Jefferson®

PROFESSIONAL TOOLS & EQUIPMENT

151A
MIG WELDER

GAS / GASLESS • 230V ~ 50Hz

autoMIG

JEFMIG151-AM

User Manual

v.1.1

CE

1. Contents

Important: *Please read all these instructions before operating this product and save these instructions. This manual has been compiled by Jefferson Tools and is an integrated part of the product with which it's enclosed and should be kept with it for the future reference.*

This manual describes the purpose for which the product has been designed and contains all the necessary information to ensure its correct and safe use. We recommend that this manual is read before any operation or, before performing any kind of adjustment to the product and prior to any maintenance tasks. By following all the general safety instructions contained in this manual you will help to ensure operator safety and extend the potential lifespan of the equipment.

All photographs and drawing in this manual are supplied by Jefferson Tools to help illustrate the operation of the product. whilst every effort has been made to ensure accuracy of information contained in this manual our policy of continuous improvement determines the right to make modifications without prior warning.

2. Introduction & Specification

IMPORTANT: These instructions contain the information you require to prepare your machine for welding, together with a maintenance and a troubleshooting section. **The instructions are not intended to teach you how to weld.** If you have no experience, we recommend that you seek training from an expert source. MIG welding is relatively easy, but does require a steady hand and supervised practice on scrap metal, as it is only with continued practice that you will achieve the desired results.

INTRODUCTION: Our professional range of **AutoMIG** welders all feature a heavy-duty high output transformer and forced air cooling to maximise duty cycle performance. **AutoMIG 151** is supplied with a comfort grip non-live torch, 1.8mtr earth cable, 1mtr gas hose, 0.45kg flux cored wire and 1.0mm contact tip. This unit is supplied set up in the gasless mode but can be switched easily to use with gas by a simple change of polarity, and the purchase of a gas conversion kit.

Model Number	**JEFMIG151-AM**		
Input Voltage	230V (single phase)		
Frequency	50Hz		
Max Input Capacity	5.5kVA		
Rated Input Current:	23A		
Output Current Range	30-151A		
Rated Output Current (A)	50	80	150
Rated Output Current (V)	16.5	18.5	21
*Duty cycle	100%	60%	15%
Gas Type	CO_2 / Argon Mix & Argon & CO_2		
Wire Capacity Steel	Flux Cored: 0.8 - 0.9mm • Steel: 0.6 - 0.9mm		
Net Weight	21.2kg		
Dimensions	720 x 320 x 540mm		
Cooling System	Forced Air		
Torch	Euro Non Live		

3. Safety Guidelines

3.1. ELECTRICAL SAFETY

• WARNING! It is the user's responsibility to read, understand and comply with the following:
You must check all electrical equipment and appliances to ensure they are safe before using. You must inspect power supply leads, plugs and all electrical connections for wear and damage. You must ensure the risk of electric shock is minimised by the installation of appropriate safety devices. An RCCB (Residual Current Circuit Breaker) should be incorporated in the main distribution board. We also recommend that an RCD (Residual Current Device) is used with all electrical products. It is particularly important to use an RCD together with portable products that are plugged into an electrical supply not protected by an RCCB. If in doubt consult a qualified electrician. You may obtain a Residual Current Device by contacting your Jefferson dealer. You must also read and understand the following instructions concerning electrical safety.

3.1.1. The Electricity At Work Act 1989 requires all portable electrical appliances, if used on business premises, to be tested by a qualified electrician, using a Portable Appliance Tester (PAT), at least once a year.

3.1.2. The **Health & Safety at Work Act 1974** makes owners of electrical appliances responsible for the safe condition of the appliance, and the safety of the appliance operator. **If in any doubt about electrical safety, contact a qualified electrician.**

3.1.3. Ensure the insulation on all cables and the product itself is safe before connecting to the mains power supply. See 3.1.1. & 3.1.2. above and use a Portable Appliance Tester (PAT).

3.1.4. Ensure that cables are always protected against short circuit and overload.

3.1.5. Regularly inspect power supply leads, plugs and all electrical connections for wear and damage and especially power connections, to ensure that none is loose.

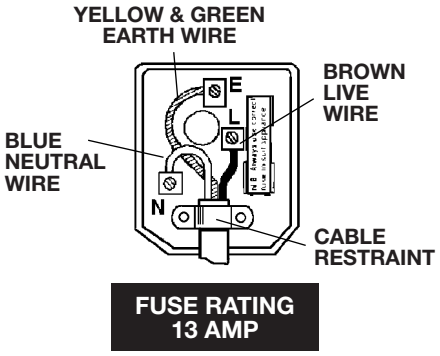
3.1.6. **Important:** Ensure the voltage marked on the product is the same as the electrical power supply to be used and check that plugs are fitted with the correct capacity fuse. A 13 amp plug may require a fuse smaller than 13 amps for certain products, see fuse rating at right.

3.1.7. **DO NOT** pull or carry the powered appliance by its power supply lead.

3.1.8. **DO NOT** pull power plugs from sockets by the power cable.

3.1.9. **DO NOT** use worn or damaged leads, plugs or connections. Immediately replace or have repaired by a qualified electrician. A U.K. 3 pin plug must be fitted according to the following instructions. (UK only - see diagram at right).

Ensure the unit is correctly earthed via a three-pin plug.
a) Connect the green/yellow earth wire to the earth terminal 'E'.
b) Connect the brown live wire to live terminal 'L'.
c) Connect the blue neutral wire to the neutral terminal 'N'.
d) After wiring, check that there are no bare wires, that all wires have been correctly connected, that the cable external insulation extends beyond the cable restraint and that the restraint is tight.



3.1.10. Some products require more than a 13 amp electrical supply. In such a case, NO plug will be fitted. You must contact a qualified electrician to ensure that a 30 amp fused supply is available. We recommend you discuss the installation of an industrial round pin plug and socket with your electrician.

3.1.11. Exposed live conductors or other bare metal in the welding circuit, or in unearthed, electrically-live equipment can fatally electrocute a person whose body becomes a conductor.

3.1.12. Do not stand, sit, lie, lean on, or touch a wet surface when welding, without suitable protection.

3.1.13. Magnetic fields from high currents can affect pacemaker operation. Persons wearing electronic life support equipment (pacemaker) should consult with their doctor before going near arc welding, gouging, or spot welding operations.

3.1.14. Keep body and clothing dry. Never work in a damp area without adequate insulation against electrical shock. Stay on a dry duckboard, or rubber mat when dampness or sweat can not be avoided. Sweat, sea water, or moisture between the body and an electrically-live part - or earthed metal - reduces the body surface electrical resistance, enabling dangerous and possibly lethal currents to flow through the body.

3.1.15. Cable extension reels. When a cable extension reel is used it should be fully unwound before connection. A cable reel with an RCD fitted is recommended since any product which is plugged into the cable reel will be protected. The section of the cable on the cable reel is important and should be at least 1.5mm², but to be absolutely sure that the capacity of the cable is suitable for this product and for others that may be used in the other output sockets, we recommend the use of 2.5mm² section cable.

• WARNING! Be very cautious if using a generator to power the welder. The generator must be self-regulating and stable with regard to voltage, wave form and frequency. The output must be greater than the power consumption of the welder. If any of these requirements is not met the electronics within the welder may be affected.

NOTE: The use of an unregulated generator may be dangerous and will invalidate the warranty on the welder.

• WARNING! The welder may produce voltage surges in the mains supply which can damage other sensitive equipment (e.g. computers). To prevent this happening, it is recommended that the welder is connected to a power supply that does not feed any sensitive equipment.

3.2. ELECTROMAGNETIC INTERFERENCE

This equipment is fully tested and compliant with EC Directive 2014/30/EU: Electromagnetic Compatibility (EMC) regulations, however it is important that the user takes responsibility when using the equipment to ensure that electromagnetic disturbances are minimised or prevented.

Before using the welding equipment you should make an assessment of potential electromagnetic problems in the working environment. Examples of unsuitable working environments include:

a) *areas where other supply cables, control cables, signalling and telephone cables are present*
b) *in the vicinity of radio and television transmitters and receivers;*
c) *near computers and other control equipment;*
d) *areas where medical or safety equipment are present (for example pacemakers and hearing aids etc)*
e) *environments containing equipment used for calibration or measurement;*

Please note: *Electromagnetic interference can be caused by devices outside the immediate working environment and neighbouring rooms and buildings should be assessed for potential issues prior to work commencing.*

3. Safety Guidelines (continued)

3.3. ENVIRONMENTAL CONDITIONS

Note: *Ambient air should be free from abnormal amounts of dust, acids, corrosive gases or substances etc. other than those generated by the welding process itself:*

- Working ambient air temperature range: **-10°C (to) +40°C**
- Ambient air temperature range for transport and storage: **-25°C (to) +55°C**
- Relative humidity: up to **50% at 40°C and 90% at 20°C**
- Altitude above sea level up to 1000m.

