

## MIG WELDER

GAS / GASLESS • 230V ~ 50Hz



**autoMIG**

**JEFMIG185-AM**

**JEFMIG215-AM**

**User Manual**  
v.1.1



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**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.

## 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. Both units are supplied set up in gas mode, but can also easily be switched to gasless mode by a simple change of polarity. Use in gasless mode will require the purchase of a spool of fluxed cored wire, a pack of 1.0mm tips and a 1.0mm wire feed roller.

Model Number	JEFMIG185-AM			JEFMIG215-AM		
Input Voltage	230V (single phase)					
Frequency	50Hz					
Max Input Capacity	7.35kVA			8.95kVA		
No-load voltage (peak)	19.5~38VDC			19.5~40VDC		
Output Current Range	35-180A			40-215A		
Rated Output Current (A)	90	130	185	100	145	215
Rated Output Current (V)	18.5	20.5	23.2	19	21.2	24.75
*Duty cycle	60%	30%	15%	60%	30%	15%
Power Supply Circuit Breaker Specification (user allocated)	32A			40A		
Gas Type	CO <sub>2</sub> / Argon Mix & Argon & CO <sub>2</sub>					
Wire Capacity Steel	5-15kg					
Net Weight	42kg			44kg		
Dimensions	800 x 460 x 675mm					
Cooling System	Forced Air					
Torch	Euro Non Live					

\*Duty cycle is the ratio of the uninterrupted on-load duration to the total time (10 minutes in this case). It lies between a range of 0 and 1, and can be expressed as a percentage. For example, in the case of a **60% duty cycle**, a load is applied continuously for **6 min** followed by a **no-load period of 4 min**.

## Safety Guidelines

### 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.

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.

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.**

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).

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

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

**Important:** Ensure the voltage marked on the appliance matches the power supply to be used and that the supply is correctly fused.

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

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

**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.**

JEFMIG185-AM and JEFMIG215-AM are single phase machines and must be run from a minimum 16A supply. **To achieve maximum output these models will require a 30amp fused supply. We recommend you discuss the installation of an industrial round pin plug and socket with your electrician.**

Fit a plug according to the following instructions (UK only).

- a) Connect the GREEN/YELLOW earth wire to the earth terminal 'E'.
- b) Connect the BROWN live wire to the 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 outer insulation extends beyond the cable restraint and that the restraint is tight.

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 cross-section of the cable on the cable reel must be suitable for the unit and never lower than the cross-section of the mains cable supplied with the unit.

## 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.*

## 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.

## GENERAL SAFETY]

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

- Keep the welder and cables in good 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 which is available from your Jefferson dealer.
- Locate the 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 that the work 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 that the workpiece is correctly secured before operating the welder.
- Avoid unintentional contact with 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 protective head shield and gloves.
- Operators must receive adequate training before using the welder.
- Stand correctly, keeping a good footing and balance, and ensure that the floor is not slippery. Wear non-slip shoes.
- Turn voltage switch to OFF when not in use.
- DO NOT operate the welder if it or its cables are damaged and DO NOT attempt to fit any unapproved torch or other parts to the welder unit.
- DO NOT get welder wet or use in damp or wet locations or areas where there is condensation.

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

- DO NOT stand welder on a metal workbench, car bodywork or similar object.
- 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 and DO NOT bend or strain cables. Protect cables from sharp or abrasive items and DO NOT stand on them. Protect from heat. Long lengths of slack must be gathered and neatly coiled. DO NOT place cables where they could endanger other people.
- 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.

## 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.

## Assembly

**ASSEMBLING THE WHEELS:** (Refer to fig.1) The wheels are more easily assembled with the welder placed upside down on a smooth non-abrasive surface. The welder should be turned over by two people as it is very heavy.

- Bolt the two castors (1) to the front end of the base (2) using the bolts provided.
- Attach a circlip (6) to the solid axle (3) and slide a wheel (4) over the end of the axle and secure it by attaching the circlip (5) to the end of the axle.
- Take an axle retaining bracket (7) and insert it into the slots in the base (2). Hold the bracket in place and slide the axle assembly through both parts of the bracket. Insert the second axle retaining bracket (7) through the base and continue to slide the axle across so that it passes through the second bracket and holds the wheel (4) up against the side of the base. Attaching a circlip (9) to the other end of the axle, slide the second wheel (10) onto the free end of the axle and secure it by attaching a circlip (11) to the end of the axle. Screw two axle retaining brackets (7) to the axle with the two screws (8).
- With the assistance of another person, turn the welder back up the right way, onto its wheels.

**ASSEMBLING THE HANDLE:** (Refer to fig.2) On the front of the welder there are two pairs of threaded inserts, one pair in the top left corner and one pair in the top right hand corner.

- Attach the left hand handle mounting (1) to the front of the welder using two of the 25mm round headed bolts provided. Do not fully tighten yet.
- Slide the handle tube (2) into the socket in the mounting and push fully home.
- Slide the socket on the right hand handle mounting (3) over the free end of the handle tube and rotate the mounting downwards until it is resting on the front of the welder. Using two of the 25mm round headed bolts provided to fix the right hand mounting in place.
- Now fully tighten all four fixings.

