

Maxmig 210i **Maxmig 210R** **Operating Manual**

Part No 05-3210
Part No. 05-4210

CODE	MACHINE
70008	05-3210
70009	05-4210



SAFETY DEPENDS ON YOU

LiquidArc machines are designed and built with safety in mind. However, your overall safety can be increased by proper installation . . . and thoughtful operation on your part. Read and observe the general safety precautions on page 2 and follow specific installation and operating instructions included in this manual.

Most importantly, think before you act and be careful.



ARC WELDING SAFETY PRECAUTIONS



ELECTRIC SHOCK can kill

1. a. The electrode and work (or ground) circuits are electrically "hot" when the welder is on. Do not touch these "hot" parts with your bare skin or wet clothing. Wear dry, hole-free gloves to insulate hands.
- b. In semi-automatic and automatic wire welding, the electrode, electrode reel, welding head and nozzle or semi-automatic welding gun are also electrically "hot".
- c. Insulate yourself from work and ground using dry insulation. When welding in damp locations, on metal framework such as floors, gratings or scaffolds, and when in positions such as sitting or Lying, make certain the insulation is large enough to cover your full area of physical contact with work and ground.
- d. Always be sure the work cable makes a good electrical connection with the metal being welded. The connection should be as close as possible to the area being welded.
- e. Ground the work or metal to be welded to a good electrical (earth) ground.
- f. Maintain the electrode holder, work clamp, welding cable and welding machine in good, safe operating condition. Replace damaged insulation.
- g. Never dip the electrode holder in water for cooling.
- h. Never simultaneously touch electrically "hot" parts of electrode holders connected to two welders because voltage between the two can be the total of the open circuit voltage of both welders.
- i. When working above floor level, protect yourself from a fall should you get a shock.
- j. Also see items 4c and 6.



FUMES AND GASES can be dangerous

2. a. Welding may produce fumes and gases hazardous to health. Avoid breathing these fumes and gases. When welding, keep your head out of the fume. Use enough ventilation and/or exhaust at the arc to keep fumes and gases away from the breathing zone. When welding on galvanised, lead or cadmium plated steel and other metals which produce toxic fumes, even greater care must be taken.
- b. Do not weld in locations near chlorinated hydrocarbon vapours coming from degreasing, cleaning or spraying operations. The heat and rays of the arc can react with solvent vapours to form phosgene, a highly toxic gas, and other irritating products.
- c. Shielding gases used for arc welding can displace air and cause injury or death. Always use enough ventilation, especially in confined areas, to ensure breathing air is safe.
- d. Read and understand the manufacturer's instructions for this equipment and the consumables to be used, including the material safety data sheet (MSDS) and follow your employer's safety practices.
- e. Also see Item 7b.



ARC RAYS can burn

3. a. Use a shield with the proper filter and cover plates to protect your eyes from sparks and the rays of the arc when welding or observing open arc welding. Headshield and filter lens should conform to AS 1674.2-1990 standards.
- b. Use suitable clothing made from durable flame resistant material to protect your skin and that of your helpers from the arc rays.
- c. Protect other nearby personnel with suitable non flammable screening and/or warn them not to watch the arc or expose themselves to the arc rays or to hot spatter or metal.



WELDING SPARKS can cause fire or explosion

4. a. Remove fire hazards from the welding area. If this is not possible, cover them to prevent the welding sparks from starting a fire. Remember that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas. Have a fire extinguisher readily available.
- b. Where compressed gases are to be used at the job site, special precautions should be used to prevent hazardous situations. Refer to AS1674 Parts 1 & 2 "Safety in Welding and Allied Processes", WTIA Technical Note 7 "Health and Safety in Welding" and the operating information for the equipment being used.
- c. When not welding, make certain no part of the electrode circuit is touching the work or ground. Accidental contact can cause overheating and create a fire hazard.
- d. Do not heat, cut or weld tanks, drums or containers until the proper steps have been taken to insure that such procedures will not cause flammable or toxic vapours from substances inside. These can cause an explosion even though the vessel has been "cleaned". For information purchase AS 1674-1990.
- e. Vent hollow castings or containers before heating, cutting or welding. They may explode.
- f. Sparks and spatter are thrown from the welding arc. Wear oil free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes and a cap over your hair. Wear ear plugs when welding out of position or in confined places. Always wear safety glasses with side shields when in a welding area.
- g. Connect the work cable to the work as close to the welding area as possible. Work cables connected to the building framework or other locations away from the welding area increase the possibility of the welding current passing through lifting chains, crane cables or other alternate circuits. This can create fire hazards or overheat lifting chains or cables until they fail.
- h. Also see Item 7c.



CYLINDER may explode if damaged

5.
 - a. Use only compressed gas cylinders containing the correct shielding gas for the process used and properly operating regulators, designed for the gas and pressure used. All hoses, fittings, etc. should be suitable for the application and maintained in good condition.
 - b. Always keep cylinders in an upright position and securely chained to an undercarriage or fixed support.
 - c. Cylinders should be located :
 - Away from areas where they may be struck or subjected to physical damage.
 - A safe distance from arc welding or cutting operations and any other source of heat, sparks or flame.
 - d. Never allow the electrode, electrode holder, or any other electrically "hot" parts to touch a cylinder.
 - e. Keep your head and face away from the cylinder valve outlet when opening the cylinder valve.
 - f. Valve protection caps should always be in place and hand-tight except when the cylinder is in use or connected for use.
 - g. Read and follow the instructions on compressed gas cylinders and associated equipment, and AS 2030 Parts 1 & 2.



FOR ELECTRICALLY powered equipment

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



FOR ENGINE powered equipment

7.
 - a. Turn the engine off before troubleshooting and maintenance work unless the maintenance work requires it to be running.



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



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



- d. Keep all equipment, safety guards, covers and devices in position and in good repair. Keep hands, hair, clothing and tools away from V-belts, gears, fans and all other moving parts when starting, operating or repairing equipment.
 - e. In some cases it may be necessary to remove safety guards to perform required maintenance. Remove guards only when necessary and replace them when the maintenance requiring their removal is complete. Always use the greatest care when working near moving parts.
 - f. Do not put your hands near the engine fan. Do not attempt to override the governor or idler by pushing on the throttle control rods while the engine is running.
 - g. To prevent accidentally starting petrol engines while turning the engine or welding generator during maintenance work, disconnect the spark plug wires, distributor cap or magneto wire as appropriate.



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

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

For more detailed information it is strongly recommended that you purchase a copy of "Safety in Welding and Cutting - ANSI Standard Z 49.1" and WTIA Technical Note 7. All WTIA publications and ANSI/AWS Standards are available from the Welding Technology Institute of Australia, P.O. Box 6165, Silverwater NSW 2128. For copies of various Australian Standards contact your local S.A.A. office.

HOW TO ORDER REPLACEMENT PARTS

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

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

Note: "Hardware" in the LiquidArc Parts Lists are not LiquidArc stock items but can be obtained via the Field Service Shop network.

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

BUY ONLY GENUINE REPAIR PARTS

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

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

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

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

There are four fundamental facts about EMF:

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

Minimising exposure

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

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

Welders with Pacemakers

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

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

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

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

INSTRUCTIONS FOR ELECTROMAGNETIC COMPATIBILITY



WARNING

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

Conformance

Products displaying the C-Tick mark are in conformity with Australian/New Zealand requirements for Electromagnetic Compatibility (EMC). They are:

- manufactured in conformity with Australian/New Zealand Standard (Emission):- AS/NZS 3652 'Electromagnetic Compatibility - Arc Welding Equipment' (Identical to and reproduced from British Standard EN 50199)
- for using with other Lincoln Electric/LiquidArc equipment.
- designed for industrial and professional use.

Introduction

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

Installation and Use

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

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

Assessment of Area

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

The following shall be taken into account:

- a. Other supply cables, control cables, signalling and telephone cables above, below and adjacent to the welding equipment;
- b. Radio and television transmitters and receivers;
- c. Computer and other control equipment;
- d. Safety critical safety equipment, eg. guarding of industrial equipment;
- e. The health of people around, eg. the use of pacemakers and hearing aids;;
- f. Equipment used for calibration or measurement;

- g. The immunity of other equipment in the environment. The purchaser/user shall ensure that other equipment being used in the environment is compatible. This may require additional protection measures;
- h. The time of the day that welding or other activities are to be carried out.

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

Methods of Reducing Emissions

Mains Supply

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

Maintenance of the Welding Equipment

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

Welding Cables

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

Equipotential Bonding

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

Earthing of the workpiece

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

Screening and Shielding

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

* Portions of the preceding text are contained in AS/NZS3652: 'Electromagnetic Compatibility - Arc Welding Equipment'.

PRODUCT DESCRIPTION


The Maxmig 250i is a fully integrated semi-automatic Constant Voltage DC arc welding machine. The Maxmig 210R offers a remote wire feeder and a separate Constant Voltage DC arc welding machine. They combine a solid state power source with electronically controlled wire feeding equipment.

Excellent arc characteristics are provided for both gas shielded and self shielded welding within its current range.

Standard features include a spot timer, gas purge facilities, a dual position 2 or 4 step trigger interlock, a Maxmig 150 MIG gun, a regulator/flowmeter and gas hose, ground cable assembly (3m on the Maxmig 210i and 5m on the Maxmig 210R) a 3m long input lead and an undercarriage on which a gas cylinder can be mounted.

Specifications

Model	Maxmig 210i			Maxmig 210R		
Part No.	05-3210 (Integrated)			05-4210 (Remote)		
Maximum Open Circuit Voltage	46V			46V		
Output Current Range	up to 210A			up to 210A		
Duty Cycle	25%	34%	100%	25%	34%	100%
Rated Output	210A/24.5V	180A/23V	120A/20V	210A/24.5V	180A/23V	120A/20V
Rated Input	240V single phase 50Hz 15 amps			240V single phase 50Hz 15 amps		
Wire Speed Range	1-20 m/min			1-20 m/min		
Weight (complete with u/c)	88 kg			107 kg		
H x W x L (mm) Over lift bail, cylinder tray & wheels	775 x 525 x 885 mm			1129 x 525 x 885mm		
Operating Temperature	-20°C to 40°C			-20°C to 40°C		



WARNING

**HIGH VOLTAGE
can kill**

- Turn the input power off at the disconnect switch before installing or servicing this machine.
- Do not touch electrically "hot" parts such as output terminals or internal wiring.
- Connect grounding screw (⏏) to a good earth ground.
- Do not operate with covers removed.
- Turn power switch "off" before connecting or disconnecting cables or other equipment.

