# Section 3 - SETTING UP FOR WELDING

The following items are required:

1) A reel of wire of suitable size and type.

2) A suitable gun and cable assembly with a “Euro” connector and the correct tip and, if necessary gas nozzle for the consumable being used. (LINC Gun MIG gun is supplied).

3) Correct drive rolls for the wire size and type to be used. The REDI-MIG® 210c & 250c are supplied with a 0.8 - 0.9mm drive roller. The REDI-MIG® 250s, 325c & 325s are supplied with a 0.9 - 1.2mm drive roller. Drive rolls for other types and sizes are available as spare parts. (See table on page 16).

4) A work return cable and clamp. (Supplied)

5) Normal welding accessories including helmet or hand shield with suitable lens, gloves etc.

6) If a gas shielded process is to be used, a cylinder of appropriate shielding gas is required. (Regulator/flowmeter and hose are supplied.) If gas shielding is required, connect the gas hose.

Remember that gas cylinders may explode if damaged, so ensure that all gas cylinders are securely mounted. Ensure that the correct type and size wire feed rolls are fitted. In replacing wire feed rolls, ensure that the key and keyway are correctly positioned and tighten the knurled locking screw securely.

Fit a spool of appropriate wire onto the spool so that it turns clockwise as the wire is fed.

Carefully release the end of the wire from the spool ensuring that the released end is held to stop the wire from unravelling. Cut off the end kink to give a smooth straight end of wire.

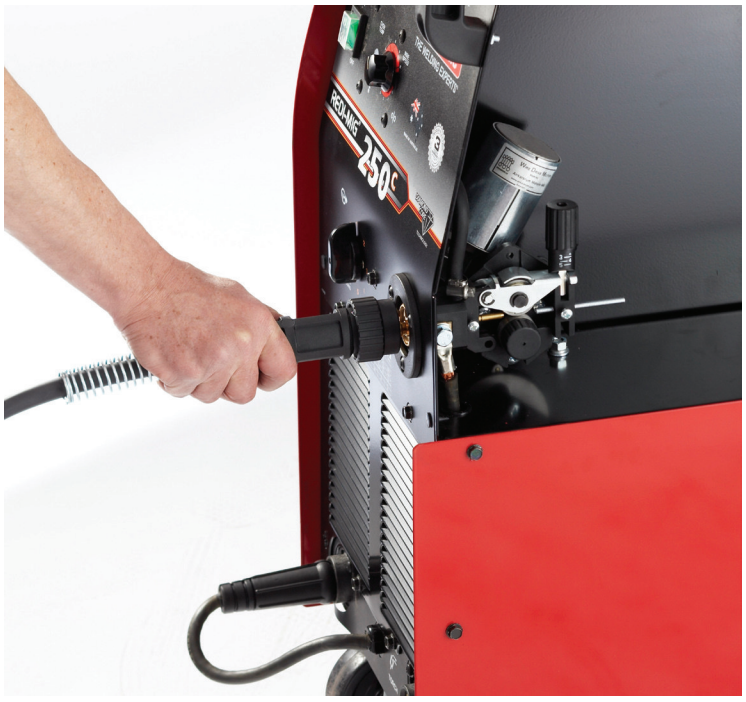
Obtain a gap between the wire feed roll and the pressure roll by lifting the cam latch. Feed the wire end into the guide tube, between the drive rolls, and into the “Euro” connector guide until it protrudes about 20mm out of the front of the “Euro” connector.

Close the drive rolls by lowering the cam latch ensuring the rolls firmly hold the wire. Adjust the tension so that wire feeds smoothly. **Do not over tighten.**

Fit the gun and cable assembly onto the “Euro” connector by slipping the end of wire into the cable wire hole.

Tighten the “Euro” connector lock ring.

Activate the power source; set the wire feed speed to 4 on the dial and press the gun trigger or wire inch push button (if fitted). The wire feed roll should turn, feeding the wire further up the gun and cable assembly. Ensure there are no kinks or sharp bends in the gun cable and hold the gun trigger or wire inch button until the wire emerges from the gun. It is good practice to remove the tip when first feeding a new coil of wire, then refitting over the wire and tightening. Cut off the end of the wire leaving 10mm to 15mm stick-out. Select required polarity. See Section 1.5



| |
|---|
| .024 in. 0.60 mm |
| .030 in. 0.80 mm |
| .036 in. 1.0 mm |
| .048 in. 1.2 mm |
| .060 in. 1.6 mm |
| .075 in. 2.0 mm |
| .105 in. 2.5 mm |
| .135 in. 3.5 mm |
| 3/16 in. 5.0 mm |
| 1/4 in. 6.0 mm |
| 5/16 in. 8.0 mm |

## Suggested setting for welding with the REDI-MIG® 210c & 250c

| | | STEEL | | | | ALUMINIUM | |
|---|---|---|---|---|---|---|---|
| | | DC- | | DC+ | | DC+ | |
| | | Innershield® - FCAW | | UltraMag® S6 / EasyMIG™S6 | | SuperGlaze® 4043, 5356 | |
| | | NR-211 MP | NR212 | | | | |
| | | No Gas Required | | 77% Argon 23% $CO_2$ * | 100% $CO_2$ * | 100% Argon * | |
| | | Wire Diameter | | | | | |
| | | 0.9mm | 1.2mm | 0.8mm | 0.9mm | 0.8mm | 0.9mm | 0.9mm | 1.2mm |
| | | V | ○ | V | ○ | V | ○ | V | ○ | V | ○ | V | ○ | V | ○ | V | ○ |
| 0.9mm | REDI-MIG 210c | | | | | 2 | 4.5 | | | 3 | 4.5 | | | | | | |
| 1.6mm | REDI-MIG 210c | 4 | 3.25 | 3 | 2.25 | 4 | 5 | 4 | 4 | 5 | 4.5 | 4 | 3.5 | 4 | 7 | 4 | 5.5 |
| 3.0mm | REDI-MIG 210c | 5 | 3 | 4 | 2.5 | 5 | 4 | 6 | 4.25 | 6 | 4.5 | 6 | 4.25 | 5 | 7.75 | 6 | 5.5 |
| 5.0mm | REDI-MIG 210c | 7 | 3.5 | 6 | 3 | 7 | 5.25 | 7 | 3.5 | 7 | 5.5 | 7 | 4 | 6 | 7.25 | 6 | 6.5 |
| 8.0mm | REDI-MIG 210c | | | 7 | 3.5 | 8 | 6 | 8 | 4 | 8 | 6 | 8 | 4 | | | 7 | 5.5 |

| | | Innershield® - FCAW | | UltraMag® S6 / EasyMIG™S6 | | | | SuperGlaze® 4043, 5356 | |
|---|---|---|---|---|---|---|---|---|---|
| | | NR-211 MP | NR212 | | | | | | |
| | | No Gas Required | | 77% Argon 23% $CO_2$ * | | 100% $CO_2$ * | | 100% Argon * | |
| | | Wire Diameter | | | | | | | |
| | | 0.9mm | 1.2mm | 0.8mm | 0.9mm | 1.2mm | 0.9mm | 1.2mm | 0.9mm | 1.2mm |
| | | V | ○ | V | ○ | V | ○ | V | ○ | V | ○ | V | ○ | V | ○ | V | ○ | V | ○ |
| 0.9mm | REDI-MIG 250c | 1 | 2.5 | | | 1 | 3 | 1 | 2.75 | | | 1 | 3 | | | | | | |
| 1.6mm | REDI-MIG 250c | 2 | 3.5 | 2 | 3 | 2 | 4.25 | 2 | 4 | 2 | 3.5 | 2 | 5 | 2 | 3 | 1 | 8 | 1 | 5.5 |
| 3.0mm | REDI-MIG 250c | 3 | 3.5 | 3 | 3 | 3 | 4.25 | 3 | 4 | 3 | 3.5 | 3 | 4.25 | 3 | 3 | 3 | 7.5 | 3 | 6 |
| 5.0mm | REDI-MIG 250c | 4 | 3.75 | 4 | 3 | 4 | 5.5 | 4 | 5 | 4 | 3.25 | 4 | 4 | 4 | 3 | 5 | 7.75 | 5 | 6 |
| 8.0mm | REDI-MIG 250c | | | 5 | 3.5 | 6 | 6 | 6 | 5 | 6 | 4 | 6 | 4.75 | 6 | 3.75 | | | 7 | 7 |

CONSUMABLE PARTS

| LINC Gun® LG240G (REDI-MIG 210c, 250c & 250s) | | |
|---|---|---|
| Contact Tip M6 0.6mm | LG240G | KP10440-06 |
| Contact Tip M6 0.8mm | LG240G | KP10440-08 |
| Contact Tip M6 0.9mm | LG240G | KP10440-09 |
| Contact Tip M6 1.2mm | LG240G | KP10440-12 |
| Contact Tip M6 0.9mm Alum | LG240G | KP10441-09A |
| Contact Tip M6 1.0mm Alum | LG240G | KP10441-10A |
| Contact Tip M6 1.2mm Alum | LG240G | KP10441-12A |
| Nozzle 12mm | LG240G | KP10461-4 |
| Tip Holder M6 | LG240G | KP10455-1 |
| Gas Diffuser | LG240G | KP10404-WT |
| Liner 0.8-1.0mm 4m | LG240G | KP10413-4M |
| Liner 1.0-1.2mm 4m | LG240G | KP10414-4M |
| Liner 1.2-1.6mm 4m | LG240G | KP10415-4M |
| Liner 0.8-1.0mm 4m Teflon | LG240G | KP10422-4M |
| Liner 1.0-1.2mm 4m Teflon | LG240G | KP10418-4M |

| DRIVE ROLLERS | |
|---|---|
| Drive Roller 0.6-0.8mm | AS4449-9 |
| Drive Roller 0.8-0.9mm | AS4449-11 |
| Drive Roller 0.9-1.2mm | AS4449-8 |
| Drive Roller 1.0-1.2mm | AS4449-2 |
| Drive Roller 0.8-1.0mm Alum Drive | AS4449-12 |
| Drive Roller 0.9-1.2mm Alum | AS4449-10 |
| Driver Roller 0.9-1.2mm FCW | AS4449-13 |
| Driver Roller 1.2-1.6mm FCW | AS4449-4 |

Note: 4 drive systems require 2 drive rollers

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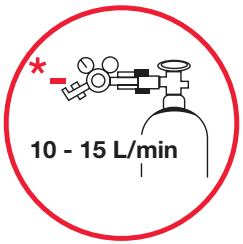
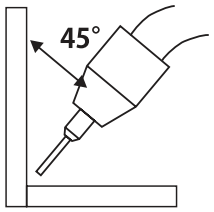
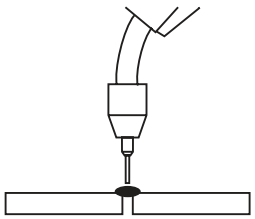
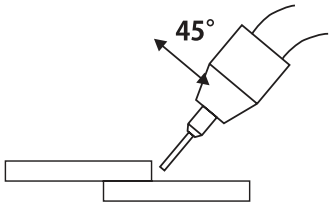
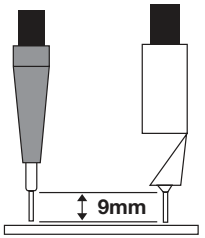





**AUS 1300 LINCOLN**
**NZ 0800 728 720**

LINCOLN® ELECTRIC
*THE WELDING EXPERTS®*

| |
|---|
| .024 in. 0.60 mm |
| .030 in. 0.80 mm |
| .036 in. 1.0 mm |
| .048 in. 1.2 mm |
| .060 in. 1.6 mm |
| .075 in. 2.0 mm |
| .105 in. 2.5 mm |
| .135 in. 3.5 mm |
| 3/16 in. 5.0 mm |
| 1/4 in. 6.0 mm |
| 5/16 in. 8.0 mm |

## Suggested setting for welding with the REDI-MIG® 250s, 325c & 325s

| | STEEL | | | | | | | ALUMINIUM | |
|---|---|---|---|---|---|---|---|---|---|
| | DC- | | | DC+ | | | | DC+ | |
| | Innershield® - FCAW | | UltraMag® S6 / EasyMIG™S6 | | | | | SuperGlaze® 4043, 5356 | |
| | NR-211 MP | NR212 | | | | | | | |
| | No Gas Required | | 77% Argon 23% $CO_2$ * | | 100% $CO_2$ * | | | 100% Argon * | |
| | Wire Diameter | | | | | | | | |
| | 0.9mm | 1.2mm | 0.8mm | 0.9mm | 1.2mm | 0.9mm | 1.2mm | 0.9mm | 1.2mm |
| 0.9mm | 1 2 | | 1 2 | 1 2 | | 1 2 | | | |
| 1.6mm | 2 2 | 2 1.5 | 3 3.5 | 3 3.25 | 3 2 | 3 3 | 3 2 | 1 6 | 1 6 |
| 3.0mm | 3 3 | 3 2 | 4 4 | 4 4 | 4 2.75 | 4 3 | 4 2.5 | 3 6.25 | 3 6.5 |
| 5.0mm | 4 3.75 | 4 2.5 | 5 5.5 | 5 4.25 | 5 3 | 5 3.75 | 5 3 | 4 8 | 4 7.5 |
| 8.0mm | | 5 3 | 7 7 | 7 6 | 7 4 | | 7 3.75 | | 5 9 |

REDI-MIG® 250s

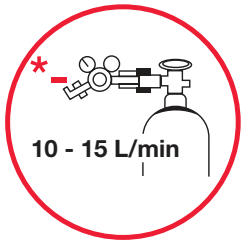
| | Innershield® - FCAW NR211MP, NR212 DC- | UltraMag® S6 / EasyMIG™S6 | | | | Outershield® - 71-CX, FCAW DC+ | SuperGlaze® 4043, 5356 | |
|---|---|---|---|---|---|---|---|---|
| | No Gas Required | 77% Argon 23% $CO_2$ * | | 100% $CO_2$ * | | | 100% Argon * | |
| | Wire Diameter | | | | | | | |
| | 1.2mm | 0.8mm | 0.9mm | 1.2mm | 0.9mm | 1.2mm | 0.9mm | 1.2mm |
| 0.9mm | | 1-4 2.5 | 1-4 1.5 | | 1-1 2.75 | | | |
| 1.6mm | | 1-8 3.5 | 1.7 3 | 1-7 2 | 2-3 3 | 2-2 2.75 | 1-1 5.5 | 1-2 4 |
| 3.0mm | 3-4 4.5 | 2-4 3.5 | 2.5 3 | 2-4 2.5 | 2-6 3.5 | 2-2 2.5 | 2-4 6.25 | 2-3 4.75 |
| 5.0mm | 3-6 4.5 | 3-4 5.75 | 3.5 5 | 3-6 3.5 | 3-2 4.5 | 3-1 2.75 | 3-1 9 | 2-7 5 |
| 8.0mm | 4-7 7.5 | 4-3 9 | 4.2 5 | 4-3 4.5 | 4-3 6 | 4-3 4.5 | | 3-1 5.5 |

REDI-MIG® 325c & 325s

*Note: REDI-MIG 325c & 325s Voltage setting refer to coarse and fine positions

LINCOLN® ELECTRIC
*THE WELDING EXPERTS®*

**AUS 1300 LINCOLN**
**NZ 0800 728 720**

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CONSUMABLE PARTS

| LINC GUN LG240G (REDI-MIG 250s) | | |
|---|---|---|
| Contact Tip M6 0.6mm | LG240G | KP10440-06 |
| Contact Tip M6 0.8mm | LG240G | KP10440-08 |
| Contact Tip M6 0.9mm | LG240G | KP10440-09 |
| Contact Tip M6 1.2mm | LG240G | KP10440-12 |
| Contact Tip M6 0.9mm Alum | LG240G | KP10441-09A |
| Contact Tip M6 1.0mm Alum | LG240G | KP10441-10A |
| Contact Tip M6 1.2mm Alum | LG240G | KP10441-12A |
| Nozzle 12mm | LG240G | KP10461-4 |
| Tip Holder M6 | LG240G | KP10455-1 |
| Gas Diffuser | LG240G | KP10404-WT |
| Liner 0.8-1.0mm 4m | LG240G | KP10413-4M |
| Liner 1.0-1.2mm 4m | LG240G | KP10414-4M |
| Liner 1.2-1.6mm 4m | LG240G | KP10415-4M |
| Liner 0.8-1.0mm 4m Teflon | LG240G | KP10422-4M |
| Liner 1.0-1.2mm 4m Teflon | LG240G | KP10418-4M |
| **LINC GUN LG360G (REDI-MIG 325c & 325s)** | | |
| Contact Tip M8 0.9mm | LG360G | KP10445-09 |
| Contact Tip M8 1.2mm | LG360G | KP10445-12 |
| Contact Tip M8 1.6mm | LG360G | KP10445-16 |
| Contact Tip M8 0.9mm Alum | LG360G | KP10445-09A |
| Contact Tip M8 1.2mm Alum | LG360G | KP10445-12A |
| Nozzle 16mm | LG360G | KP10461-3 |
| Tip Holder M8 | LG360G | KP10456-1 |
| Gas Diffuser | LG360G | KP10405-WT |
| Liner 0.8-1.0mm 4m | LG360G | KP10413-4M |
| Liner 1.0-1.2mm 4m | LG360G | KP10414-4M |
| Liner 1.2-1.6mm 4m | LG360G | KP10415-4M |
| Liner 0.8-1.0mm 4m Teflon | LG360G | KP10422-4M |
| Liner 1.0-1.2mm 4m Teflon | LG360G | KP10418-4M |
| Liner 1.2-1.6mm 4m Teflon | LG360G | KP10420-4M |
| Liner 1.2-1.6mm 4m Teflon/Bronze | LG360G | KP10419-4M |
| **DRIVE ROLLERS** | | |
| Drive Roller 0.6-0.8mm | | AS4449-9 |
| Drive Roller 0.8-0.9mm | | AS4449-11 |
| Drive Roller 0.9-1.2mm | | AS4449-8 |
| Drive Roller 1.0-1.2mm | | AS4449-2 |
| Drive Roller 0.8-1.0mm Alum | | AS4449-12 |
| Drive Roller 0.9-1.2mm Alum | | AS4449-10 |
| Driver Roller 0.9-1.2mm FCW | | AS4449-13 |
| Driver Roller 1.2-1.6mm FCW | | AS4449-4 |

Note: 4 drive systems require 2 drive rollers

# Section 4 - WELDING

## WARNING

**When the gun trigger is pressed (2T mode on REDI-MIG 4s) or pressed and released the first time (4T mode on REDI-MIG 4s), the wire is at welding voltage. The wire should never touch the case of the wire feeder. If it does, it is possible for the wire to arc to the case.**

**Any wire overrun should be avoided.**

**REDI-MIG 4s – Put into 2T Step trigger mode**

Select the output voltage required to suit the job by setting the rotary voltage switches. (Refer to REDI-MIG® Welding Guide for suggested settings).

Before beginning welding, ensure the wire protrudes from the gun tip by approximately 10-15mm. Ensure gas is turned on for gas shielded processes. Ensure welding shield and other protective clothing are in place. Present the protruding electrode just off the work. Maintain a steady grip on the gun, protect your eyes with a welding shield, then press and hold the gun trigger to create the arc.

If it is necessary to adjust the weld voltage, stop welding before changing the rotary voltage switches.

Adjust the wire feed speed as necessary to suit the job. At the completion of the weld, release the gun trigger and hold the gun over the weld pool to stop the arc.

REDI-MIG 4s – 4T Step trigger mode should only be used for long welds by experienced operators.

