



# 190 MIG WELDER OWNER'S MANUAL



## CAT. #00318 WELDER FEATURES:

- Welding range up to 190 Amps / 230V Input
- Can be used for Mild Steel, Stainless Steel, Aluminum and Cast Iron
- Large cabinet with easy access to 4" and 8" spools
- Metallic heavy-duty wire drive system
- Torch/Cable wrap
- 12' Premium MIG torch with Euro disconnect and Tweco® style consumables
- Extra long 15' power cable

## IDEAL FOR:

Do-It-Yourself, Agriculture, Maintenance & Repair, Contractor, Automotive, Metal Fabrication Hobbyist and More...

## INCLUDES:

12' Welding Torch; Ground Clamp; 15' Power Cable; Gas Hose and Regulator



WELDING IN AMERICA.  
SINCE THE BEGINNING.



5/3/1  
WARRANTY

# **STOP PLEASE! DO NOT RETURN TO THE STORE**

**If you have questions or problems with your new Welder, please call customer service at 1-800-521-6038 Monday through Friday from 7am-5pm Mountain Time or at [www.forneyind.com/customer\\_service](http://www.forneyind.com/customer_service).**

**Please take time to register your product at [www.forneyind.com/customer\\_service/register\\_your\\_product/](http://www.forneyind.com/customer_service/register_your_product/). This qualifies you for our industry leading 5/3/1 warranty.**

**Thank you, enjoy your new Welder.**



#### FIVE WAYS TO ORDER

**Web:** [www.forneyind.com](http://www.forneyind.com)

**Phone:** 800-521-6038

**Fax:** 970-498-9505

**Mail:** Forney Industries  
1830 Laporte Avenue  
Fort Collins, CO 80521

**Email:** [sales@forneyind.com](mailto:sales@forneyind.com)

#### U.S. Warehouses:

- Fort Collins CO
- Tipp City OH

## Forney Promise

We are committed to your success regardless of location, size or needs. We understand it is your goal to get the job done right, and we are ready to help you do just that.

## President's Message

We market the highest quality tools, equipment and accessories for the do-it-yourselfer and professional. Our passion and dedication in bringing new products to the industrial and retail market, combined with our personal service, is unmatched in our industry. Our ability to listen to our customers' needs enables us to create solutions to their problems.

Our dedication to the highest quality customer service within our corporate headquarters and the service provided in the field is unequalled. We are committed to creating the best solutions to our customer's needs. Above all, our employees will provide the same respect and caring attitude within the organization as they are expected to share with every Forney customer. Our goal will be to exceed our customers' expectations through empowered people, guided by shared values and commitments.

We work hard so our customers trust us because of our integrity, teamwork and innovation of Forney products, and Forney's 80 years of unmatched product quality and an unwavering commitment to our customers.

When our customers succeed we succeed.



STEVEN G. ANDERSON, President & CEO

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## **Forney 5/3/1 Limited Warranty**

Effective August 1st, 2009

- 1) Limited Warranty:** Subject to the terms and conditions below, Forney Industries, Inc., Fort Collins, Colorado, warrants to its original retail purchaser that the new Forney equipment sold after the effective date of this limited warranty is free of defects in material and workmanship at the time it is shipped by Forney. This is in lieu of all other warranties, express or implied.
- 2) Notification:** Please call **1-800-521-6038** with your warranty questions. You can also visit [www.forneyind.com](http://www.forneyind.com) for additional information about your new welder.
- 3) Length of Warranty:** Within the warranty periods listed below, Forney will repair or replace any warranted parts or components that fail due to defects in material or workmanship. Warranty is effective from the date of original retail purchase. Warranty duration is as follows:
  - A) 5 years:** Original main power rectifiers only to include SCRs, diodes and discrete rectifier modules, transformers, stabilizers and reactors.
  - B) 3 years:** Drive Systems, PC Boards, Motors, Switches and Controls.
  - C) 1 year:** MIG guns, relays, contactors and regulators, plasma cutting torches, and accessories.
  - D) 90 days:** Replacement parts. Does not include labor.
- 4) Non-Applicable Parts:** Forney's limited warranty shall not apply to consumables such as contact tips, cutting nozzles, felt wire cleaner, drive rollers, gas diffusers, plasma torch tips and electrodes, weld cables, tips and parts that fail due to normal wear. In addition, this warranty does not extend to any damage caused by the untimely replacement or maintenance of any of the previously listed consumable parts.
- 5) Warrantor:**

Forney Industries  
1830 Laporte Avenue  
Fort Collins, CO 80521  
1-800-521-6038  
[www.forneyind.com](http://www.forneyind.com).
- 6) Purchaser / Warranty:** The original purchaser of the Forney Industries product. The warranty is not transferable. Forney Industries products are intended for purchase and use by persons trained and experienced in the use and maintenance of welding equipment.
- 7) What is not covered under the warranty:**
  - A)** Implied warranties, including those of merchantability and fitness for a particular purpose are limited in duration to this express warranty. After this period, all risks of loss, from whatever reason, shall be on the purchaser.
  - B)** Any incidental, indirect, or consequential loss, damage, or expense that may result from any defect, failure or malfunction of the Forney product.
  - C)** Any failure that results from accident, purchaser's abuse, neglect or failure to operate products in accordance with instructions provided in the owner's manual(s) supplied with the product.
  - D)** Pre-delivery service, i.e. assembly and adjustment.
- 8) Claim:** In the event of a warranty claim under this warranty, the exclusive remedies shall be, at Forney Industries sole option:
  - A)** Repair; or
  - B)** Replacement; or
  - C)** Where authorized in writing by Forney Industries, the cost of repair or replacement at an authorized Forney Industries Service Center; or
  - D)** Payment of or credit for the purchase price less reasonable depreciation based on actual use upon the return of the goods at the customer's risk and expense.
- 9) Purchaser will:**
  - A)** Contact Forney's Customer Service at **1-800-521-6038** within 30 days of the defect or failure.
  - B)** Provide dated proof of purchase (typically a purchase receipt).
  - C)** Provide the serial number. Registering your welder at [registration.forneyind.com:442](http://registration.forneyind.com:442) will speed up this process.
  - D)** Deliver or ship welder to a Forney authorized Service Center. Freight &/or packaging costs, if any, must be borne by the purchaser.

