

## OPERATING MANUAL

# IDEALARC R3R 500-I & 600-I

<b>R3R 500-I</b>	K1380-A1	220/380/440V
	K1380-A2	380/500V
	K1380-A7	415V
<b>R3R 600-I</b>	K1381-A1	TV
	K1381-A7	415V



### SAFETY DEPENDS ON YOU

Lincoln Electric welders are designed and built with safety in mind. However, your overall safety can be increased by proper installation and thoughtful operation on your part. Read and observe the general safety precautions on page 2 and follow specific installation and operating instructions included in this manual. Most importantly, think before you act and be careful.

**THE LINCOLN ELECTRIC COMPANY  
(AUSTRALIA) PTY. LTD. A.B.N. 36 000 040 308  
SYDNEY, AUSTRALIA**

A Subsidiary of

**THE LINCOLN ELECTRIC CO. U.S.A.**

Associated Subsidiaries in Australasia, Asia, Canada, Europe, North and South America.

**THE WORLD'S LEADER IN WELDING AND CUTTING PRODUCTS**

**PROTECT YOURSELF AND OTHERS FROM POSSIBLE SERIOUS INJURY OR DEATH. READ AND UNDERSTAND BOTH THE SPECIFIC INFORMATION GIVEN IN THE OPERATING MANUAL FOR THE WELDER AND/OR OTHER EQUIPMENT TO BE USED AS WELL AS THE FOLLOWING GENERAL INFORMATION.**

## ARC WELDING SAFETY PRECAUTIONS



### **ELECTRIC SHOCK can kill**

1. 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.
- b. In semi-automatic and automatic wire welding, the electrode, electrode reel, welding head and nozzle or semi-automatic welding gun are also electrically "hot".
- c. Insulate yourself from work and ground using dry insulation. When welding in damp locations, on metal framework such as floors, gratings or scaffolds, and when in positions such as sitting or lying, make certain the insulation is large enough to cover your full area of physical contact with work and ground.
- 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.
- e. Ground the work or metal to be welded to a good electrical (earth) ground.
- f. Maintain the electrode holder, work clamp, welding cable and welding machine in good, safe operating condition. Replace damaged insulation.
- g. Never dip the electrode holder in water for cooling.
- 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.
- i. When working above floor level, protect yourself from a fall should you get a shock.
- j. Also see items 4c and 6.



### **FUMES AND GASES can be dangerous**

2. 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 on galvanised, lead or cadmium plated steel and other metals which produce toxic fumes, even greater care must be taken.
- b. Do not weld in locations near chlorinated hydrocarbon vapours coming from degreasing, cleaning or spraying operations. The heat and rays of the arc can react with solvent vapours to form phosgene, a highly toxic gas, and other irritating products.
- c. Shielding gases used for arc welding can displace air and cause injury or death. Always use enough ventilation, especially in confined areas, to ensure breathing air is safe.
- d. 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.
- e. Also see Item 7b.



### **ARC RAYS can burn**

3. 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 AS 1674.2-2003 AS1337-1992 and AS1338-1992 standards.
- b. Use suitable clothing made from durable flame resistant material to protect your skin and that of your helpers from the arc rays.
- c. Protect other nearby personnel with suitable non flammable screening and/or warn them not to watch the arc or expose themselves to the arc rays or to hot spatter or metal.



### **WELDING SPARKS can cause fire or explosion**

4. 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. Have a fire extinguisher readily available.
- b. Where compressed gases are to be used at the job site, special precautions should be used to prevent hazardous situations. Refer to AS1674 Parts 1 & 2 "Safety in Welding and Allied Processes", WTIA Technical Note 7 "Health and Safety in Welding" and the operating information for the equipment being used.
- 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.
- 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 vapours from substances inside. These can cause an explosion even though the vessel has been "cleaned". For information purchase AS 1674-1990.
- e. Vent hollow castings or containers before heating, cutting or welding. They may explode.
- 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.
- g. Connect the work cable to the work as close to the welding area as possible. 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.
- h. Also see Item 7c.



## CYLINDER may explode if damaged

5.
  - 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.
  - b. Always keep cylinders in an upright position and securely chained to an undercarriage or fixed support.
  - 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.
  - d. Never allow the electrode, electrode holder, or any other electrically "hot" parts to touch a cylinder.
  - e. Keep your head and face away from the cylinder valve outlet when opening the cylinder valve.
  - f. Valve protection caps should always be in place and hand-tight except when the cylinder is in use or connected for use.
  - g. Read and follow the instructions on compressed gas cylinders and associated equipment, and AS 2030 Parts 1 & 2.







## FOR ELECTRICALLY powered equipment

6.
  - a. Turn off input power using the disconnect switch at the fuse box before working on the equipment.
  - b. Install equipment in accordance with the SAA Wiring Rules, all local codes and the manufacturer's recommendations.
  - c. Ground the equipment in accordance with the SAA Wiring Rules and the manufacturer's recommendations.



## FOR ENGINE powered equipment

7.
    - a. Turn the engine off before troubleshooting and maintenance work unless the maintenance work requires it to be running.
- 
- b. Operate engines in open, well ventilated areas or vent the engine exhaust fumes outdoors.
- 
- c. Do not add fuel near an open flame, welding arc or when the engine is running. Stop the engine and allow it to cool before refuelling to prevent spilled fuel from vaporising 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.
- 
- 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.
  - 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.
  - 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.
  - g. To prevent accidentally starting petrol engines while turning the engine or welding generator during maintenance work, disconnect the spark plug wires, distributor cap or magneto wire as appropriate.
- 
- h. To avoid scalding do not remove the radiator pressure cap when the engine is hot.

**HAVE ALL INSTALLATIONS, OPERATION, MAINTENANCE AND REPAIR WORK PERFORMED BY QUALIFIED PEOPLE**

For more detailed information it is strongly recommended that you purchase a copy of "Safety in Welding and Allied Processes AS1674 Parts 1 & 2" and WTIA Technical Note 7. All WTIA publications are available from the Welding Technology Institute of Australia, P.O. Box 6165, Silverwater NSW 2128. For copies of various Australian Standards contact your local S.A.A. office.

### HOW TO ORDER REPLACEMENT PARTS

To ensure that you receive the correct replacement part the following procedure should be followed:

1. Quote Serial Number and Code Number.
2. Quote the Description, Item Number and Parts List Number of the desired part. When ordering parts for items carrying brand names of other companies, such as fan motors, drive shafts, etc., be sure to include the other company's name and part number and other relevant information.
3. Should the primary cord be damaged, a special cord is required, and is available from Lincoln Electric.
4. Parts should be ordered from Lincoln, its offices or the nearest Authorised Service Facilities. (The "Lincoln Service Directory" listing these shops geographically is available on request.)

**Note:** "Hardware" in the Lincoln Parts Lists are not Lincoln stock items but can be obtained via the Authorised Service Facilities.

Component parts of assemblies such as stator coils or armature coils, etc., which require electrical testing or locating fixtures are not considered replaceable items. This is to ensure that the customer receives parts which will keep the welder in the best operating condition.

**BUY ONLY GENUINE REPAIR PARTS**

# WELDING, EMF & PACEMAKERS

All welders should follow safe practices that minimise their exposure to electric and magnetic fields (EMF).

For welders wearing implanted pacemakers, safe welding practices are particularly important and additional procedures should be followed by those who have decided to continue to weld. (Hopefully in keeping with a doctor's advice).

The following procedures will not eliminate exposure to EMF or the possibility of arc welding having an effect on a pacemaker, however if followed, they will significantly reduce exposure to electric and magnetic fields. Electric and magnetic fields are created any time electric current flows through a conductor, however it is not clear whether such exposure affects one's health.

Some researchers have reported that exposure to EMF may cause leukemia or other illnesses. These claims originally arose in relation to high voltage electric power lines and are very much in dispute in the medical and scientific arena, however the best advice is to minimise your exposure to EMF to protect your health should doctors eventually decide there is a risk.

There are four fundamental facts about EMF:

- With direct current (DC), the field strength is relatively constant and does not change.
- With alternating current (AC), the field strength constantly changes.
- The greater the current flow, i.e. the higher the amps, the stronger the field created by the current
- The closer the conductor or electrical device is to the body, the greater the exposure to the field.

## Minimising exposure

All welders should use the following procedures to minimise EMF exposure.

- Route electrode or gun and work cables together. Secure them with tape if possible.
- Never coil the electrode lead around your body.
- Do not place your body between the electrode and work cables. If your electrode cable is on your right side the work cable should also be on your right side.
- Connect the work cable to the work piece as close as possible to the area being welded. (This is also a good practice to eliminate a common problem on welding - a poor work connection.
- Do not work next to the welding power source.

## Welders with pacemakers

There is no question that the fields in arc welding can interfere with a pacemaker's function. Generally the interference does not permanently damage the pacemaker. Once the wearer leaves the arc welding environment or stops welding, the pacemaker returns to normal functioning. The welding arc has little or no effect on the operation of some pacemakers, especially designs that are bi-polar or designed to filter out such interference.

For a welder or anyone working around electrical equipment the selection of a pacemaker is very important. Get a doctor's advice about which pacemaker is the least sensitive to interference from welding while still being medically suitable.

In addition to the normal safety precautions, the following additional procedures should be adopted by welders with pacemakers.

- Use gas welding when the application is suitable.
- Use the lowest current setting appropriate for the application. Do not exceed 400 amps. Low current (75-200 amps) direct current (DC) welding should be used if arc welding is necessary. Do not TIG weld with high frequency.
- Do not use repeated, short welds. Wait about ten seconds between stopping one weld and starting the next. When having difficulty starting an electrode, do not re-strike the rod repeatedly.
- If you feel light headed, dizzy or faint, immediately stop welding. Lay the electrode holder down so that it does not contact the work and move away from any welding being performed. Arrange your work in advance so that, if you become dizzy and drop the electrode holder, the electrode holder will not fall on your body or strike the work.
- Do not work on a ladder or other elevated position or in a cramped, confined place.
- Do not work alone. Work only in the presence of an individual who understands these precautions and the possible effect welding may have on your pacemaker.
- Do not work near spot welding equipment.
- If you have a pacemaker and wish to continue arc welding, discuss this and any other questions you may have with your physician and follow his or her advice. The doctor may wish to contact the pacemaker manufacturer for a recommendation. As mentioned before, the design of the pacemaker significantly affects the degree to which it is subject to interference from a welding circuit. Do not rely on the fact that you know another welder with a pacemaker who has welded for years without experiencing a problem. That welder and his or her pacemaker may be quite different from you and your pacemaker.

# INSTRUCTIONS FOR ELECTROMAGNETIC COMPATIBILITY



## WARNING

This welding machine must be used by trained operators only. Read this manual carefully before attempting to use the welding machine.

### Conformance

Products displaying the C-Tick mark are in conformity with Australian/New Zealand requirements for Electromagnetic Compatibility (EMC) according to standard AS/NZS "Industrial scientific and medical (ISM) radio-frequency equipment - Electromagnetic disturbance characteristics - Limits and methods of measurement".

Products displaying the CE mark are in conformity with European Community Council Directive 89/336/EEC requirements for EMC by implementing EN60974-10 "Arc Welding Equipment - Part 10: Electromagnetic Compatibility (EMC) requirements".

- manufactured in conformity with Australian/New Zealand Standard (Emission):- AS/NZS 3652 'Electromagnetic Compatibility - Arc Welding Equipment' (Identical to and reproduced from British Standard EN 50199)

Products are:

- for use with other Lincoln Electric/LiquidArc equipment.
- designed for industrial and professional use.

### Introduction

All electrical equipment generates small amounts of electromagnetic emission. Electrical emission may be transmitted through power lines or radiated through space, similar to a radio transmitter. When emissions are received by other equipment, electrical interference may result. Electrical emissions may effect many kinds of electrical equipment: other nearby welding equipment, radio and TV transmitters and receivers, numerical controlled machines, telephone systems, computers, etc. Be aware that interference may result and extra precautions may be required when a welding power source is used in a domestic establishment.

### Installation and Use

The purchaser/user is responsible for installing and using the welding equipment according to the manufacturer's instructions. If electromagnetic disturbances are detected then it shall be the responsibility of the purchaser/user of the welding equipment to resolve the situation with the technical assistance of the manufacturer. In some cases this remedial action may be as simple as earthing (grounding) the welding circuit (see note below). In other cases it could involve constructing an electromagnetic screen enclosing the power source and the work complete with associated input filters. In all cases electromagnetic disturbances must be reduced to the point where they are no longer troublesome.

NOTE: The welding circuit may or may not be earthed for safety reasons according to national codes. Changing the earthing arrangements should only be authorised by a person who is competent to assess whether the changes increase the risk of injury, eg. by allowing parallel welding current return paths which may damage the earth circuits of other equipment.

## Assessment of Area

Before installing welding equipment the purchaser/user shall make an assessment of potential problems in the surrounding area.

The following shall be taken into account:

- Other supply cables, control cables, signalling and telephone cables above, below and adjacent to the welding equipment;
- Radio and television transmitters and receivers;
- Computer and other control equipment;
- Safety critical safety equipment, eg. guarding of industrial equipment;
- The health of people around, eg. the use of pacemakers and hearing aids;
- Equipment used for calibration or measurement;
- The immunity of other equipment in the environment. The purchaser/user shall ensure that other equipment being used

in the environment is compatible. This may require additional protection measures;

- The time of the day that welding or other activities are to be carried out.

The size of the surrounding area to be considered will depend on the structure of the building and other activities that are taking place. The surrounding area may extend beyond the boundaries of the premises.

## Methods of Reducing Emissions

### Mains Supply

Welding equipment should be connected to the mains supply according to the manufacturer's recommendations. If interference occurs, it may be necessary to take additional precautions such as filtering the mains supply. Consideration should be given to shielding the supply cable of permanently installed welding equipment in metallic conduit or equivalent. Shielding should be electrically continuous throughout its length. The shielding should be connected to the welding power source so that good electrical contact is maintained between the conduit and the welding power source enclosure.

### Maintenance of the Welding Equipment

The welding equipment should be routinely maintained according to the manufacturer's recommendations. All access and service doors and covers should be closed and properly fastened when the welding equipment is in operation. The welding equipment should not be modified in any way except for those changes and adjustment covered in the manufacturer's instructions. In particular, the spark gaps of arc initiation and stabilising devices should be adjusted and maintained according to the manufacturer's recommendations.

### Welding Cables

The welding cables should be kept as short as possible and should be positioned close together, running at or close to the floor level.

### Equipotential Bonding

Bonding of all metallic components in the welding installation and adjacent to it should be considered. However, metallic components bonded to the work piece will increase the risk that the operator could receive a shock by touching these metallic components and the electrode at the same time. The operator should be insulated from all such bonded metallic components.

### Earthing of the workpiece

Where the workpiece is not bonded to earth for electrical safety, nor connected to earth because of its size and position, eg. ship's hull or building steelwork, a connection bonding the workpiece to earth may reduce emissions in some, but not all instances. Care should be taken to prevent the earthing of work pieces increasing the risk of injury to users, or damage to other electrical equipment. Where necessary, the connection of the workpiece to earth should be made by direct connection to the workpiece, but in some countries where direct connection is not permitted, the bonding should be achieved by suitable capacitance, selected according to national regulations.