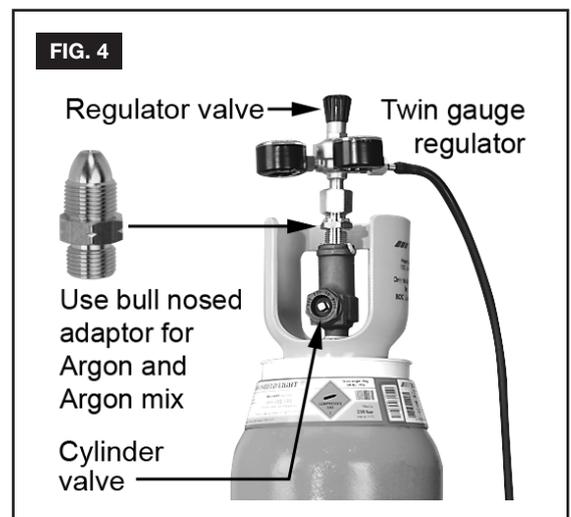
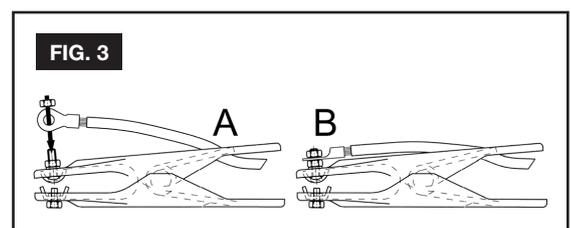
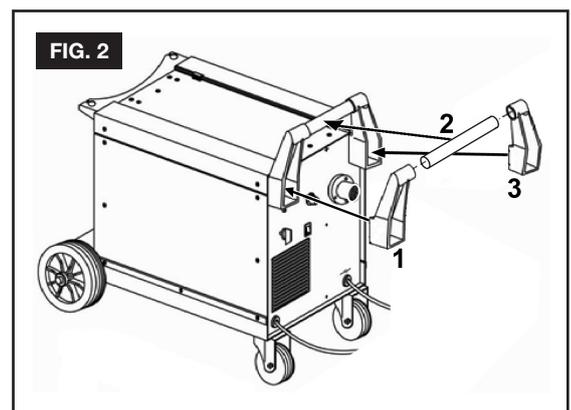
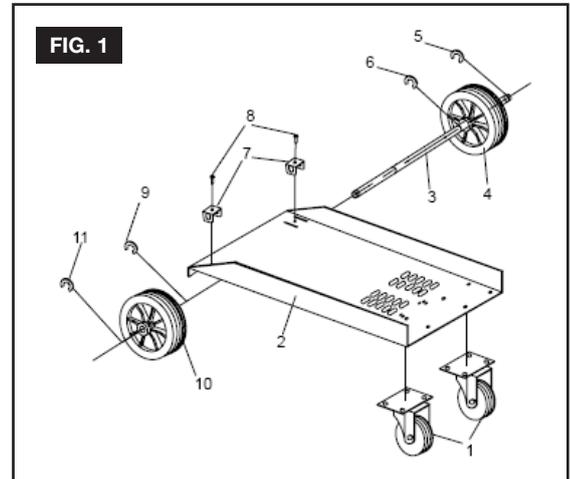
**ASSEMBLING THE EARTH CLAMP:** (Refer to fig.3) Feed the eyelet on the end of the earth lead through the hole in the clamp arm as shown in fig.3A. Drop the eyelet over the terminal and firmly fix with the bolt provided as shown in fig.3B.

• **INSTALLING THE GAS CYLINDER.** The welder is designed to accommodate small or medium sized gas cylinders up to a maximum height of 1000mm. Contact your local Gas dealer for supply.

- Place the gas cylinder onto the rear platform of the welder. Drop one end of the fixing chain into one side of the retaining bracket. Draw the chain around the cylinder and place it into the slot on the other side of the bracket leaving as little slack in the chain as possible.

**ATTACHING THE REGULATOR.** Whichever gas you are using it is advisable to 'crack' the cylinder valve before attaching the regulator. This means opening and closing the valve very quickly in order to blow away any dust and dirt that may have accumulated in the gas outlet. Stand to one side whilst doing this.

**CO<sup>2</sup> GAS.** Ensure that the threads on the gas bottle are undamaged and free of oil and grease before attaching the regulator. (Oil or grease in the presence of high pressure gases can be explosive.) E Ensure that the regulator has an undamaged gasket fitted. The regulator will screw directly to the threads on the gas bottle. Tighten with a spanner.



**ARGON GAS OR ARGON MIXTURES.** Cylinders containing Argon gas and Argon mixtures have a female thread and will require the use of a Bull Nose Adaptor to attach the regulator to the cylinder as indicated in fig.4. Ensure that the threads on the gas bottle are undamaged and free of oil and grease before attaching the regulator. (Oil or grease in the presence of high pressure gases is explosive.) Fit the Bull Nose Adaptor to the cylinder first and tighten with a spanner. Ensure that the regulator has an undamaged gasket before fitting onto the Bull Nose Adaptor. Tighten with a spanner.

- Slide a jubilee clip over each end of the gas hose supplied. Push one end of the hose onto the regulator outlet and the other end over the gas inlet spigot on the back of the welder. Tighten the clips to ensure a good seal.

- Close the regulator valve by turning it anticlockwise before opening the cylinder valve. Stand to one side when opening the cylinder valve.

- Set the regulator flow rate to 5-8 litres/min depending on the material to be welded, and whether there are draughts which are strong enough to disturb the gas flow.

**CONNECT THE TORCH CABLE TO THE WELDER.** Align the pins on the Euro connector with the socket on the welder front panel as shown in fig.5. Push the connector into the socket and rotate the locking ring (A) clockwise so that it draws the plug into the socket as shown in fig.6. **Note: damage to torches and cables is not covered by warranty.**

**FITTING A REEL OF WIRE.** These units will accept either a 5kg or a 15kg reel of wire. Ensure that the wire diameter used is matched by the correct groove size in the drive wheel and the correct tip size on the torch as well as the correct torch liner. Failure to do this could cause the wire to slip and/or bind.

Unscrew the locking knob from the end of the spool holder (see fig.7) and remove the spacer. Slide the reel of wire onto the spool holder and ensure that the clutch pin at the back of the spool holder engages into the guide hole in the wire reel moulding. This will prevent the wire reel from freewheeling on the spool holder. When using a 5kg reel, slide the spacer onto the spool holder before refixing the locking knob. Ensure that the wire is coming off the top of the reel in the direction of the wire drive unit as shown in fig.8 which shows a 15kg reel of wire in place on the spool holder.

**FEED WIRE THROUGH TO TORCH.** Open the wire feed mechanism by pushing the locking/wire tension knob (1) down to the right allowing the pressure roller carrier (2) to spring up revealing the feed roller as shown in fig.9. Ensure that the required feed groove (0.6 or 0.8) is in line with the wire path. See instructions on how to reverse or change the roller.