## 4.1 Changing Electrode Size and Type

When changing the electrode size or type, ensure the wire feed drive roll is the correct size and type for the electrode. Wire feed drive rolls have two grooves each of different sizes. Ensure the roll is located by the key.

When changing to aluminium welding a new drive roll, cable liner and contact tip should be used.

All required equipment for aluminium welding is supplied in the optional 1.2mm Aluminium Feeding Kit (for REDI-MIG® 210c & 250c use KA1440-4. for REDI-MIG® 250s, 325c & 325s use KA1440-5).

When changing to cored wire welding, a new drive roll should be used. All required equipment for cored wire welding is supplied in the optional 1.2mm Flux Cored Feeding Kit (for REDI-MIG® 210c & 250c use KA1440-4 and for REDI-MIG® 250s, 325c & 325s use KA1440-5).

Also check electrode polarity, as different processes may require different polarities.

**Note:** Ensure that the correct gun liner and contact tip are used for different wire sizes and processes. Change gun liner as necessary. See Section 6.5 Liner Removal, Installation and Trimming Instructions for LINC Gun® 240 & 360 MIG guns.

**Available Drive Rolls**

| Part No. | Size (mm) | Use with |
|---|---|---|
| AS4449-9 | 0.6 - 0.8 | Solid Wire |
| AS4449-11 | 0.8 - 0.9 | Solid Wire* |
| AS4449-8 | 0.9 - 1.2 | Solid Wire** |
| AS4449-2 | 1.0 - 1.2 | Solid Wire |
| AS4449-5 | 0.8 - 1.0 | Aluminium Wire |
| AS4449-12 | 0.9 - 1.2 | Aluminium Wire |
| AS4449-3 | 0.8 - 1.0 | Cored Wire |
| AS4449-13 | 0.9 - 1.2 | Cored Wire |
| AS4449-4 | 1.2 - 1.6 | Cored Wire |

* Standard on REDI-MIG® 210c and 250c
** Standard on REDI-MIG® 250s, 325c & 325s.

## 4.2 Adjusting Spool Tension

The spool should stop rotating when the wire feed roll stops. Overrun of the spool can cause the coil of wire to unravel. The spool hub should be tensioned so that it neither drags nor overruns. The tension can be set by adjusting the large nut inside the hub with a tube spanner.

# Section 5 - LEARNING TO WELD

No one can learn to weld simply by reading about it. Skill comes only with practice. The following pages will help the inexperienced operator to understand welding and develop this skill.

## 5.1 The Arc-Welding Circuit

The operators knowledge of arc welding must go beyond the arc itself. The operator must know how to control the arc, and this requires a knowledge of the welding circuit and the equipment that provides the electric current used in the arc. The circuit begins where the gun cable is attached to the welding machine. Current flows through the gun cable, gun, and contact tip, to the wire and across the arc. On the work side of the arc, current flows through the base metal to the work cable and back to the welding machine. This circuit must be complete for the current to flow.

This machine's welding circuit has a voltage output of 45 volts DC maximum. This voltage is quite low and is only present when the gun trigger is depressed.

To weld, the work clamp must be tightly connected to clean base metal. Remove paint, rust, dirt or oil as necessary and connect the work clamp as close as possible to the area you wish to weld. This helps prevent current from going through an unwanted path. Avoid allowing the welding circuit to pass through hinges, bearings, electronic components, or similar devices that can be damaged. Always disconnect electrical devices before welding upon them.

## FUMES AND GASES can be dangerous

**Fumes and slag generated from electrodes recommended for use with this welding machine can be toxic.**

- **Avoid contact with eyes and skin.**
- **Do not take internally.**
- **Keep out of reach of children.**
- **Follow all safety precautions found in this operating manual.**

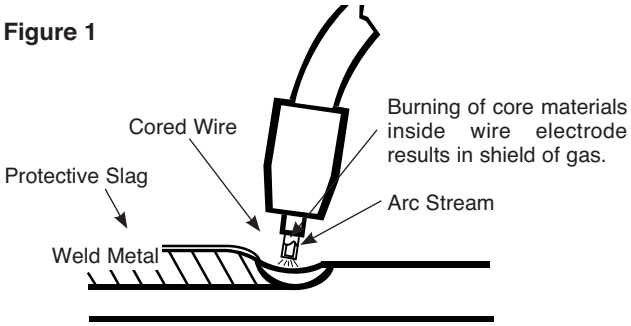
The gun and cable assembly is held by the operator who guides the automatically fed wire along the joint, maintaining a contact tip to work distance of about 10 - 12 mm This is called electrical stickout. This electrical stickout (ESO) must be properly maintained by the operator. The electric arc is made in the gap between the work and the tip end of a small diameter wire. When the power source is properly set, the arc gap is maintained automatically.

Arc welding is a manual skill requiring a steady hand, good physical condition, and good eyesight. The operator controls the welding arc, and, therefore, the quality of the weld made.

## 5.2 The Self-Shielded (Gasless) FCAW Welding Arc (DC-)

Figure 1 illustrates the action taking place in the self shielded gasless FCAW welding arc. It closely resembles what is actually seen while welding.

**Figure 1**




The “arc stream” is seen in the middle of the picture. This is the electric arc created by the electric current flowing through the space between the end of the wire electrode and the base metal. The temperature of this arc is about 3300°C, which is more than enough to melt metal.

The arc is very bright, as well as hot, and cannot be looked at with the naked eye without risking painful injury. The very dark lens, specifically designed for arc welding must be used with the hand or face shield whenever viewing the arc.

The arc melts the base metal and actually digs into it much as water through a nozzle on a garden hose digs into the earth. The molten metal forms a molten pool or crater and tends to flow away from the arc. As it moves away from the arc, it cools and solidifies.

The function of the cored wire electrode is much more than simply to carry current to the arc. The wire core is composed of fluxes and/or alloying ingredients around which a steel sheath has been formed. It is simply a stick electrode turned inside out in a continuous wire form.

The cored wire melts in the arc and tiny droplets of molten metal shoot across the arc into the molten pool. The wire sheath provides additional filler metal for the joint to fill the groove or gap between the two pieces of base metal.

The core materials also melt or burn in the arc and perform several functions. They make the arc steadier, provide a shield of smoke-like gas around the arc to keep oxygen and nitrogen in the air away from the molten metal, and provide a flux for the molten pool. The flux picks up impurities and forms the protective slag on top of the weld during cooling.

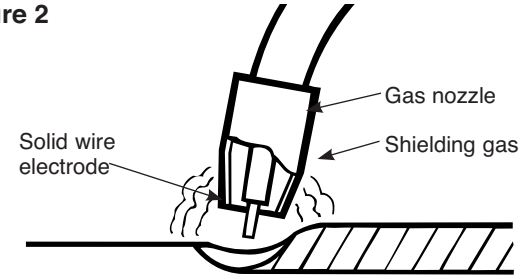
After running a weld bead, the slag may be removed with a chipping hammer and wire brush. This improves appearance and allows for inspection of the finished weld.

Machine size and output characteristics limit the size and type of wire electrode which can be used.

## 5.3 The GMAW (MIG) Welding Arc (DC+)

Figure 2 illustrates the GMAW (MIG) welding arc. Solid wire does not contain fluxes or ingredients to form its own shielding and no slag forms to protect the molten weld metal. For this reason, a continuous even flow of shielding gas is needed to protect the molten weld metal from atmospheric contaminants such as oxygen and nitrogen. Shielding gas is supplied through the gun and cable assembly, through the gas nozzle and into the welding zone.

**Figure 2**




When comparing the GMAW and FCAW processes, you can see that the principal difference between the two lies in the type of shielding used. GMAW uses gas for shielding, thus we have Gas Metal Arc Welding. FCAW uses the melting or burning of the core ingredients for shielding, and is thus termed Self-Shielded Flux Cored Arc Welding.

Gas Metal Arc Welding (MIG) is capable of welding a wide range of mild steels in all positions, however, more skill is required for out-of-position welding with the GMAW process.

## 5.4 Process Selection

By gaining knowledge of the differences between the two processes, you will be able to select the best process for the job you have at hand. In selecting a process, you should consider:

**For GMAW (MIG) Process**

1. Can I afford the extra expense, space, and lack of portability required for gas cylinders and gas supply?
2. Do I require clean, finished-looking welds?

If you have answered yes to all the above questions GMAW may be the process for you. If you have answered no to any of the above questions, then you should consider using the FCAW process.

**For FCAW (Innershield) Process**

1. Do I want simplicity and portability?
2. Will welding be performed outdoors or under windy conditions?
3. Do I require good all position welding capability?

## 5.5 Common Metals

Most metals found around the farm, small shop or home are low carbon steel, sometimes referred to as mild steel. Typical items made with this type of steel include most sheet metal, plate, pipe and rolled shapes such as channels and angle irons. This type of steel can usually be easily welded without special precautions. Some steels, however, contain higher carbon levels or other alloys and are more difficult to weld. Basically, if a magnet sticks to the metal and you can easily cut the metal with a file, chances are good that the metal is mild steel and that you will be able to weld the material. In addition, aluminum and stainless steel can be welded using the an aluminum welding kit. For further information on identifying various types of steels and other metals, and for proper procedures for welding them, we suggest you purchase a copy of “New Lessons in Arc Welding”.

Regardless of the type of metal being welded, in order to get a quality weld, it is important that the metal is free of oil, paint, rust or other contaminants.

## 5.6 Machine Set up for the Self-Shielded (Gasless) FCAW Process

1. Ensure the machine has the correct drive roll and parts (all required parts for cored wire welding are supplied in the Innershield (Gasless) Welding Kit (for REDI-MIG® 210c & 250c use KA1441-4. For REDI-MIG® 250s, 325c & 325s use KA1441-5).
2. See the Welding Procedure Guide on the inside of wire feed section door for information on setting the controls.
3. Set the “Voltage” and “Wire Speed” controls to the settings suggested on the Welding Procedure Guide for the welding wire and base metal thickness being used.
4. Check that the polarity is correct for the welding wire being used. See Section 1.5 for instructions on changing polarity.
5. Connect work clamp to metal to be welded. Work clamp must make good electrical contact to the work piece. The work piece must also be grounded as stated in the “Arc Welding Safety Precautions” at the beginning of this manual.

## 5.7 Welding Techniques For The Self-Shielded (Gasless) FCAW Process

Four simple manipulations are of prime importance when welding. With complete mastery of the four, welding will be easy. They are as follows:

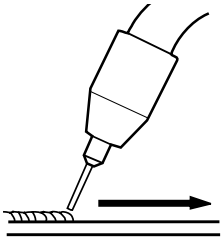
**1. The Correct Welding Position**

Figure 3 illustrates the correct welding position for right handed people. (For left handed people, it is the opposite.)

Hold the gun (of the gun and cable assembly) in your right hand and hold the shield with your left hand. (Left handers simply do the opposite.)

When using the FCAW Process, weld from left to right (if you are right handed). This enables you to clearly see what you are doing. (Left handers do the opposite.) Tilt the gun toward the direction of travel holding the electrode at an angle as shown in Figure 3.

**Figure 3**



**ARC RAYS can burn eyes and skin**

**When using an open arc process, it is necessary to use correct eye, head and body protection.**

**Protect yourself and others, read "ARC RAYS can burn" at the front of this manual.**

**2. The Correct Way To Strike An Arc**

1. Be sure the work clamp makes good electrical contact to the work.
2. Position gun over joint. End of wire may be lightly touching the work.
3. Position face shield to protect face and eyes, close gun trigger, and begin welding. Hold the gun so that the contact tip to work distance is about 10 - 12 mm.
4. To stop welding, release the gun trigger and pull the gun away from the work after the arc goes out.
5. A ball may form at the tip end of the wire after welding. For easier restrikes the ball may be removed by feeding out a few inches of wire and simply bending the wire back and forth until it breaks off.
6. When no more welding is to be done, turn off the machine.

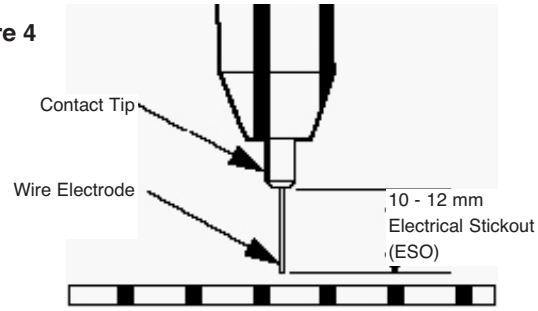
**3. The Correct Electrical Stickout (ESO)**

The electrical stickout (ESO) is the distance from the end of the contact tip to the end of the wire.

See Figure 4.

Once the arc has been established, maintaining the correct ESO becomes extremely important. The ESO should be approximately 10 - 12 mm long.

**Figure 4**



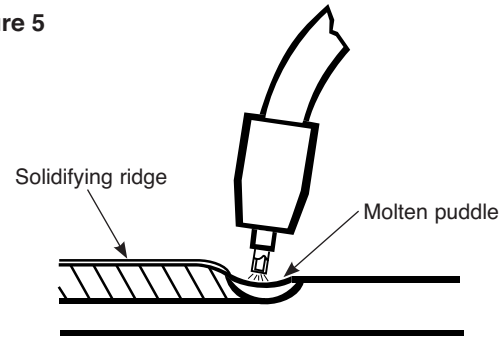

The easiest way to tell whether the ESO is the correct length is by listening to its sound. The correct ESO has a distinctive "crackling" sound, very much like eggs frying in a pan. A long ESO has a hollow, blowing or hissing sound. If the ESO is too short, you may stick the contact tip or nozzle to the weld puddle and/or fuse the wire to the contact tip.

**4. The Correct Welding Speed**

The important thing to watch while welding is the puddle of molten metal right behind the arc. See Figure 5. Do not watch the arc itself. It is the appearance of the puddle and the ridge where the molten puddle solidifies that indicates correct welding speed. The ridge should be approximately 10 mm behind the wire electrode.

Most beginners tend to weld too fast, resulting in a thin uneven, "wormy" looking bead. They are not watching the molten metal.

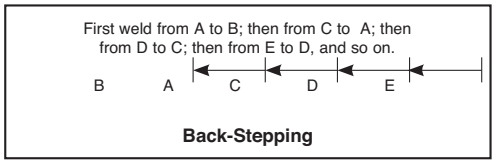
**Figure 5**




**Helpful Hints**

1. For general welding, it is not necessary to weave the arc, neither forward or backward nor sideways. Weld along at a steady pace. You will find it easier.
2. When welding on thin plate, you will find that you will have to increase the welding speed, whereas when welding on heavy plate, it is necessary to go more slowly in order to get good penetration.
3. When welding sheet metal 1.6 mm and lighter, heat buildup may cause part warpage and burn through. One way to eliminate these problems is to use the back-stepping method illustrated in Figure 6.

**Figure 6**

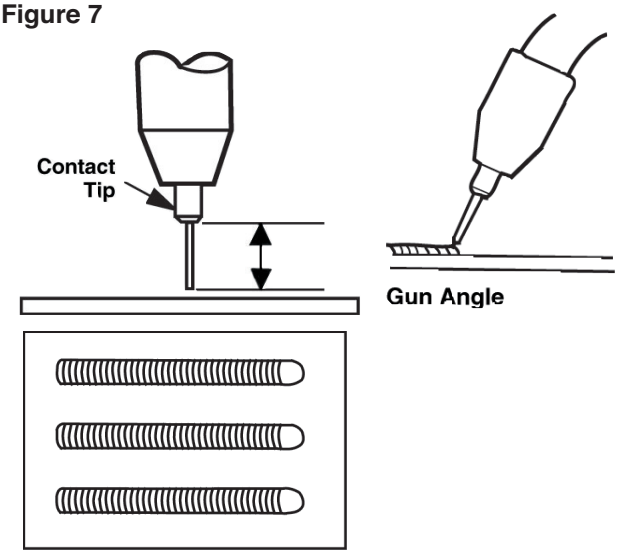



**Practice**

The best way of getting practice in the four skills that enable you to maintain:

1. Correct welding position
2. Correct way to strike an arc
3. Correct electrical stickout
4. Correct welding speed is to perform the following exercise.

**Figure 7**




**For the REDI-MIG® 250c use the following:**

| | |
|---|---|
| Mild Steel Plate | 3.0mm |
| Electrode | 0.9mm<br>Innershield 211 MP |
| Voltage Setting | 3 |
| Wire Feed Speed | 3.5 |

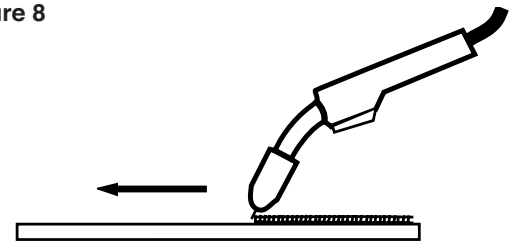
Refer to Figure 7.

1. Learn to strike an arc by positioning the gun over the joint and touching the wire to the work.
2. Position face shield to protect face and eyes.
3. Depress gun trigger, hold gun so contact tip to work distance is about 10 to 12 mm and the gun is at proper angle.
4. After you strike the arc, practice the correct electrical stickout. Learn to distinguish it by its sound.
5. When you are sure that you can hold the correct electrical stickout, with a smooth "crackling" arc start moving. Look at the molten puddle constantly, and look at the "ridge" where the metal solidifies.
6. Run beads on a flat plate. Run them parallel to the top edge (the edge farthest away from you). This gives you practice in running straight welds, and also gives you an easy way to check your progress. The 10th weld will look considerably better than the first weld. By constantly checking on your mistakes and your progress, welding will soon be a matter of routine.

## 5.8 Machine Set Up for the GMAW (MIG) Process and Gas Shielded GCAW Processes

1. The REDI-MIG® comes ready for welding using the MIG process.
2. See the Procedure Welding Guide on the inside of wire feed section door for information on setting the controls.
3. Set the "Voltage" and "Wire Speed" controls to the settings suggested on the Procedure Welding Guide for the welding wire and base metal thickness being used. '
4. Check that the polarity is correct for the welding wire being used. Set the polarity for DC(+) when welding with the GMAW (MIG) process. See Section 1.5 for instructions for changing polarity.
5. Check that the gas nozzle and proper size liner and contact tip are being used and that the gas supply is turned on. Set for 7 to 10 L/min. under normal conditions, increase to as high as 17 L/min. under drafty (slightly windy) conditions.
6. Connect work clamp to metal to be welded. Work clamp must make good electrical contact to the work piece. The work piece must also be grounded as stated in the "Arc Welding Safety Precautions" at the beginning of this manual.

**Figure 8**



## 5.9 Welding Techniques for the GMAW (MIG) Process

Four simple manipulations are of prime importance when welding. With complete mastery of the four, welding will be easy. They are as follows:

**1. The Correct Welding Position**

Figure 8 illustrates the correct welding position for right handed people. (For left handed people, it is the opposite.)

When GMAW (MIG) welding on sheet metal, it is important to use the "forehand" push technique.

Hold the gun (of the gun and cable assembly) in your right hand and hold the shield with your left hand. (Left handers simply do the opposite.) Weld from right to left (if you are right handed). This results in a colder weld and has less tendency for burn through.