3.4. GENERAL SAFETY

• DANGER! Unplug the welder from the mains power supply before performing maintenance or service.

- **OPERATORS MUST RECEIVE ADEQUATE TRAINING BEFORE USING THE WELDER.**
- Keep the welder and cables in good working order and condition. Take immediate action to repair or replace damaged parts.
- Use genuine parts and accessories only. Unapproved parts may be dangerous and will invalidate the warranty.
- Use an air hose to regularly blow out any dirt from the liner and keep the welder clean for best and safest performance.
- Check and spray the gas cup and contact tip regularly with anti-spatter spray, available from your Jefferson dealer.
- Locate welder in a suitable work area. Ensure that the area has adequate ventilation as welding fumes are harmful.
- Keep work area clean, tidy and free from unrelated materials. Also ensure the working area has adequate lighting and that a fire extinguisher is at hand.

WARNING! Use welding head shield to protect eyes and avoid exposing skin to ultraviolet rays given off by electric arc. Wear safety welding gauntlets.

- Remove ill fitting clothing, remove ties, watches, rings and other loose jewellery and contain long hair.
- Ensure the workpiece is correctly secured before welding.
- Avoid unintentional contact with the workpiece. Accidental or uncontrolled use of the torch may be dangerous and will wear the nozzle.
- Keep unauthorised persons away from the work area. Any persons working within the area must wear a protective head shield and gloves.
- Operators must receive adequate training before using the welder.
- Stand correctly keeping a good footing and balance, ensure the floor is not slippery and wear non-slip shoes.
- **DO NOT** operate the welder if it or the cables are damaged and DO NOT attempt to fit any unapproved torches or other components to the welder.
- **DO NOT** get welder wet or use in damp or wet locations or areas where there is condensation.

DANGER! DO NOT weld near flammable solids, liquids or gases and DO NOT weld containers or pipes which have held flammable materials. Avoid welding materials which have been cleaned with chlorinated solvents or welding near such solvents.

- **DO NOT** stand welder on a metal workbench, car bodywork or similar.
- **DO NOT** touch any live metal parts of the torch or electrode while the machine is switched on.
- **DO NOT** pull the welder by the cable, or the torch. Protect cables from sharp or abrasive items. DO NOT bend, strain or stand on cables or leads. Protect from heat. Long lengths of slack must be gathered and neatly coiled. DO NOT place cables where they endanger others.
- **DO NOT** touch the torch or workpiece immediately after welding as they will be very hot. Allow to cool.
- **DO NOT** operate welder while under the influence of drugs, alcohol or intoxicating medication, or if tired.
- When not in use store the welder in a safe, dry, childproof area.

3.5. GAS SAFETY

- Store gas cylinders in a vertical position only and ensure the storage area is correctly secured.
- **DO NOT** store gas cylinders in areas where the temperature may exceed 50°C. **DO NOT** use direct heat on a cylinder. Always keep gas cylinders cool.
- **DO NOT** attempt to repair or modify any part of a gas cylinder or valve and **DO NOT** puncture or damage a cylinder.
- **DO NOT** obscure or remove any official labels on a cylinder. Always check the gas identity before use. Avoid getting gas cylinders oily or greasy.
- **DO NOT** lift a cylinder by the cap, guard or valve. Always keep caps and guards in place and close valve when not in use.

4. Assembly

4.1 Assembly of wheels: (See fig.2)

4.1.1 Drop the axle brackets (7) through the slots in the rear of the bottom tray (6).

4.1.2 Attach a circlip (9) to one end of the axle (10) and slide a wheel (8) onto the axle and right up to the circlip.

4.1.3 Pass the axle (10) under the tray (6) and through the two protruding brackets (7) until the first assembled wheel is up against the side of the tray.

4.1.4 Slide the other wheel (8) onto the other end of the axle (10) and secure it by attaching a circlip (9) to the end of the axle.

4.2. Assembly of front foot: (See fig.2)

4.2.1 Place the foot (5) onto the underside of the tray (6) ensuring that the three holes on the foot align with the holes in the tray. Fix the foot in place with three self tapping screws.

4.3 Assembly of handle: (See fig.1)

4.3.1 Attach the rear handle bracket (1) to the top of the casing using two self tapping screws. Slide the straight handle (2) into the bracket (1) and slide the other bracket (3) onto the front end of the handle. Secure bracket (3) with two self tapping screws. Insert the handle extension (4) into the front end of the handle and secure it with a self tapping screw.

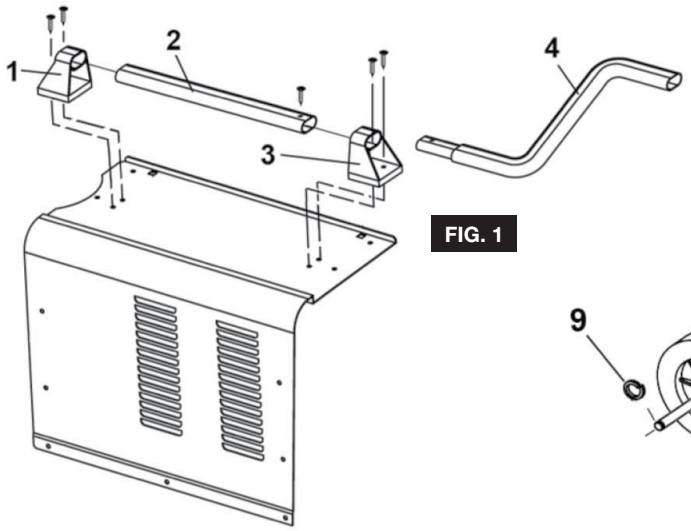


FIG. 1

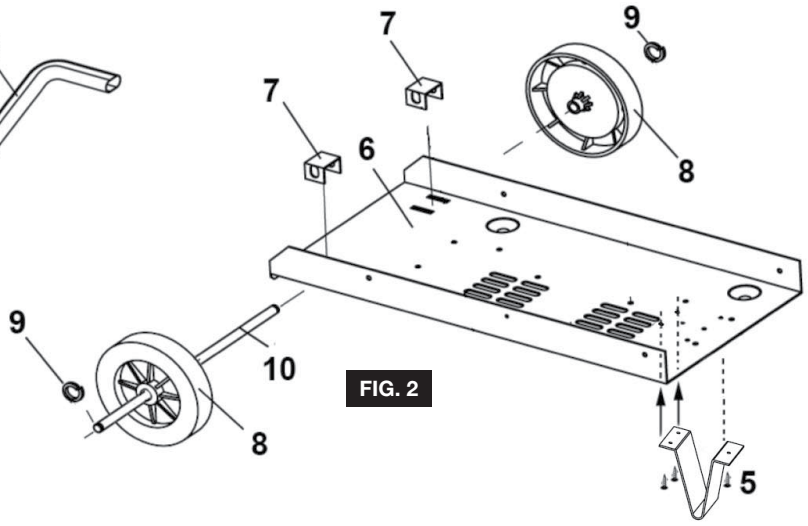


FIG. 2

5. Welding Power: Voltage and Current Characteristics

*The curve shown in **Fig.3** below shows "V-A" the external static characteristic of welding power, gradient of curve named slope, normal means "drop off voltage per 100A". The curves show the output voltage obtainable in any preset output current because the "V-A" slope is fixed.*

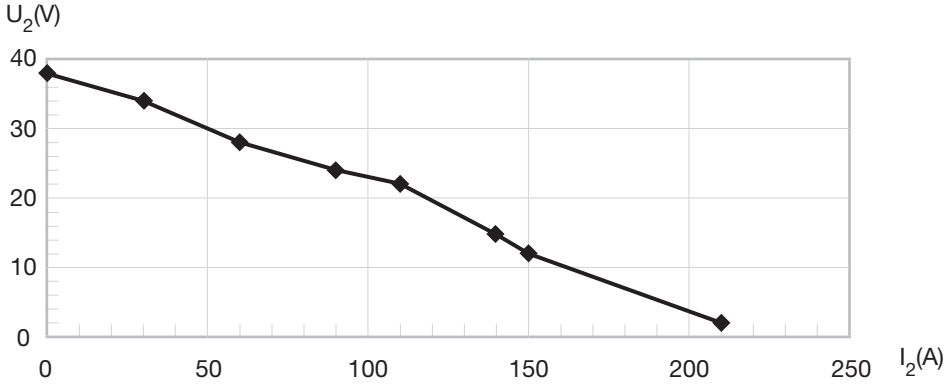


Fig.3: JEFMIG151-AM Static external characteristic curve

6. Equipment Overview

The following summary provides a brief overview of the front switch panel (see **Fig.4**). If you have any additional questions relating to the equipment please contact your nearest Jefferson Dealer before using the equipment.

