How to Use the Hobart Handler® 140 MIG Welder and Check out process

Hobart Handler® 140 MIG Welder

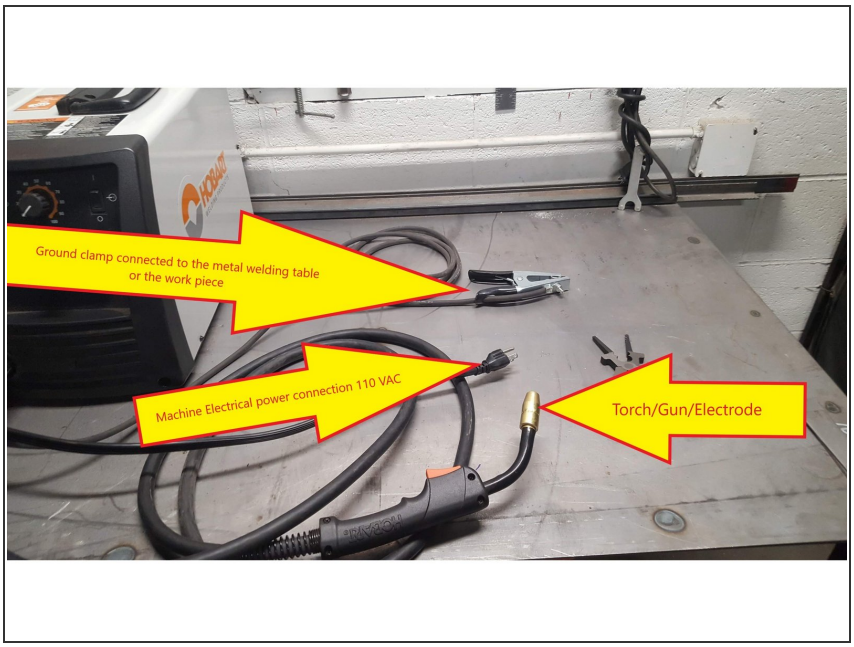
INTRODUCTION

Using the Hobart Handler® 140 MIG Welder

Step 1 — Safety

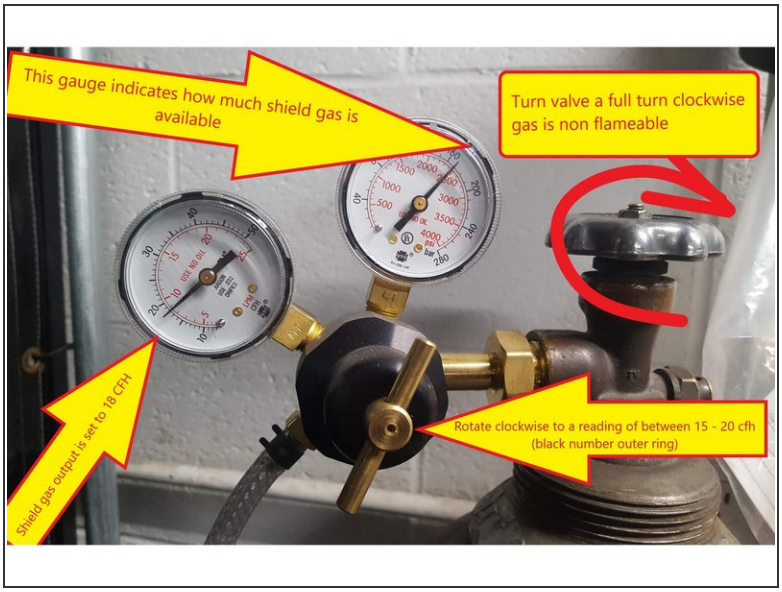
- Apparel – all skin should be covered by leather of non-synthetic fabric – synthetics can melt and cause burns. Exposed skin will get sunburned from electric arc flash.
- Leather gloves should be worn to protect hands – avoid handling hot metal with gloves – use pliers instead
- Helmet- Mig welding needs at least a shade 11 lens welding helmet. (Higher is darker)
- Don’t weld galvanized metal, or any metal with a plating (chrome, galvanized, cad-plated, etc.) These can release poisonous gases – especially galvanized. If you need to weld these, grind off surface anywhere near the weld.
- Don’t weld anything that has been in contact with flammable liquids (IE don’t weld gas tanks or oil pans)