**ARC RAYS can burn eyes and skin**

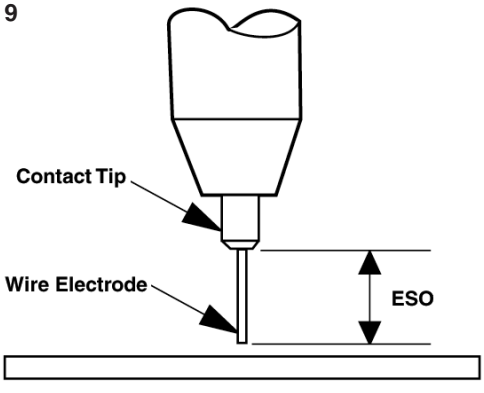
**When using an open arc process, it Is necessary to use correct eye, head and body protection.**

**Protect yourself and others, read "ARC RAYS can burn" at the front of this manual.**

**2. The Correct Way To Strike An Arc**

1. Be sure the work clamp makes good electrical contact to the work.
2. Position gun over joint. End of wire may be lightly touching the work.
3. Position face shield to protect face and eyes, close gun trigger, and begin welding. Hold the gun so that the contact tip to work distance is about 10 - 12 mm.
4. To stop welding, release the gun trigger and pull the gun away from the work after the arc goes out.
5. A ball may form at the tip end of the wire after welding. For easier restrikes, the ball may be removed by feeding out a few inches of wire and cutting off the end of the wire with wire cutters.
6. When no more welding is to be done, close the valve on the gas cylinder, momentarily operate the gun trigger to release gas pressure, then turn off the machine.

**Figure 9**



3. **The Correct Electrical Stickout (ESO)**

   The electrical stickout (ESO) is the distance from the end of the contact tip to the end of the wire. See Figure 9.

   Once the arc has been established, maintaining the correct ESO becomes extremely important. The ESO should be approximately 10 to 12 mm long.

   The easiest way to tell whether the ESO is the correct length is by listening to its sound. The correct ESO has a distinctive "crackling" sound, very much like eggs frying in a pan. A long ESO has a hollow, blowing or hissing sound. If the ESO is too short, you may stick the contact tip or nozzle to the weld puddle and/or fuse the wire to the contact tip.

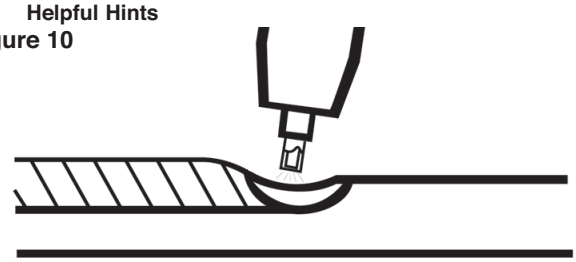
4. **The Correct Welding Speed**

   The important thing to watch while welding is the puddle of molten metal right behind the arc. See Figure 10. Do not watch the arc itself. It is the appearance of the puddle and the ridge where the molten puddle solidifies that indicates correct welding speed. The ridge should be approximately 10 mm behind the wire electrode.

   Most beginners tend to weld too fast, resulting in a thin, uneven, "wormy" looking bead. They are not watching the molten metal.

**Helpful Hints**

**Figure 10**



1. For general welding, it is not necessary to weave the arc, neither forward or backward nor sideways. Weld along at a steady pace. You will find it easier.
2. When welding on thin plate, you will find that you will have to increase the welding speed, whereas when welding on heavy plate, it is necessary to go more slowly in order to get good penetration.
3. When welding sheet metal 1.6mm and lighter, heat buildup may cause part warpage and burn through. One way to eliminate these problems is to use the back-stepping method illustrated in Figure 6.

**Practice**

The best way of getting practice in the four skills that enable you to maintain:

1. Correct welding position
2. Correct way to strike an arc
3. Correct electrical stickout
4. Correct welding speed

is to perform the following exercise.

Refer to Figure 4.

Refer to Figure 7.

**For the REDI-MIG® 250s, use the following:**

| | |
|---|---|
| Mild Steel Sheet | (1.6 mm) |
| Electrode | 0.9mm Ultramag S6 electrode Argon/$CO_2$ Blend |
| Voltage Setting | 1 |
| Wire Feed Speed | 2.75 |

1. Learn to strike an arc by positioning the gun over the joint and touching the wire to the work.
2. Position face shield to protect face and eyes.
3. Depress gun trigger, hold gun so contact tip to work distance ls about 10-12 mm and the gun is at proper angle.

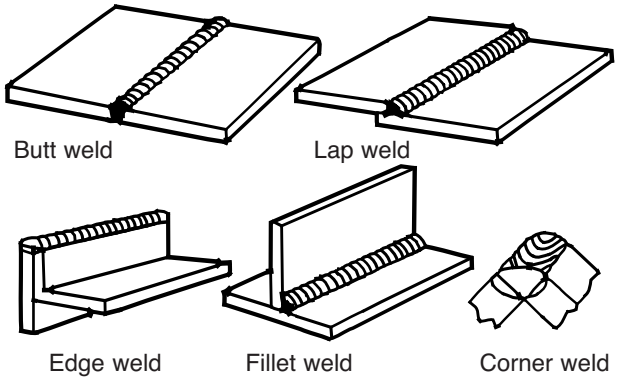
4. After you strike the arc, practice the correct electrical stickout. Learn to distinguish it by its sound. stickout, with a smooth "crackling" arc, start moving. Look at the molten puddle constantly,

6. Run beads on a flat plate. Run them parallel to the top edge (the edge farthest away from you). This gives you practice in running straight welds, and also gives you an easy way to check your progress. The 10th weld will look considerably better than the first weld. By constantly checking on your mistakes and your progress, welding will soon be a matter of routine.

## 5.10 Joint Types and Positions

Five types of welding joints are: Butt Welds, Fillet Welds, Lap Welds, Edge Welds and Corner Welds. See Figure 10.

**Figure 10**




Of these, the Butt Weld and Fillet Weld are the two most common welds.

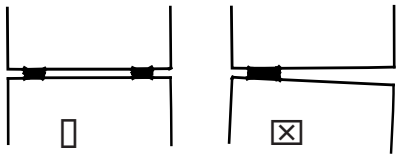
## 5.11 Butt Welds

Place two plates side by side, leaving a space approximately one half the thickness of the metal between them in order to get deeper penetration.

Securely clamp or tack weld the plates at both ends, otherwise the heat will cause the plates to move apart. See Figure 11.

Now weld the two plates together. Weld from left to right (if right handed and using self-shielded FCAW process). Point the wire electrode down in the crack between the two plates, keeping the gun slightly tilted in the direction of travel.

**Figure 11**



Watch the molten metal to be sure it distributes itself evenly on both edges and in between the plates.

## 5.12 Penetration

Unless a butt weld penetrates close to 100% of the metal thickness, a butt weld will be weaker than the material welded together. In the example shown in Figure 12, the total weld is only half the thickness of the material thus the weld is only approximately half as strong as the metal.

In the example shown in Figure 13, the joint has been welded so that 100% penetration could be achieved. The weld, if properly made, is as strong as or stronger than the original metal.

**Figure 12**

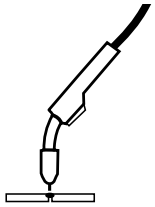
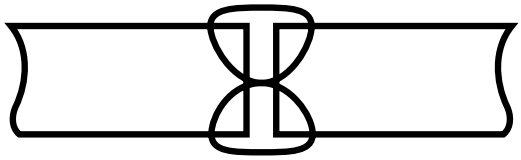


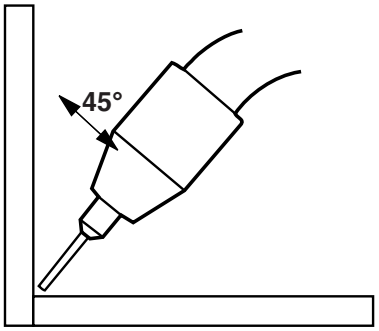
**Figure 13**



## 5.13 Fillet Welds

When welding fillet welds, it is very important to hold the wire electrode at a 45° angle between the two sides or the metal will not distribute itself evenly. The gun nozzle is generally formed at an angle to facilitate this. See Figure 14.

**Figure 14**




## 5.14 Welding In The Vertical Position

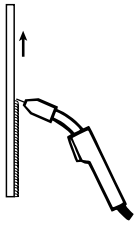
Welding in the vertical position can be done either vertical-up or vertical-down. Vertical-up is used whenever a larger, stronger weld is desired. Vertical-down is used primarily on sheet metal 4.0mm and under for fast, low penetrating welds.

## 5.15 Vertical-up And Overhead Welding

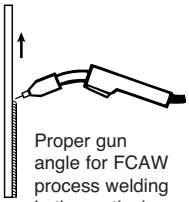
The problem, when welding vertical-up, is to put the molten metal where it is wanted and make it stay there. If too much molten metal is deposited, gravity will pull it downwards and make it “drip”. Therefore, a certain technique has to be followed.

When welding out-of-position, run stringer beads. Don’t whip, break the arc, move out of the puddle, or move too fast in any direction. Use Wire Feed Speed (WFS) in the low portion of the range. The general technique and proper gun angle are illustrated in Figure 15.

Generally, keep the electrode nearly perpendicular to the joint as illustrated. The maximum angle above perpendicular may be required if porosity becomes a problem.



Proper gun angle for GMAW process welding in the vertical up position.



Proper gun angle for FCAW process welding in the vertical up position.

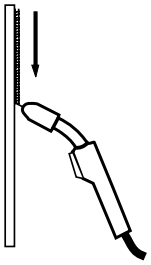
## 5.16 Vertical-down Welding

Refer to Figure 16 Vertical-down welds are applied at a fast pace. These welds are therefore shallow and narrow and, as such, are excellent for sheet metal. Vertical-down welds may be applied to 4.0 mm and lighter material.

Use stringer beads and tip the gun in the direction of travel so the arc force helps hold the molten metal in the joint. Move as fast as possible consistent with desired bead shape.

The important thing is to continue lowering the entire arm as the weld is made so the angle of the gun does not change. Move the electrode wire fast enough that the slag does not catch up with the arc. Vertical-down welding gives thin, shallow welds. It should not be used on heavy material where large welds are required.

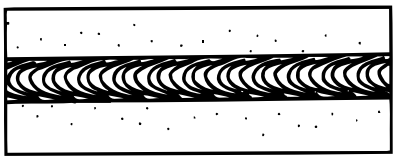
**Figure 16**



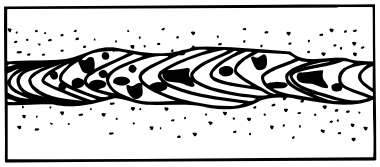
**WARNING**

**Use of this unit on thicker materials than recommended may result in poor welds. The welds may “look” good, but may just be “sitting” on top, of the plate. This is called “Cold Lapping” and will result in weld failure.**

## 5.17 Troubleshooting Welds



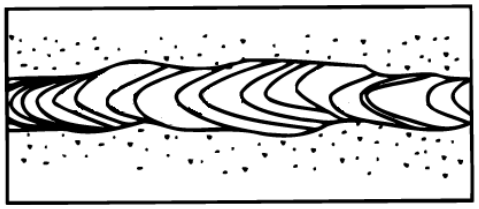
Good welds have excellent appearance.



**To Eliminate Porosity** (in order of importance):

1. Turn on gas supply, if used
2. Decrease voltage.
3. Increase stickout.
4. Increase WFS (wire feed speed).
5. Decrease torch angle.
6. Decrease travel speed.

**Note**: Always be sure the joint is free from moisture, oil,



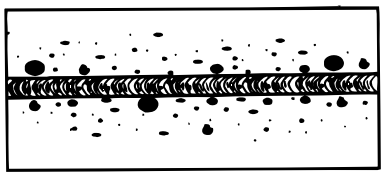
rust, paint or other contaminants.

**To Eliminate a Ropy Convex Bead**

(in order of importance):

1. Increase voltage
2. Decrease stickout.
3. Decrease WFS (wire feed speed).
4. Decrease travel speed.
5. Decrease torch angle.
6. Check for correct gas, if used.

**To Reduce Spatter** (in order of importance):



1. Increase voltage.
2. Increase torch angle.
3. Decrease stickout.
4. Increase WFS (wire feed speed).
5. Decrease travel speed.
6. Check for correct gas, if used.

**To Correct Poor Penetration** (in order of importance):

1. Decrease stickout.
2. Increase WFS (wire feed speed).
3. Increase voltage.
4. Decrease speed.
5. Decrease torch angle.
6. Check for correct gas, if used.

**If Arc Blow Occurs** (in order of importance):

**Note:** Try different ground connection locations before adjusting procedures.

1. Decrease torch angle.
2. Increase stickout.
3. Decrease voltage.
4. Decrease WFS (wire feed speed.
5. Decrease travel speed.

To Eliminate Stubbing* (in order of importance):

1. Increase voltage
2. Decrease WFS (wire feed speed)
3. Decrease stickout
4. Increase torch angle

* Stubbing occurs when the electrode drives through the molten puddle and hits the bottom plate tending to push the gun up.

**Proper Gun Handling**

Most feeding problems are caused by improper handling of the gun cable or electrodes.

1. Do not kink or pull the gun around sharp corners
2. Keep the gun cable as straight as practical when welding.
3. Do not allow dolly wheels or trucks to run over the cables.
4. Keep the cable clean.
5. Use only clean, rust-free electrode. Lincoln electrodes have proper surface lubrication.
6. Replace contact tip when it becomes worn or the end is fused or deformed.

# Section 6 - MAINTENANCE

**WARNING**

**ELECTRIC SHOCK can kill**

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

## 6.1 Routine Maintenance

**General**

In extremely dusty locations, dirt may clog the air passages and cause the welder to run hot. Blow dirt out of the welder with low-pressure air at regular intervals to eliminate excessive dirt and dust build-up on internal parts.

The fan motor has sealed ball bearings which require no service.

**Welding Thermal Overload Protection**

The REDI-MIG® has built-in protective thermostats that respond to excessive temperature. They open the wire feed and welder output circuits if the machine exceeds the maximum safe operating temperature because of a frequent overload, or high ambient temperature plus overload. The over temperature light on the control panel glows if thermostats open. The thermostats automatically reset when the temperature reaches a safe operating level. The fan will stay on when the machines welding and feeding are disabled during thermostatic over temperature protection.

## 6.2 Gun and Cable Maintenance

**Cable Cleaning**

Clean cable liner after using approximately 150kg of electrode. Remove the cable from the wire feeder and lay it out straight on the floor. Remove the contact tip from the gun. Using an air hose and approx. 350 kPa (50psi) pressure, gently blow out the cable liner from the gas diffuser end.

Flex the cable over its entire length and again blow out the cable. Repeat this procedure until no further dirt comes out.

**CAUTION**

**Excessive pressure at the start may cause dirt to form a plug.**

## 6.3 Gun Tips and Nozzles

The gun tip should be replaced when worn. Replace with the correct size for the wire type and diameter. Too large a tip for the electrode wire will cause arcing within the gun cable and possible jamming of the wire within the cable .

Remove spatter from inside of gas nozzle and from tip after each 10 minutes of arc time or as required.

**Drive Rolls and Guide Tubes**

After every coil of wire, inspect the wire drive mechanism. Clean it as necessary by blowing with low pressure compressed air. Do not use solvents for cleaning the idle roll because this may wash the lubricant out of the bearing. All drive rolls are stamped with the wire sizes they will feed. If a wire size other than that stamped on the roll is to be used, the drive roll must be changed.

**Avoiding Wire Feeding Problems**

Wire feeding problems can be avoided by observing the following gun handling procedures:-

1. Do not kink or pull gun cable around sharp corners.
2. Keep the gun cable as straight as possible when welding or feeding electrode through cable.
3. Keep gun cable clean by following maintenance instructions.
4. Use only clean, rust-free electrode. Lincoln Electric electrode has proper surface lubrication.
5. Replace contact tip when the arc starts to become unstable or the contact tip end is fused or deformed.

## 6.4 Input Lead

If the supply cord is damaged, it must be replaced with a special cord. Refer spare part list.

## 6.5 Liner Removal, Installation and Trimming Instructions for LINC Gun® 240 & 360 Torch

Note: The variation in cable lengths prevents the inter-changeability of liners between guns. Once a liner has been cut for a particular gun, it should not be installed in another gun unless it can meet the liner cutoff length requirement.

1. Remove the gas nozzle and gas diffuser, (if used), to locate the set screw in the gas diffuser which is used to hold the old liner in place. Loosen the set screw with an Allen key.
2. Remove the contact tip holder from the gun tube.
3. Lay the gun and cable out straight on a flat surface. Loosen the liner nut cap located in the brass connector at the feeder end of the cable and pull the liner out of the cable.
4. Insert a new untrimmed liner into the connector end of the cable.
5. Fully seat the liner bushing into the Euro connector. Tighten the liner nut cap on the brass cable connector. The contact tip holder, at this time, should not be installed onto the end of the gun tube.
6. With the contact tip holder still removed from the gun tube, be sure the cable is straight, and then trim the liner to length. Remove any burrs from the end of the liner.
7. Screw the contact tip holder onto the end of the gun tube and securely tighten. Be sure the contact tip holder is correct for the tips being used.
8. Tighten the set screw in the side of the gas diffuser against the cable liner using an Allen key. **Do not overtighten.**

# Section 7 - ACCESSORIES

- Drive Rolls for mild steel, stainless steel and aluminium for solid wires as well as for flux cored wires. See your nearest Lincoln distributor for details.
- 1.2mm Aluminium Welding Kit complete with 0.9mm, 1.2mm U-groove drive rolls, 0.9-1.2mm Teflon torch liner, packet of 10 X1.2mm contact tips, Teflon inlet and outlet guides (for REDI-MIG® 210c & 250c use KA1440-4 and for REDI-MIG® 250s, 325c & 325s use KA1440-5).
- 1.2mm Flux Cored, Gas and Gasless Welding Kit, complete with 0.9, 1.2mm knurled drive rolls, 0.9-1.2mm torch liner and packet of 10 x 1.2mm contact tips (for REDI-MIG® 210c & 250c use KA1441-4. For REDI-MIG® 250s, 325c & 325s use KA1441-5).

# Section 8 - GROUND TEST PROCEDURE
### These procedures refer to the REDI-MIG® 250s, 325c & 325s

**WARNING**

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

**ELECTRIC SHOCK can kill**

**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 Lincoln Field Service Shop.

The insulation resistance values listed below are from Australian Standard AS60974-.1.

1) Disconnect input cable from power outlet.
2) Disconnect all output cables (control & weld).
3) Remove the roof panel.
4) Jumper the three (3) AC terminals and the (+) & (-) terminals of the three phase bridge rectifier (A total of five (5) places).
5) Jumper the four (4) meter terminals together.
6) Switch the fine control rotary switch to position '1' & switch the coarse control rotary switch to position '1'.
7) **Primary test:** Connect one lead of the mega tester to the frame of the machine and the other lead to each of the three (3) input conductors and to the main transformer primary leads L1A, L2A & L3A. Apply the test(s).
8) **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 5.0MΩ).
9) **Welding circuit to primary test:** Connect one lead of the mega tester to the positive output stud and the other lead to each of the three (3) input conductors and to the main transformer primary leads L1A, L2A & L3A. Apply the test. (Min resistance 2.5MΩ).
10) **Transformer thermostat 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).
11) Remove all jumper leads.
12) Refit the roof panel.

## Procedure for Replacing PC Boards

Before replacing a PC board suspected of being defective, visually inspect the PC board in question for any visible damage to any of its components and conductors on the back of the board.

1. If there is no visible damage to the PC board, install a new one and see if this remedies the problem. If the problem is remedied, reinstall the original PC board to see if the problem still exists. If the problem no longer exists with the old PC board:
   a. Check the PC board harness connector pins for corrosion, contamination, or looseness.
   b. Check leads in the plug harness for loose or intermittent connection.
2. If PC board is visibly damaged, before possibly subjecting the new PC board to the same cause of failure, check for possible shorts, opens or grounds caused by:
   a. Damaged lead insulation.
   b. Poor lead termination, such as a poor contact or a short to adjacent connection or surface.
   c. Shorted or open motor leads, or other external leads.
   d. Foreign matter or interference behind the PC board.
3. If PC board is visibly damaged, inspect for cause, then remedy before installing a replacement PC board.

