Operator's Manual

SAE-400 CV ADAPTER

For use with machines having Code Numbers:

11040

GENUINE LINCOLN PARTS™

Register your machine:
www.lincolnelectric.com/register

Authorized Service and Distributor Locator:
www.lincolnelectric.com/locator

Save for future reference

Date Purchased

Code: (ex: 10859)

Serial: (ex: U1060512345)

IM852 | Issue Date 11-Nov

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

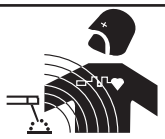
1.d. Keep all equipment safety guards, covers and devices in position and in good repair.Keep hands, hair, clothing and tools away from V-belts, gears, fans and all other moving parts when starting, operating or repairing equipment.

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.

Mar '95

ELECTRIC SHOCK can kill.

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

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

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

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

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

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

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

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

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

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

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

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

ARC RAYS can burn.

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

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

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

FUMES AND GASES can be dangerous.

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

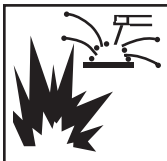
5. b. The operation of welding fume control equipment is affected by various factors including proper use and positioning of the equipment, maintenance of the equipment and the specific welding procedure and application involved. Worker exposure level should be checked upon installation and periodically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

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

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

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

5.f. Also see item 1.b.



WELDING and CUTTING SPARKS can cause fire or explosion.

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

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

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

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

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

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

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

6.h. Also see item 1.c.

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

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

CYLINDER may explode if damaged.

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

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

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

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

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

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

7.g. Read and follow the instructions on compressed gas cylinders, associated equipment, and CGA publication P-l, "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.

Jan '09

PRÉCAUTIONS DE SÛRETÉ

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

Sûreté Pour Soudage A L'Arc

1. Protegez-vous contre la secousse électrique:

   a. Les circuits à l'électrode et à la piéce 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 vétements mouillés. Porter des gants secs et sans trous pour isoler les mains.
   b. Faire trés attention de bien s'isoler de la masse quand on soude dans des endroits humides, ou sur un plancher metallique ou des grilles metalliques, 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 defonctionnement.
   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 precautions pour le porte-électrode s'applicuent 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 ou on recoit 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 lateraux 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 une endroit isolé de la masse. Un court-circuit accidental peut provoquer un échauffement et un risque d'incendie.

8. S'assurer que la masse est connectée le plus prés 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 chaines de levage, câbles de grue, ou autres circuits. Cela peut provoquer des risques d'incendie ou d'echauffement des chaines et des câbles jusqu'à ce qu'ils se rompent.

9. Assurer une ventilation suffisante dans la zone de soudage. Ceci est particuliérement important pour le soudage de tôles galvanisées plombées, ou cadmiées ou tout autre métal qui produit des fumeés 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 phosgéne (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 chassis du poste conformement au code de l'électricité et aux recommendations du fabricant. Le dispositif de montage ou la piece 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 faires des travaux à l'interieur de poste, la debrancher à l'interrupteur à la boite de fusibles.

4. Garder tous les couvercles et dispositifs de sûreté à leur place.

Thank You

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

CUSTOMER ASSISTANCE POLICY

The business of The Lincoln Electric Company is manufacturing and selling high quality welding equipment, consumables, and cutting equipment. Our challenge is to meet the needs of our customers and to exceed their expectations. On occasion, purchasers may ask Lincoln Electric for advice or information about their use of our products. We respond to our customers based on the best information in our possession at that time. Lincoln Electric is not in a position to warrant or guarantee such advice, and assumes no liability, with respect to such information or advice. We expressly disclaim any warranty of any kind, including any warranty of fitness for any customer's particular purpose, with respect to such information or advice. As a matter of practical consideration, we also cannot assume any responsibility for updating or correcting any such information or advice once it has been given, nor does the provision of information or advice create, expand or alter any warranty with respect to the sale of our products.

Lincoln Electric is a responsive manufacturer, but the selection and use of specific products sold by Lincoln Electric is solely within the control of, and remains the sole responsibility of the customer. Many variables beyond the control of Lincoln Electric affect the results obtained in applying these types of fabrication methods and service requirements.

Subject to Change – This information is accurate to the best of our knowledge at the time of printing. Please refer to www.lincolnelectric.com for any updated information.

Please Examine Carton and Equipment For Damage Immediately

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

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

Product _____

Model Number _____

Code Number or Date Code_____

Serial Number_____

Date Purchased_____

Where Purchased_____

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

On-Line Product Registration

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

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

⚠ WARNING

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

⚠ CAUTION

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

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PRODUCT PURPOSE

The CV Adapter can be connected to certain variable voltage water-cooled engine welders to provide constant voltage output recommended for welding with .068" and .072" NR-232, .068" and 5/64 NR-211, 5/64" NS-3M, Innershield electrodes within the current rating of the machine used. The unit can also be used for some other open arc processes depending on the application and process to be used. With the CV Adapter installed, the welder can be easily set to operate in either the CV mode or the standard VV mode.

The LN23P wire feeder is recommended for Innershield welding with the CV Adapter and K2379-1 Interface Kit (Required).

The voltage control range of the CV Adapter is 15 to 35 volts at the welder current rating. The table gives a summary of CV outputs when the Adapter is connected.

Machine	Rating Duty Cycle For	Max. Output Duty Cycle For	Comments
SAE-400, SAE400(Deutz) and SAE-400 Weld'N AIR	400 amp at 35V **(60%)**	500 amp at 35V **(35%)**	Polarity switch is disconnected.
SAE-500	400 amp at 40V **(100%)**	500 amp at 40V **(60%)**	

The CV Adapter will fit any of the following engine welders:

- SAE 400 (K1278-5, -6, -7, -8, -9, -10)
- SAE 400 WELD' N AIR (K1506-1)
- SAE 500 (K1278-11, -12)

Estimated time for field installation of the CV Adapter to welder is 2 to 3 hours.

The CV Adapter consists of a capacitor bank, an electronic control circuit and switches. The capacitors modify the dynamic output characteristics to make the welder suitable for Innershield welding, and the electronic circuit controls the field current to maintain a constant voltage output. Two switches are used to change from CV mode to VV mode. The switches are interlocked to insure that the capacitors are disconnected before the Adapter can be switched to the VV mode.

An output voltage remote control switch and connection receptacle is located on the side of the control box.
This feature enables voltage control at the CV Adapter or at the LN-23P (K2379-1 Interface Kit is required).

All the components are installed in a control box that attaches to the welder gas tank rail with an adapter plate. A control cable is used to connect the CV Adapter to the welder control circuit and the output terminals. A power cable is used to connect the CV output terminal of the Adapter to the welder negative brushholder. This connection by-passes the series field for CV operation.

INSTALLATION

⚠ WARNING

HAVE QUALIFIED PERSONNEL DO THE INSTALLATION WORK. TURN THE ENGINE OFF BEFORE WORKING INSIDE THE MACHINE. IN SOME CASES IT MAY BE NECESSARY TO REMOVE SAFETY GUARDS TO PERFORM REQUIRED INSTALLATION. REMOVE GUARDS ONLY WHEN NECESSARY AND REPLACE THEM WHEN THE INSTALLATION REQUIRING THEIR REMOVAL IS COMPLETE. ALWAYS USE THE GREATEST CARE WHEN WORKING NEAR MOVING PARTS.

LN-23P Connection — Instructions covered under "Operation".

⚠ CAUTION

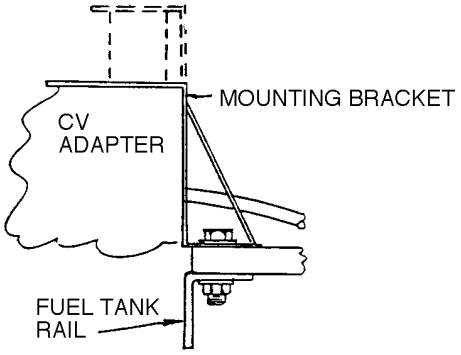
ANY SPEED UP OF THE ENGINE RPM BY CHANGING THE GOVERNOR SETTING OR OVERRIDING THE THROTTLE LINKAGE WILL CAUSE AN INCREASE IN THE AC AUXILIARY VOLTAGE. **IF THIS VOLTAGE GOES ABOVE 140 VOLTS, THE CV ADAPTER CIRCUIT WILL BE DAMAGED!** THE ENGINE GOVERNOR SETTING IS PRESET AT THE FACTORY — DO NOT ADJUST ABOVE RPM SPECIFICATIONS LISTED IN ENGINE WELDER OPERATING MANUAL.

