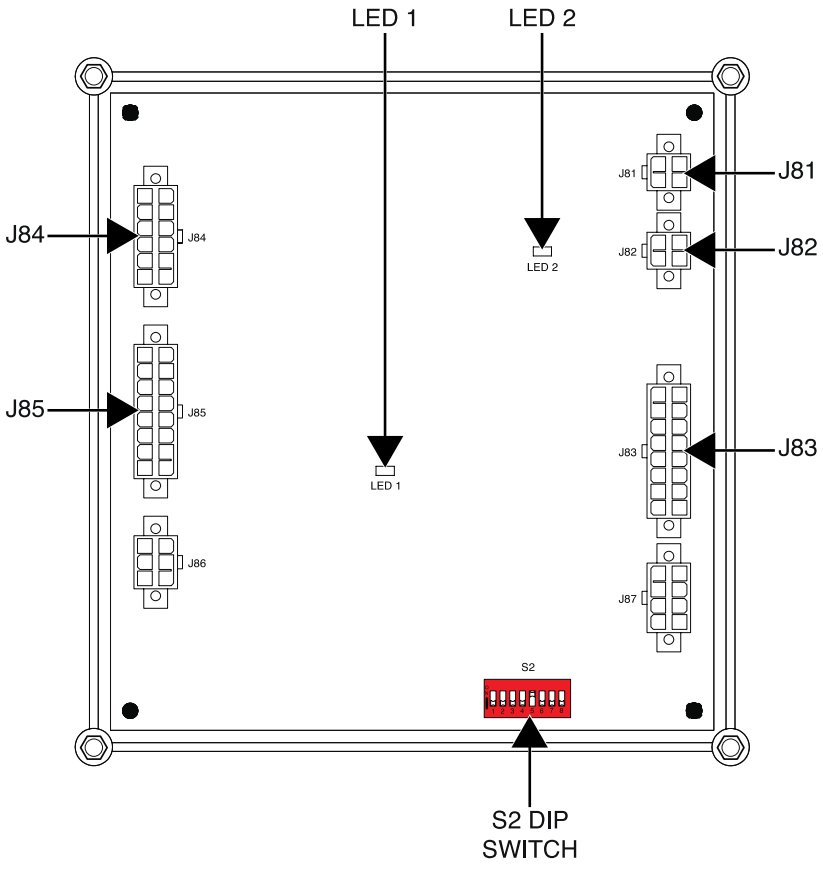
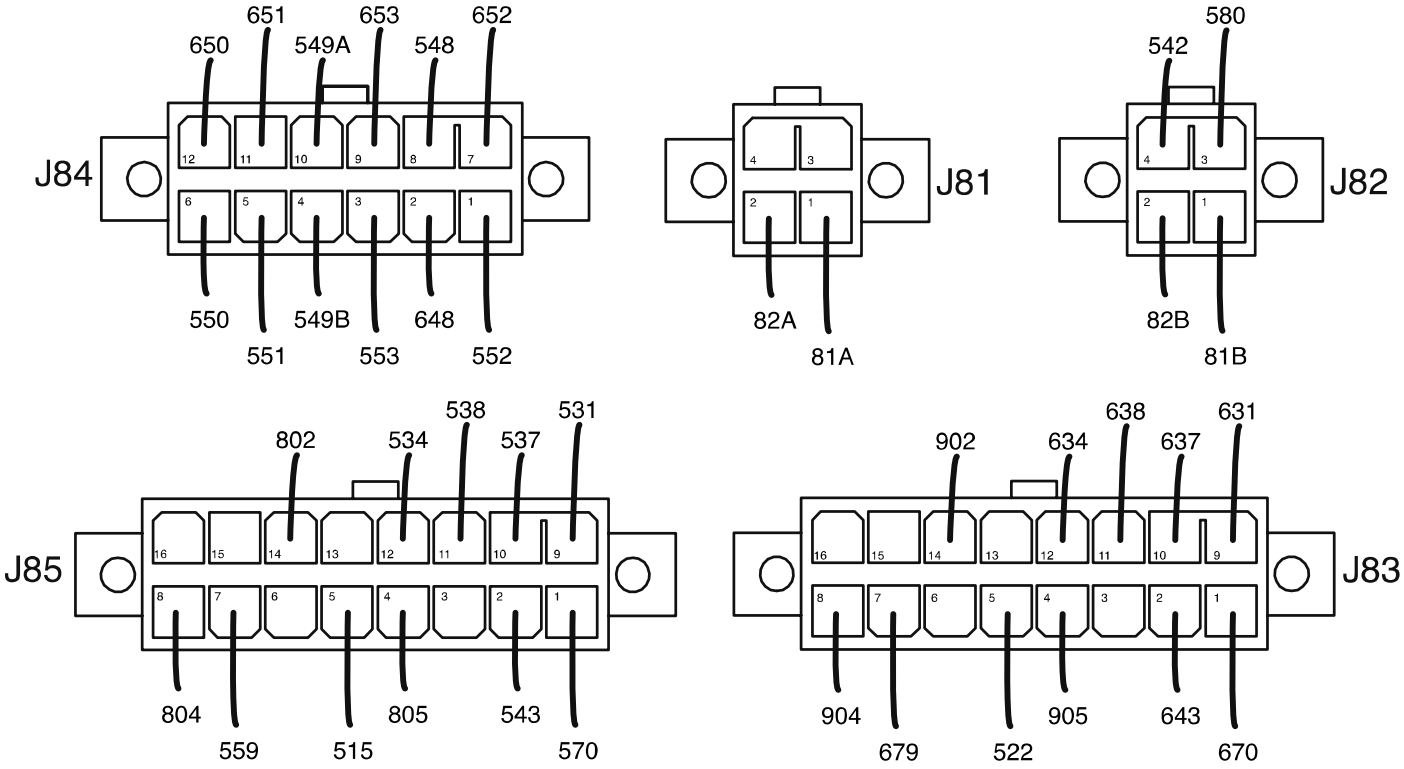


Figure F.18 – Wire drive board lead locations



FAN MOTOR TEST PROCEDURE

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 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 Fan Motor is functioning properly.

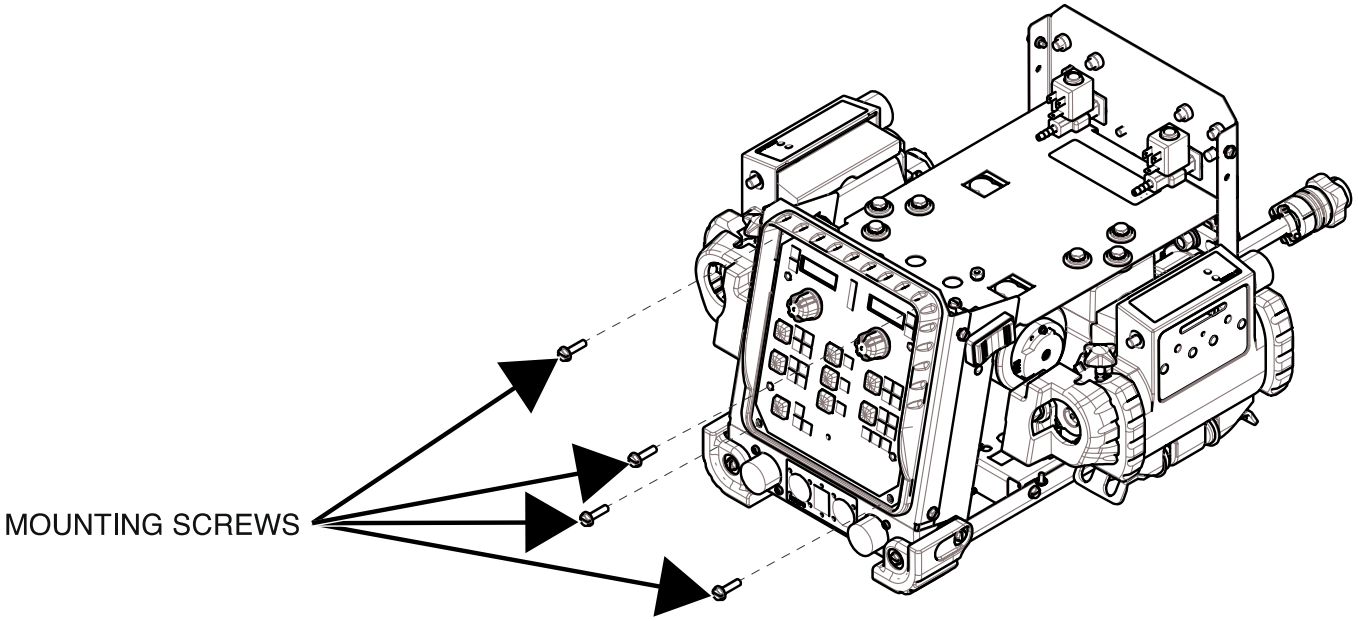
MATERIALS NEEDED

5/16” Nutdriver
Volt/Ohmmeter
Wiring Diagram

TEST PROCEDURE

1. Remove the input power from the Flex Feed 84 wire feeder.
2. Using a 5/16” nutdriver, remove the four screws securing the front panel to the machine. See ***Figure F.19***.
3. Locate plug P18. See Wiring Diagram.
4. Carefully apply 42 VAC to the Flex Feed 84 from a Lincoln power source.
5. Using a volt/ohmmeter, check for 5 VDC at plug P18 pin 8 (+) (red lead) to plug P18 pin 6 (-) (black lead). See Wiring Diagram. This is the input power to the fan motor.
6. If the correct voltage is being applied to the fan motor and the fan motor is not functioning, the fan motor may be faulty.
7. If faulty, perform the ***Fan Assembly Removal And Replacement Procedure***.
8. If the correct voltage is NOT present, perform the ***Wire Drive Board Test Procedure***.
9. When testing is complete, remove the input power from the Flex Feed 84 wire feeder.
10. Using a 5/16” nutdriver, attach the four screws securing the front panel to the machine.

Figure F.19 – Front panel mounting screws location



CURRENT TRANSDUCER(S) TEST PROCEDURE

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 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 Current Transducer(s) are functioning properly.

MATERIALS NEEDED

Volt/Ohmmeter
Load Bank
Wiring Diagram

TEST PROCEDURE

1. Remove the input power from the Flex Feed 84 wire feeder.
2. Perform the ***Case Cover Removal Procedure***.
3. Locate the current transducer(s). See ***Figure F.20***. See Wiring Diagram.
4. Locate plugs J85 and J83 on the wire drive board. See ***Figure F.21***. See Wiring Diagram.
5. Carefully apply the correct input power (42 VAC) to the Flex Feed 84.
6. Using a digital volt/ohmmeter, carefully check the DC supply voltages to the current transducer(s) per ***Tables F.2*** and ***F.3***. See ***Figure F.21***. See Wiring Diagram. Also check plugs J21 (right side) and J22 (left side). See Wiring Diagram.
   NOTE: Do not attempt to check voltages at the current transducer connector. The terminals are small and delicate and may be damaged if probed with meter leads.
7. If the correct voltages are NOT present at the wire drive board, perform the ***Wire Drive Board Test Procedure***.
8. Place the power source into constant current output mode. Using a load bank, load the machine according to ***Tables F.4*** and ***F.5***.
9. Using a digital volt/ohmmeter, test the current transducer feedback versus actual output current. See ***Tables F.4*** and ***F.5***. See ***Figure F.21***. See Wiring Diagram.
10. If the DC supply voltages are correct but the feedback voltages are incorrect the current transducer may be faulty.
11. If faulty, perform the ***Current Transducer(s) Removal And Replacement Procedure***, for the faulty current transducer(s).
12. Perform the ***Case Cover Replacement Procedure***.

Table F.2 – DC supply voltages from wire drive board (right side)

DESCRIPTION	TEST POINT (POS)	TEST POINT (NEG)	EXPECTED READING
POSITIVE VOLTAGE SUPPLY	PLUG J85 PIN 4 (LEAD 805)	PLUG J85 PIN 14 (LEAD 802)	+15 VDC
NEGATIVE VOLTAGE SUPPLY	PLUG J85 PIN 8 (LEAD 804)	PLUG J85 PIN 14 (LEAD 802)	-15 VDC

Table F.3 – DC supply voltages from wire drive board (left side)

DESCRIPTION	TEST POINT (POS)	TEST POINT (NEG)	EXPECTED READING
POSITIVE VOLTAGE SUPPLY	PLUG J83 PIN 4 (LEAD 905)	PLUG J83 PIN 14 (LEAD 902)	+15 VDC
NEGATIVE VOLTAGE SUPPLY	PLUG J83 PIN 8 (LEAD 904)	PLUG J83 PIN 14 (LEAD 902)	-15 VDC

Table F.4 – Current transducer feedback versus actual output current (right side)

ACTUAL OUTPUT CURRENT (AMPS)	TEST POINT (POS)	TEST POINT (NEG)	CURRENT TRANSDUCER FEEDBACK VOLTAGE
500	PLUG J85 PIN 13 (LEAD 801)	PLUG J85 PIN 14 (LEAD 802)	4.0 VDC
450	PLUG J85 PIN 13 (LEAD 801)	PLUG J85 PIN 14 (LEAD 802)	3.6 VDC
400	PLUG J85 PIN 13 (LEAD 801)	PLUG J85 PIN 14 (LEAD 802)	3.2 VDC
350	PLUG J85 PIN 13 (LEAD 801)	PLUG J85 PIN 14 (LEAD 802)	2.8 VDC
300	PLUG J85 PIN 13 (LEAD 801)	PLUG J85 PIN 14 (LEAD 802)	2.4 VDC
250	PLUG J85 PIN 13 (LEAD 801)	PLUG J85 PIN 14 (LEAD 802)	2.0 VDC
200	PLUG J85 PIN 13 (LEAD 801)	PLUG J85 PIN 14 (LEAD 802)	1.6 VDC
150	PLUG J85 PIN 13 (LEAD 801)	PLUG J85 PIN 14 (LEAD 802)	1.2 VDC
100	PLUG J85 PIN 13 (LEAD 801)	PLUG J85 PIN 14 (LEAD 802)	0.8 VDC
50	PLUG J85 PIN 13 (LEAD 801)	PLUG J85 PIN 14 (LEAD 802)	0.4 VDC

Table F.5 – Current transducer feedback versus actual output current (left side)

ACTUAL OUTPUT CURRENT (AMPS)	TEST POINT (POS)	TEST POINT (NEG)	CURRENT TRANSDUCER FEEDBACK VOLTAGE
500	PLUG J83 PIN 13 (LEAD 901)	PLUG J83 PIN 14 (LEAD 902)	4.0 VDC
450	PLUG J83 PIN 13 (LEAD 901)	PLUG J83 PIN 14 (LEAD 902)	3.6 VDC
400	PLUG J83 PIN 13 (LEAD 901)	PLUG J83 PIN 14 (LEAD 902)	3.2 VDC
350	PLUG J83 PIN 13 (LEAD 901)	PLUG J83 PIN 14 (LEAD 902)	2.8 VDC
300	PLUG J83 PIN 13 (LEAD 901)	PLUG J83 PIN 14 (LEAD 902)	2.4 VDC
250	PLUG J83 PIN 13 (LEAD 901)	PLUG J83 PIN 14 (LEAD 902)	2.0 VDC
200	PLUG J83 PIN 13 (LEAD 901)	PLUG J83 PIN 14 (LEAD 902)	1.6 VDC
150	PLUG J83 PIN 13 (LEAD 901)	PLUG J83 PIN 14 (LEAD 902)	1.2 VDC
100	PLUG J83 PIN 13 (LEAD 901)	PLUG J83 PIN 14 (LEAD 902)	0.8 VDC
50	PLUG J83 PIN 13 (LEAD 901)	PLUG J83 PIN 14 (LEAD 902)	0.4 VDC

