

MIG WELDER

VERSION 3.1



AUTODESK
PIER 9

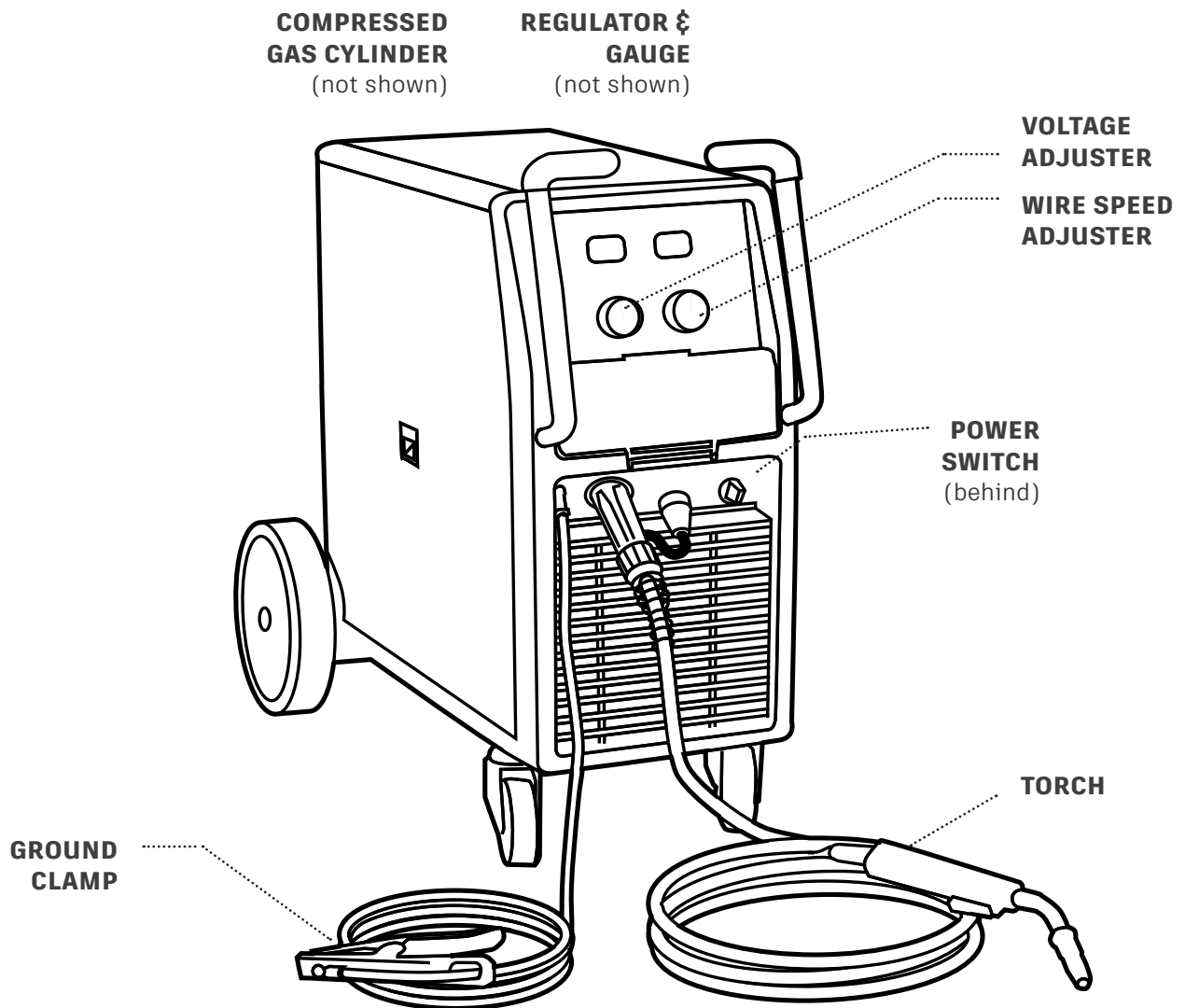
MIG WELDER

MACHINE
INTRODUCTION

VERSION 3.1

THE MIG WELDER IS USED TO PERMANENTLY JOIN PIECES OF METAL.

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MATERIALS

i ALLOWED MATERIALS

+ Mild Steel

x BANNED MATERIALS

+ Painted or plated materials

▶ All coatings must be 100% removed by grinding before being welded.

+ Galvanized metal

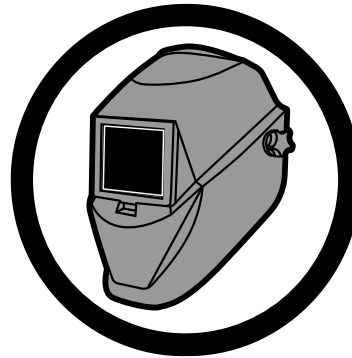
? SEE SHOP STAFF FIRST

+ Aluminum

+ Stainless steel

TAKE PROPER SAFETY PRECAUTIONS WHEN OPERATING THE MIG WELDER.