The following tools and materials are recommended for attaching the CV Adapter to an engine welder:

1. Set of socket wrenches.
2. 11/32" wrench and 3/8" nut driver or pliers.
3. 1/2" open end wrench and 9/16" wrench.
4. Screwdriver.
5. Electrical insulating tape.

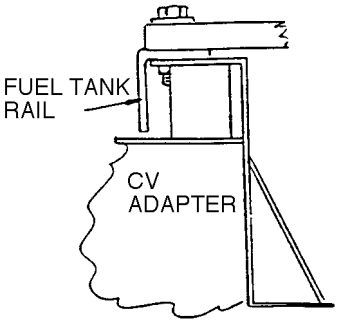
The figures A and B show the mounting bracket in different positions, depending on the type of fuel tank rail being used.

K385-2 CV ADAPTER TO SAE-400, SAE-400(Deutz), SAE-400 WELD'N AIR and SAE-500 ENGINE WELDERS



MOUNTING CV ADAPTER ON SAE-400 WELD'N AIR

FIGURE A



MOUNTING CV ADAPTER ON SAE-400

FIGURE B

K385-2 CV ADAPTER TO SAE-400, SAE-400 WELD'N AIR and SAE-500 ENGINE WELDERS (Item 1 thru 18)

⚠ WARNING

- **TURN THE ENGINE OFF WHILE INSTALLING THIS ACCESSORY.**
- **KEEP HANDS, HAIR, CLOTHING AND TOOLS AWAY FROM MOVING PARTS WHEN STARTING OR OPERATING ENGINE.**

1. Remove the upper bracket cover. Also, remove the two fuel tank support mounting bolts on the side opposite the output terminals (**see Figure 12)**. Remove the guards mounted on the inside of the front control panel.

2. Mount the K385-2 loosely in position as shown in **Figure B** and **Figure 13** for SAE-400 and SAE-500 or loosely in position as shown in **Figure A** and **Figure 13** for SAE-400 WELD'N AIR. It is important that the CV Adapter be positioned flush against the fuel tank rail. Take care not to pinch any leads or lines.

Note: CV Adapter control leads are not color coded on all units.

3. Remove existing yellow lead from the outside terminal of the reversing switch and connect it to the same terminal on the reversing switch that is connected to the red lead.

4. Remove existing resistor lead from reversing switch and connect both ends of this blue lead to the same resistor terminal to store lead.

5. Remove existing blue field lead from the 500 resister and connect it to CV Adapter blue lead 503 using #10 x 1/4 screw and nut provided. Insulate connection with tape.

6. Remove the existing brown field lead from the 500 resister and connect it to the CV Adapter lead 509 using the #10-1/4 screw and nut that is provided. Insulate the connection with tape.

7. Route the CV Adapter leads 600, 602, 610, 612 and 613 through the plastic lead clamp on the side of the "Current Control" reactor box. Connect the CV Adapter leads 600 and 602 to the 500 resister with the existing yellow lead.

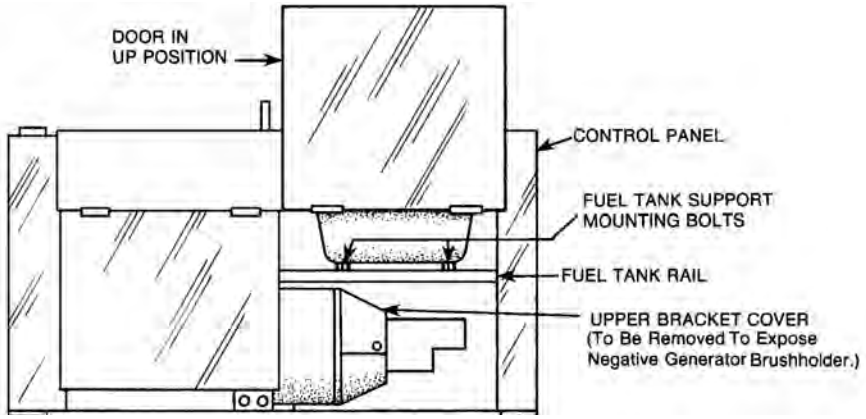


FIGURE 12 – Engine Welder (Left Side).

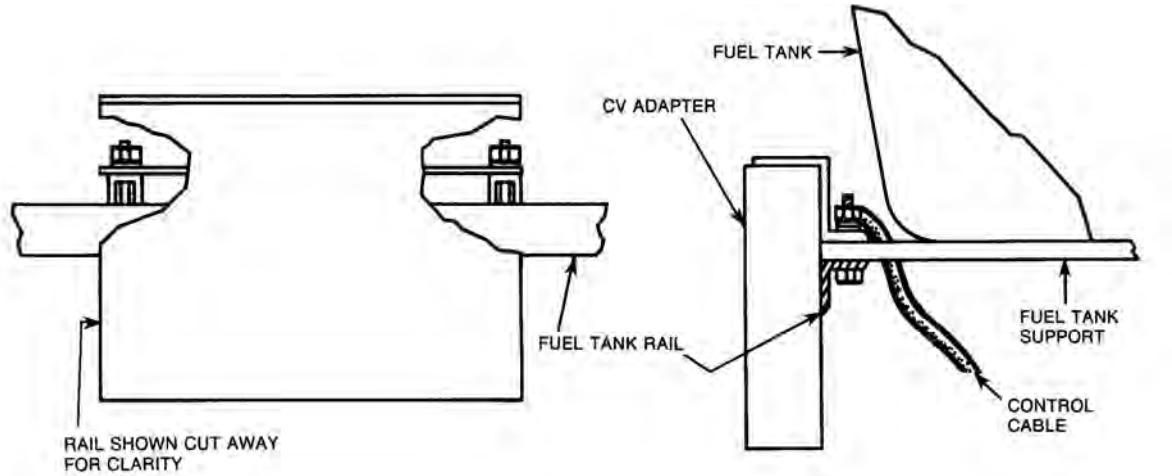


FIGURE 13 – Frame Rail Mounting.

8. Connect CV Adapter lead 610 to same terminal on polarity switch where the existing black lead is connected.

9. Separate the white flashing diode lead from the white hour meter lead at the taped junction (the flashing diode is mounted on the side of the reactor box located behind the control panel). Connect the CV Adapter leads 611 to the white flashing diode lead, 612 to the white hour meter lead, and tape off lead 613. Insulate all screw connections with tape.

10. Connect CV Adapter lead marked "Neg" to the back of "Electrode" output terminal. Connect CV Adapter lead marked "Positive" to the back of "To Work" output terminal. Tape leads to generator lead bundle for support.

11. Tape CV Adapter control cable leads to lead bundle to secure control cable.

NOTE: FOR STEPS 12 AND 13 REFER TO FIGURES 12 AND 14.

12. The negative generator brushholder, exposed when upper bracket cover is removed (**see Figure 12**), is at the 11 o'clock position when the commutator is viewed from the control panel end of welder. Remove the 5/16 bolt which connects the existing cable to the negative brushholder. Route the #2/0 heavy lead which exists from the bottom of the CV adapter case as shown in **Figure 14**. Obtain a 5/16 X 3/4 bolt from the hardware sent with the CV Adapter and connect the #2/0 heavy lead which exits from the bottom of the CV Adapter case, along with the cable removed above, to the negative brushholder. The #2/0 heavy lead lug should be between the existing cable lug and the brushholder. On welders with AC auxiliary power, tape the #2/0 heavy lead to the alternator exciter lead bundle coming from the alternator to support lead where possible.

13. Replace bracket cover removed in Step 1. Also, tighten the CV Adapter which was loosely mounted in Step 2. For the SAE-400 WELD'N AIR the CV Adapter must be positioned flush against the fuel tank rail after tightening.