- Release the wire from the reel and cut off any bent portion ensuring that there are no burrs left on the end of the wire. Keep the wire under tension at all times to prevent it uncoiling.
- Straighten about 40-50mm of wire and gently push it through the flexible metal sheathed cable (3) and through the 6 or 8mm feed roller groove and on into the torch cable liner.
- Push down the pressure roller carrier onto the wire feed roller and hold it down. Lift up the locking/wire tension knob so that it enters the slot in the pressure roller carrier and snaps into the indent in its top surface. See fig.11. Rotate the tension knob to a medium setting i.e. between 2 and 3.

Remove gas cup (fig.10-2) and contact tip (1) 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 it off end of torch tip. **WARNING! do not turn gas cup anti-clockwise, as this will damage the internal spring.** d) Unscrew copper contact tip (right hand thread) to remove.

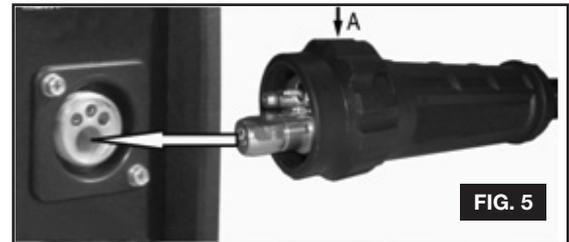


FIG. 5



FIG. 6

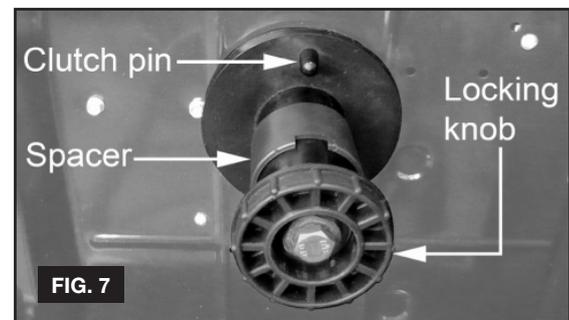


FIG. 7

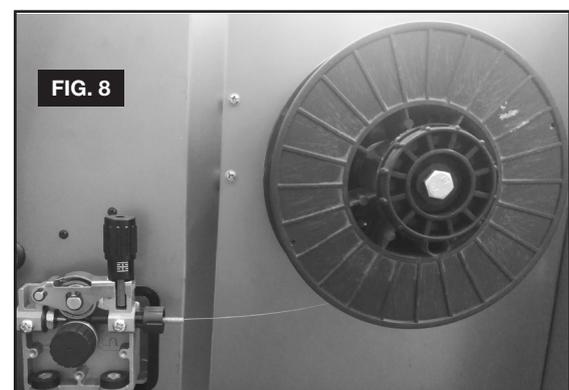


FIG. 8



FIG. 9

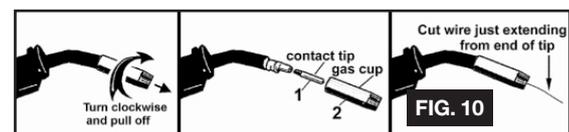


FIG. 10

Check welder is switched off "0", and that the earth clamp is away from the torch tip. Connect the welder to the mains power supply and set the voltage switch to one. Set the wire speed knob to position 5 or 6. Keep the torch cable as straight as possible and press the torch switch. The wire will feed through the torch. When the 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 back into place. b) Grasp gas cup in right hand, push onto torch head and turn clockwise only. Do not turn gas cup anti-clockwise, as this will damage the internal spring. c) Cut wire so that it is just protruding from the cup.

**SETTING WIRE TENSION.** Adjust the wire tension by rotating the wire tension knob. Turn clockwise to increase the tension and anticlockwise to decrease the tension. See (1) in fig11. **IMPORTANT: Too little or too much tension will cause problematic wire feed and result in poor welding.**

Tension between rollers is checked by slowing down the wire between gloved fingers. If top feed roller skids the tension is correct. Use as low a tension as possible, too high a tension will disfigure wire and result in a blown fuse.

**CLUTCH ADJUSTMENT.** Note: It is essential that the clutch is adjusted correctly. Once the wire is fed through the torch, switch on the machine and set the wire speed to maximum.

- D Depress torch switch and release quickly. If the spool overruns it indicates that the clutch is too loose.
- Tighten the clutch nut located in the centre of the wire spool holder with a spanner (fig.8-C) and test the machine as above until the wire stops over running.

**Note: DO NOT over tighten the clutch as this will cause wire feed problems and strain the motor.**

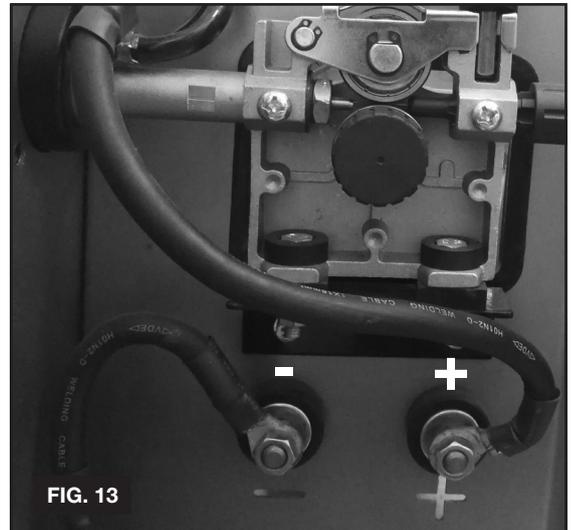
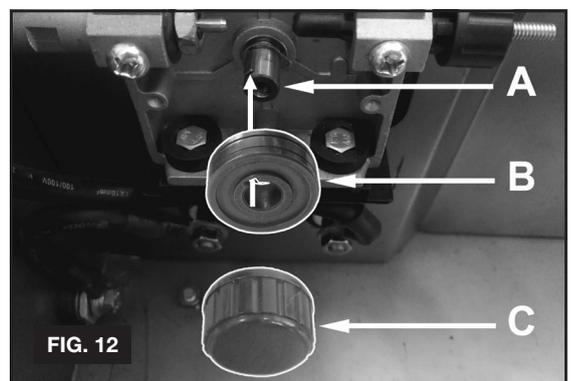
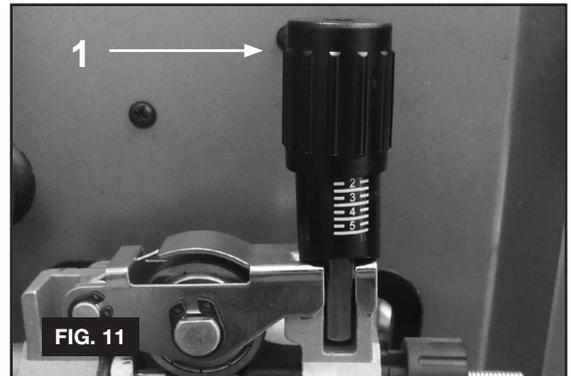
**TURNING/CHANGING THE DRIVE ROLLER.** (See fig.12) Ensure that the wire diameter used, is matched by the correct groove size in the drive wheel and the correct tip size on the torch as well as the correct torch liner. Failure to do this could cause the wire to slip and/ or bind.

