Firepower® FP 95
FLUX CORED WELDER

Operating Manual

A-13015

MIG FLUX CORED | MAX OUTPUT 90 AMPS | INPUT PLUG 15 Amp 115 VAC | GASLESS FLUX CORED | MATERIAL MILD STEEL

Révision : AB	Issue Date: April 8, 2016	Manual No.: 0-5122

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WE APPRECIATE YOUR BUSINESS!

Congratulations on your new Firepower product. We are proud to have you as our customer and will strive to provide you with the best service and reliability in the industry. This product is backed by our extensive warranty and world-wide service network. To locate your nearest distributor or service agency, visit us on the web at **www.firepoweronline.com**.

This Operating Manual has been designed to instruct you on the correct use and operation of your Firepower product. Your satisfaction with this product and its safe operation is our ultimate concern. Therefore please take the time to read the entire manual, especially the Safety Precautions. They will help you to avoid potential hazards that may exist when working with this product.

YOU ARE IN GOOD COMPANY!

The Brand of Choice for Contractors and Fabricators Worldwide.

ESAB is a Global Brand of manual and automation Plasma Cutting Products.

We distinguish ourselves from our competition through market-leading, dependable products that have stood the test of time. We pride ourselves on technical innovation, competitive prices, excellent delivery, superior customer service and technical support, together with excellence in sales and marketing expertise.

Above all, we are committed to developing technologically advanced products to achieve a safer working environment within the welding industry.

WARNING
Read and understand this entire Manual and your employer's safety practices before installing, operating, or servicing the equipment.
While the information contained in this Manual represents the Manufacturer's best judgement, the Manufacturer assumes no liability for its use.

Firepower FP 95 Flux Cored Welder
Operating Manual Number 0-5122

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Record the following information for Warranty purposes:

Where Purchased:_____ _____

Purchase Date:_____ _____

Power Supply Serial #:_____ _____

Torch Serial #:_____ _____

Be sure this information reaches the operator.
You can get extra copies through your supplier.

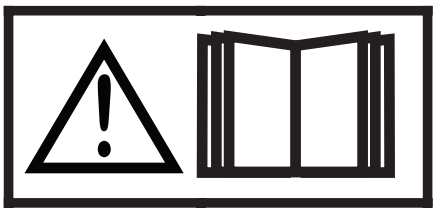
CAUTION

These INSTRUCTIONS are for experienced operators. If you are not fully familiar with the principles of operation and safe practices for arc welding and cutting equipment, we urge you to read our booklet, "Precautions and Safe Practices for Arc Welding, Cutting, and Gouging," Form 52-529. Do NOT permit untrained persons to install, operate, or maintain this equipment. Do NOT attempt to install or operate this equipment until you have read and fully understand these instructions. If you do not fully understand these instructions, contact your supplier for further information. Be sure to read the Safety Precautions before installing or operating this equipment.

USER RESPONSIBILITY

This equipment will perform in conformity with the description thereof contained in this manual and accompanying labels and/or inserts when installed, operated, maintained and repaired in accordance with the instructions provided. This equipment must be checked periodically. Malfunctioning or poorly maintained equipment should not be used. Parts that are broken, missing, worn, distorted or contaminated should be replaced immediately. Should such repair or replacement become necessary, the manufacturer recommends that a telephone or written request for service advice be made to the Authorized Distributor from whom it was purchased.

This equipment or any of its parts should not be altered without the prior written approval of the manufacturer. The user of this equipment shall have the sole responsibility for any malfunction which results from improper use, faulty maintenance, damage, improper repair or alteration by anyone other than the manufacturer or a service facility designated by the manufacturer.



READ AND UNDERSTAND THE INSTRUCTION MANUAL BEFORE INSTALLING OR OPERATING.
PROTECT YOURSELF AND OTHERS!

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1.0 Safety Precautions

Users of ESAB welding and plasma cutting equipment have the ultimate responsibility for ensuring that anyone who works on or near the equipment observes all the relevant safety precautions. Safety precautions must meet the requirements that apply to this type of welding or plasma cutting equipment. The following recommendations should be observed in addition to the standard regulations that apply to the workplace.

All work must be carried out by trained personnel well acquainted with the operation of the welding or plasma cutting equipment. Incorrect operation of the equipment may lead to hazardous situations which can result in injury to the operator and damage to the equipment.

1. Anyone who uses welding or plasma cutting equipment must be familiar with:
   - its operation
   - location of emergency stops
   - its function
   - relevant safety precautions
   - welding and / or plasma cutting
2. The operator must ensure that:
   - no unauthorized person stationed within the working area of the equipment when it is started up.
   - no one is unprotected when the arc is struck.
3. The workplace must:
   - be suitable for the purpose
   - be free from drafts
4. Personal safety equipment:
   - Always wear recommended personal safety equipment, such as safety glasses, flame proof clothing, safety gloves.
   - Do not wear loose fitting items, such as scarves, bracelets, rings, etc., which could become trapped or cause burns.
5. General precautions:
   - Make sure the return cable is connected securely.
   - Work on high voltage equipment **may only be carried out by a qualified electrician**.
   - Appropriate fire extinguishing equipment must be clearly marked and close at hand.
   - Lubrication and maintenance **must not** be carried out on the equipment during operation.

Dispose of electronic equipment at the recycling facility!
In observance of European Directive 2002/96/EC on Waste Electrical and Electronic Equipment and its implementation in accordance with national law, electrical and/or electronic equipment that has reached the end of its life must be disposed of at a recycling facility.
As the person responsible for the equipment, it is your responsibility to obtain information on approved collection stations.
For further information contact the nearest ESAB dealer.

ESAB can provide you with all necessary cutting protection and accessories.

WARNING	**Arc welding and cutting can be injurious to yourself and others. Take precautions when welding and cutting. Ask for your employer's safety practices which should be based on manufacturers' hazard data.**

ELECTRIC SHOCK - Can kill.

- Install and earth (ground) the welding or plasma cutting unit in accordance with applicable standards.
- Do not touch live electrical parts or electrodes with bare skin, wet gloves or wet clothing.
- Insulate yourself from earth and the workpiece.
- Ensure your working stance is safe.

FUMES AND GASES - Can be dangerous to health.

- Keep your head out of the fumes.
- Use ventilation, extraction at the arc, or both, to take fumes and gases away from your breathing zone and the general area.

ARC RAYS - Can injure eyes and burn skin.

- Protect your eyes and body. Use the correct welding / plasma cutting screen and filter lens and wear protective clothing.
- Protect bystanders with suitable screens or curtains.

FIRE HAZARD

- Sparks (spatter) can cause fire. Make sure therefore that there are no inflammable materials nearby.

NOISE - Excessive noise can damage hearing.

- Protect your ears. Use earmuffs or other hearing protection.
- Warn bystanders of the risk.

MALFUNCTION - Call for expert assistance in the event of malfunction.

READ AND UNDERSTAND THE INSTRUCTION MANUAL BEFORE INSTALLING OR OPERATING.

PROTECT YOURSELF AND OTHERS!

WARNING	**Do not use the power source for thawing frozen pipes.**

CAUTION	**Class A equipment is not intended for use in residential locations where the electrical power is provided by the public low-voltage supply system. There may be potential difficulties in ensuring electromagnetic compatibility of class A equipment in those locations, due to conducted as well as radiated disturbances.**	

CAUTION	**This product is solely intended for metal removal. Any other use may result in personal injury and / or equipment damage.**

CAUTION	**Read and understand the instruction manual before installing or operating.**	

2.0 Précautions de sécurité

Les utilisateurs du matériel de soudage et de coupage plasma ESAB ont la responsabilité ultime d'assurer que toute personne qui opère ou qui se trouve dans l'aire de travail observe les précautions de sécurité pertinentes. Les précautions de sécurité doivent répondre aux exigences applicables à ce type de matériel de soudage ou de coupage plasma. Les recommandations suivantes doivent être observées en plus des règles standard qui s'appliquent au lieu de travail.

Tous les travaux doivent être effectués par un personnel qualifié possédant de bonnes connaissances par rapport au fonctionnement du matériel de soudage et de coupage plasma. Un fontionnement incorrect du matériel peut produire des situations dangereuses qui peuvent causer des blessures à l'opérateur ou des dommages au matériel.

1. Toute personne travaillant avec le matériel de soudage ou de coupage plasma doit connaître :
   - son fonctionnement;
   - l'emplacement des interrupteurs d'arrêt d'urgence;
   - sa fonction;
   - les précautions de sécurité pertinentes;
   - les procédures de soudage et/ou de coupage plasma.

