The electrode wire stick out from the MIG gun nozzle should be between 10mm to 20.0mm. This distance may vary depending on the type of joint that is being welded.

The speed at which the molten pool travels influences the width of the weld and penetration of the welding run.

STICK WELDING

Place yourself in a comfortable position before beginning to weld. Get a seat of suitable height and do as much work as possible sitting down. Don't hold your body tense. A taut attitude of mind and a tensed body will soon make you feel tired. Relax and you will find that the job becomes much easier. You can add much to your peace of mind by wearing a leather apron and gauntlets. You won't be worrying then about being burnt or sparks setting alight to your clothes.

Place the work so that the direction of welding is across, rather than to or from, your body. The electrode holder lead should be clear of any obstruction so that you can move your arm freely along as the electrode burns down. If the lead is slung over your shoulder, it allows greater freedom of movement and takes a lot of weight off your hand. Be sure the insulation on your cable and electrode holder is not faulty, otherwise you are risking an electric shock.

Practice this on a piece of scrap plate before going on to more exacting work. You may at first experience contact with the work and failing to withdraw the electrode quickly enough. A low amperage will accentuate it. This freezing-on of the tip may be overcome by scratching the electrode along the plate surface in the same way as a match is struck. As soon as the arc is established, maintain a 1.6mm to 3.2mm gap between the burning electrode end and the parent metal. Draw the electrode slowly along as it melts down.

TIG WELDING

TIG Welding is generally regarded as a specialised process that requires operator competency. While many of the principles outlined in the previous Arc Welding section are applicable a comprehensive outline of the TIG Welding process is outside the scope of this Operating Manual. For further information please contact HSS Hire.

TECHNICAL SPECIFICATIONS

Primary Voltage	230VAC / 110VAC
Supply Voltage Range	230V±10% / 110V±10%
Number of Phases	Single Phase
Supply Frequency	50 / 60 Hz
Generator Requirement	7kVA(230V) / 4.5kVA(110V)
Open Circuit Voltage	79V
Input Current	15A (230V) / 18.3A(110V)
Current Range	10-210A (230V)/10-140A (110V)
Wirefeed Speed Range	2.5-18m/min

EQUIPMENT CARE

Never push the equipment beyond its design limits. If it will not do what you want with reasonable ease and speed, assume you have the wrong equipment for the job. Contact HSS Hire for advice.

Keep the equipment clean - you will find this less of a chore if you clean it regularly, rather than wait until the end of the hire period.

When not in use, store the equipment somewhere clean, dry and secure.

FINISHING OFF

Switch OFF and unplug the unit. Leave everything to cool then take the earth clamp off the work.

Where applicable remove the welding rod, disconnect all leads and coil them up neatly.

Collect all parts together and give them a final clean up ready for return, to HSS Hire.

... have you been trained

The law requires that personnel using this type of equipment in the workplace must be competent and qualified to do so. Training is available at HSS Training
0845 766 7799

...any comments?

If you have any suggestions to enable us to improve the information within this guide please e-mail your comments or write to the Safety Guide Manager at the address below
e-mail: safety@hss.com

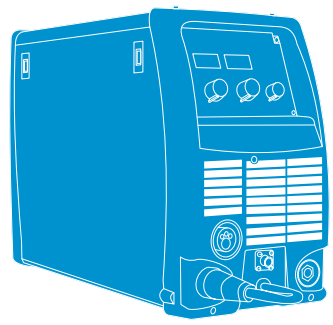
Group Office: 25 Willow Lane, Mitcham, Surrey CR4 4TS

Web Site: http://www.hss.com

HW055/01

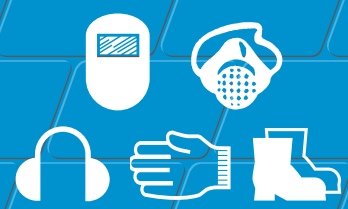
Operating & Safety Guide HW055

HSS Hire



200 amp Mig Welder

Provides excellent welding performance across a broad range of applications



Code 55308

GENERAL SAFETY

For advice on the safety and suitability of this equipment **contact HSS Hire.**

There is a serious risk of personal injury if you do not follow all instructions laid down in this guide.

