



INSTRUCTIONS FOR

# POWERMIG WELDERS

MODEL No's: **POWERMIG2750.V2**  
**POWERMIG3500.V2**  
**POWERMIG4500.V2**



# SEALEY POWER WELDERS

## INSTRUCTIONS FOR: POWERMIG2750, POWERMIG3500, POWERMIG4500.

Thank you for purchasing a Sealey Welder. Manufactured to a high standard this product will, if used according to these instructions and properly maintained, give you years of trouble free performance.



**IMPORTANT:** BEFORE USING THIS PRODUCT, PLEASE READ THE INSTRUCTIONS CAREFULLY. MAKE CAREFUL NOTE OF SAFETY INSTRUCTIONS, WARNINGS AND CAUTIONS. THIS PRODUCT SHOULD ONLY BE USED FOR ITS INTENDED PURPOSE. FAILURE TO DO SO MAY CAUSE DAMAGE OR PERSONAL INJURY, AND WILL INVALIDATE THE WARRANTY. RETAIN THESE INSTRUCTIONS FOR FUTURE USE.

### 1. SAFETY INSTRUCTIONS

#### 1.1 ELECTRICAL SAFETY. **WARNING!** It is the user's responsibility to read, understand and comply with the following:

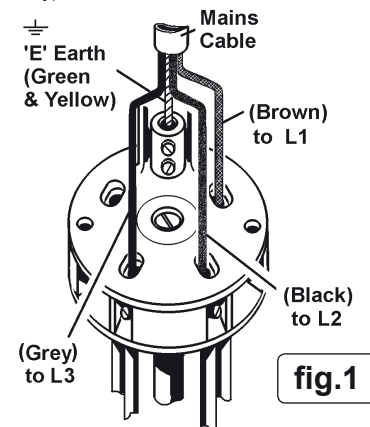
You must check all electrical equipment and appliances to ensure they are safe before using. You must inspect power supply leads, plugs and all electrical connections for wear and damage. You must ensure the risk of electric shock is minimised by the installation of appropriate safety devices. An RCCB (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 professional electrician. You may obtain a Residual Current Device by contacting your Sealey dealer. **You must** also read and understand the following instructions concerning electrical safety.

- 1.1.1 The Electricity At Work Act 1989 requires all portable electrical appliances, if used on business premises, to be tested by a qualified Electrician at least once a year, using a Portable Appliance Tester (PAT).
- 1.1.2 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.**
- 1.1.3 Ensure the insulation on all cables and the product itself is safe before connecting to the mains power supply. See 1.1.1. & 1.1.2. above and use a Portable Appliance Tester (PAT).
- 1.1.4 Ensure that cables are always protected against short circuit and overload.
- 1.1.5 Regularly inspect power supply, leads, plugs and all electrical connections for wear and damage, especially power connections, to ensure that none are loose.
- 1.1.6 **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 correct capacity fuse.
- 1.1.7 DO NOT pull or carry the powered appliance by its power supply lead or output cables.
- 1.1.8 DO NOT pull power plugs from sockets by the power cable.
- 1.1.9 DO NOT use worn or damage leads, plugs or connections. Immediately replace or have repaired by a qualified Electrician. A U.K. 3 pin plug with ASTA/BS approval is fitted. In case of damage, cut off and fit a new plug according to the model, (discard old plug safely).

#### 1.2 MODELS POWERMIG 2750, 3500 & 4500 ARE 3 PHASE MACHINES AND MUST HAVE AN APPROPRIATE PLUG FITTED.

**WARNING!** ELECTRICAL INSTALLATION OF WELDER TO A 3 PHASE 415VOLT SUPPLY MUST ONLY BE CARRIED OUT BY A QUALIFIED ELECTRICIAN. Make sure the power supply cable is correctly connected to the Earth.

- 1.2.1 **This product must be fitted with a 3 phase plug according to figure 1, and will require a minimum of 16AMPS per phase, (preferably 32AMP) electrical supply. You must contact a qualified Electrician to ensure an appropriately fused supply is available.**  
Connect GREEN/YELLOW wire to Earth 'E'  
Connect BROWN wire to L1 Terminal.  
Connect BLACK wire to L2 Terminal.  
Connect the GREY wire to terminal L3.  
When completed, check there are no bare wires, that all wires have been connected correctly and the cable restraint is tight. (NOTE: The cable core colours found in the mains cable on this welder are consistent with Amendment 2 to BS7671:2001 which harmonised UK cable core colours with those used in Europe.)



- 1.2.2 DO NOT use this product with a standard extension cable. Only use ARMoured extension cable.

#### 1.3 GENERAL SAFETY

The operator should be properly trained to use the welder safely and should be informed about the risks relating to mig and arc welding procedures, the associated protection measures and emergency procedures. (Refer also to the "IEC TECHNICAL SPECIFICATION or CLC/TS 62081: INSTALLATION AND USE OF EQUIPMENT FOR ARC WELDING")

- ▲ **DANGER!** unplug the welder from the mains power supply before performing maintenance or service.
- ✓ 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. (Non recommended 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 Sealey dealer.
- ✓ Locate welder in adequate working area for its function. Ensure area has adequate ventilation as welding fumes are harmful.
- ✓ Keep working 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:** always use a welding helmet or mask to protect your eyes.  
Use special fire resistant protective clothing and do not allow the skin to be exposed to the ultraviolet and infrared rays produced by the arc. Other people in the vicinity of the arc should be protected by shields of non reflecting welding curtains.  
The operator should be adequately insulated from the electrode, the work piece and any accessible earthed metal parts in the vicinity by the wearing of safety shoes and welding gauntlets plus the aforementioned safety clothing.  
Where necessary the operator should work on insulating mats or on an insulated safety platform in elevated positions.
- ✓ Remove ill fitting clothing, remove ties, watches, rings, and other loose jewellery, and contain long hair.
- ✓ Ensure 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 non essential persons away from the working area. Any persons working within the area must use protective head shield and gloves.
- ✓ Operators must receive adequate training before using the welder. The welder must only be operated under supervision.
- ✓ Stand correctly keeping a good footing and balance, and ensure the floor is not slippery, and wear non-slip shoes.
- ✓ Turn voltage switch to "0" or off when not in use.
- x DO NOT operate the welder if it or its cables are damaged and DO NOT attempt to fit any non genuine torches, components, or parts to the welder unit.
- x 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.
- x DO NOT touch any live metal parts of the torch or electrode while the machine is switched on.
- x DO NOT weld on on any containers which are under pressure.
- x DO NOT pull the welder by the cable, or the torch, and DO NOT bend or strain cables, protect from sharp or abrasive items, and DO NOT stand on cables or leads. Protect from heat. Long lengths of slack must be gathered & neatly coiled. DO NOT place cables where they endanger others.

- X DO NOT touch the torch or workpiece immediately after welding as they will be very hot. Allow to cool.
  - X DO NOT operate welder while under the influence of drugs, alcohol or intoxicating medication, or if fatigued.
  - ✓ When not in use store the welder in a safe, dry, childproof area.
  - X DO NOT operate welder in damp or wet places and do not weld in the rain.
  - ✓ Provide adequate ventilation or facilities for the removal for of welding fumes from near the arc. The risk should be assessed by a Health and Safety professional in relation to the exposure limits for the welding fumes, which will depend on their composition, concentration and the exposure time
- VOLTAGE BETWEEN ELECTORDE HOLDERS OR TORCHES.**
- X Working with more than one welding machine on a single piece or on pieces that are connected electrically may generate a dangerous amount of no-load voltage between the two electrode holders or torches, the value of which may reach double the allowed limit. Measuring instruments should be used to determine the existence of a risk and suitable precautions taken as detailed in section 5.9 of the IEC TECHNICAL SPECIFICATION OF CLC/TS 62081.
- 1.4 ELECTROMAGNETIC INTERFERENCE.**
- ✓ The electromagnetic fields generated by the welding process may interfere with the operation of electrical and electronic equipment. Users of vital electronic and electrical devices such as pacemakers and respirators are advised not to remain in the vicinity of an operating welding machine. If in doubt seek medical advice before entering a welding area. Users of such devices should not operate the welding machine. This welder complies with the requirements of the technical standard for the use of this type of product, only and exclusively in industrial environments and for professional purposes. It is not guaranteed to meet electronic compatibility requirements in the home.
- 1.5 GAS SAFETY**
- ✓ Store gas cylinders in a vertical position only and ensure the storage area is correctly secured.
  - X DO NOT store gas cylinders in areas where temperature exceeds 50°C. DO NOT use direct heat on a cylinder. Always keep gas cylinders cool.
  - X DO NOT attempt to repair or modify any part of a gas cylinder or valve, and DO NOT puncture or damage a cylinder.
  - X DO NOT obscure or remove any official labels from a cylinder. Always check the gas identity before use. Avoid getting gas cylinders oily or greasy.
  - X DO NOT try to lift or handle cylinder by its cap, guard or valve. Always keep caps and guards in place and close valve when not in use.
- The gas cylinder is heavy, use mechanical lifting equipment. Ensure the cylinder is correctly situated on the welder base stand and secured with chain.
- 1.6 RISK ASSESSMENT**
- ✓ Where welding is unavoidable in awkward situations such as in confined spaces, in environments with increased risk of electric shock, and in the presence of inflammable or explosive materials, a risk assessment must be carried out by an experienced and qualified expert professional in consultation with providers of emergency services to ensure that operations are carried out in the safest possible way.

