

# Instruction Manual



FYMIG306L

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Our equipment is approved by the following car manufacturers(China)



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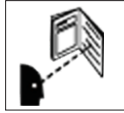
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# 1. SAFETY PRECAUTIONS SYMBOLS



To protect yourself and others from injury, read and follow these precautions before installation and operation.



Read instructions.  
1. Read the manual before using or servicing unit.  
2. Use only manufacturer's supplied replacement.



Electric shock can kill:  
1. Do not touch live electrical parts.  
2. Wear dry, hole-free insulating gloves and body protection.  
3. Do not wrap electrical cable around your body.  
4. Ground the workpiece with a good electrical ground.



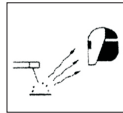
Exploding parts can injure. Always wear a face shield and long sleeves.



Fumes and gases can be hazardous: Welding produces fumes and gases. Breathing these fumes and gases can be hazardous to your health. If inside, ventilate the area. Do not weld in a confined space only if it is well ventilated.



Static can damage PC boards  
1. Put on grounded wrist strap before handling boards or parts.  
2. Use proper static-proof bags and boxes to store, move or ship PC boards.



Eye protection for welding:  
Current level in amperage / Minimum shade number  
30-150A / #8  
150-300A / #10  
300-500A / #12



1. Wear approved face shield or safety goggles with side shields.  
2. Wear proper body protection to protect skin.



Moving parts can cause injury.



Flying metal can injure eyes. Wear safety glasses with side shields or face shield.



Keep away from moving parts such as fans.



1. Magnetic fields can affect pacemakers. Pacemaker wearers keep away.  
2. Wearers should consult their doctor before going near plasma arc cutting operations.



The heat from the workpiece can cause serious burns.



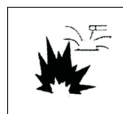
Overuse can cause overheating. Allow cooling period, follow rated duty cycle before starting to weld again.



Keep away from the torch tip.



Cylinders can explode if damaged. Gas cylinders contain gas under high pressure. If damaged, a cylinder can explode. Be sure to treat them carefully.



Remove all flammables of the welding area.



Do not weld in the height !



Falling unit can cause injury.



Fire or explosion hazard.  
Do not locate unit on, over, or near combustible surfaces. Do not install unit near flammables.

Never cut on pressurized cylinder.



Protect yourself!



Warn others!



OK



OK





















Factory safety!



Maintenance regularly!

## 2. SYMBOLS AND DESCRIPTIONS

### Symbols and Definitions

<b>A</b> Amperes	 Gas Metal Arc Welding (GMAW) Gun	<b>I</b> On	<b>%</b> Percent
<b>V</b> Volts	 Wire Feed	<b>O</b> Off	 Increase
<b>I<sub>2</sub></b> Rated Welding Current	<b>IP</b> Degree of Protection	 Protective Earth (Ground)	 Line Connection
<b>S<sub>1</sub></b> Power Rating, Products of Voltage and Current	 Single Phase	 No / Do Not Do This	 Loose Shield Cup
<b>HZ</b> Hertz	<b>X</b> Duty Cycle	 Gas Input	 Adjust Air/Gas Pressure
<b>U<sub>1</sub></b> Primary Voltage	 Direct Current	 Gas Output	 Do Not Switch While Welding
<b>U<sub>0</sub></b> Rated No Load Voltage (Average)	 Constant Current	 Input	 Wire Feed Spool Gun
<b>U<sub>2</sub></b> Conventional Load Voltage	 Temperature	 Voltage Input	

### Description:

Our semi-automatic welder is an all-in-one MIG shielding gases welder (GMAW) with high efficiency that is an ideal substitute for manual arc welding. Most advanced circuit design and technology are adopted. Excellent performances, supreme reliability, quality welding requirements can be satisfied. Spot weld, groove weld, and fillet weld are available. Most commonly used shielding gases are applicable such as Co<sub>2</sub>, AR, CO<sub>2</sub>+AR, CO<sub>2</sub>+O, etc.

Suitable for welding of various metallic materials such as mild steel, low carbon steel, low alloy steel, stainless steel, steel, iron, copper, aluminum, nickel, etc. Extensively used in the welding and field operation of oil pipeline, chemical, car fabrication, shipyard, etc.

### 3. INSTALLATION

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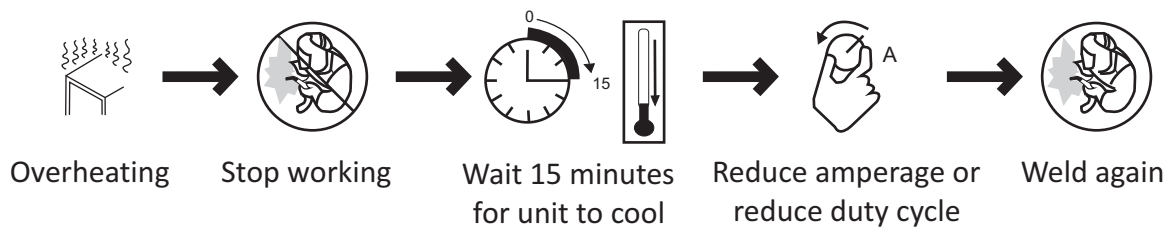
#### 3.1 Specifications

Model	FYMIG306L
Input Voltage (V)	AC 380 Three Phase
Frequency (Hz)	50/60
Rated Input Power (KW)	8
Rated Input Current (A)	12
Rated Output Current (A)	310
Output Voltage (V)	15.7-35
No-load Voltage (V)	50
Welding Wire Diameter (mm)	0.6, 0.8, 0.9, 1.0
Duty Cycle	65%
Insulation Class	F
Dimensions (mm)	1060*500*1130

## 3. INSTALLATION

### 3.2 Duty Cycle and Overheating

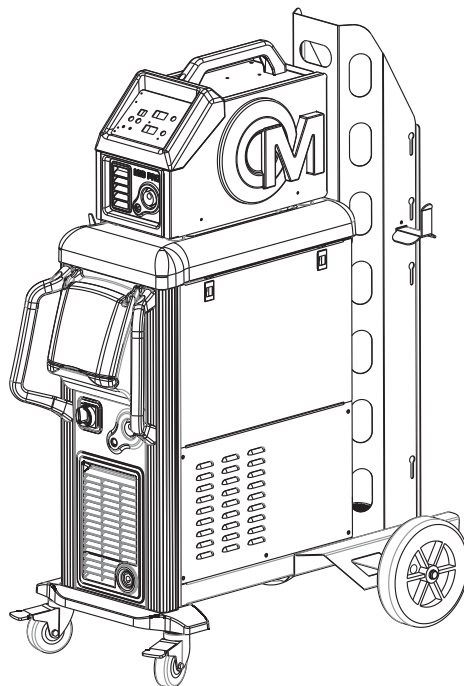
1. Overheat protection is installed on the aluminium board of main transformer and rectifier. The unit produces heat while welding.
2. If unit overheats, output stops, and cooling fan runs.
3. Wait fifteen minutes for unit to cool. Reduce amperage or voltage, or duty cycle before welding.



