



# **OPERATING MANUAL**

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**145 Multi-System MIG-ARC-TIG**

**Multi Process Welder**

**8619470**

**180 Multi-System MIG-ARC-TIG**

**Multi Process WelderWelder**

**8611311**



**3 YEARS Warranty**  
(Power Source)

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



**Thank you for your purchase of your Pro.Point 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.

Pro.Point welders are manufactured and compliant with - CAN/CSA E60974-1 & ANSI/IEC 60974-1, guaranteeing you electrical safety and performance.

**WARRANTY**

As part of Royal Service, a customer may return a defective unit to any Princess Auto location for a new replacement unit within 3 years of the purchase date.





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# 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 United States 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.
- We recommend (RCD) safety switch is used with this equipment to detect any leakage of current to earth.



**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 & spatter may cause fire, therefore remove any flammable materials well away from the working area. Cover flammable materials and containers with approved covers 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 14°F to +104°F.
- 1.3 Keep this equipment 12" 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 12". 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 prevent 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: 9.4KVA for MIG210

# 145 Multi-System MIG-ARC-TIG Welder

Part Number: 8619470



- MIG, TIG AND ARC Welding machine
- Latest IGBT inverter technology
- MIG/MAG with Gas and Gasless wire function
- Excellent MIG welding with CO2 gas & mixed gas
- Euro style MIG and TIG torch connection
- Internal wire feeder with solid construction
- Adjustable Burn Back
- Spool Gun Connection
- Stepless voltage and wire feed control
- Wire Inch + Smart Set functionality
- Dual voltage 115/230V
- Hot Start - Anti Stick
- Digital Readout
- Solid case construction
- IP21S rating and CSA/CAN Approved



Complete with Torch, Regulator, return and ARC lead set and an Adaptor!

| Input voltage         |                                                                      | Single phase AC230V/115V±15% 50/60Hz |       |       |       |
|-----------------------|----------------------------------------------------------------------|--------------------------------------|-------|-------|-------|
| Welding wire diameter |                                                                      | 0.025/0.03/0.035(in.)                |       |       |       |
| ARC                   | Input:115V Rated input current: 21.4A<br>Output:10A/20.4V 80A/23.2V  | X                                    | 25%   | 60%   | 100%  |
|                       |                                                                      | I2                                   | 80A   | 52A   | 40A   |
|                       |                                                                      | U2                                   | 23.2V | 22.1V | 21.6V |
|                       | Input:230V Rated input current: 27A<br>Output:10A/20.4V 145A/25.8V   | X                                    | 25%   | 60%   | 100%  |
|                       |                                                                      | I2                                   | 145A  | 93.6A | 72.5A |
|                       |                                                                      | U2                                   | 25.8V | 23.7V | 22.9V |
| MIG                   | Input:115V Rated input current: 21.4A<br>Output:30A/15.5V 80A/18V    | X                                    | 25%   | 60%   | 100%  |
|                       |                                                                      | I2                                   | 80A   | 52A   | 40A   |
|                       |                                                                      | U2                                   | 18V   | 16.6V | 16V   |
|                       | Input:230V Rated input current: 22.4A<br>Output:30A/15.5V 145A/21.2V | X                                    | 25%   | 60%   | 100%  |
|                       |                                                                      | I2                                   | 145A  | 93.6A | 72.5A |
|                       |                                                                      | U2                                   | 21.2V | 18.7V | 17.6V |
| TIG                   | Input:115V Rated input current: 16.5A<br>Output:10A/10.4V 80A/13.2V  | X                                    | 25%   | 60%   | 100%  |
|                       |                                                                      | I2                                   | 80A   | 52A   | 40A   |
|                       |                                                                      | U2                                   | 13.2V | 12.1V | 11.6V |
|                       | Input:230V Rated input current: 16.5A<br>Output:10A/10.4V 145A/15.8V | X                                    | 25%   | 60%   | 100%  |
|                       |                                                                      | I2                                   | 145A  | 93.6A | 72.5A |
|                       |                                                                      | U2                                   | 15.8V | 13.7V | 12.9V |
| Dimensions (in)       |                                                                      | 19.1x7.3x14.6                        |       |       |       |
| Weight Machine (lbs.) |                                                                      | 28                                   |       |       |       |

This new Pro.Point Welder will provide 145 amps of MIG, TIG and ARC output for you to complete your welding jobs! Ideal for the DIY enthusiast ,this beautifully designed and highly functional multi-system is a powerful, portable and dual voltage machine ensuring smooth and trouble free welding and backed up by a big 3 year warranty. Our Smart-set function allows you to dial in your preferred wire size and gas mixture and you are ready to start welding! The machine comes complete with Torch, Regulator, Adaptor and Arc lead set.

# 180 Multi-System MIG-ARC-TIG Welder

Part Number: 8611311



- Latest IGBT inverter technology
- MIG/MAG with Gas and Gasless wire function
- Excellent MIG welding with CO2 gas & mixed gas
- Euro style MIG and TIG torch connection
- Internal wire feeder with solid construction
- Adjustable Burn Back
- Spool Gun Connection
- Stepless voltage and wire feed control
- Wire Inch + Smart Set functionality
- MIG, TIG AND ARC Welding machine
- Dual voltage 115/230V
- Hot Start - Anti Stick
- Digital Readout
- Solid case construction
- IP21S rating and CSA/CAN Approved



Complete with Torch, Regulator, return and ARC lead set and Adaptor!

## Dual Voltage

| Input voltage (V)     |                                                                        | Single phase AC230V/115V±15% (50/60Hz) |       |       |       |
|-----------------------|------------------------------------------------------------------------|----------------------------------------|-------|-------|-------|
| Welding wire diameter |                                                                        | 0.025/0.03/0.035(in.)                  |       |       |       |
| ARC                   | Input:115V-20A Rated input current: 27.5A<br>Output:10A/20.4V~100A/24V | X                                      | 25%   | 60%   | 100%  |
|                       |                                                                        | I2                                     | 100A  | 65A   | 50A   |
|                       |                                                                        | U2                                     | 24V   | 22.6V | 22V   |
|                       | Input:230V Rated input current: 30A<br>Output:10A/20.4V~160A/26.4V     | X                                      | 25%   | 60%   | 100%  |
|                       |                                                                        | I2                                     | 160A  | 103A  | 80A   |
|                       |                                                                        | U2                                     | 26.4V | 24.1V | 23.6V |
| MIG                   | Input:115V-15A Rated input current: 21.4A<br>Output:30A/15.5V~100A/19V | X                                      | 25%   | 60%   | 100%  |
|                       |                                                                        | I2                                     | 100A  | 65A   | 50A   |
|                       |                                                                        | U2                                     | 19V   | 17.3V | 16.5V |
|                       | Input:230V Rated input current: 30.2A<br>Output:30A/15.5V~180A/21.5V   | X                                      | 25%   | 60%   | 100%  |
|                       |                                                                        | I2                                     | 180A  | 116A  | 90A   |
|                       |                                                                        | U2                                     | 23V   | 19.8V | 18.5V |
| TIG                   | Input:115V Rated input current: 21.4A<br>Output:10A/10.4V~100A/14V     | X                                      | 25%   | 60%   | 100%  |
|                       |                                                                        | I2                                     | 100A  | 65A   | 50A   |
|                       |                                                                        | U2                                     | 14V   | 12.6V | 12V   |
|                       | Input:230V Rated input current: 22.6A<br>Output:10A/10.4V~180A/17.2V   | X                                      | 25%   | 60%   | 100%  |
|                       |                                                                        | I2                                     | 180A  | 116A  | 90A   |
|                       |                                                                        | U2                                     | 17.2V | 14.6V | 13.6V |
| Dimensions (in.)      |                                                                        | 19.1×7.3×14.6                          |       |       |       |
| Weight                |                                                                        | 28.4 Pounds (Machine)                  |       |       |       |

This new Pro.Point Welder will provide 180 amps of MIG, TIG and ARC output for you to complete your welding jobs! Ideal for the serious tradesman, this beautifully designed and highly functional multi-system is a powerful, portable and dual voltage machine ensuring smooth and trouble free welding and backed up by a big 3 year warranty. Our Smart-set function allows you to dial in your preferred wire size and gas mixture and you are ready to start welding! The machine comes complete with Torch, Regulator, Adaptor and Arc lead set. A real workhorse with a high duty Cycle!



# Front, Back, & Internal Panel Layout for Pro. Point145 & 180



## FRONT PANEL LAYOUT

1. Digital Volts Meter
2. Digital Amps Meter
3. 2T/4T Selector Button
4. Wire Speed / Amps Adjustment Knob
5. Voltage / Downslope / ARC Force Adjustment Knob
6. MIG / TIG / MMA / Smartset Selector Knob
7. "-" Output terminal
8. Euro MIG / TIG Torch Connector (MIG/MAG)
9. "+" Output terminal
10. SpoolGun Power Supply Connection



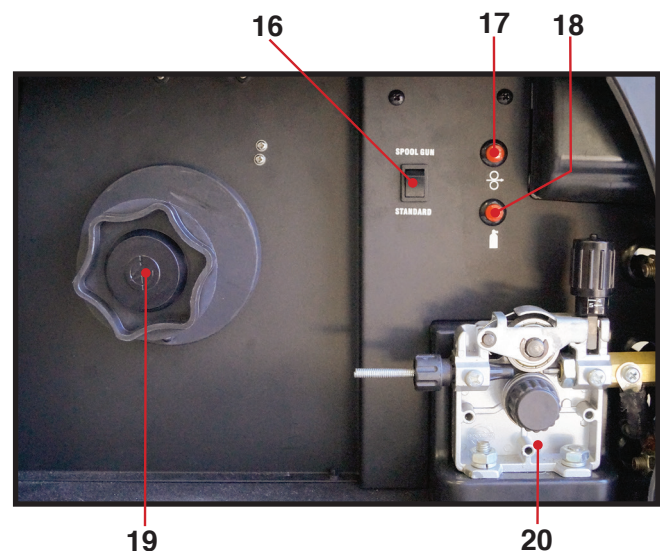
## BACK PANEL LAYOUT

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



## INTERNAL PANEL LAYOUT

16. Spoolgun/Standard selector switch
17. Inch wire feed button
18. Gas Check button
19. Spool holder assembly
20. Geared Wire feed assembly



# Installation & Operation for ARC (Stick) Welding for Pro.Point 145 & 180



## 1) Connection of Output Cables

Two sockets are available on this welding machine. For ARC 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.

**DC-** Electrode connected to (-) output socket.

(2) Turn the power source on and select the **ARC** function with the MIG/TIG/ARC selector switch.

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

(2) Set MIG/TIG/ARC selector switch to MMA



(3) Set the welding current using the amperage control dial. and adjust arcforce if required



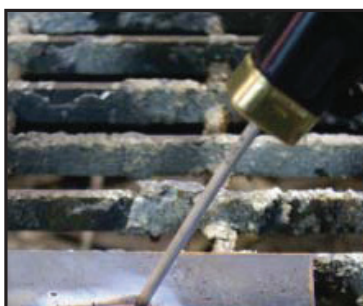
(4) Place the electrode into the electrode holder and clamp tight.



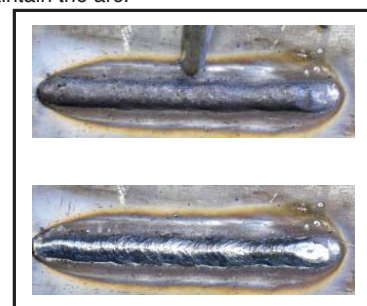
(5) Strike the electrode against the workpiece to create an arc and hold the electrode steady to maintain the arc.



(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.

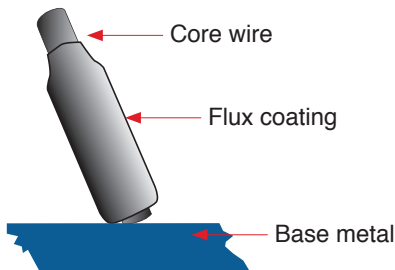
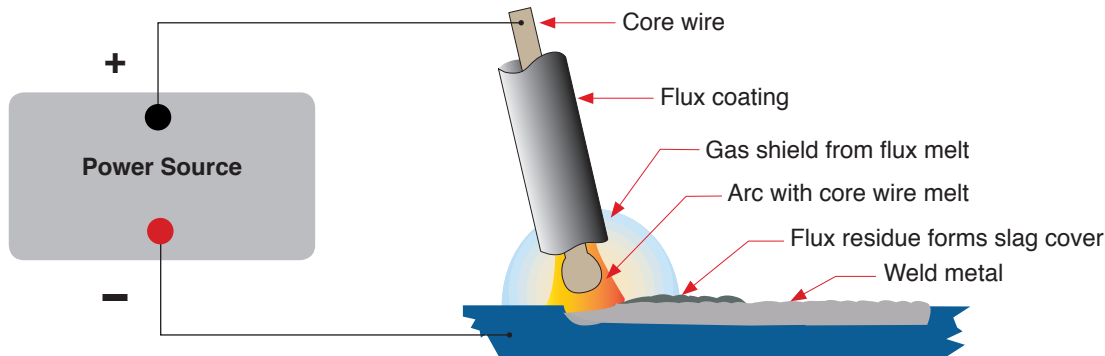


(8) Wait for the weld to cool and carefully chip away the slag to reveal the weld metal below.

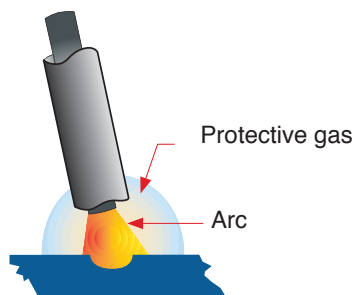
# ARC (Stick) Welding Information

## 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



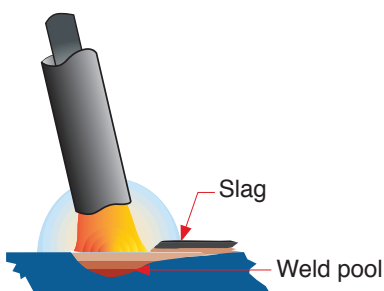
Manual metal arc (stick) electrodes have a solid metal wire core and a flux coating. These electrodes are identified by the wire diameter and by a series of letters and numbers. The letters and numbers identify the metal alloy and the intended use of the electrode.

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.





# ARC 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 recommended 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 may be used for various thicknesses of section based on using a general purpose type 6013 electrode.

## Welding Current (Amperage)

| Electrode Size<br>ø mm | Current Range<br>(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 in 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

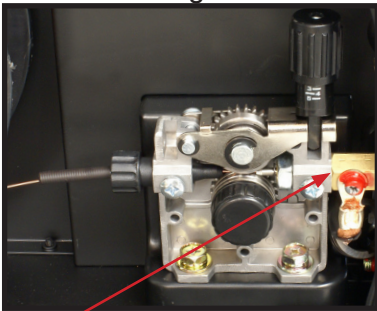
The material to be welded should be clean and free of any moisture, paint, oil, grease, mill scale, rust or any other material that will hinder the arc and contaminate the weld material. Joint preparation will depend on the method used include sawing, punching, shearing, machining, flame cutting and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



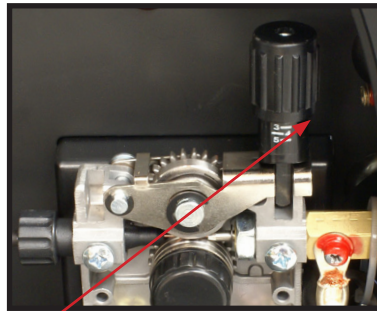


# Installation & Operation for MIG with Gas for Pro.Point 145 & 180

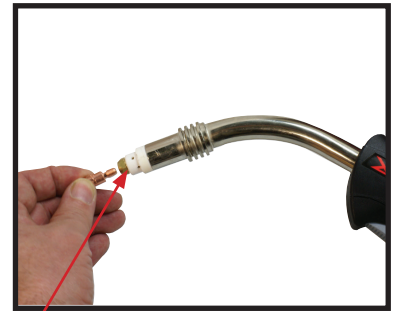
- (7) Place wire onto spool holder - (spool retaining nut is left hand thread )  
Feed the wire through the inlet guide tube on to the drive roller.
  - (8) Feed wire over the drive roller into the outlet guide tube, Push the wire through approx 3-4in
  - (9) Align the wire into the groove of the drive 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 11-21cfh.
  - (16) Set the welding parameters using the wire feed and voltage control knobs.
  - (17) Or use Smartset, Smartset is a predefined setting based on Gas and wire used.
- The machine will preselect Voltage and wire speed allowing the user to quickly find the best welding parameters for a given metal.