## Changing Settings for Motor Acceleration

If Motor Acceleration needs to be altered from factory setting, because of the welding procedure being used, locate the PCB in the REDI-MIG® 325c or REDI-MIG® 4s Remote Wire Feeder.

On the PCB there is a trimmer labelled 'Rampa', this trimmer controls the acceleration rate of the drive motor from stationary to the set wire feed speed. Maximum acceleration when fully counter-clockwise to minimum acceleration when fully clockwise. This is particularly important when welding aluminium wire. The factory setting is fully clockwise.

# Section 8 - GROUND TEST PROCEDURE
## The following procedures refer to the REDI-MIG® 210c & 250c

### WARNING

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

### ELECTRIC SHOCK can kill

**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 Electric Field Service Shop.

The insulation resistance values listed below are from Australian Standard AS60974.1.

1) Disconnect input cable from power supply.
2) Disconnect gun assembly and work cable.
3) Remove the side panel from power source.
4) Jumper the two (2) AC terminals and both output terminals of the bridge rectifier, (a total of three (4) places).
5) Disconnect the PCB plug.
6) Switch the control rotary switch to position 'one' (1) and switch the on/off switch to on.
7) **Primary Test:** Connect one lead of the mega tester to the frame of the machine and the other lead to the Active terminal of the input plug. Apply the test. (Min. resistance 2.5MΩ)
8) **Welding circuit test:** Connect one lead of the mega tester to the frame of the machine and the other lead to the (+)ve output stud. Apply the test. (Min. resistance 2.5MΩ)
9) **Welding circuit to primary test:** Connect one lead of the mega tester to the (+)ve output stud and the other lead to the Active terminal of the input plug. Apply the test. (Min. resistance 5MΩ)
10) **Transformer thermostat test:** Connect one lead of the mega to the frame of the machine and the other lead to the rectifier thermostat terminals. Apply the test. (Min. resistance 2.5MΩ)
11) Remove all jumpers and reconnect all leads and plugs.
12) Refit all panel work previously removed.

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## Procedure for Replacing PC Boards

Before replacing a PC board suspected of being defective, visually inspect the PC board in question for any visible damage to any of its components and conductors on the back of the board.

1. If there is no visible damage to the PC board, install a new one and see if this remedies the problem. If the problem is remedied, reinstall the original PC board to see if the problem still exists. If the problem no longer exists with the old PC board:
   a. Check the PC board harness connector pins for corrosion, contamination, or looseness.
   b. Check leads in the machine harness for loose or intermittent connection.
2. If PC board is visibly damaged, before possibly subjecting the new PC board to the same cause of failure, check for possible shorts, opens or grounds caused by:
   a. Damaged lead insulation.
   b. Poor lead termination, such as a poor contact or a short to adjacent connection or surface.
   c. Shorted or open motor leads, or other external leads.
   d. Foreign matter or interference behind the PC board.
3. If PC board is visibly damaged, inspect for cause, then remedy before installing a replacement PC board.

# Section 9 - TROUBLESHOOTING

**WARNING**

**ELECTRIC SHOCK can kill**

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

| Problem | Possible Cause | What To Do |
|---|---|---|
| **Rough wire feeding or wire not feeding but drive rolls turning.** | Gun cable kinked and/or twisted. | Inspect gun cable and replace if necessary. |
| | Wire jammed in gun and cable. | Remove wire from gun and cable - feed in new wire. Note any obstructions in gun and cable. Replace gun and cable if necessary. |
| | Incorrectly fitted drive roll. | See Wire Drive Roll Section in this manual for proper installation of drive roll. |
| | Drive roll loose. | Remove, clean, install and tighten. |
| | Gun cable dirty. | Clean cable or replace liner. |
| | Worn drive roll. | Replace. |
| | Electrode rusty and/or dirty. | Replace. |
| | Worn nozzle or cable liner. | Replace. |
| | Partially flashed or melted contact tip. | Replace contact tip. |
| | Incorrect idle roll pressure. | Set idle roll pressure. |
| **Variable or "hunting" arc.** | Wrong size, worn and/or melted contact tip. | Replace tip - remove any spatter on end of tip. |
| | Worn work cable or poor work connection. | Inspect - repair or replace as necessary. |
| | Loose electrode connections. | Be sure electrode lead is tight, gun cable tight in wire feeder contact block, gun nozzle and gun tip tight. All work lead connections must be tight. |
| | Wrong polarity. | Check connection at output studs for polarity required by welding process. |
| **Poor arc striking with sticking or "blast offs", weld porosity, narrow and ropey looking bead, or electrode stubbing into plate while welding.** | Improper procedures or techniques. | See "Gas Metal Arc Welding Guide" (GS100). |
| | Improper gas shielding | Clean gas nozzle. Make certain that gas diffuser is not restricted. Make certain that gas cylinder is not empty or turned off. Make certain gas solenoid valve is operating and gas flow rate is correct.<br><br>Remove gun liner and check rubber seal for any sign of deterioration or damage. Be sure set screw in brass connector is in place and tightened against the liner bushing. |
| **Tip seizes in diffuser.** | Tip overheating due to prolonged or excessive high current and/or duty cycle welding. | Do not exceed current and duty cycle rating of gun.<br><br>A light application of high temperature antiseize lubricant may be applied to tip threads. |

# TROUBLESHOOTING

| Problem | Possible Cause | What To Do |
|---|---|---|
| **No wire feed, although arc voltage is present.** | Defective wire feed motor or wire drive control PC board. | Measure the voltage between the motor leads (54) and (53) when the Gas Purge/Wire Inch toggle switch is pressed downwards. If this voltage is over 10V DC, replace the wire feed motor. If no voltage is registered, replace the wire drive PCB. (Refer PCB replacement procedure on page 19). |
| **No control of wire feed.** | Defective wire drive control PC board. | Replace PCB. (Refer PCB replacement procedure on page 19). |
| **No wire feed and no arc voltage. Pilot light indicates input power to machine.** | Overtemperature protection circuit actuated due to overload or short. (Overtemperature light should be illuminated). | Allow machine to cool down and reduce on time and/or wire feed speed. |
| | Faulty gun trigger switch or damaged control cable connected to gun trigger. | Repair. |
| | Defective control PC board. | Refer Procedure for Replacing PC Boards, if no fault is detected in trigger-thermostat circuit. |
| | Defective contactor | Replace defective contactor |
| **Poor welding characteristics and/or cannot obtain full rated output as per nameplate.** | Improper settings for wire feed speed and volts. | Set controls correctly. |
| | Faulty switch either coarse control (on/off) or fine control. | Replace switch. |
| | Faulty pilot transformer. | Replace. |
| | Faulty main transformer. | Replace. |
| | Faulty rectifier. | Replace |
| | Faulty choke. | Replace. |
| | One phase disconnected. | Check fuses, check input connection. |

# REDI-MIG PARTS LISTS AND WIRING DIAGRAMS INDEX

## REDI-MIG® 210c & 250c



## REDI-MIG® 250s



## REDI-MIG® 325c

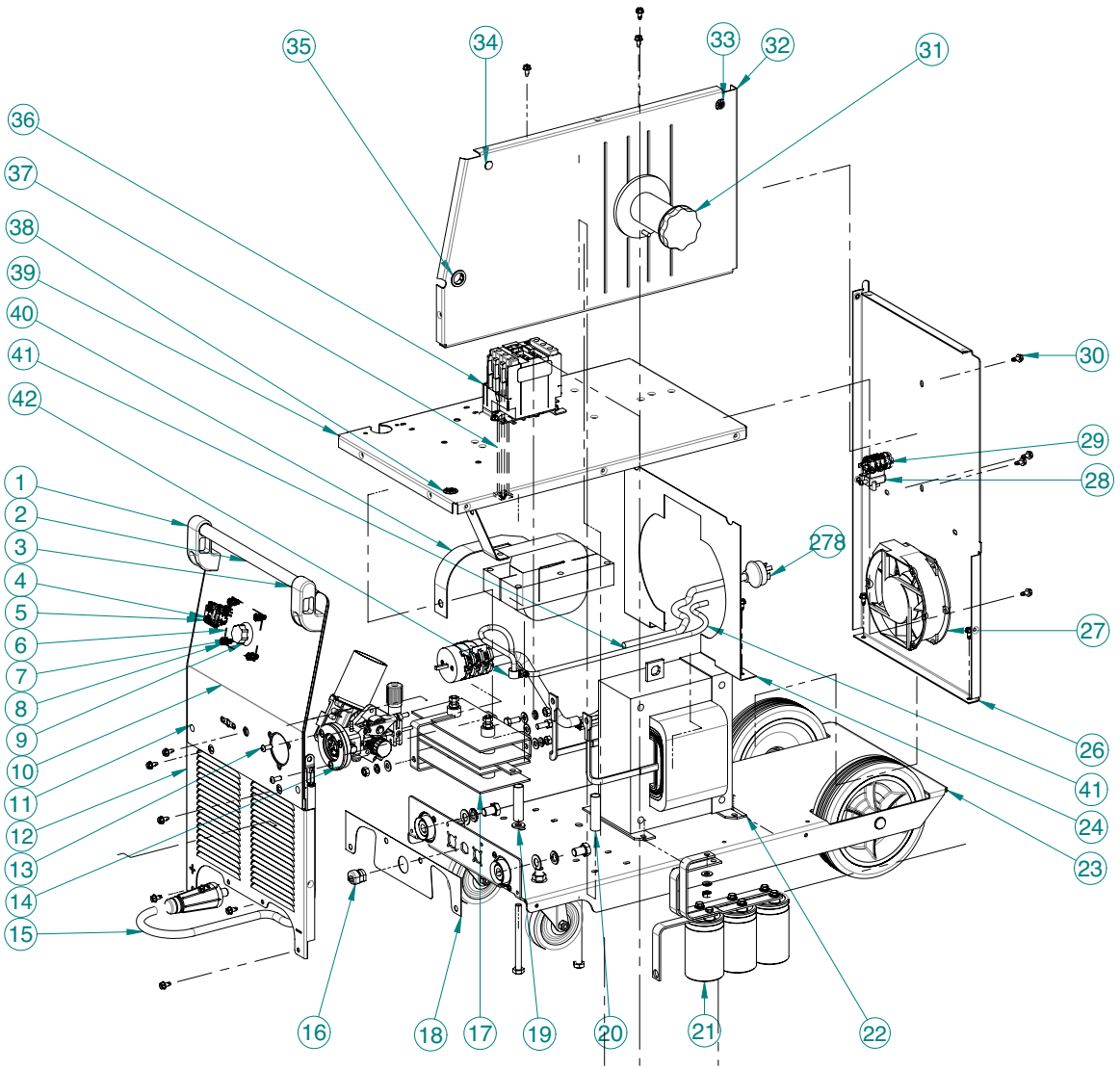


## REDI-MIG® 325s



## REDI-MIG® 4s

| SUB ASSEMBLY<br>PAGE NAME | | Wire Feed Assembly | Cover Panels | Wiring Diagram | | | | |
|---|---|---|---|---|---|---|---|---|
| PARTS LIST | | | | | | | | |
| CODE NO. | MODEL | AP224-C | AP224-D | AP228-W | | | | |
| 70169 | RediMig 210C (K32048-1) | 1 | 1 | 1 | | | | |
| 70170 | RediMig 250C (K32049-1) | 2 | 2 | | | | | |
| | | | | | | | | |
| | | | | | | | | |



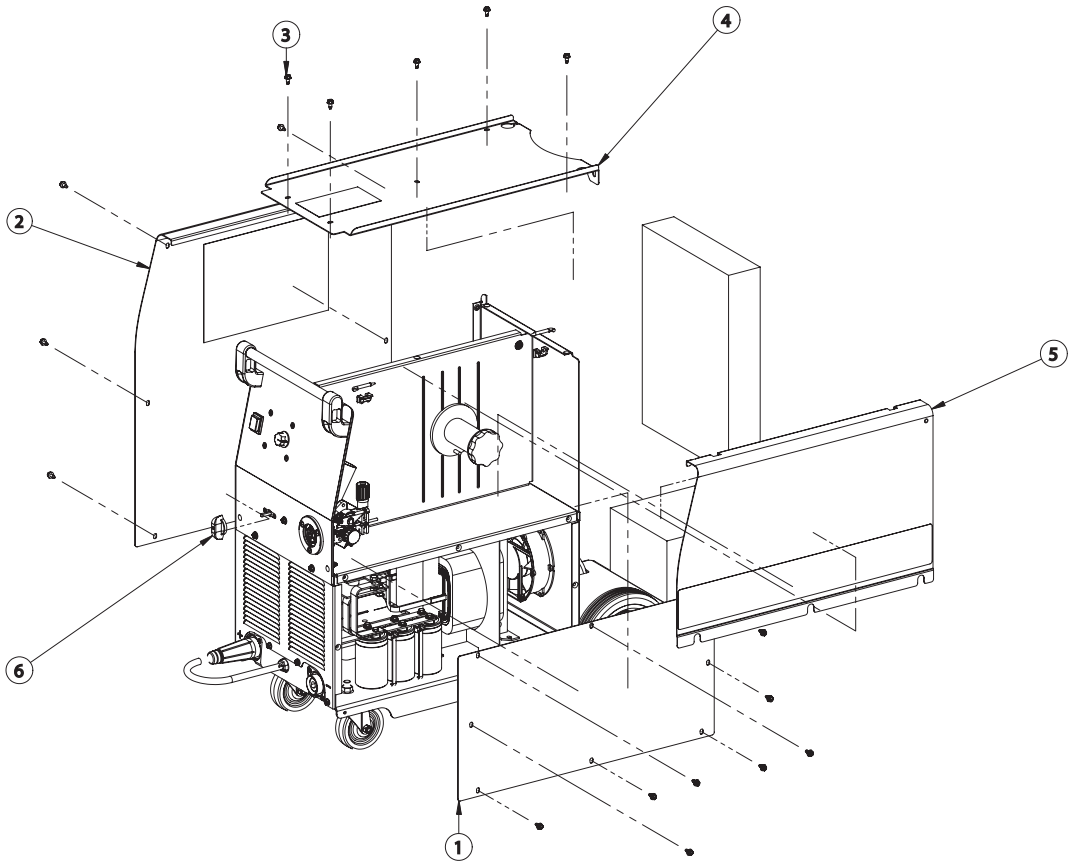
# REDI-MIG 210C & 250C PARTS LIST

# Indicates a change this printing.

Use only the parts marked “x” in the column under the heading number called for in the model index page.

| ITEM | DESCRIPTION | PART NUMBER | QTY | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Moulded Handle Left Side | M51551-1L | 1 | X | X | | | | | | | |
| 2 | Handle | AS5032 | 1 | X | X | | | | | | | |
| 3 | Moulded Handle Right Side | M51551-1R | 1 | X | X | | | | | | | |
| 4 | Rocker Switch | AM3990A | 1 | X | X | | | | | | | |
| 5 | Sealing Boot | AM3990B | 1 | X | X | | | | | | | |
| 6 | Control PCB | AS4966-2 | 1 | X | X | | | | | | | |
| 7 | Expansion Nut | S14020-1A | 4 | X | X | | | | | | | |
| 8 | Thread Forming Screw | S9225-63A | 4 | X | X | | | | | | | |
| 9 | Knob | T10491 | 1 | X | X | | | | | | | |
| 10 | REDI-MIG 210C Nameplate Engraved | AM3977 | 1 | X | | | | | | | | |
| | REDI-MIG 250c nameplate | AM3980 | | | X | | | | | | | |
| 11 | Fastener Button | T14659-1A | 2 | X | X | | | | | | | |
| 12 | Front Panel | AL2857 | 1 | X | X | | | | | | | |
| 13 | Button Hd. Socket Screw | AM3053-331 | 3 | X | X | | | | | | | |
| 14 | REDI-MIG 2 Wheel Drive Assy | AM3993 | 1 | X | X | | | | | | | |
| 15 | Cable -- Sec.Tap to Neg.Stud | AS4462-3 | 1 | X | X | | | | | | | |
| 16 | Cord Strain Relief | AT3764-1 | 1 | X | X | | | | | | | |
| 17 | Rectifier FullBridge | AL2480-4 | 1 | X | X | | | | | | | |
| 18 | Lower Nameplate C Range | AM3973 | 1 | X | X | | | | | | | |
| 19 | 3/8" Flatwasher | S9262-120A | 2 | X | X | | | | | | | |
| 20 | Spacer Tube | AT4024-8 | 2 | X | X | | | | | | | |
| 21 | Redimig 210&250 Capacitor Assy | AM3970 | 1 | X | X | | | | | | | |
| 22 | REDI-MIG 210C Switch&Transfomer Assy | AG1544-1 | 1 | X | X | | | | | | | |
| | REDI-MIG 250C Switch&Transfomer Assy | AG1544-2 | | | X | | | | | | | |
| 23 | REDI-MIG Base Assy | AL2892 | 1 | X | X | | | | | | | |
| 24 | REDI-MIG Baffle 210/250 | AM3972 | 1 | X | X | | | | | | | |
| 25 | REDI-MIG Rear Panel Single Fan | AL2868 | 1 | X | X | | | | | | | |
| | REDI-MIG Double Fan | AL2869 | 1 | X | X | | | | | | | |
| 26 | Fan 170mm | AM3809-2 | 1 | X | X | | | | | | | |
| | Fan 170mm No.2 | AM3809-2 | 1 | X | X | | | | | | | |
| 27 | Gas Valve 240Vac | AS4967 | 1 | X | X | | | | | | | |
| 28 | Cable Gland | AT3871-1 | 1 | X | X | | | | | | | |
| 29 | .25in x .50inT/C Screw (Black) | S9225-68A | 20 | X | X | | | | | | | |
| 30 | Spool Post EasyMIGs | AS4970 | 1 | X | X | | | | | | | |
| 31 | RediMig Bulkhead Panel | AL2863 | 1 | | X | | | | | | | |
| 32 | Bushing | T14614-2 | 1 | | X | | | | | | | |
| 33 | Plug Button | T10397-3A | 1 | | X | | | | | | | |
| 34 | Bushing | T12380-4 | 1 | | X | | | | | | | |
| 35 | 50A Contactor Switch | AM3879-2 | 1 | | X | | | | | | | |
| 36 | Resistor 100W | S10404-94 | 1 | | X | | | | | | | |
| 37 | Bushing | T14614-3 | 1 | | X | | | | | | | |
| 38 | REDI-MIG Shelf Panel | AL2856 | 1 | | X | | | | | | | |
| 39 | Choke Coil Assy | AM4005 | 1 | | X | | | | | | | |
| 40 | Hose 5mm (Black) | AS4150-23 | 1 | | X | | | | | | | |
| 41 | Hose Clamp | AT3061-10 | 1 | | X | | | | | | | |
| 278 | Input Lead 15A 240V | AS2373-9 | 1 | | X | | | | | | | |

