

**MODEL 17A
SEMI-AUTOMATIC, VARIAC CONTROLLED
WIRE FEEDER**

For the Following Specs:

- 100011-1
- 100011-2
- 100011-3 (C€)



OWNER'S MANUAL Number **193111-024** (Rev - AA)
Revised May 7, 1999

IMPORTANT: Read these instructions before installing, operating, or servicing this system.

THERMAL ARC INC., TROY, OHIO 45373-1085, U.S.A.

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**INSTRUCTION SHEET – INSTALLATION OF WIRE REEL/SPOOL
SUPPORT ASSEMBLY**

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DIAGRAMS

INTRODUCTION

How To Use This Manual:

This Owner's Manual usually applies to just the underlined specification or part numbers listed on the cover. If none are underlined, they are all covered by this manual.

To ensure safe operation, read the entire manual, including the chapter on safety instructions and warnings.

Throughout this manual, the words **WARNING**, **CAUTION**, and **NOTE** may appear. Pay particular attention to the information provided under these headings. These special annotations are easily recognized as follows:

WARNING gives information regarding possible personal injury. Warnings will be enclosed in a box such as this.

CAUTION refers to possible equipment damage. Cautions will be shown in bold type.

NOTE offers helpful information concerning certain operating procedures. Notes will be shown in italics.

Equipment Identification:

The unit's identification number (specification or part number), model, and serial number usually

appear on a nameplate attached to the control panel. In some cases, the nameplate may be attached to the rear panel. Equipment which does not have a control panel such as gun and cable assemblies is identified only by the specification or part number printed on the shipping container. Record these numbers for future reference.

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 Thermal Arc, Order Department, 2200 Corporate Drive, Troy, Ohio 45373-1085. 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 uncrating the unit. Use care to avoid damaging the equipment when using bars, hammers, etc., to uncrate the unit.

Additional copies of this manual may be purchased by contacting Thermal Arc at the address given above. Include the Owner's Manual number and equipment identification numbers.

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DESCRIPTION OF EQUIPMENT

General:

The Model 17A is a semiautomatic, variac controlled wire feeder capable of a 100% duty cycle. This wire feeder only consists of electromechanical components which ensures lower operating costs, ease of use and repair, and improved reliability. The wire feeder comes complete with a wire spool support assembly that must be installed in the field.

The Model 17A's sheet metal control box totally encloses the electromechanical components and wire drive system. A hinged, latched door allows quick and easy access to the feedhead assembly featuring quick change feed rolls and a hand operated plastic knob for clamping the welding gun into the feedhead.

The Model 17A comes with an abundance of standard features which include: (1) an on/off rocker switch with built-in circuit breaker for total system protection, (2) a wire feed speed control knob, (3) an inch/purge momentary switch, (4) quick change feed rolls, (5) a feed roll kit for .035/.045 size filler wire, (6) an electromechanical dynamic brake, (7) a gas valve solenoid, (8) a resistor providing current limit to the motor, (9) a low voltage gun trigger circuit for operator safety, (10) a fully insulated base for protection against weld current fault conditions, and (11) ground fault protection on Spec. No. 100011-3 only.

The Model 17A has been designed to comply with CE (Spec. No. 100011-3 only), CSA NRTL/C, and NEMA EW 3 standards.

Product Specifications:

Input Voltage	120 VAC
Input Frequency ..	50/60 Hz
Input Voltage Tolerance	±10%
Maximum Input Current.....	1.5 Amps
Motor Voltage Range	6 - 115 VDC
Motor Current Range	0.14 - 0.72 Amps
Motor Torque Range	0 - 20 In. Lbs.
Motor Gear Ratio.....	30:1
Wire Speed Range (For All Filler Wire Sizes)	
.....	30 - 650 IPM
.....	(76 - 1651 CPM)
Wire Sizes	0.024 - 5/64"
.....	(0.61 - 1.98 mm)
Feed Rolls	2 (Both Driven)
Welding Current (I)	475 A/X±60%
.....	425 A/X±100%
Welding Gun/Torch Size	5/8" Nominal
Maximum Shielding Gas Inlet Pressure	
.....	100 P.S.I.
Weight (Less Wire).....	30 Lbs.
.....	(13.6 kg)
Approvals ..	CE (Spec No.
.....	100011-3 Only)
.....	CSA NRTL/C
.....	NEMA EW 3

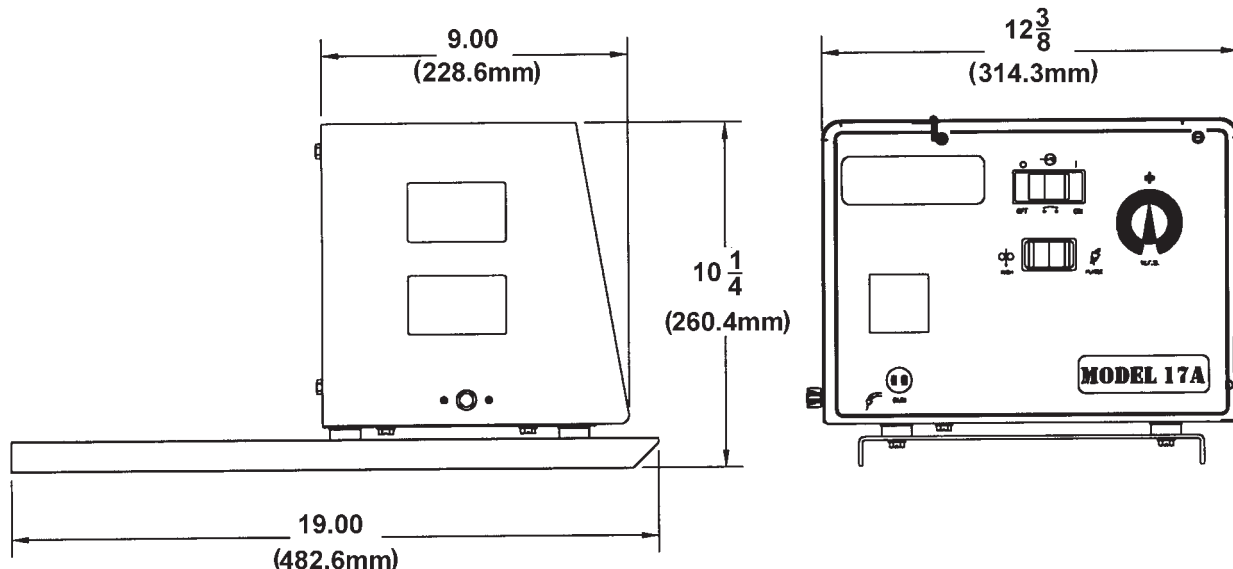

















Figure 3-1 Dimensional Information

Features/Benefits:

FEATURES	BENEFITS
1. Variac Control	A. Lower operating cost B. Easy to use and repair C. Improved reliability
2. Input Circuit Breaker	A. Provides total system protection
3. 100% Duty Cycle	A. Eliminates nuisance shutdowns due to overtemperature
4. Polarity Insensitive	A. Weld with straight or reverse polarity
5. Standard Inch/Purge	A. Allows "cold" inching of wire at set wire feed speed B. Allows purging of gas without running wire
6. Gas Valve Solenoid	A. Controls the "on/off" flow of shielding gas
7. Electromechanical Brake	A. Electromechanical control of a motor brake offers precise stopping of the wire
8. Convenient Hinged Door	A. Permits quick and easy access to the wire drive system
9. Quick Change Feed Rolls	A. Allows operator to change feed rolls without the use of tools
10. Gun Clamp Knob	A. Allows operator to secure welding gun to the feedhead without the use of tools
11. Welding Gun Quick Connects	A. Offers a quick and easy connection for welding guns
12. Fully Insulated Base	A. Isolates control box from base to ensure safety from excessive ground currents due to a fault condition
13. Small Size/Light Weight	A. Takes up small amount of space; easy to move
14. Replaceable Motor Brushes	A. Extends motor life
15. Needle Bearing Construction On Motor Output Shaft	A. Reduces friction and extends bearing life over a sleeve bearing
16. Feed Roll Pressure Release	A. Allows operator to change feed rolls or wire while retaining preset feed roll pressure
17. Made In USA	A. Local support for parts and technical assistance