## 3. INSTALLATION

### 3.3 Machine Installation

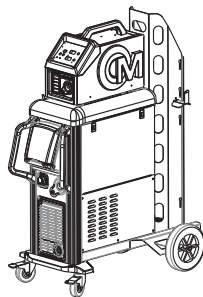
1. Open the package and find out the Manual.
2. Check the details of accessories according to packing list that attached to this manual.
3. Properly install this equipment as following diagram. Inspect the unit for any damage. If so, contact your local distributor or service agency.
4. The unit should not be located under sunshine. The worksite should be in low humidity and without dust.
5. Operating Temperature range:  $-10^{\circ}\text{C}$  to  $+40^{\circ}\text{C}$ .
6. Storage Temperature range:  $-25^{\circ}\text{C}$  to  $+56^{\circ}\text{C}$ .
7. At least 20cm of space for airflow, 30cm of space for two units located side by side.
8. Use tent to protect the machine from stormy weather when operate outdoor.
9. Welding produces fumes and gases, breathing these fumes and gases can be hazardous to your health. If inside, less than 300m, Ventilate the area.
10. Properly ground this equipment.
11. The input power cord gradient should not more than  $15^{\circ}$ .



## 3. INSTALLATION

### 3.4 Selecting a Location

1. Select a correct location to place the unit.
2. Determine input power cord length according to its actual operation requirement. Input power cord must have a minimum inside diameter of 6mm<sup>2</sup>.
3. Do not move or operate unit where it could tip.
4. Use cart or unit handle to move unit. Do not pull the cords to move unit.
5. Moving gas cylinder and main unit to high space only. Use lifting eye to lift unit only, not running gear, gas cylinders, or any other accessories.
6. Optional order for individual wire feeder is available. The wire feeder and welding gun divide from the main unit. It is more convenient to operate.





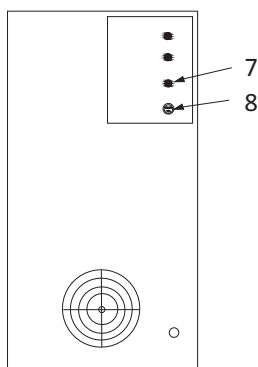
## 3. INSTALLATION

### 3.5 Installing Gas Supply

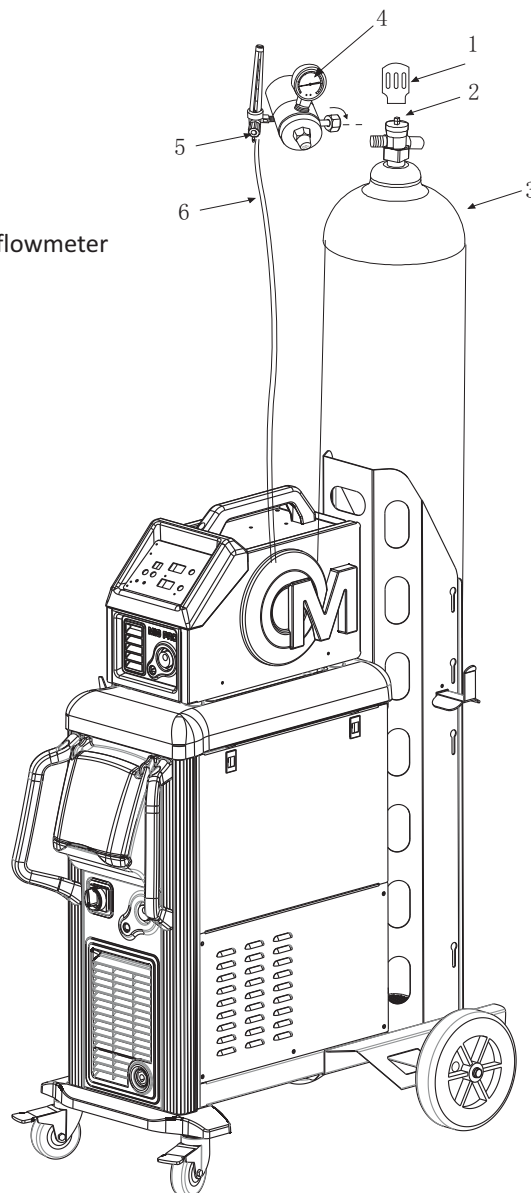
1. Cap
2. Cylinder valve (Remove cap, stand to side of valve, and open valve slightly. Gas flow blows dust and dirt from valve. Close valve.)
3. Cylinder
4. Regulator/Flowmeter (Make sure the surface is vertical while installing.)
5. Flow Adjust (Typical pressure is 0.05-0.15MPa.)
6. Hose
7. Hose Connection (Connect gas hose between regulator/flowmeter and the unit.)
8. Regulator/Flowmeter heating socket (For low temperature worksite, please plug the regulator/flowmeter to the socket for heating.)



DO NOT use other gases regulator/flowmeter with CO<sub>2</sub> shielding gas.

