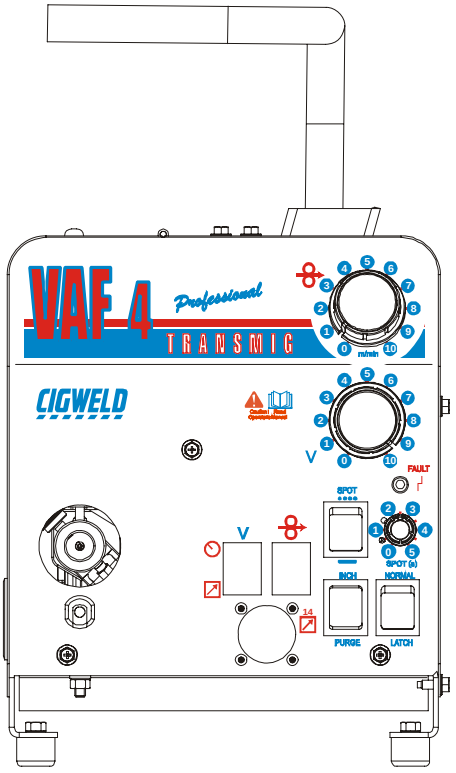
CIGWELD Professional

VAF-4

TRANSMIG
WIREFEEDER



Operating Manual

Version No:2 Issue Date: November 2007 Manual No: 719534

Operating Features

GMAW FCAW | DC | CV | 110 V

CIGWELD Professional

LEADER IN ARC WELDING TECHNOLOGY

We appreciate your business!

Congratulations on your new CIGWELD product. We are proud to have you as our customer and will strive to provide you with the best service and reliability in the industry. This product is backed by our extensive warranty and world-wide service network. To locate your nearest distributor or service agency call 1300-654-674, or visit us on the web at www.cigweld.com.au.

This Operating Manual has been designed to instruct you on the correct use and operation of your CIGWELD product. Your satisfaction with this product and its safe operation is our ultimate concern. Therefore please take the time to read the entire manual, especially the Safety Precautions. They will help you to avoid potential hazards that may exist when working with this product.

YOU ARE IN GOOD COMPANY

The Brand of Choice for Contractors and Fabricators. CIGWELD is the Market Leading Brand of Arc Welding Products for Thermadyne Industries Inc.

We are a mainline supplier to major welding industry sectors in the Asia Pacific and emerging global markets including; Manufacturing, Construction, Mining, Automotive, Engineering, Rural and DIY.

We distinguish ourselves from our competition through market leading dependable brands that have stood the test of time, technical innovation, competitive prices, excellent delivery, superior customer service and technical support, together with excellence in sales and marketing expertise.

We are committed to develop technologically advanced products to achieve a safer working environment for industry operators.

WARNING 1

Read and understand this entire Manual and your employer's safety practices before installing, operating, or servicing the equipment.
While the information contained in this Manual represents the Manufacturer's best judgement, the Manufacturer assumes no liability for its use.

Welding Power Supply
Instruction Manual Number 719534 for:

VAF-4	Wirefeeder 14P	Spec Number	705700
VAF-4	Wirefeeder 19P	Spec Number	706965

Published by:
CIGWELD Pty Ltd
71 Gower Street
Preston, Victoria, Australia, 3072

www.cigweld.com.au

Publication Date: November 11, 2007

Record the following information for Warranty purposes:

Where Purchased: _____

Purchase Date: _____

Equipment Serial #: _____

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SECTION 1: Arc Welding Safety Instructions and Warnings

WARNING 2

ARC WELDING can be hazardous.
Protect yourself and others from possible serious injury or death. Keep children away. Pace maker wearers keep away until consulting your doctor. Do not lose these instructions. Read operating / instruction manual before installing, operating or servicing this equipment.

Welding products and welding processes can cause serious injury or death, or damage to other equipment or property, if the operator does not strictly observe all safety rules and take precautionary actions.
Safe practices have developed from past experience in the use of welding and cutting. These practices must be learned through study and training before using this equipment. Anyone not having extensive training in welding and cutting practices should not attempt to weld. Certain practices apply to equipment connected to power lines; other practices apply to engine driven equipment.
Safe practices are out lined in the American National Standard Z49.1 entitled: SAFETY IN WELDING AND CUTTING. This publication and other guides to what you should learn before operating this equipment are listed at the end of these safety precautions.

HAVE ALL INSTALLATION, OPERATION, MAINTENANCE, AND REPAIR WORK PERFORMED ONLY BY QUALIFIED PEOPLE.

ELECTRIC SHOCK can kill.

Touching live electrical parts can cause fatal shocks or severe burns. The electrode and work circuit is electrically live whenever the output is on. The input power circuit and machine terminal circuits are also live when power is on. In semiautomatic or automatic wire welding, the wire, wire reel, drive roll housing, and all metal parts touching the welding wire are electrically live. Incorrectly installed or improperly grounded equipment is a hazard.

1. Do not touch live electrical parts.
2. Wear dry, hole-free insulating gloves and body protection.
3. Insulate yourself from work and ground using dry insulating mats or covers.
4. Disconnect input power or stop engine before installing or servicing this equipment. Lock input power disconnect switch open, or remove line fuses so power cannot be turned on accidentally.
5. Properly install and ground this equipment according to its Owner's Manual and national, state, and 10 cal codes.

ARC RAYS can burn eyes and skin; NOISE can damage hearing.

Arc rays from the welding process produce intense heat and strong ultraviolet rays that can burn eyes and skin. Noise from some processes can damage hearing.

6. Turn off all equipment when not in use. Disconnect power to equipment if it will be left unattended or out of service.
7. Use fully insulated electrode holders. Never dip holder in water to cool it or lay it down on the ground or the work surface. Do not touch holders connected to two welding machines at the same time or touch other people with the holder or electrode.
8. Do not use worn, damaged, under sized or poorly spliced cables.
9. Do not wrap cables around your body.
10. Ground the workpiece to a good electrical (earth) ground.
11. Do not touch electrode while in contact with the work (ground) circuit.
12. Use only well-maintained equipment. Repair or replace damaged parts at once.
13. In confined spaces or damp locations, do not use a welder with AC output unless it is equipped with a voltage reducer. Use equipment with DC output.
14. Wear a safety harness to prevent falling if working above floor level.
15. Keep all panels and covers securely in place.

1. Wear a welding helmet fitted with a proper shade of filter (see ANSI 249.1 listed in Safety Standards) to protect your face and eyes when welding or watching.
2. Wear approved safety glasses. Side shields recommended.
3. Use protective screens or barriers to protect others from flash and glare; warn others not to watch the arc.
4. Wear protective clothing made from durable, flame-resistant material (wool and leather) and foot protection.
5. Use approved earplugs or earmuffs if noise level is high.

Eye protection filter shade selector for welding or cutting (goggles or helmet), from AWS A 8.2-73

Welding or Cutting operation	Electrode size Metal Thickness or Welding Current	Filter shade no.	Welding or Cutting operation	Electrode size Metal Thickness or Welding Current	Filter shade no.
Torch soldering	All	2	Gas metal arc welding		
Torch brazing	All	2 or 3	Non Ferrous base metal	All	11
Oxygen cutting			Ferrous base metal	All	12
Light	Under 1 in., 25 mm	3 or 4	Gas tungsten arc welding (TIG)	All	12
Medium	1 – 6 in., 25 – 150 mm	4 or 5	Atomic Hydrogen welding	All	12
Heavy	Over 6 in., 150 mm	5 or 6	Carbon Arc welding	All	12
Gas welding			Plasma arc Welding	All	12
Light	Under 1/8 in., 3 mm	4 or 5	Carbon Arc Gouging		
Medium	1/8 – 1/2 in., 3 – 12 mm	5 or 6	Light		12
Heavy	Over 1/2 in., 12 mm	6 or 8	Heavy		14
Shielded metal-arc welding (stick) electrodes			Plasma arc cutting		
	Under 5/32 in., 4 mm	10	Light	Under 300 Amp	9
	Under 5/32 to ¼ in., 4 to 6.4mm	12	Medium	300 to 400 Amp	12
	Over ¼ in., 6.4 mm	14	Heavy	Over 400 Amp	14

FUMES AND GASES can be hazardous to your health.

Welding produces fumes and gases. Breathing these fumes and gases can be hazardous to your health.

1. Keep your head out of the fumes. Do not breathe the fumes.
2. If inside, ventilate the area and/or use exhaust at the arc to remove welding fumes and gases.
3. If ventilation is poor, use an approved air-supplied respirator.
4. Read the Material Safety Data Sheets (MSDS) and the manufacturer's instruction for metals, consumables, coatings, and cleaners.
5. Work in a confined space only if it is well ventilated, or while wearing an air-supplied respirator. Shielding gases used for welding can displace air causing injury or death. Be sure the breathing air is safe.
6. Do not weld in locations near degreasing, cleaning, or spraying operations. The heat and rays of the arc can react with vapours to form highly toxic and irritating gases.
7. Do not weld on coated metals, such as galvanized lead, or cadmium plated steel, unless the coating is re moved from the weld area, the area is well ventilated, and if necessary, while wearing an air supplied respirator. The coatings and any metals containing these elements can give off toxic fumes if welded.

WELDING can cause fire or explosion.

Sparks and spatter fly off from the welding arc. The flying sparks and hot metal, weld spatter, hot work piece, and hot equipment can cause fires and burns. Accidental contact of electrode or welding wire to metal objects can cause sparks, over heating, or fire.