### Screening and Shielding

Selective screening and shielding of other cables and equipment in the surrounding area may alleviate problems of interference. Screening of the entire welding installation may be considered for special applications.\*

Portions of the preceding text are extracted from:

- Australian/New Zealand standard AS/NZS 3652. permission to reproduce has been granted by Standards Australia and Standards New Zealand. For further explanation, reads should be referred to the standard itself.
- British Standards Institution standard BS EN 50199: 1995. Reproduced with permission of BSI under license number 2000SK0631. Complete standards can be obtained from BSI Customer Services, 389 Chiswick High Road, London W4 4AL, United Kingdom. (Tel +44 (0) 20 8996 9001).

Copyright of the above text is property of Standards Australia, Standards New Zealand and British Standards Institution. Permission to reproduce the text must be obtained.

# PRODUCT DESCRIPTION

## Technical Specifications

		<b>R3R 500-I</b>			<b>R3R 600-I</b>		
<b>Duty Cycle</b>							
35%		500 Amp / 40 Volt			600 Amp / 44 Volt		
60%		400 Amp / 36 Volt			500 Amp / 40 Volt		
100%		300 Amp / 32 Volt			375 Amp / 35 Volt		
<b>Max OCV</b>		66-71 Volts DC			66-71 Volts DC		
<b>Output Range</b>		60 Amp / 22 Volt --- 550 Amp / 40 Volt			45 Amp / 22Volt --- 375 Amp / 35 Volt		
<b>Input Current and Circuit Protection</b>							
<b>Input Voltage</b>	<b>HRC superlag</b>			<b>HRC superlag</b>			
	<b>Rated</b>	<b>Max</b>	<b>fuse in Amps</b>	<b>Rated</b>	<b>Max</b>	<b>fuse in Amps</b>	
220 Volt	57 Amp	98 Amp	125 Amp	65 Amp	112 Amp	150 Amp	
380 Volt	33 Amp	57 Amp	80 Amp	35 Amp	65 Amp	90 Amp	
415 Volt	30 Amp	52 Amp	70 Amp	34 Amp	59 Amp	80 Amp	
440 Volt	28 Amp	48 Amp	60 Amp	32 Amp	55 Amp	70 Amp	
500 Volt	25 Amp	43 Amp	55 Amp	28 Amp	49 Amp	60 Amp	

# INSTALLATION



## WARNING

**FALLING EQUIPMENT can cause injury**

- Do not lift this machine using lift bale if it is equipped with a heavy accessory such as trailer or gas cylinder.



- Lift only with equipment of adequate lifting capacity.
- Be sure machine is stable when lifting

The machine should be located in a clean, dry place where there is free circulation of clean air, such that air movement entering the front and exiting the back will not be restricted. Dirt and dust that can be drawn into the machine should be kept to a minimum. Failure to observe these precautions can result in excessive operating temperatures and nuisance shutdown of the machine.

The Idealarc R3R welders can be stacked three high when the following precautions are observed:

1. Be sure the bottom machine is on a firm, level surface suitable for the total weight up to 608kg of the stacked machines.
2. Stack the machines with the fronts flush. be certain the pins on the top front corners of the lower machines fit through the holes in the base rails of the upper machines.
3. No unit heavier than the bottom unit should be stacked on top of it

## DUTY CYCLE

The maximum output rating of this welder is at a 35% duty cycle. Duty cycle is based on a ten minute period. Therefore, the welder can be operated at the maximum rated output for 3.5 minutes out of every 10 minute period without overheating.

## OUTPUT CONNECTIONS

With the machine power switch off, the output leads are connected to the output terminals marked “-” and “+”. They are located at the lower right and lower left corners of the front panel. Strain relief for the electrode and work cables is provided by routing the leads through the rectangular holes in the base before the connections to the output terminals are made.

The recommended output cable sizes can be found in the Table below.

Machine Size	Up to 30m	30-45m	45-60m	60-70m
500-I	70mm <sup>2</sup> (2/0)	70mm <sup>2</sup> (2/0)	95mm <sup>2</sup> (3/0)	95mm <sup>2</sup> (4/0)
600-I	70mm <sup>2</sup> (2/0)	95mm <sup>2</sup> (3/0)	95mm <sup>2</sup> (3/0)	1x50mm <sup>2</sup> 1x95mm <sup>2</sup> (4/0)



## WARNING



### INPUT POWER CONNECTION

**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.

Remove the rear access panel. Connect the three phase input power to the three line terminals on the input contactor, and the earth ground lead to the ground stud marked with the symbol. Install the reconnect panel for the proper input voltage per the diagram pasted inside the access panel cover.

# OPERATION



**ELECTRIC SHOCK** can kill.

- Do not touch electrically live parts or electrode with skin or wet clothing.
- Insulate yourself from work and ground.
- Always wear dry insulating gloves.



**FUMES AND GASES** 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.
- Do not weld on containers that have held combustibles.



**ARC RAYS** can burn.

- Wear eye, ear and body protection.

## STARTING THE MACHINE

The “power on-off” switch on the machine control panel energises the three phase line contactor from a small 115 volt pilot transformer. This in turn energises the main power transformer.

Note: All PC boards are protected by a moisture resistant coating. When the welder is operated, this coating will “bake off” of certain power resistors that normally operate at high temperatures, emitting some smoke and odour for a short time. These resistors and the PC board beneath them may become blackened. This is a normal occurrence and does not damage the component or affect the machine performance.

## PILOT LIGHT

The red light on the machine control panel indicates when The line contactor is energised.

**Note:** If the amber High Temperature Warning Light is lit, it indicates that one or both of the protective thermostats has opened the line contactor.

## OUTPUT CONTROL

The “current control” dial (labelled “I”) on the front of the machine indicates the output current.

On the R3R 500-I, and 600-I, there are two dials. The “A” range controls the current over about 1/2 of the “B” range. A toggle switch on the control panel allows selection of the desired range. The output control can be adjusted while welding.

## MACHINE OR REMOTE CURRENT CONTROL SWITCH

Provisions for remote control are standard on each power source. A current control switch on the machine control panel labelled “” or “” is provided for selecting the desired mode of operation, either remote (  ) or at the machine (  ).

## ARC FORCE CONTROL

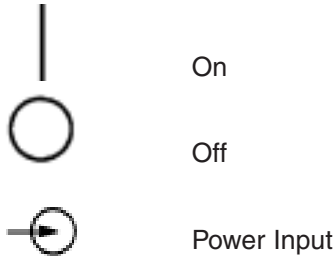
The arc force control, located on the right side of the front control panel, is calibrated from one to ten. For most welding, the dial should be set at approximately mid-range, 5-6. Adjustments up or down can then be made depending on the electrode, procedures, and operator preference. Lower settings will provide less short circuit current and a softer arc. A setting that is too low may cause the electrode to stick in the puddle. Higher settings will provide a higher short circuit current and a more forceful arc. Excessive spatter may result if the control setting is too high. For most TIG welding applications, adjust this control to minimum for best operating characteristics.

## INTERNATIONAL SYMBOLOGY REFERENCE

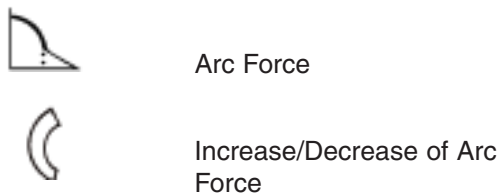
The R3R nameplates feature international symbols in describing the function of the various components.

Below are the symbols used and an explanation of what each represents.

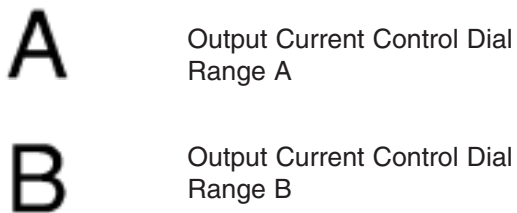
### A. POWER ON-OFF SWITCH



### B. ARC FORCE CONTROL DIAL



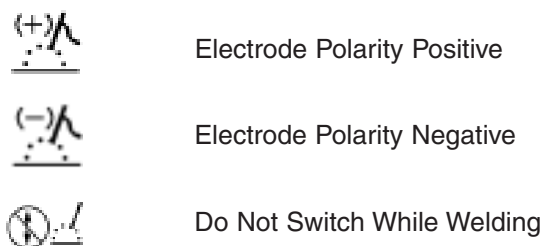
### D. OUTPUT CURRENT CONTROL RANGE SWITCH



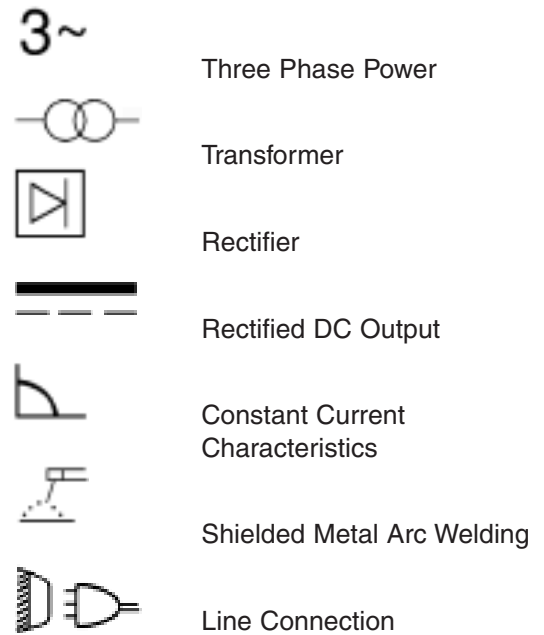
### E. OUTPUT CURRENT CONTROL "MACHINE-REMOTE" SWITCH



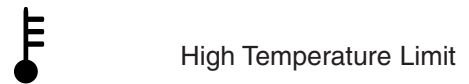
### F. POLARITY SWITCH (Factory installed option on domestic models only)



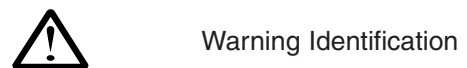
### G. RATING PLATE



### H. HIGH TEMPERATURE WARNING LIGHT



### I. Warning



### J. Ground



## OPTIONAL EQUIPMENT

### K857 – REMOTE CURRENT CONTROL

The K857 consists of a control box with 8.5 m (K857-20 20m long) of four conductor cable and a 6 pin Amphenol for easy connection to the front of the power source.

The K857 (K857-20 20m long) will give the same control as the current control on the machine depending on the position of the current dial selector switch.



### CAUTION

**Extreme care must be observed when installing or extending the wiring of a remote control. The Remote Control cord can be lengthened to any length by splicing four wires to the standard 8.5 m cord before connecting to the R3R receptacle. Only the green lead can and should be grounded to the machine case.**

**(Use K857-20 for the 20m cable)**

### KA1236, KA1237 – UNDERCARRIAGE

For easy moving of the machine, optional undercarriages are available with either basic (KA1236) or with gas bottle support (KA1237).

### K963-1 – HAND AMPTROL AND K870 FOOT AMPTROL

Connect directly to the 6 pin Amphenol on the front of the power source.

### POCKET AMPTROL – (factory installed only)

The Pocket Amptrol option provides a remote current control for the R3R welders. This “wireless” control requires no control cable connection to the welder.

- a. On the R3R 500-I and R3R 600-I the welder Current Control (labelled “ ” switch must be in the Remote ( ) position and the Current Dial Selector switch in the “B” range. With the Current Control switch in the Remote position, the current control potentiometer on the welder is removed from the circuit and its setting has no effect on the output. With the Current Dial Selector switch in the “B” range position, the Pocket Amptrol provides total control of the welder’s output.
- b. Turn the welder power switch on.
- c. Insert one end of the probe into the electrode holder and hold the other end on the work for approximately five seconds.

### AMMETER AND VOLTMETER – (factory installed options only)

# MAINTENANCE



## 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.

## ROUTINE MAINTENANCE

1. The fan motor has sealed bearings which require no service.
2. In extremely dusty locations, dirt may clog the air channels causing the welder to run hot. Blow out the machine at regular intervals.

## POCKET AMPTROL

Routine cleaning should be the only maintenance required. The probe tip should be kept in condition to provide sharp edges at the ends to assure penetration of heavy oxide coatings on the work piece. A blunted tip could result in giving different welding currents for a given dial setting.

## POWER RECTIFIER REPLACEMENT

Refer to the troubleshooting section "Power Rectifier Bridge Assembly Checking Procedure" if a rectifier failure is suspected

**Note:** Since proper material and correct assembly procedures are critical, field disassembly of the power rectifier bridge sections can do more harm than good. Return a defective rectifier bridge section (or the entire bridge) to the factory for repairs.

# GROUND TEST PROCEDURE



## WARNING

**This procedure is only suitable for applications using DC mega testers up to 500V.**

**Note:** This procedure is for 'machines as built' many modifications could have taken place over the life of a particular machine, so details of this procedure may need to be 'adjusted' to suit these modifications.

For prompt service contact your local authorised Lincoln field service shop.

The insulation resistance values listed below are from Australian Standard AS1966.1



## ELECTRIC SHOCK can kill

- 1) Disconnect input power mains supply.
- 2) Remove welding leads (electrode cables and work lead) from the machine before any tests are carried out.
- 3) Remove all connections from the PCB. Install a shorting socket into the 2 harness plugs. (Shorting plugs or machine wiring harness must not touch any part of PCB or PCB mountings during mega testing.
- 4) Short leads 201, 202, 203 & 204 together. (Away from ground and the PCB).

- 5) Short Gate leads G1, G2 & G3 together. (Away from ground and the PCB).
- 6) Jumper all input and output lead connections on the input contactor (1CR).
- 7) Short each Diode and SCR on the Power Rectifier Bridge.
- 8) Disconnect the ground lead on the snubber network mounted on the case front.
- 9) Jumper volt and amp meter terminals, (if fitted).
- 10) Input circuit test: connect one lead of the mega tester to the frame of the machine and the other lead to the input contactor jumper. Apply the test. (Min resistance 1MΩ).
- 11) Welding circuit test: connect one lead of the mega tester to the frame of the machine and the other lead to the positive output stud. Apply the test. (Min resistance 1MΩ).
- 12) Input circuit to welding circuit test: connect one lead of the mega to the input contactor jumper and the other to the positive output stud. Apply the test. (Min resistance 1MΩ).
- 13) Auxiliary circuit test: connect one lead of the mega tester to the frame of the machine and the other lead to the power On-Off switch terminals. Apply the test. (Min resistance 1MΩ).
- 14) Remove all shorting plugs, and jumpers and reconnect all plus and leads.

If any problems are encountered refer to your nearest authorised Lincoln Field Service Shop.

# TROUBLESHOOTING

## HOW TO USE THE TROUBLESHOOTING GUIDE



### WARNING

Service and Repair should only be performed by Lincoln Electric Factory Trained Personnel.

Unauthorised 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 labelled "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 labelled "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.

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



### WARNING

ELECTRIC SHOCK can kill.