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### **CAUTION!**

**BEFORE INSTALLING, OPERATING OR CARRYING OUT MAINTENANCE ON THE 210 WELDER, READ THE CONTENTS OF THIS MANUAL CAREFULLY, PAYING PARTICULAR ATTENTION TO THE SAFETY RULES AND HAZARDS.**

**In the event of these instructions not being clear, please contact your Forney Authorized Dealer or Forney Customer Service 1-800-521-6038**

## **Safety Information**

## **READ BEFORE USING**

### **Principal Safety Standards**

- Safety in Welding and Cutting, ANSI Standard Z49.1, from American Welding Society, 8669 Doral Boulevard, Suite 130, Doral, FL 33166
- Safety and Health Standards, OSHA 29 CFR 1910, from Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.
- Recommended Safe Practices for the Preparation for Welding and Cutting of Containers That Have Held Hazardous Substances, American Welding Society Standard AWS F4.1, from American Welding Society, 8669 Doral Boulevard, Suite 130, Doral, FL 33166
- National Electrical Code, NFPA Standard 70, from National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.
- Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, from Compressed Gas Association, 1235 Jefferson Davis Highway, Suite 501, Arlington, VA 22202.
- Code for Safety in Welding and Cutting, CSA Standard W117.2, from Canadian Standards Association, Standards Sales, 178 Rexdale Boulevard, Rexdale, Ontario, Canada M9W 1R3.
- Safe Practices For Occupation And Educational Eye And Face Protection, ANSI Standard Z87.1, from American National Standards Institute, 1430 Broadway, New York, NY 10018.
- Cutting And Welding Processes, NFPA Standard 51B, from National Fire Protection Association, Batterymarch Park, Quincy, MA 02269

### **EMF Information**

Considerations about Welding or Cutting and the Effects of Low Frequency Electric and Magnetic Fields

Welding or cutting current, as it flows through the welding or cutting cables, will cause electromagnetic fields. There has been and still is some concern about such fields. However, after examination the committee of the National Research Council concluded that: "The body of evidence, in the committee's judgment, has not demonstrated that exposure to power-frequency electric and a magnetic field is a human health hazard." However, studies are still going forth and evidence continues to be examined. Until the final conclusions of the research are reached, you may wish to minimize your exposure to electromagnetic fields when welding or cutting.

To reduce magnetic fields in the workplace, use the following procedures:

1. Keep cables close together by twisting or taping them.
2. Arrange cables to one side and away from the operator.
3. Do not coil or drape cables around your body.
4. Keep welding or cutting power source and cables as far away from operator as practical.
5. Connect work clamp to work piece as close to the cut or weld as possible.

### **About Pacemakers & Hearing Aids:**

Pacemaker & Hearing Aid wearers consult your doctor first. If cleared by your doctor, then following the above procedures is recommended.

## Personal Protection

Welding processes of any kind can be dangerous not only to the operator but to any person situated near the equipment, if safety and operating rules are not strictly observed.



**Arc rays can injure your eyes and burn your skin. The welding arc produces very bright ultraviolet and infrared light. These arc rays will damage your eyes and burn your skin if you are not properly protected.**

- Wear closed, non-flammable protective clothing without pockets or turned up trousers, gloves and shoes with insulating sole and steel toe. Avoid oily greasy clothing.
- Wear a non-flammable welding helmet with appropriate filter lenses, designed so as to shield the front and sides of the neck and face. Keep protective lens clean and replace them when broken, cracked or spattered.
- Weld in a closed, but well ventilated area that does not open into other working areas.
- Never look at the arc without correct lens.



**Gases and fumes produced during the welding process can be dangerous and hazardous to your health.**

- Adequate local exhaust ventilation must be used in the area. It should be provided through a mobile hood or through a built-in system on the workbench that provides exhaust ventilation from the sides, the front and below, but not from above the bench so as to avoid raising dust and fumes. Local exhaust ventilation must be provided together with adequate general ventilation and air circulation, particularly when work is done in a confined space.
- Welding process must be performed on metal surfaces thoroughly cleaned from rust or paint, or zinc coatings to avoid production of harmful fumes. Parts degreased with a solvent must be, thoroughly dried before welding.
- Be very careful when welding any metals which may contain one or more of the following:  
Antimony    Beryllium    Cobalt    Manganese    Selenium    Arsenic    Cadmium  
Copper    Mercury    Silver    Barium    Chromium    Lead    Nickel  
Vanadium    Zinc
- Remove all chlorinated solvents from the welding area before welding. Certain chlorinated solvents decompose when exposed to ultraviolet radiation to form phosgene gas (nerve gas).

## Fire Prevention



**Fire and explosion can be caused by hot slag, sparks or the welding arc.**

- Keep an approved fire extinguisher of the proper size and type in the working area. Inspect it regularly to ensure that it is in proper working order.
- Remove all combustible materials from the working area. If you can not remove them, protect them with fire-proof covers.
- Ventilate welding work areas adequately. Maintain sufficient air flow to prevent accumulation of explosive or toxic concentrations of gases.
- Do not weld on containers that may have held combustibles.
- Continually monitor check welding area to make sure it is free of lingering sparks, slag or glowing metal and flames.
- The work area must have a fireproof floor.

## Electric Shock



### **WARNING: ELECTRIC SHOCK CAN KILL!**

- A person qualified in First Aid techniques should always be present in the working area; If a person is found unconscious and electric shock is suspected, do not touch the person if she or he is in contact with cable or electric wires. Disconnect power from the machine, then use First Aid. Use dry wood or other insulating materials to move cables, if necessary, away from the person.
- Wear dry gloves and clothing. Insulate yourself from the work piece or other parts of the welding circuit.
- Make sure the main line is properly grounded.
- Do not coil the torch or the ground cables around your body.
- Never touch or come in physical contact with any part of the input current circuit and welding current circuit.

### **Electric Warning:**

- Repair or replace all worn or damaged parts.
- Extra care must be taken when working in moist or damp areas.
- Install and maintain equipment according to local regulations.
- Disconnect power supply before performing any service or repair.
- Should you feel the slightest electrical shock, stop any welding immediately and do not use the welder until the fault has been found and corrected.

## Noise



Noise can cause permanent hearing loss. Welding processes can cause noise levels that exceed safe limits. You must protect your ears from loud noise to prevent permanent loss of hearing.

- To protect your hearing from loud noise, wear protective ear plugs and/or ear muffs.
- Noise levels should be measured to be sure the decibels (sound) do not exceed safe levels.

## Electromagnetic Compatibility

**Before installing your welder, carry out an inspection of the surrounding area, observing the following guidelines:**

- Make sure that there are no other power supply cables, control lines, telephone leads or other equipment near the unit.
- Make sure that there are no radio receivers, electrical appliances, computers or other control systems near the unit.
- People with pacemakers or hearing-aids should keep far from the welder.

**! In particular cases special protection measures may be required.**

**Interference can be reduced by following these suggestions:**

- If there is interference in the power source line, an E.M.F. filter can be mounted between the outlet and the welder.
- The output cables of the welder should not be too long, kept together or connected to ground;
- After any maintenance all the panels of the welder must be securely fastened in place.