1. Protect yourself and others from flying sparks and hot metal.
2. Do not weld where flying sparks can strike flammable material Remove all flammables within 35ft (10.7 m) of the welding arc. If this is not possible, tightly cover them with approved covers.
3. Be alert that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas.
4. Watch for fire, and keep a fire extinguisher nearby.
5. Be aware that welding on a ceiling, floor, bulkhead, or partition can cause fire on the hidden side.
6. Do not weld on closed containers such as tanks or drums.
7. Connect work cable to the work as close to the welding area as practical to prevent welding current from travelling long, possibly unknown paths and causing electric shock and fire hazards.
8. Do not use welder to thaw frozen pipes.
9. Remove stick electrode from holder or cut off welding wire at contact tip when not in use.

Flying sparks and hot metal can cause Injury

Chipping and grinding cause flying metal. As welds cool, they can throw off slag.

1. Wear approved face shield or safety goggles. Side shields recommended.
2. Wear proper body protection to protect skin.

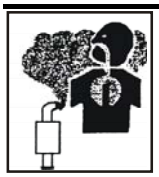
CYLINDERS can explode if damaged.

Shielding gas cylinders contain gas under high pressure. If damaged, a cylinder can explode. Since gas cylinders are normally part of the welding process, be sure to treat them carefully.

1. Protect compressed gas cylinders from excessive heat, mechanical shocks, and arcs.
2. Install and secure cylinders in an upright position by chaining them to a stationary support or equipment cylinder rack to prevent falling or tipping.
3. Keep cylinders away from any welding or other electrical circuits.
4. Never allow a welding electrode to touch any cylinder.
5. Use only correct shielding gas cylinders, regulators, hoses and fittings designed for the specific application; maintain them and associated parts in good condition.
6. Turn face away from valve outlet when opening cylinder valve.
7. Keep protective cap in place over valve except when cylinder is in use or connected for use.
8. Read and follow instructions on compressed gas cylinders, associated equipment, and CGA publication P-1 listed in Safety Standards.

WARNING 3

ENGINES can be dangerous.



ENGINE EXHAUST GASES can kill.

Engines produce harmful exhaust gases

1. Use equipment outside in open, well-ventilated areas.
2. If used in a closed area, vent engine exhaust outside and away from any building air intakes.

ENGINE FUEL can cause fire or explosion.

Engine fuel is highly flammable

1. Stop engine before checking or adding fuel.
2. Do not add fuel while smoking or if unit is near any sparks or open flames.
3. Allow engine to cool before fuelling. If possible, check and add fuel to cold engine before beginning job.
4. Do not overfill tank - allow room for fuel to expand away from any building air intakes.

MOVING PARTS can cause injury.

Moving parts, such as fans, rotors, and belts can cut fingers and hands and catch loose clothing.

1. Keep all doors, panels, covers, and guards closed and securely in place.
2. Stop engine before installing or connecting unit.
3. Have only qualified people remove guards or covers for maintenance and troubleshooting as necessary.
4. To prevent accidental starting during servicing, disconnect negative (-) battery cable from battery.
5. Keep hands, hair, loose clothing, and tools away from moving parts.
6. Re-install panels or guards and close doors when servicing is finished and before starting engine.

SPARKS can cause BATTERY GASES TO EXPLODE; BATTERY ACID can burn eyes and skin.

Batteries contain acid and generate explosive gases

1. Always wear a face shield when working on a battery.
2. Stop engine before disconnecting or connecting battery cables.
3. Do not allow tools to cause sparks when working on a battery.
4. Do not use welder to charge batteries or jump start vehicles.

STEAM AND PRESSURIZED HOT COOLANT can burn face, eyes, and skin.

The coolant in the radiator can be very hot and under pressure

1. Do not remove radiator cap when engine is hot. Allow engine to cool.
2. Wear gloves and put a rag over cap area when removing cap.
3. Allow pressure to escape before completely removing cap.

WARNING: This product, when used for welding or cutting, produces fumes or gases which contain chemicals known to the State of California to cause birth defects and, in some cases, cancer. (California Health & Safety Code Sec. 25249.5 et seq.)

NOTE: Considerations About Welding And The Effects Of Low Frequency Electric And Magnetic Fields

The following is a quotation from the General Conclusions Section of the U.S. Congress, Office of Technology Assessment, Biological Effects of Power Frequency Electric & Magnetic Fields Background Paper OTA-BP-E-63 (Washington, DC: U.S. Government Printing Office, May 1989): "... there is now a very large volume of scientific findings based on experiments at the cellular level and from studies with animals and people which clearly establish that low frequency magnetic fields can interact with, and produce changes in, biological systems. While most of this work is of very high quality, the results are complex. Current scientific understanding does not yet allow us to interpret the evidence in a single coherent framework. Even more frustrating, it does not yet allow us to draw definite conclusions about questions of possible risk or to offer clear science based advice on strategies to minimize or avoid potential risks."

To reduce magnetic fields in the work place, use the following procedures:

1. Keep cables close together by twisting or taping them.
2. Do not coil or drape cables around the body.
3. Arrange cables to one side and away from the operator.
4. Keep welding power source and cables as far away from body as practical.

About Pacemakers: The above procedures are among those also normally recommended for pacemaker wearers. Consult your doctor for complete information.

1.01 Publications

Refer to the following standards or their latest revisions for more information:

1. OSHA, SAFETY AND HEALTH STANDARDS, 29CFR 1910, obtainable from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402
2. ANSI Standard Z49.1, SAFETY IN WELDING AND CUTTING, obtainable from the American Welding Society, 550 N.W. LeJeune Rd, Miami, FL 33126
3. NIOSH, SAFETY AND HEALTH IN ARC WELDING AND GAS WELDING AND CUTTING, obtainable from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402
4. ANSI Standard Z87.1, SAFE PRACTICES FOR OCCUPATION AND EDUCATIONAL EYE AND FACE PROTECTION, obtainable from American National Standards Institute, 1430 Broadway, New York, NY 10018
5. ANSI Standard Z41.1, STANDARD FOR MEN'S SAFETY-TOE FOOTWEAR, obtainable from the American National Standards Institute, 1430 Broadway, New York, NY 10018
6. ANSI Standard Z49.2, FIRE PREVENTION IN THE USE OF CUTTING AND WELDING PROCESSES, obtainable from American National Standards Institute, 1430 Broadway, New York, NY 10018
7. AWS Standard A6.0, WELDING AND CUTTING CONTAINERS WHICH HAVE HELD COMBUSTIBLES, obtainable from American Welding Society, 550 N.W. LeJeune Rd, Miami, FL 33126

8. NFPA Standard 51, OXYGEN-FUEL GAS SYSTEMS FOR WELDING, CUTTING AND ALLIED PROCESSES, obtainable from the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269
9. NFPA Standard 70, NATIONAL ELECTRICAL CODE, obtainable from the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269
10. NFPA Standard 51B, CUTTING AND WELDING PROCESSES, obtainable from the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269
11. CGA Pamphlet P-1, SAFE HANDLING OF COMPRESSED GASES IN CYLINDERS, obtainable from the Compressed Gas Association, 1235 Jefferson Davis Highway, Suite 501, Arlington, VA 22202
12. CSA Standard W117.2, CODE FOR SAFETY IN WELDING AND CUTTING, obtainable from the Canadian Standards Association, Standards Sales, 178 Rexdale Boulevard, Rexdale, Ontario, Canada M9W 1R3
13. NWSA booklet, WELDING SAFETY BIBLIOGRAPHY obtainable from the National Welding Supply Association, 1900 Arch Street, Philadelphia, PA 19103
14. American Welding Society Standard AWSF4.1, RECOMMENDED SAFE PRACTICES FOR THE PREPARATION FOR WELDING AND CUTTING OF CONTAINERS AND PIPING THAT HAVE HELD HAZARDOUS SUBSTANCES, obtainable from the American Welding Society, 550 N.W. LeJeune Rd, Miami, FL 33126
15. 15. ANSI Standard Z88.2, PRACTICE FOR RESPIRATORY PROTECTION, obtainable from American National Standards Institute, 1430 Broadway, New York, NY 10018

1.02 Declaration of Conformity

Manufacturer and Merchandiser of Quality Consumables and Equipment: CIGWELD

Address: 71 Gower St, Preston
Victoria 3072
Australia

Description of equipment: Welding Equipment (GMAW). CIGWELD VAF-4 Professional Wirefeeder and associated accessories.

* Serial numbers are unique with each individual piece of equipment and details description, parts used to manufacture a unit and date of manufacture.
* The equipment conforms to all applicable aspects and regulations of the 'Low Voltage Directive' (Directive 73/23/EU, as recently changed in Directive 93/68/EU and to the National legislation for the enforcement of the Directive.

National Standard and Technical Specifications

The product is designed and manufactured to a number of standards and technical requirements among them are:

* IEC60974.5 2002 applicable to wirefeeders.
* AS/NZS 3652-(EMC Directive EN50199) applicable to arc welding equipment - generic emissions and regulations.
* AS60974-1 2006 applicable to welding equipment and associated accessories.
* UL-94V0 flammability rating for all Printed Circuit Boards used.
* 92/31/EEC – EMC directive EN50199 applicable to Arc Welding Equipment – generic emissions and regulations.
* Extensive product design verification is conducted at the manufacturing facility as part of the routine design and manufacturing process, to ensure the product is safe and performs as specified. Rigorous testing is incorporated into the manufacturing process to ensure the manufactured product meets or exceeds all design specifications.

CIGWELD has been manufacturing and merchandising an extensive equipment range with superior performance, ultra safe operation and world class quality for more than 30 years and will continue to achieve excellence.