Only qualified personnel should install or service this equipment.

1. INSTALLATION

Machine Installation


1.1 Location

Place the welder where clean cooling air can freely circulate in through the front louvers and out through the rear louvers. Dirt, dust or any foreign material that can be drawn into the welder should be kept at a minimum. Failure to observe these precautions can result in excessive operating temperatures and nuisance thermostat trips.

1.2 Connection to Mains Supply

Before connecting the machine to the mains supply check that the voltage and current capacity correspond to the machine voltage and rated input current. Use a fuse or C/B per AS3000 or local wiring rules.

The machine is supplied with an input lead and a 15A, 3 pin plug.



CAUTION

Never connect the green/yellow conductor to any of the active supply lines from the mains. This conductor is to earth the machine as required by Electrical Regulations.

Once the above has been followed the machine can be plugged into the mains outlet.

1.3 Shielding Gas Supply (For the Gas Metal Arc Welding Process)

Refer "Safety in welding and cutting" - ANSI Standard Z49-1 and WTIA Technical Note 7, available from the Welding Technology Institute of Australia.

Obtain cylinder of appropriate type shielding gas for the process being used.



**CYLINDER may explode
if damaged**

1. Set gas cylinder on rear platform of the machine. Hook chain in place to secure cylinder to rear of welder.
2. Remove the cylinder cap. Inspect the cylinder valve for damaged threads, dirt and dust. For cylinders having an external thread fitting, remove any dust and dirt from the threads with a clean cloth.

DO NOT ATTACH THE REGULATOR/FLOWMETER IF CYLINDER VALVE IS DAMAGED! Inform your gas supplier of this condition.
3. Stand to one side away from the outlet and open the cylinder valve for an instant. This blows away any dust or dirt which may have accumulated in the valve outlet.



WARNING

Be sure to keep your face away from the valve outlet when "cracking" the valve.

4. Inspect the regulator/flowmeter for damaged threads and seals, dirt and dust. Remove dust and dirt with a clean cloth.

DO NOT USE THE REGULATOR/FLOWMETER IF DAMAGE IS PRESENT! Have an authorised repair station repair any damage.



WARNING

Gas under pressure is explosive. Always keep gas cylinders in an upright position and always keep chained to undercarriage or stationary support. Refer "Safety in Welding and Cutting" - ANSI Standard Z49-1 and WTIA Technical Note 7 available from the Welding Technology Institute of Australia.

5. Attach the regulator/flowmeter to the cylinder valve and tighten the union nut(s) securely with a spanner.
6. Attach the inlet gas hose to the outlet fitting of the regulator/flowmeter, and tighten the union nut securely with a spanner.
7. Before opening the cylinder valve, turn the regulator adjusting knob counter-clockwise until the adjusting spring pressure is released.



WARNING

Never stand directly in front of or behind the regulator/flowmeter when opening the cylinder valve. Always stand to one side.

8. Open the cylinder valve slowly a fraction of a turn. When the cylinder pressure gauge pointer stops moving, open the valve fully.
9. The regulator/flowmeter is adjustable. Set it for the flow rate recommended for the procedure and process being used before starting to weld.

1.4 Gun and Cable



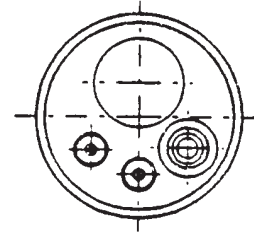
WARNING

Turn the welder power switch off before installing gun and cable.

The Maxmig 150 3m Ergonomic MIG gun and cable provided with the machine has a factory fitted 0.6-1.0mm liner and a 0.9mm contact tip.

1. Lay the cable out straight.
2. Make sure all pins on the gun cable connector are aligned with the proper mating sockets on the front panel gun connector and then join the connectors and tighten the hand nut on the gun cable connector.

Note: If a gun and cable other than the supplied gun is to be used, it must conform to standard European-style connector specifications. See diagram under.



The gun trigger switch must be capable of switching 10 milliamps at 60 volts DC—resistive.



CAUTION

The gun trigger switch connected to the gun trigger control cable must be a normally open, momentary switch. The terminals of the switch must be insulated from the welding circuit. Improper operation of, or damage to, the machine might result if this switch is common to an electrical circuit other than the machine trigger circuit.

1.5 Output Polarity Connection



WARNING






Turn the welder power switch off before changing polarity.

The integrated machines are shipped from the factory connected electrode (+)ve. This is the normal polarity for GMA welding. The gun polarity can be changed by placing the flexible lead protruding from the front of the machine to the required output stud, eg. for electrode (-)ve, connect the lead to the (-)ve output stud.

The remote wire feeder machines are connected to the power source via a control/electrode/gas cable assembly. The electrode cable is connected to the required output stud. The control cable connects to the plug in the front panel of the power source.

Connect the work lead to the other output stud.

2. OPERATING INSTRUCTIONS

 WARNING	
	<ul style="list-style-type: none"> • Do not touch electrically live parts or electrode with skin or wet clothing. • Insulate yourself from work and ground. • Always wear dry insulating gloves.
ELECTRIC SHOCK can kill	
	<ul style="list-style-type: none"> • Keep your head out of fumes. • Use ventilation or exhaust to remove fumes from breathing zone.
FUMES AND GASES can be dangerous	
	<ul style="list-style-type: none"> • Keep flammable material away. • Do not weld upon containers which have held combustibles.
WELDING SPARKS can cause fire or explosion	
	<ul style="list-style-type: none"> • Wear eye, ear and body protection.
ARC RAYS can burn.	

IMPORTANT SAFETY NOTE: In 2T mode {refer 2.2 (h)}, this DC Constant Voltage wire welder provides “COLD” electrode when the gun trigger is not operated. Conversely, the output terminals are “LIVE” when the gun trigger is “activated” when pressed in 2T mode, or triggered on in 4T mode.

2.1 Duty Cycle

The machine is rated at the following duty cycles:

Duty Cycle ⁽¹⁾	Amps	Volts
25%	210	24.5
34%	180	23
100%	120	20

(1) Based on 10 min. time period (i.e., for 25% duty cycle, it is 2.5 minutes actual welding and 7.5 minutes with no welding output, but with the input power remaining on keeping the cooling fan operative.)

2.2 Control Panel

a) Power Switch

The mains power switch is incorporated in the “coarse” output voltage control rotary switch. In the “0” positions the input mains power is switched off.

b) Pilot Light

This light illuminates when the input mains power is switched on.

c) Volts Control

The output voltage is controlled by two rotary switches. One rotary switch provides two “coarse” voltage settings as well as switching the mains power on. The other rotary switch provides the user with a selection of eight “fine” voltage settings. The selection between these two switches allows the user to select any one of sixteen welding voltages.

The approximate weld voltages for the switch positions are:

d) Wire Feed Speed Control *

Coarse	Fine	Volts	Coarse	Fine	Volts
1	1	13.0	2	1	18.0
1	2	13.5	2	2	19.0
1	3	14.0	2	3	20.0
1	4	14.5	2	4	21.0
1	5	15.5	2	5	22.0
1	6	16.0	2	6	23.0
1	7	17.0	2	7	24.0
1	8	17.5	2	8	25.5

Use this control to adjust the speed at which the electrode wire feeds when welding. This is in effect a current control as the power source will deliver the current necessary to melt the wire. The higher the speed, the more current will be required. Wire feed speed range is approximately 1 to 20 meters/min (40 to 790 inches/min.).

Operation of the gun trigger switches the wire feed motor on and off, depending upon the mode setting. The wire feed motor is dynamically braked to minimise wire overrun after welding has ceased.

Welding voltage is available immediately the gun trigger is operated, but when welding is stopped there is a factory set delay of approximately 1/2 sec. after wire feed has stopped to allow the electrode to burn back slightly and prevent sticking in the crater.

e) Spot Welding *

In spot welding mode welding takes place for a pre-set time and then stops automatically. Welding time is adjustable between 0.5 sec. and 4 sec. by operation of the spot weld control on the front panel. There is a positive click in the extreme anti-clockwise position to indicate that the spot weld feature is “off”.

* Mounted on machine control panel for Integrated units.

Mounted on remote wire feeder for Remote units.

f) **Gas Purge ***

Use the gas purge push button to operate the gas solenoid to purge air from the hose after connecting a new gas cylinder. Gas purge will only operate while the button is held in.

g) **Wire Inch ***

Use this push button to operate the wire feed motor and "cold" inch the wire.

h) **2T/4T Operation ***

A two position switch on the front panel provides two modes of operation of the gun trigger. In 2T mode, the gun trigger is pressed to start welding and released to stop.

In 4T mode, pressing the gun trigger only operates the gas solenoid, allowing shielding gas to flow. Releasing the trigger activates the contactor which starts the wire feed motor and connects welding current to the wire so that welding may commence. To stop welding, the trigger must again be operated; pressing it stops the wire feed, activates the burn back time delay and opens the contactor after the pre-set burn back time. Releasing the trigger stops the gas flow.

To recommence welding, the above cycle must be repeated.

i) **Over temperature light**

Indicates that the thermostats have operated to protect unit from over temperature.

- *
Mounted on machine control panel for Integrated units.
Mounted on remote wire feeder for Remote units.