## Protective Welding Gases

**Shielding Gas Cylinders contain gas under high pressure. If damaged, a cylinder can explode. Treat them carefully.**

- Arc welders use only inert or non-flammable gases for welding arc protection. It is important to choose the appropriate gas for the type of welding being performed.
- Do not use gas from unidentified cylinders or damaged cylinders.
- Do not connect the cylinder directly to the welder. Use a pressure regulator.
- Make sure the pressure regulator and the gauges function properly.
- Do not lubricate the regulator with oil or grease.
- Each regulator is designed for use with a specific gas. Make sure the regulator is designed for the protective gas being used.
- Make sure that the cylinder is safely secured tightly to the welder with the chain provided.
- Never expose cylinders to sparks, slag, flame or excessive heat.
- Make sure that the gas hose is in good condition.
- Keep the gas hose away from the working area.

## Installation Recommendations

### Location



**Be sure to locate the welder according to the following guidelines:**

- In areas free from moisture and dust;
- In areas with ambient temperature between 30° to 90°F;
- In areas free from oil, steam and corrosive gases;
- In areas not subjected to abnormal vibration or shock;
- In areas not exposed to direct sunlight or rain;
- Place at a distance of 12" or more from walls or similar obstructions that could restrict natural air flow for cooling.

### Ventilation

Since the inhalation of welding fumes can be harmful, ensure that the welding area is effectively ventilated.

### Main Supply Voltage Requirements

Before you make any electrical connection, make sure that supply voltage and frequency available at site are those stated in the ratings label of your welder.

The main supply voltage should be within  $\pm 10\%$  of the rated main supply voltage. Too low a voltage may cause poor welding performance. Too high a supply voltage will cause components to overheat and possibly fail. The welder outlet must be:

- Correctly installed, if necessary, by a qualified electrician;
- Correctly grounded (electrically) in accordance with local regulations;
- Connected to the correct size electric circuit.

**Notes:**

- Periodically inspect supply cable for any cracks or exposed wires. If it is not in good condition, have it repaired by a Service Center.
- Do not pull violently the input power cable to disconnect it from supply outlet.
- Do not lay material or tools on the power supply cable. The cable may be damaged and result in electrical shock.
- Keep the supply cable away from heat sources, oils, solvents or sharp edges.
- If you use an extension cord, keep it as straight as possible. For lengths up to 50 ft. use 12 AWG. For lengths up to 100 ft. use 10 AWG.

**Safety Instructions**

For your safety, before connecting the power source to the line, closely follow these instructions:

- An adequate two-pole switch must be inserted before the main outlet. This switch must be equipped with time-delay fuses.
- The connection with ground must be made with a two-pole plug compatible with the above mentioned socket.
- When working in a confined space, the welder must be kept outside the welding area and the ground cable should be fixed to the workpiece. Never work in a damp or wet confined space.
- Do not use damaged input or welding cables.
- The welding torch should never be pointed at the operator's or at other persons' bodies.
- The welder must never be operated without its panels attached. This could cause serious injury to the operator and could damage the equipment.

**California Proposition 65 Warnings**

Welding or cutting equipment and processes produce fumes or gases which contain chemicals known to the State of California to cause birth defects and, in some cases, cancer. (California Health & Safety Code Section 25249.5 et seq.)

## Assembly

- Unpack the welder.
- Assemble the plastic top handle using the screws provided.
- Attach the welding torch cable to the threaded connection on the front of the welder.
- Attach the gas hose and the electrical connector.

### Torch Lead Gun Assembly



Standard Gun or Torch Lead

### Gas Cylinder and Regulator Connection

The bottle (not supplied) should be located at the rear of the welder, fix the cylinder securely to the work bench or to the wall to insure that it does not fall. For safety, and economy, ensure that the regulator is fully closed, (turned counterclockwise) when not welding and when fitting or removing the gas cylinder.

- Turn the regulator adjustment knob counterclockwise to ensure the valve is fully closed.
- Screw the gas regulator fully down on the gas bottle valve, and fully tighten.
- Connect the gas hose to the regulator securing with clip/nut provided.
- Open the cylinder valve, then set the gas flow to approx. 20-30 CFH on the regulator.
- Operate the torch trigger to ensure that the gas is flowing through the torch.

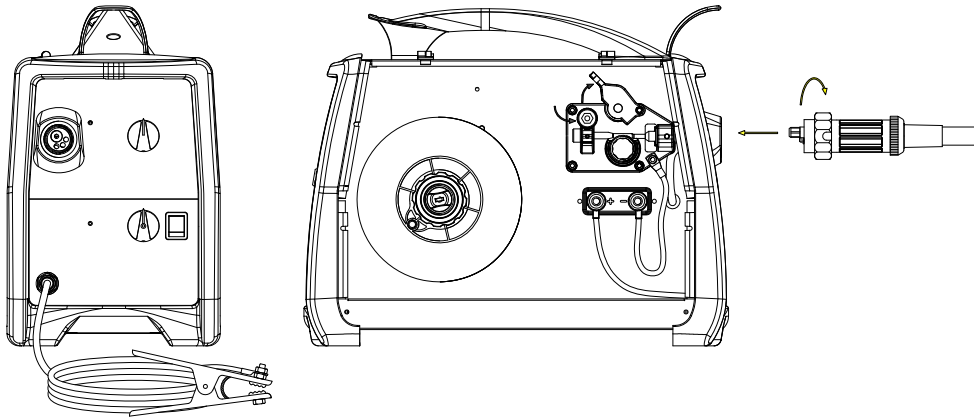


**WARNING:** Cylinders are highly pressurized. Handle with care. Serious accidents can result from improper handling or misuse of compressed gas cylinders. Do not drop the cylinder, knock it over, expose it to excessive heat, flames or sparks. Do not strike it against other cylinders.

# MIG, "GMAW" - Fluxcore wire, "FCAW" Welding

## Torch Connection

- Connect the standard MIG torch to the threaded connector on the front of the welder, tighten firmly by hand.



## Wire Loading



Ensure the gas and electrical supplies are disconnected. Before proceeding, remove the nozzle and the contact tip from the torch.