Figure F.20 – Current transducer location

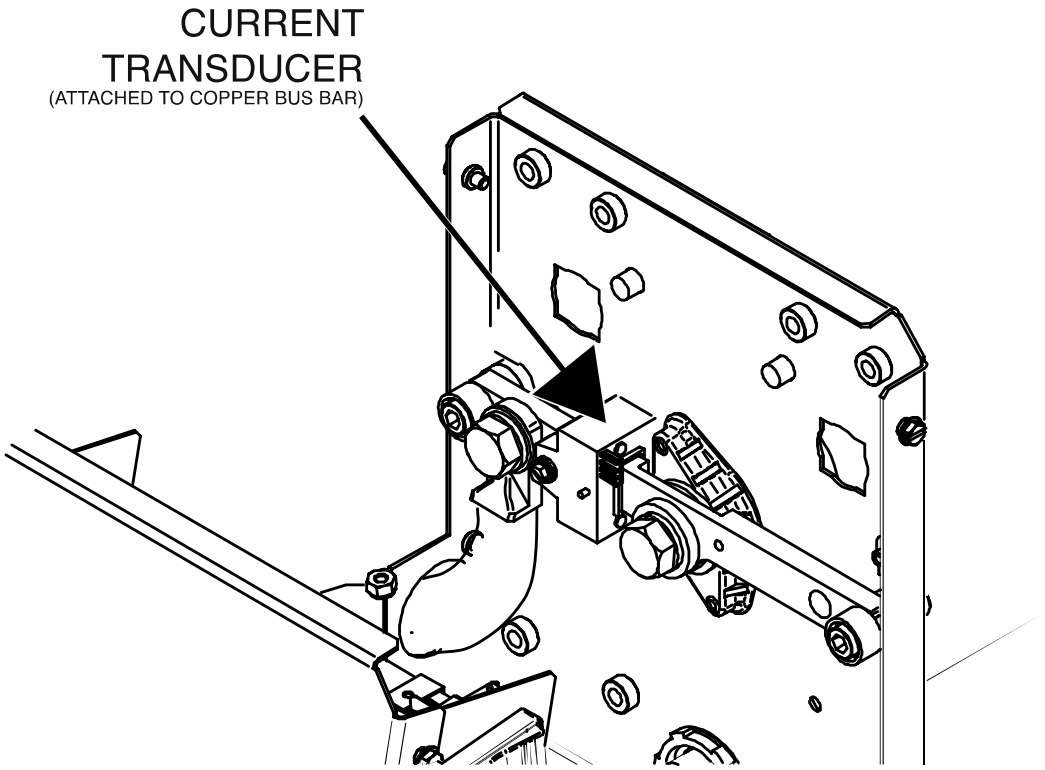
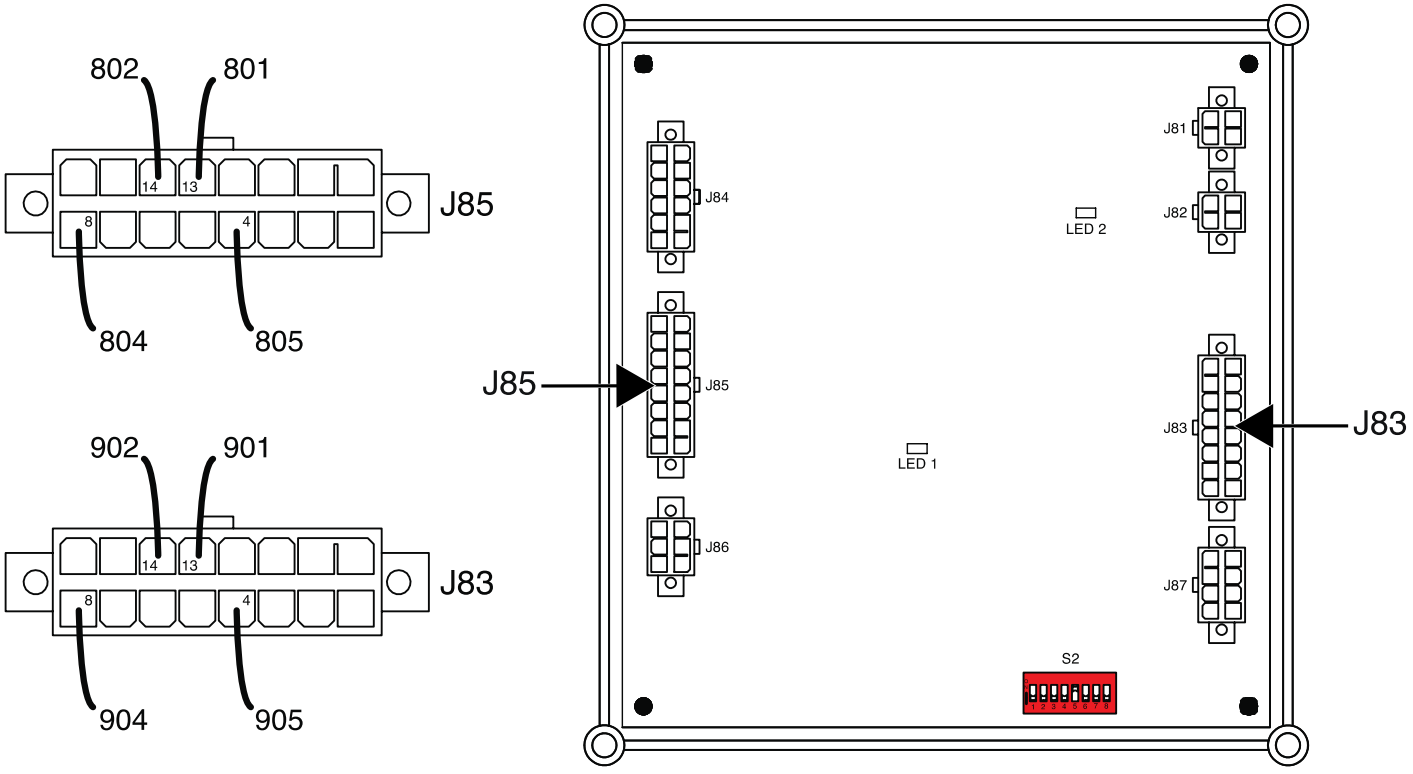


Figure F.21 – Wire drive board plug and lead locations



INPUT RECTIFIER TEST PROCEDURE

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 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 Input Rectifier is receiving AC input voltage and is converting it to the correct DC output voltage.

MATERIALS NEEDED

5/16” Nutdriver
42 VAC Power Supply
Volt/Ohmmeter
Wiring Diagram

TEST PROCEDURE

1. Remove the input power from the Flex Feed 84 wire feeder.
2. Using a 5/16” nutdriver, remove the four screws securing the front panel. See ***Figure F.22***.
3. Locate the input rectifier. See ***Figure F.23***. See Wiring Diagram.
4. Apply the correct input voltage (42 VAC) to the machine at the 14-pin connection. See Wiring Diagram.
5. Using a volt/ohmmeter, check for the correct input voltage (42 VAC) at leads 41 and 42 on the input rectifier. If the input voltage is not present, check the wiring between the input connector and the input rectifier. See ***Figure F.24***. See Wiring Diagram.
6. Using a volt/ohmmeter, check for the proper output on leads 580 (negative) and 542 (positive). The voltage should be 59 VDC. If you are only reading 38 VDC leads (542 or 580) may be open between the wire drive board and the input rectifier. See ***Figure F.24***. See Wiring Diagram. If the wiring is OK, the wire drive board may be faulty. Check the wiring and the connections back to the wire drive board.
7. Label and disconnect leads 41A, 41B, 542, 42A, 42B and 580 from the input rectifier. See ***Figure F.24***. See Wiring Diagram.
8. Using a volt/ohmmeter, perform the tests outlined in ***Table F.6***. See ***Figure F.24***. See Wiring Diagram.
9. If any of the tests fail, the input rectifier may be faulty.
10. If faulty, perform the ***Input Rectifier Removal And Replacement Procedure***.
11. Connect leads 41A, 41B, 542, 42A, 42B and 580 to the input rectifier. See Wiring Diagram.
12. Using a 5/16” nutdriver, attach the four screws securing the front panel to the machine.

Table F.6 - Input rectifier forward voltage drop tests

TEST POINT (POS)	TEST POINT (NEG)	EXPECTED READING
TOP AC TERMINAL	POSITIVE TERMINAL	0.2 VDC – 0.7 VDC
BOTTOM AC TERMINAL	POSITIVE TERMINAL	0.2 VDC – 0.7 VDC
NEGATIVE TERMINAL	TOP AC TERMINAL	0.2 VDC – 0.7 VDC
NEGATIVE TERMINAL	BOTTOM AC TERMINAL	0.2 VDC – 0.7 VDC

Figure F.22 – Front panel mounting screw locations

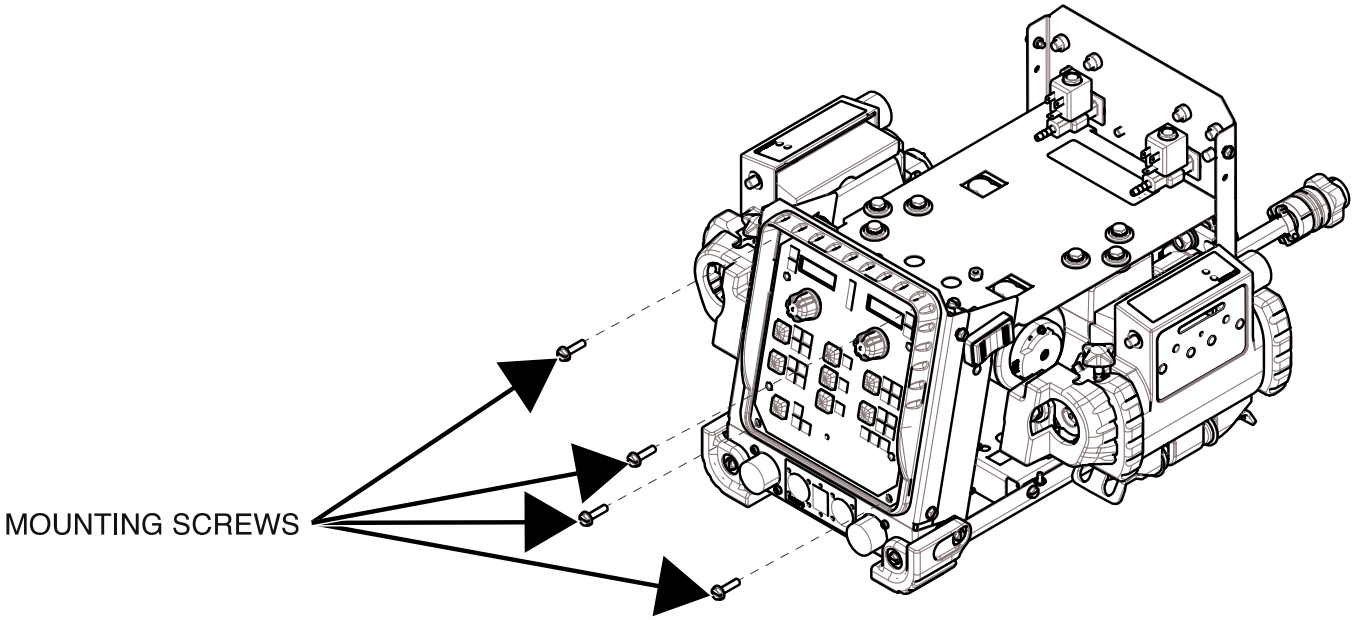


Figure F.23 – Input rectifier location

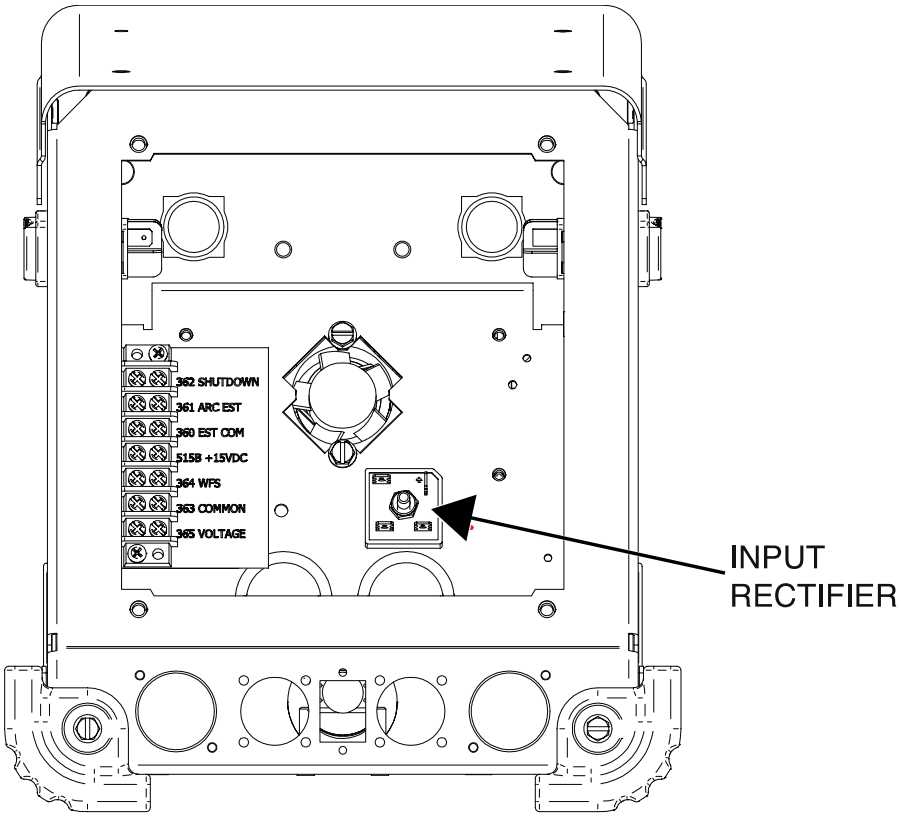
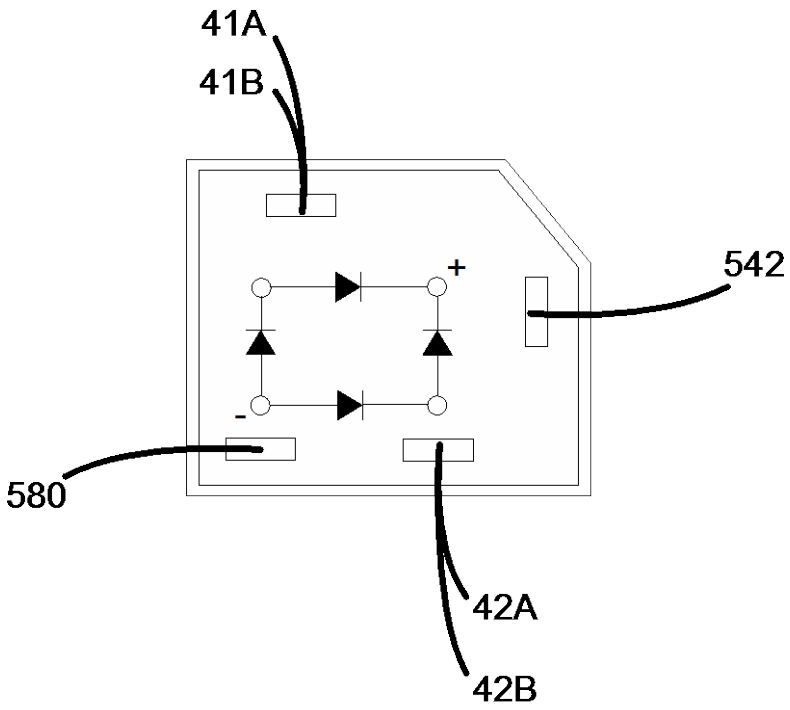