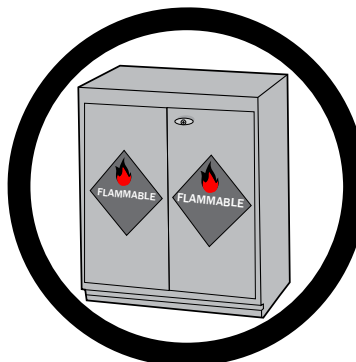
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Always wear a welding hood with a shade 10 or darker lens and safety glasses under the hood.



Always wear long gauntlet leather gloves, welding jacket, apron and leather shoes. Pull back and tuck in long hair, remove jewelry and lanyards, etc.



Ensure that the area is totally clear of any flammable or combustible objects.

THERE ARE MANY UNIQUE SAFETY PRECAUTIONS TO CONSIDER WHEN WELDING.

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PIER 9 WELDING FIRE WATCH

The fire code requires a *fire watch* policy.

- + After welding, users must return the welding area twice to check for signs of fire.
 - ▶ Return to the area 30 minutes after welding.
 - ▶ Return again, 30 minutes later.

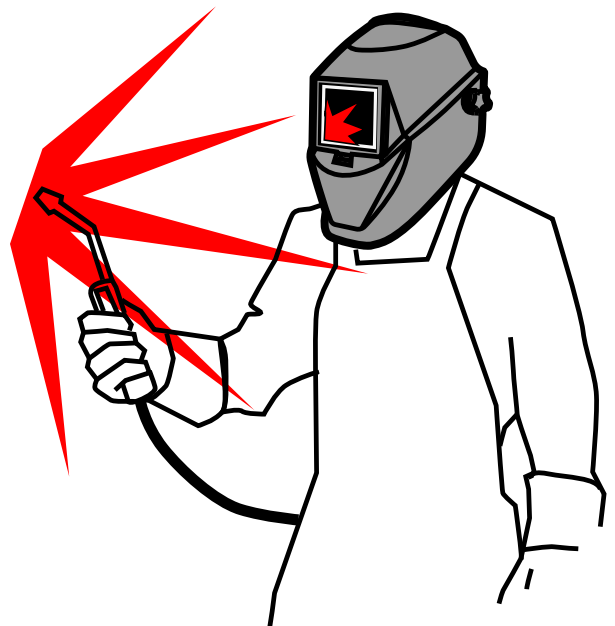
REQUIRED WELDING SPECIFIC SAFETY GEAR

- + Long sleeves and pants - natural fibers or leather
- + Leather shoes
- + Long gauntlet leather gloves
- + Welding hood - shade 10 or darker

ULTRA VIOLET (UV) LIGHT EXPOSURE

UV exposure will cause painful burns, similar to a sunburn.

- + Cover all skin from arc flash, at all times.
- + A full welding hood, at least #10 or darker, must be worn at all times.
- + All people in the welding area must wear all protective gear.
- + Fully surround the area with welding screens at all times.



WELDING COATED METAL

Metal with coatings like paint or powdercoat can emit harmful gases when heated.

- + Grind off all coatings before welding.
- + Use the fume extractor when grinding and when welding.
- + Never wear gloves when grinding.
- + Grinding or welding of galvanized material is not allowed.

TURN ON FUME EXTRACTOR WHEN GRINDING OR WELDING. TURN OFF WHEN FINISHED.

MIG BASICS

The basic steps to MIG weld:

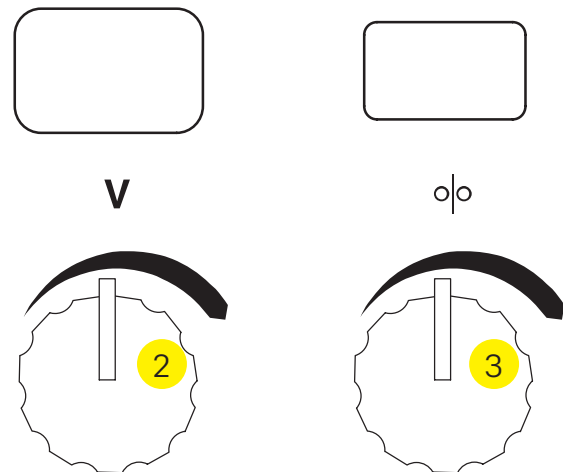
1. The material must be grounded to the welder with the *ground clamp*.
 - ▶ Connect the ground clamp close to the area to be welded.
 - ▶ Grind any rust or paint before attaching the ground clamp.
2. When the *trigger* is pulled, the welder electrically energizes a wire on a spool inside the welder.
 - ▶ The wire is pushed through the hose, and out the end of the *torch*.
3. A *shielding gas* flows from a *compressed gas cylinder* to the end of the torch.
 - ▶ The gas keeps oxygen away from the weld until it cools and solidifies.
4. An electrical arc forms between the wire and the workpiece, creating temperatures high enough to melt the wire and workpiece.
5. The workpieces and wire melt and flow together, creating a single piece of metal.
 - ▶ The resulting weld should be stronger than the original material.

