

DIY

M100



INVERTER GASLESS MIG WELDER

MANUAL



BOSSWELD

WELD LIKE A BOSS

Thank you for choosing a BOSSWELD M100 Inverter Gasless MIG Welder

In this manual you will find instructions on how to set up your welder along with general welding information, safety information and helpful tips. We encourage you to go online to our website for more tips and troubleshooting as well as many welding resources.

The BOSSWELD M100 is the latest in IGBT Inverter welder technology, this very portable MIG welder is easy to set up, easy to use, enabling the user to complete smooth welds with Gasless MIG wire. Ideal for around the home, DIY workshop, or rural applications.

BOSSWELD products are manufactured to the highest standards so that performance is maximised. We truly hope you enjoy using your welder!



Every effort has been made to ensure that this manual has been prepared accurately, however errors and omissions are excepted.

BOSSWELD is a trademark of Dynaweld Industrial Supplies Pty Ltd.

WARRANTY

This warranty is in addition to the statutory warranty provided under Australian Consumer Law, but does not include damage resulting from transport, misuse, neglect or if the product has been tampered with.

The product must be maintained as per this manual, and installed and used according to these instructions on an appropriate power supply. The product must be used in accordance with industry standards and acceptable practice.

This warranty covers the materials used to manufacture the machine and the workmanship used to produce the item. This Warranty does not cover damage caused by:

1. Normal wear and tear due to usage
2. Misuse/ abuse or Neglect of the item
3. Transport/handling breakages
4. Lack of maintenance, care and cleaning
5. Environmental factors, such as usage in temperatures exceeding 40 degrees, above 1000 metres sea level, rain, water, excessive damp, cold or humid conditions.
6. Improper setup or installation.
7. Use on Incorrect voltage or non authorised electrical connections and plugs.
8. Use of non standard parts.
9. Repair, case opening, tampering with, modifications to any part of the item by non authorised BOSSWELD repairers.

This warranty covers the machine only and does not include Torches, Leads, Earth Clamps, Electrode Holders, Plasma Torches, TIG Torches and any of the parts on those items unless there is a manufacturing fault.

1. REGISTRATION

Purchasers are encouraged to register for warranty on our website.

www.dynaweld.com.au/warranty

2. TIME PERIOD - 1 Year

A warranty claim must be made within 1 year from the date of purchase of this product. Any claim must include proof of purchase.

3. HOW TO MAKE A CLAIM - NEED SOME HELP?

- Visit our website www.dynaweld.com.au/troubleshooting for many helpful tips and guides to assist with the setup and usage of your new machine. Still stuck....?
- Call the BOSSWELD Helpdesk on 1300 460 665 for over the phone assistance.
- If the machine is not operational then return the item to the place of purchase.

DYNAWELD MAKES NO OTHER WARRANTY, EXPRESS OR IMPLIED. THIS WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHERS, INCLUDING, BUT NOT LIMITED TO ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.

BOX CONTENTS



Refer	Item
1.	BOSSWELD M100 Inverter Gasless MIG Welder
2.	Direct Connect MIG Torch
3.	Welding Earth cable with earth clamp
4.	Carry Strap
5.	Cable / Lead tidy
6.	Torch Spares (not shown)
7.	Driver Roller (spare – not shown)
8.	Owners Manual (not shown)

WARNING

The device and packaging material are not toys! Children must not be allowed to play with the machine and its accessories. Plastic parts and packaging are choking risks for children.

- Open the packaging and remove the welder carefully.
- Check that the delivery is complete.
- If possible, store the packaging until the warranty period has expired.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

GLOVES AND PROTECTIVE CLOTHING

Use protective gloves and fire resistant protective clothing when welding. Avoid exposing skin to ultraviolet rays produced by the arc.