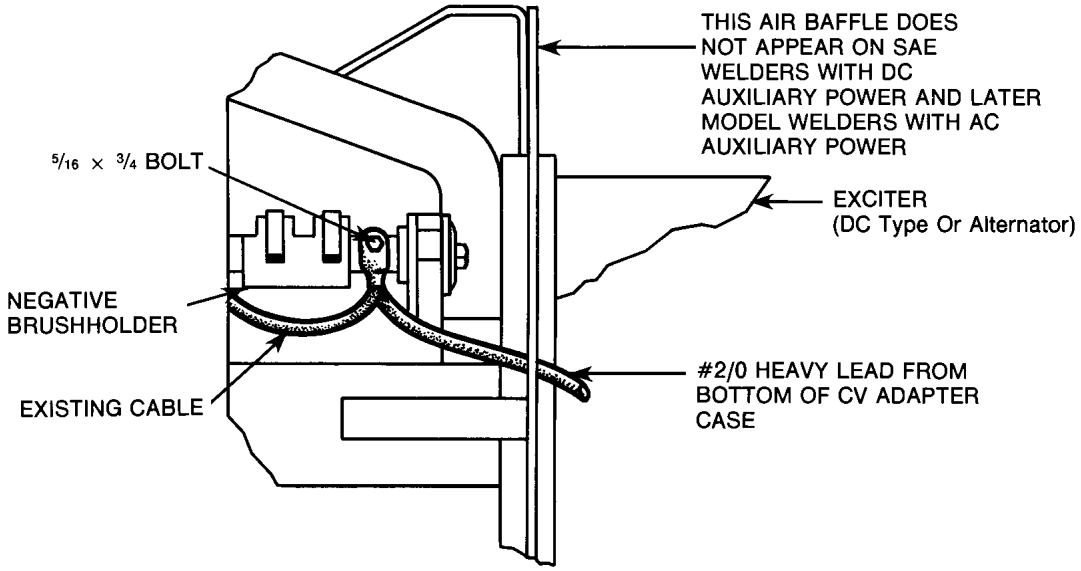


FIGURE 14 – View of Negative Generator Brushholder after Bracket cover is Removed.

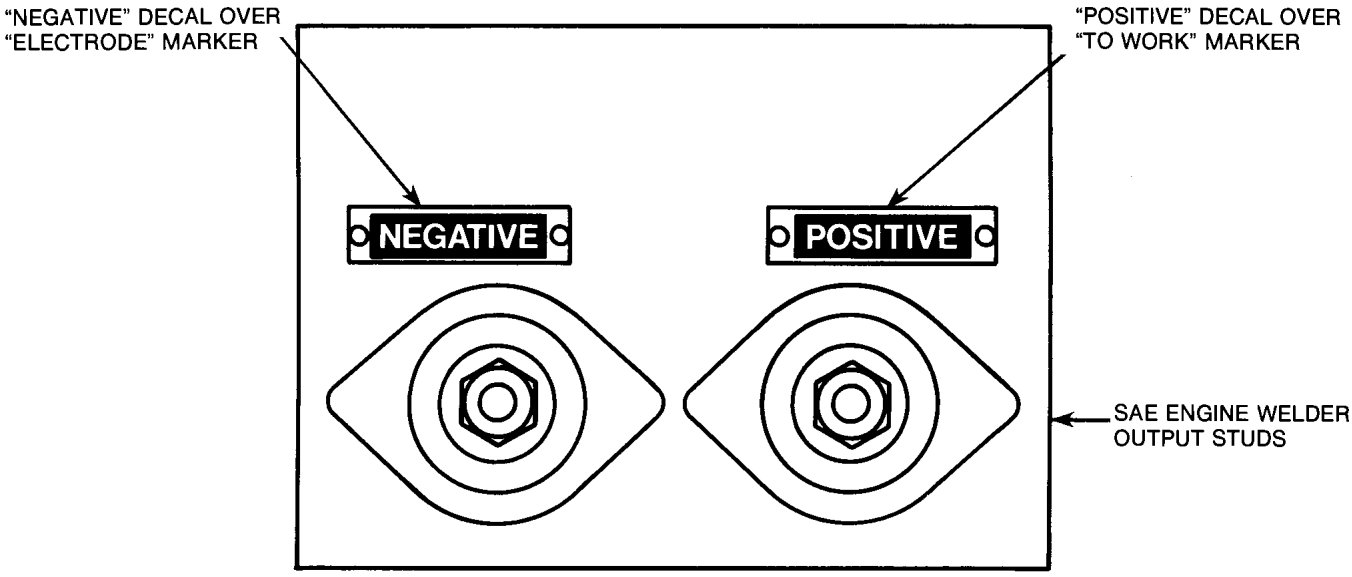


FIGURE 15 –Decal Mounting.

14. Connect lead 31 to unused "WHITE" terminal of the 120-volt duplex receptacle. Connect lead 32 to "CB 3" (circuit breaker 3) at the terminal that has one black lead coming from the 120-volt duplex receptacle. Connect lead "G" to the ground stud located on the control panel. (Same location that the 120-volt duplex receptacle ground lead is connected.)

15. Peel backing from decals sent in mounting kit package and install as shown in **Figure 15**. Reinstall the two guards that were removed at step 1. Be sure that the guards have a clearance of at least one half inch from any electrically live part. All new and existing leads must be routed so they are clear of any sharp edges on the guards.

⚠ CAUTION

POLARITY OF THE STANDARD OUTPUT TERMINALS MUST BE AS STATED IN STEP 15 AND THE MAXIMUM OPEN CIRCUIT VOLTAGE WITH THE LOWER MODE SWITCH IN CV POSITION MUST BE AS STATED IN STEP 16 BEFORE PLACING THE UPPER MODE SWITCH IN CV POSITION. FAILURE TO HAVE THE CORRECT POLARITY AND VOLTAGE BEFORE PLACING THE UPPER MODE SWITCH IN CV POSITION WILL RESULT IN DAMAGE TO THE CV ADAPTER.

16. To check the VV output, place both CV/VV switches on the CV Adapter in the "VV" position. Set the Remote Control Switch to the "REMOTE" or "LOCAL" position as applicable, if so equipped. Start the engine welder and set for High Idle operation. Use a DC voltmeter to check the output polarity. The "Electrode" output terminal that is relabeled "Negative" must be negative and the "To Work" output terminal that is relabeled "Positive" must be positive. If polarity is not correct, recheck Steps 3 to 12. Voltage should be about 40-60 volts DC when the "Job Selector" control is set at minimum and 90-100 volts DC when set at maximum. These voltages may be higher if readings are taken when welder is cold.

17. To check the CV output, place only the lower CV Adapter switch in the CV position. Place the CV Adapter Remote Control Switch in the "LOCAL" Position.This may be done while the engine is running as long as no welding is being done. **On codes 10600 and above the "Job Selector" must be at Maximum.** Check voltage between the output stud on the CV adapter and frame ground. The voltage should be less than 10 VDC. Voltage between the "To Work" output terminal that is relabeled "Positive" and the CV Adapter output terminal should be 7-12 volts DC when the CV Adapter voltage control is at minimum setting and 36-48 volts DC at maximum setting.

18. If output varies greatly from that specified in Steps 15 and 16, check wiring and refer to the troubleshooting section of the manual.

K385-2 CV ADAPTER TO SAE-400 (DEUTZ) (Items 1 thru 16)

⚠ WARNING

- **TURN THE ENGINE OFF WHILE INSTALLING THIS ACCESSORY.**
- **KEEP HANDS, HAIR, CLOTHING AND TOOLS AWAY FROM MOVING PARTS WHEN STARTING OR OPERATING ENGINE.**

1. Remove the upper bracket cover. Also, remove the two fuel tank support mounting bolts on the side opposite the output terminals (**see Figure 12)**. Remove the breaker and receptacle guards mounted on the inside of the front control panel.

2. Mount the K385-2 loosely in position as shown in **Figure B** and **Figure 13** for SAE-400(Deutz) loosely in position as shown in **Figure A**. It is important that the CV Adapter be positioned flush against the fuel tank rail. Take care not to pinch any leads or lines.

3. Remove existing brown field lead from the terminal block located on the control panel reactor box side. Connect the yellow lead #600 and the white lead #602 from the CV adapter to this terminal block screw directly under the red lead from the diode bridge.

4. Connect the existing brown field lead to the CV adapter brown lead #509 using a #10 x 1/4" screw and nut provided. Insulate connection with electrical tape.