1.03 Limited Warranty

LIMITED WARRANTY: CIGWELD, A Thermadyne Company, hereafter, "CIGWELD" warrants to customers of its authorized distributors hereafter "Purchaser" that its products will be free of defects in workmanship or material. Should any failure to conform to this warranty appear within the time period applicable to the CIGWELD products as stated below, CIGWELD shall, upon notification thereof and substantiation that the product has been stored, installed, operated, and maintained in accordance with CIGWELD's specifications, instructions, recommendations and recognized standard industry practice, and not subject to misuse, repair, neglect, alteration, or accident, correct such defects by suitable repair or replacement, at CIGWELD's sole option, of any components or parts of the product determined by CIGWELD to be defective.

CIGWELD MAKES NO OTHER WARRANTY, EXPRESS OR IMPLIED. THIS WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHERS, INCLUDING, BUT NOT LIMITED TO ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.

LIMITATION OF LIABILITY: CIGWELD SHALL NOT UNDER ANY CIRCUMSTANCES BE LIABLE FOR SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES, SUCH AS, BUT NOT LIMITED TO, LOST PROFITS AND BUSINESS INTERRUPTION. The remedies of the Purchaser set forth herein are exclusive and the liability of CIGWELD with respect to any contract, or anything done in connection therewith such as the performance or breach thereof, or from the manufacture, sale, delivery, resale, or use of any goods covered by or furnished by CIGWELD whether arising out of contract, negligence, strict tort, or under any warranty, or otherwise, shall not, except as expressly provided herein, exceed the price of the goods upon which such liability is based. No employee, agent, or representative of CIGWELD is authorized to change this warranty in any way or grant any other warranty.

PURCHASER'S RIGHTS UNDER THIS WARRANTY ARE VOID IF REPLACEMENT PARTS OR ACCESSORIES ARE USED WHICH IN CIGWELD'S SOLE JUDGEMENT MAY IMPAIR THE SAFETY OR PERFORMANCE OF ANY CIGWELD PRODUCT. PURCHASER'S RIGHTS UNDER THIS WARRANTY ARE VOID IF THE PRODUCT IS SOLD TO PURCHASER BY NON-AUTHORIZED PERSONS.
The warranty is effective for the time stated below beginning on the date that the authorized distributor delivers the products to the Purchaser. Notwithstanding the foregoing, in no event shall the warranty period extend more than the time stated plus one year from the date CIGWELD delivered the product to the authorized distributor.

Terms of Warranty – July 2007

1. The Trade Practices Act 1974 (Commonwealth) and similar State Territory legislation relating to the supply of goods and services, protects consumers' interests by ensuring that consumers are entitled in certain situations to the benefit of various conditions, warranties, guarantees, rights and remedies (including warranties as to merchantability and fitness for purpose) associated with the supply of goods and services. A consumer should seek legal advice as to the nature and extent of these protected interests. In some circumstances, the supplier of goods and services may legally stipulate that the said conditions, warranties, guarantees, rights and remedies are limited or entirely excluded. The warranties set out in Clause 2 shall be additional to any non-excludable warranties to which the Customer may be entitled pursuant to any statute.
2. Subject to Clause 3. CIGWELD gives the following warranties to the Customer:

   Insofar as they are manufactured or imported by CIGWELD, goods will upon delivery be of merchantable quality and reasonably fit for the purpose for which they are supplied by CIGWELD.

   CIGWELD will repair or, at its option, replace those of the goods which, upon examination, are found by CIGWELD to be defective in workmanship and/or materials.

   CIGWELD reserves the right to request documented evidence of date of purchase.
3. The Warranty in Clause 2;

   Is conditional upon:

   The Customer notifying CIGWELD or our Accredited Distributor in writing of its claim within seven (7) days of becoming aware of the basis thereof, and at its own expense returning the goods which are the subject of the claim to CIGWELD or nominated Accredited Distributor/Accredited Service Provider.

   The goods being used in accordance with the Manufacturer's Operating Manuals, and under competent supervision.

   Does not apply to:

   Obsolete goods sold at auction, second-hand goods and prototype goods.

   Breakdown or malfunction caused by accident, misuse or normal wear and tear.

   Repairs or replacement made other than by CIGWELD or Accredited Service Providers, unless by prior arrangement with CIGWELD.

   Replacement parts or accessories which may affect product safety or performance and which are not manufactured, distributed or approved by CIGWELD.
4. CIGWELD declares that, to the extent permitted by law, it hereby limits its liability in respect of the supply of goods which are not of a kind ordinarily acquired for personal, domestic or household use or consumption to any one or more of the following (the choice of which shall be at the option of CIGWELD).

   The replacement of the goods or the supply of equivalent goods.

   The repair of goods.

   The payment of cost of replacing the goods or acquiring equivalent goods.

   The payment of the cost of having goods repaired.
5. Except as provided in Clauses 2 to 4 above, to the extent permitted by statute, CIGWELD hereby excludes all liability for any loss, damage, death or injury of any kind whatsoever occasioned to the Customer in respect of the supply of goods including direct, indirect, consequential or incidental loss, damage or injury of any kind.

Warranty Schedule – January 2007

These warranty periods relate to the warranty conditions in clause 2. All warranty periods are from date of sale from the Accredited Distributor of the equipment. Notwithstanding the foregoing, in no event shall the warranty period extend more than the time stated plus one year from the date CIGWELD delivered the product to the Accredited Distributor. Unless otherwise stated the warranty period includes parts and labour.

CIGWELD reserves the right to request documented evidence of date of purchase.

CIGWELD MIG WELDING EQUIPMENT	*WARRANTY PERIOD*
TRANSMIG VAF-4 Professional Wirefeeder	
Control Printed Circuit Board	3 years
All other circuits and components including, but not limited to, relays, switches, contactors, solenoids, fans, power switch semi-conductors	1 year
ACCESSORIES	
MIG torch (where fitted)	3 months
MIG torch consumable items	NIL

Please note that the information detailed in this statement supersedes any prior published data produced by CIGWELD.

WARNING 4

For the purpose of safety and performance and to protect your CIGWELD Equipment Warranty always use genuine CIGWELD replacement parts and accessories.

SECTION 2: Introduction

2.01 How to Use This Manual

This Owner's Manual usually applies to just the underlined specification or part numbers listed on the page 3. If none are underlined, they are all covered by this manual.
To ensure safe operation, read the entire manual, including the chapter on safety instructions and warnings.
Throughout this manual, the word WARNING,
CAUTION and NOTE may appear. Pay particular attention to the in formation provided under these headings. These special annotations are easily recognized as follows:

WARNING

Gives information regarding possible personal injury. Warnings will be enclosed in a box such as this.

CAUTION

Refers to possible equipment damage. Cautions will be shown in bold type.

NOTE

Offers helpful information concerning certain operating procedures. Notes will be shown in italics.

2.02 Equipment Identification

The unit's identification number (specification or part number), model, and serial number usually appear on a nameplate attached to the machine.
Equipment which does not have a nameplate attached to the machine is identified only by the specification or part number printed on the shipping container. Record these numbers for future reference.

2.03 Receipt of Equipment

When you receive the equipment, check it against the invoice to make sure it is complete and inspect the equipment for possible damage due to shipping. If there is any damage, notify the carrier immediately to file a claim. Furnish complete information concerning damage claims or shipping errors to:
CIGWELD, Customer Care Department, 71 Gower St, Preston, Victoria, Australia, 3072.
Include all equipment identification numbers as described above along with a full description of the parts in error.

Additional copies of this manual may be purchased by contacting CIGWELD, Customer Care Department, at the address given above. Include the Owner's Manual number and equipment identification numbers.

SECTION 3: Electromagnetic Compatibility

WARNING 5

Extra precautions for Electromagnetic Compatibility may be required when this Welding Power Source is used in a domestic situation.

3.01 Installation and use - Users Responsibility

The 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 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 the welding circuit, see NOTE 1. In other cases it could involve constructing an electromagnetic screen enclosing the Welding Power Source and the work, complete with associated input filters. In all cases, electromagnetic disturbances shall be reduced to the point where they are no longer troublesome.

NOTE 1

The welding circuit may or may nor be earthed for safety reasons. Changing the earthing arrangements should only be authorised by a person who is competent to assess whether the changes will increase the risk of injury, e.g. by allowing parallel welding current return paths which may damage the earth circuits of other equipment. Further guidance is given in IEC 974-13 Arc Welding Equipment - Installation and use (under preparation).

3.02 Assessment of Area

Before installing welding equipment, the user shall make an assessment of potential electromagnetic problems in the surrounding area. The following shall be taken into account

i) Other supply cables, control cables, signalling and telephone cables; above, below and adjacent to the welding equipment.

ii) Radio and television transmitters and receivers.

iii) Computer and other control equipment.

iv) Safety critical equipment, e.g. guarding of industrial equipment.

v) The health of people around, e.g. the use of pacemakers and hearing aids.

vi) Equipment used for calibration and measurement.

vii) The time of day that welding or other activities are to be carried out.

viii) The immunity of other equipment in the environment: the user shall ensure that other equipment being used in the environment is compatible: this may require additional protection measures.

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.

3.03 Methods of Reducing Electromagnetic Emissions

a) 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 of 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 it's 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.

b) Maintenance of 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 adjustments covered in the manufacturer's instructions. In particular, the spark gaps of arc striking and stabilising devices should be adjusted and maintained according to the manufacturer's recommendations.

c) 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.

d) 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 the metallic components and the electrode at the same time. The operator should be insulated from all such bonded metallic components.

e) Earthing of the Workpiece

Where the workpiece is not bonded to earth for electrical safety, nor connected to earth because of it's size and position, e.g. 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 the workpiece 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.

f) Screening and Shielding

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

SECTION 4: General Information

4.01 VAF-4 Professional Wirefeeder

The VAF-4 Professional 4 Roll Wirefeeder is compact, light weight and easy to use with a wide range of Power Sources and has many great features to offer the operator such as Wire Inching, Gas Purge, Trigger latching, along with standard features such as Wirespeed Control and Spot timer Control.