Referring to fig.9, open the wire feed mechanism by pushing the locking/ wire tension knob (1) down to the right allowing the pressure roller carrier (2) to spring up revealing the feed roller.

- Referring to fig.12, loosen and unscrew the black feed roller retaining knob (C) and put to one side.
- The roller carrier (A) is keyed to the main drive shaft and the drive roller (B) is keyed to the carrier, see below. Place a finger onto the end of the drive shaft to prevent the carrier moving and slide the drive roller off the carrier with your other hand.
- The size of each wire feed groove is printed on the edge of the roller on the same side as the groove.
- Turn the roller over to use the other groove or use a roller with different sized grooves as required. The groove to be used should be positioned furthest away from you to be in line with the drive path.
- Check that the key in the carrier (A) is properly seated in its slot. Ensure that the slot on the inside face of the drive roller (B) is aligned with the key and slide the roller back onto the carrier.
- Screw the black roller retaining knob (C) back on to the end of the drive shaft and tighten.

**CONVERTING TO GASLESS WELDING.** When delivered, your welder is set up for gas welding with the torch cable connected to the positive (+) terminal and the earthing cable connected to the negative (-) terminal.

- To weld without gas (using flux cored wire) you must reverse the polarity and connect the torch cable to the negative (-) terminal and the earthing cable to the positive (+) terminal as shown in fig.13.
- Ensure that the machine is switched off and unplugged from the mains supply before carrying out this task.
- Safely disconnect the gas and Fit a 1.0mm tip to the torch.
- Change the drive roller to one having a 1.0mm groove then • Mount the flux cored wire reel and feed it through to the torch.



## Equipment Overview

The following summary provides a brief overview of the front switch panel (see Fig.14). If you have any additional questions relating to the equipment please contact your nearest Jefferson Dealer before using the equipment.

### “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.

### Voltage Setting switch

The voltage setting switch is on the front panel of the machine. There are six settings, allowing you to choose the correct voltage level for the thickness and type of metal being welded.

### 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 ~ 11.6m/min.

### 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 10 minutes**, before the unit will reset and allow you to continue welding.

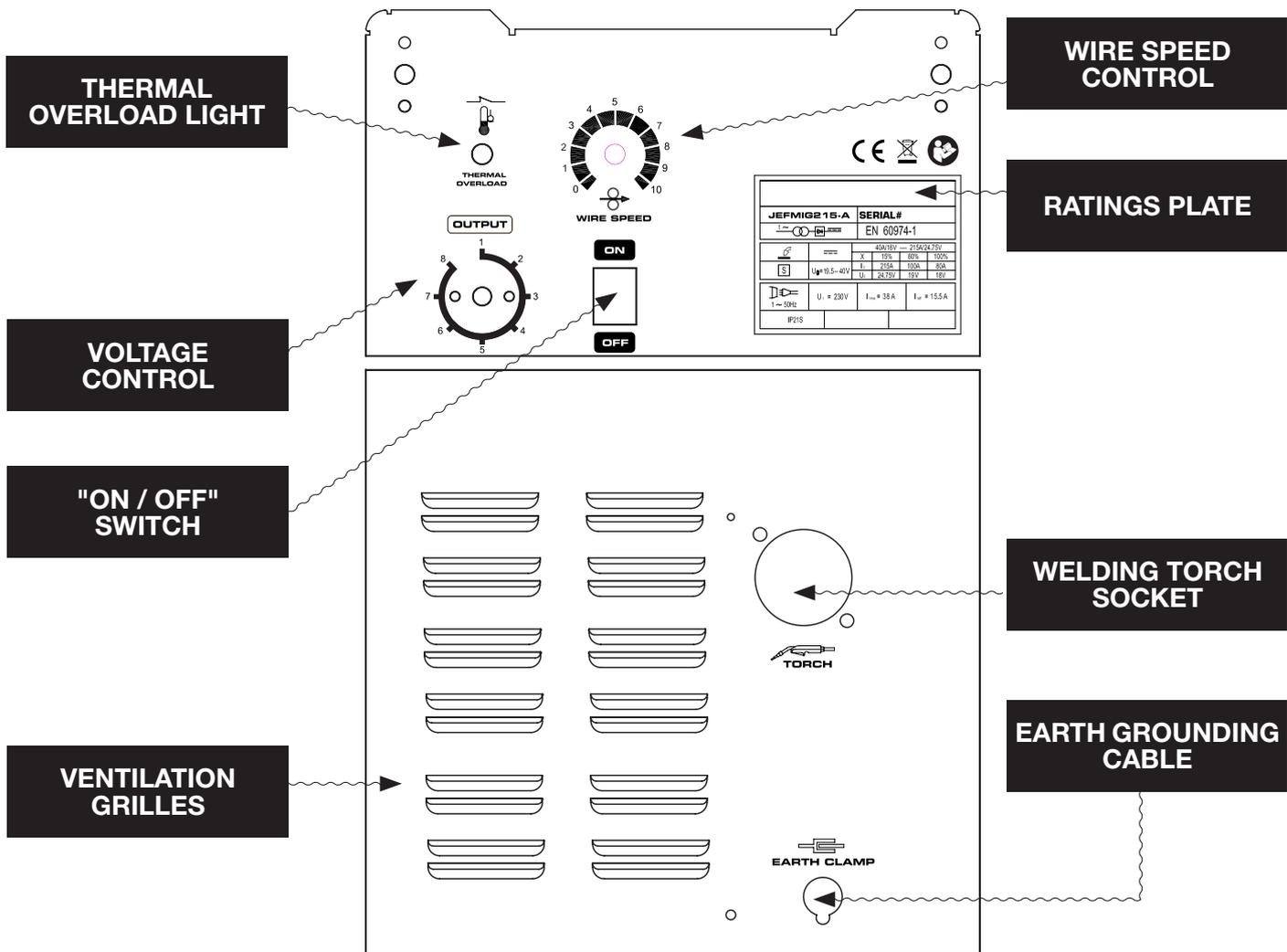
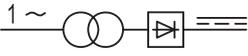