## 2. INTRODUCTION & SPECIFICATIONS

IMPORTANT: These instructions contain information you require to prepare your machine for welding, together with maintenance and a trouble shooting section. If you have no previous experience the instructions are not intended to show you how to become a welder. Should you have no experience, we recommend that you seek training from an expert source. Mig welding is relatively easy to perform, but does require a steady hand and time practising under supervision with scrap metal as it is only with continued practice that you will achieve the desired results.

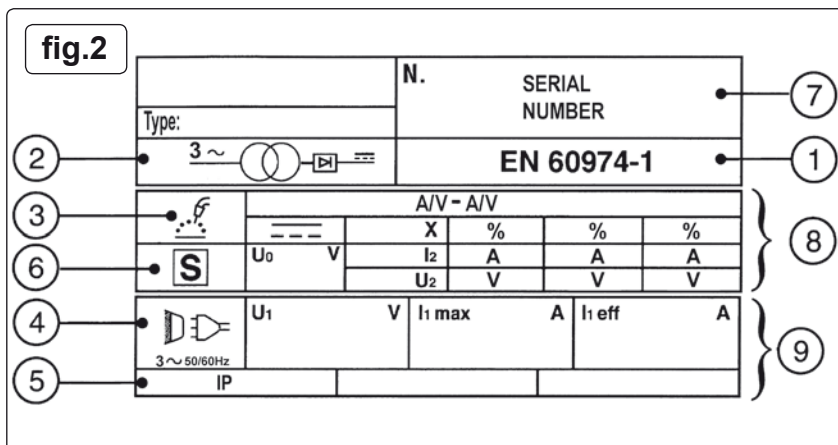
Tried and trusted by fabricators and professional car repair shops across the UK. Superb quality, Swedish made electronic wire drive motors and heavy-duty transformers make these machines unmatched in performance and value. Our three top of the range 3ph units, are covered by the Sealey 12 month warranty plus an additional 24 months on the main transformer. Each unit comes with 0.8mm steel wire, non- live torch and industrial Argon/CO2 regulator. All can be used with CO2, Argon or CO2/Argon mix and accept any bottle size. Gas bottles not included.

Model:	POWERMIG2750	POWERMIG3500	POWERMIG4500
Current adjustment:	10 level rotary power selection.	12 level rotary power selection.	18 level rotary power selection.
Output Range:	35-275 Amps	35-350 Amps	35-450 Amps
Duty Cycle:	10% @ 260A, 30% @ 240A 60% @ 160A, 100% @ 130A	10% @ 330A, 15% @ 320A, 25% @ 300A, 60% @ 200A, 100% @ 150A	10% @ 430A, 15% @ 420A, 25% @ 400A, 60% @ 260A, 100% @ 200A
Power Supply:	415 Volt 3ph	415 Volt 3ph	415 Volt 3ph
Power Efficiency:	8.0 kVA	12.5 kVA	18.5 kVA
Cooling System:	Turbo Fan	Turbo Fan	Turbo Fan
Accepts Bottle Size:	All	All	All
Spot Welding:	Timer Fitted	Timer Fitted	Timer Fitted
Weight:	75 kg	95 kg	110 kg

## 3. RATINGS PLATE SYMBOLS

Detailed technical data relative to the performance of the machine is located on the back panel plate. **Please note** that the ratings plate shown (fig.2) below is an example only intended to assist with the explanations of symbols. To determine the correct technical values of the machine in your possession, you must refer to the data plate.

- 1 The EUROPEAN standard regarding safety and the construction of arc welding machines.
- 2 Symbol for the main internal parts of the welder : i.e. inverter - transformer - rectifier.
- 3 Symbol of planned welding procedure: i.e welding with a continuous flow of welding wire
- 4 Symbol for power supply line: 3 phase alternating voltage.
- 5 Case protection rating: IP2. Standard governing the required protection from water ingress and isolation of internal parts from persons and objects.
- 6 Symbol S: Indicates that welding operations may be carried out in areas with greater risk of electric shock (e.g. close to metal masses).
- 7 Serial Number : Refer to your particular machine
- 8 Performance of the welding circuit:  
 U<sub>0</sub> : Maximum voltage with no-load peak (welding circuit open)  
 12 / U<sub>2</sub> : Current and corresponding voltage are normal [ U<sub>2</sub>=(20+0.04 I<sub>2</sub>) V ] and may be supplied from the machine during welding.  
 X : Intermittent welding ratio: Indicates time during which machine can supply the corresponding current (same column). This is expressed in % on the basis of a 10min. cycle (e.g. 60% = 6 min of work, 4 min. break and so on).  
 A/V-A/V : Indicates the welding current adjustment range ( minimum - maximum ) at the corresponding arc voltage.



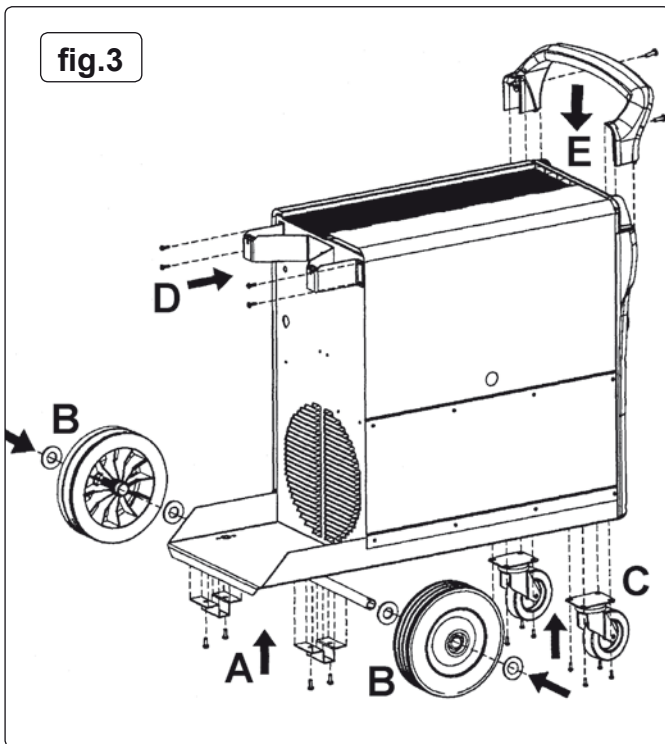
- 9 DATA REGARDING THE MAINS.  
 U<sub>1</sub> : Alternating supply voltage of the machine. Allowed limits (±10%).  
 I<sub>1</sub> max: Maximum current consumed.  
 I<sub>1</sub> eff: Maximum effective current consumed.  
 Value of delayed fuses for mains protection.

### 3. ASSEMBLY & INSTALLATION

Carefully remove outer carton and packing. Be very careful when removing the welding unit from the packing base as the unit is very heavy, we recommend that unpacking the base and wheel assembly is undertaken by two persons. Check the welder and contents. Should there be any damaged or missing parts contact your supplier immediately.

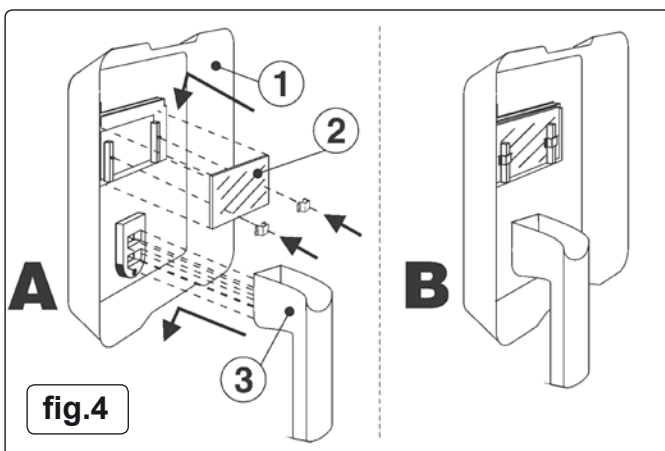
#### 3.1. WELDER ASSEMBLY (fig.3).