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



### 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 Authorised Field Service Facility for technical troubleshooting assistance before you proceed.

# TROUBLESHOOTING

PROBLEMS (SYMPTOMS)	POSSIBLE CAUSE	RECOMMENDED COURSE OF ACTION
<b>FUNCTION PROBLEMS</b>		
A. Input contactor chatters.	<ol style="list-style-type: none"> <li>1 Faulty input contactor.</li> <li>2 Low line voltage.</li> </ol>	<ol style="list-style-type: none"> <li>1. Repair or replace.</li> <li>2. Check with Power Company.</li> </ol>
B. Machine input contactor does not operate.	<ol style="list-style-type: none"> <li>1. Supply line fuse blown.</li> <li>2. Power circuit dead.</li> <li>3. Broken or loose power lead.</li> <li>4. Wrong voltage.</li> <li>5. Thermostats tripped. (High Temperature Warning Light should be lit.) (Welder overheated.)</li> <li>6. Input contactor coil open.</li> <li>7. Open winding on 115V pilot transformer.</li> <li>8. Power ON-OFF switch not closing.</li> <li>9. Lead broken or loose connection in 115V starter circuit.</li> <li>10. Thermostats defective. (High Temperature Warning Light should be lit.)</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace (look for reason for blown fuse first).</li> <li>2. Check voltage.</li> <li>3 Repair.</li> <li>4. Check voltage against instructions.</li> <li>5.               <ol style="list-style-type: none"> <li>a. Make sure the fan is operating and that there are no obstructions to free flow of air.</li> <li>b. Operate at normal current and duty cycle.</li> <li>c. Replace High Temperature Warning Light if defective.</li> </ol> </li> <li>6. Replace.</li> <li>7. Replace.</li> <li>8. Replace.</li> <li>9. Replace.</li> <li>10. Turn input power off (115V circuit is hot when input power is connected). Check thermostats with continuity meter – should read short-circuit when machine is cool. Replace if defective.  There are two thermostats; one on the secondary lead and one on the choke. Replace High Temperature Warning Light if defective.</li> </ol>

# TROUBLESHOOTING

PROBLEMS (SYMPTOMS)	POSSIBLE CAUSE	RECOMMENDED COURSE OF ACTION
<b>FUNCTION PROBLEMS</b>		
<p>C. Machine input contactor closes but has no or low output. Open circuit voltage should be 67 to 71 volts.</p>	<ol style="list-style-type: none"> <li>1. Electrode or work lead loose or broken.</li> <li>2. Open transformer primary or secondary circuit.</li> <li>3. Supply line fuse blown.</li> <li>4. Input line grounded causing single phase input.</li> <li>5. Input leads not connected to contactor.</li> <li>6. Latching resistor, R3, open.</li>   <li>7. Control circuit problems.</li> </ol>	<ol style="list-style-type: none"> <li>1. Repair connections.</li> <li>2. Repair.</li> <li>3. Replace blown fuse – check fuse size.</li> <li>4. Repair input to machine.</li> <li>5. Connect input lead.</li> <li>6.               <ol style="list-style-type: none"> <li>a. Replace.</li> <li>b. Check leads to the resistor and repair if defective.</li> </ol> </li> <li>7. See Troubleshooting Procedures – Power Silicon Controlled Rectifier (Page ?).</li> </ol>
<p>D. Machine has maximum output but no control.</p>	<ol style="list-style-type: none"> <li>1. Possible defective power SCR.</li> <li>2. Possible defective control board.</li> </ol>	<ol style="list-style-type: none"> <li>1. Remove all gate leads G1, G2 and G3 at PC board connector. If welder has any open circuit voltage, power SCR is defective. See Troubleshooting Procedures Page ?.</li> <li>2. See PC board Troubleshooting Procedures Page ?.</li> </ol>


# TROUBLESHOOTING

PROBLEMS (SYMPTOMS)	POSSIBLE CAUSE	RECOMMENDED COURSE OF ACTION
<b>FUNCTION PROBLEMS</b>		
E. Machine does not have maximum output (67 to 71 volts).	<ol style="list-style-type: none"> <li>1. Input fuse blown. Machine is single phased.</li> <li>2. One phase of main transformer windings open.</li> <li>3. Defective power bridge.</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace fuse or repair input line. Check reason for fault.</li> <li>2. Repair.</li> <li>3. Check bridge per Troubleshooting Procedures Page ? and check snubber per Page ?.</li> </ol>
F. Machine comes on but soon trips off while under load and High Temperature Warning Light glows. (Thermostat tripped)	<ol style="list-style-type: none"> <li>1. Improper ventilation.</li> <li>2. Loaded beyond rating.</li> <li>3. Fan inoperative.</li> <li>4. Shorted diode or SCR in power rectifier bridge.</li> </ol>	<ol style="list-style-type: none"> <li>1. Make sure all case openings are free for proper circulation of air.</li> <li>2. Operate at rated current and duty cycle.</li> <li>3. Check leads and motor bearings. Fan can be tested on 115 volt line.</li> <li>4. Refer to Troubleshooting Procedures Page ? and Snubber, Page ?</li> </ol>
G. Machine comes on but reduces to low output under load and remains there until the load is broken and arc restarted. See Fault Protection Troubleshooting Page ?.	<ol style="list-style-type: none"> <li>1. Excessive load causing the overload protection on control board to operate.</li> <li>2. Machine output shorted causing overload protection on control board to operate.</li> <li>3. Control circuit defective.</li> </ol>	<ol style="list-style-type: none"> <li>1. Reduce load.</li> <li>2. Turn machine off and remove short.</li> <li>3. Replace per PC board, Troubleshooting, Page ?.</li> </ol>

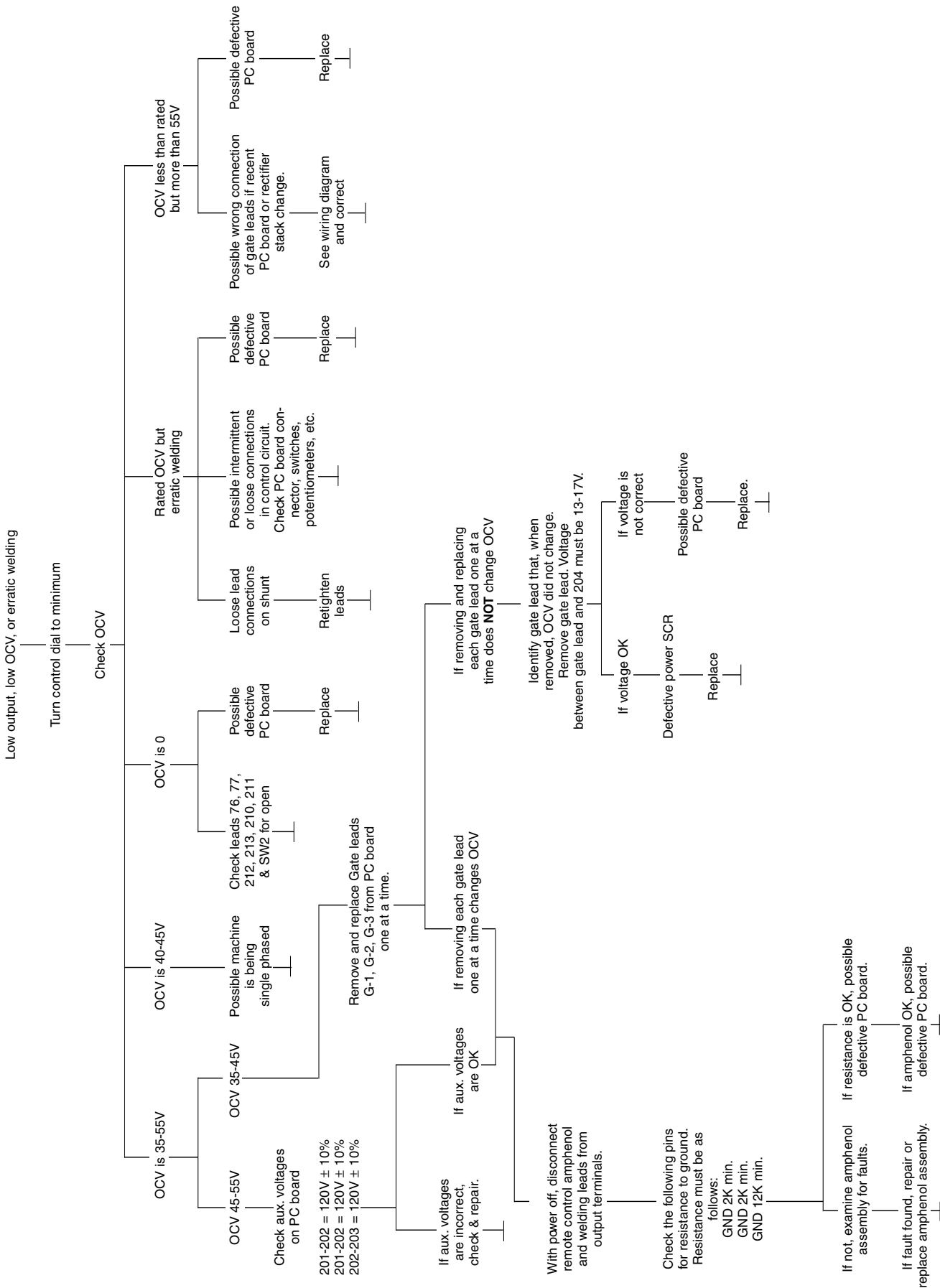
# TROUBLESHOOTING

PROBLEMS (SYMPTOMS)	POSSIBLE CAUSE	RECOMMENDED COURSE OF ACTION
<b>FUNCTION PROBLEMS</b>		
H. Machine trips off when under no load or makes excessive noise like it is loaded.	<ol style="list-style-type: none"> <li>1. Power bridge rectifier may have a shorted diode or SCR.</li> <li>2. Short in the transformer.</li> <li>3. Fan hitting vertical baffle.</li> </ol>	<ol style="list-style-type: none"> <li>1. Refer to Power Hybrid, Troubleshooting Procedures, Page ? and Snubber, Page ?.</li> <li>2. Repair.</li> <li>3. Clear the fan.</li> </ol>
I. Variable or sluggish welding arc.	<ol style="list-style-type: none"> <li>1. Poor work or electrode cable connection.</li> <li>2. Current too low.</li> <li>3. Welding leads too small.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check and clean cable connections.</li> <li>2. Check recommended currents for rod type and size.</li> <li>3. See Table in Output Connection Section.</li> </ol>
J. Welder will not shut off.	<ol style="list-style-type: none"> <li>4. Open SCR or diode in power rectifier bridge.</li> <li>5. Control circuit problems.</li> </ol>	<ol style="list-style-type: none"> <li>4. Check per Power Rectifier Bridge Troubleshooting Procedures, Page ? and Snubber, Page ?.</li> <li>5. See SCR Troubleshooting, Page ?.</li> </ol>
	<ol style="list-style-type: none"> <li>1. Input contactor contacts frozen.</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace input contactor.</li> </ol>
K. Current control on machine not functioning.	<ol style="list-style-type: none"> <li>1. Current control switch in wrong position.</li> <li>2. Current control switch defective.</li> <li>3. Current control potentiometer defective.</li> <li>4. Lead or connection in control circuit open.</li> <li>5. Defective control or circuit boards.</li> </ol>	<ol style="list-style-type: none"> <li>1. Place switch in "machine" ( I ) position.</li> <li>2. Check per Page ?.</li> <li>3. Check per Page ?.</li> <li>4. Repair or connect.</li> <li>5. See SCR Troubleshooting, Page ?..</li> </ol>

# TROUBLESHOOTING

PROBLEMS (SYMPTOMS)	POSSIBLE CAUSE	RECOMMENDED COURSE OF ACTION
<b>FUNCTION PROBLEMS</b>		
<p>L. Optional remote current control not functioning. See Troubleshooting , Page ? before connecting.</p>	<ol style="list-style-type: none"> <li>1. Current control switch in the wrong position.</li> <li>2. Leads 75, 76 and 77 not connected to correct numbers on models with terminal strip.</li> <li>3. Remote control leads broken.</li> <li>4. Remote control potentiometer open.</li> <li>5. Lead or connection in current control circuit open.</li> <li>6. Control PC board plug disconnected or loose.</li> <li>7. Control circuit problems.</li> </ol>	<ol style="list-style-type: none"> <li>1. Place switch in "remote" (  ) position.</li> <li>2. Correct connection.</li> <li>3. Repair broken leads.</li> <li>4. See Troubleshooting, Page ?.</li> <li>5. Connect or repair.</li> <li>6. Connect plug.</li> <li>7. See SCR Troubleshooting, Page ?.</li> </ol>

## CONTROL CIRCUIT TROUBLESHOOTING CHART



# TROUBLESHOOTING PROCEDURES

## A. PROCEDURE FOR REPLACING PC BOARDS

When a PC board is to be replaced, the following procedure must be followed:

1. Visually inspect PC board in question. Are any of the components damaged? Is a conductor on the back side of the board damaged?
  - a. If there is no damage to the PC board, insert a new one and see if this remedies the problem. If the problem is remedied replace the old PC board and see if the problem still exists with the old PC board.
    1. If the problem does not exist with the old board, check the PC board harness plug and PC board plug for corrosion, contamination, or oversize.
    2. Check leads in the harness for loose connections.
  - b. If there is damage to the PC board, refer to the Troubleshooting Guide.

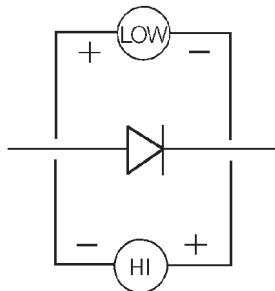
## B. PROCEDURE FOR CHECKING DIODES

1. Isolate the diode in question. (Electrically disconnect from other circuits.)
2. Use an ohmmeter X10 scale. Connect the meter across the diode and note the resistance value. Reverse the ohmmeter leads and note the resistance value.

Shorted diode – Low resistance readings in both directions.

Open diode – High or infinite resistance in both directions.

Good diode – One reading will be high or infinite and the other reading will be low.



## C. CONNECTING THE REMOTE CONTROL TO THE MACHINE

Extreme caution must be observed when installing or extending the wiring of a remote control. Improper connection of this unit can lead to failure of the current control rheostat or the control circuit. Only the green lead can and should be grounded to the machine case. When extending the standard remote control make sure the leads are the same and the splice is waterproof. Be very careful not to ground the cable when in use and do not let these connections touch against the case.

## D. OUTPUT VOLTAGE

The open circuit voltage of the machine should be 66 to 71 volts and should not vary when the rheostat is varied unless the machine is welding. If any other condition exists, refer to the Troubleshooting Guide.

## E. FAULT PROTECTION OPERATION

The overload protection circuit, in the control board, will reduce the welding current (heat) to some safe value if the machine is overloaded for 2 to 3 seconds. The overload values are as

Machine Name	f	Load Current $\pm 5\%$
R3R 500-I	50 Hz	100 A
R3R 600-I		

appears in the following table.