Fig.14 Front Switch Panel

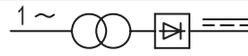
## Ratings Plate

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.

<b>JEFMIG185-AM</b>		<b>S/N:</b>	
		<b>EN 60974-1</b>	
		Welding Current Range: 35A ---- 180A	
		$U_0 = 25-46V$	
		X	15%    60%    100%
		$I_2$	180A    90A    70A
		$U_2$	23V    18.5V    17.5V
		$U_1 = 230V$	$I_{1max} = 31.5 A$
$1 \sim 50Hz$		$I_{1eff} = 13 A$	
IP21S			

<b>JEFMIG215-AM</b>		<b>S/N:</b>	
		<b>EN 60974-1</b>	
		40A/16V ---- 215A/24.75V	
		$U_0=19.5-40V$	
		X	15%    60%    100%
		$I_2$	215A    100A    80A
		$U_2$	24.75V    19V    18V
		$U_1 = 230V$	$I_{1max} = 38 A$
$1 \sim 50Hz$		$I_{1eff} = 15.5 A$	
IP21S			

## MIG / MAG Welding

A spool of welding wire is positioned on the welder's spool holder and automatically fed through an insulated liner in the torch to the tip. The torch assembly consists of a switch, liner, gas hose, and control cable. The switch activates the wire feed roller and the gas flow. Conversely, 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 end of the torch. A gas cup fits over the contact tip to direct the gas flow towards the weld ensuring that the arc welding process is shielded from oxidising air contaminants. The shielding gas also assists heating of the weld materials. (The welder can also be used in gasless mode using flux cored wire). The torch is connected to the positive side of a DC rectifier, and the negative clamp is attached to the workpiece.

**IMPORTANT:** Should you have no welding experience, we recommend you seek training from an expert source to ensure your personal health & safety. Good Mig welding may be achieved only with continued, supervised practice.

### 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 you have read & understood the electrical safety instructions.

#### Connecting the Earth Lead.

To ensure a complete circuit, the earth lead must be securely attached to the work piece that is to be welded.

- Best connection is obtained by grinding clean the point of contact on the workpiece before connecting the earth clamp.
- The weld area must also be free of paint, rust, grease, etc.
- When welding a vehicle, be sure the vehicle battery is disconnected or fit an Electronic Circuit Protector available from your Jefferson dealer.

**Power Output switch.** Set the switch to position 1 or 2 for welding up to 2mm thickness. Use settings 3,4,5,6 for thicker welds.

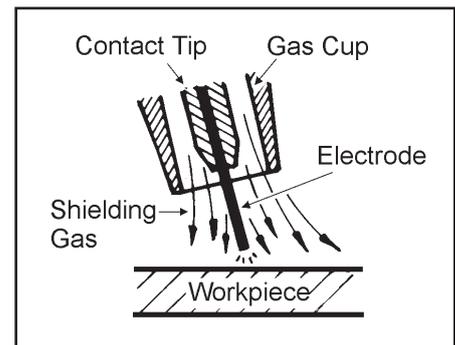
**Setting the welder controls.** In principle, the lower the amperage required, the slower the wire speed. See setting chart for voltage and corresponding wire speeds. Note: these settings are only a guide and will vary according to the operators experience.

**Welding mild steel.** To weld mild steel you can use CO<sub>2</sub> gas for most tasks where spatter and the high build up of weld do not pose a problem. Welding with a long arc reduces penetration and widens the arc. This in turn results in more spatter. A long welding arc can be appropriate for welding butt joints in thin materials. Welding with a short arc, at the same weld settings, results in greater penetration and a narrower weld and reduces the amount of spatter. To achieve a consistent spatter free and flat weld, you must use an Argon/CO<sub>2</sub> mixture.

#### To weld aluminium use:

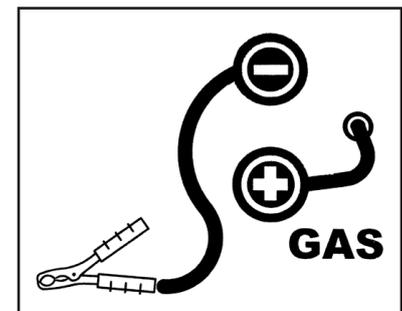
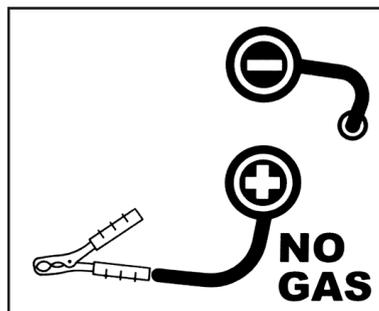
- Argon gas,
- 0.8mm Contact Tip (MIG927),
- 0.8mm Aluminium Wire, (MIG/2KAL08).