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. (A Maxmig 150 MIG gun is supplied).
- 3) Correct drive rolls for the wire size and type to be used. The wire feeder is supplied with a 0.9/1.2mm hard wire feed roll as standard; drive rolls for other types and sizes are available as spare parts. (see table on page 10).
- 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 gas is required. (Regulator/flowmeter and hose are supplied.) If gas shielding is required, connect the gas hose.

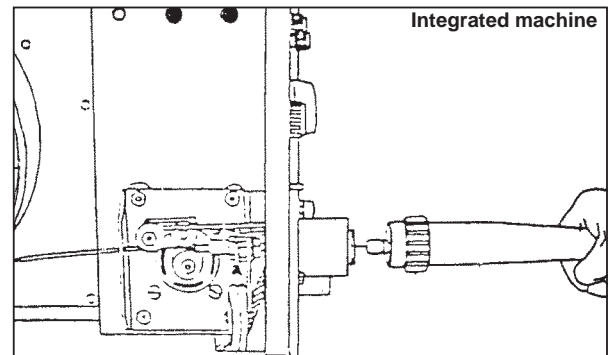
Remember that gas cylinders may explode if damaged, so ensure that all gas cylinders are securely mounted.

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 50mm spool hub so that, for the integrated model, as wire is fed the spool turns anti-clockwise when looking at the spool. For the remote unit, the unit spool must turn 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 overtighten.**

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 wire inch push button. 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 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 - Output Polarity Connection.

4. Welding

**WARNING**

When the gun trigger is pressed (2T mode) or pressed and released the first time (4T mode), 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.

Put into 2T mode.

Select the output voltage required to suit the job by setting the coarse and fine rotary switches.

Before beginning welding, ensure the wire protrudes from the gun tip by approximately 10-15mm. 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 either or both of the rotary switches.

Adjust the wire feed speed as necessary to suit the job. At the completion of the weld, release the gun trigger and pull the gun away from the work to stop the arc.

4T mode should only be used for long welds by experienced operators.

Changing Electrode Size and Type

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

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

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

Adjust 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.


Available Drive Rolls


Part No.	Size (mm)	Use with
AS4449-9	0.6 - 0.8	Hard Wire
AS4449-1	0.8 - 1.0	Hard Wire
AS4449-2	1.0 - 1.2	Hard Wire*
AS4449-5	0.8A - 1.0A	Aluminium Wire
AS4449-10	1.0A - 1.2A	Aluminium Wire*
AS4449-3	0.8 - 1.0	Cored Wire

* The Maxmig 150 gun, with a 1.2mm tip and liner will be required for 1.2mm wires.

5. MAINTENANCE

Safety Precautions

**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.

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 motors have sealed ball bearings which require no service.

Welding Thermal Overload Protection

The Maxmig 210 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.

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.

**CAUTION**

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

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

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 loading electrode through cable.
3. Keep gun cable clean by following maintenance instructions.
4. Use only clean, rust-free electrode. LiquidArc 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.

Input Lead

If the supply cord is damaged, it must be replaced with a special cord, Part No. AS2373-2.

GROUND TEST PROCEDURE

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 LiquidArc Field Service Shop.

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

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

1. Disconnect input cable from power supply.
2. Disconnect gun assembly and work cable.
3. Remove the RHS side panel from power source and LHS from traveller (if applicable).
4. Jumper the two (2) AC terminals and the (+)ve terminal of the bridge rectifier, (a total of three (3) places).

5. Disconnect the PCB plug and insert a 20 way shorting plug into the harness.
6. Switch the 'fine' control rotary switch to position 'one' (1) and switch the 'course' control toggle 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 the Active terminal of the input plug. Apply the test. (Min. resistance 1M Ω)
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 1M Ω)
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 10M Ω)
10. Transformer Thermostat Test: Connect one lead of the mega to the frame of the machine and the other lead to lead No 42 (transformer thermostat). Apply the test. (Min. resistance 1M Ω)
11. Remove all jumpers and reconnect all leads and plugs.
12. Refit all panel work previously removed.

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 Wire Burnback and Motor Acceleration

If Electrode Wire Burnback or Motor Acceleration need to be altered from factory settings, because of the welding procedure being used, locate the PCB in the power source or in the traveller.


On the PCB there is a trimmer labelled 'R.T.S.', this trimmer controls the wire burnback time. It adjusts a time period from when the drive motor stops until the power source and gas solenoid are switched off. [Approximately 0.1 seconds (when fully counter-clockwise) to approximately 1.1 seconds (when fully clockwise)]. Factory setting is mid-position.

Another trimmer on the PCB is 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.

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.
Variable or “hunting” arc.	Incorrect idle roll pressure.	Set idle roll pressure.
	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.
Poor arc striking with sticking or “blast offs”, weld porosity, narrow and ropey looking bead, or electrode stubbing into plate while welding.	Wrong polarity.	Check connection at output studs for polarity required by welding process.
	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. 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. 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 Red motor lead (54) and the Green motor lead (53) when the wire inch push button is depressed. 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 at end of Troubleshooting Guide).
No control of wire feed.	Defective wire drive control PC board.	Replace PCB. (Refer PCB replacement procedure at end of Troubleshooting Guide).
No wire feed and no arc voltage. Pilot light indicates input power to machine.	Control cable not connected.* Overtemperature protection circuit actuated due to overload or short. Overtemperature light should be illuminated.	Connect cable to welding power source. 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 at end of Trouble Shooting Guide, 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 rotary switch either coarse control (on/off) or fine control.	Replace rotary switch.
	Faulty pilot transformer.	Replace.
	Faulty main transformer.	Replace.
	Faulty rectifier.	Replace
	Faulty choke.	Replace.

* For Remote M/Cs only.

NOTES

MAXMIG 210i

PARTS LIST AP-82

Do not use this Parts List for a machine if its code number is not listed. Contact the Service Department for any code numbers not listed.

Numbers in the table below indicate which column to use in each parts list for each individual code number.

Refer Page 21 for Maxmig 210R

Refer Page 27 for Maxidrive 2R

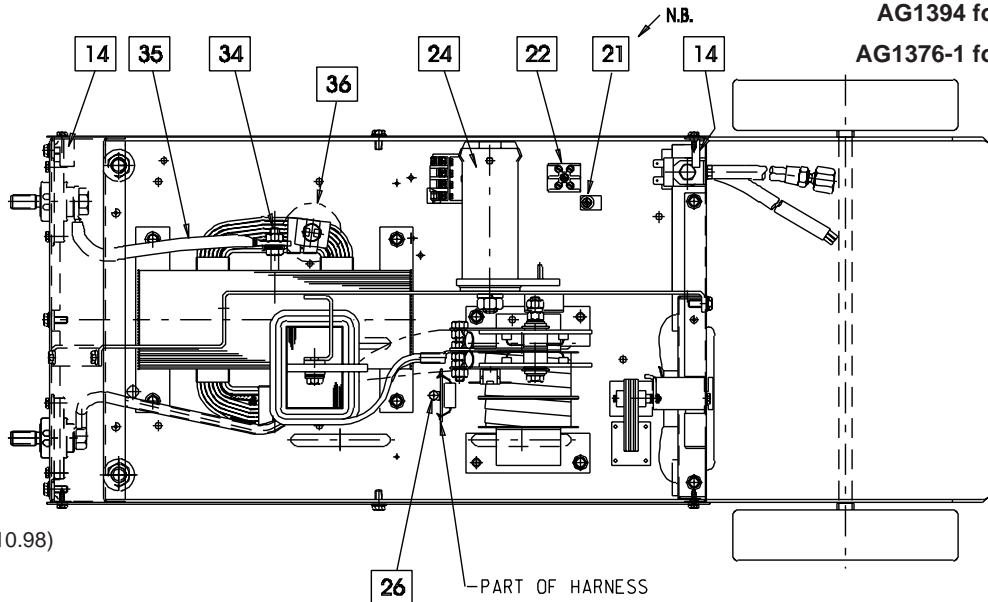
Machine Description ↓	Sub Assembly Item No. →		1	2	3	4	5	6
	Sub Assembly Page Name →	Specification No.	General Assembly	Front Panel Assembly	Drive Plate Assembly	MIG Torch	Wiring Diagram	Instruction Manual
	Part List No. →		AP-82-C	AP-82-D	AP-93-D	AP-103-[]	AP-82-W	IMA578BLA
	Code No. ↓							
	1483	05-2210	1	1		AP-103-Z	AL2597	IMA578ALA
	1539	05-3210	2	2	1		AL2597	IMA578ALA
	1641	05-3210	2	2		AP-103-Z	AL2597	IMA578ALA
	70008	05-3210	2	2		AP-103-E	AL2597	IMA578BLA