5. Remove existing blue field lead from the terminal block located on the control panel reactor box side. Connect the black lead #610 from the CV adapter to this terminal block screw directly under the black lead from the diode bridge.

6. Remove the existing blue field lead to the CV adapter blue lead #503 using a #10 x 1/4" screw and nut provided. Insulate connection with electrical tape.

7. Separate the white flashing diode lead from the white hour meter lead at the taped junction (the flashing diode is mounted on the side of the reactor box located behind the control panel). Connect the CV Adapter leads 611 to the white flashing diode lead, 612 to the white hour meter lead, and tape off lead 613. Insulate all screw connections with tape.

8. Connect CV Adapter lead marked "Neg" to the back of the negative output terminal. Connect CV Adapter lead marked "Positive" to the back of the positive output terminal. Tape leads to generator lead bundle for support.

9. Tape or cable tie CV Adapter control cable leads to lead bundle to secure control cable.

10. The negative generator brush holder, exposed when upper bracket cover is removed (**see Figure 12**), is at the 11 o'clock position when the commutator is viewed from the control panel end of welder. Remove the 5/16 bolt which connects the existing cable to the negative brush holder. Route the #2/0 heavy lead which exists from the bottom of the CV adapter case as shown in **Figure 14**. Obtain a 5/16 X 3/4 bolt from the hardware sent with the CV Adapter and connect the #2/0 heavy lead which exits from the bottom of the CV Adapter case, along with the cable removed above, to the negative brush holder. The #2/0 heavy lead lug should be between the existing cable lug and the brush holder. On welders with AC auxiliary power, tape the #2/0 heavy lead to the alternator exciter lead bundle coming from the alternator to support lead where possible.

11. Replace bracket cover removed in Step 1. Also, tighten the CV Adapter which was loosely mounted in Step 2. For the SAE-400 WELD'N AIR the CV Adapter must be positioned flush against the fuel tank rail after tightening.

12. Connect lead 31 to unused "WHITE" terminal of the 120-volt duplex receptacle. Connect lead 32 to "CB 3" (circuit breaker 2) at the terminal that has one black lead coming from the 120-volt duplex receptacle. Connect lead "G" to the ground stud located on the control panel. (Same location that the 120-volt duplex receptacle ground lead is connected.)

13. Reinstall the breaker and receptacle guard that was removed in **Step 1**. Be sure that the guard has a clearance of at least 1/2" from any electrically live part. All new and existing leads must be routed so they are clear of any sharp edges on the guard.

14. To check the VV output, place both CV/VV switches on the CV Adapter in the “VV” position. Set the Remote Control Switch to the “REMOTE” or “LOCAL” position as applicable, if so equipped. Start the engine welder and set for High Idle operation. Use a DC voltmeter to check the output polarity. The “Electrode” output terminal that is “Negative” must be negative and the “To Work” output terminal that is “Positive” must be positive. If polarity is not correct, recheck Steps 3 to 12. Voltage should be about 40-60 volts DC when the “Job Selector” control is set at minimum and 90-100 volts DC when set at maximum. These voltages may be higher if readings are taken when welder is cold.

15. To check the CV output, place only the lower CV Adapter switch in the CV position. Place the CV Adapter Remote Control Switch in the “LOCAL” Position. This may be done while the engine is running as long as no welding is being done. Check voltage between the output stud on the CV adapter and frame ground. The voltage should be less than 10 VDC. Voltage between the “To Work” output terminal that is “Positive” and the CV Adapter output terminal should be 7-12 volts DC when the CV Adapter voltage control is at minimum setting and 36-48 volts DC at maximum setting.

16. If output varies greatly from that specified in Steps 15 and 16, check wiring and refer to the troubleshooting section of the manual.

SAFETY PRECAUTIONS

⚠ CAUTION

DO NOT OPERATE SWITCHES ON CV ADAPTER WHILE WELDING.

VV OR CV WELDING

⚠ WARNING

ANY LN-23P WIRE FEEDER OR CABLES ATTACHED TO CV ADAPTER OUTPUT TERMINAL AND STANDARD OUTPUT TERMINALS ARE ALWAYS ENERGIZED WHEN ENGINE IS RUNNING REGARDLESS OF MODE SWITCH POSITION. STORE LN-23P GUN OR ELECTRODE HOLDER SO THEY DO NOT CONTACT WORK WHEN NOT WELDING.

VV STICK WELDING

Place both mode switches on the CV Adapter to VV Stick position. For units with remote control, place the Remote Control Switch in the desired position.

NOTE: THE UPPER SWITCH MUST IN VV POSITION BEFORE THE LOWER SWITCH CAN BE PLACED IN VV POSITION. An interlocking handle prevents operation of the switches in the wrong sequence.

Connect the welding cables to the standard output terminals of the engine welder and use the standard controls to set the welding current. On the SAE-400, SAE-500 and SAE-400 WELD'N AIR engine welders, the polarity switch is disconnected so the standard "To Work" terminal that has been relabeled "Positive" is always positive, and the standard "Electrode" terminal that has been relabeled "Negative" is always negative.

CV INNERSHIELD WELDING

Place both switches in CV Innershield position.

NOTE: THE LOWER SWITCH MUST BE IN THE "CV" POSITION BEFORE THE UPPER SWITCH CAN BE PLACED IN "CV" POSITION. An interlocking handle prevents operation of the switches in the wrong sequence. **The "Job Selector" must be at maximum.**

For electrode negative Innershield welding, connect the electrode lead of an LN-23P wire feeder to the output terminal on the CV Adapter and connect the work to the "To Work" standard SAE output terminal that is relabeled "Positive".
The standard SAE "Electrode" output terminal that is relabeled "Negative" is not used for CV welding.

The output voltage is set in one of two ways. With the CV Adapter Remote Control switch set in the "LOCAL" position, the voltage is controlled with the control dial on the CV Adapter. With the CV Adapter switch set in "REMOTE" position, the voltage is controlled at the LN-23P. Set the SAE "Current Control" to the 9 o'clock position for optimum welding characteristics with innershield electrodes.
Changing the "Current Control" affects arc characteristics.

For proper CV Adapter operation, the "Job Selector" must be at maximum.

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.

Step 2. POSSIBLE CAUSE.
The second column labeled “POSSIBLE CAUSE” lists the obvious external possibilities that may contribute to the machine symptom.

Step 3. RECOMMENDED COURSE OF ACTION
This column provides a course of action for the Possible Cause, generally it states to contact your local Lincoln Authorized Field Service Facility.

If you do not understand or are unable to perform the Recommended Course of Action safely, contact your local Lincoln Authorized Field Service Facility.

⚠ CAUTION

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact your **Local Lincoln Authorized Field Service Facility** for technical troubleshooting assistance before you proceed.

Observe all Safety Guidelines detailed throughout this manual

PROBLEMS (SYMPTOMS)	POSSIBLE AREAS OF MISADJUSTMENTS	RECOMMENDED COURSE OF ACTION
FUNCTION PROBLEMS		
With CV Adapter in CV position: • Open circuit voltage is 60 to 70 volts and cannot be adjusted. • Open circuit voltage cannot be adjusted above 38 volts. • Open circuit voltage can be adjusted to 60-70 volts instead of the normal maximum 36 to 48 volts.	1. Check to see if DC field circuit is grounded to frame of welder. If grounded, remove ground. Then check 1/8(1) amp fuse on CV Adapter PC board and replace if blown. (Grounded DC field circuit may or may not cause fuse to blow.) **NOTE:** On SAE-400 and SAE-400 WELD'N AIR Engine Welders with AC auxiliary output, disconnect one side of flashing diode. On SAE-400 and SAE-400 WELD'N AIR machines above Code 8812 also disconnect SAE green lead from CV Adapter lead 613. **NOTE:** ON SAE UNITS BELOW CODE 9936, THE SAE GREEN LEAD WAS RED. Reconnect the above items after trouble is determined and resolved. 2. Verify that the diodes in the lead between D1 negative and the ground screw are not shorted and are oriented properly. Check 1/8 amp fuse on CV adapter PC board and replace if blown.	If all recommended possible areas of misadjustment have been checked and the problem persists, **Contact your local Lincoln Authorized Field Service Facility.**
No CV control of output voltage.	1. Lower CV Adapter mode switch in wrong position. 2. 2 amp fuse blown on CV Adapter PC board — replace fuse. 3. Output not connected to the proper output terminals. See manual for proper connections. 4. Defective lower mode switch — replace 3PDT toggle switch (Sl). 5. Defective relay — replace relay. 6. Defective CV Adapter PC board — replace PC board.	