WELDING HELMET

Under no circumstances should the welder be operated unless the operator is wearing a welding helmet to protect the eyes and face. There is serious risk of eye damage if a helmet is not used. The sparks and metal projectiles can cause serious damage to the eyes and face. The light radiation produced by the arc can cause damage to eyesight, and burns to skin. Never remove the welding helmet whilst welding.

SAFETY GLASSES

After welding use appropriate safety glasses when brushing, chipping or grinding the slag from the weld.

OTHER PERSONS

Ensure that other persons are screened from the welding arc and are at least 15 metres away from the work piece. Always ensure that the welding arc is screened from onlookers, or people just passing by. Use screens if necessary, or non-reflecting welding curtain. Do not let children or animals have access to the welding equipment or to the work area.

SWITCHING OFF

When the operator has finished welding they must switch the welder off. DO NOT put the electrode holder down with the welder switched ON. When leaving the welder unattended, move the ON/OFF switch to the OFF position and disconnect the welder from the electrical mains supply. Do not leave hot material unattended after welding.

MACHINE CARE / SAFETY

Keep the welding cables, earth clamp and electrode holder in good condition. Failure to do this can result in poor welding quality, which could be dangerous in structural situations.

Prior to use, check for breakage of parts and any other conditions that may affect operation of the welder. Any part of the welder that is damaged should be carefully checked to determine whether it will perform its intended function whilst being safe for the operator. Any part that is damaged should be properly repaired, or replaced by an authorised service centre.

IMPROPER USE

It is hazardous to use the welding machine for any work other than that for which it was designed e.g. do not use welder for thawing pipes.

HANDLING

Ensure the handle is correctly fitted. As welding machines can be heavy, always use safe lifting practices when lifting.

POSITION AND HANDLING

To reduce risk of the machine being unstable / danger of overturning, position the welding machine on a horizontal surface that is able to support the machine weight. Operators **MUST NOT BE ALLOWED** to weld in raised positions unless safety platforms are used.

SAFETY INSTRUCTIONS

WARNING

The user of this welder is responsible for their own safety and the safety of others. It is important to read, understand and respect the contents of this user guide. When using this welder, basic safety precautions, including those in the following sections must be followed to reduce the risk of fire, electric shock and personal injury. Ensure that you have read and understood all of these instructions before using this welder. Persons who are not familiar with this user guide should not use this welder. Keep this booklet in a safe place for future reference.



TRAINING



The operator should be properly trained to use the welding machine safely and should be informed about the risks relating to arc welding procedures. This user guide does not attempt to cover welding technique. Training should be sought from qualified/ experienced personnel on this aspect, especially for any welds requiring a high level of integrity for safety.

SERIOUS FIRE RISK

The welding process produces sparks, droplets of fused metal, metal projectiles and fumes. This constitutes a serious fire risk. Ensure that the area in which welding will be undertaken is clear of all inflammable materials. It is also advisable to have a fire extinguisher, and a welding blanket on hand to protect work surfaces.

WORK AREA

-  Ensure a clear, well lit work area with unrestricted movement for the operator.
-  The work area should be well ventilated, as welding emits fumes which can be dangerous.

-  Always maintain easy access to the ON/OFF switch of the welder, and the electrical mains supply.
-  Do not expose the welder to rain and do not operate in damp or wet locations.

Where welding must be undertaken in environments with increased risk of electric shock, confined spaces or in the presence of flammable or explosive materials, it is important that the environment be evaluated in advance by an “expert supervisor”. It is also recommended that welding in these circumstances be carried out in the presence of persons trained to intervene in emergencies.

AVOID ELECTRICAL CONTACT

Use adequate electrical insulation with regard to the electrode, the work piece and any accessible earthed metal parts in the vicinity. Avoid direct contact with the welding circuit. The no load voltage between the earth clamp and the electrode can be dangerous under certain circumstances.

Note: For additional protection from electric shock. It is recommended that this welder be used in conjunction with a residual current device (RCD) with rated residual current of 30MA or less.