The hirer has a responsibility to ensure that all necessary risk assessments have been completed prior to the use of this equipment.

Most welding tasks may be considered as hot work in site situations and may be subject to specific permits to work.

This equipment should only be used by an operator who has been deemed competent to do so by his/her employer.

This equipment should be used by a competent adult who has read and understood these instructions. Anyone with either a temporary or permanent disability, should seek expert advice before using it.

Keep children, animals and bystanders away from the work area. Cordon off a NO GO area using cones and either barriers or tape, available for hire from HSS Hire. Welding screens are also available for hire from HSS Hire.

WARNING

IF YOU ARE WEARING AN ELECTRONIC LIFE SUPPORT DEVICE (A HEART PACEMAKER) YOU MUST CONSULT YOUR DOCTOR BEFORE GOING NEAR OR WORKING WITH THIS EQUIPMENT. MAGNETIC FIELDS ASSOCIATED WITH HIGH CURRENTS MAY AFFECT THESE DEVICES.

Never use this equipment if you are **ill, feeling tired,** or **under the influence of alcohol or drugs.**

Cover your skin. Wear practical, dry, hole-free insulating gloves, protective clothing and footwear. Avoid loose garments and jewellery that could catch in moving parts, tie back long hair.

Insulate yourself from work and ground using dry insulating mats or covers.

Ensure the work area is well lit and ventilated, a fume extractor or smoke eliminator should be used. If in doubt, ask about lighting and ventilation equipment at HSS Hire.

Do not work near flammable gases or liquids, petrol or paint thinner fumes for example. **Keep combustible materials at a safe distance** - at least 5m.

Watch for fire, and keep a fire extinguisher nearby.

This equipment generates potentially harmful noise levels. To comply with health and safety at work regulations, **ear defenders must be worn** by everyone in the vicinity.

A head shield with suitable shading MUST be worn by anyone in the work area – goggles are not suitable. Avoid loose garments and jewellery that could interfere with the work.

If the headshield or lens becomes damaged, return it to HSS Hire.

Fumes produced by the welding process, if inhaled, can be harmful to health. A suitable mask must be worn when using this equipment. **Respiratory protective equipment is available for hire,** contact HSS Hire for details.

Do not weld in locations near degreasing, cleaning, or spraying operations. The heat and rays of the arc can react with vapours to form highly toxic and irritating gases.

Do not weld on coated metals, such as galvanized lead, or cadmium plated steel, unless the coating is removed from the weld area, the area is well ventilated, and if necessary, while wearing an air supplied respirator. The coatings and any metals containing these elements can give off toxic fumes if welded.

Never use welding equipment near computers or any sensitive electronic equipment. Observe potential electromagnetic problems in the surrounding area.

Make sure you know how to switch this machine OFF before you switch it ON in case you get into difficulty.

If working **above floor level, wear a safety harness** to prevent falling.

Always switch equipment OFF before making any adjustments to it. Never leave it switched ON and unattended.

LET IT COOL

HANDLE WELDING EQUIPMENT AND WORK WITH CARE – IT WILL BE HOT. LEAVE EQUIPMENT TO COOL BEFORE CHANGING WELDING RODS, MOVING EARTH CLAMPS, AND SO ON.

Keep the power unit's air vents clear of all obstructions.

Always transport, store and operate the machine in an upright position.

Never dip electrode holder in water to cool it or lay it down on the ground or the work surface. Do not touch holders connected to two welding machines at the same time or touch other people with the holder or electrode.

Do not wrap cables around your body.