A MIG Power Source plus a VAF-4 Professional 4 Roll Wirefeeder give excellent performance on mild steel, flux cored, stainless steel, aluminium, silicon bronze and hard facing wires with the Argon based shielding gases.

The following instructions detail how to correctly set up the machine and give guidelines on gaining the best production efficiency from the Power Source and Wirefeeder. Please read these instructions thoroughly before using your TRANSMIG VAF-4 Professional wirefeeder.

4.02 User Responsibility

This equipment will perform as per the information contained herein when installed, operated, maintained and repaired in accordance with the instructions provided. This equipment must be checked periodically. Defective equipment (including welding leads) should not be used. Parts that are broken, missing, plainly worn, distorted or contaminated, should be replaced immediately. Should such repairs or replacements become necessary, it is recommended that such repairs be carried out by appropriately qualified persons approved by CIGWELD. Advice in this regard can be obtained by contacting accredited CIGWELD Distributor.

This equipment or any of its parts should not be altered from standard specification without prior written approval of CIGWELD. The user of this equipment shall have the sole responsibility for any malfunction which results from improper use or unauthorised modification from standard specification, faulty maintenance, damage or improper repair by anyone other than appropriately qualified persons approved by CIGWELD.

4.03 Duty Cycle

The rated duty cycle of a Welding Power Source, is a statement of the time it may be operated at its rated welding current output without exceeding the temperature limits of the insulation of the component parts. To explain the 10 minute duty cycle period the following example is used. Suppose a Welding Power Source is designed to operate at a 60% duty cycle, 200 amperes at 24 volts. This means that it has been designed and built to provide the rated amperage (200A) for 6 minutes, i.e. arc welding time, out of every 10 minute period (60% of 10 minutes is 6 minutes). During the other 4 minutes of the 10 minute period the Welding Power Source must idle and allowed to cool.

SECTION 5: Safe Practices For The Use Of Welding Equipment

In many situations the “striking” voltage can be hazardous. Any person touching simultaneously the electrode lead/terminal and the work lead/terminal may receive a serious electrical shock. Additional precautions must be exercised where two Welding Power Sources are being used close to each other because, under certain conditions, the voltages between the welding terminals of the two Welding Power Sources could be two times the specified open circuit voltage.

It is essential that the Welding Power Source is correctly installed, if necessary, by a qualified electrician and maintained in sound mechanical and electrical condition. It is also important that the Welding Power Source be switched off when not in use.

5.01 Precautions to be Taken by Operators

- Whenever practicable, all parts of the welding circuit should be isolated from earth and other conducting material and under no circumstances should any earthing conductor of the electrical installation be used in place of the work lead.
- The Mains supply voltage should be switched off before connecting or disconnecting welding leads. Welding lead connections must have clean contact surfaces and must be securely tightened. Poor connections will result in overheating and loss of welding current. All parts of the welding circuit, including the return paths, are to be considered electrically alive, so the operator must ensure that no part of the body is placed in such a position that it will provide a path for an electric current.
- Welding operators should avoid direct contact with the work to be welded or against any metal in contact with the work. When this cannot be avoided the operator must not touch any exposed portion of the electrode holder with any part of the body. Should this occur, the operator will risk completing the electrical circuit through the body.
- When welding in confined spaces, where reasonable movement is restricted, particular care must be taken to ensure that the area is well ventilated and the operator is under constant observation by a person who can immediately switch off the power and give assistance in an emergency.
- The flux covering of an electrode cannot be assumed to provide effective insulation, consequently an insulating glove must be worn when placing an electrode into its holder, or should it be necessary to handle an electrode once it is in contact with its holder.

- During pauses between welding runs, electrode holders, TIG torches and MIG torches should be so placed that they cannot make electrical contact with persons or conductive objects.
- The welding leads, both the electrode lead, TIG torch lead or MIG torch lead and the work lead, must be protected from damage. Damaged leads must not be used.
- Keep combustible materials away from the welding area. Have a suitable fire extinguisher handy.
- Do not stand on damp ground when welding.

5.02 Personal Protection

The radiation from an electric arc during the welding process can seriously harm eyes and skin. It is essential that the following precautions be taken:

- Gloves should be flameproof gauntlet type to protect hands and wrists from heat burns and harmful radiations. They should be kept dry and in good repair.
- Protective clothing must protect the operator from burns, spatter and harmful radiation. Woollen clothing is preferable to cotton because of its greater flame resistance. Clothing should be free from oil or grease. Wear leggings and spats to protect the lower portion of the legs and to prevent slag and molten metal from falling into boots or shoes.
- Welding Faceshield

  It is a requirement to use a welding Faceshield, complying to a relevant standard, when electric arc welding. Use a welding Faceshield in serviceable condition and fitted with an eye filter lens to safely reduce harmful radiation from the arc as per Table 1.

Welding Process	Welding current range	Suggested Filter Lens
GMAW	40 – 150A	Shade 10
GMAW	150 – 250A	Shade 11
GMAW	250 – 300A	Shade 12
GMAW	300 – 400A	Shade 13
GMAW	Over 400A	Shade 14

Table 1 - Filter lens size verses welding current/electrode size

Protective filter lenses are provided to reduce the intensity of radiation entering the eye thus filtering out harmful infra-red, ultra-violet radiation and a percentage of the visible light. Such filter lenses are incorporated within welding handshields. To prevent damage to the filter lenses from molten or hard particles an additional hard clear glass or special plastic external cover lens is provided. This cover lens should always be kept in place and replaced before the damage impairs your vision while welding.

Notes:

- Recognised standards for recommended practices for occupational eye protection include AS/ANZ 1336 and EN 175.
- For maximum possible protection, the use of full helmet equipment is recommended.
- The indicated filter lens shade numbers are minimum. If any discomfort is felt, higher shade numbers (i.e. darker filters) should be used.

SECTION 6: Resuscitation For Electric Shock Victims

Electric shock may kill immediately. Early resuscitation is required if a life is to be saved. Every Second Counts! Electrical currents may:

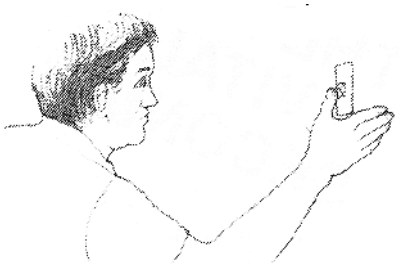
- Stop the heart;
- Cause contraction of the muscles of the body;
- Paralyse breathing due to paralysis of the centre of respiration in the brain;
- Cause burns.

The victims often cannot free themselves from the current and may not be able to breathe due to fixation of the chest.

6.01 Resuscitation

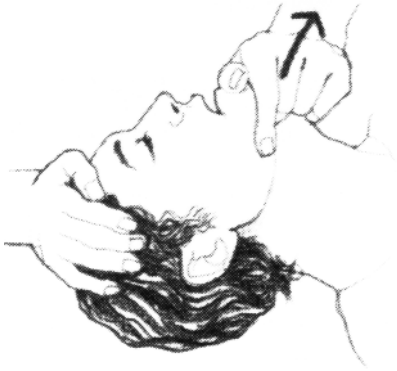
Efficient resuscitation requires training which is available from the St John's Ambulance Association, Red Cross and other sources.

1 Don't become a victim. Switch off power if possible. If not, remove victim from contact, using some insulating material.



2 If unconscious, place victim on their side and clear vomit and other foreign matter from mouth. Check for breathing by look, listen and feel. If not breathing, commence expired air resuscitation (E.A.R.). This should take no longer than 3 or 4 seconds.

3 Place victim flat on their back on a hard surface, open airway - using head tilt and jaw support as shown.



4 Begin artificial breathing - 5 full breaths in 10 seconds, sealing nostrils with cheek or holding nose closed.

5 Check carotid pulse in neck. If pulse is present, continue E.A.R.
15 breaths per minute for adults.
20 breaths per minute for children.

6 If pulse is absent and you have been trained, begin cardio pulmonary resuscitation (C.P.R).
Cardiac Compression - depress lower end of breast bone (sternum) 4cm to 5cm, less for small children.
<u>One rescuer</u> - 2 breaths, 15 compressions in 15 seconds, i.e. 4 cycles per minute.
<u>Two rescuers</u> - 1 breath, 5 compressions in 5 seconds, i.e. 12 cycles per minute.

7 Check for return of pulse and breathing after 1 minute and at least every 2 minutes. Continue uninterrupted until trained assistance is available. When breathing and pulse return, turn on side and continue observation.