Meanings Of Markings And Graphical Symbols:

	Signifies an OFF position
	Signifies an ON position
	Signifies voltage input
	Signifies a wire feed function
	Signifies voltage
	Signifies amperage
	Signifies cycles per second
	Signifies a welding gun
	Signifies the feeding of wire towards the workpiece with output voltage off
	Signifies a purging of gas
	Signifies a circuit breaker in an electrical circuit
	Signifies welding current
	Signifies duty cycle
	Signifies a percentage
	Signifies the equipment connection point for the protective earth ground

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DESCRIPTION OF EQUIPMENT

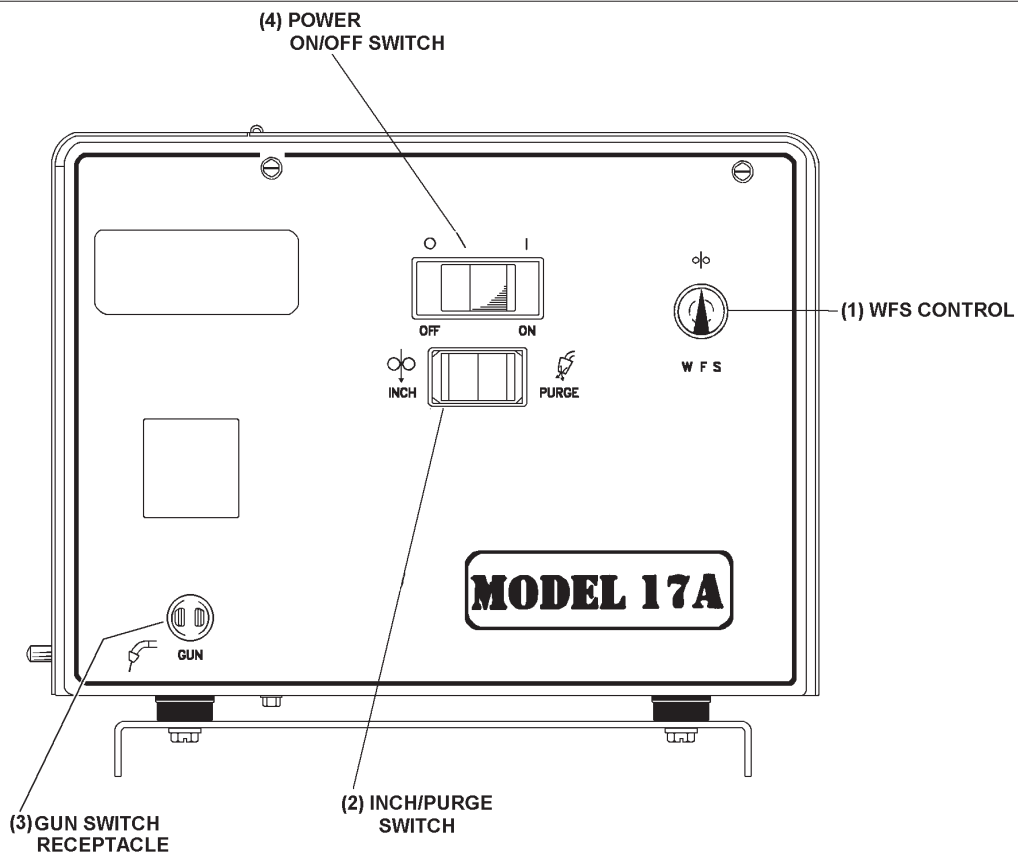


Figure 3-2 Front Panel Controls And Connections

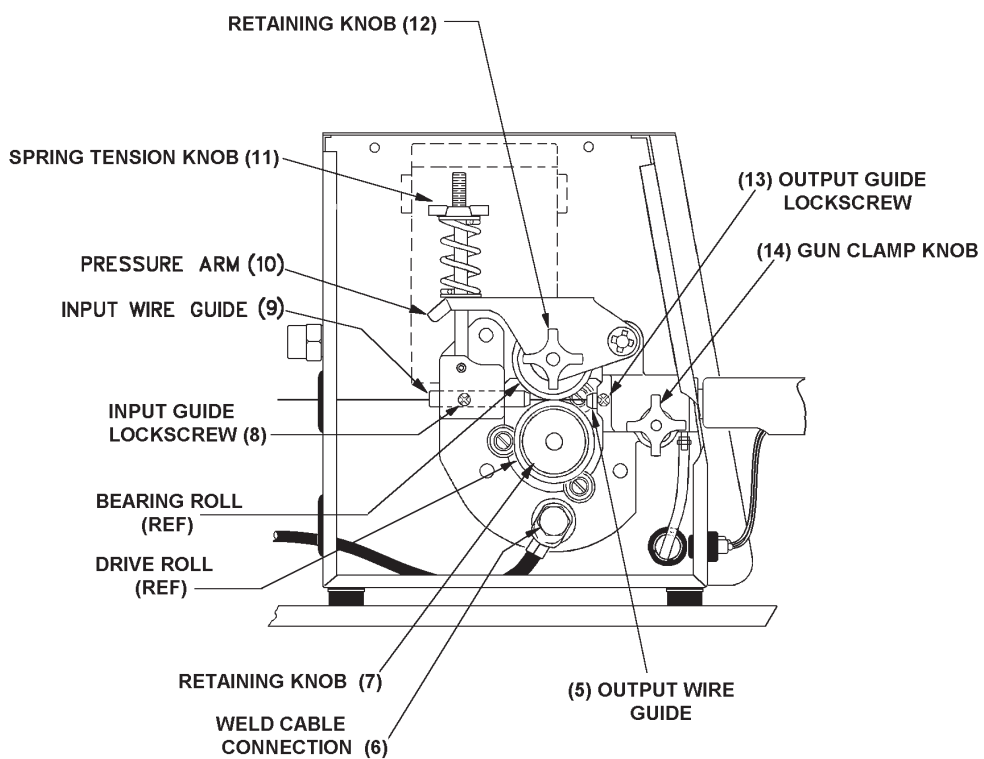


Figure 3-3 Interior Components

Front Panel Controls And Connections:

See Figure 3-2 for details.

1. WFS CONTROL — This knob controls wire feed speed. The wire feed speed control knob can be adjusted during setup or actual welding.

2. INCH/PURGE SWITCH — Depressing the inch portion of the switch will feed wire at a speed set by the WFS control. The wire will not be electrically "hot" when using the inch switch. Depressing the purge portion of the switch will allow shielding gas to flow out of the welding gun without feeding wire.

3. GUN SWITCH RECEPTACLE — The gun switch receptacle accepts the welding gun control wires. The gun switch receptacle is where a gun switch closure is inputted to the wire feeder.

4. POWER ON/OFF SWITCH — This switch controls only the wire feeder and not the power source (welding machine). It is used as an on/off switch and also serves as a circuit breaker.

NOTE: If the circuit breaker trips, it turns the power switch to the OFF position. A short cooling period must be allowed before an attempt is made to reset the unit by placing the switch in the ON position.

Interior Components:

See Figure 3-3 for details.

5. OUTPUT WIRE GUIDE — This guide is required to direct the welding wire from the drive roll to the welding gun cable.

6. WELD CABLE CONNECTION — This is where the power source welding cable is connected to the feeder. Make sure this connection is tight or arcing could occur.

7. RETAINING KNOB — This knob is used to secure the drive roll and insulate the drive roll from the motor. Remove this knob to change the drive roll.

8. INPUT GUIDE LOCKSCREW — Tighten this lock screw to secure the input wire guide.

9. INPUT WIRE GUIDE — The welding wire must be fed through the input wire guide for proper operation.

10. PRESSURE ARM — This arm carries the bearing roll assembly.

11. SPRING TENSION KNOB — Use the spring tension knob to adjust the amount of force the bearing roll exerts on the welding wire.

12. RETAINING KNOB — This knob is used to secure the bearing roll assembly to the pressure arm. Remove this knob to change the bearing roll.