ADJUSTMENTS & SETTINGS

There are two main adjustments for welding.

- + Voltage
 - ▶ Higher voltage creates more heat, which is used for thicker material.
- + Wire speed
 - ▶ Faster wire speed will put more wire out the end of the torch. Higher voltage usually requires a higher wire speed.

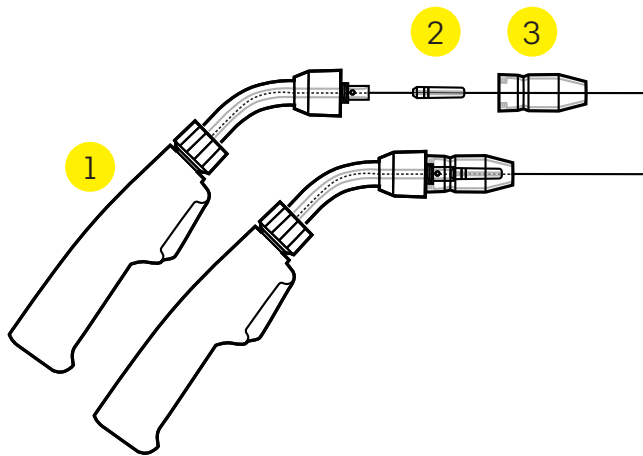
Always adjust the welder to match the wall chart that shows the suggested settings based on wire size, shielding gas, metal alloy and metal thickness.



CONTROL PANEL

The 252 has a simple control panel.

1. Use the wall chart to determine voltage and wire speed.
2. Set the voltage with the voltage knob.
 - ▶ The display will show the voltage.
3. Set the wire speed with the wire speed knob.
 - ▶ The display will show wire speed in inches per second.



MIG TORCH

The MIG torch has 3 main parts, plus the wire.

1. Torch body
 - ▶ The handle and trigger
2. Contact tip
 - ▶ The tip attaches to the end of the torch.
 - ▶ If the contact tip is damaged, see Shop Staff for assistance.
3. Gas nozzle
 - ▶ The replaceable nozzle slides or screws on the end of the torch. It helps to focus the shielding gas out the end of the torch.

COMPRESSED GAS CYLINDER HANDLING

Gas cylinders are pressurized up to 4,500 PSI and can be deadly if not handled correctly. Only Shop Staff may move or change cylinders.

Shop users can only turn on the gas. Flow and pressure are pre-set by shop staff.

- ▶ Never remove or unscrew the regulator.

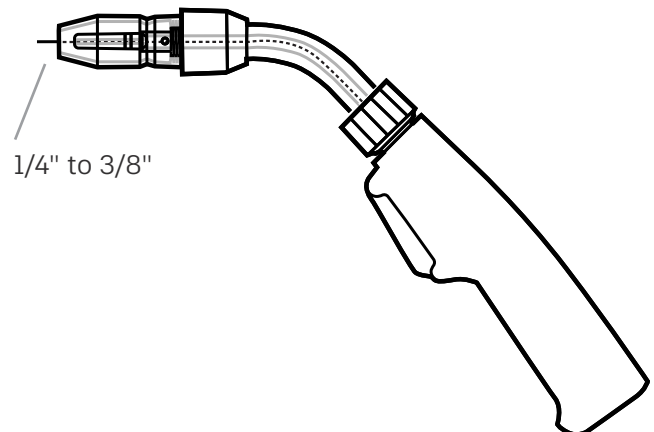
OPENING THE VALVE

1. Stand to the side of the cylinder, on the opposite side of the regulator.
2. Open the valve all the way, gently.
 - ▶ The cylinder pressure gauge will show the bottle pressure.
 - ▶ The working pressure gauge will show pressure at the torch.
 - ▶ A flow meter will show the gas flow in cubic feet per hour.

SETTING THE GAS FLOW

Refer to charts on the machine to set the proper gas pressure for your work.