# REDI-MIG COVER PANEL PARTS LIST




**AP-244D.1** **AP-244D.1**

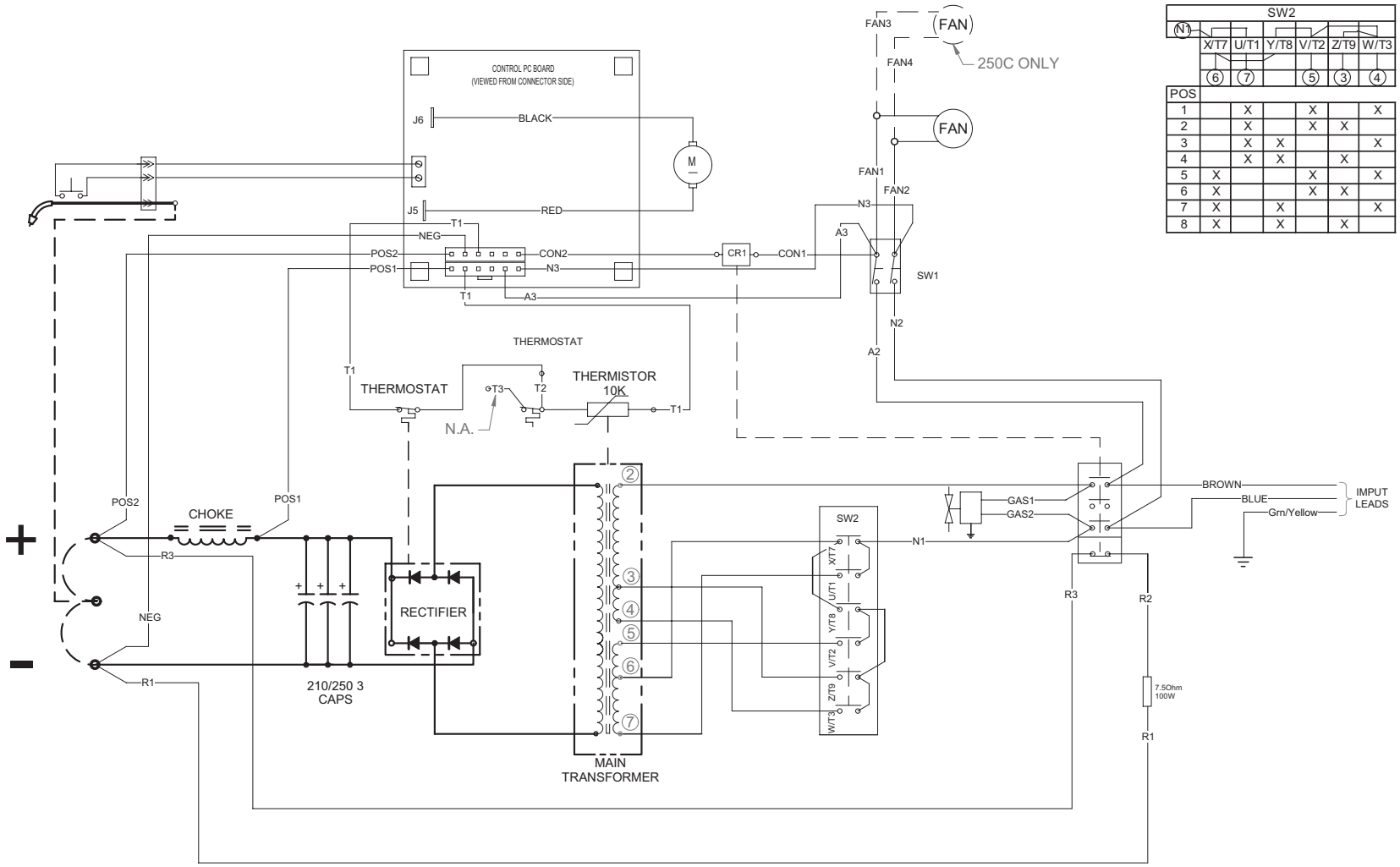
# Indicates a change this printing.

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

| ITEM | DESCRIPTION | PART NUMBER | QTY | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | |
| 1 | RH Lower Side Panel | AL2861 | 1 | X | X | X | X | X | | | | |
| 2 | LH Side Panel | AL2860 | 1 | X | X | X | X | X | | | | |
| | Decal Side Stripe Set 210C | AG1546 | 1 | X | | | | | | | | |
| | Decal Side Stripe Set 250C | AG1554 | 1 | | X | | | | | | | |
| | Decal Side Stripe Set 250S | AG1553 | 1 | | | X | | | | | | |
| | Decal Side Stripe Set 325C | AG1555 | 1 | | | | X | | | | | |
| | Decal Side Stripe Set 325S | AG1556 | 1 | | | | | X | | | | |
| 3 | Black Screw .25" x .50" | S9225-68 | 21 | X | X | X | X | X | | | | |
| 4 | Roof Assembly | AL2859 | 1 | X | X | X | X | X | | | | |
| | Decal | AS4244 | 1 | X | X | X | X | X | | | | |
| | | S52073-1 | 2 | X | X | X | X | X | | | | |
| | | AT3425-2 | 2 | X | X | X | X | X | | | | |
| 5 | Access Door | AL2864 | 1 | X | X | X | X | X | | | | |
| | Decal Side Stripe Set 210C | AG1546 | | X | | | | | | | | |
| | Decal Side Stripe Set 250C | AG1554 | | | X | | | | | | | |
| | Decal Side Stripe Set 250S | AG1553 | | | | X | | | | | | |
| | Decal Side Stripe Set 325C | AG1555 | 1 | | | | X | | | | | |
| | Decal Side Stripe Set 325S | AG1556 | 1 | | | | | X | | | | |
| | | | 1 | X | X | X | X | X | | | | |
| 6 | Knob (Supplied with Switch) | NSS | 1 | X | X | X | X | X | | | | |
| | **ITEMS NOT SHOWN** | | | | | | | | | | | |
| | Linc Gun LG240G 4m | K10413-24-4M | 1 | X | X | X | | | | | | |
| | Linc Gun LG360G 4m | K10413-36-4M | 1 | | | | X | X | | | | |
| | Regulator Argon | LE250-RG002 | 1 | X | X | X | X | X | | | | |
| | Chain 27" Long | AT3873 | 1 | X | X | X | X | X | | | | |
| | Welding Guide 210 | AM4016 | 1 | X | | | | | | | | |
| | Welding Guide 250 | AM4017 | 1 | | X | X | | | | | | |
| | Welding Guide 325 | AM4019 | 1 | | | | X | X | | | | |

SWAP BLACK & RED FOR MOTOR, ADD J6, J5

AM4011 CHANGE DETAILS : REVISE T2, T3 CONNECTION




N.A. CUT OFF TERMINAL AND INSULATE TO PROVIDE 600V INSULATION ONLY IN THE 250C/S.

DO NOT SCALE OFF DRAWING



UNLESS OTHERWISE STATED TOLERANCE ON HOLE SIZES PER E2056. ALL DIMENSIONS ± .5 UNLESS OTHERWISE STATED. ON ALL ANGLES IS ± .5 OF A DEGREE. MATERIAL TOLERANCE TO AGREE WITH PUBLISHED STANDARDS.

| CHANGE DATE | | | | |
|---|---|---|---|---|
| ALPHA | | | | |
| BETA | | | | |
| A03-09-08W | | | | |
| A01-10-08Q | | | | |
| A17-12-08C | | | | |

THE LINCOLN ELECTRIC CO. (AUST) PTY. LTD.
PADSTOW, N.S.W. AUSTRALIA.

SCALE: NTS DATE: 22-07-08 EQUIP TYPE REDIMIG 210C 250C

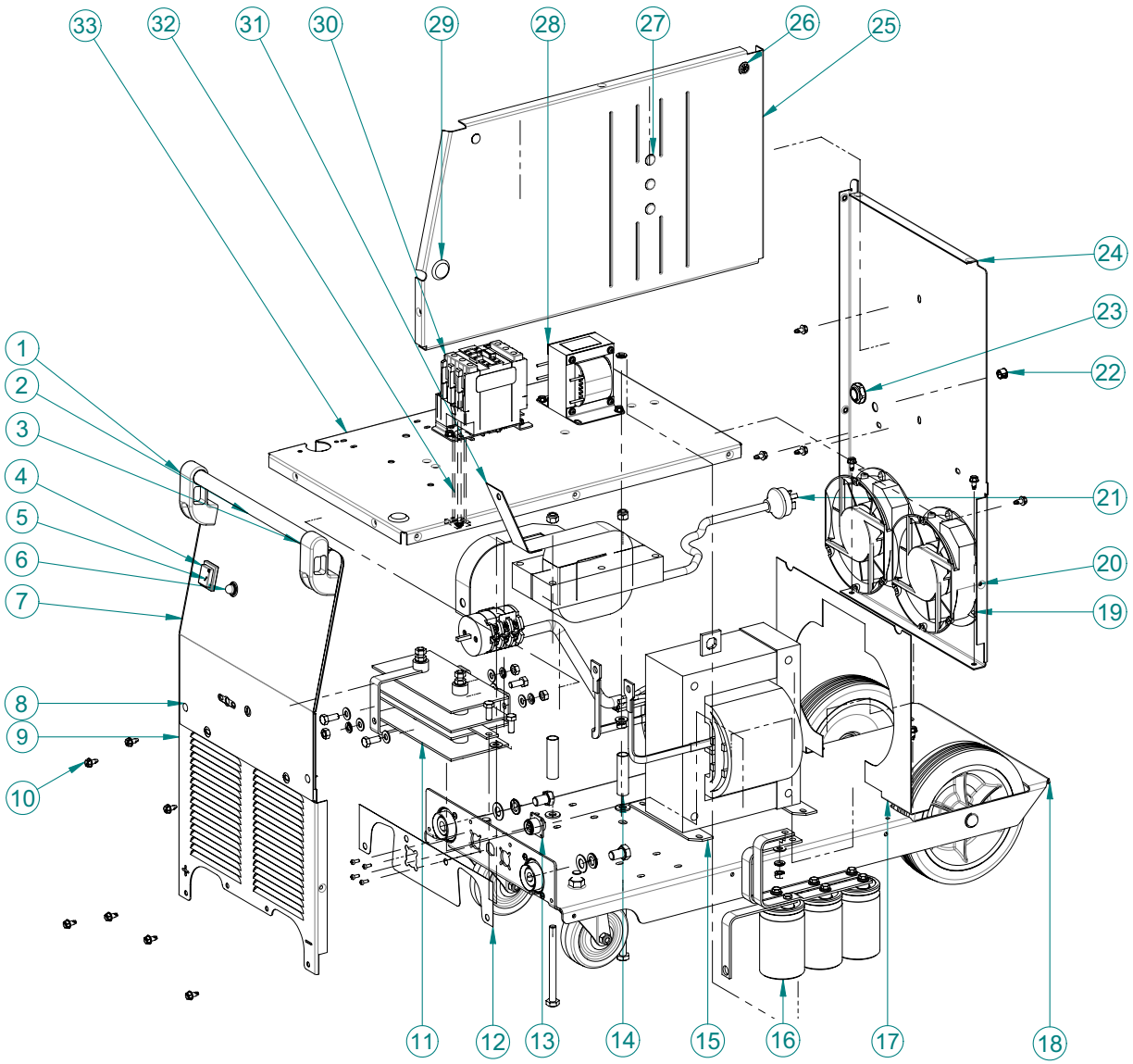
SUBJECT WIRING DIAGRAM

DRAWN: A.S. CHK: REF: AM3848 SUP'S'D'G: SHT. NO. AM4011

SOLID EDGE

# REDI-MIG 250s PARTS LIST

| SUB ASSEMBLY<br>PAGE NAME | | Wire Feed Assembly | Cover Panels | Wiring Diagram | | | |
|---|---|---|---|---|---|---|---|
| PARTS LIST | | | | | | | |
| CODE NO. | MODEL | AP225-C | AP224-D | AP225-W | | | |
| 70171 | REDI-MIG® 250s (K32049-2) | 1 | 1 | 1 | | | |
| | | | | | | | |



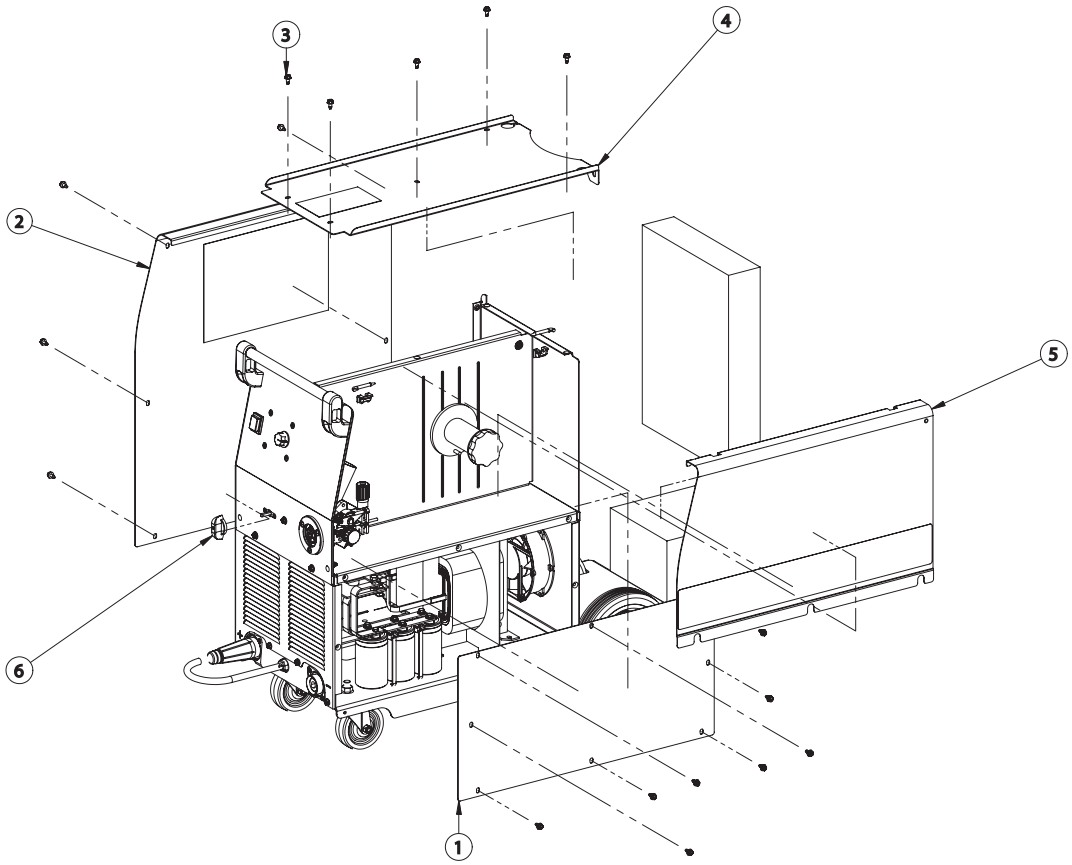
# REDI-MIG 250s PARTS LIST

# Indicates a change this printing.

Use only the parts marked “x” in the column under the heading number called for in the model index page.

| ITEM | DESCRIPTION | PART NUMBER | QTY | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Moulded Handle Left Side | M51551-1L | 1 | X | | | | | | | | |
| 2 | REDI-MIG Handle | AS5032 | 1 | X | | | | | | | | |
| 3 | Moulded Handle Right Side | M51551-1R | 1 | X | | | | | | | | |
| 4 | Sealing Boot | AM3990B | 1 | X | | | | | | | | |
| 5 | Rocker Switch | AM3990A | 1 | X | | | | | | | | |
| 6 | Light Diode & Resistor Assy | AS5021 | 1 | X | | | | | | | | |
| 7 | REDI-MIG 250S Nameplate Engraved | AM3982 | 1 | X | | | | | | | | |
| 8 | Fastener Button | T14659-1A | 2 | X | | | | | | | | |
| 9 | REDI-MIG Front Panel | AL2857 | 1 | X | | | | | | | | |
| 10 | .25in x .50inT/C Screw (Black) | S9225-68A | 15 | X | | | | | | | | |
| 11 | Rectifier FullBridge | AL2480-4 | 1 | X | | | | | | | | |
| 12 | Lower Nameplate S Range | AM3978 | 1 | X | | | | | | | | |
| 13 | Plug Base & Resistor Assy | AS4407-10 | 1 | X | | | | | | | | |
| 14 | Spacer Tube | AT4024-8 | 2 | X | | | | | | | | |
| 15 | REDI-MIG 250C/S Switch&Transfomer Assy | AG1544-2 | 1 | X | | | | | | | | |
| 16 | REDI-MIG 210 & 250 Capacitor Assy | AM3970 | 1 | X | | | | | | | | |
| 17 | REDI-MIG Baffle 210/250 | AM3972 | 1 | X | | | | | | | | |
| 18 | REDI-MIG Base Assy | AL2892 | 1 | X | | | | | | | | |
| 19 | S/T Screw Hex | S8025-91A | 6 | X | | | | | | | | |
| 20 | Fan 170mm MIGs | AM3809-2 | 2 | X | | | | | | | | |
| 21 | Input Lead 15A 240V | AS2373-9 | 1 | X | | | | | | | | |
| 22 | Plug Button | T10397-3A | 2 | X | | | | | | | | |
| 23 | Cable Gland | AT3871-1 | 1 | X | | | | | | | | |
| 24 | REDI-MIG Rear Panel DoubleFan | AL2869 | 1 | X | | | | | | | | |
| 25 | REDI-MIG Bulkhead Panel | AL2863 | 1 | X | | | | | | | | |
| 26 | Bushing | T14614-2 | 1 | X | | | | | | | | |
| 27 | Buffer Grommet | AS4404-4 | 3 | X | | | | | | | | |
| 28 | Aux Transformer 240/42v | AM4000-2 | 1 | X | | | | | | | | |
| 29 | Hole Plug | T13597-1 | 2 | X | | | | | | | | |
| 30 | Delexi 42V Contactor | AM3879-3 | 1 | X | | | | | | | | |
| 31 | Redimig 210/250/C/S Choke Coil Assy | AM4005 | 1 | | | | | | | | | |
| 32 | Resistor 100W | S10404-94 | 1 | | | | | | | | | |
| 33 | REDI-MIG Shelf Panel | AL2856 | 1 | | | | | | | | | |

