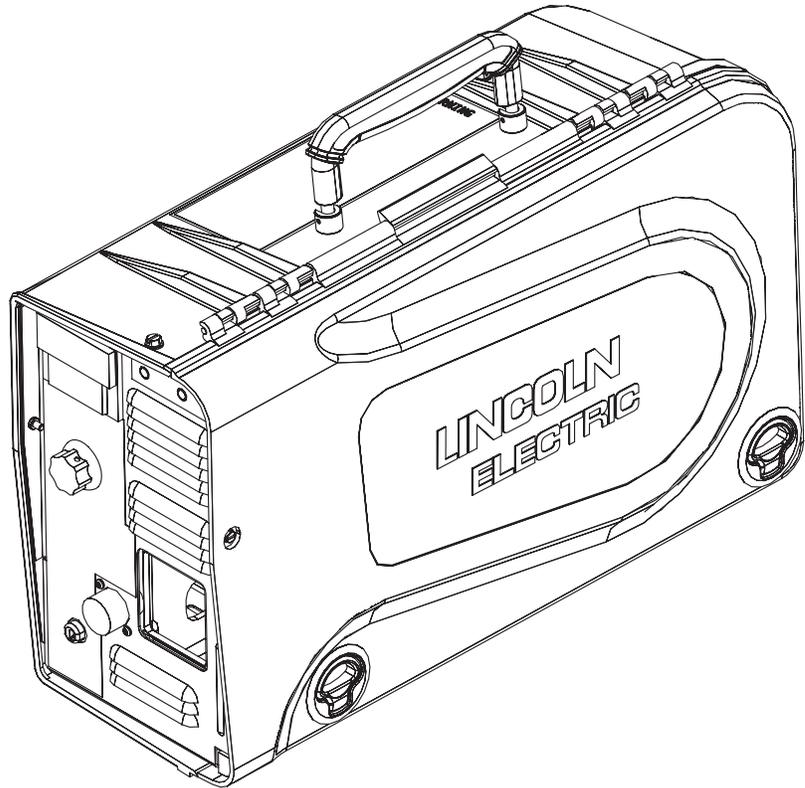


LN-25™ PRO WIRE FEEDER

For use with machines having Code Numbers: 11387, 11388
11507, 11508
11620, 11621
11716, 11717
11746, 11747

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.



SERVICE MANUAL



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• World's Leader in Welding and Cutting Products •

• Sales and Service through Subsidiaries and Distributors Worldwide •

Cleveland, Ohio 44117-1199 U.S.A. TEL: 216.481.8100 FAX: 216.486.1751 WEB SITE: www.lincolnelectric.com

⚠ WARNING

⚠ CALIFORNIA PROPOSITION 65 WARNINGS ⚠

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

The Above For Diesel Engines

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

The Above For Gasoline Engines

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.

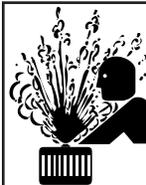
1.d. Keep all equipment safety guards, covers and devices in position and in good repair. Keep hands, hair, clothing and tools away from V-belts, gears, fans and all other moving parts when starting, operating or repairing equipment.

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 Z87.1 standards.

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

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



FUMES AND GASES can be dangerous.

5.a. Welding may produce fumes and gases hazardous to health. Avoid breathing these fumes and gases. When welding, keep your head out of the fume. Use enough ventilation and/or exhaust at the arc to keep fumes and gases away from the breathing zone. **When welding with electrodes which require special ventilation such as stainless or hard facing (see instructions on container or MSDS) or on lead or cadmium plated steel and other metals or coatings which produce highly toxic fumes, keep exposure as low as possible and within applicable OSHA PEL and ACGIH TLV limits using local exhaust or mechanical ventilation. In confined spaces or in some circumstances, outdoors, a respirator may be required. Additional precautions are also required when welding on galvanized steel.**

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

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

5.d. Shielding gases used for arc welding can displace air and cause injury or death. Always use enough ventilation, especially in confined areas, to insure breathing air is safe.

5.e. Read and understand the manufacturer’s instructions for this equipment and the consumables to be used, including the material safety data sheet (MSDS) and follow your employer’s safety practices. MSDS forms are available from your welding distributor or from the manufacturer.

5.f. Also see item 1.b.



WELDING and CUTTING SPARKS can cause fire or explosion.

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

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

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

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

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

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

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

6.h. Also see item 1.c.

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

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



CYLINDER may explode if damaged.

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

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

7.c. Cylinders should be located:

- Away from areas where they may be struck or subjected to physical damage.

- A safe distance from arc welding or cutting operations and any other source of heat, sparks, or flame.

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

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

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

7.g. Read and follow the instructions on compressed gas cylinders, associated equipment, and CGA publication P-1, "Precautions for Safe Handling of Compressed Gases in Cylinders," available from the Compressed Gas Association 1235 Jefferson Davis Highway, Arlington, VA 22202.



FOR ELECTRICALLY powered equipment.

8.a. Turn off input power using the disconnect switch at the fuse box before working on the equipment.

8.b. Install equipment in accordance with the 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.

PRÉCAUTIONS DE SÛRETÉ

Pour votre propre protection lire et observer toutes les instructions et les précautions de sûreté spécifiques qui paraissent dans ce manuel aussi bien que les précautions de sûreté générales suivantes:

Sûreté Pour Soudage A L'Arc

1. Protégez-vous contre la secousse électrique:
 - a. Les circuits à l'électrode et à la pièce sont sous tension quand la machine à souder est en marche. Eviter toujours tout contact entre les parties sous tension et la peau nue ou les vêtements mouillés. Porter des gants secs et sans trous pour isoler les mains.
 - b. Faire très attention de bien s'isoler de la masse quand on soude dans des endroits humides, ou sur un plancher métallique ou des grilles métalliques, principalement dans les positions assis ou couché pour lesquelles une grande partie du corps peut être en contact avec la masse.
 - c. Maintenir le porte-électrode, la pince de masse, le câble de soudage et la machine à souder en bon et sûr état de fonctionnement.
 - d. Ne jamais plonger le porte-électrode dans l'eau pour le refroidir.
 - e. Ne jamais toucher simultanément les parties sous tension des porte-électrodes connectés à deux machines à souder parce que la tension entre les deux pinces peut être le total de la tension à vide des deux machines.
 - f. Si on utilise la machine à souder comme une source de courant pour soudage semi-automatique, ces précautions pour le porte-électrode s'appliquent aussi au pistolet de soudage.
2. Dans le cas de travail au dessus du niveau du sol, se protéger contre les chutes dans le cas où on reçoit un choc. Ne jamais enrouler le câble-électrode autour de n'importe quelle partie du corps.
3. Un coup d'arc peut être plus sévère qu'un coup de soliel, donc:
 - a. Utiliser un bon masque avec un verre filtrant approprié ainsi qu'un verre blanc afin de se protéger les yeux du rayonnement de l'arc et des projections quand on soude ou quand on regarde l'arc.
 - b. Porter des vêtements convenables afin de protéger la peau de soudeur et des aides contre le rayonnement de l'arc.
 - c. Protéger l'autre personnel travaillant à proximité au soudage à l'aide d'écrans appropriés et non-inflammables.
4. Des gouttes de laitier en fusion sont émises de l'arc de soudage. Se protéger avec des vêtements de protection libres de l'huile, tels que les gants en cuir, chemise épaisse, pantalons sans revers, et chaussures montantes.
5. Toujours porter des lunettes de sécurité dans la zone de soudage. Utiliser des lunettes avec écrans latéraux dans les zones où l'on pique le laitier.

6. Eloigner les matériaux inflammables ou les recouvrir afin de prévenir tout risque d'incendie dû aux étincelles.
7. Quand on ne soude pas, poser la pince à un endroit isolé de la masse. Un court-circuit accidentel peut provoquer un échauffement et un risque d'incendie.
8. S'assurer que la masse est connectée le plus près possible de la zone de travail qu'il est pratique de le faire. Si on place la masse sur la charpente de la construction ou d'autres endroits éloignés de la zone de travail, on augmente le risque de voir passer le courant de soudage par les chaînes de levage, câbles de grue, ou autres circuits. Cela peut provoquer des risques d'incendie ou d'échauffement des chaînes et des câbles jusqu'à ce qu'ils se rompent.
9. Assurer une ventilation suffisante dans la zone de soudage. Ceci est particulièrement important pour le soudage de tôles galvanisées plombées, ou cadmiées ou tout autre métal qui produit des fumées toxiques.
10. Ne pas souder en présence de vapeurs de chlore provenant d'opérations de dégraissage, nettoyage ou pistolage. La chaleur ou les rayons de l'arc peuvent réagir avec les vapeurs du solvant pour produire du phosgène (gas fortement toxique) ou autres produits irritants.
11. Pour obtenir de plus amples renseignements sur la sûreté, voir le code "Code for safety in welding and cutting" CSA Standard W 117.2-1974.

PRÉCAUTIONS DE SÛRETÉ POUR LES MACHINES À SOUDER À TRANSFORMATEUR ET À REDRESSEUR

1. Relier à la terre le châssis du poste conformément au code de l'électricité et aux recommandations du fabricant. Le dispositif de montage ou la pièce à souder doit être branché à une bonne mise à la terre.
2. Autant que possible, l'installation et l'entretien du poste seront effectués par un électricien qualifié.
3. Avant de faire des travaux à l'intérieur de poste, la débrancher à l'interrupteur à la boîte de fusibles.
4. Garder tous les couvercles et dispositifs de sûreté à leur place.

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MACHINES COVERED IN THIS MANUAL

PRODUCT NAME	PRODUCT NUMBER	CODE NUMBERS
LN-25™ PRO (NORMAL SPEED)	K2613-1	11387, 11507 11620, 11716
LN-25™ PRO (EXTRA TORQUE)	K2613-2	11388, 11508 11621, 11717
LN-25™ PRO (NORMAL SPEED)	K2613-5	11746
LN-25™ PRO (EXTRA TORQUE)	K2613-7	11747

TECHNICAL SPECIFICATIONS – LN-25™ PRO (K2613-1, -2, -5, and -7)

INPUT VOLTAGE and CURRENT				
INPUT VOLTAGE ± 10%			INPUT AMPERES	
15-110 VDC (24-42 VAC with remote voltage control kit installed)			4A	
RATED OUTPUT @ 104°F (40°C)				
DUTY CYCLE		INPUT AMPERES		
60% rating		450		
100% rating		325		
GEARING - WIRE FEED SPEED RANGE-WIRE SIZE				
GEARING	GMAW		FCAW	
	WFS RANGE	WIRE SIZES	WFS RANGE	WIRE SIZES
Extra torque K2613-2 & K2613-7	50 – 400 ipm (0.8 – 10.1m/min)	.023 – 1/16" (0.6 – 1.6mm)	30 – 400 ipm (0.8 – 10.1m/min)	.030 - 3/32" (10.3 – 2.4mm)
Normal Speed K2613-1 & K2613-5	50 – 700 ipm (1.3 – 17.7m/min)	.023 – 1/16" (0.6 – 1.6mm)	50 – 700 ipm (1.3 – 17.7m/min)	.030 - 5/64 (0.8 - 2.0mm)
PHYSICAL DIMENSIONS				
HEIGHT	WIDTH	DEPTH	WEIGHT	
14.8 Inches (376 mm) Handle folded down	8.7 Inches (221 mm)	22.2 Inches (589 mm)	36 lbs (16 kg)	
TEMPERATURE RANGE				
OPERATION:	-40°F to 104°F (-40°C to 40°C)			
STORAGE:	-40°F to 185°F (-40°C to 85°C)			

LN-25™ PRO



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SAFETY PRECAUTIONS

⚠ WARNING



ELECTRIC SHOCK CAN KILL.

- Turn the input power OFF at the disconnect switch or fuse box before attempting to connect or disconnect input power lines, output cables or control cables.
- Only qualified personnel should perform this installation.
- Do not touch metal portions of the LN-25™ PRO work clip when the welding power source is on.
- Do not attach the work clip to the wire feeder.
- Connect the work clip directly to the work, as close as possible to the welding arc.
- Turn power off at the welding power source before disconnecting the work clip from the work.
- Only use on power sources with open circuit voltages less than 110 VDC.

LOCATION

For best wire feeding performance, place the LN-25™ PRO on a stable and dry surface. Keep the wire feeder in a vertical position. Do not operate the wire feeder on an angled surface of more than 15 degrees.

Do not submerge the LN-25™ PRO.

The LN-25™ PRO is rated IP23 and is suitable for outdoor use.

The handle of the LN-25™ PRO is intended for moving the wire feeder about the work place only.

When suspending a wire feeder, insulate the hanging device from the wire feeder enclosure.

HIGH FREQUENCY PROTECTION

⚠ CAUTION

Locate the LN-25™ PRO away from radio controlled machinery. The normal operation of the LN-25™ PRO may adversely affect the operation of RF controlled equipment, which may result in bodily injury or damage to the equipment.

WELD CABLE SIZE

Table A.1 Located below are copper cable sizes recommended for various currents and duty cycles. Lengths stipulated are the distance from the welder to work and back to the welder again. Cable sizes are increased for greater lengths primarily for the purpose of minimizing voltage drop in the cables.

TABLE A.1

RECOMMENDED CABLE SIZES (RUBBER COVERED COPPER - RATED 167°F or 75°C)**						
AMPERES	PERCENT DUTY CYCLE	CABLE SIZES FOR COMBINED LENGTHS OF ELECTRODE AND WORK CABLES				
		0 to 50Ft. (0 to15m)	50 to 100Ft. (15 to 30m)	100 to 150 Ft. (30 to 46m)	150 to 200 Ft. (46 to 61m)	200 to 250 Ft. (61 to 76m)
200	60	2	2	2	1	1/0
200	100	2	2	2	1	1/0
225	20	4 or 5	3	2	1	1/0
225	40 & 30	3	3	2	1	1/0
250	30	3	3	2	1	1/0
250	40	2	2	1	1	1/0
250	60	1	1	1	1	1/0
250	100	1	1	1	1	1/0
300	60	1	1	1	1/0	2/0
325	100	2/0	2/0	2/0	2/0	3/0
350	60	1/0	1/0	2/0	2/0	3/0
400	60	2/0	2/0	2/0	3/0	4/0
400	100	3/0	3/0	3/0	3/0	4/0
500	60	2/0	2/0	3/0	3/0	4/0

** Tabled values are for operation at ambient temperatures of 104°F(40°C) and below. Applications above 104°F(40°C) may require cables larger than recommended, or cables rated higher than 167°F(75°C).

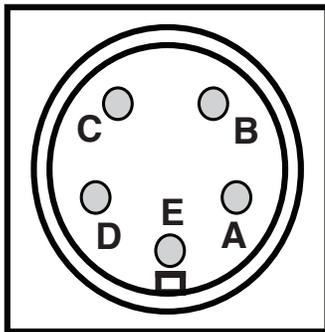
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CABLE CONNECTIONS

There is one circular connector for the gun trigger on the front of the LN-25™ PRO.

Table A.2

Function	Pin	Wiring
5-pin trigger connector for push-guns only.	A	Trigger
	B	Not used
	C	Common
	D	Not used
	E	Not used



SHIELDING GAS CONNECTION

⚠ WARNING



CYLINDER may explode if damaged.

- Keep cylinder upright and chained to support.

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



- **BUILD UP OF SHIELDING GAS MAY HARM HEALTH OR KILL.**
- Shut off shielding gas supply when not in use.

- See American National Standard Z-49.1, "Safety in Welding and Cutting" Published by the American Welding Society.

Maximum inlet pressure is 100 psi. (6.9 bar.)

Install the shielding gas supply as follows:

1. Secure the cylinder to prevent it from falling.

2. Remove the cylinder cap. Inspect the cylinder valves and regulator for damaged threads, dirt, dust, oil or grease. Remove dust and dirt with a clean cloth. **DO NOT ATTACH THE REGULATOR IF OIL, GREASE OR DAMAGE IS PRESENT!** Inform your gas supplier of this condition. Oil or grease in the presence of high pressure oxygen is explosive.

3. Stand to one side away from the outlet and open the cylinder valve for an instant. This blows away any dust or dirt which may have accumulated in the valve outlet.

4. Attach the flow regulator to the cylinder valve and tighten the union nut(s) securely with a wrench. Note: if connecting to 100% CO₂ cylinder, insert regulator adapter between regulator and cylinder valve. If adapter is equipped with a plastic washer, be sure it is seated for connection to the CO₂ cylinder.

5. Attach one end of the inlet hose to the outlet fitting of the flow regulator. Attach the other end to the welding system shielding gas inlet. Tighten the union nuts with a wrench.

6. Before opening the cylinder valve, turn the regulator adjusting knob counterclockwise until the adjusting spring pressure is released.

7. Standing to one side, open the cylinder valve slowly a fraction of a turn. When the cylinder pressure gage stops moving, open the valve fully.

8. The flow regulator is adjustable. Adjust it to the flow rate recommended for the procedure and process being used before making a weld.

WIRE DRIVE CONFIGURATION

(See Figure A.1)

CHANGING THE GUN RECEIVER BUSHING

⚠ WARNING

ELECTRIC SHOCK can kill.



- Turn the input power **OFF** at the welding power source before installation or changing drive rolls and/or guides.
- Do not touch electrically live parts.
- When inching with the gun trigger, electrode and drive mechanism are "hot" to work and ground and could remain energized several seconds after the gun trigger is released.
- Do not operate with covers, panels or guards removed or open.
- Only qualified personnel should perform maintenance work.

Tools required:

- 1/4" hex key wrench.

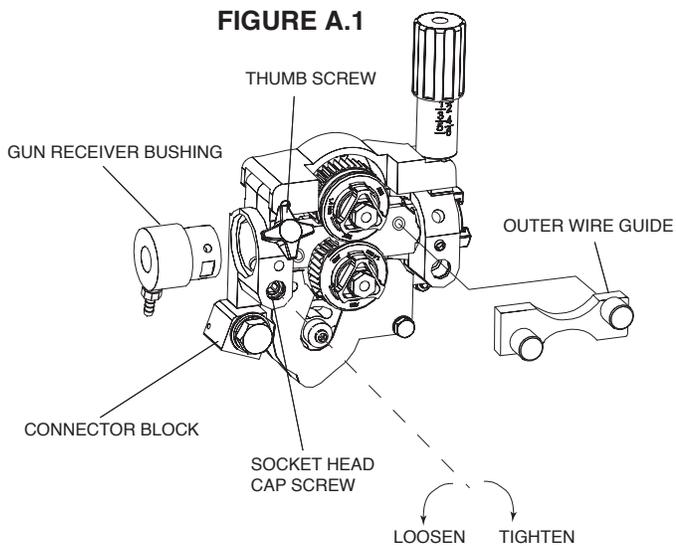
1. Turn power off at the welding power source.
2. Remove the welding wire from the wire drive.
3. Remove the thumb screw from the wire drive.
4. Remove the welding gun from the wire drive.
5. Loosen the socket head cap screw that holds the connector bar against the gun bushing.

IMPORTANT:

Do not attempt to completely remove the socket head cap screw.

6. Remove the outer wire guide, and push the gun bushing out of the wire drive. Because of the precision fit, light tapping may be required to remove the gun bushing.
7. Disconnect the shielding gas hose from the gun bushing, if required.
8. Connect the shielding gas hose to the new gun bushing, if required.
9. Rotate the gun bushing until the thumb screw hole aligns with the thumb screw hole in the feed plate. Slide the gun receiver bushing into the wire drive and verify the thumb screw holes are aligned.
10. Tighten the socket head cap screw.
11. Insert the welding gun into the gun bushing and tighten the thumb screw.

NOTE: Some gun bushings do not require the use of the thumb screw.



PROCEDURE TO INSTALL DRIVE ROLLS AND WIRE GUIDES

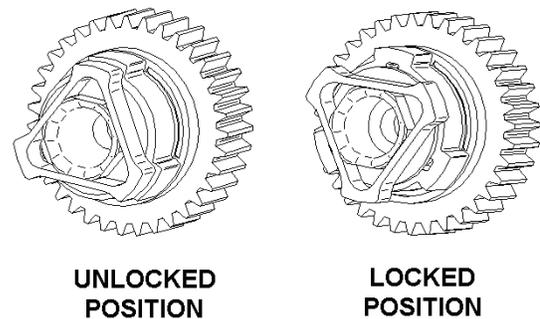
⚠ WARNING



- Turn the input power OFF at the welding power source before installation or changing drive rolls and/or guides.
- Do not touch electrically live parts.
- When inching with the gun trigger, electrode and drive mechanism are "hot" to work and ground and could remain energized several seconds after the gun trigger is released.
- Do not operate with covers, panels or guards removed or open.
- Only qualified personnel should perform maintenance work.

1. Turn power off at the welding power source.
2. Release the idle roll pressure arm.
3. Remove the outer wire guide by turning the knurled thumbscrews counter-clockwise to unscrew them from the feed plate. See **Figure A.2**.
4. Rotate the triangular lock and remove the drive rolls.
5. Remove the inner wire guide
6. Insert the new inner wire guide, groove side out, over the two locating pins in the feed plate.
7. Install a drive roll on each hub assembly secure with the triangular lock.
8. Install the outer wire guide by aligning it with the pins and tightening the knurled thumbscrews.
9. Close the idle arm and engage the idle roll pressure arm. Adjust the pressure appropriately.

FIGURE A.2



LN-25™ PRO

LINCOLN
ELECTRIC

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PRESSURE ARM ADJUSTMENT

⚠ WARNING



ELECTRIC SHOCK can kill.

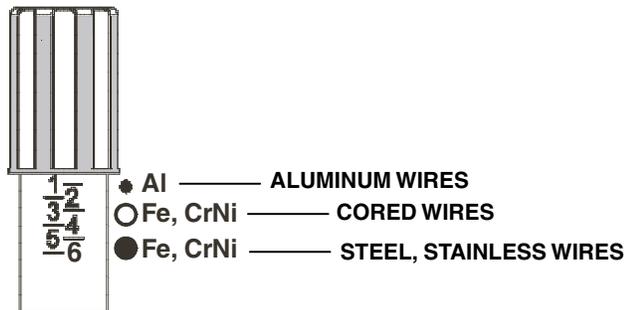
- Turn the input power OFF at the welding power source before installation or changing drive rolls and/or guides.
- Do not touch electrically live parts.
- When inching with the gun trigger, electrode and drive mechanism are "hot" to work and ground and could remain energized several seconds after the gun trigger is released.
- Do not operate with covers, panels or guards removed or open.
- Only qualified personnel should perform maintenance work.

The pressure arm controls the amount of force the drive rolls exert on the wire. Proper adjustment of the pressure arm gives the best welding performance.

Set the pressure arm as follows:
(See **Figure A.3**)

Aluminum wires	between 1 and 3
Cored wires	between 3 and 4
Steel, Stainless wires	between 4 and 6

FIGURE A.3



LOADING SPOOLS OF WIRE

⚠ WARNING



- Keep hands, hair, clothing and tools away from rotating equipment.
- Do not wear gloves when threading wire or changing wire spool.
- Only qualified personnel should install, use or service this equipment.

Loading 10 to 15 lb. (4.5 – 6.8kg) Spools.

A K468 spindle adapter is required for loading 2" (51mm) wide spools on 2" (51mm) spindles. Use a K468 spindle adapter for loading 2-1/2" (64mm) wide spools.

1. Squeeze the release bar on the retaining collar and remove it from the spindle.
2. Place the spindle adapter on the spindle, aligning the spindle brake pin with the hole in the adapter.
3. Place the spool on the spindle and align the adapter brake tab with one of the holes in the back side of the spool. An indicator mark on the end of the spindle shows the orientation of the brake tab. Be certain the wire feeds off of the spool in the proper direction.
4. Re-install the retaining collar. Make sure that the release bar snaps out and that the retaining collar fully engages the groove on the spindle.

GUN CONNECTION

⚠ WARNING



ELECTRIC SHOCK can kill.

- Turn the input power OFF at the welding power source before installation or changing drive rolls and/or guides.
- Do not touch electrically live parts.
- When inching with the gun trigger, electrode and drive mechanism are "hot" to work and ground and could remain energized several seconds after the gun trigger is released.
- Do not operate with covers, panels or guards removed or open.
- Only qualified personnel should perform maintenance work.

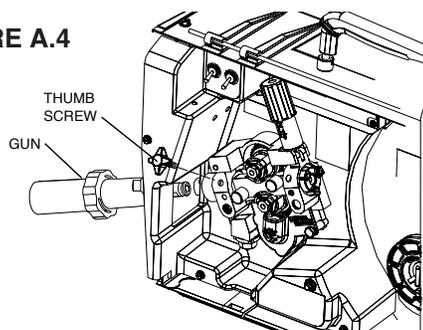
The LN-25™ PRO comes with a K1500-2 gun adapter installed. (See **Figure A.4**)

To install a gun,

1. Turn power OFF.
2. Remove the thumb screw.
3. Push the gun the completely into the gun bushing.
4. Secure the gun in place with the thumb screw.
5. Connect the trigger cable from the gun to the trigger connector on the front of the feeder.

Note: Not all gun bushings require the use of the thumb screw.

FIGURE A.4



LN-25™ PRO

LINCOLN
ELECTRIC

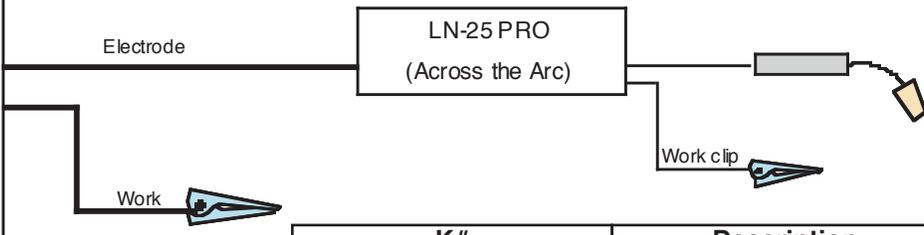
**POWER SOURCE TO LN-25™ PRO
CABLE CONNECTION DIAGRAMS**

ACROSS THE ARC SET-UPS

CC Power Sources with Output Terminals Always Hot (See Figure A.5)

- CC Power Source
- Ranger 250, 250 LPG
- Ranger 305G, 305D
- Commander 300
- Vantage 300, 400, 500
- Air Vantage 500
- Ranger 10,000
- Ranger 3 phase
- SAE 400 with CV adapter
- Engine Driven welder with Wire Feed Module

FIGURE A.5



If the power source has a Remote/Local switch, place the switch in the Local position.

Place the Power Source CC/CV switch (if present) or Range Switch in the CV position if possible.

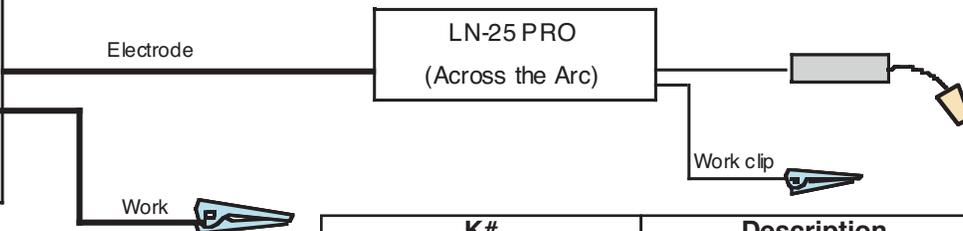
Set the CV/CC switch in the feeder to match the power source.

K#	Description
K2613-1	LN-25™ PRO Wire Feeder
K2613-2	LN-25™ PRO Extra Torque
KP1695-XX	Drive Roll Kit
KP1696-XX	
KP1697-XX	
See Magnum Literature	Welding Gun
	CC power Source
K1803-1	Welding Cables

CV Power Sources with Stud Connectors and Remote/Local Switch (See Figure A.6)

- CV-655
- CV-400
- DC-400
- DC-600
- DC-655
- V450-Pro

FIGURE A.6



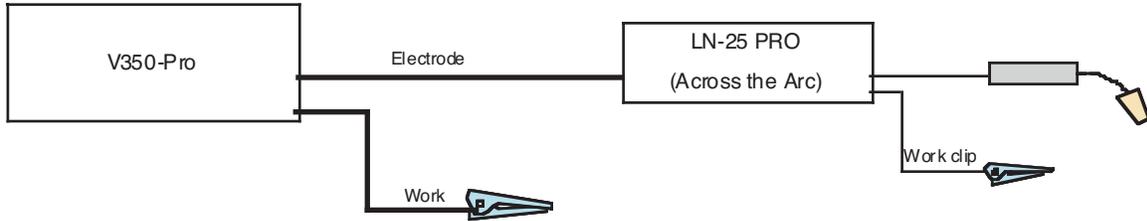
Place the power source Remote/Local switch in the Local position.

Place CV/CC switch in the feeder in the "CV" position.