Figure F.24 – Input rectifier lead and terminal locations



Removal And Replacement Procedures

COLD INCH/FEED GAS PURGE SWITCH REMOVAL AND REPLACEMENT PROCEDURE

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 or machine operator and will invalidate your factory warranty. For your safety and to avoid electrical shock, please observe all safety notes and precautions detailed throughout this manual. If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

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

MATERIALS NEEDED

Wiring Diagram

REMOVAL PROCEDURE

1. Remove the input power from the Flex Feed 84 wire feeder.
2. Perform the ***Case Cover Removal Procedure***.
3. Label and disconnect leads 558, 515, 515A and 559 from the left side cold inch/feed gas purge switch or leads 635, 522 and 679 from the right side cold inch/feed gas purge switch. See ***Figure F.25***. See Wiring Diagram.
4. Squeeze the side tabs of the switch and push the switch outward and away from the machine. See ***Figure F.26***.
5. The cold inch/feed gas purge switch(s) can now be replaced.

REPLACEMENT PROCEDURE

1. Carefully position new switch in machine and press firmly to seat switch in it's mount.
2. Connect leads 558, 515, 515A and 559 to the left side cold inch/feed gas purge switch and/or leads 635, 522 and 679 to the right side cold inch/feed gas purge switch. See Wiring Diagram.
3. Perform the ***Case Cover Replacement Procedure***.
4. Perform the ***Retest After Repair Procedure***.

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

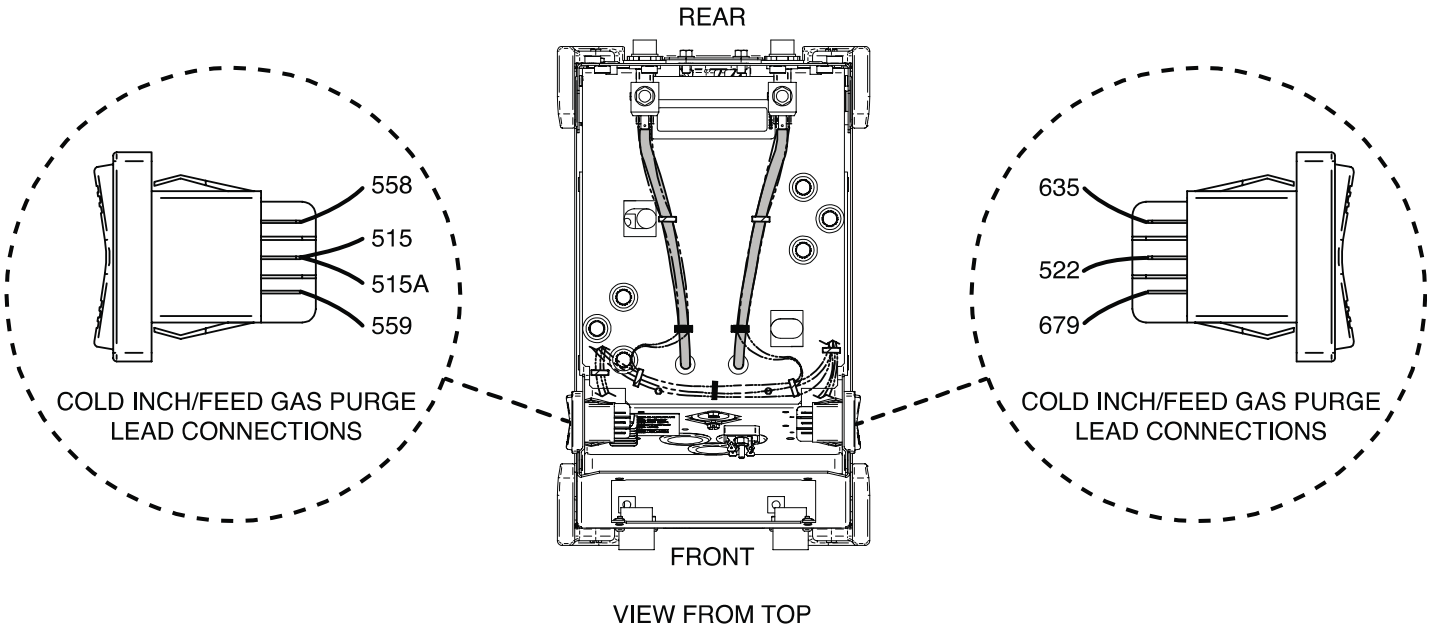
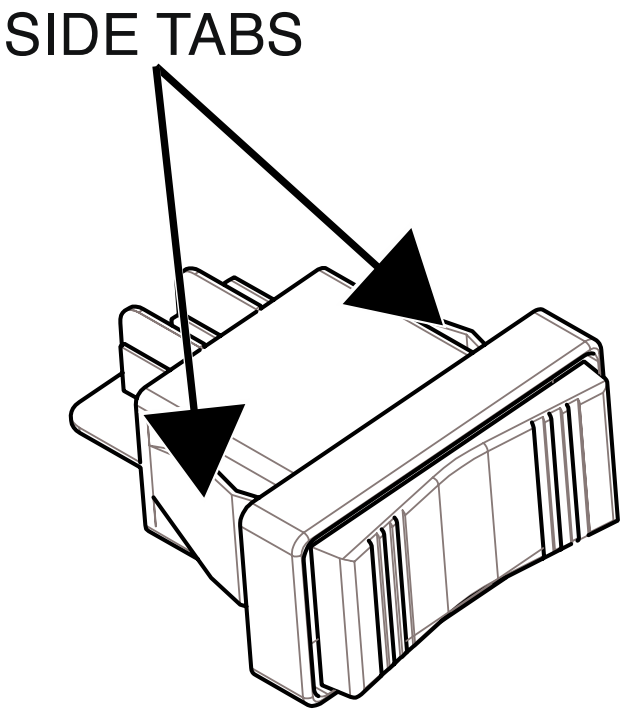


Figure F.26 – Cold inch/feed gas purge side tab locations



GAS SOLENOID(S) REMOVAL AND REPLACEMENT PROCEDURE

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 or machine operator and will invalidate your factory warranty. For your safety and to avoid electrical shock, please observe all safety notes and precautions detailed throughout this manual. If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

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

MATERIALS NEEDED

Slotted Screwdriver
Hammer
Needle Nose Pliers
Wiring Diagram

REMOVAL PROCEDURE

1. Remove the input power from the Flex Feed 84 wire feeder.
2. Perform the ***Case Cover Removal Procedure***.
3. Label and disconnect leads from the gas solenoid(s) (552 and 553 for left gas solenoid, 652 and 653 for right gas solenoid). See ***Figure F.27***. See Wiring Diagram.
4. Using a slotted screwdriver and a hammer, remove the nut and flat washer securing the gas solenoid to the rear of the machine. See ***Figure F.28***. Repeat procedure for second gas solenoid if necessary.
5. Using needle nose pliers, loosen the hose clamp and disconnect the gas hose from the gas solenoid(s). See ***Figure F.28***. Repeat procedure for second gas solenoid if necessary.
6. The gas solenoid(s) can now be removed and replaced.

REPLACEMENT PROCEDURE

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

Figure F.27 – Gas solenoid(s) lead locations

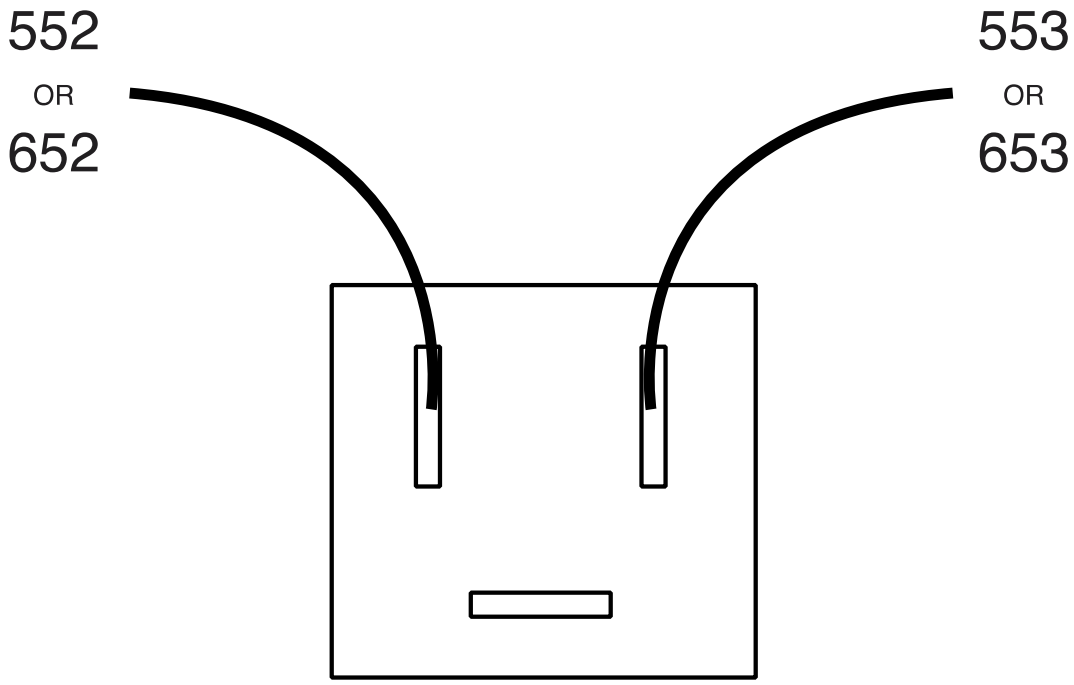
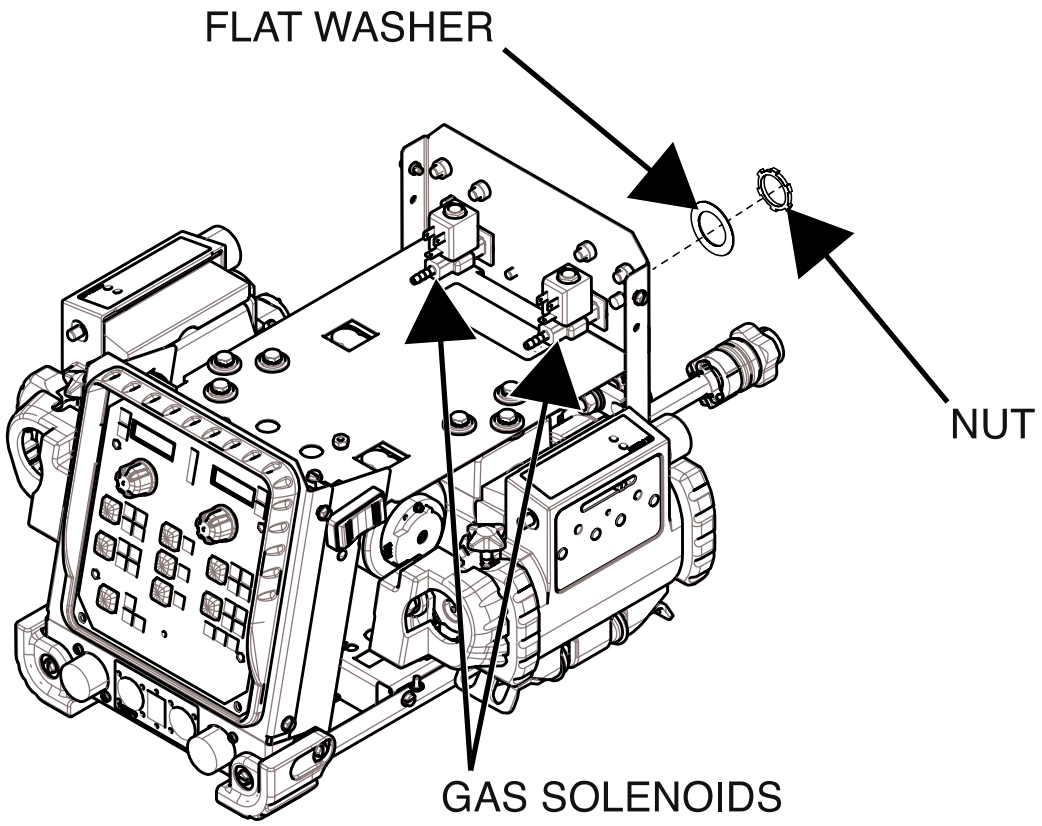


Figure F.28 – Gas solenoid flat washer and mounting nut locations



WIRE DRIVE MOTOR(S) REMOVAL AND REPLACEMENT PROCEDURE

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 or machine operator and will invalidate your factory warranty. For your safety and to avoid electrical shock, please observe all safety notes and precautions detailed throughout this manual. If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

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

MATERIALS NEEDED

Phillips Screwdriver
3/4” Nutdriver
Needle Nose Pliers
1/4” Allen Wrench
7/16” Nutdriver
5/16” Nutdriver
Wiring Diagram

REMOVAL PROCEDURE

1. Remove the input power from the Flex Feed 84 wire feeder.
2. Perform the ***Case Cover Removal Procedure***.
3. Perform the ***Gas Solenoid(s) Removal Procedure***.
4. Using a Phillips screwdriver, remove the screw, lock washer and flat washer securing the gun adaptor cover to the feedplate assembly and remove the gun adaptor cover. See ***Figure F.29***.
5. Using a 3/4” nutdriver, remove the bolt, lock washer and flat washer securing the electrode lead to the feedplate. See ***Figure F.30***. See Wiring Diagram.
6. Using needle nose pliers, remove the clamp securing the gas hose to the feedplate and disconnect the gas hose. See ***Figure F.30***.
7. Using a Phillips screwdriver, remove the screw and washer securing lead (67A left side / 67B right side) to the feedplate. See ***Figure F.31***. See Wiring Diagram.
8. Using a Phillips screwdriver, remove the screw, lock washer and flat washer securing the drive gear and remove the drive gear from the motor shaft. See ***Figure F.32***.
9. Using a 1/4” Allen wrench, remove the two screws and flat washers securing the feedplate assembly to the wire drive motor assembly and remove the feedplate assembly. See ***Figure F.32***.
10. Using a 7/16” nutdriver, remove the six screws and lock washers securing the top motor support to the wire drive motor assemblies. See ***Figure F.33***.
11. Using a 5/16” nutdriver, remove the two screws securing the motor top support to the rear panel of the machine. See ***Figure F.33***.

