NHPROEQUIP.com MTS 180/200 MIG TIG STICK Welder Manual

Please read and understand this instruction manual carefully before the installation and operation of this equipment.

Thank you for your purchase of the welding machine.

We are proud of our range of welding equipment that has a proven track record of innovation, performance and reliability. Our product range represents the latest developments in Inverter technology put together by our professional team of highly skilled engineers. The expertise gained from our long involvement with inverter technology has proven to be invaluable towards the evolution and future development of our equipment range. This experience gives us the inside knowledge on what the arc characteristics, performance and interface between man and machine should be. Within our team are specialist welders that have a proven history of welding knowledge and expertise, giving vital input towards ensuring that our machines deliver control and performance to the utmost professional level. We employ an expert team of professional sales, marketing and technical personnel that provide us with market trends, market feedback and customer comments and requirements. Secondly, they provide a customer support service that is second to none, thus ensuring our customers have confidence that they will be well satisfied both now and in the future.
The welders are manufactured and compliant with - CAN/CSA E60974-1 & ANSI/IEC 60974-1, guaranteeing you electrical safety and performance.

WARRANTY

- One Year from date of Purchase.
- This Warranty does not cover freight or goods that have been interfered with.
- All goods in question must be repaired by an authorized repair agent as appointed by this company.
- Warranty does not cover abuse, mis-use, accident, theft, general wear and tear.
- New Product will not be supplied unless we inspect product returned for warranty and agree to replace product.
- Please view full Warranty term and Conditions

CONTENTS

The Mig-180/200 is a dual voltage inverter-based portable Multi-Function MIG welding machine. The MIG function allows you to weld with both Gas Shielded and Gas less wires. The MMA welding capability delivers easy electrode welding with high quality results, including cast Iron, stainless and low hydrogen. The machine comes complete with Power Adapter, MIG torch, ARC lead sets. A semi-industrial machine, it is lightweight and portable, being both 115V and 230v single phase gives great portability, ideal for general fabricators, maintenance workshops, rural workshops, and home workshops.

MIG/MMA - 180/200 Amp DC Welding Machine
Lightweight & Portable

MIG/MMA-180/200

- DUAL VOLTAGE (115~230V) - SINGLE PHASE
- LATEST IGBT + SMT TECHNOLOGY
- NEW ERGONOMIC PORTABLE DESIGN
- MIG/MAG WITH GAS & GASLESS FUNCTION
- OVER VOLTAGE PROTECTION
- THERMAL OVERLOAD PROTECTION
- SPOOL GUN READY
- STEPLESS VOLTAGE & WIRE SPEED CONTROL
- GEARED WIRE DRIVE MECHANISM
- INTERNAL WIRE FEEDER TAKES UP TO 8” Ø SPOOL
- MMA - HOT START – ANTI STICK

Technical Data

Power Supply / Phases (V-Ph)	115V/230V - 1 ±15%
Rated Input Power (KVA)	6 - 230V
ieff (Amps)	22.5A 115V 21.5A 230V
Imax (Amps)	38A 115V 36A 230V
Rated Output	180A/24.0V MIG 180A/28.0V MMA
Welding Current Range	30 ~180A
No-Load Voltage (V)	53V
Duty Cycle @ 104ºF	35%@200Amps MIG-230V 35%@200Amps MMA-230V
Protection Class	IP21S
Size (inches)	19.1” x 7.3” x 14.6”
Weight (pounds)	28.4
Warranty	One Year
Compliant to	CAN/CSA E60974-1

OPTIONS

The MIG/MMA-180/200 is a compact dual voltage inverter-based portable Multi-Function MIG welding machine. The MIG function allows you to weld with both Gas Shielded and Gasless wires. The MMA welding capability delivers easy electrode welding with high quality results, including cast Iron, stainless and low hydrogen. The machine comes complete with a quality carry bag, Power Adapter, MIG torch, ARC lead sets and Regulator. A semi-industrial machine, it is lightweight and portable, Being both 115V and 230v single phase gives great portability, ideal for general fabricators, maintenance workshop and home workshops.

SAFETY

Welding and cutting equipment can be dangerous to both the operator and people in or near the surrounding working area, if the equipment is not correctly operated. Equipment must only be used under the strict and comprehensive observance of all relevant safety regulations. Read and understand this instruction manual carefully before the installation and operation of this equipment.

Machine Operating Safety

- Do not switch the function modes while the machine is operating. Switching of the function modes during welding can damage the machine. Damage caused in this manner will not be covered under warranty.
- Disconnect the electrode-holder cable from the machine before switching on the machine, to avoid arcing should the electrode be in contact with the work piece.
- Operators should be trained and or qualified.

Electric shock: It can kill. Touching live electrical parts can cause fatal shocks or severe burns. The electrode and work circuit is electrically live whenever the output is on. The input power circuit and internal machine circuits are also live when power is on. In Mig/Mag welding, the wire, drive rollers, wire feed housing, and all metal parts touching the welding wire are electrically live. Incorrectly installed or improperly grounded equipment is dangerous.

- Connect the primary input cable according to Australian and New Zealand standards and regulations.
- Avoid all contact with live electrical parts of the welding circuit, electrodes and wires with bare hands. The operator must wear dry welding gloves while he/she performs the welding task.
- The operator should keep the work piece insulated from himself/herself.
- Keep cords dry, free of oil and grease, and protected from hot metal and sparks.
- Frequently inspect input power cable for wear and tear, replace the cable immediately if damaged, bare wiring is dangerous and can kill.
- Do not use damaged, under sized, or badly joined cables.
- Do not drape cables over your body.

Fumes and gases are dangerous. Smoke and gas generated whilst welding or cutting can be harmful to people's health. Welding produces fumes and gases. Breathing these fumes and gases can be hazardous to your health.

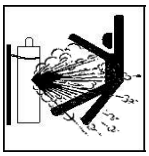
- Do not breathe the smoke and gas generated whilst welding or cutting, keep your head out of the fumes
- Keep the working area well ventilated, use fume extraction or ventilation to remove welding fumes and gases.
- In confined or heavy fume environments always wear an approved air-supplied respirator. Welding fumes and gases can displace air and lower the oxygen level causing injury or death. Be sure the breathing air is safe.
- Do not weld in locations near de-greasing, cleaning, or spraying operations. The heat and rays of the arc can react with vapours to form highly toxic and irritating gases.
- Materials such as galvanized, lead, or cadmium plated steel, containing elements that can give off toxic fumes when welded. Do not weld these materials unless the area is very well ventilated, and or wearing an air supplied respirator.

Arc rays: harmful to people's eyes and skin. Arc rays from the welding process produce intense visible and invisible ultraviolet and infrared rays that can burn eyes and skin.

- Always wear a welding helmet with correct shade of filter lens and suitable protective clothing including welding gloves whilst the welding operation is performed.
- Measures should be taken to protect people in or near the surrounding working area. Use protective screens or barriers to protect others from flash,glare and sparks; warn others not to watch the arc.

Fire hazard. Welding on closed containers, such as tanks,drums, or pipes, can cause them to explode. Flying sparks from the welding arc, hot work piece, and hot equipment can cause fires and burns. Accidental contact of electrode to metal objects can cause sparks, explosion, overheating, or fire. Check and be sure the area is safe before doing any welding.

- The welding sparks may cause fire, therefore remove any flammable materials away from the working area, at least 12 yards from the welding arc. Cover flammable materials and containers with approved cover if unable to be moved from the welding area.
- Do not weld on closed containers such as tanks, drums, or pipes, unless they are properly prepared according to the required Safety Standards to insure that flammable or toxic vapors and substances are totally removed, these can cause an explosion even though the vessel has been "cleaned". Vent hollow castings or containers before heating, cutting or welding. They may explode.
- Do not weld where the atmosphere may contain flammable dust, gas, or liquid vapours (such as petrol)
- Have a fire extinguisher nearby and know how to use it. Be alert that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas. Be aware that welding on a ceiling, floor, bulkhead, or partition can cause fire on the hidden side.



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

- Protect gas cylinders from excessive heat, mechanical shocks, physical damage, slag, open flames, sparks, and arcs.
- Insure cylinders are held secure and upright to prevent tipping or falling over.
- Never allow the welding electrode or earth clamp to touch the gas cylinder, do not drape welding cables over the cylinder.
- Never weld on a pressurised gas cylinder, it will explode and kill you.
- Open the cylinder valve slowly and turn your face away from the cylinder outlet valve and gas regulator.

Gas build up. The build up of gas can causes a toxic environment, deplete the oxygen content in the air resulting in death or injury. Many gases use in welding are invisible and odourless.

- Shut off shielding gas supply when not in use.
- Always ventilate confined spaces or use approved air-supplied respirator.

Electronic magnetic fields. MAGNETIC FIELDS can affect Implanted Medical Devices.

- Wearers of Pacemakers and other Implanted Medical Devices should keep away.
- Implanted Medical Device wearers should consult their doctor and the device manufacturer before going near any electric welding, cutting or heating operation.

Noise can damage hearing. Noise from some processes or equipment can damage hearing. Wear approved ear protection if noise level is high.

Hot parts. Items being welded generate and hold high heat and can cause severe burns. Do not touch hot parts with bare hands. Allow a cooling period before working on the welding gun. Use insulated welding gloves and clothing to handle hot parts and prevent burns.

CAUTION

1. Working Environment.

1.1 The environment in which this welding equipment is installed must be free of grinding dust, corrosive chemicals, flammable gas or materials etc, and at no more than maximum of 80% humidity.

1.2 When using the machine outdoors protect the machine from direct sun light, rain water and snow etc; the temperature of working environment should be maintained within -10°C to +40°C..

1.3 Keep this equipment 1ft distant from the wall.

1.4 Ensure the working environment is well ventilated.

2. Safety Tips.

2.1 Ventilation

This equipment is small-sized, compact in structure, and of excellent performance in amperage output. The fan is used to dissipate heat generated by this equipment during the welding operation. **Important:** Maintain good ventilation of the louvers of this equipment. The minimum distance between this equipment and any other objects in or near the working area should be 1ft.Good ventilation is of critical importance for the normal performance and service life of this equipment.

2.2 Thermal Overload protection.

Should the machine be used to an excessive level, or in high temperature environment, poorly ventilated area or if the fan malfunctions the Thermal Overload Switch will be activated and the machine will cease to operate. Under this circumstance, leave the machine switched on to keep the built-in fan working to bring down the temperature inside the equipment. The machine will be ready for use again when the internal temperature reaches safe level.

2.3 Over-Voltage Supply

Regarding the power supply voltage range of the machine, please refer to “Main parameter” table. This equipment is of automatic voltage compensation, which enables the maintaining of the voltage range within the given range. In case that the voltage of input power supply amperage exceeds the stipulated value, it is possible to cause damage to the components of this equipment. Please ensure your primary power supply is correct.

2.4 Do not come into contact with the output terminals while the machine is in operation. An electric shock may possibly occur.

MAINTENANCE

Exposure to extremely dusty, damp, or corrosive air is damaging to the welding machine. In order to pre - vent any possible failure or fault of this welding equipment, clean the dust at regular intervals with clean and dry compressed air of required pressure.

Please note that: lack of maintenance can result in the cancellation of the guarantee; the guarantee of this welding equipment will be void if the machine has been modified, attempt to take apart the machine or open the factory-made sealing of the machine without the consent of an authorized representative of the manufacturer.

TROUBLE SHOOTING

Caution: Only qualified technicians are authorized to undertake the repair of this welding equipment. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions detailed in this manual.

Note:

Minimum Motor Generator Power Suggested:- 6.5KVA for M:8 150 - 7KVA for MIG200

FRONT PANEL LAYOUT

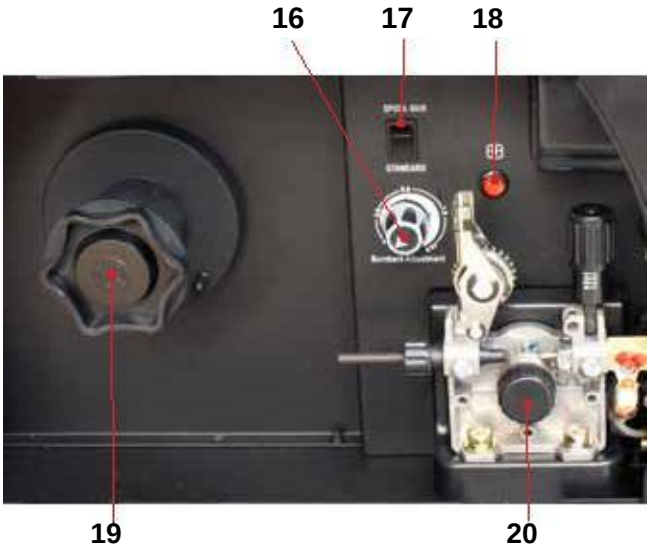
1. Mains Power LED
2. Thermal Overload LED
3. Wire Feed Adjustment Knob (MIG/MAG)
4. Voltage Adjustment Knob (MIG/MAG)
5. Amperage Adjustment Knob (MMA)
6. "-" Output terminal
7. Euro Mig Torch Connector (MIG/MAG)
8. "+" Output terminal
9. SpoolGun Power Supply Connection

BACK PANEL LAYOUT

11. Power switch
12. Gas Inlet
13. Fan
14. Input power cable
15. Data Plate

INTERNAL PANEL LAYOUT

16. Burn back control
17. Spoolgun/Standard selector switch
18. Inch wire feed button
19. Spool holder assembly
20. Wire feed assembly



Installation set up for MMA (Stick) Welding

(1) Turn the power source on and select the **MMA** function with the ARC:8 selector switch.

(2) Connection of Output Cables

Two sockets are available on this welding machine. For MMA welding the electrode holder is shown be connected to the negative socket, while the earth lead (work piece) is connected to the positive socket, this is known as DC- polarity. However various electrodes require a different polarity for optimum results and careful attention should be paid to the polarity, refer to the electrode manufacturers information for the correct polarity.

DC+ Electrode connected to + output socket.

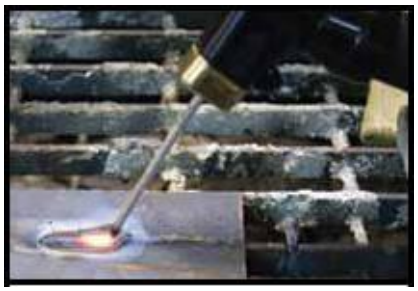
(3) Set the welding current relevant to the electrode type and size being used as recommended by the electrode manufacturer.