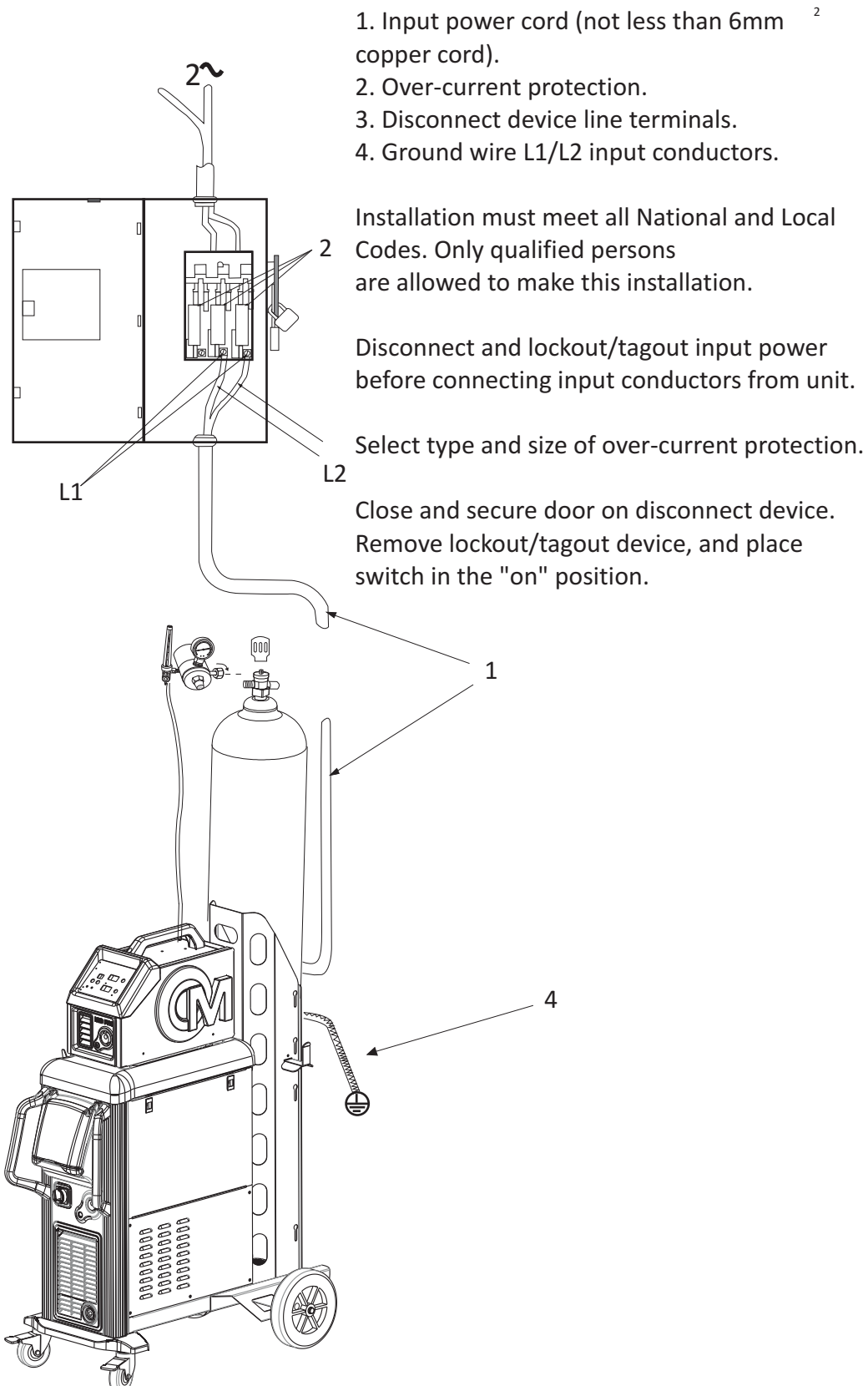


Rear Panel



## 3. INSTALLATION

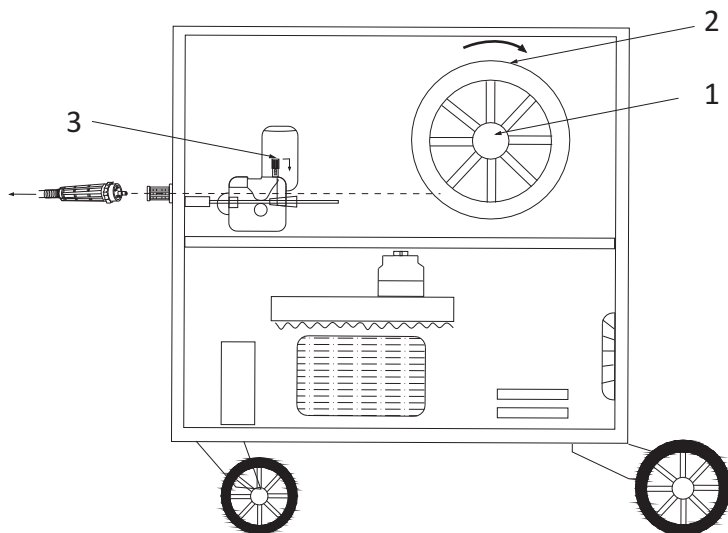
### 3.6 Connecting Input Power



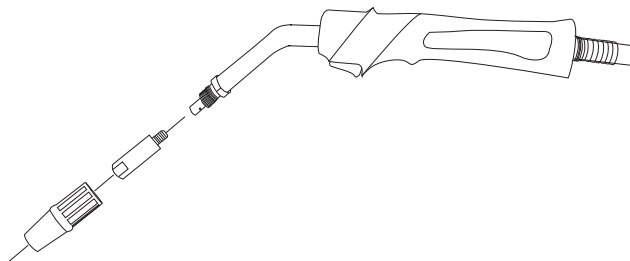
## 3. INSTALLATION

### 3.7 Threading Welding Wire

1. Wire spool spindle
2. Welding wire
3. Pressure adjustment knob

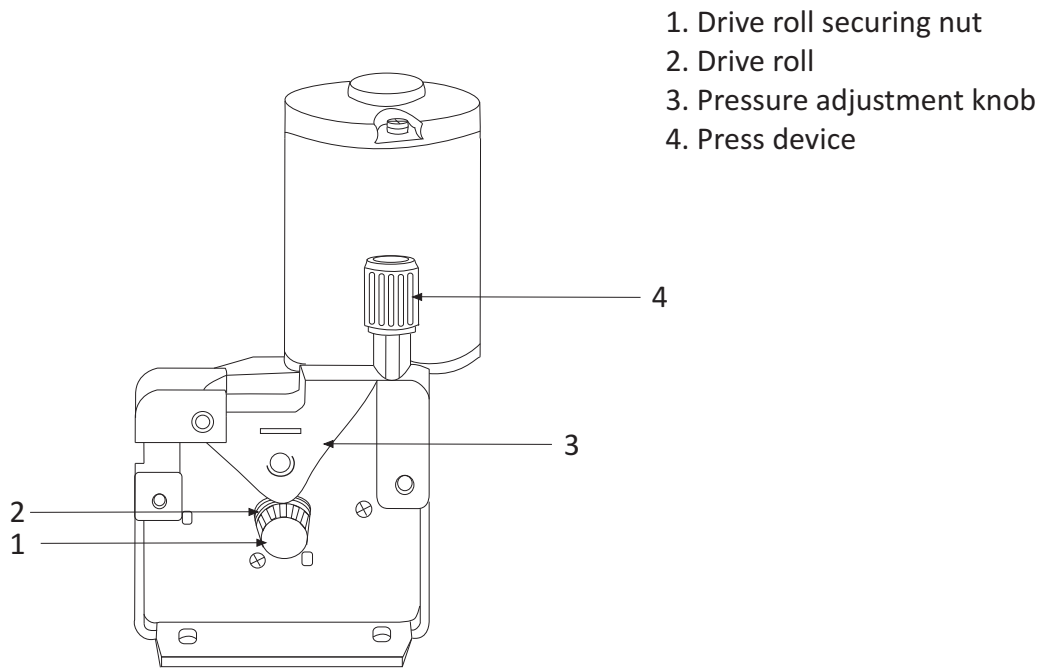


1. Open wire spool spindle; install wire spool; release pressure adjustment knob; pull and hold wire.  
Push wire thru guides into drive roll. Close wire spool spindle tightly to prevent slipping (Feed wire to check wire spool installation).
2. Set a desired drive roll pressure, close and tighten pressure adjustment knob.
3. Press gun trigger and let go of wire.
4. Remove gun nozzle and contact tip.
5. Press gun trigger until wire comes out of gun. Reinstall contact tip and nozzle.