- 3.1.1 **WHEELS** - Attach the axle to the underside of the bottom tray using the two top hat sections provided. (See fig.3A) Do not fully tighten until the wheels are attached. Slide a washer over each end of the axle followed by a wheel followed by another washer. (See fig.3B) Retain the wheels by inserting a split pin through either end of the axle. Check that the wheels can rotate freely then tighten the top hat sections. Attach the front castors to the unit using the self tapping screws provided as shown in fig.3C.
- 3.1.2 **GAS BOTTLE REST** - Attach the gas bottle rest to the rear face of the welder using the self tapping screws provided as shown in fig.3D.
- 3.1.3 Push the handle down into the recesses provided at the top of the front face of the welder as shown in fig.3E. Retain the handle on either side using the self tapping screws provided.



#### 3.2. WELDING MASK ASSEMBLY (fig.4).

- 3.2.1 Assemble the welding mask as shown below.

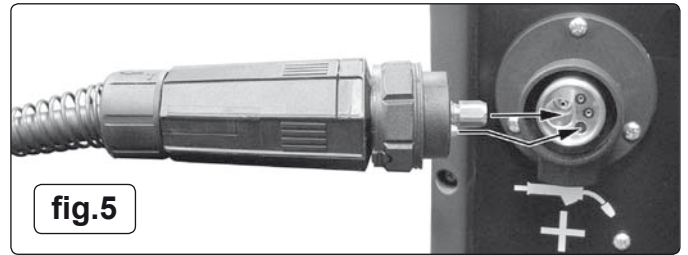


#### 3.3. CONNECTION TO THE MAINS POWER SUPPLY.

- 3.3.1 Before making any electrical connections, ensure that the mains voltage and frequency of the supply matches the electrical specification of the welder as stated on the welder's rating plate.
- 3.3.2 The welder must only be connected to a three phase power supply with the neutral conductor connected to earth.
- 3.3.3 Refer to the section on electrical safety at the start of these instructions for information on the correct connection of the mains power plug.

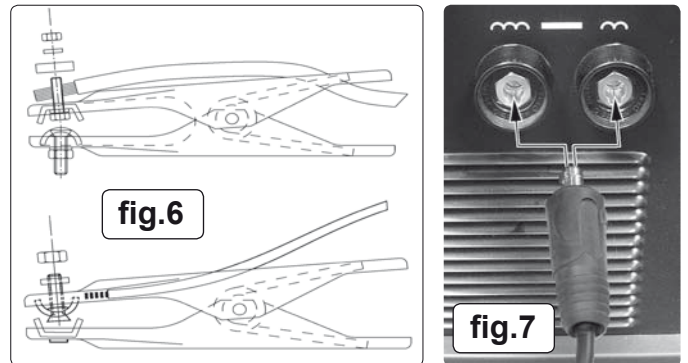
#### 3.4. TORCH "Euro Connection" (fig.5).

Your welder is fitted with a "Euro Connection" quick release torch. Simply line the pins in the torch up with appropriate holes on the front panel connector and push in and tighten the locking nut.



#### 3.5. EARTH CLAMP (fig.6).

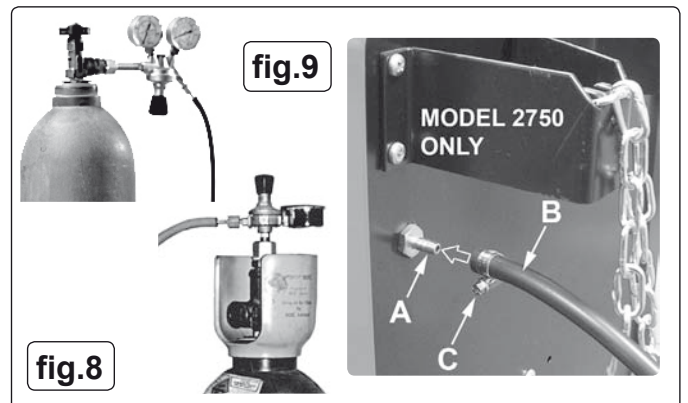
- 3.5.1 Assemble the earth lead to the earth clamp as shown below left.



- 3.6 Connecting the welding current return cable (fig.7). The earthing clamp should be firmly attached to the piece being welded ( or to a metal bench supporting it ), as close as possible to the joint being made. The quick connector at the other end of the cable will be connected to one of the terminals identified with a minus symbol (-). There are two alternative connections offering different reactance levels depending on the type of material being welded.

The lefthand socket as shown above has maximum reactance and is intended for aluminium material and derivative alloys (Al), copper alloys (CuAl/CuSi).

The right hand socket has minimum reactance and is intended for stainless steel (SS), carbon steel and low alloys (Fe).



#### 3.7. Connecting the gas cylinder (fig.8 & 9).

- 3.7.1 Stand the gas cylinder on the platform at the rear of the welder and secure with chain supplied. The platform is designed to support bottles up to a maximum weight of 20kg.
- 3.7.2 If using Argon or Argon mixtures, you will need to use the "bull nose adaptor" enclosed. If you intend to use CO2 gas the regulator will fit directly onto the cylinder. If using the bull nose, fit nose adaptor to the cylinder and tighten with a spanner.
- 3.7.3 Remove regulator from box and screw it to the bull nose adaptor (or CO2 cylinder). Slide a small jubilee clip over the rubber hose from the welder, connect the hose to the regulator "BP" output and secure with the jubilee clip (fig 8). On model 2750 connect the gas hose to the gas inlet on the rear of the welder (See fig.9A). Tighten the jubilee clip.
- 3.7.4 Close the regulator by turning the adjusting screw anti-clockwise to relieve the pressure on the diaphragm before opening the cylinder valve. If this is not done, pressure from the cylinder can damage the diaphragm and render the regulator inoperative.
- 3.7.5 Set the regulator flow rate to 4litres/min depending on the material to be welded, also taking into consideration any draughts which are strong enough to disturb the gas flow.



3.8 **FIT A REEL OF WIRE.** Ensure the welder is unplugged from the mains power. The machine is supplied with a mini spool of wire, but will accept up to 15kg spools without modification.

3.8.1 Open the side of the unit, remove any spacer from the reelholder and push the reel of wire over the holder end springs and onto the holder ensuring that the spool is rotating anti-clockwise with the wire drawing off the reel from the bottom towards the wire drive unit. The larger spools of wire have a guide hole 'B' which must be pushed over the plastic pin located at the back of the reel holder 'A' (See fig.10 below). When a larger reel has been located on this pin, push the appropriate spacer back onto the holder to keep reel engaged with the pin. The pin, in conjunction with the braking mechanism will stop large reels from free wheeling around the holder.

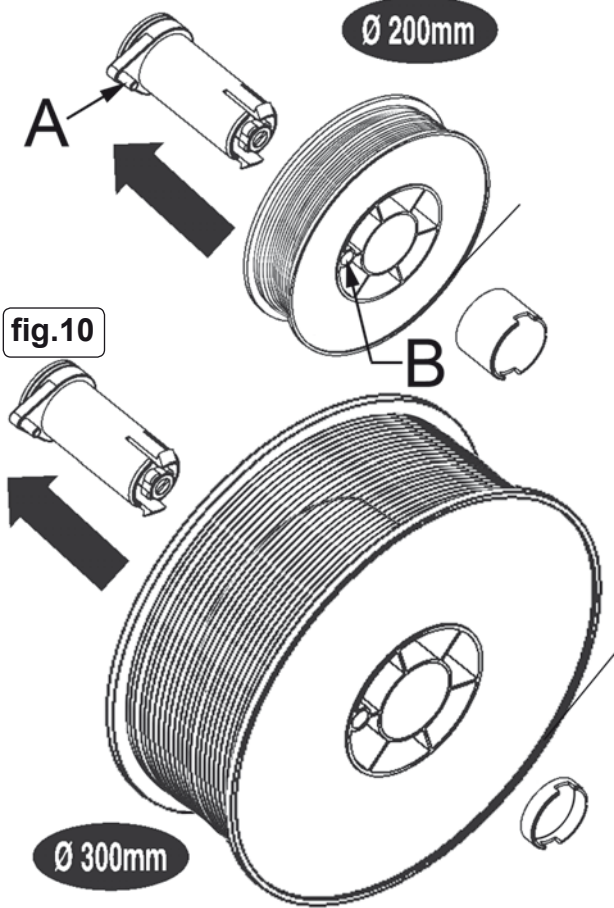


fig.10

3.8.2 Rotate the reel of wire anticlockwise whilst tightening the adjuster in the centre of the reel holder until a slight braking pressure can be felt. See fig.11.