Step 2 — Machine electical components



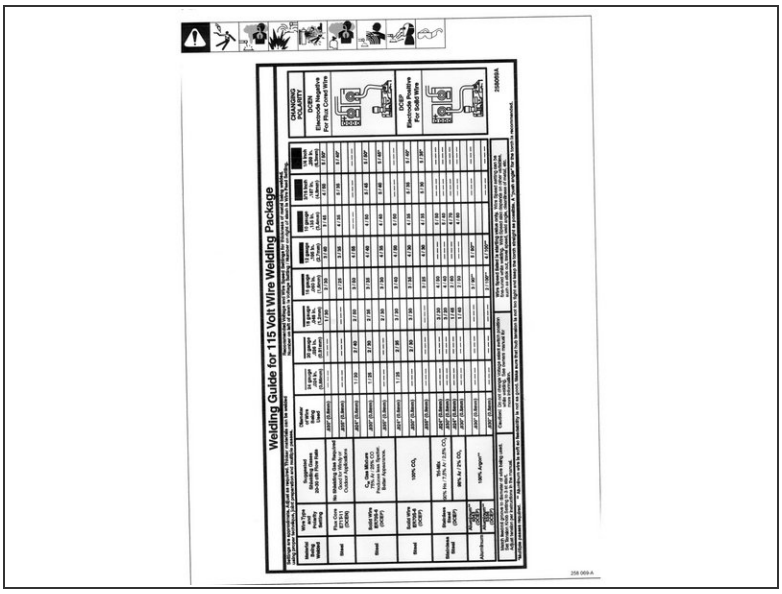
- Machine Electrical power connection 110 VAC
- Ground clamp connected to the metal welding table or the work piece
- Torch/Gun/Electrode where all the sparks and welding takes place.

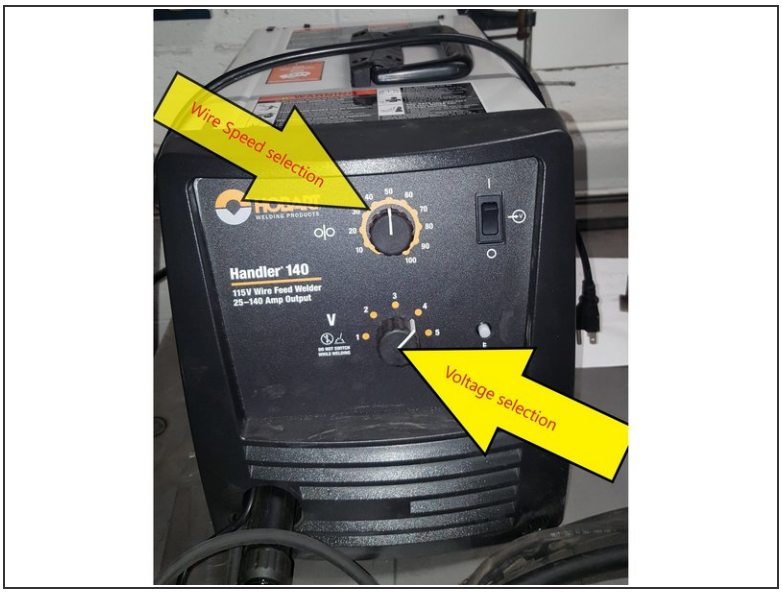
Step 3 — Turning on and setting shield gas



- Open Argon/ CO2 75/25 tank main valve all the way. check that shield gas is set to 20 cfh (cubic feet per hour) on gauge. If you are getting bad welds, it is likely that you forgot to open the shielding gas.

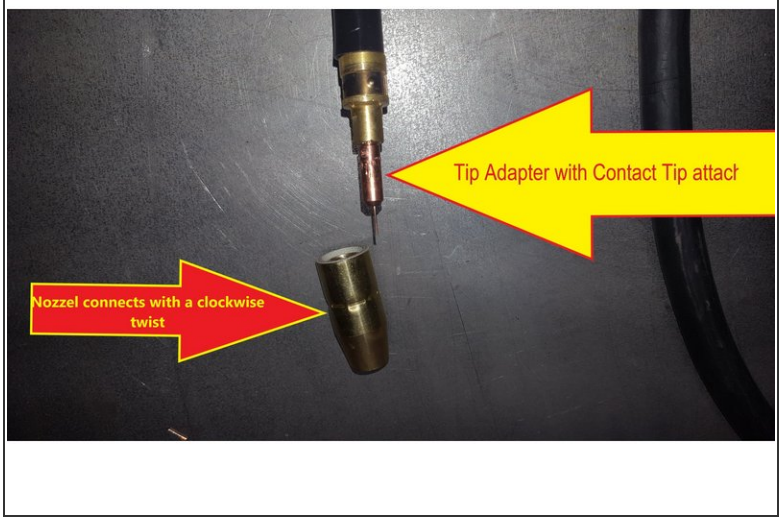
Step 4 — Demonstrate Measure material to be welded and determine manufacuture recommeded setting