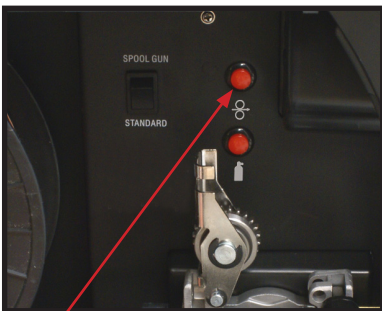
(9) Close down the top roller bracket and clip the pressure arm into place.



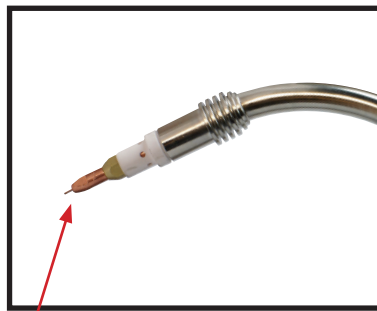
(10) Apply a medium amount of pressure to the drive roller



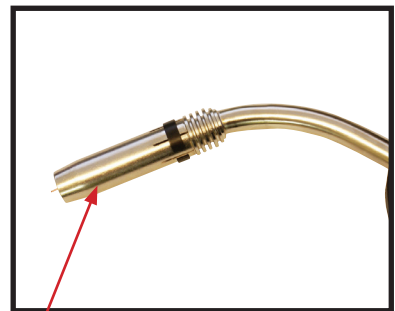
(11) Remove the gas nozzle and contact tip from the front end of the mig torch.



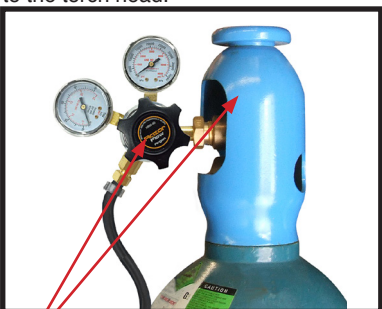
(12) Press and hold the inch wire button to feed the wire down the torch cable through to the torch head.



(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 21cfh



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



(17) Smartset is a predefined setting based on Gas and wire used. The machine will preselect Voltage and wire speed allowing the user to quickly find the best welding parameters for a given metal.

## Wire Feed Roller Selection for Pro.Point 145 & 180



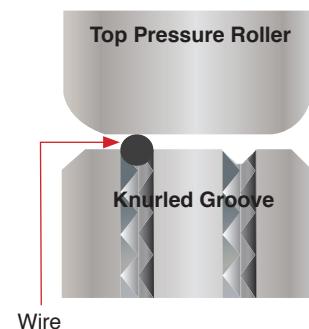
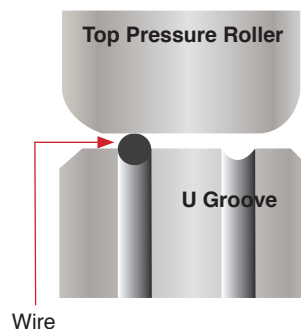
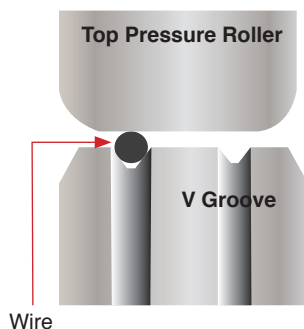
The importance of smooth consistent wire feeding during MIG welding cannot be emphasized enough. Simply put the smoother the wire feed then the better the welding will be.

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.

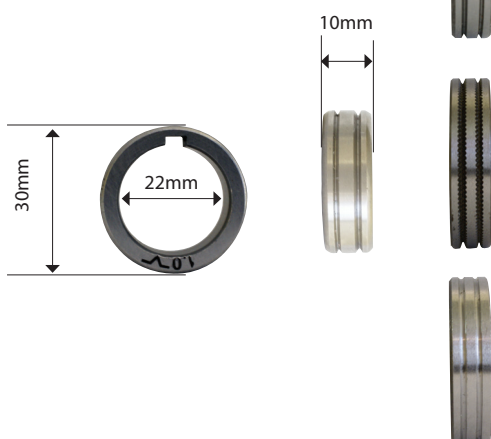
**Solid Hard Wire** - like Steel, Stainless Steel require a drive roller with a V shape groove for optimum grip and drive capability. Solid wires can have more tension applied to the wire from the top pressure roller that holds the wire in the groove and the V shape groove is more suited for this. Solid 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 off 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



#### V Groove Drive Roller - Steel Wire

Drive Roll V Groove 0.6-0.8mm  
Drive Roll V Groove 0.8-1.0mm  
Drive Roll V Groove 0.9-1.2mm  
Drive Roll V Groove 1.0-1.2mm  
Drive Roll V Groove 1.2-1.6mm

#### Knurled Drive Roller - Flux Core Wire

Drive Roll Knurled 0.6-0.9mm  
Drive Roll Knurled 0.8-0.9mm  
Drive Roll Knurled 0.9-1.2mm  
Drive Roll Knurled 1.2-1.6mm

#### U Groove Drive Roller - Soft Wire

Drive Roll U Groove 1.0-1.2mm  
Drive Roll U Groove 0.9-1.0mm  
Drive Roll U Groove 0.9-1.2mm  
Drive Roll U Groove 1.0-1.2mm



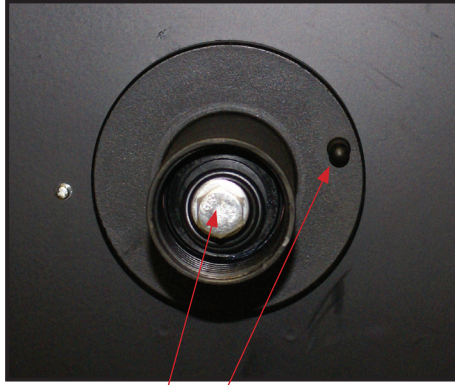
# Wire Installation and Set Up Guide for Pro.Point 145 & 180



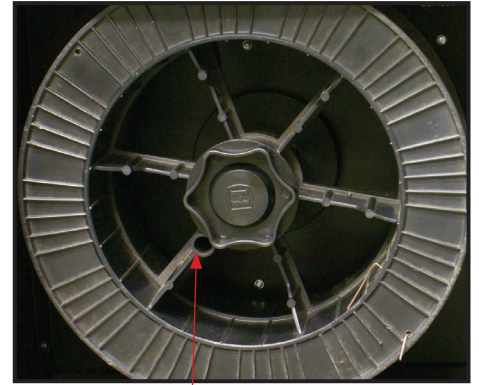
Again the importance of smooth consistent wire feeding during MIG welding cannot be emphasized enough. The correct installation of the wire spool and the wire into the wire feed unit is critical to achieving an even and consistent wire feed. A high percentage of faults with mig welders emanate from poor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



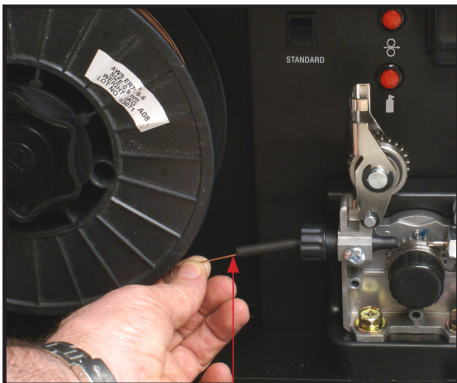
(1) Remove the spool retaining nut.



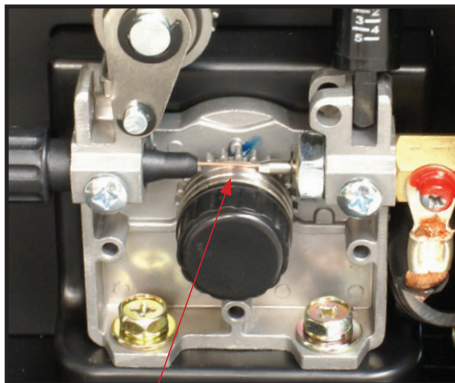
(2) Note the tension spring adjuster and spool locating pin.



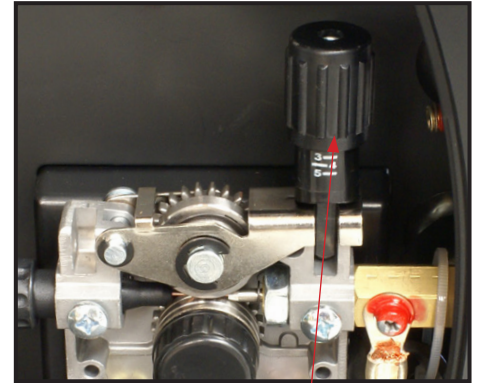
(3) Fit the wire spool onto the spool holder fitting the locating pin into the location hole on the spool. Replace the spool retaining nut tightly



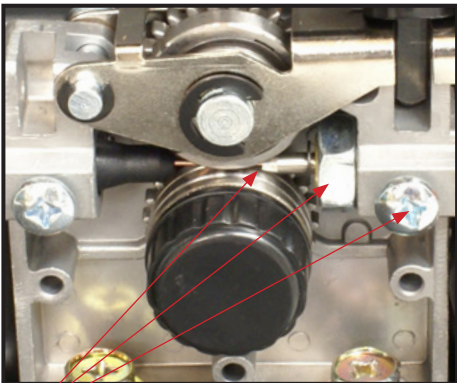
(4) Snip the wire carefully, be sure to hold the wire to prevent the spool uncoiling. Carefully feed the wire into the inlet guide tube of the wire feed unit.



(5) Feed the wire through the drive roller and into the outlet guide tube of the wire feeder.  
NOTE: MIG 180-145 not geared



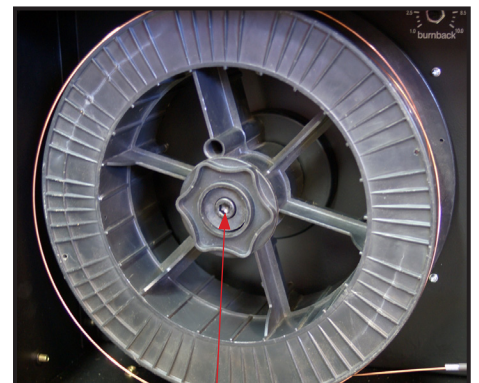
(6) Lock down the top pressure roller and apply a medium amount of pressure using the tension adjustment knob  
NOTE: MIG 180-145not geared



(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.  
NOTE: MIG 180-145 not geared



(8) A simple check for the correct drive tension is to bend the end of the wire over hold it about 4in 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 & Operation for Gasless MIG for Pro.Point 145 & 180



- (1) Connect Mig Torch  
**IMPORTANT:** When connecting the torch be sure to tighten the connection. Additionally Digital MIG torch must be connected prior to power being turned on otherwise remote control will not work
- (2) Connect the earth lead to **Positive** socket
- (3) Connect the weld power lead to **Negative** socket
- (4) Turn the power source on and select the **MIG** function with the MIG/TIG/MMA selector switch.
- (5) Set torch operation 2T / 4T.
  - When 2T operation is selected press trigger Arc starts, release trigger, Arc stops. burnback operation is automatic and preset.
  - When 4T operation is selected press and release trigger Arc starts, press and release trigger Arc stops. burnback operation is automatic and preset..
- (6) Fit the correct size **Knurled** drive roller for Gas Less Flux Core wire.



## WARNING:

Ensure that an approved welding helmet, protective clothing and gloves are use for all welding operations

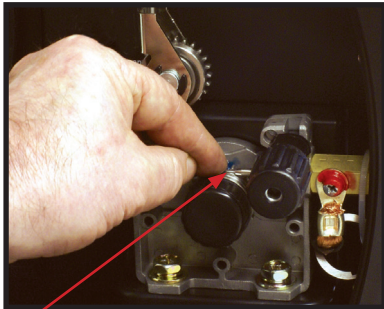
## WARNING:

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.

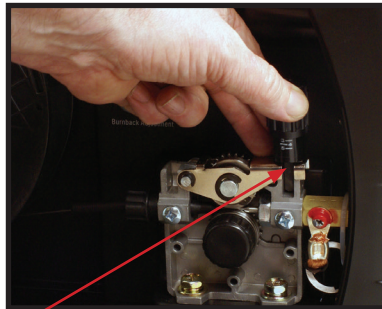
# Installation & Operation for Gassless MIG for Pro.Point 145 & 180



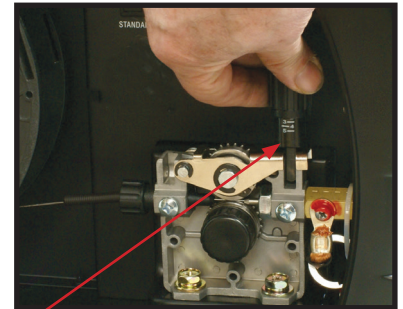
- (7) Place the Wire Spool onto the Spool Holder - Note: the spool retaining nut is Left Hand thread. Snip the wire from the spool being sure to hold the wire to prevent rapid uncoiling. Feed the wire into the wire feeder inlet guide tube through to the drive roller.
- (8) Carefully feed the wire over the drive roller into the outlet guide tube, feed through about 8-9in into the torch receptacle. .
- (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.
- (15) Set the welding parameters using the wire feed and voltage control knobs.



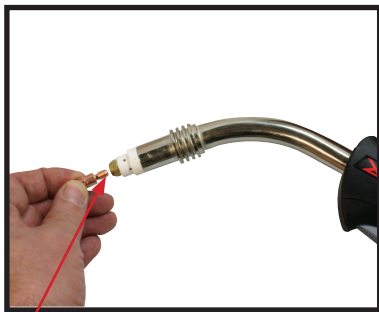
(8) Feed wire over the drive roller into the outlet guide tube, Push the wire through approx 8-9in. Use a Knurled Drive Roller of the correct size



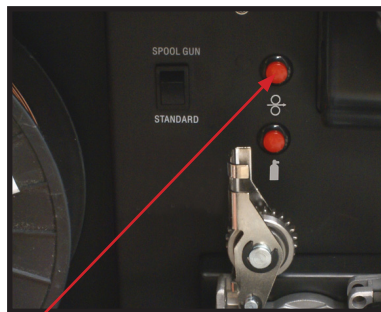
(9) Close down the top roller bracket and clip the pressure arm into place.



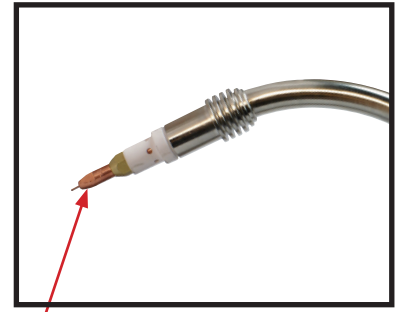
(10) Apply a medium amount of pressure to the drive roller



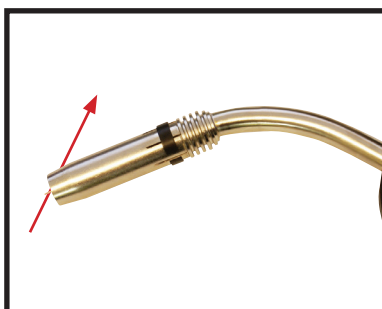
(11) Remove the gas nozzle and contact tip from the front end of the mig torch.