12. Using a 5/16” nutdriver, remove the two screws securing the motor top support to the machine. See ***Figure F.33***.
13. Carefully maneuver the motor top support to allow access to the wire drive motors.
14. Using a 5/16” nutdriver, remove the four screws securing the motor bottom support to the machine. See ***Figure F.33***.
15. Label and disconnect plugs P9 and P16 from the wire drive motor assemblies. See Wiring Diagram.
16. Carefully lift and tilt the motor bottom support to gain access to the bottom screws.
17. Using a 7/16” nutdriver, remove the three screws and lock washers securing each wire drive motor assembly to the motor bottom support.
18. The wire drive motors can now be removed and replaced.

REPLACEMENT PROCEDURE

1. Carefully position the new wire drive motor(s) onto the motor bottom support.
2. Carefully lift and tilt the motor bottom support to attach the bottom screws.
3. Using a 7/16” nutdriver, attach the three screws and lock washers securing each wire drive motor assembly to the motor bottom support.
4. Connect plugs P9 and P16 to the wire drive motor assemblies. See Wiring Diagram.
5. Using a 5/16” nutdriver, attach the four screws securing the motor bottom support to the machine.
6. Carefully position the motor top support onto the wire drive motor assemblies.
7. Using a 5/16” nutdriver, attach the two screws securing the motor top support to the machine.
8. Using a 5/16” nutdriver, attach the two screws securing the motor top support to the rear panel of the machine.
9. Using a 7/16” nutdriver, attach the six screws and lock washers securing the motor top support to the wire drive motor assemblies.
10. Carefully position the feedplate assembly onto the machine.
11. Using a 1/4” Allen wrench, attach the two screws and flat washers securing the feedplate assembly to the wire drive motor assembly. Perform this step for each feedplate assembly.
12. Using a Phillips screwdriver, attach the screw, lock washer and flat washer securing the drive gear to the motor shaft.
13. Using a Phillips screwdriver, attach the screw and washer securing lead (67A left side / 67B right side) to the feedplate. See Wiring Diagram.
14. Using needle nose pliers, attach the clamp securing the gas hose to the Feedplate.
15. Using a 3/4” nutdriver, attach the bolt, lock washer and flat washer securing the heavy lead to the feedplate.
16. Using a Phillips screwdriver, attach the screw, lock washer and flat washer securing the gun adaptor cover to the feedplate assembly.
17. Perform the ***Gas Solenoid(s) Replacement Procedure***.
18. Perform the ***Case Cover Replacement Procedure***.
19. Perform the ***Retest After Repair Procedure***.

Figure F.29 – Gun adaptor mounting screw location

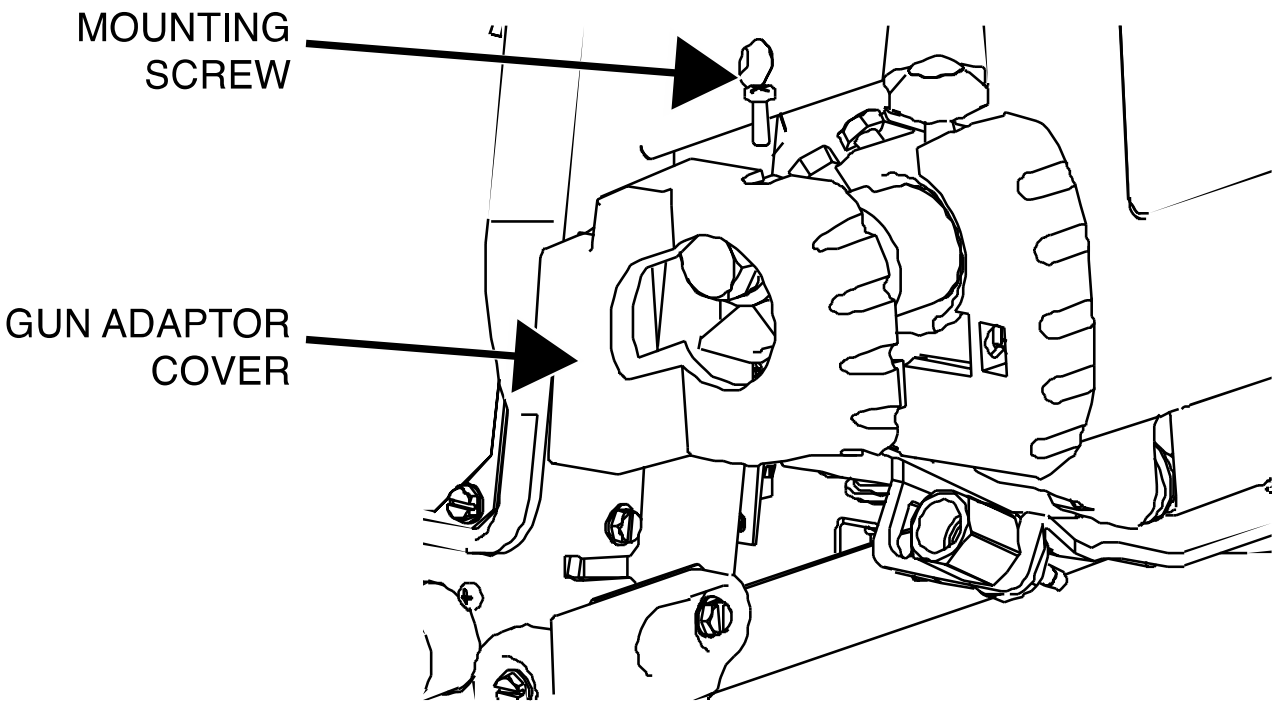


Figure F.30 – Electrode lead and gas hose mounting hardware locations

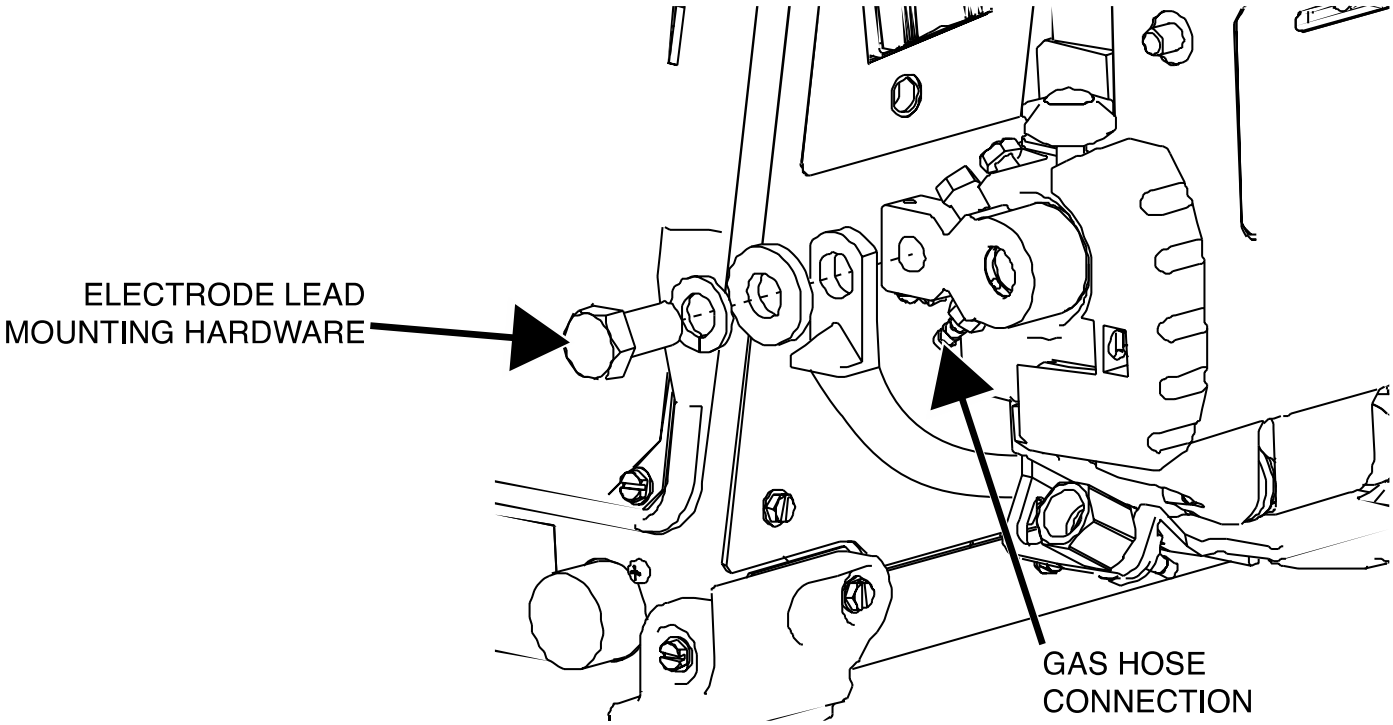


Figure F.31 – Sense lead mounting screw location

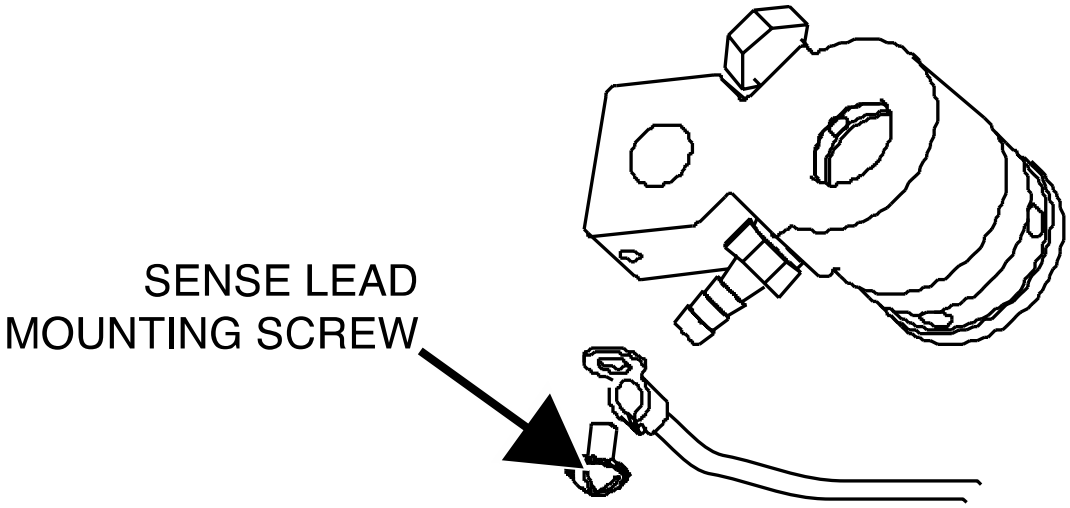


Figure F.32 – Feedplate and drive gear mounting screw locations

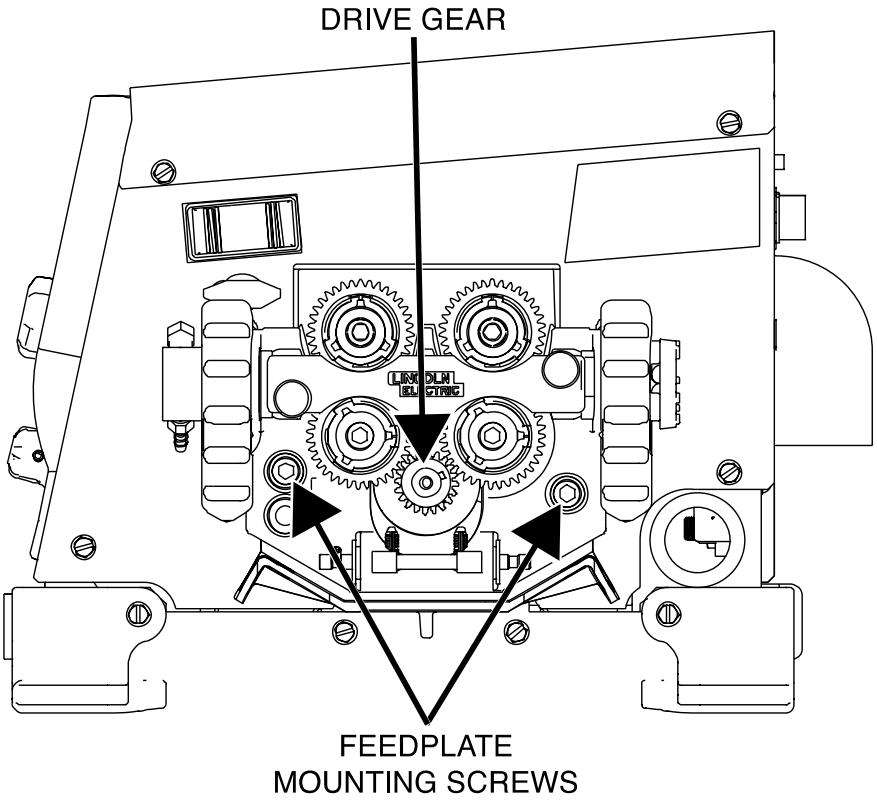
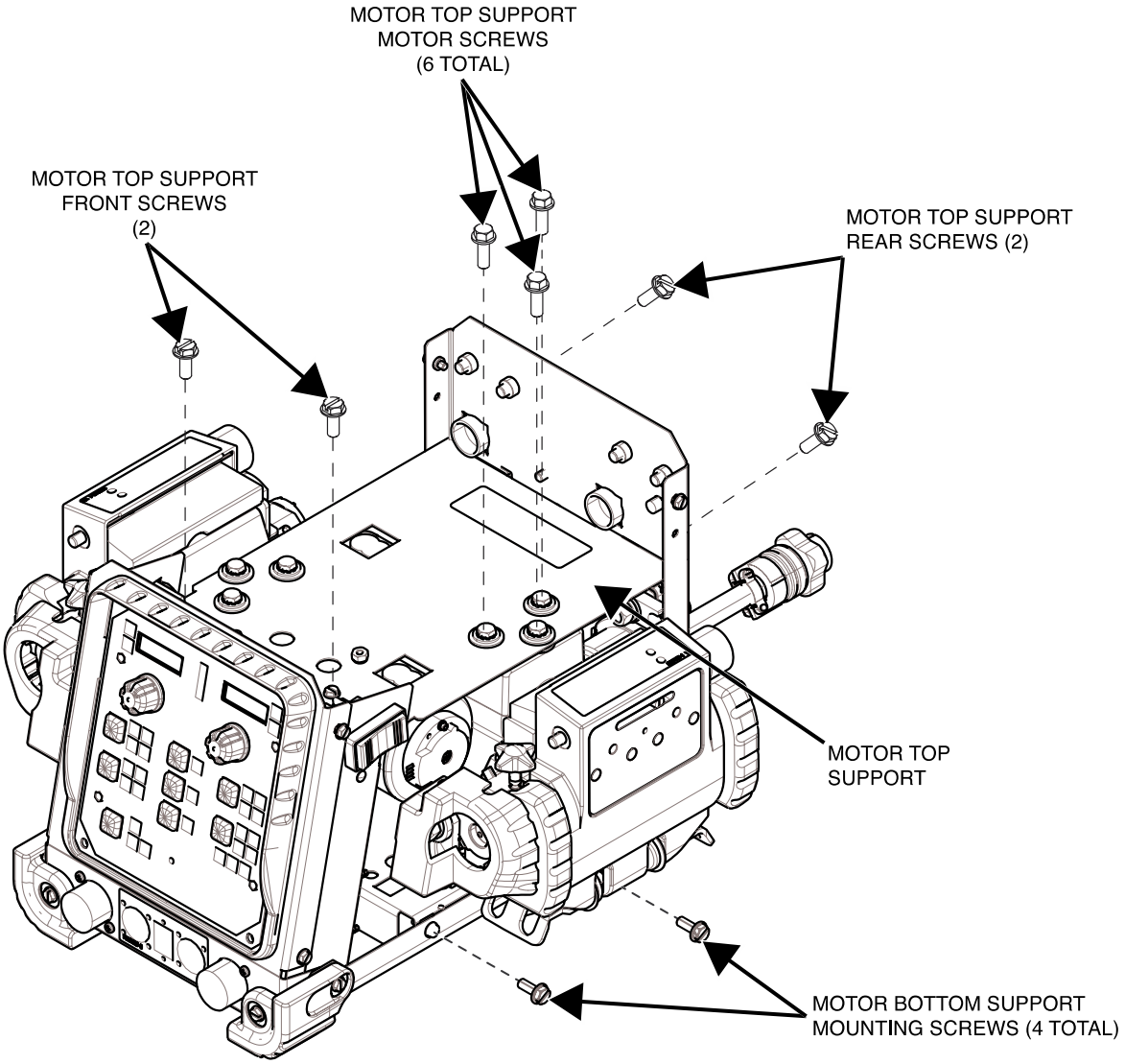