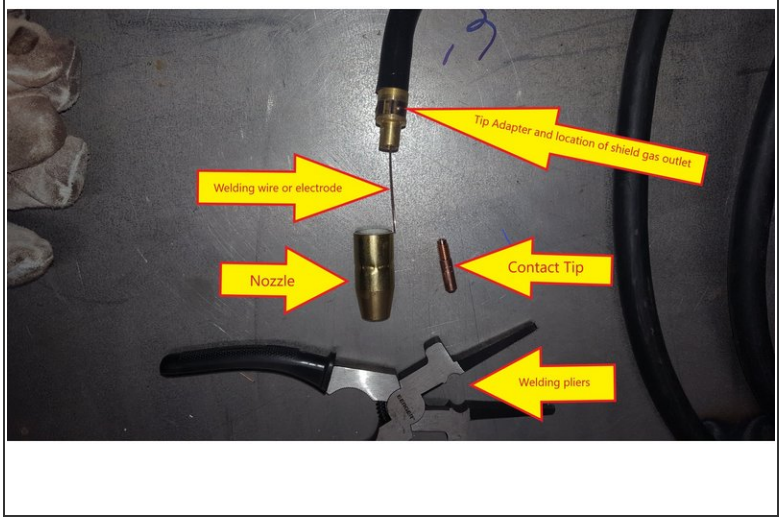




- To use the chart, determine the thickness of your metal, and the current wire thickness (it will generally be .030). We use Argon CO2 gas, so locate the line on the chart for Argon CO2 and .030 wire and go across to your metal thickness. Dial in the correct voltage and wire feed rate.
- A copy of the chart is posted in the welding area for convenience. The chart is also located on the inside cover door panel left side where wire spool is located.
- As an example the steel is determined 10 gauge (.135 inch) the wire speed would be 4 and voltage 50.
- If your weld is high, or flat you may need to adjust voltage and wire speed. See pages at the back of this SOP for guidance.