⚠ CAUTION

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact your **Local Lincoln Authorized Field Service Facility** for technical troubleshooting assistance before you proceed.

Observe all Safety Guidelines detailed throughout this manual

PROBLEMS (SYMPTOMS)	POSSIBLE AREAS OF MISADJUSTMENTS(S)	RECOMMENDED COURSE OF ACTION
FUNCTION PROBLEMS		
No output control when welding “STICK”.	1. Lower CV Adapter mode switch in wrong position. 2. Defective lower CV Adapter mode switch — replace 3PDT toggle switch (Sl). 3. For units with remote control, Remote Control Switch set in the wrong position.	If all recommended possible areas of misadjustment have been checked and the problem persists, **Contact your local Lincoln Authorized Field Service Facility.**
Poor arc characteristics	1. Mode switch in wrong position. 2. Output connected to wrong output terminal. 3. In CV mode — standard current control or range selector in wrong position. See operating manual. 4. Check bank of capacitors in CV Adapter control box. A failure is indicated if the small vent plug on top of a capacitor is raised or blown out. Replace entire bank of capacitors. Do not replace individual capacitors. **⚠ WARNING** **THE LIQUID ELECTROLYTE IN THESE CAPACITORS IS TOXIC. AVOID CONTACT WITH ANY PORTION OF YOUR BODY. CLEAN UP VENTED ELECTROLYTE USING RUBBER GLOVES AND A WATER DAMPENED CLOTH. ANY ELECTROLYTE WHICH GETS ON SKIN, CLEAN WITH SOAP AND WATER.**	
Welder does not stay a high speed while welding.	1. Under certain conditions with smooth, spray-type arc transfer, the idler control may not stay energized. Place idler control in “high” position.	

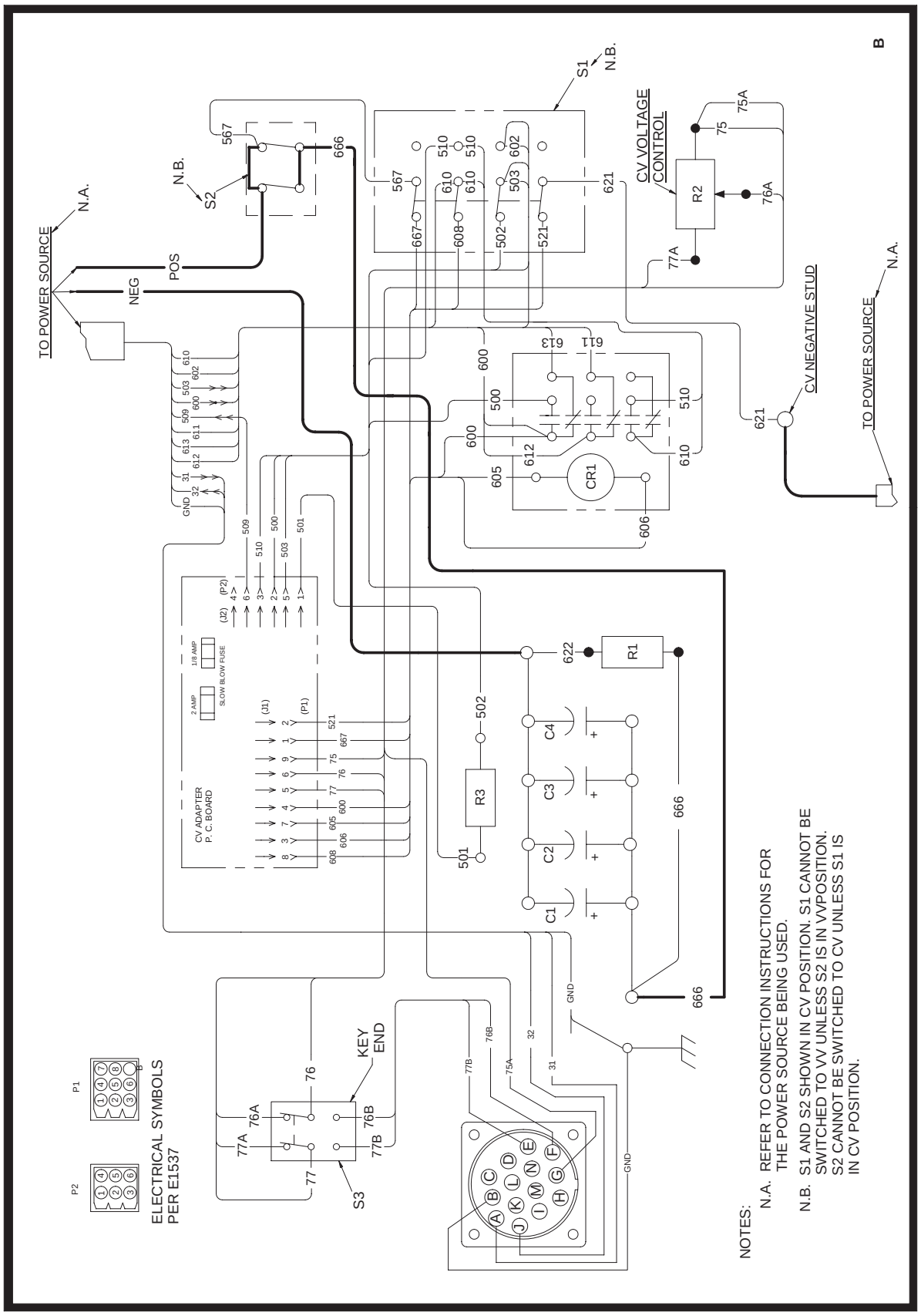
⚠ CAUTION

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact your **Local Lincoln Authorized Field Service Facility** for technical troubleshooting assistance before you proceed.