In general the use of extension leads should be avoided. If used however, ensure that the extension lead is used with the welder is of a suitable current rating and heavy duty in nature that **MUST** have an earth connection. If using the welder outdoors, ensure that the extension lead is suitable for outdoor use. Always keep extension leads away from the welding zone, moisture and any hot materials.

WELDING SURFACES

Do not weld containers or pipes that hold, or have held, flammable liquids or combustible gases or pressure. Do not weld on coated, painted or varnished surfaces as the coatings may ignite, or can give off dangerous fumes.

WORK PIECE

When welding, the work piece will remain at high temperature for a relatively long period. The operator must not touch the weld or the work piece unless wearing welding gloves. Always use pliers or tongs. Never touch the welded material with bare hands until it has completely cooled.

VOLTAGE BETWEEN ELECTRODE HOLDERS OR TORCHES

Working with more than one welding machine on a single work piece, or on work pieces that are connected, may generate a dangerous accumulation of no-load voltage between two different electrode holders or torches, the value of which may reach double the allowed limit.



MAINTENANCE

WARNING

Before starting any cleaning, or maintenance procedures on the welding machine, make sure that it is switched OFF and disconnected from the mains supply.

There are no user serviceable parts inside the welder. Refer to a qualified service personnel if

any internal maintenance is required. After use, wipe the welder down with a clean soft dry cloth.

Regular inspection of the mains power cord is required and if damaged is suspected, it must be immediately replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard

STORAGE / TRANSPORT

Store the welder and accessories out of children's reach in a dry place. If possible store the welder in the original packaging. The welder must unconditionally be secured against falling or rolling over during transport.



DISPOSAL

DISPOSING OF THE PACKAGING

Recycling packaging reduces the need for landfill and raw materials. Reuse of the recycled material decreases pollution in the environment. Please recycle packaging where facilities exist. Check with your local council authority for recycling advice.

DISPOSING OF THE WELDER

Welders that are no longer usable should not be disposed of with household waste but in an environmentally friendly way. Please recycle where facilities exist. Check with your local council authority for recycling advice.