Figure F.33 – Motor top and bottom support mounting screw locations



OPTIONAL OUTPUT CONTACTOR(S) REMOVAL AND REPLACEMENT PROCEDURE

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 or machine operator and will invalidate your factory warranty. For your safety and to avoid electrical shock, please observe all safety notes and precautions detailed throughout this manual. If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

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

MATERIALS NEEDED

5/16” Nutdriver
7/16” Nutdriver
3/4” Nutdriver
5/8” Nutdriver
Wiring Diagram

REMOVAL PROCEDURE

1. Remove the input power from the Flex Feed 84 wire feeder.
2. Perform the ***Case Cover Removal Procedure***.
3. Perform the ***Gas Solenoid(s) Removal Procedure***.
4. Using a 5/16” nutdriver, remove the two screws securing the front of the motor top support. See ***Figure F.34***.
5. Using a 5/16” nutdriver, remove the two screws securing the motor top support to the rear panel. See ***Figure F.34***.
6. Using a 7/16” nutdriver, remove the six screws and lock washers securing the motor top support to the wire drive motors. See ***Figure F.34***.
7. The motor top support can now be removed to gain access to the contactors.
8. Using a 3/4” nutdriver, remove the bolt, lock washer and flat washer from the center of the bus bar. See ***Figure F.35***.
9. Label and disconnect plugs P21 (left) and P22 (right) from the current transducer(s). See ***Figure F.35***. See Wiring Diagram.
10. Using a 5/8” nutdriver, remove the nut securing the top of each contactor. See ***Figure F.35***.
11. Carefully slide the bus bar off of the mounting posts.
12. Using a 5/8” nutdriver, remove the nut and washer securing the heavy lead to the bottom post of each contactor. See ***Figure F.35***. See Wiring Diagram.
13. Label and disconnect the red and black contactor leads from the quick connects. See ***Figure F.36***. See Wiring Diagram.

14. Using a 5/16” nutdriver, remove the two bolts and washers securing each contactor to the rear panel while holding the square nut in place. See ***Figure F.37***.
15. Using a 5/16” nutdriver, remove the four screws securing the motor bottom support to the machine. See ***Figure F.34***.
16. Carefully lift and tilt the drive motor assemblies to allow the contactors to be slid off of the mounting posts.
17. The optional output contactor(s) can now be removed and replaced.

REPLACEMENT PROCEDURE

1. Carefully position the new optional output contactor(s) onto the mounting posts.
   NOTE: It may be necessary to temporarily lift and tilt the wire drive motor assemblies to allow for access to the mounting posts.
2. Using a 5/16” nutdriver, attach the four screws securing the motor bottom support to the machine.
3. Using a 5/16” nutdriver, attach the bolts and washers securing each of the contactors to the rear panel while holding the square nut in place.
4. Connect the red and black contactor leads quick connect terminals. See Wiring Diagram.
5. Using a 5/8” nutdriver, attach the nut and washer securing the heavy lead to the bottom post of each contactor. See Wiring Diagram.
6. Carefully slide the bus bar onto the mounting posts.
7. Using a 5/8” nutdriver, attach the top nut securing the bus bar and contactor to the machine.
8. Connect plugs P21 (left) and P22 (right) to the current transducer(s). See Wiring Diagram.
9. Using a 3/4” nutdriver, attach the bolt, lock washer and flat washer to the center of the bus bar.
10. Carefully place the motor top support into position on top of the wire drive motor assemblies.
11. Using a 7/16” nutdriver, attach the six screws and lock washers securing the motor top support to the wire drive motors.
12. Using a 5/16” nutdriver, attach the two screws securing the motor top support to the rear panel of the machine.
13. Using a 5/16” nutdriver, attach the two screws securing the front portion of the motor top support.
14. Perform the ***Gas Solenoid(s) Replacement Procedure***.
15. Perform the ***Case Cover Replacement Procedure***.
16. Perform the ***Retest After Repair Procedure***.

Figure F.34 – Motor top and bottom support mounting screw locations

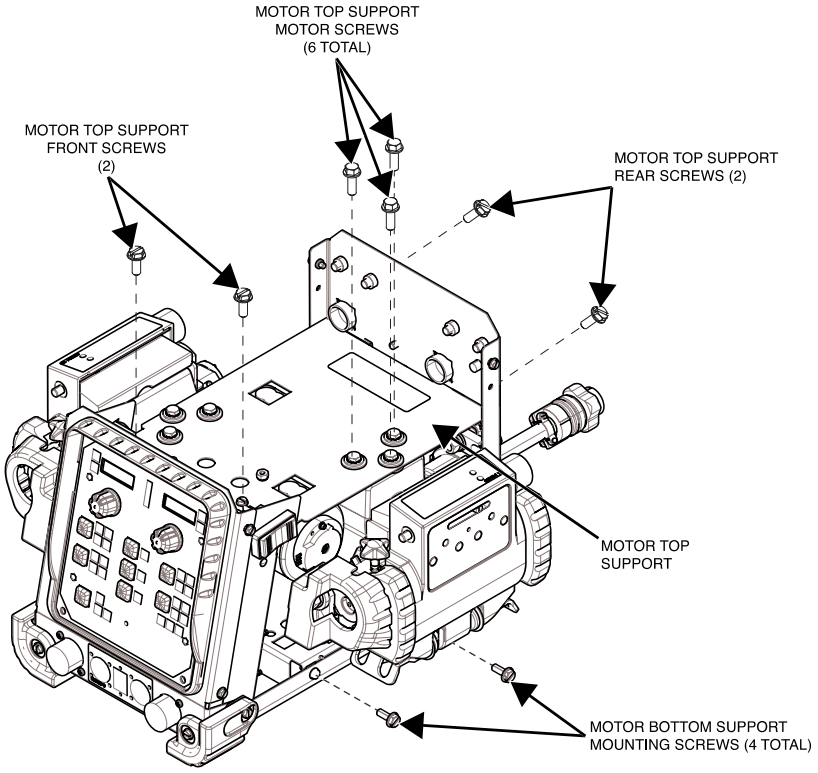


Figure F.35 – Bus bar and contactor mounting bolt and nut locations

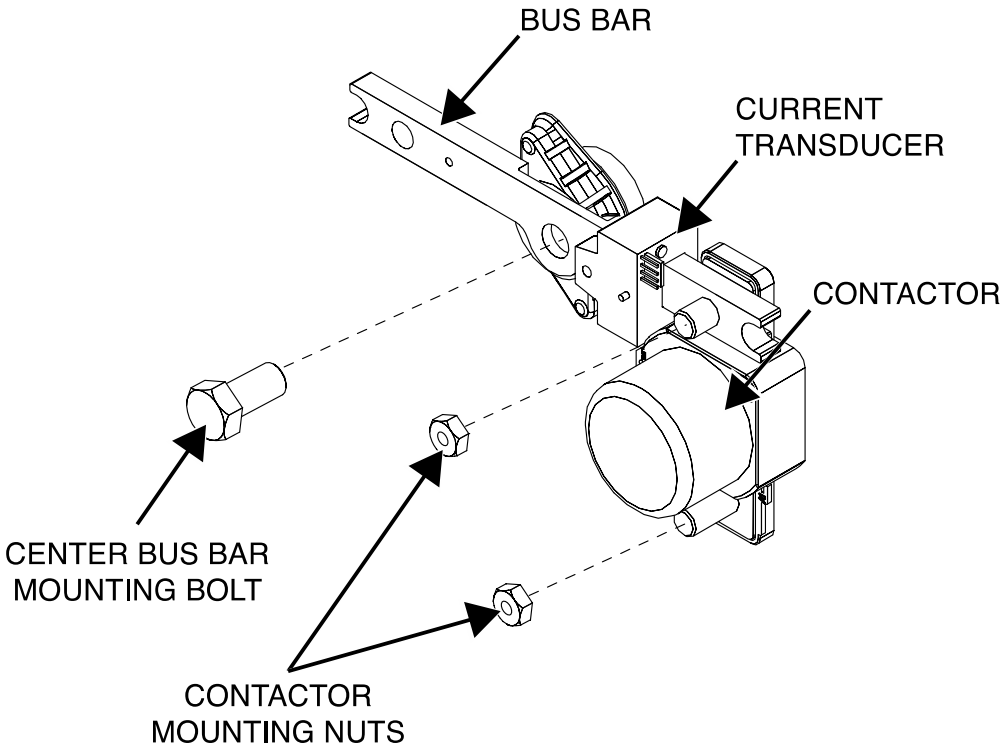


Figure F.36 – Contactor red and black lead locations

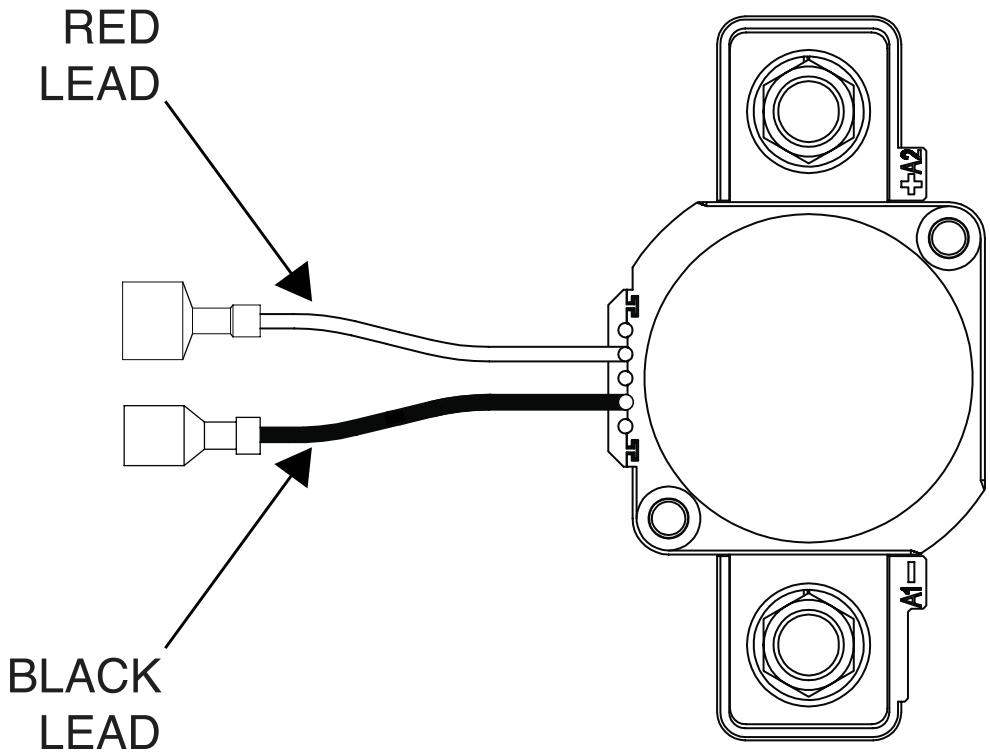
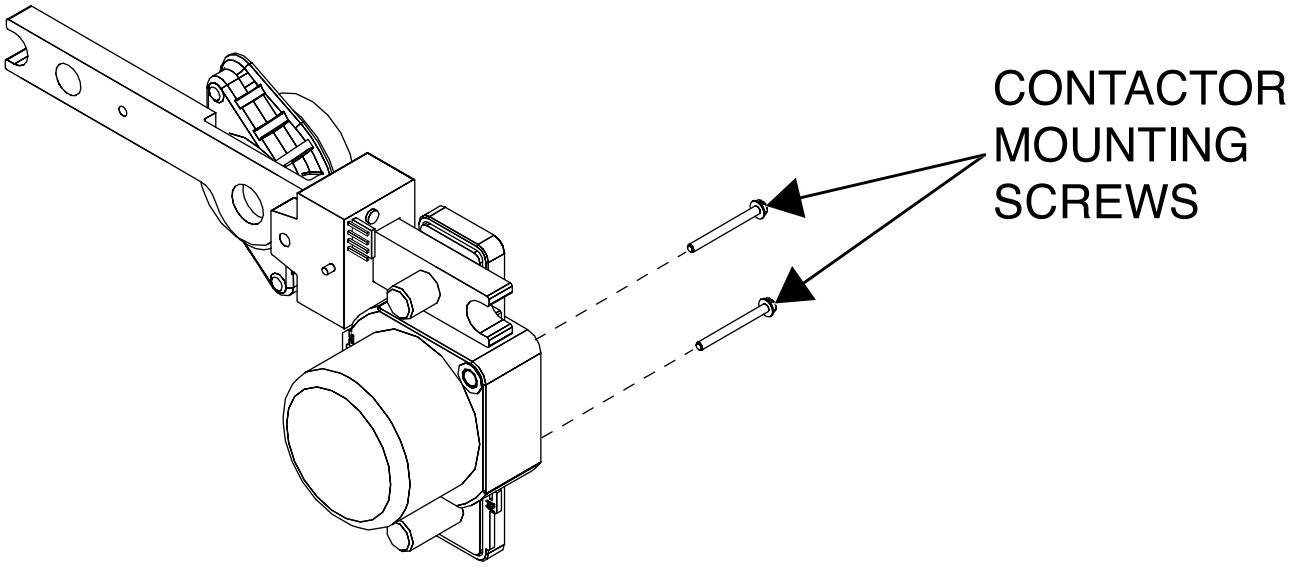


Figure F.37 – Contactor mounting screw locations



USER INTERFACE BOARD REMOVAL AND REPLACEMENT PROCEDURE

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 or machine operator and will invalidate your factory warranty. For your safety and to avoid electrical shock, please observe all safety notes and precautions detailed throughout this manual. If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

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

MATERIALS NEEDED

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

REMOVAL PROCEDURE

1. Remove the input power from the Flex Feed 84 wire feeder.
2. Using a 5/16” nutdriver, remove the four screws securing the front panel to the machine. See ***Figure F.38***.
3. Label and disconnect plug J3 from the user interface board. See ***Figure F.39***. See Wiring Diagram.
4. Label and disconnect the quick connect from plug J1 to ground lead. See ***Figure F.39***. See Wiring Diagram.
5. Using a 5/64” Allen wrench, loosen the set screw securing each knob to the machine. See ***Figure F.40***. Remove the knob and felt washer. Repeat this step for the other knob.
6. Using a Phillips screwdriver, remove the four screws securing the user interface board to the front panel. See ***Figure F.40***.
7. The user interface board can now be removed and replaced.