2. L'opérateur doit assurer que :
   - seules les personnes autorisées à travailler sur l'équipement se trouvent dans l'aire de travail lors de la mise en marche de l'équipement;
   - toutes les personnes dans l'aire de travail sont protégées lorsque l'arc est amorcé.

3. Le lieu de travail doit être :
   - aménagé convenablement pour acquérir le matériel en toute sécurité;
   - libre de courants d'air.

4. Équipement de sécurité personnelle
   - Vous devez toujours utiliser un équipement de sécurité convenable tels que les lunettes de protection, les vêtement ininflammables et des gants de protection.
   - Vous ne devez jamais porter de vêtements amples, tels que foulards, bracelets, bagues, etc., qui pourraient se prendre dans l'appareil ou causer des brûlures.

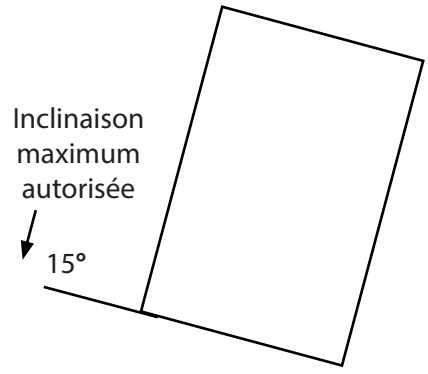
5. Précautions générales :
   - Assurez-vous que le câble de retour est bien branché.
   - La réparation d'un équipement de haute tension **doit être effectuée par un électricien qualifié seulement**.
   - Un équipement d'extinction d'incendie approprié doit être à proximité de l'appareil et l'emplacement doit être clairement indiqué.
   - Vous **ne devez jamais** procéder à la lubrification ou l'entretien du matériel lorsque l'appareil est en marche.

Classe de boîtier

Le code **IP** indique la classe du boîtier, à savoir le niveau de protection offert contre toute pénétration par des objets solides ou de l'eau. La protection est fournie contre le contact d'un doigt, la pénétration d'objets solides d'une taille supérieure à 12 mm et contre l'eau pulvérisée jusqu'à 60 degrés de la verticale. L'équipement marqué **IP21S** peut être stocké mais ne doit pas être utilisé à l'extérieur quand il pleut à moins d'être sous abri.

ATTENTION

Si l'équipement est placé sur une surface inclinée de plus de 15°, il y a danger de basculement et en conséquence, des blessures personnelles et/ou des dommages importants à l'équipement.



AVERTISSEMENT

LE SOUDAGE ET LE COUPAGE À L'ARC PEUVENT CAUSER DES BLESSURES À L'OPÉRATEUR OU LES AUTRES PERSONNES SE TROUVANT DANS L'AIRE DE TRAVAIL. ASSUREZ-VOUS DE PRENDRE TOUTES LES PRÉCAUTIONS NÉCESSAIRES LORS D'UNE OPÉRATION DE SOUDAGE OU DE COUPAGE. DEMANDEZ À VOTRE EMPLOYEUR UNE COPIE DES MESURES DE SÉCURITÉ QUI DOIVENT ÊTRE ÉLABORÉES À PARTIR DES DONNÉES DES RISQUE DU FABRICANT.

CHOC ÉLECTRIQUE - peut être mortel.

- Assurez-vous que l'unité de soudage ou de coupage plasma est installée et mise à la terre conformément aux normes applicables.
- Ne touchez pas aux pièces électriques sous tension ou les électrodes si vos mains ne sont pas bien protégées ou si vos gants ou vos vêtements sont humides.
- Assurez-vous que votre corps est bien isolé de la mise à la terre et de la pièce à traiter.
- Assurez-vous que votre position de travail est sécure.

VAPEURS ET GAZ - peuvent être danereux pour la santé.

- Gardez votre tête éloignée des vapeurs.
- Utilisez un système de ventilation et/ou d'extraction à l'arc pour évacuer les vapeurs et les gaz de votre zone respiratoire.

RAYONS DE L'ARC - peuvent endommager la vue ou brûler la peau.

- Protégez vos yeux et votre corps. Utilisez un écran de soudage/coupage plasma convenable équipé de lentilles teintées et portez des vêtements de protection.
- Protégez les personnes se trouvant dans l'aire de travail à l'aide d'un écran ou d'un rideau protecteur convenable.

RISQUE D'INCENDIE

- Les étincelles (projections) peuvent causer un incendie. Assurez-vous qu'il n'y a pas de matériel inflammable à proximité de l'appareil.

BRUIT - un bruit excessif peut endommager la capacité auditive.

- Protégez vos oreilles. Utilisez des protecteurs d'oreilles ou un autre type de protection auditive.
- Avertissez les personnes se trouvant dans l'aire de travail de ce risque.

FONCTIONNEMENT DÉFECTUEUX - Dans le cas d'un fonctionnement défectueux demandez l'aide d'une personne qualifiée.

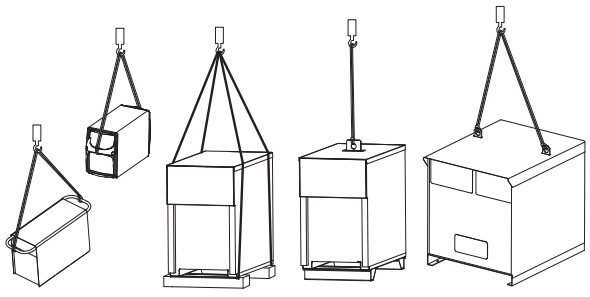
ASSUREZ-VOUS DE LIRE ET DE COMPRENDRE LE MANUEL D'UTILISATION AVANT D'INSTALLER OU D'OPÉRER L'UNITÉ. PROTÉGEZ-VOUS ET LES AUTRES !

ATTENTION

Ce produit est uniquement destiné à la découpe du plasma. Toute autre utilisation peut entraîner des blessures ou endommager l'équipement.

ATTENTION

Pour éviter toute blessure personnelle et/ou endommagement à l'équipement, soulever à l'aide de la méthode et des points d'attache indiqués ici.



SECTION 2: INTRODUCTION

2.01 How To Use This Manual

This Owner's Manual applies to just specification or part numbers listed on page i.
To ensure safe operation, read the entire manual, including the chapter on safety instructions and warnings.
Throughout this manual, the words WARNING, CAUTION, DANGER, and NOTE may appear. Pay particular attention to the information provided under these headings. These special annotations are easily recognized as follows:

NOTE!
An operation, procedure, or background information which requires additional emphasis or is helpful in efficient operation of the system.

CAUTION
A procedure which, if not properly followed, may cause damage to the equipment.

WARNING
A procedure which, if not properly followed, may cause injury to the operator or others in the operating area.

WARNING
Gives information regarding possible electrical shock injury. Warnings will be enclosed in a box such as this.

DANGER
Means immediate hazards which, if not avoided, will result in immediate, serious personal injury or loss of life.

Additional copies of this manual may be purchased by contacting Firepower at the address and phone number in your area listed on back cover of this manual. Include the Owner's Manual number and equipment identification numbers.

Electronic copies of this manual can also be downloaded at no charge in Acrobat PDF format by going to the Firepower web site listed below

http://www.firepoweronline.com

2.02 Equipment Identification

The unit's identification number (specification or part number), model, and serial number usually appear on a data tag attached to the rear panel. Equipment which does not have a data tag such as torch and cable assemblies are identified only by the specification or part number printed on loosely attached card or the shipping container. Record these numbers on the bottom of page i for future reference.

2.03 Receipt Of Equipment

When you receive the equipment, check it against the invoice to make sure it is complete and inspect the equipment for possible damage due to shipping. If there is any damage, notify the carrier immediately to file a claim. Furnish complete information concerning damage claims or shipping errors to the location in your area listed in the inside back cover of this manual.

Include all equipment identification numbers as described above along with a full description of the parts in error.

Move the equipment to the installation site before un-crating the unit. Use care to avoid damaging the equipment when using bars, hammers, etc., to un-crate the unit.