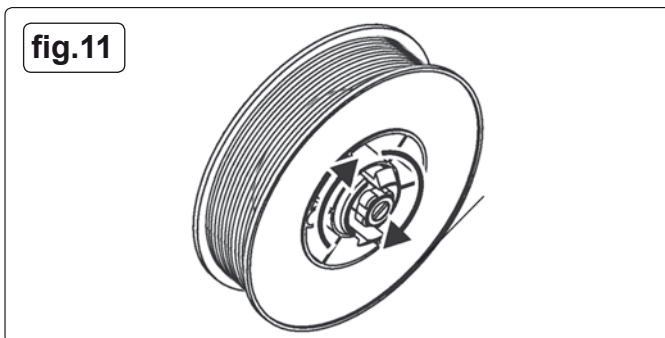


fig.11

#### 4. WIRE FEED FOR POWERMIG2750

MAKE SURE THAT THE WIRE FEED ROLLERS, THE WIRE GUIDE HOSE AND THE CONTACT TIP OF THE TORCH MATCH THE DIAMETER AND TYPE OF WIRE TO BE USED AND ARE FITTED CORRECTLY.

4.1 Loosen the roller pressure adjustment screw and hinge it forwards and downwards to allow the pressure roller housing to spring upwards (fig.12a). Ensure that the drive roller is correctly set to drive the wire diameter chosen (0.6 or 0.8mm). If necessary release and reverse the roller as shown in fig.12b.

4.2 Straighten about 50-100mm of spool wire (*do not allow wire to uncoil*). Ensure the wire is undistorted and clean cut with no burrs or sharp points. Gently push the wire through the plastic guide, over the 6mm or 8mm drive roller groove and into the torch fitting wire guide by 50 to 100mm. (See fig.12c) Note: Burrs or sharp points at wire tip may damage the torch liner.

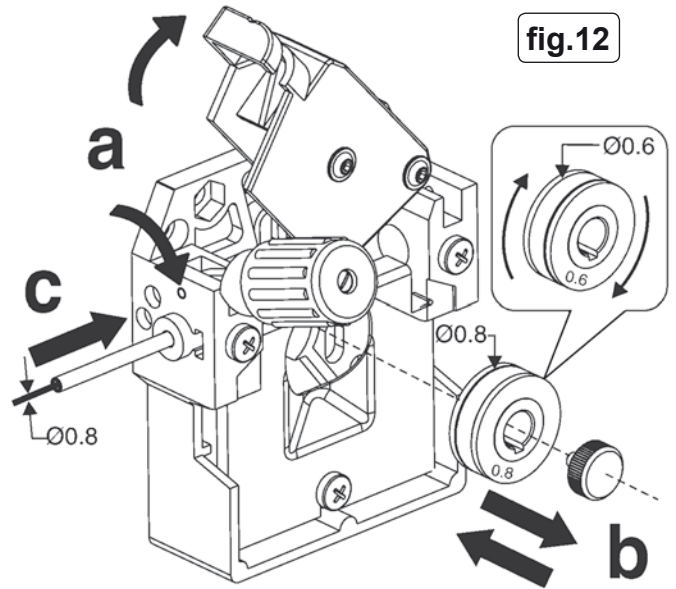


fig.12

4.3 Ensure that the wire is resting in the groove correctly then close the pressure roller housing and hinge the adjusting screw upwards to retain it in place. (See fig.13)

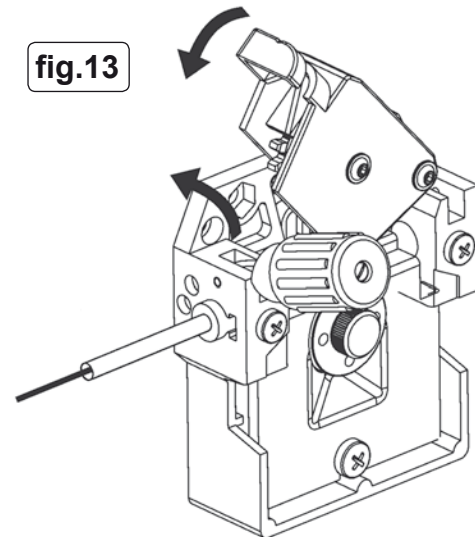


fig.13

4.4 Set the roller pressure adjustment screw to an intermediate value. (See fig.14)

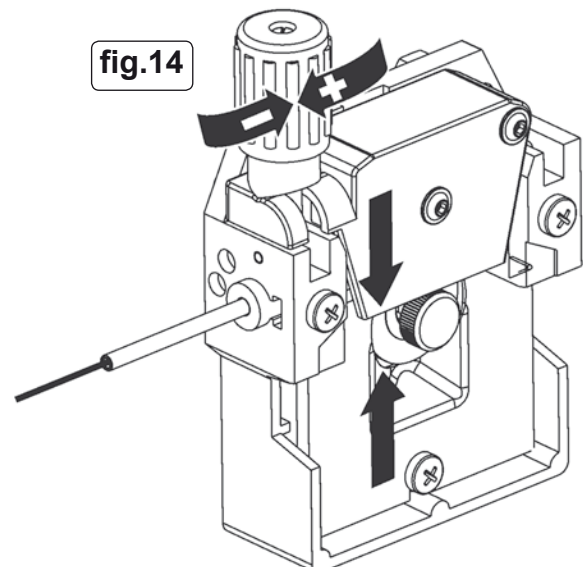
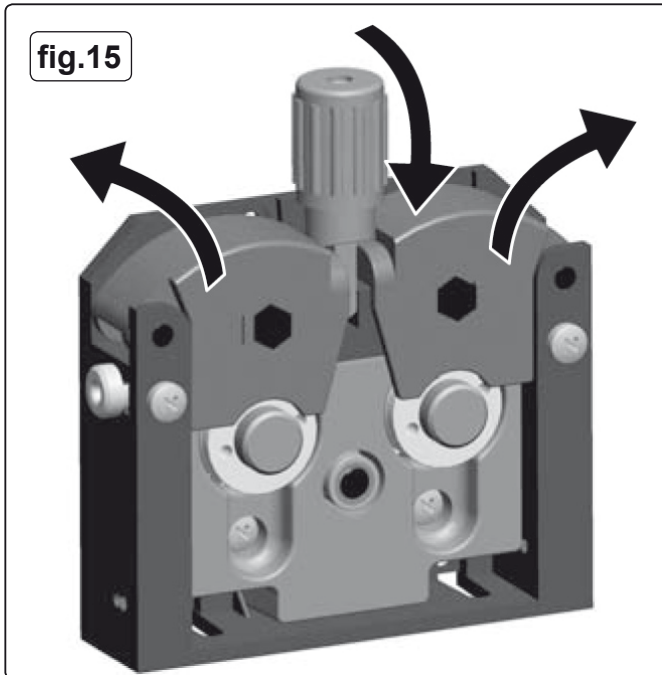