(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.

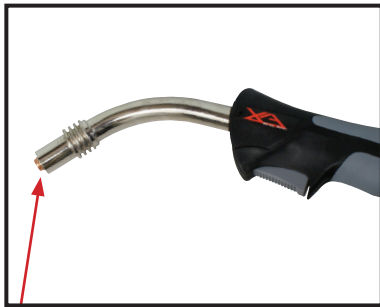


(15) Set welding parameters using the voltage and wire feed controls.

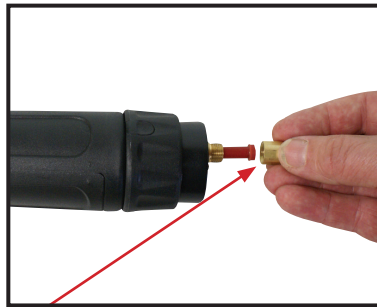
# MIG Torch Liner Installation for Pro.Point 145 & 180



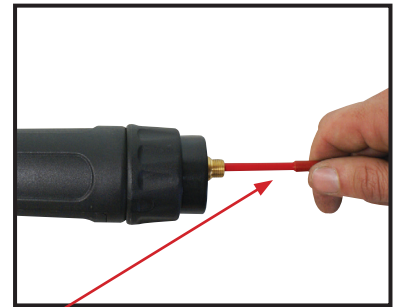
- (1) Lay the torch out straight on the ground and remove the front end parts
- (2) Remove the liner retaining nut.
- (3) Carefully pull the liner out of the torch cable assembly
- (4) Select the correct new liner and carefully unravel avoiding putting any kinks in the liner, if you kink the liner it 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 1/8in past the end of the torch neck
- (8) Place the tip holder over the end of the liner and screw into the torch neck trimming it up tight.
- (9) Screw down the liner nut the remaining 1/2 and trim it up tight. This method compresses the liner inside the torch cable assembly preventing it moving during use and ensures good wire feed.



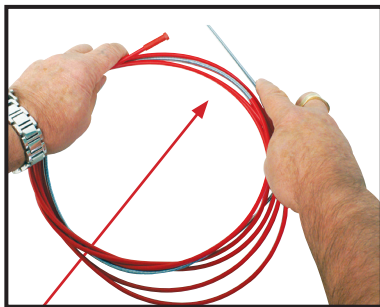
(1) Remove mig torch front end parts



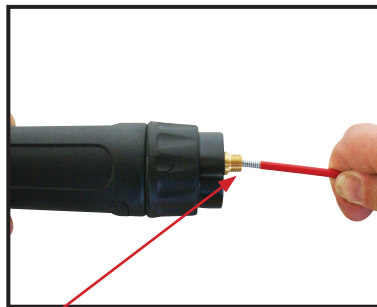
(2) Remove the liner retaining nut



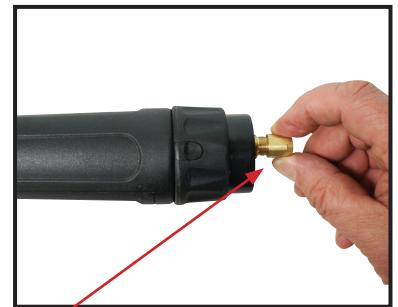
(3) Carefully pull out and completely remove the liner



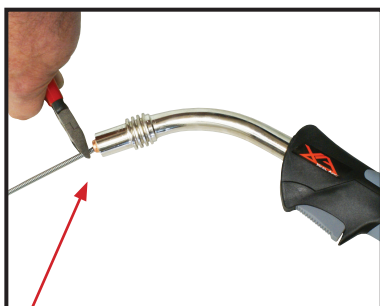
(4) Carefully unravel the new liner



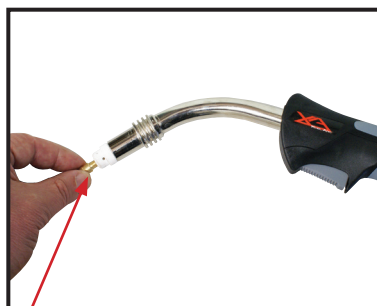
(5) Carefully feed in the new liner down the torch lead all the way to exit the torch neck.



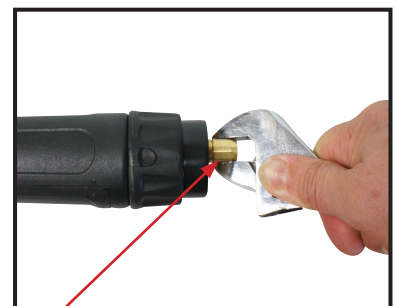
(6) Fit the liner retaining nut and screw only 1/2 way down



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



(8) Replace the front end parts



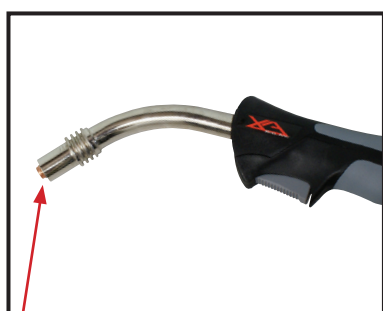
(9) Fully screw down the liner retaining nut and nip it up tight.



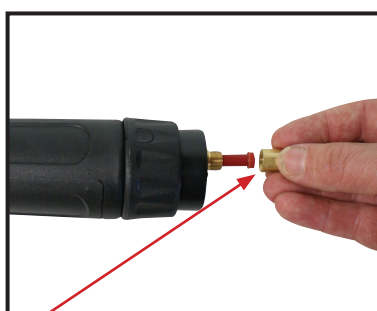
# Torch & Wire Feed Set Up for Aluminium Wire for Pro.Point 145 & 180



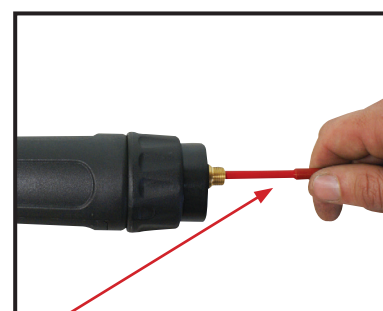
- (1) Lay the torch out straight on the ground and remove the front end parts
- (2) Remove the liner retaining nut.
- (3) Carefully pull the liner out of the torch cable assembly
- (4) Select a PA or liner, carefully and slowly feed the liner in short forward movements down the cable assembly all the 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 1/8in
- (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.



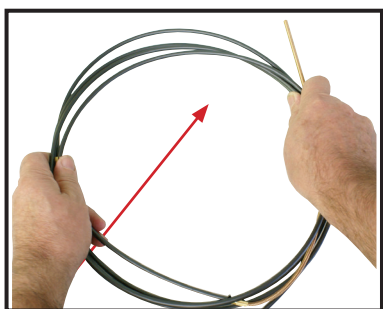
(1) Remove mig torch front end parts



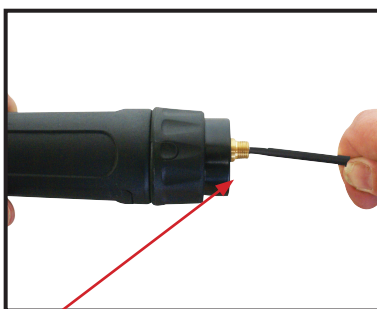
(2) Remove the liner retaining nut



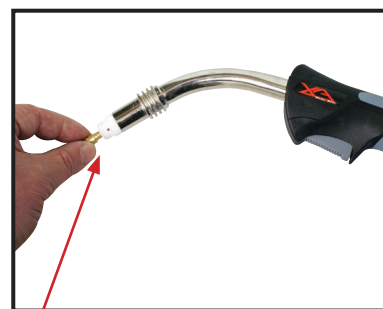
(3) Carefully pull out and completely remove the liner



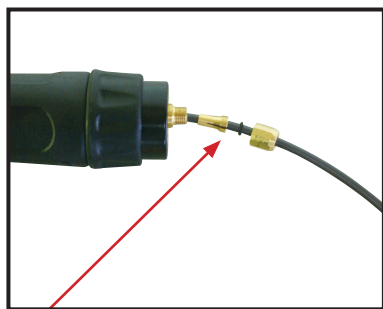
(4) Carefully unravel the new liner



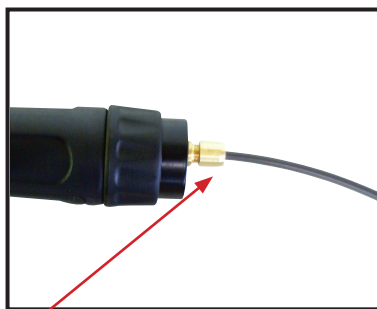
(5) Carefully feed in the new liner in short forward movements down the torch lead all the way to exit the torch neck. Be careful not to kink the liner



(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

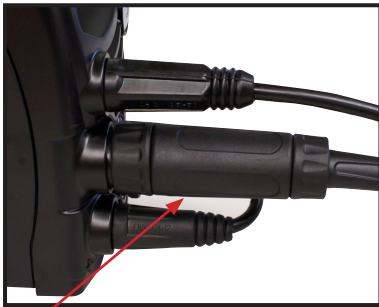


(9) Cut the liner flush with the end of liner retaining nut using a sharp box cutter knife.

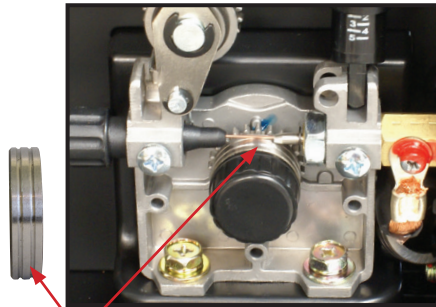
## Torch & Wire Feed Set Up for Aluminium Wire for Pro.Point 145 & 180



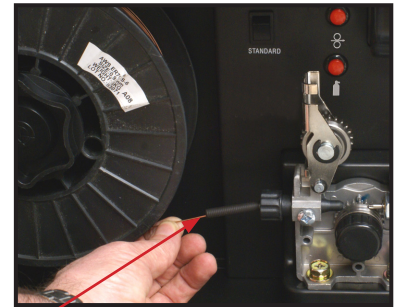
- (10) Loosen off the inlet guide tube retaining screw
- (11) Remove the inlet guide tube from the front end machine euro connector using long nose pliers.
- (12) Carefully feed the extended PA liner section into the inlet guide tube hole of the machine euro connector
- (13) Feed the extended PA liner 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 razor knife just in front of the drive roller
- (16) Fit an Aluminum 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



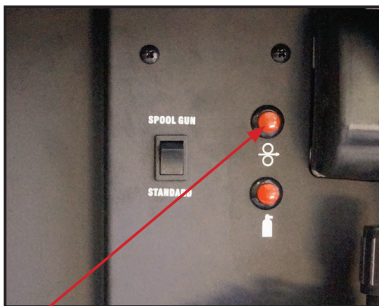
(10) Connect the torch to the machine tighten and secure the torch euro connector to the machine euro connection.



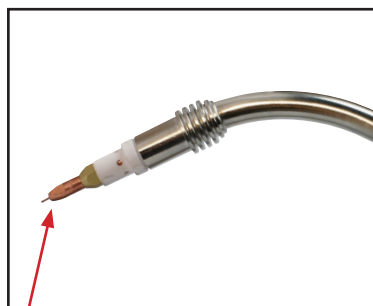
(11) Install a U groove drive roller of the correct size for the diameter wire being used.  
NOTE: MIG 180-145 not geared



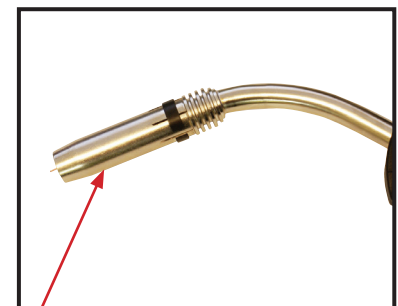
(7) Place aluminum wire onto spool holder. Feed the wire through the inlet guide tube on to the drive roller.  
NOTE: MIG 180-145 not geared



(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.

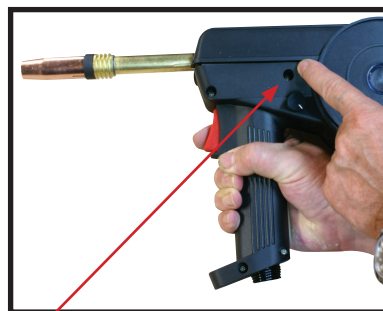
# Installation & Operation of the Spool Gun for Pro.Point 145 &180



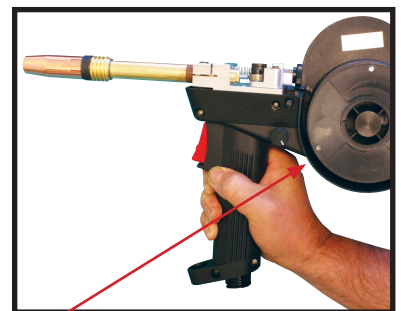
- (1) Select **Spool Gun** using the Standard/Spool Gun selector switch.
  - (2) Connect the Spool Gun to the Euro MIG torch connection socket on the front panel, and tighten it. Connect the Spool Gun control cable to the receptacle and tighten it.
- IMPORTANT :** When connecting the torch be sure to 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.
- (3) Insert the earth cable plug into the **Negative** socket on the front of the machine and tighten it.
  - (4) Connect weld power lead to **Positive** socket
  - (5) Connect **Gas Line** to **Gas Regulator** and connect the gas regulator to the **Gas Cylinder**.
  - (6) Turn the power source on and select the **MIG** function with the MIG/TIG/MMA selector switch.
  - (7) Take the Spool Gun and push the **Cover Release Button** to unlock the wire feed / spool cover.
  - (8) 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.



(1) Set Standard/Spoolgun selector switch inside door to Spoolgun



(7) Push the cover release button to unlock the wire feed /spool cover



(8) Place a spool of wire onto the Spool holder. Note: the spool retaining nut is Left Hand thread, turn it clockwise to undo it

## **WARNING:**

Ensure that an approved welding helmet, protective clothing and gloves are use for all welding operations

## **WARNING:**

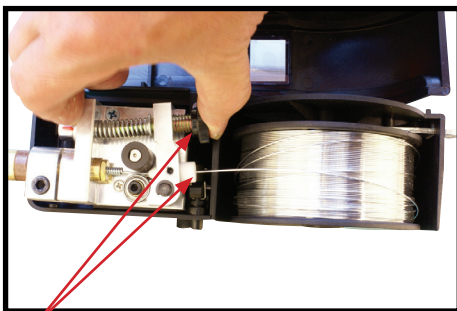
Disconnect the Electrode Holder cable from the machine before using MIG function. If cable is not disconnected welding voltage is present and can cause arcing or flash.



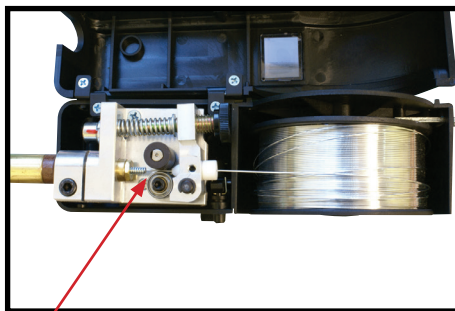
# Installation & Operation of the Spool Gun for Pro.Point 145 &180



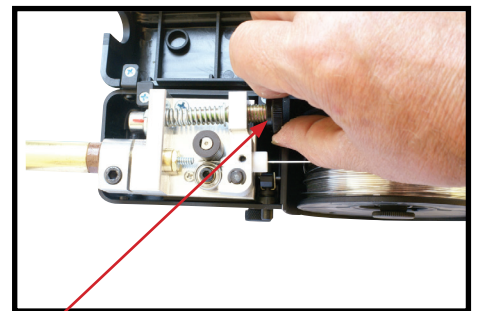
- (9) Carefully feed the wire over the drive roller into the outlet guide tube, feed through into the torch neck. Check that the drive roller being used complies with the wire diameter, replace the roller if necessary.
- (10) Align the wire into the groove of the drive roller and release the tension arm making sure the wire is in the groove of the drive roller.
- (11) Apply a adequate amount of pressure to the drive roller by winding in the tension adjusting knob,
- (12) Adjust spool hoder tension
- (13) 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
- (14) 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.
- (15) Fit the gas nozzle to the torch head and close the wire spool cover.
- (16) Carefully open the gas cylinder valve and set the flow rate to between 21-30cfh.
- (17) Set the welding parameters using the wire feed and voltage control knobs.