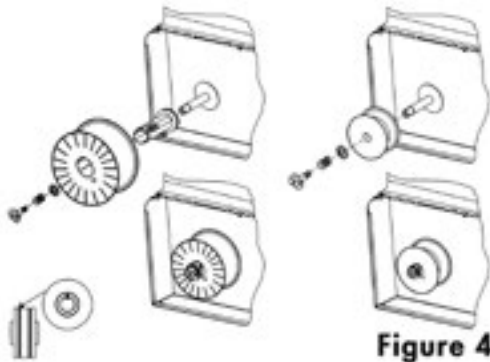


Figure 4

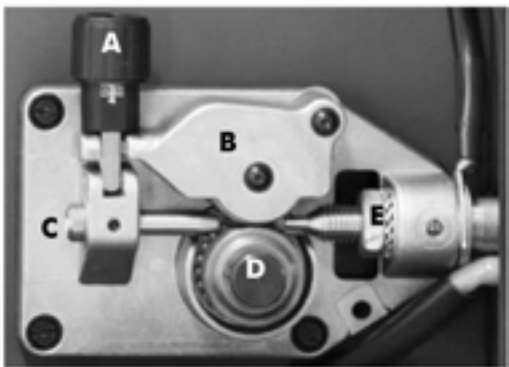


Figure 5

- Open the side panel.
- Loosen the nut of the spool holder (brake drum) and remove the spring and the external ring. (Fig.4)
- Remove the plastic protection from the spool (4) and place the wire spool on on the spool holder.
- Mount the external ring, the spring and the plastic lock nut again. These parts form the braking system of the wire spool speed. NOTE: Do not tighten the nut too much, excessive pressure strains the wire feeding motor, while too little pressure does not allow the immediate stop of the wire spool at the end of the welding.

- Loosen and lower the plastic knob (A) (Fig.5). Open the pressure arm (B) of the feeder
- Disconnect the wire from the edge of the wire spool being careful to keep tension on the end of the wire. Cut off a short section of the end of the wire to insure a straight end. Insert the straight end into the wire inlet guide (C) past the wire feed roll and into the wire liner. Lower pressure arm (B) and lift pressure adjustment

knob (A) into place. Connect the input power cord and turn on the welder. Press the torch trigger and observe the wire feeding into the torch liner. Adjust the pressure on the wire with knob (A) to insure smooth feeding without slippage. Do not over tighten the pressure adjustment as it may damage the motor. Close the welder side panel. Remove the nozzle and contact tip from the welding torch. Straighten the torch cable to remove any coils or kinks. Squeeze and hold the torch trigger until the wire appears at the end of the torch neck. Turn off the welder and install the contact tip and nozzle.



**WARNING:** Keep the torch straight. When feeding a new wire through the liner, make sure the wire is cut cleanly (no burrs or angles) and that at least 2 cm from the end is straight (no curves). Failure to follow these instructions could cause damage to the liner.

**WARNING:** When changing the wire diameter being used, or replacing the wire feed roll, be sure that the correct groove for the wire diameter selected is inside, closest to the machine. The wire is driven by the inside groove. Feed rolls are marked on the side identifying the groove nearest that side.

**WARNING:** When loading wire and watching for it to come through the torch neck, to avoid injury, do not hold the torch close to your face, instead, direct the wire toward the floor. To avoid injury, do not place fingers near the wire feed rolls when the wire feeder is operating.

### Replacing the Wire Liner

**WARNING:** Ensure the gas and electrical supplies are disconnected.

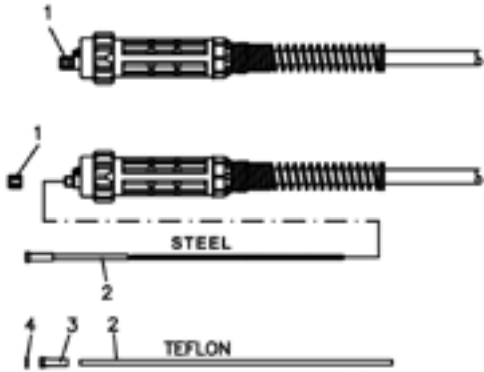


Figure 6

- Disconnect the torch from the machine.
- Place it on a flat surface and carefully remove the brass nut (1).
- Pull the liner out of the hose.
- Install the new liner and mount the brass nut (1) again. In case you are replacing a Teflon wire liner, follow these instructions:
- Install the new liner followed by the collet (3).
- Insert the O ring (4) on the wire liner collet (4) and replace the brass nut (1).
- Cut the wire liner close to the brass nut

**WARNING:** The length of the new wire liner must be the same as the liner you have just pulled out of the hose.

- Connect the torch to the machine and install the wire into the feeding system.

### Gas Cylinder and Regulator Connection

**WARNING:** Cylinders are highly pressurized. Handle with care. Serious accidents can result from improper handling or misuse of compressed gas cylinders. Do not drop the cylinder, knock it over, expose it to excessive heat, flames or sparks. Do not strike it against other cylinders.

The gas cylinder (not supplied) should be located at the rear of the welder, in a well ventilated area and securely fixed to the work bench or to the wall to insure that it will not fall. For safety, and economy, ensure that the regulator is fully closed, (turned counter-clockwise) when not welding and when installing or removing the gas cylinder.

- Turn the regulator adjustment knob counter-clock wise to ensure the valve is fully closed.
- Install the gas regulator on the gas cylinder, tighten the connecting nut firmly to insure against gas leakage.
- Connect the gas hose to the gas regulator.
- Open the cylinder valve, then set the gas flow to 20 - 35 CFH (cubic ft. per hour).

### Fluxcore Wire Welding, "FCAW"

- Connect the ground cable to the positive terminal of the Polarity Change Board inside the spool compartment.
- Connect the working cable to the negative terminal of Polarity Change Board inside the spool compartment.

### MIG Welding, "GMAW"

- Connect the ground cable to the negative terminal on the Polarity Change Board inside the spool compartment
- Connect the working cable to the positive terminal of the Polarity Change Board inside the spool compartment.

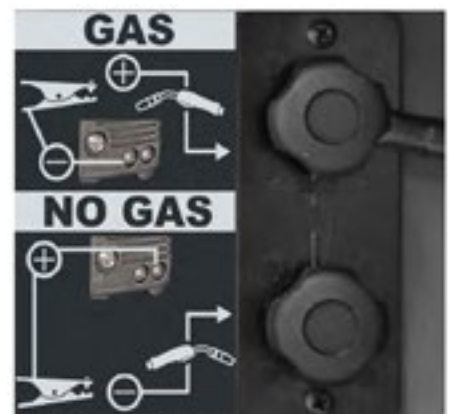
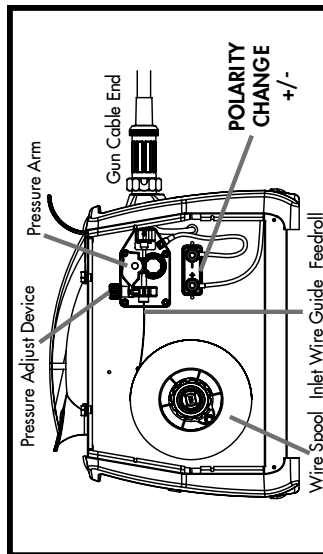