6. Feed wire to check drive roll pressure, tighten knob enough to prevent slipping.
7. Cut off wire if welding wire extends too far beyond nozzle.



## 3. INSTALLATION

### 3.8 Changing Drive Roll

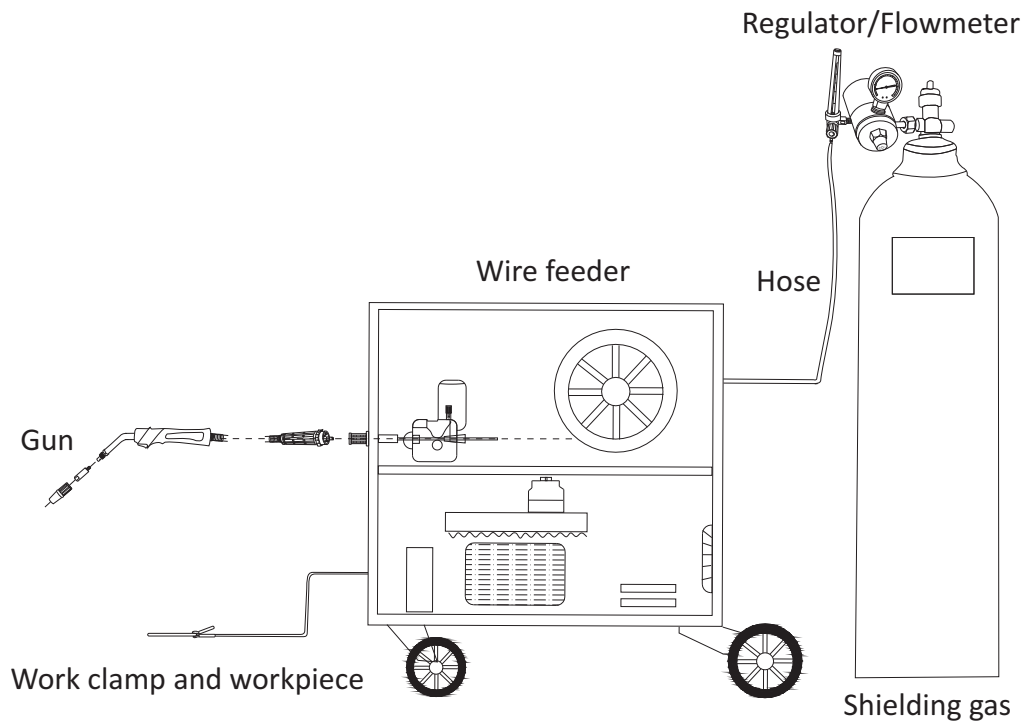


#### Changing Drive roll:

1. Release pressure adjustment knob. Press wire device springs open.
2. Loosen securing nut, Remove drive roll.
3. The drive roll consists of two different sized grooves. Reinstall the desired wire sized groove close to the motor shaft.
4. Tighten securing nut.
5. Replace press wire device, and set a desired pressure.
6. Make sure drive roll groove lines up with wire guide.

## 3. INSTALLATION

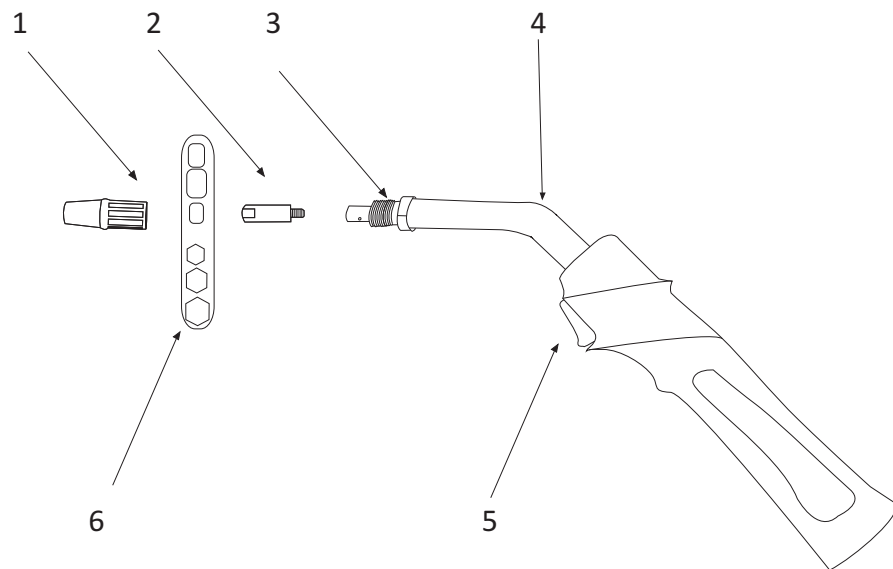
### 3.9 Typical MIG Process Connection



Weld current can damage electronic parts in vehicles. Disconnect both battery cables before welding on a vehicle. Place work clamp as close to the weld as possible.