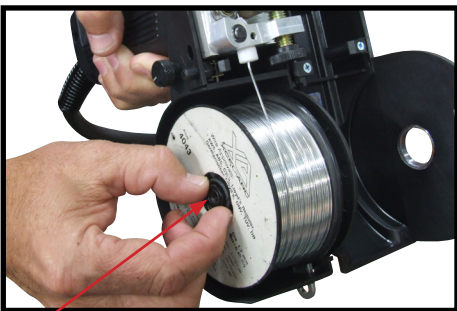
(9) Carefully feed the wire through the inlet guide tube onto the drive roller through into the outlet guide tube. Squeezing the tension arm adjustment knob to release the pressure of the tension arm will allow the wire to be guided through the drive roller easily



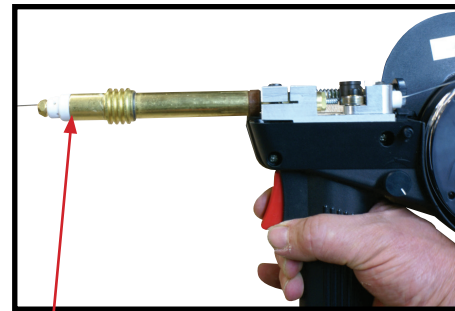
(10) Check to make sure that the wire passes cleanly through the drive roller into the outlet guide tube.



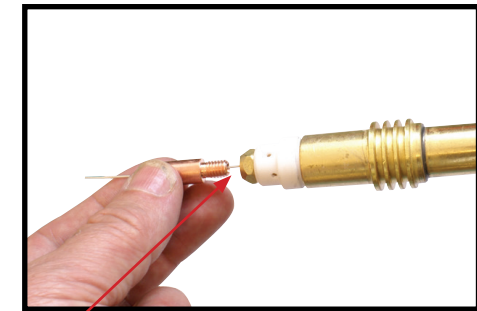
(11) Apply a medium amount of pressure using the tension arm adjustment knob.



(12) Adjust spool holder tension



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



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



(15) Fit the gas nozzle and close the wire feed spool cover



(16) Carefully open the valve of the gas cylinder, set the flow to 12-15 l/min

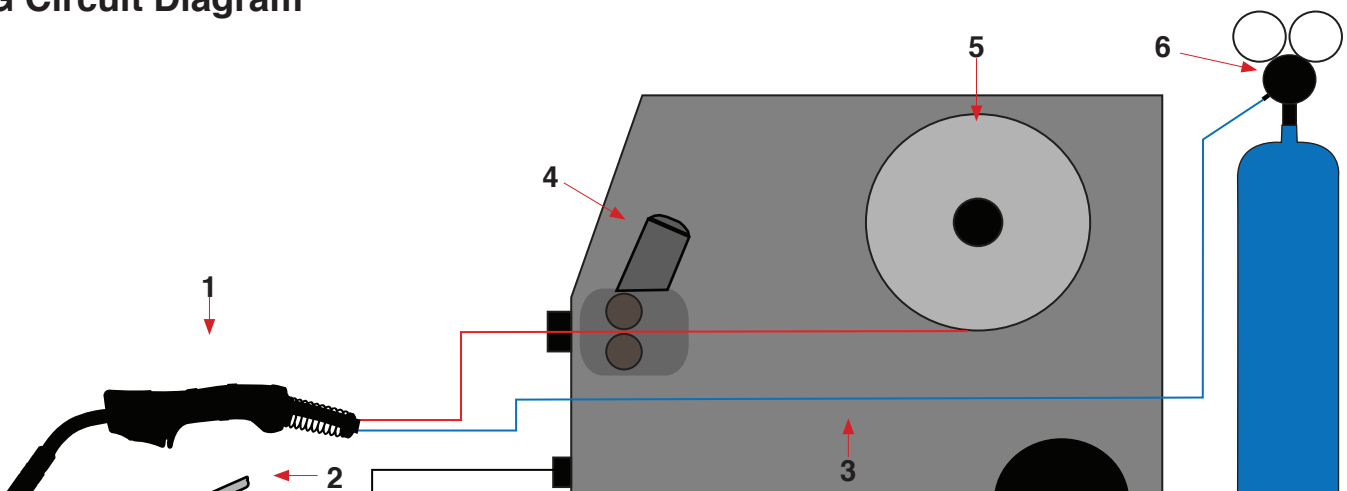


(17) Set welding parameters using the voltage and wire feed controls.

## BASIC MIG WELDING GUIDE - MIG (METAL INERT GAS) WELDING

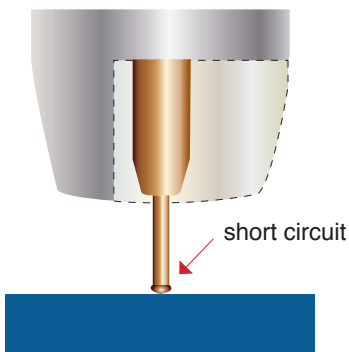
**Definition of MIG Welding** - MIG (metal inert gas) welding also known as GMAW (gas metal arc welding) or MAG (metal active gas welding), is a semi-automatic or automatic arc welding process in which a continuous and consumable wire electrode and a shielding gas are fed through a welding gun. A constant 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 equipment 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

### MIG Circuit Diagram

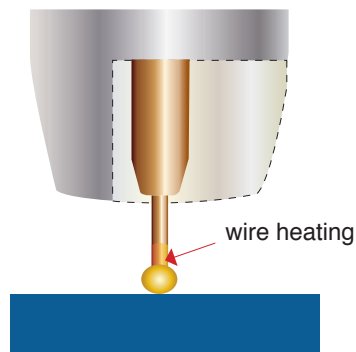


## BASIC MIG WELDING GUIDE - MIG (METAL INERT GAS) WELDING

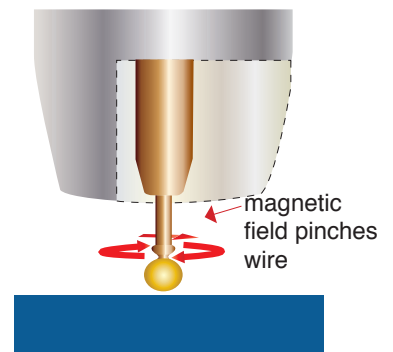
**Short Circuit Transfer** - Short circuit transfer is the most common used method whereby the wire electrode is fed continuously down the welding torch through to and exiting the contact tip. The wire touches the work piece and causes a short circuit the wire heats up and begins to form a molten bead, 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.



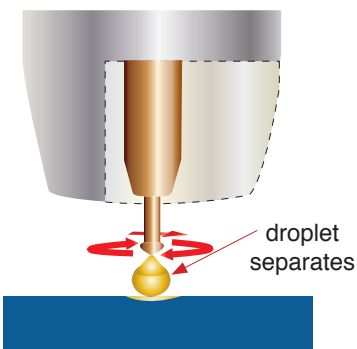
The wire approaches the work piece and touches the work creating a short circuit between the wire and the base metal, because there is no space between the wire and the base metal there is no arc and current flows through the wire.



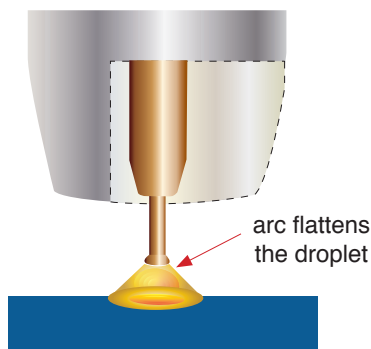
The wire cannot support all the current flow, resistance builds up and the wire becomes hot and weak and begins to melt



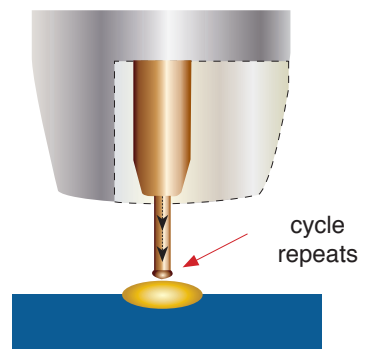
The current flow creates a magnetic field that begins to pinch the melting wire forming it into droplet



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 GUIDE

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

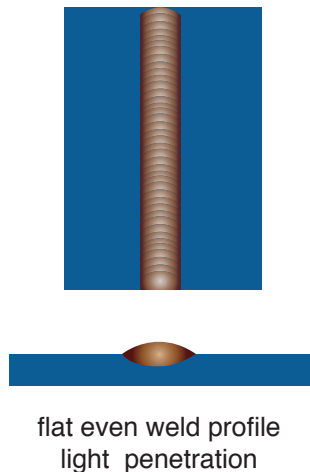
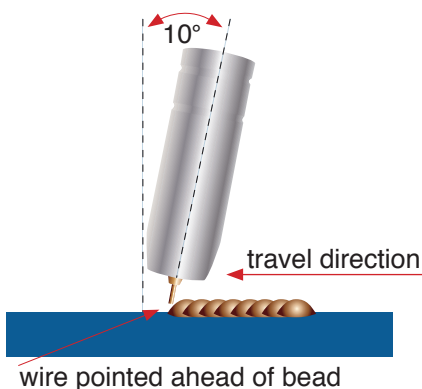
Gun position or technique usually refers to how the wire is directed at the base metal, the angle and travel direction chosen. Travel speed and work angle will determine the characteristic of the weld bead profile and degree of weld penetration.

**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.

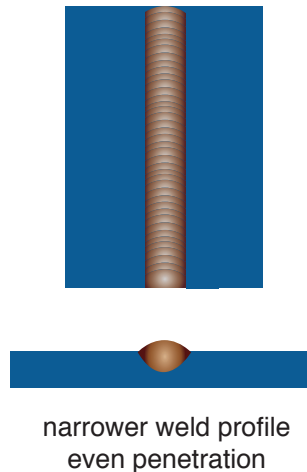
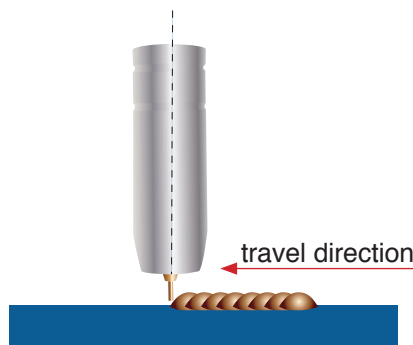
**Perpendicular Technique** - The wire is fed directly into the weld, this technique is used primarily for automated situations or when conditions make it necessary. The weld profile is generally higher and a deeper penetration is achieved.

**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.

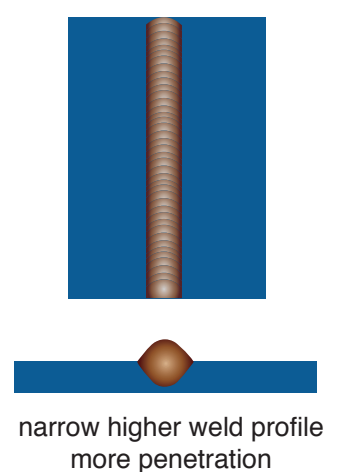
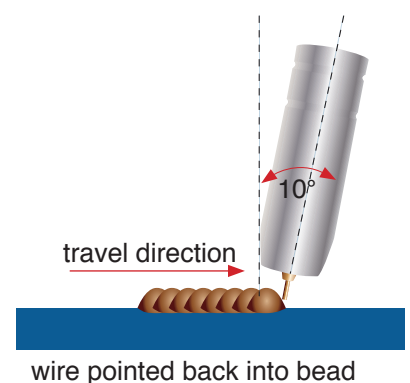
(A) Push Technique