REPLACEMENT PROCEDURE

1. Carefully position the new user interface board on the rear of the front panel.
2. Using a Phillips screwdriver, attach the four screws securing the user interface board to the front panel.
3. Using a 5/64” Allen wrench, tighten the screw securing each of the knobs to the machine.
4. Attach the quick connect between plug J1 and the ground lead. See Wiring Diagram.
5. Connect plug J3 to the user interface board. See Wiring Diagram.
6. Using a 5/16” nutdriver, attach the four screws securing the front panel to the machine.
7. Perform the ***Retest After Repair Procedure***.

Figure F.38 – Front panel mounting screw locations

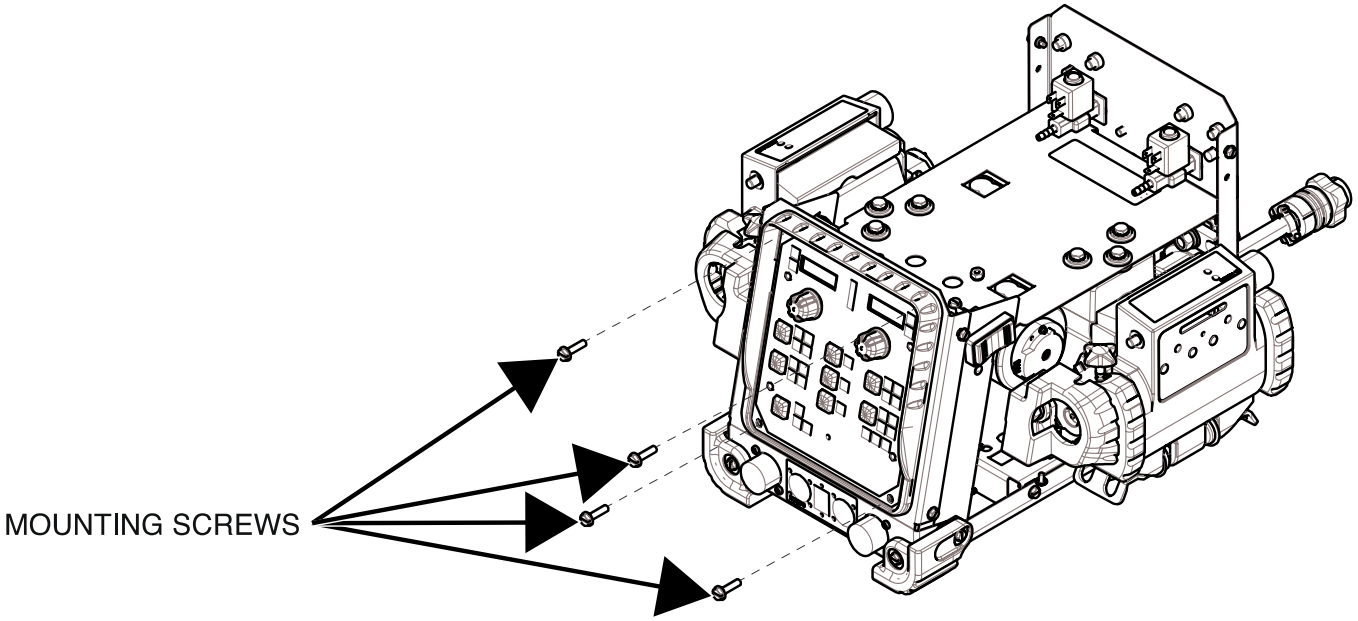


Figure F.39 – User interface board plug locations

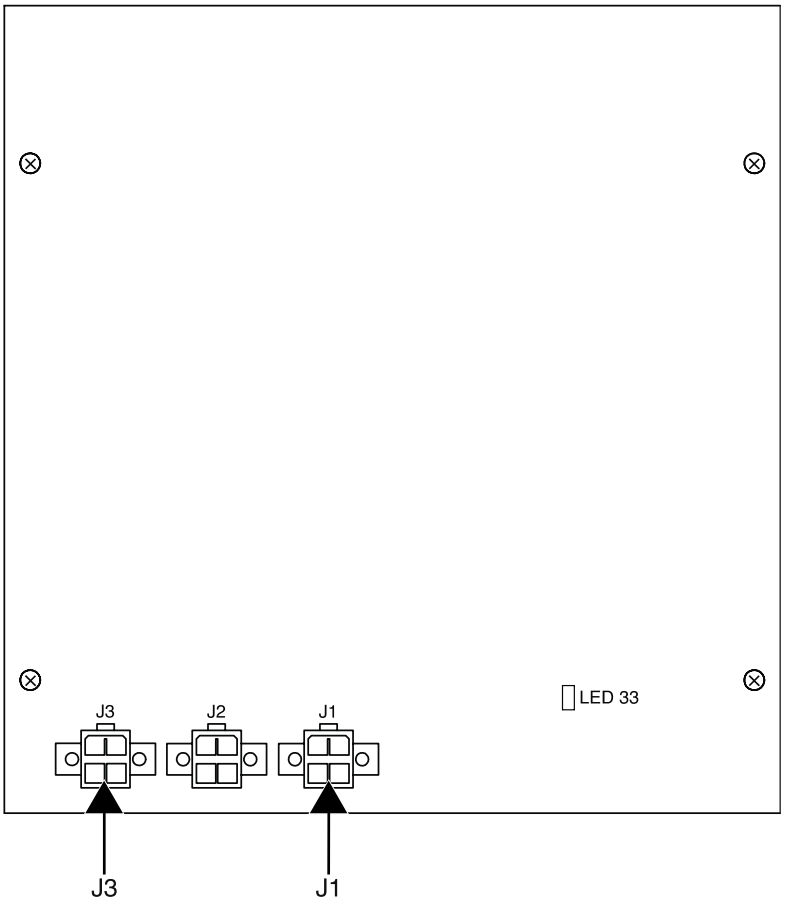
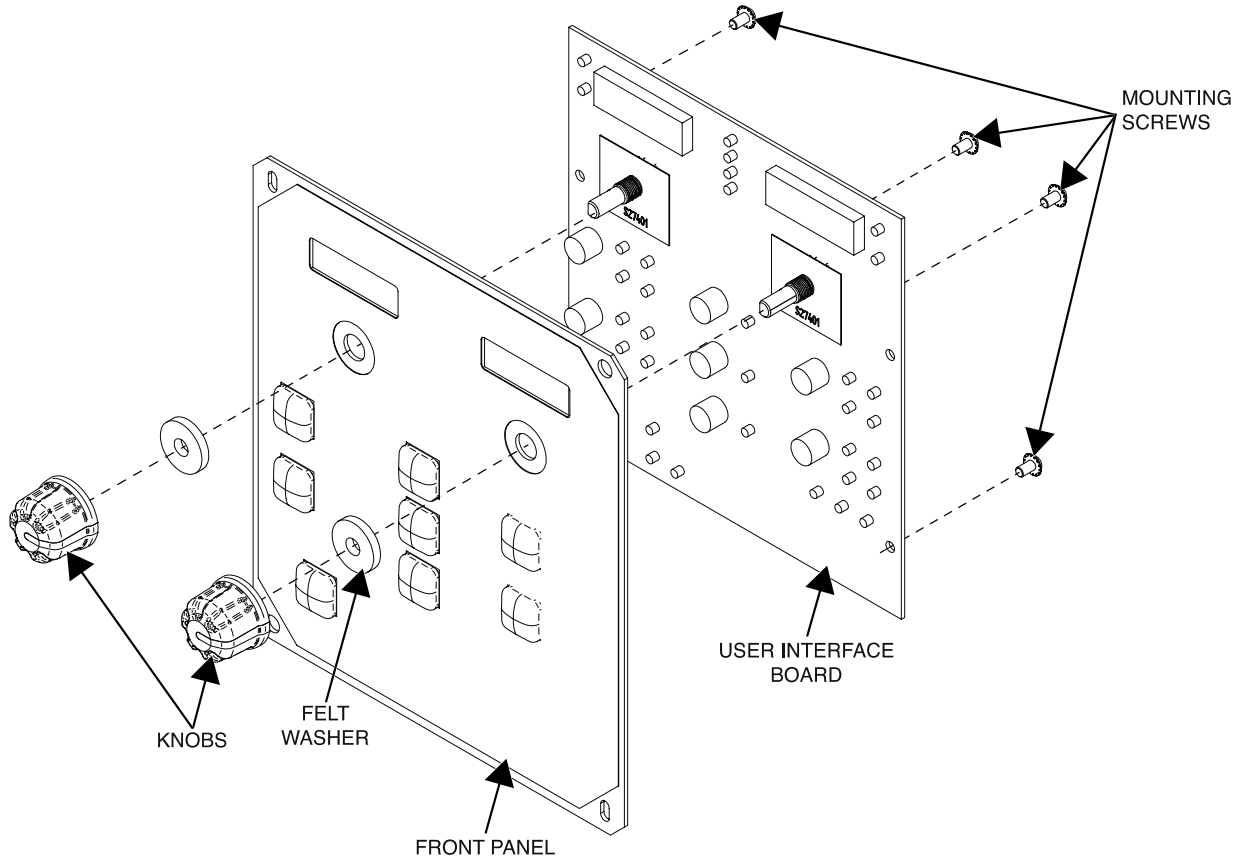


Figure F.40 – Front panel, knob, felt washer and mounting screw locations



WIRE DRIVE BOARD REMOVAL AND REPLACEMENT PROCEDURE

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 or machine operator and will invalidate your factory warranty. For your safety and to avoid electrical shock, please observe all safety notes and precautions detailed throughout this manual. If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

This procedure will aid the technician in the removal and replacement of the Wire Drive Board.

MATERIALS NEEDED

3/8” Nutdriver
Wiring Diagram

REMOVAL PROCEDURE

1. Remove the input power from the Flex Feed 84 wire feeder.
2. Perform the ***Case Cover Removal Procedure***.
3. Label and disconnect plugs J81, J82, J83, J84, J85, J86 and J87 from the wire drive board. See ***Figure F.41***. See Wiring Diagram.
4. Using a 3/8” nutdriver, remove the four nuts securing the wire drive board to the underside of the roof. See ***Figure F.42***.
5. The wire drive board can now be removed and replaced.

REPLACEMENT PROCEDURE

1. Carefully position the new wire drive board on the underside of the roof.
2. Using a 3/8” nutdriver, attach the four nuts securing the wire drive board to the roof.
3. Connect plugs J81, J82, J83, J84, J85, J86 and J87 to the wire drive board. See Wiring Diagram.
4. Perform the ***Case Cover Replacement Procedure***.
5. Perform the ***Retest After Repair Procedure***.

Figure F.41 – Wire drive board plug locations

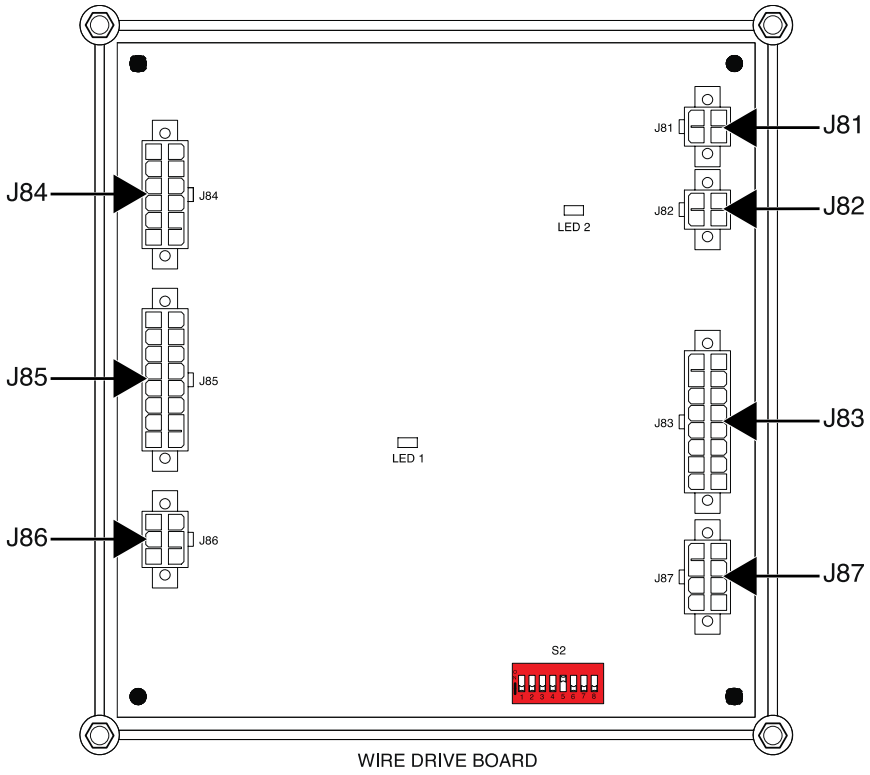
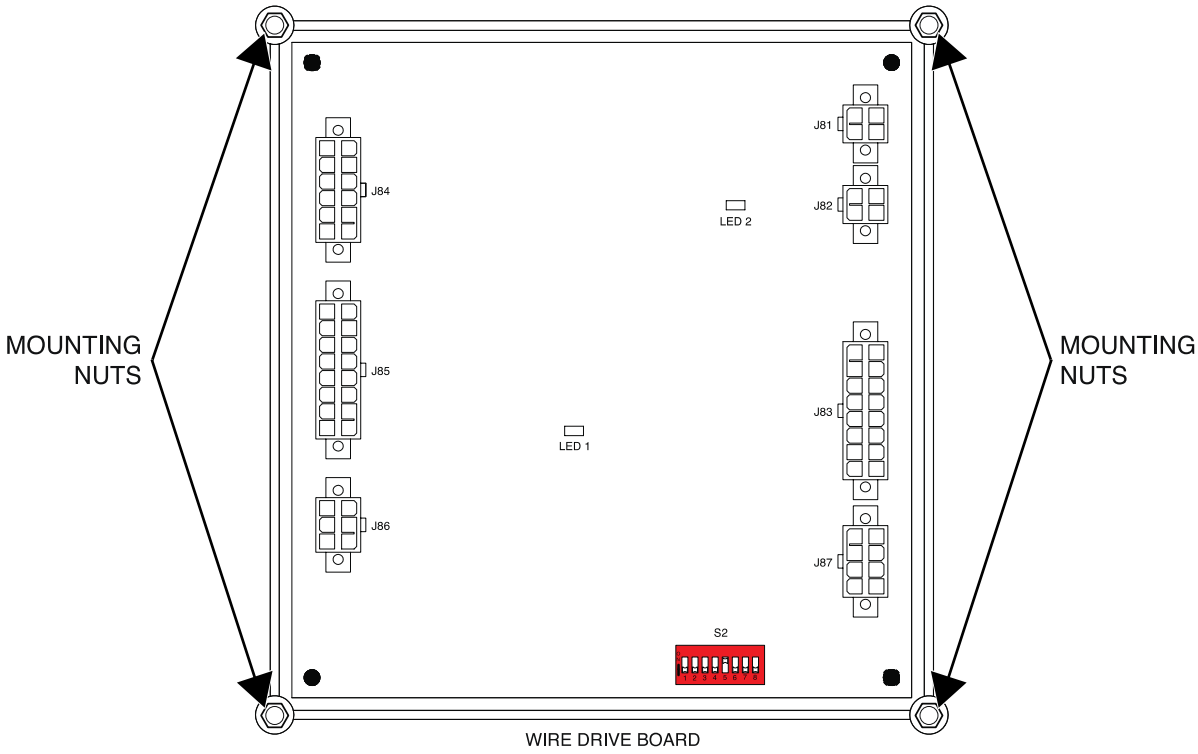