6.1. "ON/OFF" switch
When the switch is in the "OFF" position it means power has been shut off to the welder, when the switch is in the "ON" position it means power is supplied to the main transformer and control circuit.

6.2. "MIN/MAX" switch
The "MIN/MAX" and "1/2" switches are on the front panel of the machine. Each have two settings. You can choose different setting combinations of the two switches according to the metal thickness.

6.3. Wire speed control knob
Used to control the wire speed: turn clockwise to increase the wire speed or counter-clockwise to decrease the wire speed. The numbers (0-10) around the knob show the wire feed speed. The rated wire feed speed for this equipment is 1.8m/min ~ 11.4m/min.

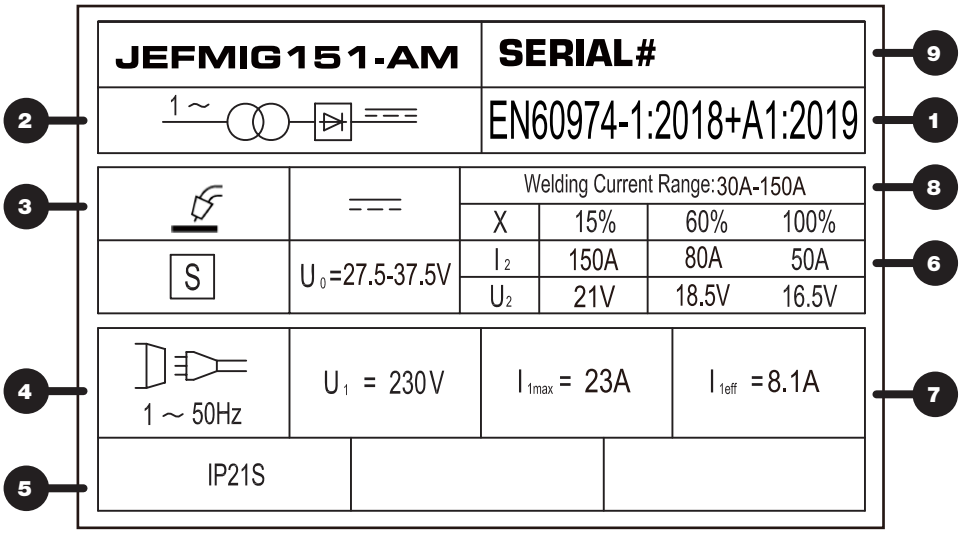
6.4. Overload light
If you are welding with a large current for a long time and exceed the duty cycle, the overload lamp will light (yellow), and the welder will automatically shut down until it cools down. If this happens, you must stop welding and wait **approximately 5 minutes,** before the unit will reset and allow you to continue welding.

Fig.4 Front Switch Panel

7. Ratings Plate

On the front panel of the welder is the ratings plate, giving the following data:

1: The BS/EU standard relating to the safety and construction of arc welding and associated equipment.
2: Single phase transformer – rectifier.
3: Symbol indicates welding with a continuous flow of welding wire.
4: Symbol for Single-phase AC supply.
5: Rating of internal protection provided by casing.
6: Output U_0 Rated minimum and maximum no load voltage.
I_2, U_2 Current and corresponding voltage.
X Welding ratio based on a 10 minute cycle.
20% indicates 2 minutes welding and 8 minutes rest,
100% would indicate continuous welding.
7: Mains Supply U_1 Rated supply voltage and frequency.
I_{1max} Maximum current.
I_{1eff} Maximum effective current.
8: Welding current range.
9: Serial Number. Specifically identifies each welder.



8. Preparation

WARNING:
The following steps require applying power to the welder. Do not touch anything with the torch handle or an arc may be ignited. Do not operate the welder when the casing has been opened for maintenance.

8.1 Fitting a reel of wire:

8.1.1 Lift the black catch on the side of the welder and open the side compartment to gain access to the wire feed unit mechanism and the wire spool holder. See fig.5. The welder is supplied with a mini spool containing 0.45kg of flux cored wire.

8.1.2 Referring to fig.7, rotate the butterfly nut (5) anti-clockwise and remove it from the threaded spindle together with the pressure disc (4). Leave the spring (1) on the spindle (2).

8.1.3 Place the wire reel (3) over the spindle and down onto the spring ensuring that the wire will withdraw from the top of the spool in a forwards direction towards the wire feed unit.

8.1.4 Push lightly down on the top of the reel of wire and screw the pressure disc (4) onto the end of the spindle and down onto the top of the wire reel. The reel take off pressure should be set to provide a mild braking effect to prevent overrun where loose coils of wire form on the reel. Do not overtighten the pressure disc as too much braking will conflict with the wire tension set on the wire drive unit. Lock the position of the pressure disc by screwing the butterfly nut (5) down on top of it.

8.1.5 Referring to fig.5 turn the knob on the wire lock screw (C) anti-clockwise and lift it up and away from the pressure roller moulding. Swing the pressure roller moulding (D) away from the drive roller.

8.1.6 Release the wire from the spool (do not allow wire to uncoil) and straighten 40-50mm of wire and gently push through the flexible plastic guide and through the 0.9mm feed roller groove and into the torch liner. Refer to maintenance section 14.3 on how to reverse or change the roller for driving other wire diameters.

8.1.7 Referring to fig.6, move the pressure roller moulding back round onto the grooved drive wheel and swing the wire lock screw back down to lock it in place. See section 8.2 regarding wire tension.

8.1.8 Feeding the wire through to the torch. (See fig.8) Remove gas cup (a) and contact tip (b) from end of torch as follows:

a) Take torch in left hand with the torch tip facing to the right.
b) Grasp gas cup firmly in your right hand.
c) Turn gas cup clockwise only and pull cup out to the right.
WARNING! do not turn gas cup anti-clockwise, as this will damage internal spring.
d) Unscrew the copper contact tip (right hand thread) to remove.

8.1.9 Check welder is switched “OFF” and that the earth clamp is away from the torch tip. Connect the welder to the mains power supply and set the current switch to MAX.

8.1.10 Set the wire speed knob to position 5 or 6. See fig.9. Switch welder on. Keeping the torch cable as straight as possible and press the torch switch. The wire will feed through the torch.

8.1.11 When wire has fed through, switch welder off, unplug from mains.

a) Take torch in left hand, slide the contact tip over the wire and screw it back into place.

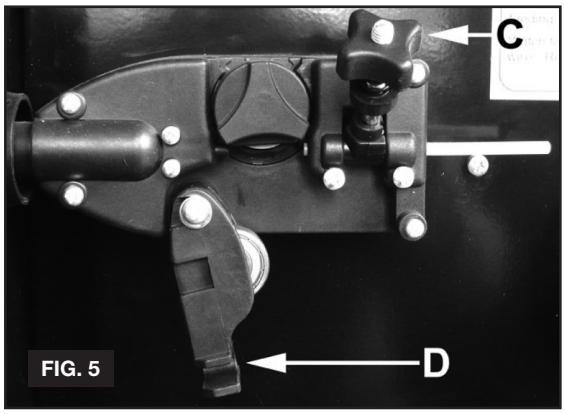


FIG. 5

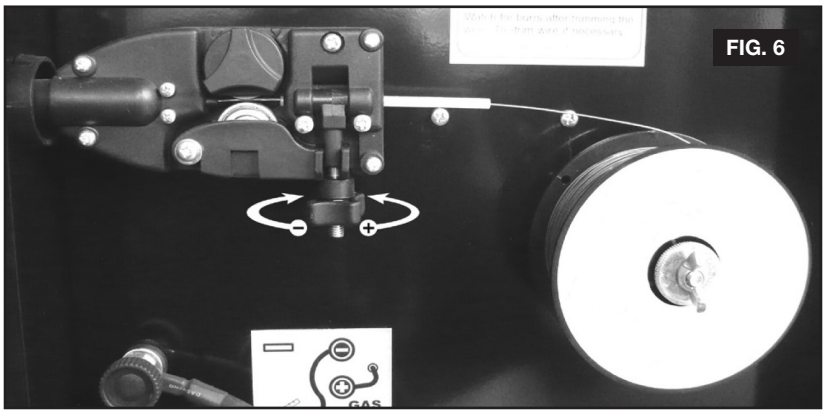


FIG. 6

b) Grasp gas cup in right hand, push onto torch head and turn clockwise only. **WARNING!** do not turn gas cup anti-clockwise, as this will damage internal spring.
c) Cut wire so that it is just protruding from the cup.