(B) Gun Perpendicular

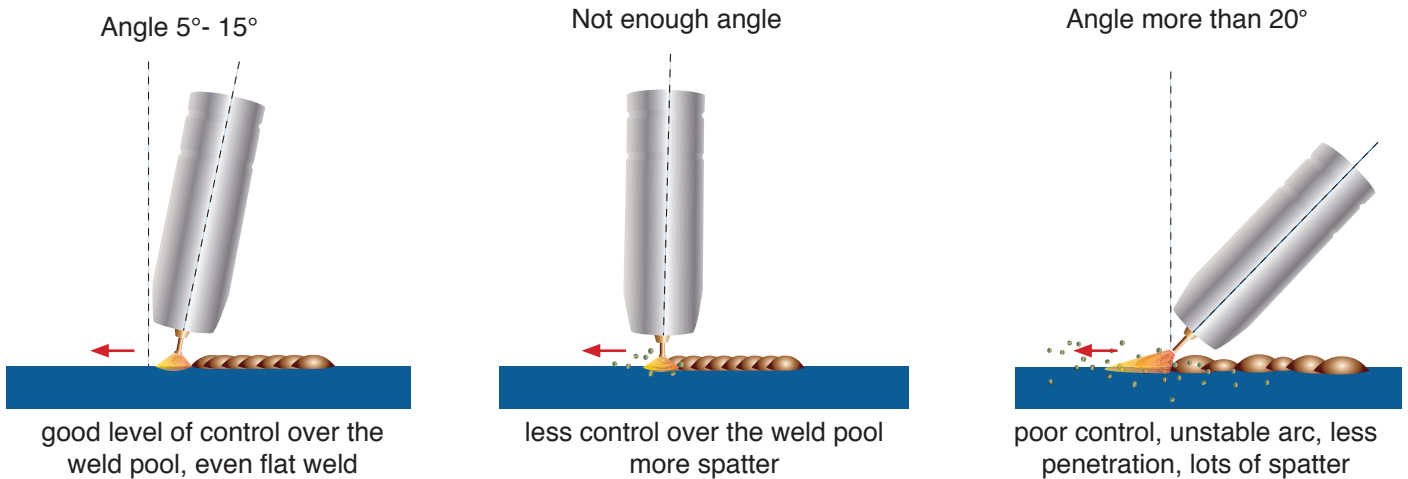


(C) Drag Technique

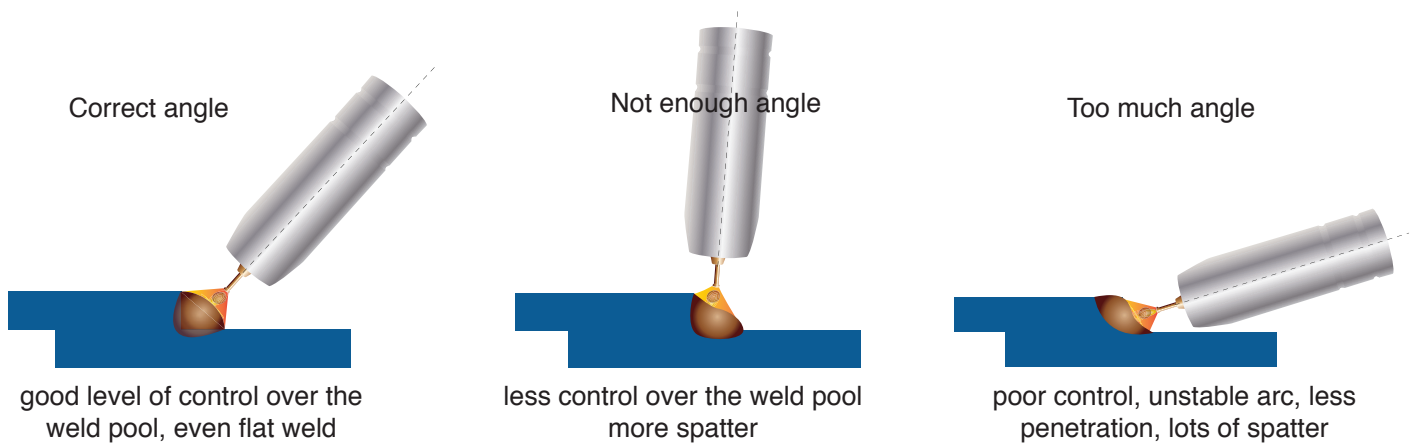


## BASIC MIG WELDING GUIDE

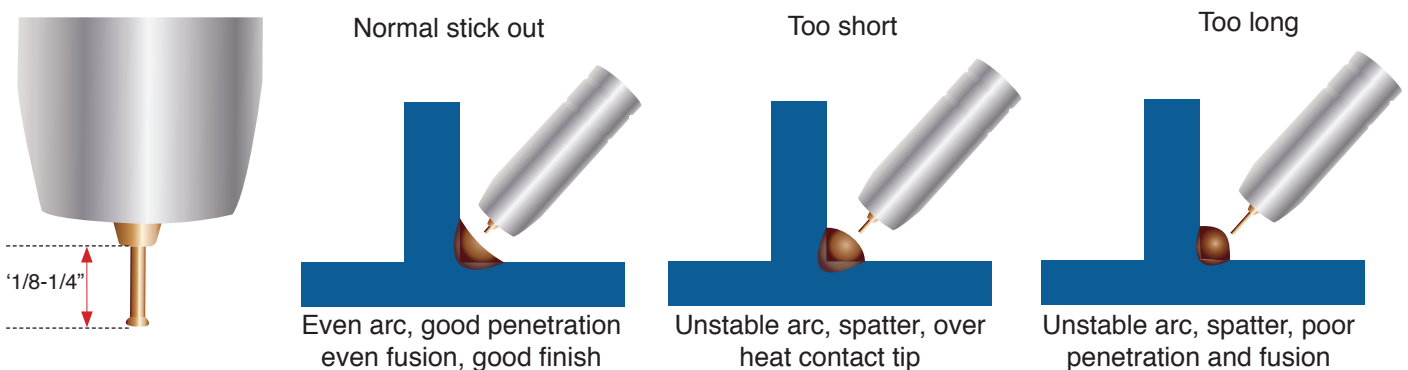
**Travel Angle** - Travel angle is the right to left angle relative to the direction of welding. A travel angle of 5°- 15° is ideal and produces a good level of control over the weld pool. A travel angle greater than 20° will give an unstable arc condition with poor weld metal transfer, less penetration,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



**Angle 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.

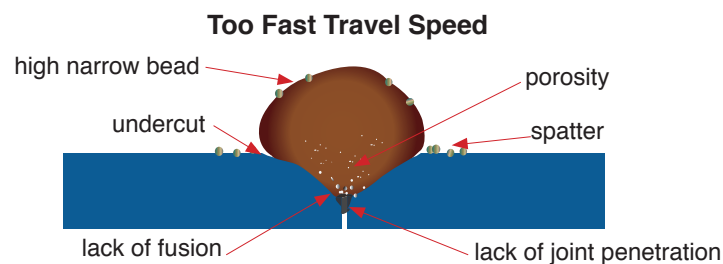


**Stick Out**- Stick out is the length of the unmelted wire protruding from the end of the contact tip. A constant even stick out of 1/8-1/4" will produce a stable arc, and an even current flow providing good penetration and even fusion. Too short stick out will cause an unstable weld pool, produce spatter and over heat the contact tip. Too long stick out will cause an unstable arc, lack of penetration, lack of fusion and increase spatter.

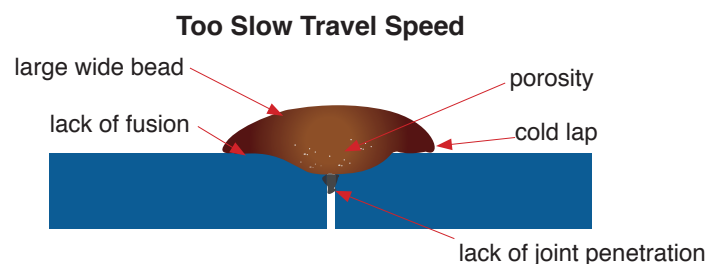


**Travel Speed** - Travel speed is the rate that the gun is moved along the weld joint and is usually measured in mm per minute. Travel speeds can vary depending on conditions and the welders skill and is limited to the welders ability to control the weld pool. Push technique allows faster travel speeds 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.

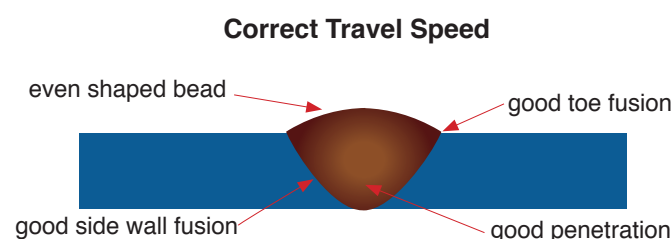
**Too Fast Travel Speed** - A too fast travel speed produces too little heat per inch of travel resulting in less penetration and reduced weld fusion, the weld bead solidifies very quickly trapping gases inside the weld metal causing porosity. Undercutting of the base metal can also occur and an unfilled 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 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 mm than is required resulting in a weld deposit of poor quality.



**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.





**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 your machine.

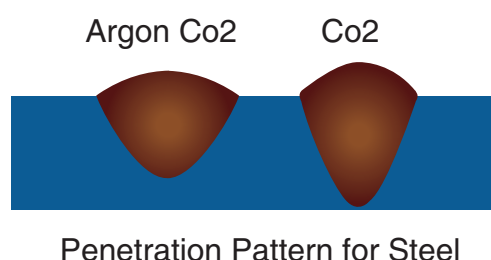
As a guide refer to the “Welding Wire Thickness Chart” below.

| 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" / 10.0mm                                                                                                                                                       |                            |        |        |        |                         |        |        |
| 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 75% Co2 25% is a good all round mix suitable for most applications.



# Installation and Set Up for DC TIG Welding for Pro.Point 145 & 180



TIG Torch Sold Separately

- (1) Connect TIG torch to Euro connection socket,  
**IMPORTANT** : When connecting the torch be sure to tighten the connection.
- (2) Connect earth lead to **Positive**
- (3) Connect weld power lead to **Negative**
- (4) Turn the power source on and select the **TIG** function with the MIG/TIG/MMA selector switch.
- (5) Set torch operation 2T / 4T.
  - When 2T operation is selected press trigger Gas starts, touch and lift arc start, release trigger Gas and Arc stops.
  - When 2T operation is selected with downslope time of either 1 to 10 seconds press trigger Gas starts, touch and lift arc star, release trigger, after 1 to 10 seconds depending on the downslope time selected Gas and Arc stops. Crater fill operation is automatic to factory preset level.
  - When 4T operation is selected press and release trigger Gas starts, touch and lift arc start, press and release trigger Gas and Arc stops.
  - When 4T operation is selected with downslope time of either 1 to 10 seconds press and release trigger Gas starts, touch and lift arc start Press and hold trigger, after 1 to 10 seconds depending on the downslope time selected Arc crater fill downslopes, crater fill operation is automatic to factory preset level., release trigger Gas and Arc stops
- NOTE: This feature is recommend for welding above 70Amps only.**
- (6) Connect the gas line to regulator and connect the regulator to the gas cylinder.



## **WARNING:**

Ensure that an approved welding helmet, protective clothing and gloves are use for all welding operations

## **WARNING:**

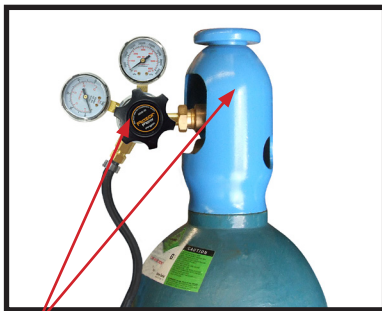
Disconnect the Electrode Holder cable from the machine before using MIG function. If cable is not disconnected welding voltage is present and can cause arcing or flash.

# LIFT ARC DC TIP Operation for Pro.Point for 145 & 180



Lift Arc ignition allows the arc to be started easily in DC TIG by simply touching the tungsten to the work piece and lifting it up to start the arc. This prevents the tungsten tip sticking to the work piece and breaking the tip from the tungsten electrode. There is a particular technique called “rocking the cup” used in the Lift Arc process that provides easy use of the Lift Arc function.

- (7) Carefully open the valve of the gas cylinder, set the flow to 21-30cfh
- (8) Set the welding current using the amperage control dial
- (9) Make sure the front end parts of the tig torch are correctly assembled, use the correct size and type of tungsten electrode for the job, the tungsten electrode requires a sharpened point for DC welding.
- (10) Lay the outside edge of the Gas Cup on the work piece with the Tungsten Electrode 1/16 inm from the work piece. Press the trigger button on TIG torch to start the gas flow.
- (11) With a small movement rotate the Gas Cup forward so that the Tungsten Electrode touches the work piece.
- (12) Now rotate the Gas Cup in the reverse direction to lift the Tungsten electrode from the work piece to create the arc.



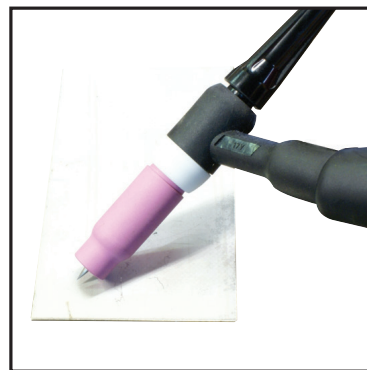
(7) Carefully open the valve of the gas cylinder, set the flow to 6-10 l/min



(8) Set the welding current using the amperage control dial



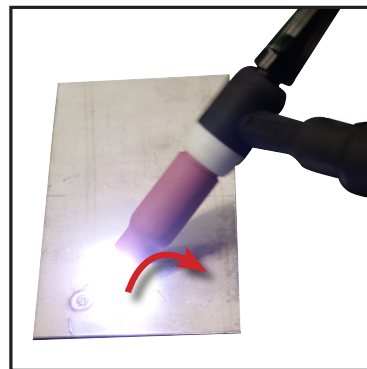
(9) Assemble front end parts of the TIG torch, fitting a sharpened tungsten suitable for DC welding.



(10) Lay the outside edge of the Gas Cup on the work piece with the Tungsten Electrode 1/16in from the work piece. Press the trigger button on TIG torch to start the gas flow.



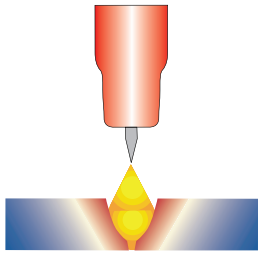
(11) With a small movement rotate the Gas Cup forward so that the Tungsten Electrode touches the work piece.



(12) Now rotate the Gas Cup in the reverse direction to lift the Tungsten electrode from the work piece to create the arc.

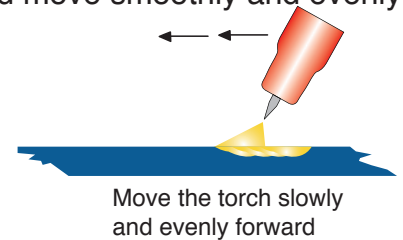
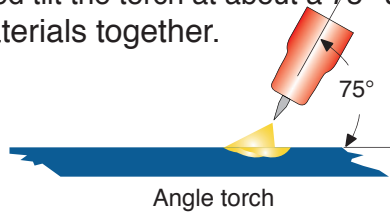
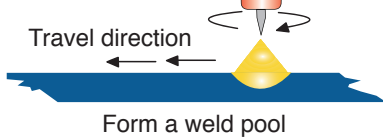


## TIG WELDING FUSION TECHNIQUES

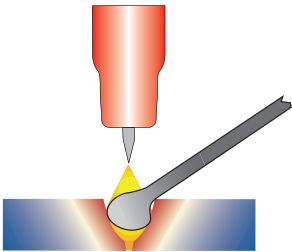


Manual TIG welding is often considered the most difficult of all the welding processes. Because the welder must maintain a short arc length, great care and skill are required to prevent contact between the electrode and the workpiece. Similar to Oxygen Acetylene torch welding, Tig welding normally requires two hands and in most instances requires the welder to manually feed a filler wire into the weld pool with one hand while manipulating the welding torch in the other. However, some welds combining thin materials can be accomplished without filler metal like edge, corner, and butt joints.

This is known as Fusion welding where the edges of the metal pieces are melted together using only the heat and arc force generated by the TIG arc. Once the arc is started the torch tungsten is held in place until a weld pool is created, a circular movement of the tungsten will assist in creating a weld pool of the desired size. Once the weld pool is established tilt the torch at about a  $75^\circ$  angle and move smoothly and evenly along the joint while fusing the materials together.

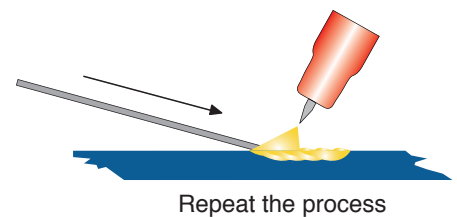
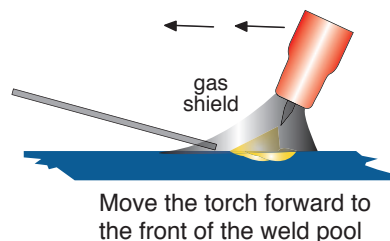
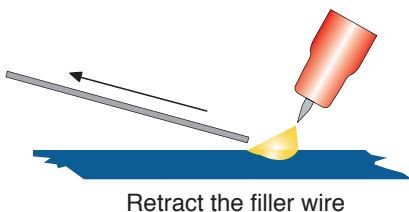
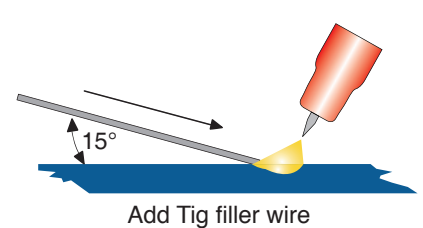
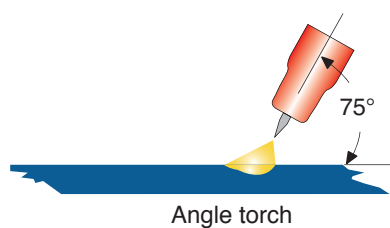
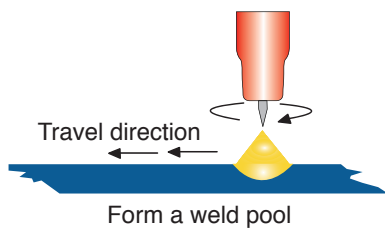


## TIG Welding with Filler Wire Technique



It is necessary in many situations with TIG welding to add a filler wire into the weld pool to build up weld reinforcement and create a strong weld. Once the arc is started the torch tungsten is held in place until a weld pool is created, a circular movement of the tungsten will assist in creating a weld pool of the desired size. Once the weld pool is established tilt the torch at about a  $75^\circ$  angle and move smoothly and evenly along the joint. The filler metal is introduced to the leading edge of the weld pool. The filler wire is usually held at about a  $15^\circ$  angle and fed into the leading edge of the molten pool, the arc will melt the filler wire into the weld pool as the torch is moved forward.

Also a dabbing technique can be used to control the amount of filler wire added, the wire is fed into the molten pool and retracted in a repeating sequence as the torch is moved slowly and evenly forward. It is important during the welding to keep the molten end of the filler wire inside the gas shield as this protects the end of the wire from being oxidized and contaminating the weld pool.