K#	Description
K2613-1	LN-25™ PRO Wire Feeder
K2613-2	LN-25™ PRO Extra Torque
KP1695-XX	Drive Roll Kit
KP1696-XX	
KP1697-XX	
See magnum Literature	Welding Gun
	CV power Source
K1803-1	Welding Cables

CV Power Source with Twist-Mate Connectors and Remote/Local Switch. (See Figure A.7)

FIGURE A.7

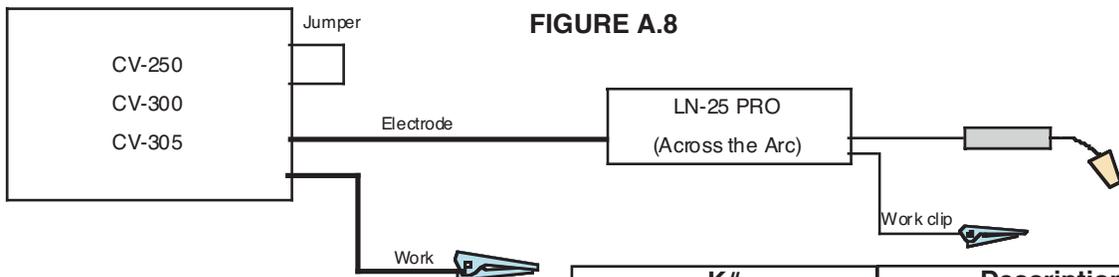


Place CV/CC switch in the feeder in the "CV" position.

K#	Description
K2613-1	LN-25™ PRO Wire Feeder
K2613-2	LN-25™ PRO Extra Torque
KP1695-XX	Drive Roll Kit
KP1696-XX	
KP1697-XX	
See Magnum Literature	Welding Gun
	CC power Source
K1841	Welding Cables

CV Power Source with Twist-Mate Connectors and no Remote/Local Switch. (See Figure A.8)

FIGURE A.8



Place CV/CC switch in the feeder in the "CV" position.

K#	Description
K2613-1	LN-25™ PRO Wire Feeder
K2613-2	LN-25™ PRO Extra Torque
KP1695-XX	Drive Roll Kit
KP1696-XX	
KP1697-XX	
See Magnum Literature	Welding Gun
	CV power Source
K1841-	Welding Cables
K484	Jumper Plug kit

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 Constant Current vs Constant Voltage Wire Welding B-7

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Rear Controls B-12

Gas Purge/Flow Meter/Power-Up B-13

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SAFETY PRECAUTIONS

READ AND UNDERSTAND ENTIRE SECTION BEFORE OPERATING MACHINE.

⚠ WARNING



- **ELECTRIC SHOCK CAN KILL.** Unless using COLD FEED feature, when feeding with gun trigger, the electrode and drive mechanism are always electrically energized and could remain energized several seconds after the welding ceases..

- Do not touch electrically live part or electrode with skin or wet clothing.
- Insulate yourself from work and ground.
- Always wear dry insulating gloves.
- Do not operate with covers, panels or guards removed or open.



- **FUMES AND GASSES** can be dangerous.
- Keep your head out of fumes.
- Use ventilation or exhaust to remove fumes from breathing zone.



- **WELDING SPARKS** can cause fire or explosion.
- Keep flammable material away.



- **ARC RAYS** can burn.
- Wear eye, ear and body protection.

SEE ADDITIONAL WARNING INFORMATION UNDER ARC WELDING SAFETY PRECAUTIONS AND IN THE FRONT OF THIS OPERATING MANUAL.

GRAPHIC SYMBOLS THAT APPEAR ON THIS MACHINE OR IN THIS MANUAL



INPUT POWER



ON



OFF



WIRE FEEDER



POSITIVE OUTPUT



NEGATIVE OUTPUT



INPUT POWER



DIRECT CURRENT

U_0

OPEN CIRCUIT VOLTAGE

U_1

INPUT VOLTAGE

U_2

OUTPUT VOLTAGE

I_1

INPUT CURRENT

I_2

OUTPUT CURRENT



PROTECTIVE GROUND



WARNING OR CAUTION

DEFINITION OF WELDING TERMS

WFS

- Wire Feed Speed

CC

- Constant Current

CV

- Constant Voltage

GMAW

- Gas Metal Arc welding

SMAW

- Shielded Metal Arc welding

FCAW

- Flux Core Arc Welding

GENERAL DESCRIPTION

General Physical Description

The LN-25™ PRO is specially engineered to be the most rugged portable wire feeder available. The models covered by this manual are designed for “across the arc” operation only.

Several models of the LN-25™ PRO are offered to best meet individual welder needs. The Extra Torque model features additional torque gearing for reliable feeding of large diameter FCAW wires. The Standard model features wire drive gearing for optimal performance for both FCAW and GMAW wires of common sizes. All of the models include a gas solenoid and flow meter for the flexibility to run most wire processes. The plastic case is molded from a high impact, flame retardant plastic for durability and low weight. The patent pending design keeps the internal components protected and dry.

The heart of the LN-25™ PRO is the 2 roll MAX-TRAC™ drive. The patented features on the wire drive offer tool-less changing of the drive rolls and wire guides for quick spool changes. A tachometer controlled motor powers the patent pending drive rolls for smooth, steady feeding without slippage.

With only one p.c. board, the LN-25™ PRO is designed to be simple, reliable and easy to service. The p.c. board is mounted with Lincoln's leading environmental design protection that consists of mounting the board in a plastic tray and potting it with epoxy.

With a 325 amp 100% duty cycle rating, these feeders are ready for heavy duty welding.

General Functional Description

The LN-25™ PRO as designed is a simple, robust feeder. Standard features include a calibrated wire feed speed dial, 2 step/trigger interlock switch, CV-CC switch, Gas Purge and Cold Feed. Some newer codes also have a Wire Speed range switch for more precise setting at lower speeds.

RECOMMENDED PROCESSES

- GMAW
- FCAW

PROCESS LIMITATIONS

- GMAW-P procedures must be qualified by the customer.
- Across-the-Arc models are not recommended for stitch or spot welding.

EQUIPMENT LIMITATIONS

- The duty cycle of the wire feeder is 325A, 100% and 450A, 60%. Duty cycle is based upon the amount of welding performed in a 10 minute period.
- The maximum spool size is 45 lb, 12" diameter.
- Maximum FCAW gun length is 15 ft.
- Maximum GMAW gun length is 25 ft.
- Push-pull guns do not work with the wire feeder.
- K2330-1 Timer kits do not work with this feeder, use K2330-2 kits

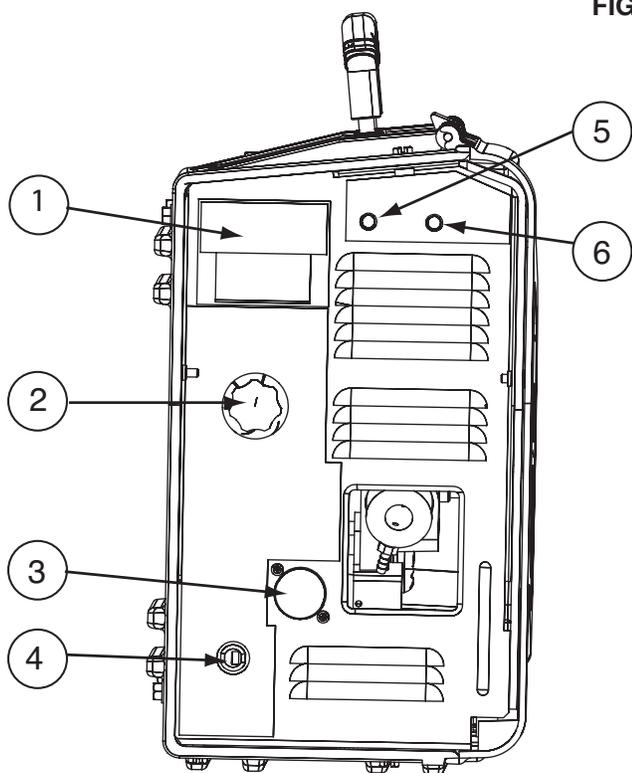
RECOMMENDED POWER SOURCES

- | | |
|----------------------|------------------|
| • CV-305 | • Ranger 3 Phase |
| • CV-400 | • Ranger GXT |
| • CV-655 | • Ranger 250 |
| • DC-400 | • Ranger 305 |
| • DC-600 | • SAE-400 |
| • DC-655 | • Pipeliner 200G |
| • Invertec V-350 PRO | • Classic 300 |
| • Invertec V-450 PRO | • Vantage 300 |
| • Multi-Weld 350 | • Vantage 400 |
| • Ranger 10,000 | • Vantage 500 |

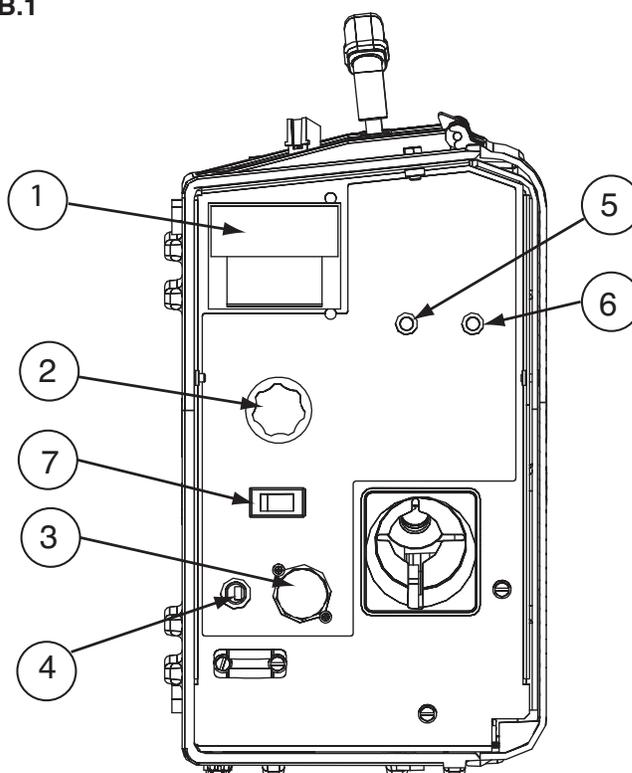
LN-25™ PRO



FIGURE B.1



K2613-1 & K2613-2



K2613-5 & K2613-7

CASE FRONT CONTROLS (See Figure B.1)

ITEM	DESCRIPTION
1.	Analog Voltmeter
2.	Wire Feed Speed Control
3.	5-Pin Gun Trigger Receptacle
4.	Work Sense Lead Connector
5.	Thermal LED (Motor Overload)
6.	Polarity LED
7.	Wire Feed Speed Range Switch

1. ANALOG VOLTMETER

The analog voltmeter shows the voltage between electrode and work. The voltmeter shows open circuit voltage when the wire feeder is not welding. As a result, it is not unusual to see the needle “pegged” when not welding. The voltmeter is polarity insensitive and the range is 0 - 40VDC.

2. WIRE FEED SPEED KNOB

The large, calibrated wire feed speed knob makes for easy and accurate adjustment of the wire feed speed. The knob rotates 3/4 turn. Turn the knob clockwise to increase the wire feed speed, and counter clockwise to reduce the wire feed speed.

Models with analog voltmeters have a calibrated scale printed around the wire feed speed knob using "in/min" units. A separate decal with "m/min" units is included with these models wire feeder. Units with a range switch have two calibrated scales.

Wire Feed Speed, CV Operation

When Across the Arc models are operated with CV power sources, the wire feed speed will remain a constant value, independent of arc voltage changes, as long as the arc voltage does not drop below the minimum values per the following table.

TABLE B.1 - CV OPERATION		
Minimum Arc Voltage	Maximum WFS (Standard)	Maximum WFS (Extra Torque)
15 V	280"/min.	210"/min.
17V	340"/min.	235"/min.
21V	440"/min.	400"/min.
24V	520"/min.	400"/min.
27V	600"/min	400"/min.

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Wire Feed Speed, CC Operation (See Figure B.2 or See Table B.2)

When Across the Arc models are operated with CC power sources, the wire feed speed changes as the arc voltage changes. When the arc voltage increases, the wire feed speed will increase; and when the arc voltage decreases, the wire feed speed will decrease.

4. Determine the vertical line representing the CC Wire Feed Speed setting where the above two lines cross. (See Figure B.2 arrow line for 450.) Set the LN-25™ PRO wire feed speed knob to this value.

To preset the wire feed speed on CC power sources:

1. Set the Wire Feed Mode switch inside the LN-25™ PRO to "CC".
2. Refer to the Figure B.2 graph for the setting for the wire feed speed knob setting. Select the horizontal line representing the Desired Wire Feed Speed. (See Figure B.2 arrow for 375 in./min.)
3. Select the diagonal line representing the Arc Volts. (See Figure B.2 for 29 volts.)

$$\text{CC WFS dial setting} = \frac{\text{desired WFS} \times 35}{\text{Arc Volts}}$$

Example: $\frac{375 \text{ in./min. (Horizontal Line)} \times 35}{29 \text{ Arc Volts (Diagonal Line)}}$

$$= \frac{13125}{29} = 452.5 \text{ (Vertical Line)}$$

Set the Wire Speed Control at 450"/min., and when welding at 29 volts the average actual speed should be approximately 375"/min.

FIGURE B.2

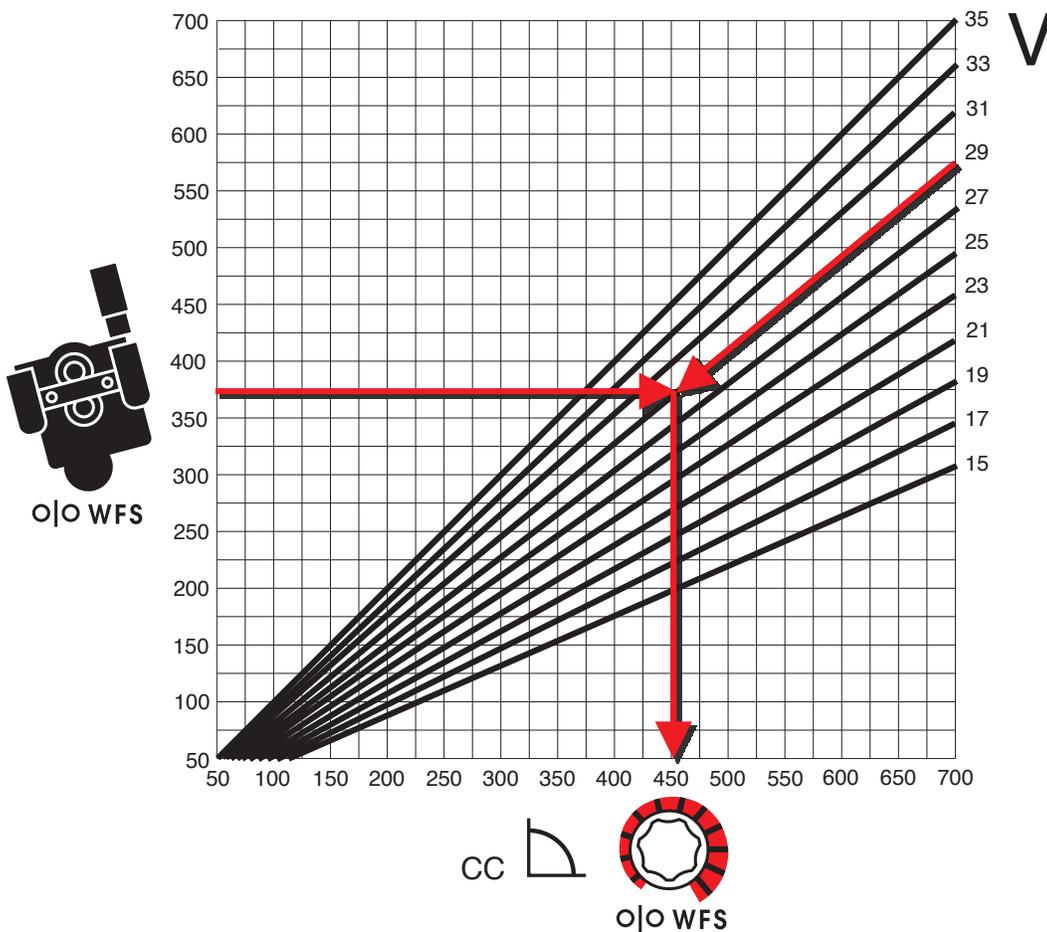


TABLE B.2 - VV (CC) WIRE SPEED SETTING

Desired In/Min	Arc Volts Used									
	16	18	20	22	24	26	28	30	32	34
50	109	97	88	80	73	67	63	58	55	51
60	131	117	105	95	88	81	75	70	66	62
70	153	136	123	111	102	94	88	82	77	72
80	175	156	140	127	117	108	100	93	88	82
90	197	175	158	143	131	121	113	105	98	93
100	219	194	175	159	146	135	125	117	109	103
110	241	214	193	175	160	148	138	128	120	113
120	263	233	210	191	175	162	150	140	131	124
130	284	253	228	207	190	175	163	152	142	134
140	306	272	245	223	204	188	175	163	153	144
150	328	292	263	239	219	202	188	175	164	154
160	350	311	280	255	233	215	200	187	175	165
170	372	331	298	270	248	229	213	198	186	175
180	394	350	315	286	263	242	225	210	197	185
190	416	369	333	302	277	256	238	222	208	196
200	438	389	350	318	292	269	250	233	219	206
210	459	408	368	334	306	283	263	245	230	216
220	481	428	385	350	321	296	275	257	241	226
230	503	447	403	366	335	310	288	268	252	237
240	525	457	420	382	350	323	300	280	263	247
250	547	486	438	398	365	337	313	292	273	257
260	569	506	455	414	379	350	325	303	284	268
270	591	525	473	430	394	365	338	315	295	278
280	613	544	490	445	408	377	350	327	306	288
290	634	564	508	461	423	390	363	338	317	299
300	656	583	525	477	438	404	375	350	328	309
310	678	603	543	493	452	417	388	362	339	319
320	700	622	560	509	467	431	400	373	350	329
330		642	578	525	481	444	413	385	361	340
340		661	595	541	496	458	425	397	372	350
350		681	613	557	510	471	438	408	383	360
360		700	630	572	526	484	450	420	394	370
380			666	604	554	512	472	444	416	392
400			700	636	584	538	500	466	438	412
420				668	612	566	526	490	460	432
440				700	642	592	550	514	482	452
460					670	620	576	536	504	472
480					700	646	600	560	526	494
500						674	626	584	546	514
520						700	650	606	568	536
540							676	630	590	556
560							700	654	612	576
580								676	634	598
600								700	656	618
620									678	638
640									700	658
660										680
680										700
700										

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CONSTANT CURRENT vs CONSTANT VOLTAGE WIRE WELDING

Most semiautomatic welding processes perform better using constant voltage power sources.

Welding codes usually do not address the power source selection or specifically, whether the welding process is to be operated in the constant voltage or constant current mode. Instead, codes typically specify limitations on the current, voltage, heat input and preheat temperature based on the material to be welded. The intention is to assure that proper weld material properties will develop.

Welding is sometimes performed using constant current power sources. The operation can be more convenient because it may allow the use of an existing stick (SMAW) power source and the power source can be placed at a distant location without any provision for adjusting the output settings.

For constant current operation, the power source is set to deliver the specified current. The power source regulates this current regardless of changes in the welding circuit, including cable length, electrode diameter, wire feed speed, contact tip to work distance, etc.

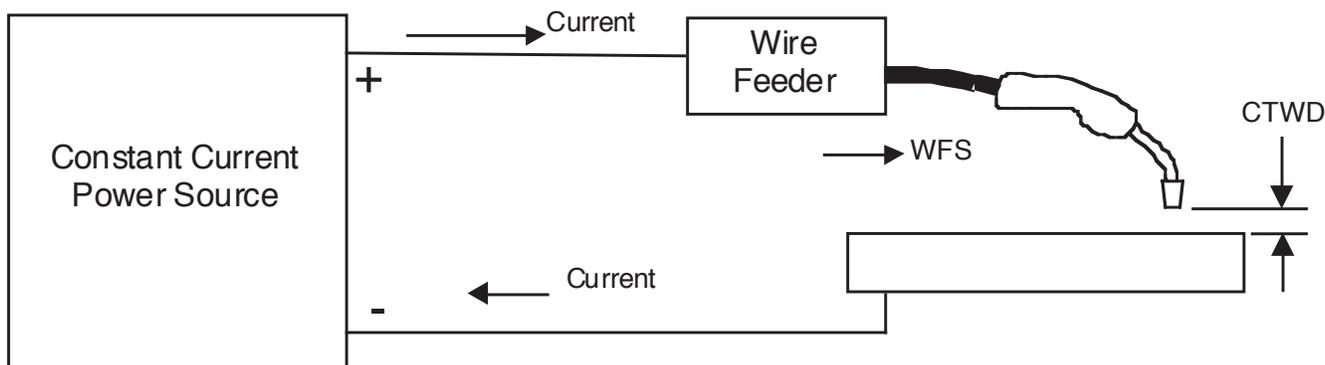
Changes in the wire feed speed (WFS) or contact tip to work distance (CTWD) affect the arc voltage when constant current power sources are used. Lowering the wire feed speed raises the voltage, raising the wire feed speed lowers the voltage. Lengthening the contact tip to work distance raises the voltage, shortening the contact tip to work distance lowers the voltage. (See **Figure B.3**)

If the contact tip to work distance is properly maintained, a satisfactory operating voltage range may be achieved, and a sound weld may result. However, when a welder uses a longer contact tip to work distance, an arc-sensing wire feeder compensates by increasing the wire feed speed to regulate the voltage. Even if the voltage and current remain unchanged, the increased wire feed speed may result in a deposition rate well beyond the specified range of the electrode. Under these conditions, the specified weld metal properties may not be achieved.

Constant voltage power sources deliver large current surges to stabilize the arc when the electrode is shorted or the arc length is very short. However, a constant current power source does not provide such a response to stabilize the arc. It may be difficult to achieve required weld metal properties, or to achieve the required quality of welds needed to pass nondestructive tests, when such welds are made under constant current operation.

For these reasons, Lincoln Electric does **NOT** recommend constant current semiautomatic welding for applications which need to meet specified weld metal chemical or mechanical property requirements or weld quality requirements.

FIGURE B-3



3. 5-PIN GUN TRIGGER CONNECTOR

(See Figure B.1)

4. WORK SENSE LEAD

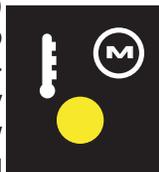
(See Figure B.1)

Must be connected for the drive motor to operate.

5. THERMAL LED, MOTOR OVERLOAD

(See Figure B.1)

The thermal light illuminates (yellow) when the wire drive motor draws too much current. If the thermal light illuminates, the wire drive will automatically shutdown for up to 30 seconds to allow the motor to cool. To start welding again, release the gun trigger, inspect the gun cable, liner (and conduit). Clean and make repairs as necessary. Start welding again when the problem has been safely resolved.



For best results, keep the gun cable and conduit as straight as possible. Perform regular maintenance and cleaning on the gun liner, conduit and gun. Always use quality electrode, such as L-50 or L-56 from Lincoln Electric.

6. POLARITY LED

(See Figure B.1)

The Polarity LED lights (green) when the wire feeder is connected for positive polarity, and is not lit in Negative Polarity. Use the polarity LED to verify the wire feeder is connected properly for the process being used.



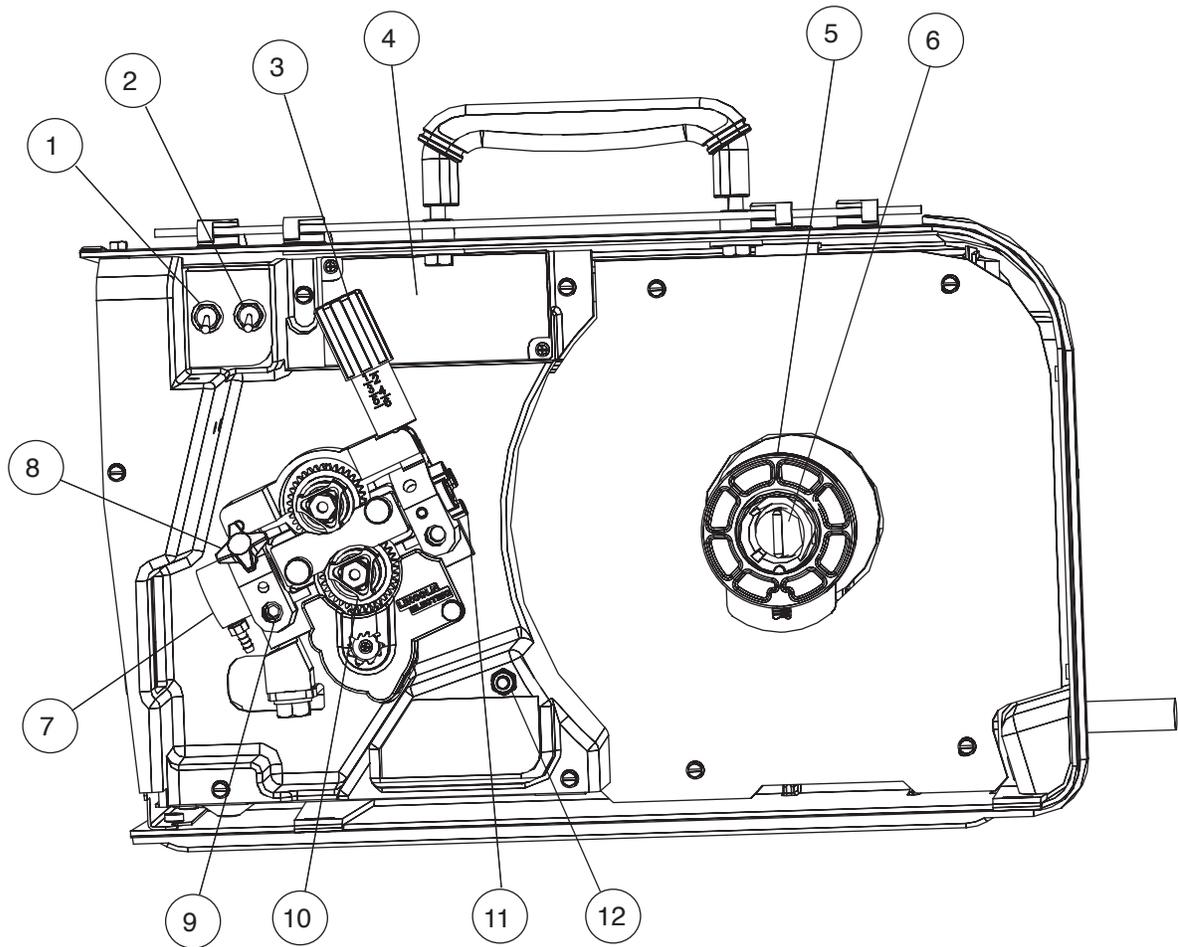
NOTE: Both LED's will flash briefly when power is applied to the feeder.

7. WIRE FEED SPEED RANGE SWITCH (K2613-5 and K2613-7 only.)

Used to select either HIGH or LOW range for the Wire Feed Speed Control. LOW range allows for more precise setting at lower feed rates. On the Standard Torque models, selecting the LOW range **DOES NOT** increase the torque of the wire drive system.

INTERNAL CONTROLS

FIGURE B.4



ITEM	DESCRIPTION
1	2 Step Trigger Interlock Switch
2	CV / CC Switch
3	Pressure Adjustment Arm
4	Optional Timer Kit (See Accessories Section)
5	Spool Retainer
6	Spindle Brake
7	Gun Bushing
8	Thumb Screw for securing the welding Gun
9	Socket Head Cap Screw for securing the Gun Bushing
10	Drive Hubs
11	Inlet Wire Guide
12	Cold Feed Pushbutton

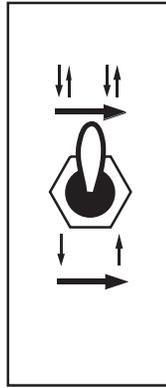
LN-25™ PRO

INTERNAL CONTROLS DESCRIPTION

(See Figure B.4)

2 STEP - TRIGGER INTERLOCK SWITCH

The 2 Step - Trigger Interlock switch changes the function of the gun trigger. 2 Step trigger operation turns welding on and off in direct response to the trigger. Trigger Interlock operation allows welding to continue when the trigger is released for comfort on long welds.



Place the toggle switch in the DOWN position for 2 Step operation or in the UP position for Trigger Interlock operation.

2 Step Trigger

2 Step trigger operation is the most common. When the gun trigger is pulled, the welding power source energizes the electrode output and the wire feeder feeds wire for welding. The power source and wire feeder continue welding until the trigger is released.

Trigger Interlock

Trigger Interlock operation provides for operator comfort when making long welds. When the gun trigger is first pulled, the welding power source energizes the output and the wire feeder feeds wire for welding. The gun trigger is then released while the weld is made. To stop welding, the gun trigger is pulled again, and when it is released the welding power source output turns off and the wire feeder stops feeding wire.