2.04 Description

The Firepower FP 95 FC Machine is a single-phase input welding machine and comes equipped with the following:

1. Built-in Wire Feeder and Wire Spool Hub
2. Welding Gun and Cable (6.5' / 2m)
3. Work Cable and Clamp (5' / 1.6m)
4. Input Cord (7' / 2.25m)
5. Operational Manual
6. Spare parts kit (2 contact tips)
7. 0.5 lb Wire spool

The welding system is designed for use with the following processes:

1. FCAW – Flux-cored arc welding – Does not require the use of a shielding gas.

2.05 Specifications

Description	Firepower FP 95 FC
Package System Part Number	1444-0322
Power Source Weight	37.15 lb (16.8 kg)
Power Source Dimensions HxWxD	14"x7"x15" (355.6 x 177.8 x 381mm)
Number of Phases	1 Ø
Frequency	60Hz
Flexible Supply Cable Size	7 ft (2.25 m) 14AWG
Supply Lead Plug Type	5-15P
Nominal Input Voltage	120V AC
Rated Input Current	15A
Rated kVA @ 100% Duty Cycle	1.2kVA
Rated Input Current	15A (60A@20%)
Maximum Input Current	28A (85A@17%)
Generator Requirements	98145.4519
98145.4519	# 3.4kVA
Open Circuit Voltage Range	15 – 27V
Output Current Range	23 – 90A
Duty Cycle Period	10 Minutes
Number of Output Voltage Values	2
Minimum Mains Circuit to suit factory fitted Plug & Lead (Weld Current @ Duty Cycle)	(+) 15A (60A@20%)
Maximum Mains Circuit to suit factory fitted Plug & Lead (Weld Current @ Duty Cycle)	(+) 28A (85A@17%)
Wire Size Range (Flux Core)	.023” - .030” (0.6 - 0.8mm)

Table 2-1: System Specifications

Δ The recommended time delay fuse or circuit breaker size is 20 amp. An individual branch circuit capable of carrying 30 amperes and protected by fuses or circuit breaker is recommended for this application. Fuse size is based on not more than 200 percent of the rated input amperage of the welding power source (Based on Article 630, National Electrical Code)

Firepower continuously strives to produce the best product possible and therefore reserves the right to change, improve or revise the specifications or design of this or any product without prior notice. Such updates or changes do not entitle the buyer of equipment previously sold or shipped to the corresponding changes, updates, improvements or replacement of such items.

The values specified in the table above are optimal values, your values may differ. Individual equipment may differ from the above specifications due to in part, but not exclusively, to any one or more of the following; variations or changes in manufactured components, installation location and conditions and local power grid supply conditions.

2.06 Volt - Amp Curves

Figure 2-1: Volt/Amp curves of the FirePower 95

2.07 Duty Cycle

Duty Cycle is the amount of arc-on time (actual welding time) during any 10 minute period that a machine can operate at it's rated output without damaging internal components. For example, the Firepower FP 95 FC is designed for 17% duty cycle at 85 amps. This means that it has been designed and built to provide the rated amperage, 85 amps, for1.7 minutes out of every 10 minute period. During the other 8.3 minutes of the 10 minute period, the Firepower FP 95 FC must idle and be allowed to cool. The thermal cutout will operate if the duty cycle is exceeded.
If the unit overheats and the thermostat opens, wait 15 minutes for unit to cool.

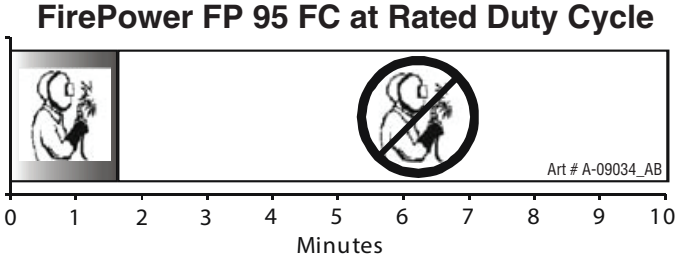


Figure 2-2: Duty Cycle of Firepower FP 95 FC

2.08 MIG Gun Maintenance

Remove dust and metallic particles from the gun conduit by forcing clean, dry compressed air into the conduit once a week. This will minimize wire feeding problems.

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SECTION 3: INSTALLATION

3.01 Location

For best operating characteristics and longest unit life, take care in selecting the installation site. Avoid locations exposed to high humidity, dust, high ambient temperature, or corrosive fumes. Moisture can condense on electrical components, causing corrosion or shorting of circuits. Dirt on components will retain this moisture and also increases wear on moving parts.
Adequate air circulation is needed at all times in order to assure proper operation. Provide a minimum of 12" (300mm) of free air space at both the front and rear of the unit. Make sure that the ventilation openings are not obstructed.

CAUTION
The Firepower FP 95 FC is not suitable for use in rain.

3.02 Safety

Refer to additional installation instructions under the SAFETY INSTRUCTIONS AND WARNINGS (Section 1) in this manual.

3.03 Grounding

The internal frame of this welding machine should be grounded for personal safety. Where grounding is mandatory under state or local codes, it is the responsibility of the user to comply with all applicable rules and regulations. Where no state or local codes exist, it is recommended that the National Electrical Code be followed.

3.04 Electrical Input Requirements

Plug the input cord into a properly grounded and protected (by fuse or circuit breaker) mains receptacle capable of handling a minimum of 20 Amperes. The Firepower FP 95 FC requires a 120VAC supply voltage.
The Firepower FP 95 FC's power cord is equipped with a NEMA 5-15P plug and will only connect to a NEMA 5-15P receptacle.

CAUTION
Consult the nameplate for proper input voltage and input amperage. The method of installation, conductor size, and overcurrent protection shall conform to the requirements of the local electrical code. All installation wiring and machine connection shall be done by a competent electrician.

The National Electrical Code (Article 630B) provides standards for amperage handling capability of supply conductors based on the duty cycle of the welding power source. The Firepower FP 95 FC has a 17% duty cycle (1 minute and 40 secondss of every 10 minutes can be used for welding).The power cord supplied with this unit complies with these standards. Ensure that the building supply and receptacle comply with NEC standards and any additional state and local codes.

NOTE!
The supply wiring for the welding power source must be capable of handling a minimum of 20 amperes. The welding power source must be the only load connected to the supply circuit. Poor unit performance or frequently opening line fuses or circuit breakers can result from an inadequate or improper supply..

CAUTION
Do not connect the Firepower FP 95 FC to an input power supply with a rated voltage that is greater than 120 +10% VAC. Do not remove the power cord ground prong.

3.05 Requirements for Maximum Output

In order to obtain the maximum output capability of the Firepower FP- 95, a branch circuit capable of 20 amperes at 115 to 125 Volts 60 Hz is required. This generally applies when welding steel that is equal to or greater than 12 gauge (0.105" 2.5mm) in thickness.
The rated output with this installation is 85 amperes, 18.25 Volt, 17% duty cycle (1 minute 40 seconds out of every 10 minutes used for welding).

3.06 Installing Wire Spool

As delivered from the factory, the unit is set with a 4" (102mm) spool.

Installation of Wire Spool

Assemble parts in sequence (shown in Figure 3-1 from right to left).

1. Retaining Spring
2. "D" Washer
3. Spool
4. Locking knob (press the two tabs to remove it).

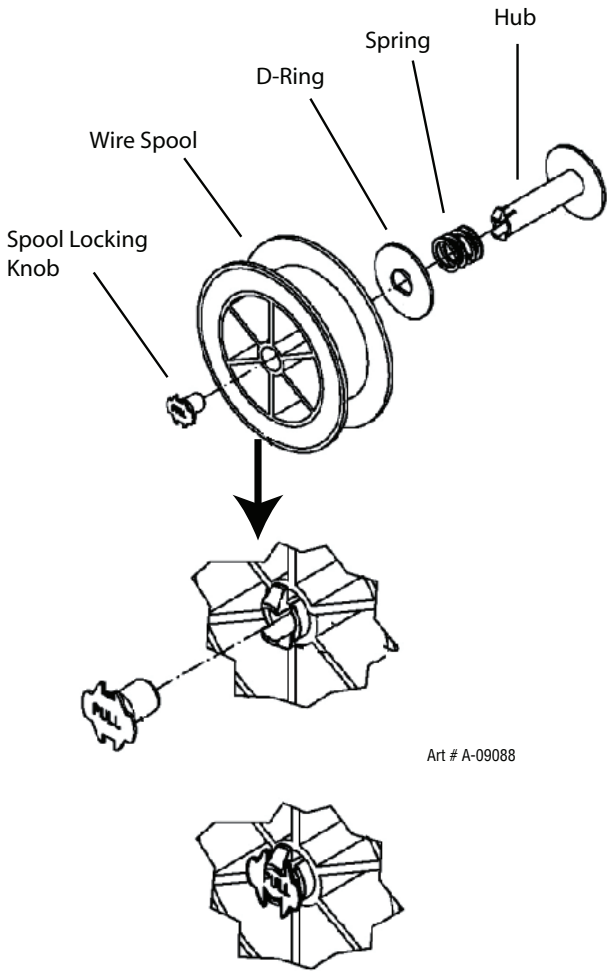

Figure 3-1: 4" Spool Installation

3.07 Feedrolls

A feedroll consists of two different sized grooves. As delivered from the factory, the drive roll is installed for .030" (0.8mm) Firepower FP 95 FC.
The branding inside at the end of the feedroll refers to the size nearest to the mark
This also applies to optional feedrolls which are available for this machine.