**Overload Protection.** Thermostatic overload protection is provided. When an overload has occurred, leave the unit to cool. The thermostat will automatically reset the unit when the temperature has returned within limits



Settings shown as a guide only

Wire 0.6mm Steel Argon / CO <sub>2</sub> Mix						
Voltage Step	1	2	3	4	5	6
Wire Speed	5	6	7	8	9	10



Above: Polarity settings for welding without gas and with gas

## Operation

### 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
- Ensure 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:** Orient yourself on 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.

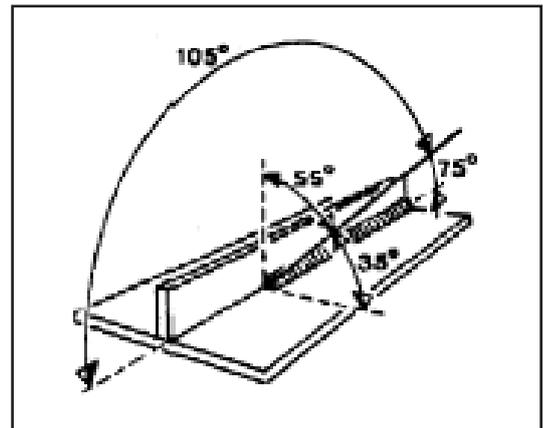
**Step 7:** Once the arc is ignited, tilt the electrode wire forward at an angle of approximately 35° (as shown in **Fig.15**).

**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.

### 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<sub>2</sub> 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 the 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.



**Fig.15** Electrode wire angle

## 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

**WIRE FEED UNIT.** 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 welding. Clean the rollers weekly, especially the feed roller groove, removing all dust deposits.

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

### CHANGING FEED ROLLER

**CONTACT TIP.** The contact tip is a consumable item and must be replaced when the hole becomes enlarged or oval. The contact tip MUST be kept free from spatter to ensure an unimpeded flow of gas.

**GAS CUP.** 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 either the fuse blowing on the printed circuit card, or expensive machine repairs.

To keep the contact tip free from spatter, we recommend the use of anti-spatter spray available from your Jefferson Dealer.

**REPLACING THE LINER.** Wind the wire back on to the spool and secure it. Unscrew the torch from the machine and undo the brass nut. The liner should now be visible. Pull it out and replace with a new one.

**Jefferson**<sup>®</sup>  
PROFESSIONAL TOOLS & EQUIPMENT

### Parts & Servicing

For Jefferson approved replacement parts contact your nearest dealer or contact Jefferson tools