WIRING DIAGRAM

F-1

WIRING DIAGRAM FOR CV ADAPTER



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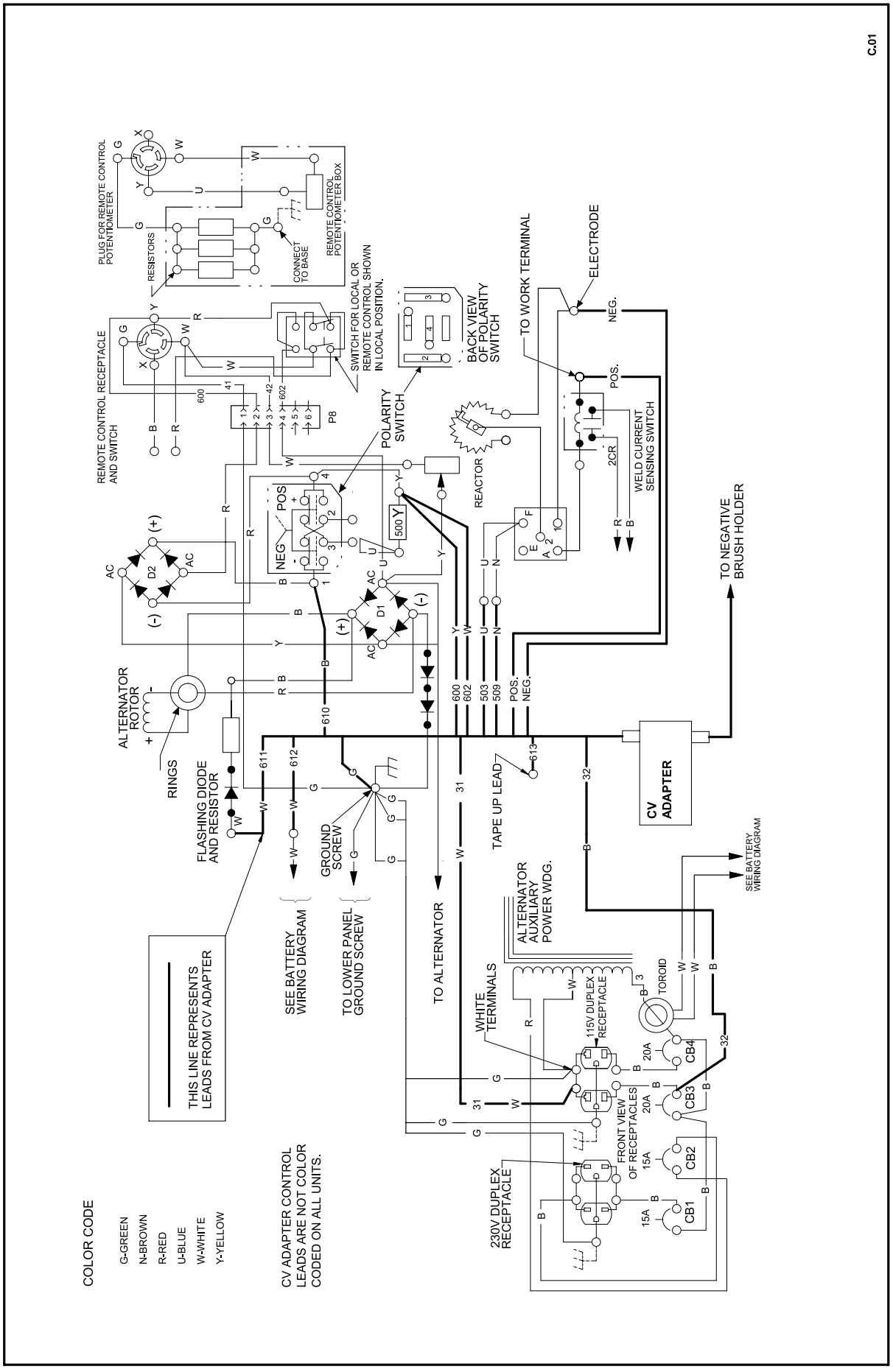
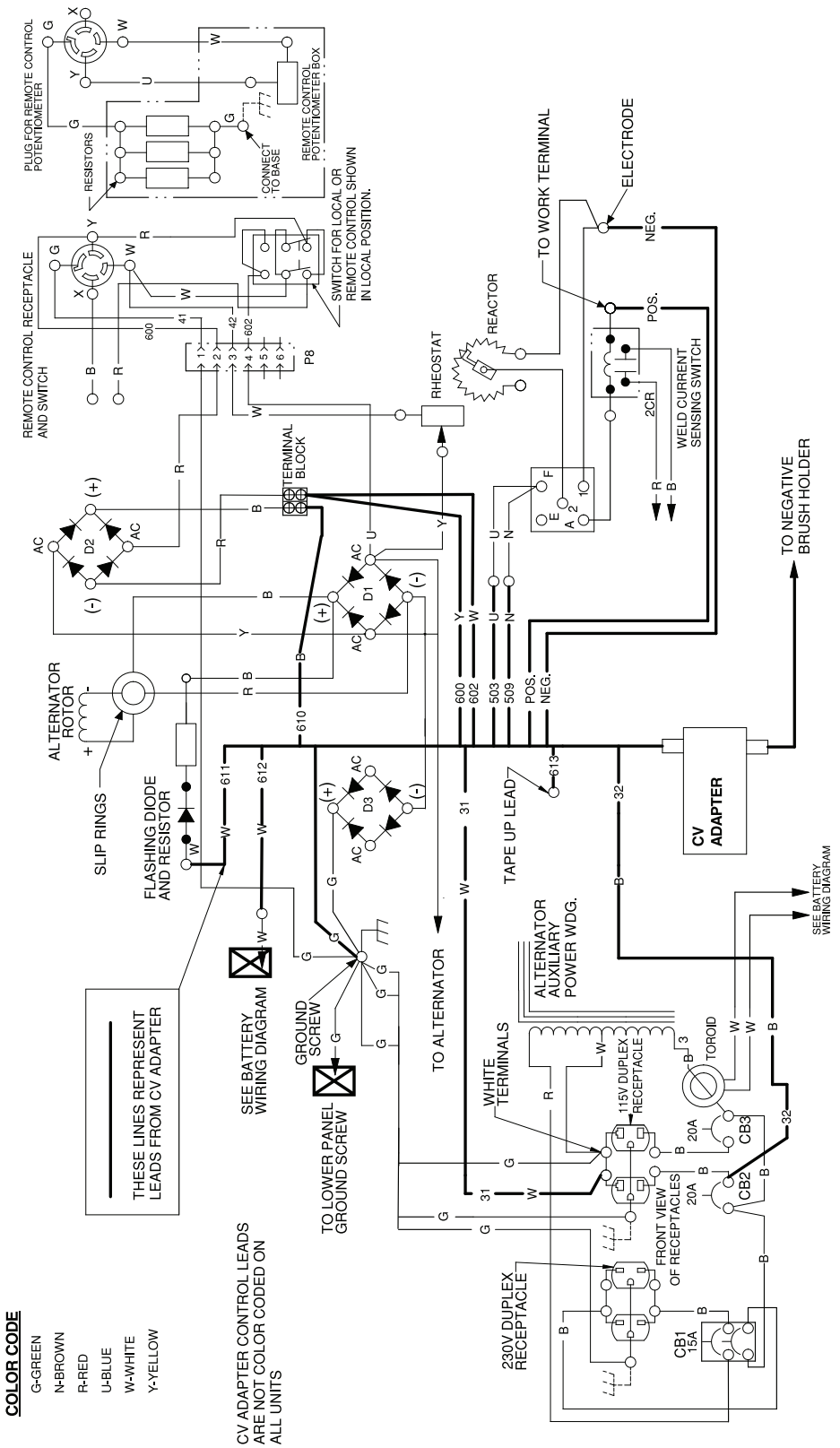
NOTE: This diagram is for reference only. It may not be accurate for all machines covered by this manual. The specific diagram for a particular code is pasted inside the machine on one of the enclosure panels. If the diagram is illegible, write to the Service Department for a replacement. Give the equipment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

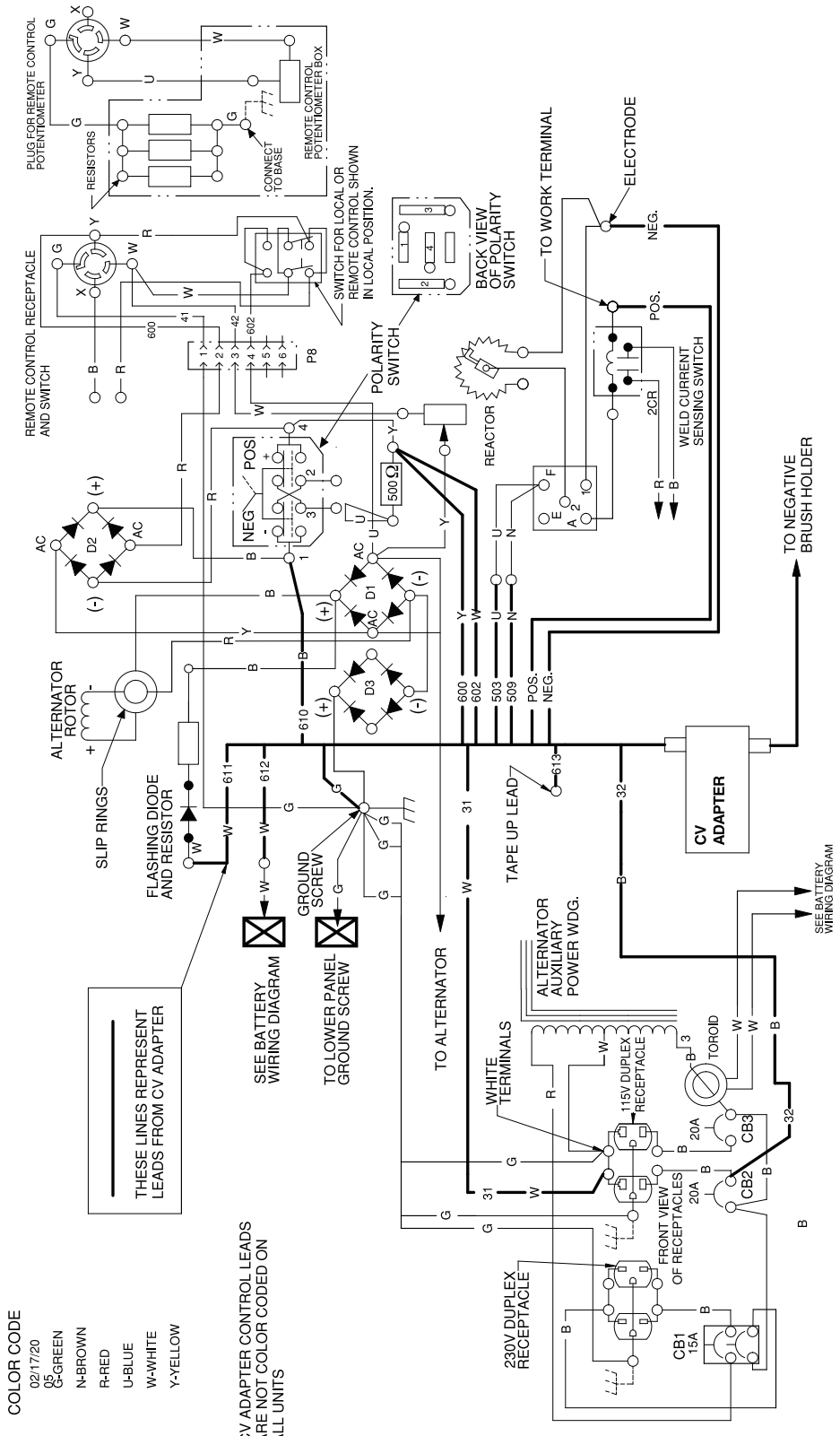
CONNECTION DIGRAM - CV ADAPTER TO SAE 400