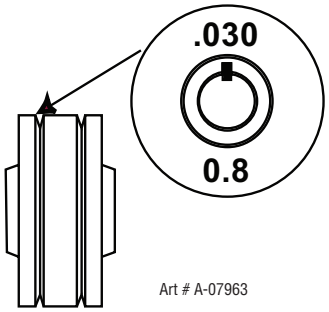

Figure 3-2 : Feedroll Example

3.08 Install Wire into the Feedhead

WARNING
ELECTRIC SHOCK CAN KILL! Make certain the machine is unplugged from the power receptacle. Do not plug machine in until told to do so in these instructions.

If Not Installed Load the Wire Spool per directions in section 3.06 onto the hub so that the wire will feed off the spool as the spool rotates counter- clockwise.

CAUTION
Use care in handling the spooled wire as it will tend to "unravel" when loosened from the spool. Grasp the end of the wire firmly and do not let go of it. Make sure that the end of the wire is free of any burrs and is straight.

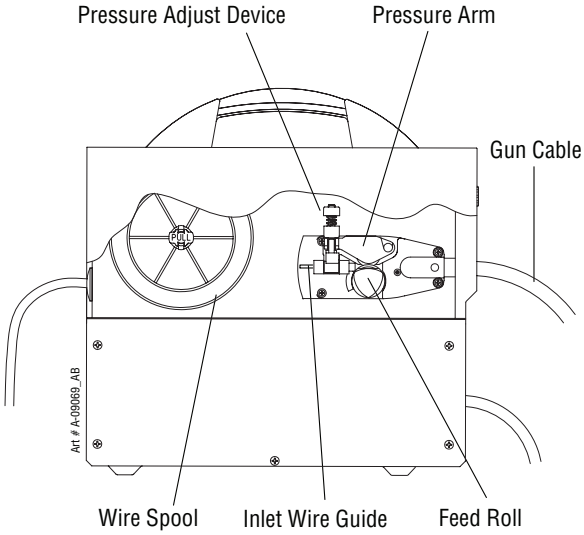

Figure 3-3: Wire Feeder Components

Route the Wire Through the Feedhead

1. Loosen Pressure Adjust Device (Fig. 3-3).
2. Open Pressure Adjust Device (Fig. 3-3).
3. Open Pressure Arm (Fig. 3-4).
4. Place the end of the wire into the Inlet Wire Guide, feeding it over the Feedroll. Make certain that the proper groove is being used (Fig. 3-5).
5. Pass the wire into the Gun Liner of the Gun Cable End (Fig. 3-5).
6. Close the Pressure Arm (Fig. 3-5).
7. Close the Pressure Adjust Device. Tighten it to a "snug" condition (Fig. 3-6).
8. Figure 3-6 shows the result with the wire installed.

NOTE!
If there is too much pressure on the drive roll the wire gets locked and the motor could get damaged, If it is too loose the wire will not feed properly.

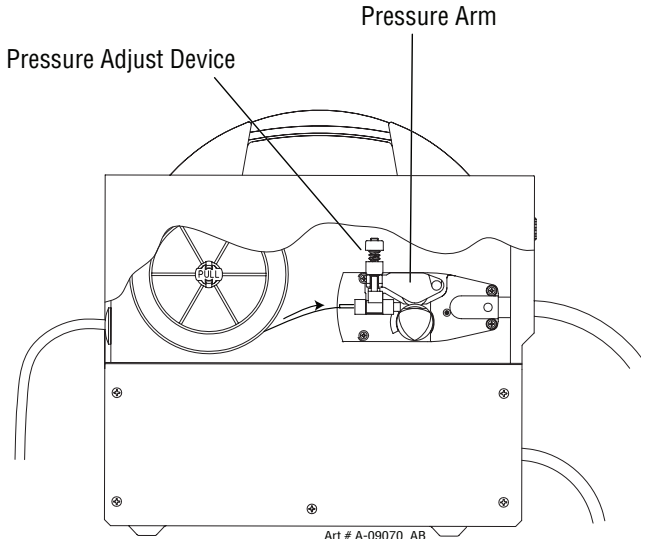

Figure 3-4: Opening Pressure Arm

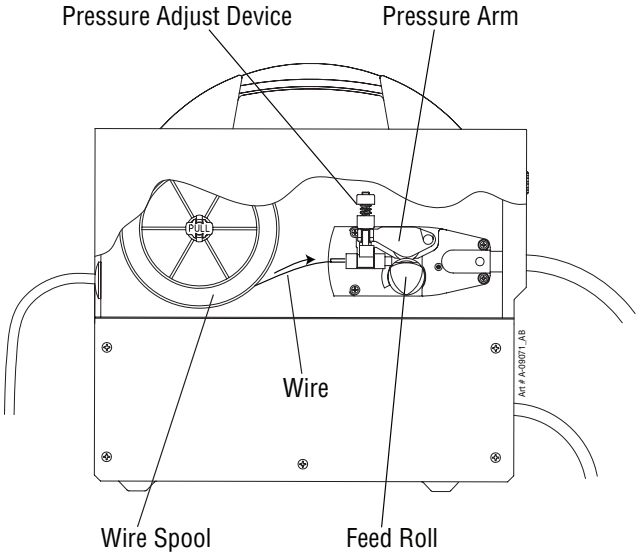

Figure 3-5: Inserting Wire

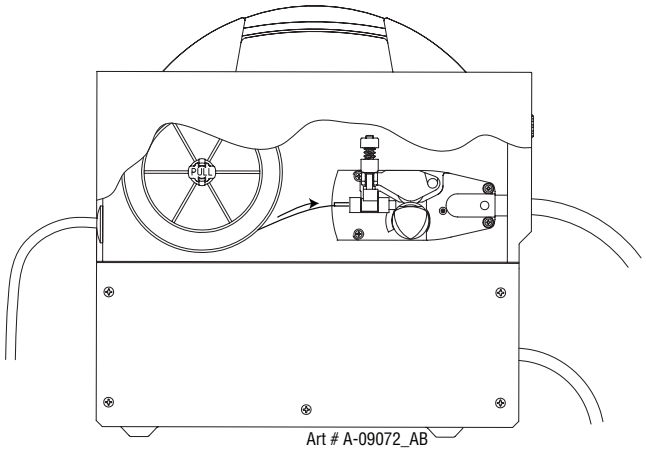

Figure 3-6: Wire Installed

3.09 Install Wire into the Welding Gun

1. Plug the Welding Power Source into the 120VAC receptacle.

WARNING
ELECTRIC SHOCK CAN KILL! With the gun switch (located on the gun) activated, welding power is applied to the output terminals, feedroll, ground clamp, gun cable connection and welding wire. Do not touch these parts with the gun switch activated.

2. Turn the welding machine ON with the front panel Voltage Power Switch set to "Min"

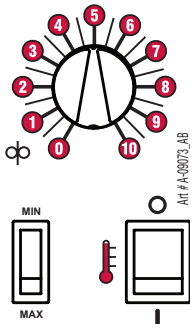

Figure 3--7: Power ON

3. Set the wire feed speed to half-way or "5".

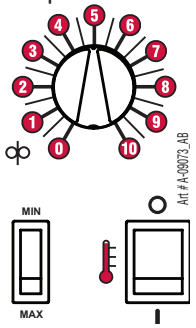

Figure 3-8: Wire Speed Half-way

4. Straighten the gun cable. Remove the nozzle and contact tip from the MIG welding gun (see Section 2.08).

WARNING
If ground connection clamp is in place on the workpiece the electrode wire is electrically “hot” when the gun switch is activated.