**Telephone:** +44 (0)1244 646 048

**Fax:** +44 (0)1244 241 191

**Email:** [warranty@jeffersonstools.com](mailto:warranty@jeffersonstools.com)

## 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
<b>No output</b>	<ol style="list-style-type: none"> <li>1. Duty cycle exceeded</li> <li>2. Poor work clamp connection</li> <li>3. Blown breaker or fuse</li> </ol>	<ol style="list-style-type: none"> <li>1. Allow welder to cool until lamp goes out</li> <li>2. Be sure all connections are secure, and attaching surface is clean</li> <li>3. Reduce circuit load, reset breaker or replace fuse</li> </ol>
<b>Wire tangles at drive roller</b>	<ol style="list-style-type: none"> <li>1. Wrong size contact tip</li> <li>2. Torch liner clogged or damaged</li> <li>3. Contact tip clogged or damaged</li> <li>4. Drive roller worn</li> <li>5. Not enough tension</li> </ol>	<ol style="list-style-type: none"> <li>1. Use proper size contact tip</li> <li>2. Clean or replace wire liner</li> <li>3. Clean or replace contact tip</li> <li>4. Replace drive roller</li> <li>5. Tighten tension knob</li> </ol>
<b>Gun nozzle arcs to work surface</b>	<ol style="list-style-type: none"> <li>1. Slag inside gun nozzle</li> <li>2. Insulation ring melted or expired</li> </ol>	<ol style="list-style-type: none"> <li>1. Clean slag from gun nozzle</li> <li>2. Replace nozzle</li> </ol>
<b>Work clamp and/or cable gets hot</b>	<ol style="list-style-type: none"> <li>1. Poor contact</li> <li>2. Using an extension cord with excessive length</li> </ol>	<ol style="list-style-type: none"> <li>1. Be sure all connections are secure, and welding surface is clean</li> <li>2. Never use an extension cord longer than 20ft</li> </ol>
<b>Wire does not feed</b>	<ol style="list-style-type: none"> <li>1. Wire jammed</li> <li>2. Out of wire</li> <li>3. Not enough tension</li> <li>4. Wire liner worn</li> <li>5. Contact tip clogged</li> </ol>	<ol style="list-style-type: none"> <li>1. Reload wire</li> <li>2. Replace wire spool</li> <li>3. Tighten tension knob if wire is slipping</li> <li>4. Replace liner</li> <li>5. Replace contact tip</li> </ol>
<b>Weld pops and sputters</b>	<ol style="list-style-type: none"> <li>1. Wire speed setting</li> <li>2. Contact tip size too large</li> <li>3. Drive roller slipping</li> </ol>	<ol style="list-style-type: none"> <li>1. Tune in correct setting</li> <li>2. Replace contact tip</li> <li>3. Increase tension</li> </ol>
<b>Weld current interrupted</b>	<ol style="list-style-type: none"> <li>1. Overheating protection activated due to overload</li> </ol>	<ol style="list-style-type: none"> <li>1. Protection automatically resets when transformer has cooled (approximately 15 minutes)</li> </ol>
<b>No weld current</b>	<ol style="list-style-type: none"> <li>1. Rectifier blown</li> <li>2. Bad connection between clamp and workpiece</li> <li>3. Break in earth lead</li> <li>4. Break in torch lead</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace rectifier</li> <li>2. Clean or grind contact surface and weld area</li> <li>3. Repair or replace earth lead</li> <li>4. Repair or replace torch lead</li> </ol>
<b>Feed motor not working</b>	<ol style="list-style-type: none"> <li>1. Gear damaged or worn</li> <li>2. Motor defective</li> <li>3. PCB fault</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace gears</li> <li>2. Replace motor (contact service agent)</li> <li>3. Replace PCB</li> </ol>
<b>Wire does not feed. Feed roller rotates</b>	<ol style="list-style-type: none"> <li>1. Pressure roller improperly adjusted</li> <li>2. Dirt, copper, dust, etc. have collected in torch liner</li> <li>3. Gas cup (nozzle) or tip defective</li> <li>4. Deformed wire</li> </ol>	<ol style="list-style-type: none"> <li>1. Adjust tension</li> <li>2. Clean the liner from the machine forward using compressed air</li> <li>3. Replace gas cup (nozzle) and/or tip. Check roller tension (Sec 6)</li> <li>4. Adjust roller tension</li> </ol>
<b>Wire feeds unevenly</b>	<ol style="list-style-type: none"> <li>1. Dirt etc. in liner</li> <li>2. Gas cup (nozzle) or tip defective</li> <li>3. Gas cup (nozzle) spattered</li> <li>4. Feed roller groove clogged</li> <li>5. Feed roller groove deformed</li> <li>6. Pressure roller tension incorrect</li> </ol>	<ol style="list-style-type: none"> <li>1. Clean the liner from the machine forward using compressed air</li> <li>2. Replace gas cup (nozzle) and/or tip</li> <li>3. Clean or replace gas cup (nozzle)</li> <li>4. Clean feed roller</li> <li>5. Replace feed roller</li> <li>6. Adjust tension</li> </ol>
<b>Unstable arc</b>	<ol style="list-style-type: none"> <li>1. Incorrect settings</li> <li>2. Impurities in weld area</li> <li>3. Worn or defective gas cup (nozzle)</li> </ol>	<ol style="list-style-type: none"> <li>1. Check settings</li> <li>2. Clean and/or grind workpiece</li> <li>3. Replace gas cup (nozzle)</li> </ol>
<b>Porous weld</b>	<ol style="list-style-type: none"> <li>1. No gas</li> <li>2. Gas cup clogged</li> <li>3. Draught blowing away shielding gas</li> <li>4. Rusty/dirty joints</li> <li>5. Torch too far from, or at wrong angle to, workpiece</li> <li>6. Gas leak</li> <li>7. Faulty electrovalve</li> </ol>	<ol style="list-style-type: none"> <li>1. Open gas cylinder, regulate gas flow</li> <li>2. Clean or replace gas cup (nozzle)</li> <li>3. Screen off welding site or increase gas flow</li> <li>4. Clean and/or grind workpiece</li> <li>5. Gas cup to workpiece should be 8-10mm. Torch angle approx 75°</li> <li>6. Check hoses, connections and torch assembly. Press gas cup into position</li> <li>7. Clean out or replace</li> </ol>
<b>Electrode sticking in gas cup (nozzle)</b>	<ol style="list-style-type: none"> <li>1. Worn or defective gas cup (nozzle)</li> <li>2. Wire deformed</li> <li>3. Wire speed too slow</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace gas cup (nozzle)</li> <li>2. Check roller tension</li> <li>3. Increase wire speed</li> </ol>
<b>Irregular weld head</b>	<ol style="list-style-type: none"> <li>1. Torch incorrectly held</li> <li>2. Wire weaving in weld pool</li> </ol>	<ol style="list-style-type: none"> <li>1. Use correct torch angle</li> <li>2. Check roller tension and adjust</li> </ol>
<b>Weld bead too narrow and raised</b>	<ol style="list-style-type: none"> <li>1. Weld current too low</li> <li>2. Weld speed too fast</li> </ol>	<ol style="list-style-type: none"> <li>1. Increase power and wire speed</li> <li>2. Move torch more slowly and weave a little more</li> </ol>
<b>Weld bead too wide</b>	<ol style="list-style-type: none"> <li>1. Weld current too high</li> <li>2. Weld speed too slow</li> <li>3. Arc too long</li> </ol>	<ol style="list-style-type: none"> <li>1. Increase power and wire speed</li> <li>2. Move torch more quickly and weave a little less</li> <li>3. Bring torch closer to workpiece</li> </ol>
<b>Poor penetration</b>	<ol style="list-style-type: none"> <li>1. Weld current too low</li> <li>2. Arc too long</li> </ol>	<ol style="list-style-type: none"> <li>1. Increase current and wire speed</li> <li>2. Bring torch closer to workpiece</li> </ol>
<b>Excessive penetration</b>	<ol style="list-style-type: none"> <li>1. Weld current too high</li> <li>2. Weld speed too slow</li> <li>3. Incorrect distance of torch to workpiece</li> </ol>	<ol style="list-style-type: none"> <li>1. Decrease current and wire speed</li> <li>2. Move torch faster</li> <li>3. Torch distance should be 8-10mm</li> </ol>