8.2. Setting wire tension.
IMPORTANT: You must set the correct tension, too little or too much tension will cause problematic wire feed and result in a poor weld. Turn the wire lock screw clockwise to increase the tension and anticlockwise to decrease the tension as shown in fig.6.

8.2.1 Correct tension between the rollers is checked by slowing down the wire between gloved fingers. If the pressure roller skids the tension is correct. Try to use the lowest tension possible as too high a tension will deform the wire. When you have completed welding allow the welder to cool before storing in a safe, dry place. Note: Damaged torches and cables are not covered under warranty.

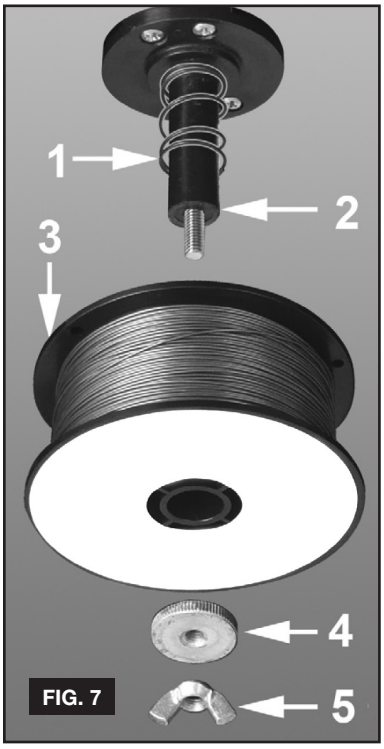


FIG. 7

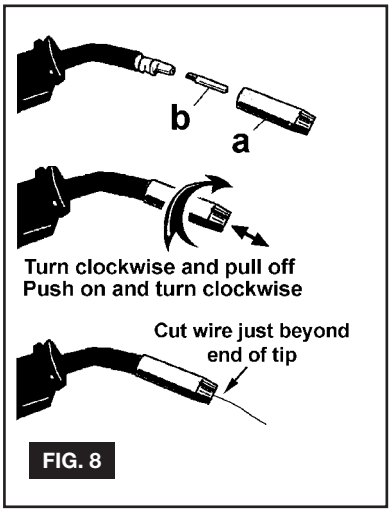


FIG. 8

9. Control Panel

9.1 Thermal overload light. (see fig.9) If the duty cycle is exceeded as a result of welding too long with a high current the yellow overload light will illuminate and the welder will turn off. When the welder has cooled down (approx. 5 to 10 minutes) the power will be restored and welding can recommence.

9.2 Power ON/OFF switch. (see fig.9) When the power is ON the green switch will be illuminated. When the welder is no longer required it should be switched to the OFF position and the power plug should be disconnected from the mains supply.

9.3 Current switches MIN, MAX & 1, 2. (see fig.9) Used together these two switches provide 4 increasing power levels as follows: MIN/1, MIN/2, MAX/1, MAX/2.

9.4 Wire speed control knob. (see fig.9) As a general rule, a higher current requires a higher wire speed.

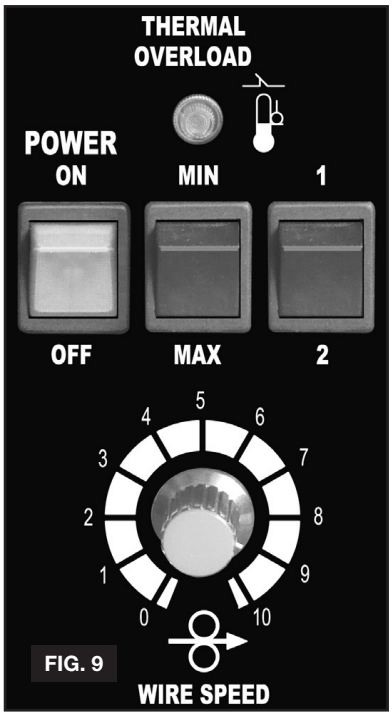
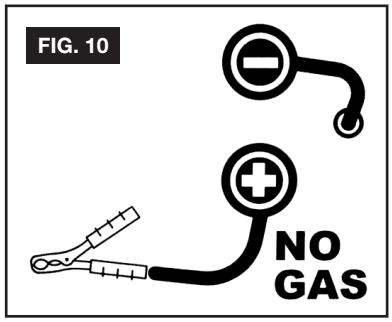


FIG. 9

10. Gasless Operation

• WARNING! ENSURE THAT YOU READ, UNDERSTAND AND APPLY SAFETY INSTRUCTIONS BEFORE OPERATING THE WELDER. IF WELDING A VEHICLE, DISCONNECT THE BATTERY OR FIT AN ELECTRONIC CIRCUIT PROTECTOR.



10.1 **Polarity check:** Ensure that the welder is disconnected from the main power supply, open the side panel and check that the polarity is correctly set up for gasless operation. The earth clamp wire must be connected to the POSITIVE (+) terminal and the power (torch) lead must be connected to the NEGATIVE (-) terminal as shown in fig.10.

10.2 To ensure a complete circuit, the earth clamp must be securely attached to the workpiece.
a) The weld area must also be free of paint, rust, grease, etc.
b) Obtain the best connection by grinding the point of contact on the workpiece before connecting the clamp.

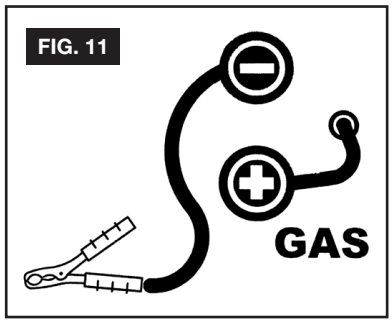
10.3 If welding a vehicle, disconnect the battery or fit a “Electronic Circuit Protector” (available from your Jefferson dealer).

10.4 Set up the current switches to give the required power setting and adjust the wire speed accordingly.

10.5 During the welding process, wire drawn from the spool is automatically fed through an insulated liner in the torch cable to the torch tip. The torch switch activates the wire feed roller (to stop wire feed release the switch). As wire comes into contact with the workpiece an arc is struck. The arc melts the wire which is deposited into the weld.

11. Conversion to MIG (Gas) Welding

For welding stainless steel or aluminium, this welder can be converted to a conventional mig welder. To convert to gas, order a reel of regular wire, a bottle of suitable gas, tips and nozzles and a conversion kit containing a regulator plus connection hoses, hose adaptor and jubilee clips (see fig.12) from your local Jefferson dealer.



11.1 **Check Polarity:** Ensure that the welder is disconnected from the mains power supply and open the side panel and check that the polarity is correctly set up for gas operation. The earth clamp wire must be connected to the NEGATIVE (-) terminal and the power (torch) lead must be connected to the POSITIVE (+) terminal as shown in fig.11.

11.2 **Check wire feed roller:** If necessary, change and/or turn the wire feed roller (See maintenance section 14) so that the appropriately sized groove is in line with the drive path i.e. in the groove nearest to you.

11.3 **Fit required wire:** Fit a reel of steel or aluminium wire (either 0.6 or 0.8mm).

11.4 **Set the wire tension as described in section 8.2.**

11.5 **Mount the gas cylinder:** Strap the gas cylinder to the back of the machine. Two nylon straps are provided to hold small cylinders in place. Thread the straps through the raised metal fixing loops on the back of the welder. Stand the gas cylinder on the rear platform and fix the straps around it as shown in fig.12.

11.5.1 Close the flow regulator before screwing it onto the cylinder. Screwing down the regulator will automatically open the cylinder valve. When the sound of gas escaping is heard screw the regulator one further turn only. This will be sufficient to seal the cylinder.
WARNING! Excessive tightening of the flow regulator will over-compress the rubber sealing washer and allow the gas to escape slowly without being detected.