Figure 7

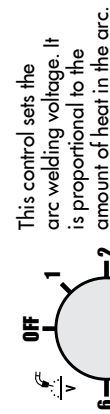
# MIG, "GMAW" Welding Setting Chart

## 190 MIG SET-UP CHART

MATERIAL (Wire)	GAS	WIRE Ø	MATERIAL THICKNESS							
			24 Gauge .0236" (.6 mm)	22 Gauge .0315" (.8 mm)	18 Gauge .0236" (1.2 mm)	16 Gauge .0139" (1.6 mm)	1/8" (3 mm)	1/4" (6.4 mm)		
Mild Steel	Regulation Knob		Solid Wire	2	3.5	5	6	7	8	9
			75% Ar + 25% CO <sub>2</sub> (ER70S-6)	-	2.5	3.5	4	5	6	7
			.023" (0.6 mm)	2	3.5	5	6	7	8	9
			.030" (0.8 mm)	2	2.5	3.5	4	5	6	7
			.035" (0.9 mm)	2	2	3	4	4	5	6
Flux Core Wire (No Gas) (E71T-GS)	2	2.5	3	4	5	6	7	8		
			2	1.5	4	3.5	5	6	7	



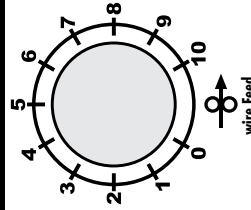
### Arc Voltage Control



This control sets the arc welding voltage. It is proportional to the amount of heat in the arc.

Position 6 is the highest arc voltage or heat setting.

### Wire Speed Control



This sets the wire feed speed (WFS) of the electrode wire through the MIG gun.

Position 0 is 80 IPM

Position 10 is 700 IPM



**WELDING IN AMERICA.**  
SINCE THE BEGINNING.

Forney Industries, Inc.  
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## Shielding Gas Guide

Metal	GAS	NOTE
Mild Steel	CO2 Argon + CO2 Argon + CO2 + Oxygen	Argon controls spatter Oxygen improves arc stability
Aluminum	Argon Argon + Helium	Arc stability, good fusion and minimum splatter. Higher heat input suitable for heavy sections. Minimum porosity.
Stainless Steel	Argon + CO2 + Oxygen Argon + Oxygen	Arc stability. Minimum splatter.
Copper, Nickel & Alloys	Argon Argon + Helium	Suitable for light gauges because of low flowability of the weld pool. Higher heat input suitable for heavy sections.

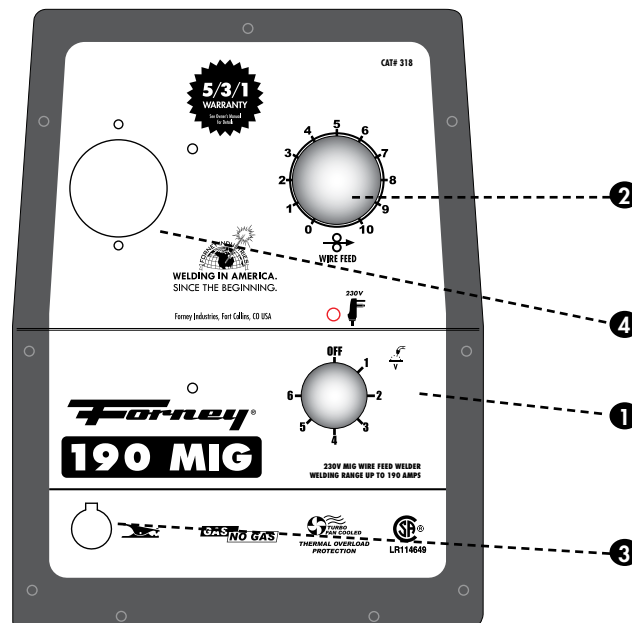
**Contact the technical service of your gas supplier to know the percentages of the different gasses which are the most suitable to your application.**

## Front Panel Operation

Units may be used with the standard torch.

### Welder Controls

- 1. Main ON/OFF switch and welding voltage adjustment:**
- 2. Wire feed adjustment knob**  
To increase the wire speed, turn the potentiometer clockwise; to decrease the wire speed, turn it counter-clockwise. The same procedure decreases the values on the welding parameters. Turn knob slowly.
- 3. Ground Clamp**
- 4. MIG Torch/Gun**



## Welding Preparation

- Attach the ground clamp to the bare metal to be welded, making sure of good contact;
- Make sure that the wire-roller groove in the roller corresponds to the diameter of the wire being used.
- Plug the machine into a suitable outlet.
- Completely open the gas cylinder valve. Adjust the gas pressure regulator to the correct flow rate.

## General Operating Instructions

Some experience is required to adjust and use a MIG welder. In MIG welding two parameters are fundamental: the welding voltage and the wire speed. The resulting welding current is a result of these two settings.

- Set the voltage and wire feed controls to positions suitable for the thickness of the material to be welded. Welding current varies in relationship to wire feed speed. For low welding current output, the wire feed speed potentiometer should be set at the low end of the wire feed speed scale. Turning the wire feed speed control potentiometer clockwise. Will result in increased wire feed speed and welding current. Welding voltage is adjusted to match the wire feed speed (welding current). Progressively select higher voltage positions while increasing wire speed.

Increasing welding voltage leads to a longer arc (without substantially affecting the current). Conversely, a decreased welding voltage results in a shorter arc (the current again is not substantially changed). A change in wire diameter results in changed parameters. A smaller diameter wire requires an increase in wire feed speed to reach the same current. If certain limits are exceeded, a satisfactory weld cannot be obtained. Refer to welding set up chart on page (14) These are:

- A) Feeding wire too fast (with regard to the welding voltage) results in pulsing within the torch. This is because the wire electrode dips into the puddle and cannot be melted off fast enough.
- B) Setting welding voltage to high (with regard to the wire feed speed), will result in excessive and unstable arc. Increase the voltage even higher and the contact tip will burn.
- C) Excessive wire speed can be corrected through the arc voltage increase. The limit of this adjustment depends on the thickness of the material to welded (a certain limit exceeded will result in burnthrough).

Place the torch on the joint you want to weld: the angle between the torch and the nozzle should be around 45°. The distance between the torch and the work piece should be approximately 1/2". Lower the face shield and press the torch trigger to start the arc. When the arc has struck, move the nozzle slowly from left to right along the joint. Adjust the wire feed speed until the arc makes a "crisp" sound (experience will help you to recognize the right sound).

## Aluminum Welding

The machine should be set up as for mild steel except for the following changes:

- 100% ARGON as weld shielding gas.
- Ensure that your torch is set up for aluminum welding:
- The length of the torch cable should not exceed 10' (it is advisable not to use longer torches).
- Install a teflon wire liner. Follow the instructions for changing the liner.
- Ensure that drive rolls are suitable for aluminum wire.
- Use contact tips that are suitable for aluminum wire and make sure that the diameter of the contact tip hole corresponds to the wire diameter that is going to be used.