## 3. INSTALLATION

### 3.10 Welding Gun



1. Shield cup C012
2. Contact tip C004
3. Front adaptor C010
4. Gooseneck (15/24AK) C020/C018
5. Trigger
6. Spanner

## 11、Installation of Aluminum Welding Gun

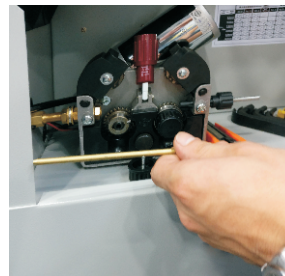
Tools :Cutter and hex wrench



Loosen the fastening bolts of the bass tube



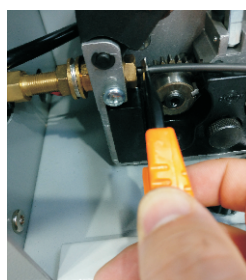
Pull out the guide wire



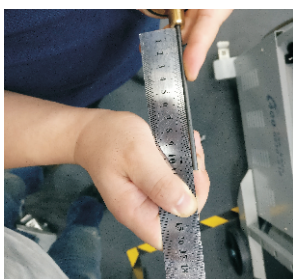
Install into welding gun



Cut off the guide wire from the bottom of 3-5mm



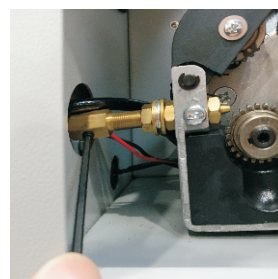
Cut off the extended part 11.3mm of the guide wire.



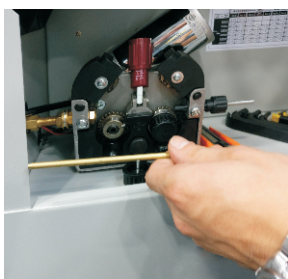
Use cutter and hex wrench



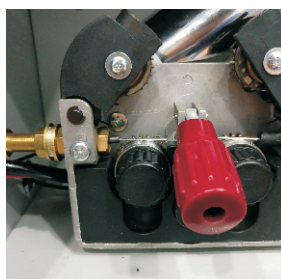
Loosen the fastening bolts of the bass tube



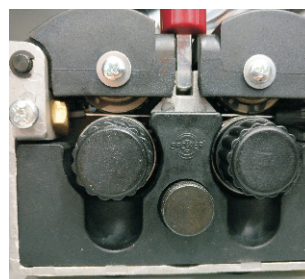
Pull out the guide wire



Install into welding gun

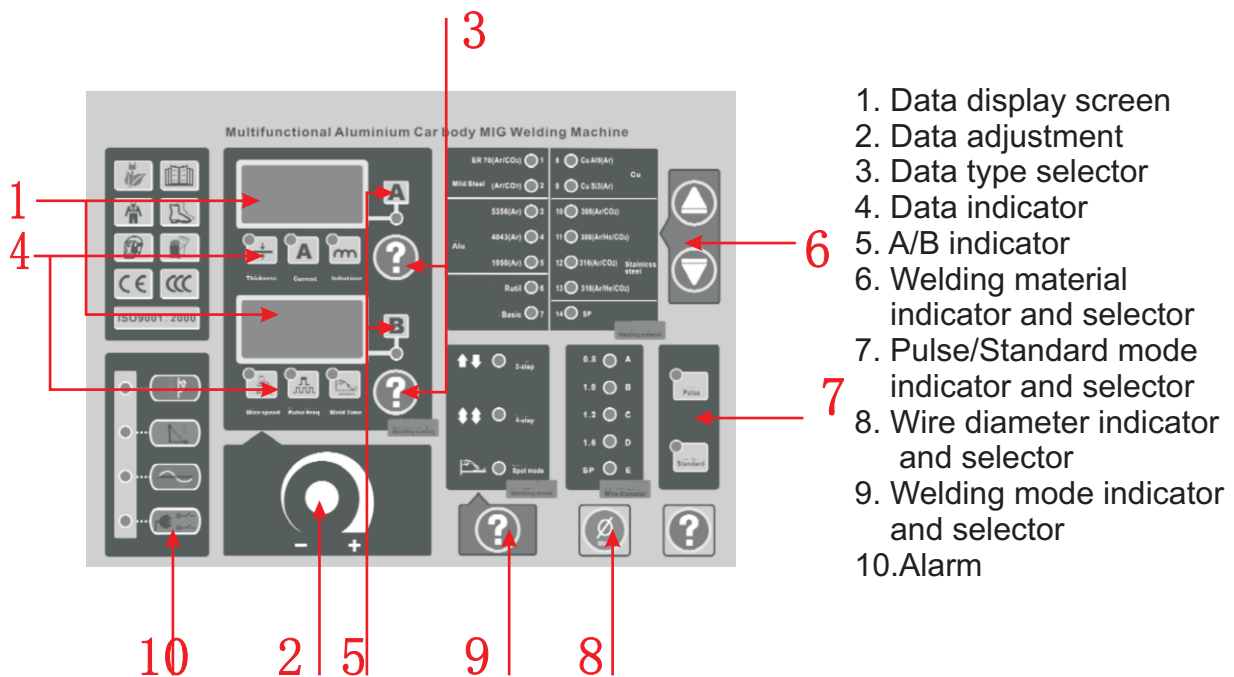


Fastened



Advantages : wire feeding more smooth and stable, and without friction in wire feeding

# Operation



Setting welding data instruction:



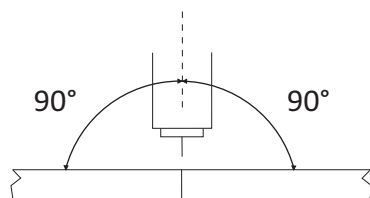
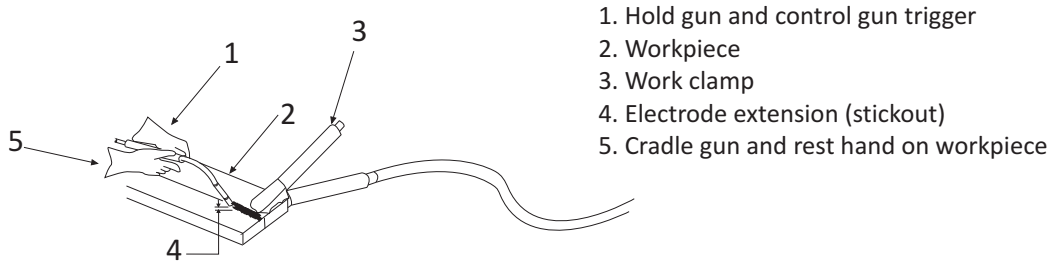
1. The data displayed on the screen is according to the setting of the Data type selector (For example, when you set material thickness, the screen will show the thickness of the material)
2. The Data type selector is for selecting the type of data, corresponding to A/B indicator.
3. Adjust the data by turning the Data Adjustment when the A/B indicator and Data Indicator are lighting up at the same time.