General Assembly

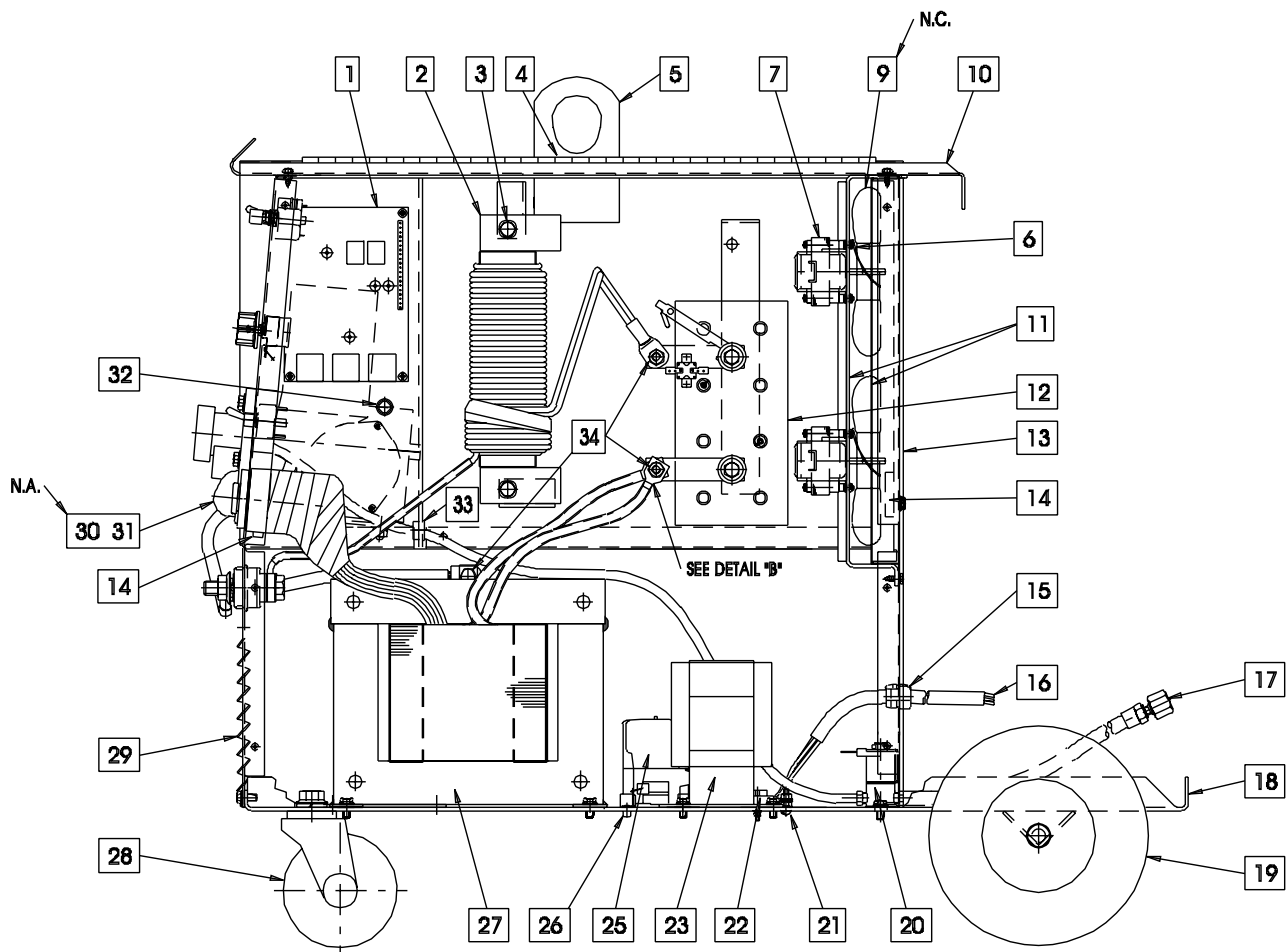
Maxmig 210i

Operative: AP-82-C 4.7.03
Supersedes: 28.10.98

AG1394 for Code 1483
AG1376-1 for Code 1539



Ref: AG1394 (28.10.98)



DO NOT SCALE OFF DRAWING

Indicates a change this printing.

* Items not illustrated.

Recommended Spare Parts are highlighted in bold
Nut, bolt and washer sizes are given so they may be procured locally.

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

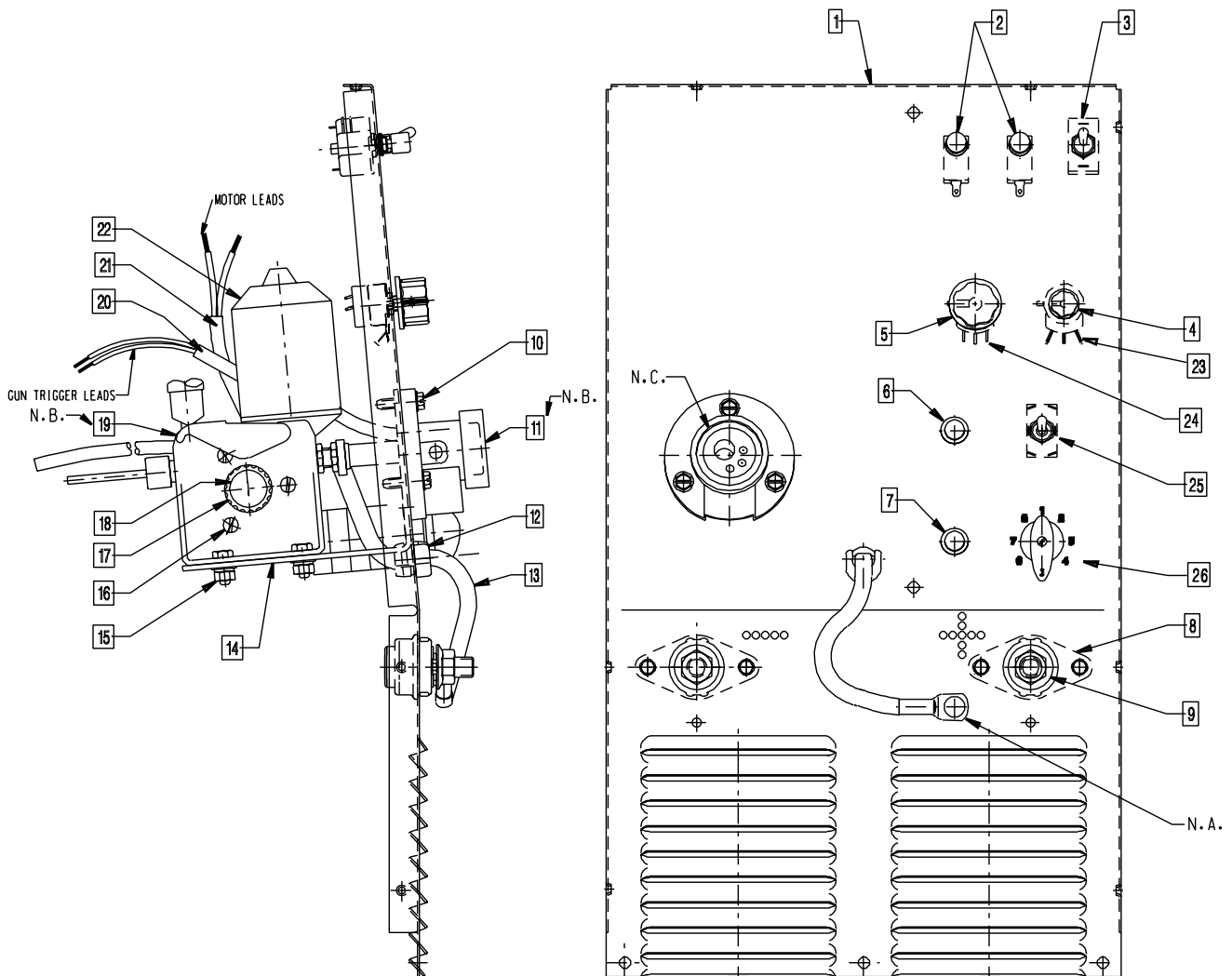
ITEM	DESCRIPTION	PART NO.	QTY.	1	2	3	4	5	6	7	8	9
1	Motor Control PCB	AS4212-4SP	1	X	X							
2	Choke Assembly	AM3484	1	X	X							
3D*	Insulating Tube	T7028-226	2	X	X							
3E*	Insulating Washer	AT2882	4	X	X							
4	Liftbale Seal	S12934	1	X	X							
5	Bulkhead Assembly	AL2491	1	X	X							
7	Fan Motor	AS4233-1	1	X	X							
9	Fan Blade	AM3285	1	X	X							
	Fan Blade (code 1641 and above)	AM3285-1	1	-	X							
10	Roof and Door Assembly	AG1343U	1	X	-							
	Roof and Door Assembly	AG1343-1	1	-	X							
11	Fan Shroud and Bracket Assembly	AM3450-1	1	X	X							
12	Rectifier	AL2480-2	1	X	X							
13	Rear Panel	AL2486	1	X	X							
14	Rubber Buffer	AS4404-1	2	X	-							
	Magnetic Catch	AS4532	2	-	X							
15	Cord Grip Grommet	AT3764-1	1	X	X							
16	Input Lead	AS2373-2	1	X	X							
17	Gas Hose Assembly	AS4150-1	1	X	X							
18	Base and Axle Assembly	AM3279-2	1	X	X							
19	Wheel	AS4071-1	2	X	X							
	Axle Push Nut	AT2876	2	X	X							
20	Gas Solenoid	AM3399-1	1	X	X							
	Brass Bard Straight Tail	AT3730-3	2	X	X							
21	Earth Tag	AT3166	1	X	X							
22	Terminal Block	AT3070-2	1	X	X							
23	Auxiliary Transformer	PT0052	1	X	X							
24	Spool Post	AM3387SP	1	X	X							
	Spacer Washer	AS4482	1	X	X							
25	Contactor	AM3423-1	1	X	X							
26	⁵ / ₃₂ " X ¹ / ₂ " Blind Rivet	AT3425-2	1	X	X							
27	Transformer Assembly	AL2535-1	1	X	X							
28	4" Swivel Castor	AS4070	2	X	X							
29	Front Panel Assembly	AL2537-2	1	X	-							
	Front Panel Assembly	AL2537-4	1	-	X							
	Top Panel Assembly	AL2537-4	1	-	X							
30	Rotary Sw Reworked- 8 Pos	AS4559	1	X	X							
32	Bushing	T12380-2	1	X	X							
33	Bushing	T14614-2	1	X	X							
35	Lead - Sec.Tap to(-) Stud	NSS	1	X	X							
36	Thermostat	T14542-1	1	X	X							
41*	Lead Harness	AG1375	1	X	X							
51*	Side Panel	AL2487U	1	X	-							
	Side Panel	AL2487-1	1	-	X							
52*	Side and Reel Shelf	AL2488U	1	X	X							
53*	Wiring Diagram	AL2597	1	X	X							
54*	Warning Decal	AS4244	1	X	X							
55*	Warning Decal	AT3378	1	X	X							
56*	Ground Cable Assembly	AS4092-4	1	X	X							
58*	Regulator/Flowmeter	94001310	1	X	X							
59*	Chain	AT3873	1	X	X							
60*	Warning Tag	AS3234	1	X	X							
62*	Literature	AL1369-119	1	X	X							
63*	Pallet	AM3288	1	X	X							

Control Panel Assembly

Maxmig 210i

Operative: AP-82-D
4.7.03
Supersedes: 28.10.98

Ref: AL2537-4 (28.10.98)



* Items not illustrated.