11.6 **Connect gas cylinder to welder gas input.** Push the small adaptor into one end of the larger diameter hose. Push the other end of the hose onto the ribbed gas input connector on the back of the welder. Secure both ends of the hose with the jubilee clips provided. Push one end of the smaller diameter gas hose into the open end of the adaptor and push the other end into the regulator outlet, it will seal automatically. See fig. 12. To release the gas hose, press the collet inwards on the quick couplers and pull the hose out.

11.6.1 Turn the gas regulator knob halfway for a 2ltr/min flow and all the way for maximum flow of 4ltr/min.

11.6.2 Always remove the flow regulator after use if the machine is to be stored for any length of time.

11.7 **Gas types.** Welding mild steel with CO^2 gas is appropriate for most welding tasks where spatter and high build up of weld do not pose a problem. To achieve a spatter-free and flat weld however, you must use an CO^2/Argon mixture.
To weld aluminium use:
• Argon gas • 0.8mm Contact Tip • 0.8mm Aluminium Wire (MIG/2/KAL08)

11.8 **Cylinder sizes.** The platform at the rear of the welder will support cylinders up to a diameter of 140mm, a height of 500mm and a maximum weight of 10kg. If you wish to use larger cylinders they must be properly secured to a separate welding trolley. An industrial gas cylinder adaptor kit will be required. Contact your local Jefferson dealer to order these items.

11.8.1 The following table is an estimated duration of cylinders based on a flow rate of 2 litres per minute. Actual duration will be dependant upon various job conditions including the operator's welding technique. All times are therefore approximate.


FIG. 12

Disposable cylinders:	CO^2/100 390g = 1-1/4hours.	CO^2/101 600g = 2 hours.
	Argon ARG/100 300g = 1hour.	Argon/CO^2 MIX/100 300g = 1 hour.
	Note: When comparing prices, always check fill weights.	

11.9 **Mig/Mag gas welding principles:** Welding wire is automatically fed through an insulated liner to the tip of the torch. The torch consists of a switch, liner, gas hose, and control cable. The switch activates the wire feed roller and the gas flow. Releasing the switch stops the wire feed and gas flow. The weld current is transferred to the electrode (the wire) from the contact tip at the torch end. The current switches (see section 9.3) control the current to the electrode. Wire speed must be adjusted according to current output. The higher the current the faster the wire speed. A gas cup fits over the contact tip to direct gas flow towards the weld, ensuring that the arc welding process is shielded from oxidisation. The shielding gas also assists heating of the weld. The torch is connected to the positive side of a DC rectifier, and the negative clamp is attached to the workpiece.

12. Welding Guidelines

IMPORTANT: *These instructions are not intended to teach you how to weld. If you have no experience, we recommend that you seek training from an expert source. MIG welding is relatively easy, but does require a steady hand and supervised practice on scrap metal, as it is only with continued practice that you will achieve the desired results.*

12.1 Mig/Mag welding:
Welding wire is automatically fed through an insulated liner to the tip of the torch. The torch consists of a switch, liner, and control cable. The switch activates the wire feed roller. Releasing the switch stops wire feed. The weld current is transferred to the electrode (the wire) from the contact tip at the torch end. The current to the electrode is set using the rocker switch on the front of the control panel. Wire speed must be adjusted according to current output using the rotary control positioned to the left of the control panel. The higher the current the faster the wire speed. The torch is connected to the positive side of a DC rectifier, and the negative clamp is attached to the workpiece.

12.2 Preparation for welding: ***IMPORTANT!*** *BEFORE YOU COMMENCE, MAKE SURE THE MACHINE IS SWITCHED OFF AT THE MAINS. IF WELDING A CAR, DISCONNECT THE BATTERY OR FIT AN ELECTRONIC CIRCUIT PROTECTOR. ENSURE THAT YOU READ, UNDERSTAND AND APPLY THE SAFETY INSTRUCTIONS IN SECTION 3.*

12.2.1 To ensure a complete circuit, the negative lead must be securely attached to the workpiece close to the weld area. Best connection is obtained by grinding the point of contact on the workpiece before connecting the clamp.

12.2.2 The weld area must be free of paint, rust, grease, etc.

12.3 Thermal Protection:
Should the welder become overheated due to prolonged use beyond the stated duty cycle the thermal protection will cause the welder to cut out and the orange light on the front panel will illuminate (as shown in **Fig.9** on page 11). Wait for fifteen minutes for the welder to cool down at which time it will reconnect automatically.

PRECAUTIONS

- Ensure that there is free air circulating around the outer casing of the welder, and that the air vents are unobstructed.
- Welding arc can seriously damage your eyes. Both the operator and spectators must always use a suitable welding face shield or helmet, with suitable filter lenses for the welding processes.
- Suitable Personal Protection Equipment (PPE) including gloves and working clothes should be worn at all times.
- Always check and ensure that the pressure regulator and gauges (if fitted) are working correctly before use.
- Regulators are designed to be used with specific gases, it is important that you use the correct regulator for the gas required.
- Do not lubricate the regulator.
- Inspect gas hoses, cables and clamps before use to ensure they are in good condition.
- Remove all flammable materials from the working environment before use.
- Keep a fire extinguisher nearby at all times. The extinguisher should be Dry Powder or CO_2 type.
- Do not remove any of the casing panels for repair or maintenance unless the machine is disconnected from the supply, and never use the machine with any of the panels removed. All repairs should be carried out by qualified engineers using Jefferson approved parts. Contact your nearest Jefferson Dealer for details.
- Never use or store this equipment in a wet or damp environment and do not expose the equipment to rain during use.
- The MIG welding process uses an inert gas to protect the weld pool. It is important to ensure the appropriate gas is being used.
- Never use an unknown or unidentifiable gas supply or gas from a damaged or unmarked cylinder.
- Do not lift or move a gas cylinder by holding he cylinder by the valve.
- Do not expose the cylinder to a heat source or sparks while in storage or in use.
- Stop welding immediately if any static / electric shocks are felt or detected. Do not attempt to weld using the equipment until the source of the fault is identified and repaired.
- Do not point the MIG torch at anyone when in use.
- Do not touch the MIG torch nozzle until the welder is switched **OFF** and the nozzle has been allowed to cool off.
- Never connect, disconnect, or attempt to service the MIG torch, until the machine is switched **OFF** and disconnected from the mains power supply.
- Never allow the equipment cables to become wrapped around the operator or any bystanders in the working environment.

13. Operation Guidelines

Before welding:

- Read and understand the safety rules section of this manual
- Ensure all flammable materials are removed the work area
- Ensure there is good ventilation around the welding unit and the working environment
- Enure you have a fire-extinguisher in the vicinity of the working environment and that it is ready for use in the event of fire
- Wear appropriate protective clothing and insulated leather gloves (check with your nearest Jefferson Dealer for advice)

Step 1:
Connect work clamp onto metal to be welded, or to the metal workbench where the object is mounted and electrically connected.

Step 2:
Before plugging in, adjust the amperage and wire feed speed according to material type and thickness, and the wire size.

Step 3:
Check the power switch is in the **OFF** position, and then plug the power cable into the electrical outlet.

Step 4:
While holding the torch with the wire and tip clearly out of the way of any grounded objects, turn the power switch to **ON** position.

Step 5:
Position yourself in the area to be welded, and then place the face shield over your eyes.

WARNING: WEAR APPROPRIATE PERSONAL PROTECTION EQUIPMENT AT ALL TIMES
Never look at the ignited arc without approved, arc shaded, eye protection in a full-face shield. Permanent eye damage or blindness can occur. Skin burns can occur. Never breathe arc fumes.

Step 6:
Press (and hold) the torch button and stroke the area to be welded with the electrode wire to ignite the arc.

Step 7:
Once the arc is ignited, tilt the electrode wire forward at an angle of approximately 35° (as shown in **Fig.13**).

Step 8:
When the weld is complete, release the torch button and lift the wire clearly away from any grounded object, set the Face Shield down and turn the Power Switch to the "**OFF**" position.

Step 9:
Unplug the Power Cord from the electrical outlet.