CONTROLS

FRONT PANEL

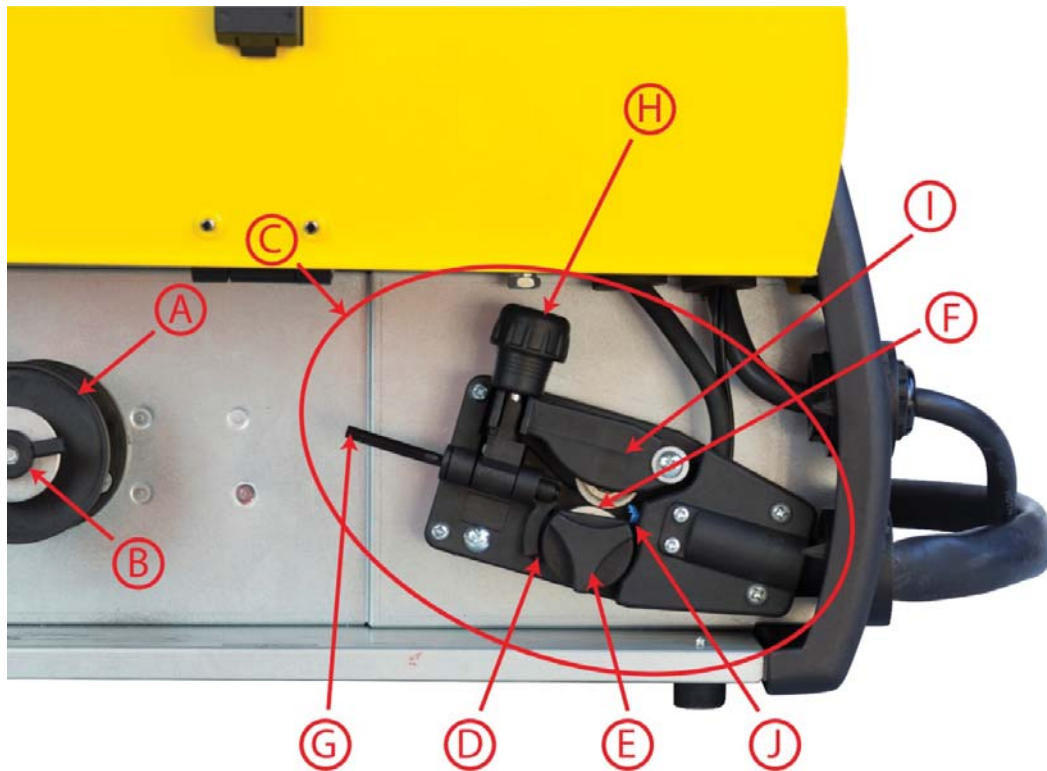


BACK PANEL



1.	Power Light Indicator	6.	Welding Earth Lead
2.	Overload Error Indicator Light	7.	240V AC Mains Power Cord
3.	Welding Voltage Control Knob	8.	Mains Power Switch
4.	Wire Speed Control Knob	9.	Cooling Fan
5.	MIG Torch Output	10.	10 Amp Input Plug

INSIDE OF M100 MIG WELDER



A.	Spool Hub	F.	Idle Roller
B.	Spool Hub Nut	G.	Guide Tube
C.	Wire Drive Assembly	H.	Wire Feed Tensioning Knob
D.	Drive Roller	I.	Wire Tensioning Arm
E.	Drive Roller Cover	J.	Inlet Tube

SET UP OF WIRE FEED UNIT

1. Open the side door of the machine.
2. Remove the Spool Hub Nut (B) and place spool of wire on Spool Hub (A).
3. Replace Spool Hub Nut (B) and adjust firmly - without too much pressure.
4. Release the Wire Feed Tensioning Knob (H) by pulling it towards you.
5. Lift Wire Tensioning Arm (I).
6. Remove the Drive Roller Cover (E). Check the Drive roller is matched to the wire size for the job. Then replace the Drive Roller Cover (E).
7. Take the end of the wire and feed into the Guide Tube (G) until it passes to the Inlet Tube (J).
8. Put down Wire Tensioning Arm (I) so it locks into position.
9. Turn the Wire Feed Tensioning Knob (H) to gently tighten.
10. Remove nozzle and tip from torch and press the trigger. This will feed the wire through the torch. Release button when wire appears at the end of the torch.
11. Re-install tip and nozzle to torch and trim wire to the end of the nozzle.

Note: This unit is suitable for D100 Rolls of MIG Wire (<1Kg in weight)

SET UP TO WELD MIG WELDING MILD STEEL – SELF SHIELD FLUX CORE (GASLESS)

1. Plug the machine 10 Amp Input Plug (10) into the wall socket, ensuring that the power switch (8) on the machine is in the OFF position.
2. Open wire feed door and install Flux cored wire into machine ensuring the drive roller is the same wire size and type (Knurled). (See instructions on Set up Wire Unit on previous page)
3. De-Tension wire feed tensioner and hand feed wire approx. 100mm through the Euro Connector.
4. Tension wire enough to grip the wire without slippage but not so much to crush the soft flux cored wire. Tension can be re-adjusted at a later stage after trialling welding.
5. Fit the earth lead to the positive (6) terminal of the machine and connect earth clamp to work-piece ensuring that the clamp makes good contact with bare metal.
6. Switch the machine on using the mains power switch (8).
7. Remove nozzle and tip from torch and press the Wire Control trigger on the torch. This will feed the wire through the torch. Release button when wire appears at the end of the torch.
8. Re install tip and nozzle to torch and trim wire to the end of the nozzle.
9. It is recommended for ease of use that the wire-feed speed is adjusted first and then the voltage setting fine-tuned if necessary.
10. To adjust wire speed turn the Wire Speed Control Knob (4)
11. To adjust the voltage turn the Welding Voltage Control Knob (3)
12. You are now ready to MIG weld using Flux Cored self-shielded wire.