CAUTION



If the arc goes out while welding with trigger interlock operation, the electrode output from the welding power source remains energized and the wire feeder will continue to feed wire until the gun trigger is again pulled and then released.

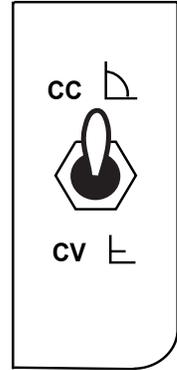
CV/CC SWITCH

(See Figure B.4)

The CV/CC switch sets the wire feed speed control method for the wire feeder.

In the CV position, the wire feed speed remains constant during welding. A steady arc voltage is regulated by the power source by adjusting the arc current.

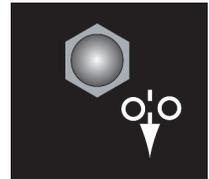
In the CC position, the wire feed speed varies during welding. The arc length is maintained by changing the wire feed speed.



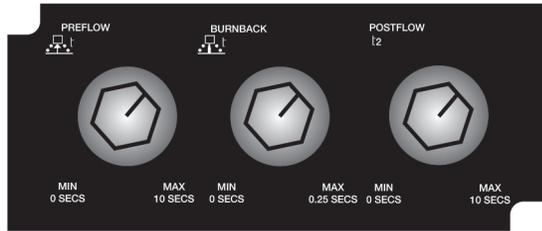
COLD FEED PUSHBUTTON

(See Figure B.4)

When cold feeding, the wire drive will feed electrode but neither the power source nor the gas solenoid will be energized. Adjust the speed of cold feeding by rotating the WFS knob. Cold feeding, or "cold inching" the electrode is useful for threading the electrode through the gun.



OPTIONAL PREFLOW, BURNBACK AND POSTFLOW TIMER KIT (K2330-2)



The preflow, Burnback and Postflow Timer Kit gives you control over the shielding gas at the beginning and end of the weld and prepares the end of the wire for the next arc start. Additional shielding gas protection is often required when welding aluminum, stainless steel or exotic alloys.

NOTE: When stitch welding, set the postflow time to maximum for best results.

Preflow Timer

The preflow timer range is OFF to 10 seconds. Preflow time is the time delay from when the trigger is pulled to when the wire starts to feed and is energized. Preflow is used to purge the welding gun with shielding gas and helps to maximize porosity at the start of the weld.

Burnback Timer

The Burnback timer range is OFF to 0.25 seconds. The burnback timer controls the additional amount of time the power source output remains ON after the wire drive has stopped feeding wire. Burnback adjustment prevents the wire from sticking to the weld at the end of a weld and helps to condition the wire for the next weld.

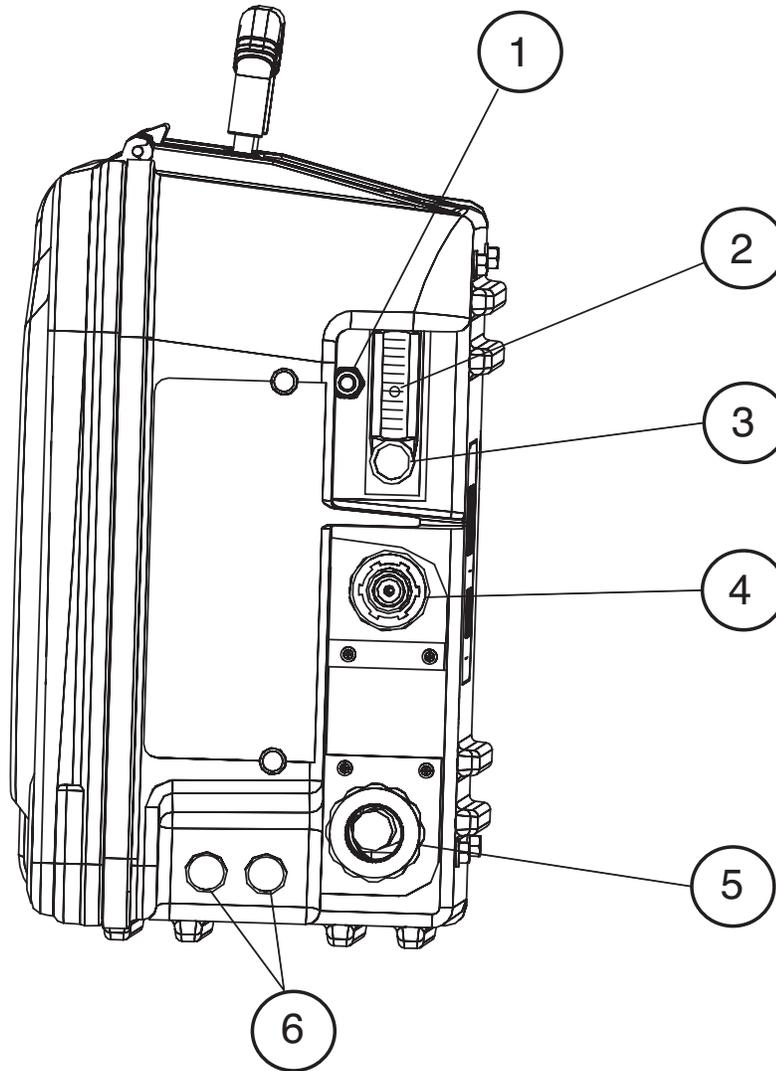
To set the burnback time, adjust the knob to approximately 0.03 seconds and then decrease or increase the time as desired.

Postflow Timer

The postflow timer range is OFF to 10 seconds. Postflow is the time from when the power source output turns OFF until the postflow timer expires. Use postflow to protect the weld while the weld cools.

REAR CONTROLS:

FIGURE B.5



ITEM	DESCRIPTION
1	Gas Purge Pushbutton
2	Flow Meter Ball
3	Flow Meter Valve
4	Shielding Gas Inlet
5	Electrode Lead
6	Optional Water cooled gun connections

GAS PURGE PUSHBUTTON

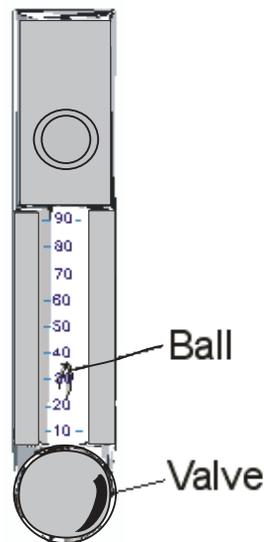
The gas solenoid valve will energize but neither the power source output nor the drive motor will be turned on. The Gas Purge switch is useful for setting the proper flow rate of shielding gas and for purging the lines. Flow meters should always be adjusted while the shielding gas is flowing.

FLOW METER

The flowmeter shows the flow rate of shielding gas and has a valve to adjust the flow. The flow meter is scaled for CO₂, Ar, and Ar/CO₂ blends. The middle of the ball indicates the flow rate of shielding gas.

Adjust the flow rate while depressing the GAS PURGE switch by turning the valve at the bottom of the meter. Most weld procedures require 25-40 scfh (11.8 - 18.9 lpm) for sufficient shielding gas coverage. Gun angle, nozzle diameter, joint configuration and wind conditions may effect the amount of shielding gas required.

When using a wire feeder with a flow meter, adjust the regulator at the shield gas bottle or supply to a flow rate that is higher than the flow rate indicated on the feeder flow meter. Note that most regulators are calibrated based upon having low restrictions on the outlet. The valve on the feeder flow meter creates a high restriction and may cause errors in the readings at the supply regulator. Set the gas flow rate using the feeder flow meter reading and not the supply regulator reading.



SCFH	Liter/Min.
10	4.7
20	9.4
30	14.2
40	18.9
50	23.6
60	28.3
70	33.1
80	37.8

POWER-UP SEQUENCE

For feeders with analog voltmeters, the thermal LED and the Polarity LED will light briefly during power-up.

If the gun trigger is activated during power up, the feeder will not operate unless the gun trigger is released and re-activated.

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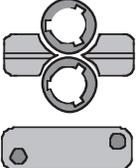
Return to Master TOC

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FACTORY INSTALLED EQUIPMENT

- K1500-2 Gun Receiver Bushing.

DRIVE ROLL KITS

WIRE TYPE	ELECTRODE SIZE	KP KIT		
Steel Wires:	.023-.030 (0.6-0.8mm) .035 (0.9mm) .045 (1.2mm) .052 (1.4mm) 1/16 (1.6mm) .035,.045 (0.9, 1.2mm) .040 (1.0mm)	KP1696-030S KP1696-035S KP1696-045S KP1696-052S KP1696-1/16S KP1696-1 KP1696-2	Includes: 2 V groove drive rolls and inner wire guide.	
Cored Wires:	.030-.035" (0.8-0.9mm) .040-.045" (1.0-1.2mm) .052" (1.4mm) 1/16" (1.6mm) .068-.072" (1.7-1.8mm) 5/64" (2.0mm) 3/32" (2.4mm)	KP1697-035C KP1697-045C KP1697-052C KP1697-1/16C KP1697-068 KP1697-5/64 KP1697-3/32	Includes: 2 Knurled drive rolls and inner wire guide.	
Aluminum Wires:	.035" (0.9 mm) .040" (1.0mm) 3/64" (1.2mm) 1/16" (1.6mm)	KP1695-035A KP1695-040A KP1695-3/64A KP1695-1/16A	Includes: 2 polished U groove drive rolls, outer wire guide and inner wire guide.	

K2596-1	Aluminum Case	Includes: a complete aluminum case. Decals, skids, insulation and latches are all preassembled.	
K2596-2	Plastic Case	Includes: a complete engineered plastic case. Decals and latches are all preassembled.	
K1796-xx	AWG 1/0 Co-Axial Power Cable	Includes: 1/0 Coaxial weld cable of length "xx". Ends of the weld cable have lug connections. Use for Pulse welding.	
K2593-xx	AWG #1 Coaxial Power Cable	Includes: AWG #1 Coaxial weld cable of length "xx". Ends of the weld cable have lug connections. Use for Pulse or STT™ welding.	
K1803-1	Work and Feeder Cables Package	Includes: Twist-Mate to Lug 2/0 cable 14' (1.2m) long with Ground Clamp, and Twist-Mate to Lug 2/0 Cable 9' (2.7m) long.	
K1840-xx	Weld Power Cable, Twist-Mate to Lug	Includes: Twist-Mate to Lug, 1/0 cable of length "xx".	
K1842-xx	Weld Power Cable, Lug to Lug	Includes: Lug to Lug, 3/0 Cable of length "xx" for lengths up to 60' (18.3m). Lug to Lug, 4/0 Cable of length "xx" for lengths greater than 60' (18.3m).	
K484	Jumper Plug Kit	Includes: 14 pin circular connector with jumper for leads 2-4. For use in power sources for turning the weld terminals "ON" at all times.	
K2330-2	Timer Kit	Includes Panel and harness. Provides adjustable Preflow, post flow and Burnback.	

K910-1	Ground Clamp	Includes: One 300 Amp Ground Clamp.	
K910-2	Ground Clamp	Includes: One 500 Amp Ground Clamp.	
K1500-1	Gun Receiver Bushing (for guns with K466-1 Lincoln gun connectors; Innershield and Subarc guns)	Includes: Gun receiver bushing, set screw and hex key wrench.	
K1500-2	Gun Receiver Bushing (for guns with K466-2, K466-10 Lincoln gun connectors; Magnum 200/300/400 guns and compatible with Tweco® #2-#4)	Includes: Gun receiver bushing with hose nipple, set screw and hex key wrench.	
K1500-3	Gun Receiver Bushing (for guns with K613-7 Lincoln gun connectors; Magnum 550 guns and compatible with Tweco® #5)	Includes: Gun receiver bushing with hose nipple, set screw and hex key wrench.	

K1500-4	Gun Receiver Bushing (for gun with K466-3 Lincoln gun connectors; compatible with Miller® guns.)	Includes: Gun receiver bushing with hose nipple, set screw and hex key wrench.	
K1500-5	Gun Receiver Bushing (compatible with Oxo® guns.)	Includes: Gun receiver bushing with hose nipple, 4 guide tubes, set screw and hex key wrench.	
K489-7 *	Gun Receiver Bushing (for Lincoln Fast-Mate guns.)	Includes: Gun receiver bushing with trigger connector.	
K435	Spindle Adapter, for mounting 14 lb. (6.4 kg) Innershield Coils on 2 in (51 mm) spindles.	Includes: Spindle Adapter made from 2 coil retainers. (Electrode not included.)	
K468	Spindle Adapter, for mounting 8in (203mm) diameter spools on 2 in (51 mm) spindles.	Includes: 2 Spindle Adapters, one for 2" wide spools and the other for 3" wide spools.	
K590-6	Water Connection Kit (for European and Control cable models only)	Includes: 2 hoses with female quick connectors at each end, 2 male connectors for 3/16" ID hose, 2 male connectors for 1/2" ID hose, and mounting hardware.	
K586-1	Deluxe Adjustable Gas Regulator	Includes: Deluxe Gas Regulator for Mixed Gases, Adapter for CO2 and 10' (3.0m) Hose.	

* Not compatible with K2613-5 & K2613-7 feeders (Codes 11746, & 11747)

INSTALLATION OF THE K590-6 WATER COOLING KIT

⚠ WARNING



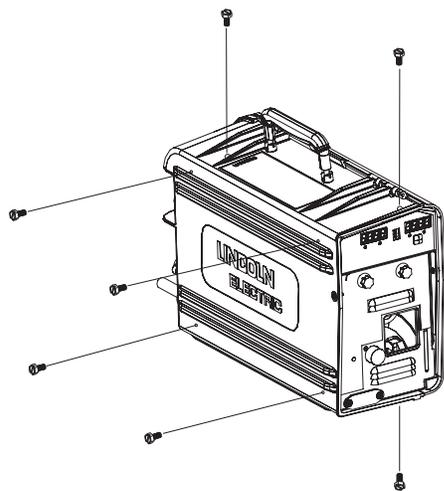
ELECTRIC SHOCK can kill.

- Turn the input power OFF at the disconnect switch before working on this equipment.
- Do not touch electrically hot parts.
- Only qualified personnel should install, use or service this equipment.

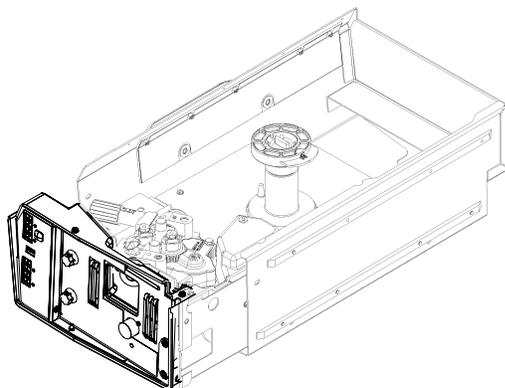
The K590-6 components are rated up to 70 psi (5 bar) and 158°F (70°C). Use a coolant fluid that is compatible with the water cooler and the gun.

Tools required:

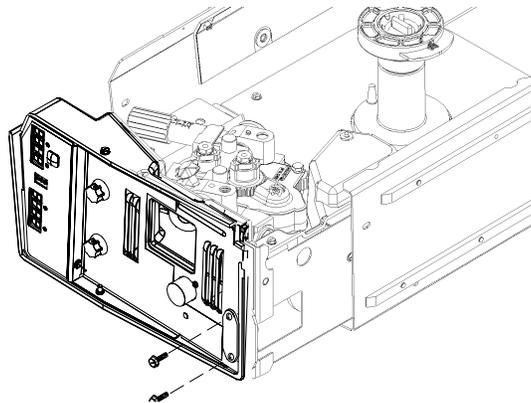
- 3/8" wrench
 - 5/16" nut driver
 - medium flat bladed screw driver
 - cutting tool
1. Turn power off at the welding power source.
 2. Remove the screws securing the case to the inner module using a 3/8" wrench.



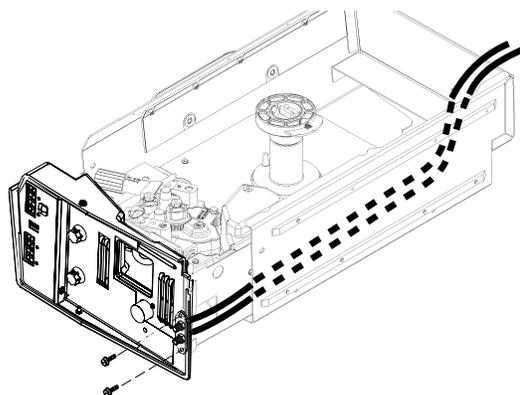
3. Remove the module from the case by lifting the front of the module approximately .25" (6 mm) and then sliding forward.



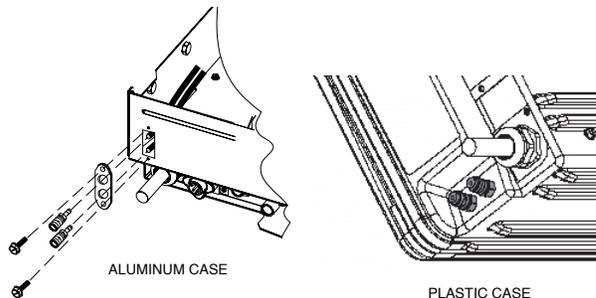
4. Use a 5/16" nut driver to remove the screws holding the water cooling cover on the case front of the inner module and on the rear of the case.



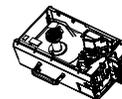
5. Install the fitting and hose assembly to the case front. Route the hoses along the bottom of the inner module and out through the cutout of the cover. Slide the module back into the case.



6. Secure the module to the case with the screws. (Shown in Step 2)
7. Install the fitting assembly to the rear of the case



8. Slide the hose clamps on to the hoses. Trim the hoses to length so that they lay flat on the case bottom. Slide hose clamps on the hose. Slide the hoses on to the fittings on the case rear and secure with the hose clamps.



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SAFETY PRECAUTIONS

⚠ WARNING

ELECTRIC SHOCK can kill.



- Do not operate with covers removed.
 - Turn off power source before installing or servicing.
 - Do not touch electrically hot parts.
- Turn the input power to the welding power source off at the fuse box before working in the terminal strip.
 - Only qualified personnel should install, use or service this equipment.

ROUTINE MAINTENANCE

- Check weld cables and gas hoses for cuts.
- Clean and tighten all weld terminals.

PERIODIC MAINTENANCE

- Clean drive rolls and inner wire guide and replace if worn.
- Blow out or vacuum the inside of the feeder.

CALIBRATION SPECIFICATION

The voltmeter and flow meter are not calibrated and are for reference purposes only.

Voltmeter Validation, Across the Arc Analog Meter Models

Tools required:

- DC voltmeter reference standard
- Constant voltage DC welding power source with adjustable no-load voltage (DC-400, V-350, CV-400 or equivalent).

To verify the analog voltmeter accuracy:

1. Turn power OFF.
2. Connect the LN-25™ PRO to the constant voltage DC welding power source. The work lead of the LN-25™ PRO must be connected to the work terminal of the power source.
3. Connect the reference voltmeter between the brass block of the LN-25™ PRO and the work lead.
4. Turn power ON.

5. Energize the output circuit of the power source. Adjust the power source output to 20 ± 1 VDC as measured on the reference meter.

6. Verify that LN-25™ PRO voltmeter reads between 19 and 21 volts.

If the voltmeter reading is out of range, check for loose connections or replace the voltmeter. There is no calibration adjustment for the LN-25™ PRO voltmeter.

Flow Meter Validation

Tools required:

- Flow meter reference standard.
- Constant voltage DC welding power source (DC-400, V-350, CV-400 or equivalent).

To verify the flow meter accuracy:

1. Turn power OFF.
2. Connect the LN-25™ PRO to the constant voltage DC welding power source. The work lead of the LN-25™ PRO must be connected to the work terminal of the power source.
3. Connect a supply of CO₂ to the wire feeder. Do not exceed the maximum inlet pressure of the wire feeder.
4. Disconnect the shielding gas hose that connects to the gun bushing.
5. Connect the shielding gas hose to flow meter reference standard.
6. Orient the LN-25™ PRO in a vertical position.
7. Turn power ON.
8. Adjust the flow meter on the LN-25™ PRO to 40 scfh while pressing the GAS PURGE button.
9. Measure the gas flow with the calibrated flow meter while pressing the GAS PURGE button.
10. The measured flow rate should be between 35 and 45 scfh.

The LN-25™ PRO flow meter cannot be calibrated. If the flow meter reads incorrectly, check for leaks or kinks in the gas hose. Replace the flow meter if necessary.

LN-25™ PRO



Wire Feed Speed Validation

(See Figure D.1)

Calibration of the LN-25™ PRO may be required when the p.c. board, wire feed speed potentiometer or motor is replaced or serviced. Calibration matches the scale on the name plate to the actual wire feed speed.

Tools required:

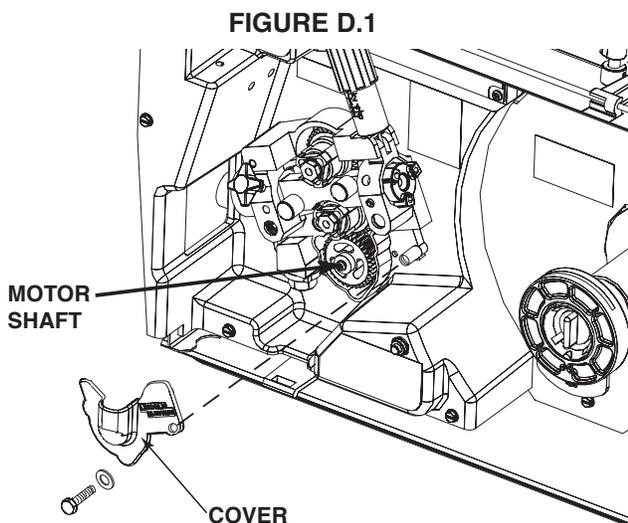
- RPM meter
- Constant voltage DC welding power source (DC-400, V-350, CV-400 or equivalent)
- 7/16" open end wrench

To verify if calibration is necessary:

1. Turn power OFF.
2. Set the wire feed speed per the table.

Model gearing	Wire Feed Speed	Acceptable Range
Normal Speed	400 in/min	69 - 77 rpm
Extra Torque	150 in/min	25 - 31 rpm

3. Remove the plastic cover from the lower portion of the wire drive with a 7/16" wrench.
4. Connect the LN-25™ PRO to the constant voltage DC welding power source. The work lead of the LN-25™ PRO must be connected to the work terminal of the power source.
5. Turn power ON.
6. Measure the motor rpm when the COLD FEED button is pressed.
7. Verify the rpm is within the acceptable range.



To change the wire feed speed calibration:

(See Figure D.2)

Tools required:

- 5/16" nut driver
- RPM meter
- Shorting plug. LE CO, part # S18250-982 - The shorting plug shorts pins 4 & 8 of connector J3 on the Control P.C. Board. J3 is an 8 pin Molex connector.

1. Turn power OFF.
2. Remove the 4 screws holding the rear cover inside the feeder and remove the cover.
3. Open the idle arm.
4. Set the wire feed speed per the table.

Model gearing	Wire Feed Speed
Normal Speed	400 in/min
Extra Torque	150 in/min

5. Connect the LN-25™ PRO to the constant voltage DC welding power source. The work lead of the LN-25™ PRO must be connected to the work terminal of the power source.
6. Turn power ON.
7. Insert the shorting plug into connector J3 on the Control P.C. Board. The shorting plug shorts pins 4 & 8.
8. Remove the shorting plug.
9. Turn power OFF.
10. Replace the cover and secure with the screws.

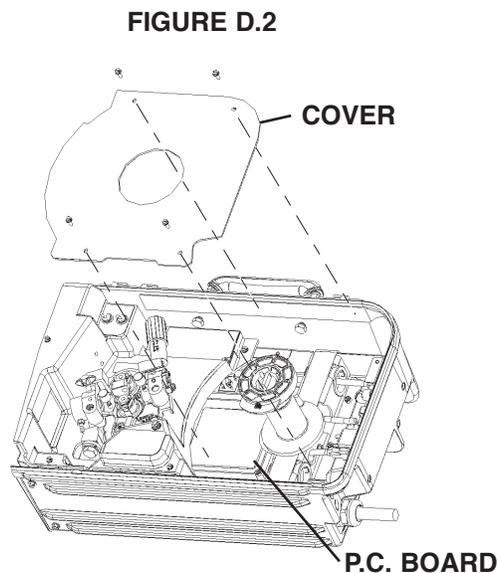
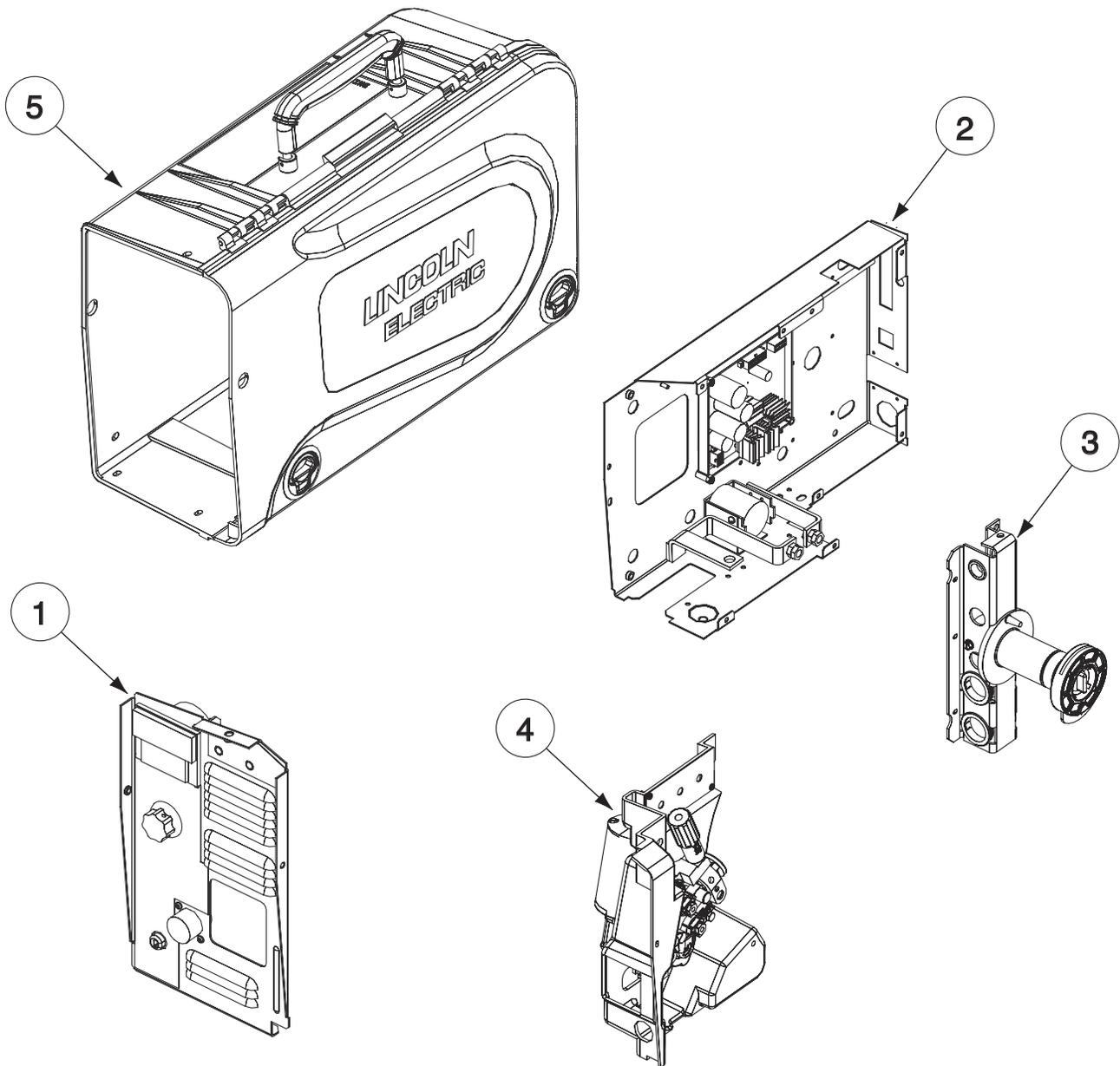


FIGURE D.3. - MAJOR COMPONENT LOCATION

1. FRONT PANEL ASSEMBLY
2. CONTROL BOX ASSEMBLY
3. SPINDLE & MAST ASSEMBLY
4. WIRE DRIVE ASSEMBLY
5. CASE ASSEMBLY



LN-25™ PRO



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FIGURE E.1 – BLOCK LOGIC DIAGRAM.