1. In normal welding, the users only need to set the material, wire diameter and thickness to start to weld. It is unnecessary to set other data. All other data have been preset by the manufacturer.
2. If the welding is not as good as expected, please fine-tune the current and wire speed.
3. Resume to the default setting:  
Press the 2 buttons of "Data type selector" and 2 buttons of "Welding material selector" for 1s at the same time. Switch off power supply and then switch on the welder again. The welder will resume to the default setting as leaving the factory.
4. When setting "Standard" welding, the "Pulse" can not be adjusted, displaying "---".
5. When setting "2-step" and "4-step", the "Spot time" can not be adjusted, displaying "FFF".

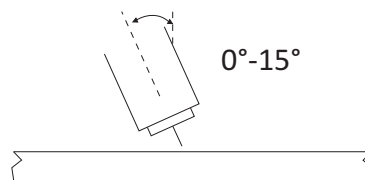


## 4. OPERATION

### 4.2 Holding and Positioning Welding Gun

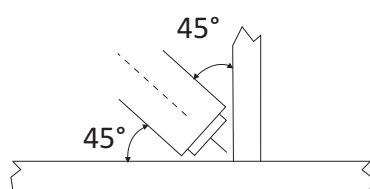


End view of work angle

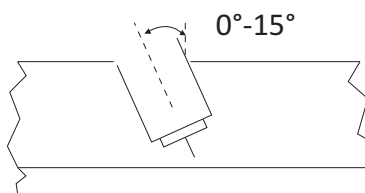


Side view of gun angle

#### GROOVE WELDS



End view of work angle



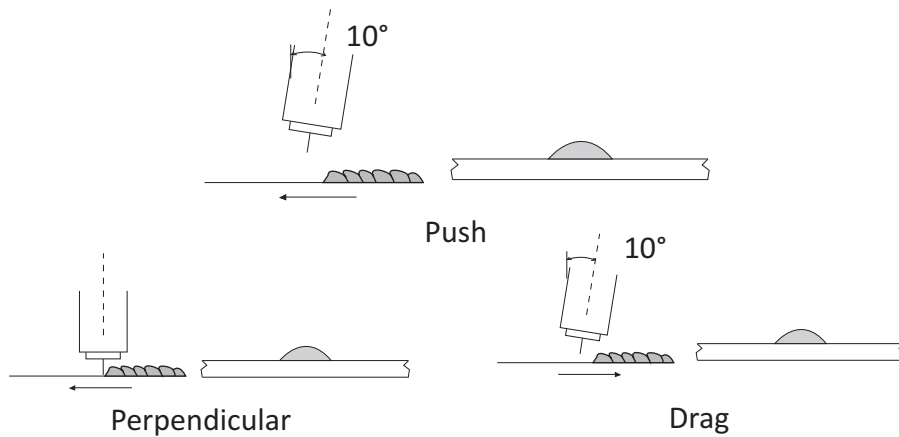
Side view of gun angle

#### FILLET WELDS

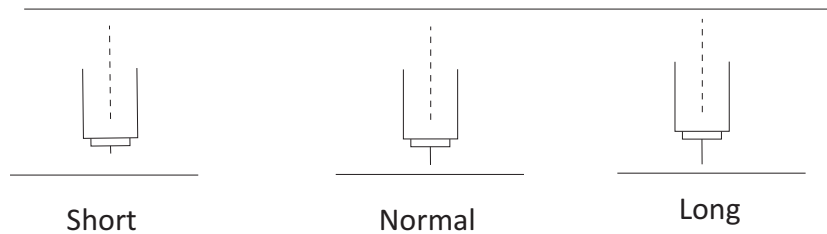
Welding wire is energized when gun trigger is pressed. Before lowering helmet and pressing trigger, be sure wire size is correct to past end of contact tip, and tip of wire is positioned correctly on seam.

## 4. OPERATION

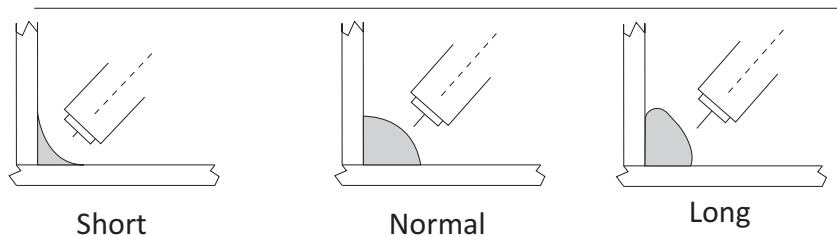
### 4.3 Conditions that Affect Weld Bead Shape



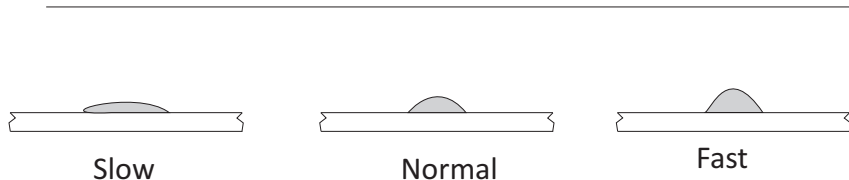
#### GUN ANGLES AND WELD BEAD PROFILES



#### ELECTRODE EXTENSIONS (STICKOUT)



#### FILLET WELD ELECTRODE EXTENSIONS (STICKOUT)

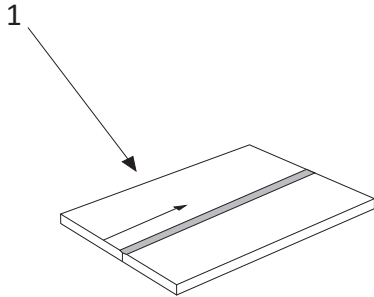


#### GUN TRAVEL SPEED

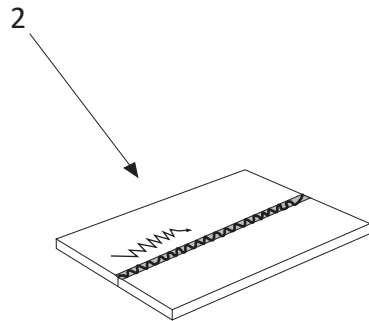
Weld bead shape depends on gun angle ,direction of travel, electrode extension (stickout), travel speed, thickness of base metal, wire feed speed (weld current), and voltage.