Recommended Spare Parts are highlighted in bold
Nut, bolt and washer sizes are given so they may be procured locally.

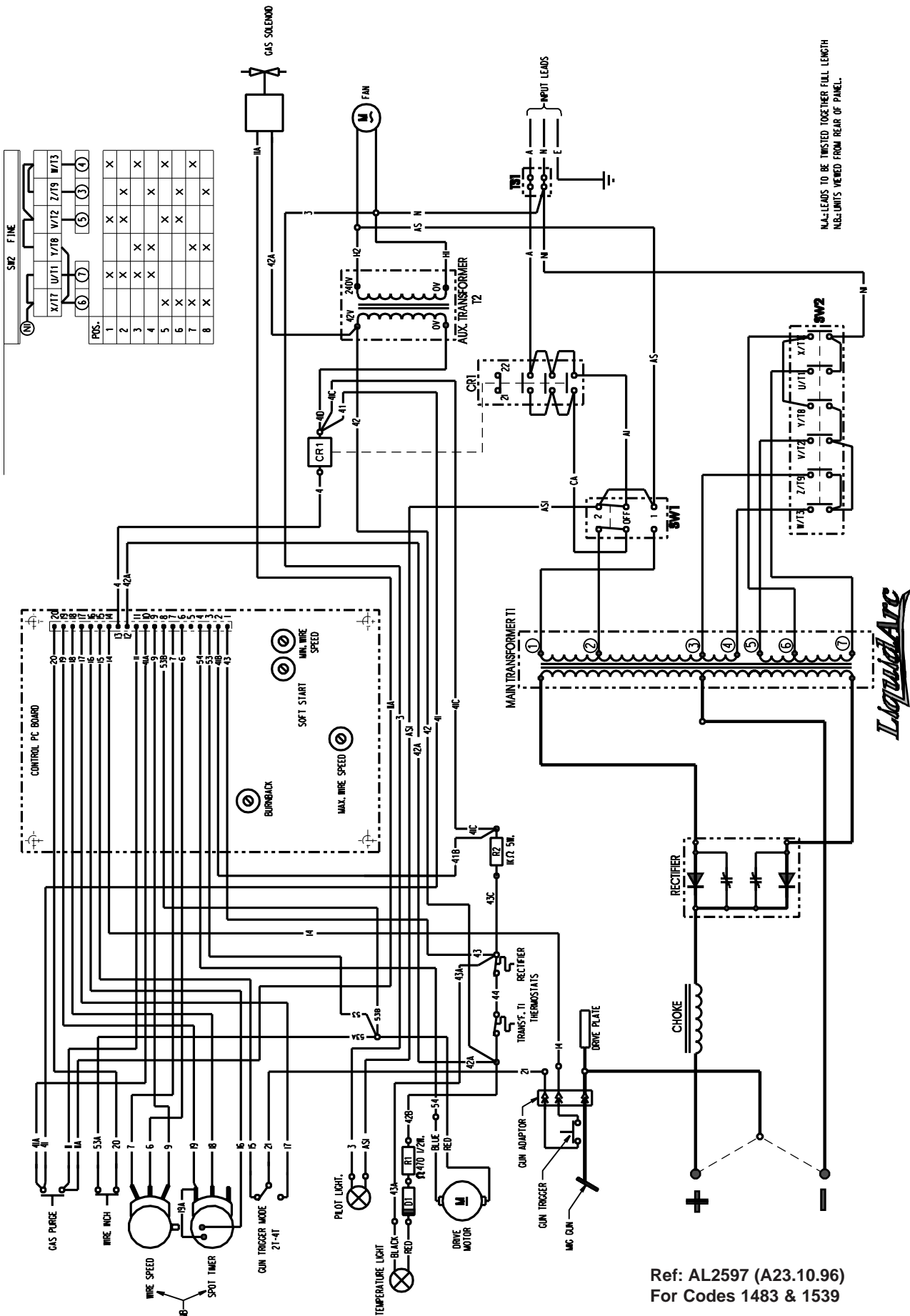
Use only the parts marked "X" in the column under the heading number called for in the model index page.

IMA 578BLA Maxmig 210 Page 19

Wiring Diagram

Maxmig 210i

Operative: 4.7.03
Supersedes: 28.10.98



MAXMIG 210R

PARTS LIST AP-95

AP-95
Operative: 8.7.03
Supersedes: 28.10.98

Do not use this Parts List for a machine if its code number is not listed. Contact the Service Department for any code numbers not listed.

Numbers in the table below indicate which column to use in each parts list for each individual code number.

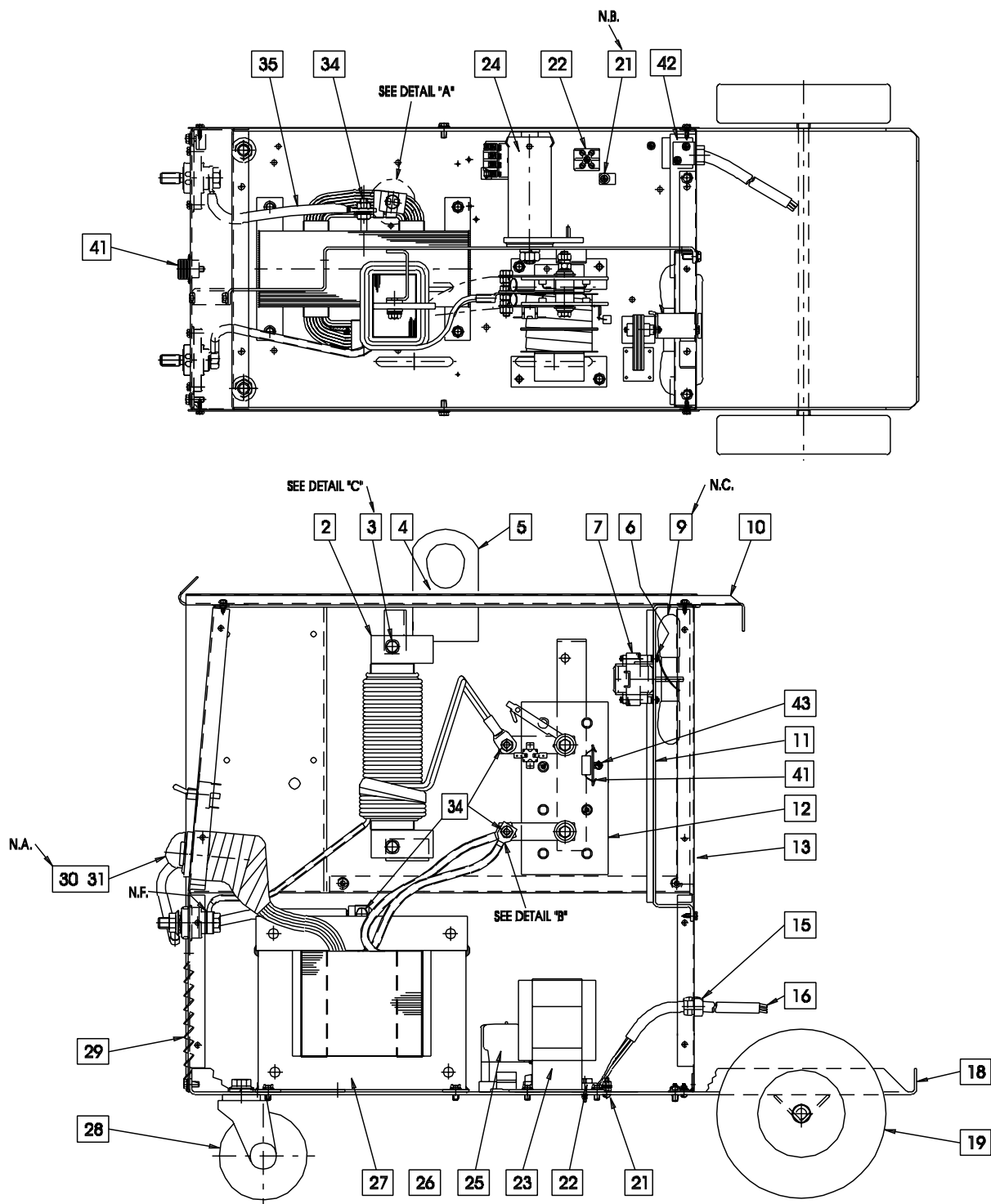
Refer Page 27 for Maxidrive 2R.

Machine Description ↓	Sub Assembly Item No. →		1	2	3	4	5
	Sub Assembly Page Name →	Specification No.	General Assembly	Front Panel Assembly	MIG Torch	Wiring Diagram	Instruction Manual
	Part List No. →		AP-95C	AP-95D	AP-103-[]	AP-95-W	IMA578BLA
	Code No. ↓						
	1540	05-4210	1	1	AP-103-Z	AM3578-1	IMA578ALA
	1598	05-4210	1	1	AP-103-Z	AM3578-1	IMA578ALA
	1642	05-4210	1	1	AP-103-Z	AM3578-1	IMA578ALA
	70009	05-4210	1	1	AP-103-E	AM3578-1	IMA578BLA

General Assembly Maxmig 210R

AP-95-C
Operative: 28.10.98
Supersedes: NEW

Ref. AG1394-2



DO NOT SCALE OFF DRAWING

* Items not illustrated.

Recommended Spare Parts are highlighted in bold
Nut, bolt and washer sizes are given so they may be procured locally.