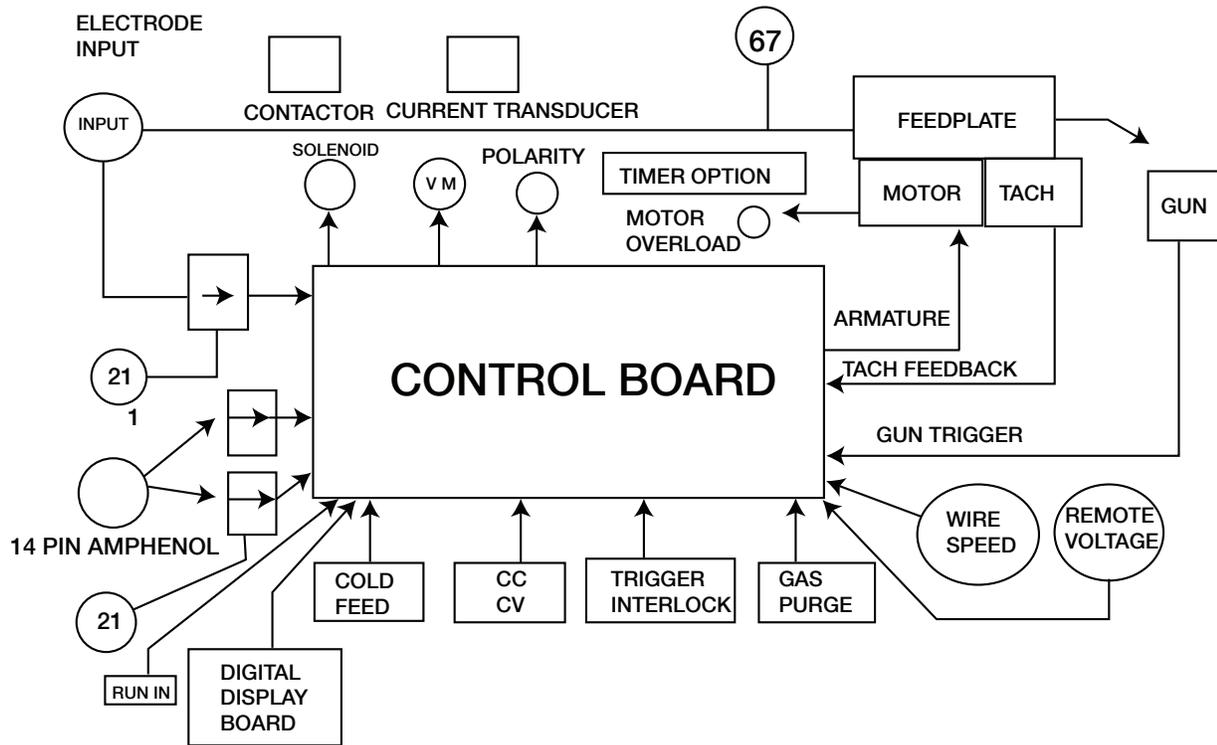
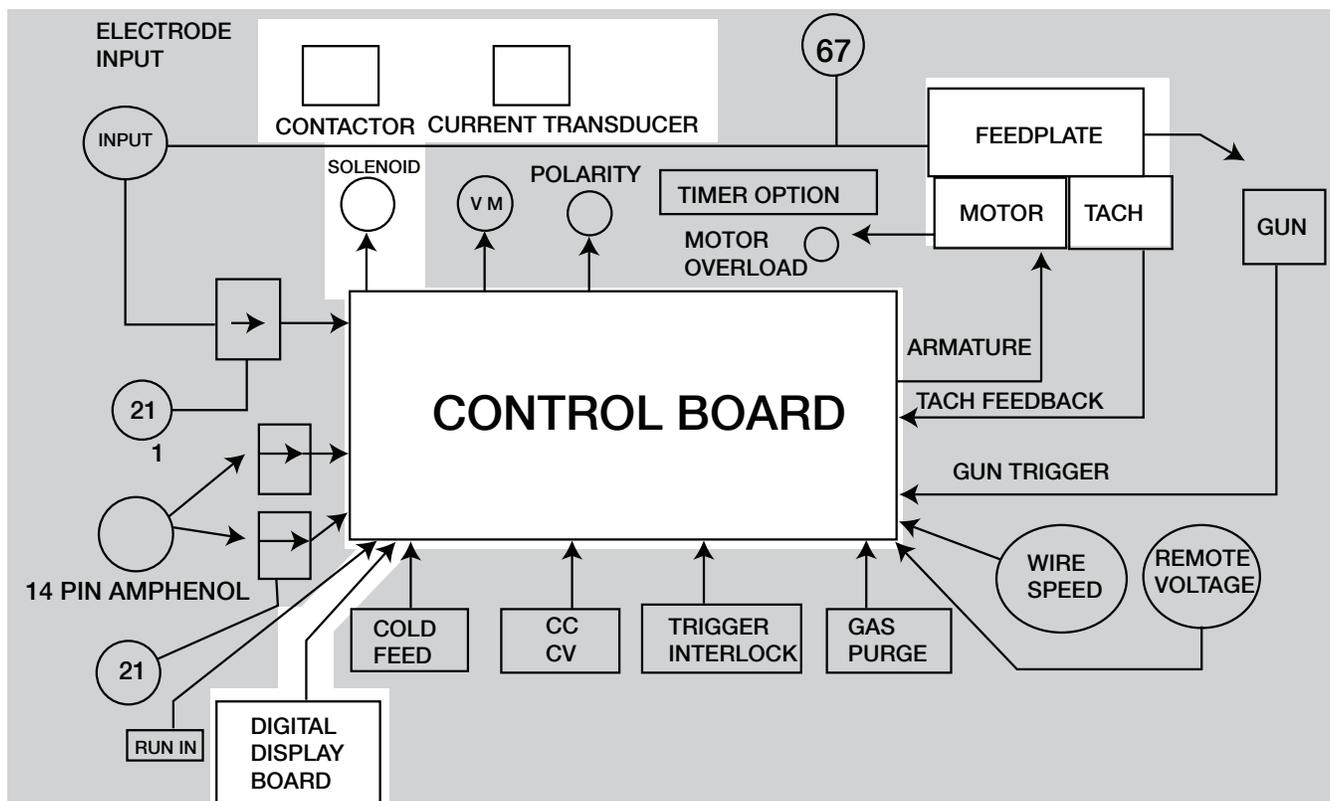


FIGURE E.2 – GENERAL DESCRIPTION



GENERAL DESCRIPTION

Several models of the LN-25™ PRO are offered to best meet the individual welders needs. The Extra Torque model features additional torque for reliable feeding of large diameter FCAW wire. The standard and control cable models feature wire drive gearing for optimal performance with both FCAW and GMAW wires of common sizes. All the models include a gas solenoid and flow meter for the flexibility to run most wire processes. Control Cable models also includes digital meters and remote voltage control.

The plastic case is molded from high impact, flame retardant plastic for durability and low weight. The patent pending design keeps the internal components protected and dry.

The heart of the LN-25™ PRO is a 2 roll MAXTRAC wire drive system. The patented features on the wire drive offer tool-less changing of the drive rolls and wire guides for quick changeovers. A tachometer controlled motor powers the patent pending drive rolls for smooth, steady feeding without slippage.

With only one p.c. board, the LN-25™ PRO is designed to be simple, reliable and easy to service. The p.c. board is manufactured with Lincoln's industry leading environmental design protection which involves mounting the board in a plastic tray and potting it with epoxy.

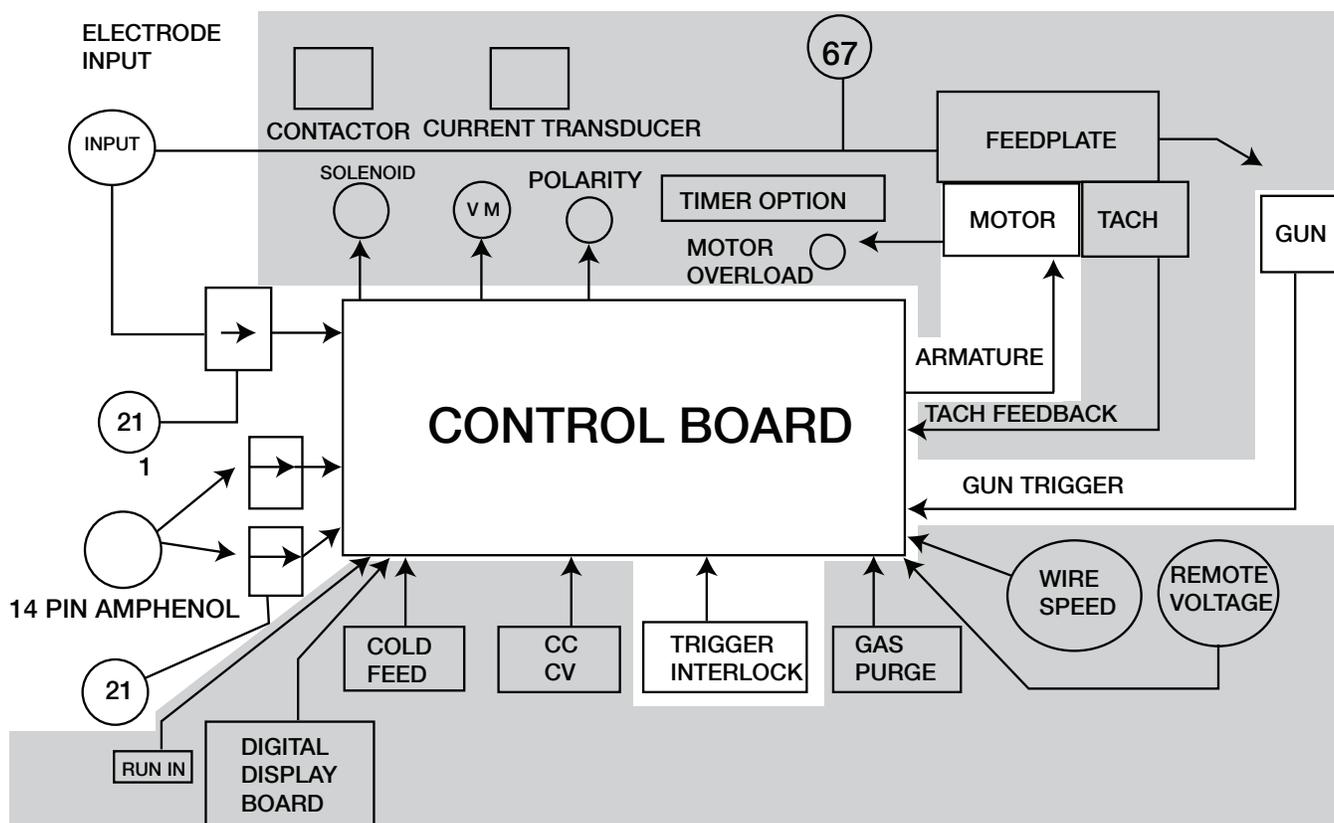
With a 325 amp, 100% duty cycle rating, these feeders are ready for heavy duty welding.

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

LN-25™ PRO



FIGURE E.3 — INPUT POWER & TRIGGER CIRCUIT



INPUT POWER

The DC input voltage is applied from the power source via the electrode cable and the work sensing lead on the across the arc model. With the control cable model 24 to 42VDC is supplied from the power source via the control cable and the work sense lead.

This voltage is applied through a bridge rectifier and an analog voltmeter (across the arc), or digital meter (control cable) and then is supplied to the control board.

The control board regulates and disperses the various supply voltages needed for machine operation.

TRIGGER CIRCUIT

When the gun trigger is closed, the control board is signaled to apply armature voltage to the drive motor and to activate any auxiliary circuits that may be incorporated within the LN-25PRO.

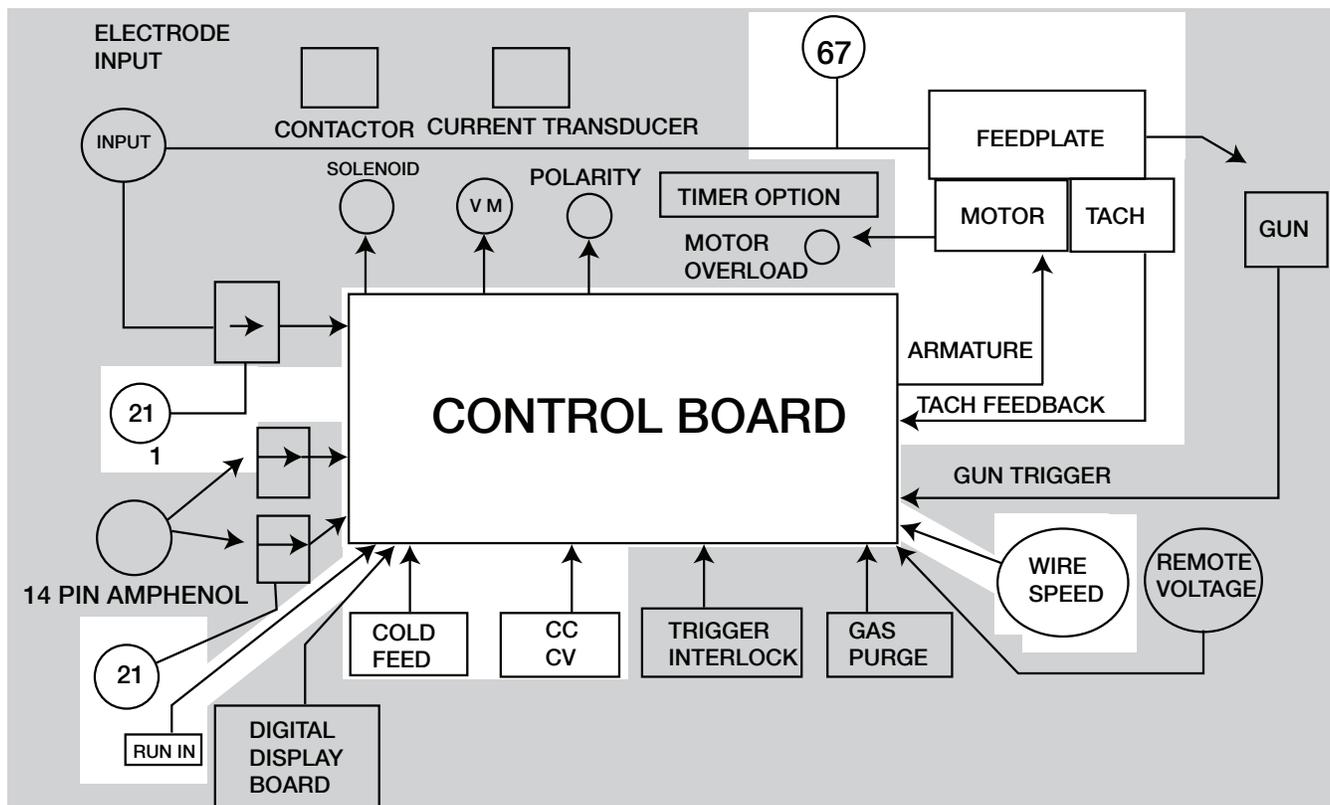
Trigger interlock is used for long welds. When an arc is established the trigger can be released. To stop welding, the gun trigger is pulled again, and when it is released the second time, the welding power source output turns off and the wire speed stops.

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

LN-25™ PRO

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FIGURE E.4 – FEEDBACK & CONTROL CIRCUITS



FEEDBACK AND CONTROL CIRCUITS

The wire speed pot provides command signal to the control board indicating the desired wire speed. The tachometer transforms the motor RPM to a digital frequency that is fed back to the control board.

When operating in constant voltage (CV) mode, the control board monitors the feedback signal, compares it to the command signal and delivers the appropriate voltage to the wire drive motor.

When operating in constant current (CC) mode, a variable wire speed is desirable to compensate for the varying arc voltages associated with the constant current process. To accomplish this, the control board monitors the command voltage, the feedback signal from the tach and the arc voltage.

These three factors are monitored and compared, then the appropriate armature voltage is applied to the wire drive motor.

When the Run-in Switch is on, the wire speed is reduced until an arc is struck. When it is off the run-in wire speed is the same as the welding wire feed speed.

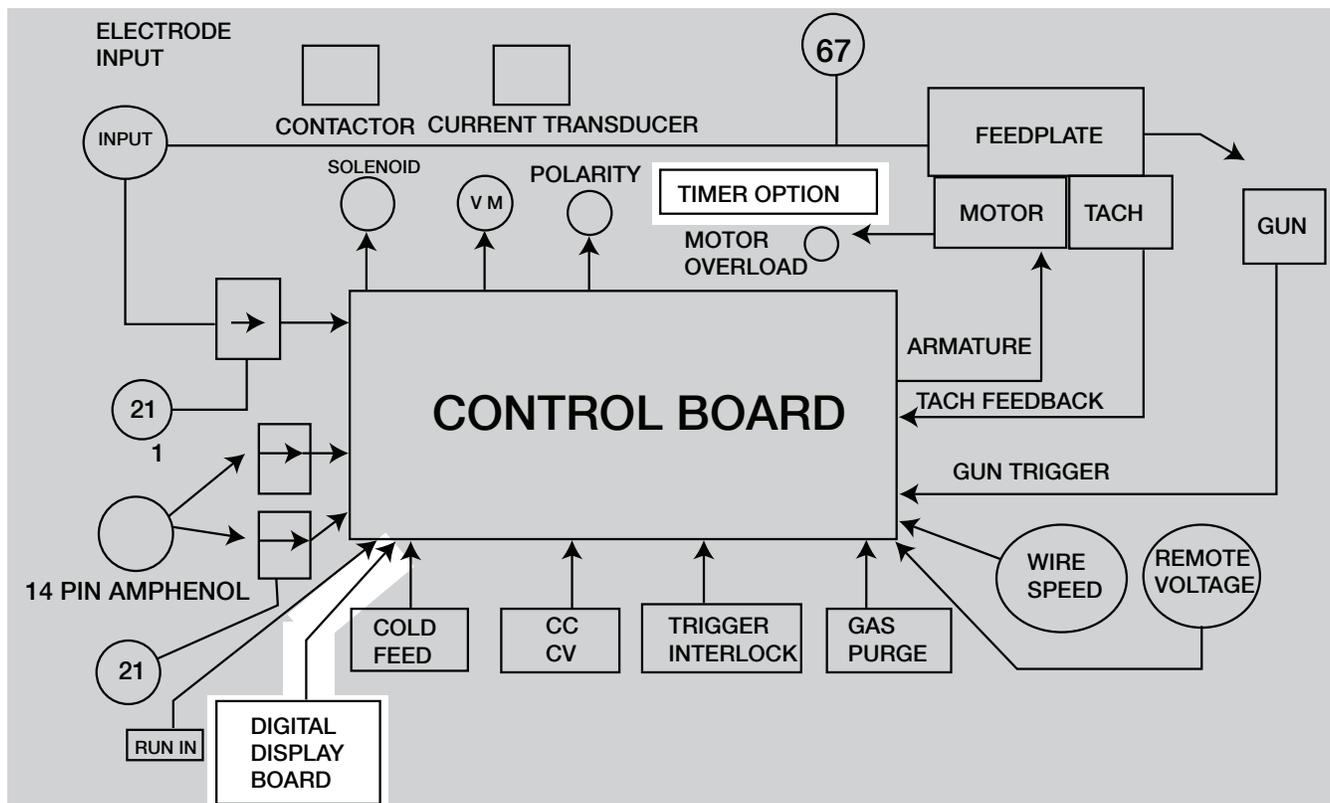
Pressing the cold feed button activates the drive rolls but neither the power source nor the gas solenoid will be activated.

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

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FIGURE E.5 — OPTIONAL CIRCUITS & DIGITAL DISPLAY BOARD



DIGITAL DISPLAY BOARD (control cable models only)

When the wire feeder is not welding, the left display shows the wire feed speed. The default units are “in/min” and may be changed to “m/min” through the setup menu. During welding the left display shows the average welding current, and will continue to hold the last value for 5 seconds after the trigger is released.

When the wire feeder is in idle the right display shows the preset voltage. This voltage will change with different power sources and can be changed through the setup menu. During welding, the right display shows the average welding voltage, and will hold the last value for 5 seconds after the trigger is released.

OPTIONAL CIRCUITS

The preflow, burnback, and postflow timer kit gives control over the shielded gas at the beginning and end of the weld and prepares the end of the wire for the next arc start.

The preflow timer range is zero to 10 seconds. Preflow is used to purge the welding gun with shielding gas and helps to minimize porosity at the start of a weld.

The burnback timer range is zero to 0.25 seconds. Burnback controls the additional amount of time the power source output remains on after the wire drive has stopped feeding wire.

The postflow timer range is zero to 10 seconds. Use postflow to protect the weld while it cools.

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

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HOW TO USE TROUBLESHOOTING GUIDE

⚠ WARNING

Service and Repair should only be performed by 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 the following categories: output problems, function problems, wire feeding problems, and welding problems.

Step 2. PERFORM EXTERNAL TESTS.

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

Step 3. RECOMMENDED COURSE OF ACTION

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 chapter. Refer to the Troubleshooting and Repair Table of Contents to locate each specific Test Procedure. All of the specified 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 tests/repairs safely, contact the Lincoln Electric Service Department for technical 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.**ATTENTION
Static-Sensitive
Devices
Handle only at
Static-Safe
Workstations**

- Remove your body's static charge before opening the static-shielding bag. Wear an anti-static wrist strap. For safety, use a 1 Meg ohm resistive cord connected to a grounded part of the equipment frame.

- If you don't have a wrist strap, touch an un-painted, grounded, part of the equipment frame. Keep touching the frame to prevent static build-up. Be sure not to touch any electrically live parts at the same time.

- Tools which come in contact with the PC board must be either conductive, anti-static or static-dissipative.

- Remove the PC board from the static-shielding bag and place it directly into the equipment. Don't set the PC board on or near paper, plastic or cloth which could have a static charge. If the PC board can't be installed immediately, put it back in the static-shielding bag.

- If the PC board uses protective shorting jumpers, don't remove them until installation is complete.

- If you return a PC board to The Lincoln Electric Company for credit, it must be in the static-shielding bag. This will prevent further damage and allow proper failure analysis.

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

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

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

5. Remove the replacement PC board and substitute it with the original PC board to recreate the original problem.

- a. If the original problem does not reappear by substituting the original board, then the PC board was not the problem. Continue to look for bad connections in the control wiring harness, junction blocks, and terminal strips.

- b. If the original problem is recreated by the substitution of the original board, then the PC board was the problem. Reinstall the replacement PC board and test the machine.

6. Always indicate that this procedure was followed when warranty reports are to be submitted.

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

Observe Safety Guidelines detailed in the beginning of this manual.

PROBLEMS (SYMPTOMS)	POSSIBLE AREAS OF MISADJUSTMENT(S)	RECOMMENDED COURSE OF ACTION
Fault Code	Description	Possible Adjustment
Thermal LED Lit Motor overloaded, long term (Err 81 on Digital Models)	1. The wire drive motor has over-heated.	1. Remove any bends in the gun. 2. Check to see if the wire moves smoothly through the gun and cable. 3. Check the tightness of the spindle brake. 4. Wait for the motor to cool and the error to reset.
Thermal LED Lit Motor overloaded, short term (Err 82 on Digital Models)	1. The wire drive motor is in a locked state causing the motor to exceed it's maximum amperage draw.	1. Verify that the motor can move freely when the pressure arm is released. 2. Verify that the drive system is free of dirt and debris. 3. Perform the MOTOR OVERLOAD TEST .
OUTPUT PROBLEMS		
The feeder does not power up - no display (Digital Models) - no cold feed. NOTE: Both LED's should flash briefly when power is applied.	1. The work sense lead has an open or poor connection (across the arc model). 2. The power source is off. 3. The circuit breaker for the feeder on the power source may have tripped. (Control cable model).	1. Connect the work sense lead to the work in a location free of dirt or paint. 2. Turn on the power source. 3. Reset the circuit breaker.
The wire feeder powers up but there is no welder output when the gun trigger is pulled. The shielding gas flows and the drive rolls turn. (Across the arc models)	1. The contactor coil connections are loose. 2. The contactor has failed.	1. Verify the connections. 2. Check for opens in the leads. 3. Perform the CONTACTOR TEST , replace if necessary.

⚠ CAUTION

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

LN-25™ PRO



Observe Safety Guidelines detailed in the beginning of this manual.

PROBLEMS (SYMPTOMS)	POSSIBLE AREAS OF MISADJUSTMENT(S)	RECOMMENDED COURSE OF ACTION
OUTPUT PROBLEMS		
Inconsistent wire feeding or wire not feeding but the drive rolls are turning.	<ol style="list-style-type: none"> 1. The gun cable is kinked. 2. The wire is jammed in the gun cable. 3. The gun liner is dirty or worn. 4. The electrode is rusty or dirty. 5. The gun tip is worn or has splatter. 6. Improper gun liner, tip, drive rolls, or wire guides. 7. Incorrect pressure on the wire drive rolls. 8. Spindle brake too tight. 9. Worn drive rolls. 	<ol style="list-style-type: none"> 1. Keep the gun as straight as possible. Avoid sharp corners or bends in the gun cable. 2. Remove the gun and clear the jam. 3. Clear liner with pressurized air (40 PSI) or less. Change liner if worn. 4. Use only clean electrode. Use only quality electrode, like L-50 or L-56 from the Lincoln Electric. 5. Replace the contact tip. 6. Verify the proper parts are installed. 7. Adjust the tension arm per the manual. Most electrodes feed well with the tension at around "3". 8. Verify the spool moves with minimal effort. 9. Replace the drive rolls if needed.
Wire feed speed consistently operates at the wrong value. The speed changes when the control knob is adjusted.	<ol style="list-style-type: none"> 1. The jumper lead for normal speed / extra torque is connected improperly. 2. The wrong gear is installed in the wire drive unit. 3. The motor brushes are worn. 	<ol style="list-style-type: none"> 1. Properly connect the jumper. 2. Install the proper pinion gear in the wire drive unit. 3. Replace the motor/gearbox assembly.
This wire feeds but cannot be controlled with the wire speed pot.	<ol style="list-style-type: none"> 1. The tachometer is connected improperly. 2. The tachometer has failed. 	<ol style="list-style-type: none"> 1. Verify that tachometer leads are properly connected. 2. Perform the MOTOR AND TACHOMETER TEST. Replace the tachometer if necessary. 3. Possible control board problem.

⚠ CAUTION

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

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Observe Safety Guidelines detailed in the beginning of this manual.

PROBLEMS (SYMPTOMS)	POSSIBLE AREAS OF MISADJUSTMENT(S)	RECOMMENDED COURSE OF ACTION
OUTPUT PROBLEMS		
Variable or "hunting" arc.	<ol style="list-style-type: none"> 1. Wrong size, worn or melted tip. 2. Worn work cable or poor connection. 3. Wrong polarity' 4. The gas nozzle is extended beyond the contact tip or the wire stickout is too long. 5. Poor gas shielding on processes requiring gas. 	<ol style="list-style-type: none"> 1. Replace the tip. 2. Verify all the work and electrode connections are tight and in good condition Clean if necessary and replace. 3. Adjust polarity to recommended procedure verify DIP switch 7 setting matches the electrode polarity. 4. Adjust the gas nozzle and shorten the stickout to 1/2 to 3/4 inches. 5. Check gas flow and mixture. Remove or block sources of drafts. Perform the GAS SOLENOID TEST, replace if necessary.
When the trigger is pulled, the wire feeds slowly. (Digital display models)	The Run-in switch is "ON"	Turn the run-in switch to the "OFF" position.
The preset voltage does not match the power source voltage. (Digital display models)	The preset voltage calibration in the feeder has been selected for a different power source.	Use the setup menu to change the preset voltage in the feeder to match the power source.
Poor arc starts with sticking or "Blast-offs", weld porosity, narrow or ropy looking beads.	Improper procedures or techniques.	See "Gas metal arc welding guide" (GS-100)

⚠ CAUTION

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

LN-25™ PRO



Observe Safety Guidelines detailed in the beginning of this manual.

PROBLEMS (SYMPTOMS)	POSSIBLE AREAS OF MISADJUSTMENT(S)	RECOMMENDED COURSE OF ACTION
GAS SHIELDING ISSUES		
No shielding gas.	<ol style="list-style-type: none"> 1. The gas supply is off or empty. 2. The gas hose is cut or crushed. 3. The flow meter is closed. Dirt or debris is in the solenoid. 4. There is a loose connection at the solenoid. 5. The solenoid has failed. 	<ol style="list-style-type: none"> 1. Verify the gas supply is ON and flowing. 2. Reroute the gas hose to avoid sharp corners and make sure nothing is on it. Repair or replace damaged hoses. 3. Open the flow meter valve. 4. Apply 80 psi of filtered air to the solenoid to remove dirt and debris. 5. Remove the cover and verify that all the connections are in good condition. 6. Perform the GAS SOLENOID TEST, replace if necessary.