GMAW (MIG) WELDING

Metal Inert Gas (MIG) welding is an attractive alternative to MMA (stick welding), offering high deposition rates and high productivity.

PROCESS CHARACTERISTICS

MIG welding is a versatile technique suitable for both thin sheet and thick section components. An arc is struck between the end of a wire electrode and the work piece, melting both of them to form a weld pool. The wire serves as both heat source (via the arc at the wire tip) and filler metal for the joint. The wire is fed through a copper contact tube (contact tip) which conducts welding current into the wire. The weld pool is protected from the surrounding atmosphere by a shielding gas fed through a nozzle surrounding the wire. Shielding gas selection depends on the material being welded and the application. The wire is fed from a reel by a motor drive, and the welder moves the welding torch along the joint line. Wires may be solid (simple drawn wires), or cored (composites formed from a metal sheath with a powdered flux or metal filling). Consumables are generally competitively priced compared with those for other processes. The process offers high productivity, as the wire is continuously fed.

Manual MIG welding is often referred as a semi-automatic process, as the wire feed rate and arc length are controlled by the power source, but the travel speed and wire position are under manual control. The process can also be mechanised when all the process parameters are not directly controlled by a welder, but might still require manual adjustment during welding. When no manual intervention is needed during welding, the process can be referred to as automatic. The process usually operates with the wire positively charged and connected to a power source delivering a constant voltage. Selection of wire diameter (usually between 0.6 and 1.6mm) and wire feed speed determine the welding current, as the burn-off rate of the wire will form an equilibrium with the feed speed.

SHIELDING GAS

In addition to general shielding of the arc and the weld pool, the shielding gas performs a number of important functions:

- forms the arc plasma
- stabilises the arc roots on the material surface
- ensures smooth transfer of molten droplets from the wire to the weld pool

The shielding gas will have a substantial effect on the stability of the arc and metal transfer and the behaviour of the weld pool, in particular, its penetration. General purpose shielding gases for MIG welding are mixtures of argon, oxygen and CO₂, and special gas mixtures may contain helium.

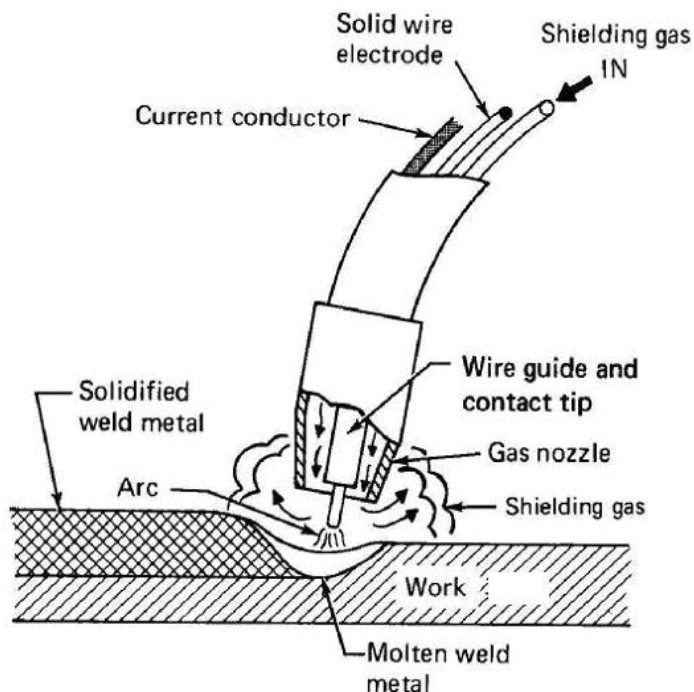
The gases which are normally used for the various materials are:

- Steels: CO₂, argon +2 to 5% oxygen, argon +5 to 25% CO₂
- Non-ferrous (e.g. Aluminium, copper or nickel alloys): Argon, argon / helium.