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

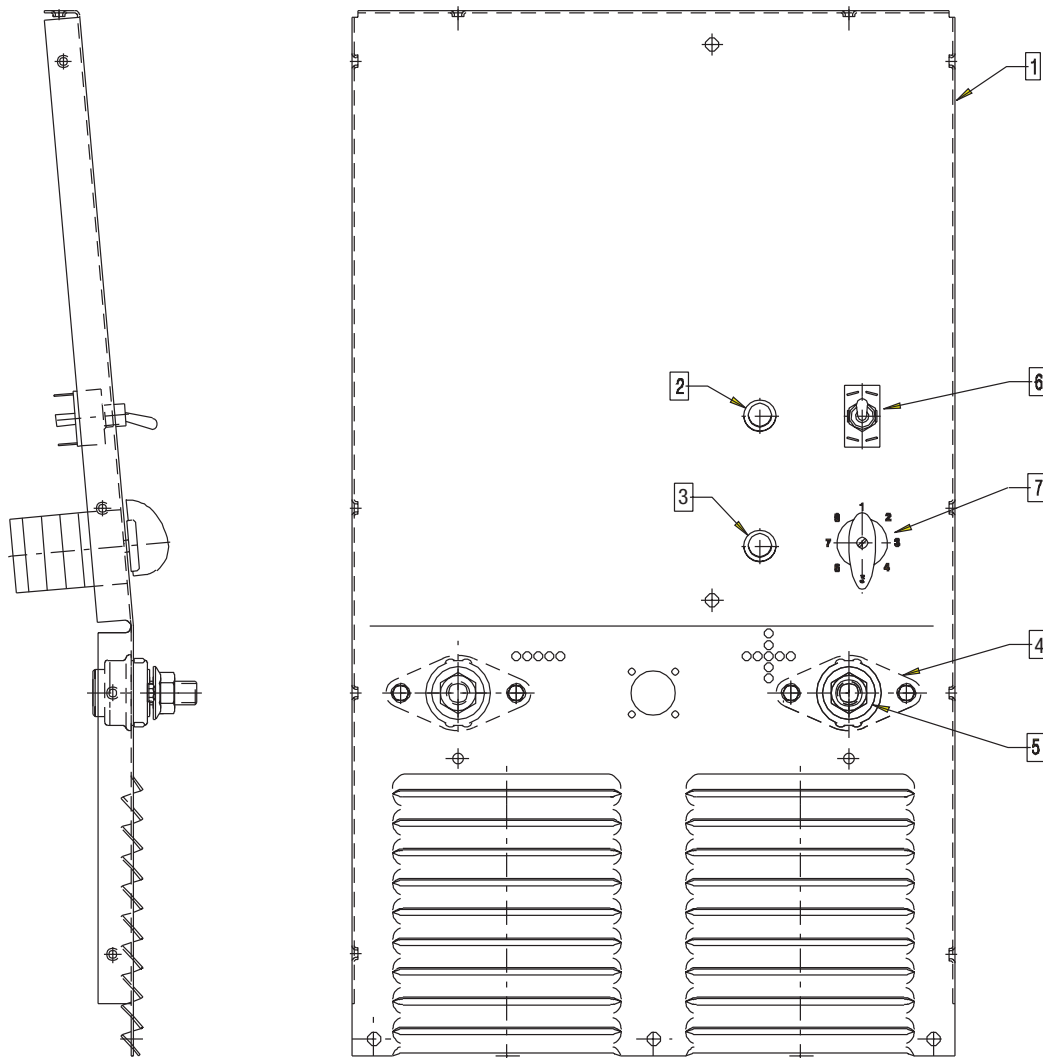
Page 23

Front Panel Assembly

Maxmig 210R

Operative: AP-95-D
Supersedes: 4.7.03
28.10.98

Ref. AL2655-1



* Items not illustrated.

Recommended Spare Parts are highlighted in bold
Nut, bolt and washer sizes are given so they may be procured locally.

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

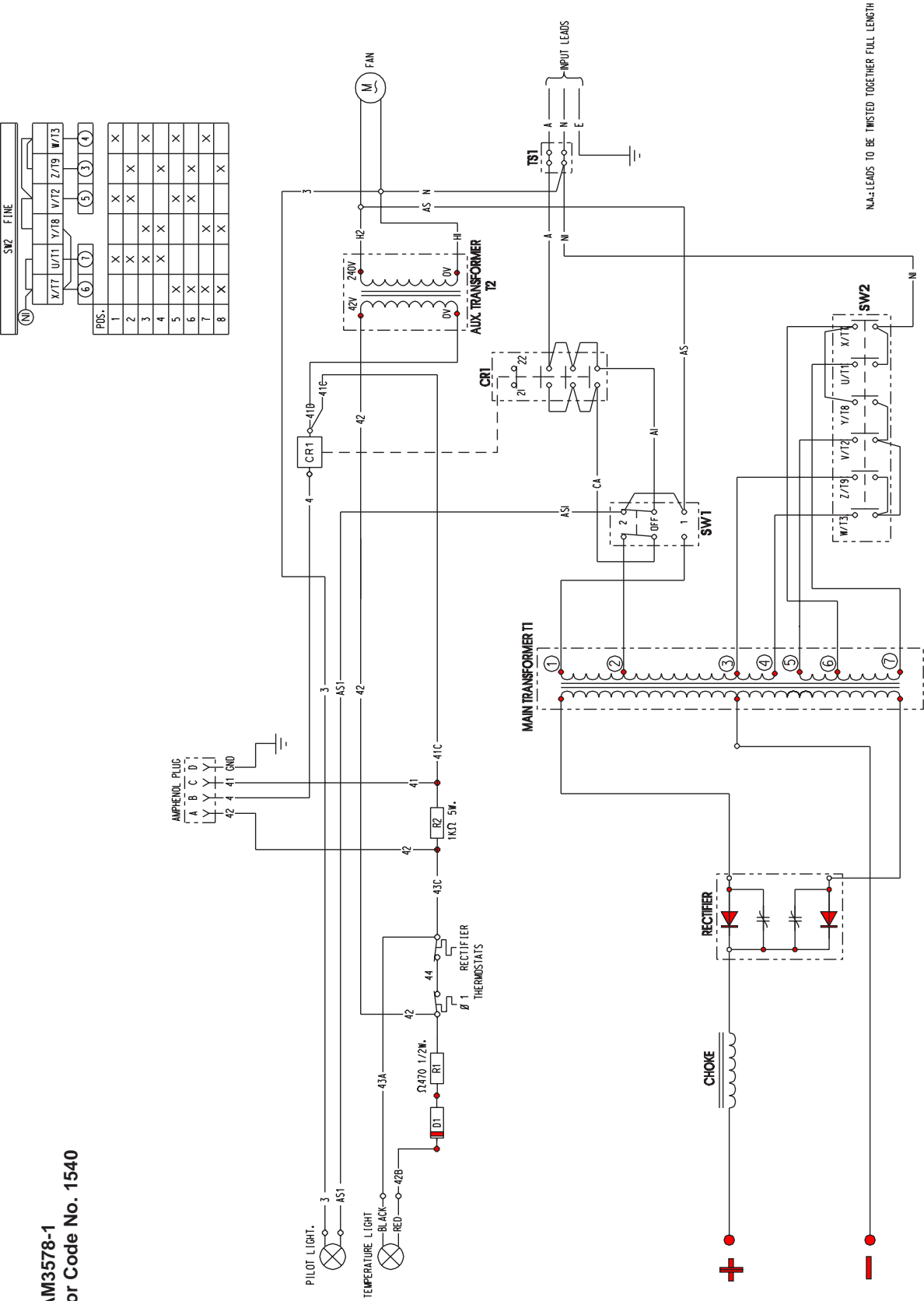
IMA 578BLA Maxmig 210 Page 25

Wiring Diagram

Maxmig 210R

Operative: 4.7.03
Supersedes: 28.10.98

AP-95-W
4.7.03
28.10.98



LiquidArc
SYDNEY, AUSTRALIA

AM3578-1
for Code No. 1540

MAXIDRIVE 2R

PARTS LIST AP-93

AP-93
Operative: 4.7.03
Supersedes: 28.10.98

Do not use this Parts List for a machine if its code number is not listed. Contact the Service Department for any code numbers not listed.