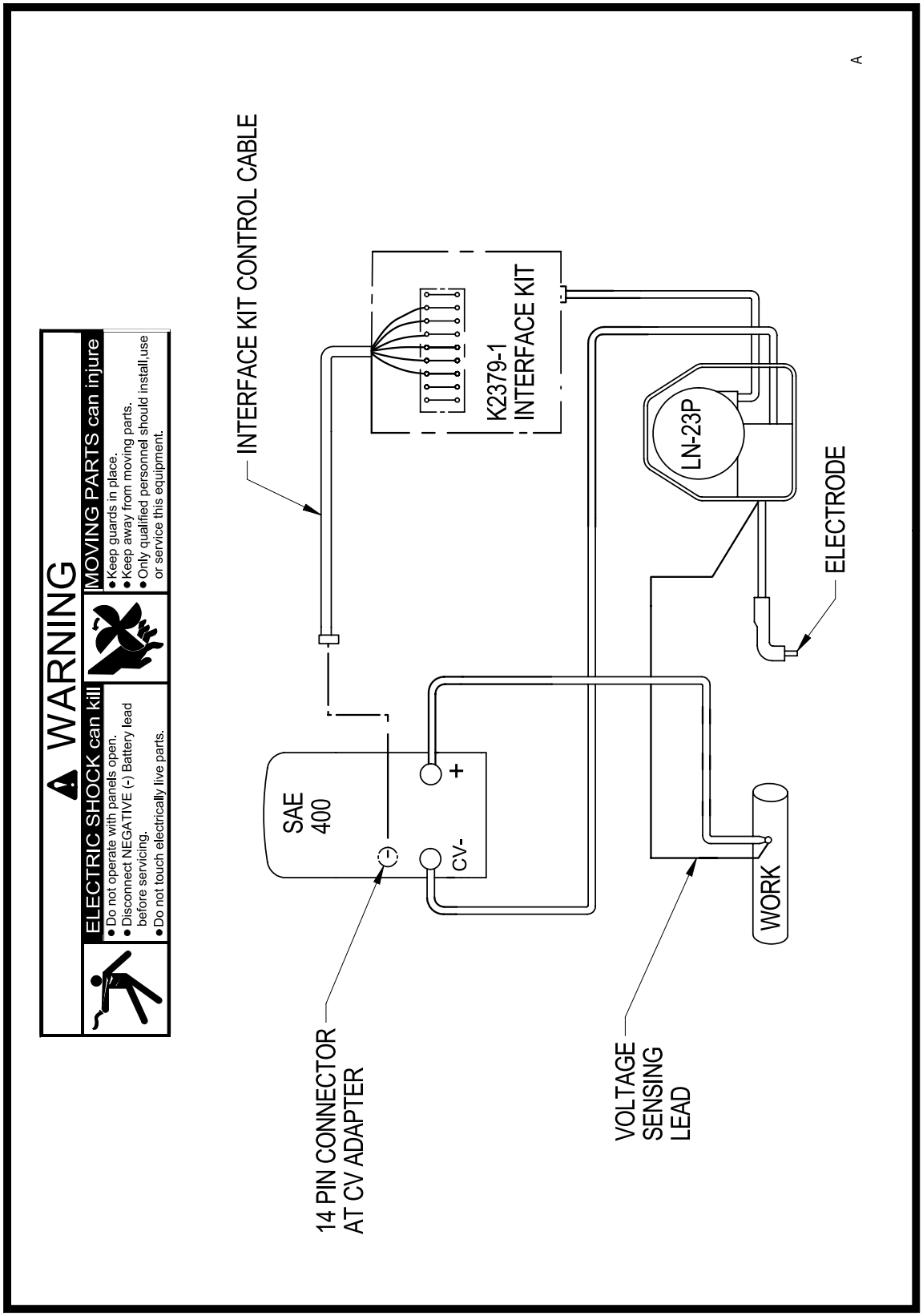
CONNECTION DIAGRAM CV ADAPTER TO SAE 400 (DEUTZ)



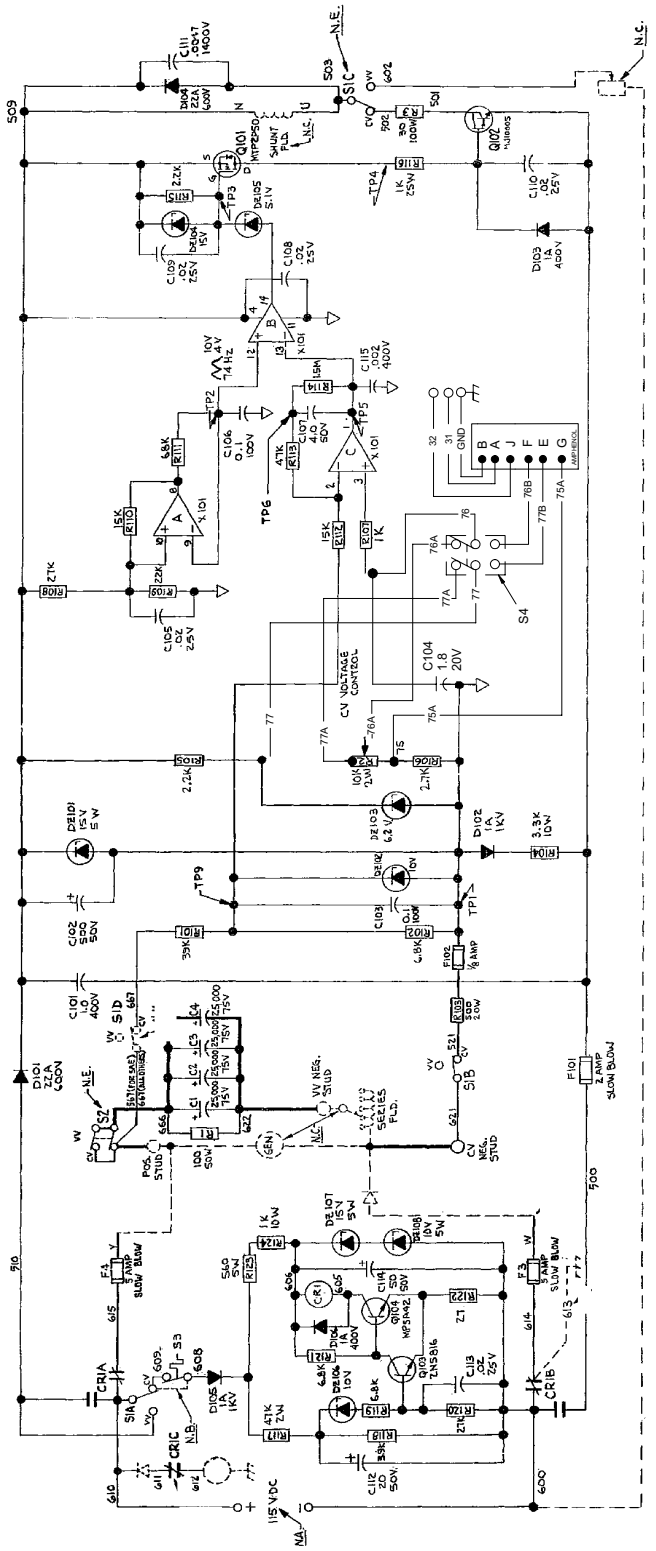
CONNECTION DIAGRAM CV ADAPTER (SAE500 K1278-11 & -12)