# REDI-MIG COVER PANEL PARTS LIST




**AP-244D.1** **AP-244D.1**

# Indicates a change this printing.

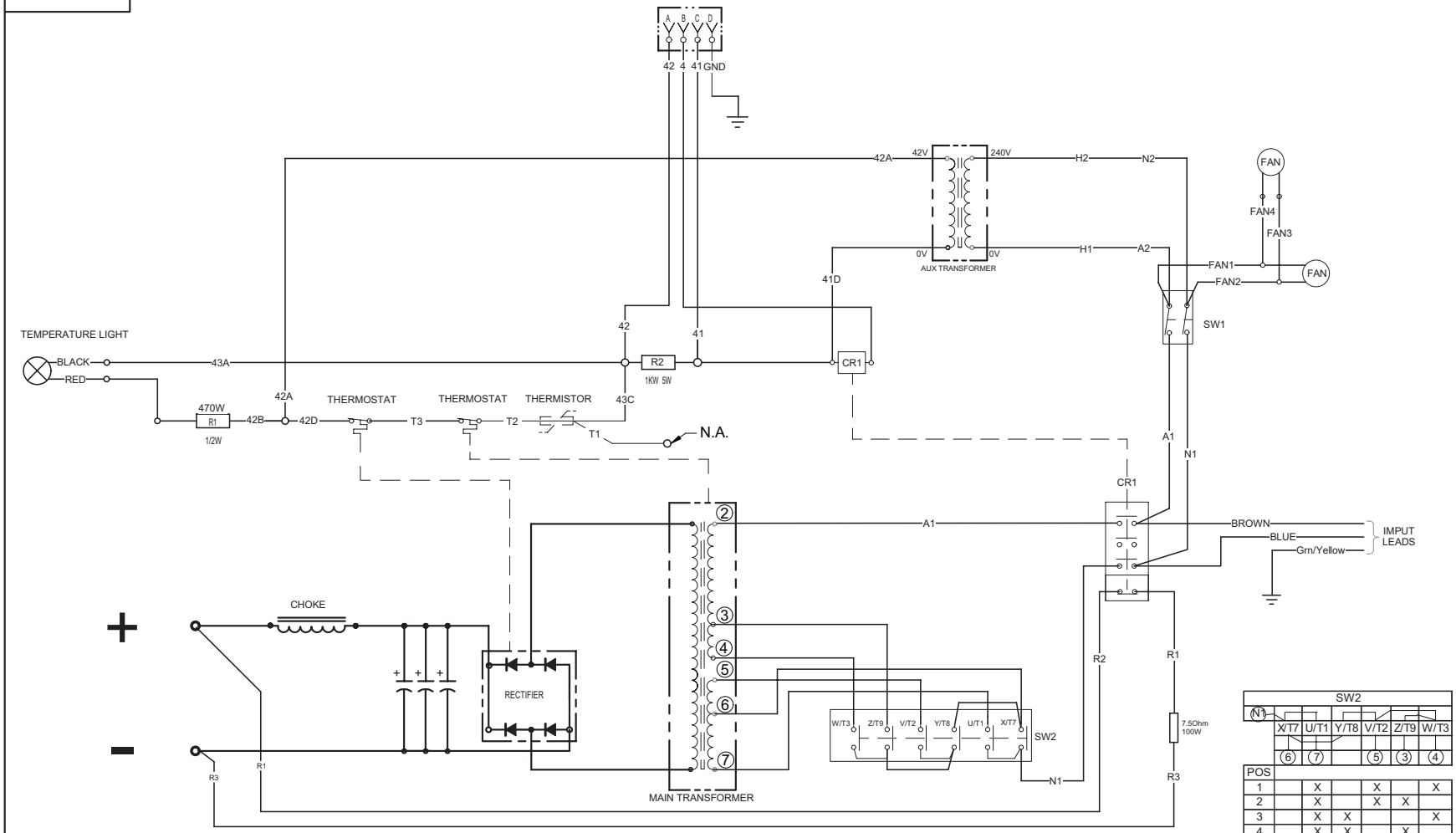
Use only the parts marked "x" in the column under the heading number called for in the model index page.

| ITEM | DESCRIPTION | PART NUMBER | QTY | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | |
| 1 | RH Lower Side Panel | AL2861 | 1 | X | X | X | X | X | | | | |
| 2 | LH Side Panel | AL2860 | 1 | X | X | X | X | X | | | | |
| | Decal Side Stripe Set 210C | AG1546 | 1 | X | | | | | | | | |
| | Decal Side Stripe Set 250C | AG1554 | 1 | | X | | | | | | | |
| | Decal Side Stripe Set 250S | AG1553 | 1 | | | X | | | | | | |
| | Decal Side Stripe Set 325C | AG1555 | 1 | | | | X | | | | | |
| | Decal Side Stripe Set 325S | AG1556 | 1 | | | | | X | | | | |
| 3 | Black Screw .25" x .50" | S9225-68 | 21 | X | X | X | X | X | | | | |
| 4 | Roof Assembly | AL2859 | 1 | X | X | X | X | X | | | | |
| | Decal | AS4244 | 1 | X | X | X | X | X | | | | |
| | | S52073-1 | 2 | X | X | X | X | X | | | | |
| | | AT3425-2 | 2 | X | X | X | X | X | | | | |
| 5 | Access Door | AL2864 | 1 | X | X | X | X | X | | | | |
| | Decal Side Stripe Set 210C | AG1546 | | X | | | | | | | | |
| | Decal Side Stripe Set 250C | AG1554 | | | X | | | | | | | |
| | Decal Side Stripe Set 250S | AG1553 | | | | X | | | | | | |
| | Decal Side Stripe Set 325C | AG1555 | 1 | | | | X | | | | | |
| | Decal Side Stripe Set 325S | AG1556 | 1 | | | | | X | | | | |
| | | | 1 | X | X | X | X | X | | | | |
| 6 | Knob (Supplied with Switch) | NSS | 1 | X | X | X | X | X | | | | |
| | | | | | | | | | | | | |
| | **ITEMS NOT SHOWN** | | | | | | | | | | | |
| | Linc Gun LG240G 4m | K10413-24-4M | 1 | X | X | X | | | | | | |
| | Linc Gun LG360G 4m | K10413-36-4M | 1 | | | | X | X | | | | |
| | Regulator Argon | LE250-RG002 | 1 | X | X | X | X | X | | | | |
| | Chain 27" Long | AT3873 | 1 | X | X | X | X | X | | | | |
| | Welding Guide 210 | AM4016 | 1 | X | | | | | | | | |
| | Welding Guide 250 | AM4017 | 1 | | X | X | | | | | | |
| | Welding Guide 325 | AM4019 | 1 | | | | X | X | | | | |

# REDI-MIG 250s WIRING DIAGRAM

AM4012

CHANGE DETAILS : SWAP R1,R2 CHG N2 TO H2, A2 TO H1 ADD A2, N2. DEL DIODE.




SW2

| (N1) | X/T7 | U/T1 | Y/T8 | V/T2 | Z/T9 | W/T3 |
|---|---|---|---|---|---|---|
| | (6) | (7) | | (5) | (3) | (4) |

| POS | | | | | | |
|---|---|---|---|---|---|---|
| 1 | | X | | X | | X |
| 2 | | X | | X | X | |
| 3 | | X | X | | | X |
| 4 | | X | X | | X | |
| 5 | X | | | X | | X |
| 6 | X | | | X | X | |
| 7 | X | | X | | | X |
| 8 | X | | X | | X | |

DO NOT SCALE OFF DRAWING



UNLESS OTHERWISE STATED TOLERANCE ON HOLE SIZES PER E2056.
ALL DIMENSIONS ± .5 UNLESS OTHERWISE STATED.
ON ALL ANGLES ± .5 OF A DEGREE.
MATERIAL TOLERANCE TO AGREE WITH PUBLISHED STANDARDS.

| CHANGE DATE | | | | |
|---|---|---|---|---|
| ALPHA | | | | |
| BETA | | | | |
| A03-09-08W | | | | |
| A22-10-08H | | | | |

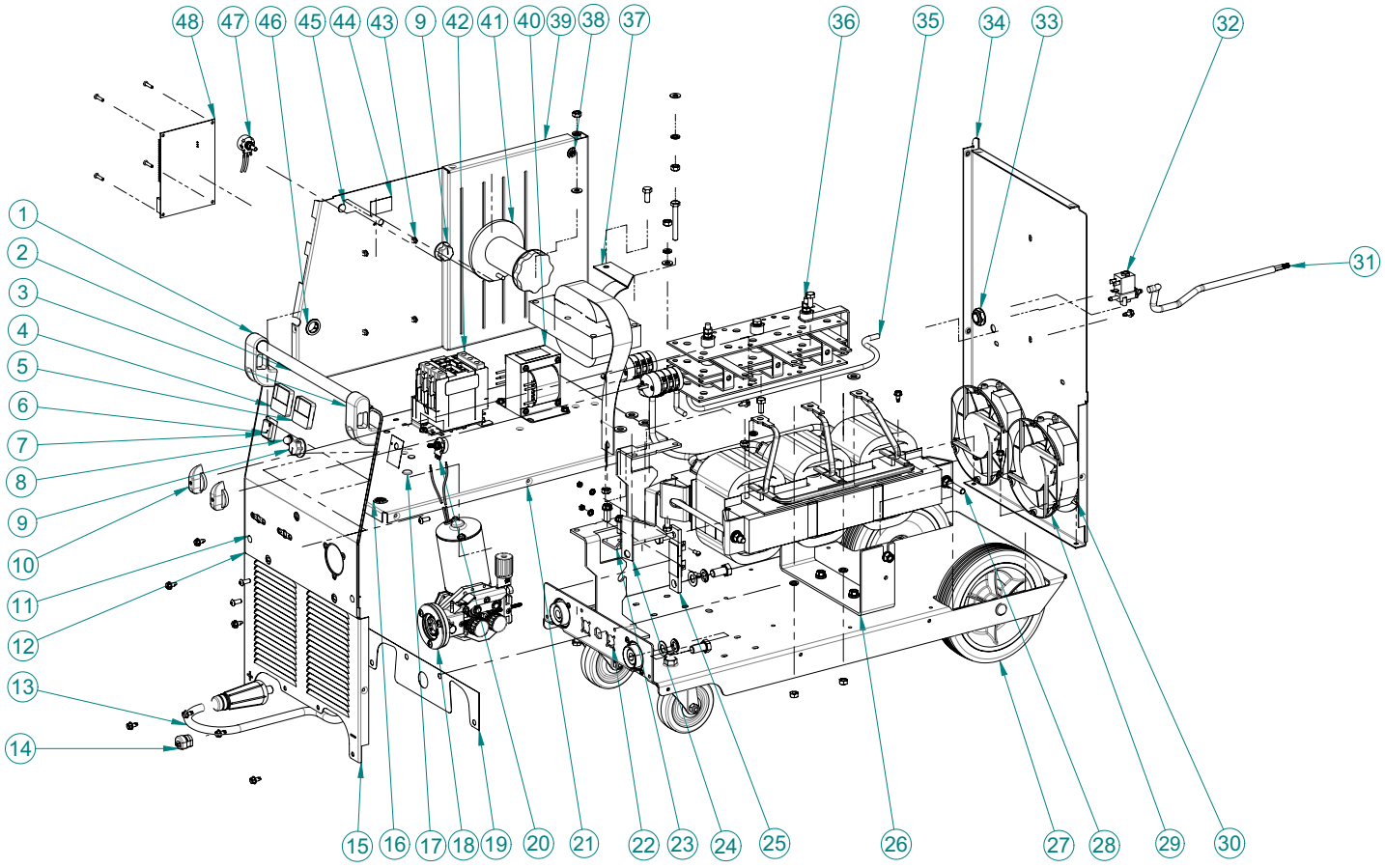
THE LINCOLN ELECTRIC CO. (AUST) PTY. LTD.
PADSTOW, N.S.W. AUSTRALIA.

EQUIP TYPE: REDIMIG 250S
SUBJECT: WIRING DIAGRAM
SCALE: NTS
DATE: 22-07-08
DRAWN: A.S.
CHK:
REF: AM3848
SUP'S'D'G:
SHT. NO. AM4012

SOLID EDGE

# REDI-MIG 325C WIRE FEEDER PARTS LIST

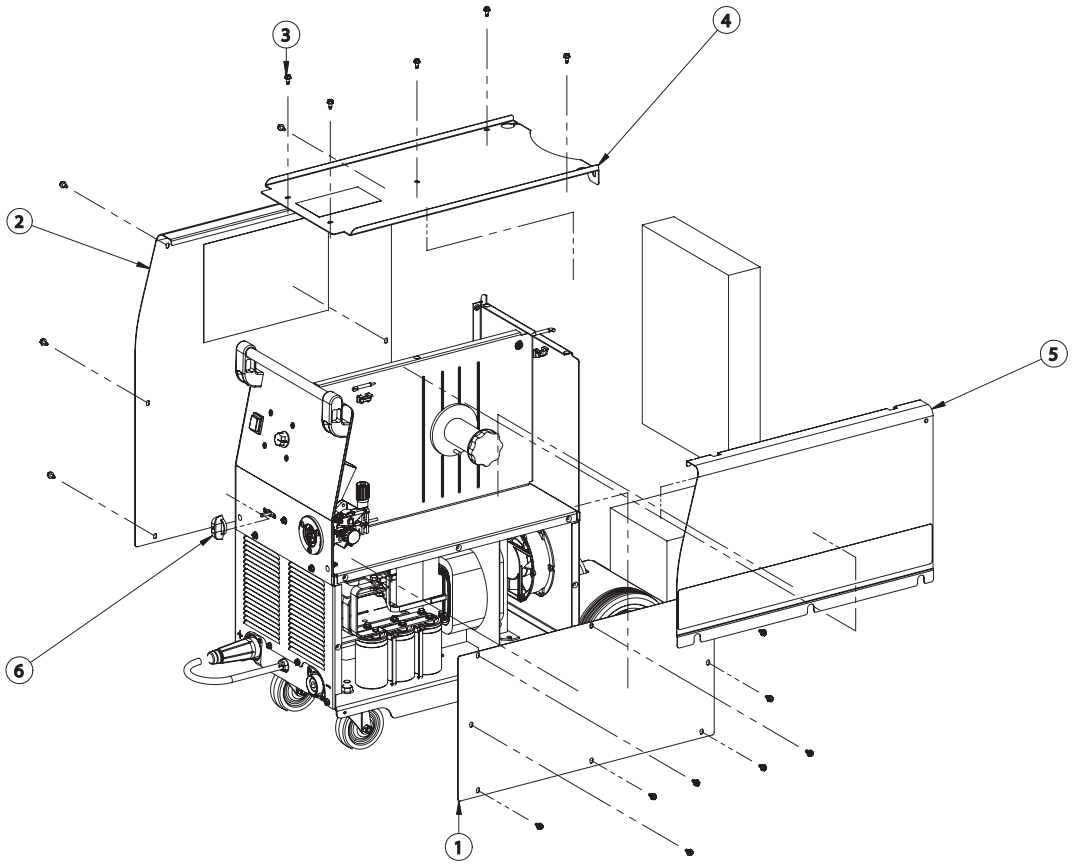
| SUB ASSEMBLY<br>PAGE NAME | | Wire Feed Assembly | Cover Panels | Wiring Diagram | | | |
|---|---|---|---|---|---|---|---|
| PARTS LIST | | | | | | | |
| CODE NO. | MODEL | AP227-C | AP224-D | AP227-W | | | |
| 70173 | REDI-MIG® 325c (K32050-2) | 1 | 1 | 1 | | | |
| | | | | | | | |



# REDI-MIG 325c PARTS LIST

| ITEM | DESCRIPTION | PART NUMBER | QTY | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Moulded Handle Left Side | M51551-1L | 1 | X | | | | | | | |
| 2 | REDI-MIG Handle | AS5032 | 1 | X | | | | | | | |
| 3 | Moulded Handle Right Side | M51551-1R | 1 | X | | | | | | | |
| 4 | Voltmeter 0-50V DC | AM3397-1 | 1 | X | | | | | | | |
| 5 | Ammeter 0-400A DC | AM3398-1 | 1 | X | | | | | | | |
| 6 | Rocker Switch | AM3990A | 1 | X | | | | | | | |
| 7 | Sealing Boot | AM3990B | 1 | X | | | | | | | |
| 8 | Light Diode & Resistor Assy | AS5021 | 1 | X | | | | | | | |
| 9 | Knob | S18425-1 | 2 | X | | | | | | | |
| 10 | Knob Large (Supplied With Switch) | AM3388A | 2 | X | | | | | | | |
| 11 | Fastener Button | T14659-1A | 3 | X | | | | | | | |
| 12 | REDI-MIG 325C Nameplate | AM3986 | 1 | X | | | | | | | |
| 13 | Cable -- Sec.Tap to Neg.Stud | AS4462-3 | 1 | X | | | | | | | |
| 14 | Cord Strain Relief | AT3764-1 | 1 | X | | | | | | | |
| 15 | REDI-MIG Front Panel | AL2857 | 1 | X | | | | | | | |
| 16 | Bushing | T14614-3 | 1 | X | | | | | | | |
| 17 | Buffer Grommet | AS4404-4 | 1 | X | | | | | | | |
| 18 | 42V-4 Wheel Greared Drive Plate Assy | AM3994 | 1 | X | | | | | | | |
| 19 | Lower Nameplate C Range | AM3973 | 1 | X | | | | | | | |
| 20 | Potentiometer | AS4212-2 | 1 | X | | | | | | | |
| 21 | REDI-MIG Shelf Panel | AL2856 | 1 | X | | | | | | | |
| 22 | Left Bracket | AM3969 L | 1 | X | | | | | | | |
| 23 | Right Bracket | AM3969 R | 1 | X | | | | | | | |
| 24 | REDI-MIG 325 C/S Rectifier To Stud Strap | AS5035 | 1 | X | | | | | | | |
| 25 | Shunt 400 Amp | S6602-22 | 1 | X | | | | | | | |
| 26 | Bracket Rear | AM3968 | 1 | X | | | | | | | |
| 27 | Base Assy | AL2892 | 1 | X | | | | | | | |
| 28 | Switch&Transformer Assy | AG1559 | 1 | X | | | | | | | |
| 29 | Fan 170mm MIGs | AM3809-2 | 2 | X | | | | | | | |
| 30 | S/T Screw Hex | S8025-91A | 6 | X | | | | | | | |
| 31 | Input Lead REDI-MIG 325C/S | AS4303 | 1 | X | | | | | | | |
| 32 | Gas Valve 42V | AS5016 | 1 | X | | | | | | | |
| 33 | Cable Gland | AT3871-1 | 1 | X | | | | | | | |
| 34 | REDI-MIG Rear Panel DoubleFan | AL2869 | 1 | X | | | | | | | |
| 35 | Hose 5mm (Black) | AS4150-23 | 1 | X | | | | | | | |
| 36 | Rectifier REDI-MIG 325C/S | AL2877 | 1 | X | | | | | | | |
| 37 | REDI-MIG 325 C/S Chokel Assy | AM4006 | 1 | X | | | | | | | |
| 38 | Bushing | T14614-2 | 1 | X | | | | | | | |
| 39 | REDI-MIG Bulkhead Panel | AL2858 | 1 | X | | | | | | | |
| 40 | AUX TRANSFORMER 415V/240V/42V | AM4000-1 | 1 | X | | | | | | | |
| 41 | Spool Post | AS4970 | 1 | X | | | | | | | |
| 42 | Contactor | AM3879-3 | 1 | X | | | | | | | |
| 43 | Expansion Nut | S14020-1A | 4 | X | | | | | | | |
| 44 | Burnback Decal | AS4707-1 | 1 | X | | | | | | | |
| 45 | Plug Button | T10397-3A | 1 | X | | | | | | | |
| 46 | Bushing | T12380-4 | 1 | X | | | | | | | |
| 47 | Burnback Pot. Assembly | AS4711 | 1 | X | | | | | | | |
| 48 | Motor Control PCB / Burnback Header | AS4212-5 | 1 | X | | | | | | | |

# REDI-MIG COVER PANEL PARTS LIST




**AP-244D.1** **AP-244D.1**

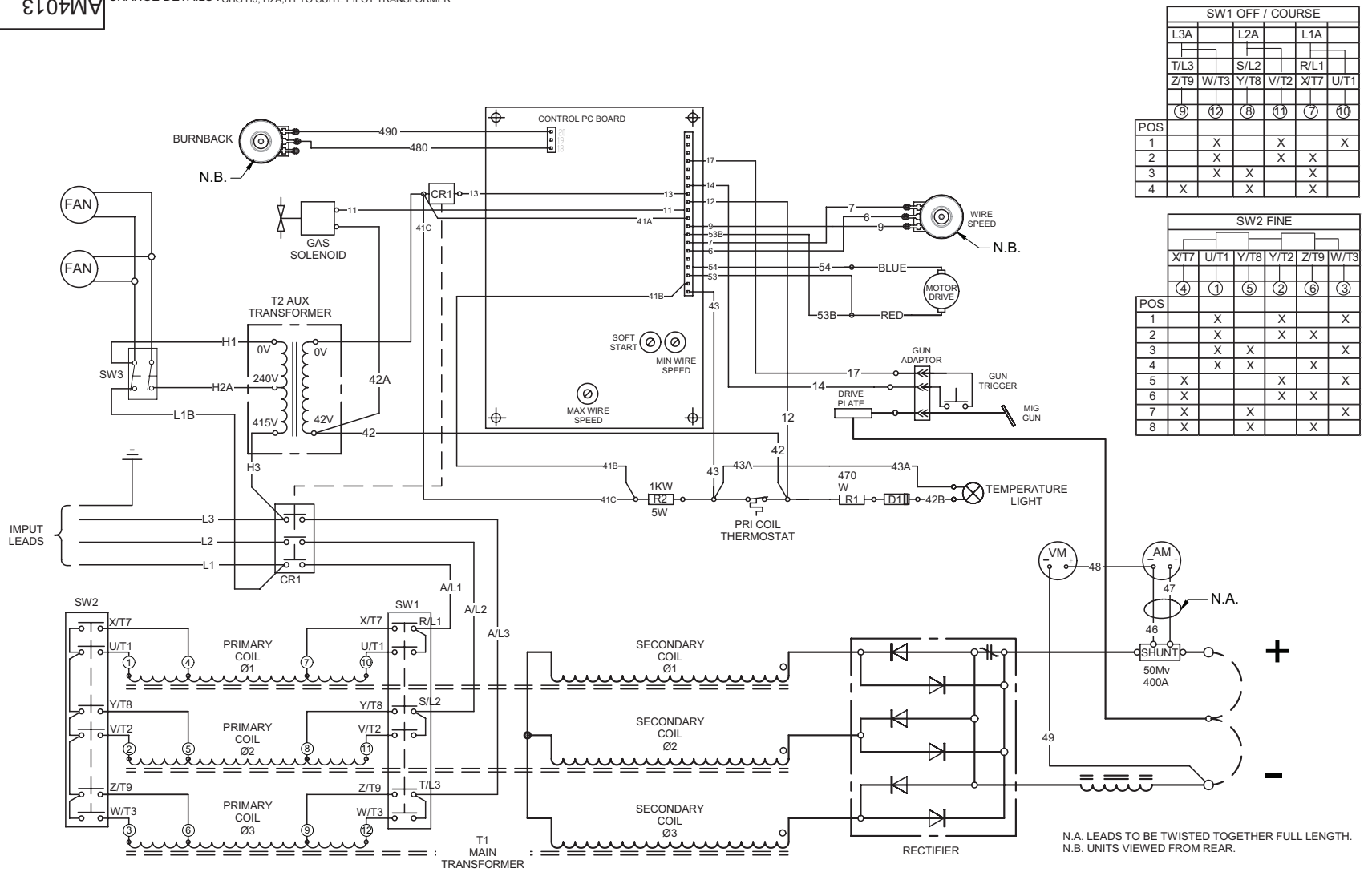
# Indicates a change this printing.