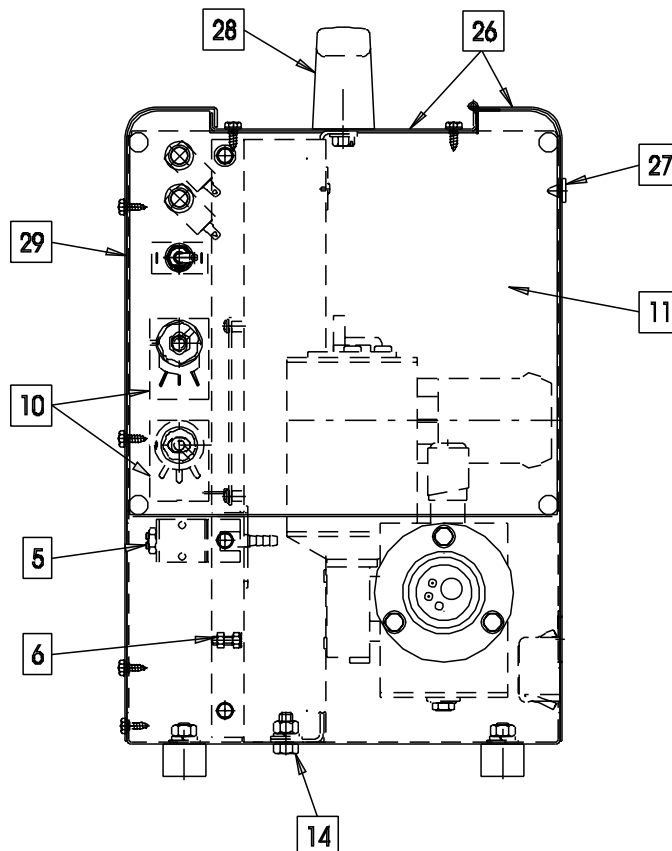
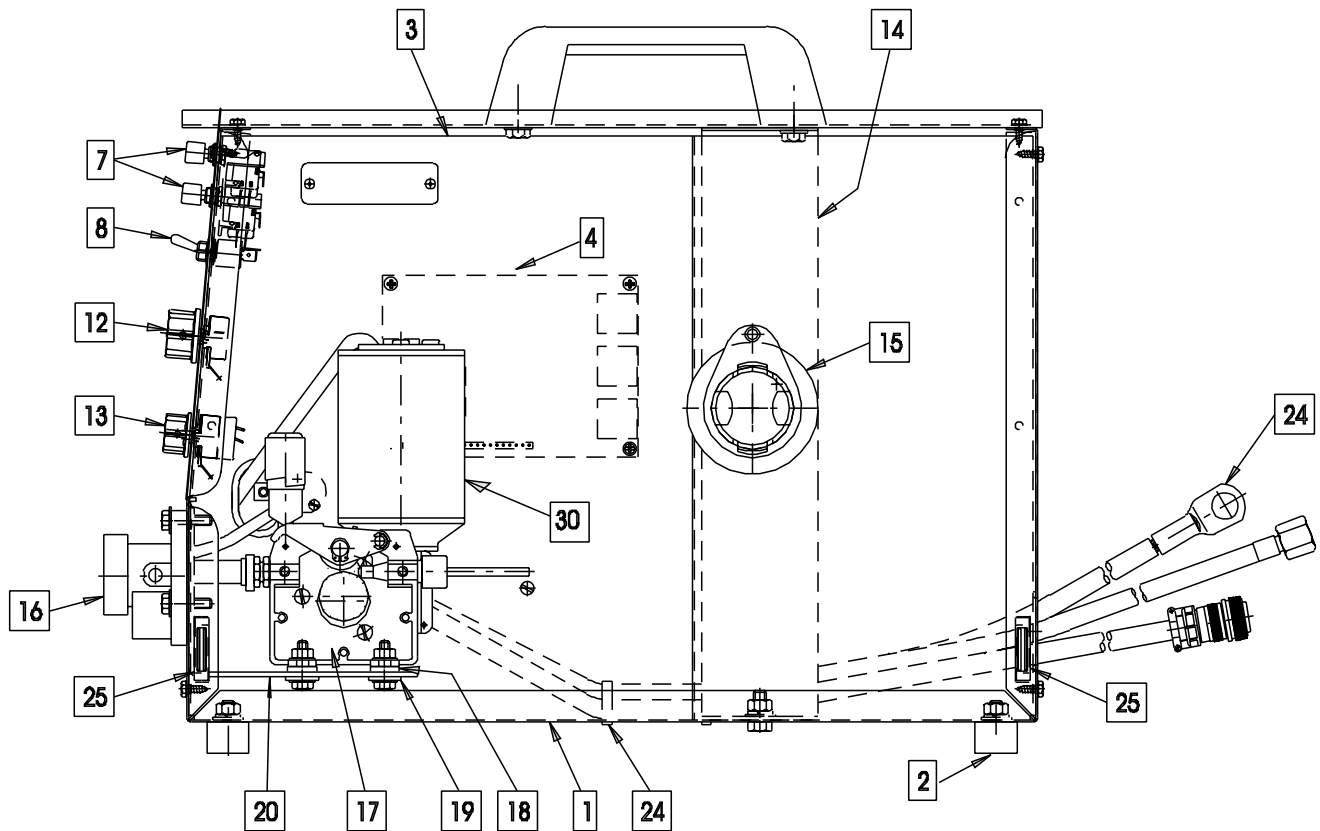
Numbers in the table below indicate which column to use in each parts list for each individual code number.

Machine Description ↓	Sub Assembly Item No. →		1	2	3	4	5
	Sub Assembly Page Name →	Specification No.	General Assembly	Drive Plate Assembly	Wiring Diagram	Instruction Manual	
	Part List No. →		AP-93-C	AP-93-D	AP-93-W	IMA580BLA	
	Code No. ↓						
	1547	05-1022	1	1	AM3574	IMA592LA	

General Assembly

Maxidrive 2R

AP-93-C
Operative: 4.7.03
Supersedes: 28.10.98



Ref. AG1412 for Code 1547

* Items not illustrated.

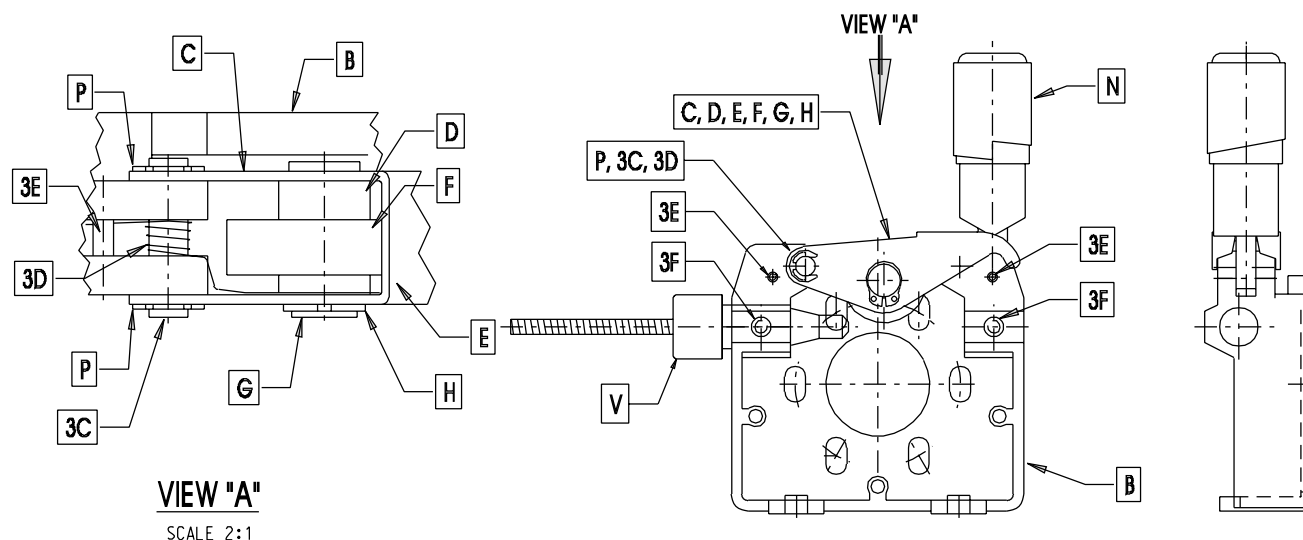
Use only the parts marked "X" in the column under the heading number called for in the model index page.

[illegible]

Drive Plate Assembly

Maxidrive 2R

Operative: AP-93-D 4.7.03
Supersedes: 28.10.98



VIEW "A"

SCALE 2:1

AM3391-8

BODY ASSEMBLY

Indicates a change this printing.

* Items not illustrated.

Recommended Spare Parts are highlighted in bold
Nut, bolt and washer sizes are given so they may be procured locally.

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

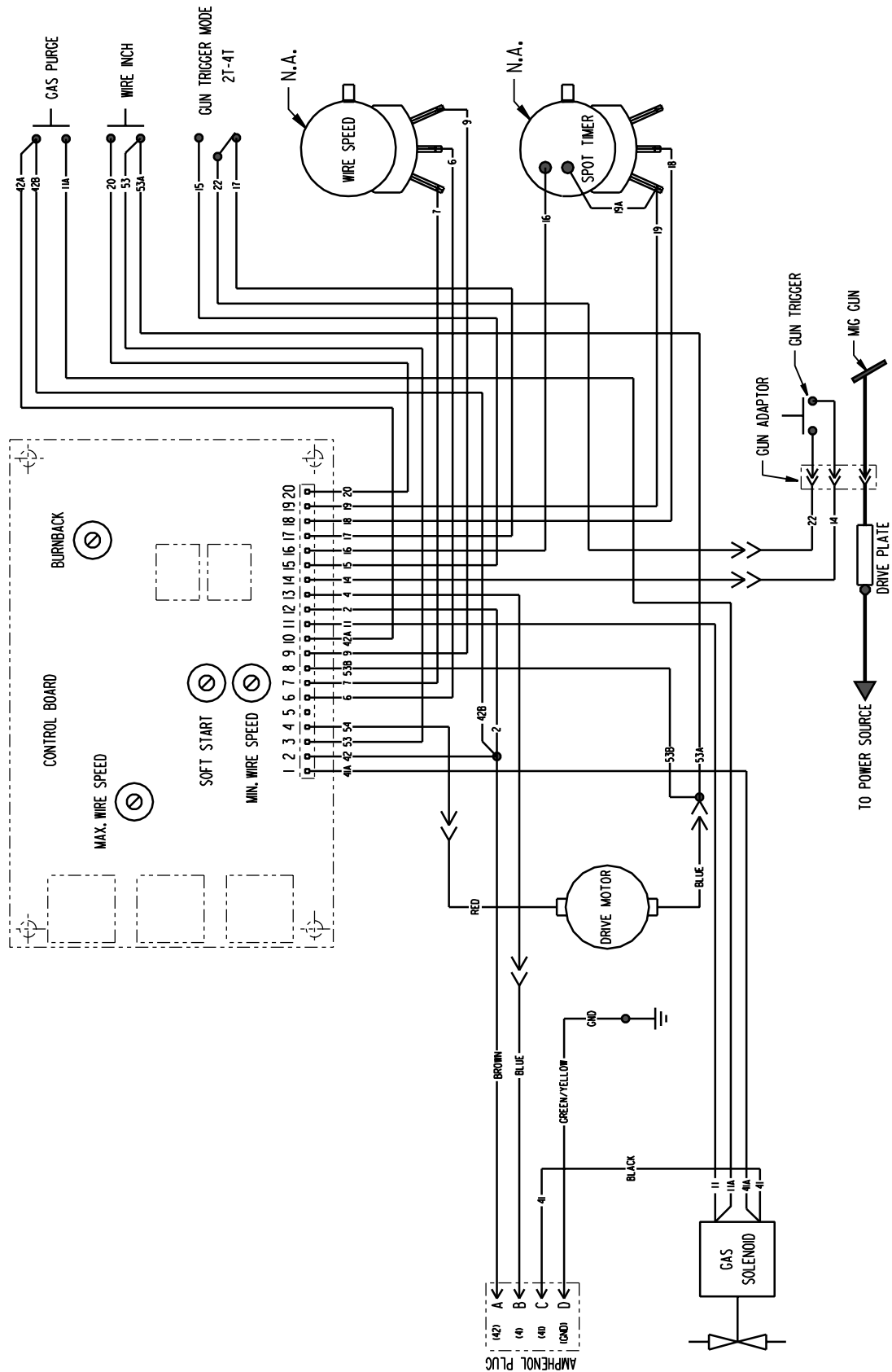
ITEM	DESCRIPTION	PART NO.	QTY.	1	2	3	4	5	6	7	8	9
B	Aluminium Body	AM3391-6A	1	x								
C	Idle Roll Arm	AM3391-1C	1	x								
D	Idle Roll Spacer - Thick	AM3391-1D	1	x								
E	Idle Roll Spacer - Thin	AM3391-1E	1	x								
F	Idle Roll	AM3391-1F	1	x								
G	Idle Roll Shaft	AM3391-1G	1	x								
H	Circlip (Idle Roll)	AM3391-1H	1	x								
N	Tensioner	AM3391-1N	1	x								
P	Circlip (Idle Roll Arm Shaft)	AM 3391-1P	1	x								
R*	Drive Roll Retaining Screw	AM3391-1R	1	x								
V	Incoming Guide Tube	AM3391-1V	1	x								
3C	Idle Roll Arm Shaft	AM3391-3C	1	x								
3D	Idle Roll Spring	AM3391-3D	1	x								
3E	Roll Pin	AM3391-3E	1	x								
3F	Grub Screw	AM3391-3F	1	x								
3G*	Drive Roll 0.9-1.2mm Solid	AS4449-8	1	x								
3H*	Drive Roll Adaptor	AM3391-3H	1	x								