## Tungsten Electrodes

Tungsten is a rare metallic element used for manufacturing TIG welding electrodes. The TIG process relies on tungsten's hardness and high-temperature resistance to carry the welding current to the arc. Tungsten has the highest melting point of any metal, 3,410 degrees Celsius.

Tungsten electrodes are nonconsumable and come in a variety of sizes, they are made from pure tungsten or an alloy of tungsten and other rare earth elements. Choosing the correct tungsten depends on the material being welded, the amount of amps required and whether you are using AC or DC welding current.

Tungsten electrodes are colour-coded at the end for easy identification.

Below are the most commonly used tungsten electrodes found in the New Zealand and Australian market.

### Thoriated

Thoriated tungsten electrodes (AWS classification EWTh-2) contain a minimum of 97.30 percent tungsten and 1.70 to 2.20 percent thorium and are called 2 percent thoriated. They are the most commonly used electrodes today and are preferred for their longevity and ease of use. Thorium increases the electron emission qualities of the electrode, which improves arc starts and allows for a higher current-carrying capacity. This electrode operates far below its melting temperature, which results in a considerably lower rate of consumption and eliminates arc wandering for greater stability. Compared with other electrodes, thoriated electrodes deposit less tungsten into the weld puddle, so they cause less weld contamination.

Thorium however is a low-level radioactive hazard and many users have switched to other alternatives. Regarding the radioactivity, thorium is an alpha emitter but when it is enclosed in a tungsten matrix the risks are negligible. Thus holding a stick of Thoriated tungsten in your hand should not pose a great threat unless a welder has open cuts on their skin. Thoriated tungsten should not get in contact with open cuts or wounds. The more significant danger to welders can occur when thorium oxide gets into the lungs. This can happen from the exposure to vapours during welding or from ingestion of material/dust in the grinding of the tungsten. Follow the manufacturer's warnings, instructions, and the Material Safety Data Sheet (MSDS) for its use.

### Ceriated (Color Code: Orange)

Ceriated tungsten electrodes (AWS classification EWCe-2) contain a minimum of 97.30 percent tungsten and 1.80 to 2.20 percent cerium and are referred to as 2 percent ceriated. Ceriated tungstens perform best in DC welding at low current settings. They have excellent arc starts at low amperages and become popular in such applications as orbital tube welding, thin sheet metal work. They are best used to weld carbon steel, stainless steel, nickel alloys, and titanium, and in some cases it can replace 2 percent thoriated electrodes. Ceriated tungsten is best suited for lower amperages it should last longer than Thoriated tungsten higher amperage applications are best left to Thoriated or Lanthanated tungsten.

### Lanthanated (Color Code: Gold)

Lanthanated tungsten electrodes (AWS classification EWL-1.5) contain a minimum of 97.80 percent tungsten and 1.30 percent to 1.70 percent lanthanum, and are known as 1.5 percent lanthanated. These electrodes have excellent arc starting, a low burn off rate, good arc stability, and excellent re-ignition characteristics. Lanthanated tungstens also share the conductivity characteristics of 2 percent thoriated tungsten. Lanthanated tungsten electrodes are ideal if you want to optimise your welding capabilities. They work well on AC or DC electrode negative with a pointed end, or they can be balled for use with AC sine wave power sources. Lanthanated tungsten maintains a sharpened point well, which is an advantage for welding steel and stainless steel on DC or AC from square wave power sources.

### Zirconiated (Color Code: White)

Zirconiated tungsten electrodes (AWS classification EWZr-1) contain a minimum of 99.10 percent tungsten and 0.15 to 0.40 percent zirconium. Most commonly used for AC welding Zirconiated tungsten produces a very stable arc and is resistant to tungsten spitting. It is ideal for AC welding because it retains a balled tip and has a high resistance to contamination. Its current-carrying capacity is equal to or greater than that of thoriated tungsten. Zirconiated tungsten is not recommended for DC welding.

## Tungsten Electrodes Rating for Welding Currents

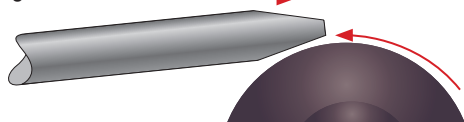
| Tungsten Diameter mm  | DC Current Amps<br>Torch Negative<br>2% Thoriated | AC Current Amps<br>Un-Balanced Wave<br>0.8% Zirconiated | AC Current Amps<br>Balanced Wave<br>0.8% Zirconiated |
|-----------------------|---------------------------------------------------|---------------------------------------------------------|------------------------------------------------------|
| 3/64" (0.040")        | 15 - 80                                           | 15 - 80                                                 | 20 - 60                                              |
| 1/16" (.062" & .060") | 70 - 150                                          | 70 - 150                                                | 60 - 120                                             |
| 3/32" (.93")          | 150 - 250                                         | 140 - 235                                               | 100 - 180                                            |
| 1/8" (.125")          | 250 - 400                                         | 225 - 325                                               | 160 - 250                                            |
| 5/32" (.156")         | 400 - 500                                         | 300 - 400                                               | 200 - 320                                            |

## Tungsten Preparation

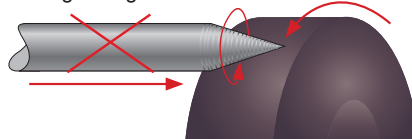
Always use **DIAMOND** wheels when grinding and cutting. While tungsten is a very hard material, the surface of a diamond wheel is harder, and this makes for smooth grinding. Grinding without diamond wheels, such as aluminium oxide wheels, can lead to jagged edges, imperfections, or poor surface finishes not visible to the eye that will contribute to weld inconsistency and weld defects.

Always ensure to grind the tungsten in a longitudinal direction on the grinding wheel. Tungsten electrodes are manufactured with the molecular structure of the grain running lengthwise and thus grinding crosswise is “grinding against the grain.” If electrodes are ground crosswise, the electrons have to jump across the grinding marks and the arc can start before the tip and wander. Grinding longitudinally with the grain, the electrons flow steadily and easily to the end of the tungsten tip. The arc starts straight and remains narrow, concentrated, and stable.

grind longitudinal on the grinding wheel



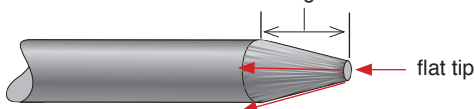
don't grind across the grinding wheel



### Electrode Tip/Flat

The shape of the tungsten electrode tip is an important process variable in precision arc welding. A good selection of tip/flat size will balance the need for several advantages. The bigger the flat, the more likely arc wander will occur and the more difficult it will be to arc start. However, increasing the flat to the maximum level that still allows arc start and eliminates arc wander will improve the weld penetration and increase the electrode life. Some welders still grind electrodes to a sharp point, which makes arc starting easier. However, they risk decreased welding performance from melting at the tip and the possibility of the point falling off into the weld pool.

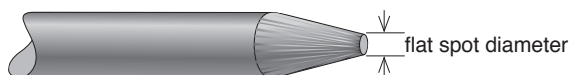
2.5 times tungsten diameter



### Electrode Included Angle/Taper - DC Welding

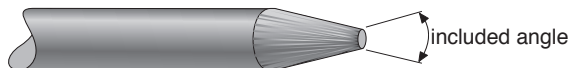
Tungsten electrodes for DC welding should be ground longitudinally and concentrically with diamond wheels to a specific included angle in conjunction with the tip/flat preparation. Different angles produce different arc shapes and offer different weld penetration capabilities. In general, blunter electrodes that have a larger included angle provide the following benefits:

- Last Longer
- Have better weld penetration
- Have a narrower arc shape
- Can handle more amperage without eroding.



Sharper electrodes with smaller included angle provide:

- Offer less arc weld
- Have a wider arc
- Have a more consistent arc

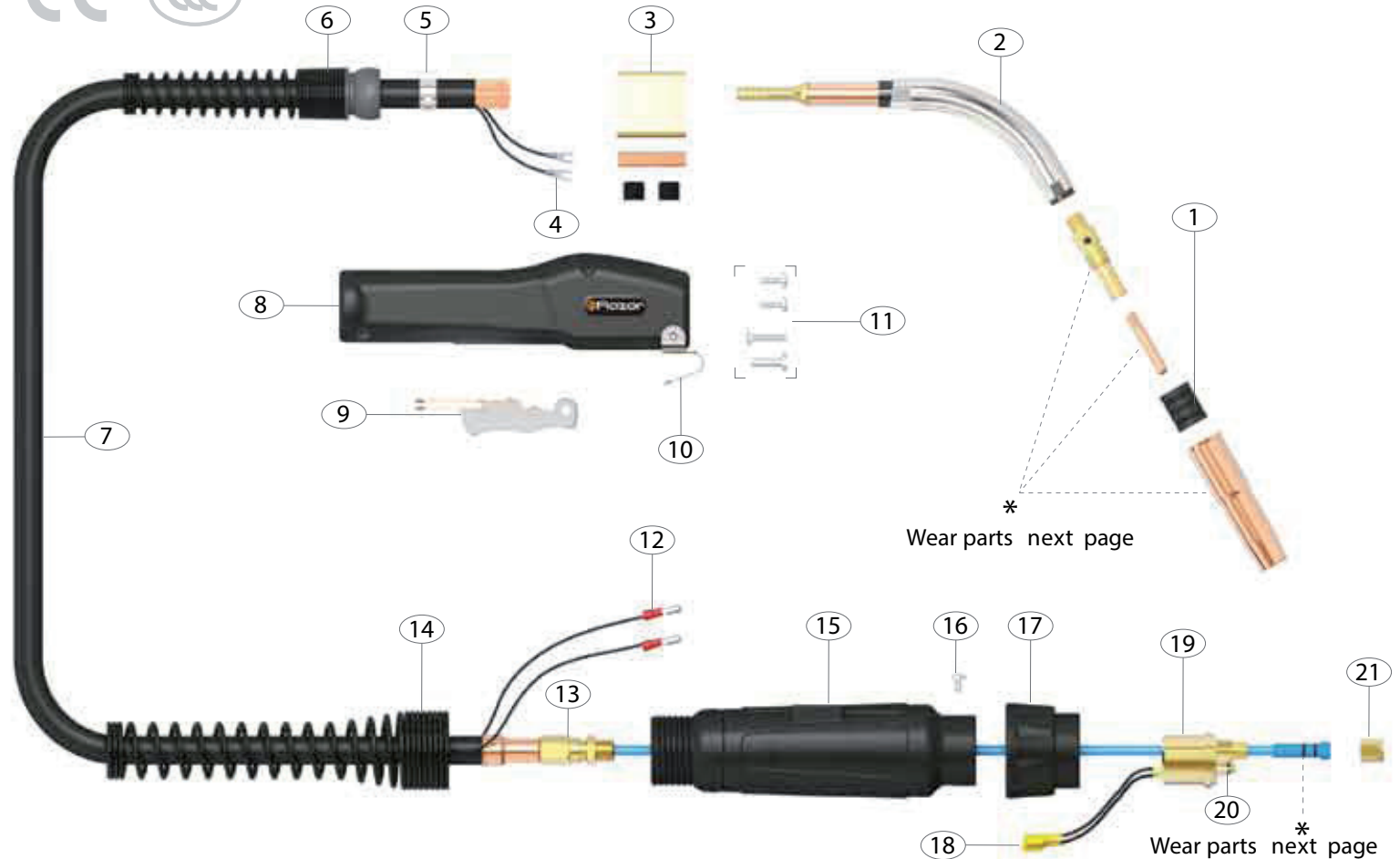


The included angle determines weld bead shape and size. Generally, as the included angle increases, penetration increases and bead width decreases.

| Tungsten Diameter     | Diameter at the Tip - mm | Constant Included Angle - Degrees | Current Range Amps | Current Range Pulsed Amps |
|-----------------------|--------------------------|-----------------------------------|--------------------|---------------------------|
| 3/64" (.040")         | .250                     | 20                                | 05 - 30            | 05 - 60                   |
| 1/16" (.062" & .060") | .500                     | 25                                | 08 - 50            | 05 - 100                  |
| 1/16" (.062" & .060") | .800                     | 30                                | 10 - 70            | 10 - 140                  |
| 3/32" (.93")          | .800                     | 35                                | 12 - 90            | 12 - 180                  |
| 3/32" (.93")          | 1.100                    | 45                                | 15 - 150           | 15 - 250                  |
| 1/8" (.125")          | 1.100                    | 60                                | 20 - 200           | 20 - 300                  |
| 1/8" (.125")          | 1.500                    | 90                                | 25 - 250           | 25 - 350                  |

# TWC2 STYLE MIG 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



- |   | Description                                                                                                                                                                   |
|---|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | Adjustable Nozzle Insulator                                                                                                                                                   |
| 2 | TW No.2 Metal Jacket Neck Assembly<br>45 Degree Neck Assembly<br>60 Degree Neck Assembly                                                                                      |
| 3 | Block C/W Spacer & Screws                                                                                                                                                     |
| 4 | Control Wire Terminals                                                                                                                                                        |
| 5 | Hose Clamp 18.5mm / (47/64)                                                                                                                                                   |
| 6 | Spring Cable Support Small & Ball Joint                                                                                                                                       |
| 7 | Hyperflex C/Assy X 10ft Euro<br>Hyperflex C/Assy X 12ft Euro<br>Hyperflex C/Assy X 15ft Euro<br>Hyperflex C/Assy X 10ft<br>Hyperflex C/Assy X 12ft<br>Hyperflex C/Assy X 15ft |
| 8 | Handle With Hook & Screw                                                                                                                                                      |

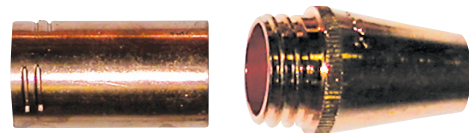
- |     | Description                    |
|-----|--------------------------------|
| 9   | Grey Trigger Switch            |
| 10  | Hanger Hook                    |
| 11  | Screw Kit                      |
| 112 | Cable Terminal Male            |
| 13  | Cable End Lock Nut (M12 X 1.0) |
| 14  | Cable Support                  |
| 15  | Gun Plug Housing C/W Nut       |
| 16  | Gun Plug Screw                 |
| 17  | Gun Plug Nut                   |
| 18  | Gun Plug Terminal Female       |
| 19  | TWC Euro Gun Plug Body         |
| 20  | Gun Plug 'O' Ring              |
| 21  | Liner Retaining Nut            |

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



# MIG Torch 8613002 Spare Part Front End Consumables

Sold Separately



## TWC2 Contact Tips

|                            |       |
|----------------------------|-------|
| Contact tip 0.8mm / 0.030" | QTY10 |
| Contact tip 0.9mm / 0.035" | QTY10 |
| Contact tip 1.0mm / 0.040" | QTY10 |
| Contact tip 1.2mm / 0.045" | QTY10 |

## TWC2 Contact Tips H/D

|                                    |       |
|------------------------------------|-------|
| Contact H/D tip 0.8mm / 0.030"     | QTY10 |
| Contact H/D tip 0.9mm / 0.035"     | QTY10 |
| Contact H/D tip 1.0mm / 0.040"     | QTY10 |
| Contact H/D tip 1.2mm / 0.045"     | QTY10 |
| Contact H/D tip 1.4mm / 0.052"     | QTY10 |
| Contact H/D tip 2.0mm / (5/64)     | QTY10 |
| Contact H/D Ali tip 1.2mm / 0.045" | QTY10 |
| Contact H/D Ali tip 1.6mm / (1/16) | QTY10 |

## TWC2 Gas Diffuser

|                                   |      |
|-----------------------------------|------|
| Gas Diffuser                      | QTY2 |
| Gas Diffuser to suit fixed nozzle | QTY2 |

## TWC2 Torch Nozzle

|                                  |      |
|----------------------------------|------|
| Nozzle Adjustable 13mm / (33/67) | QTY2 |
| Nozzle Adjustable 16mm / (5/8)   | QTY2 |

## TWC2 Torch Nozzle Fixed

|                             |      |
|-----------------------------|------|
| Nozzle Insulator            | QTY2 |
| Nozzle fixed 13mm / (33/67) | QTY2 |
| Nozzle fixed 16mm / (5/8)   | QTY2 |
| Nozzle fixed 13mm / (33/67) | QTY2 |
| Nozzle fixed 16mm / (5/8)   | QTY2 |

## Liners



## TWC2 Liners

|                                                |
|------------------------------------------------|
| Liner 15 ft 0.8 - 0.9mm / 0.030" - 0.035"      |
| Liner 15ft 1.0 - 1.2mm / 0.040" - 0.0457"      |
| 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.