3) Set the welding current using the amperage control dial

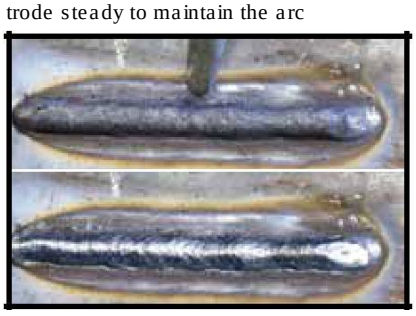
4) Place the electrode into the electrode holder and clamp tight.

5) Strike the electrode against the work piece to create and arc and hold the electrode steady to maintain the arc

6) Hold the electrode slightly above the work maintaining the arc while travelling at an even speed.



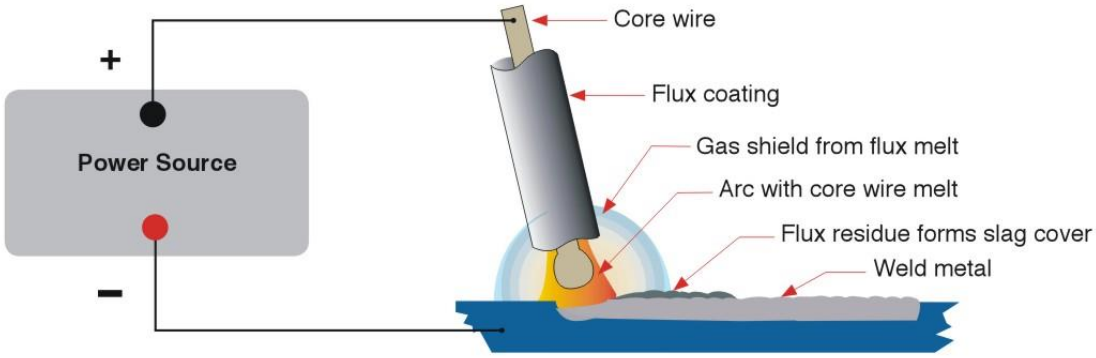
7) To finish the weld, break the arc by quickly snapping the electrode away from the work piece.

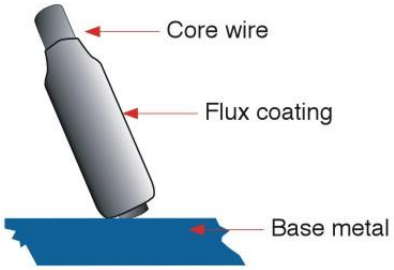


8) Wait for the weld to cool and carefully chip away the slag to reveal the weld metal below.

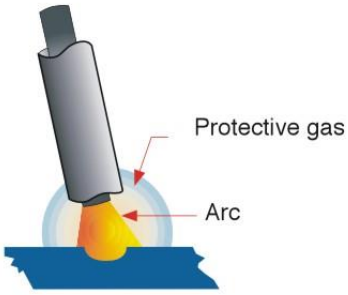
MMA (Manual Metal Arc) Welding

One of the most common types of arc welding is manual metal arc welding (MMA) or stick welding. An electric current is used to strike an arc between the base material and a consumable electrode rod or 'stick'. The electrode rod is made of a material that is compatible with the base material being welded and is covered with a flux that gives off gaseous vapours that serve as a shielding gas and providing a layer of slag, both of which protect the weld area from atmospheric contamination. The electrode core itself acts as filler material the residue from the flux that forms a slag covering over the weld metal must be chipped away after welding.



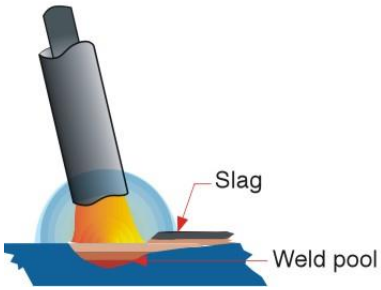


- The arc is initiated by momentarily touching the electrode to the base metal.
- The heat of the arc melts the surface of the base metal to form a molten pool at the end of the electrode.
- The melted electrode metal is transferred across the arc into the molten pool and becomes the deposited weld metal.
- The deposit is covered and protected by a slag which comes from the electrode coating.
- The arc and the immediate area are enveloped by an atmosphere of protective gas



Manual metal arc (stick) electrodes have a solid metal wire core and a flux coating. These electrodes are identified by the wire diameter and by a series of letters and numbers. The letters and numbers identify the metal alloy and the intended use of the electrode.

The **Metal Wire Core** works as conductor of the current that maintains the arc. The core wire melts and is deposited into the welding pool.



The covering on a shielded metal arc welding electrode is called **Flux**. The flux on the electrode performs many different functions. These include:

- producing a protective gas around the weld area
- providing fluxing elements and deoxidizers
- creating a protective slag coating over the weld as it cools
- establishing arc characteristics
- adding alloying elements.

Covered electrodes serve many purposes in addition to adding filler metal to the molten pool. These additional functions are provided mainly by the covering on the electrode.

MMA (Stick) Welding Fundamentals

Electrode Selection

As a general rule, the selection of an electrode is straight forward,in that it is only a matter of selecting an electrode of similar composition to the parent metal. However, for some metals there is a choice of several electrodes, each of which has particular properties to suit specific classes of work. It is recommend to consult your welding supplier for the correct selection of electrode.

Electrode Size

Average Thickness of Material	Maximum Recommended Electrode Diameter
0.03 - 0.07 inches	0.09 inches
0.07 - 0.19 inches	0.12 inches
0.19 - 0.31 inches	0.15 inches
0.31 - > inches	0.19 inches

The size of the electrode generally depends on the thickness of the section being welded, and the thicker the section the larger the electrode required. The table gives the maximum size of electrodes that maybe used for various thicknesses of section based on using a general purpose type 6013 electrode.

Welding Current (Amperage)

Electrode Size ø mm	Current Range (Amps)
0.09 inches	60 - 100
0.12 inches	100 - 130
0.15 inches	130 - 165
0.19 inches	165 - 260

Correct current selection for a particular job is an important factor in arc welding. With the current set too low, difficulty is experienced in striking and maintaining a stable arc. The electrode tends to stick to the work, penetration is poor and beads with a distinct rounded profile will be deposited. Too high current is accompanied by overheating of the electrode resulting undercut and burning through of the base metal and producing excessive spatter. Normal current for a particular job may be considered as the maximum, which can be used without burning through the work, over-heating the electrode or producing a rough spattered surface.The table shows current ranges generally recommended for a general purpose type 6013 electrode.

Arc Length

To strike the arc, the electrode should be gently scraped on the work until the arc is established. There is a simple rule for the proper arc length; it should be the shortest arc that gives a good surface to the weld. An arc too long reduces penetration, produces spatter and gives a rough surface finish to the weld. An excessively short arc will cause sticking of the electrode and result in poor quality welds. General rule of thumb for down hand welding is to have an arc length no greater than the diameter of the core wire.

Electrode Angle

The angle that the electrode makes with the work is important to ensure a smooth, even transfer of metal. When welding in down hand, fillet, horizontal or overhead the angle of the electrode is generally between 5 and 15 degrees towards the direction of travel. When vertical up welding the angle of the electrode should be between 80 and 90 degrees to the work piece.

Travel Speed

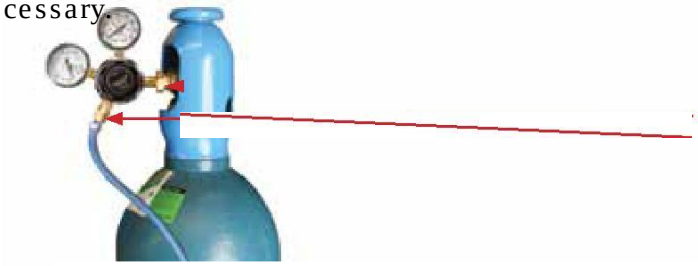
The electrode should be moved along in the direction of the joint being welded at a speed that will give the size of run required. At the same time, the electrode is fed downwards to keep the correct arc length at all times. Excessive travel speeds lead to poor fusion, lack of penetration etc, while too slow a rate of travel will frequently lead to arc instability,slag inclusions and poor mechanical properties.

Material and Joint Preparation

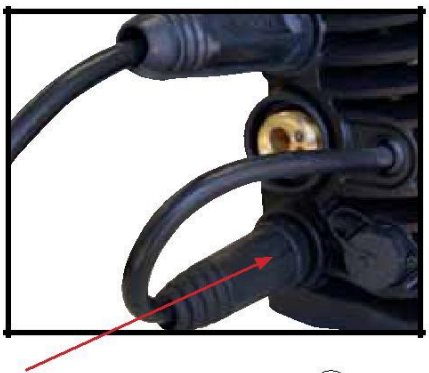
The material to be welded should be clean and free of any moisture, paint, oil, grease, mill scale, rust or any other material that will hinder the arc and contaminate the weld material. Joint preparation will depend on the method used include sawing, punching, shearing, machining, flame cutting and others. In all cases edges should be clean and free of any contaminates. The type of joint will be determined by the chosen application.

Installation set up for MIG with gas

(1) Select the **MIG** function with the MMA/MIG selector switch.
(2) Select **Standard** using the Standard/Spool Gun selector switch.
(3) Plug the welding torch into the Euro Mig torch connection socket on the front panel, and tighten it.
IMPORTANT : When connecting the torch be sure to tighten the connection. A loose connection can result in the connector arcing and damaging the machine and gun connector.
This damage is not covered under warranty.
(4) Insert the earth cable plug into the **negative** socket on the front of the machine and tighten it.
(5) Connect **Gas Line** to **Gas Regulator** and connect the gas regulator to the **Gas Cylinder**.
(6) Connect the weld power lead to Positive socket .
(7) Place the **Wire Spool** onto the **Spool Holder** - Note: the spool retaining nut is Left Hand thread. Snip the wire from the spool being sure to hold the wire to prevent rapid uncoiling. Feed the wire into the wire feeder inlet guide tube through to the drive roller.
(8) Carefully feed the wire over the drive roller into the outlet guide tube, feed through about 5.9" into the torch receptacle. Check that the drive roller being used complies with the wire diameter, replace the roller if necessary.



(5) Connect the gas line to the regulator and connect to the gas cylinder



(6) Connect weld power lead to

(7) Place wire onto spool holder - (spool retaining nut is left hand thread) Feed the wire through the inlet guide tube on to the drive roller.

(8) Feed wire over the drive roller into the outlet guide tube, Push the wire through approx 5.9 Inches.

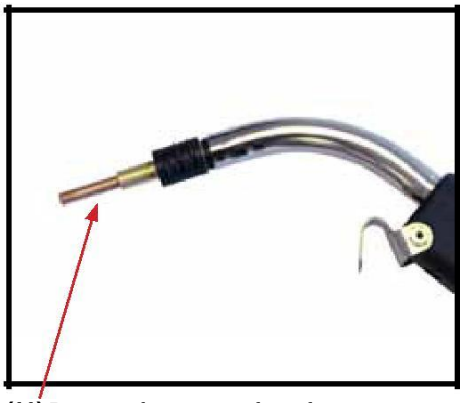
Caution:
Disconnect the Electrode Holder cable from the machine before using MIG function. If cable is not disconnected welding voltage is present and can cause arcing or flash.

Continued set up for MIG with Gas for MIG/MMA-180/200

(9) Align the wire into the groove of the drive roller and close down the top roller making sure the wire is in the groove of the bottom drive roller, lock the pressure arm into place.
(10) Apply a medium amount of pressure to the drive roller.
(11) Remove the gas nozzle and contact tip from the torch neck,
(12) Press and hold the inch button to feed the wire through to the torch neck, release the inch button when the wire exits the torch neck.
(13) Fit the correct sized contact tip and feed the wire through it, screw the contact tip into the tip holder of the torch head and nip it up tightly.
(14) Fit the gas nozzle to the torch head.
(15) Carefully open the gas cylinder valve and set the flow rate to between 15-25 CFH.
(16) Set the welding parameters using the wire feed and voltage control knobs.
(17) Using the **Burn Back** control set the amount of wire to 'burn back' after you release the torch trigger. This prevents the wire becoming stuck in the weld pool when finishing the weld.

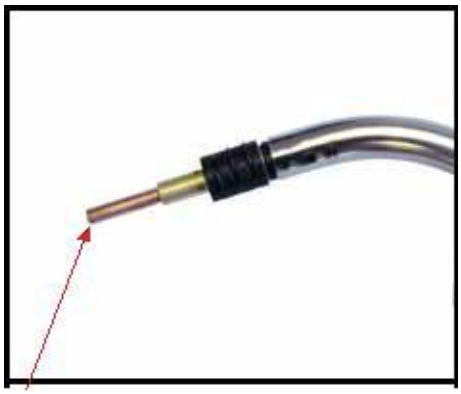
(9) Close down the top roller bracket and clip the pressure arm into place.

(10) Apply a medium amount of pressure to the drive roller

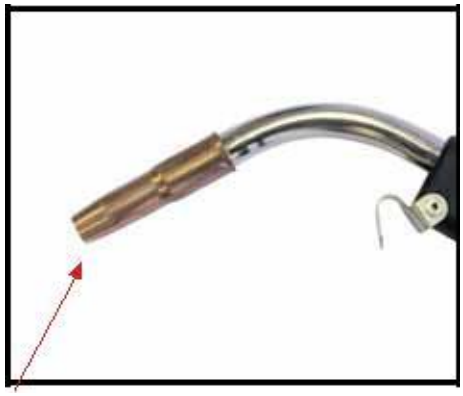


(11) Remove the gas nozzle and contact tip from the front end of the mig torch.

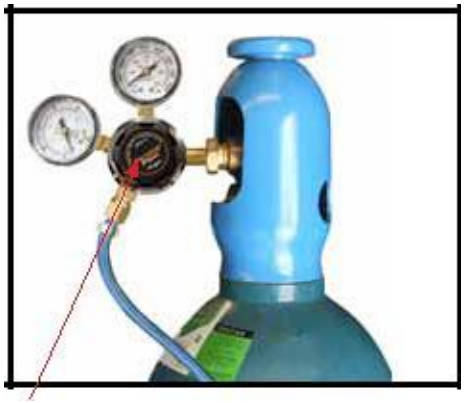
(12) Press and hold the inch wire button to feed the wire down the torch cable through to the torch head.



(13) Fit the correct size contact tip over the wire and fasten tightly into the tip holder.



(14) Fit the gas nozzle to the torch head.



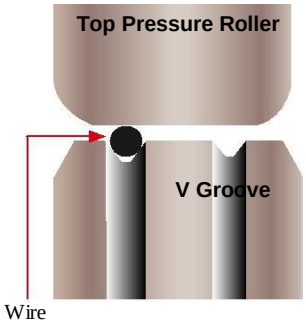
(15) Carefully open the valve of the gas cylinder, set the flow to 25CFH

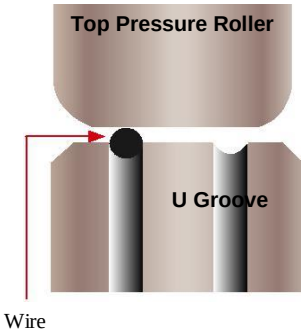
(16) Set welding parameters using the voltage and wire feed controls.