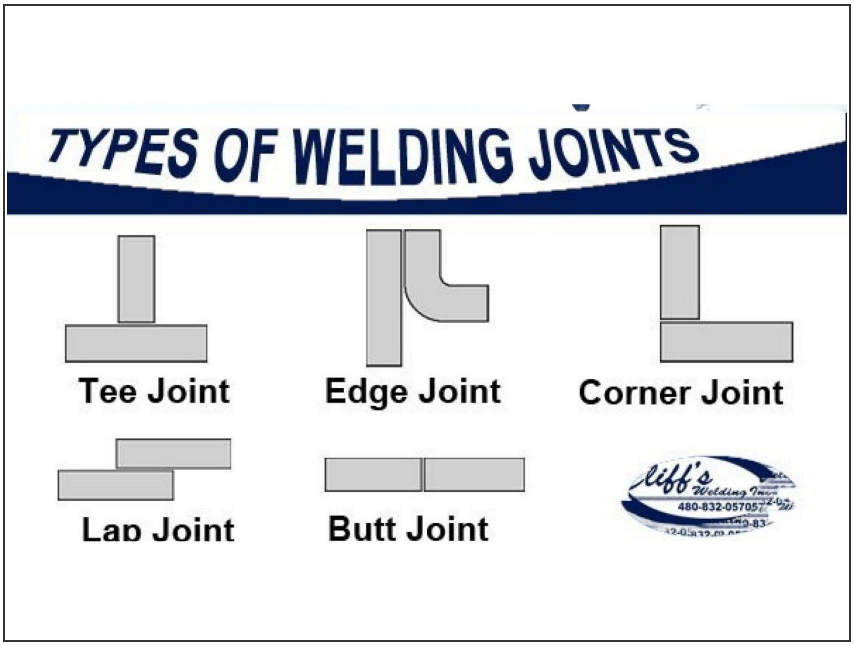
Step 5 — Torch/Gun/Electrode Assemply





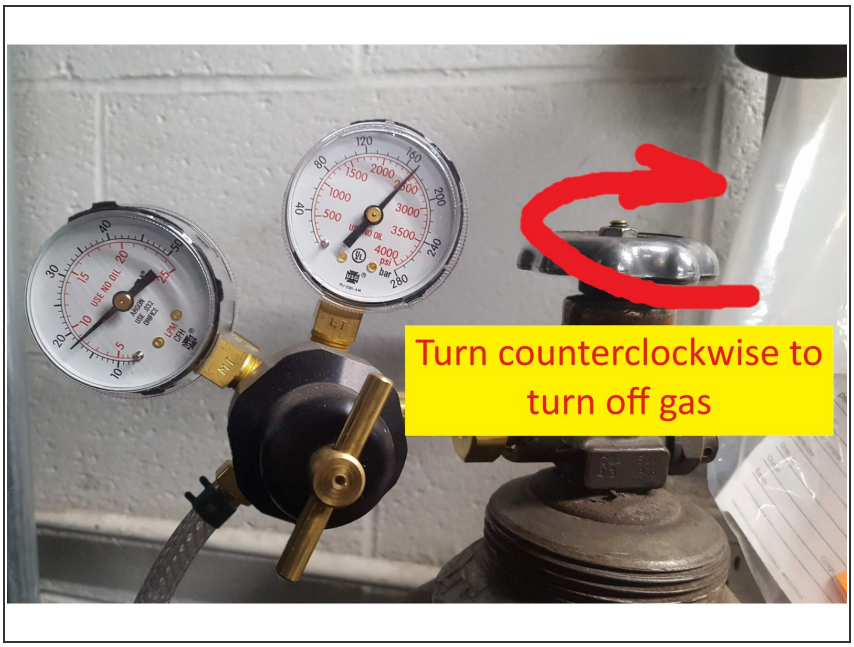
- While welding, the nozzle may get a buildup. This will block the flow of shielding gas. Nozzle gel can be used to reduce this problem. From time to time you should remove the nozzle and use the welding pliers to remove buildup.
- The mig tip can become clogged. If this happens, first see if running the ruff edge of the pliers or a wire over the mig tip will release the wire. If not, you may need to unscrew the mig tip and replace it with a new one.
- Contact Tip only needs be snug. Do not over tighten as will damage the tip cause multiple issues including wire not feeding properly
- Nozzle goes on with a twist. You do not require an tools to attach. The nozzle keeps the shield gases concentrated in the weld area.

Step 6 — Weld demonstration and checkout



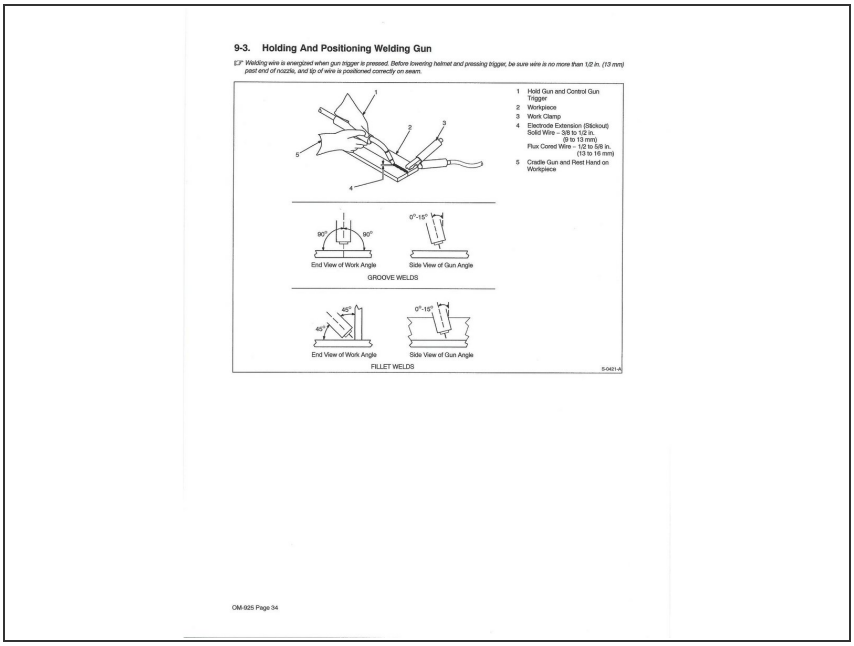
- Retrieve demonstration material
- go over setup and shutdown, including cleanup and when the grinder is needed during cleanup.
- Material must be clean (no galvanized or painted surfaces where welding/remove dirt and oil before welding). Cleaning material with grinder may be necessary to remove mill scale, rust, or and other material that will inhibit proper welding.
- Demonstrate spot welding minimum of 3 beads
- Demonstrate lap weld Also considered a fillet type, the weld can be made on one or both sides. A Lap Joint is formed when 2 pieces are placed in an over lapping pattern on top of each other.
- Demonstrate Butt welds are welds where two pieces of metal to be joined are in the same plane. Talk about chaphering.
- Demonstrate Tee weld/ Tee welding joints are formed when two members intersect at a 90° angle which makes the edges come together in the center of a plate or component. Tee Joints are considered a type of fillet weld, and can also be made when a pipe or tube is welded onto a base plate.