SECTION 7: Specifications

7.01 VAF-4 Professional Wirefeeder Specifications

Description (Refer NOTE 2)	VAF-4 (14 pin)	VAF-4 (19 pin)
Product Part Number	705700	706965
Control Supply Voltage	110 VAC	110 VAC
Control Supply Current	2.5A	2.5A
Minimum Wire Speed	2 m/min	2 m/min
Maximum Wire Speed	20 m/min	20 m/min
Wire Diameter (Hard)	0.8mm – 1.6mm	0.8mm – 1.6mm
Wire Diameter (Cored)	1.2mm – 2.0mm	1.2mm – 2.0mm
Wire Diameter (Soft)	1.2mm – 1.6mm	1.2mm –1.6mm
Operating Temperature Range	0ºC - 40ºC	0ºC - 40ºC
Wire Spool Size	15kg / 25kg	15kg / 25kg
Spot Timer Range	0.2s – 3.0s	0.2s – 3.0s
Current Rating	325A 100%, 420A 60%, 500A 40%	325A 100%, 420A 60%, 500A 40%
Torch Connector	Tweco #4	Tweco #4
Trigger Latching / Spot Timer	✓	✓
Gas Purge / Wire Inching	✓	✓
Power Source Voltage Control	✓	✓
Remote Pendant Outlet	optional	optional
Interconnection control plug	14 Pin	19 Pin
Burnback Time Range	0 – 0.6s	0 – 0.6s
Wirefeeder Mass	30kg	30kg
Dimensions	30kg	30kg
Gas Fitting	5/8-18UNF	5/8-18UNF
Suitable Gas Types	Argon based mixed gases & C02	Argon based mixed gases & C02
Maximum Inlet Gas Pressure	1.2 MPa (gas hose)	1.2 MPa (gas hose)

Table 2 – Wirefeeder Specifications

NOTE 2

Due to variations that can occur in manufactured products, claimed performance, voltages, ratings, all capacities, measurements, dimensions and weights quoted are approximate only. Achievable capacities and ratings in use and operation will depend upon correct installation, use, applications, maintenance and service.

7.02 Optional Accessories

Part Number	Description
710061	Wheeling Kit
704620	Torch Adaptor
717201	TWECO No.4 torch (3.6M)
SE4004M16	TWECO Supra XT No 4 torch (4.0M)
7977729	Feed Roll 0.6 / 0.8 HARD
7977344	Feed Roll 0.8 / 1.0 HARD
7977703	Feed Roll 0.9 / 1.2 HARD
7977346	Feed Roll 1.2 / 1.6 HARD
7977733	Feed Roll 0.8 / 0.9 SOFT
7977730	Feed Roll 1.0 / 1.2 SOFT

7977348	Feed Roll 1.2 / 1.6 SOFT
7977372	Feed Roll 1.6 / 2.0 CORED
7977734	Feed Roll 0.8 / 0.9 CORED
7977347	Feed Roll 1.2 / 1.6 CORED
7977451	Feed Roll 2.0 / 2.4 CORED
7977553	Feed Roll 2.8 / 3.2 CORED
705000	MIG pliers (size No 1)
705001	MIG pliers (size No 2)
705470	Remote Pendant Interface Kit
705467	Remote Pendant
646265	Weld measurement gauge

Table 3 – Optional Accessories

NOTE 3

Two feedrolls are required for each electrode wire size used

SECTION 8: Installation Recommendations

8.01 Environment

These units are not designed for use in environments with increased hazard of electric shock.

a) Examples of environments with increased hazard of electric shock are -

i) In locations in which freedom of movement is restricted, so that the operator is forced to perform the work in a cramped (kneeling, sitting or lying) position with physical contact with conductive parts;

ii) In locations which are fully or partially limited by conductive elements, and in which there is a high risk of unavoidable or accidental contact by the operator, or

iii) In wet or damp hot locations where humidity or perspiration considerable reduces the skin resistance of the human body and the insulation properties of accessories.

b) Environments with increased hazard of electric shock do not include places where electrically conductive parts in the near vicinity of the operator, which can cause increased hazard, have been insulated.

8.02 Location

Be sure to locate the welder according to the following guidelines:

a) In areas, free from moisture and dust.

b) Ambient temperature between 0^0 C to 40^0 C.

c) In areas, free from oil, steam and corrosive gases.

d) In areas, not subjected to abnormal vibration or shock.

e) In areas, not exposed to direct sunlight or rain.

f) Place at a distance of 300mm or more from walls or similar that could restrict natural air flow for cooling.

8.03 Ventilation

Since the inhalation of welding fumes can be harmful, ensure that the welding area is effectively ventilated.

8.04 Mains Supply Voltage Requirements

The Mains supply voltage should be within $\pm$ 10% of the rated Mains supply voltage. Too low a voltage may cause poor welding performance. Too high a supply voltage will cause components to overheat and possibly fail.

The Welding Power Source must be:

- Correctly installed, if necessary, by a qualified electrician.
- Correctly earthed (electrically) in accordance with local regulations.
- Connected to the correct size power point and fuse as per the Specifications on pages 15.

SECTION 9: Set up for the VAF-4 Professional Wirefeeder

9.01 Power Source Connections

a) Remove all packaging materials.

b) Connect the work lead to the negative welding terminal (-) [positive welding terminal (+) for flux cored electrode wire]. If in doubt, consult the electrode wire manufacturer.

c) Position a gas cylinder on the rear tray of the Power Source and lock securely to the Power Source cylinder bracket with the chain provided. If this arrangement is not used or the Power Source is not fitted with a gas cylinder tray then ensure that the gas cylinder is secured to a building pillar, wall bracket or otherwise securely fixed in an upright position.

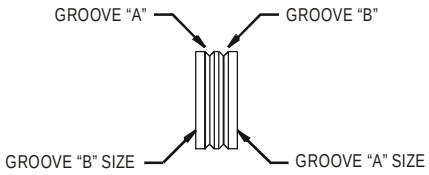
9.02 Wirefeeder Connections

a) Connect the welding power cable from the Wirefeeder's interconnection cables to the positive welding terminal (+) [negative welding terminal (-) for flux cored electrode wire]. If in doubt, consult the electrode wire manufacturer.

b) Connect the control cable from the Wirefeeder to the socket on the Power Source.

c) Fit the gas regulator and flowmeter to the gas cylinder then connect the gas hose from the rear of the Wirefeeder to the Flowmeter outlet.

d) Dual groove feed rollers are supplied as standard. They can accommodate 0.9 / 1.2 diameter hard wires. Select the roller required with the chosen wire size marking facing outwards.



e) Fit the electrode wire spool to the wire reel hub. Ensure that the drive dog-pin engages the mating hole in the wire spool. Push the 'R' clip into place to retain the wire spool securely. The electrode wire should feed from the bottom of the spool.

f) MIG Torch, EURO MIG Torch Connection
Fit the MIG Torch to the Wirefeeder by pushing the torch connector into the brass torch adaptor and screwing the plastic torch nut clockwise to secure the torch to the torch adaptor. Remove the contact tip from the torch handset.

g) Lift up the wire feeder pressure levers and pass the electrode wire through the inlet guide, between the rollers, through the centre guide, between the rollers, through the outlet guide and into the MIG torch.

WARNING 6

DO NOT WEAR GLOVES WHILE THREADING THE WIRE OR CHANGING THE WIRE SPOOL.

h) Lower the pressure levers and with the torch lead reasonably straight, feed the electrode wire through the torch. Fit the appropriate contact tip, eg a 0.9mm tip for 0.9mm wire.

i) Press the Torch switch to feed the wire through the torch.

WARNING 7

The electrode wire will be at welding voltage potential whilst it is being fed through the wirefeeder system if the wire is fed by using the TORCH SWITCH

9.03 Drive Roller Pressure Adjustment

The moveable rollers apply pressure to the grooved feed rollers via a scaled adjustable tension screw. These devices should be adjusted to a minimum pressure that will provide satisfactory WIREFEED without slippage. If slipping occurs, and inspection of the wire contact tip reveals no wear, distortion or burn back jam, the conduit liner should be checked for kinks and clogging by metal flakes and swarf. If it is not the cause of slipping, the feedroll pressures can be increased by rotating the scaled tension screws clockwise. The use of excessive pressure may cause rapid wear of the feed rollers, shafts and bearing.

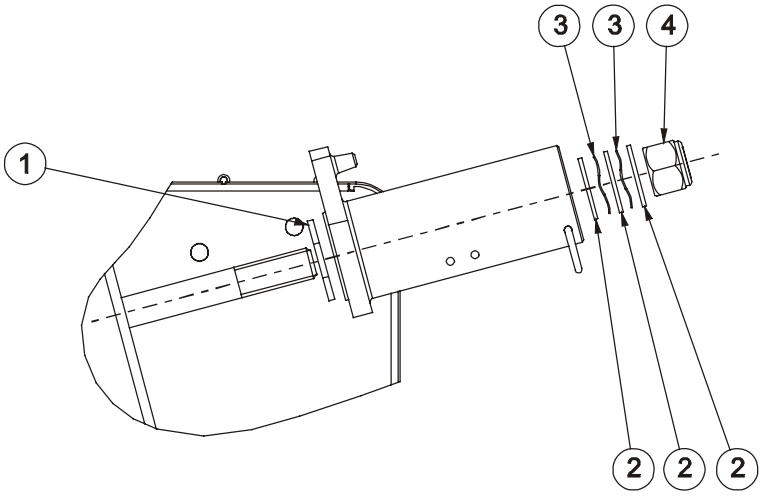
9.04 Wire Reel Brake

The wire reel hub incorporates a friction brake which is adjusted during manufacture for optimum breaking. If it is considered necessary, adjustment can be made by turning the large nut inside the open end of the hub clockwise to tighten the brake. Correct adjustment will result in the wire reel circumference continuing no further than 20mm after release of the trigger. The electrode wire should be slack without becoming dislodged from wire spool

CAUTION 1

Overtension of brake will cause rapid wear of mechanical WIREFEED parts, overheating of electrical componentry and possibly an increased incidence of electrode wire Burnback into contact tip