## F. CHECKING SNUBBER CIRCUIT

In case of an SCR malfunction or failure, the snubber assembly should be checked. Turn the machine off and disconnect one lead of the snubber assembly. (Either 221, 222 or 223 depending on the SCR in question. See wiring diagram.) The sides of the machine have to be removed to do this. (See the instruction manual parts list for the exact location.)

1. Visually inspect the snubber assembly for over-heated components.
2. Using a VOM meter on the X10 scale, connect the positive lead to the lead removed. Touch the negative lead to the other lead still connected to the SCR bridge. The indicating needle on the meter will move quickly to the right (low resistance value) and then slowly return to the left (high resistance value). This indicates that the capacitor in the snubber circuit is taking a charge.
3. If the needle stays to the right, the capacitor is shorted and the assembly is defective.
4. If the needle does not move, the capacitor is open and the assembly is defective.

## G. CHECKING CURRENT CONTROL RHEOSTAT ON MACHINE

1. Turn machine off.
2. Remove the control panel screws and open the front cover.
3. Turn the current control switch to remote.
4. Disconnect the harness plug from the control board.
5. Put current range switch to B range.
6. With an ohmmeter on X1K, connect it to lead 210 and 211 on SW #2. Rotate the current control rheostat. The resistance reading should be from around zero to 10K ohms. Check the resistance reading between 75 on the Amphenol and 211 on SW #2. The reading must be 10K ohms. No reading will indicate an open rheostat and low reading will indicate a shorted or partially shorted rheostat; in either case, replace.

## H. TOGGLE SWITCH CHECK

1. Turn off the machine power input. SW-1 has 110 volts across it when the input power is connected.
2. Isolate the switch to be tested by removing all connecting leads.
3. Check to make sure the switch is making connections with a VOM meter. The meter should read zero resistance.
4. Put the ohmmeter on X1K scale and measure the resistance between the terminal and the case of the machine (touch a self-tapping screw). Reading should be infinite.
5. If either step (3) or step (4) fails, replace the switch.

## I. REMOTE CONTROL CHECK

The remote control Amphenol pin assignments are: pin C-75, pin B-76, and pin A-77. Disconnect the remote field control and connect an ohmmeter across 75 and 76 and rotate the rheostat in the remote control. The resistance reading should go from zero to 10K ohms. Repeat with triplet across 77 and 76 with same results. Connect ohmmeter across 75 and 77. The reading should be 10K ohms. A lower reading will indicate a shorted or partially shorted rheostat. A very high reading will indicate an open rheostat. In either of the last two cases, replace rheostat. Check cable for any physical damage.

## J. POWER RECTIFIER BRIDGE ASSEMBLY

**CAUTION**

The rectifier bridge tests outlined below will identify the most common effects found in power diodes or power silicon controlled rectifiers. If a bridge problem still exists after test, please call a Lincoln Field Service Shop. Further evaluation of diodes or silicon controlled rectifiers may require laboratory equipment.

### CHECKING PROCEDURE

- DEVICE ISOLATION** (see the instruction manual Parts List for the exact location)

Disconnect the following leads from the bridge, shown in Diagram 1:

- Wiring harness gate leads (G1, G2, G3) from the gate lead terminals on the Control PC board.

- AC leads X1, X2 and X3 from the anodes of the SCR's and cathodes of the diodes.
- The 220, 221 and 223 leads from the Snubber PC board.
- Lead 220 that connects to the latching resistor (R3).
- The cathode of each diode (4 total).

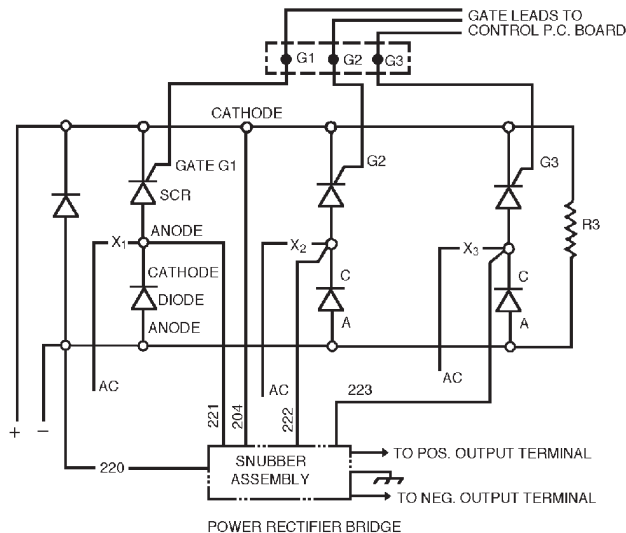
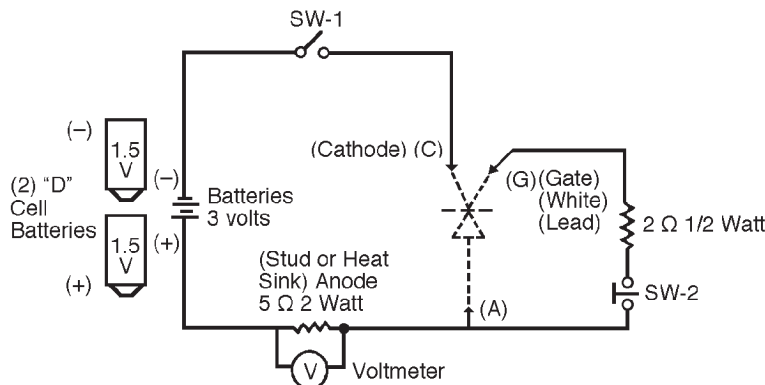
### 2. POWER DIODE TEST

- Establish the polarity of the ohmmeter leads and set to X10 scale.
- Connect the ohmmeter positive lead to anode and negative lead to the cathode.
- Reverse the leads of the ohmmeter from Step b.
- A shorted diode will indicate zero or an equally low resistance in both directions. An open diode will have an infinite or high resistance in both directions, and a good diode will have a low resistance in Step b and a much higher resistance in Step c.

## K. POWER SILICON CONTROLLED RECTIFIER TEST

The SCR must be mounted in the heat sink when making this test.

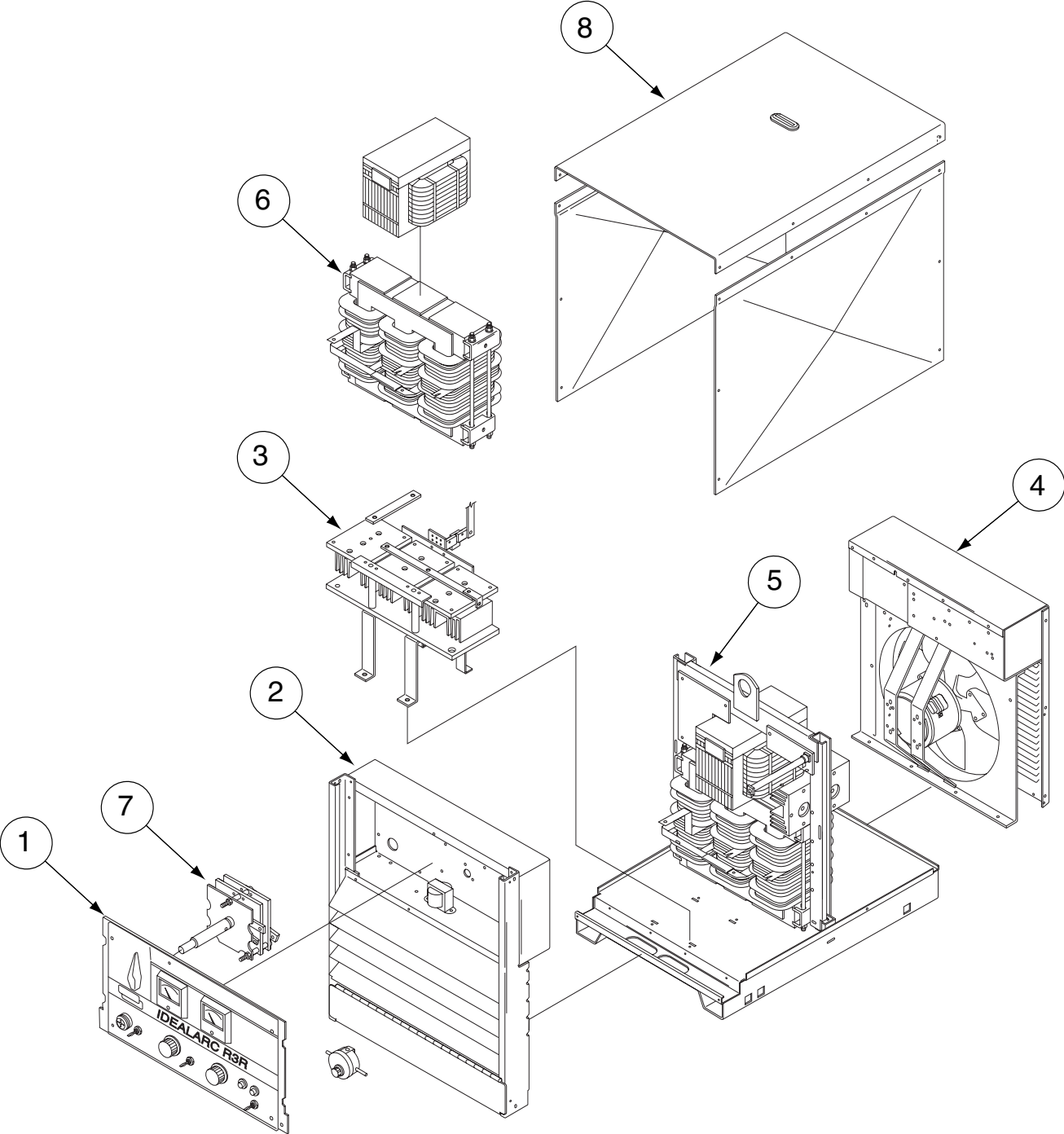
- Connect the ohmmeter (set to the X10 scale) leads to the anode and cathode.
- Reverse the leads of the ohmmeter from Step a.
- A shorted SCR will indicate zero or an equally low resistance in one or both directions.
- Establish the polarity of the ohmmeter. Connect the positive lead to the gate and the negative lead to the cathode.
- An open gate circuit will have an infinite or high resistance. A good gate circuit will read a low resistance, but not zero ohms.



# NOTES

# Illustration of Sub-Assemblies

Operative: AP-217-A  
Supersedes: May 2003  
NEW



# Idealarc R3R 500-I & 600-I

(for codes 1385 & above)

Sub Assembly Item No. →			1	2	3	4	5	6	7
SUB ASSEMBLY PAGE NAME →	Optional Equipment	Miscellaneous Items	Control Panel Assembly	Case Front Assembly	3 Phase Bridge Assembly	Input Box & Fan Assembly	Centre Assembly	Transformer Assembly	Cover Assembly
PAGE NO. →	AP217-B.1	AP217-B.2	AP217-C	AP217-D	AP217-E	AP217-F	AP217-G	AP217-H	AP217-J
CODE NO. ↓									
R3R 500-I (415V)		1	1	1	1	1	1	1	1
1456		1	1	1	1	1	1	1	1
1457		1	1	1	1	1	1	1	1
1528		1	1	1	1	1	1	1	1
1645		1	1	1	1	1	1	1	1
1675		1	1	1	1	1	1	1	1
1706									
R3R 500-I (220/380/440)		1	1	1	1	1	1	2	1
1437		1	1	1	1	1	1	2	1
1442		1	1	1	1	1	1	2	1
1446		1	1	1	1	1	1	2	1
1475		1	1	1	1	1	1	2	1
1573		1	1	1	1	1	1	2	1
1681		1	1	1	1	1	1	2	1
1694		1	1	1	1	1	1	2	1
1704		1	1	1	1	1	1	2	1
R3R500-I (380/500)		1	1	1	1	1	1	3	1
1458		1	1	1	1	1	1	3	1
1705		1	1	1	1	1	1	3	1
R3R 600-I (220/380/440/3/50/60)		1	1	1	2	1	1	4	1
1425		1	1	1	2	1	1	4	1
1574		1	1	1	2	1	1	4	1
1696		1	1	1	2	1	1	4	1
R3R 600-I (415V)		1	1	1	2	1	1	5	1
1385		1	1	1	2	1	1	5	1
1502		1	1	1	2	1	1	5	1
1603		1	1	1	2	1	1	5	1

# NOTES

# Optional Equipment

AP-217B  
 Operative: May 2003  
 Supersedes: NEW

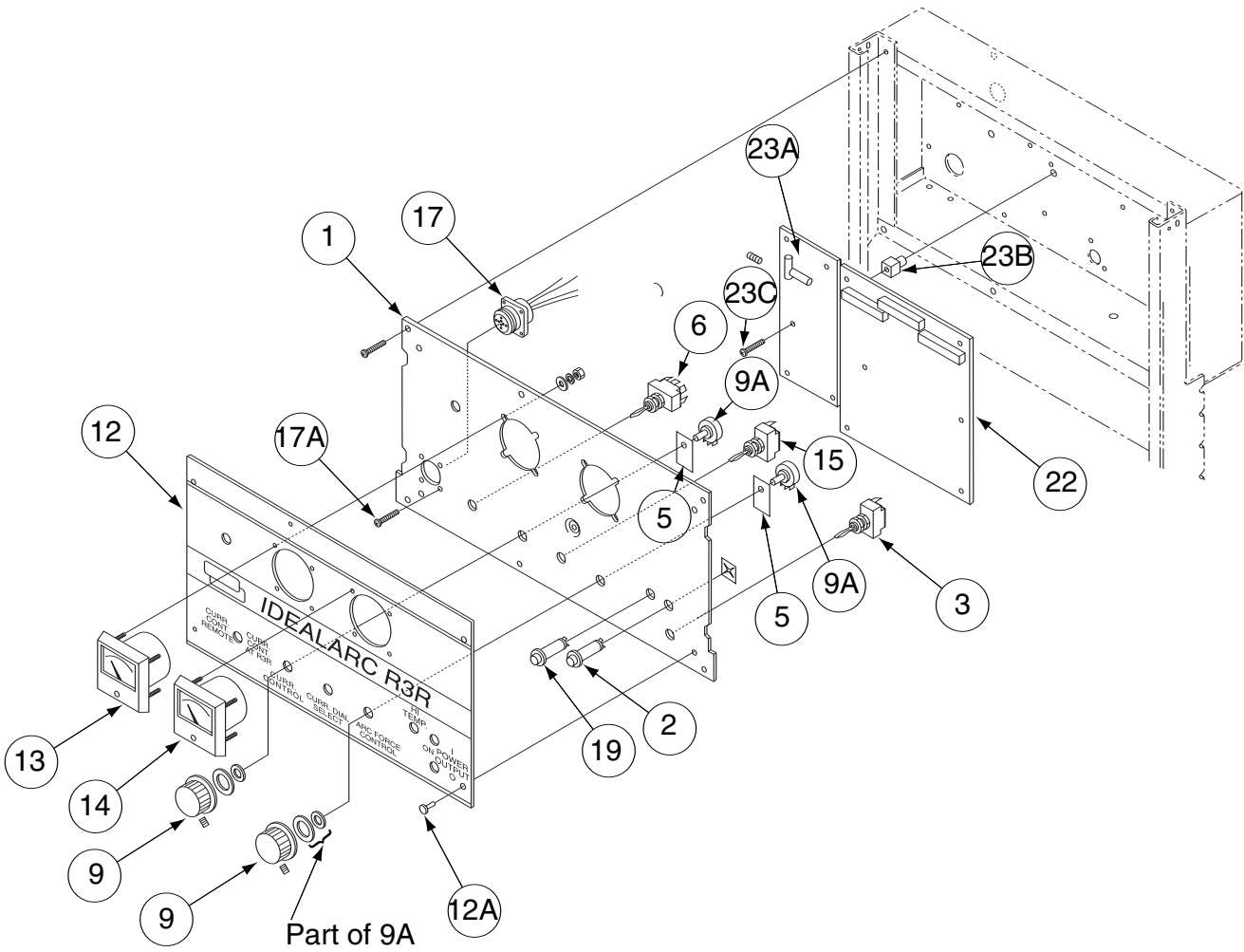
Miscellaneous Options Available for your machine are listed below:

# Indicates a change this printing.

DESCRIPTION .....	PART NO.
Hi-Freq .....	Order K799-1
Undercarriage .....	Order KA1236
Undercarriage (gas cylinder) .....	Order KA1237
Remote Control 8.5m 6 pin .....	Order K857
Remote Control 20m 6 pin .....	Order K857-20
Foot Amptrol .....	Order K870
Hand Amptrol (for LA-9, LA-17 & LW-20 TIG Torches) .....	Order K963-1
Hand Amptrol (for LA-26 & LW-18 TIG Torches) .....	Order K963-2
Twist-Mate Plug (25-95mm) (R3R 500I & 600-I) .....	Order KA1346
<b>Factory Fit Options</b>	
TIG Arc Start .....	Order call
TIG Arc Start & Gas Control .....	Order call
Pocket Amptrol .....	Order call

# Control Panel Assembly

Operative: AP-217-C  
Supersedes: May 2003  
NEW



# Indicates a change this printing.  
 \* Items not illustrated.

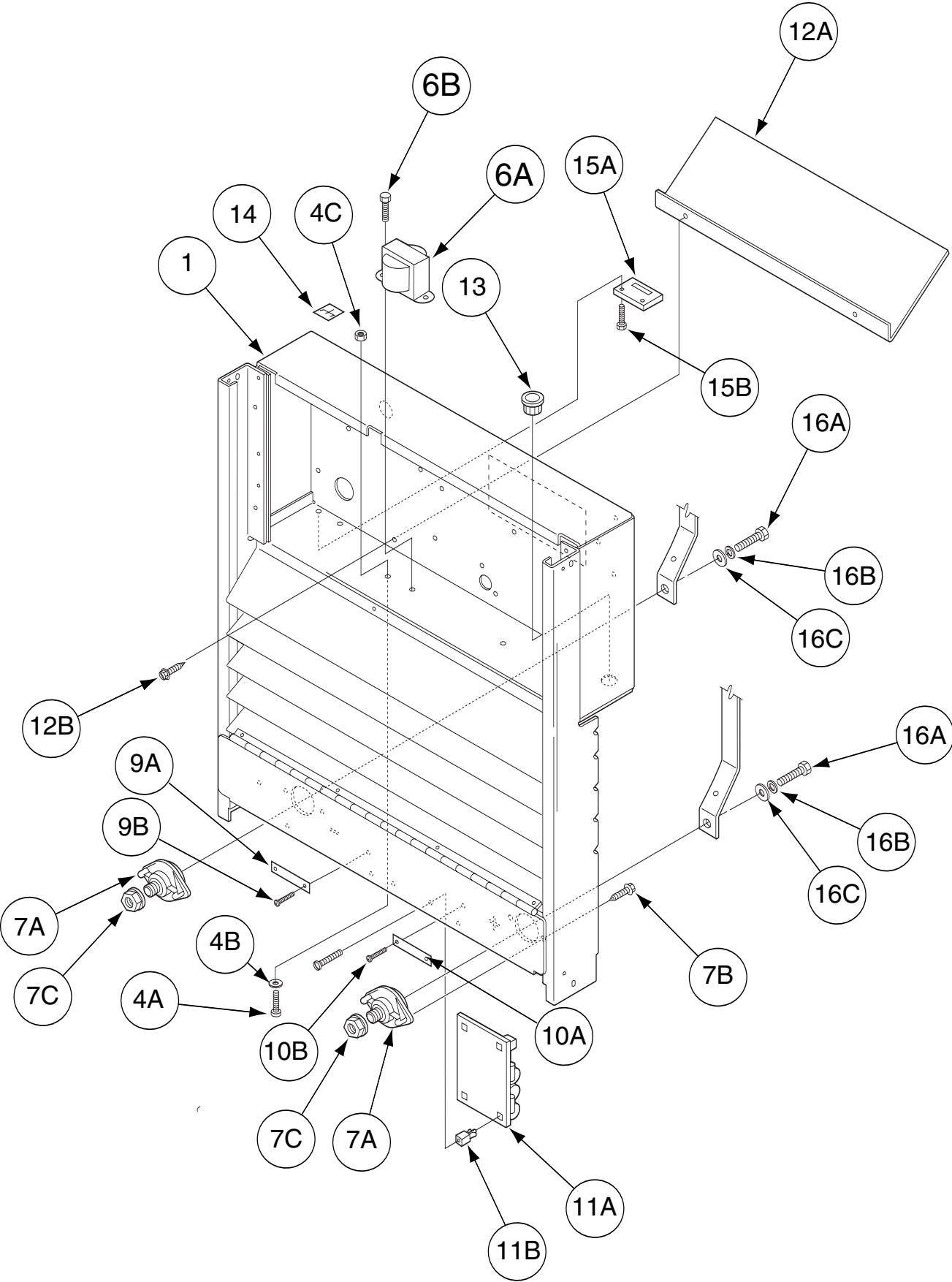
Use only the parts marked "X" in the column under the heading number called for in the model index page.

**Recommended Spare Parts are highlighted in bold**

ITEM	DESCRIPTION	PART NO.	QTY.	1	2	3	4	5	6	7	8	9
1	Control Box Cover	AM3198	1	x								
2	Pilot Light	AT3384	1	x								
3	Power Switch (SW1)	T13562	1	x								
5	Insulation	T12792-1	2	x								
6	Remote Switch (SW2)	T10800-39	1	x								
9	Knob	T10491	2	x								
9A	Potentiometer	T10812-40	2	x								
12	Nameplate R3R 500-I	AM3198B	1	x								
12	Nameplate R3R 600-I	AM3198D										
13	Voltmeter (optional) 60V	M15538-1	4	x								
13	Voltmeter (optional) 80V	M15538-2										
14	Ammeter (optional) 600 amp	M15539-2	1	x								
14	Ammeter (optional) 800 amp	M15593-3	1	x								
17	Amphenol Connector)	S12021-32	1	x								
17A	Self Tapping Screw	S8025-73	4	x								
18	Amphenol Connector Cap (not shown)	S17062-2	1	x								
19	Pilot Light (High Temperature) Amber	AT3385-1	1	x								
22	PCB Assembly R3R 500-I	G1574-[ ]	1	x								
22	PCB Assembly R3R 600-I	G1575-[ ]	1	x								
22B	Expansion Nut (not shown)	S14020-3	7	x								
22C	Self Tapping Screw	S8025-71	7	x								
23A	PC Board (w/pocket amptrol) (optional)	L6653-[ ]	1	x								
23B	Expansion Nut	S14020-3	5	x								
23C	Self Tapping Screw	S8025-71	5	x								
<div style="border: 1px solid black; padding: 5px;"> <p><b>Note:</b> when ordering new printed circuit boards indicate the dash number [ ] of the "Old" board that is to be replaced. This will aid Lincoln in supplying the correct and latest board along with any necessary jumpers or adapters. The dash number brackets [ ] have purposely been left blank so as to eliminate errors, confusion and updates.</p> </div>												

# Case Front Assembly

Operative: AP-217-D  
Supersedes: May 2003  
NEW



# Indicates a change this printing.

\* Items not illustrated.

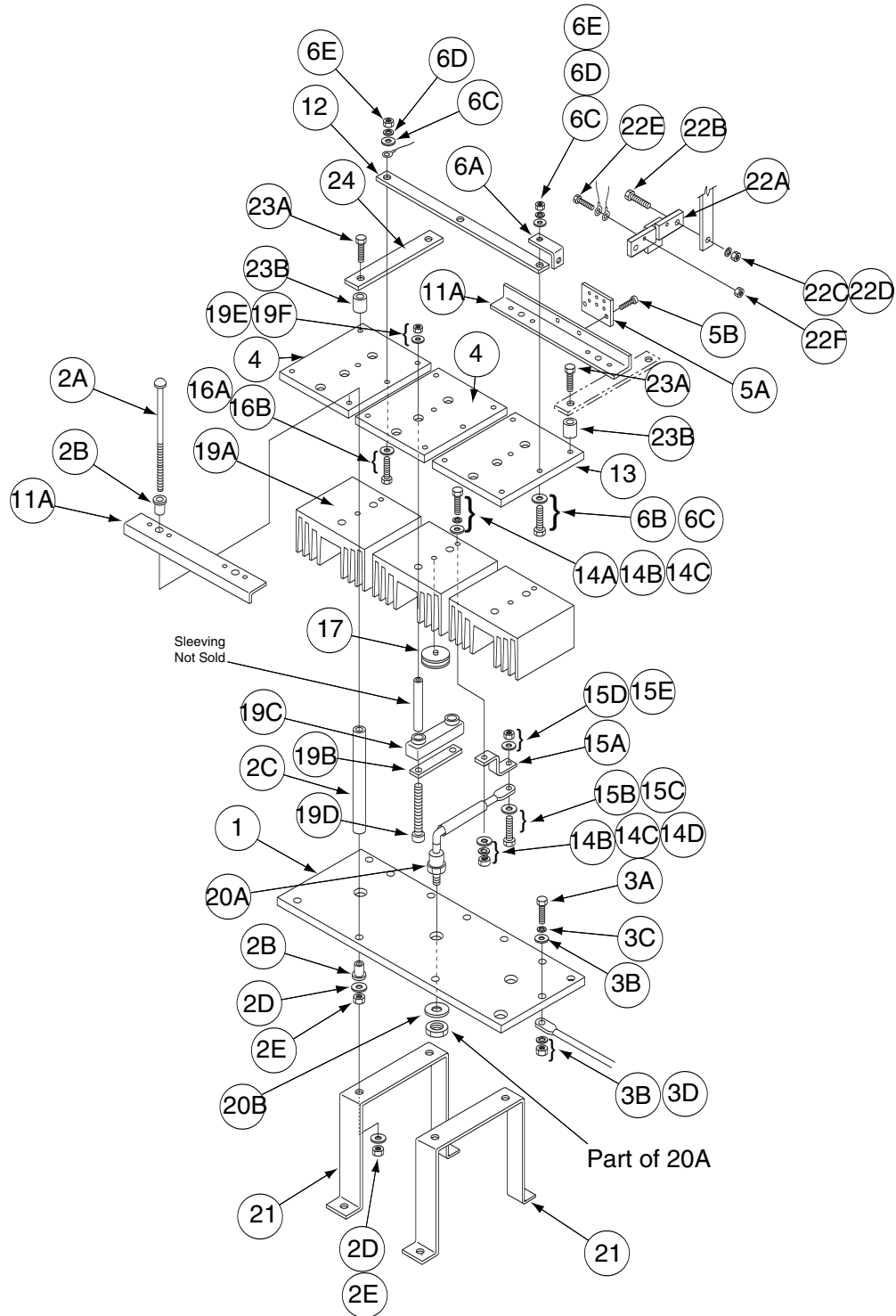
Use only the parts marked "X" in the column under the heading number called for in the model index page.

**Recommended Spare Parts are highlighted in bold**

ITEM	DESCRIPTION	PART NO.	QTY.	1	2	3	4	5	6	7	8	9
1	Front Support, Louvres & Control Box	AL2217-3	1	x								
4A	Thread Forming Screw	S9225-36	1	x								
4B	Lock Washer	T9695-1	1	x								
4C	#10-24 Hex Nut	NSS	1	x								
6A	Plug Transformer & Lead (with Polarity Switch & Pocket Amptrol) (optional)	S19927	1	x								
6B	Self Tapping Screw	S8025-65	2	x								
7A	Output terminal Assembly	AM2464-1	2	x								
7B	Self Tapping Screw	AS1733-3Z	4	x								
7C	Nut (R3R models)	T3960	2	x								
9A	Marker (to work) (R3R models) (w/Polarity Switch)	T3962	1	x								
9B	Self Tapping Screw	S8025-60	2	x								
10A	Marker (Electrode) (R3R models) (w/Polarity Switch)	T3961	1	x								
10B	Self Tapping Screw	S8025-60	2	x								
11A	PC Board Snubber	AM2538-[ ]	1	x								
11B	Self Tapping Screw		4	x								
12A	Air Deflector (R3R 600-I)	S17113	1	x								
12B	Self Tapping Screw	AS1733-3Z	2	x								
13	Bushing	T12380-2	1	x								
14	Ground Decal	T13260-4	1	x								
15A	Lead Insulating Panel	S14585-2	1	x								
15B	Self Taping Screw		2	x								
16A	1/2-13 x .750 Hex head Cap Screw	NSS	2	x								
16B	Lock Washer 1/2"	NSS	2	x								
16C	Plain Washer 1/2"	NSS	2	x								
<p><b>Note:</b> when ordering new printed circuit boards indicate the dash number [ ] of the "Old" board that is to be replaced. This will aid Lincoln in supplying the correct and latest board along with any necessary jumpers or adapters. The dash number brackets [ ] have purposely been left blank so as to eliminate errors, confusion and updates.</p>												