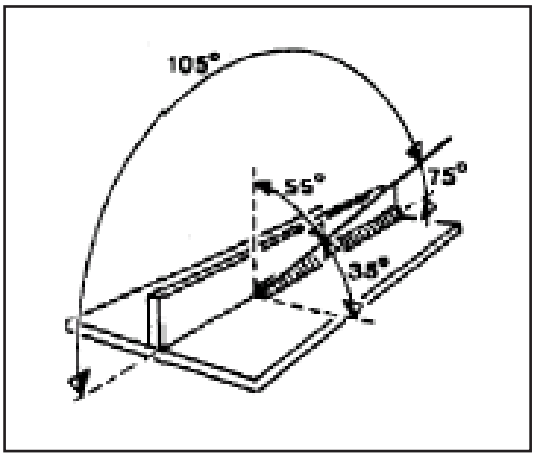


Fig.13 Electrode wire angle

14. Maintenance

WARNING:
Before performing any maintenance on the Welder, unplug the Power Cable from the electrical outlet and allow all parts of the welder to cool thoroughly

Periodically open the access panel from the unit and, using compressed air, blow out all dust and debris from the interior. Inspect all air vents and cooling slots to ensure that they are clean and unobstructed.

Always store the welder in a clean, dry, safe location out of reach of children and other unauthorized people.

14.1. Wire feed unit:

14.1.1 Check the wire feed unit at regular intervals. The feed roller wire guide plays an important part in obtaining consistent results. Poor wire feed affects the weld. Clean the rollers weekly, especially the feed roller groove, removing all dust deposits.

14.2. Torch:

14.2.1 Protect the torch cable assembly from mechanical wear. Clean the liner from the machine forwards by using compressed air. If the liner is blocked it must be replaced.

14.3. Turning feed roller IMPORTANT: Turn the feed roller to suit the wire size.

14.3.1 There are two grooves on the feed roller, 0.6mm and 0.9mm. Always have the groove that is being used on the outside of the roller (nearest to you). To turn the feed roller first loosen the wire tension knob and move it into its up position (see fig.14-1) then move the tensioning roller assembly to its down position (see fig.14-2). Take hold of the triangular knob on the roller retainer and rotate it 90°anticlock wise to release it as shown in fig.14.3. Now pull the roller retainer off the drive spindle to reveal the roller as shown in fig.15. Pull the roller off the drive spindle, flip it over and put it back on the drive spindle. (See fig.16) The groove size you require should now be visible on the face of the roller. Push the roller retainer back onto the drive spindle with the opening facing right. Ensure that the flanges at the base of the retainer, seat fully into the circular recess in the main moulding and then rotate the retainer through 90° to lock it in place.

14.4. Contact tip (to remove tip follow steps in 6.1.8):

14.4.1 The contact tip is a consumable item and must be replaced when the bore becomes enlarged or oval. The contact tip MUST be kept free from spatter.

14.5. Gas cup (to remove cup follow steps in 6.1.8):

14.5.1 The gas cup must also be kept clean and free from spatter. Build-up of spatter inside the gas cup can cause a short circuit at the contact tip which will result in expensive machine repairs.

14.6. Replacing wire liner:

14.6.1 A worn or damaged wire liner will seriously affect the performance of the welder and should be immediately replaced. First wind the wire back onto the spool and secure it. Remove the four screws securing the torch cable clamp to the wire feed unit (fig.17) and take off the clamp.

14.6.2 To open the torch case first take hold of the locking ring (fig.18-5) and turn it anticlockwise until it stops and then pull it off the two halves of the torch case and slide it a little way down the torch cable.

14.6.3 Lift up the back of the upper torch moulding as shown in fig18-1 and unhook it from the front of the lower moulding (see 7 in fig.18) and lift it off.

14.6.4 Move the lower moulding away from the inner torch assembly as shown in fig19-4.

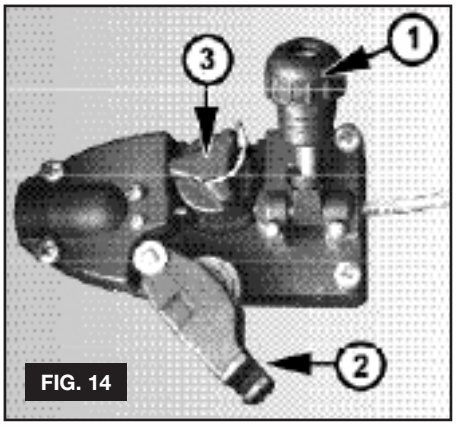


FIG. 14

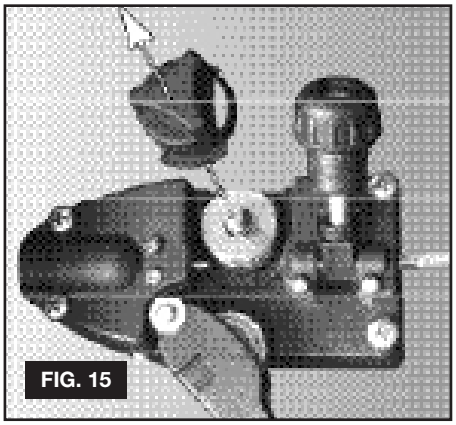


FIG. 15

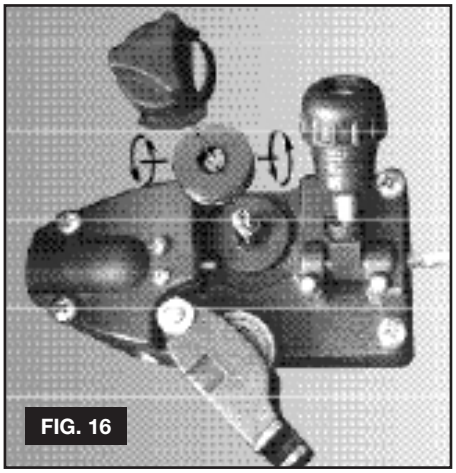


FIG. 16

14.6.5 Disconnect the black liner from the torch control assembly by pressing the locking ring into the connector and withdrawing the liner. See A in fig.19.

14.6.6 With the torch cable as straight as possible pull the liner from the torch cable.

14.6.7 Insert the new liner into the torch cable and secure it in the wire drive unit by replacing the torch cable clamp. See fig.17. Insert the other end of the liner through the locking ring and fully into the torch control assembly.

14.6.8 Ensure that the switch moulding (fig.19-3) is fully seated down into the lower moulding (4). Place the torch head assembly (2) down into the lower moulding and arrange the inner connections within the moulding. The gas pipe and wire liner will rest into notches on the inner ribs of the moulding.
The two thin switch wires should be to the left of the gas pipe and the larger black control cable should be to the right of the wire liner.

14.6.9 Hook the upper moulding (1) onto the lower moulding (4) as shown in fig.18-7. Close the upper moulding down onto the lower moulding ensuring that there are no wires trapped between the two halves. The two mouldings should close easily, do not force them shut.

14.6.10 Once the mouldings are closed slide the locking ring (fig.18-5) up onto them. Turn the locking ring clockwise to secure the assembly.