Always ground the workpiece to a good electrical (earth) **ground.**

Do not touch electrode while in contact with the work (ground) **circuit.**

Use protective screens or barriers to protect others from flash and glare; warn others not to watch the arc.

Turn off all equipment when not in use. Disconnect power to equipment if it will be left unattended or out of service.

Do not touch live electrical parts.

Check the condition of the equipment before use.

If it shows signs of damage or excessive wear, return it to HSS Hire.

COSHH information sheets are available from HSS Hire.

VEHICLE SAFETY

BEFORE CARRYING OUT WELDING WORK ON CARS/LORRIES AND SIMILAR VEHICLES...

REMOVE THE VEHICLE'S BATTERY AND DISCONNECT THE ALTERNATOR.

REMOVE ALL COMBUSTIBLE MATERIAL AND OTHER FIRE/EXPLOSION HAZARDS.

GAS CYLINDERS

IF WORKING WITH GAS CYLINDERS HANDLE THEM WITH CARE. IF DAMAGED, A CYLINDER CAN EXPLODE.

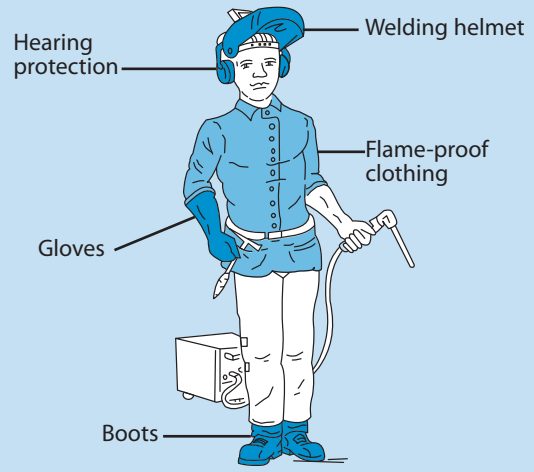
PROTECT COMPRESSED GAS CYLINDERS FROM EXCESSIVE HEAT, MECHANICAL SHOCKS, AND ARCS.

INSTALL AND SECURE CYLINDERS IN AN UPRIGHT POSITION BY CHAINING THEM TO A STATIONARY SUPPORT OR EQUIPMENT CYLINDER RACK TO PREVENT FALLING OR TIPPING.

KEEP CYLINDERS AWAY FROM ANY WELDING OR OTHER ELECTRICAL CIRCUITS.

NEVER ALLOW A WELDING ELECTRODE TO TOUCH ANY CYLINDER.

SAFETY OUTFIT



ELECTRICAL SAFETY

The HSS 200 amp Mig Welder unit must be powered from a 230/110V mains supply, **Extension leads must always be protected by armoured cable.**

Keep flexes and leads out of harm's way. Never run them through water, over sharp edges, or where they could trip someone.

If the welder fails, or if its flex or plug (if fitted) **gets damaged, return it. Never try to repair it yourself.**

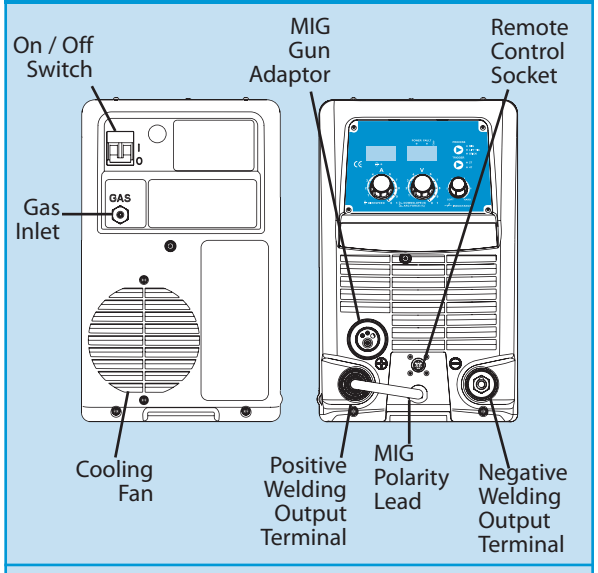
Do not use electrical equipment in very damp or wet conditions, it can be dangerous.