Argon based gases, compared with CO₂, are generally more tolerant to parameter settings and generate lower spatter levels with the dip transfer mode. However, there is a greater risk of lack of fusion defects because these gases are colder. As CO₂ cannot be used in the open arc (pulsed or spray transfer) modes due to high back-plasma forces, argon based gases containing oxygen or CO₂ are normally employed.

APPLICATIONS






MIG is widely used in most industry sectors and accounts for more than 50% of all weld metal deposited. Compared to MMA, MIG has the advantage in terms of flexibility, deposition rates and suitability for mechanisation. However, it should be noted that while MIG is ideal for 'squirting' metal, a high degree of manipulative skill is demanded of the welder.



Welding information is of a general nature and is courtesy of The Welding Institute. For more welding information go to <http://www.twi-global.com/technical-knowledge/job-knowledge/>

M100 INVERTER DC MIG WELDER

PRODUCT SPECIFICATION

BOSSWELD WELD LIKE A BOSS			
INVERTER DC MIG WELDER BOSSWELD M100		PART NO.	610050
		STANDARD	IEC 60974
 	U₀=49V	40A/16V-100A/19V	
		X	20% 60% 100%
		I₂	100A 68A 52A
		U₂	19V 17V 16.3V
 1~50-60Hz	U₁=240V	I_{1max}=19A	I_{1eff}=8.5A
IP21	H	5.6Kg	AF

Note: This unit is suitable for connection to standard Domestic 10 Amp power outlet.



HELPFUL INFORMATION

Filler Metal	Notes
Solid Mild Steel wire	Use Industry standard - copper coated ER70S-6 Steel MIG Wire. This requires a shielding gas (CO2 or argon/CO2 mix), excellent results on panel steel.
Gasless Flux cored Mild Steel Wire (Known as GS)	<ul style="list-style-type: none"> ➤ Use Industry standard flux cored ER71T-GS Steel MIG Wire. This does not require a shielding gas. ➤ Suitable for outside use (smokes and splatters) - used where gas shield can be blown away or not available. ➤ Suitable for seldom use or when bottle hire is not practical or too costly for small jobs and infrequent use. ➤ Great on galvanised materials ➤ Not suitable for panel steel ➤ Leaves chalky residue. This is normal.
Drive Feed Roller Selection	It is important that correct drive roller is used to get the best results.
-Solid mild steel -Stainless steel wire	"V" groove Roller. Roller has a small V shaped groove to guide the wire.
Flux cored wire	"V Knurled" roller (assists in gripping as wire is soft).

GENERAL TIPS

- Keep the welding voltage as low as possible for the job at hand to maintain the best duty cycle from your welding machine, prevent the flux from burning and make removal slag easier.
- To stop welding break the circuit withdraw the tip from the work piece. Be careful with the end of the MIG Torch, as it will be HOT. Provided the current setting is correct, the surface of the work piece will also melt by the intensity of the arc. A degree of "penetration" is thereby obtained, and a complete "fusion" of the work piece and the deposited electrode is met.
- This welder is automatically protected from overheating by a thermal overload cut-out protector.
- If the transformer overheats, the overload cut-out protector will activate and cut off. The light will illuminate to show that the cut out has operated.
- After cooling, the protector will reconnect the supply circuit and the welder will be ready for further use.

Note: If the duty cycle of the machine is exceeded, the thermostatic protection will activate and the machine will cut out, to cool down.