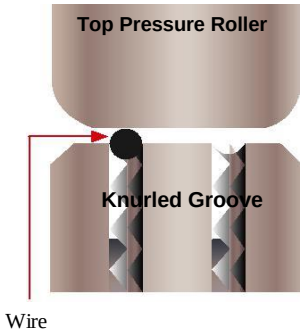
(17) Adjust the burn back control to prevent the wire sticking in the weld pool.

Wire Feed Roller Selection

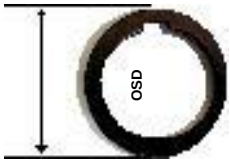
The importance of smooth consistent wire feeding during MIG welding cannot be emphasized enough. Simply put the smoother the wire feed then the better the welding will be.
Feed rollers or drive rollers are used to feed the wire mechanically along the length of the welding gun. Feed rollers are designed to be used for certain types of welding wire and they have different types of grooves machined in them to accommodate the different types of wire. The wire is held in the groove by the top roller of the wire drive unit and is referred to as the pressure roller, pressure is applied by a tension arm that can be adjusted to increase or decrease the pressure as required. The type of wire will determine how much pressure can be applied and what type of drive roller is best suited to obtain optimum wire feed. **Solid Hard Wire** - like Steel, Stainless Steel require a drive roller with a V shape groove for optimum grip and drive capability. Solid wires can have more tension applied to the wire from the top pressure roller that holds the wire in the groove and the V shape groove is more suited for this. Solid wires are more forgiving to feed due to their higher cross sectional column strength, they are stiffer and don't bend so easy.
Soft Wire - like Aluminium requires a U shape groove. Aluminium wire has a lot less column strength, can bend easily and is therefore more difficult to feed. Soft wires can easily buckle at the wire feeder where the wire is fed into inlet guide tube of the torch. The U-shaped roller offers more surface area grip and traction to help feed the softer wire. Softer wires also require less tension from the top pressure roller to avoid deforming the shape of the wire, too much tension will push the wire out of shape and cause it to catch in the contact tip.
Flux Core / Gasless Wire - these wires are made up of a thin metal sheath that has fluxing and metal compounds layered onto it and then rolled into a cylinder to form the finished wire. The wire cannot take too much pressure from the top roller as it can be crushed and deformed if too much pressure is applied. A knurled drive roller has been developed and it has small serrations in the groove, the serrations grip the wire and assist to drive it without too much pressure from the top roller. The down side to the knurled wire feed roller on flux cored wire is it will slowly over time bit by bit eat away at the surface of the welding wire, and these small pieces will eventually go down into the liner. This will cause clogging in the liner and added friction that will lead to welding wire feed problems. A U groove wire can also be used for flux core wire without the wire particles coming of the wire surface. However it is considered that the knurled roller will give a more positive feed of flux core wire without any deformation of the wire shape.







Drive Rollers



Out Side Diameter

In Side Diameter


V


U


F

V Groove Drive Roller - Steel Wire

Part Number	Description
MIG200	
0.6-0.8V30/22	Drive Roll V Groove 0.6-0.8mm / 0.023" - 0.030"
0.8-1.0V30/22	Drive Roll V Groove 0.8-1.0mm / 0.030" - 0.040"
0.9-1.2V30/22	Drive Roll V Groove 0.9-1.2mm / 0.035" - 0.045"
1.0-1.2V30/22	Drive Roll V Groove 1.0-1.2mm / 0.040" - 0.045"

U Groove Drive Roller - Soft Wire

Part Number	Description
MIG200	
0.8-1.0U30/22	Drive Roll U Groove 1.0-1.2mm / 0.040" - 0.045
0.9-1.0U30/22	Drive Roll U Groove 0.9-1.0mm / 0.035" - 0.040"
0.9-1.2U30/22	Drive Roll U Groove 0.9-1.2mm / 0.035" - 0.045"
1.0-1.2U30/22	Drive Roll U Groove 1.0-1.2mm / 0.040" - 0.045"

Knurled Drive Roller - Flux Core Wire

Part Number	Description
MIG195	
0.6-0.8F30/22	Drive Roll Knurled 0.6-0.9mm / 0.023" - 0.035"
0.8-0.9F30/22	Drive Roll Knurled 0.8-0.9mm / 0.030" - 0.035"
0.9-1.2F30/22	Drive Roll Knurled 0.9-1.2mm / 0.035" - 0.045"

Wire Installation and Set Up Guide

Again the importance of smooth consistent wire feeding during MIG welding cannot be emphasized enough. The correct installation of the wire spool and the wire into the wire feed unit is critical to achieving an even and consistent wire feed. A high percentage of faults with mig welders emanate from poor set up of the wire into the wire feeder. The guide below will assist in the correct setup of your wire feeder.

(1) Remove the spool retaining nut.

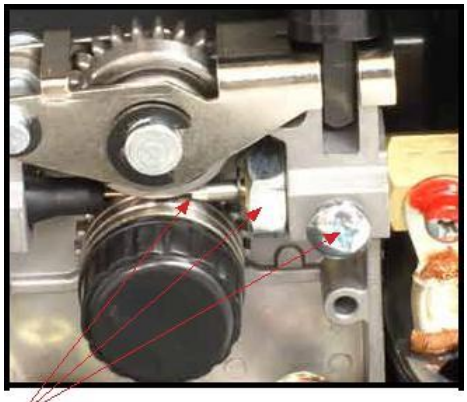
(2) Note the tension spring adjuster and spool locating pin.

(3) Fit the wire spool onto the spool holder fitting the locating pin into the location hole on the spool. Replace the spool retaining nut tightly

(4) Snip the wire carefully, be sure to hold the wire to prevent the spool uncoiling. Carefully feed the wire into the inlet guide tube of the wire feed unit.

(5) Feed the wire through the drive roller and into the outlet guide tube of the wire feeder.

(6) Lock down the top pressure roller and apply a medium amount of pressure using the tension adjustment knob



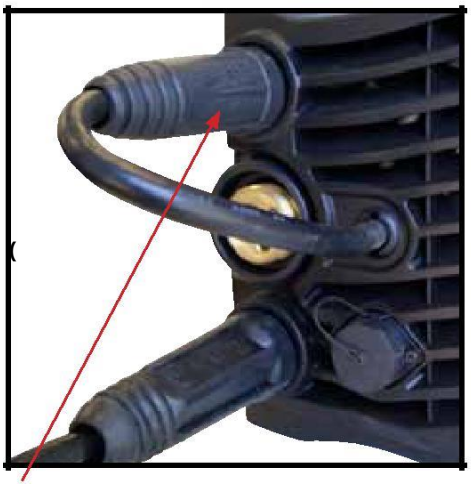
(7) Check that the wire passes through the centre of the outlet guide tube without touching the sides. Loosen the locking screw and then loosen the outlet guide tube retaining nut too make adjustment if required. Carefully retighten the locking nut and screw to hold the new position.

(8) A simple check for the correct drive tension is to bend the end of the wire over hold it about 100mm from your hand and let it run into your hand, it should coil round in your hand without stopping and slipping at the drive rollers, increase the tension if it slips.

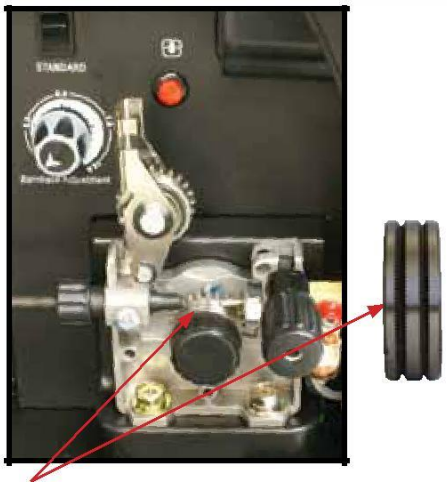
(8) The weight and speed of the wire spool turning creates an inertia that can cause the spool to run on and the wire loop over the side of the spool and tangle. if this happens increase the pressure on the tension spring inside the spool holder assembly using the tension adjustment screw.

Installation set up for MIG with Gasless wire for MIG/MMA-180/200

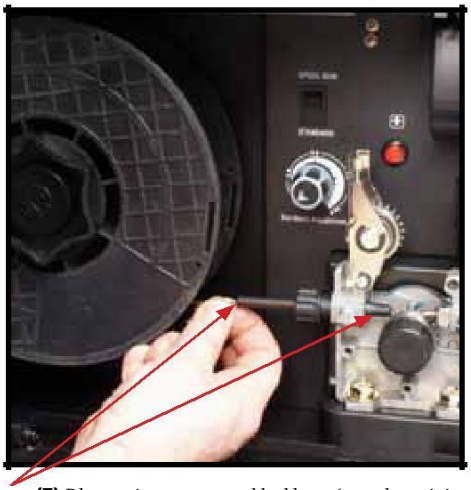
(1) Switch on the machine, select the **MIG** function with the MMA/MIG selector switch.
(2) Select **Standard** using the Standard/Spool Gun selector switch.
(3) Plug the welding torch into the Euro Mig torch connection socket on the front panel, and tighten it.
IMPORTANT : When connecting the torch be sure to tighten the connection. A loose connection can result in the connector arcing and damaging the machine and gun connector.
This damage is not covered under warranty.
(4) Insert the earth cable plug into the **Positive** socket on the front of the machine and tighten it.
(5) Connect the weld power lead to Negative socket.
(6) Fit the correct size **Knurled** drive roller for Gas Less Flux Core wire.
(7) Place the **Wire Spool** onto the **Spool Holder** - Note: the spool retaining nut is Left Hand thread.
Snip the wire from the spool being sure to hold the wire to prevent rapid uncoiling. Feed the wire into the wire feeder inlet guide tube through to the drive roller.



(5) Connect weld power lead to ⊖



(6) Fit the correct sized Knurled Drive roller for Gas Less Flux Cored wire

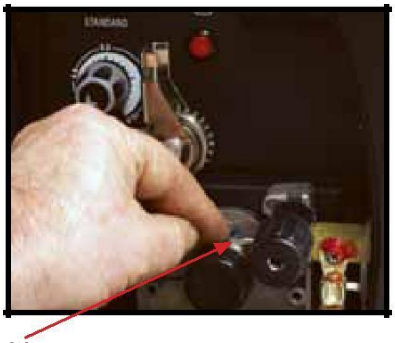


(7) Place wire onto spool holder - (spool retaining nut is left hand thread) Feed the wire through the inlet guide tube on to the drive roller.

Caution:
Disconnect the Electrode Holder cable from the machine before using MIG function. If cable is not disconnected welding voltage is present and can cause arcing or flash.

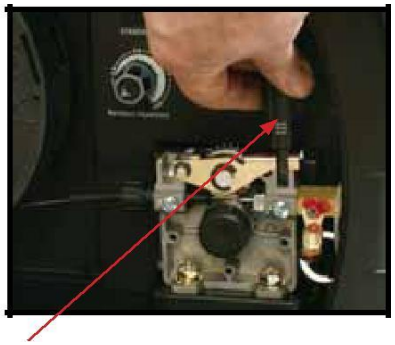
Continued set up for MIG with Gasless wire for MIG/MMA-180/200

(8) Carefully feed the wire over the drive roller into the outlet guide tube, feed through about 5.9" into the torch receptacle. Check that the correct drive roller is being used.
(9) Align the wire into the groove of the drive roller and close down the top roller making sure the wire is in the groove of the bottom drive roller, lock the pressure arm into place.
(10) Apply a light amount of pressure to the drive roller. Too much pressure will crush the cored wire.
(11) Remove the gas nozzle and contact tip from the torch neck,
(12) Press and hold the inch button to feed the wire through to the torch neck, release the inch button when the wire exits the torch neck.
(13) Fit the correct sized contact tip and feed the wire through it, screw the contact tip into the tip holder of the torch head and nip it up tightly.
(14) Fit the gas nozzle to the torch head.
(16) Set the welding parameters using the wire feed and voltage control knobs.
(17) Using the **Burn Back** control set the amount of wire to 'burn back' after you release the torch trigger. This prevents the wire becoming stuck in the weld pool when finishing the weld.

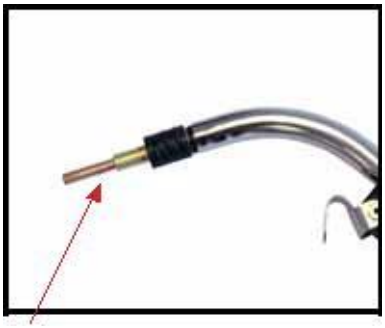


(8) Feed wire over the drive roller into the outlet guide tube, Push the wire through approx 5.9". Use a Knurled Drive Roller of the correct size

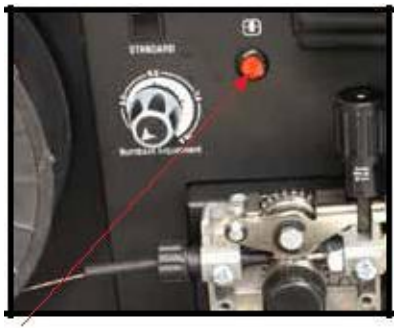
(9) Close down the top roller bracket and clip the pressure arm into place.



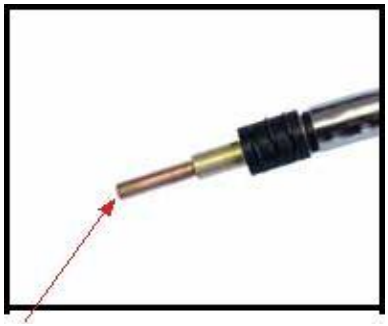
(10) Apply a medium amount of pressure to the drive roller



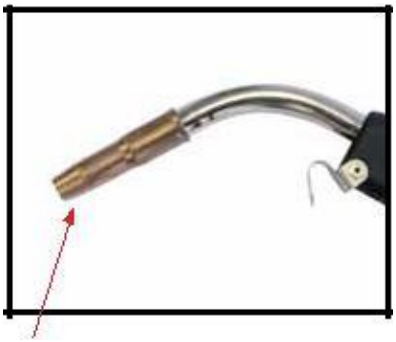
(11) Remove the gas nozzle and contact tip from the front end of the mig torch.



(12) Press and hold the inch wire button to feed the wire down the torch cable through to the torch head.



(13) Fit the correct size contact tip over the wire and fasten tightly into the tip holder.