## Welding Hints and Maintenance

- Always weld clean, dry and well prepared material.
- Hold gun at a 45° angle to the workpiece with nozzle about 1/2" from the surface.
- Move the gun smoothly and steadily as you weld.
- Avoid welding in very drafty areas. A weak, pitted and porous weld will result due to air blowing away the protective welding gas.
- Keep wire and wire liner clean. Do not use rusty wire.
- Sharp bends or kinks in the welding cable should be avoided.
- Always try to avoid getting particles of metal inside the machine since they could cause short circuits or other damage.
- Use compressed air to periodically clean the hose liner, especially when changing wire spools.

### **IMPORTANT: Disconnect from power source when carrying out this operation.**

- Using low pressure air (3/5 Bar=20-30 PSI), occasionally blow the dust from the inside of the welder. This keeps the machine running cooler. **Note: do not blow air over the printed circuit board and electronic components.**
- The wire feed roller will eventually wear during normal use. With the correct tension the pressure roller must feed the wire without slipping. If the pressure roller and the wire feed roller make contact when the wire is in place between them, the wire feed roller must be replaced.
- Check all cables periodically. They must be in good condition and not cracked.

## Troubleshooting

This chart will assist you in resolving common problems you may encounter. These are not all the possible solutions.

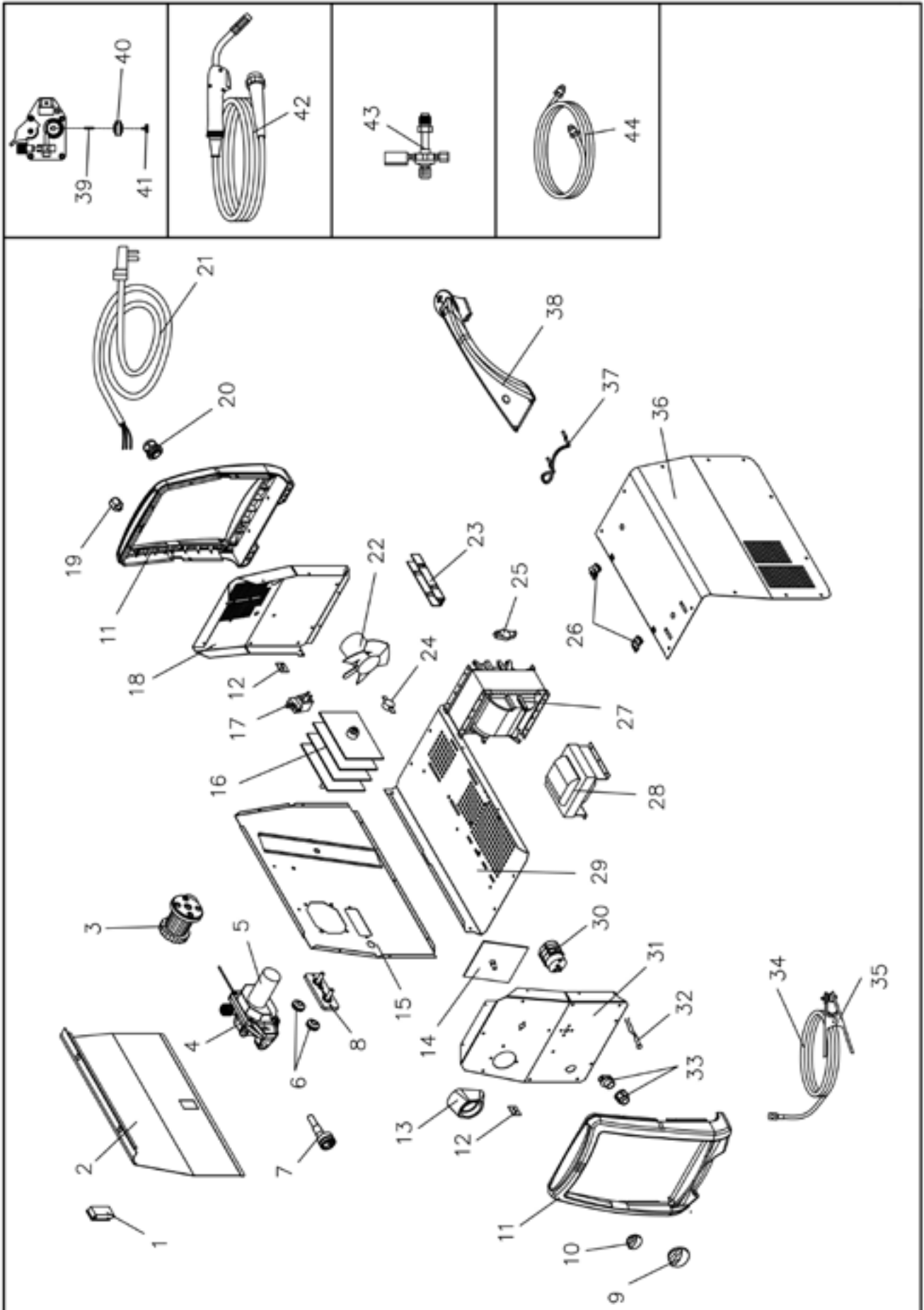
PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTION
No "power" from welder.	Input cable or plug malfunction. Wrong size fuse.	Check for proper input cable connection. Check fuse and replace as necessary.
Fan operates normally, but when gun trigger pulled, there is no wire feed, weld output or gas flow.	Faulty trigger gun. Thermostat intervention.	Replace torch trigger. Allow welder to cool. When the pilot lamp/switch on the front panel goes dark indicates the thermostat has closed.
Feed motor operates but wire will not feed.	Faulty wire feeding motor (rare). Insufficient feed roller pressure. Burr on end of wire. Liner blocked or damaged.	Replace wire feeding motor. Increase roller pressure. Re-cut wire square with no burr. Clear with compressed air or replace liner.
Lack of penetration.	Voltage or wire feed speed too low. Loose connection inside the machine (rare). Worn or wrong size contact tip. Loose gun connection or faulty gun assembly. Wrong size wire. Torch moved too fast.	Re-adjust the welding parameters. Clear with compressed air and tighten all connections. Replace the contact tip. Tighten or replace torch. Use correct size welding wire. Move the gun smoothly and not too fast.
Wire is birdnesting at the drive roller.	Excessive pressure on drive roller. Gun liner worn or damaged. Contact tip clogged or damaged. Liner stretched or too long.	Adjust pressure on drive roller. Replace wire liner. Replace contact tip. Cut wire liner at the right length.