# 3 Phase Bridge Assembly

Operative: AP-217-E  
Supersedes: May 2003  
NEW



# Indicates a change this printing.  
 \* Items not illustrated.

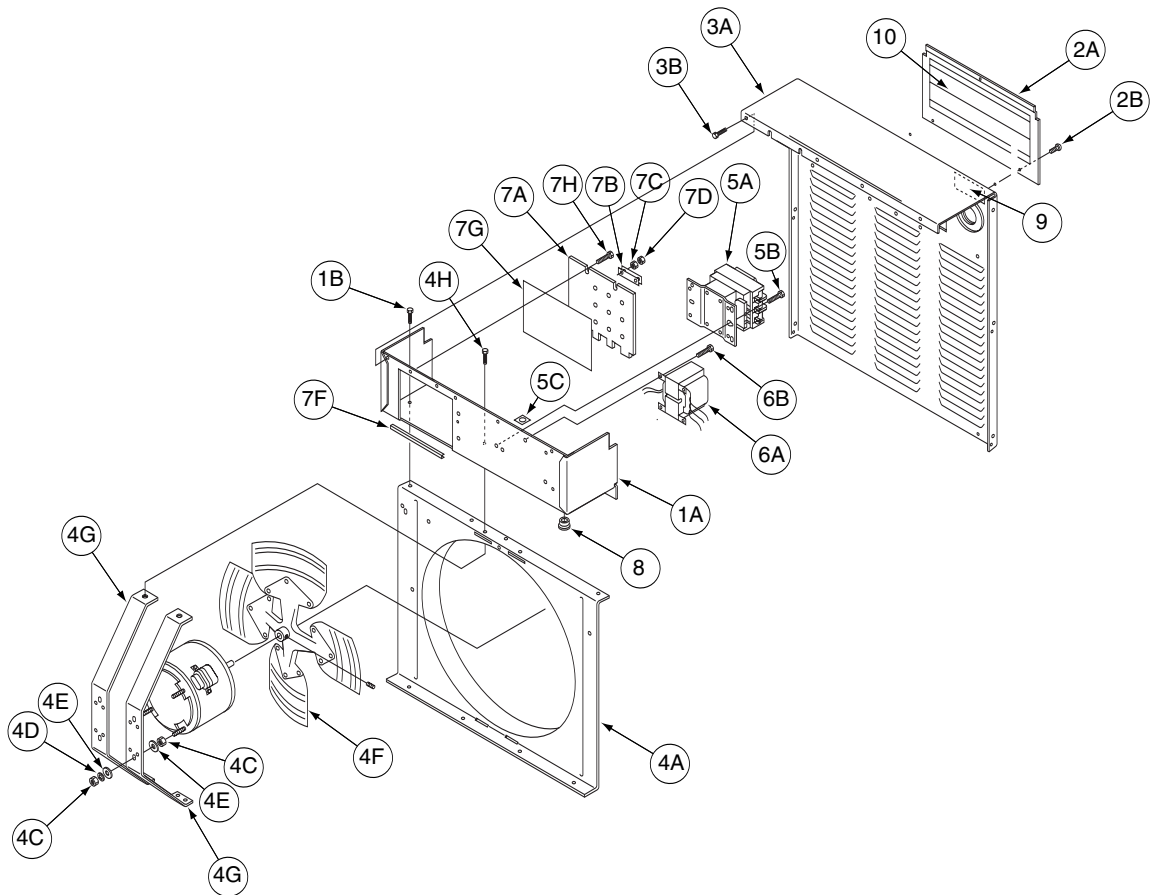
Use only the parts marked "X" in the column under the heading number called for in the model index page.

Recommended Spare Parts are highlighted in bold

ITEM	DESCRIPTION	PART NO.	QTY.	1	2	3	4	5	6	7	8	9
	3 Phase bridge Assembly includes: Items 1 through 20b 500-I & 600-I)	L6849	1	x								
1	Heat Sink (DC negative)	L5824	1	x								
2A	Carriage Bolt	T11827-31	4	x								
2B	Insulating Bushing	S16860	8	x								
2C	Insulating Tape	T7028-170	4	x								
2D	Plain Washer 1/4"		4	x								
2E	1/4-20 hex Nut		4	x								
3A	5/16-18 x 1.00 Hex Head Cap Screw		1	x								
3B	Plain Washer 5/16"		2	x								
3C	Lock Washer 5/16"		1	x								
3D	5/16-18 Hex Nut		1	x								
4	Cathode heat Sink	AM2435-1	2	x								
5A	Terminal Plate	T14211	1	x								
5B	Self Tapping Screw	S8025-62	2	x								
6A	Shunt Strap	S11109-6	1	x								
6B	5/16-18 x 1.25 Hex Head Cap Screw		1	x								
6C	Plain Washer 5/16"		2	x								
6D	Lock Washer 5/16"		1	x								
6E	5/16-18 hex Nut		1	x								
11A	Support Bracket	M13430	2	x								
11B	Thread Cutting Screw (not shown)		8	x								
12	Positive Heat Sink Lead	T9706-30	1	x								
13	Cathode Heat Sink	AM2435-1	1	x								
14A	5/16-18 x 1.25 Hex Head Cap Screw		3	x								
14B	Plain Washer 5/16"		6	x								
14C	Lock Washer 5/16"		3	x								
14D	5/16-18 Hex Nut		3	x								
15A	Rectifier Jumper Lead		3	x								
15B	5/16-18 x 1.25 Hex Head Cap Screw		3	x								
15C	Plain Washer	S9262-121	3	x								
15D	Lock Washer		3	x								
15E	5/16-18 Hex Nut		3	x								
16A	5/16-18 x 1.00 Hex Head Cap Screw		2	x								
16B	Plain Washer 5/16"		4	x								
16C	Lock Washer 5/16"		2	x								
16D	5/16-18 Hex Nut		2	x								
17	SCR	M12283-10	3	x								
18A	5/16- x 1.25 Hex Head Cap Screw (not shown)		1	x								
18A	5/16-18 x 1.25 Hex Head Cap Screw (not shown)		1	x								
18B	Plain Washer 5/16" (not shown)		2	x								
18C	Lock Washer 5/16" (not shown)		1	x								
18D	5/16-18 hex Nut 5/16" (not shown)		1	x								
19A	Heat Sink	M12314-3	3	x								
19B	SCR Spring	S14724A	3	x	x							
19C	SCR Clamp	S14724-B	3	x	x							
19D	Socket Head Cap Screw	T9447-44	6	x	x							
19E	Plain Washer	S9262-98	6	x	x							
19F	1/4-20 Hex Nut		6	x	x							
20A	Rectifier Diode	M9661-31	4	x	x							
20B	Spring Washer	T12735	4	x	x							
21	Bridge Mounting Bracket	M14173	2	x	x							
22A	Shunt (R3R 500-I)	S6602-25	1	-	x							
22A	Shunt (R3R 600-I)	S6602-20	1	-	x							
22B	3/8-16 x 1.00 Hex Head Cap Screw		1	x	x							
22C	Lock Washer 3/8"		1	x	x							
22D	3/8-16 Hex Nut		1	x	x							
22E	Sems Screw	T10082-3	2	x	x							
22F	#10-24 Hex Nut		2	x	x							
23A	Thread Form Screw	S9225-47	2	x	x							
23B	Spacer	T7028-113	2	x	x							
24	Brace	T8477-35	2	x	x							

# Input Box & Fan Assembly

Operative: AP-217-F  
Supersedes: May 2003  
NEW



# Indicates a change this printing.  
 \* Items not illustrated.

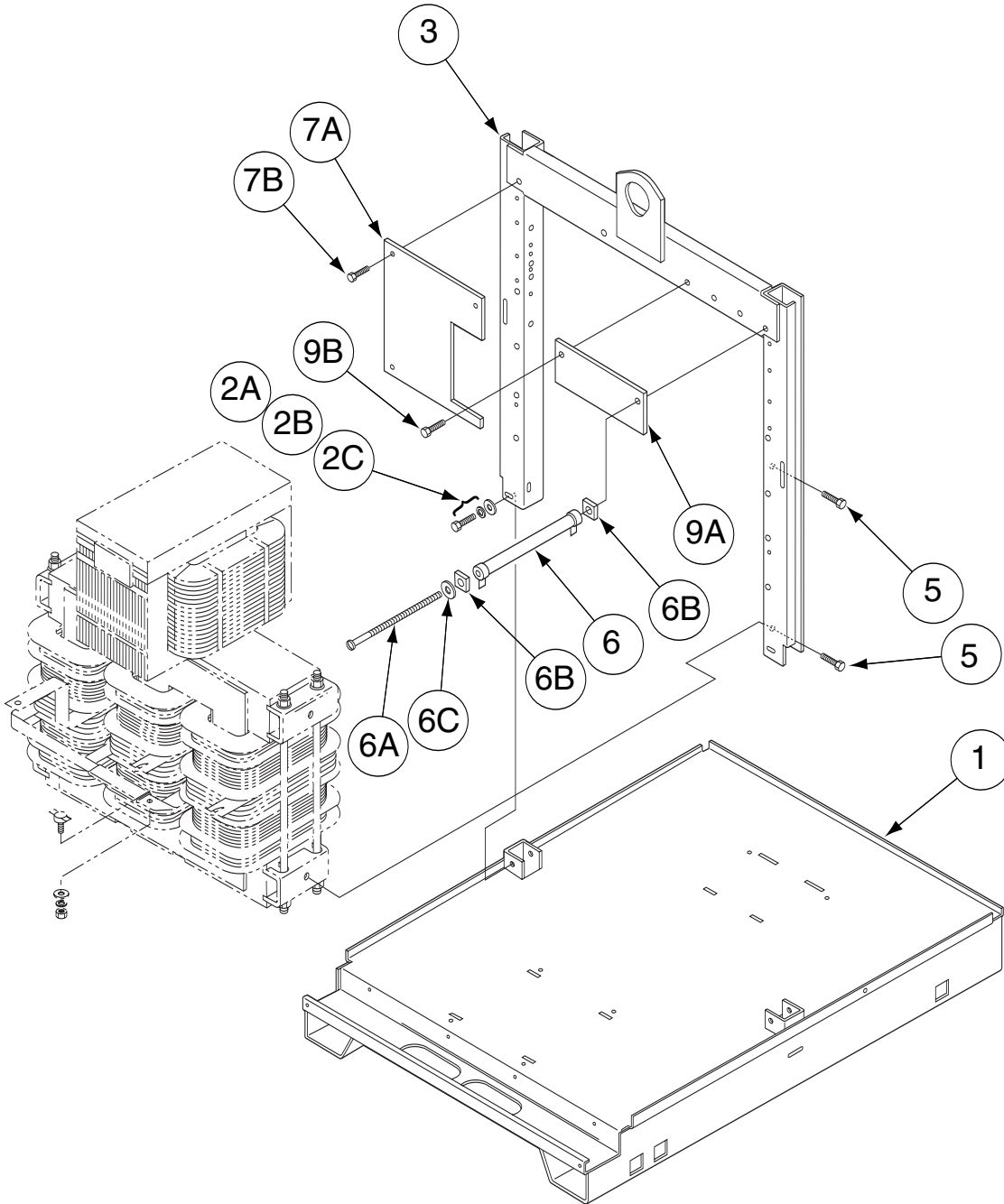
Use only the parts marked "X" in the column under the heading number called for in the model index page.

Recommended Spare Parts are highlighted in bold

ITEM	DESCRIPTION	PART NO.	QTY.	1	2	3	4	5	6	7	8	9
1A	Input Box Assembly	AL1890	1	x								
1B	Self Tapping Screw	AS1733-3Z	3	x								
2A	Input Access Door	AM3257	1	x								
2B	Self Tapping Screw	AL2375	1	x								
3A	Rear Panel	AL2375	1	x								
3B	Self Tapping Screw	AS1733-3Z	12	x								
4	Fan Baffle Assembly includes (R3R 500-I only)	M16526-2	1	x								
	Fan Baffle Assembly includes (R3R 600-I only)	M16526-3										
4A	Fan Baffle	L6247	1	x								
4B	Fan Motor	M7468-2	1	x								
4C	#10-32 or 8-32 Hex Nut	NSS	as req	x								
4D	Lock Washer	T9695-1	as req	x								
4E	Plain Washer 3/16"	S9267-27	4	x								
4F	Fan (R3R 500-I)	M6819-8	1	x								
4G	Fan Motor Mounting Bracket	M16525	1	x								
4H	Self Tapping Screw	AS1733-3Z	4	x								
5A	Contactor (R3R 500-I)	M12161-80	1	x								
5A	Contactor (R3R 600-I)	M18712	1	x								
5B	Self Tapping Screw	AS1733-3Z	3	x								
5C	Rectifier Bridge											
6A	Control Transformer (415V)	AM2434	1	x								
6A	Control Transformer (multi voltage)	AM2681	1	x								
6B	Self Tapping Screw	AS1733-3Z	3	x								
7	Input Reconnect panel Assembly includes: (multi voltages models only)	AS3745	1	x								
7A	Reconnect panel	S17190	1	x								
7B	Reconnect panel Link	T14190	9	x								
7C	1/4-20 Hex Nut		9	x								
7D	Heavy Hex Nut 1/4"		9	x								
7F	Grommet Strip	T12823-15	1	x								
7G	E2521/1-.010-5.13-7.20 Insulation		1	x								
7H	Self Tapping Screw	AS12733-3Z	2	x								
8	Bushing	T12380-2	1	x								
9	Ground Decal	T13259	1	x								
10	Connection Diagram (415V)	AT3164-1	1									
10	Connection Diagram (380/500V)	AT3170-1	1	x								
10	Connection Diagram (220/380/44)	AM3237	1	x								

# Centre Assembly

Operative: AP-217-G  
Supersedes: May 2003  
NEW



# Indicates a change this printing.  
\* Items not illustrated.

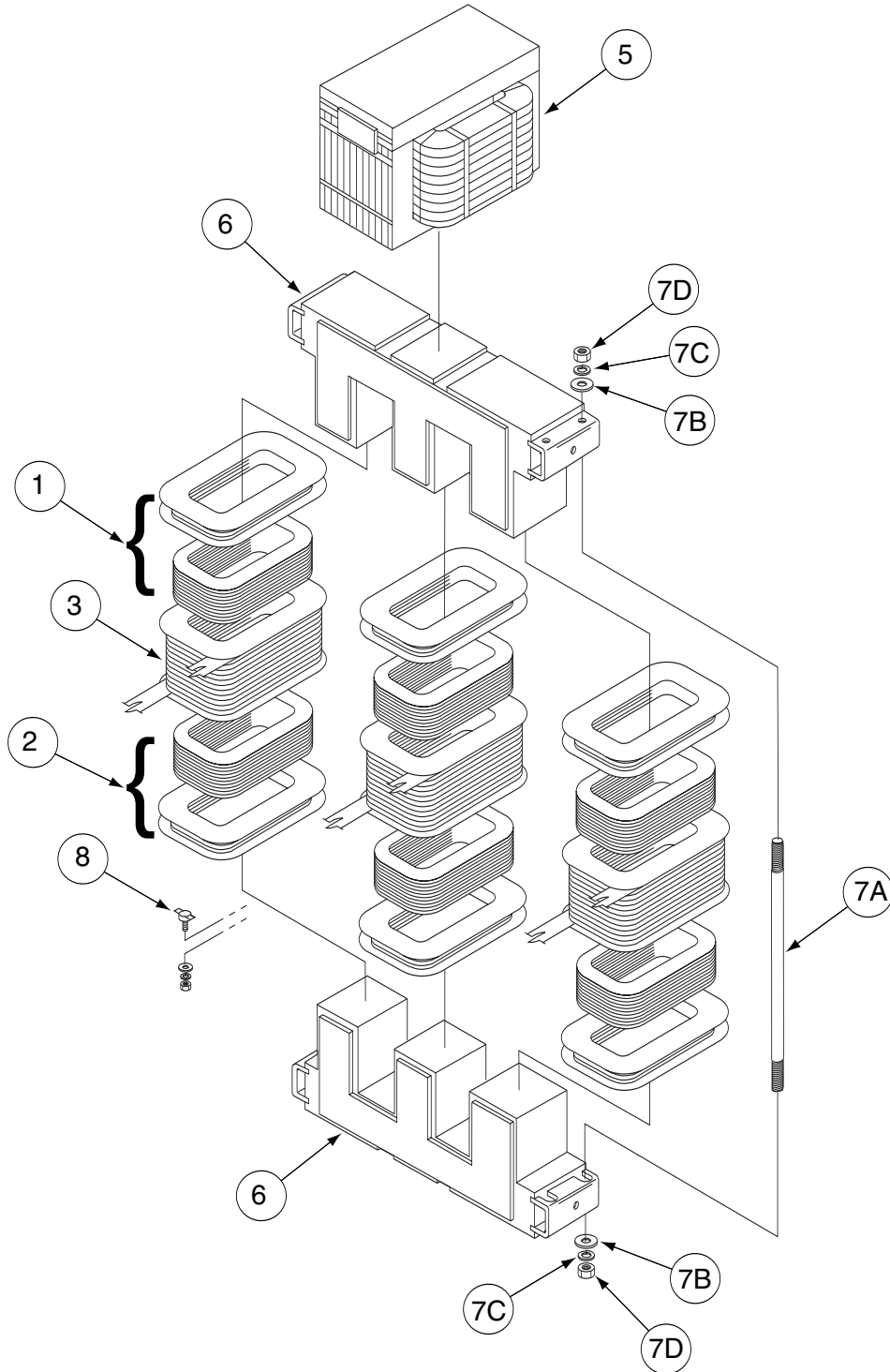
Use only the parts marked "X" in the column under the heading number called for in the model index page.