13. OUTPUT GUIDE LOCKSCREW — Tighten this lock screw to secure the output wire guide.

14. GUN CLAMP KNOB — This knob is used to tighten the welding gun into the feedhead.

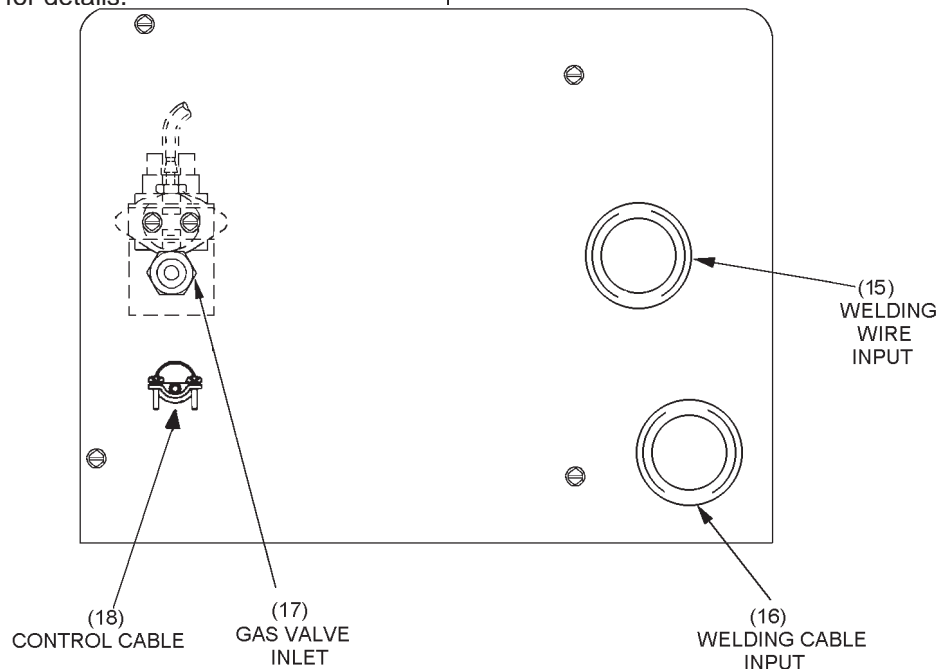


Figure 3-4 Rear Panel Connections

DESCRIPTION OF EQUIPMENT

Rear Panel Connections:

See Figure 3-4 for details.

15. WELDING WIRE INPUT — The welding wire must be fed through this insulated opening.

16. WELDING CABLE INPUT — The welding cable from the power source must be fed through this insulated opening before being connected to the weld cable connection.

17. GAS VALVE INLET — This is where the shielding gas hose is connected to the wire feeder. The gas valve inlet controls the “on/off” flow of shielding gas through the welding gun.

18. CONTROL CABLE — The control cable connects to the power source and after a gun switch trigger provides a closure between pins A and B (of the 19 pin amphenol connector) energizing the power source. The control cable also provides 120 VAC input power between pins E and F and a protective earth ground on pin G.

WARNING: The protective earth ground on pin G of the control cable is established only when the power source is properly grounded. See the power source owner’s manual for proper grounding methods.

Pin A	Contactor Hi	} Relay Closure To Energize Power Source
Pin B	Contactor Lo	
Pin E	120 VAC Hi	
Pin F	120 VAC Lo	
Pin G	Protective Earth Ground	

CAUTION: The relay contacts between pins A and B have a maximum rating of 1/3 HP, 120 VAC or 10A, 240 VAC.

If the power source only has a 5 pin amphenol and AC voltage outlets, a 870000-1 adapter cable will be required for proper hookup with the Model 17A wire feeder.

If the power source only has a 6 pin amphenol and AC voltage outlets, a 870107-1 adapter cable will be required for proper hookup with the Model 17A wire feeder.

If the power source only has a 14 pin amphenol, a 870093A-1 adapter cable will be required for proper hookup with the Model 17A wire feeder.

Power Source Compatibility:

The Model 17A wire feeder will work with any Thermal Arc CV or CC/CV power source. If the Thermal Arc power source only offers a 5 pin amphenol connector and AC voltage outlets, a 870000-1 adapter cable will be required to connect between the 19 pin control cable of the wire feeder and the 5 pin amphenol connector and AC voltage outlets of the power source.

If the Thermal Arc power source only offers a 6 pin amphenol connector and AC voltage outlets, a 870107-1 adapter cable will be required to connect between the 19 pin control cable of the wire feeder and the 6 pin amphenol connector and AC voltage outlets of the power source.

If the Thermal Arc power source only offers a 14 pin amphenol connector, a 870093A-1 adapter cable will be required to connect between the 19 pin control cable of the wire feeder and the 14 pin amphenol connector of the power source.

The Model 17A will also work with most competitive power sources that provide 120 VAC and require a relay closure to become energized. If the competitive power source requires 120 VAC to energize an internal contactor, the following modifications will have to be made to the wiring of the Model 17A wire feeder (Refer to the Connection/Schematic Diagram in this manual):

1. Remove the red wire (with no number stamped on it) from TB1-3 and connect it to TB1-2.
2. Remove the red wire (with 18 stamped on it) from TB1-3 and connect it to TB1-1.

Available Options:

The following list of options is available for use with the Model 17A wire feeder. Some options are kits while others are individual items.

- | | |
|------------------------|-----------|
| 1. Spool Adapter - 10# | 375585-1 |
| 2. Spool Adapter - 15# | 375864-1 |
| 3. Coil Adapter - 14# | 375942A |
| 4. Coil Adapter - 60# | 407142A |
| 5. Spool Cover - 30# | 375582A-4 |
| 6. Lifting Eye Kit | 375104A |
| 7. Swivel Base Kit | 375606A-5 |
| 8. Gun Holder Kit | 171463 |
| 9. Feeder Cart Kit | 171438 |

DESCRIPTION OF EQUIPMENT

10. Wire Spool Kit Assembly	870058	19. Control Cable Extension - 50 Ft.	870073-50
11. Wire Reel Kit Assembly	870059	20. Control Cable Extension - 75 Ft.	870073-75
12. Wire Reel/Spool Support Assembly	870060-1	21. Control Cable Extension - 100 Ft.	870073-100
13. Feed Roll Kits (See Diagrams Chapter)	171435-X	22. Adapter Cable (For 5 Pin Amphenol Power Sources)	870000-1
14. Ground Fault Interrupt Kit (Ground fault interrupt is standard on Spec. Number 100011-3)	870081	23. Adapter Cable (For 14 Pin Amphenol Power Sources)	870093A-1
15. Dual Amphenol Splitter Kit	204395A	24. Adapter Cable (For 6 Pin Amphenol Power Sources)	870107-1
16. Dual Feeder Interlock Box	870008-1	25. Control Pot Shaft Friction Lock	402663
17. Control Cable Extension - 15 Ft.	870073-15	<i>NOTE: For installation and operating instructions for the above options, see the drawings and instructions furnished with each kit.</i>	
18. Control Cable Extension - 25 Ft.	870073-25		

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INSTALLATION

Installation Of Wire Reel/Spool Support Assembly:

The wire reel/spool support assembly bolts into place at the rear of the base. See section I-169 in this owner's manual for details on proper installation of the wire reel/spool support assembly.

Connections:

See the System Outline drawing (870076) in the Diagrams chapter of this manual for details.

1. Make the proper welding cable connections between the power source and wire feeder and between the power source and work connection.

2. Connect the control cable from the feeder to the power source. Control cable extensions are available; see Available Options.

NOTE: An optional 870000-1 adapter cable will be required for connection to a power source with only a 5 pin amphenol connection and AC voltage outlets. An optional 870093A-1 adapter cable will be required for connection to a power source with only a 14 pin amphenol connection.

3. Make the proper gas line connection from the gas supply to the wire feeder gas valve (if gas will be used).

4. Attach the welding gun to the wire feeder.

5. Connect the welding gun control leads to the wire feeder gun switch terminals located on the front of the feeder.

Grounding:

To assure operator safety in the case of a fault condition, the frame of the power source (welding machine) must be grounded. The wire feeder sheet metal frame is grounded only through pin G of the control cable that connects to the power source. Therefore, if the power source frame is not grounded, then, the wire feeder sheet metal frame is not grounded, and a shock hazard could possibly develop. Follow the instructions found in the power source Owner's Manual for correct grounding methods.