5. Activate the gun switch until the wire feeds out past the gun nozzle and deactivate the gun switch.

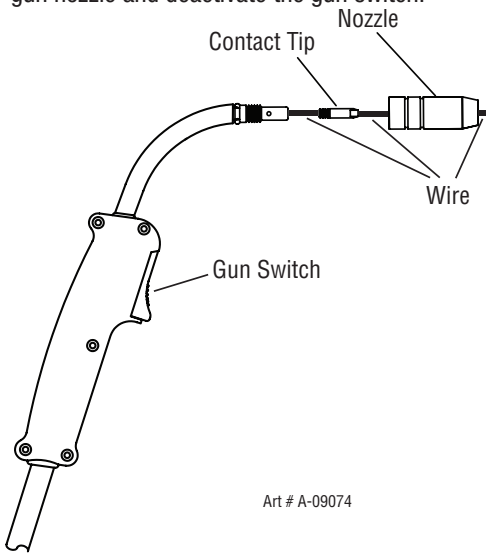

Figure 3-9: Feed Wire Through Gun

6. Set the Voltage Power Switch to "OFF" and unplug the supply cord.
7. Replace the contact tip and nozzle. Cut the wire within ¼” (6mm) from the nozzle.

WARNING
The drive rollers, when moving, may crush the fingers. Periodically, check the drive rollers. Replace them when they are worn and compromise the regular feeding of the wire.

CAUTION
The Firepower FP 95 FC’s welding torch is a “live” contact torch and is ALWAYS in the power on position. Wear eye protection at all times when handling this torch.

WARNING
ELECTRIC SHOCK CAN KILL! With the gun switch (located on the gun) activated, welding power is applied to the output terminals, feedroll, ground clamp, gun cable connection and welding wire. Do not touch these parts while the gun switch is activated.

SECTION 4: OPERATION

4.01 General Safety Precautions

Read and understand the safety instructions at the beginning of this manual prior to operating this machine.

WARNING
Be sure to put on proper protective clothing and eye safeguards (welding coat, apron, gloves, and welding helmet, with proper lenses installed). See Safety Instructions and Warnings chapter included in this manual. Neglect of these precautions may result in personal injury.

WARNING
Make all connections to the power source including electrode and work cables, as well as remote control cables, with the power source turned off. These connections could be electrically live with the power switch ON.

WARNING
ELECTRIC SHOCK CAN KILL! Do not operate the machine with the door open.

CAUTION
Do not pull the machine with the gun. Damage can occur to the gun, gun liner and machine. Avoid bending the gun cable with a sharp radius. Damage can occur to the gun liner.

4.02 Firepower Controls

Refer to Figure 4-1

1. Power ON / OFF switch turns the power on and off. It also lights when the power supply has gone into overtemp.
2. The Wire Speed Control knob controls the welding current via the electrode wire feed rate (i.e. the speed of the wire feed motor).
3. The Voltage Power Switch selects between MIN and MAX voltage levels to the welding terminals.

CAUTION
The Voltage Power Switch MUST NOT BE SWITCHED during the welding process.

4. Welding Torch and Cable
5. The Work Cable & Clamp connects to the item being welded.
6. Main Power Cable.
7. The moveable tension knob applies pressure to the grooved roller via screw-adjustable spring pressure. The adjustable spring screw should be adjusted to a minimum pressure that will provide satisfactory wire feed without slippage. If slipping occurs, and inspection of the wire contact tip reveals no wear, distortion or burn-back jam, the conduit liner should be checked for kinks and clogging by metal flakes and slag. If this is not the cause of slipping, the feedroll pressure can be increased by rotating the adjustable spring screw clockwise. The use of excessive pressure may cause rapid wear of the feed roller, motor shaft and motor bearings.

CAUTION
Loose welding terminal connections can cause overheating and result in the cables being fused to the welding terminals.

(8) The wire reel hub incorporates a friction brake which is adjusted during manufacture for optimum braking.

Figure 4-1: Firepower Controls

4.03 Flux Cored Arc Welding (FCAW)

See Welding Guidelines included in this manual.

1. Make all necessary connections as instructed in the INSTALLATION chapter.
2. Place the WELDING OUTPUT VOLTAGE SELECTOR at the desired setting.
3. Rotate the WIRE SPEED FEED control to the desired setting.
4. Plug the supply cord into a 120 VAC 20 Ampere receptacle.
5. Connect the WORK CLAMP to the workpiece (material to be welded).
6. Extend wire from the gun, and cut to proper stick-out for that type of wire (when welding always maintain this distance).
7. Position gun to where it is at approximately right angles to the workpiece with proper wire stick-out. Lower your welding helmet and pull the gun trigger switch.

WARNING
Be sure to put on proper protective clothing and eye safeguards (welding coat, apron, gloves, and welding helmet with proper lenses installed). See Safety Instructions and Warnings chapter included in this manual. Neglect of these precautions may result in personal injury.

Travel at a speed necessary to maintain a bead width from 1/8" to ¼" (3mm to 6mm) depending on the thickness of the material. For material that may require larger weldments, either change to a larger diameter filler wire or use multi pass beads. On some applications, it may be necessary to adjust the voltage range to stabilize the arc.

Upon completion of the weld, release the gun trigger switch, raise the welding helmet, and visually examine the weld.

NOTE!
To help you overcome any problems that might arise, you will find useful information in section 4.05 Basic Welding Techniques.

4.04 Shutdown Procedures

Place the POWER ON/OFF SWITCH in the OFF position.

WARNING
After releasing the gun switch, the electrode wire will remain electrically “hot” for several seconds.

4.05 Basic Welding Technique

General

Two different welding processes are covered in this section, with the intention of providing the very basic concepts in using the semi-automatic mode of welding. In this mode, the welding gun is hand-held. The electrode (welding wire) is then fed into a weld puddle and the arc is shielded by a gas or gas mixture.

Setting of the Power Supply

The settings of the Firepower FP 95 FC requires some practice by the operator in that the welding Power Supply has two control settings that need to balance. These are the Wire Speed control and the Voltage Control switches. The welding current is determined by the Wire Speed control (i.e., the current will increase with increased wire speed, resulting in a shorter arc). Slower wire speed will reduce the current and lengthen the arc. Increasing the welding voltage hardly alters the welding current level, but lengthens the arc. By decreasing the voltage, a shorter arc is obtained with little change in welding current.
When changing to a different electrode wire diameter, different control settings are required. A thinner electrode wire needs more wire speed to achieve the same current level.
A satisfactory weld cannot be obtained if the wire speed and voltage switch settings are not adjusted to suit the electrode wire diameter and dimensions of the work piece.
If the wire speed is too high for the welding voltage, “stubbing” will occur as the wire dips into the molten pool and does not melt. Welding in these conditions normally produces a poor weld due to lack of fusion. If however, the welding voltage is too high, large drops will form on the end of the electrode wire, causing spatter. The correct setting of voltage and wire speed can be seen in the shape of the weld deposit and heard by a smooth regular arc sound.

Flux-Cored Arc Welding (FCAW)

This process also known as Open Arc, Innershield, FAB Shield, etc., is an electric arc welding process which fuses together the parts to be welded by heating them with an arc between a continuous flux filled electrode wire and the work. Shielding is obtained through decomposition of the flux within the tubular wire. The process is normally applied semi-automatically; however the process may be applied automatically or by machine. It is commonly used to weld large diameter electrodes in the flat and horizontal position and small electrode diameters in all positions. The process is used to a lesser degree for welding stainless steel and for overlay work.

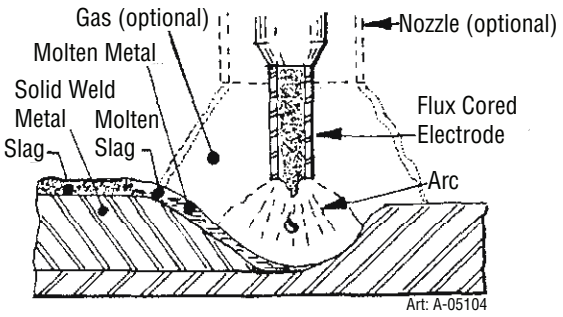

Figure 4-3: FCAW Process

WARNING
Follow these instructions only after referring to the Safety Instructions and Warnings chapter of this manual, and the instructions in the Installation chapter

Check List Before Starting

Wire Feed Speed – 1 to 10
Voltage Range Switch Setting – MIN or MAX
Electrode Wire Stick-out – approx 3/8" (10mm)

4.06 Welding Gun Positions

The welding gun should be held at an angle to the weld joint. Hold the gun so that the welding seam is viewed at all times. Always wear the welding helmet with proper filter lenses.

CAUTION
Do not pull the welding gun back when the arc is established. This will create excessive wire extension (stickout) and make a very poor weld.