CONNECTION DIAGRAM: SAE 400 ENGINE WELDERS COMPATIBLE WITH LN-23P AND K2379-1 INTERFACE KIT



CV ADAPTER SCHEMATIC



GENERAL INFORMATION

ELECTRICAL SYMBOLS PER E-1537.
CAPACITORS = MFD UNLESS OTHERWISE SPECIFIED.
RESISTORS = OHMS, 1/2 WATT UNLESS OTHERWISE SPECIFIED.
ZENER DIODES = 1/2 WATT (UNLESS OTHERWISE SPECIFIED).
▽ = COMMON CONNECTION TP = TEST POINT

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.

LEAD COLOR CODE
W - WHITE
Y - YELLOW
U - BLUE
N - BROWN

CV ADAPTER CONTROL LEADS ARE NOT COLOR CODED ON ALL UNITS.

COMPONENTS ON P.C. BOARD

C101 THRU C115
D101 THRU D106
DE101 THRU DE109
F101 & F102
Q101 THRU Q104
R101 THRU R154
X101 QUAD OP-AMP (LM-124)

COMPONENTS NOT ON P.C. BOARD

C1 THRU C4
CR1 24VDC, 3 PDT
R1 THRU R3
S1 { 4 PDT (USED ON SAE WELDERS)
3 PDT (USED ON ALL OTHERS)
S2 DPST
S3 THERMOSTAT
F3 & F4
S4 DPDT
AMPHENOL 14-PIN

NOTES:

N.A. INPUT POWER SUPPLIED BY POWER SOURCE EXCITER.
N.B. S3 IS NOT USED WITH SAE POWER SOURCES.
N.C. SOME REPRESENTATIVE POWER SOURCE CIRCUITRY IS SHOWN FOR OPERATIONAL CLARITY.

N.E. S1 CANNOT BE SWITCHED TO VV UNLESS S2 IS IN VV POSITION.
S2 CANNOT BE SWITCHED TO CV UNLESS S1 IS IN CV POSITION.

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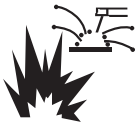
NOTES

NOTES

NOTES

			
WARNING	● Do not touch electrically live parts or electrode with skin or wet clothing. ● Insulate yourself from work and ground.	● Keep flammable materials away.	● Wear eye, ear and body protection.
Spanish **AVISO DE PRECAUCION**	● No toque las partes o los electrodos bajo carga con la piel o ropa mojada. ● Aislese del trabajo y de la tierra.	● Mantenga el material combustible fuera del área de trabajo.	● Protéjase los ojos, los oídos y el cuerpo.
French **ATTENTION**	● Ne laissez ni la peau ni des vêtements mouillés entrer en contact avec des pièces sous tension. ● Isolez-vous du travail et de la terre.	● Gardez à l'écart de tout matériel inflammable.	● Protégez vos yeux, vos oreilles et votre corps.
German **WARNUNG**	● Berühren Sie keine stromführenden Teile oder Elektroden mit Ihrem Körper oder feuchter Kleidung! ● Isolieren Sie sich von den Elektroden und dem Erdboden!	● Entfernen Sie brennbarres Material!	● Tragen Sie Augen-, Ohren- und Körperschutz!
Portuguese **ATENÇÃO**	● Não toque partes elétricas e electrodos com a pele ou roupa molhada. ● Isole-se da peça e terra.	● Mantenha inflamáveis bem guardados.	● Use proteção para a vista, ouvido e corpo.
Japanese **注意事項**	● 通電中の電気部品、又は溶材にヒフやぬれた布で触れないこと。 ● 施工物やアースから身体が絶縁されている様にして下さい。	● 燃えやすいものの側での溶接作業は絶対にしてはなりません。	● 目、耳及び身体に保護具をして下さい。
Chinese **警 告**	● 皮肤或濕衣物切勿接觸帶電部件及銲條。 ● 使你自己與地面和工件絕緣。	● 把一切易燃物品移離工作場所。	● 佩戴眼、耳及身體勞動保護用具。
Korean **위 험**	● 전도체나 용접봉을 젖은 헝겁 또는 피부로 절대 접촉치 마십시요. ● 모재와 접지를 접촉치 마십시요.	● 인화성 물질을 접근 시키지 마시요.	● 눈, 귀와 몸에 보호장구를 착용하십시요.
Arabic **تحذير**	● لا تلمس الاجزاء التي يسري فيها التيار الكهربائي أو الالكترود بجلد الجسم أو بالملابس المبللة بالماء. ● ضع عازلا على جسمك خلال العمل.	● ضع المواد القابلة للاشتعال في مكان بعيد.	● ضع أدوات وملابس واقية على عينيك وأذنيك وجسمك.

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

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

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

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

			
● Keep your head out of fumes. ● Use ventilation or exhaust to remove fumes from breathing zone.	● Turn power off before servicing.	● Do not operate with panel open or guards off.	**WARNING**
● Los humos fuera de la zona de respiración. ● Mantenga la cabeza fuera de los humos. Utilice ventilación o aspiración para gases.	● Desconectar el cable de alimentación de poder de la máquina antes de iniciar cualquier servicio.	● No operar con panel abierto o guardas quitadas.	Spanish **AVISO DE PRECAUCION**
● Gardez la tête à l'écart des fumées. ● Utilisez un ventilateur ou un aspirateur pour ôter les fumées des zones de travail.	● Débranchez le courant avant l'entretien.	● N'opérez pas avec les panneaux ouverts ou avec les dispositifs de protection enlevés.	French **ATTENTION**
● Vermeiden Sie das Einatmen von Schweibrauch! ● Sorgen Sie für gute Be- und Entlüftung des Arbeitsplatzes!	● Strom vor Wartungsarbeiten abschalten! (Netzstrom völlig öffnen; Maschine anhalten!)	● Anlage nie ohne Schutzgehäuse oder Innenschutzverkleidung in Betrieb setzen!	German **WARNUNG**
● Mantenha seu rosto da fumaça. ● Use ventilação e exhaustão para remover fumo da zona respiratória.	● Não opere com as tampas removidas. ● Desligue a corrente antes de fazer serviço. ● Não toque as partes elétricas nuas.	● Mantenha-se afastado das partes moventes. ● Não opere com os paineis abertos ou guardas removidas.	Portuguese **ATENÇÃO**
● ヒュームから頭を離すようにして下さい。 ● 換気や排煙に十分留意して下さい。	● メンテナンス・サービスに取りかかる際には、まず電源スイッチを必ず切って下さい。	● パネルやカバーを取り外したままで機械操作をしないで下さい。	Japanese **注意事項**
●頭部遠離煙霧。 ●在呼吸區使用通風或排風器除煙。	●維修前切斷電源。	●儀表板打開或沒有安全罩時不準作業。	Chinese **警 告**
● 얼굴로부터 용접가스를 멀리하십시요. ● 호흡지역으로부터 용접가스를 제거하기 위해 가스제거기나 통풍기를 사용하십시요.	● 보수전에 전원을 차단하십시요.	● 판넬이 열린 상태로 작동치 마십시요.	Korean **위 험**
● ابعد رأسك بعيداً عن الدخان. ● استعمل التهوية أو جهاز ضغط الدخان للخارج لكي تبعد الدخان عن المنطقة التي تتنفس فيها.	● اقطع التيار الكهربائي قبل القيام بأية صيانة.	● لا تشغل هذا الجهاز اذا كانت الاغطية الحديدية الواقية ليست عليه.	Arabic **تحذير**

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

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

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

이 제품에 동봉된 작업지침서를 숙지하시고 귀사의 작업자 안전수칙을 준수하시기 바랍니다.

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

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