Installation Of Welding Wire Spool:

See section I-169 of this manual.

NOTE: The Wire Spool Hub (13) supplied with the unit is provided for mounting a 30 or 60 pound spool of wire. Optional adapters are available allowing a 10 or 15 pound spool of wire or a 14 or 60 pound coil of wire to be used.

1. Remove Wire Spool Hub Nut (17) by turning counterclockwise.

2. Slide the spool of wire over the hub (13), making sure that the alignment pin on the hub enters the hole in the backside of the wire spool.

3. Replace the Hub Nut (17) and turn clockwise to a snug position.

NOTE: Install the welding wire spool so that the wire feeds from the bottom of the spool into the input wire guide.

Adjustment Of Spool Tension:

Adjust the wire spool tension so that the wire will feed freely into the input wire guide. However, the spool of welding wire must not "coast" when wire feeding stops. To adjust the wire spool tension, tighten or loosen the hub tension screw accordingly (See Figure 4-1).

NOTE: Excessive tightening of the Hub Tension Screw will result in a shorter motor life.

Input And Output Wire Guide Installation:

Refer to Figure 4-1.

Install the input wire guide (the longer one) by loosening the input guide lockscrew and inserting the guide into the hole in the feedhead assembly. The recessed end of the guide should be toward the wire spool. Adjust the guide so that it is clear of the feed rolls and tighten the input guide lockscrew.

Install the output wire guide in the same manner, with the conical end toward the feed rolls. The tip of

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the conical end should be as close to the feed rolls as practical. Tighten the output guide lock screw.

NOTE: Before tightening the input and output guide lock screws, install the drive roll to help in the alignment of the wire guides.

Selection And Installation Of Feed Rolls:

NOTE: See feed roll kit drawing (supplied in the Diagrams chapter) to order feed roll kits. Kit includes a bearing roll, a drive roll, an input wire guide, and an output wire guide for a specific wire type and size.

For installation of feed rolls, refer to Figure 4-1.

For selection of feed roll styles, refer to Figure 4-2.

Style 1 feed rolls consist of a flat smooth bearing roll and a double smooth, vee grooved drive roll. They feed .024 - .068" hard and tubular wire.

Style 2 feed rolls consist of a flat knurled bearing roll and a double smooth, vee grooved drive roll. They feed .030 - .045" hard and tubular wire.

Style 3 feed rolls consist of a double knurled, vee grooved bearing roll and a double knurled, vee grooved drive roll. They feed .045 - 5/64" hard and tubular wire.

Style 4 feed rolls consist of double cog bearing and drive rolls. They feed .045 - .068" tubular wire.

Style 5 feed rolls consist of double U-grooved bearing and drive rolls. They feed .035 - 3/64" soft wire.

NOTE: All grooved feed rolls have their wire size or range stamped on the side of the roll. On rolls with different size grooves, the outer (visible when installed) stamped wire size indicates the groove in use.

Bearing rolls are installed by unscrewing the retaining knob in the pressure arm and removing the idler gear. The bearing roll retaining knob is then removed from the idler gear, and the bearing roll is placed over the lobes on the idler gear. The bearing roll retaining knob is replaced, and this assembly is returned to the pressure arm and secured with the retaining knob.

Drive rolls are installed by removing the retaining knob, placing the drive roll over the lobes on the drive gear, and securing with the retaining knob.

NOTE: Installation of all styles of feed rolls for this feeder is identical.

Welding Gun Compatibility And Installation:

Refer to Figure 4-1.

The Model 17A wire feeder is designed to be used with most welding guns. In some cases, a special adapter may be required.

To install the welding gun, simply loosen the gun clamp knob and insert the welding gun into the feedhead until it stops. Tighten the gun clamp knob and connect the welding gun control wires to the gun switch receptacle.

NOTE: Before inserting the welding gun into the feedhead, make sure the gun clamp does not extend into the feedhead; otherwise, the welding gun cannot be properly inserted.

Threading Wire Into Feedhead:

Refer to Figure 4-1.

WARNING: ELECTRIC SHOCK CAN KILL! Make certain the power source and wire feeder are turned OFF. Do not turn the power ON until told to do so in these instructions.

CAUTION: Use care when handling the spooled wire as the wire tends to "unravel" when loosened from the spool. Grasp the end of the wire firmly, and don't let it get away from you. Make sure that the end of the wire is straight and free of burrs.

1. Place end of the welding wire through the welding wire input (See Figure 3-4) and into the input wire guide. Feed it through the guide and over the drive roll groove closest to the feedhead casting.

NOTE: Place the pressure arm in the "UP" position (as shown in Figure 4-1) when feeding the wire into the feedhead.

2. Pass the wire through the output wire guide and into the welding gun assembly (See welding gun manual).

3. Close the pressure arm, and lock in position with the spring tension knob. To adjust the amount of force the bearing roll exerts on the welding wire,

turn the spring tension knob clockwise for increased force or counterclockwise for decreased force.

NOTE: If the force applied to the wire is too great, the welding wire will "bird nest" in the feedhead and not feed properly.

4. Turn the welding machine and wire feeder ON, and set the wire feed speed control to midrange (See Figure 3-2). Remove contact tube from welding gun. See Gun Manual. Press the gun switch or INCH switch until wire feeds out past the gun nozzle. Place contact tube over the wire and screw into place and tighten. Cut wire off at about 1/4 inch (6 mm) from the nozzle.

WARNING: The welding electrode is electrically "Hot" if wire is fed by depressing gun switch. Electrode contact to workpiece will cause an arc with gun switch depressed. Feed motor will run feeding "HOT" electrode.