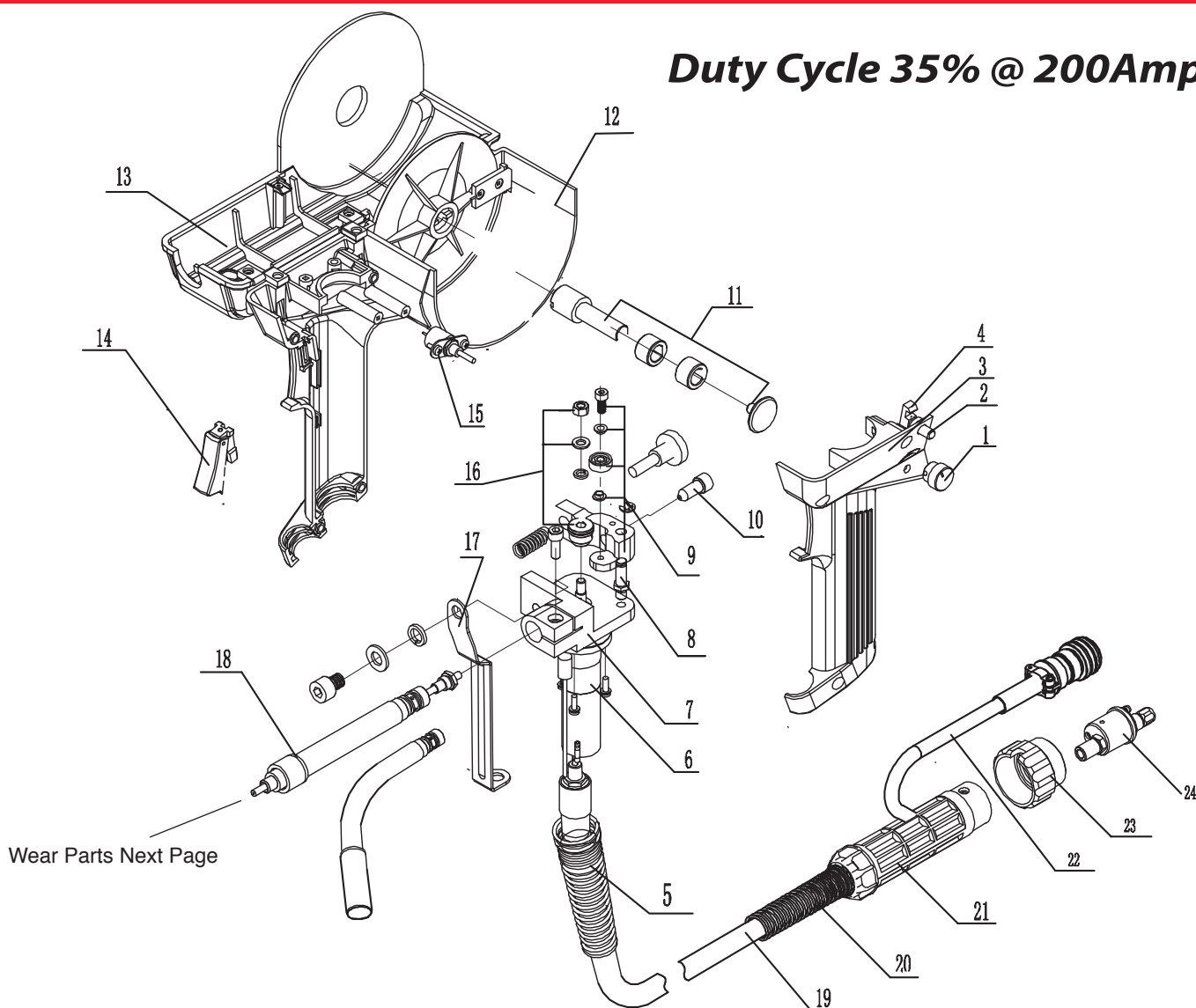
# 200 AMP Spool Gun Parts Breakdown

Part Number: 8612517

Sold Separately



**Duty Cycle 35% @ 200Amp**



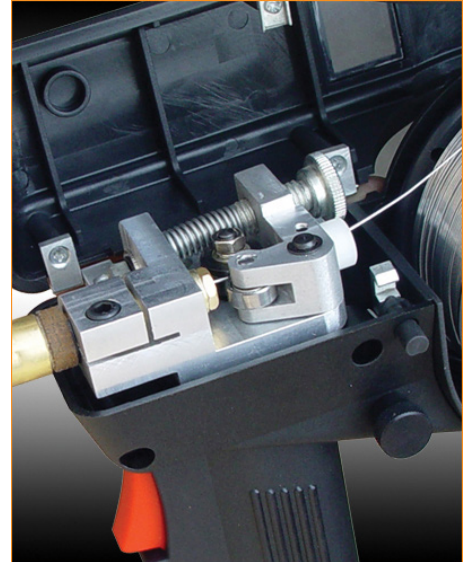
- |    | Description          |
|----|----------------------|
| 1  | Speed Adjusting Knob |
| 2  | Open/Close Button    |
| 3  | Left-Gun Case        |
| 4  | Hang Hook            |
| 5  | Spring Support       |
| 6  | Motor                |
| 7  | Motor Plate          |
| 8  | Suspension Screw     |
| 9  | Drive Roll Assembly  |
| 10 | Wire Nipple          |
| 11 | Spool Shaft          |
| 12 | Right-Gun Case       |
| 13 | Upper-Gun Case       |
| 14 | Switch               |

- |    | Description           |
|----|-----------------------|
| 15 | Potentiometer         |
| 16 | Push Roll             |
| 17 | Conducting Board      |
| 18 | Conducting Tube       |
| 19 | Welding Cable         |
| 20 | Spring Support (Back) |
| 21 | Adaptor Support       |
| 22 | Adaptor Support Nut   |
| 23 | Adaptor               |
| 24 | 4 Pin Plug            |

# 200 AMP Spool Gun Parts Breakdown

Part Number: 8612517

Sold Separately



## TWC2 Contact Tips

- Contact tip 0.8mm / 0.030"
- Contact tip 0.9mm / 0.035"
- Contact tip 1.0mm / 0.040"
- Contact tip 1.2mm / 0.045"



## TWC2 Contact Tips H/D

- Contact H/D tip 0.8mm / 0.030"
- Contact H/D tip 0.9mm / 0.035"
- Contact H/D tip 1.0mm / 0.040"
- Contact H/D tip 1.2mm / 0.045"
- Contact H/D tip 1.4mm / 0.052"
- Contact H/D tip 2.0mm / (5/64)
- Contact H/D Ali tip 1.2mm / 0.045"
- Contact H/D Ali tip 1.6mm / (1/16)



## TWC2 Gas Diffuser & Insulator

- Gas Diffuser
- Gas Diffuser suit fixed nozzle
- Insulator



## TWC2 TORCH Nozzle

- Nozzle Adjustable 13mm / (33/67)
- Nozzle Adjustable 16mm / (5/8)

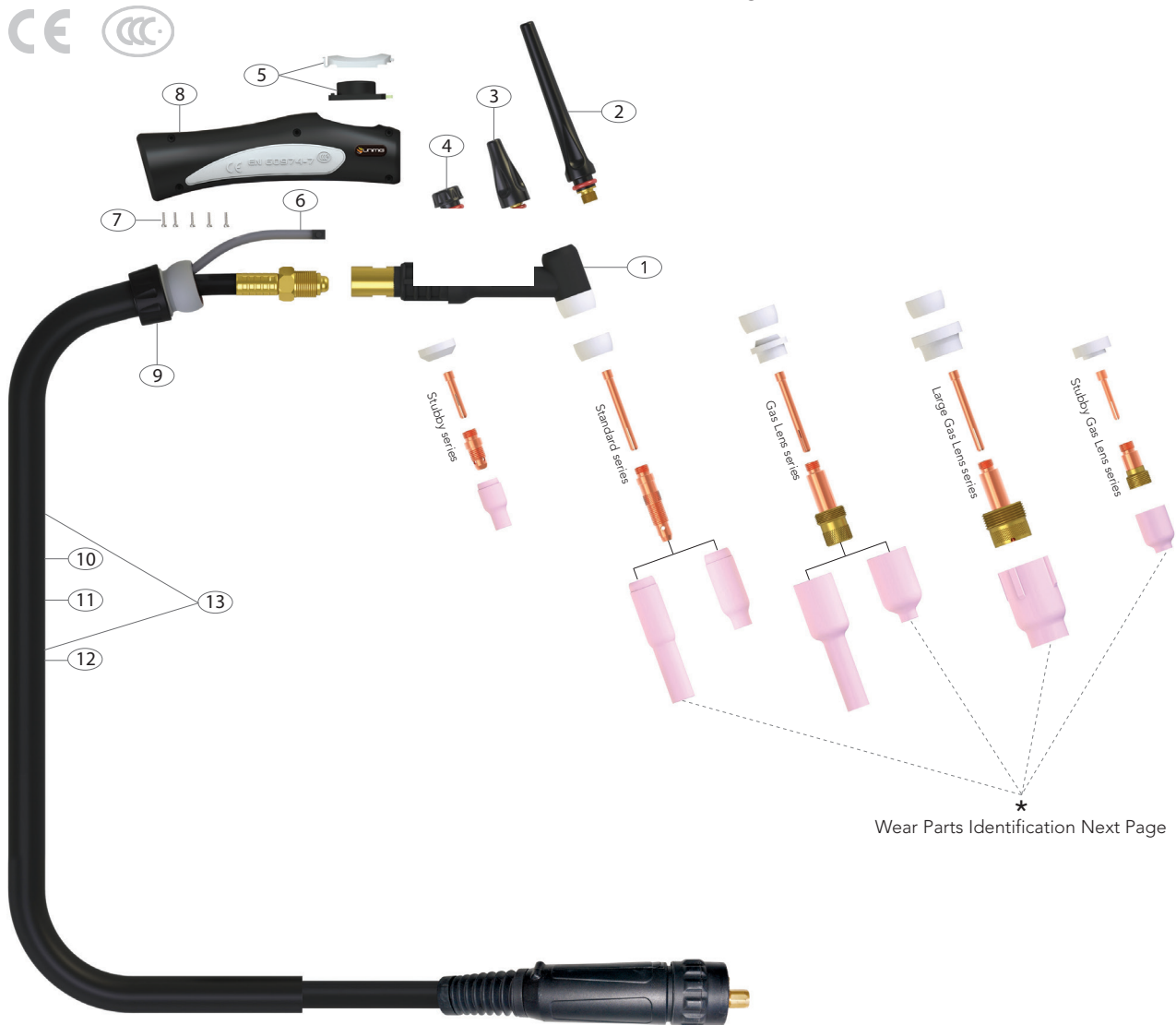
These parts are not original and are offered as replacement parts suitable for "TWECO" style torches.

# TIG Torch 8618456 Parts Breakdown



Sold Separately

180A AIR COOLED TIG WELDING TORCH  
Rating: 180Amp DC, 125Amp AC @35% duty cycle.



Wear Parts Identification Next Page

- |    | Description                              |
|----|------------------------------------------|
| 1  | Torch head<br>Torch head flexible        |
| 2  | Back cap long                            |
| 3  | Medium back cap                          |
| 4  | Short back cap                           |
| 5  | Momentary Kit                            |
| 6  | Trigger Lead 12.5ft<br>Trigger Lead 25ft |
| 7  | Screw Pack                               |
| 8  | Large Ergo Tig Handle                    |
| 9  | Large Knuckle Joint                      |
| 10 | Leather Cover X 0.8mt                    |
| 11 | Jointing Repair Kit                      |

- |    | Description                                                          |
|----|----------------------------------------------------------------------|
| 12 | Neoprene Cover X 3.2mt<br>Neoprene Cover X 7.2mt                     |
| 13 | Sheath X 12.5ft Inc Leather Cover<br>Sheath X 25ft Inc Leather Cover |



# TIG Torch 8618456 Spare Part



Sold Separately

## Description



## Description

Collet 1.0mm / 0.040"  
Collet 1.6mm / (1/16)  
Collet 2.4mm / (3/32)  
Collet 3.2mm / (1/8)

## Description

Collet Body 1.0mm / 0.040"  
Collet Body 1.6mm / (1/16)  
Collet Body 2.4mm / (3/32)  
Collet Body 3.2mm / (1/8)



## Description

Alumina Nozzle Ø 6mm / (15/64) #4  
Alumina Nozzle Ø 8mm / (5/16) #5  
Alumina Nozzle Ø 10mm / (25/64) #6  
Alumina Nozzle Ø 11mm / (7/16) #7  
Alumina Nozzle Ø 13mm / (33/64) #8  
Alumina Nozzle Ø 16mm / (5/8) #10  
Alumina Nozzle Ø 19mm / (3/4) #12

## Description

Long Alumina Nozzle Ø 8mm / (5/16) #5L  
Long Alumina Nozzle Ø 10mm / (25/64) #6L  
Long Alumina Nozzle Ø 11mm / (7/16) #7L



## Compact Gas Lens Front End Parts

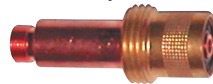
### Description

Gas Lens Gasket



### Description

Gas Lens Body 1.6mm / (1/16)  
Gas Lens Body 2.4mm / (3/32)  
Gas Lens Body 3.2mm / (1/8)



### Description

Gas lens ceramic 8.0mm / (5/16)  
Gas lens ceramic 7.0mm / (9/32)  
Gas lens ceramic 5.0mm / (13/64)



TR0004-16



**RED**  
ANSI/AWS A5.12-98  
ISO 6848 WT20

2% Thoriated: Best stability at medium currents, good arc starts, medium tendency to spit, medium erosion rate. Commonly used for steel and stainless steel applications

1/16 x 7" (1.6mm x 175mm)  
3/32 x 7" (2.4mm x 175mm)  
1/8 x 7" (3.2mm x 175mm)

### Description

1.0mm x 175mm / 0.040" x 6 57/64" thoriated tungsten electrode 2%  
1.6mm x 175mm / (1/16) x 6 57/64" thoriated tungsten electrode 2%  
2.4mm x 175mm / (3/32) x 6 57/64" thoriated tungsten electrode 2%  
3.2mm x 175mm / (1/8) x 6 57/64" thoriated tungsten electrode 2%

TR0006-16



**WHITE**  
ANSI/AWS A5.12 M-98  
ISO 6848 WZ8

.8% Zirconiated: Balls well, handles higher current with less spitting, better arc starts and arc stability than pure tungsten. Commonly used for aluminium applications

1/16 x 7" (1.6mm x 175mm)  
3/32 x 7" (2.4mm x 175mm)  
1/8 x 7" (3.2mm x 175mm)

### Description

1.0mm x 175mm / 0.040" x 6 57/64" zirconiated tungsten electrode 1%  
1.6mm x 175mm / (1/16) x 6 57/64" zirconiated tungsten electrode 1%  
02.4mm x 175mm / (3/32) x 6 57/64" zirconiated tungsten electrode 1%  
3.2mm x 175mm / (1/8) x 6 57/64" zirconiated tungsten electrode 1%