Wiring Diagram

Maxidrive 2R

Operative: AP93-W
Supersedes: 28.10.98
NEW

AM3574 for Code No. 1547



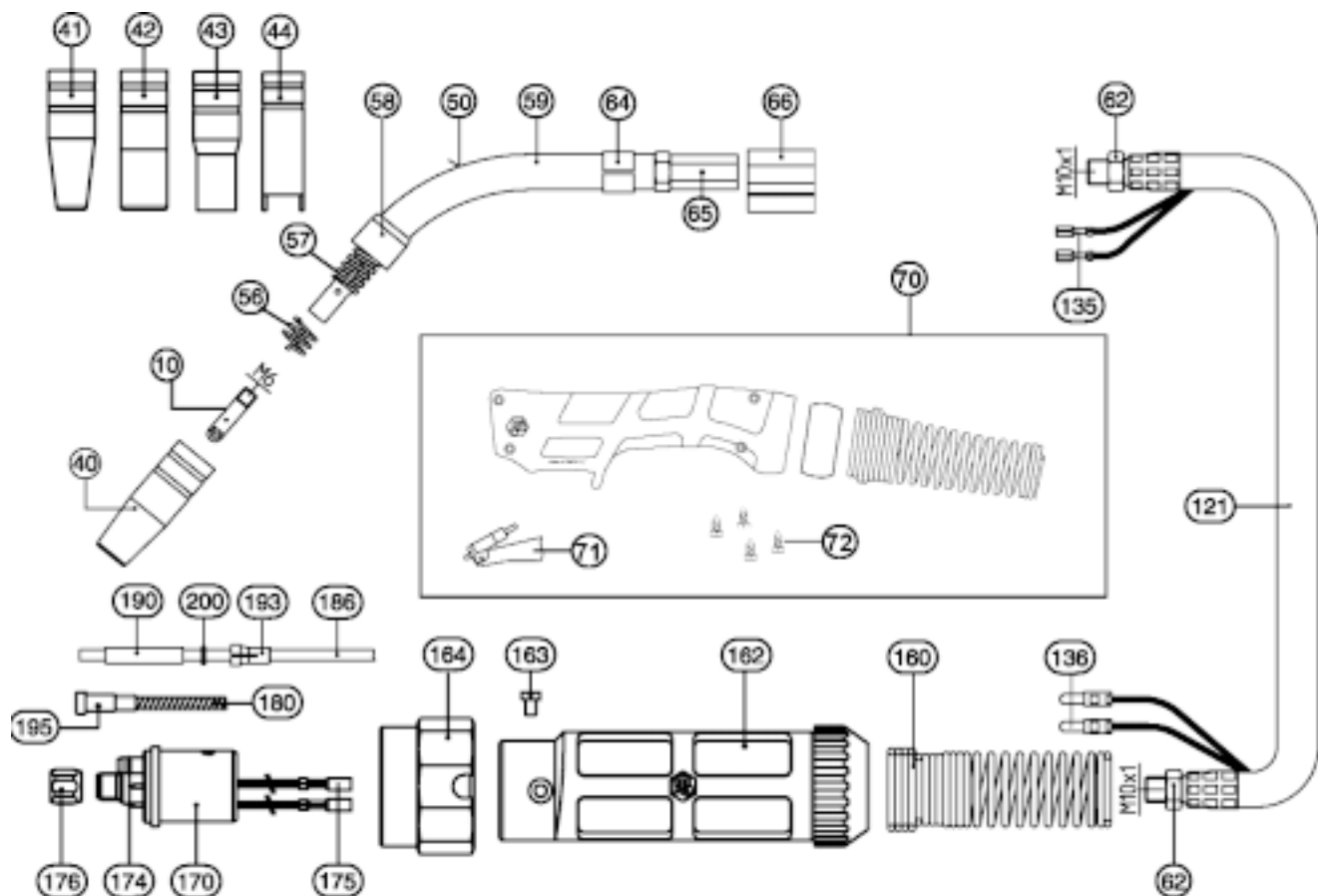
NOTES
N.A.: UNITS VIEWED FROM REAR OF PANEL.

LiquidArc
SYDNEY, AUSTRALIA

Maxmig 150

TBi Welding Torch

Operative: AP-103-E
Supersedes: 4.7.03
NEW



Indicates a change this printing.

* Items not illustrated.

Recommended Spare Parts are highlighted in bold
Nut, bolt and washer sizes are given so they may be procured locally.

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

ITEM	DESCRIPTION	PART NO.	QTY.	1	2	3	4	5	6	7	8	9
	Complete Torch	102P953D30										
10	Contact Tip ECu ø, M6 x 25mm	340P 1073										
10	Contact Tip CuCrZr	340P 3073										
10	Contact Tip for Alu	341P 1073										
40	Gas Nozzle conical NW 12mm	345P012002										
41	Gas Nozzle tapered NW 9.5mm	345P013002										
42	Gas Nozzle cylindrical NW 16mm	345P011002										
43	Gas Nozzle bottle form NW 13mm	345P014002										
44	Gas Nozzle spot welding NW 16mm	345P015402										
50	Torch Neck Maxmig 50, 50°bent	102P001002										
54	Sleeve	102P002019										
56	Nozzle Spring	102P002011										
57	Nozzle support (l.h. thread)	102P002037										
58	Head Insulator	102P002003										
59	Insulating Hose (L=100mm)	101P002003										
62	Hex Nut M10X1)	101P002005										
65	Brass Body	600P002126										
66	Torch Body PVC	600P002017										
70	Handle Blue compl. 2-pol	380P220400										
71	Switch Red, 2-poles	385P021016										
72	Screw (PU=12 pcs)	100P008413										
121	TBi-Flex cable 16mm² 3m	360P161130										
121	TBi-Flex cable 16mm² 4m	360P161140										
135	Cable lug	375P000023										
136	Trigger wire connector, male	375P000004										
160	Spring support small	600P102099										
162	Adapter support	701P001045										
163	Screw M4 x 6	100P008401										
164	Adapter nut PVC	701P002081										
170	ESG-connector, complete	701P001002										
174	O-Ring	365P100040										
175	Trigger wire connector, female	375P000003										
176	Liner positioning nut M10 x 1	701P002005										
180	Liner white 3m 1.3 x 3.8mm for wire 0.6-0.9mm	324P133834										
180	Liner white 4m 1.3 x 3.8mm for wire 0.6-0.9mm	324P133844										
180	Liner blue 3m 1.5 x 4.5mm for wire 0.8-1.0mm	324P154534										
180	Liner blue 4m 1.5 x 4.5mm for wire 0.8-1.0mm	324P154544										
186	Teflon liner blue 3m 1.5 x 4.0mm for wire 0.8-1.0mm	326P154034										
186	Teflon liner blue 4m 1.5 x 4.0mm for wire 0.8-1.0mm	326P154045										
190	Support tube for teflon liner, L=150mm	329P544150										
193	Collet for teflon liner up to ø 4.0mm	331P020040										
195	Collet for liner 2.5 x 4.5	330P025045										
200	O-Ring for teflon liner	365P150035										

NOTES

NOTES

LIMITED WARRANTY

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 "LIQUIDARC BRANDED GOODS"

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

Five Years

Handymax 160

Three Years

Handymig

Maxmig

Maxidrive

All Models

All Models

All Models

One Year

Handytig 130

Viking STP

PJ20 Plasma

PJ35 Plasma

Promax

Solex Electronic Lenses

Electronic Welding Helmets

All Models

6 Months

Printed Circuit Boards

All Models

3 Months

MIG Torches

TIG Torches

Plasma Torches

Gas & Cutting Equipment

All Models

All Models

All Models

All Models

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.

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:

- The cost of replacing the goods;
- The cost of obtaining equivalent goods; or
- 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:

- 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;
- 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.

IN LINE WITH THE COMPANY'S POLICY OF CONTINUING PRODUCT IMPROVEMENT, SPECIFICATIONS HEREIN ARE SUBJECT TO MODIFICATION OR CHANGE WITHOUT NOTICE



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

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Southern Region: 1-3 Grange Road, Cheltenham, Vic, 3192

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