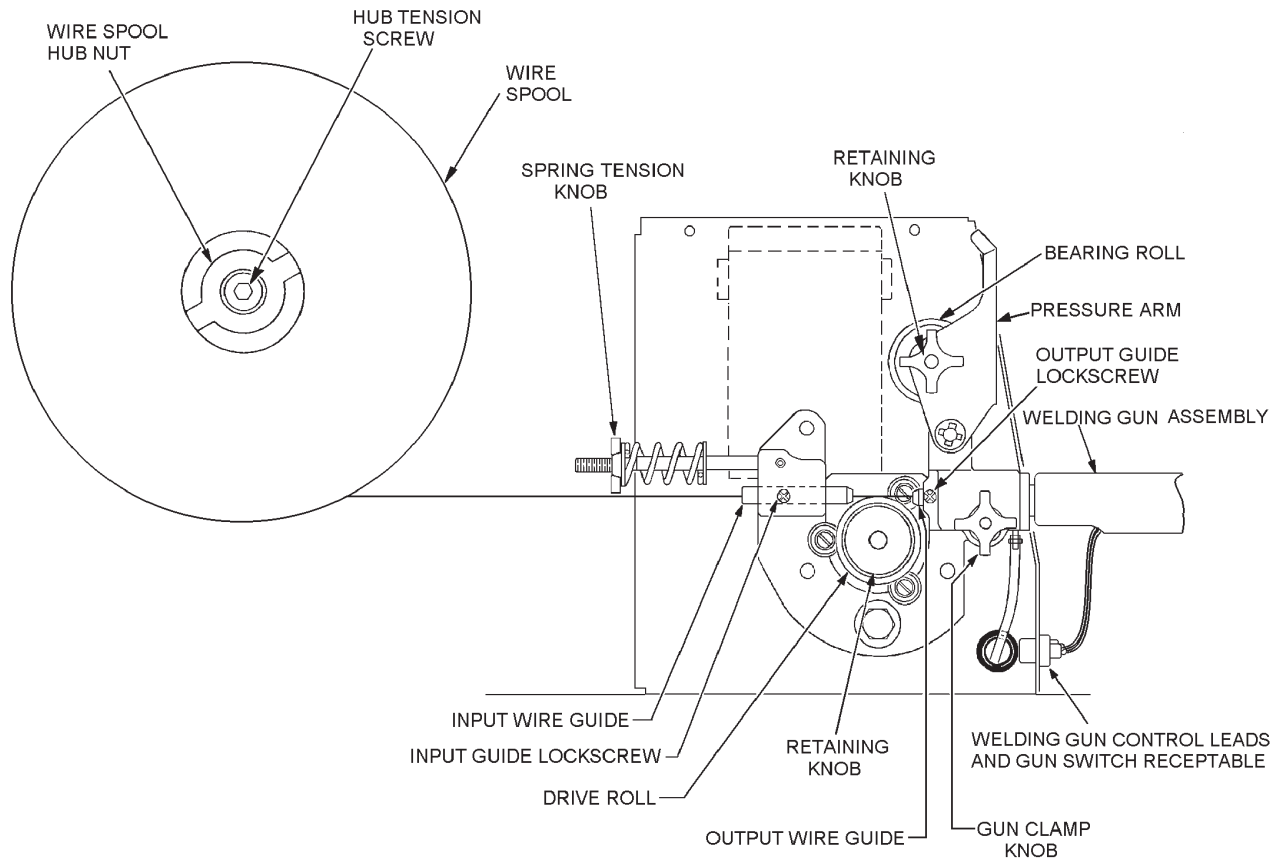

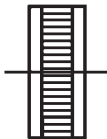
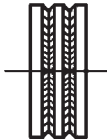
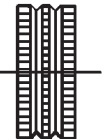

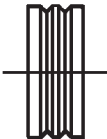
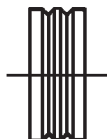
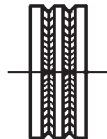
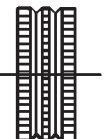

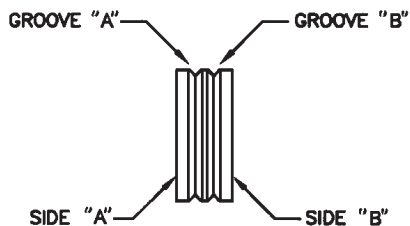


Figure 4-1 Wire Drive System

FEED ROLL STYLES				
STYLE 1 SMALL HARD & SOFT WIRE	STYLE 2 HARD WIRE	STYLE 3 HARD & TUBULAR WIRE	STYLE 4 TUBULAR WIRE	STYLE 5 SOFT WIRE
FLAT 	FLAT KNURLED 	DOUBLE KNURLED VEE 	DOUBLE COG 	DOUBLE "U" 
				
DOUBLE SMOOTH VEE	DOUBLE SMOOTH VEE	DOUBLE KNURLED VEE	DOUBLE COG	DOUBLE "U"



NOTE: Number stamped on Side "A" indicates the wire size of Groove "B" and vice versa.

Figure 4-2 Feed Roll Styles

OPERATION

Prewelding Procedure:

Follow all installation instructions for the wire feeder, the welding power source, and the welding gun before attempting to operate the Model 17A.

1. Make sure all necessary connections have been made (Refer to "Connections" in the Installation chapter of this manual).
2. Turn ON the power source and the wire feeder.
3. Push PURGE on the inch/purge switch of the feeder and adjust the flow of shielding gas.
4. Push INCH on the inch/purge switch of the feeder and adjust the wire feed speed to the desired value by means of the wire feed speed control.

WARNING: If the gun switch is depressed, the electrode (welding wire) is electrically "hot". Do not permit it to touch any metal or a welding arc may be established which may be injurious to someone's eyes (flash) or skin (burn).

5. Adjust the voltage of the power source to the desired value. The gun switch must be triggered to close power source contactor.

Welding Procedure:

WARNING: In semiautomatic or automatic wire welding, the welding wire, wire reel (if used), input guide, feed rolls, output guide, feedhead, and welding gun metal parts are all ELECTRICALLY "HOT".

Refer to Figure 5-1.

Position the welding gun above the workpiece and depress the gun switch trigger. Depressing the gun switch trigger enables the gas valve, wire feed motor, and power source; the welding process begins. To end the weld, release the gun switch trigger which disables the gas valve, wire feed motor, and power source.

NOTE: At the end of the work day or when welding has been completed, it is recommended that the gas be SHUTOFF at the cylinder, and the wire feeder and power source be turned OFF.

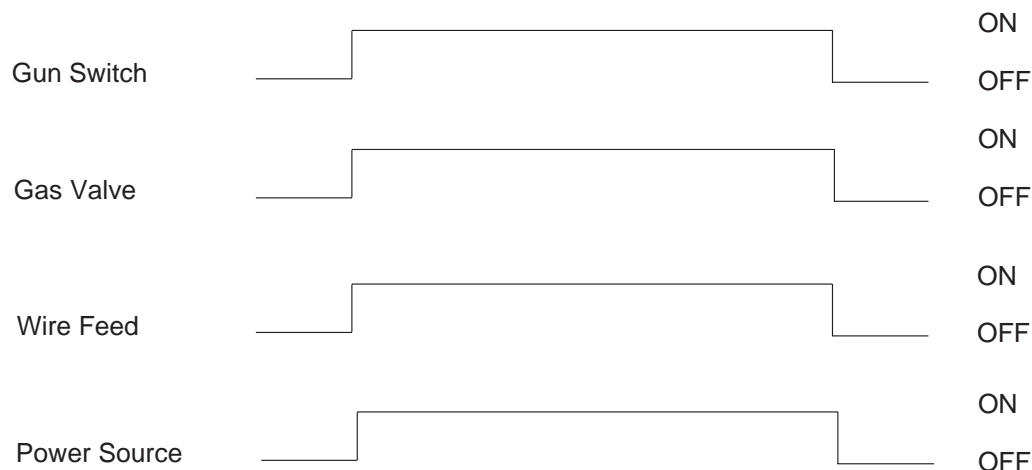


Figure 5-1 Functional Timing Diagram

Theory Of Operation:

Refer to the Connection/Schematic Diagram in the Diagrams chapter of this manual for graphical assistance.

With the wire feeder control cable (P1) connected to the power source, depress the power on/off switch (S2) to the ON position. Input power is then supplied through the circuit breaker portion of switch S2 to the variable transformer (T1) and stepdown transformer (T2).

NOTE: If the circuit breaker trips, it turns the power switch (S2) to the OFF position. A short cooling period must be allowed before an attempt is made to reset the unit by placing switch S2 in the ON position.

When the gun switch on the welding gun is depressed, receptacle (J1) is shorted, and the gas valve (L1) and relay (K1) are energized by power supplied from T2. One set of K1 contacts provides a short on pins (A and B) of P1 which enables the welding power source. Another set of K1 contacts allows voltage and current from T1 to travel through the bridge rectifier (CR1) and current-limiting resistor (R1) to the wire feed motor (B1).

When the gun switch on the welding gun is released, power supplied by T2 is removed from L1 and K1 causing both to deenergize. One set of K1 contacts then provides a short across the wire feed motor causing dynamic braking.

MAINTENANCE

Cleaning Of The Unit:

Periodically, clean the inside of the wire feeder and feedhead assembly by using a vacuum cleaner or clean, dry compressed air of not more than 25 psi (172 kPa) pressure. After cleaning the unit, check all electrical components for loose or faulty connections and correct if necessary.

Cleaning Of The Feed Rolls:

Clean the grooves on the lower drive roll frequently. This cleaning operation can be done by using a small wire brush. Also, wipe off or clean the grooves on the upper bearing roll. After cleaning the feed rolls, tighten the feed roll retaining knobs accordingly.

Feedhead Maintenance:

See Figure 6-1 for details.

The only point of maintenance in the feedhead assembly is the motor brushes. Inspect these about every 300 hours of operation. When these brushes are worn to about 1/8" (3.2 mm), new brushes should be installed.

CAUTION: Neglect in brush maintenance may cause damage to the motor commutator resulting in a shorter motor operating life.

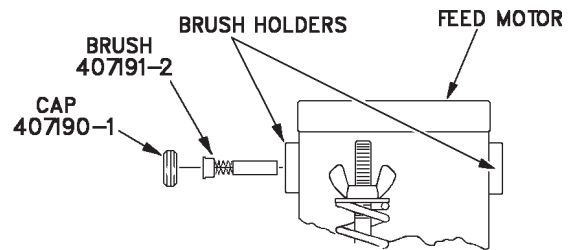


Figure 6-1

TROUBLESHOOTING

Scope:

The troubleshooting guide is intended to be used by qualified service technicians. The troubleshooting guide contains information which can be used to diagnose and correct unsatisfactory operation or failure of the various components of the wire feeder. Each symptom of trouble is followed by a list of probable causes and the procedure necessary to correct the problem.