The electrode wire is not energized until the gun trigger switch is depressed. The wire may therefore be placed on the seam or joint prior to lowering the helmet.

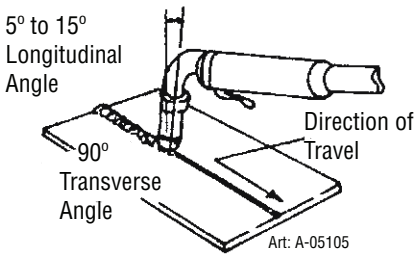

Figure 4-4: Butt and Horizontal Welds

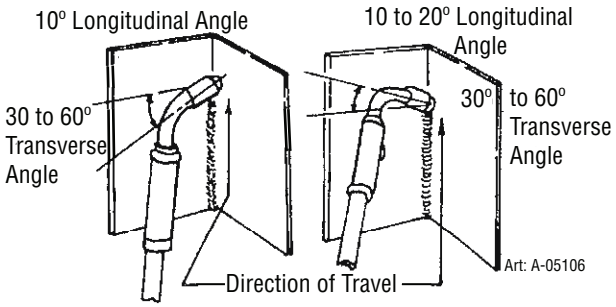

Figure 4-5: Vertical Weld

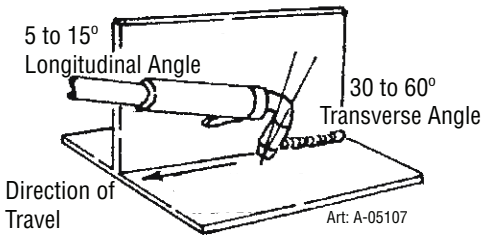

Figure 4-6: Horizontal Fillet Weld

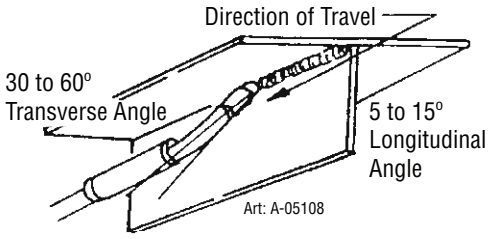

Figure 4-7: Overhead

4.07 Establishing the Arc and Making Weld Beads

Before attempting to weld on a finished piece of work, it is recommended that practice welds be made on a sample metal of the same material as that of the finished piece.
The easiest MIG welding procedure for the beginner to experiment with, is the flat position. This equipment is capable of flat, vertical and overhead positions.
For practicing MIG welding, secure some pieces of 16 or 18 gauge (0.06" 1.5mm or 0.08" 2.0mm) mild steel plate 6" x 6" (150 x 150mm). Use 0.024" (0.6mm) wire.

4.08 Pre-Weld Procedure

1. Check the OPERATION chapter of this manual for details on this equipment.
2. Set the welding voltage range switch at position MIN or MAX.
3. Set the wire feed speed control to about the 2.5 setting. Readjust as necessary.
4. Review standard safe practice procedures in ventilation, eye and face protection, fire, compressed gas and preventative maintenance. See Safety Instructions and Warnings chapter included in this manual.

4.09 Welding Procedure

1. Maintain the tip to work distance (stickout) at 5/16” to 3/8” (8 to 9mm) at all times.
2. For transverse and longitudinal nozzle angles, see section 4.06 Welding Gun Positions.
3. Hold the gun about 3/8” (9mm) from the work, lower the helmet by shaking your head and squeeze the trigger to start the wire feeding, and establish the arc.

NOTE!
Get in the habit of shaking the helmet down, rather than using the hands. One hand must hold the gun, and the other is often needed to hold pieces to be tacked or positioned.

4. Make a single down-hand (pulling) stringer weld bead.
5. Practice welding beads. Start at one edge and weld across the plate to the opposite edge.

NOTE!
When the equipment is properly adjusted, a rapidly cracking or hissing sound of the arc is a good indicator of correct arc length.

6. Practice stopping in the middle of the plate, restarting into the existing weld crater and continuing the weld bead across the plate.

NOTE!
When the gun trigger is released after welding, the electrode forms a ball on the end. To the new operator, this may present a problem in obtaining the penetration needed at the start of the next weld. This can be corrected by cutting the ball off with wire cutters.

4.10 Reference Table

The following table is provided as a user aid when performing FLUX CORED welding.

Result Desired	Welding Variable					
	Arc Voltage	Welding Current (wire speed)	Travel Speed	Nozzle Angle	Stick out	Wire size
Deeper Penetration		[1]Increase		[3]Trailing Max 25°	[2]Decrease	[4]Smaller (*)
Shallower Penetration		[1]Decrease		[3]Leading	[2]Increase	[4]Larger
Larger Bead		[1]Increase	[2]Decrease		[3]Increase (*)	
Smaller Bead		[2]Decrease	[2]Increase		[3]Decrease (*)	
Higher Narrower Bead	[1]Decrease			[2]Trailing	[3]Increase	
Flatter Wider Bead	[1]Increase			[2]90° or Leading	[3]Decrease	
Faster Deposition Rate		[1]Increase			[2]Increase (*)	[3]Larger
Slower Deposition Rate		[1]Decrease			[2]Decrease (*)	[3]Smaller
Key: 1 - First Choice, 2 - Second Choice, 3 - Third Choice, 4 - Fourth Choice						

Table 4-1: Welding Reference Table

4.11 Firepower FP 95 FC Welding Setting Selection Guide

Material Type	Wire Type	Shielding Gas and Flow Rate	Wire Size (Diameter)
Steel	Flux Core E71T-GS	None Required	.030" (0.8mm) .035" (0.9mm)

Art # A-09033_AB

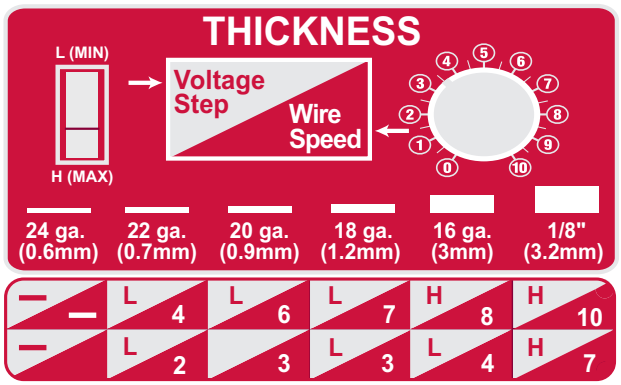

Figure 4-8 Welding Settings Guide

SECTION 5: SERVICE

5.01 Cleaning of the Unit

Periodically remove the right side panel (after disconnecting the supply cord from the receptacle) and blow out the interior with clean, dry, compressed air of not more than 25 PSI air pressure. Do not strike any components with the air hose nozzle.

5.02 Cleaning of the Feed Rolls

Clean the wire groove on the feed roll at frequent intervals. This cleaning operation can be done by using a small wire brush. To clean the wire groove, loosen the pressure device and lift the feedroll pressure arm. Remove all wire from the feedhead. Wipe off the bearing roll (the “top” roll in the feedhead).

5.03 Basic Troubleshooting

The basic level of troubleshooting is that which can be performed without special equipment or knowledge, and without removing the covers from the Power Source.
If major components are faulty, then the Power Source should be returned to an Accredited ESAB Service Agent for repair.

1. Porosity

When there is a gas problem the result is usually porosity within the weld metal. Porosity always stems from some contaminant within the molten weld pool which is in the process of escaping during solidification of the molten metal.
Contaminants range from no gas around the welding arc to dirt on the work piece surface. Porosity can be reduced by checking the following points:

1. *Welding dirty, oily, painted, oxidized or greasy plate.*
   a. Clean contaminates off the plate.
2. *Distance between the MIG torch nozzle and the work piece.*
   a. Keep the distance between the MIG torch nozzle and the work piece to a minimum.