## 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)

**Equipment Category:** MIG Welder

**Product Name/Model:** JEFMIG185-AM / JEFMIG215-AM

**Signed by:** Stephen McIntyre

**Position in the company:** Operations Director

**Date:** 29 July 2021

*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

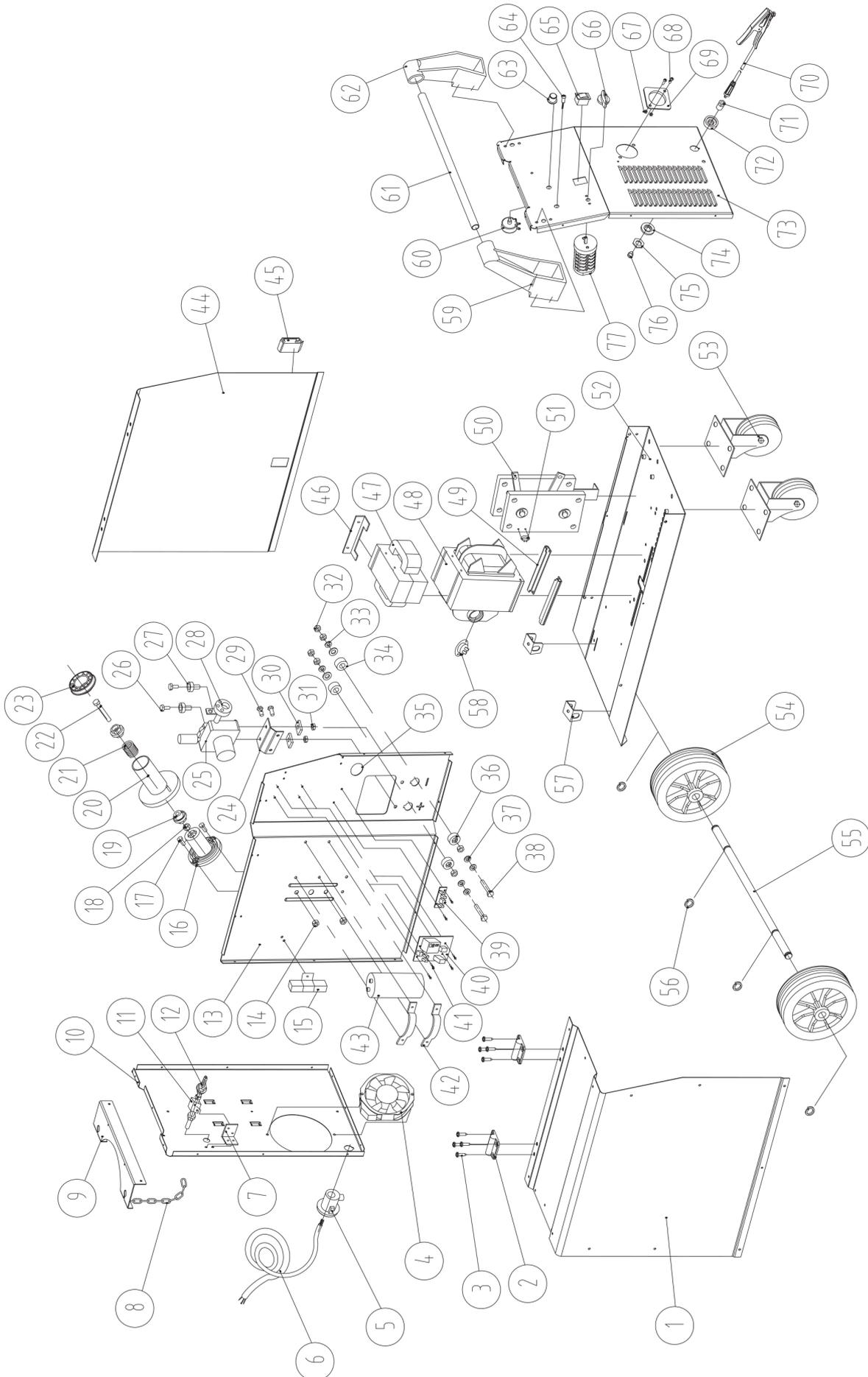
**Tel:** +44 (0)1244 646 048 (UK) / +353 (0)1473 0300 (ROI)

**Email:** info@jeffersonstools.com

## Parts Diagram

### JEFMIG185-AM & JEFMIG215-AM

ITEM	DESCRIPTION	ITEM	DESCRIPTION
1	Side Panel	40	Wire Feed PCB
2	Hinge	41	Screw, M3 x 8mm
3	Screw, M6 x 16mm	42	Capacitor Bracket
4	Fan	43	Capacitor
5	Cable Tip	44	Door Panel
6	Power Cord	45	Latch
7	Valve Bracket	46	Reactor Bracket
8	Chain	47	Filter Reactor
9	Gas Bottle Support	48	Transformer
10	Back Panel	49	Transformer Support
11	Gas Valve	50	Rectifier
12	Valve Connector	51	Thermal Switch (RC)
13	Inner Panel	52	Bottom Panel
14	Nut, M8	53	Wheel, Caster
15	Resistance	54	Wheel
16	Spool Axle	55	Axle
17	Bolt, M8 x 20mm	56	Circlip
18	Nut, M10	57	Axle Bracket
19	Plastic Knob	58	Thermal Switch (TR)
20	Spool Holder	59	Handle Support (Left)
21	Spring	60	Potentiometer
22	Bolt, M10 x 80mm	61	Handle
23	Retainer	62	Handle Support (Right)
24	Wire Feeder Support	63	Speed Control Knob
25	Wire Feeder	64	Overload Indicator Light
26	Bolt, M6 x 25mm	65	ON/OFF Switch
27	Insulating Washer	66	Voltage Control Knob
28	Torch Holder	67	Nut, M5
29	Screw, M5 x 12mm	68	Screw, M5 x 16mm
30	Insulating Washer	69	Insulating Cover
31	Nut, M6	70	Ground Cable with Clamp
32	Nut, Copper, M8	71	Cable connector socket
33	Washer	72	Protective cover
34	Insulating Washer	73	Front Panel
35	Rubber Ring	74	Insulating Washer
36	Insulating Washer	75	Nut, M16
37	Washer	76	Bolt, M8 x 12mm
38	Bolt, M8 x 55mm	77	Voltage Control Switch
39	Filter PCB		



## 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

- JEFMIG185-AM / JEFMIG215-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.jeffersonstools.com/warranty](http://www.jeffersonstools.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.jeffersonstools.com/warranty](http://www.jeffersonstools.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@jeffersonstools.com](mailto:warranty@jeffersonstools.com)

#### Disclaimer:

*The information in this document is to the best of our knowledge true and accurate, but all recommendations or suggestions are made without guarantee. Since the conditions of use are beyond their control, Jefferson Tools® disclaim any liability for loss or damage suffered from the use of this data or suggestions. Furthermore, no liability is accepted if use of any product in accordance with this data or suggestions infringes any patent. Jefferson Tools® reserve the right to change product specifications and warranty statements without further notification. All images are for illustration purposes only.*

## **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@jeffersonstools.com](mailto:info@jeffersonstools.com)

**[www.jeffersonstools.com](http://www.jeffersonstools.com)**