Safety:

To ensure safe operation and service, read this entire manual before attempting to service or repair this machine. The service technician may be asked to check voltage levels while the machine is turned ON; to assure safety, use care and follow all instructions accordingly!

Troubleshooting Hints:

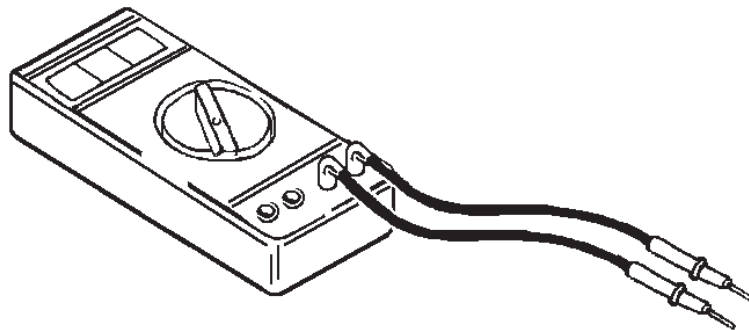
Examine connections for proper assembly and contact before replacing a component. Wire lugs

should be in tight contact with the lead's conductor and should be crimped to the lead's insulation. The mating surfaces of the connection should be clean and free of oxidation. Faulty connections or wiring problems are often the cause of an equipment malfunction!

Do not pull on wires to disassemble connections. Firmly grasp each lug or connector when disconnecting. Pulling on wires for disassembly can damage the integrity of the connection and cause future malfunctions.

Prior to disassembly or servicing of the machine, note the wiring and connections in the machine. Reassembling should place the wires in the same location and routing as received from the factory. Keep wires and leads away from hot parts and sharp objects.

All signals referenced in the following troubleshooting guide can be measured with a digital multimeter (DMM).



Troubleshooting Guide:



WARNING



ELECTRIC SHOCK can kill.

- Follow all safety precautions.
- Do not touch live electrical parts.
- Turn OFF input power before servicing the machine unless otherwise noted.
- Only qualified technicians are to service the machine.

NOTES:

(1) Refer to the Connection/Schematic Diagram in the Diagrams chapter of this manual for graphical assistance in disassembling and troubleshooting the wire feeder.

(2) The acceptable tolerance (in most cases) on resistance and voltage measurements made with the DMM is $\pm 0\%$.

(3) Use only genuine replacement parts.

A. Unit is completely inoperative - nothing functions

Make sure all connections have been made to both the power source and wire feeder.

See Connections section of this manual.

Make sure both the power source and wire feeder are turned ON.

Make sure ground fault protection circuit has not activated.

If the ground fault protection has activated, input power will have to be reset before normal operation can resume.

Check for a damaged control cable (P1) that connects between the power source and wire feeder.

Check for a tripped circuit breaker (S2).

If the circuit breaker trips, it turns the power switch (S2) to the OFF position. A short cooling period must be allowed before an attempt is made to reset the unit by placing switch S2 in the ON position.

Check for a damaged power on/off switch (S2).

Check on/off switch (S2), terminal block (TB1), variable transformer (T1), and stepdown transformer (T2) for loose or faulty connections.

With input power supplied to the wire feeder and the on/off switch ON, measure the AC voltage from TB1-1 to TB1-2. The measured voltage should be 120 VAC.

If not, check for an "activated" protection device in the power source.

B. Wire feed motor operates but wire does not feed or feeds erratically

Check for incorrect voltage and/or wire feed speed settings.

Make sure all connections to the wire feeder are tight.

Make sure feed rolls are of the correct size and properly installed.

Check for too little or too much pressure on the welding wire.

See spring tension knob in the Interior Components section of this manual.

Check to see if wire spool tension is too great.

See Adjustment Of Spool Tension section of this manual.

Check for restriction in welding gun and/or contact tip.

Check for the correct size welding gun liner and contact tip for welding wire being used.

Check for failed insulator on drive gear assembly - motor shaft turning inside insulator

Replace drive gear assembly.

C. Wire wraps around the feed rolls

Check for too much pressure on the welding wire.

See spring tension knob in the Interior Components section of this manual.

Check for proper alignment of the input and output wire guides.

Check for the correct size welding gun liner and contact tip for welding wire being used.

D. Wire does not feed with gun switch depressed

Check to see if the feed rolls are mechanically restricted.

Move the WFS control knob (on the front panel) off the minimum setting.

Check the continuity of the welding gun trigger leads with the trigger depressed.

If no continuity, repair or replace the welding gun.

Check all components for loose or faulty connections.

With the wires removed from resistor (R1), measure the resistance. The measured resistance should be in the range of 4.6 to 6.6 ohms.

If not, replace resistor (R1).

With input power supplied to the wire feeder and the on/off switch ON, check the following items:

A. Measure the AC voltage across the secondary of the stepdown transformer (T2). The measured voltage should be 24 VAC.

If not, replace the stepdown transformer (T2).

B. Depress the welding gun trigger; relay (K1) should operate.

If not, replace relay (K1).

C. With the WFS control set to maximum, measure the AC voltage from the wiper of the variable transformer (T1) to TB1-2. The measured voltage should be 120 VAC.

If not, replace the variable transformer (T1).

Check wear on motor brushes.

See Feedhead Maintenance in the Maintenance chapter of this manual.

Replace bridge rectifier (CR1) if necessary.

E. Wire feed motor continues to run after gun switch has been released

Check the continuity of the welding gun trigger leads with the trigger released.

If shorted, repair or replace the welding gun.

Check for a shorted gun switch receptacle (J1), terminal block (TB1), or inch/purge switch (S1).

Check to see if relay (K1) is functioning properly.

F. No wire feed speed (WFS) control

Check for a loose WFS control knob.

Check variable transformer (T1), bridge rectifier (CR1), and terminal block (TB1) for loose or faulty connections.

With input power supplied to the wire feeder and the on/off switch ON, measure the AC voltage from the wiper of the variable transformer (T1) to TB1-2. The measured voltage should change from 0 to 120 VAC while adjusting the WFS control knob from minimum to maximum.

If not, replace the variable transformer (T1).

G. Wire feeds but no gas flows

Check to see if the gas cylinder is empty or the valve closed.

Make sure the proper gas flow rate has been set.

Check for a possible restriction in the gas line or gas valve.

Check to see if the welding gun nozzle is plugged.

Check gas valve (L1), terminal block (TB1), and inch/purge switch (S1) for loose or faulty connections.

With input power supplied to the wire feeder and the on/off switch ON, measure the AC voltage across the gas valve terminals with the welding gun trigger depressed. The measured voltage should be 24 VAC.

If 24 VAC is present on the gas valve terminals and gas does not flow, replace the gas valve (L1).

H. Wire feeds but there is no arc

Make sure all connections have been made to both the power source and wire feeder.

See Connections section of this manual.

Check for a damaged control cable (P1) that connects between the power source and wire feeder.

Check relay (K1), inch/purge switch (S1), and terminal block (TB1) for loose or faulty connections.

With input power supplied to the wire feeder and the on/off switch ON, depress the welding gun trigger. Make sure "all" relay (K1) contacts are properly operating.

If not, replace relay (K1).

I. Wire does not feed with inch switch depressed or gas does not flow with purge switch depressed

Check inch/purge switch (S1) and terminal block (TB1) for loose or faulty connections.

Check for a defective inch/purge switch (S1).

PARTS LIST

Equipment Identification:

All identification numbers as described in the Introduction chapter must be furnished when ordering parts or making inquiries. This information is usually found on the nameplate attached to the equipment. Be sure to include any dash numbers following the Specification or Assembly numbers.

How To Use This Parts List:

The Parts List is a combination of an illustration (Figure Number) and a corresponding list of parts which contains a breakdown of the equipment into assemblies, subassemblies, and detail parts. All parts of the equipment are listed except for commercially available hardware, bulk items such as wire, cable, sleeving, tubing, etc., and permanently attached items which are soldered, riveted, or welded to another part. The part descriptions may be indented to show part relationships.