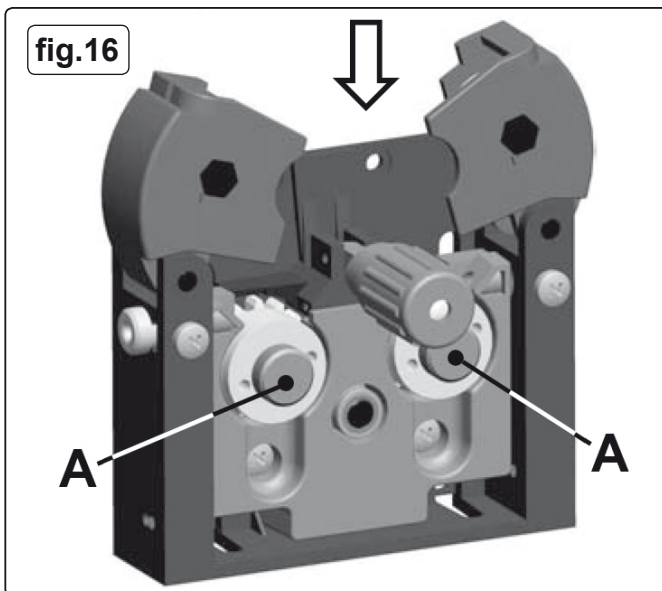
fig.14

## 5. WIRE FEED - POWERMIGS 3500,4500

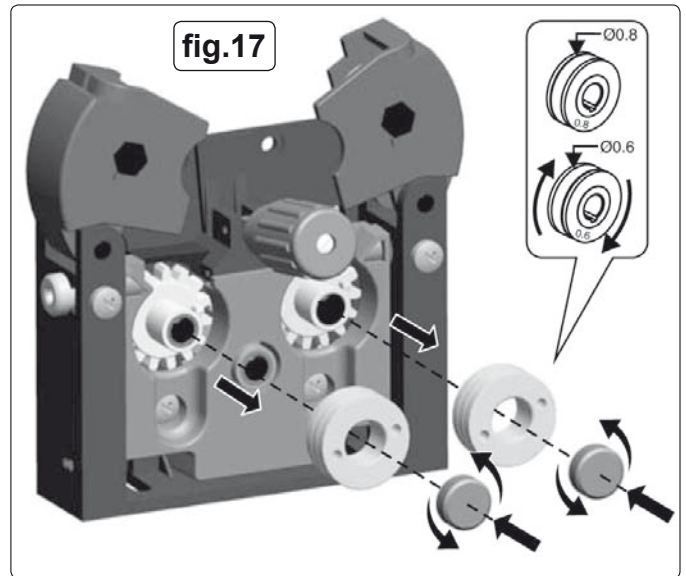
MAKE SURE THAT THE WIRE FEED ROLLERS, THE WIRE GUIDE HOSE AND THE CONTACT TIP OF THE TORCH MATCH THE DIAMETER AND TYPE OF WIRE TO BE USED AND ARE FITTED CORRECTLY.



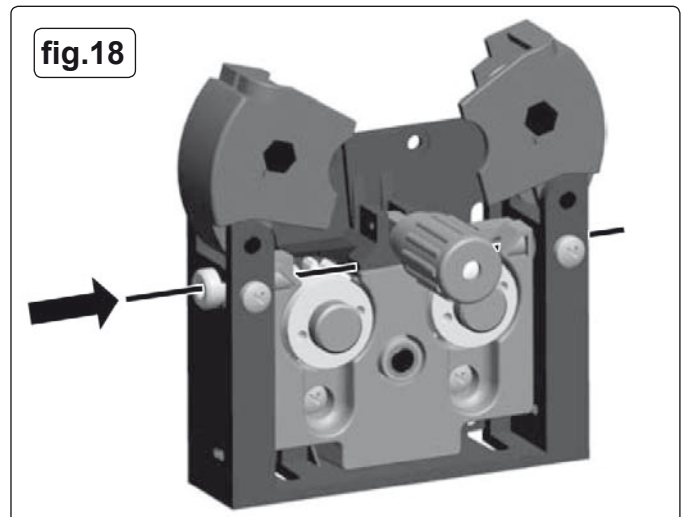
- 5.1 The wire feed mechanism has two separate grooved drive rollers and two separate pressure rollers. The pressure rollers are in separate housings which are held in place and acted upon by a single, central pressure adjustment knob as shown in fig.15 above. To access the drive mechanism pull the pressure adjustment knob forwards and allow it to hinge downwards. As you do so the pressure roller housings will spring upwards as shown in fig.16 below.



- 5.2 Each drive roller has two drive grooves, one for 0.8mm wire and one for 1.0mm wire. When using a different thickness of wire it will be necessary to reverse the position of each roller to ensure that the correct drive groove is in line with the wire feed drive path.
- 5.3 You will see a number reference stamped on the face of each roller e.g. 08 (referring to 0.8mm wire). The number refers to the groove nearest the back of the roller which is in line with the wire feed path. To reverse the position of the rollers firstly unscrew and remove the knurled knobs that hold each roller in position (see A in fig.16).



- 5.4 To set up the drive for 0.6mm wire pull the rollers from their drive axles as shown in fig.17, reverse them and push them back onto the drive axles. Rotate each roller on its axle until one of the 4 holes in the roller drops over the alignment pin on the drive gear. Check that the required groove dimension appears on the visible face of both rollers. Fix rollers in position by screwing in the knurled knobs previously removed.



- 5.5 Straighten about 50-100mm of spool wire (*do not allow wire to uncoil*). Ensure the wire is undistorted and clean cut with no burrs or sharp points. (Note: Burrs or sharp points at wire tip may damage the torch liner.) Gently push the wire through the flexible plastic guide and into the brass wire inlet (fig.18). Guide the wire over the first roller and through the central plastic guide block. Guide the wire over the second roller and into the torch fitting wire guide by 50 to 100mm.

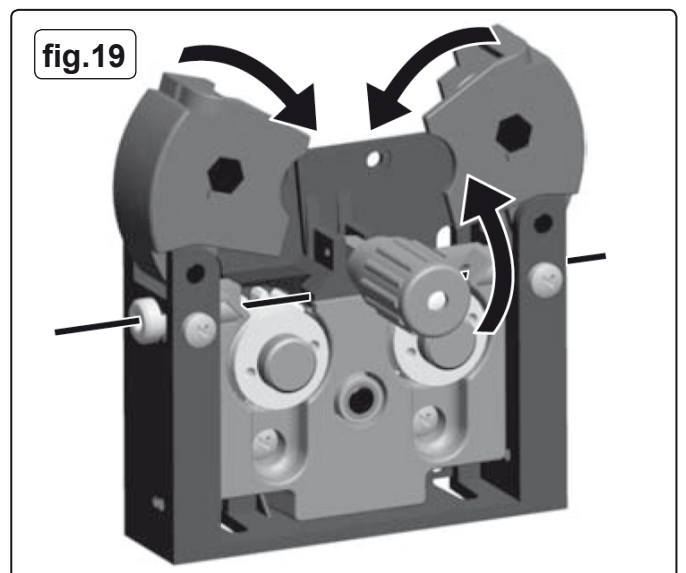
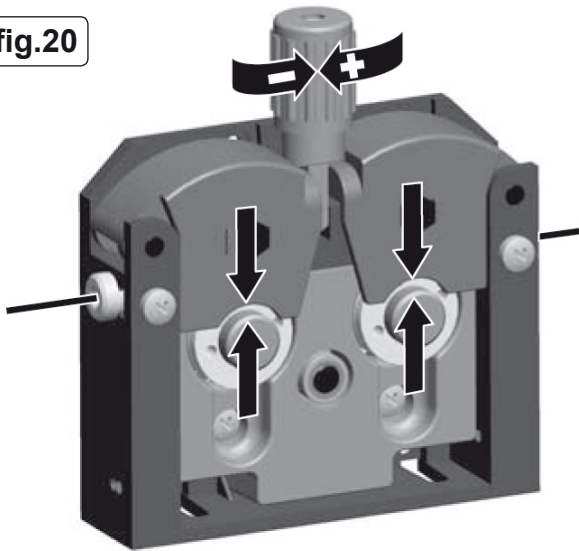


fig.20



5.6 Close and hold down each pressure roller housing then hinge the pressure knob upwards and onto the housings until it snaps into position. (fig.19) Set an intermediate pressure between marks 2 and 3. Turning the knob clockwise increases the pressure. Turning the knob anti-clockwise decreases the pressure. (See fig.20 above).

### 5.7 FEEDING WIRE THROUGH TO THE TORCH.

5.7.1 Before feeding the wire through to the torch the gas cup and contact tip should be removed as shown in fig.21.

5.7.2 **Model POWERMIG 2750** 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. (Cup is a friction fit.)
- 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 the internal spring.
- d) Unscrew the copper contact tip using a 6mm spanner on the flats of the contact tip. It has a conventional right hand thread.

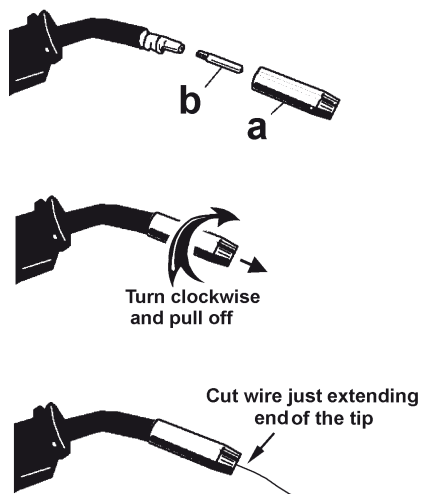
5.7.3 **Models POWERMIG 3500 & 4500.** The gas cup is a friction fit onto the torch and can be pulled off with a twisting action in either direction. Unscrew the copper contact tip using a 6mm spanner on the flats of the contact tip. It has a conventional right hand thread.