Figure F.42 – Wire drive board mounting nut locations



FAN ASSEMBLY REMOVAL AND REPLACEMENT PROCEDURE

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 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 Fan Assembly.

MATERIALS NEEDED

5/16” Nutdriver
Wiring Diagram

REMOVAL PROCEDURE

1. Remove the input power from the Flex Feed 84 wire feeder.
2. Perform the ***Case Cover Removal Procedure***.
3. Using a 5/16” nutdriver, remove the four screws securing the front panel to the case. See ***Figure F.43***. See Wiring Diagram.
4. Label and disconnect plug P18 from the wiring harness. See Wiring Diagram.
5. Carefully route P18 thru the panel hole. See ***Figure F.44***.
6. Using a 5/16” nutdriver, remove the two screws securing the fan to the panel. See ***Figure F.44***.
7. The fan assembly can now be removed and replaced.

REPLACEMENT PROCEDURE

1. Carefully position the new fan on rear side of the panel.
2. Using a 5/16” nutdriver, attach the two screws securing the fan assembly to the panel.
3. Carefully route plug P18 thru the panel hole and connect it to the wiring harness. See Wiring Diagram.
4. Using a 5/16” nutdriver, attach the four screws securing the front panel to the case.
5. Perform the ***Case Cover Replacement Procedure***.
6. Perform the ***Retest After Repair Procedure***.

Figure F.43 – Front panel mounting screw locations

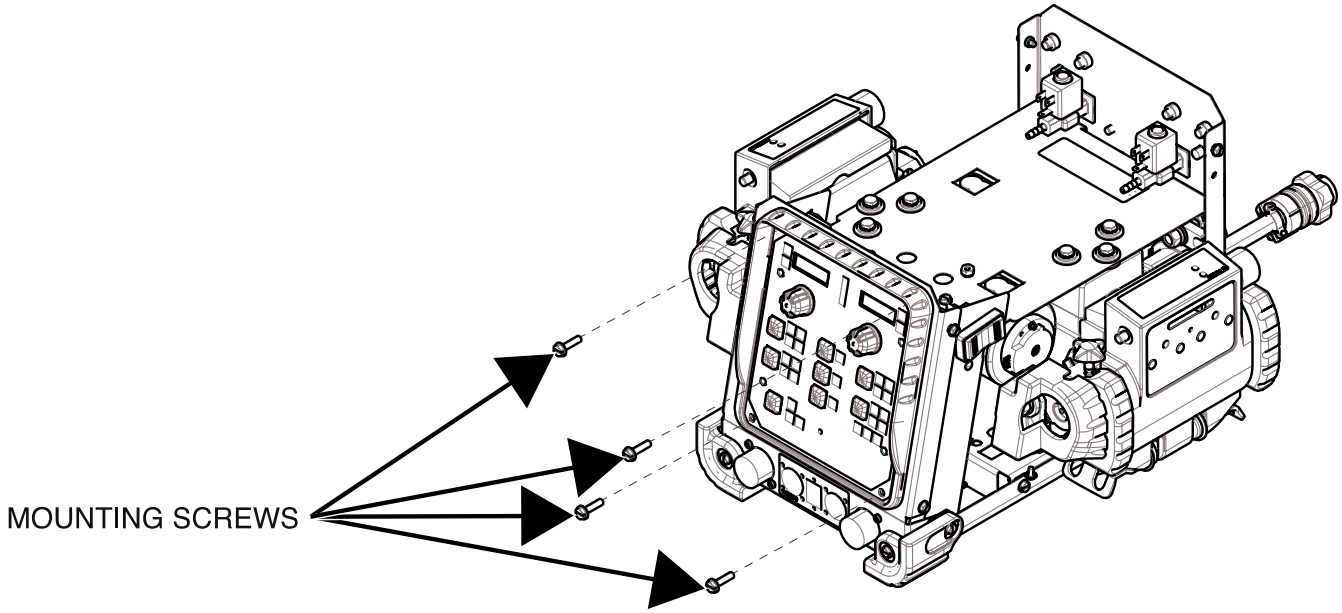
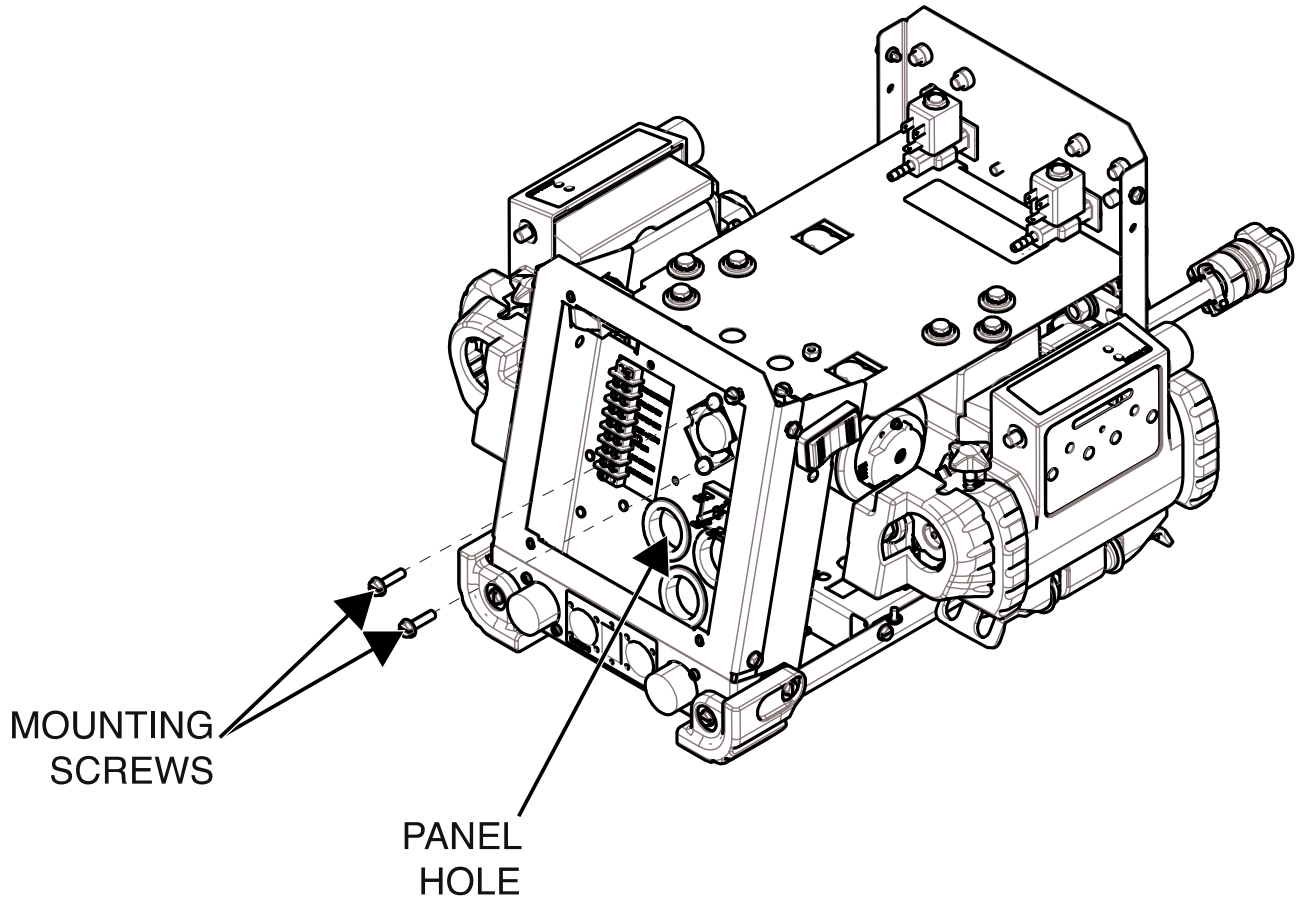


Figure F.44 – Fan mounting screw and panel hole locations



CURRENT TRANSDUCER(S) REMOVAL AND REPLACEMENT PROCEDURE

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 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 Transducer(s).

MATERIALS NEEDED

5/16” Nutdriver
7/16” Nutdriver
3/4” Nutdriver
5/8” Nutdriver
1/4” Nutdriver
Wiring Diagram

REMOVAL PROCEDURE

1. Remove the input power from the Flex Feed 84 wire feeder.
2. Perform the ***Case Cover Removal Procedure***.
3. Perform the ***Gas Solenoid Removal Procedure***.
4. Using a 5/16” nutdriver, remove the two screws securing the front of the motor top support. See ***Figure F.45***.
5. Using a 5/16” nutdriver, remove the two screws securing the motor top support to the rear panel. See ***Figure F.45***.
6. Using a 7/16” nutdriver, remove the six screws and lock washers (three for each wire drive motor) securing the motor top support to the wire drive motors. See ***Figure F.45***.
7. The motor top support can now be removed to gain access to the contactors.
8. Using a 3/4” nutdriver, remove the bolt, lock washer and flat washer from the center of the bus bar. See ***Figure F.46***.
9. Label and disconnect plugs P21 (left) and P22 (right) from the current transducer(s). See ***Figure F.46***. See Wiring Diagram.
10. Using a 5/8” nutdriver, remove the nut securing the top of each contactor. See ***Figure F.46***.
11. Carefully slide the bus bar off of the mounting posts.
12. Using a 1/4” nutdriver, remove the screw, lock washer and flat washer securing each current transducer to the bus bar. See ***Figure F.47***.
13. Carefully slide each current transducer off of the bus bar.
14. The current transducer(s) can now be replaced.

REPLACEMENT PROCEDURE

1. Carefully slide the new current transducer(s) onto the bus bar.
2. Using a 1/4” nutdriver, attach the screw, lock washer and flat washer securing each current transducer to the bus bar.
3. Carefully slide the bus bar onto the mounting posts.
4. Using a 5/8” nutdriver, attach the nut securing the bus bar and each of the contactors to the machine.
5. Connect plugs P21 (left) and P22 (right) to the current transducer(s). See Wiring Diagram.
6. Using a 3/4” nutdriver, attach the bolt, lock washer and flat washer securing the bus bar to the machine.
7. Carefully place the motor top support into position on top of the wire drive motor assemblies.
8. Using a 7/16” nutdriver, attach the six screws and lock washers securing the motor top support to the wire drive motors.
9. Using a 5/16” nutdriver, attach the two screws securing the motor top support to the rear panel of the machine.
10. Using a 5/16” nutdriver, attach the two screws securing the front portion of the motor top support.
11. Perform the ***Gas Solenoid(s) Replacement Procedure***.
12. Perform the ***Case Cover Replacement Procedure***.
13. Perform the ***Retest After Repair Procedure***.