**Recommended Spare Parts are highlighted in bold**

ITEM	DESCRIPTION	PART NO.	QTY.	1	2	3	4	5	6	7	8	9
1	Base Welded Assembly	AM2802-2	1	x								
2A	Hex Head Cap Screw 3/8-16 x .75		4	x								
2B	Lock Washer		4	x								
2C	Plain Washer		4	x								
3	Life Bale Assembly	L6485	1	x								
5	Thread Forming Screw	S9225-28	4	x								
6	Resistor	T12300-49	1	x								
6A	#10-24 x 7.50 Round Head Screw	AM3053-78	1	x								
6B	Insulating Washer		1	x								
6C	Plain Washer		1	x								
6D	Lock Washer (not shown)		1	x								
6E	Hex Nut 3/16" (not shown)		1	x								
7A	Choke Baffle (left)	S17111-1	1	x								
7B	Thread Forming Screw	S9225-8AZ	3	x								
8A	Choke Baffle (right) (not shown)	A17112-1	1	x								
8B	Thread Forming Screw (not shown)	S9225-8	1	x								
9A	Right Choke Baffle (top) (w/Pocket Ampctrl option only)	T14655-2	1	x								
9B	Thread Forming Screw	S9225-8	2	x								
10A	Pocket Ampctrl Baffle (bottom) (w/Pocket Ampctrl option only)	S17103-1	1	x								
10B	Self Tapping Screw	S8025-65	4	x								
11	Diode heat Sink Assembly includes: (w/Pocket Ampctrl option only)	M16456	1	x								
11A	heatsink	S17053	1	x								
11B	SCR Diode	M9661-36	3	x								
11C	Lead (Pigtail to Shunt)	S11012-47	1	x								
11D	Voltage Sensing Resistor Assembly includes: Resistor	S19936	1	x								
	Capacitor	T9512-17	1	x								
11E	Self Tapping Screw	T11577-46	1	x								
11F	Thread Cutting Screw	S8025-12	1	x								
11G	Thread Cutting Screw	S9225-8	1	x								
11H	Connection Stud Insulation	T14613	1	x								
11I	Hex Washer Cap Screw	T11827-39	1	x								
11J	Plain Washer	S9262-30	2	x								
11K	5/16" Lock Washer		2	x								
11L	5/16-18 Hex Nut		3	x								
11M	Spring Washer	T12735	3	x								
12A	5/16-18 x 1.50 Hex head Cap Screw		2	x								
12B	Insulating Tube	T7028-171	2	x								
12C	Insulating Tube	T7028-113	4	x								
12D	Plain Washer	S9262-121	2	x								
12E	Lock Washer	E106A-14	2	x								

# Transformer Assembly

Operative: AP-217-H  
Supersedes: May 2003  
NEW



# Indicates a change this printing.  
 \* Items not illustrated.

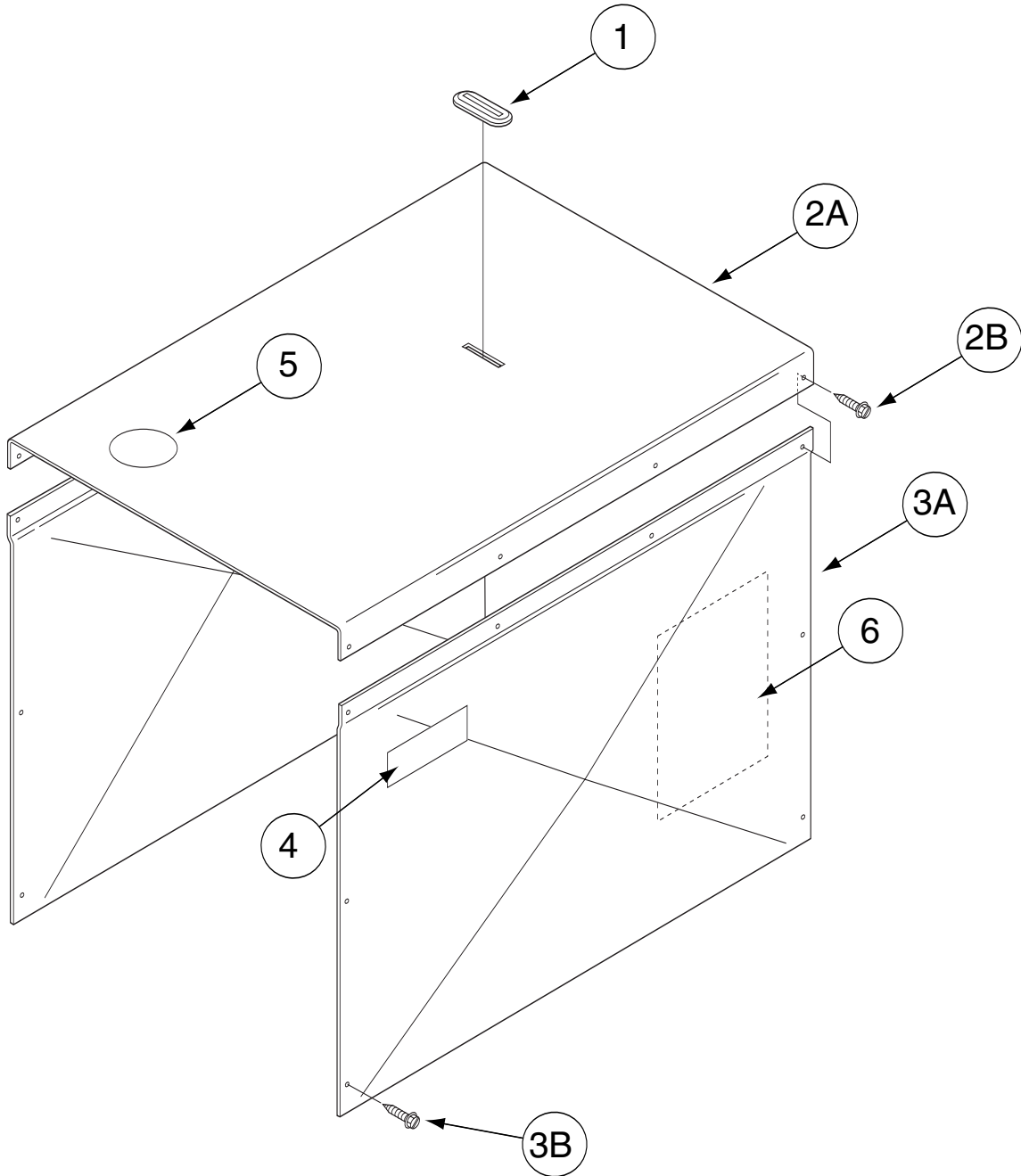
Use only the parts marked "X" in the column under the heading number called for in the model index page.

Recommended Spare Parts are highlighted in bold

ITEM	DESCRIPTION	PART NO.	QTY.	1	2	3	4	5	6	7	8	9
	<b>R3R 500-I</b> Transformer Assembly 415V includes	G2711-2	1	x								
	Transformer Assembly TV includes	G2711-4	1	-	x							
	Transformer Assembly DV includes	G2711-5	1	-	-	x						
	<b>R3R 600-I</b> Transformer Assembly TV includes	G2711-9	1	-	-	-	x					
	Transformer Assembly 415V TV includes	G2711-7	1	-	-	-	-	x				
1	<b>R3R 500-I</b> Primary Coils (top) (415V)	9878-5T	3	x								
1	Primary Coils (top) (TV)	9879-5T	3	-	x							
1	Primary Coils (top) (DV)	9880-5T	3	-	-	x						
1	<b>R3R 600-I</b> Primary Coils (top) (TV)	9889-5T	3	-	-	-	x					
	Primary Coils (top) (415V)	9888-5T	3	-	-	-	-	x				
2	<b>R3R 500-I</b> Primary Coils (bottom) (415V)	9878-5B	3	x								
2	Primary Coils (bottom) (TV)	9879-5B	3	-	x							
2	Primary Coils (bottom) (DV)	9880-5B	3	-	-	x						
2	<b>R3R 600-I</b> Primary Coils (bottom) (TV)	9889-5B	3	-	-	-	x					
2	Primary Coils (bottom) (415V)	9888-5B	3	-	-	-	-	x				
3	<b>R3R 500-I</b> Secondary Coils	M14168-4	3	x								
3	<b>R3R 600-I</b> Secondary Coils	M14168-5	3	x								
5	<b>R3R 500-I</b> Choke Coil	M14217-1	1	x								
5	<b>R3R 600-I</b> Choke Coil	M14217-2	1	x								
6	<b>R3R 500-I</b> Lamination Assembly	L6268-3	2	x								
6	<b>R3R 600-I</b> Lamination Assembly	L6268-4	2	x								
7A	Stud	AS4324-6	4	x								
7B	Plain Washer	S9262-120	4	x								
7C	Lock Washer	T9860-4	4	x								
7D	3/8-16 Hex Nut		8	x								
8	Secondary Thermostat	T13359-2	1	x								

# Cover Assembly

Operative: AP-217-J  
Supersedes: May 2003  
NEW





# Wiring Diagram

## LEGEND

- D5 } POCKET AMPTRON SENSING BRIDGE
- D6 } POCKET AMPTRON SENSING BRIDGE
- D7 } POCKET AMPTRON SENSING BRIDGE
- L1 DC OUTPUT FILTER
- R1 10KΩ POT., OUTPUT CONTROL
- R2 10KΩ POT., ARC FORCE CONTROL
- R3 40Ω 100W RESISTOR
- R4 1MΩ POCKET AMPTRON SENSING RESISTOR

- SW1 POWER SWITCH
- SW2 MACHINE / REMOTE SWITCH
- SW3 DIAL SELECTOR SWITCH
- SW4 OPTIONAL POLARITY SWITCH

- SCR1 - D1 } DCR AND DIODE
- SCR2 - D2 } BRIDGE RECTIFIER
- SCR3 - D3 } BRIDGE RECTIFIER
- D4 } BRIDGE RECTIFIER

1CR INPUT CONTACTOR

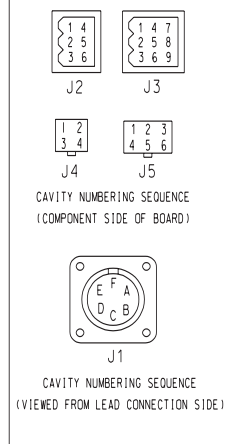
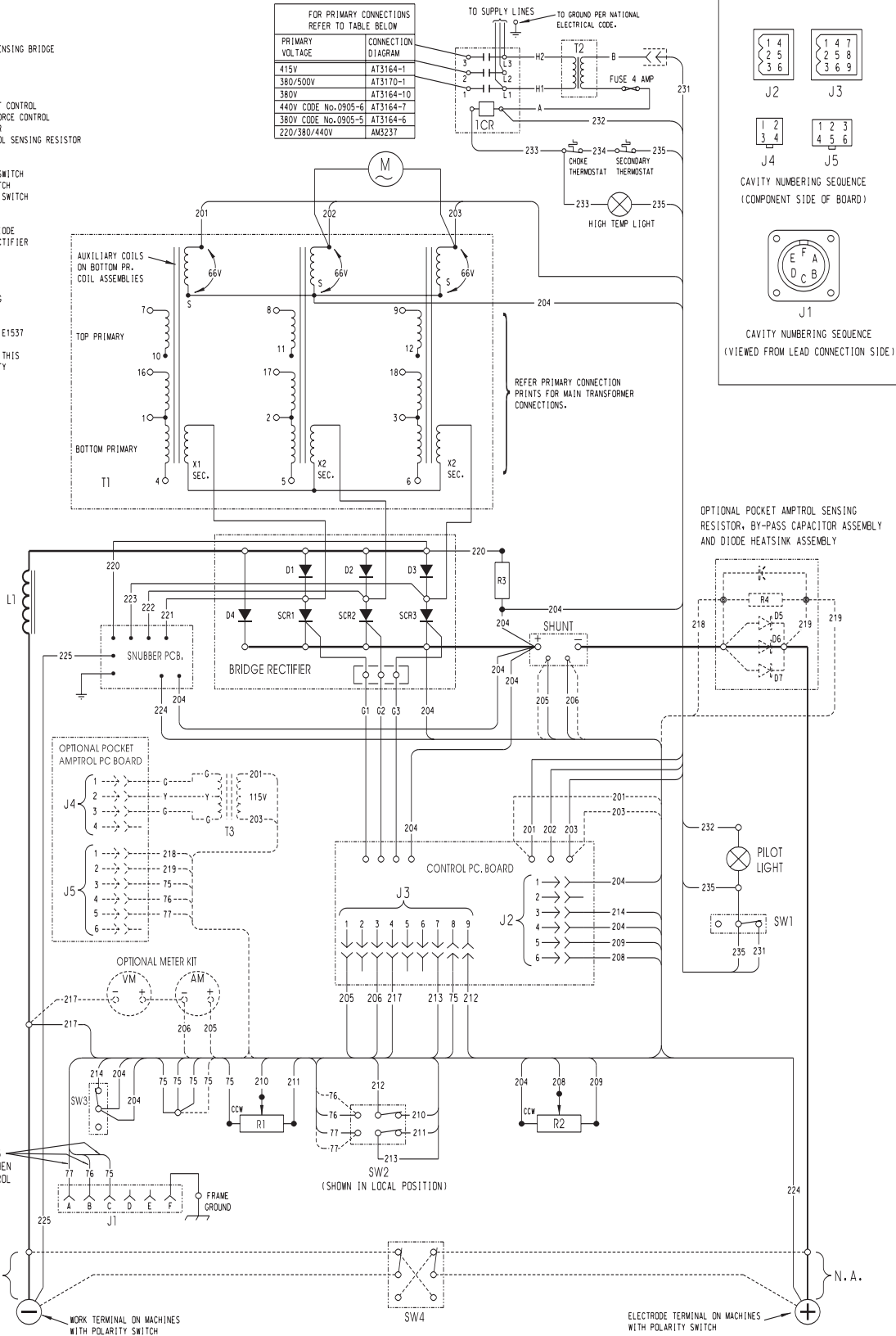
(DASHED ITEMS ON WIRING DIAGRAM ARE OPTIONAL)

ELECTRICAL SYMBOLS PER E1537

N.A. NO CONNECTIONS AT THIS POINT WHEN POLARITY SWITCH INSTALLED

FOR PRIMARY CONNECTIONS REFER TO TABLE BELOW

PRIMARY VOLTAGE	CONNECTION DIAGRAM
415V	AT3164-1
380/500V	AT3170-1
380V	AT3164-10
440V CODE No.0905-6	AT3164-7
380V CODE No.0905-5	AT3164-6
220/380/440V	AM3237



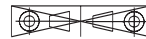
Ref: AL2405-1  
12898M

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 enclosed panels.