5.7.4 To feed the wire through to the torch it will be necessary to power up the welder.

5.7.5 **Model 2750.**

Check welder is switched off "0", and that the earth clamp is isolated and away from the torch tip. Connect the welder to the mains power supply and set the voltage switch to "1".

fig.21



5.7.6 **Models 3500 & 4500** have a portable feed unit inside the welder. Ensure that this is connected to the main unit before proceeding. Connect the positive power supply lead and the control lead from the feeder to the sockets in the internal compartment as shown in fig.22.

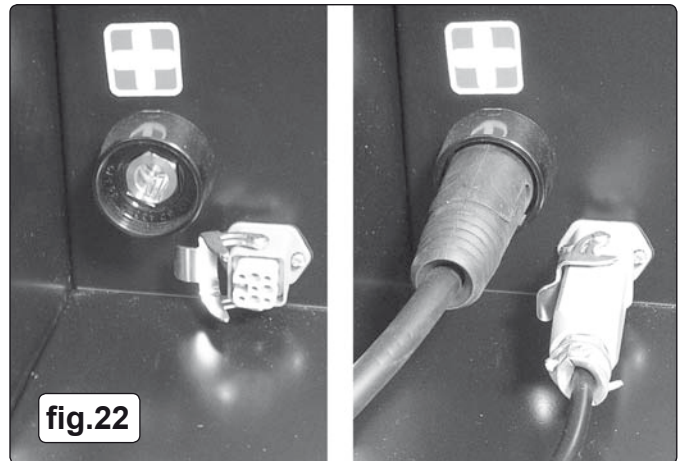


fig.22

5.7.7 Connect the welder to the mains power supply and set the voltage switch to "1".

5.7.8 Set the wire speed knob to position 5 or 6, (the higher the number the faster the speed). Keep the torch cable as straight as possible and press the torch switch to feed wire through the torch.

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

5.7.10 Replace contact tip and gas cup. Cut wire so that it is protruding 1/4" from the cup.

**WARNING!** During these operations the wire is live and subject to mechanical stress; therefore, if adequate precautions are not taken the wire could cause hazardous electric shock, injury and striking of electric arcs. Do not direct the torch tip towards parts of the body and keep the torch away from the gas bottle

### 5.8 SETTING WIRE TENSION.

**IMPORTANT:** You must set the correct tension, too little or too much tension will cause problematic wire feed and result in poor welding.

5.8.1 Tension between rollers is checked by slowing down the wire between your fingers. If top feed roller skids the tension is correct. Use as low a tension as possible, too high a tension will deform wire and result in a blown fuse on the printed circuit board. Adjust tension by turning pressure knob as shown in fig.20.

### 5.9 CLUTCH ADJUSTMENT

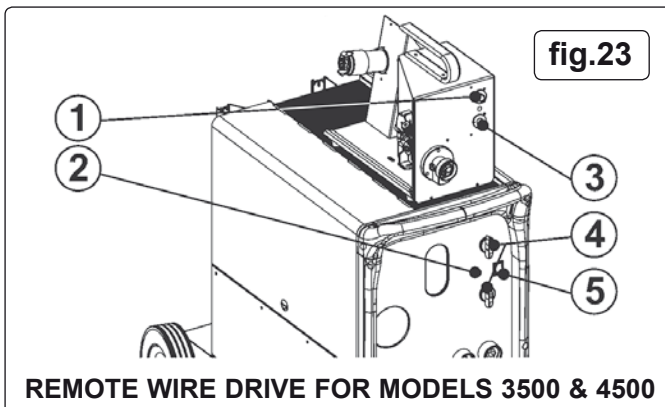
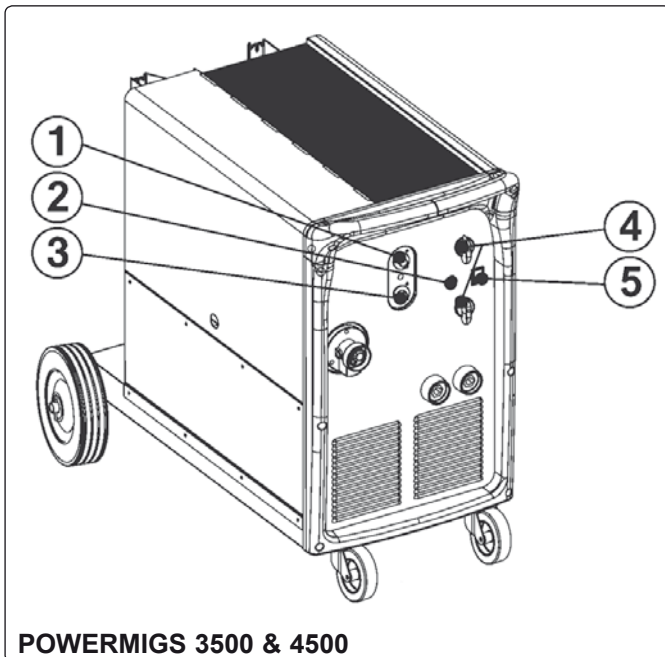
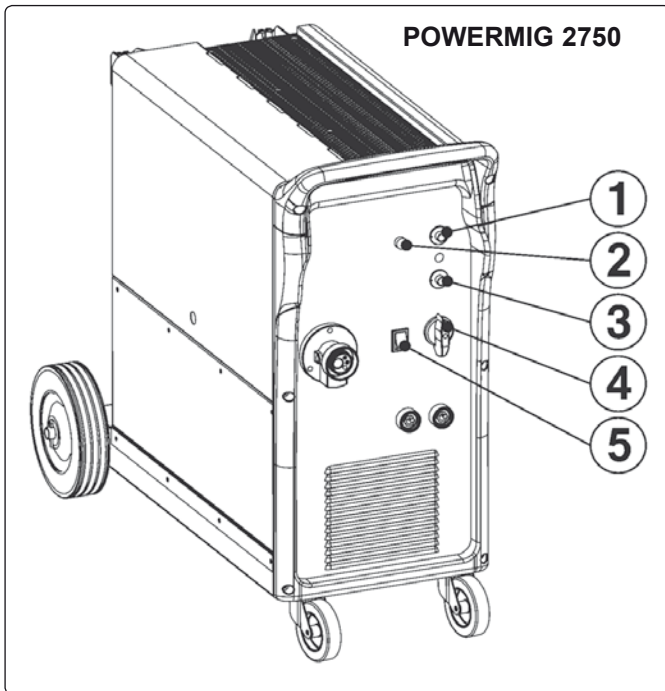
It is essential that the clutch is adjusted correctly. Once the wire is fed through the torch, switch on the machine and set the wire speed and voltage switch to maximum. Depress the torch switch and release quickly. If spool overruns it indicates that the clutch is too loose. Tighten the clutch (located in the centre of the wire spool holder (fig 11), and test the machine as above until the wire stops over running.

**WARNING!** DO NOT over tighten the clutch as this will cause wire feed problems.



## 6. POWERMIG CONTROLS

- |                            |                          |
|----------------------------|--------------------------|
| ① WIRE FEED RATE           | ④ ARC VOLTAGE ADJUSTMENT |
| ② THERMOSTAT TRIGGER LIGHT | ⑤ MAIN SWITCH            |
| ③ WELDING TIME             |                          |



## 7. REMOTE WIRE DRIVE UNIT



### 7.1 USING REMOTE WIRE DRIVE Models 3500 & 4500.

The wire drive unit supplied with the models 3500 & 4500 is a separate entity which can be mounted inside the welder (as supplied), on top of the welder (as shown in fig.23), or remotely from the welder by the connection of an umbilical lead assembly as shown in fig.24 .

- 7.1.1 Lift the side panel to access the drive unit.
- 7.1.2 Unplug the circular dinse connector and the adjacent square connector to be found in the left hand side of the compartment.(fig.22)
- 7.1.3 Undo the butterfly bolt that secures the unit.
- 7.1.4 The unit may be placed on top of the welder where a location hole is to be found, and secured with the butterfly bolt.
- 7.1.5 Pass the connectors through the hole in the rear bulkhead adjacent to the internal sockets and re-connect the dinse and square connectors, and fit the torch to the euro-connection on the portable unit.  
The wire drive may also be used away from the welder with optional umbilical extensions.  
Contact your local Sealey dealer to order:  
3 metre umbilical lead assembly model no. 120/802271.  
9 metre umbilical lead assembly model no. 120/802272.