(14) Fit the gas nozzle to the torch head.

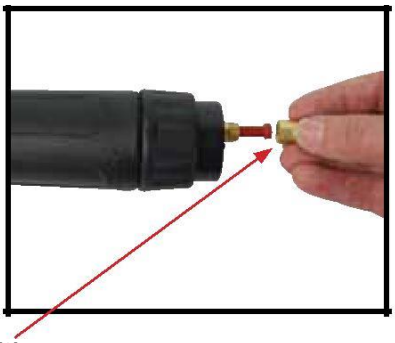
(16) Set welding parameters using the voltage and wire feed controls.

(17) Adjust the burn back control to prevent the wire sticking in the weld pool.

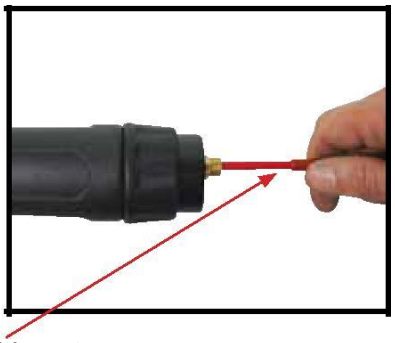
Mig Torch Liner Installation

(1) Lay the torch out straight on the ground and remove the front end parts
(2) Remove the liner retaining nut.
(3) Carefully pull the liner out of the torch cable assembly
(4) Select the correct new liner and carefully unravel avoiding putting any kinks in the liner, if you kink the liner it will make it no good and will require replacement.
(5) Carefully and slowly feed the liner in short forward movements down the cable assembly all the way through and out the torch neck end. Avoid kinking the liner, kinking liner it will make it no good and require replacement.
(6) Fit the liner retaining nut and screw down only 1/2 way
(7) Leaving the torch straight snip the liner approximately 0.118" past the end of the torch neck
(8) Place the tip holder over the end of the liner and screw into the torch neck nipping it up tight.
(9) Screw down the liner nut the remaining 1/2 and nip it up tight. This method compresses the liner inside the torch cable assembly preventing it moving during use and ensures good wire feed.

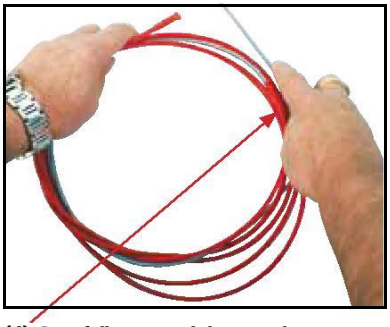
(1) Remove MIG torch front end parts



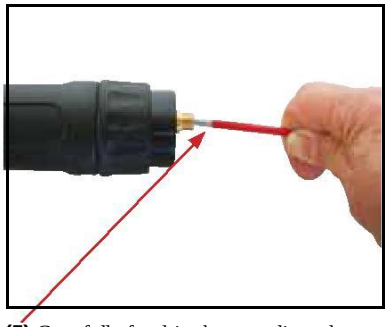
(2) Remove the liner retaining nut



(3) Carefully pull out and completely remove the liner



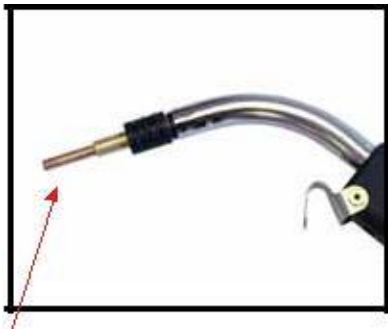
(4) Carefully unravel the new liner



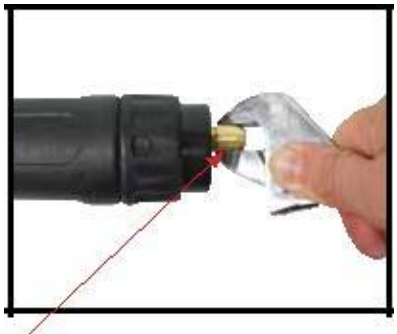
(5) Carefully feed in the new liner down the torch lead all the way to exit the torch neck.

(6) Fit the liner retaining nut and screw only 1/2 way down

(7) Snip the liner off 3mm past the end of the torch neck.



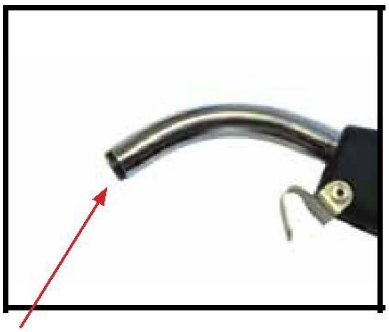
(8) Replace the front end parts



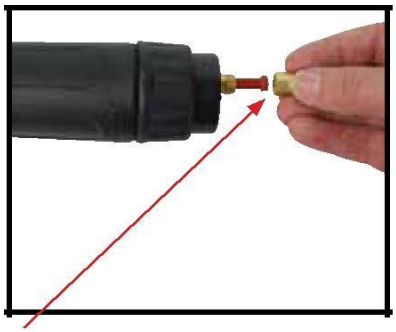
(9) Fully screw down the liner retaining nut and nip it up tight.

Torch & Wire Feed Set Up for Aluminium Wire

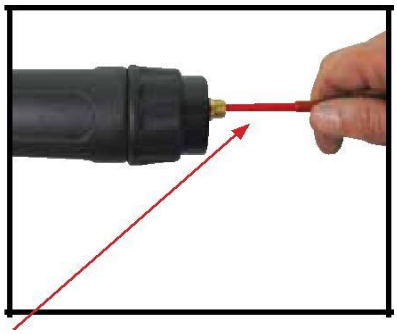
(1) Lay the torch out straight on the ground and remove the front end parts
(2) Remove the liner retaining nut.
(3) Carefully pull the liner out of the torch cable assembly
(4) Select a PA or liner, carefully and slowly feed the liner in short forward movements down the cable assembly all the way through and out the torch neck end. Avoid kinking the liner, kinking the liner will ruin it and require replacement.
(5) Leave the liner extending out the end of the torch neck end by 0.188".
(5) Fit the liner retaining nut together with the liner o-ring.
(8) Push the liner firmly into the torch lead and tighten the liner retaining nut.
(9) Install a U groove drive roller of the correct size to match the wire diameter being used.



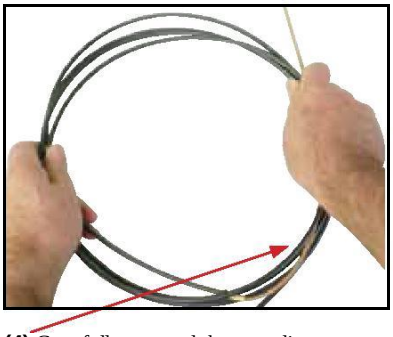
(1) Remove MIG torch front end parts



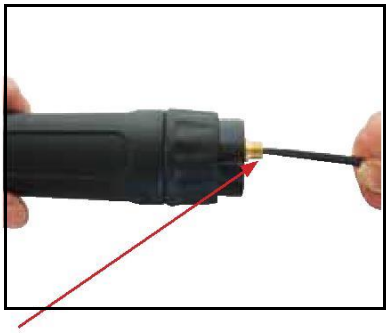
(2) Remove the liner retaining nut



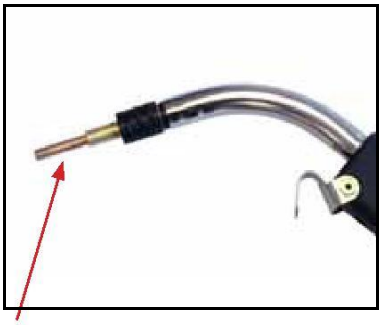
(3) Carefully pull out and completely remove the liner



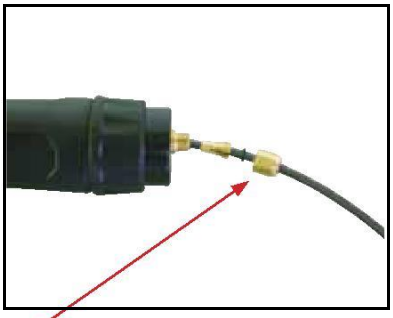
(4) Carefully unravel the new liner



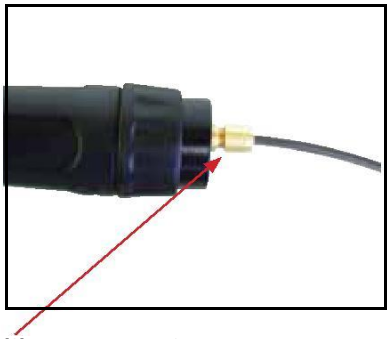
(5) Carefully feed in the new liner in short forward movements down the torch lead all the way to exit the torch neck.
Be careful not to kink the liner



(6) Replace the front end parts



(7) Fit the liner collet, liner O-ring and liner retaining nut.

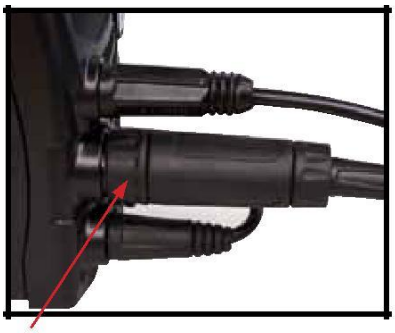


(8) Push the liner firmly into the torch lead and tighten the liner retaining nut

(9) Cut the liner flush with the end of liner retaining nut using a sharp box cutter knife.

Continued Torch & Wire Feed Set Up for Aluminium Wire

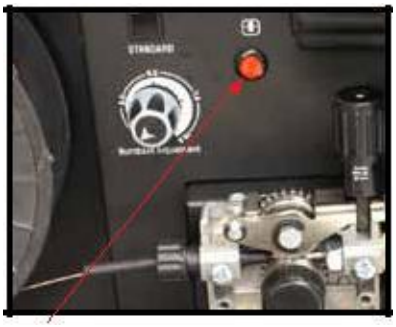
(10) Loosen off the inlet guide tube retaining screw
(11) Remove the inlet guide tube from the front end machine euro connector using long nose pliers.
(12) Carefully feed the extended PA liner section into the inlet guide tube hole of the machine euro connector
(13) Feed the extended PA liner all the way up and over the drive roller
(14) Tighten the torch euro connection to the machine euro connector
(15) Cut the extended liner with a sharp Stanley knife just in front of the drive roller
(16) Fit an Aluminium contact tip of the correct size to match the diameter of the wire being used
(17) Fit the remaining front end parts to the torch neck ready for welding



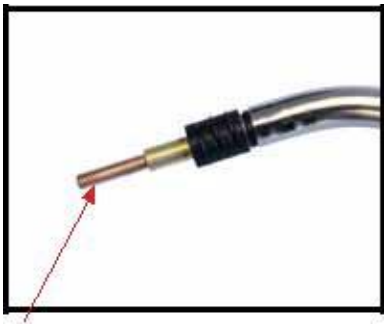
(10) Connect the torch to the machine tighten and secure the torch euro connector to the machine euro connection.

(11) Install a U groove drive roller of the correct size for the diameter wire being used.

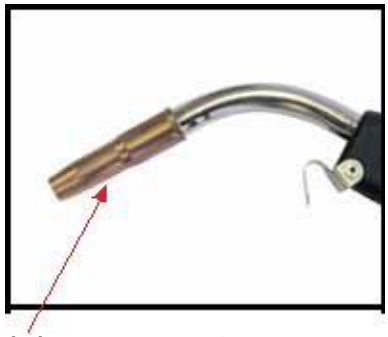
(7) Place aluminium wire onto spool holder. Feed the wire through the inlet guide tube on to the drive roller.



(12) Press and hold the inch wire button to feed the wire down the torch cable through to the torch head.



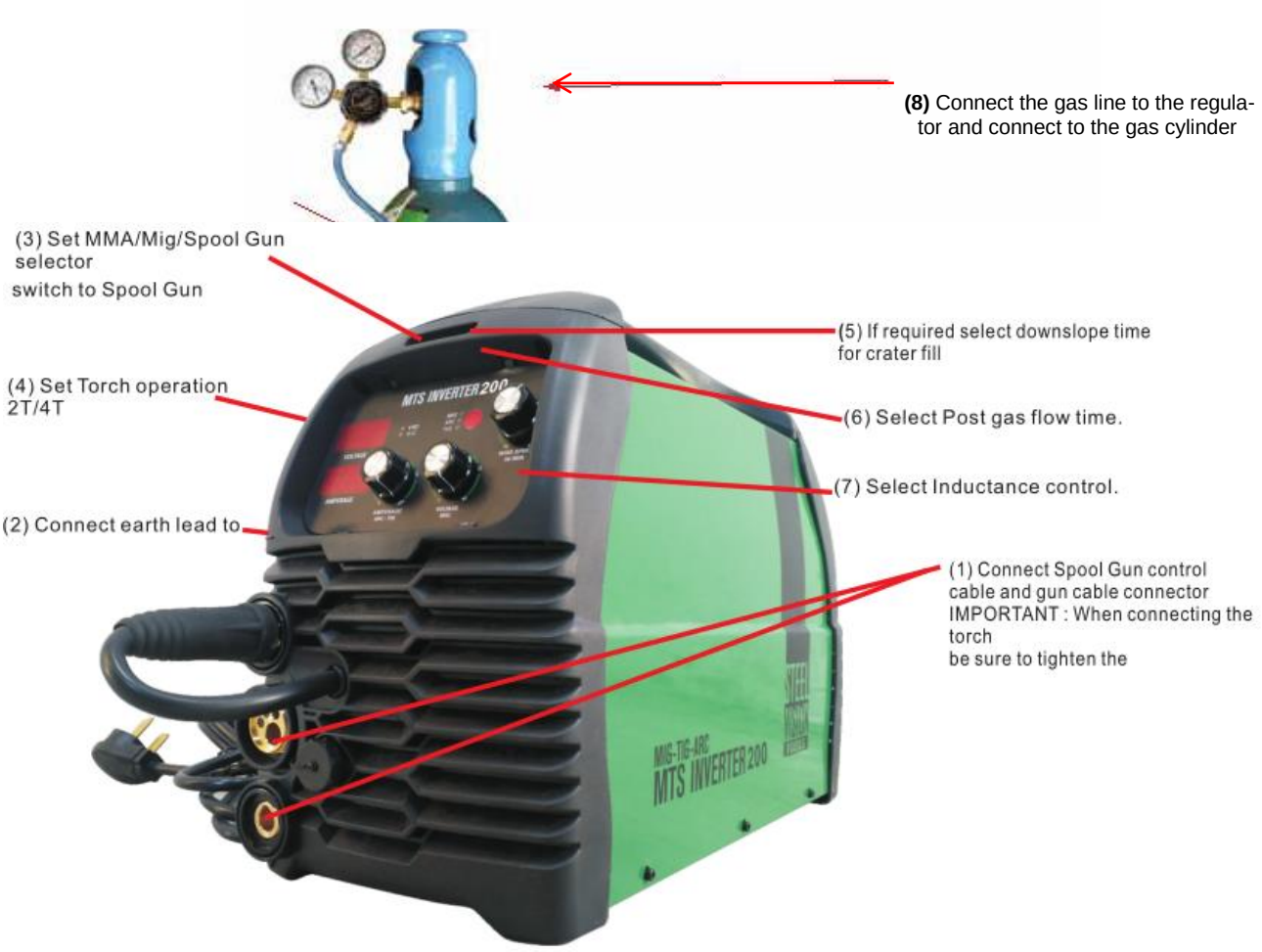
(16) Fit an Aluminium contact tip of the correct size to match the wire diameter being used



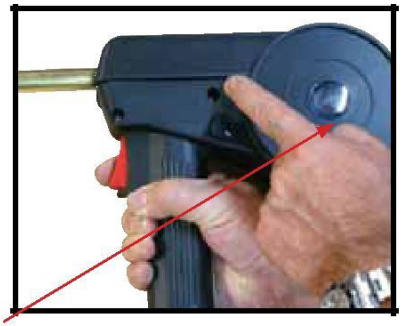
(17) Fit the remaining front end parts to the torch neck ready for welding.