<b>PROBLEM</b>	<b>POSSIBLE CAUSE</b>	<b>POSSIBLE SOLUTION</b>
Wire burns back to contact tip.	Contact tip clogged or damaged. Wire feed speed too slow. Wrong size contact tip. Bad connection from cable to clamp. Slag buildup inside nozzle or nozzle is shorted.	Replace the contact tip. Increase wire speed. Use correct size contact tip. Tighten clamp connection or replace cable. Clean or replace nozzle.
Workpiece clamp and/or cable gets hot.	Wire feed speed too fast.	Decrease wire feed speed.
Gun nozzle arcs to work surface.	Nozzle clogged.	Clean or replace nozzle
Wire pushes torch back from the workpiece.	Torch held too far from the workpiece.	Hold the torch at the right distance.
Poor quality welds.	Insufficient gas at weld area.  Rusty, painted, oil or greasy workpiece.  Rusty or dirty wire.  Poor ground contact.  Incorrect gas/wire combination	Check that the gas is not being blown away by drafts and, if so, move to more sheltered weld area. If not check gas cylinder contents gauge, regulator setting and operation of gas valve. Ensure workpiece is clean and dry.  Ensure wire is clean and dry.  Check ground clamp/workpiece connection. Check the manual for the correct combination.
Weld deposit "stringy" and incomplete.	Torch moved over workpiece too quickly.  Gas mixture incorrect.	Move the torch slower.  See shielding gas table.
Weld deposit too thick.	Torch moved over workpiece too slowly.  Welding voltage too low.	Move the torch faster.  Increase welding voltage.

## Tools and Spare Parts List

NO.	PART NUMBER	ITEM DESCRIPTION	QTY.
01	21690226K	Door latch (1pc pack)	1
02	05000272	Left panel with silk screen and labels	1
03	04600437	Kit spool holder with ring for 5kg spool	1
04	44410068	Wire feeder plast/all d.37 Rul.06-09	1
05	04600145	Motor d.37 + Pinion	1
06	21800051K	4 Lobes d.30 Hand-wheel m8bush 2pcs pack	2
07	23005501	Mig gun euro connection l=32	1
08	04600114	Kit gas/no gas change board	1
09	04600270	Switch knob d.38 Black	1
10	04600337	Black knob d.38 For potentiom. + Pointer	1
11	04600433	Assembly frame + caps	1
12	21690713	Spacer for plastic frame	1
13	21690805	Torch grommet for euro connection	1
14	22710037	P.C. Board e0795 220/240v + fuse "csa"	1
15	05000279	Dividing panel with labels	1
16	22400038	Rectifier pms 8/4/1 f	1
17	22900014K	Solenoid valve 11va 230v 60hz 1 pc pack	1
18	05000276	Rear panel	1
19	22910110	Female gas connector 1/8"gas - 5/8"unf	1
20	21605040K	Cable clamp m25x1,5 black 2pcs pack	2
21	20220173	Inp.Power cable3x12awg 4.5M+50a6-50p plug	1
22	04600286	Fan & fan motor assy. 220V 60hz	1
23	21690261	Cable holder	1
24	22210014K	Thermostat 100ø 10a 1 pc pack	1

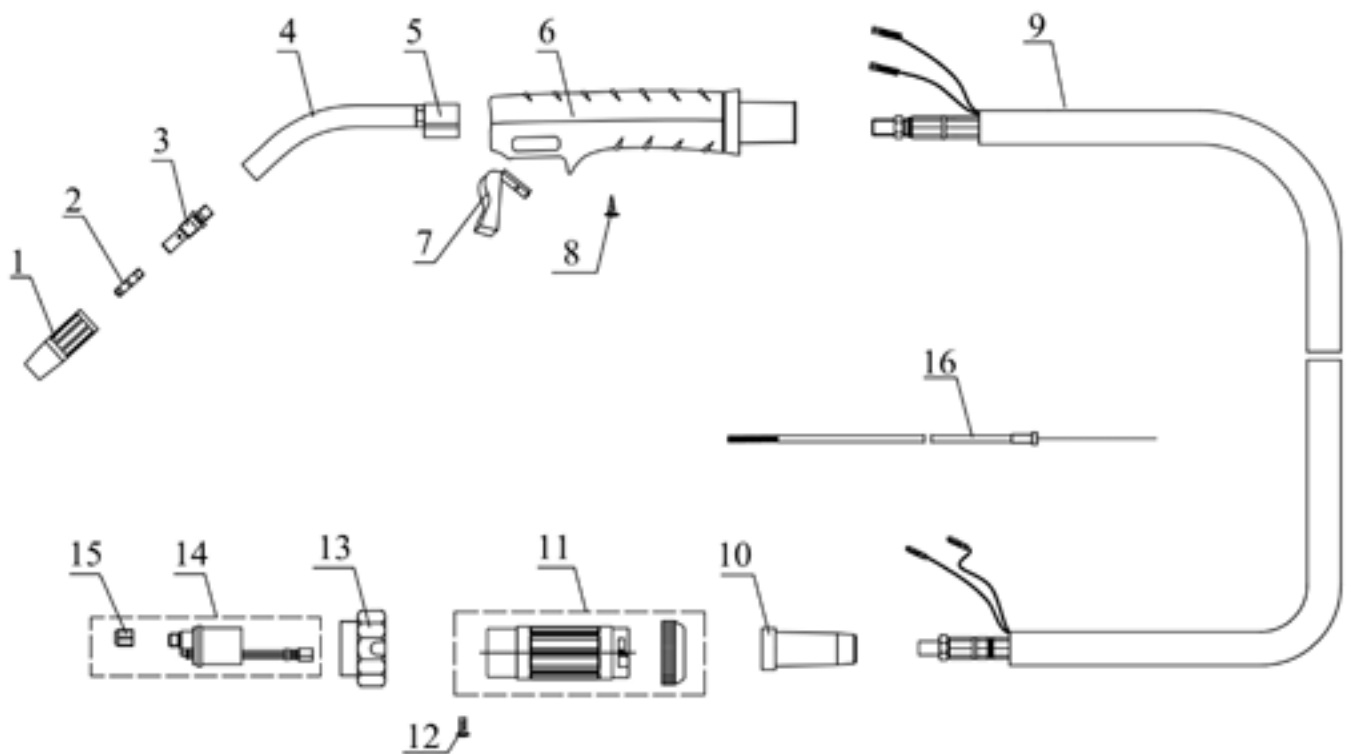
NO.	PART NUMBER	ITEM DESCRIPTION	QTY.
25	22210016K	Thermostat 127ø 16a 1 pc pack	1
26	21690225K	Plastic hinge for door 20x30 2pcs pack	2
27	44120178	Transformer mig 180 60hz 220v 40x85 al	1
28	44135018	Choke 40x40 al	1
29	33700414 9005	Bottom panel	1
30	22205159	17A switch "csa"	1
31	05000268	Front panel 190 mig forney w/silk screen	1
32	22610006K	Green pilot-lamp 220v l=230 1 pc pack	1
33	21605010K	Cable clamp+ring nut,hole d.20,2Pcs pack	2
34	43210120K	Earth cable 10gr.Mmq mt. 2 (Pack.1)	1
35	22110033K	Earth clamp 300a zinc-coated 1 pc pack	1
36	05000261	Right cover panel with silk screen	1
37	33740579 9005	Torch wrapper	1
38	21600067	Handle for torch wrapper	1
39	21060152K	Flat-key 3x3 l=20 1pc pack	1
40	33805071K	Feed roll d.30 0,6-0,9Mm mot2r 1 pc pack	1
41	33810136	Feed roll secure knob	1
42	23000448	Mig torch 14mm2 3mt tweco 1 euro connect	1
43	22905101	Gas reducer 2 man. Cga580-5/8" unf-2b	1
44	30900035	Black gas hose 3 meter	1