⚠ CAUTION

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

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CASE REMOVAL PROCEDURE**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 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 molded case assembly

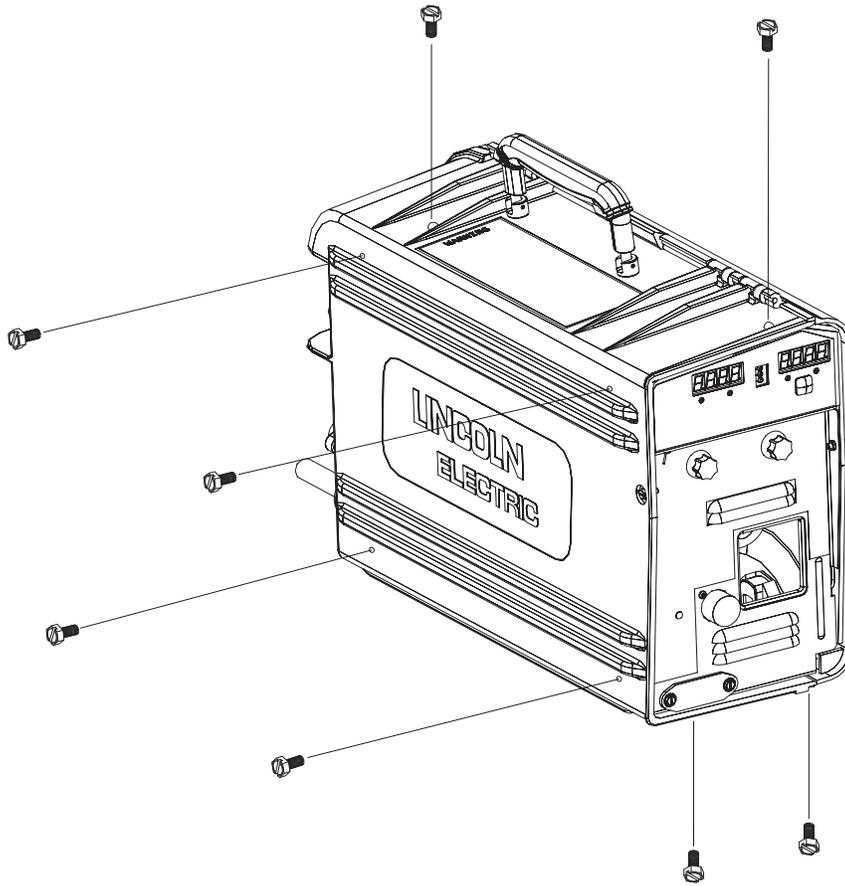
MATERIALS NEEDED

Misc. Hand Tools

TROUBLESHOOTING & REPAIR

CASE REMOVAL PROCEDURE (CONTINUED)

FIGURE F.1 – CASE REMOVAL



PROCEDURE

1. Remove the input power from the LN25 PRO unit.
2. Using the 1/4-20 nut driver, remove the 8 screws holding the control box. Loosen the cord grip connector, and slide the control box assembly out of the case. See **Figure F.1**

LN-25™ PRO



GAS SOLENOID TEST**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 or machine operator and will invalidate your factory warranty. For your safety and to avoid electrical shock, please observe all safety notes and precautions detailed throughout this manual.

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

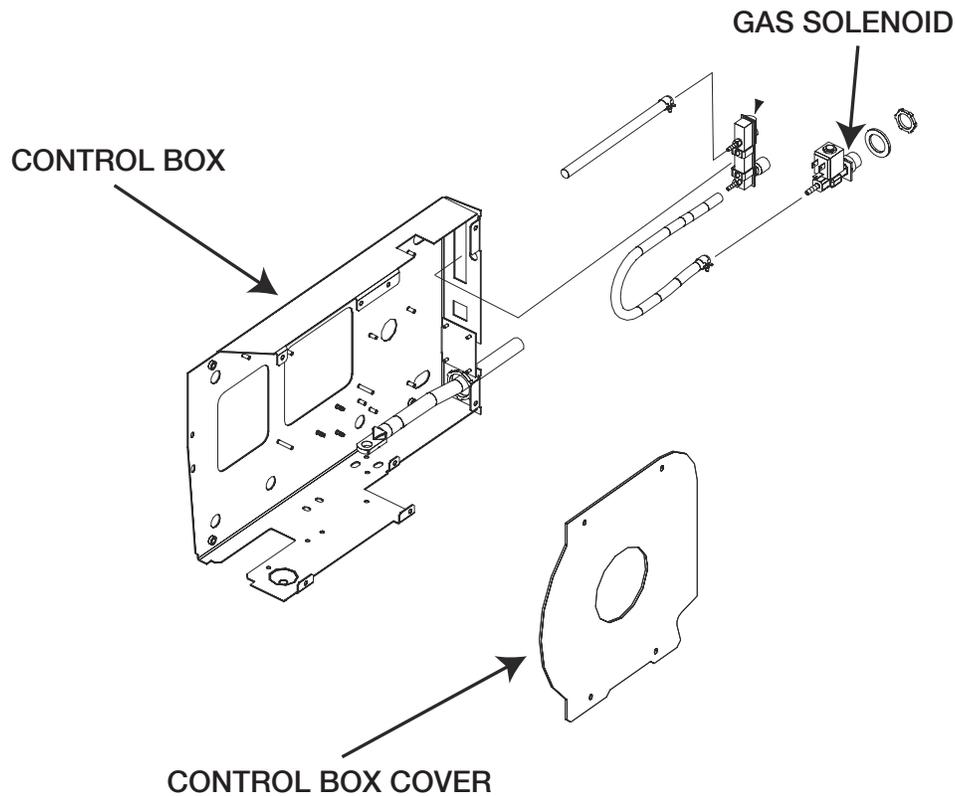
TEST DESCRIPTION

This test will determine if the gas solenoid circuit is faulty.

MATERIALS NEEDED

1/4-20 Nut driver
#10-24 Nut driver
Digital meter

FIGURE F.2 – GAS SOLENOID



PROCEDURE

1. Perform the **Case Removal Procedure**.
2. Remove the five #10-24 x .50 screws holding the control box cover and access the solenoid leads. See **Figure F2**.
3. Apply the correct input voltage (15-110vdc) to the unit.
4. While pressing the gas purge button or activating the gun trigger, check for approximately 4VDC is present at the solenoid leads. If the 4VDC is present the solenoid should activate. If the 8VDC is present but the solenoid does not activate the solenoid may be faulty.
5. If the 4VDC is missing or low, check the leads and connections between the solenoid and the control board. See the **Wiring Diagram**. If the leads and connections are ok, the control board may be faulty.
6. If high voltage is seen (Approx. 35 volts) the solenoid coil is open.
7. Normal solenoid coil resistance is 22 ohms.
8. The solenoid can also be checked by disconnecting the leads and applying 12VDC directly to the terminals. If the solenoid does not activate the solenoid is faulty.
9. If the solenoid fails any of the above tests replace it.
10. Reassemble the feeder in reverse order.

CONTACTOR TEST**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 or machine operator and will invalidate your factory warranty. For your safety and to avoid electrical shock, please observe all safety notes and precautions detailed throughout this manual.

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

TEST DESCRIPTION

This test will determine if the contactor is faulty.

MATERIALS NEEDED

1/4-20 Nut driver
#10-24 Nut driver
Digital meter

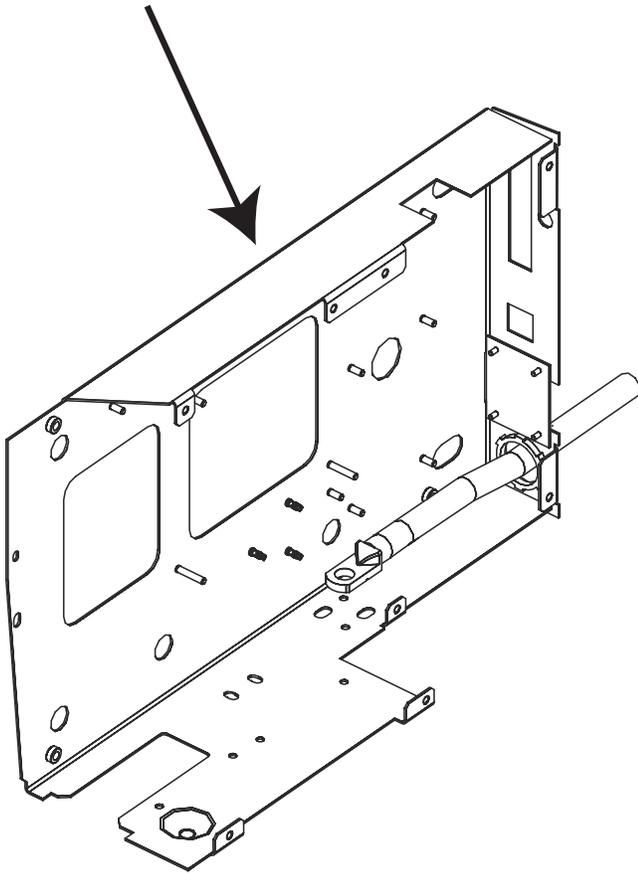
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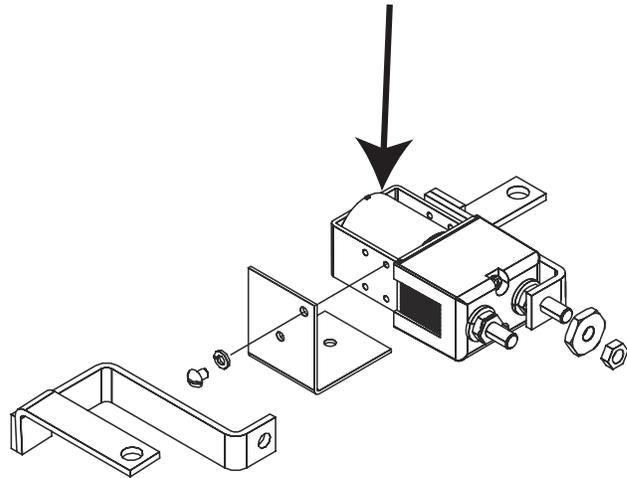
CONTACTOR TEST (CONTINUED)

FIGURE F.3 – CONTACTOR

CONTROL BOX



CONTACTOR



PROCEDURE

1. Perform the **Case Removal Procedure**.
2. Remove the 5 #10-24 x .50 screws holding the control box cover to access the contactor leads. See **Figure F.2**.
3. Apply the correct input voltage (15-110vdc) to the LN25 PRO unit.
4. Check for the correct voltage at leads 507 and 578 at the contactor. Look for 0VDC when the trigger is open and about 3VDC when it is closed. See wiring diagram.
5. If the 3VDC is missing or low, check the leads and connections between the Contactor and the control board. See the **Wiring Diagram**. If the leads and connections are ok, the control board may be faulty.
6. If high voltage is seen (Approx. 35 volts) the Contactor coil is open.
7. Normal solenoid coil resistance is 4 ohms.
8. The Contactor can also be checked by disconnecting the leads and applying 12VDC directly to the terminals. If the solenoid does not activate the solenoid is faulty.
9. If the contactor does not pass all the above tests it needs to be replaced. See **contactor removal and replacement procedures**.
10. Reassemble the feeder in reverse order.

TROUBLESHOOTING & REPAIR

DRIVE MOTOR AND TACH FEEDBACK TEST



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 or machine operator and will invalidate your factory warranty. For your safety and to avoid electrical shock, please observe all safety notes and precautions detailed throughout this manual.

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

TEST DESCRIPTION

This test will help determine if the motor and tach circuit is faulty.

MATERIALS NEEDED

1/4-20 nut driver
#10-24 nut driver
Digital meter

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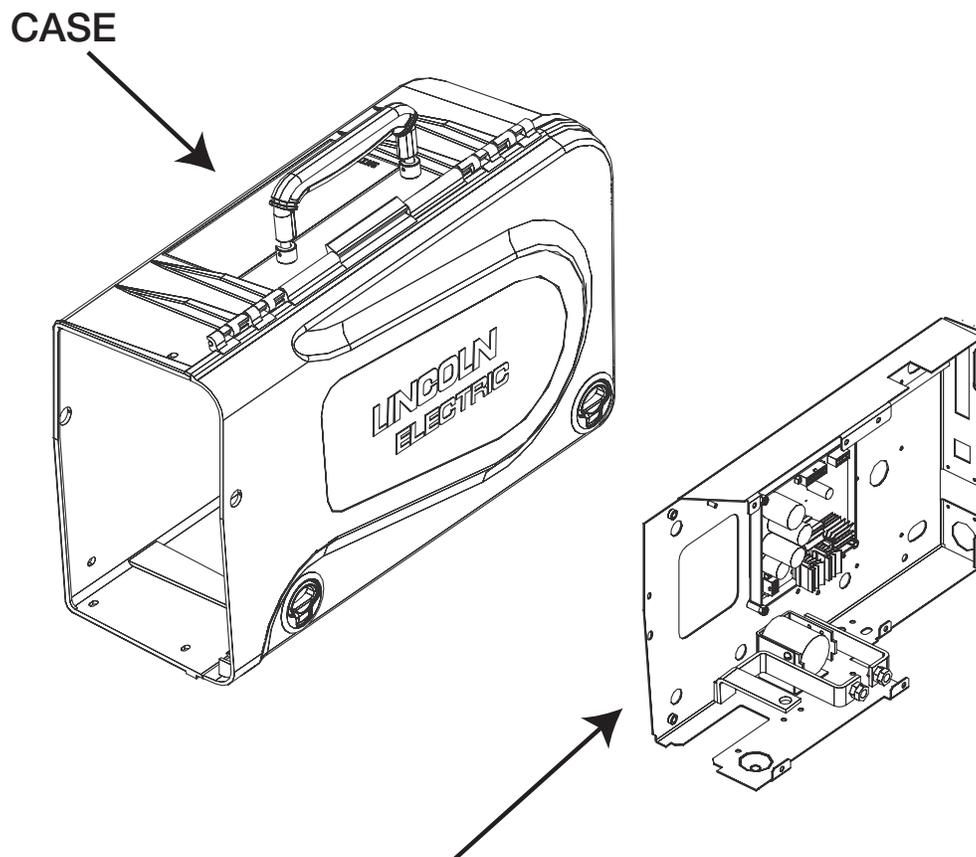
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DRIVE MOTOR AND TACH FEEDBACK TEST (*CONTINUED*)

FIGURE F.4 – CONTROL BOX ASSEMBLY



CONTROL BOX ASSEMBLY

PROCEDURE

1. Perform the **Case Removal Procedure**.
2. Remove the 5 #10-24 x .50 screws holding the control box cover to access the contactor leads. **See Figure F.2.**
3. Remove the 5 #10-24 screws holding the control box cover, and locate the two motor leads and the 3 tach leads See the **Wiring Diagram**.
4. Apply the correct input voltage (15-110vdc) to the unit.
5. With trigger activated and the motor running check for 2.6VDC min. to 32VDC max. between the black and white motor leads (pins 7 and 8).
6. Check for 1.5 ohms of resistance between the black and white leads. Also make sure there is at least 550k ohms of resistance between both leads and the motor shell.
7. With the trigger activated and the motor running check for 15.6VDC input on the black and red tach leads. Check for 6.2vdc at any speed or $\approx 72\text{hz}$ (min.) to $\approx 1.2\text{Khz}$ (max). on the black and blue return leads.
8. For further testing on the drive motor you can use an isolated source and apply between 2.6VDC and 32VDC to the motor leads.
9. If all the above voltages are not there the motor or tach needs to be replaced. **See Wire Drive Motor and Gear Box Removal and Replacement.**

NOTE: If the tach feedback is missing the board will limit the motor voltage to 10VDC no matter where the w/s pot is set.

LN-25™ PRO



MOTOR OVERLOAD TEST**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 or machine operator and will invalidate your factory warranty. For your safety and to avoid electrical shock, please observe all safety notes and precautions detailed throughout this manual.

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

TEST DESCRIPTION

This test will determine if the motor overload circuit is faulty.

MATERIALS NEEDED

1/4-20 nut driver
#10-24 nut driver
Digital meter

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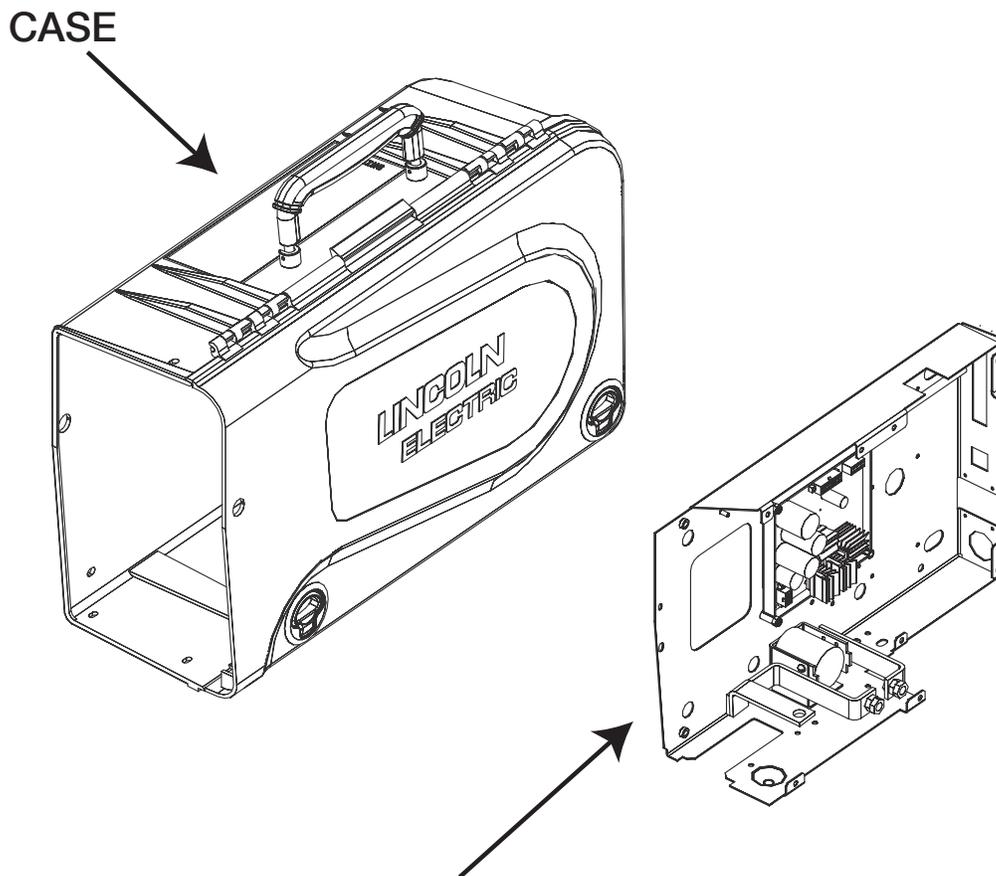
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FIGURE F.5 – CONTROL BOX ASSEMBLY



CONTROL BOX ASSEMBLY

PROCEDURE

1. Perform the **Case Removal Procedure**.
2. Remove the 5 #10-24 x .50 screws holding the control box cover to access the contactor leads. See **Figure F.2**.
3. Remove the five #10-24 screws holding the control box cover, and locate the two motor leads and 3 tach leads. See the **Wiring Diagram**.
4. Apply the correct input voltage (15-110vdc) to the unit.
5. With the trigger activated and the motor running check the motor armature current. Normal armature current is less than 3 amps.
6. If the amperage exceeds 3.2 amps for more than 8 seconds the motor will be disabled.
7. If the motor armature current is normal and the motor still shuts down the control board may be faulty.
8. If the current is high check for restrictions in the feed system. They can be caused by a clogged liner, spindle tightness, drive rolls to tight, fault drive motor or a faulty gearbox.
9. After testing replace faulty parts and reassemble the feeder in reverse order of disassembly.

CONTACTOR REMOVAL AND REPLACEMENT PROCEDURE



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 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 contactor.

MATERIALS NEEDED

1/4-20 nut driver
#10-24 nut driver
Adjustable wrench
Torque wrench

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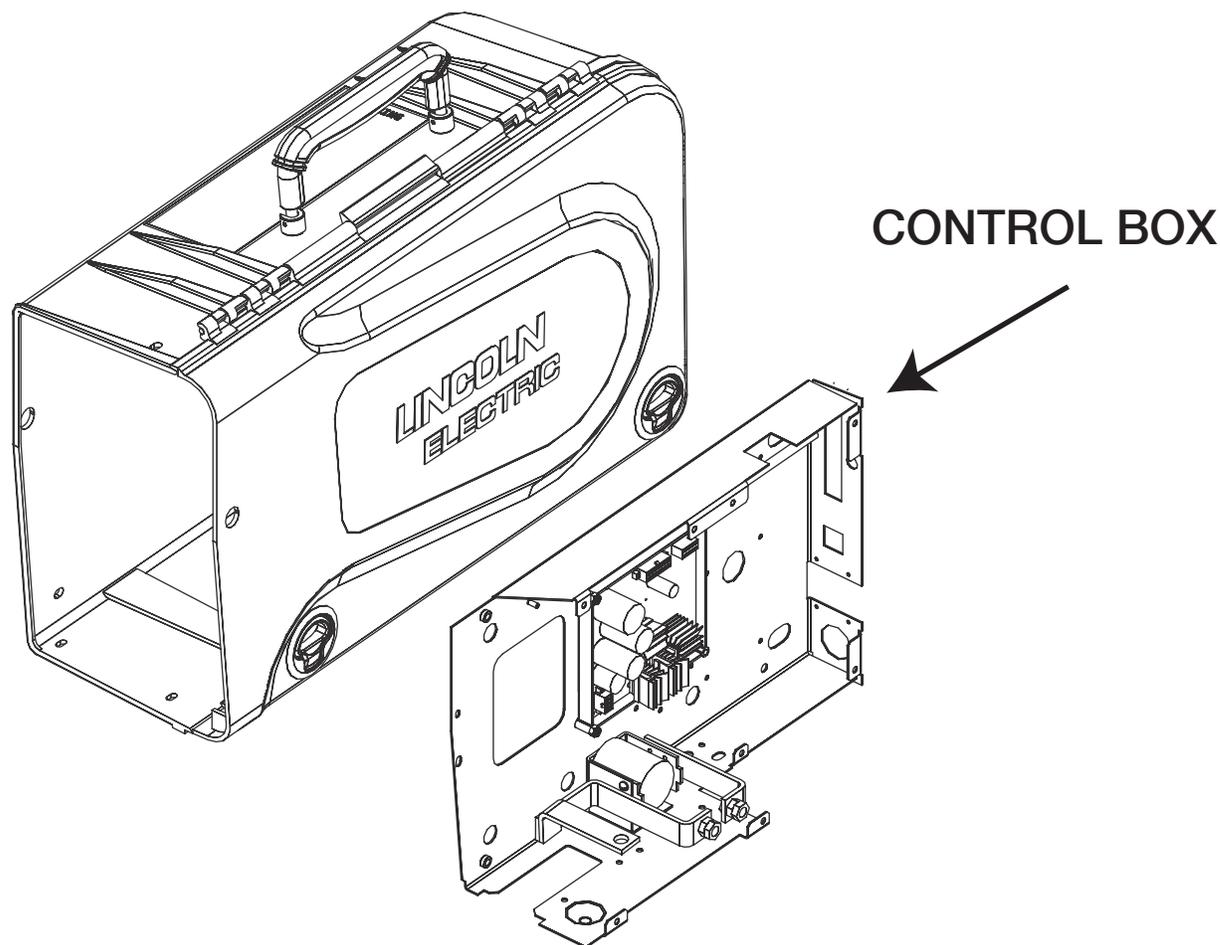
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CONTACTOR REMOVAL AND REPLACEMENT PROCEDURE (*CONTINUED*)

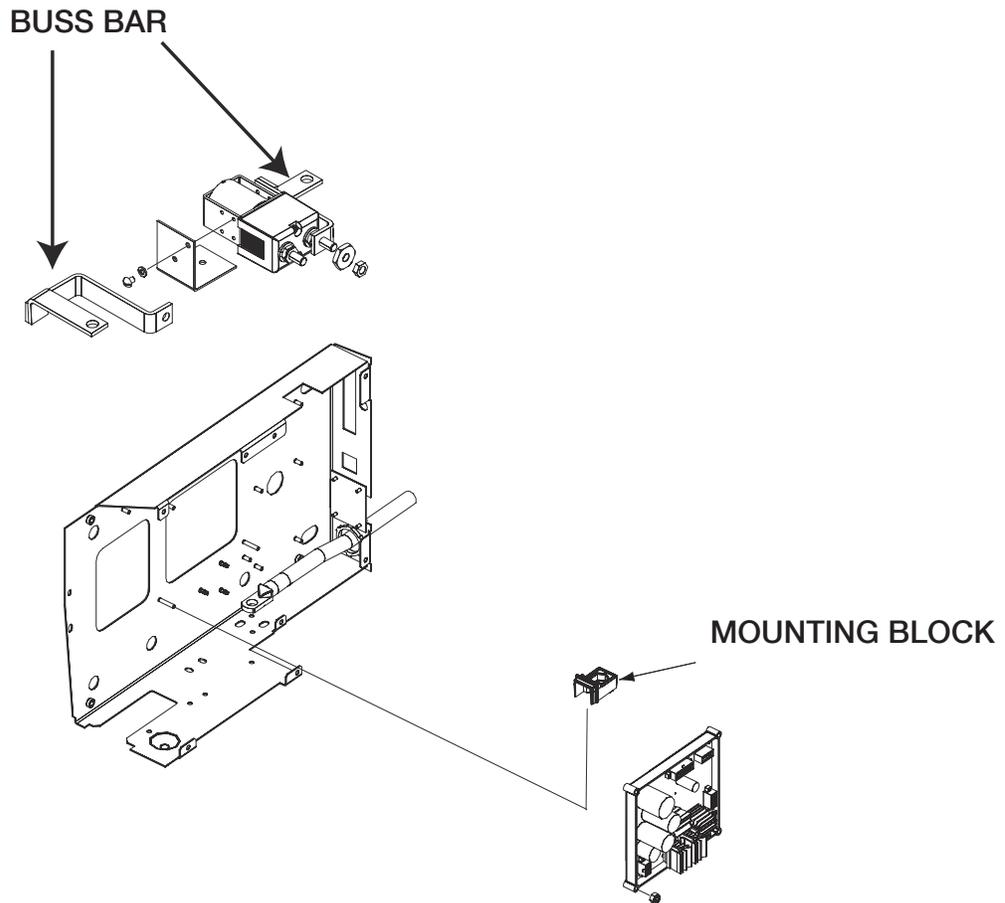
FIGURE F.6 – CONTROL BOX

**REMOVAL PROCEDURE**

1. Perform the **Case Removal Procedure**.
2. Remove the 5 #10-24 x .50 screws holding the control box cover to access the contactor leads. See **Figure F.2**.
3. Disconnect both of the buss bar connectors. DO NOT loosen the mounting block before loosening the buss bar. See **Figure F.6**.
4. Remove the five #10-24 x .50 screws from the wire drive panel, and separate the panel from the control box.
5. Remove the two #10-24 x .50 screws at the base of the control box that holds the contactor and remove the contactor.
6. Disconnect the coil leads, and the buss bars from the contactor.

CONTACTOR REMOVAL AND REPLACEMENT PROCEDURE (*CONTINUED*)

FIGURE F.7 – BUSS BAR AND MOUNTING BLOCK



REPLACEMENT PROCEDURE

1. Loosely connect the buss bars to the new contactor.
2. Reconnect the coil leads. Slide the buss bar into the mounting block and start the 1/2-13 bolt.
3. Using the two #10-24 x .50 screws reattach the contactor to the control box.
4. Tighten the buss bars to the contactor to 15fp.
5. Slide the wire drive panel into place and reattach using the five screws.
6. Reconnect the gas hose and tighten the other two buss bar connections.
7. Slide the control box into the case and reassemble in reverse order.

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FRONT PANEL REMOVAL AND REPLACEMENT PROCEDURE**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 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 front panel.