## Trouble Shooting

### ARC(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.

|                                                                                        |                                                                                                                                     |
|----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| <b>1: No arc</b>                                                                       |                                                                                                                                     |
| <i>Possible Reason</i>                                                                 | <i>Suggested Remedy</i>                                                                                                             |
| Incomplete welding circuit                                                             | Check earth lead is connected. Check all cable connections.                                                                         |
| Wrong mode selected                                                                    | Check the ARC selector switch is selected                                                                                           |
| No power supply                                                                        | Check that the machine is switched on and has a power supply                                                                        |
| <b>2: Porosity – small cavities or holes resulting from gas pockets in weld metal.</b> |                                                                                                                                     |
| <i>Possible Reason</i>                                                                 | <i>Suggested Remedy</i>                                                                                                             |
| 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                                                                                                             |
| <b>3: Excessive Spatter</b>                                                            |                                                                                                                                     |
| <i>Possible Reason</i>                                                                 | <i>Suggested Remedy</i>                                                                                                             |
| Amperage too high                                                                      | Decrease the amperage or choose a larger electrode                                                                                  |
| Arc length too long                                                                    | Shorten the arc length                                                                                                              |
| <b>3: Weld sits on top, lack of fusion</b>                                             |                                                                                                                                     |
| <i>Possible Reason</i>                                                                 | <i>Suggested Remedy</i>                                                                                                             |
| 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                                                      |
| <b>4: Lack of penetration</b>                                                          |                                                                                                                                     |
| <i>Possible Reason</i>                                                                 | <i>Suggested Remedy</i>                                                                                                             |
| 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 |
| <b>5: Excessive penetration - burn through</b>                                         |                                                                                                                                     |
| <i>Possible Reason</i>                                                                 | <i>Suggested Remedy</i>                                                                                                             |
| Excessive heat input                                                                   | Reduce the amperage or use a smaller electrode                                                                                      |
| Incorrect travel speed                                                                 | Try increasing the weld travel speed                                                                                                |
| <b>6: Uneven weld appearance</b>                                                       |                                                                                                                                     |
| <i>Possible Reason</i>                                                                 | <i>Suggested Remedy</i>                                                                                                             |
| Unsteady hand, wavering hand                                                           | Use two hands where possible to steady up, practice your technique                                                                  |
| <b>7: Distortion – movement of base metal during welding</b>                           |                                                                                                                                     |
| <i>Possible Reason</i>                                                                 | <i>Suggested Remedy</i>                                                                                                             |
| 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 |
| <b>7: Electrode welds with different or unusual arc characteristic</b>                 |                                                                                                                                     |
| <i>Possible Reason</i>                                                                 | <i>Suggested Remedy</i>                                                                                                             |
| Incorrect polarity                                                                     | Change the polarity, check the electrode manufacturer for correct polarity                                                          |

## Trouble Shooting

### MIG WELDING TROUBLE SHOOTING

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

| <b>1: Excessive Spatter</b>                                                                                    |                                                                                                                                                                                                                                                                             |
|----------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Possible Reason</i>                                                                                         | <i>Suggested Remedy</i>                                                                                                                                                                                                                                                     |
| 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 21-30cfh flow rate. Check hoses and fittings for holes, leaks etc<br>Protect the welding zone from wind and drafts                                                |
| <b>2: Porosity - small cavities or holes resulting from gas pockets in weld metal.</b>                         |                                                                                                                                                                                                                                                                             |
| <i>Possible Reason</i>                                                                                         | <i>Suggested Remedy</i>                                                                                                                                                                                                                                                     |
| 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 21-30cfh flow rate. Check hoses and fittings for holes, leaks etc.<br>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 missing or damaged                                                               | check and replace the o-ring                                                                                                                                                                                                                                                |
| <b>4: Wire stubbing during welding</b>                                                                         |                                                                                                                                                                                                                                                                             |
| <i>Possible Reason</i>                                                                                         | <i>Suggested Remedy</i>                                                                                                                                                                                                                                                     |
| Holding the torch too far away                                                                                 | Bring the torch closer to the work and maintain stick out of 5-10mm                                                                                                                                                                                                         |
| Welding voltage set too low                                                                                    | Increase the voltage                                                                                                                                                                                                                                                        |
| Wire Speed set too high                                                                                        | Decrease the wire feed speed                                                                                                                                                                                                                                                |
| <b>5: Lack of Fusion – failure of weld metal to fuse completely with base metal or a proceeding weld bead.</b> |                                                                                                                                                                                                                                                                             |
| <i>Possible Reason</i>                                                                                         | <i>Suggested Remedy</i>                                                                                                                                                                                                                                                     |
| 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.<br>Gun angle to work should be between 5 & 15°<br>Direct the arc at the weld joint<br>Adjust work angle or widen groove to access bottom during welding<br>Momentarily hold arc on side walls if using weaving technique |
| <b>5: Excessive Penetration – weld metal melting through base metal</b>                                        |                                                                                                                                                                                                                                                                             |
| <i>Possible Reason</i>                                                                                         | <i>Suggested Remedy</i>                                                                                                                                                                                                                                                     |
| Too much heat                                                                                                  | Select a lower voltage range and /or adjust the wire speed to suit<br>Increase travel speed                                                                                                                                                                                 |

## Trouble Shooting

### MIG WELDING TROUBLE SHOOTING - Continued

| <b>6: Lack of Penetration – shallow fusion between weld metal and base metal</b> |                                                                                                                                                                                                                                                                                                     |
|----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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 1/8-1/4in |
| Not enough heat input                                                            | Select a higher voltage range and /or adjust the wire speed to suit<br>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.

| <b>1: No wire feed</b>                                        |                                                                                                                                            |
|---------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Possible Reason</i>                                        | <i>Suggested Remedy</i>                                                                                                                    |
| Wrong mode selected                                           | Check that the TIG/ARC/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          |
| <b>2: Inconsistent / interrupted wire feed</b>                |                                                                                                                                            |
| <i>Possible Reason</i>                                        | <i>Suggested Remedy</i>                                                                                                                    |
| 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; .030in wire requires .030in 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                                                               |



## Trouble Shooting

### TIG WELDING TROUBLE SHOOTING

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

| <b>1: Tungsten burning away quickly</b>                                              |                                                                                                                                                                               |
|--------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Possible Reason</i>                                                               | <i>Suggested Remedy</i>                                                                                                                                                       |
| Incorrect Gas                                                                        | Check that pure Argon is being used                                                                                                                                           |
| No gas                                                                               | Check the gas cylinder contains gas and is connected and the torch gas valve is open                                                                                          |
| Inadequate gas flow                                                                  | Check the gas is connected, check hoses, gas valve and torch are not restricted. Set the gas flow between 21-30cfh flow rate                                                  |
| Back cap not fitted correctly                                                        | Make sure the torch back cap is fitted so that the o-ring is inside the torch body                                                                                            |
| Torch connected to DC +                                                              | Connect the torch to the DC- output terminal                                                                                                                                  |
| Incorrect tungsten being used                                                        | Check and change the tungsten type if necessary                                                                                                                               |
| Tungsten being oxidised after weld is finished                                       | Keep shielding gas flowing 10–15 seconds after arc stoppage. 1 second for each 10 amps of weld current.                                                                       |
| <b>2: Contaminated tungsten</b>                                                      |                                                                                                                                                                               |
| <i>Possible Reason</i>                                                               | <i>Suggested Remedy</i>                                                                                                                                                       |
| Touching tungsten into the weld pool                                                 | Keep tungsten from contacting weld puddle. Raise the torch so that the tungsten is off of the work piece 1/8-1/4in                                                            |
| Touching the filler wire to the tungsten                                             | Keep the filler wire from touching the tungsten during welding, feed the filler wire into the leading edge of the weld pool in front of the tungsten                          |
| Tungsten melting into the weld pool                                                  | Check that correct type of tungsten is being used. Too much current for the tungsten size so reduce the amps or change to a larger tungsten                                   |
| <b>3: Porosity - poor weld appearance and colour</b>                                 |                                                                                                                                                                               |
| <i>Possible Reason</i>                                                               | <i>Suggested Remedy</i>                                                                                                                                                       |
| Incorrect Gas                                                                        | Check that pure Argon is being used                                                                                                                                           |
| Inadequate gas flow / gas leaks                                                      | Check the gas is connected, check hoses, gas valve and torch are not restricted. Set the gas flow between 21-30cfh flow rate. Check hoses and fittings for holes, leaks etc., |
| 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 filler wire                                                             | Remove all grease, oil, or moisture from filler metal.                                                                                                                        |
| Incorrect filler wire                                                                | Check the filler wire and change if necessary                                                                                                                                 |
| <b>4: Yellowish residue / smoke on the alumina nozzle &amp; discoloured tungsten</b> |                                                                                                                                                                               |
| <i>Possible Reason</i>                                                               | <i>Suggested Remedy</i>                                                                                                                                                       |
| Incorrect Gas                                                                        | Use pure Argon gas                                                                                                                                                            |
| Inadequate gas flow                                                                  | Set the gas flow between 21-30cfh flow rate                                                                                                                                   |
| Alumina gas nozzle too small for size of tungsten being used                         | Increase the size of the alumina gas nozzle                                                                                                                                   |
| <b>5: Unstable Arc during DC welding</b>                                             |                                                                                                                                                                               |
| <i>Possible Reason</i>                                                               | <i>Suggested Remedy</i>                                                                                                                                                       |
| Torch connected to DC +                                                              | Connect the torch to the DC- output terminal                                                                                                                                  |
| Contaminated base metal                                                              | Remove materials like paint, grease, oil, and dirt, including mill scale from base metal.                                                                                     |
| Tungsten is contaminated                                                             | Remove 10mm of contaminated tungsten and re grind the tungsten                                                                                                                |
| Arc length too long                                                                  | Lower torch so that the tungsten is off of the work piece 2 - 5mm                                                                                                             |

## Trouble Shooting

### TIG WELDING TROUBLE SHOOTING - Continued

| <b>7: Arc wanders during DC welding</b> |                                                                                                                               |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| <i>Possible Reason</i>                  | <i>Suggested Remedy</i>                                                                                                       |
| Poor gas flow                           | Check and set the gas flow between 21-30cfh flow rate                                                                         |
| Incorrect arc length                    | Lower torch so that the tungsten is off of the work piece 1/8-1/4in                                                           |
| Tungsten incorrect or in poor condition | Check that correct type of tungsten is being used. Remove 1/2in from the weld end of the tungsten and re sharpen the tungsten |
| Poorly prepared tungsten                | Grind marks should run lengthwise with tungsten, not circular. Use proper grinding method and wheel.                          |
| Contaminated base metal                 | Remove contaminating materials like paint, grease, oil, and dirt, including mill scale from base metal.                       |
| Contaminated filler wire                | Remove all grease, oil, or moisture from filler metal.                                                                        |
| Incorrect filler wire                   | Check the filler wire and change if necessary                                                                                 |

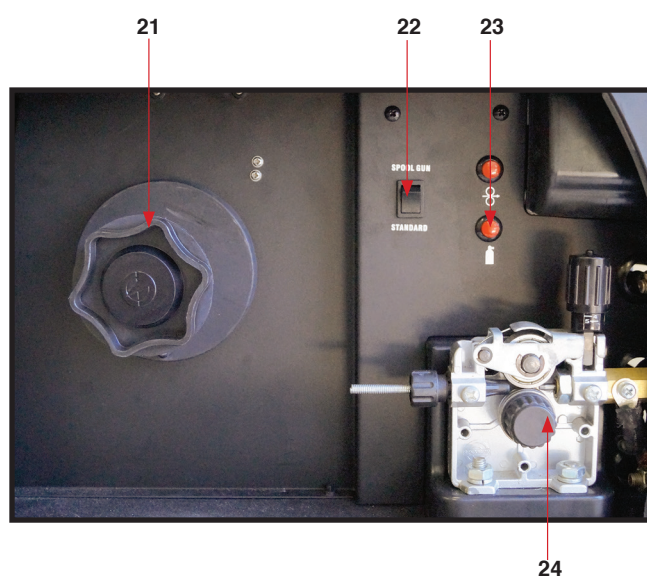
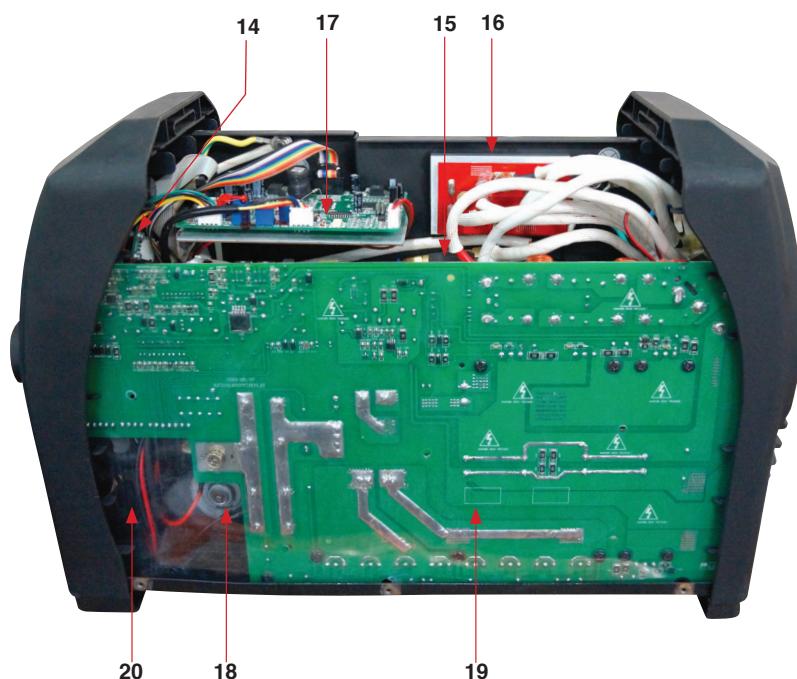
| <b>8: Arc difficult to start or will not start DC welding</b> |                                                                                                                                                           |
|---------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Possible Reason</i>                                        | <i>Suggested Remedy</i>                                                                                                                                   |
| Incorrect machine set up                                      | Check machine set up is correct                                                                                                                           |
| No gas, incorrect gas flow                                    | Check the gas is connected and cylinder valve open, check hoses, gas valve and torch are not restricted. Set the gas flow between 10 - 15 l/min flow rate |
| Tungsten is contaminated                                      | Remove 10mm of contaminated tungsten and re grind the tungsten                                                                                            |
| Incorrect tungsten size and or tungsten being used            | Check and change the size and or the tungsten if required                                                                                                 |
| Loose connection                                              | Check all connectors and tighten                                                                                                                          |
| Earth clamp not connected to work                             | Connect the earth clamp directly to the work piece wherever possible                                                                                      |

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 21-30cfh.
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 21-30cfh, 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 for Pro.Point 145 & 180



| #  | Description         | #  | Description                     |
|----|---------------------|----|---------------------------------|
| 1  | handle              | 12 | fan DC24V                       |
| 2  | front panel         | 13 | power cable                     |
| 3  | Knob pointer        | 14 | display pcb                     |
| 4  | Knob pointer        | 15 | plastic packaged solenoid valve |
| 5  | Polarity lead       | 16 | silicon bridge plate            |
| 6  | central adaptor     | 17 | Control pcb                     |
| 7  | quick-connect 35-50 | 18 | wire feeder motor               |
| 8  | 9 pin female socket | 19 | mainboard                       |
| 9  | rear panel          | 20 | Insulation sheet                |
| 10 | power switch        | 21 | Spool holder                    |
| 11 | gas inlet           | 22 | Selector switch                 |
|    |                     | 23 | Wire inch & Gas check button    |
|    |                     | 24 | wire feeder motor               |



## Warranty/Warranty Exclusions

### WARRANTY

As part of Royal Service, a customer may return a defective unit to any Princess Auto location for a new replacement unit within 3 years of the purchase date.

### 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 PRINCESS AUTO 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-authorised electrical connections
- Improper installation
- Use of non-authorised/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 Authorised PRINCESS AUTO Dealers





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