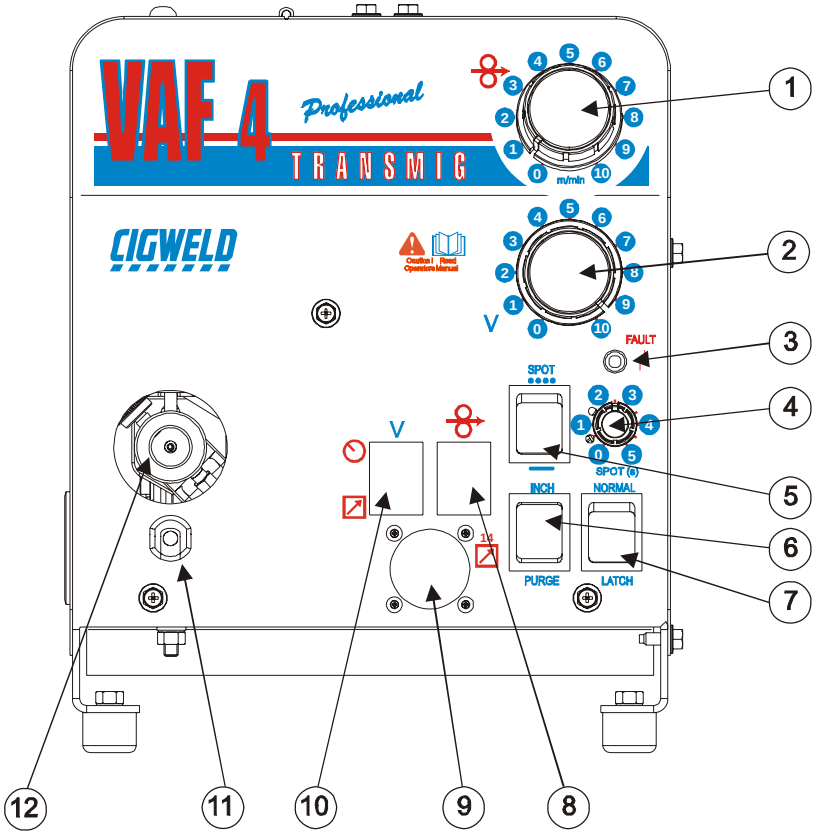
9.05 Wire Reel Hub Assembly



Item Number	Part Number / Description
1	7976411 / friction Washer
2	NB1245 / washer flat M16
3	7977187 / washer wave M16
4	7958040 / nut nyloc 5/8 BSW
--	702337 / Hub

Table 4 – Wire Spool parts

SECTION 10: Wirefeeder Controls, Indicators and Features



10.01 Wirespeed Control

The Wirespeed Control knob controls the welding current via the electrode wirefeed rate. ie the speed of the wirefeed motor.

10.02 Power Source Voltage Control

The Power Source Voltage Control knob controls the Power Source welding voltage.

10.03 Earth Fault Indicator LED

The VAF-4 contains an electronic circuit that detects if welding current is flowing in the earthing wire of the interconnection lead, and disables the Wirefeeder Trigger Output. The Earth Fault Indicator LED will illuminate if the protection circuit has operated.

This circuit may be reset by turning the 110VAC control power off to the Wirefeeder.

10.04 Spot Timer Control

The Spot Timer Control knob controls the Spot Time.

10.05 Spot Timer Switch

This mode of welding is used to weld two plates together at a desired location by melting the top & bottom plates together to form a nugget between them. The spot time period is set by the Spot Timer control

Set this switch to “Continuous” for normal welding operation.

10.06 Wire Inch / Gas Purge Switch

The electrode wire can be fed through the Wirefeed system & MIG torch when the Inch Switch is depressed. No gas flows and welding voltage is not present when the Inch Switch is depressed.

The gas line in the Wirefeed system & MIG torch can be purged when the Gas Purge Switch is depressed. The Wirefeed motor does not operate and welding voltage is not present when the Inch Switch is depressed.

NOTE 4

The electrode wire is not at welding voltage potential whilst it is being fed through the Wirefeed system with Inch switch operation.

10.07 Trigger Latch Switch

This switch selects 2T (normal) or 4T (trigger latching) mode of operation.

Trigger Latching (4T) function is as follows:

- When the torch trigger switch is depressed the gas flows, when the torch trigger switch is released the electrode wire is fed through the MIG torch and welding current is established. This allows for manual control of PREFLOW if desired.
- When the torch trigger switch is depressed for a second time the electrode wire stops then, when the Burnback time has expired, the welding current ceases. When the torch trigger switch is released the gas flow ceases. This allows for manual control of POSTFLOW if desired.

10.08 Remote Wirespeed Switch (if option kit 705470 fitted)

This switch selects local wirespeed (front panel control) or remote wire speed from the optional remote pendant 705467.

10.09 Remote Control Socket (if option kit 705470 fitted)

The optional remote pendant 705467 connects to this socket.

10.10 Remote Wirespeed Switch (if option kit 705470 fitted)

This selects local Power Source Voltage (front panel control) or remote Power Source Voltage from the optional remote pendant 705467.

Socket Pin	Part Number / Description
C	Remote Power Source Voltage Control Potentiometer Maximum
D	Remote Power Source Voltage Control Potentiometer Minimum
E	Remote Power Source Voltage Control Potentiometer Wiper
K	Chassis Ground (Mains Earth)
L	Remote Wirespeed Control Potentiometer Maximum
M	Remote Wirespeed Control Potentiometer Minimum
N	Remote Wirespeed Control Potentiometer Wiper

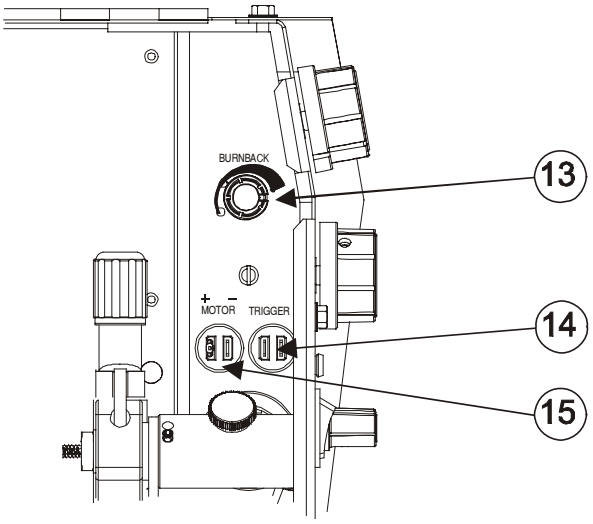
Table 5 – Optional Remote Control Socket configuration

10.11 Torch Trigger Lead

The Torch Trigger Lead connects to the trigger terminals on the MIG torch

10.12 Torch Connector

The MIG torch connects to this outlet.



10.13 Burnback Control

Burnback time is the difference between the wirefeed motor stopping and switching off of the welding current. The Burnback time allows the electrode wire to burn out of the molten metal weld pool. The Burnback time is factory set for optimum performance.

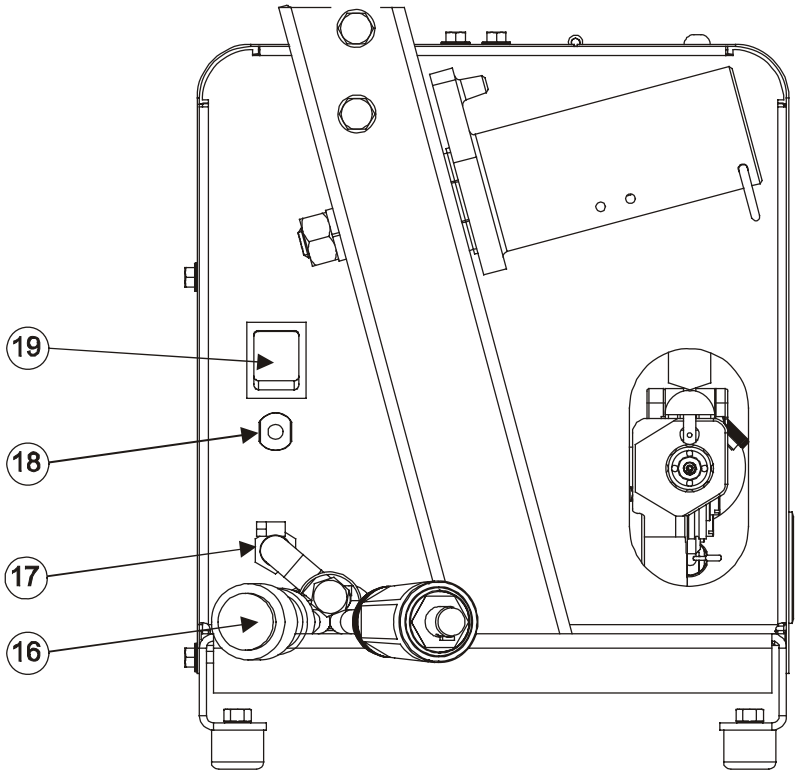
Clockwise adjustment increases Burnback time.

10.14 Torch Trigger Connector (internal)

The Torch Trigger Lead connects to the Trigger Terminals on the Wirefeeder Internal Panel

10.15 Motor Connector (internal)

The Wirefeed Motor connects to the Motor Terminals on the Wirefeeder Internal Panel



10.16 Interconnection lead

The Interconnection Lead provides the control power, control signals & the welding cable connection to the Wirefeeder

Socket Pin	Part Number / Description
A	Output to energise the power supply contactor (Contact closure is provided between socket pins A and B to energise the contactor)
B	Output to energise the power supply contactor
C	Remote Power Source Voltage Control Potentiometer Maximum
D	Remote Power Source Voltage Control Potentiometer Minimum
E	Remote Power Source Voltage Control Potentiometer Wiper
G	115VAC common
I	Input Supply 110VAC 10A with respect to Socket G (circuit common)
K	Chassis Ground (Mains Earth)

Table 6 – Interconnection Control Plug configuration

10.17 Gas solenoid

Gas inlet for the TRANSMIG VAF-4 Wirefeeder.

10.18 4A Circuit Breaker

This Circuit Breaker protects the unit from electrical faults.