Step 7 — Shut down and Clean-up



- Turn off machine
- Turn off Argon/CO2 cylinder.
- Coil stinger(welding tip) and ground cable clean area and put tools away
- if spatter or welds stick to table, remove with angle grinder.
- Put away helmets, lens up to prevent scratching

Step 8 — Holding And Positioning Welding Gun


9-3. Holding And Positioning Welding Gun

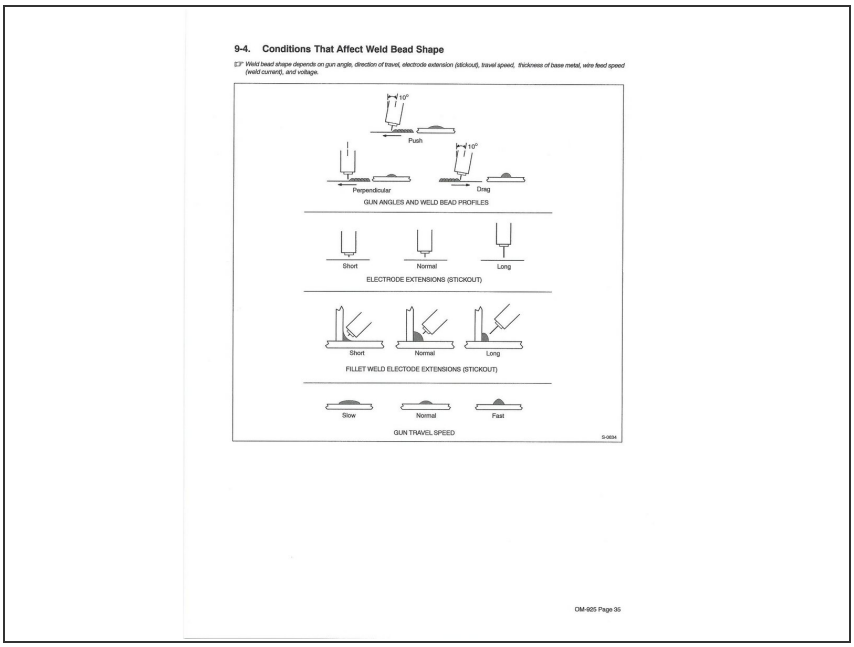
1 Hold Gun and Control Gun Trigger
2 Workpiece
3 Work Clamp
4 Electrode Extension (Stickout) Solid Wire – 3/8 to 1/2 in. (9 to 13 mm) Flux Cored Wire – 1/2 to 5/8 in. (13 to 16 mm)
5 Cradle Gun and Rest Hand on Workpiece

End View of Work Angle
Side View of Gun Angle
GROOVE WELDS
End View of Work Angle
Side View of Gun Angle
FILLET WELDS