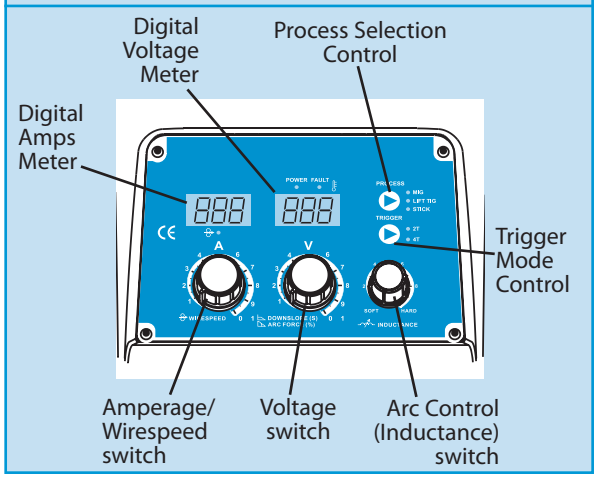
WARNING

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 MACHINE INTERNAL CIRCUITS ARE ALSO LIVE WHEN POWER IS ON.

The ON/OFF switch (front panel) **is the main circuit breaker. The Power Indicator display illuminates when the power switch is in the ON position.**

IDENTIFIER





GETTING STARTED

The HSS 200 amp Mig Welder is a self contained single phase multi process welding inverter that is capable of performing MIG (GMAW/FCAW), STICK (MMA) and LIFT TIG (GTAW) welding processes. The unit is equipped with an integrated wire feed unit, digital voltage and amperage meters, and a host of other features in order to fully satisfy the broad operating needs of the modern welding professional.

Never use the 200 amp Mig Welder until you have fully read and understood this User Guide and the machine has been properly set up using the information it contains.

MIG (GMAW) WELDING WITH GAS SHIELDED MIG WIRE

The process selection control is used to select the desired welding mode. Three modes are available, MIG (GMAW/FCAW), LIFT TIG (GTAW) and STICK (MMA) modes.

Note that when the unit is powered off the mode selection control will automatically default to MIG mode. This is necessary so as to prevent inadvertent arcing should an electrode holder be connected to the unit and mistakenly be in contact with the work piece during power up.

MIG (GMAW) WELDING WITH GAS SHIELDED MIG WIRE

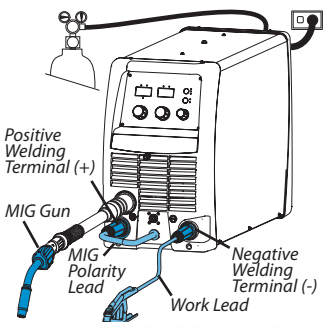
Select MIG mode with the process selection control.

Next, connect the MIG polarity lead to the positive welding terminal (+).

Fit the MIG gun to the power source.

Connect the work lead to the negative welding terminal (-).

Fit the welding grade shielding gas regulator / flow meter to the shielding gas cylinder, then connect the shielding gas hose from the rear of the power source to the regulator / flowmeter outlet.



Refer to the Weld Guide located on the inside of the wirefeed compartment door for further information.

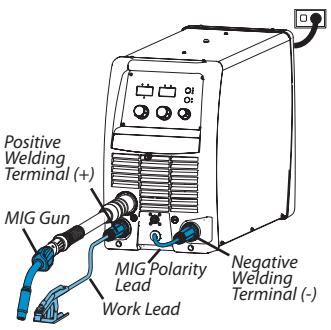
MIG (FCAW) WELDING WITH GASLESS MIG WIRE

Select MIG mode with the process selection control.