MATERIALS NEEDED

1/4-20 Nut driver

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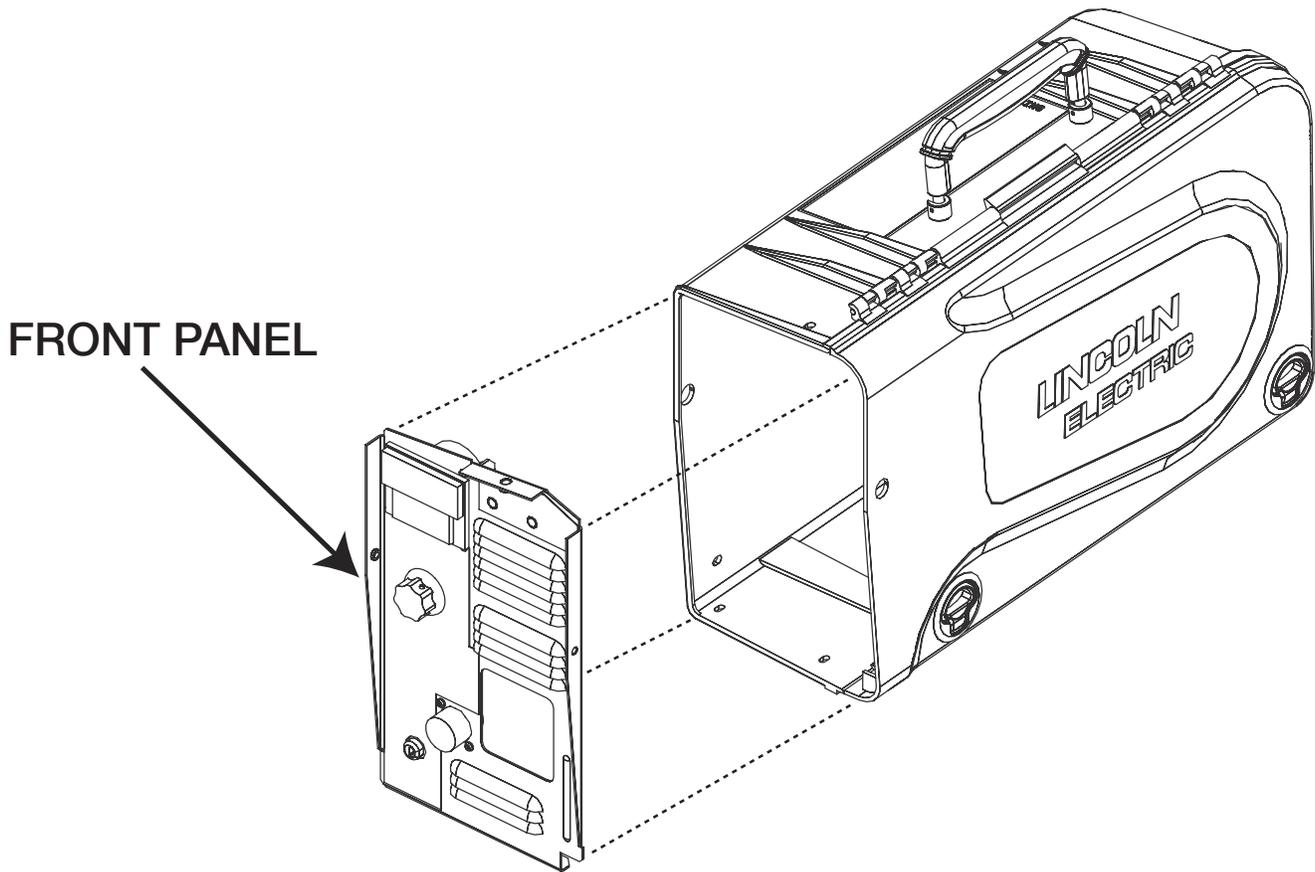
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FRONT PANEL REMOVAL AND REPLACEMENT PROCEDURE (*CONTINUED*)

FIGURE F.8 – FRONT PANEL



REMOVAL PROCEDURE

1. Perform the *Case Removal Procedure*.
2. Remove the 5 #10-24 x .50 screws holding the control box cover to access the contactor leads. See *Figure F.2*.
3. Remove the two 1/4-20 screws that hold the front panel and lift it out. See *Figure F.8*.
4. Disconnect the molex plugs from the control harness. See wiring diagram.
5. Disconnect the work lead and set it aside to use with the new panel.

REPLACEMENT PROCEDURE

1. Connect the work lead that was previously removed.
2. Reconnect the molex plugs.
3. Slide the front panel into the control box and attach it with two 1/4-20 screws.
4. Slide the control box into the case and attach it with the remaining 1/4-20 screws.

WIRE DRIVE MOTOR AND GEAR BOX REMOVAL AND REPLACEMENT PROCEDURE



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 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

The procedure will aid the technician in the removal and replacement of the wire drive motor and gear box.

MATERIALS NEEDED

1/4-20 Nut driver
#10-24 Nut driver
3/8 nut driver
Phillips head screwdriver

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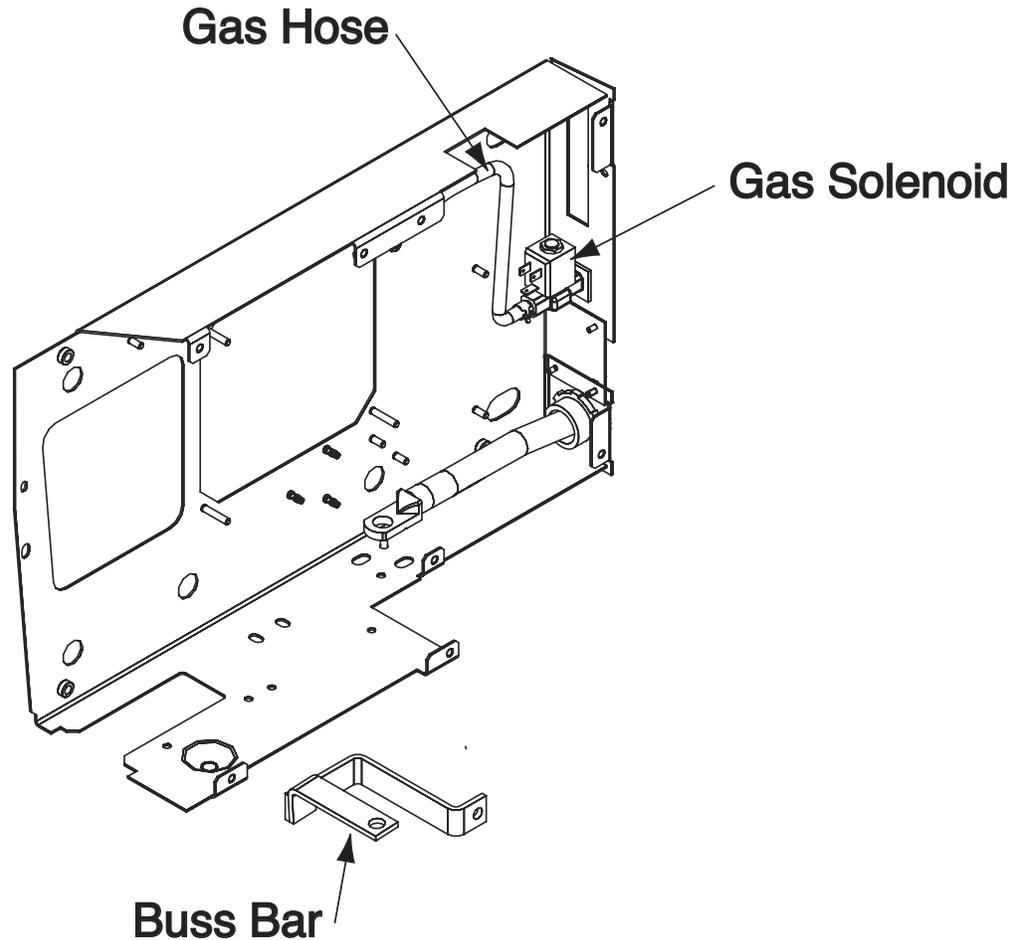
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WIRE DRIVE MOTOR AND GEAR BOX REMOVAL AND REPLACEMENT PROCEDURE (*CONTINUED*)

FIGURE F.9 – BUSS BAR AND GAS HOSE REMOVAL



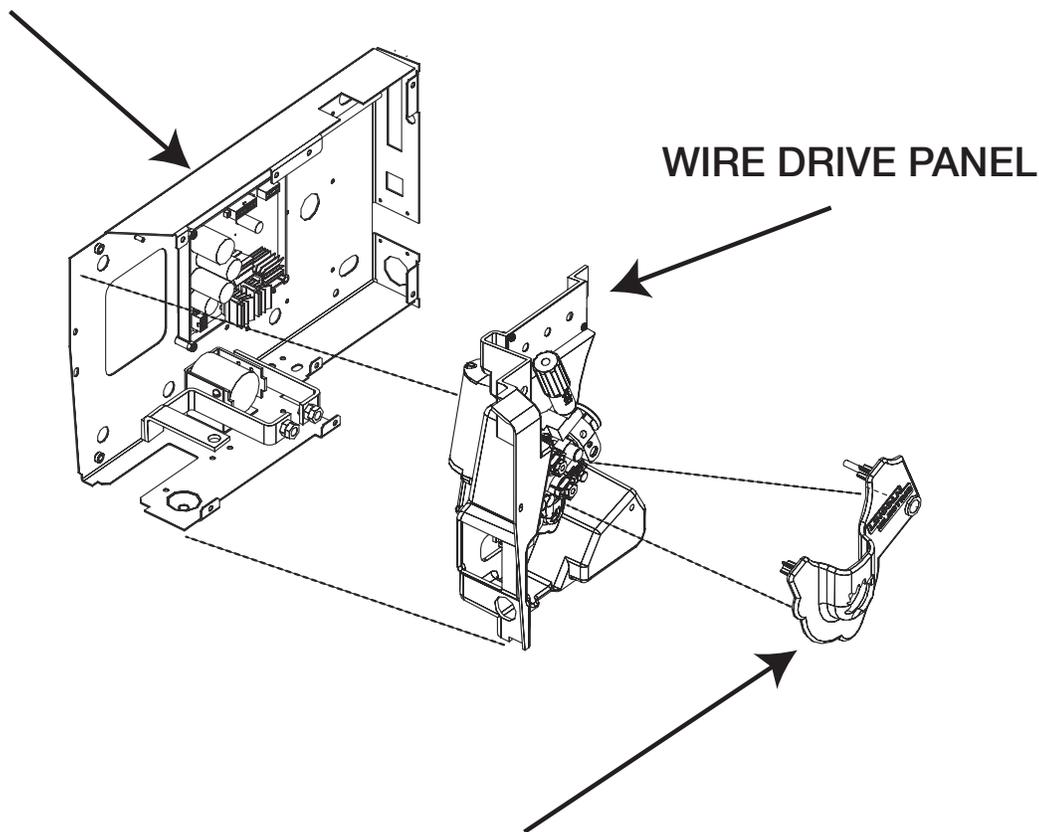
REMOVAL PROCEDURE

1. Perform the **Case Removal Procedure**.
2. Remove the 5 #10-24 x .50 screws holding the control box cover to access the contactor leads. See **Figure F.2**.
3. Disconnect the gas hose and the buss bar from the drive deck. See **Figure F.9**.
4. Remove the four #10-24 x .50 screws holding the control box cover.
5. Remove the five #10-24 x .50 screws from the wire drive panel, and separate the panel from the control box. See **Figure F.10**.
6. Remove the plastic drive gear cover and with a phillips head screwdriver remove the drive gear. See **Figure F.10**.
7. Remove the tach and motor leads by disconnecting the P9 connector. see wiring diagram.
8. Remove the three M6 x 1.00 phillips pan head screws holding the motor to the motor panel and lift out the motor.
9. Remove the four 1/4-20 x .50 screws from the back of the motor panel and remove the drive deck. Note screw locations for reassembly.

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

FIGURE F.10 – WIRE DRIVE PANEL REMOVAL

CONTROL BOX



DRIVE GEAR COVER

REPLACEMENT PROCEDURE

1. Line up the gear box with the four holes on the panel. Replace and tighten the four 1/4-20 x .50 screws.
2. Insert the drive motor through the panel and gear box. Line up and tighten the three M6 x 1.00 in. phillips pan head screws.
3. Replace the drive gear and secure in place using the screw and lock washer previously removed.
4. Replace the drive rolls and secure the locking rings.
5. Reconnect the motor and tach leads to harness.
6. Reassemble the wire drive panel and the control box using the five #10-24 x .50 screws.
7. Reconnect the gas hose and the buss bar assembly.
8. Replace the control box cover using the four #10-24 x .50 screws.
9. Slide the control box into the case and secure it in reverse order.
10. Reinstall the gun.

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PC BOARD REMOVAL AND REPLACEMENT PROCEDURE



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 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

The procedure will aid the technician in the removal and replacement of the Control PC Board.

MATERIALS NEEDED

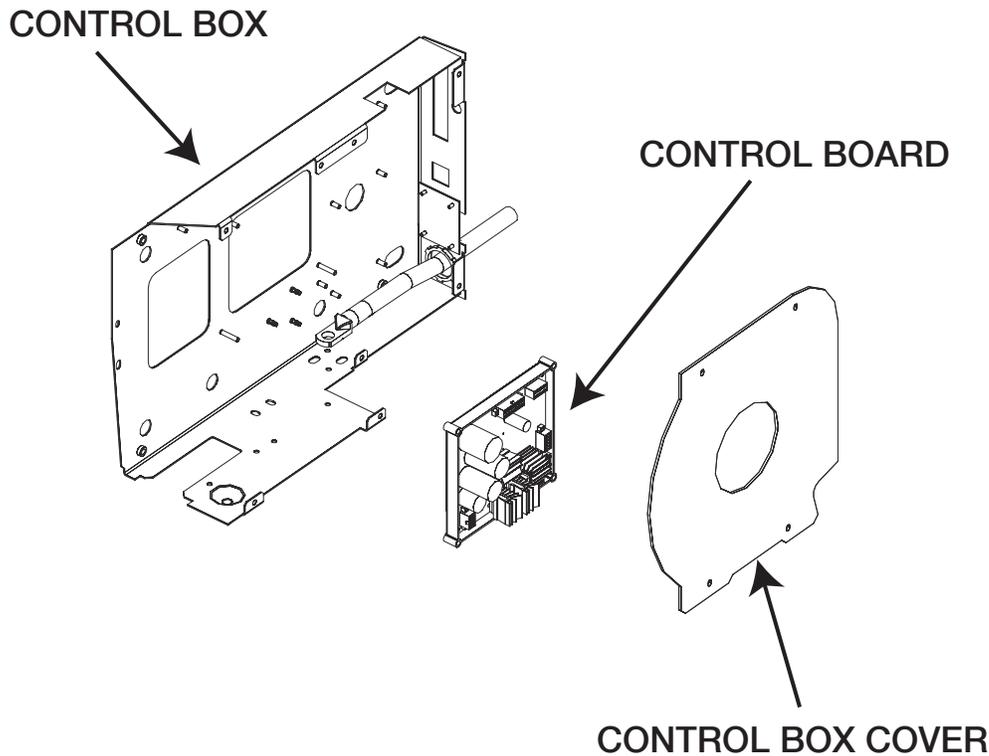
1/4-20 Nut driver
#10-24 Nut driver
3/8 Nut driver

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PC BOARD REMOVAL AND REPLACEMENT PROCEDURE (*CONTINUED*)

FIGURE F.11 – CONTROL PC BOARD LOCATION

**REMOVAL PROCEDURE**

1. Perform the **Case Removal Procedure**.
2. Remove the 5 #10-24 x .50 screws holding the control box cover to access the contactor leads. See **Figure F.2**.
3. Disconnect the gas hose and the buss bar from the drive deck.
4. Remove the five #10-24 x .50 screws from the wire drive panel and separate the panel from the box to access the control board.
5. Locate the control board and remove the harness plugs on the control board. Observe static electricity precautions. Label plugs for reassembly. See **Figure F.11**.
6. Remove the 4 nuts holding the board using the 3/8 inch nut driver, and remove the board.

REPLACEMENT PROCEDURE

1. Remove the new control board from the static bag and place it on the 4 studs.
2. Reassemble the 4 nuts and tighten hand tight.
3. Reassemble the harness plugs.
4. Replace the wire drive panel and control box assembly in reverse order.
5. Reconnect the buss bar and the gas hose.
6. Replace the control box cover.
7. Slide the control box into the case and secure it in reverse order.

GAS SOLENOID REMOVAL AND REPLACEMENT PROCEDURE



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 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

The procedure will aid the technician in the removal and replacement of the gas solenoid.

MATERIALS NEEDED

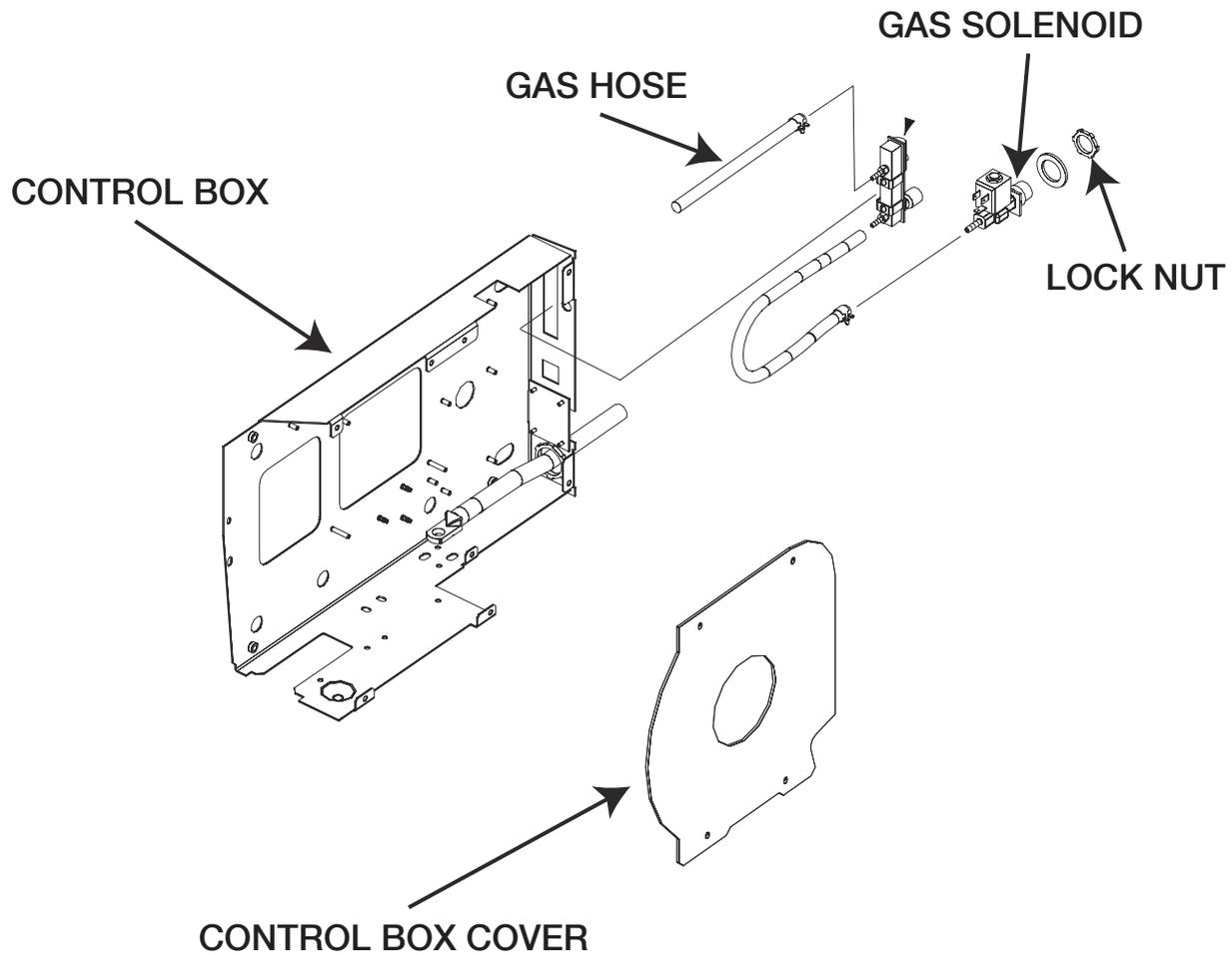
#10-24 nut driver
Adjustable pliers

Return to Section TOC

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GAS SOLENOID REMOVAL AND REPLACEMENT PROCEDURE (*CONTINUED*)

FIGURE F.12 – SOLENOID NUT AND HOSE



PROCEDURE

1. Perform the **Case Removal Procedure**.
2. Remove the 5 #10-24 x .50 screws holding the control box cover to access the contactor leads. **See Figure F.2**.
3. Remove the 2 wires on the solenoid coil. See wiring diagram.
4. Using the pliers remove the gas hose. Be careful not to damage the hose. **See Figure F.12**.
5. Remove the lock nut holding the solenoid. **See Figure F.12**.
6. Remove the solenoid from the unit.
7. Install the new solenoid with the attached hardware.
8. Reconnect the gas hose.
9. Reconnect the wires to the solenoid coil.
10. Replace the control box cover.

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LN-25™ PRO



Electrical Diagrams **G-1**

 Wiring Diagram - Code 11387, 11388 (G5681) G-2

 Wiring Diagram - Code 11507, 11508 (G5681-1) G-3

 Wiring Diagram - Code 11620, 11621,11716,11717 (G5681-2) G-4

 Wiring Diagram - Code 11746, 11747 (G5681-3) G-5

 Schematic - Complete Machine - Code 11387, 11388 (G5683) G-6 / G-7

 Schematic - Complete Machine - Code 11507, 11508 (G5683-1) G-8 / G-9

 Schematic - Complete Machine - Code 11620, 11621,11716, 11717 (G5683-2) G-10 / G-11

 Schematic - Complete Machine - Code 11746, 11747 (G5683-3) G-12 / G-13

 Schematic - Control PC Board* - Code 11387/8, 11507/8 (G4745-1) G-14 / G-18

 Schematic - Control PC Board* - Code 11620/1, 11716/7, 11746/7 (G4783-1) G-19 / G-23

 Schematic - Motor Filter PC Board* - Code 11746, 11747 (S27505-1) G-24

 Schematic - K2330-2 Timer Kit PC Board* - All Codes (M21341-1) G-25

*** NOTE:** Many PC Board Assemblies are now totally encapsulated, surface mounted and or multi-layered and are therefore considered to be unserviceable. Assembly drawings of these boards are no longer provided.

Return to Master TOC

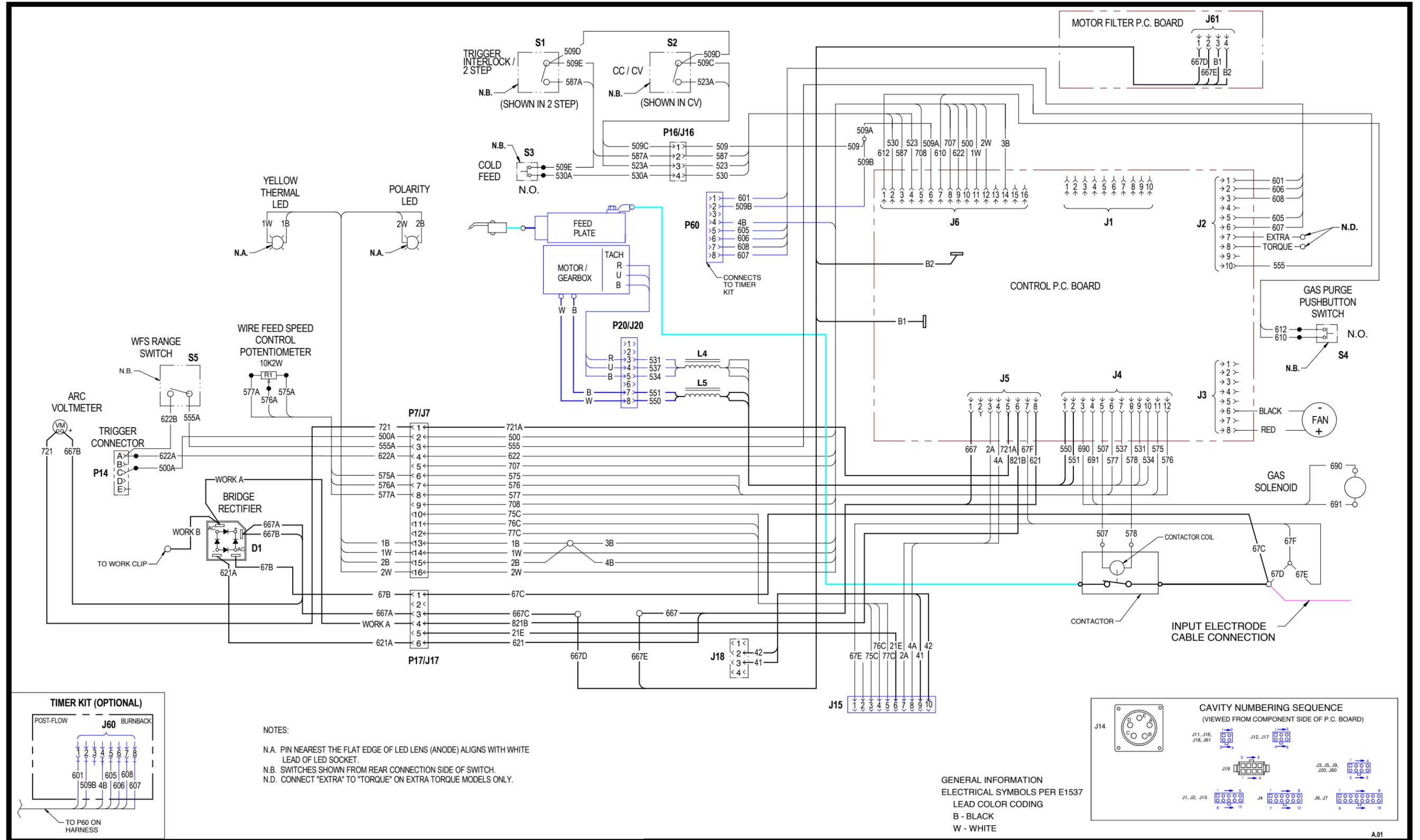
Return to Master TOC

Return to Master TOC

Return to Master TOC

WIRING DIAGRAM - LN-25 PRO - CODES 11746, 11747 (G5681-3)

WIRING DIAGRAM- LN-25 PRO ANALOG



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

Return to Section TOC
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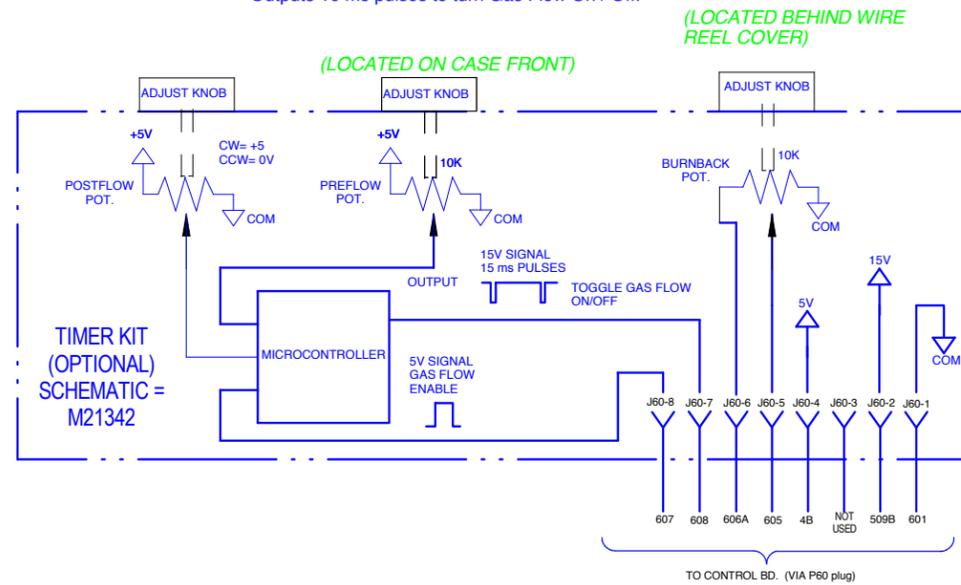
ENGINEERING CONTROLLED CHANGE DETAIL: REVISED LEADS GOING TO P17.
MANUFACTURER: No

LN-25 PRO WIRE FEEDER

TIMER P. C. BOARD CIRCUIT

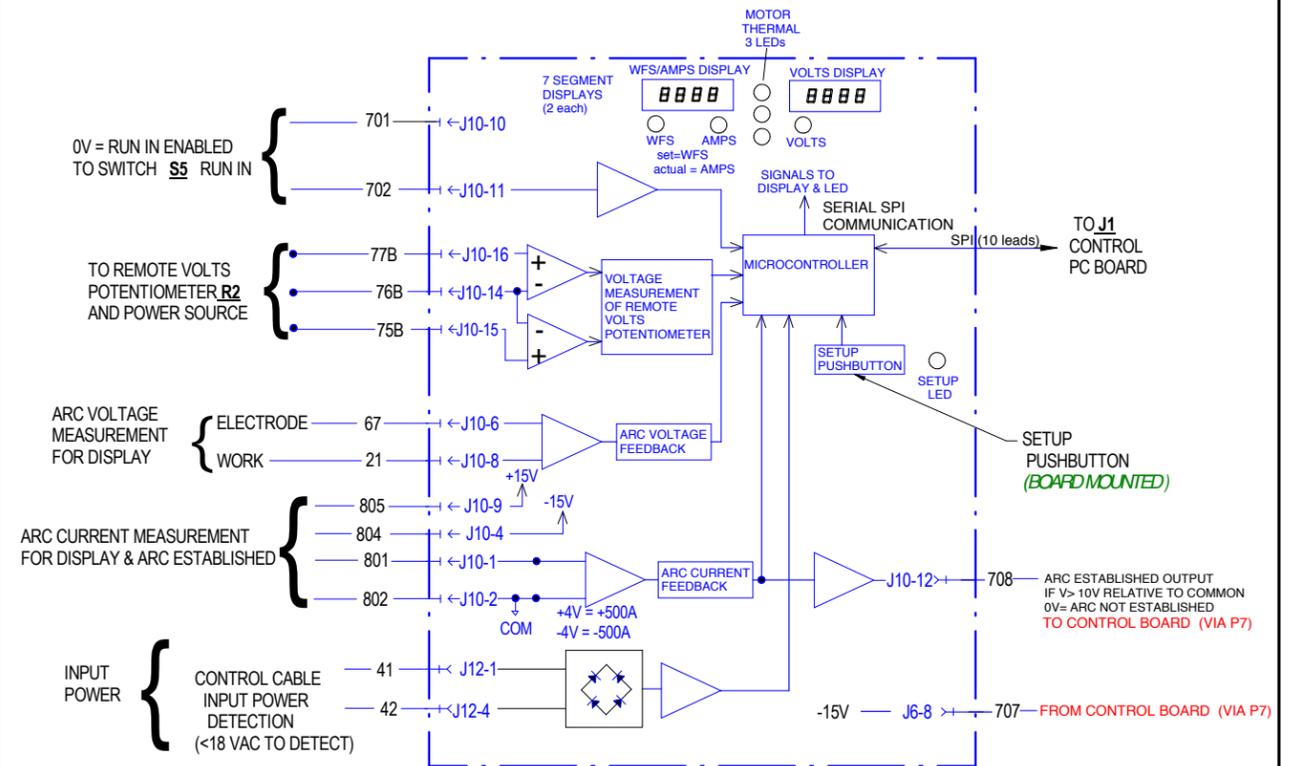
Timer Board Summary

- Has potentiometers for Burnback, Preflow and Postflow.
- Preflow range from 0ms to 10s.
- Burnback range from 0 to 250 ms.
- Postflow range from 50ms to 10 s.
- Receives "Gas Flow Enable" signal.
- Outputs 16 ms pulses to turn Gas Flow On / Off.