Installation set up of the Spool Gun for MIG/MMA-180/200

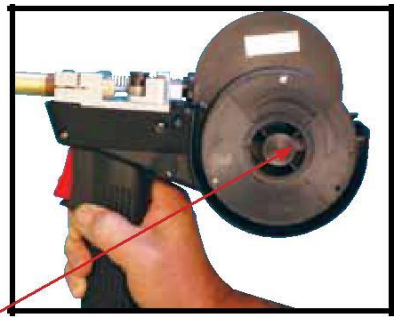
(1) Switch on the machine, select the **MIG** function with the MMA/Mig selector switch.
(2) Select **Spool Gun** using the Standard/Spool Gun selector switch.
(3) Connect the Spool Gun to the Euro Mig torch connection socket on the front panel, and tighten it. Connect the Spool Gun control cable to the receptacle and tighten it.
IMPORTANT : When connecting the torch be sure to tighten the connection. A loose connection can result in the connector arcing and damaging the machine and gun connector.
This damage is not covered under warranty.
(4) Insert the earth cable plug into the **Negative** socket on the front of the machine and tighten it.
(5) Connect **Gas Line** to **Gas Regulator** and connect the gas regulator to the **Gas Cylinder**.
(6) Take the Spool Gun and remove the spool cover.
(7) Place the **Wire Spool** onto the **Spool Holder** - Hold and snip the wire from the spool being sure to hold the wire to prevent rapid uncoiling.



(5) Connect weld power lead to ⊖ output terminal



(6) Remove the spool cover by unscrewing the retaining nut and lifting off the cover

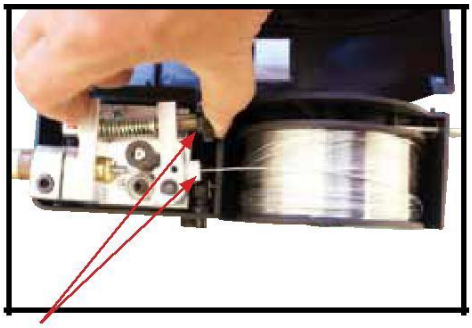


(7) Place a spool of wire onto the Spool holder.

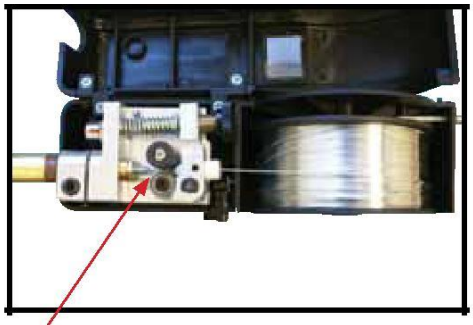
Caution:
Disconnect the Electrode Holder cable from the machine before using MIG function. If cable is not disconnected welding voltage is present and can cause arcing or flash.

Continued set up of the Spool Gun with MIG/MMA-180/200

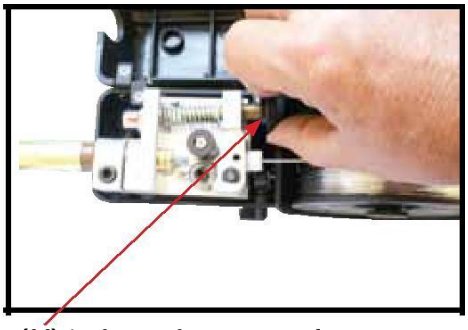
(9) Connect weld power lead to GAS (+)
(10) Take the Spool Gun and push the **Cover Release Button** to unlock the wire feed / spool cover.
(11) Place the **Wire Spool** onto the **Spool Holder** - Note: the spool retaining nut is Left Hand thread. Hold and snip the wire from the spool being sure to hold the wire to prevent rapid uncoiling.
(12) Carefully feed the wire over the drive roller into the outlet guide tube, feed through into the torch neck. Check that the drive roller being used complies with the wire diameter, replace the roller if necessary.
(13) Align the wire into the groove of the drive roller and release the tension arm making sure the wire is in the groove of the drive roller.
(14) Apply a adepuate amount of pressure to the drive roller by winding in the tension adjusting knob,
(15) Adjust spool hoder tension
(16) Remove the gas nozzle and contact tip from the torch neck, Pull the trigger to drive the wire through the neck until it exits the contact tip holder
(17) Fit the correct sized contact tip and feed the wire through it, screw the contact tip into the tip holder of the torch neck and nip it up tightly.
(18) Fit the gas nozzle to the torch head and close the wire spool cover.
(19) Carefully open the gas cylinder valve and set the flow rate to between 15 - 25 CFH.
(20) Set the welding parameters using the wire feed and voltage control knobs.



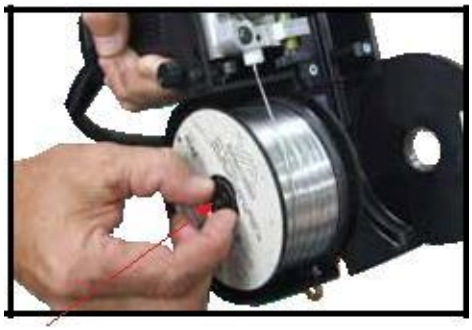
(12) Carefully feed the wire through the inlet guide tube onto the drive roller through into the outlet guide tube. Squeezing the tension arm adjustment knob to release the pressure of the tension arm will allow the wire to be guided through the drive roller easily



(13) Check to make sure that the wire passes cleanly through the drive roller into the outlet guide tube.



(14) Apply a medium amount of pressure using the tension arm adjustment knob.



(15) Adjust spool hoder tension

(16) Remove the gas nozzle and contact tip. Pull the trigger to drive the wire through the neck until it exits the contact tip holder

(17) Fit the contact tip over the wire and screw it into the tip holder, nip it up tight.

Note: Pictures may vary from your model machine

(18) Fit the gas nozzle and close the wire feed spool cover
(20) Set welding parameters using the voltage and wire feed controls.

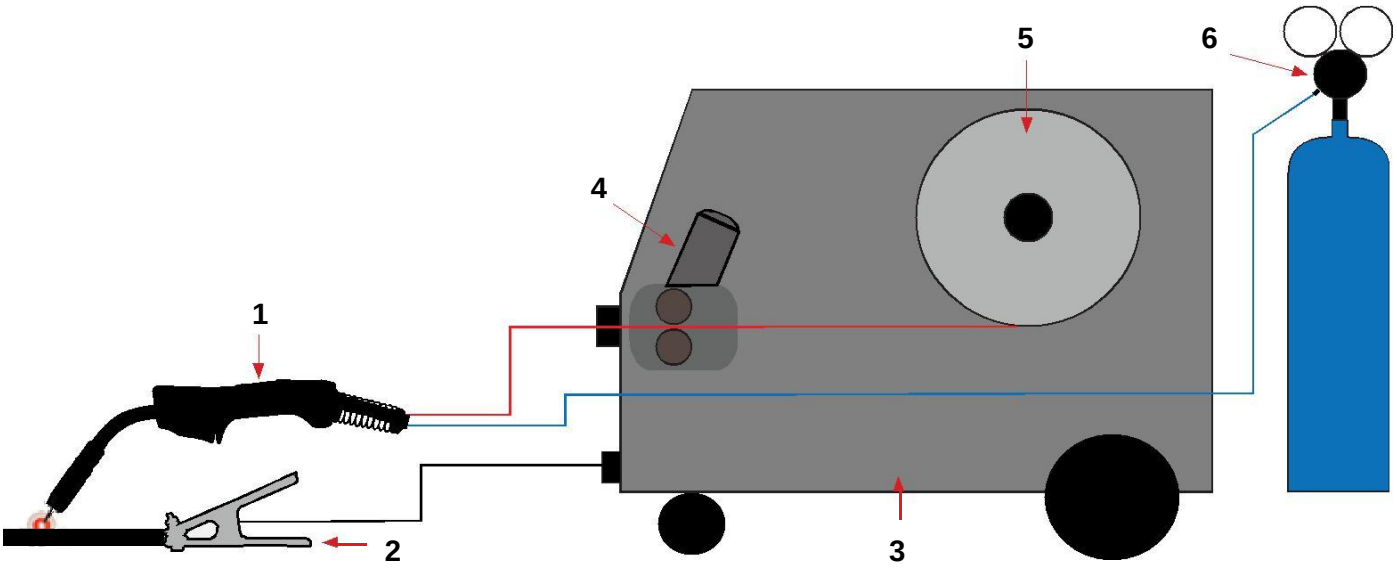
(19) Carefully open the valve of the gas cylinder, set the flow to 15 - 25 CFH

(20) Set welding parameters using the voltage and wire feed controls.

MIG (Metal Inert Gas) Welding

Definition of MIG Welding - MIG (metal inert gas) welding also known as GMAW (gas metal arc welding) or MAG (metal active gas welding), is a semi-automatic or automatic arc welding process in which a continuous and consumable wire electrode and a shielding gas are fed through a weld-ing gun. A constant voltage, direct current power source is most commonly used with MIG welding. There are four primary methods of metal transfer in MIG welding, called short circuit (also known as dip transfer) globular transfer, spray transfer and pulsed-spray, each of which has distinct properties and corresponding advantages and limitations. To perform MIG welding, the basic necessary equip-ment is a welding gun, a wire feed unit, a welding power supply, an electrode wire, and a shielding gas supply. Short circuit transfer is the most common used method whereby the wire electrode is fed continuously down the welding torch through to and exiting the contact tip. The wire touches the work piece and causes a short circuit the wire heats up and begins to form a molten bead, the bead separates from the end of the wire and forms a droplet that is transferred into the weld pool. This process is repeated about 100 times per second, making the arc appear constant to the human eye.

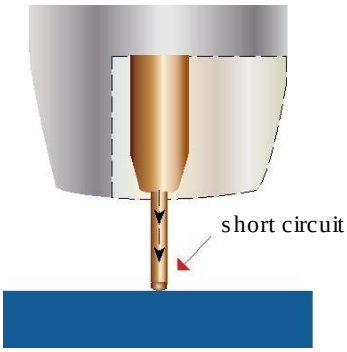
MIG Circuit Diagram



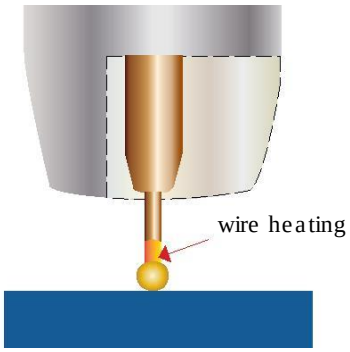
1. Mig Torch - **2.** Work Piece - **3.** Power Source - **4.** Wire Feeder - **5.** Wire Spool - **6.** Gas

MIG (Metal Inert Gas) Welding

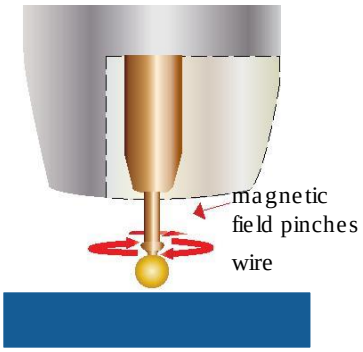
Short Circuit Transfer - Short circuit transfer is the most common used method whereby the wire electrode is fed continuously down the welding torch through to and exiting the contact tip. The wire touches the work piece and causes a short circuit the wire heats up and begins to form a molten bead, the bead separates from the end of the wire and forms a droplet that is transferred into the weld pool. This process is repeated about 100 times per second, making the arc appear constant to the human eye.



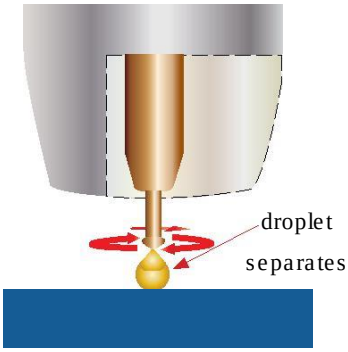
The wire approaches the work piece and touches the work creating a short circuit between the wire and the base metal, because there is no space between the wire and the base metal there is no arc and current flows through the wire.



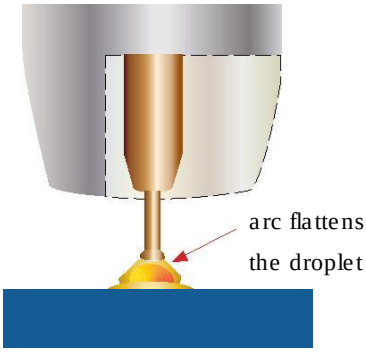
The wire cannot support all the current flow, resistance builds up and the wire becomes hot and weak and begins to melt



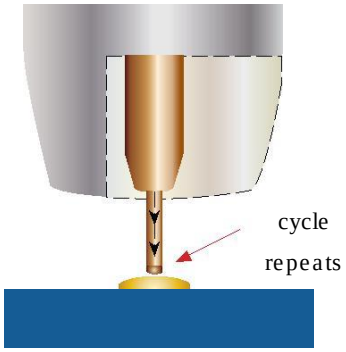
The current flow creates a magnetic field that begins to pinch the melting wire forming it into droplet



The pinch causes the forming droplet to separate and fall towards the now creating weld pool.