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

| ITEM | DESCRIPTION | PART NUMBER | QTY | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | |
| 1 | RH Lower Side Panel | AL2861 | 1 | X | X | X | X | X | | | | |
| 2 | LH Side Panel | AL2860 | 1 | X | X | X | X | X | | | | |
| | Decal Side Stripe Set 210C | AG1546 | 1 | X | | | | | | | | |
| | Decal Side Stripe Set 250C | AG1554 | 1 | | X | | | | | | | |
| | Decal Side Stripe Set 250S | AG1553 | 1 | | | X | | | | | | |
| | Decal Side Stripe Set 325C | AG1555 | 1 | | | | X | | | | | |
| | Decal Side Stripe Set 325S | AG1556 | 1 | | | | | X | | | | |
| 3 | Black Screw .25" x .50" | S9225-68 | 21 | X | X | X | X | X | | | | |
| 4 | Roof Assembly | AL2859 | 1 | X | X | X | X | X | | | | |
| | Decal | AS4244 | 1 | X | X | X | X | X | | | | |
| | | S52073-1 | 2 | X | X | X | X | X | | | | |
| | | AT3425-2 | 2 | X | X | X | X | X | | | | |
| 5 | Access Door | AL2864 | 1 | X | X | X | X | X | | | | |
| | Decal Side Stripe Set 210C | AG1546 | | X | | | | | | | | |
| | Decal Side Stripe Set 250C | AG1554 | | | X | | | | | | | |
| | Decal Side Stripe Set 250S | AG1553 | | | | X | | | | | | |
| | Decal Side Stripe Set 325C | AG1555 | 1 | | | | X | | | | | |
| | Decal Side Stripe Set 325S | AG1556 | 1 | | | | | X | | | | |
| | | | 1 | X | X | X | X | X | | | | |
| 6 | Knob (Supplied with Switch) | NSS | 1 | X | X | X | X | X | | | | |
| | | | | | | | | | | | | |
| | **ITEMS NOT SHOWN** | | | | | | | | | | | |
| | Linc Gun LG240G 4m | K10413-24-4M | 1 | X | X | X | | | | | | |
| | Linc Gun LG360G 4m | K10413-36-4M | 1 | | | | X | X | | | | |
| | Regulator Argon | LE250-RG002 | 1 | X | X | X | X | X | | | | |
| | Chain 27" Long | AT3873 | 1 | X | X | X | X | X | | | | |
| | Welding Guide 210 | AM4016 | 1 | X | | | | | | | | |
| | Welding Guide 250 | AM4017 | 1 | | X | X | | | | | | |
| | Welding Guide 325 | AM4019 | 1 | | | | X | X | | | | |

AM4013

CHANGE DETAILS : CHG H3, H2A,H1 TO SUITE PILOT TRANSFORMER




| SW1 OFF / COURSE | | | | | | |
|---|---|---|---|---|---|---|
| | L3A | | L2A | | L1A | |
| | T/L3 | | S/L2 | | R/L1 | |
| | Z/T9 | W/T3 | Y/T8 | V/T2 | X/T7 | U/T1 |
| | ⑨ | ⑫ | ⑧ | ⑪ | ⑦ | ⑩ |
| POS | | | | | | |
| 1 | | X | | X | | X |
| 2 | | X | | X | X | |
| 3 | | X | X | | X | |
| 4 | X | | X | | X | |

| SW2 FINE | | | | | | |
|---|---|---|---|---|---|---|
| | X/T7 | U/T1 | Y/T8 | Y/T2 | Z/T9 | W/T3 |
| | ④ | ① | ⑤ | ② | ⑥ | ③ |
| POS | | | | | | |
| 1 | | X | | X | | X |
| 2 | | X | | X | X | |
| 3 | | X | X | | | X |
| 4 | | X | X | | X | |
| 5 | X | | | X | | X |
| 6 | X | | | X | X | |
| 7 | X | | X | | | X |
| 8 | X | | X | | X | |

N.A. LEADS TO BE TWISTED TOGETHER FULL LENGTH.
N.B. UNITS VIEWED FROM REAR.

DO NOT SCALE OFF DRAWING



UNLESS OTHERWISE STATED TOLERANCE ON HOLE SIZES PER E2056. ALL DIMENSIONS ± .5 UNLESS OTHERWISE STATED. ON ALL ANGLES IS ± .5 OF A DEGREE. MATERIAL TOLERANCE TO AGREE WITH PUBLISHED STANDARDS.

| CHANGE DATE |
|---|
| ALPHA |
| BETA |
| A03-09-08W |
| A12-11-08Q |

THE LINCOLN ELECTRIC CO. (AUST.) PTY. LTD.
PADSTOW, N.S.W. AUSTRALIA.

SCALE: NTS DATE: 19-08-08

DRAWN: A.S. CHK: REF: AM3596-4 SUP'S'D'G:

EQUIP. TYPE REDIMIG 325C

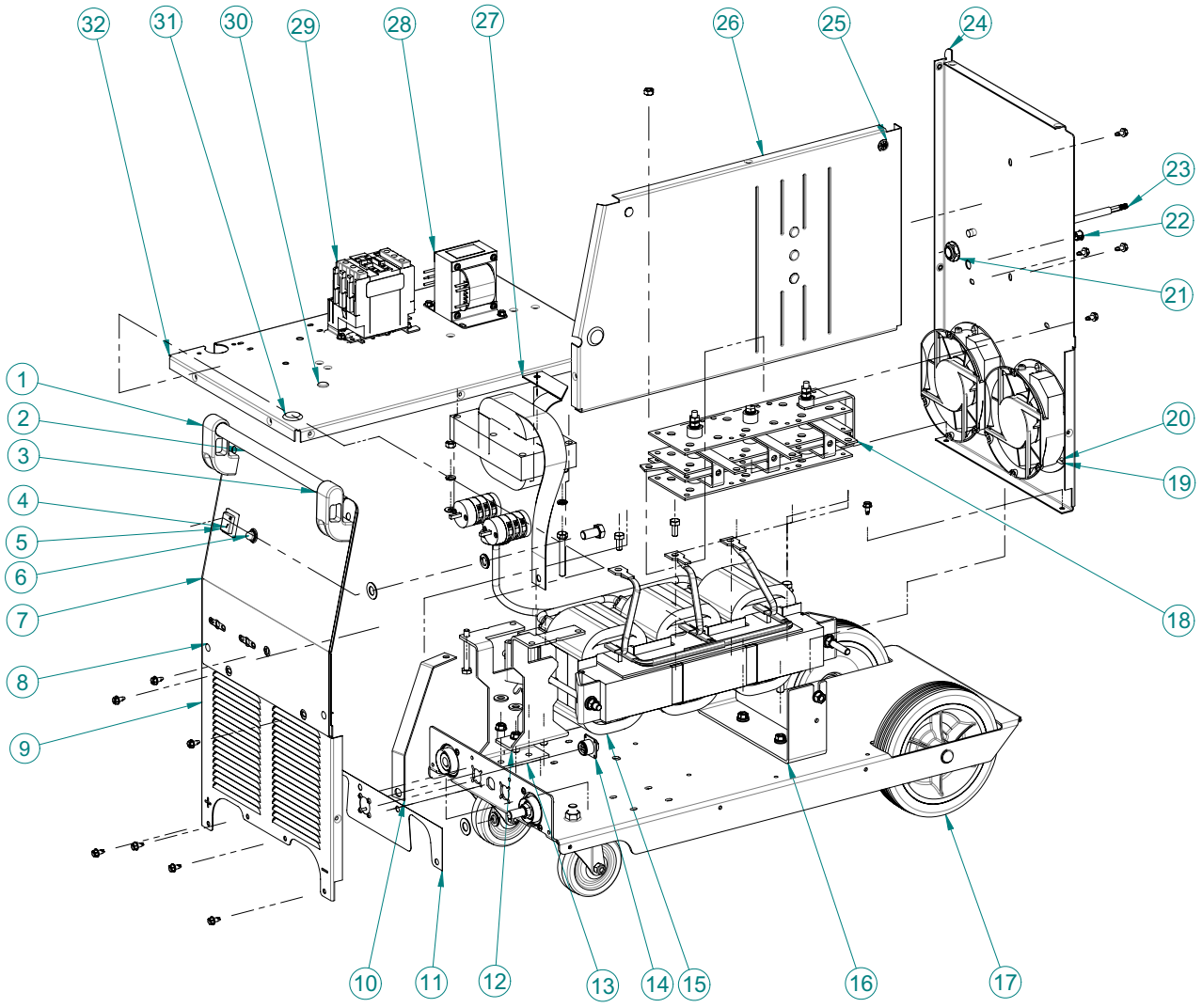
SUBJECT WIRING DIAGRAM

SHT. NO. AM4013

SOLID EDGE

# REDI-MIG 325s PARTS LIST

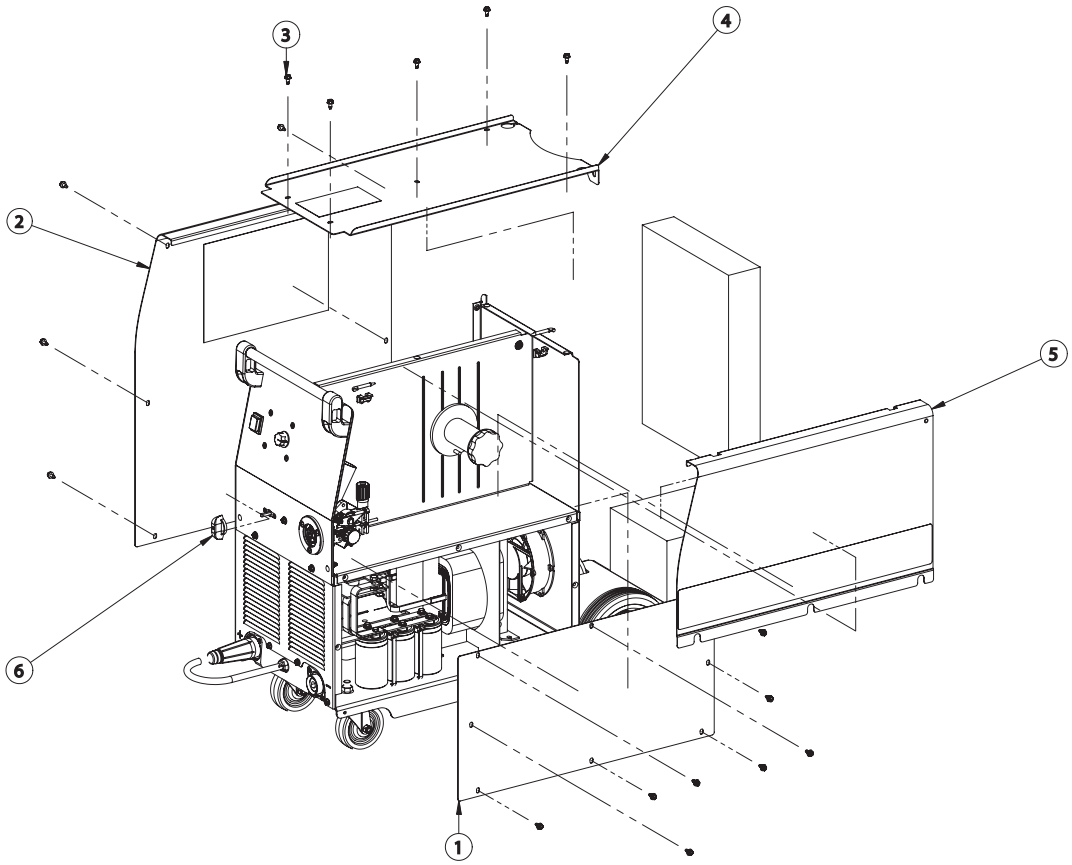
| SUB ASSEMBLY<br>PAGE NAME | | Wire Feed Assembly | Cover Panels | Wiring Diagram | | | |
|---|---|---|---|---|---|---|---|
| PARTS LIST | | | | | | | |
| CODE NO. | MODEL | AP226-C | AP224-D | AP226-W | | | |
| 70172 | REDI_MIG® 325s (K32050-2) | 1 | 1 | 1 | | | |
| | | | | | | | |



# REDI-MIG 325s PARTS LIST

| ITEM | DESCRIPTION | PART NUMBER | QTY | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Moulded Handle Left Side | M51551-1L | 1 | X | | | | | | | | |
| 2 | Handle | AS5032 | 1 | X | | | | | | | | |
| 3 | Moulded Handle Right Side | M51551-1R | 1 | X | | | | | | | | |
| 4 | Rocker Switch | AM3990A | 1 | X | | | | | | | | |
| 5 | Sealing Boot | AM3990B | 1 | X | | | | | | | | |
| 6 | Light Diode & Resistor Assy | AS5021 | 1 | X | | | | | | | | |
| 7 | 325S Nameplate | AM3989 | 1 | X | | | | | | | | |
| 8 | Fastener Button | T14659-1A | 2 | X | | | | | | | | |
| 9 | REDI-MIG Front Panel | AL2857 | 1 | X | | | | | | | | |
| 10 | Rectifier To Stud Strap | AS5035 | 1 | X | | | | | | | | |
| 11 | Lower Nameplate S Range | AM3978 | 1 | X | | | | | | | | |
| 12 | Right Bracket | AM3969 R | 1 | X | | | | | | | | |
| 13 | Left Bracket | AM3969 L | 1 | X | | | | | | | | |
| 14 | Plug Base & Resistor Assy | AS4407-9 | 1 | X | | | | | | | | |
| 15 | Transformer & Switch | AG1559 | 1 | X | | | | | | | | |
| 16 | Bracket Rear | AM3968 | 1 | X | | | | | | | | |
| 17 | Base Assy | AL2892 | 1 | X | | | | | | | | |
| 18 | Rectifier | AL2877 | 1 | X | | | | | | | | |
| 19 | Fan 170mm MIGs | AM3809-2 | 2 | X | | | | | | | | |
| 20 | S/T Screw Hex | S8025-91A | 6 | X | | | | | | | | |
| 21 | Cable Gland | AT3871-1 | 1 | X | | | | | | | | |
| 22 | Plug Button | T10397-3A | 2 | X | | | | | | | | |
| 23 | Input Lead | AS4303 | 1 | X | | | | | | | | |
| 24 | Rear Panel DoubleFan | AL2869 | 1 | X | | | | | | | | |
| 25 | Bushing | T14614-2 | 1 | X | | | | | | | | |
| 26 | Bulkhead Panel | AL2863 | 1 | X | | | | | | | | |
| 27 | Chokel Assy | AM4006 | 1 | X | | | | | | | | |
| 28 | Aux Transformer 415v/240v/42v | AM4000-1 | 1 | X | | | | | | | | |
| 29 | Contactor | AM3879-3 | 1 | X | | | | | | | | |
| 30 | Buffer Grommet | AS4404-4 | 4 | X | | | | | | | | |
| 31 | Hole Plug | T13597-1 | 2 | X | | | | | | | | |
| 32 | Shelf Panel | AL2856 | 1 | X | | | | | | | | |

# REDI-MIG COVER PANEL PARTS LIST




**AP-244D.1** **AP-244D.1**

# Indicates a change this printing.

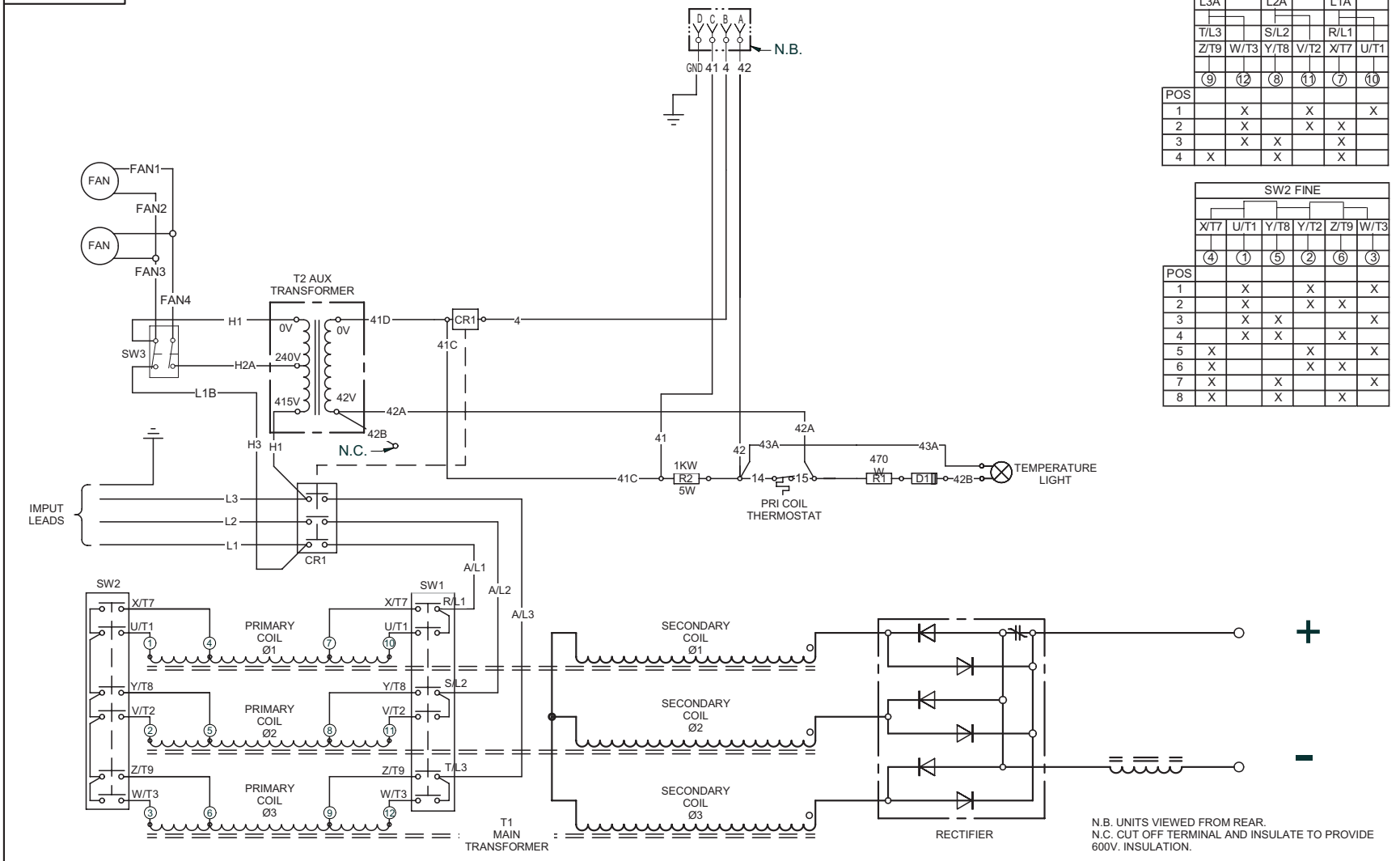
Use only the parts marked “x” in the column under the heading number called for in the model index page.