OM-925 Page 34

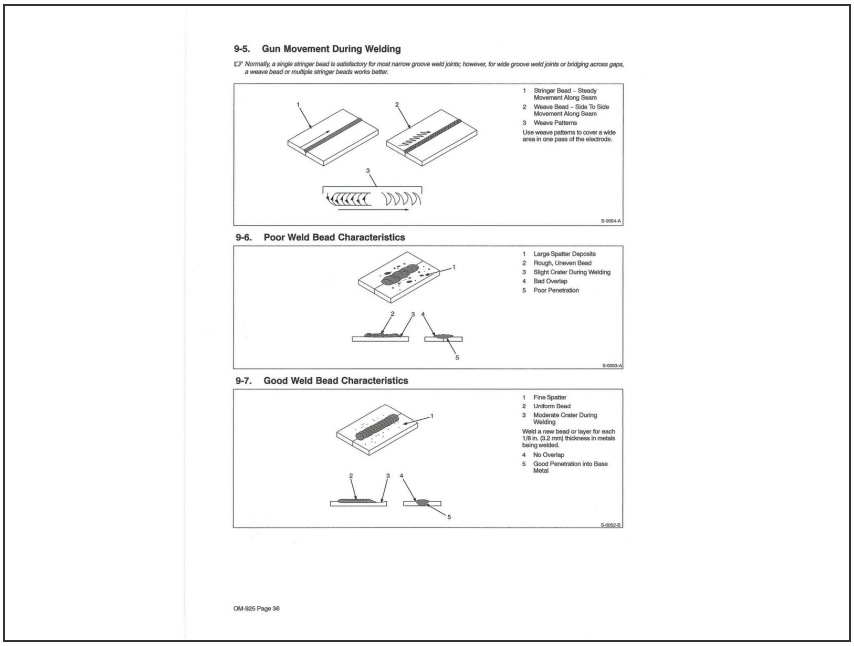
- Welding wire is energized when gun trigger is pressed. Before lowering helmet and pressing trigger, be sure wire is no more than 1/2 in. (13 mm) past end of nozzle, and tip of wire is positioned correctly on seam.

Step 9 — Conditions That Affect Weld Bead Shape



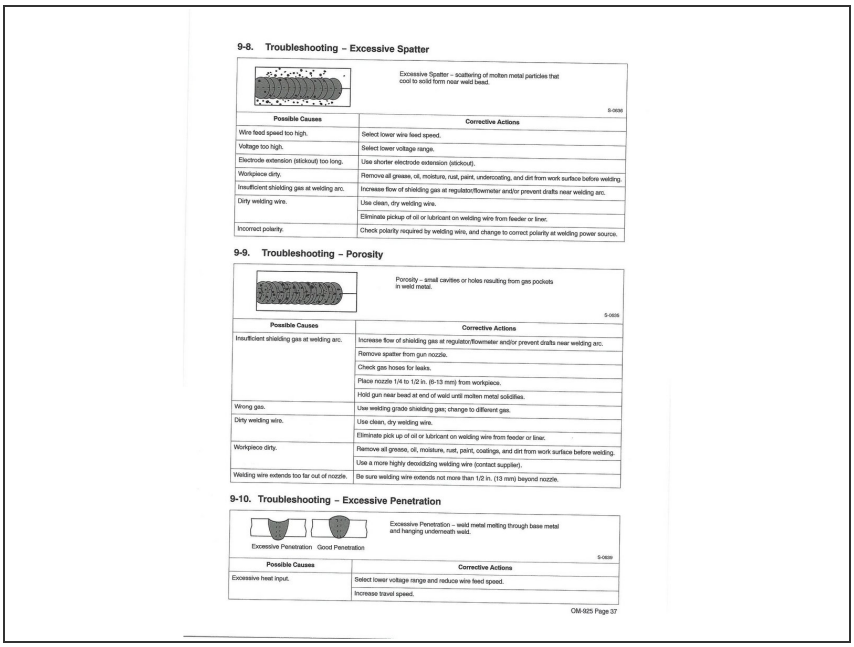
- Weld bead shape depends on gun angle, direction of travel, electrode extension (stickout), travel speed, thickness of base metal, wire feed speed (weld current), and voltage.

Step 10 — Gun Movement During Welding



- Normally, a single stringer bead is satisfactory for most narrow groove weld joints; however, for wide groove weld joints or bridging across gaps, a weave bead or multiple stringer beads works better.

Step 11 — Troubleshooting – Excessive Spatter



9-8. Troubleshooting – Excessive Spatter

Excessive Spatter – scattering of molten metal particles that cool to solid form near weld bead.

S-0036

Possible Causes	Corrective Actions
Wire feed speed too high.	Select lower wire feed speed.
Voltage too high.	Select lower voltage range.
Electrode extension (stickout) too long.	Use shorter electrode extension (stickout).
Workpiece dirty.	Remove all grease, oil, moisture, rust, paint, undercoating, and dirt from work surface before welding.
Insufficient shielding gas at welding arc.	Increase flow of shielding gas at regulator/flowmeter and/or prevent drafts near welding arc.
Dirty welding wire.	Use clean, dry welding wire.
	Eliminate pickup of oil or lubricant on welding wire from feeder or liner.
Incorrect polarity.	Check polarity required by welding wire, and change to correct polarity at welding power source.

9-9. Troubleshooting – Porosity

Porosity – small cavities or holes resulting from gas pockets in weld metal.