CONNECTOR AND THESE 3 LEADS ARE NOT USED WHEN OPTIONAL POCKET AMPTRON IS PROVIDED

WORK TERMINAL ON MACHINES WITH POLARITY SWITCH

ELECTRODE TERMINAL ON MACHINES WITH POLARITY SWITCH



# Wiring Diagram

## LEGEND

- L1 DC OUTPUT FILTER
- R1 10K $\Omega$  POT., OUTPUT CONTROL
- R2 10K $\Omega$  POT., ARC FORCE CONTROL
- R3 40 $\Omega$  100W RESISTOR
- R4 1M $\Omega$  GAS AFTERFLOW CONTROL

- SW1 POWER SWITCH
- SW2 MACHINE / REMOTE SWITCH
- SW3 DIAL SELECTOR SWITCH
- SW4 OPTIONAL POLARITY SWITCH
- SW5 TIG / STICK

- SCR1-3 SCR AND DIODE
- D1-4 BRIDGE RECTIFIER

ICR INPUT CONTACTOR

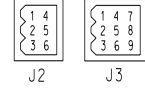
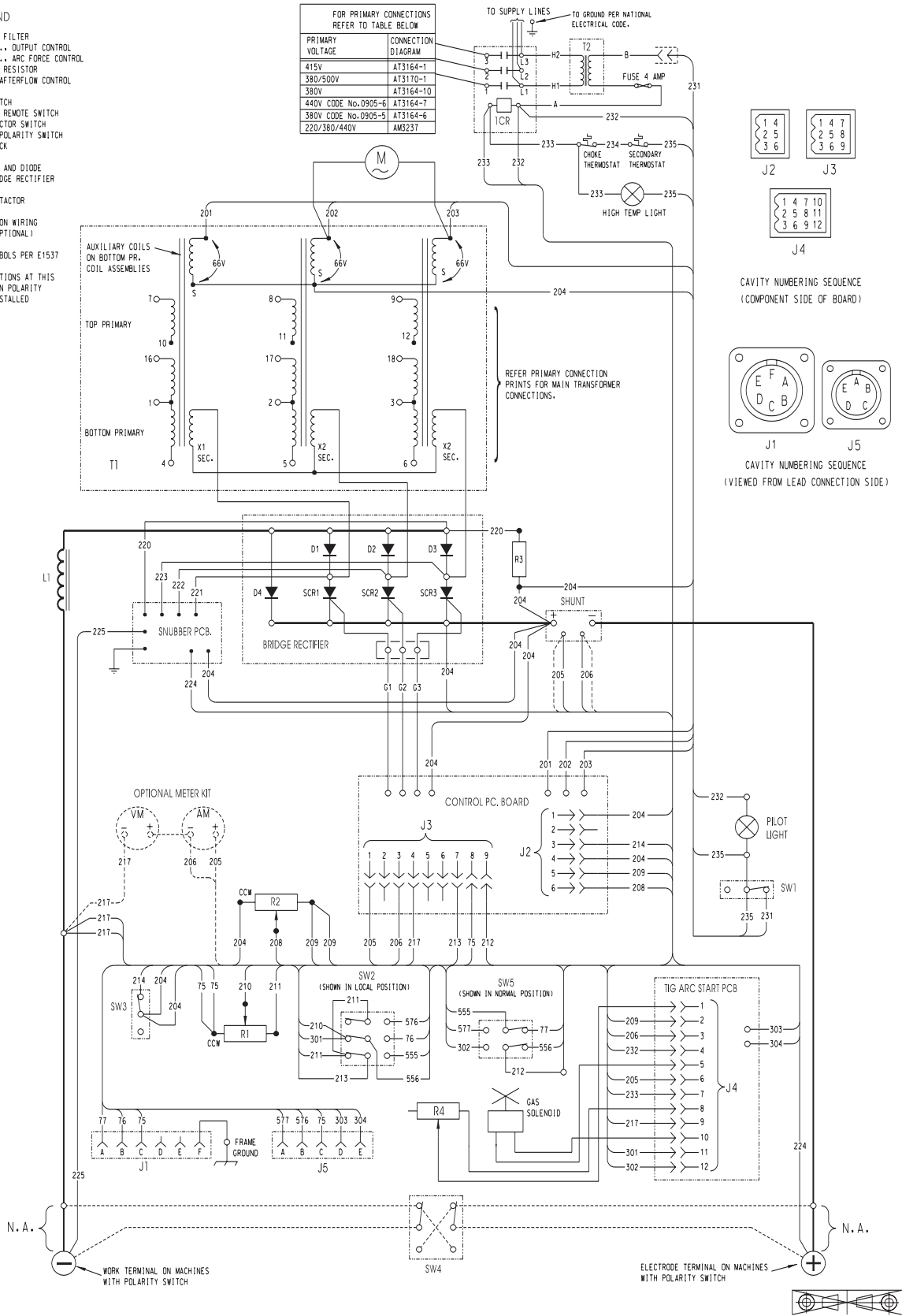
(DASHED ITEMS ON WIRING DIAGRAM ARE OPTIONAL)

ELECTRICAL SYMBOLS PER E1537

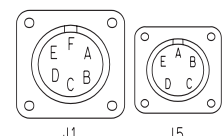
N.A. NO CONNECTIONS AT THIS POINT WHEN POLARITY SWITCH INSTALLED

FOR PRIMARY CONNECTIONS REFER TO TABLE BELOW

PRIMARY VOLTAGE	CONNECTION DIAGRAM
415V	AT3164-1
380/500V	AT3170-1
380V	AT3164-10
440V CODE No.0905-6	AT3164-7
380V CODE No.0905-5	AT3164-6
220/380/440V	AMB237



CAVITY NUMBERING SEQUENCE (COMPONENT SIDE OF BOARD)



CAVITY NUMBERING SEQUENCE (VIEWED FROM LEAD CONNECTION SIDE)

Ref: AL2405-2  
12898M

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 enclosed panels.

# NOTES

# NOTES

**STATEMENT OF LIMITED WARRANTY**

The Lincoln Electric® Company (Australia) Pty Limited ("Lincoln") warrants all new machinery and equipment ("goods") manufactured by Lincoln® against defects in workmanship and material subject to certain limitations hereinafter provided.

This warranty is void if Lincoln® or its Authorised Service Facility finds that the equipment has been subjected to improper installation, improper care or abnormal operations.

**PERIOD OF WARRANTY "LINCOLN BRANDED GOODS"**

The period from the commencement of the warranty in respect of goods covered by this warranty shall be as follows:

**Three Years**

All Lincoln® welding machines, wire feeders and plasma cutting machines unless listed below.

**Two Years**

All Weldanpower®, Ranger®, Italian Invertec® welders, PC65 and PC105 Plasmas.

**One Year**

- PC60 & PC100 Plasmas
- All water coolers (internal and external).
- Arc welding and cutting robots and robotic controllers.
- All stick electrodes, welding wires and fluxes.
- All Environmental Systems equipment, including portable units, central units and accessories. (Does not include consumable items listed under 30-day warranty).
- All welding and cutting accessories including wire feed modules, undercarriages, field installed options that are sold separately, unattached options, welding supplies, standard accessory sets, replacement parts. (Does not include expendable parts and guns/torches listed under 90 and 30 day warranties).

**90 Days**

- All Gun and Cable Assemblies (manufactured by Lincoln®) and Spool guns.
- All MIG, TIG and Plasma Torches.
- All "Pro Torch" TIG Torches.

**30 Days**

- All consumable items that may be used with the environmental systems described above. This includes hoses, filters, belts and hose adapters.
- Expendable Parts - Lincoln® is not responsible for the replacement of any expendable part that is required due to normal wear.

**ENGINE WARRANTY**

To the extent permitted by law Lincoln® shall be entitled to in its absolute discretion repair all engines and engine accessories however Lincoln® shall not be held responsible for any such repair which shall be the sole responsibility of the engine manufacturer which provides for warranties for the period and subject to any limitations provided for by those manufacturers of the respective engines and engine accessories.

**Three Years\***

**Deutz 912 Engine and Accessories**  
(Warranty service can only be carried out an authorised Deutz service dealer)

\*Subject to conditions imposed by Deutz.

**Cummins B3.3 Engine and Accessories**  
(Warranty service can only be carried out an authorised Cummins service dealer)

\*Subject to conditions imposed by Cummins

**Two Years**

**Perkins Engines and Accessories**  
(The Perkins Distributor Organisation provides all warranty service (accessories included) for the Perkins Engines powering goods manufactured by Lincoln.

\*Subject to conditions imposed by Perkins

**Briggs & Stratton Vanguard Engines and Accessories.** (Warranty service can only be carried out by an authorised Briggs & Stratton service dealer).

\*The Magneton ignition system is warranted by Briggs & Stratton for 5 years.

**Kubota Engines and Accessories**  
(Warranty service can only be carried out an authorised Kubota service dealer)

\*Subject to conditions imposed by Kubota.

**One Year\***

**Ruggerini Engines and Accessories**  
(Warranty service can only be carried out by authorised Lincoln Field Service Shop or the engine distributors authorised by the Lincoln® branch office).

**BATTERY WARRANTY**

Lincoln® supplies certain batteries in connection with its supply of goods and the purchaser acknowledges that any such battery is warranted by its manufacturer and any claim in respect of such a battery whether as to a defect in the battery or as to damage consequential upon a defect in a battery shall be made by the purchaser to the manufacturer of the battery and the purchaser shall not hold Lincoln® in any way liable for the operation, non-operation or malfunction of any such battery.

**CONDITION OF WARRANTY TO OBTAIN WARRANTY COVERAGE:**

The purchaser must contact Lincoln® or Lincoln's Authorised Service Facility about any defect claimed under Lincoln's warranty.

Determination of warranty on welding and cutting equipment will be made by Lincoln® or Lincoln's Authorised Service Facility.

**WARRANTY REPAIR**

If Lincoln® or Lincoln's Authorised Service Facility confirms the existence of a defect covered by this warranty, the defect will be corrected by repair or replacement at Lincoln's option.

At Lincoln's request, the purchaser must return, to Lincoln® or its Authorised Service Facility, any "Goods" claimed defective under Lincoln's warranty.

**FREIGHT COSTS**

The purchaser is responsible for shipment to and from the Lincoln® Authorised Service Facility.

**WARRANTY LIMITATIONS**

Certain conditions warranties and obligations are implied by law (for example under the Trade Practices Act 1974) and cannot be excluded or modified ("the statutory warranties").

Where the statutory warranties do apply then any express warranties given by Lincoln® (the "express warranties") are given in addition and without derogation from the statutory warranties. Apart from the express warranties and (in cases where they apply by law but not otherwise) the statutory warranties Lincoln® gives no warranties whether express or implied by operation of law or otherwise in respect of any goods manufactured or supplied by Lincoln® or by its authorised distributor.

Any warranty whether express or statutory and the term of any such warranty as set out herein commences on the date Lincoln® or Lincoln's authorised distributorship forwards the goods from the premises of Lincoln® or Lincoln's authorised distributor to the purchaser.

In respect of any claim under the warranty herein provided a purchaser must furnish Lincoln® with written notice of any claim under the warranty within the time period of the warranty as further specified herein.

The extent of Lincoln's warranty whether express or statutory is limited to a liability to repair, replace or pay to the purchaser an amount equal to:

- a) The cost of replacing the goods;
- b) The cost of obtaining equivalent goods; or
- c) cost of having the goods repaired whichever remedy in its absolute discretion Lincoln® chooses.

Upon request by Lincoln® the purchaser must permit Lincoln® to inspect the goods the subject of any claim under this warranty and Lincoln® may at its absolute discretion repair or replace the goods F.O.B. at its own premises or at such other premises as Lincoln® may designate provided that all freight charges to and from Lincoln's premises or such other premises as Lincoln® may designate shall be paid by the purchaser.

Subject to the express and statutory warranties hereinbefore provided Lincoln® provides no other warranties in respect of the manufacture or sale of goods and in particular Lincoln® shall have no responsibility or liability in respect of:

- a) Repairs done to Lincoln's goods and undertaken by the purchaser outside Lincoln's premises without written authority from Lincoln® obtained prior to any such repair;
- b) Any damage or failure of the goods as a result of normal wear and tear or the neglect misuse abuse or failure to properly service goods by any purchaser.

The liability of Lincoln® is limited as hereinbefore provided and Lincoln® shall not be liable for any incidental special or consequential damage suffered by a purchaser whether or not arising out of circumstances known or foreseeable known by Lincoln® and in particular arising out of the supply of goods to a purchaser or the use of goods by a purchaser whether based on breach of contract negligence or tort.

**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 this type of fabrication methods and service requirements.



THE WELDING EXPERTS®

**The Lincoln Electric Company  
(Australia) Pty. Ltd.** A.B.N. 36 000 040 308

**35 Bryant Street, Padstow, Sydney 2211, Australia**

**Telephone: (02) 9772 7222 Fax: (02) 9792 2420**

**International: Ph: +61 2 9772-7222 Fax: +61 2 9792 2420**

**In Australia, Lincoln Technical Sales Representatives are located in, Mackay, Brisbane, Newcastle, Sydney, Melbourne, Adelaide and Perth. To contact your local Lincoln Technical Sales Representative, call 1300 728 720 (for the cost of a local call). Lincoln products are sold primarily through its distributors. Our Regional Office locations are:**

**Northern Region:** Unit 1/15 Westgate St, Wacol, QLD, 4076 (07) 3271 3000

**Central Region:** 35 Bryant Street, Padstow, NSW, 2211 (02) 9772 7222

**Southern Region:** Unit 8/2 Sarton Rd, Clayton, VIC, 3168 (03) 9590 0143

**Western Region:** 25 Barker Street, Belmont, WA, 6104 (08) 9277 8744

**New Zealand:** 7B/761 Great South Rd, Penrose, Auckland (9) 580 4008

**Singapore:** 11 Pandan Crescent, Singapore (65) 6773 6689

**THE LINCOLN ELECTRIC CO.**

**Cleveland, Ohio, U.S.A. - Subsidiary companies established in Australasia, Asia, Canada, Europe, North and South America.**