To determine the part number, description, quantity, or application of an item, simply locate the item in question from the illustration and refer to that item number in the corresponding Parts List.

An "Application Code" is used to distinguish parts that are applicable only to certain Specifications and/or Assemblies. This code is found in the rightmost column of the Parts List. If an item in the Parts

List applies to all Specifications or Assemblies, the word "ALL" will be in the Application Code column. Refer to the following list to determine the appropriate Application Codes for the Specifications or Assemblies covered by this manual. If only the assembly or specification number is listed, the use of an Application Code does not apply to this manual.

How To Select Recommended Spares:

The first two columns of the Parts List are used to show the recommended quantity of parts which are typically required for spares or replacement purposes. The quantities under Class 1 are for parts that are consumed or that may need replacement in two years or less depending on operating hours. Class 2 quantities are for parts that may need replacement under unusual service conditions or additional operating hours. These are suggested quantities based on expected usage or the minimum package quantity. Class 1 spares are repeated under Class 2 but the quantities may be larger to allow for additional operating hours. Contact your equipment dealer for assistance in establishing the spare parts program best suited for your needs.

SPEC NUMBER CODE

100011-1	A
100011-2	B
100011-3	C

**193111-024
PARTS LIST**

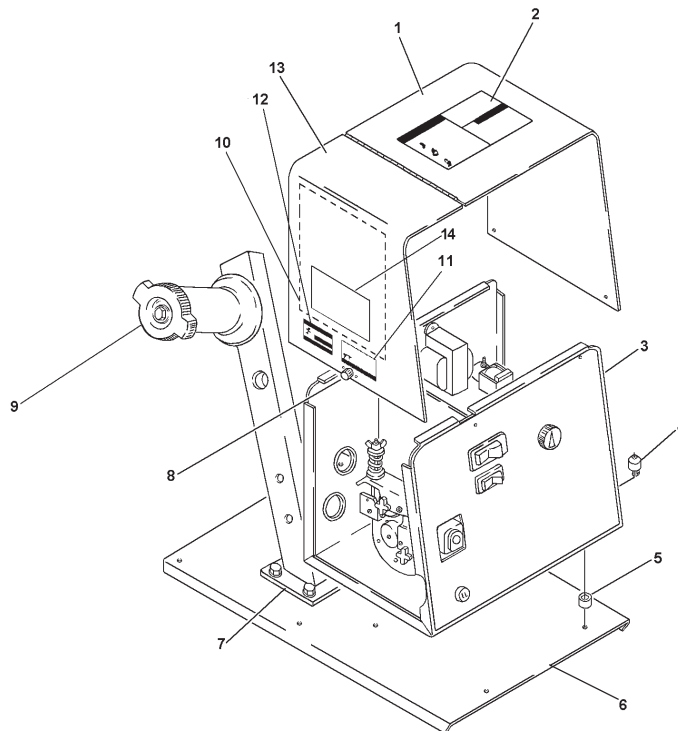


Figure 8-1 Wire Feeder

Parts List for Figure 8-1

Quantity		Item No	Part Number	Description	Qty per Assy	Application Code
Recomm. Spares	Class 1					
			100011-1	Model 17A	1	A
			100011-2	Model 17A	1	B
			100011-3	Model 17A (CE)	1	C
		1	170960	. Cover - Control Box Ay.	1	AC
			170960-2	. Cover - Control Box Ay.	1	B
		2	204036	. Label - Precaution	1	All
		3	Ref.	. Control Box - (For details see Fig. 8-2)	Ref.	All
		4	409838	. Grommet - Mounting	4	All
		5	409837	. Spacer - Mounting	4	All
		6	170962	. Base - Wire Feeder	1	All
		7	870060-1	. Support - Wire Spool (For details see I-169)	1	All
		8	406618-2	. Latch - Spring, Self Adjusting	1	All
		9	870058	. Kit - Wire Spool (For details see I-169)	1	All
		10	170101	. Label - Feed Roll Chart	1	All
		11	406636	. Label - Feeder, Moving Parts	1	All
		12	407099	. Label - Electric Shock	1	All
		13	170961	. Door - Feeder	1	AC
			170961-2	. Door - Feeder	1	B
		14	870087-1	. Label - Company	2	All