| ITEM | DESCRIPTION | PART NUMBER | QTY | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | |
| 1 | RH Lower Side Panel | AL2861 | 1 | X | X | X | X | X | | | | |
| 2 | LH Side Panel | AL2860 | 1 | X | X | X | X | X | | | | |
| | Decal Side Stripe Set 210C | AG1546 | 1 | X | | | | | | | | |
| | Decal Side Stripe Set 250C | AG1554 | 1 | | X | | | | | | | |
| | Decal Side Stripe Set 250S | AG1553 | 1 | | | X | | | | | | |
| | Decal Side Stripe Set 325C | AG1555 | 1 | | | | X | | | | | |
| | Decal Side Stripe Set 325S | AG1556 | 1 | | | | | X | | | | |
| 3 | Black Screw .25" x .50" | S9225-68 | 21 | X | X | X | X | X | | | | |
| 4 | Roof Assembly | AL2859 | 1 | X | X | X | X | X | | | | |
| | Decal | AS4244 | 1 | X | X | X | X | X | | | | |
| | | S52073-1 | 2 | X | X | X | X | X | | | | |
| | | AT3425-2 | 2 | X | X | X | X | X | | | | |
| 5 | Access Door | AL2864 | 1 | X | X | X | X | X | | | | |
| | Decal Side Stripe Set 210C | AG1546 | | X | | | | | | | | |
| | Decal Side Stripe Set 250C | AG1554 | | | X | | | | | | | |
| | Decal Side Stripe Set 250S | AG1553 | | | | X | | | | | | |
| | Decal Side Stripe Set 325C | AG1555 | 1 | | | | X | | | | | |
| | Decal Side Stripe Set 325S | AG1556 | 1 | | | | | X | | | | |
| | | | 1 | X | X | X | X | X | | | | |
| 6 | Knob (Supplied with Switch) | NSS | 1 | X | X | X | X | X | | | | |
| | **ITEMS NOT SHOWN** | | | | | | | | | | | |
| | Linc Gun LG240G 4m | K10413-24-4M | 1 | X | X | X | | | | | | |
| | Linc Gun LG360G 4m | K10413-36-4M | 1 | | | | X | X | | | | |
| | Regulator Argon | LE250-RG002 | 1 | X | X | X | X | X | | | | |
| | Chain 27" Long | AT3873 | 1 | X | X | X | X | X | | | | |
| | Welding Guide 210 | AM4016 | 1 | X | | | | | | | | |
| | Welding Guide 250 | AM4017 | 1 | | X | X | | | | | | |
| | Welding Guide 325 | AM4019 | 1 | | | | X | X | | | | |

# REDI-MIG 325s WIRING DIAGRAM

AM4014

CHANGE DETAILS : CHG H3, H2A,H1 TO SUITE PILOT TRANSFORMER




| SW1 OFF / COURSE | | | | | | |
|---|---|---|---|---|---|---|
| | L3A | | L2A | | L1A | |
| | T/L3 | | S/L2 | | R/L1 | |
| | Z/T9 | W/T3 | Y/T8 | V/T2 | X/T7 | U/T1 |
| | ⑨ | ⑫ | ⑧ | ⑪ | ⑦ | ⑩ |
| POS | | | | | | |
| 1 | | X | | X | | X |
| 2 | | X | | X | X | |
| 3 | | X | X | | X | |
| 4 | X | | X | | X | |

| SW2 FINE | | | | | | |
|---|---|---|---|---|---|---|
| | X/T7 | U/T1 | Y/T8 | Y/T2 | Z/T9 | W/T3 |
| | ④ | ① | ⑤ | ② | ⑥ | ③ |
| POS | | | | | | |
| 1 | | X | | X | | X |
| 2 | | X | | X | X | |
| 3 | | X | X | | | X |
| 4 | | X | X | | X | |
| 5 | X | | | X | | X |
| 6 | X | | | X | X | |
| 7 | X | | X | | | X |
| 8 | X | | X | | X | |

N.B. UNITS VIEWED FROM REAR.
N.C. CUT OFF TERMINAL AND INSULATE TO PROVIDE 600V. INSULATION.

DO NOT SCALE OFF DRAWING



UNLESS OTHERWISE STATED TOLERANCE ON HOLE SIZES PER E2056.
ALL DIMENSIONS ±.5 UNLESS OTHERWISE STATED.
ON ALL ANGLES IS ±.5 OF A DEGREE.
MATERIAL TOLERANCE TO AGREE WITH PUBLISHED STANDARDS.

| CHANGE DATE | | | | |
|---|---|---|---|---|
| ALPHA | | | | |
| BETA | | | | |
| A03-09-08W | | | | |
| A12-11-08Q | | | | |

**THE LINCOLN ELECTRIC CO. (AUST.) PTY. LTD.**
PADSTOW, N.S.W. AUSTRALIA.

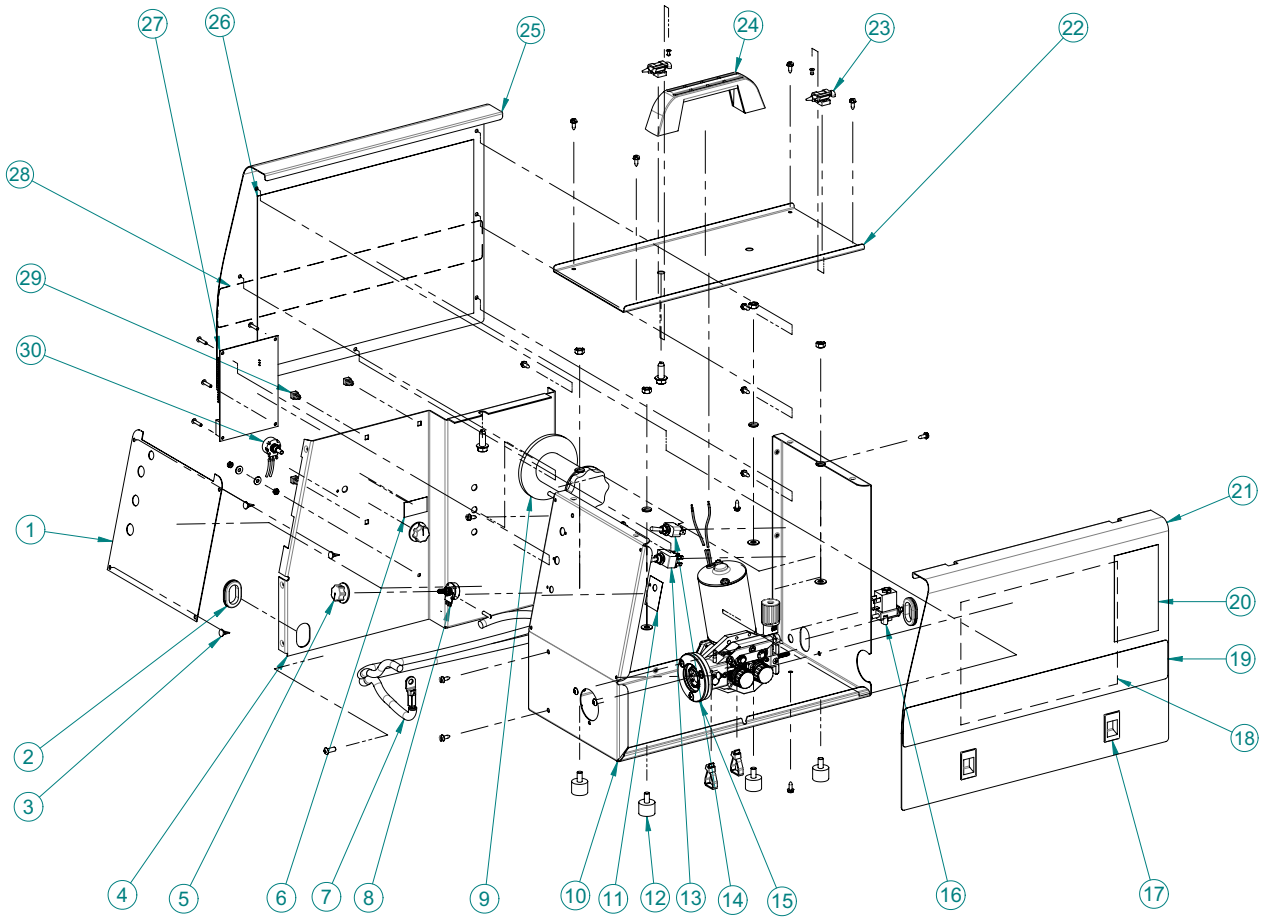
SCALE: NTS DATE: 19-08-08
DRAWN: A.S. CHK: REF: AM3569-4 SUP'S'D'G:

EQUIP. TYPE: REDIMIG 325S
SUBJECT: WIRING DIAGRAM
SHT. NO. AM4014

SOLID EDGE

# REDI-MIG 4s WIRE FEEDER PARTS LIST

| SUB ASSEMBLY<br>PAGE NAME | | Wire Feed Assembly | | Wiring Diagram | | | |
|---|---|---|---|---|---|---|---|
| PARTS LIST | | | | | | | |
| CODE NO. | MODEL | AP224-C | | AP228-W | | | |
| 70174 | REDI-MIG® 4s (K32051-1) | 1 | | 1 | | | |
| | | | | | | | |

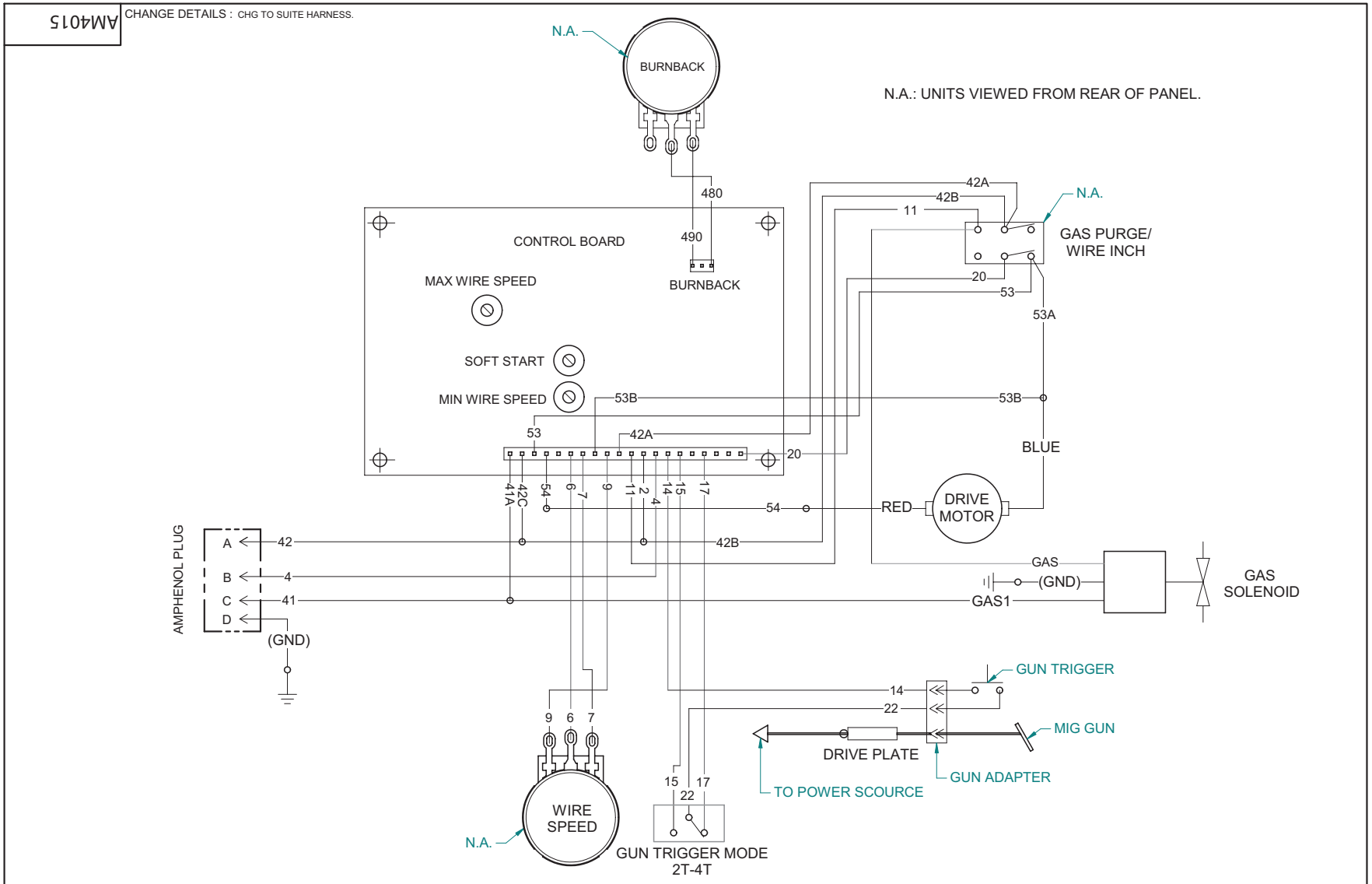


# REDI-MIG 4s WIRE FEEDER PARTS LIST

| ITEM | DESCRIPTION | PART NUMBER | QTY | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Nameplate | AM3995 | 1 | X | | | | | | | | |
| 2 | Rubber Gromet | AT2853 | 2 | X | | | | | | | | |
| 3 | Fastener Button | T14659-1A | 4 | X | | | | | | | | |
| 4 | Bulkhead | AL2865 | 1 | X | | | | | | | | |
| 5 | Knob | S18425-1 | 2 | X | | | | | | | | |
| 6 | Burnback Decal | AS4707-1 | 1 | X | | | | | | | | |
| 7 | 4S Interconnection Cables | AL2901 | 1 | X | | | | | | | | |
| 8 | Potentiometer | AS4212-2 | 1 | X | | | | | | | | |
| 9 | Spool Post | AS4970 | 1 | X | | | | | | | | |
| 10 | 4S Base+Front&Rear | AG1541 | 1 | X | | | | | | | | |
| 11 | Insulation | T12792-1 | 1 | X | | | | | | | | |
| 12 | Vibro Insulator | AS4404-3 | 4 | X | | | | | | | | |
| 13 | DPDT Toggle Switch (Sprung) | AS4706 | 1 | X | | | | | | | | |
| 14 | SPDT Toggle Switch | T13562 | 1 | X | | | | | | | | |
| 15 | 42V-4 Wheel Greared Drive Plate Assy | AM3994 | 1 | X | | | | | | | | |
| 16 | Gas Valve 42V | AS5016 | 1 | X | | | | | | | | |
| 17 | Door Latch | AS5018 | 2 | X | | | | | | | | |
| 18 | Decal Weld Guide 4S | AM4020 | 1 | X | | | | | | | | |
| 19 | RediMig 4S Remote Side Stripe L | AG1551 | 1 | X | | | | | | | | |
| 20 | Warning Decal | AS4244 | 1 | X | | | | | | | | |
| 21 | 4S Door | AL2866 | 1 | X | | | | | | | | |
| 22 | 4S Roof | AM3967 | 1 | X | | | | | | | | |
| 23 | Hinge Plastic | S52073-1 | 2 | X | | | | | | | | |
| 24 | Handle | M15446 | 1 | X | | | | | | | | |
| 25 | 4S Side Panel | AL2867 | 1 | X | | | | | | | | |
| 26 | 4S Wiring Diagram. | AM4015 | 1 | X | | | | | | | | |
| 27 | Motor Control PCB / Burnback Header | AS4212-5SP | 1 | X | | | | | | | | |
| 28 | RediMig 4S Remote Side Stripe R | AG1551 | 1 | X | | | | | | | | |
| 29 | Expansion Nut | S14020-1A | 4 | X | | | | | | | | |
| 30 | Burnback Pot. Assembly | AS4711 | 1 | X | | | | | | | | |

AM4015

CHANGE DETAILS : CHG TO SUITE HARNESS.




DO NOT SCALE OFF DRAWING



UNLESS OTHERWISE STATED TOLERANCE ON HOLE SIZES PER E2056. ALL DIMENSIONS ± .5 UNLESS OTHERWISE STATED. ON ALL ANGLES IS ± .5 OF A DEGREE. MATERIAL TOLERANCE TO AGREE WITH PUBLISHED STANDARDS.

| CHANGE DATE | | | | | |
|---|---|---|---|---|---|
| ALPHA | . | . | . | . | . |
| BETA. | . | . | . | . | . |
| A10-09-08H | . | . | . | . | . |
| A15-10-08N | . | . | . | . | . |
| . | . | . | . | . | . |

THE LINCOLN ELECTRIC CO. (AUST) PTY. LTD.
PADSTOW, N.S.W. AUSTRALIA.

SCALE: . NTS DATE: 28-08-08 TYPE REDIMIG 4S

SUBJECT WIRING DIAGRAM

DRAWN: A.S. CHK: S.W. REF: AM3596-5 SUP'S'D'G: . SHT. NO. AM4015

SOLID EDGE

# LIMITED WARRANTY

IMAWS1 (1/06)

**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 Weldanpowers, Rangers and Italian Invertec welders.

**One Year**
Italian 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)
- All "Pro Torch" TIG torches.

**90 Days**
- All Gun and Cable Assemblies (manufactured by Lincoln) and Spool guns.
- All MIG, TIG and Plasma 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 Magnetron 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) The 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.


LINCOLN® ELECTRIC

*THE WELDING EXPERTS℠*

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

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**Central Region:** 35 Bryant Street, Padstow, NSW, 2211 (02) 9772 7222
**Southern Region:** 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 Road, Penrose, Auckland (9) 580 4008
**Singapore:** No.195, Lane 5008, Hutai Road, +86 21 66026620
Baoshan,Shanghai, China 201907


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


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