2. Inconsistent wire feed

Wire feeding problems can be reduced by checking the following points:

1. *Wire spool brake is too tight.*
   a. Feed roller driven by motor in the cabinet will slip.
2. *Wire spool brake is too loose.*
   a. Wire spool can unwind and tangle.
3. *Worn or incorrect feed roller size.*
   a. Use ‘V’ groove drive feed roller matched to the steel wire size you are welding.
4. *Misalignment of inlet/outlet guides.*
   a. Wire will rub against the misaligned guides and reduces wire feedability.
5. *Liner blocked with slag.*
   a. Slag is produced by the wire passing through the feed roller, if excessive pressure is applied to the pressure roller adjuster. Slag can also be produced by the wire passing through an incorrect feed roller groove shape or size. Slag is fed into the liner where it accumulates, thus reducing wire feedability.
6. *Incorrect or worn contact tip.*
   a. The contact tip transfers the weld current to the electrode wire. If the hole in the contact tip is too large, then arcing may occur inside the contact tip resulting in the electrode wire jamming in there. When using soft electrode wire such as aluminum, the wire may become jammed in the contact tip due to expansion of the wire when heated. A contact tip designed for soft electrode wires should be used.
7. *Poor work lead contact to work piece.*
   a. If the work lead has a poor electrical contact to the work piece, then the connection point will heat up and result in a reduction of power at the arc.
8. *Bent liner.*
   a. This will cause friction between the wire and the liner thus reducing wire feedability

5.04 Welding Problems

	FAULT		CAUSE		REMEDY
1	Undercut.	A	Welding arc voltage too high.	A	Reduce voltage by reducing the voltage selection switch position or increase the wire feed speed.
		B	Incorrect torch angle	B	Adjust angle
		C	Excessive heat input	C	Increase the torch travel speed and/or reduce welding current by reducing the voltage selection switch position or reducing the wire feed speed.
2	Lack of penetration.	A	Welding current too low	A	Increase welding current by increasing wire feed speed and increasing voltage selection switch position.
		B	Joint preparation too narrow or gap too tight	B	Increase joint angle or gap
3	Lack of fusion.		Voltage too low		Increase voltage by increasing voltage selection switch position.
4	Excessive spatter.	A	Voltage too high	A	Lower voltage by reducing the voltage selection switch or increase wirespeed control.
		B	Voltage too low	B	Raise voltage by increasing the voltage selection switch or reduce wirespeed control.
5	Irregular weld shape.	A	Incorrect voltage and current settings. Convex = voltage too low. Concave = voltage too high.	A	Adjust voltage and current by adjusting the voltage selection switch and the wirespeed control.
		B	Wire is wandering	B	Replace contact tip
		C	Insufficient or excessive heat input	D	Adjust the wirespeed control or the voltage selection switch
6	Weld cracking	A	Weld beads too small	A	Decrease travel speed
		B	Weld penetration narrow and deep	B	Reduce current and voltage and increase MIG torch travel speed or select a lower penetration shielding gas.
		C	Excessive weld stresses	C	Increase weld metal strength or revise design.
		D	Excessive voltage	D	Decrease voltage by reducing the voltage selection switch.
		E	Cooling rate too fast	E	Slow the cooling rate by preheating part to be welded or cool slowly.
7	Cold weld puddle	A	Faulty rectifier unit	A	Have an Accredited ESAB Service Agent to test then replace the faulty component.
		B	Loose welding cable connection.	B	Check all welding cable connections.
		C	Low Primary Voltage	C	Contact supply authority.

Table 5-1: Welding Problems

5.05 Power Source Problems

	FAULT		CAUSE		REMEDY
1	Primary line voltage is ON. Welding arc can not be established.	A	Primary fuse is blown.	A	Replace primary fuse.
		B	Broken connection in primary circuit.	B	Have an Accredited ESAB Service Agent check primary circuit.
2	Primary line voltage is ON but when the MIG Gun trigger switch is depressed nothing happens.		MIG Gun trigger switch leads are disconnected.		Reconnect.
3	Primary line voltage is ON, no wire feed but gas flows from the MIG Gun when the torch trigger switch is depressed.	A	Electrode wire stuck in wire liner or contact tip (burn-back jam).	A	Check for clogged / kinked MIG Gun wire liner or worn contact tip. Replace faulty component(s).
		B	Faulty control PCB	B	Have an Accredited ESAB Service Agent investigate the fault.
4	Wire feeds when the MIG Gun trigger switch is de-pressed but arc can not be established.		Poor or no work lead connection.		Clean work clamp area and ensure good electrical contact.
5	Jerky wire feed	A	Worn or dirty contact tip	A	Replace
		B	Worn feed roller.	B	Replace
		C	Excessive back tension from wire reel hub.	C	Reduce brake tension on spool hub
		D	Worn, kinked or dirty conduit liner	D	Clean or replace conduit liner
6	Thermal Overtemp Light is ON and Fan motor is running		The machine duty cycle has been exceeded.		Allow the fan to run so machine can cool down. When light goes out, welding may resume.
7	Thermal Overtemp Light turns on in less than 30 seconds during welding.		Fan has stopped running or fuse on PCB has blown		Have an Accredited ESAB Service Agent replace the fuse.

Table 5-2: Power Source Problems

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APPENDIX 1: OPTIONS AND ACCESSORIES

Contact your Firepower distributor to order options and accessories. For assistance in locating a Firepower distributor, contact the Firepower office listed in the inside rear cover that is nearest to you.

Note the model and specification number shown on the equipment nameplate.

Call 1-800-318-6819 Consumable Parts Management Group

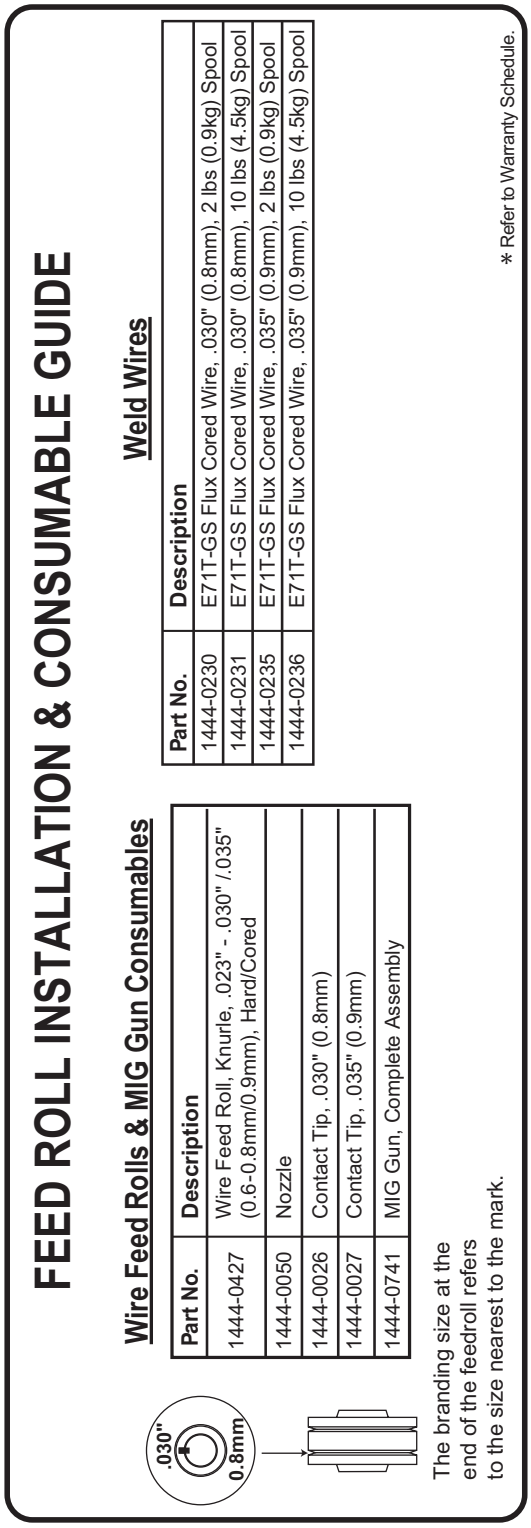

Figure A-1: Feed Roll Replacements

APPENDIX 2: POWER SUPPLY REPLACEMENT PARTS

ITEM	DESCRIPTION	PART NO.
1	CABLE CLAMP FOR CABLE DIAM.6+ SCREW	1444-0806
2	CABLE CLAMP, FP 95 FC/125/135	1444-0807
3	INPUT POWER CABLE, FP 95 FC/125/135	1444-0433
4	YELLOW PILOT-LIGHT SWITCH	1444-0440
5	CHOKE, FP 95 FC/125	1444-0846
6	CURRENT SWITCH	1444-0438
7	DIVIDING PANEL FP 95 FC + LABEL	HELV05000364
8	EARTH CABLE, FP 95 FC	HELV43210021
9	EARTH CLAMP, FP 95 FC	1444-0724
10	FRONT FRAME, FP 95 FC	1444-0829
11	HANDLE, FP 95 FC	HELV21600036
12	KIT SPOOL HOLDER FOR D.16 SPOOLS - COMP.	1444-0801
13	LEFT SIDE PANEL FP 95 FC W/SILKS.	HELV05000363
14	LOWER PANEL FP 95 FC +SILKSCR.	HELV05000360
15	MIG GUN, FP 95 FC	1444-0741
16	P.C. BOARD, FP 95 FC	1444-0441
17	POTENTIOMETER KNOB, FP 95 FC	1444-0952
18	RECTIFIER, FP 95 FC	1444-0851
19	RIGHT UPPER PANEL FP 95 FC +SILKSC.+LAB.+HINGES	HELV05000361
20	SIDE PANEL.FP 95 FC +SILKS.+LABEL+HINGES	HELV05000362
21	SLOW MOTOR D.28 +PINION	1444-0805
22	THERMOSTAT	1444-0443
23	TORCH GROMMET, FP 95 FC	1444-0832
24	TRANSFORMER, FP 95 FC	1444-0845
25	WIRE FEEDER, FP 95 FC	1444-0849
26	FEED ROLL	1444-0842