An arc is created at the separation of the droplet and the heat and force of the arc flattens out the droplet into the weld pool. The heat of the arc melts the end of the wire slightly as it feeds towards the base metal



The wire feed speed overcomes the heat of the arc and the wire again approaches the work to short circuit and repeat the cycle.

Basic MIG Welding .

Good weld quality and weld profile depends on gun angle, direction of travel, electrode extension (stick out), travel speed, thickness of base metal, wire feed speed (amperage) and arc voltage. To follow are some basic guides to assist with your setup.

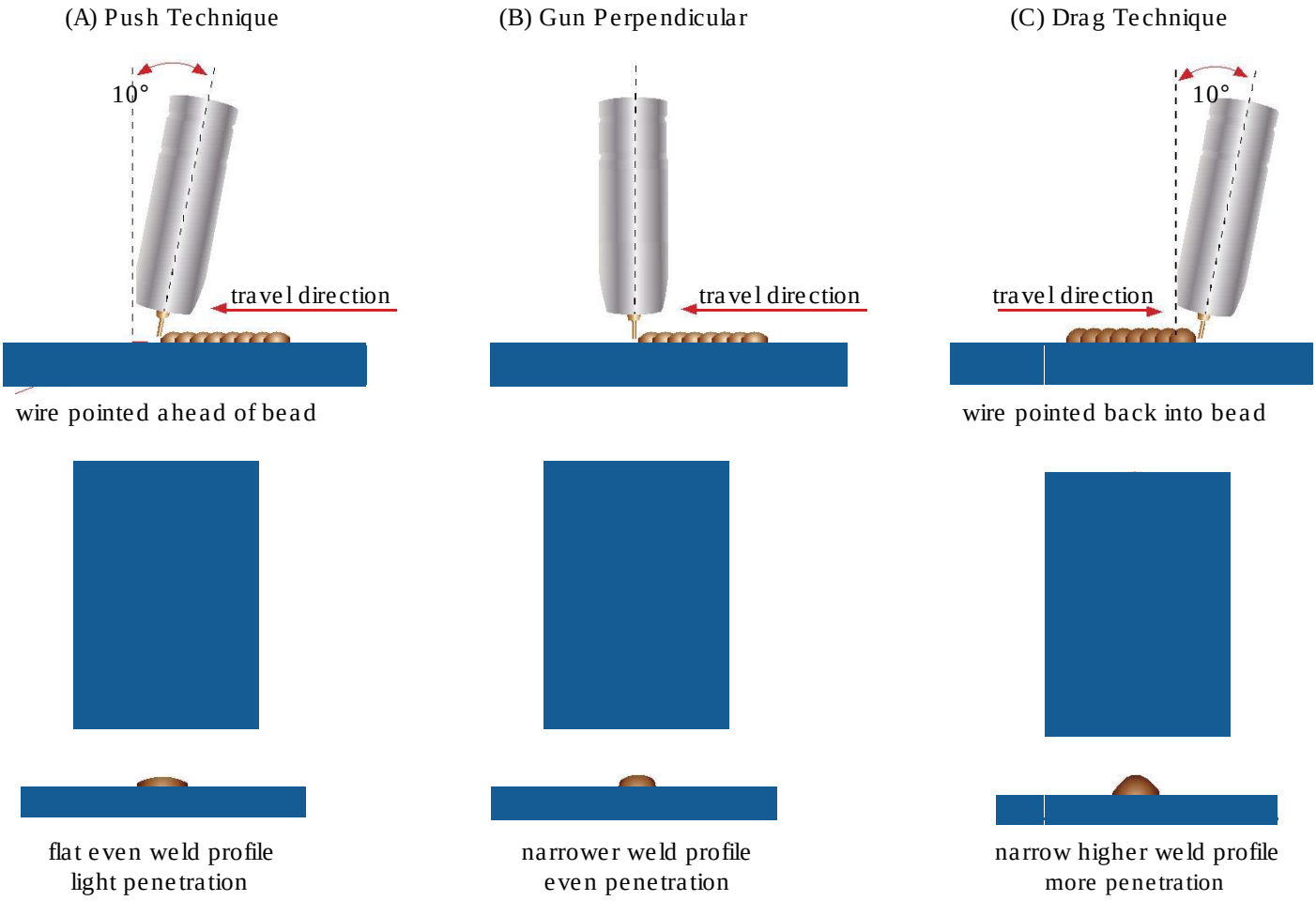
Gun Position - Travel Direction, Work Angle

Gun position or technique usually refers to how the wire is directed at the base metal, the angle and travel direction chosen. Travel speed and work angle will determine the characteristic of the weld bead profile and degree of weld penetration.

Push Technique - The wire is located at the leading edge of the weld pool and pushed towards the un-melted work surface. This technique offers a better view of the weld joint and direction of the wire into the weld joint. Push technique directs the heat away from the weld puddle allowing faster travel speeds providing a flatter weld profile with light penetration - useful for welding thin materials. The welds are wider and flatter allowing for minimal clean up / grinding time.

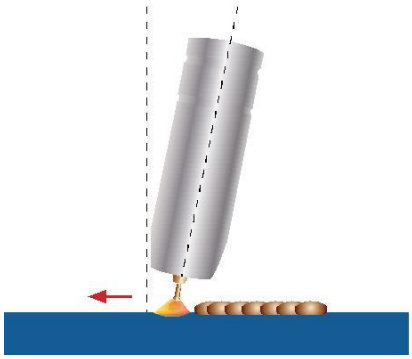
Perpendicular Technique - The wire is fed directly into the weld, this technique is used primarily for automated situations or when conditions make it necessary. The weld profile is generally higher and a deeper penetration is achieved.

Drag Technique - The gun and wire is dragged away from the weld bead. The arc and heat is concentrated on the weld pool, the base metal receives more heat, deeper melting, more penetration and the weld profile is higher with more build up.



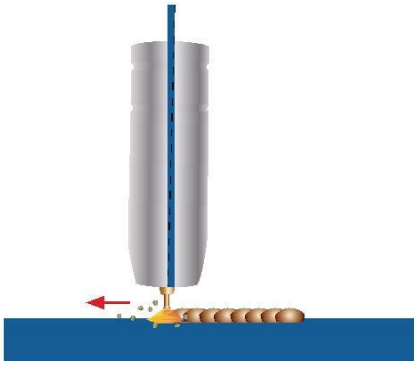
Travel Angle - Travel angle is the right to left angle relative to the direction of welding. A travel angle of 5°- 15° is ideal and produces a good level of control over the weld pool. A travel angle greater that 20° will give an unstable arc condition with poor weld metal transfer, less penetration, high levels of spatter, poor gas shield and poor quality finished weld.

Angle 5°- 15°



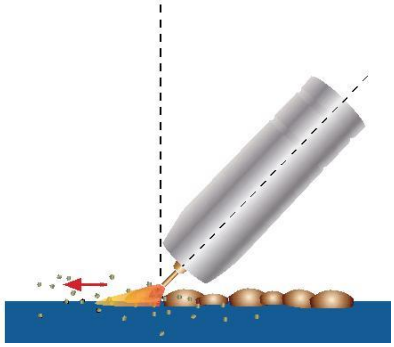
good level of control over the weld pool, even flat weld

Not enough angle



less control over the weld pool more spatter

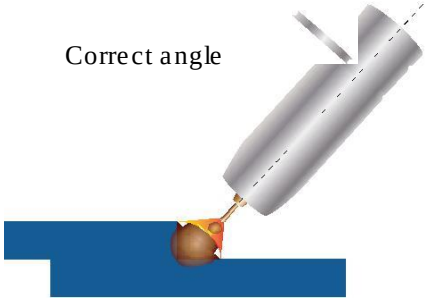
Angle more than 20°



poor control, unstable arc, less penetration, lots of spatter

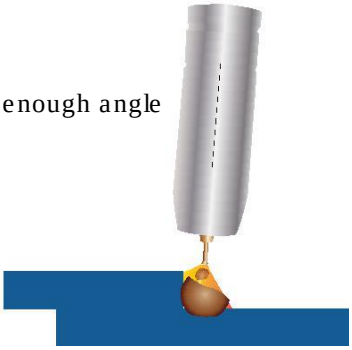
Angle to Work - The work angle is the forward back angle of the gun relative to the work piece. The correct work angle provides good bead shape, prevents undercut, uneven penetration, poor gas shield and poor quality finished weld.

Correct angle



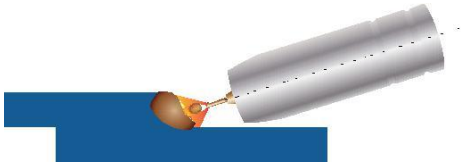
good level of control over the weld pool, even flat weld

Not enough angle



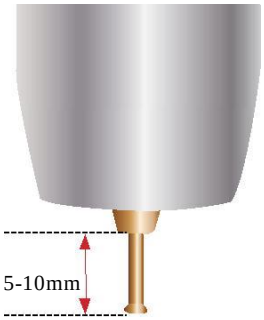
less control over the weld pool more spatter

Too much angle



poor control, unstable arc, less penetration, lots of spatter

Stick Out- Stick out is the length of the unmelted wire protruding from the end of the contact tip. A constant even stick out of 0.196"-0.393" will produce a stable arc, and an even current flow providing good penetration and even fusion. Too short stick out will cause an unstable weld pool, produce spatter and over heat the contact tip. Too long stick out will cause an unstable arc, lack of penetration, lack of fusion and increase spatter.



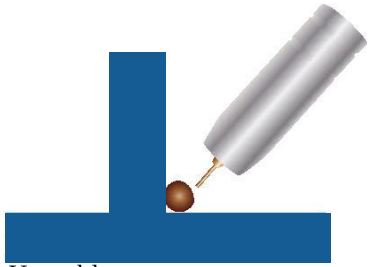
Normal stick out

Even arc, good penetration even fusion, good finish

Too short

Unstable arc, spatter, over heat contact tip

Too long

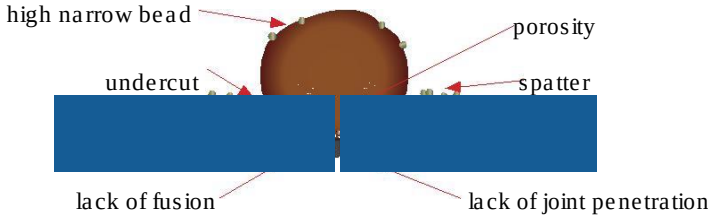


Unstable arc, spatter, poor penetration and fusion

Travel Speed - Travel speed is the rate that the gun is moved along the weld joint and is usually measured in mm per minute. Travel speeds can vary depending on conditions and the welders skill and is limited to the welders ability to control the weld pool. Push technique allows faster travel speeds than Drag technique. Gas flow must also correspond with the travel speed, increasing with faster travel speed and decreasing with slower speed. Travel speed needs to match the amperage and will decrease as the material thickness and amperage increase.

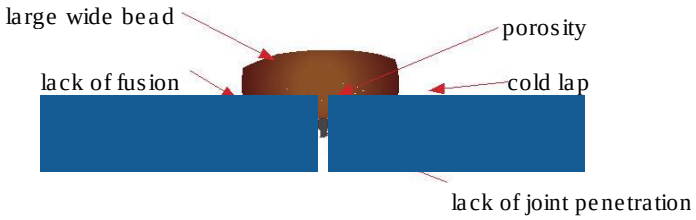
Too Fast Travel Speed - A too fast travel speed produces too little heat per mm of travel resulting in less penetration and reduced weld fusion, the weld bead solidifies very quickly trapping gases inside the weld metal causing porosity. Undercutting of the base metal can also occur and an unfilled groove in the base metal is created when the travel speed is too fast to allow molten metal to flow into the weld crater created by the arc heat.

Too Fast Travel Speed



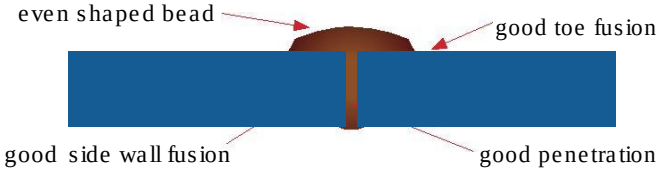
Too Slow Travel Speed - A too slow travel speed produces a large weld with lack of penetration and fusion. The energy from the arc dwells on top of the weld pool rather than penetrating the base metal. This produces a wider weld bead with more deposited weld metal per inches than is required resulting in a weld deposit of poor quality.

Too Slow Travel Speed



Correct Travel Speed - The correct travel speed keeps the arc at the leading edge of the weld pool allowing the base metal to melt sufficiently to create good penetration, fusion and wetting out of the weld pool producing a weld deposit of good quality.

Correct Travel Speed



Wire types and sizes - Use the correct wire type for the base metal being welded. Use stainless steel wire for stainless steel, aluminium wires for aluminium and steel wires for steel.

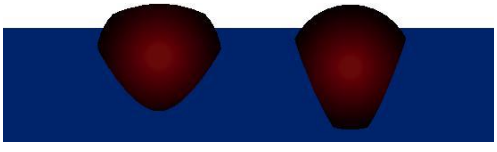
Use a smaller diameter wire for thin base metals. For thicker materials use a larger wire diameter and larger machine, check the recommended welding capability of you machine.
As a guide refer to the “Welding Wire Thickness Chart” below.

WELDING WIRE DIAMETER CHART

MATERIAL THICKNESS	RECOMMENDED WIRE DIAMETERS						
	MIG SOLID WIRE				GASLESS FLUX CORED WIRE		
	0.025”	0.030”	0.035”	0.040”	0.030”	0.035”	0.045”
24 Gauge (.60mm)							
22 Gauge (.75mm)							
20 Gauge (.90mm)							
18 Gauge (1.0mm)							
16 Gauge (1.2mm)							
14 Gauge (1.9mm)							
0.118” / 3.0mm							
0.196” / 5.0mm							
0.236” / 6.0mm							
0.314” / 8.0mm							
0.393” / 10.mm							
0.472” / 12.0mm							

For material thickness of 0.196” / 5.0mm and greater, multi-pass runs or a beveled joint design may be required depending on the amperage capability of your machine.

Gas selection - The purpose of the gas in the MIG process is to protect / shield the wire, the arc and the molten weld metal from the atmosphere. Most metals when heated to a molten state will react with the air in the atmosphere, without the protection of the shielding gas the weld produced would contain defects like porosity, lack of fusion and slag inclusions. Additionally some of the gas becomes ionised (electrically charged) and helps the current flow smoothly.
The correct gas flow is also very important in protecting the welding zone from the atmosphere. Too low flow will give inadequate coverage and result in weld defects and unstable arc conditions. Too high flow can cause air to be drawn into the gas column and contaminate the weld zone.
Use the correct shielding gas. Co2 is good for steel and offers good penetration characteristics, the weld profile is narrower and slightly more raised than the weld profile obtained from Argon Co2 mixed gas. Argon Co2 mix gas offers better weld ability for thin metals and has a wider range of setting tolerance on the machine. Argon 80% Co2 20% is a good all round mix suitable for most applications.