NOTE 5

If the circuit breaker trips, a short cooling period must be allowed before an attempt is made to reset the unit by pressing the circuit breaker reset button.

10.19 110VAC On / Off Switch

The 110VAC Power On / Off Switch turns the power on or off to the wirefeeder.

SECTION 11: Basic Welding Technique

11.01 Setting of the Power Source & Wirefeeder s

Power source and Wirefeeder setting requires some practice by the operator, as the welding plant has two control settings that have to balance. These are the Wirespeed control and the welding Voltage Control. The welding current is determined by the Wirespeed control, the current will increase with increased Wirespeed, resulting in a shorter arc. Less wire speed will reduce the current and lengthen the arc. Increasing the welding voltage hardly alters the current level, but lengthens the arc. By decreasing the voltage, a shorter arc is obtained with a little change in current level.

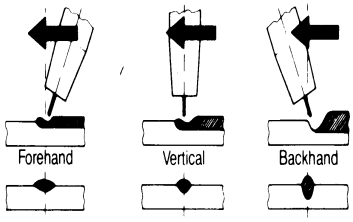
When changing to a different electrode wire diameter, different control settings are required. A thinner electrode wire needs more Wirespeed to achieve the same current level.

A satisfactory weld cannot be obtained if the Wirespeed and Voltage settings are not adjusted to suit the electrode wire diameter and the dimensions of the work piece.

If the Wirespeed is too high for the welding voltage, “stubbing” will occur as the wire dips into the molten pool and does not melt. Welding in these conditions normally produces a poor weld due to lack of fusion. If, however, the welding voltage is too high, large drops will form on the end of the wire, causing spatter. The correct setting of voltage and Wirespeed can be seen in the shape of the weld deposit and heard by a smooth regular arc sound.

11.02 Position of MIG Torch r

The angle of MIG torch to the weld has an effect on the width of the weld.



11.03 Distance from the MIG Torch Nozzle to the Work Piece

The electrode wire stick out from the MIG Torch nozzle should be between 10mm to 20.0mm. This distance may vary depending on the type of joint that is being welded.

11.04 Travel Speed

The speed at which the molten pool travels influences the width of the weld and penetration of the welding run.

11.05 Electrode Wire Size Selection

The choice of Electrode wire size and shielding gas used depends on the following

- Thickness of the metal to be welded
- Type of joint
- Capacity of the wire feed unit and Power Source
- The amount of penetration required
- The deposition rate required
- The bead profile desired
- The position of welding
- Cost of the wire

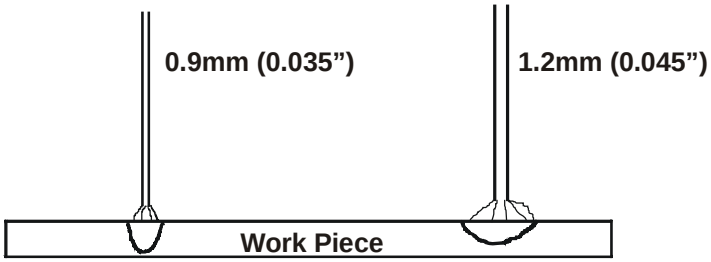
Weld metal deposition rate is proportional to current density. Current density is defined as the current per cross sectional area of the electrode wire and is normally expressed as amps per mm^2. An example is shown below

Electrode Wire Size mm (inch)	Current	Current Density (A/mm^2)	Deposition Rate (kg/hour)
0.9 (0.035)	200A	314	3.2
1.2 (0.045)	200A	177	2.8

Table 7 – Electrode Wire Deposition Rate

This demonstrates that where the upper limit of current is limited by machine capacity and duty cycle, higher deposition rates and therefore greater productivity will be achieved by using smaller electrode wire. The TRANSMIG is a particularly efficient MIG welder with the 0.9mm steel wire in spray transfer mode. The savings from decreased welding time will more than cover the small cost penalty of the smaller electrode wire sizes. (0.9mm wire cost approximately 10% more than 1.2mm, but is deposited approximately 15% faster).

Higher current density (or smaller diameter wire) also gives deeper penetration



Penetration comparison using 200A for both electrodes

SECTION 12: Routine Maintenance & Inspection

The only routine maintenance required for the TRANSMIG VAF-4 Wirefeeder is a thorough cleaning and inspection, with the frequency depending on the usage and the operating environment.

WARNING 8

There are dangerous voltage and power levels present inside this product. Do not attempt to open or repair unless you are a qualified electrical tradesperson. Disconnect the Wirefeeder from the Welding Power Source and the Welding Power Source from the Mains Supply Voltage before disassembling.

Special maintenance is not necessary for the control unit parts in the Wirefeeder. If these parts are damaged for any reason, replacement is recommended.

CAUTION 2

Do not blow air into the Wirefeeder during cleaning. Blowing air into the Wirefeeder can cause metal particles to interfere with sensitive electronic components and cause damage to the Wirefeeder.

To clean the Wirefeeder, disconnect it from the Power Source then open the enclosure and use a vacuum cleaner to remove any accumulated dirt and dust. The Wirefeeder should also be wiped clean. If necessary, solvents that are recommended for cleaning electrical apparatus may be used.

Troubleshooting and repairing the TRANSMIG VAF-4 Wirefeeder should be carried out only by those who are familiar with electrical equipment.

12.01 Cleaning the Feed Rolls

Clean the grooves in the drive rolls frequently. This can be done by using a small wire brush. Also wipe off, or clean the grooves on the upper feed roll. After cleaning, tighten the feed roll retaining knobs.

SECTION 13: Basic Troubleshooting

WARNING 9

There are dangerous voltage and power levels present inside this product. Do not attempt to open or repair unless you are a qualified electrical tradesperson and you have had training in power measurements and troubleshooting techniques.

If major complex subassemblies are faulty, then the Welding Power Source must be returned to an Accredited CIGWELD Service Agent for repair.

The basic level of troubleshooting is that which can be performed without special equipment or knowledge and without removing the covers from the Wirefeeder.

13.01 Solving Problems Beyond the Welding Terminals

The general approach to fix Gas Metal Arc Welding (GMAW) problems is to start at the wire spool then work through to the MIG torch. There are two main areas where problems occur with GMAW, Porosity and Inconsistent wire feed

13.02 Solving Problems Beyond the Welding Terminals - Porosity

When there is a gas problem the result is usually porosity within the weld metal. Porosity always stems from some contaminant within the molten weld pool which is in the process of escaping during solidification of the molten metal. Contaminants range from no gas around the welding arc to dirt on the work piece surface. Porosity can be reduced by checking the following points.

FAULT	CAUSE
1 Gas cylinder contents and flow meter.	Ensure that the gas cylinder is not empty and the flow meter is correctly adjusted to 15 litres per minute.
2 Gas leaks.	Check for gas leaks between the regulator/cylinder connection and in the gas hose to the Power Source.
3 Internal gas hose in the Power Source.	Ensure the hose from the solenoid valve to the torch adaptor has not fractured and that it is connected to the torch adaptor.
4 Welding in a windy environment.	Shield the weld area from the wind or increase the gas flow.
5 Welding dirty, oily, painted, oxidised or greasy plate.	Clean contaminates off the work piece.
6 Distance between the MIG torch nozzle and the work piece.	Keep the distance between the MIG torch nozzle and the work piece to a minimum. Refer to section 11.03 on page 22.
7 Maintain the MIG torch in good working order.	A Ensure that the gas holes are not blocked and gas is exiting out of the torch nozzle. B Do not restrict gas flow by allowing spatter to build up inside the torch nozzle. C Check that the MIG torch O-rings are not damaged.

CAUTION 3

Disengage the drive roll when testing for gas flow by ear.

13.03 Solving Problems Beyond the Welding Terminals – Inconsistent Wire Feed

Wire feeding problems can be reduced by checking the following points.

FAULT	CAUSE
1 Wire spool brake is too tight	Feed roller driven by motor in the cabinet will slip.
2 Wire spool brake is too loose	Wire spool can unwind and tangle.
3 Worn or incorrect feed roller size	A Use 'U' groove drive feed roller matched to the aluminium wire size you are welding. B Use 'V' groove drive feed roller matched to the hard wire size you are welding. C Use 'knurled V' groove drive feed roller matched to the flux cored wire size you are welding.
4 Mis-alignment of inlet/outlet guides	Wire will rub against the mis-aligned guides and reduces wire feedability.
5 Liner blocked with swarf	A Increased amounts of swarf are produced by the wire passing through the feed roller when excessive pressure is applied to the pressure roller adjuster. B Swarf can also be produced by the wire passing through an incorrect feed roller groove shape or size. C Swarf is fed into the conduit liner where it accumulates thus reducing wire feedability.
6 Incorrect or worn contact tip	A The contact tip transfers the weld current to the electrode wire. If the hole in the contact tip is too large then arcing may occur inside the contact tip resulting in the wire jamming in the contact tip B When using soft wire such as aluminium it may become jammed in the contact tip due to expansion of the wire when heated. A contact tip designed for soft wires should be used.
7 Poor work lead contact to work piece	If the work lead has a poor electrical contact to the work piece then the connection point will heat up and result in a reduction of power at the arc.
8 Bent liner	This will cause friction between the wire and the liner thus reducing wire feedability

13.04 Welding Problems

FAULT	CAUSE	REMEDY
1 Undercut	A Welding arc voltage too high. B Incorrect torch angle C Excessive heat input	A Reduce voltage by reducing the Voltage Control switch positions or turn the Wirespeed control knob anticlockwise. B Adjust angle C Increase the torch travel speed or reduce welding current by reducing the Voltage Control switch positions and turn the Wirespeed control knob anti-clockwise.
2 Lack of penetration	A Welding current too low B Joint preparation too narrow or gap too tight C Shielding gas incorrect	A Increase welding current by increasing the Wirespeed control knob clockwise and increasing Voltage Control switch positions. B Increase joint angle or gap C Change to a gas which gives higher penetration