Figure F.45 – Motor top support mounting screw locations

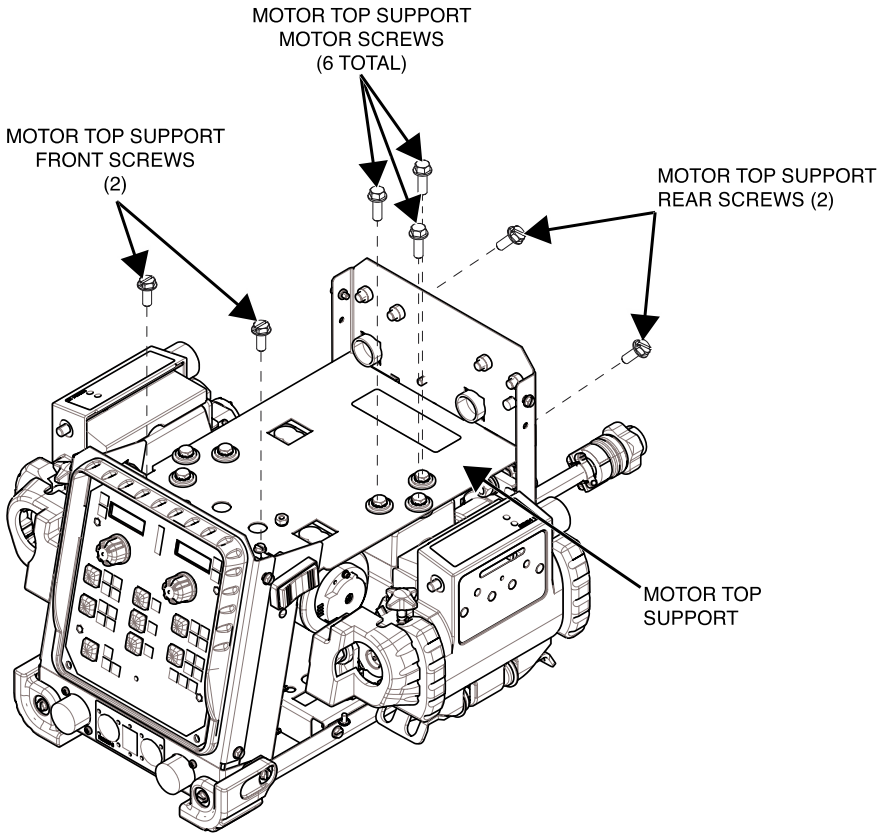


Figure F.46 – Bus bar mounting nut locations

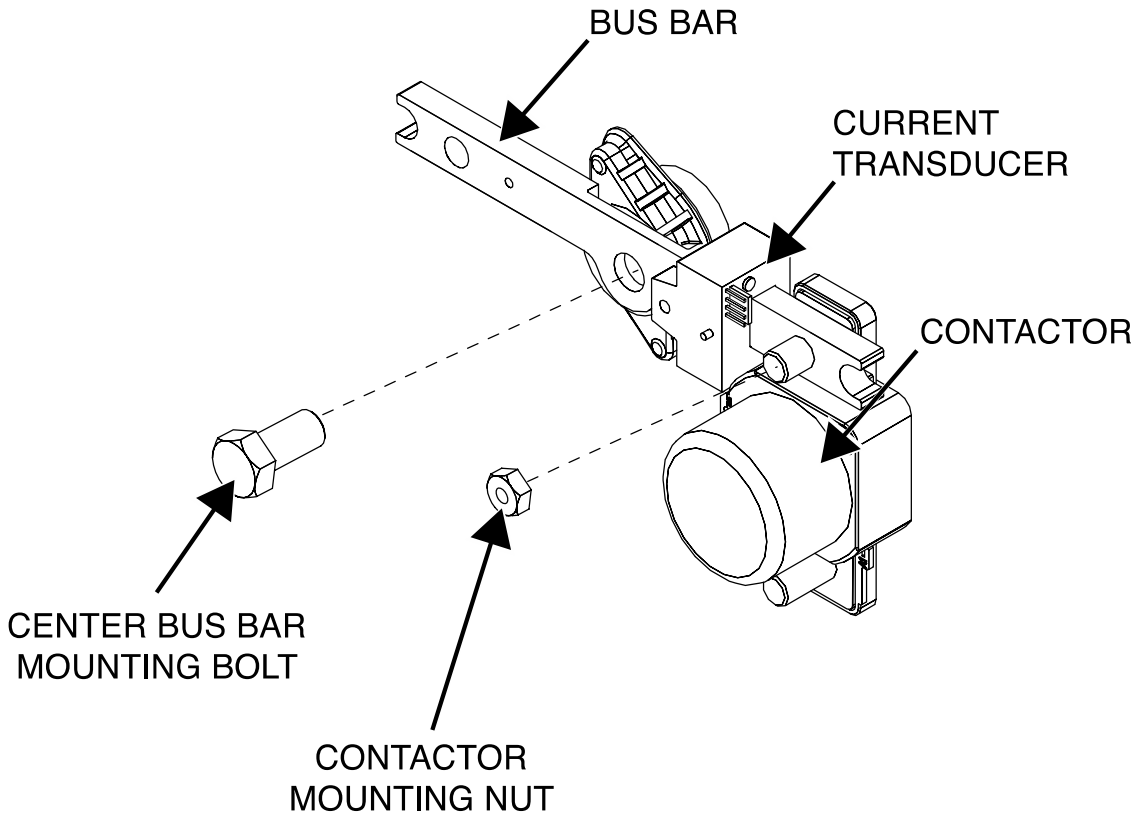
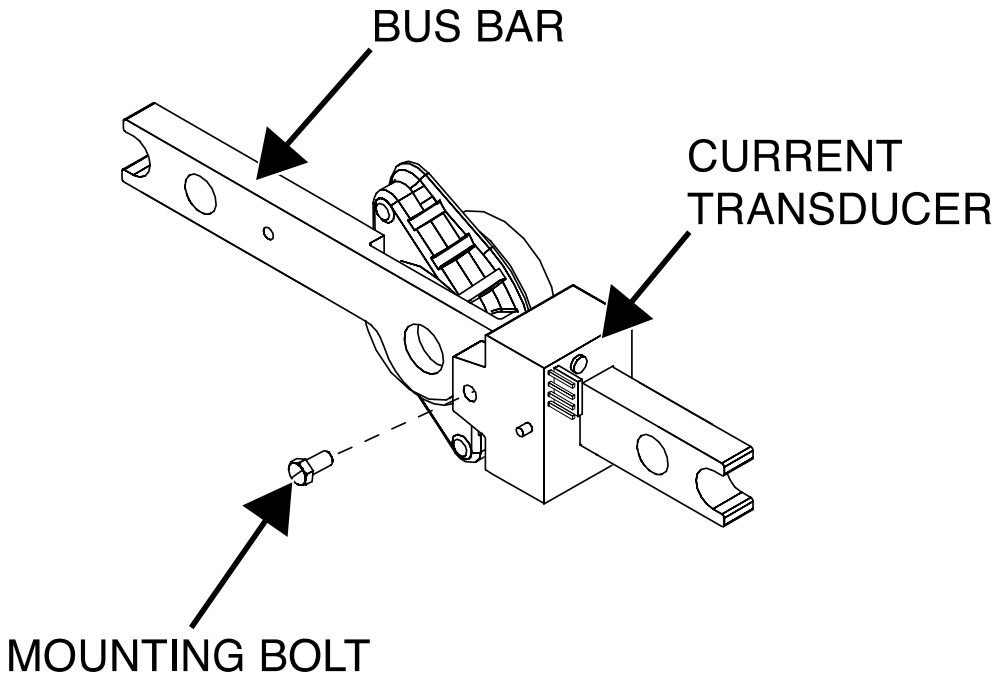


Figure F.47 – Current transducer mounting screw locations



INPUT RECTIFIER REMOVAL AND REPLACEMENT PROCEDURE

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 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 Input Rectifier.

MATERIALS NEEDED

5/16” Nutdriver
3/8” Nutdriver
Dow Corning 340 Heat Sink Compound (Lincoln Part #T12837)
Wiring Diagram

REMOVAL PROCEDURE

1. Remove the input power from the Flex Feed 84 wire feeder.
2. Using a 5/16” nutdriver, remove the four screws securing the front panel to the machine. See ***Figure F.48***.
3. Label and disconnect leads 41A, 41B, 542, 42A, 42B and 580 from the input rectifier. See ***Figure F.49***. See Wiring Diagram.
4. Using a 3/8” nutdriver, remove the nut and washer securing the input rectifier to the machine. See ***Figure F.50***.
5. The input rectifier can now be removed and replaced.

REPLACEMENT PROCEDURE

1. Apply a thin coating of Dow Corning 340 heat sink compound (Lincoln part #T12837) to the rear of the input rectifier.
2. Carefully position the new input rectifier into the machine.
3. Using a 3/8” nutdriver, attach the nut and washer securing the input rectifier to the machine.
4. Connect leads 41A, 41B, 542, 42A, 42B and 580 to the input rectifier. See Wiring Diagram.
5. Perform the ***Case Cover Replacement Procedure***.
6. Perform the ***Retest After Repair Procedure***.

Figure F.48 – Front panel mounting screw locations

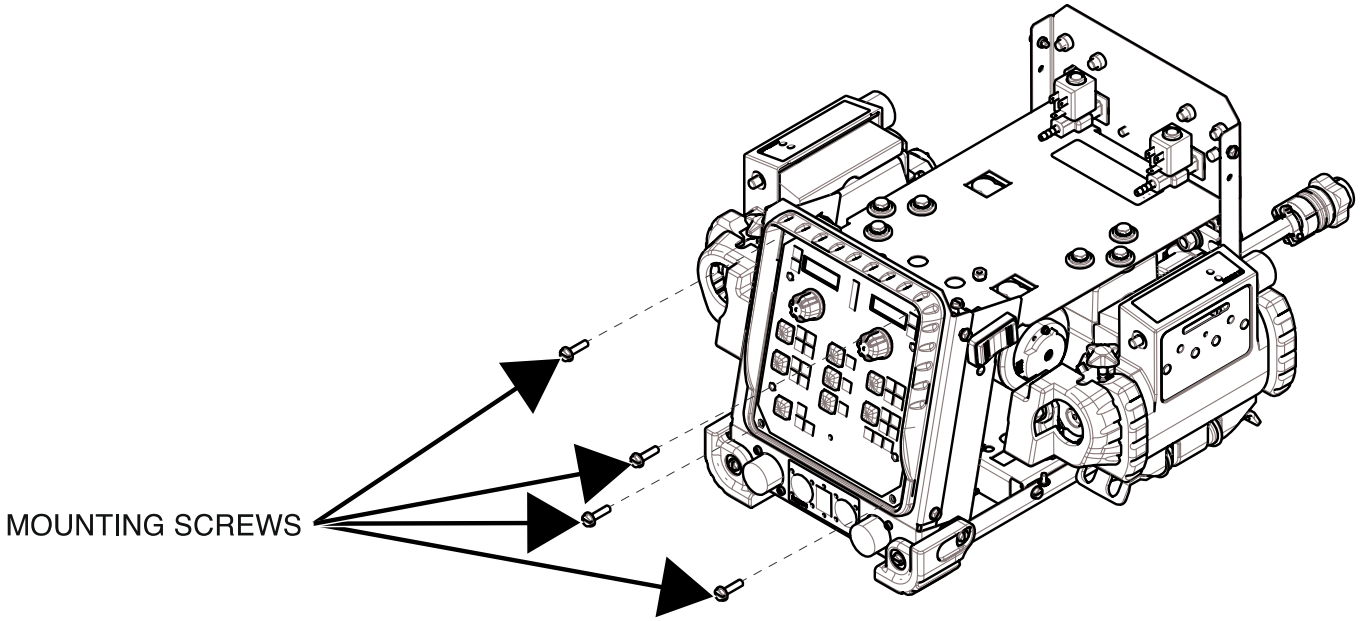


Figure F.49 – Input rectifier lead locations

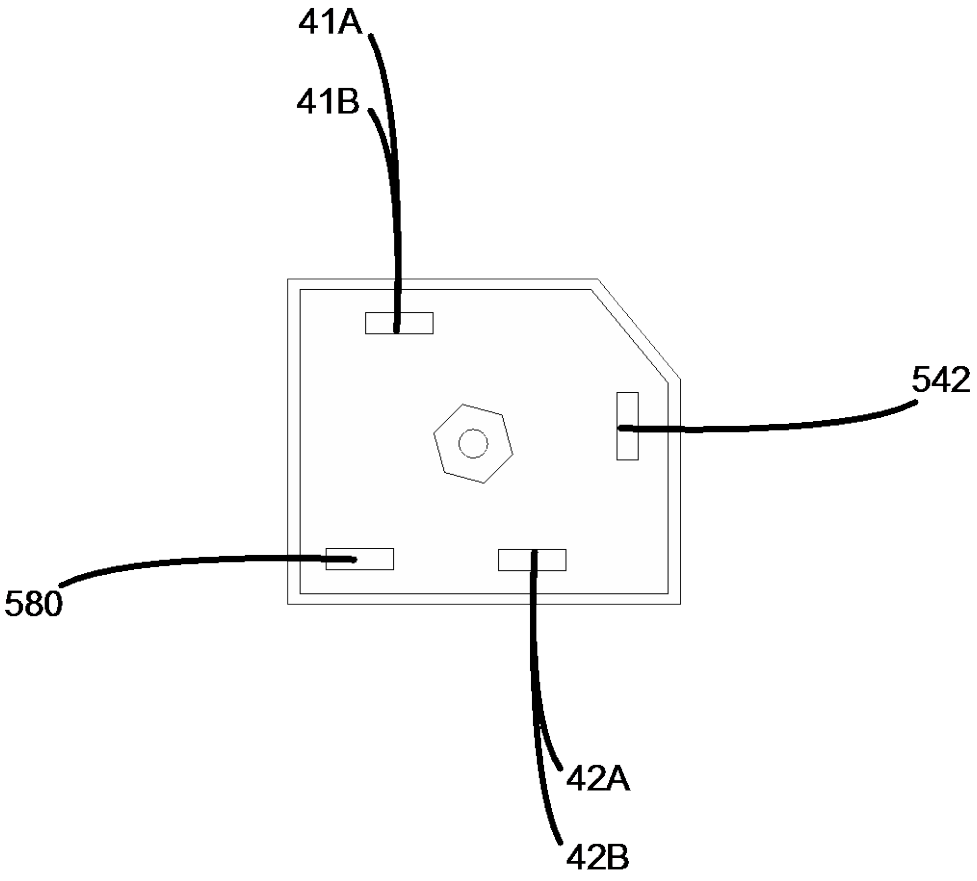
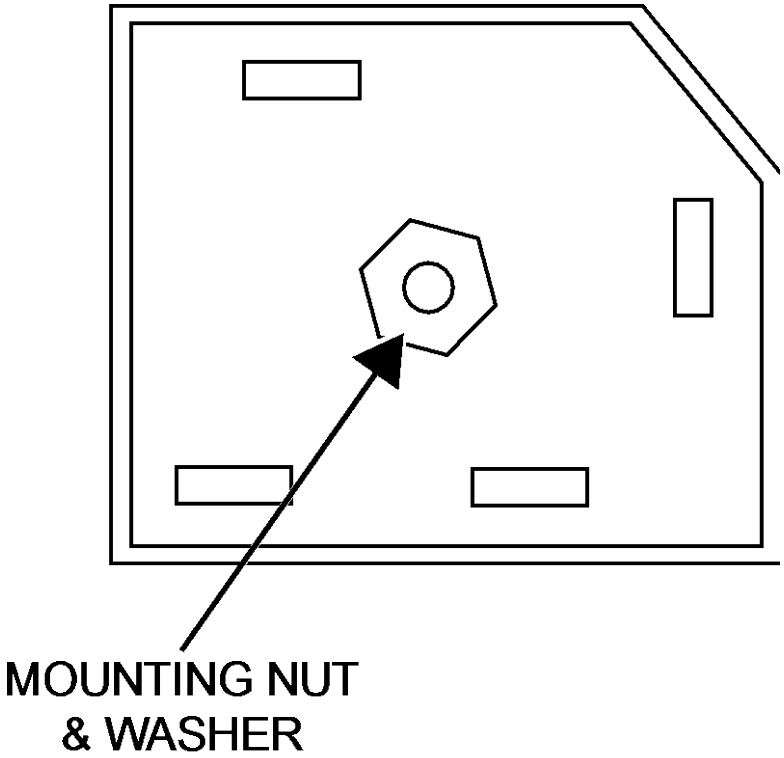


Figure F.50 – Input rectifier mounting nut and washer location



RETEST AFTER REPAIR

Retest a machine:

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

OR

• If you repair or replace any electrical components.

Setup

1. Connect a supply of filtered compressed air at 80 psi to the gas inlet.
2. Supply 24 to 42 VAC to the machine.
3. Connect the gun to the connector block.

Operation verification

WIRE FEED SPEED	35 THROUGH 750 INCHES PER MINUTE
GAS SOLENOID	MUST OPERATE WHEN GUN TRIGGER IS ACTIVATED