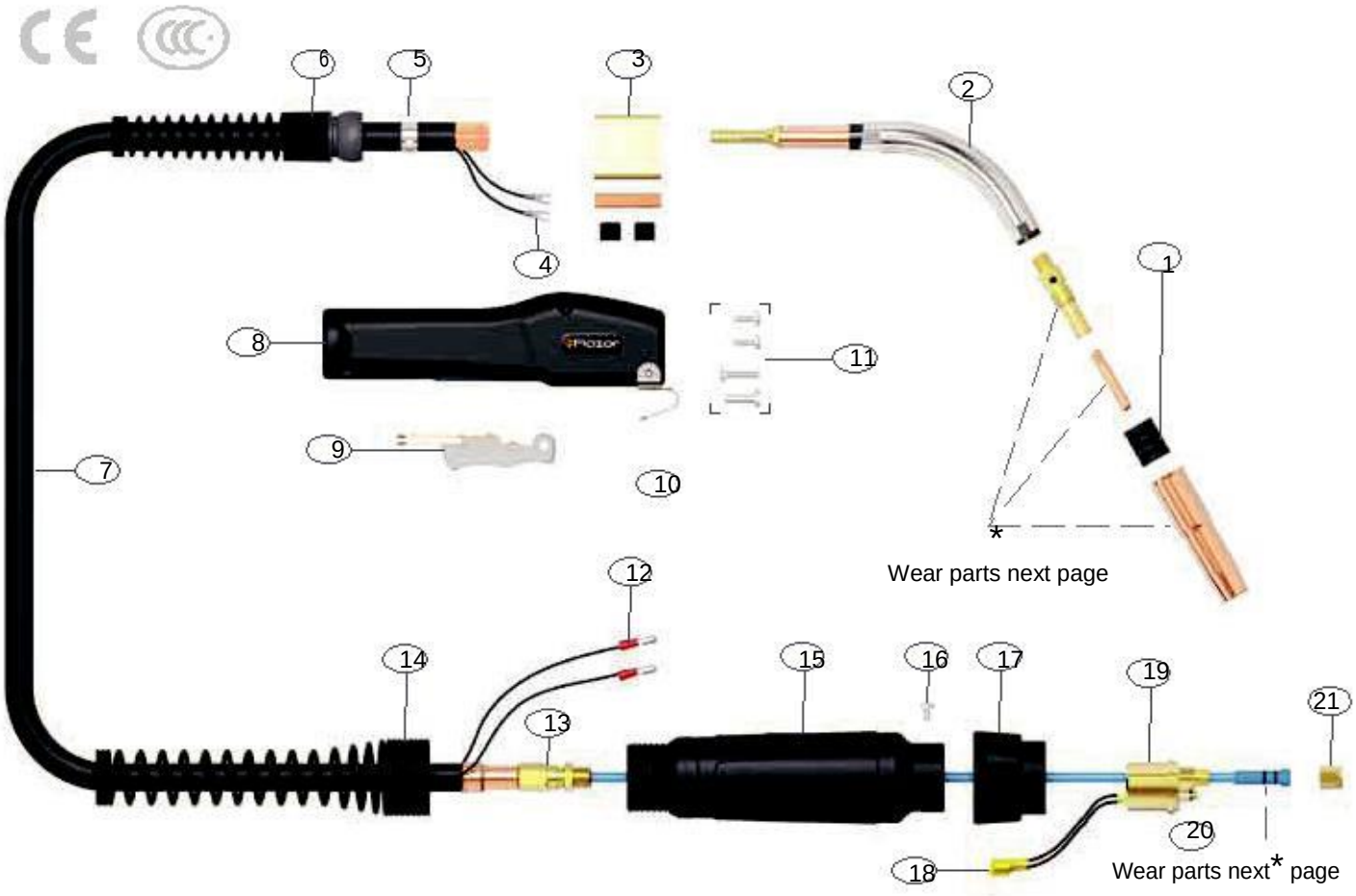


Penetration Pattern for Steel

TWC2 STYLE MIG TORCH

TWC2 Air Cooled Mig Welding Torch

Rating: 200A CO2 150A mixed gas, EN60974-7 @ 60% duty cycle. 0.6 to 1.2mm / 0.025” to 0.045 47/34” wires



Torch Model	
Description	**Part Number**
	15ft
Welding Torch c/w Euro Fitting	TWC2-15FTE

Spare Parts

	Part Number	Description		Part Number	Description
1	PWGA32	Adjustable Nozzle Insulator	9	U92	Grey Trigger Switch
2	U62J60	TW No.2 Metal Jacket Neck Assembly	10	U152	Hanger Hook
	WGA62A-45	45 Degreet Neck Assembly	11	U122FMS	Screw Kit
	WGA62A-60	60 DegreetNeck Assembly	112	UB1522	Cable Terminal Male
3	U102	Block C/W Spacer & Screws	13	UXL1542	Cable End Lock Nut (M12 X 1.0)
4	U244T	Control Wire Terminals	14	UPA2041	Cable Support
5	UB5044	Hose Clamp 18.5mm / (47/64)	15	UB1518	Gun Plug Housing C/W Nut
6	U141-6S	Spring Cable Support Small & Ball Joint	16	UB1526	Gun Plug Screw
7	U200-10E	Hyperflex C/Assy X 10ft Euro	17	UB1519/S	Gun Plug Nut
	U200-12E	Hyperflex C/Assy X 12ft Euro	18	UB1523	Gun Plug Terminal Female
	U200-15E	Hyperflex C/Assy X 15ft Euro	19	U174EX-1	TWC Euro Gun Plug Body
	U200-10	Hyperflex C/Assy X 10ft	20	UB1524	Gun Plug ‘O’ Ring
	U200-12	Hyperflex C/Assy X 12ft	21	UXL1826	Liner Retaining Nut
	U200-15	Hyperflex C/Assy X 15ft			
8	UP83	Handle With Hook & Screw			

These parts are manufactured in China and are offered as replacement parts suitable for “TWECO” style torches.

TWC2 STYLE MIG TORCH

Front end consumables

TWC2 Contact Tips

Part Number	Description	
PWGA14-30	Contact tip 0.8mm / 0.030”	QTY10
PWGA14-35	Contact tip 0.9mm / 0.035”	QTY10
PWGA14-40	Contact tip 1.0mm / 0.040”	QTY10
PWGA14-45	Contact tip 1.2mm / 0.045”	QTY10

TWC2 Contact Tips H/D

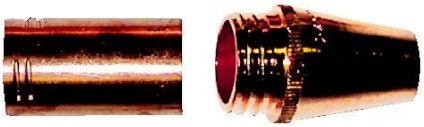
Part Number	Description	
PWGA14H-30	Contact H/D tip 0.8mm / 0.030”	QTY10
PWGA14H-35	Contact H/D tip 0.9mm / 0.035”	QTY10
PWGA14H-40	Contact H/D tip 1.0mm / 0.040”	QTY10
PWGA14H-45	Contact H/D tip 1.2mm / 0.045”	QTY10
PWGA14H-52	Contact H/D tip 1.4mm / 0.052:	QTY10
PWGA14H-564	Contact H/D tip 2.0mm / (5/64)	QTY10
PWGA14AH-364	Contact H/D Ali tip 1.2mm / 0.045”	QTY10
PWGA14AH-116	Contact H/D Ali tip 1.6mm / (1/16)	QTY10

TWC2 Gas Diffuser

Part Number	Description	
PWGA52	Gas Diffuser	QTY2
PWGA52FN	Gas Diffuser to suit fixed nozzle	QTY2

TWC2 Torch Nozzle

Part Number	Description	
PWGA22A50	Nozzle Adjustable 13mm / (33/67)	QTY2
PWGA22A62	Nozzle Adjustable 16mm / (5/8)	QTY2



TWC2 Torch Nozzle Fixed

Part Number	Description	
PWGA34CT	Nozzle Insulator	QTY2
PWGA23-50	Nozzle fixed 13mm / (33/67)	QTY2
PWGA23-62	Nozzle fixed 16mm / (5/8)	QTY2
PWGS24CT50S	Nozzle fixed 13mm / (33/67)	QTY2
PWGA24CT62S	Nozzle fixed 16mm / (5/8)	QTY2

Liners

TWC2 Liners

Part Number	Description
WGA42-3035-15	Liner 15 ft 0.8 - 0.9mm / 0.030” - 0.035”
WGA42-4045-15	Liner 15ft 1.0 - 1.2mm / 0.040” - 0.0457”
WGA42N-4045-15	Liner 15ft 1.0 - 1.2mm / 0.040” - 0.045” Alloy

These parts are manufactured in China and are offered as replacement parts suitable for “TWECO” style torches.

MIG WELDING TROUBLE SHOOTING

The following chart addresses some of the common problems of MIG welding. In all cases of equipment malfunction, the manu-facturer's recommendations should be strictly adhered to and followed.

1: Excessive Spatter	
Possible Reason	*Suggested Remedy*
Wire feed speed set too high	Select lower wire feed speed
Voltage too high	Select a lower voltage setting
Wrong polarity set	select the correct polarity for the wire being used - see machine setup guide
Stick out too long	Bring the torch closer to the work
Contaminated base metal	Remove materials like paint, grease, oil, and dirt, including mill scale from base metal
Contaminated mig wire	Use clean dry rust free wire. Do not lubricate the wire with oil, grease etc
Inadequate gas flow or too much gas flow	Check the gas is connected, check hoses, gas valve and torch are not restricted. Set the gas flow between 15 - 25 CFH flow rate. Check hoses and fittings for holes, leaks etc Protect the welding zone from wind and drafts
2: Porosity - small cavities or holes resulting from gas pockets in weld metal.	
Possible Reason	*Suggested Remedy*
Wrong gas	Check that the correct gas is being used
Inadequate gas flow or too much gas flow	Check the gas is connected, check hoses, gas valve and torch are not restricted. Set the gas flow between 15 - 25 CFH flow rate. Check hoses and fittings for holes, leaks etc. Protect the welding zone from wind and drafts
Moisture on the base metal	Remove all moisture from base metal before welding
Contaminated base metal	Remove materials like paint, grease, oil, and dirt, including mill scale from base metal
Contaminated mig wire	Use clean dry rust free wire. Do not lubricate the wire with oil, grease etc
Gas nozzle clogged with spatter, worn or out of shape	Clean or replace the gas nozzle
Missing or damaged gas diffuser	Replace the gas diffuser
Mig torch euro connect o-ring miss-ing or damaged	check and replace the o-ring
4: Wire stubbing during welding	
Possible Reason	*Suggested Remedy*
Holding the torch too far away	Bring the torch closer to the work and maintain stick out of 0.196" to 0.393":
Welding voltage set too low	Increase the voltage
Wire Speed set too high	Decrease the wire feed speed
5: Lack of Fusion − failure of weld metal to fuse completely with base metal or a proceeding weld bead.	
Possible Reason	*Suggested Remedy*
Contaminated base metal	Remove materials like paint, grease, oil, and dirt, including mill scale from base metal
Not enough heat input	Select a higher voltage range and /or adjust the wire speed to suit
Improper welding technique	Keep the arc at the leading edge of the weld pool. Gun angle to work should be between 5 & 15° Direct the arc at the weld joint Adjust work angle or widen groove to access bottom during welding Momentarily hold arc on side walls if using weaving technique
5: Excessive Penetration − weld metal melting through base metal	
Possible Reason	*Suggested Remedy*
Too much heat	Select a lower voltage range and /or adjust the wire speed to suit Increase travel speed
6: Lack of Penetration − shallow fusion between weld metal and base metal	
Poor in incorrect joint preparation	Material too thick. Joint preparation and design needs to allow access to bottom of groove while maintaining proper welding wire extension and arc characteristics Keep the arc at the leading edge of the weld pool and maintain the gun angle at 5 & 15° keeping the stick out between 0.196" to 0.393":
Not enough heat input	Select a higher voltage range and /or adjust the wire speed to suit Reduce travel speed
Contaminated base metal	Remove materials like paint, grease, oil, and dirt, including mill scale from base metal.

MIG WIRE FEED TROUBLE SHOOTING

The following chart addresses some of the common WIRE FEED problems during MIG welding. In all cases of equipment malfunction, the manufacturer's recommendations should be strictly adhered to and followed.

1: No wire feed	
Possible Reason	*Suggested Remedy*
Wrong mode selected	Check that the TIG/MMA/MIG selector switch set to MIG position
Wrong torch selector switch	Check that the STANDARD/SPOOLGUN selector switch is set to STANDARD position for MIG welding and SPOOLGUN when using the Spoolgun
2: Inconsistent / interrupted wire feed	
Possible Reason	*Suggested Remedy*
Adjusting wrong dial	Be sure to adjust the WIRE FEED and VOLTAGE dials for MIG welding. The AMPERAGE dial is for STICK and TIG welding mode
Wrong polarity selected	Select the correct polarity for the wire being used - see machine setup guide
Incorrect wire speed setting	Adjust the wire feed speed
Voltage setting incorrect	Adjust the voltage setting
Mig torch lead too long	Small diameter wires and soft wires like aluminium don't feed well through long torch leads - replace the torch with a lesser length torch
Mig torch lead kinked or too sharp angle being held	Remove the kink, reduce the angle or bend
Contact tip worn, wrong size, wrong type	Replace the tip with correct size and type
Liner worn or clogged (the most common causes of bad feeding)	Try to clear the liner by blowing out with compressed air as a temporary cure, it is recommended to replace the liner
Wrong size liner	Install the correct size liner
Blocked or worn inlet guide tube	Clear or replace the inlet guide tube
Wire misaligned in drive roller groove	Locate the wire into the groove of the drive roller
Incorrect drive roller size	Fit the correct size drive roller eg; 0.030" wire requires 0.030" drive roller
Wrong type of drive roller selected	Fit the correct type roller (e.g. knurled rollers needed for flux cored wires)
Worn drive rollers	Replace the drive rollers
Drive roller pressure too high	Can flatten the wire electrode causing it to lodge in the contact tip - reduce the drive roller pressure
Too much tension on wire spool hub	Reduce the spool hub brake tension
Wire crossed over on the spool or tangled	Remove the spool untangle the wire or replace the wire
Contaminated mig wire	Use clean dry rust free wire. Do not lubricate the wire with oil, grease etc

MMA (Stick) WELDING TROUBLE SHOOTING

The following chart addresses some of the common problems of MMA welding. In all cases of equipment malfunction, the manufacturer's recommendations should be strictly adhered to and followed.