Table A-1: Replacement Parts

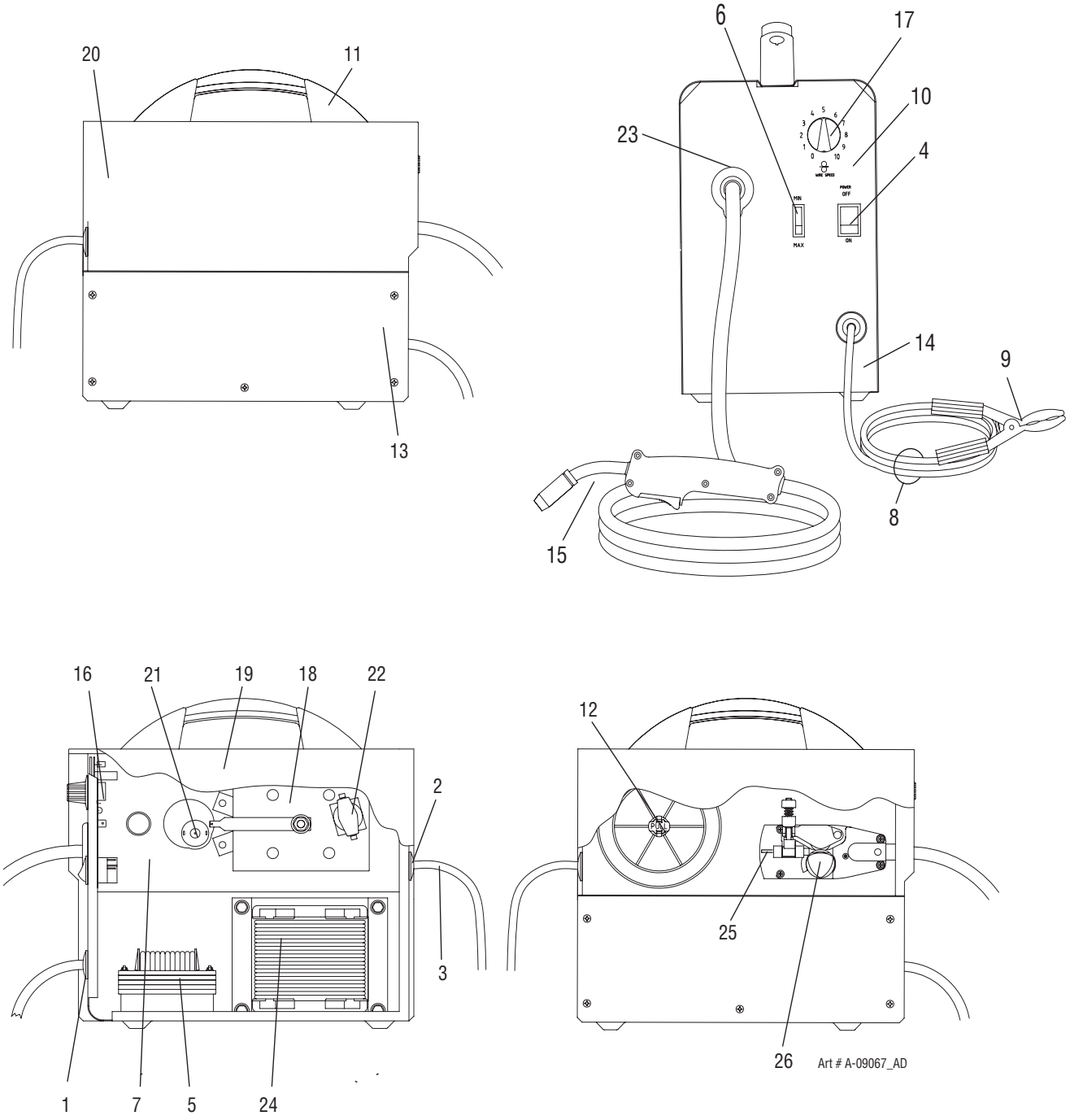

Figure A-2: FP 95 FC Parts List Callouts

APPENDIX 3: FIREPOWER FP 95 FC SYSTEM SCHEMATIC

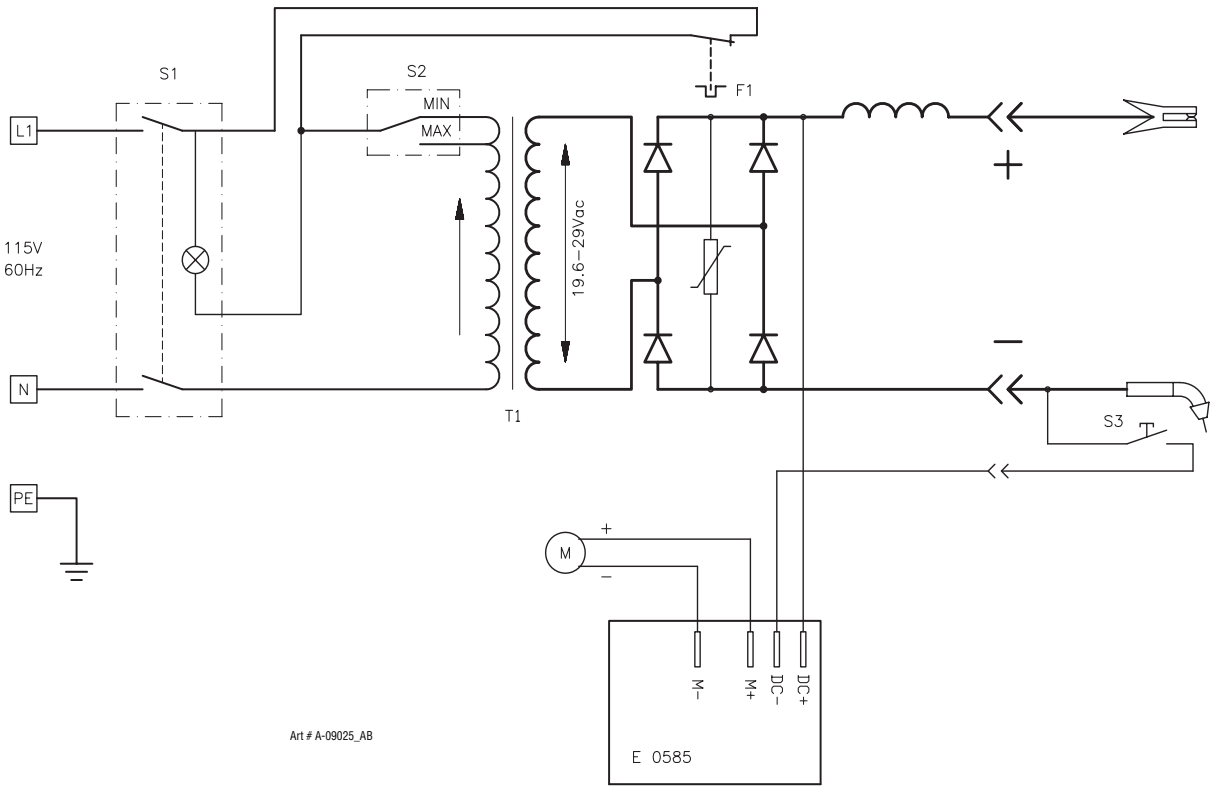

Figure A-3: FP 95 FC Simple System Schematic

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Revision History

Date	Rev	Description
03/19/2009	AA	Manual release
04/08/2016	AB	Rebrand updates, part number/art updates, schematic updates

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