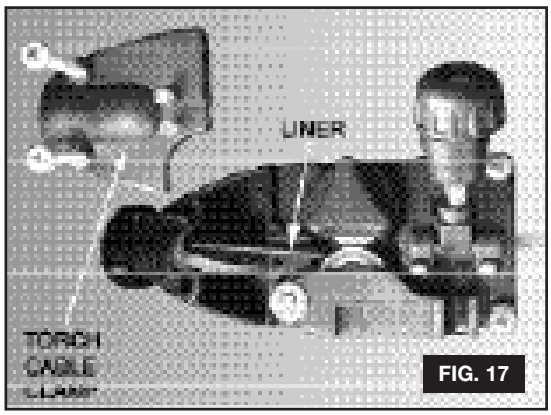


FIG. 17

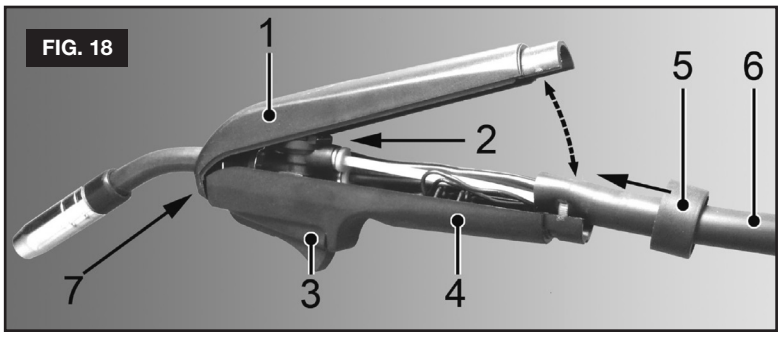


FIG. 18

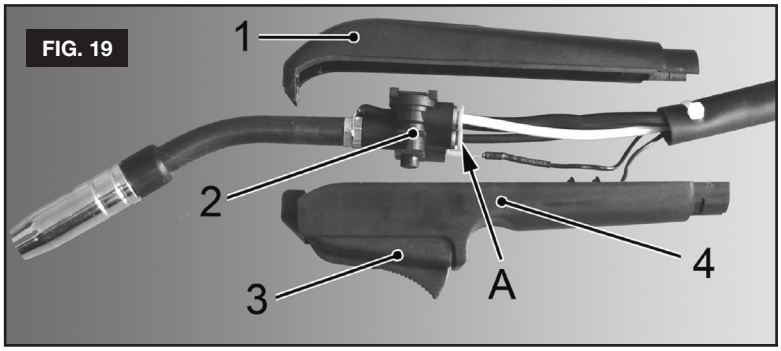


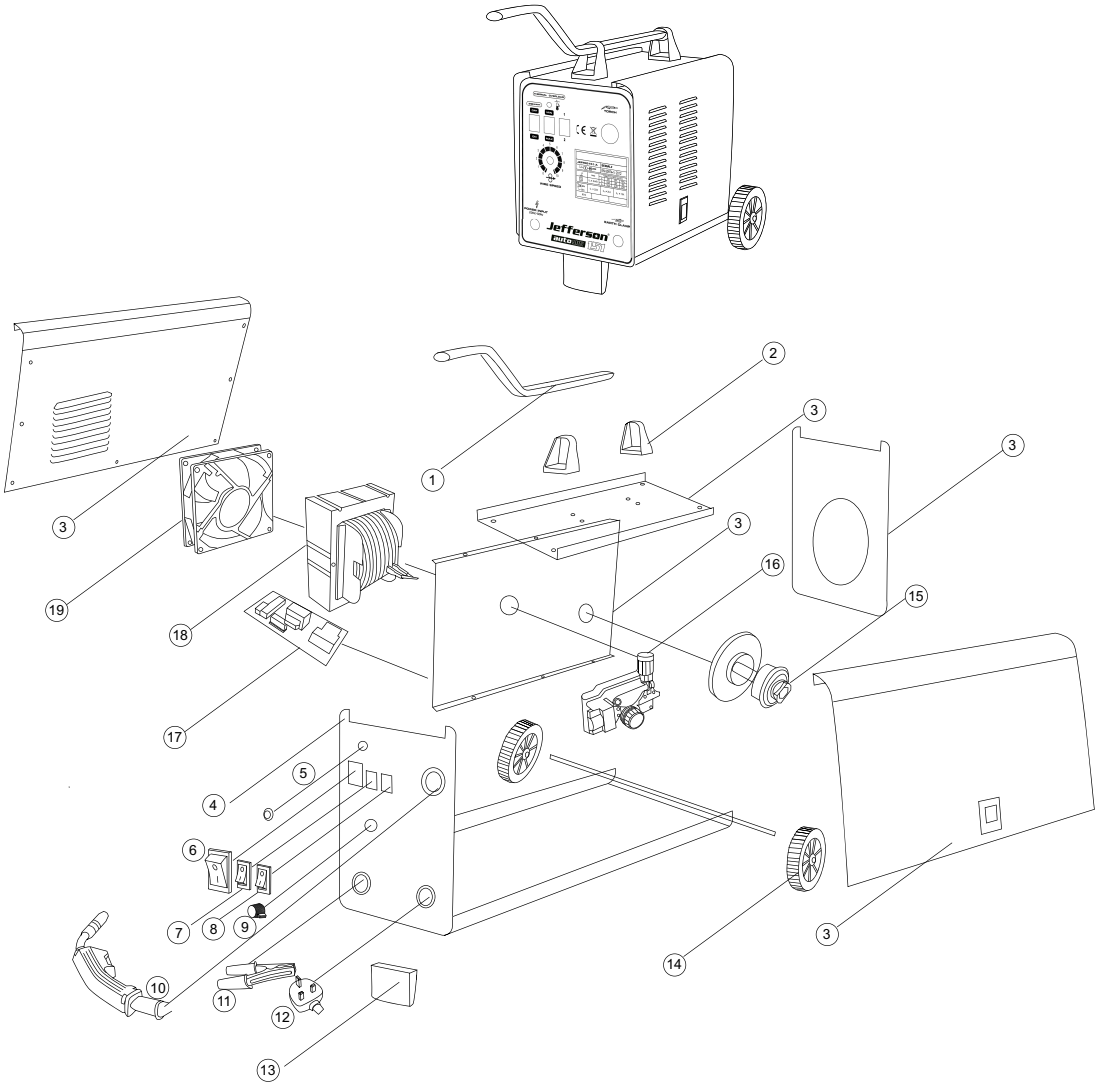
FIG. 19

15. Troubleshooting

WARNING:
Be certain to shut off the welder, disconnect it from power, and discharge the torch to ground before adjusting, cleaning, or repairing the unit. Electrical repairs should only be made by a trained technician.

Symptom	Possible Cause	Corrective Action
No output	1. Duty cycle exceeded 2. Poor work clamp connection 3. Blown breaker or fuse	1. Allow welder to cool until lamp goes out 2. Be sure all connections are secure, and attaching surface is clean 3. Reduce circuit load, reset breaker or replace fuse
Wire tangles at drive roller	1. Wrong size contact tip 2. Torch liner clogged or damaged 3. Contact tip clogged or damaged 4. Drive roller worn 5. Not enough tension	1. Use proper size contact tip 2. Clean or replace wire liner 3. Clean or replace contact tip 4. Replace drive roller 5. Tighten tension knob
Gun nozzle arcs to work surface	1. Slag inside gun nozzle 2. Insulation ring melted or expired	1. Clean slag from gun nozzle 2. Replace nozzle
Work clamp and/or cable gets hot	1. Poor contact 2. Using an extension cord with excessive length	1. Be sure all connections are secure, and welding surface is clean 2. Never use an extension cord longer than 20ft
Wire does not feed	1. Wire jammed 2. Out of wire 3. Not enough tension 4. Wire liner worn 5. Contact tip clogged	1. Reload wire 2. Replace wire spool 3. Tighten tension knob if wire is slipping 4. Replace liner 5. Replace contact tip
Weld pops and sputters	1. Wire speed setting 2. Contact tip size too large 3. Drive roller slipping	1. Tune in correct setting 2. Replace contact tip 3. Increase tension
Weld current interrupted	1. Overheating protection activated due to overload	1. Protection automatically resets when transformer has cooled (approximately 15 minutes)
No weld current	1. Rectifier blown 2. Bad connection between clamp and workpiece 3. Break in earth lead 4. Break in torch lead	1. Replace rectifier 2. Clean or grind contact surface and weld area 3. Repair or replace earth lead 4. Repair or replace torch lead
Feed motor not working	1. Gear damaged or worn 2. Motor defective 3. PCB fault	1. Replace gears 2. Replace motor (contact service agent) 3. Replace PCB
Wire does not feed. Feed roller rotates	1. Pressure roller improperly adjusted 2. Dirt, copper, dust, etc. have collected in torch liner 3. Gas cup (nozzle) or tip defective 4. Deformed wire	1. Adjust tension 2. Clean the liner from the machine forward using compressed air 3. Replace gas cup (nozzle) and/or tip. Check roller tension (Sec 6) 4. Adjust roller tension
Wire feeds unevenly	1. Dirt etc. in liner 2. Gas cup (nozzle) or tip defective 3. Gas cup (nozzle) spattered 4. Feed roller groove clogged 5. Feed roller groove deformed 6. Pressure roller tension incorrect	1. Clean the liner from the machine forward using compressed air 2. Replace gas cup (nozzle) and/or tip 3. Clean or replace gas cup (nozzle) 4. Clean feed roller 5. Replace feed roller 6. Adjust tension
Unstable arc	1. Incorrect settings 2. Impurities in weld area 3. Worn or defective gas cup (nozzle)	1. Check settings 2. Clean and/or grind workpiece 3. Replace gas cup (nozzle)
Porous weld	1. No gas 2. Gas cup clogged 3. Draught blowing away shielding gas 4. Rusty/dirty joints 5. Torch too far from, or at wrong angle to, workpiece 6. Gas leak 7. Faulty electrovalve	1. Open gas cylinder, regulate gas flow 2. Clean or replace gas cup (nozzle) 3. Screen off welding site or increase gas flow 4. Clean and/or grind workpiece 5. Gas cup to workpiece should be 8-10mm. Torch angle approx 75° 6. Check hoses, connections and torch assembly. Press gas cup into position 7. Clean out or replace
Electrode sticking in gas cup (nozzle)	1. Worn or defective gas cup (nozzle) 2. Wire deformed 3. Wire speed too slow	1. Replace gas cup (nozzle) 2. Check roller tension 3. Increase wire speed
Irregular weld head	1. Torch incorrectly held 2. Wire weaving in weld pool	1. Use correct torch angle 2. Check roller tension and adjust
Weld bead too narrow and raised	1. Weld current too low 2. Weld speed too fast	1. Increase power and wire speed 2. Move torch more slowly and weave a little more
Weld bead too wide	1. Weld current too high 2. Weld speed too slow 3. Arc too long	1. Increase power and wire speed 2. Move torch more quickly and weave a little less 3. Bring torch closer to workpiece
Poor penetration	1. Weld current too low 2. Arc too long	1. Increase current and wire speed 2. Bring torch closer to workpiece
Excessive penetration	1. Weld current too high 2. Weld speed too slow 3. Incorrect distance of torch to workpiece	1. Decrease current and wire speed 2. Move torch faster 3. Torch distance should be 8-10mm