PRESET P. C. BOARD CIRCUIT

SCHEMATIC = G4748
(LOCATED ON CASE FRONT)



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MANUFACTURING TOLERANCE PER ASME Y14.5 UNLESS OTHERWISE SPECIFIED TOLERANCE: ON 2 PLACE DECIMALS IS ± .02 in. (± 0.5 mm) ON 3 PLACE DECIMALS IS ± .002 in. (± 0.05 mm) ON ALL ANGLES IS ± .5 OF A DEGREE MATERIAL TOLERANCE ("I") TO AGREE WITH PUBLISHED STANDARDS	CONTROL: CLEVELAND	SCALE: NONE IF PRINTED @ A2 SIZE	EQUIPMENT TYPE: LN-25 PRO	PAGE 2 OF 2		DOCUMENT NUMBER: G5683	DOCUMENT REVISION: C	SOLID EDGE	
DRAWN BY: ddieltz	ENGINEER: ENYEDY	UNITS: INCH	SUBJECT: MACHINE SCHEMATIC	MATERIAL DISPOSITION: UF	APPROVAL DATE: 11/16/2007	PROJECT NUMBER: CRM39437	REFERENCE: -	INSIGHT	
DO NOT SCALE THIS DRAWING									

NOTE: This diagram is for reference only. It may not be accurate for all machines covered by this manual.

Return to Section TOC
Return to Master TOC

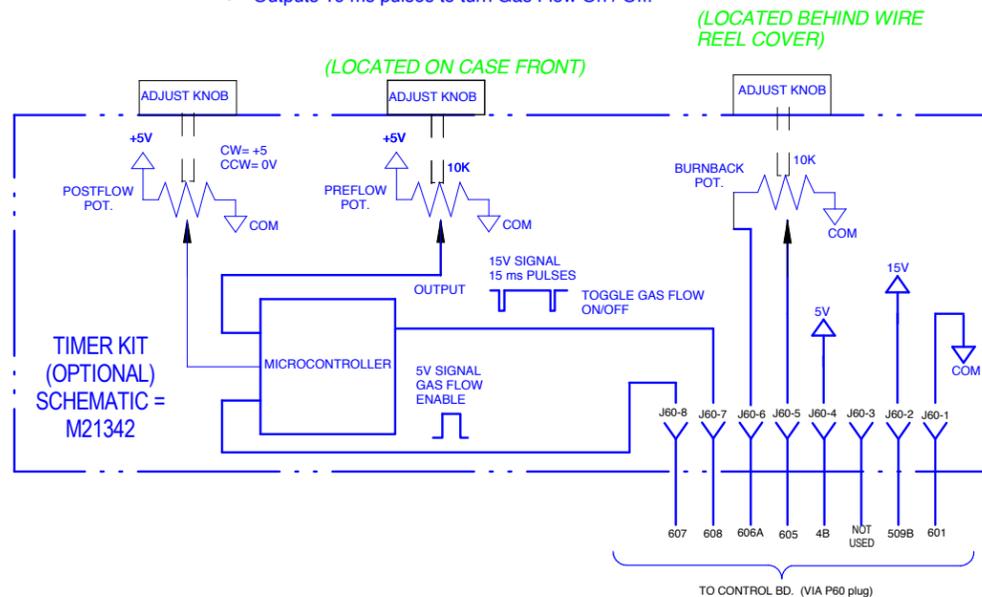
ENGINEERING CONTROLLED CHANGE DETAIL: REVISED LEADS GOING TO P17.
MANUFACTURER: No

LN-25 PRO WIRE FEEDER

TIMER P. C. BOARD CIRCUIT

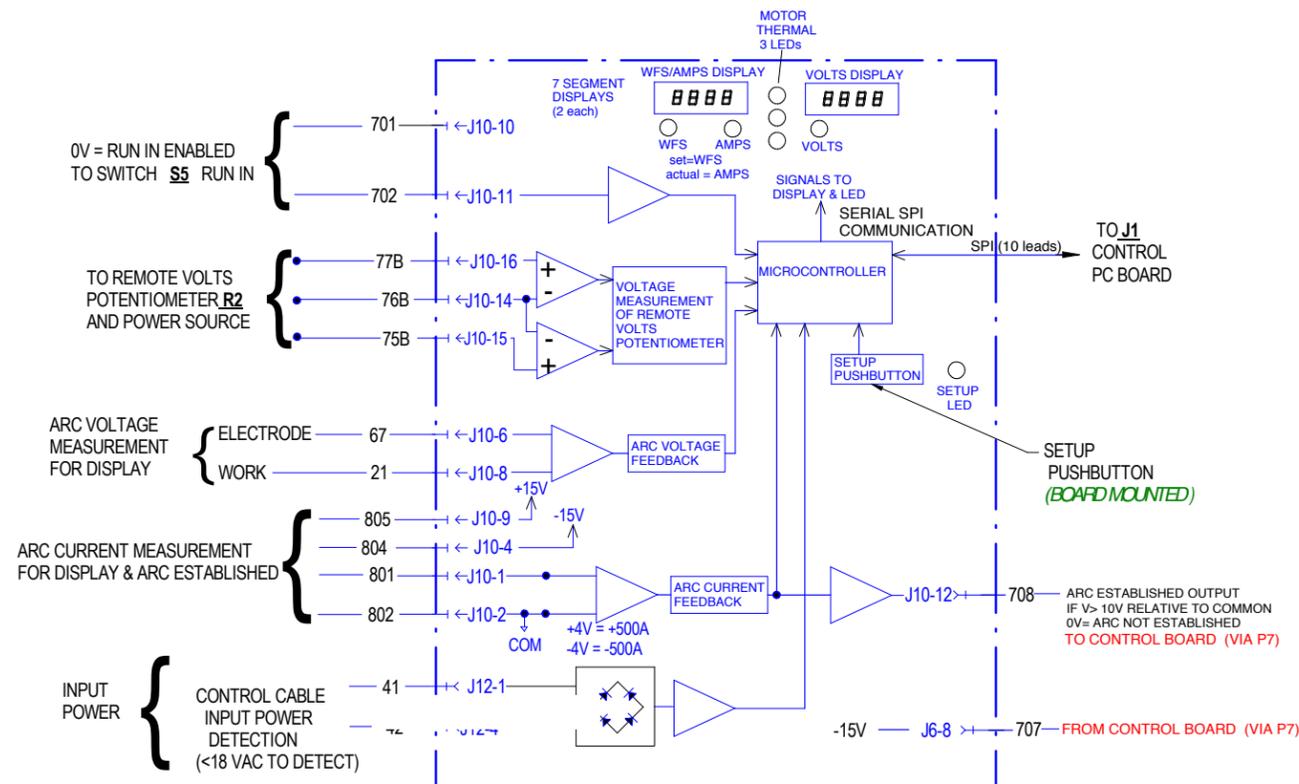
Timer Board Summary

- Has potentiometers for Burnback, Preflow and Postflow.
- Preflow range from 0ms to 10s.
- Burnback range from 0 to 250 ms.
- Postflow range from 50ms to 10 s.
- Receives "Gas Flow Enable" signal.
- Outputs 16 ms pulses to turn Gas Flow On / Off.



PRESET P. C. BOARD CIRCUIT

SCHEMATIC = G4748
(LOCATED ON CASE FRONT)



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MANUFACTURING TOLERANCE PER E20356: UNLESS OTHERWISE SPECIFIED TOLERANCE ON 2 PLACE DECIMALS IS ± .02 in. (± 0.5 mm) ON 3 PLACE DECIMALS IS ± .002 in. (± 0.05 mm) ON ALL ANGLES IS ± 5 OF A DEGREE MATERIAL TOLERANCE (1:1) TO AGREE WITH PUBLISHED STANDARDS.	CONTROL, CLEVELAND	SCALE: NONE IF PRINTED @ A2 SIZE	EQUIPMENT TYPE: LN-25 PRO	PAGE 2 OF 2		DOCUMENT NUMBER: G5683	DOCUMENT REVISION: C		
DO NOT SCALE THIS DRAWING	DRAWN BY: ddietz	ENGINEER: ENYEDY	SUBJECT: MACHINE SCHEMATIC	APPROVAL DATE: 11/16/2007	PROJECT NUMBER: CRM39437	REFERENCE:			

NOTE: This diagram is for reference only. It may not be accurate for all machines covered by this manual.

Return to Section TOC
Return to Master TOC

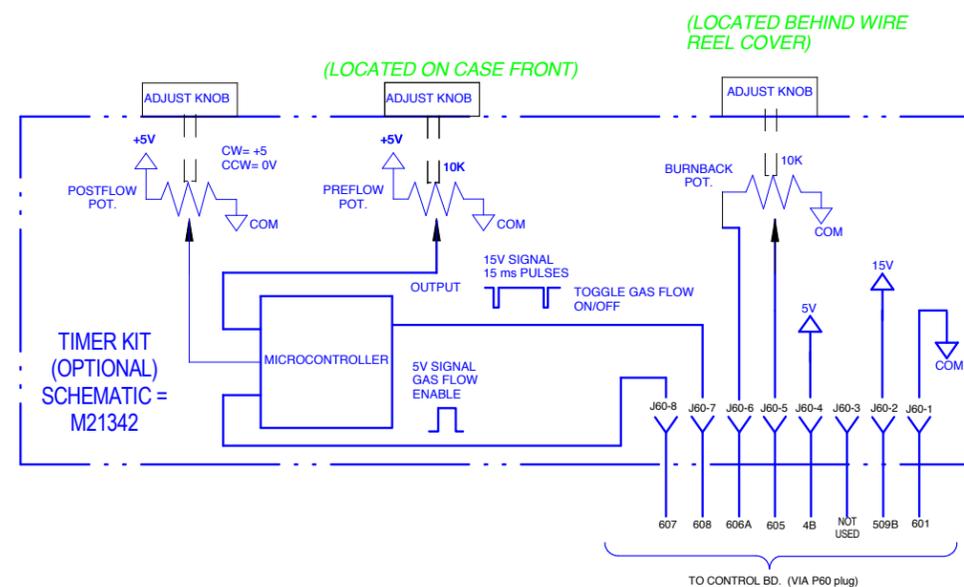
1-69955 ENGINEERING CONTROLLED CHANGE DETAIL: MISC. UPDATES PER SERVICE DEPARTMENT.
MANUFACTURER: No

LN-25 PRO WIRE FEEDER

TIMER P. C. BOARD CIRCUIT

Timer Board Summary

- Has potentiometers for burnback, postflow and preflow.
- Preflow range is 0 to 10 sec.
- Burnback range is 0 to 0.25 sec.
- Postflow range is 0.25 to 10 sec.
- Receives "Gas Flow Enable" signal.
- Outputs 100 msec pulses to turn Gas Flow On, Gas Flow Off.

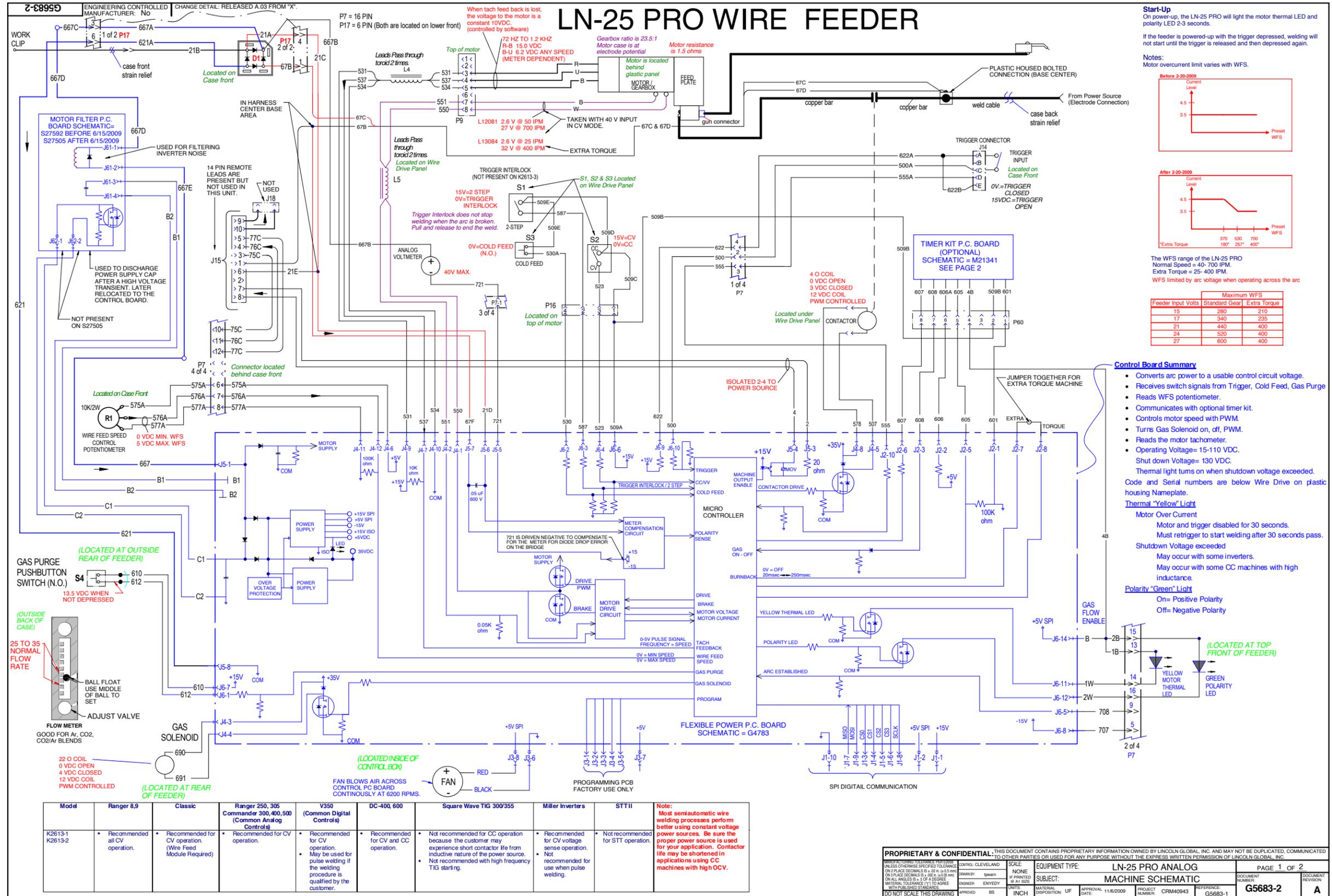


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MANUFACTURING TOLERANCE PER ASME Y14.5 UNLESS OTHERWISE SPECIFIED TOLERANCE: ON 2 PLACE DECIMALS IS ± .02 in. (± 0.5 mm) ON 3 PLACE DECIMALS IS ± .002 in. (± 0.05 mm) ON ALL ANGLES IS ± 5 OF A DEGREE MATERIAL TOLERANCE ("T") TO AGREE WITH PUBLISHED STANDARDS.	CONTROL: CLEVELAND	SCALE: NONE	EQUIPMENT TYPE: LN-25 PRO		PAGE 2 OF 2		DOCUMENT NUMBER:	DOCUMENT REVISION:	
DO NOT SCALE THIS DRAWING	DRAWN BY: tpearl	IF PRINTED @ A2 SIZE	SUBJECT: MACHINE SCHEMATIC		G5683-1		C		SOLID EDGE
APPROVED: SCHOLTI	ENGINEER: ENYEDY	UNITS: INCH	MATERIAL DISPOSITION: NA	APPROVAL DATE: 2/12/2010	PROJECT NUMBER: CRM40936	REFERENCE: G5683			

NOTE: This diagram is for reference only. It may not be accurate for all machines covered by this manual.

SCHEMATIC - LN-25 PRO - COMPLETE MACHINE CODES 11620, 11621, 11716, 11717 - (G5683-2) PG1

Return to Section TOC
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NOTE: This diagram is for reference only. It may not be accurate for all machines covered by this manual.

Return to Section TOC
Return to Master TOC

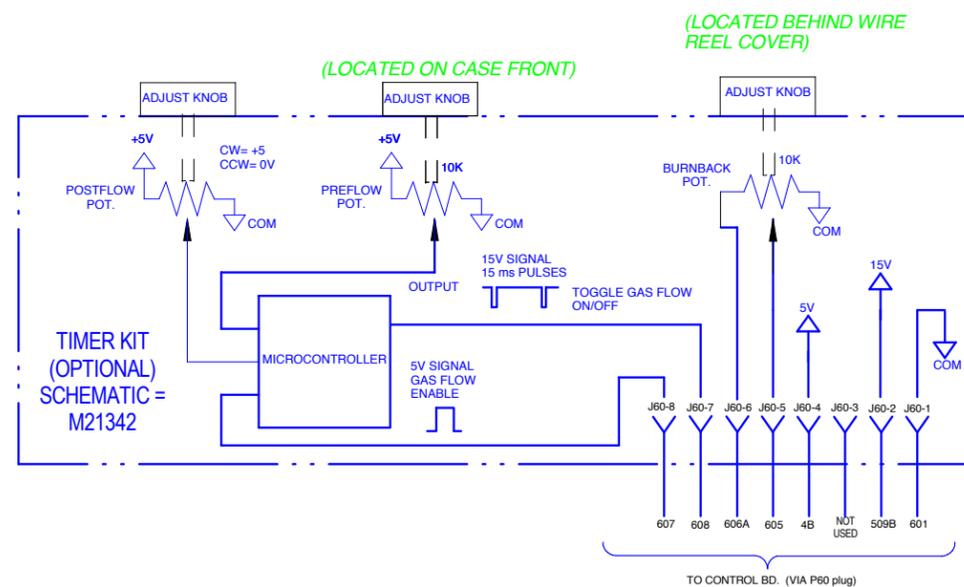
2-3895 ENGINEERING CONTROLLED CHANGE DETAIL: RELEASED A.03 FROM "X". MANUFACTURER: No

LN-25 PRO WIRE FEEDER

TIMER P. C. BOARD CIRCUIT

Timer Board Summary

- Has potentiometers for burnback, postflow and preflow.
- Preflow range is 0 to 10 sec.
- Burnback range is 0 to 0.25 sec.
- Postflow range is 0.25 to 10 sec.
- Receives "Gas Flow Enable" signal.
- Outputs 100 msec pulses to turn Gas Flow On, Gas Flow Off.

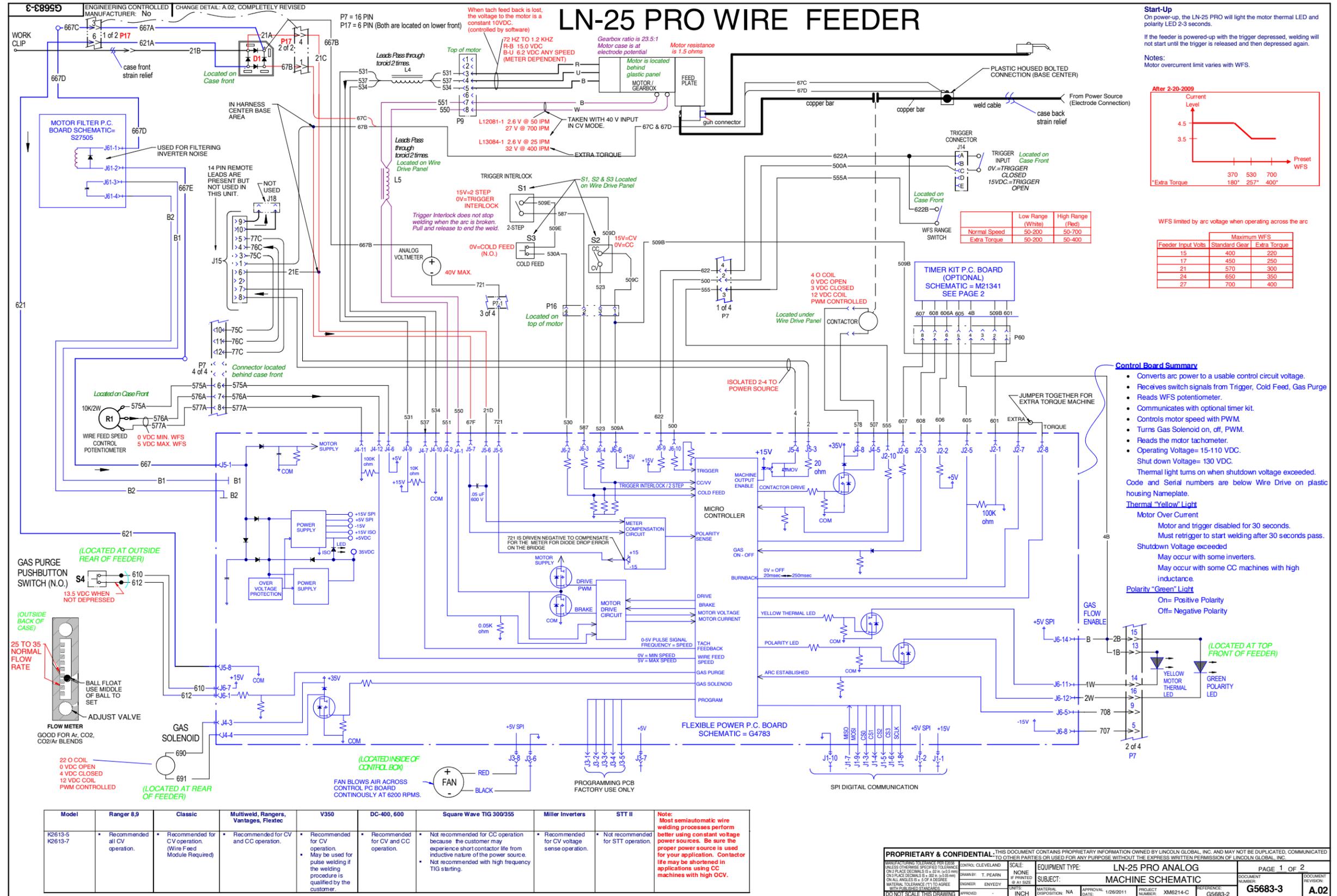


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MANUFACTURING TOLERANCE PER ASME UNLESS OTHERWISE SPECIFIED TOLERANCE ON 2 PLACE DECIMALS IS ± .02 in. (± 0.5 mm) ON 3 PLACE DECIMALS IS ± .002 in. (± 0.05 mm) ON ALL ANGLES IS ± 5 OF A DEGREE MATERIAL TOLERANCE (1") TO AGREE WITH PUBLISHED STANDARDS.		CONTROL: CLEVELAND	SCALE: NONE IF PRINTED @ A2 SIZE	EQUIPMENT TYPE: LN-25 PRO ANALOG	PAGE 2 OF 2		DOCUMENT NUMBER: G5683-2	DOCUMENT REVISION: A		
DRAWN BY: tpearl		ENGINEER: ENYEDY	UNITS: INCH	SUBJECT: MACHINE SCHEMATIC	MATERIAL DISPOSITION: UF	APPROVAL DATE: 11/6/2009	PROJECT NUMBER: CRM40943	REFERENCE: G5683-1		
DO NOT SCALE THIS DRAWING										

NOTE: This diagram is for reference only. It may not be accurate for all machines covered by this manual.

SCHEMATIC - LN-25 PRO - COMPLETE MACHINE CODES 11746, 11747 - (G5683-3) PG1

Return to Section TOC
Return to Master TOC

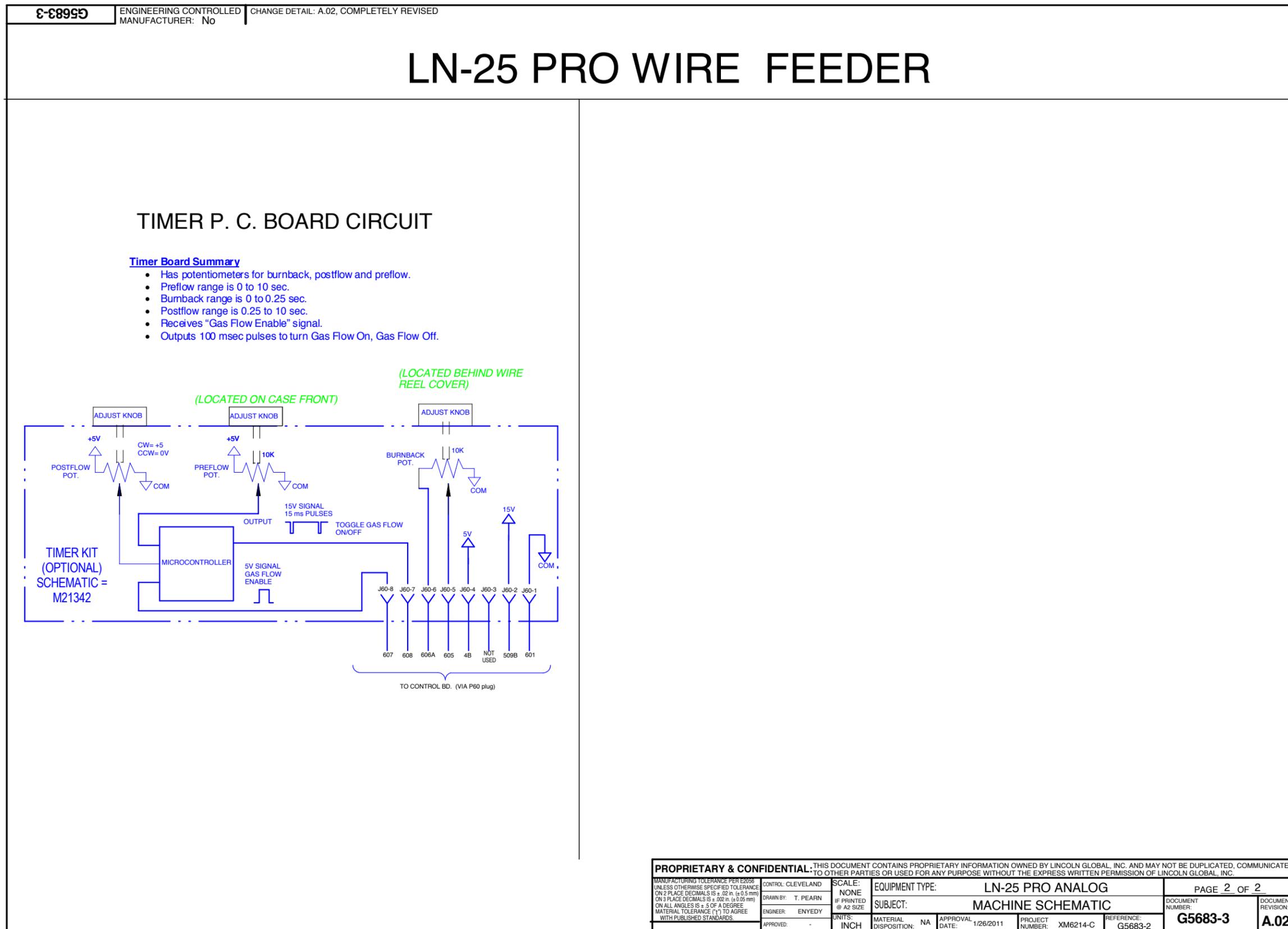


NOTE: This diagram is for reference only. It may not be accurate for all machines covered by this manual.