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**193111-024
PARTS LIST**

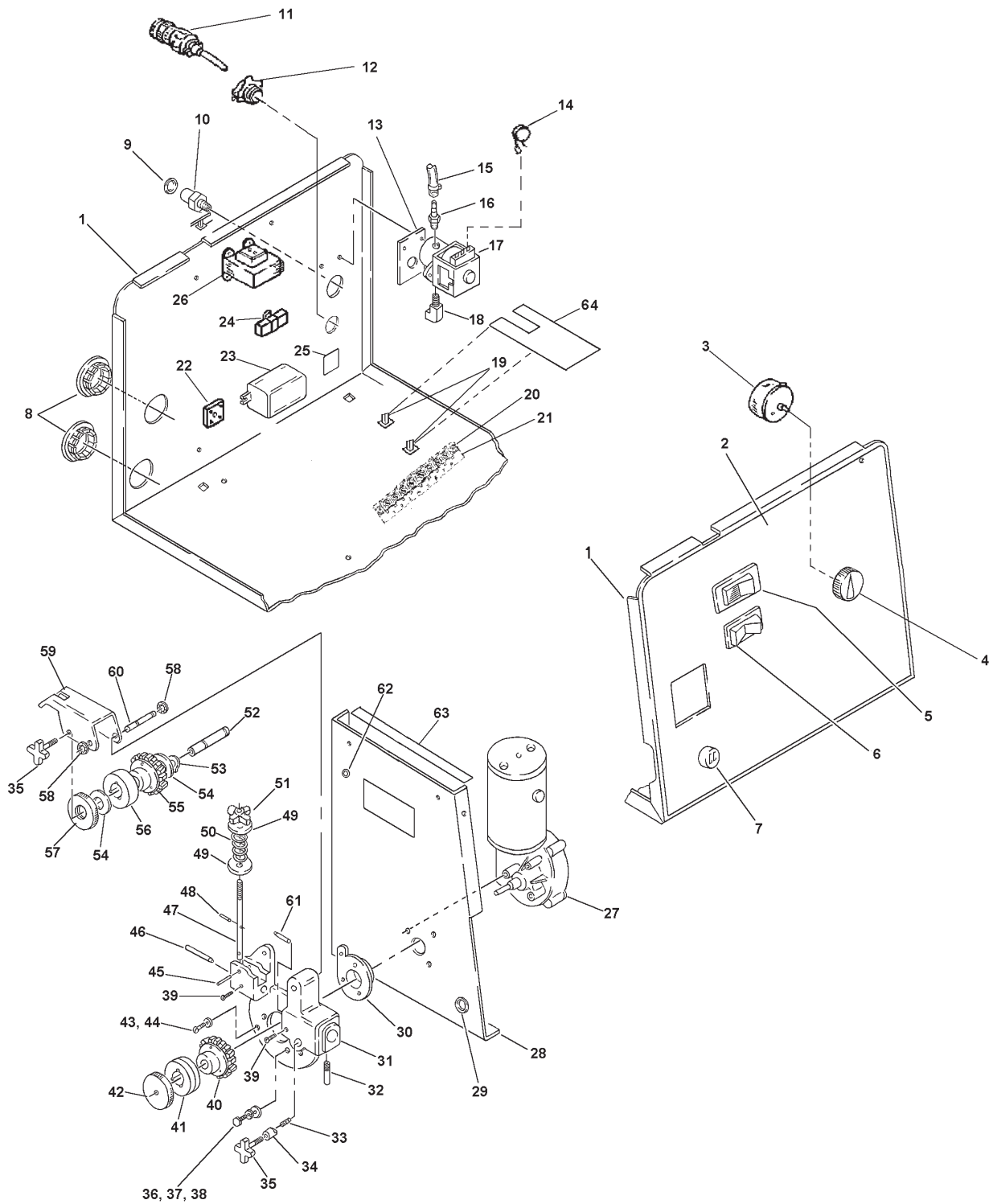


Figure 8-2 Control Box

Quantity Recomm. Spares Class 1	Item No Class 2	Part Number	Description	Qty per Assy	Application Code
		100011-1	Model 17A	Ref	A
		100011-2	Model 17A	Ref	B
		100011-3	Model 17A (CE)	Ref	C
	1	870027	. Wrapper - Feeder	1	All
	2	870077	. Label - Overlay, Front	1	All
	3	400244	. Transformer - Variac	T1	1
	4	406806-3	. Knob - Control		1
	5	870032-1	. Switch - Rocker, Circuit Breaker	S2	1
	6	407135-1	. Switch - 4PDT	S1	1
	7	405576-1	. Bushing - Terminal	J1	1
	8	405362-2	. Bushing - Snap		2
	9	402128-10	. Protective - Plastic Cap & Plug		1
	10	200548-1	. Adapter - Gas, Right Hand		1
	11	870072-3	. Cable - Control	P1	1
	12	W-10080-1	. Cable - Clamp		1
	13	171416	. Spacer - Gas Valve		1
	14	202258-4	. Suppressor Ay	RV1	1
	15	16DA-3304-1	. Tube - Water or Gas		1
	16	203846-2	. Fitting - Barbed, Plastic		1
	17	404162-8	. Valve - Solenoid	L1	1
	18	W-10892-1	. Elbow - Street, 90°		1
	19	171086-2	. Support - Standoff		2
	20	401937-11	. Terminal - Block	B1	1
	21	407146	. Label - Terminal Block		1
	22	409554-2	. Rectifier - Bridge	CR1	1
	23	403056-11	. Relay - Enclosed	K1	1
	24	405626-3	. Resistor - Power	R1	1
	25	830116	. Label - Frame Ground		1
	26	16DA-3134	. Transformer - Stepdown	T2	1
	27	204994-2	. Motor - Gear, Permanent Magnet	B1	1
	—	407190-1	. . Cap - Holder, Brush		2
	2	—	. . Brush and Spring - Assembly		2
	28	170959A	. Plate - MTG. Feedhead		1
		170959A-1	. Plate - MTG. Feedhead		1
		870122	. Plate - MTG. Feedhead		1
	29	402037-6	. Grommet - Rubber		1
	30	171360	. Insulator - Feedhead		1
	—		Not Illustrated		

193111-024
PARTS LIST

Quantity		Item No	Part Number	Description	Qty per Assy	Application Code
Recomm. Spares Class 1	Class 2					
		31	171271	. Plate - Feedhead	1	All
		32	375298	. Tube - Gas	1	All
		33	400562-48	. Spring - Compression	1	All
		34	171362	. Clamp - Gun Tube	1	All
		35	171380	. Knob - Retaining	2	All
		36	No Number	. Screw - 3/8-16x3/4, HHC, ST.	1	All
		37	No Number	. Washer - LK, Std. 3/8	1	All
		38	No Number	. Washer - Flat, ST. 3/8	1	All
		39	No Number	. Screw - #8-32x1/2 Pan Hd. Phil	2	All
	1	40	171356	. Gear - Drive, Insulated	1	All
		41	Ref.	. Roll - Feed, Bottom	Ref	All
		42	870011	. Knob - Retaining	1	All
		43	171374	. Insulator - Screw	3	All
		44	No Number	. Screw - 1/4x3/4, Rd. Hd. Sems	3	All
		45	16DA-1202-15	. Pin - Spring	1	All
		46	Ref.	. Guide - Input	Ref.	All
		47	375301	. Rod - Feed Roll Tension	1	All
		48	16DA-1202-16	. Pin - Spring	1	All
		49	No Number	. Washer - Flat, ST. 1/4	2	All
		50	400562-33	. Spring - Feed Roll Tension	1	All
		51	870082	. Knob, Plastic - 1/4-20	1	All
		52	171359	. Shaft - Pressure Roll	1	All
		53	16DA-4249-5	. Ring - Snap, External	1	All
		54	407108	. Washer - Flat	2	All
	1	55	171358	. Gear - Idler, Assy.	1	All
		56	Ref.	. Roll - Feed, Top	Ref.	All
	1	57	171377	. Knob - Feed Roll	1	All
		58	406314-1	. Ring - Retaining	2	All
		59	171273	. Arm - Pressure	1	All
		60	375300-1	. Pin - Pressure Arm	1	All
		61	Ref.	. Guide - Output	Ref.	All
		62	403091-12	. Plug - Hole	1	AB
		63	040209	. Strip - Weather	0.5Ft	C
		64	375581	. Board, PC - Ground Fault	1	C

— Not Illustrated

INSTRUCTION SHEET - Installation of Wire “Reel” or “Spool” on the Support

The wire feeder will be shipped from the factory with a wire spool kit 870058 and a wire reel/spool support assembly 870060-X. An “optional” wire reel kit 870059 is also available.

WARNING: Mount spool with hub nut angled upward (see Figure 1). Hub nut may detach causing personal injury from falling wire coil spool if improperly mounted.

Figure 1

1. To install the Wire Reel/Spool Support Assembly (870060-X) onto the Baseplate:

a. Use the four 1/4-20 x 7/8" screws, the four hex keps nuts, and the two flat washers to fasten the support (1) to the wire feeder base.

2. To install the Wire Spool Kit (870058):

a. Mount the shaft (6) in the lower hole (if using a 30-45 lb. spool) or in the upper hole (if using a 60 lb. spool) of the support (1). Make sure the 1/2-13 hex nut (2) is securely tightened on the shaft (6). See Figure 2.

b. Mount the Wire Spool Hub (13) on the Shaft (6).

Figure 2

c. Install the spool tension spacer, compression spring, spacer, and the hub tension screw.

d. Place a wire spool on the hub (13). Align the positioning pin on the hub with the hole in the wire spool so that the wire feeds from the bottom of the coil. See Figure 3.

Figure 3

e. Install the wire spool hub nut (17) and tighten until the spring ball plunger falls into the dimple on the wire spool hub.

f. Adjust the compression spring tension by use of the hub tension screw until the proper reel drag is achieved.

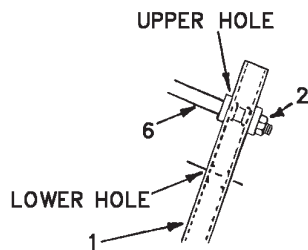


Figure 4

3. To install the Wire Reel Kit (870059):

a. Mount the shaft (6) in the upper hole of the support (1) to assure proper clearance for the wire reel (7). See Figure 4.

b. Mount the wire reel (7) on the shaft (6).

c. Install the wire reel washer, the steel wire reel washer, compression spring, "T" wire reel washer, and the drag adjusting screw.

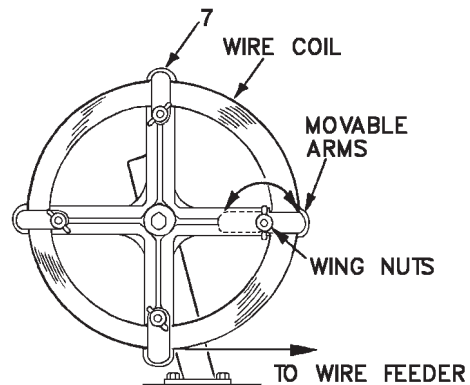


Figure 5

d. Loosen the wing nuts holding the movable arms. Rotate the arms inward towards the center of the reel (7). Place the coiled wire on the reel so the wire feeds from the bottom of the coil to the wire feeder. See Figure 5.

e. Reposition the movable arms outward and tighten the wing nuts.

f. Tighten the drag adjusting screw until the desired reel drag is achieved.

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DIAGRAMS

- Note the model and specification number shown on the equipment nameplate.
- Locate these numbers in the model and specification number columns below.
- Use only those diagrams and instructions that are applicable.

MODEL	SPECIFICATION NUMBER	CONNECTION & SCHEMATIC DIAGRAM	SYSTEM OUTLINE	FEED ROLL CHART
Model 17A	100011-1	870075	870076	171435
	100011-2	870075	870076	171435
	100011-3	870143	870076	171435