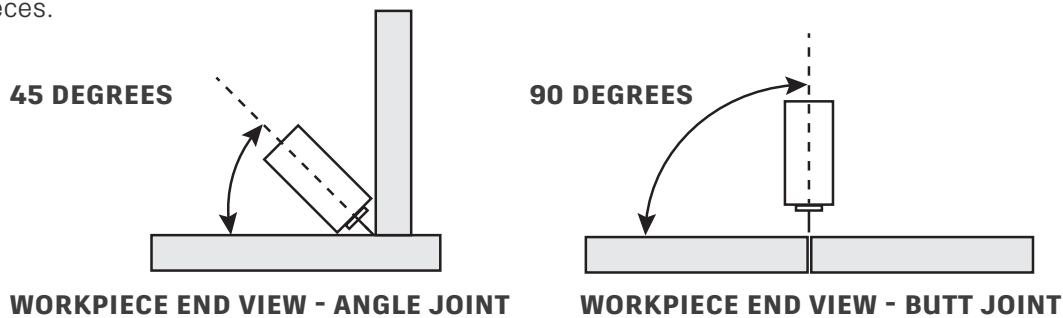
1. Turn on the welder.
2. Turn the wire speed as low as it will go.
3. Turn the voltage as low as it will go.
4. Pull the trigger on the torch in order to start the gas flow.
 - ▶ Make sure that the wire that comes out of the torch doesn't touch anything grounded, the gas cylinder or the welder
5. Release the trigger.
6. Cut the wire so it sticks out 1/4" to 3/8" from the gas nozzle.



HOLDING AND MOVING THE TORCH

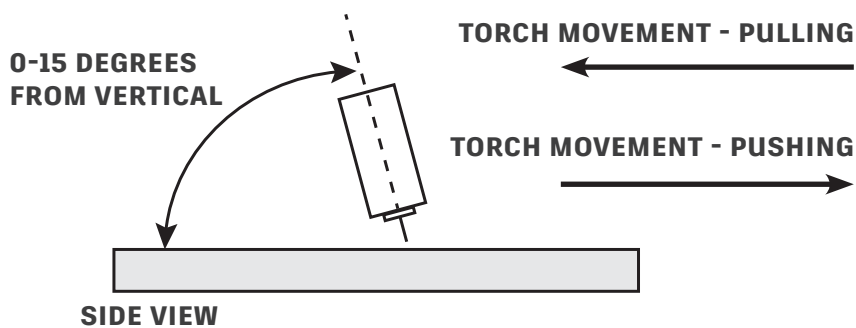
Hold the torch so the wire is about 1/4" above the workpiece.

The angle that the torch intersects the workpiece is known as the *work angle*. In general the torch should bisect the angle of the two workpieces.



The angle of the torch in relation to its movement is known as the *torch angle*.

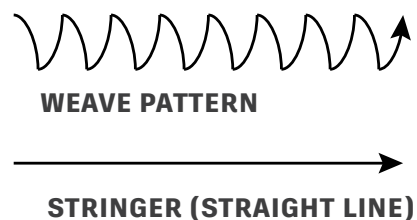
- ▶ The torch can be *pulled* or *pushed*, depending on many factors including personal preference.



MOVING THE TORCH

The torch can be moved in a straight line (stringer bead), or in small overlapping arcs (weave pattern).

- ▶ A stringer is best for very thin material that cannot take much heat.
- ▶ A weave is better for thicker materials that require more heat.



AREA AND MACHINE PREPARATION

1. Clean and clear the table.
2. Prepare your workpiece.
 - ▶ Grind all coatings from the metal.
 - ▶ Use the fume extractor when grinding.
3. Adjust the welding screens to protect people in the shop from flash.
4. Remove all flammable and combustible materials from the area.
5. Cover the exposed parts of the table with the aluminum covers.
6. Attach the ground clamp to the workpiece.
7. Slowly open the gas bottle fully.
8. Turn the machine on.
9. Set the voltage and wire feed according to the chart.

REMOVE GLOVES WHEN GRINDING ANY METAL.

OPERATING THE MACHINE

1. Bring the torch to approximately a 1/4" from the surface to be welded.
2. Hold the torch at the correct angle.
3. Pull the trigger to begin the weld.
4. Pull or push the torch along the seam where the two pieces will be welded.
5. Release the trigger.

EXPERIENCE & PRACTICE WILL TEACH THE PROPER SPEED FOR MOVING THE TORCH ALONG THE WELD.

CLEANUP

1. Turn the wire feed and voltage down to the minimum setting.
2. Close the tank valve completely.
3. Press the trigger to release any gas.
 - ▶ Point the torch away from anything grounded.
4. Turn off the welder.
5. Clean the tip of the torch of welding debris.
6. Loosely coil the cables and hang them from the welder.
7. Put your materials away and put the machine back in its storage location.

MAKE SURE TO RELEASE ALL GAS PRESSURE FROM THE SYSTEM DURING CLEANUP.