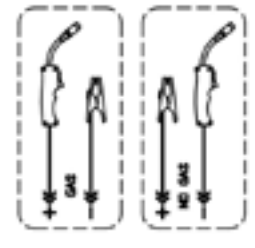
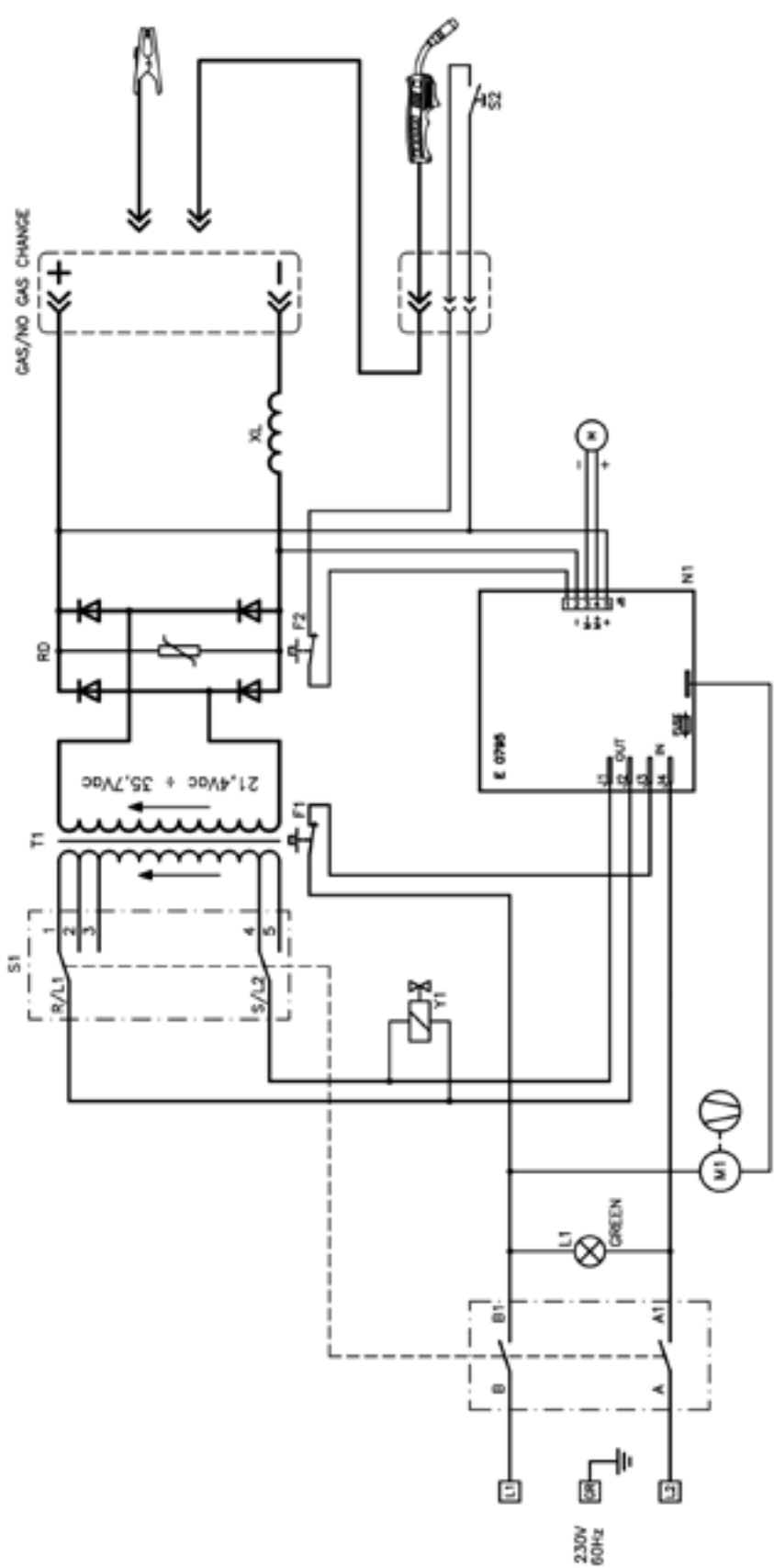


# MIG Gun Torch Spare Parts List

NO.	PART NUMBER	ITEM DESCRIPTION	QTY.
01	23005373K	Tweco torch nozzle 21-50f 1 pc pack	1
02	23005018K	0,6Mm contact tip for t1.4-1.6 10 Ppc pack	10
02	23005019K	0,8Mm contact tip for t1.4-1.6 10 pc pack	10
02	23005182K	0,9Mm contact tip for t1.4-1.6 10 pc pack	10
03	23005374K	Tweco gas diffuser 35-50 1 pc pack	1
04	23005375K	Tw1 m15 torch neck 1 pc pack	1
05	23005360K	Torch head plastic housing 1 pc pack	1
06	23005376K	Black handle for m15 torch 1 pc pack	1
07	23005377K	Red torch trigger 1 pc pack	1

NO.	PART NUMBER	ITEM DESCRIPTION	QTY.
08	23005362K	Screws for m25 torch handle 12 pc pack	12
09	23005535	Coax cable 14mm2 3m 1 pc pack	1
10	23005482	Plastic cable support	1
11	23005483	Rear box kit	1
12	23005539	Black screw m4x6	1
13	23005484	Plastic grommet	1
14	23005536	Male euro connection	1
15	23005537	Torch liner block nut	1
16	23005538	Blue steel wire liner 0,8-1,0	1





POSITION	1	2	3	4	5	A	B
RL1				X	X	X	X
SL2							
1	X						
2		X					
3			X				
4				X			
5					X		
6						X	X

F1-F2	THERMOSTAT
Y1	SOLENOID VALVE
L1	POWER ON PILOT LAMP
M	WIRE FEEDING MOTOR
M1	FAN
N1	P.C. BOARD
RD	RECTIFIER
S1	SWITCH
S2	TORCH TRIGGER
T1	TRANSFORMER
XL	CHOKE



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