16. Parts Diagram & Listing



Parts for gas / gasless MIG Welder 151Amp 230V: Model JEFMIG151-AM			
ITEM	**DESCRIPTION**	**ITEM**	**DESCRIPTION**
1	Handle	11	Earth Clamp Interface
2	Plastic Interface	12	Power Cord/Power Plug
3	Iron Shell	13	Bracket
4	Front Panel Iron Shell	14	Casters
5	Indicator Light	15	Wire holder
6	ON/OFF switch	16	Wire Feeder
7	MAX/MIN switch	17	PCB Control Board
8	Gear switch	18	Movements
9	Current knob	19	Fan
10	MIG Torch Interface		

LIMITED WARRANTY STATEMENT

Jefferson Professional Tools & Equipment, or hereafter "Jefferson" warrants its customers that its products will be free of defects in workmanship or material. Jefferson shall, upon suitable notification, correct any defects, by repair or replacement, of any parts or components of this product that are determined by Jefferson to be faulty or defective.

This warranty is void if the equipment has been subjected to improper installation, storage, alteration, abnormal operations, improper care, service or repair.

Warranty Period

Jefferson will assume both the parts and labour expense of correcting defects during the stated warranty periods below.

All warranty periods start from the date of purchase from an authorised Jefferson dealer. If proof of purchase is unavailable from the end user, then the date of purchase will be deemed to be 3 months after the initial sale to the distributor.

1 Year
• JEFMIG151-AM
90 Days
• All replacement parts purchased outside of the warranty period

Important: *All parts used in the repair or replacement of warranty covered equipment will be subject to a minimum of 90 days cover or the remaining duration of the warranty period from the original date of purchase*.

Warranty Registration / Activation

You can register and activate your warranty by visiting the Jefferson Tools website using the following address: **www.jeffersontools.com/warranty** and completing the online form.

Online warranty registration is recommended as it eliminates the need to provide proof of purchase should a warranty claim be necessary.

Warranty Repair

Should Jefferson confirm the existence of any defect covered by this warranty the defect will be corrected by repair or replacement at an authorized Jefferson dealer or repair centre.

Packaging & Freight Costs

The customer is responsible for the packaging of the equipment and making it ready for collection. Jefferson will arrange collection and transportation of any equipment returned under warranty. Upon inspection of the equipment, if no defect can be found or the equipment is not covered under the terms of the Jefferson warranty, the customer will be liable for any labour and return transportation costs incurred. These costs will be agreed with the customer before the machine is returned.

* *Jefferson reserve the right to void any warranty for damages identified as being caused through misuse*

Warranty Limitations

Jefferson will not accept responsibility or liability for repairs made by unauthorised technicians or engineers. Jefferson's liability under this warranty will not exceed the cost of correcting the defect of the Jefferson products.

Jefferson will not be liable for incidental or consequential damages (such as loss of business or hire of substitute equipment etc.) caused by the defect or the time involved to correct the defect. This written warranty is the only express warranty provided by Jefferson with respect to its products.

Any warranties of merchantability are limited to the duration of this limited warranty for the equipment involved. Jefferson is not responsible for cable wear due to flexing and abrasion. The end user is responsible for routine inspection of cables for possible wear and to correct any issues prior to cable failure.

Claiming Warranty Coverage

The end user must contact Jefferson Professional Tools & Equipment **Tel: +44 (0)1244 646 048 (UK) / +353 (0)1473 0300 (ROI)** or their nearest authorised Jefferson dealer where final determination of the warranty coverage can be ascertained.

Step 1 - Reporting the Defect

Online Method:

- Visit our website www.jeffersontools.com/warranty and complete the Warranty Returns form. You can complete the form online and submit it to us directly or download the form to print out and return by post.

Telephone Method:

Contact your Jefferson dealer or sales representative with the following information:

- Model number
- Serial number (usually located on the specification plate)
- Date of purchase

A Warranty Returns form will be sent to you for completion and return by post or fax, together with details of your nearest authorised Jefferson repair centre. On receipt of this form Jefferson will arrange to collect the equipment from you at the earliest convenience.

Step 2 - Returning the Equipment

It is the customer's responsibility to ensure that the equipment is appropriately and securely packaged for collection, **together with a copy of the original proof of purchase**. Please note that Jefferson cannot assume any responsibility for any damage incurred to equipment during transit. Any claims against a third party courier will be dealt with under the terms & conditions of their road haulage association directives.

Please note: *Jefferson will be unable to collect or process any warranty requests without a copy of the original proof of purchase.*

Step 3 - Assessment and Repair

On receipt, the equipment will be assessed by an authorised Jefferson engineer and it will be determined if the equipment is defective and in need of repair and any repairs needed are covered by the warranty policy. In order to qualify for warranty cover all equipment presented must have been used, serviced and maintained as instructed in the user manual.

Where repair is not covered by the warranty a quotation for repair, labour costs and return delivery will be sent to the customer (normally within 7 working days). **Note:** If the repair quotation is not accepted Jefferson Professional Tools & Equipment will invoice **1 hour labour time at £30 per hour plus return carriage costs (plus VAT)**.

In cases where no fault can be found with the equipment, or, if incorrect operation of the equipment is identified as the cause of the problem, a minimum of 1 hour labour at **£30 per hour plus carriage costs** will be required before the equipment will be despatched back to the customer.

Any equipment repaired or replaced under warranty will normally be ready for shipment back to the customer within 7 working days upon receipt of the equipment at an authorised Jefferson Repair centre (subject to part availability). Where parts are not immediately available Jefferson will contact you with a revised date for completion of the repair.

General Warranty Enquiries

For any further information relating to Jefferson warranty cover please call **Tel: +44 (0)1244 646 048 (UK) +353 (0)1473 0300 (ROI)** or send your enquiry via email to **warranty@jeffersontools.com**

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EU Declaration of Conformity

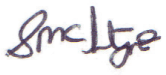
We, Jefferson Professional Tools & Equipment, as the authorised European Community representative of the manufacturer, declare that the following equipment conforms to the requirements of the following:

BS EN IEC 60974-1:2018+A1:2019 - Arc welding equipment. Welding power sources

2014/30/EU - ElectroMagnetic Compatibility (EMC)

2014/35/EU - Low Voltage (LVD)

Signed by: Stephen McIntyre
Position in the company: Operations Director
Date: 25 August 2022



Technical file holder's address as shown below

Name and address of manufacturer or authorised representative:

Jefferson Professional Tools & Equipment
24 Lisgorgan Lane,
Upperlands,
BT46 5TE

Tel: +44 (0)1244 646 048 (UK) / +353 (0)1473 0300 (ROI)

Email: info@jeffersontools.com

IMPORTANT! SAFETY FIRST!

Before attempting to use this product please read all the safety precautions and operating instructions outlined in this manual to reduce the risk of fire, electric shock or personal injury.

Jefferson Professional Tools & Equipment
24 Lisgorgan Lane,
Upperlands,
BT46 5TE

Tel: +44 (0)1244 646 048 (UK) / +353 (0)1473 0300 (ROI)
Email: info@jeffersontools.com

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