S-0035

Possible Causes	Corrective Actions
Insufficient shielding gas at welding arc.	Increase flow of shielding gas at regulator/flowmeter and/or prevent drafts near welding arc.
	Remove spatter from gun nozzle.
	Check gas hoses for leaks.
	Place nozzle 1/4 to 1/2 in. (6-13 mm) from workpiece.
	Hold gun near bead at end of weld until molten metal solidifies.
Wrong gas.	Use welding grade shielding gas; change to different gas.
Dirty welding wire.	Use clean, dry welding wire.
	Eliminate pick up of oil or lubricant on welding wire from feeder or liner.
Workpiece dirty.	Remove all grease, oil, moisture, rust, paint, coatings, and dirt from work surface before welding.
	Use a more highly deoxidizing welding wire (contact supplier).
Welding wire extends too far out of nozzle.	Be sure welding wire extends not more than 1/2 in. (13 mm) beyond nozzle.

9-10. Troubleshooting – Excessive Penetration

Excessive Penetration Good Penetration

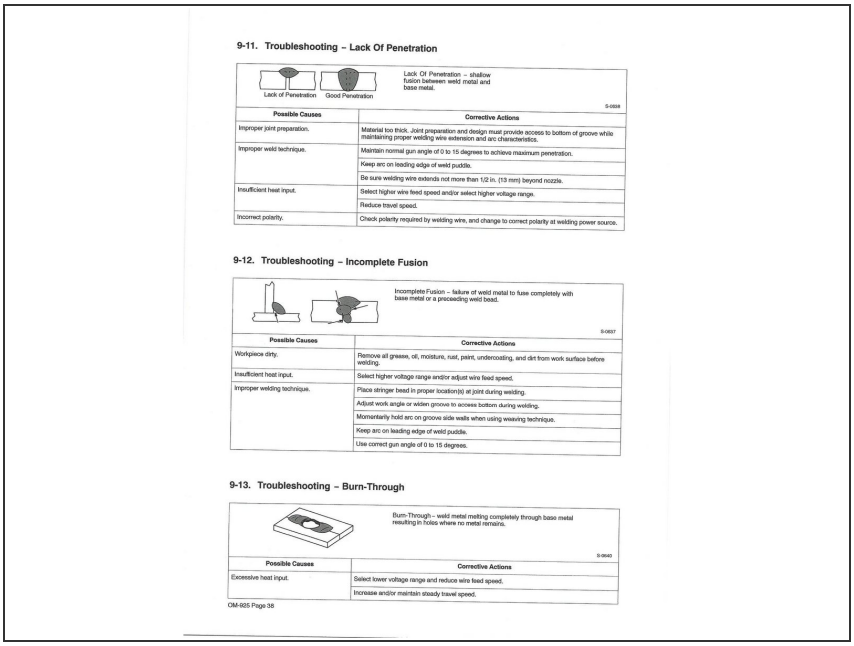
Excessive Penetration – weld metal melting through base metal and hanging underneath weld.

S-0039

Possible Causes	Corrective Actions
Excessive heat input.	Select lower voltage range and reduce wire feed speed.
	Increase travel speed.

OM-925 Page 37

Step 12 — Troubleshooting – Lack Of Penetration



9-11. Troubleshooting – Lack Of Penetration

Lack of Penetration Good Penetration

Lack Of Penetration – shallow fusion between weld metal and base metal.

S-0038

Possible Causes	Corrective Actions
Improper joint preparation.	Material too thick. Joint preparation and design must provide access to bottom of groove while maintaining proper welding wire extension and arc characteristics.
Improper weld technique.	Maintain normal gun angle of 0 to 15 degrees to achieve maximum penetration.
	Keep arc on leading edge of weld puddle.
	Be sure welding wire extends not more than 1/2 in. (13 mm) beyond nozzle.
Insufficient heat input.	Select higher wire feed speed and/or select higher voltage range.
	Reduce travel speed.
Incorrect polarity.	Check polarity required by welding wire, and change to correct polarity at welding power source.

9-12. Troubleshooting – Incomplete Fusion

Incomplete Fusion – failure of weld metal to fuse completely with base metal or a preceding weld bead.

S-0037

Possible Causes	Corrective Actions
Workpiece dirty.	Remove all grease, oil, moisture, rust, paint, undercoating, and dirt from work surface before welding.
Insufficient heat input.	Select higher voltage range and/or adjust wire feed speed.
Improper welding technique.	Place stringer bead in proper location(s) at joint during welding.
	Adjust work angle or widen groove to access bottom during welding.
	Momentarily hold arc on groove side walls when using weaving technique.
	Keep arc on leading edge of weld puddle.
	Use correct gun angle of 0 to 15 degrees.