Connect the MIG polarity lead to the negative welding terminal (-).

Connect the work lead to the positive welding terminal(+).

Refer to the Weld Guide located on the inside of the wirefeed compartment door for further information.

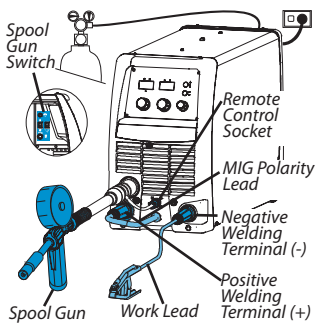


SPOOL GUN MIG (GMAW) WELDING WITH GAS SHIELDED MIG WIRE

Select MIG mode with the process selection control.

Connect the MIG polarity lead to the positive welding terminal(+).

Fit the Euro Spool Gun to the power source using the front panel EURO adaptor (see Attaching MIG gun). Connect the 8 pin Remote Control Plug to the 8 pin Remote Control Socket on the power source.



Connect the work lead to the negative welding terminal(-).

Fit the welding grade shielding gas regulator / flowmeter to the shielding gas cylinder, then connect the shielding gas hose from the rear of the power source to the regulator / flowmeter outlet.

Refer to the Weld Guide located on the inside of the wirefeed compartment door for further information.

Select MIG mode with the process selection control.

Set the Spool Gun Switch located inside the wire drive compartment, to SPOOL GUN.

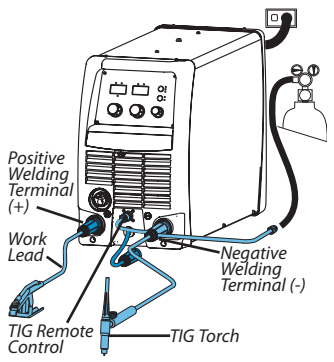
TIG (GTAW) WELDING

Select LIFT TIG mode with the process selection control.

Connect the TIG Torch to the negative welding terminal (-).

Connect the work lead to the positive welding terminal (+).

Connect the TIG torch trigger switch via the 8 pin socket located on the front of the power source as shown below. The TIG torch will require a trigger switch to operate in LIFT TIG Mode.

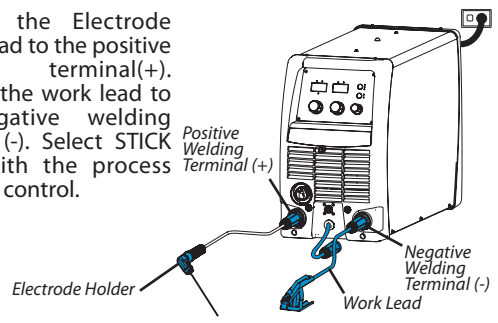


NOTE: If the TIG torch has a remote TIG torch current control fitted then it will require to be connected to the 8 pin socket.

Fit the welding grade shielding gas regulator/flowmeter to the shielding gas cylinder (see MIG Welding With Gas Shielded Mig Wire) then connect the shielding gas hose from the TIG torch to the regulator/flowmeter outlet. Note that the TIG torch shielding gas hose is connected directly to the regulator/flowmeter. The power source is not fitted with a shielding gas solenoid to control the gas flow in LIFT TIG mode therefore the TIG torch will require a gas valve.

STICK (MMA) WELDING

Connect the Electrode Holder lead to the positive welding terminal(+). Connect the work lead to the negative welding terminal (-). Select STICK mode with the process selection control.



DANGER!

BEFORE INSERTING THE ELECTRODE IN THE TIG TORCH MAKE SURE THE MAINS POWER SUPPLY IS SWITCHED OFF.

WARNING

WELDING PRODUCTS AND WELDING PROCESSES CAN CAUSE SERIOUS INJURY OR DEATH, OR DAMAGE TO OTHER EQUIPMENT OR PROPERTY, IF THE OPERATOR DOES NOT STRICTLY OBSERVE ALL SAFETY RULES AND TAKE PRECAUTIONARY ACTIONS.