### 7.2 SYSTEM PROTECTION

To provide a level of protection against faults such as short circuits or overheating, two safety features are incorporated in the welder unit. The auxiliary circuit is protected by a 1 Amp fuse located on the auxiliary transformer. Two thermostats are built into the system to protect against overheating, the second providing a margin of safety should the first thermostat fail. Regularly check the thermostats to ensure they are correctly in contact with adjacent parts. The indicator light comes on when there is overheating and cuts off the power supply; it will reset automatically within a few minutes, after cooling down.

## 8. WELDING PRINCIPLES

### IMPORTANT.

*Should you have no welding experience, we recommend you seek training from an expert source to ensure your personal health & safety. You must familiarise yourself with welding applications and limitations, and specific potential hazards peculiar to welding. Good Mig welding may be achieved only with continued, supervised practice.*

- 8.1 **MIG/MAG welding.** (See fig.25 ). A spool of welding wire is placed on the spool holder and automatically fed through an insulated liner in the torch to its tip. The torch consist of a switch, liner, gas hose, and control cable. The switch activates the wire feed roller and the gas flow. Releasing the switch stops wire feed and gas flow. The weld current is transferred to the electrode (the wire) from the contact tip at the torch end.



Wire speed must be adjusted according to power 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 the arc welding process is shielded from oxidising air contamination (fig.25). The shielding gas also assists heating of the weld. The torch is connected to the positive side of a DC rectifier, and negative clamp is attached to the workpiece.

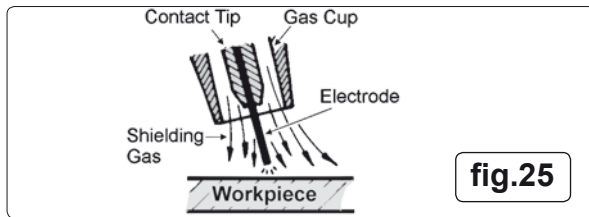


fig.25

**8.2 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 YOU READ AND UNDERSTAND THE SAFETY INSTRUCTIONS IN CHAPTER 1.**

**8.2.1 Connecting the Earth Lead.**

Connect the earth lead as described in section 3.6. Use the single return earth for steel up to 6mm in thickness, and the double return earth for steel over 6mm.

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

a) Best connection is obtained by grinding the point of contact on the workpiece before connecting clamp to the workpiece.

b) The weld area must also be free of paint, rust, grease, etc.

c) If welding a vehicle, disconnect vehicle battery or fit an "Electronic Circuit Protector" to battery, (available from your Sealey dealer).

**8.2.2 The wire feed rate switch controls the speed of the wire feed. In principle, the lower the amperage number the slower the wire speed.**

**8.3 Gas types and their use.**

Welding mild steel with CO<sub>2</sub> 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 Argon/CO<sub>2</sub> mixture. *To weld aluminium use: ✓ Argon gas or Argo-Helium mixture, ✓ 0.8mm Contact Tip, ✓ 0.8mm Aluminium Wire, (MIG/2/KAL08) ✓ Liner (red) Aluminium.*

**8.4 COMMENCING WELDING.**

**8.4.1** Before carrying out difficult sections of welding, tests should be carried out on scrap pieces of metal. These tests should be carried out to find the best control settings in order to obtain the best welding possible. As a starting point refer to the welding guide below in conjunction with the current switch setting charts overleaf. If the arc melts in drops and tends to go out, the speed of the wire should be increased or the welding current decreased. If, however, the wire hits the piece violently and causes material to be projected, the wire speed should be reduced.

**8.4.2** It should be remembered that in order to obtain the best results, each type of wire is suited to a specific current and wire feed speed. Therefore, for difficult sections of welding and welding which requires a great deal of time, wires with different diameters should be tried so that the most suitable may be chosen.


**8.4.3 Turn on and adjust the protective gas** using the pressure regulator. Adjust to a flow rate of 5-7 l/min.

**8.4.4 NOTE: At the end of the job, remember to turn off the protective gas.**

**8.4.5 Switch the welder on and set the welding current** by means of the rotary switch or switches. (Refer to current switch settings overleaf)

**8.4.6 Ensure that the earth clamp is in contact with the workpiece.**

**8.4.7 Press the torch button**, keeping the torch at a safe distance from the workpiece.

<b>WELDING GUIDE: See also current settings overleaf.</b>			
'S' SHEET THICKNESS	WELDING WIRE DIAMETER	NUMBER OF PASSES	
		REFERENCE DIAGRAM	
0.6-0.8	0.6	a	1
1-1.5	0.8	a	1
2.5	0.8	a-b	1
4	1	a-b	1-2
6-10	1	a-b	2

**8.5 Aluminium Welding.**

Argon or an Argon-Helium mixture should be used for shielding. The wire used must have the same characteristics as the material to be welded. Always use an alloy wire (i.e. aluminium/silicium); DO NOT use pure aluminium wire. A problem you may experience when aluminium MIG welding is in pulling the wire for the whole length of the torch, as aluminium has poor mechanical characteristics. The smaller the diameter of wire the more difficult the wire feed may be. To overcome this problem do the following.

- Use contact tip suitable for aluminium.
- Replace the wire puller rollers with aluminium compatible rollers.
- Replace the steel guide hose for wire feed with a Teflon guide hose.
- For information contact your local Sealey dealer .

**8.6 SPOT WELDING (fig.26)**

**8.6.1** This model has the capability to spot weld two overlapping metal sheets and is equipped with an adjustable timer which allows ideal spot welding time to be set and therefore the creation of spot-welds which have the same characteristics. In order to use the machine for spot welding, it should be set-up as follows:

**8.6.2** Replace the nozzle of the torch with the nozzle required for spot welding. The castelations on the cup keep it the correct distance from the weld pool and allow the shielding gas to escape. The nozzle is also used to push the two pieces being welded together.

**8.6.3** Set the rotary current adjustment switch / switches to the highest setting. (See current switch setting charts overleaf.) Set the wire feed speed at almost maximum speed.

Turn ON the Timer control and set the spot welding time according to the thickness of the metal sheets.

**8.6.4** To carry out the spot welding; rest the nozzle of the torch on the surface of the first metal sheet, then press the torch button to start welding; the wire will melt the first sheet, pass through this sheet and into the second, making a molten wedge between the two metal sheets.

**8.6.5** The torch button should be pressed until the timer interrupts the welding. This system allows spot-welding to be carried out which would not normally be possible with conventional spot welders, since metal sheets can be joined which do not allow access to the rear side of the workpiece.

This system also makes the operator's work much easier thanks to the extremely light-weight torch in comparison to conventional spot welding equipment.

The application limits of this system depend on the thickness of the first metal sheet; the second sheet may be extremely thick.

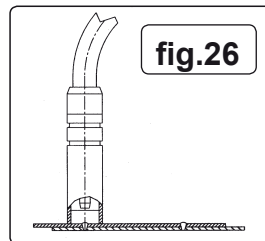


fig.26

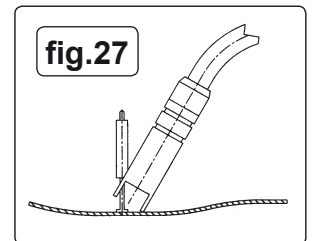


fig.27

**8.7 Rivet Welding. (Fig 27).**

This process allows the re-structuring/re-shaping of dented or misshaped metal sheets, without the need to hammer the sheet from behind. This is useful when repairing inaccessible sections of vehicle bodywork. Replace the torch nozzle with a rivet nozzle. This nozzle has a side inlet tube for housing the rivet.

Turn the rotary current adjustment switch to position 3.

**8.7.1** Adjust the wire feed speed according to the current and the diameter of the wire used as if a welding operation was to be carried out. Turn ON the Timer control and set the spot welding time for 1 to 1.5 seconds.

Welding will take place at the point where the head of the rivet is located and will join the rivet to the metal. The rivet may now be used as an anchor point in order to re-shape using appropriate appliances.

**9. MAINTENANCE**

**⚠ WARNING! Ensure the unit is disconnected from the mains power supply before performing any maintenance or service.**

**9.1** Regularly check all welding cables and secondary terminals to ensure they are in good order and connected correctly, also check during welding to ensure they are not overheating.

**9.2** Check that the gas hose connections are tight and that there are no gas leaks.

**9.3 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 feeding affects welding. Clean the rollers weekly, especially the feed roller groove, removing all dust deposits from the feeder area.