## 4. OPERATION

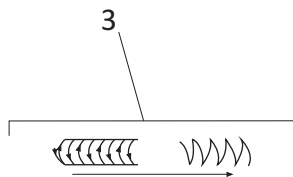
### 4.4 Gun Movement during Welding



1. Stringer Bead  
Steady movement along seam



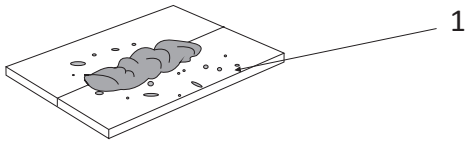
2. Weave Bead  
Side to side movement along seam



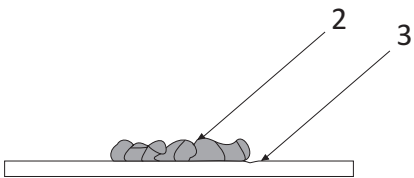
3. Weave Patterns  
Use weave patterns to cover a wide area in one pass of the electrode

## 4. OPERATION

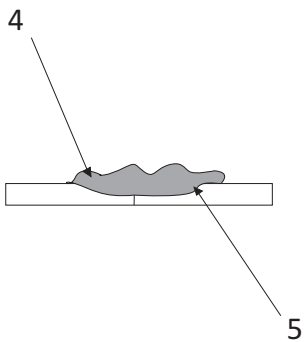
### 4.5 Poor Weld Bead Characteristics



1. Large Spatter Deposits



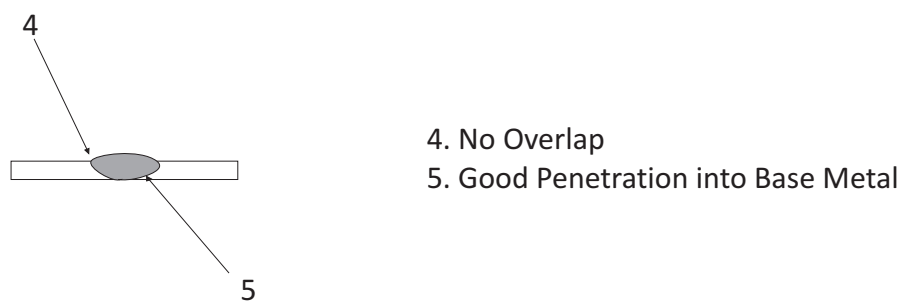
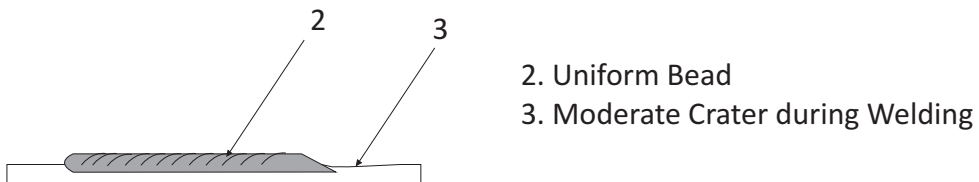
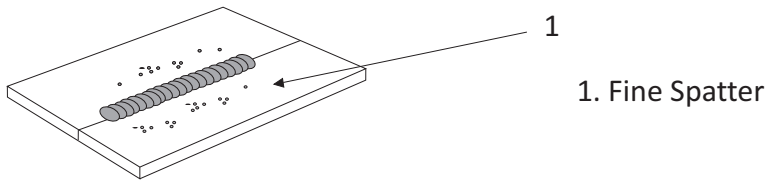
2. Rough, Uneven Bead  
3. Slight Crater during Welding



4. Bad Overlap  
5. Poor Penetration

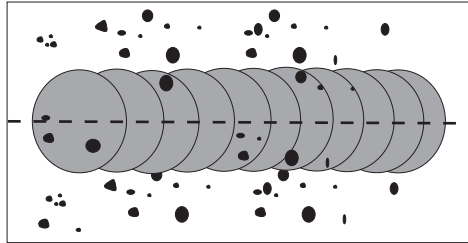
## 4. OPERATION

### 4.6 Good Weld Bead Characteristics



## 5. TROUBLESHOOTING

### 5.1 Excessive Spatter

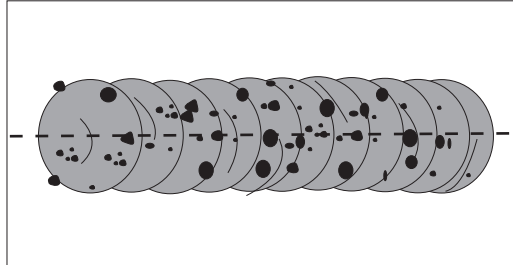


Scattering of molten metal particles that cool to solid form near weld bead.

Possible Causes	Corrective Actions
Wire feed 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 under coating, and dirt from 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

## 5. TROUBLESHOOTING

### 5.2 Porosity

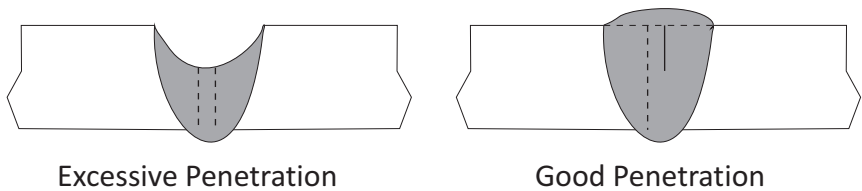


Small cavities or holes resulting from gas pockets in weld metal.