It is important that the equipment duty cycle is taken into consideration when in use.

Duty Cycle for 110V Power

MIG DUTY CYCLE		STICK DUTY CYCLE		TIG DUTY CYCLE	
140A	20%	125A	20%	200A	20%
99A	60%	80A	60%	130A	60%
77A	100%	60A	100%	101A	100%

Duty Cycle for 230V Power

MIG DUTY CYCLE		STICK DUTY CYCLE		TIG DUTY CYCLE	
210A	20%	200A	20%	200A	20%
130A	60%	130A	60%	130A	60%
101A	100%	101A	100%	101A	100%

This welding power source is protected by a self resetting thermostat. The indicator will illuminate if the duty cycle of the power source has been exceeded. Should the thermal overload indicator illuminate the output of the power source will be disabled. Once the power source cools down this light will go OFF and the over temperature condition will automatically reset. Note that the mains power switch should remain in the on position such that the fan continues to operate thus allowing the unit to cool sufficiently. Do not switch the unit off should a thermal overload condition be present.

TRANSPORTING METHODS

This unit is equipped with a handle for carrying purposes.

Lift unit with handles built into the top of the front and rear moulded panels.

Use handcart or similar device of adequate capacity.

If using a fork lift vehicle, place and secure unit on a proper skid before transporting.

PREPARING FOR WORK

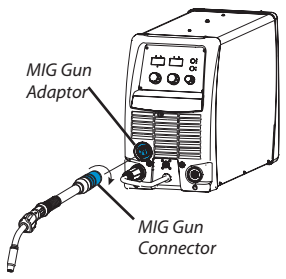
Place the unit on the **stable, levelled ground at a distance of 300mm or more from the walls or similar that could restrict natural air flow for cooling. Make sure the area is free from moisture, dust, oil, steam and corrosive gases. It is important to operate the machine in ambient temperature between** 0^{o} C and 40^{o} C.

DANGER!

ALWAYS MAKE SURE THE MAINS POWER SUPPLY IS SWITCHED OFF BEFORE UNDERTAKING ANY TYPE OF INTERVENTION ON THE WELDER

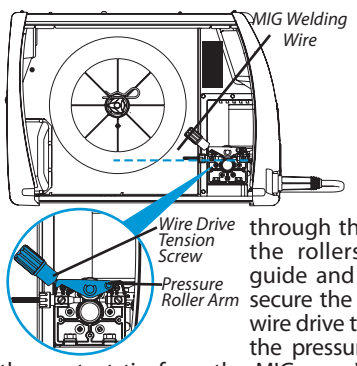
ATTACHING MIG GUN

Fit the MIG gun to the power source by pushing the MIG gun connector into the MIG gun adaptor and screwing the plastic nut clockwise to secure the MIG gun to the MIG gun adaptor.



INSERTING WIRE INTO THE WIRE FEED MECHANISM

Release the tension from the pressure roller by turning the adjustable wire drive tension screw in an anti-clockwise direction. Then to release the pressure roller arm push the tension screw toward the front of the machine which releases the pressure roller arm. With the MIG welding wire feeding from the bottom of the spool pass the electrode wire through the inlet guide, between the rollers, through the outlet guide and into the MIG gun. Re-secure the pressure roller arm and wire drive tension screw and adjust the pressure accordingly. Remove the contact tip from the MIG gun. With the MIG gun lead reasonably straight, feed the wire through the MIG gun by depressing the trigger switch. Fit the appropriate contact tip.



DANGER!

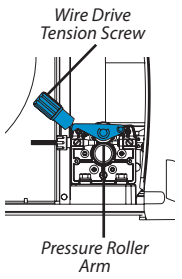
BEFORE CONNECTING THE WORK CLAMP TO THE WORK MAKE SURE THE MAINS POWER SUPPLY IS SWITCHED OFF.