1: No arc	
Possible Reason	*Suggested Remedy*
Incomplete welding circuit	Check earth lead is connected. Check all cable connections.
Wrong mode selected	Check the MMA selector switch is selected
No power supply	Check that the machine is switched on and has a power supply
2: Porosity − small cavities or holes resulting from gas pockets in weld metal.	
Possible Reason	*Suggested Remedy*
Arc length too long	Shorten the arc length
Work piece dirty, contaminated or moisture	Remove moisture and materials like paint, grease, oil, and dirt, including mill scale from base metal
Damp electrodes	Use only dry electrodes
3: Excessive Spatter	
Possible Reason	*Suggested Remedy*
Amperage too high	Decrease the amperage or choose a larger electrode
Arc length too long	Shorten the arc length
3: Weld sits on top, lack of fusion	
Possible Reason	*Suggested Remedy*
Insufficient heat input	Increase the amperage or choose a larger electrode
Work piece dirty, contaminated or moisture	Remove moisture and materials like paint, grease, oil, and dirt, including mill scale from base metal
Poor welding technique	Use the correct welding technique or seek assistance for the correct technique
4: Lack of penetration	
Possible Reason	*Suggested Remedy*
Insufficient heat input	Increase the amperage or choose a larger electrode
Poor welding technique	Use the correct welding technique or seek assistance for the correct technique
Poor joint preparation	Check the joint design and fit up, make sure the material is not too thick. Seek assistance for the correct joint design and fit up
5: Excessive penetration - burn through	
Possible Reason	*Suggested Remedy*
Excessive heat input	Reduce the amperage or use a smaller electrode
Incorrect travel speed	Try increasing the weld travl speed
6: Uneven weld appearance	
Possible Reason	*Suggested Remedy*
Unsteady hand, wavering hand	Use two hands where possible to steady up, practise your technique
7: Distortion − movement of base metal during welding	
Possible Reason	*Suggested Remedy*
Excessive heat input	Reduce the amperage or use a smaller electrode
Poor welding technique	Use the correct welding technique or seek assistance for the correct technique
Poor joint preparation and or joint design	Check the joint design and fit up, make sure the material is not too thick. Seek assistance for the correct joint design and fit up
7: Electrode welds with different or unusual arc characteristic	
Possible Reason	*Suggested Remedy*
Incorrect polarity	Change the polarity, check the electrode manufacturer for correct polarity

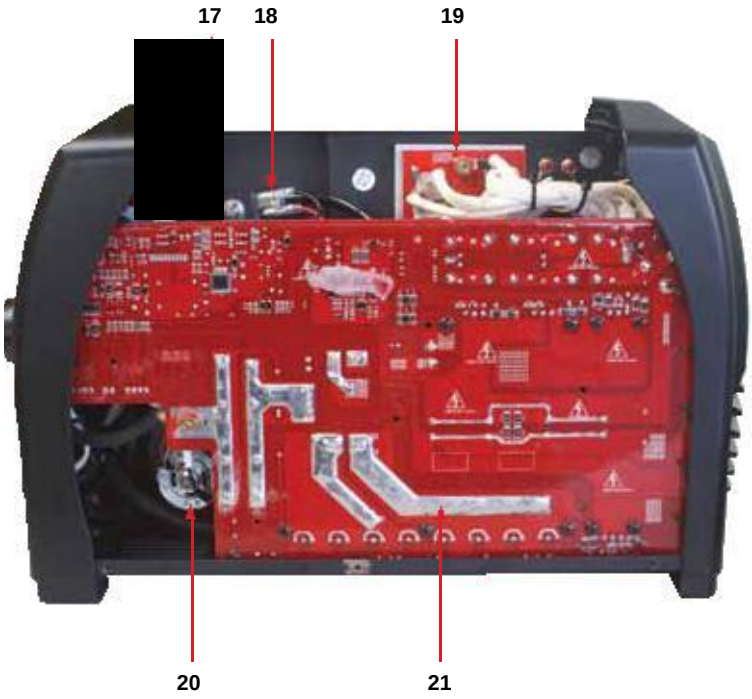
ATTENTION! - CHECK FOR GAS LEAKS

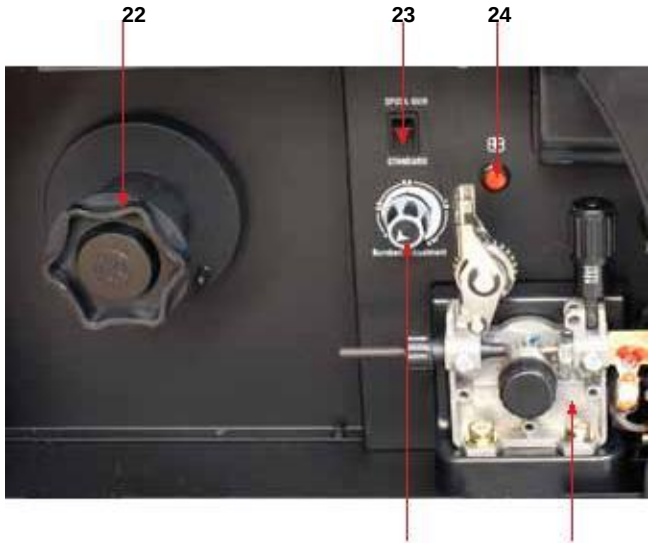
At initial set up and at regular intervals we recommend to check for gas leakage.

Recommended procedure is as follows:

1. Connect the regulator and gas hose assembly and tighten all connectors and clamps.
2. Slowly open the cylinder valve.
3. Set the flow rate on the regulator to approximately 15-25 CFH.
4. Close the cylinder valve and pay attention to the needle indicator of the contents pressure gauge on the regulator, if the needle drops away towards zero there is a gas leak. Sometimes a gas leak can be slow and to identify it will require leaving the gas pressure in the regulator and line for an extended time period. In this situation it is recommended to open the cylinder valve, set the flow rate to 15-21 CFH, close the cylinder valve and check after a minimum of 15 minutes.
5. If there is a gas loss then check all connectors and clamps for leakage by brushing or spraying with soapy water, bubbles will appear at the leakage point.
6. Tighten clamps or fittings to eliminate gas leakage.

Spare Parts Identification – MIG/MMA-180/200





	Description	Part Number		Description	Part Number
1	Carry handle	10043478			
2	Front cover	10043403	16	Power Input Cable	10043418
3	Wire feed potentiometer	10037793	17	Gas hose	
4	MMA/MIG toggle switch	10004968	18	Gas Solenoid	10040667
5	MIG voltage potentiometer	10037793	19	Rectifier bridge	10039915
6	MMA amperage potentiometer	10037793	20	Wire Feeder Motor	10042965
7	Power lead connector	10041426	21	Main PCB	10043414
8	Euro Connector	10041419	22	Spool holder assembly	10041449
9	Female Dinse Panel Socket 35-50	10037151	23	Spoolgun switch	10041284
10	Spoolgun Socket	10041416	24	Inch wire push switch	10041420
11	Metal Side Cover	10043377	25	Wire drive assembly	10041418
12	On/Off Switch	10004957			
13	Gas Connector	10041723			
14	Fan(internal located)	10041446			
15	Rear Cover	10043404			

WARRANTY

We warrants that the following products under supplied by us and purchased by you from an authorized dealer throughout the U.S.A & Canada are free of material and faulty workmanship defects except for those products listed under ‘warranty exclusions’.
These terms and conditions supersede and exclude all former and other representations and arrangements relating to any warranties on these products.

Warranty Period

We offer the following ‘warranty periods’ from ‘date of purchase’

inverter mig (power source only)	1 year	(clause 3)
inverter mig swf (power source / separate wire feeder only)	1 year	(clause 3)
flow regulators argon / acetylene / oxygen / lpg / bobbin flowmeter	1 year	(clause 3)
automatic welding helmets	1 year	(clause 3)
torches -gmaw, gtaw, mmaw, plasma, earth leads, interconnecting cables, gas hose	1 year	(clause 3)

(clause 3) this only covers manufactures defaults on all accessories for the first three months after date of purchase.

•Seller makes no warranties expressed or implied, including but not by way of limitation, any implied warranty of merchantability and any implied warranty of fitness for a particular purpose, on any order except that seller warrants title to all goods furnished by seller and except that seller warrants for a period of one year from the date of sale as noted on seller original bill of sale, that all goods described on seller’s bill of sale, will be manufactured in accordance with the specifications, if any, set forth in said bill of sale and expressly accepted in seller’s acknowledgment subject to seller’s standard manufacturing variations and practices. In the case of components or accessories furnished by suppliers to seller, purchaser’s warranty from seller shall be limited to the warranty of the component or accessory supplier. The foregoing warranties are the sole and exclusive warranties applicable to the goods delivered, and all other warranties, express or implied, including without limitation any warranty of merchantability, are hereby expressly disclaimed and negated without limiting the generality of the foregoing, purchaser acknowledges that seller’s products are not packaged or protected for long periods of storage and thus may corrode or rust over time.

WARRANTY / RETURNS / EXCHANGES

We understand that sometimes a product may need to be returned. If you have purchased from an authorized Dealer, the following is the correct procedure and returns policy.

Our Returns Policy includes the rights you have under the American consumer Law and other relevant laws. You are entitled to a replacement or refund for a major failure and for compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.

- You shall inspect the Goods on delivery and shall within seven (7) days of delivery (time being of the essence) notify us of any alleged defect, shortage in quantity, damage or failure to comply with the description or quote.
- You shall also afford us the opportunity to inspect the Goods within a reasonable time following delivery if you believe the Goods are defective in any way.

Returns will only be accepted provided that:

(a) You have complied with the provisions outlined above, and

(b) where the Goods are unable to be repaired, the Goods are returned at your cost within thirty (30) days of the delivery date

(c) we will not be liable for Goods which have not been stored or used in a proper manner, and

(d) the Goods are returned in the condition in which they were delivered and with all packaging material, brochures and instruction material in as new condition as is reasonably possible in the circumstances.

- We Accepts no responsibility for products lost or damaged while in transit
- We may (at their sole discretion) accept the return of Goods for credit but this may incur a handling fee of up to fifteen percent (15%) of the value of the returned Goods plus any freight costs.
- Where a failure does not amount to a major failure, we are entitled to choose between providing you with a repair, replacement or other suitable remedy.

Purchaser's Remedies:

With respect to any claim arising out of any order, any goods delivered pursuant to any order and expressly accepted in seller's acknowledgment, or seller's performance in connection with any order, including, without limitation, any claim arising out of any recall, defect or alleged defect in any goods or services furnished by seller, shall be limited exclusively to the right of repair or replacement of such goods or services, at seller's option. without in any way limiting the generality of the foregoing, in no event shall seller be liable for any consequential or incidental damages, including, without limitation, any loss of anticipated profits incurred by purchaser with respect to any goods or services furnished by seller, or any damages arising from injuries to persons as a result of purchaser's or a third party's negligence. seller's warranty does not cover failures resulting from the improper installation, mounting design or application or from corrosion. The provisions of this paragraph are a material term of this transaction.

Making a Claim

If you wish to make a claim under this Warranty, you should:

Return the product to the point of purchase either in person or on a prepaid courier; or

Contact Us by Telephone at 206.428.9831 or e-mail sales@steelvisiontools.com

When returned, the product must be accompanied with the original invoice including the purchase price and disclosing the purchase date.

All costs of installation, cartage, freight, traveling expenses, hiring tools and insurance are paid by the Customer.

To the extent permitted by law, our total liability for loss or damage of every kind related to the product in any way whatsoever is limited to the amount paid to the retailer by you for the product or the value of the product.

No responsibility will be taken for products lost, damaged while in transit.

WARRANTY EXCLUSIONS

This Warranty covers Material and Faulty Workmanship defects only.
This Warranty does not cover damage caused by:

- Normal wear and tear due to usage
- Misuse or abusive use of the WELDER as outlined in the instructions supplied with the product.
- Failure to clean or improper cleaning of the product
- Failure to maintain the equipment such as regular services etc
- Incorrect voltage or non-authorized electrical connections
- Improper installation
- Use of non-authorized/non-standard parts
- Abnormal product performance caused by any ancillary equipment interference or other external factors
- Failure or any breakage caused by overload, dropping or abusive treatment or use by the customer
- Repair, modifications or other work carried out on the product other than by an Authorized Dealers

Unless it is a manufacturing fault, this Warranty does not cover the following parts:

MIG Welding Torches and consumables to suit, such as:

Gas Nozzles, Gas Diffusers, Contact Tip holder, Contact tip, Swan Necks, Trigger, Handle, Liners, Wire Guide, Drive Roller, Gas Nozzle Spring. Neck Spring, Connector Block, Insulator, Gas Nipple, Cap, Euro Block, Head Assembly, Gas Block, Trigger Spring, Spring Cable Support, Neck Insulator, Shroud Spring, Gun Plug Cover, Lock Nut, Snap On Head, Spring Cap, Ball, Motor 42 Volt, Pot 10K standard, Knob, Drive Roll Seat, Washer, Bow, Ball Bearing, Wire Conduit Nipple, Central Plug, Printed Circuit Board, Gun Plug House, Cable Support, Gas Connector, Handle To Suit PP36 with Knobs, & Electrodes, Arc Leads, Welding Cable, Electrode Holder, Earth Clamps.

Tig Welding Torches and consumables to suit, such as:

Tungsten Electrodes, Collet, Collet Body, Alumina Nozzle, Torch Head, Torch Head water Cooled, Torch Head Flexible,Back Caps, Gas Lens, Torch Handle, Cup Gasket, Torch Body Gas Valve, O-ring, Arc Leads, Welding Cable, Electrode Holder, Earth Clamps.

Plasma cutting Torches and consumables to suit, such as:

All Cutting Tips, All Diffuser/Swirl Ring, All Electrode, Retaining Caps, Nozzle Springs, All Spacers, All Shield Caps, All Air and Power Cables, All Switches, All O-rings, All Springs, All Circle Guides and Cutting Kits, Torch Bodies, Air Filter Regulator, Arc Leads, Welding Cable, Electrode Holder, Eatch Clamps

Straight line cutting machines and consumables to suit, such as:

Hoses, Fittings, Track, Cutting Nozzles.
This Warranty does not cover products purchased:

- From a non-authorized Dealer (such as purchases from unauthorized retailers and purchases over the Internet from unauthorized local/international sellers.)
- At an auction;
- From a private seller Unless it is a manufacturing fault, this Warranty does not apply to any products sold to Hire Companies.

These conditions may only be varied with the written approval of the Directors of Steel vision

REMEMBER TO RETAIN YOUR ORIGINAL INVOICE FOR PROOF OF PURCHASE.