TROUBLESHOOTING

Issue	Possible Reason	Suggested Remedy
Power indicator is not lit, fan does not work and no output current	Welder is not plugged into power supply	Check that the welder is plugged into the 240V mains outlet and is switched on.
	Circuit breaker may have operated	Check that the mains fuse or breaker has not operated.
	Main power switch may not be in the ON position	Check that the main switch on the rear of the unit is in the on position.
Power indicator is lit, fan works, no output current	Output connectors may be disconnected or damaged	Check output connectors are connected properly and are not damaged
	Welding cables or earth clamp not connected properly	Check connections and that work piece is free of paint and rust at connection point
Over temperature indicator is on, no output current	Duty cycle of the unit has been exceeded.	Allow the unit to cool for 20 minutes
Output current is not stable	Earth clamp connection loose	Check earth clamp is connected to work piece properly.
	Mains Voltage is not constant	Change the Main Supply to an alternative
Hot Welding Clamp	Welding clamp rated current is too small	Replace with larger size welding clamp
Excessive Spatter	Wire feed speed set too high	Select lower wire feed speed
	Voltage too high	Select a lower voltage setting
	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.
Porosity - small cavities or holes resulting from gas pockets in weld metal	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
	MIG torch euro connect O-Ring missing or damaged	Check and replace the O-Ring
	Holding the torch too far away	Bring the torch closer to the work and maintain stick out of 5-10mm
Wire stubbing during welding	Welding voltage set too low	Increase the voltage
	Wire speed set too high	Decrease the wire feed speed

Issue	Possible Reason	Suggested Remedy
	Contaminated base metal	Remove materials like paint, grease, oil, and dirt, including mill scale from base metal.
Lack of Fusion – failure of weld metal to fuse completely with base metal or a proceeding weld bead	Not enough heat input	Select a higher voltage range and /or adjust the wire speed to suit.
	Improper welding technique	Keep the arc at the leading edge of the weld pool. Gun angle to work should be between 5 & 15° Direct the arc at the weld joint Adjust work angle or widen groove to access bottom during welding Momentarily hold arc on side walls if using weaving technique.
	Too much heat	Select a lower voltage range and /or adjust the wire speed to suit Increase travel speed.
Excessive Penetration – weld metal melting through base metal	Poor in incorrect joint preparation	Ensure joint fit up is correct
Lack of Penetration – shallow fusion between weld metal and base metal	Not enough heat input	Select a higher voltage range and /or adjust the wire speed to suit Reduce travel speed.
	Contaminated base metal	Remove materials like paint, grease, oil, and dirt, including mill scale from base metal.

MIG WIRE FEED TROUBLESHOOTING

Possible Reason	Suggested Remedy
Adjusting wrong dial	Be sure to adjust the wire feed and voltage dials for MIG welding.
Incorrect wire speed setting	Adjust the wire feed speed
Voltage setting incorrect	Adjust the voltage setting
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

Possible Reason	Suggested Remedy
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 E.g. 0.8mm wire requires 0.8mm 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
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

OPERATIONAL ENVIRONMENT

- Height above sea level $\leq 1000\text{m}$
- Operation temperature range $-10\sim +40^{\circ}\text{C}$
- Air relative humidity is below 90% (20°C)
- Preferably site the machine above floor level, ensure the maximum angle does not exceed 15 degrees.
- Protect the machine against heavy rain and against direct sunshine.
- The content of dust, acid, corrosive gas in the surrounding air or substance must not exceed normal standards.
- Take care that there is sufficient ventilation during welding. There must be at least 30cm free distance between the machine and wall.

For other tips and troubleshooting refer to our website www.dynaweld.com.au/troubleshooting

NOTES

OTHER PRODUCTS IN OUR RANGE

- ELECTRODES
- TIG RODS
- WELDING HELMETS
- WELDING MACHINES
- TORCH SPARE PARTS
- WELDING ACCESSORIES
- MIG WIRE
- GAS EQUIPMENT
- WELDING SAFETY
- MIG TORCHES
- TIG TORCHES
- WELDING CABLE

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