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
	Adjust nozzle distance 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 under coating, and dirt from surface, before welding
	Use a more highly deoxidizing welding wire (contact supplier)
Welding wire extends too far out of nozzle	Do not extend wire too far beyond nozzle

## 5. TROUBLESHOOTING

### 5.3 Excessive Penetration



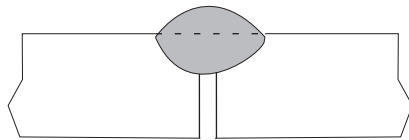
Weld metal melting through base metal and hanging underneath weld.

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

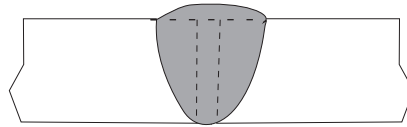


## 5. TROUBLESHOOTING

### 5.4 Lack of Penetration



Lack of Penetration



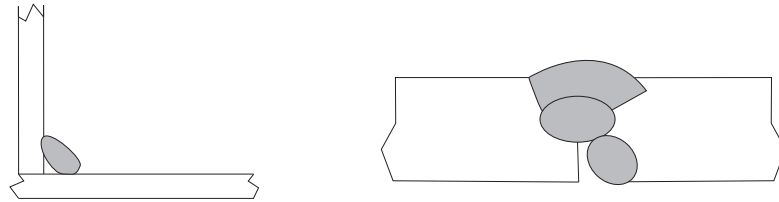
Good Penetration

Shall fusion between weld metal and base metal.

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 characteristic
Improper weld technique	Maintain normal gun angle of 0 to 15 degrees to achieve maximum penetration
	Keep arc on leading edge of weld puddle
	Do not extend wire too far from nozzle
Insufficient heat input	Select higher wire feed speed and/or select higher voltage range
	Reduce travel speed

## 5. TROUBLESHOOTING

### 5.5 Incomplete Fusion

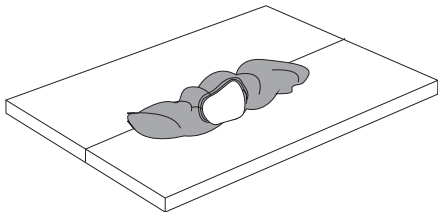


Failure of weld metal to fuse completely with base metal or a preceeding weld bead.

Possible Causes	Corrective Actions
Improper joint preparation	Remove all grease, oil, moisture, rust paint under coating, and dirt from surface, before welding
Improper weld technique	Select higher voltage range and/or adjust wire feed speed
Insufficient heat input	Place stringer bead in proper locations 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

## 5. TROUBLESHOOTING

### 5.6 Burn Through

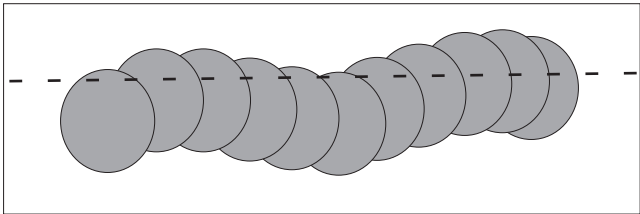


Weld metal melting completely through base metal resulting in holes where no metal remains.

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

# 5. TROUBLESHOOTING

## 5.7 Waviness of Bead

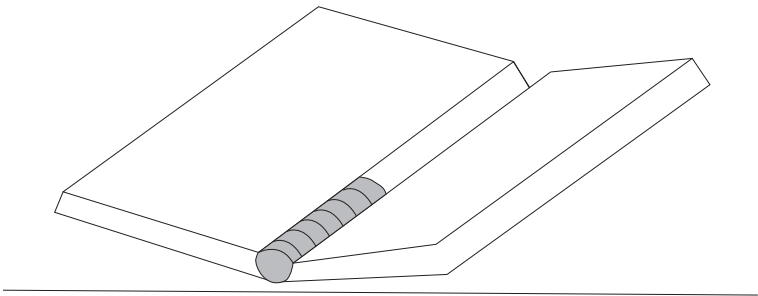


Weld metal that is not parallel and does not cover joint formed by base metal.

Possible Causes	Corrective Actions
Welding wire extends too far out of nozzle	Do not extend wire too far from nozzle
Unsteady hand	Support hand on solid surface or use two hands

# 5. TROUBLESHOOTING

## 5.8 Distortion



Contraction of weld metal during welding that forces base metal to move.

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

## 5. TROUBLESHOOTING

### 5.9 Other Troubleshooting

Problem	Probable Cause	Remedy
Arc can not weld Incomplete fusion	1. Not enough power phase 2. Too low welding voltage	1. Check power source 2. Select higher voltage range
No wire feed	1. Drive roll groove does not line up with wire guide 2. Obstruction in wire guide 3. Drive roll pressure too high 4. Incorrect wire size 5. Obstruction in wire inlet guide or contact tip 6. Dirty or bad quantity welding wire 7. Press wire device pressure too low	1. Aligning drive roll and wire guide 2. Clear obstruction in wire guide or replace it if necessary 3. Readjust drive roll pressure 4. Replace wire or wire guide 5. Clear obstruction in gun contact tip or liner 6. Use good quantity welding wire 7. Readjust screws
Excessive spatter	1. Wire feed speed too high 2. Contact tip damaged	1. Select lower wire feed speed 2. Replace contact tip
Small cavities or holes resulting from gas pockets in weld metal	1. Insufficient shielding gas at welding arc 2. Regulator/flowmeter damaged 3. Contact tip damaged 4. Leakage, outside gas mix with shielding gas	1. Increase flow of shielding gas at regulator/flowmeter 2. Replace regulator/flowmeter 3. Replace contact tip 4. Check gas hoses for leaks
Welding are not stable	1. Welding wire dirty 2. Bad contact of work clamp 3. Wrong size gun liner or contact tip, or contact tip worn	1. Use clean, dry welding wire 2. Connect work clamp to get good to metal as contact 3. Replace contact tip
Low or unstable wire speed	1. Distorted welding wire 2. Obstruction in gun contact tip or liner	1. Eliminate pickup of distorted welding wire from feeder or liner, or readjust drive roll pressure 2. Replace contact tip or liner
No weld output	1. Main transformer overheats, overheat protection working 2. Fuse broken 3. Gun trigger damaged or plug worn	1. Wait 15-30 mins for unit to cool 2. Replace fuse 3. Replace gun trigger or plug