**9.4 Changing Feed Roller / Rollers IMPORTANT: Set up the feed rollers according to the wire size required for the job in hand. Refer to section 4 for the Powermig2750 and section 5 for Powermigs 3500 & 4500.**

- 9.5 Torch**  
Protect torch cable assembly from mechanical wear. Also do not allow the torch or its cable to come into contact with hot surfaces, especially a hot workpiece as this would cause the insulating materials to melt, making the torch unsafe and unusable.
- Make regular checks on the gas pipe and connector seals;
  - Every time the wire reel is changed, blow out the wire-guide hose using dry compressed air (max. 5 bar) to make sure it is not damaged;
  - Before using the welding machine, always check the torch terminal parts for wear and make sure they are assembled correctly: nozzle, contact pipe, gas diffuser.
- 9.6 Contact Tip (to remove the tip refer to section 5.7 and fig.21).**  
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.
- 9.7 Gas Cup (to remove the tip refer to section 5.7 and fig.21).**  
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 Sealey anti-spatter spray (MIG/722307) available from your Sealey Dealer.
- 9.8 Changing Fuses**  
The fuse is located on the auxiliary transformer and is mainly blown for the following reasons:
- ✓ Spatter collecting in the gas cup, causing contact tip to short circuit.
  - ✓ Wire tension is too great. ✓ A sudden surge of current.

- 9.9 INTERNAL MAINTENANCE / INSPECTION**  
INTERNAL INSPECTION AND MAINTENANCE OPERATIONS SHOULD BE CARRIED OUT ONLY AND EXCLUSIVELY BY SKILLED OR AUTHORISED ELECTRICAL/MECHANICAL TECHNICIANS. **WARNING** BEFORE REMOVING THE WELDING MACHINE PANELS AND WORKING INSIDE THE MACHINE MAKE SURE THE WELDING MACHINE IS SWITCHED OFF AND DISCONNECTED FROM THE MAIN POWER SUPPLY OUTLET.
- If checks are made inside the welding machine while it is live, this may cause serious electric shock due to direct contact with live parts and/or injury due to direct contact with moving parts.
- Inspect the welding machine regularly, with a frequency depending on use and the dustiness of the environment, and remove the dust deposited on the transformer, reactance and rectifier using a jet of dry compressed air (max. 10 bar).
  - Do not direct the jet of compressed air on the electronic boards; these can be cleaned with a very soft brush or suitable solvents.
  - At the same time make sure the electrical connections are tight and check the wiring for damage to the insulation.
  - At the end of these operations re-assemble the panels of the welding machine and screw the fastening screws right down.
  - Never, ever carry out welding operations while the welding machine is open.

**CURRENT ADJUSTMENT SWITCH SETTINGS FOR POWERMIG 2750**

3 ~	MAX CURRENT (AMPS)										
	200	20A	40A	60A	80A	110A	140A	170A	200A (max 220A)	----	----
	240	30A	45A	60A	80A	110A	140A	160A	180A	210A	240A (max 270A)

**CURRENT ADJUSTMENT SWITCH SETTINGS FOR POWERMIGS 3500 & 4500**

3 ~	MAX CURRENT (AMPS)								
	300	40A	50A	60A	75A	90A	110A		
		140A	160A	190A	210A	250A	300A		
	400	50A	60A	70A	80A	90A	100A		
		120A	140A	160A	180A	200A	220A		
		240A	270A	300A	340A	360A	400A		

## 10. TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	REMEDY <i>(Numbers refer to chapter and item heading)</i>
1. Power source stops	Overheating protection activated due to overload	Protection automatically resets when transformer has cooled (about 15 min).
2. No weld current	Rectifier blown	Replace rectifier.
3. No weld current	Bad connection between clamp & workpiece Break in earth lead Break in torch lead	Clean or grind contact surface and weld area. Repair or replace earth lead. Repair or replace torch, lead.
4. Feed motor not working, lamp is on	Fuse blown Gear damaged or worn Motor defective	Replace fuse 1.5 amp. Contact service agent. Replace motor (Contact service agent).
5. Wire does not feed, feed roller rotates	Pressure roller improperly adjusted Dirt, copper, dust, etc, have collected in torch liner  Gas cup (Nozzle) or tip defective. Faulty speed control Deformed wire Spot timer is ON.	Adjust tension. Clean the liner from the machine forward. Use compressed air. If too much dirt, replace the liner. Replace gas cup (nozzle) and/or tip. (See section 5.7).  Check roller tension and adjust it if necessary (See sections 5.8).
6. Wire feeds unevenly.	Dirt, etc, in liner Gas cup (Nozzle) or Tip defective Gas cup (Nozzle) spattered Feed roller groove clogged Feed roller groove deformed Pressure roller tension improper	Clean the liner from the machine forward. Use compressed air. Replace gas cup (nozzle) and/or tip. (See section 5.7). Clean or replace gas cup (nozzle) (See section 5.7). Clean feed roller. (See sections 4 or 5). Replace feed roller. (See sections 4 or 5). Adjust tension. (See fig.14 or 22).
7. Unstable arc.	Incorrect settings Impurities in weld area Worn or defective gas cup (nozzle)	Check settings. (See section .8). Clean and/or grind workpiece. (See section 8.2.1). Replace gas cup (nozzle). (See section 5.7).
8. Porous weld	No gas Gas cup clogged Draft blowing away shielding gas Rusty or dirty joints Torch too far from or at wrong angle to work  Gas leak Dirty Workpiece	Open gas cylinder, regulate gas flow. Clean or replace cup. (See section 5.7). Screen off welding site or increase gas flow. Clean or grind the workpiece (See section 8.2.1). The distance from gas cup to workpiece should be 8-10mm See chapter 4 for angle. Check contact tip and nozzle. Check hoses, connections and torch assembly. (See section 9). Press the gas cup into correct position.
9. Electrode sticking in gas cup (nozzle)	Worn or defective gas cup (nozzle) Electrode deformed Wire speed too slow	Replace gas cup (nozzle). (See section 5.7). Check roller tension. (See sections 4 or 5 ). Adjust wire feed rate control.
10. Irregular weld bead	Torch incorrectly held Wire weaving in weld pool	Use correct torch angle. Check roller tension and adjust as needed. (See section 5.8).
11. Weld bead too narrow and raised	Weld current too high Weld speed too low	Increase power and wire speed. Move torch slower and weave a little more.
12. Weld bead too wide	Weld current too high Weld speed too low Arc too long	Decrease power and wire speed. Move torch faster and weave less. Bring torch closer to workpiece.
13. Poor penetration	Weld current too high Arc too long	Increase power and wire speed. Bring torch closer to workpiece.
14. Excessive penetration	Weld current too high weld speed too slow incorrect distance of torch to workpiece	Decrease power and wire speed. Move torch faster. Torch distance should be 8-10mm.
15. Fuse blowing	Tension too great Gas cup contact tip clogged	Release tension. (See fig.14 or 22). Clean gas cup and contact tip. (See section 9.7).
16. Coils of wire on reel overlap, or wire is oxidised. Coils break or fall under wheel.	Tension too loose or tight. Coil damaged or wire twisted.	Reset tension. Change wire reel.
17. Wire runs through torch but there is no welding current.	Defective contactor. Worn contacts of contactor regulator. Regulation switch problem Faulty rectifier.  Fault on electronic circuit of contactor. Work cable not connected correctly.	Check coil ends, change coil if necessary. Check, clean contacts, change if oxidation is present. Check secondary voltage for each switch setting. If not change rectifier. Disconnect rectifier from secondary, check each diode goes one way only. Change control module. Connect work clamp directly to workpiece. Check wire is in good condition and making good contact with clamp.





# POWERMIG WELDERS

**POWERMIG2750.V2**  
**POWERMIG3500.V2**  
**POWERMIG4500.V2**

#### Environmental Protection.



Recycle unwanted materials instead of disposing of them as waste. All tools, accessories and packaging should be sorted, taken to a recycle centre and disposed of in a manner which is compatible with the environment.



**WEEE REGULATIONS.** Dispose of this product at the end of its working life in compliance with the EU Directive on Waste Electrical and Electronic Equipment. When the product is no longer required, it must be disposed of in an environmentally protective way.

**NOTE:** It is our policy to continually improve products and as such we reserve the right to alter data, specifications and component parts without prior notice.

**IMPORTANT:** No liability is accepted for incorrect use of this product.

**WARRANTY:** Guarantee is 12 months from purchase date, proof of which will be required for any claim.

**INFORMATION:** For a copy of our latest catalogue and promotions call us on 01284 757525 and leave your full name and address, including postcode.



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