FAULT	CAUSE	REMEDY
3 Lack of fusion	Arc voltage to low	Increase Arc voltage by increasing the Voltage Control switch positions.
4 Excessive spatter	A Arc voltage too high B Arc voltage too low	A Lower voltage by reducing the Voltage Control switch positions or turn the Wirespeed control knob anti-clockwise. B Raise voltage by increasing the Voltage Control switches or turn the Wirespeed control knob clockwise.
5 Irregular weld shape	A Incorrect voltage and current settings. Convex, Arc voltage too low Concave, voltage too high B Wire is wandering C Incorrect shielding gas D Insufficient or excessive heat input	A Adjust voltage and current by adjusting the Voltage Control switch positions and the Wirespeed control knob. B Replace contact tip C Check gas selection D Adjust the Wirespeed control knob or the Voltage Control switch.
6 Arc does not have a crisp sound that short arc exhibits when the wirefeed speed and voltage are adjusted correctly	The MIG torch has been connected to the wrong voltage polarity on the front panel	Connect the MIG torch to the positive welding terminal (+) for solid wires and gas shielded flux cored wires.
7 Weld cracking	A Weld beads too small B Weld penetration narrow and deep C Excessive weld stresses D Excessive voltage E Cooling rate too fast	A Decrease torch travel speed B Reduce current and voltage and increase the MIG Torch travel speed or select a lower penetration shielding gas. C Increase weld metal strength or revise design D Decrease voltage by reducing the Voltage Control switches. E Slow the cooling rate by preheating part to be welded or cool slowly.
8 Cold weld puddle	A Faulty rectifier unit B Loss of a phase in the Mains supply voltage. C Loose welding cable connection. D Low Mains supply voltage	A Have an Accredited CIGWELD Service Agent test then replace the faulty component. B Check mains power C Check all welding cable connections. D Contact supply authority

13.05 Power Source / Wirefeeder Problems

FAULT	CAUSE	REMEDY
1 Indicator light is ON but welding arc can not be established.	Power Source is in the *STANDBY* position.	Set the Power Source to a welding setting.
2 Mains supply voltage is ON. Indicator light is not lit and welding arc can not be established.	A Primary fuse is blown. B Broken connection in primary circuit.	A Replace primary fuse. B Have an Accredited CIGWELD Service Agent check primary circuit.
3 Mains indicator light is not lit but welding arc can be established.	Burnt out Indicator light.	Have an Accredited CIGWELD Service Agent replace Indicator light.

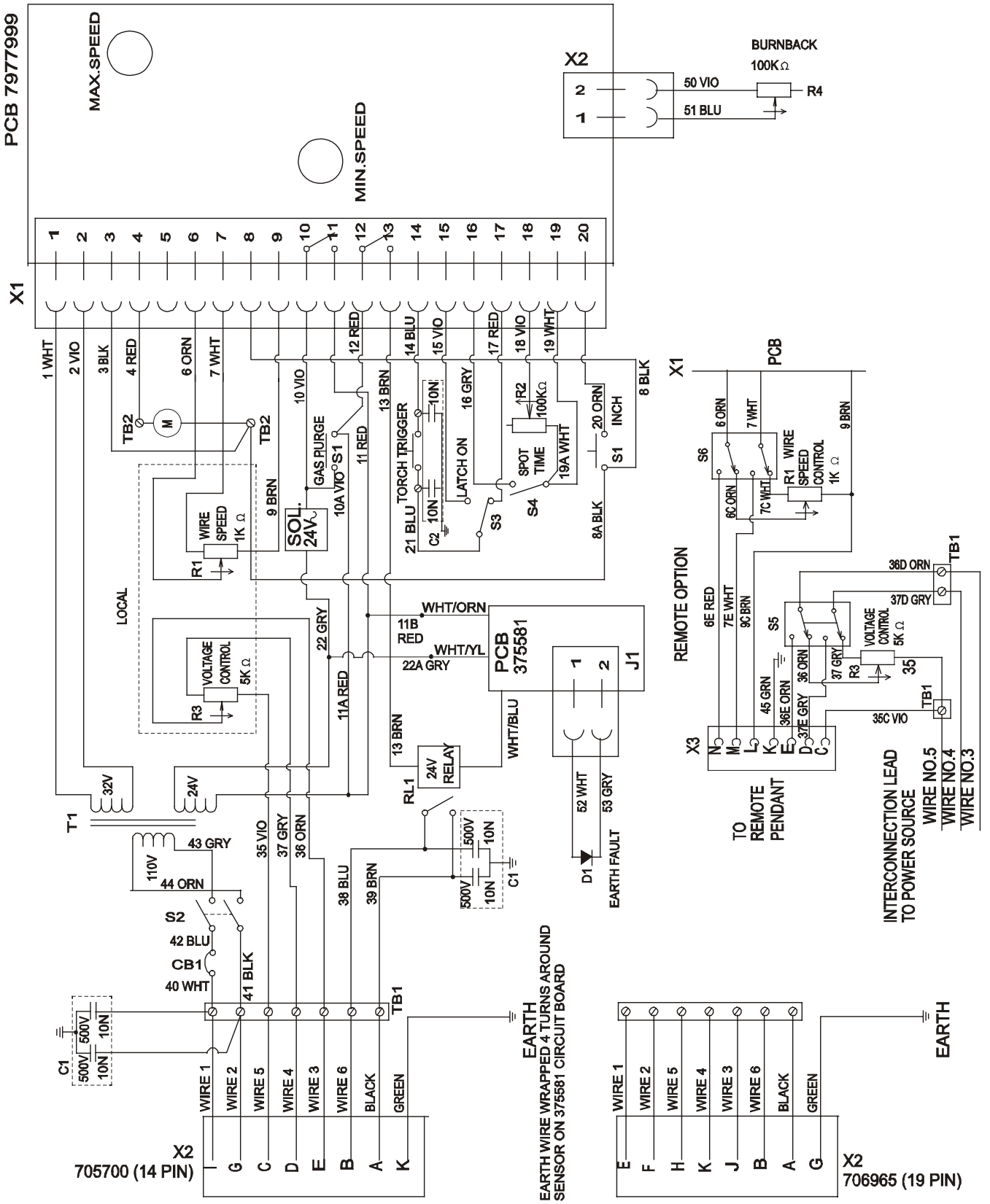
	FAULT	CAUSE	REMEDY
4	Mains supply voltage is ON and Indicator light is lit but when the torch trigger switch is depressed nothing happens.	Torch trigger switch leads are disconnected.	Re connect Torch trigger switch leads
5	Mains supply voltage is ON, no wire feed but gas flows from the MIG Torch when the torch trigger switch is depressed.	A Electrode wire stuck in conduit liner or contact tip (burn-back jam). B Faulty control PCB	A Check for clogged / kinked MIG Torch conduit liner or worn contract tip. Replace faulty components. B Have an Accredited CIGWELD Service Agent investigate the fault.
6	Wire feeds when the torch trigger switch is depressed but arc can not be established.	Poor or no work lead contact.	Clean work clamp area and ensure good electrical contact.
7	Jerky wire feed	A Worn or dirty contact tip B Worn feed roll. C Excessive back tension from wire reel hub. D Worn, kinked or dirty conduit liner	A Replace B Replace C Reduce brake tension on spool hub D Clean or replace conduit liner
8	No gas flow	A Gas hose is cut. B Gas passage contains impurities. C Gas regulator turned off. D Empty Cylinder	A Replace or repair. B Disconnect gas hose from the rear of Power Source or wirefeeder then raise gas pressure and blow out impurities. C Turn on. D Replace cylinder.
9	Gas flow continues after the torch trigger switch has been released.	Gas valve has jammed open due to impurities in the gas or the gas line.	Have an Accredited CIGWELD Service Agent repair or replace gas valve.
10	Wire does not feed when torch trigger depressed	Faulty trigger switch / lead	Repair or replace Torch / trigger lead
11	Wire continues to feed when torch trigger released	A Wirefeeder in 4T (LATCH) mode B Torch trigger leads shorted	A Change to 2T (NORMAL) mode B Repair or replace Torch / trigger lead
12	Wire feeds when the torch trigger switch is depressed but arc can not be established and FAULT led is illuminated	Earth Fault Protection circuit has operated	Turn Wirefeeder Power Switch off, then back on. If protection circuit continues to operate have an Accredited CIGWELD Service Agent investigate the fault.

SECTION 14: Key Spare Parts

Cigweld Part Number	Description	Cigweld Part Number	Description
7977721	Switch DPDT	7977983	2 way QC panel connector
7977781	Switch Momentary – off - Momentary	702527	Nipple Barbed
NB1636	Rubber Foot	7995107004	Grub Screw M4
705606	Wire Drive Insulating Plate	OTWAK1S	Thumb screw, Torch Adaptor
7978021PKD	Wire Drive Assembly	OTWAK1P	Lockpin, Wire Reel Hub
7977867	Solenoid Valve	7977306	Insulating Washer, Wire Drive
870696	Knob (large)	7977999	PCB Control
870734	Knob (small)	7976457	PCB Mounting Pillar
702337	Hub Wire Reel	7977710	Cable connector 14 pin
7977670	Relay 24VAC	7977750	Panel socket 14 pin
704972	Transformer 110V – 32/24V	7977993	Cable connector 19 pin
375581	Earth Fault Detection PCB		

Table 8 – Key Spare Parts

SECTION 15: Circuit Diagram



NOTES

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