THE WELDING WIRE WILL BE AT WELDING VOLTAGE POTENTIAL WHILE IT IS BEING FEED THROUGH THE SYSTEM.

KEEP MIG GUN AWAY FROM EYES AND FACE.

FEED ROLLER PRESSURE ADJUSTMENT

The pressure (top) roller applies pressure to the grooved feed roller via an adjustable pressure screw. These devices should be adjusted to a minimum pressure that will provide satisfactory WIREFEED without slippage. If slipping occurs, and inspection of the wire contact tip reveals no wear, distortion or burn back jam, the conduit liner should be checked for kinks and clogging by metal flakes and swarf. If it is not the cause of slipping, the feed roll pressure can be increased by rotating the pressure screw clockwise.



DANGER!

BEFORE CONNECTING THE WORK CLAMP TO THE WORK MAKE SURE THE MAINS POWER SUPPLY IS SWITCHED OFF.

SECURE THE WELDING GRADE SHIELDING GAS CYLINDER IN AN UPRIGHT POSITION BY CHAINING IT TO A SUITABLE STATIONARY SUPPORT TO PREVENT FALLING OR TIPPING.

CAUTION!

LOOSE WELDING TERMINAL CONNECTIONS CAN CAUSE OVERHEATING AND RESULT IN THE MALE PLUG BEING FUSED IN THE TERMINAL.

ATTENTION

IF IN DOUBT, WHEN CONNECTING THE WORK LEAD CONTACT HSS HIRE FOR ADVICE

WELDING CURRENT FLOWS FROM THE POWER SOURCE VIA HEAVY DUTY BAYONET TYPE TERMINALS. IT IS ESSENTIAL, HOWEVER, THAT THE MALE PLUG IS INSERTED AND TURNED SECURELY TO ACHIEVE A SOUND ELECTRICAL CONNECTION.

BASIC TECHNIQUES

ADVICE

IF YOU HAVE NOT YET DONE ANY WELDING, PRACTICE ON A PIECE OF SCRAP PLATE BEFORE GOING ON TO MORE SERIOUS WORK. YOU MAY AT FIRST EXPERIENCE DIFFICULTY.

MIG WELDING

The easiest welding procedure for the beginner to experiment with MIG welding is the flat position. The equipment is capable of flat, vertical and overhead positions. For practicing MIG welding, secure some pieces of 1.6mm or 1.2mm mild steel plate 150 x 150mm. Use 0.8mm flux cored gasless wire or a solid wire with shielding gas.

Begin work by setting up power source. Power source has two control settings that have to balance. These are the Wirespeed control and the welding Voltage Control. The welding current is determined by the Wirespeed control, the current will increase with increased Wirespeed, resulting in a shorter arc. Less wire speed will reduce the current and lengthen the arc. Increasing the welding voltage hardly alters the current level, but lengthens the arc. By decreasing the voltage, a shorter arc is obtained with a little change in current level.

When changing to a different electrode wire diameter, different control settings are required. A thinner electrode wire needs more Wirespeed to achieve the same current level.

A satisfactory weld cannot be obtained if the Wirespeed and Voltage settings are not adjusted to suit the electrode wire diameter and the dimensions of the work piece.

If the Wirespeed is too high for the welding voltage, "stubbing" will occur as the wire dips into the molten pool and does not melt. Welding in these conditions normally produces a poor weld due to lack of fusion. If, however, the welding voltage is too high, large drops will form on the end of the wire, causing spatter. The correct setting of voltage and Wirespeed can be seen in the shape of the weld deposit and heard by a smooth regular arc sound. Refer to the Weld Guide located on the inside of the wirefeed compartment door for setup information.

The angle of MIG gun to the weld has an effect on the width of the weld. The welding gun should be held at an angle to the weld joint. Hold the gun so that the welding seam is viewed at all times.