9-13. Troubleshooting – Burn-Through

Burn-Through – weld metal melting completely through base metal resulting in holes where no metal remains.

S-0040

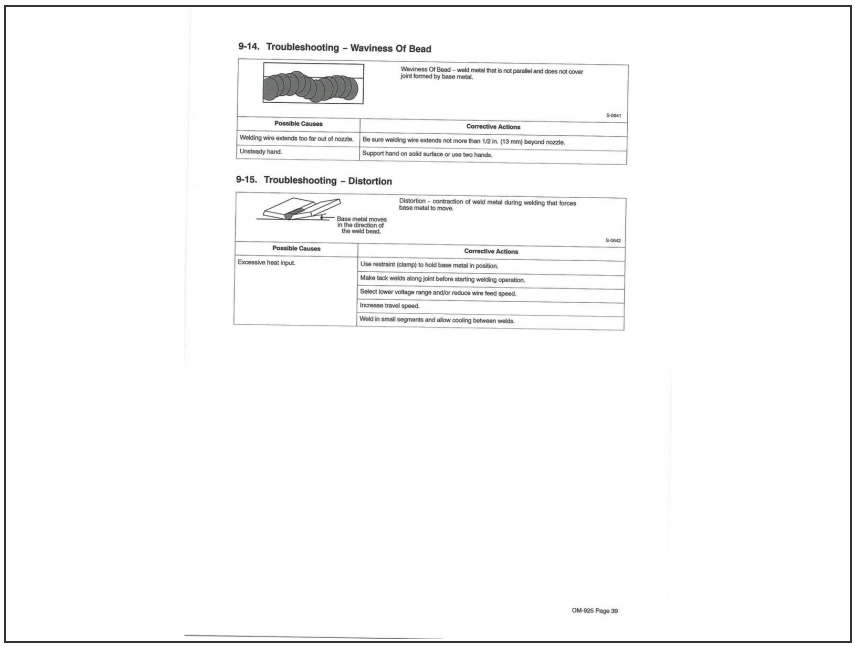
Possible Causes	Corrective Actions
Excessive heat input.	Select lower voltage range and reduce wire feed speed.
	Increase and/or maintain steady travel speed.

OM-925 Page 38

- Insert wisdom here.

- Insert wisdom here.

Step 13 — Troubleshooting – Waviness Of Bead



9-14. Troubleshooting – Waviness Of Bead

Waviness Of Bead – weld metal that is not parallel and does not cover joint formed by base metal.

S-0441

Possible Causes	Corrective Actions
Welding wire extends too far out of nozzle.	Be sure welding wire extends not more than 1/2 in. (13 mm) beyond nozzle.
Unsteady hand.	Support hand on solid surface or use two hands.

9-15. Troubleshooting – Distortion

Base metal moves in the direction of the weld bead.

Distortion – contraction of weld metal during welding that forces base metal to move.

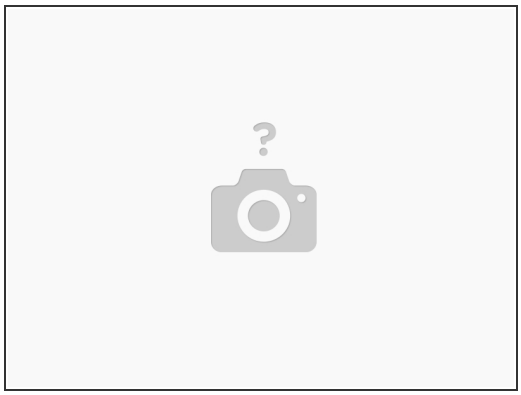
S-0442

Possible Causes	Corrective Actions
Excessive heat input.	Use restraint (clamp) to hold base metal in position.
	Make tack welds along joint before starting welding operation.
	Select lower voltage range and/or reduce wire feed speed.
	Increase travel speed.
	Weld in small segments and allow cooling between welds.

OM-925 Page 39

- Insert wisdom here.

Step 14 — Additional Resources



- Beginner’s Guide To MIG Welding. Everything you need to Get Started & More!
- https://www.youtube.com/watch?v=W4-eYXsU...
- YouTube weldingtipsandtricks Mig Welding Basics Series 1- 4
- https://www.youtube.com/watch?v=W4-eYXsU...