SCHEMATIC - LN-25 PRO - COMPLETE MACHINE CODES 11746, 11747 - (G5683-3) PG2

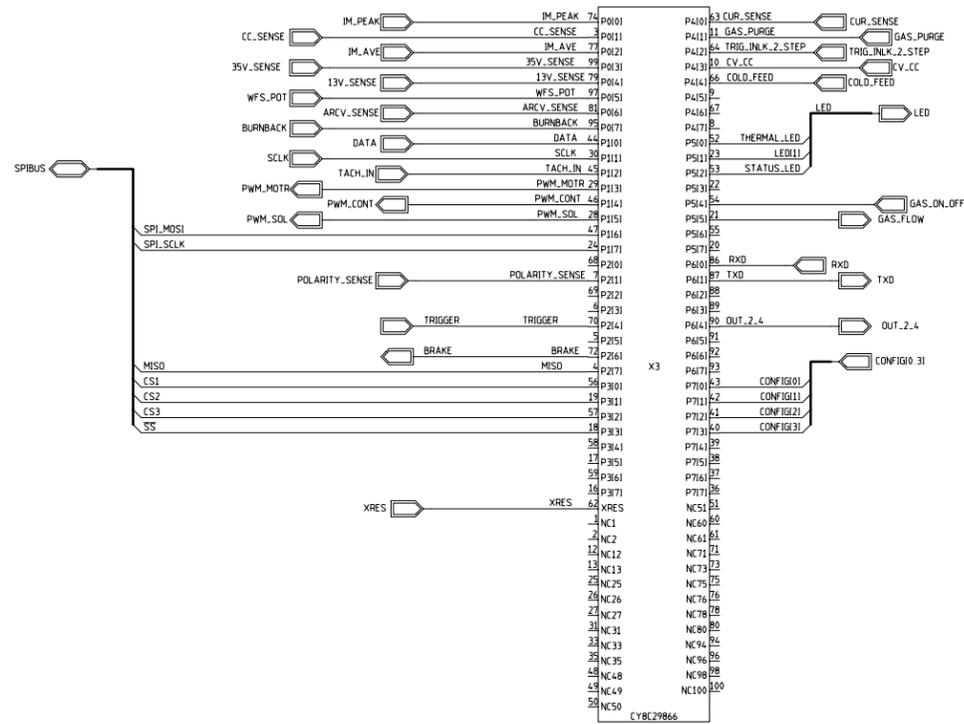
Return to Section TOC
Return to Master TOC



NOTE: This diagram is for reference only. It may not be accurate for all machines covered by this manual.

SCHEMATIC - LN-25 PRO CONTROL PC BOARD - CODES 11387, 11388, 11507, 11508 (G4745-1) PG 2

Return to Section TOC
Return to Master TOC

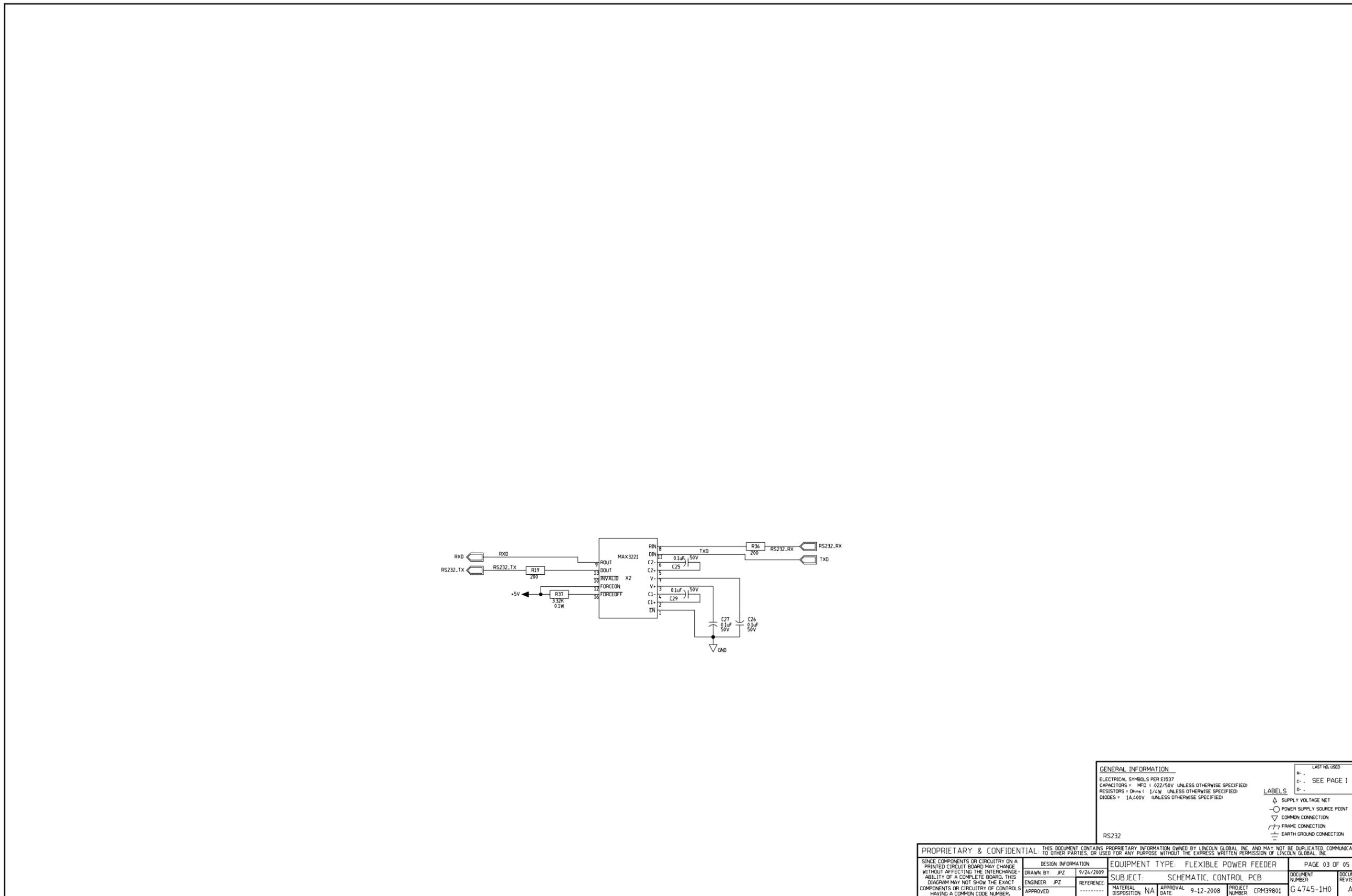


GENERAL INFORMATION		LAST NO. USED
ELECTRICAL SYMBOLS PER E1537		R - - SEE PAGE 1
CAPACITORS = MFD / 022/50V UNLESS OTHERWISE SPECIFIED		C - -
RESISTORS = Ohms / 1/4W UNLESS OTHERWISE SPECIFIED		D - -
DIODES = 1A, 400V UNLESS OTHERWISE SPECIFIED		
PSDC		

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DESIGN INFORMATION	EQUIPMENT TYPE: FLEXIBLE POWER FEEDER	PAGE 02 OF 05	
DRAWN BY: JPZ 9/24/2009	SUBJECT: SCHEMATIC, CONTROL PCB	DOCUMENT NUMBER:	REVISION:
ENGINEER: JPZ	REFERENCE:	MATERIAL DISPOSITION: NA	APPROVAL DATE: 9-12-2008
APPROVED:	PROJECT NUMBER: CRM39801	G 4745-1H0	A

NOTE: This diagram is for reference only. It may not be accurate for all machines covered by this manual.

Return to Section TOC
Return to Master TOC



GENERAL INFORMATION		LAST NO. USED
ELECTRICAL SYMBOLS PER E1637		R - SEE PAGE 1
CAPACITORS = MED (0.22/50V UNLESS OTHERWISE SPECIFIED)		C -
RESISTORS = 0wms (1/4W UNLESS OTHERWISE SPECIFIED)		D -
DIODES = 1A-400V (UNLESS OTHERWISE SPECIFIED)		
RS232		

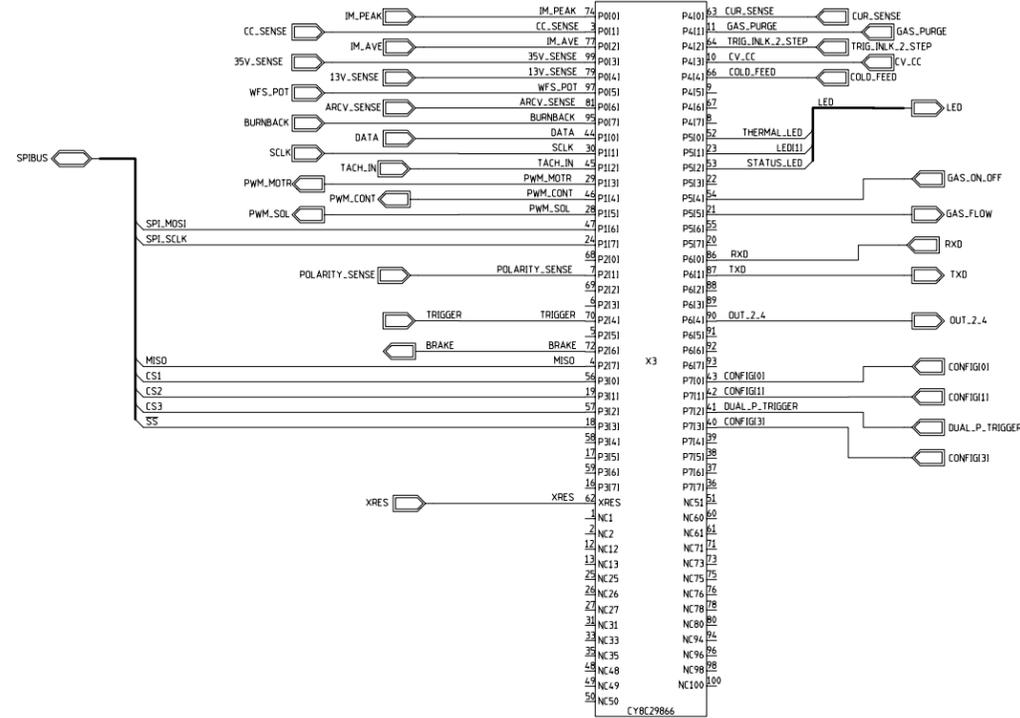
PROPRIETARY & CONFIDENTIAL. THIS DOCUMENT CONTAINS PROPRIETARY INFORMATION OWNED BY LINCOLN GLOBAL, INC. AND MAY NOT BE DUPLICATED, COMMUNICATED TO OTHER PARTIES, OR USED FOR ANY PURPOSE WITHOUT THE EXPRESS WRITTEN PERMISSION OF LINCOLN GLOBAL, INC.		EQUIPMENT TYPE: FLEXIBLE POWER FEEDER		PAGE 03 OF 05	
DESIGN INFORMATION		SUBJECT: SCHEMATIC, CONTROL PCB		DOCUMENT NUMBER	
DRAWN BY: JPZ	DATE: 9/24/2009	MATERIAL DISPOSITION: NA		APPROVAL DATE: 9-12-2008	
ENGINEER: JPZ	REFERENCE:	PROJECT NUMBER: CRM39801		G 4745-1H0	
APPROVED:				DOCUMENT REVISION: A	

NOTE: This diagram is for reference only. It may not be accurate for all machines covered by this manual.



SCHEMATIC- LN-25 PRO CONTROL PC BOARD - CODES 11620, 11621, 11716, 11717, 11746, 11747 (G4783-1) PG 2

Return to Section TOC
Return to Master TOC



GENERAL INFORMATION		LAST NO. USED
ELECTRICAL SYMBOLS PER E1937		R -
CAPACITORS = MFD (0.22/50V UNLESS OTHERWISE SPECIFIED)		C - SEE PAGE 1
RESISTORS = Ohm (1/4W UNLESS OTHERWISE SPECIFIED)		D -
DIODES = 1A,400V (UNLESS OTHERWISE SPECIFIED)		
PSOC		
△ SUPPLY VOLTAGE NET ○ POWER SUPPLY SOURCE POINT ▽ COMMON CONNECTION ▽ FRAME CONNECTION ⊥ EARTH GROUND CONNECTION		LABELS

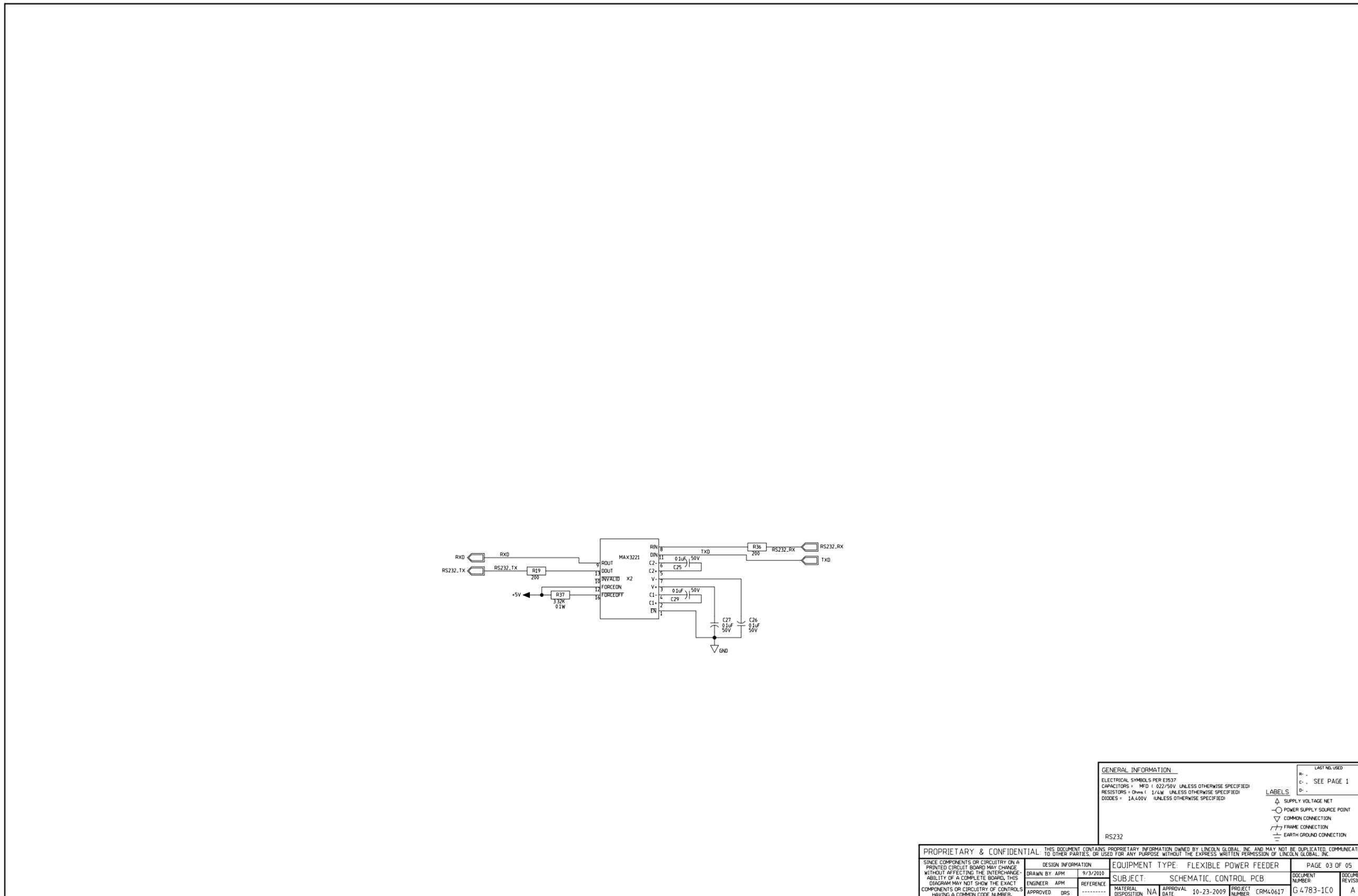
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DESIGN INFORMATION		SUBJECT: SCHEMATIC, CONTROL PCB		DOCUMENT NUMBER	DOCUMENT REVISION
DRAWN BY: APM	9/2/2010	MATERIAL DISPOSITION: NA		APPROVAL DATE: 10-23-2009	PROJECT NUMBER: CRM40617
ENGINEER: APM	REFERENCE: -----	APPROVED: DRS		DATE: -----	PROJECT NUMBER: CRM40617
SINCE COMPONENTS OR CIRCUITRY ON A PRINTED CIRCUIT BOARD MAY CHANGE WITHOUT AFFECTING THE INTERCHANGEABILITY OF A COMPLETE BOARD, THIS DIAGRAM MAY NOT SHOW THE EXACT COMPONENTS OR CIRCUITRY OF CONTROLS HAVING A COMMON CODE NUMBER.		APPROVED: DRS		DATE: -----	PROJECT NUMBER: CRM40617

NOTE: This diagram is for reference only. It may not be accurate for all machines covered by this manual.



SCHEMATIC- LN-25 PRO CONTROL PC BOARD - CODES 11620, 11621, 11716, 11717, 11746, 11747 (G4783-1) PG 3

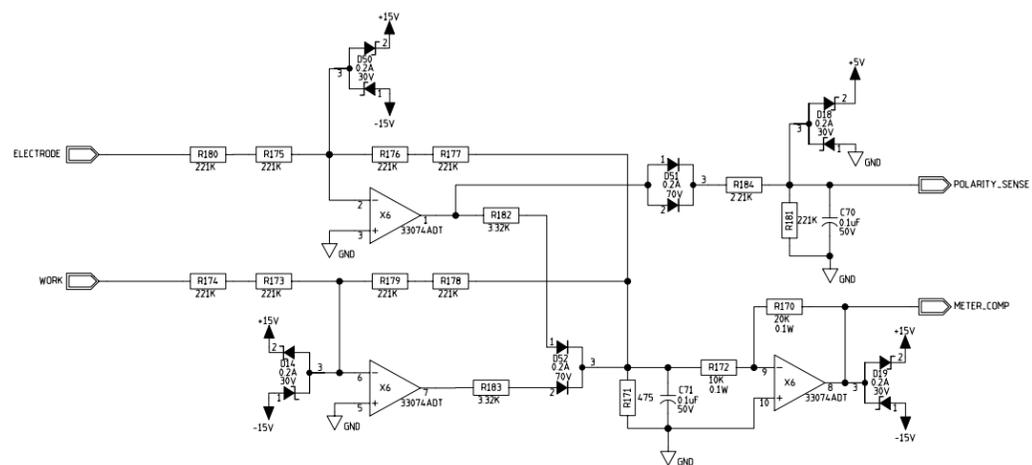
Return to Section TOC
Return to Master TOC



NOTE: This diagram is for reference only. It may not be accurate for all machines covered by this manual.

SCHEMATIC- LN-25 PRO CONTROL PC BOARD - CODES 11620, 11621, 11716, 11717, 11746, 11747 (G4783-1) PG 4

Return to Section TOC
Return to Master TOC



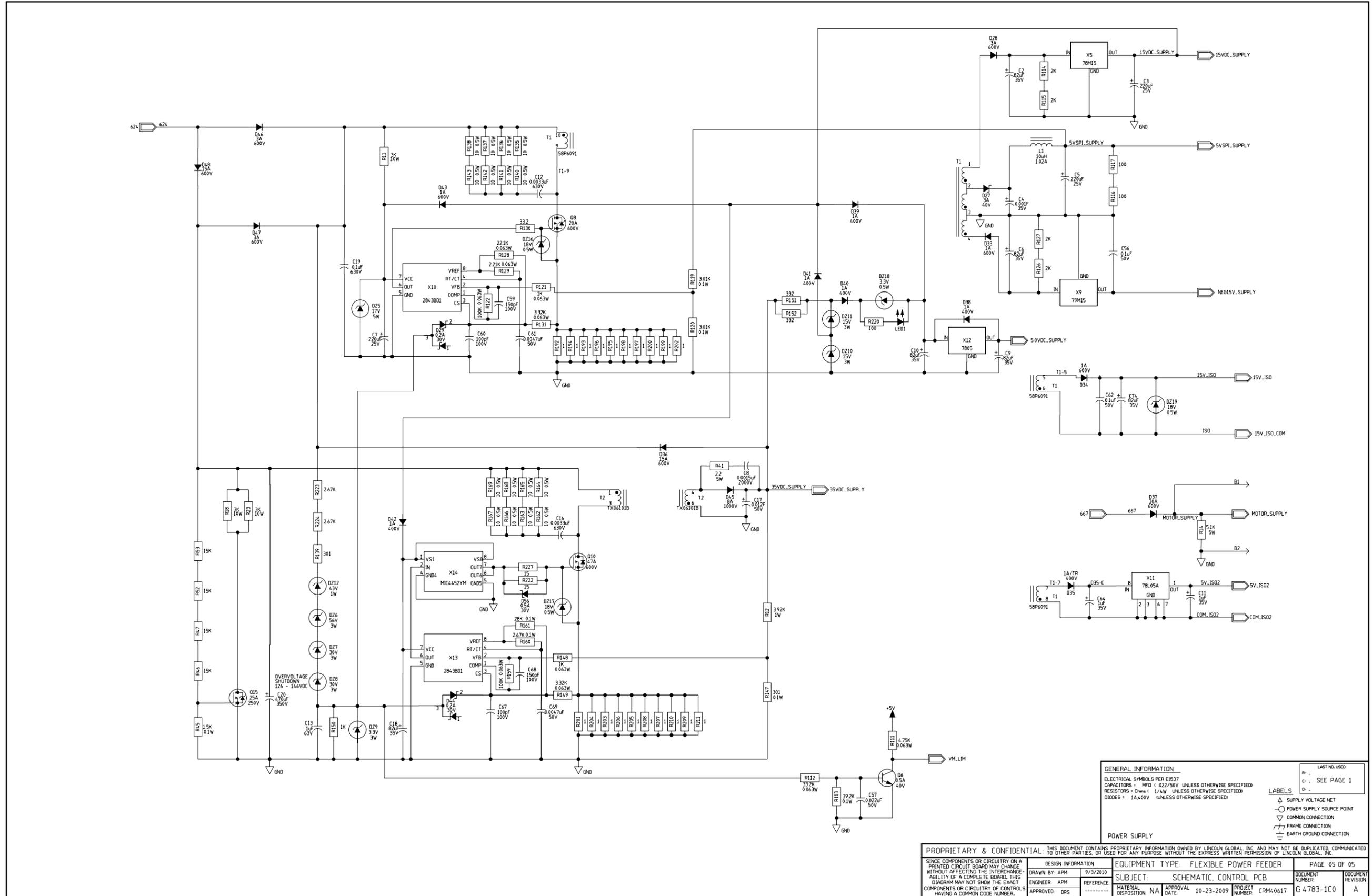
GENERAL INFORMATION		LAST NO. USED
ELECTRICAL SYMBOLS PER E9337		R - SEE PAGE 1
CAPACITORS = NFD (0.22/50V UNLESS OTHERWISE SPECIFIED)		C -
RESISTORS = Ohms (1/4W UNLESS OTHERWISE SPECIFIED)		D -
DIODES = 1A,400V UNLESS OTHERWISE SPECIFIED		
ARC VOLTS READ		
△	SUPPLY VOLTAGE NET	
○	POWER SUPPLY SOURCE POINT	
▽	COMMON CONNECTION	
⏏	FRAME CONNECTION	
⊥	EARTH GROUND CONNECTION	

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DRAWN BY: ARM	9/3/2010	ENGINEER: ARM	PAGE 04 OF 05
APPROVED: DRS	REFERENCE: -----	SUBJECT: SCHEMATIC, CONTROL PCB	DOCUMENT NUMBER: G 4783-1C0
MATERIAL DISPOSITION: NA	APPROVAL DATE: 10-23-2009	PROJECT NUMBER: CRM40617	DOCUMENT REVISION: A

NOTE: This diagram is for reference only. It may not be accurate for all machines covered by this manual.

SCHEMATIC- LN-25 PRO CONTROL PC BOARD - CODES 11620, 11621, 11716, 11717, 11746, 11747 (G4783-1) PG 5

Return to Section TOC
Return to Master TOC



GENERAL INFORMATION	
ELECTRICAL SYMBOLS PER EIB37	
CAPACITORS = MFD (0.22/50V UNLESS OTHERWISE SPECIFIED)	
RESISTORS = Ohm (1/4W UNLESS OTHERWISE SPECIFIED)	
DIODES = 1A,400V (UNLESS OTHERWISE SPECIFIED)	
POWER SUPPLY	

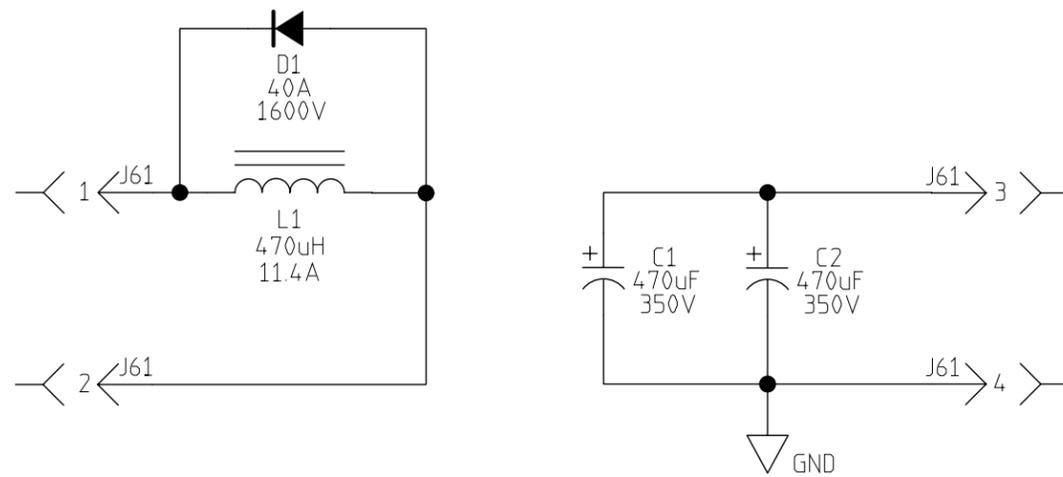
DESIGN INFORMATION		EQUIPMENT TYPE: FLEXIBLE POWER FEEDER		PAGE 05 OF 05	
DRAWN BY: APM	9/3/2010	SUBJECT: SCHEMATIC, CONTROL PCB	DOCUMENT NUMBER:	G4783-1C0	REVISION:
ENGINEER: APM	REFERENCE:	MATERIAL DISPOSITION: NA	APPROVAL DATE: 10-23-2009	PROJECT NUMBER: CRM40617	DOCUMENT REVISION: A
APPROVED: DRS					

NOTE: This diagram is for reference only. It may not be accurate for all machines covered by this manual.



SCHEMATIC - MOTOR FILTER PC BOARD - CODE 11746, 11747 (S27505-1)

Return to Section TOC
Return to Master TOC



GENERAL INFORMATION

ELECTRICAL SYMBOLS PER E1537
 CAPACITORS = MFD (.022/50V UNLESS OTHERWISE SPECIFIED)
 RESISTORS = Ohms (1/4W UNLESS OTHERWISE SPECIFIED)
 DIODES = 1A,400V (UNLESS OTHERWISE SPECIFIED)

LAST NO. USED	
R- -	
C- -	
D- -	

LABELS

- SUPPLY VOLTAGE NET
- POWER SUPPLY SOURCE POINT
- COMMON CONNECTION
- FRAME CONNECTION
- EARTH GROUND CONNECTION

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	DRAWN BY: WDW	10-30-2008	SUBJECT: SCHEMATIC, MOTOR FILTER PCB		DOCUMENT NUMBER:	DOCUMENT REVISION:
	ENGINEER: APM	REFERENCE: -----	MATERIAL DISPOSITION: NA	APPROVAL DATE: -----	PROJECT NUMBER: 5021492	S 27505-1B0 A.01
APPROVED:						

NOTE: This diagram is for reference only. It may not be accurate for all machines covered by this manual.

