



**THERMAL ARC**  
*Professional*

# **WF-100**

## *Wire Feed System*

### **Add-On Capstan Wire Feed System**

The Thermal Arc WF-100 Cold Wire Capstan Feeder is a compact, lightweight, precision wire feeder for robotic or automation fixture applications. The Capstan's small size and lightweight (less than 6lbs.) allows the wire feeder to be placed directly on the automated fixture or robot wrist. The Capstan also provides an increase in wire drive contact area by wrapping the wire around the wire drive wheel.

This wire drive method has three major benefits:

- Plastic deforms the filler wire, virtually eliminating wire cast.
- Increased drive force eliminates wire slip, flattening and damage to wire surface.
- Integral wire straightener on the discharge side of the feeder allows the Wire Drive to precisely locate the filler wire independent of wire cast.

#### **MARKETS**

- Aerospace/Aircraft
- Automotive
- Robotics
- Automated Welding Systems Integrators



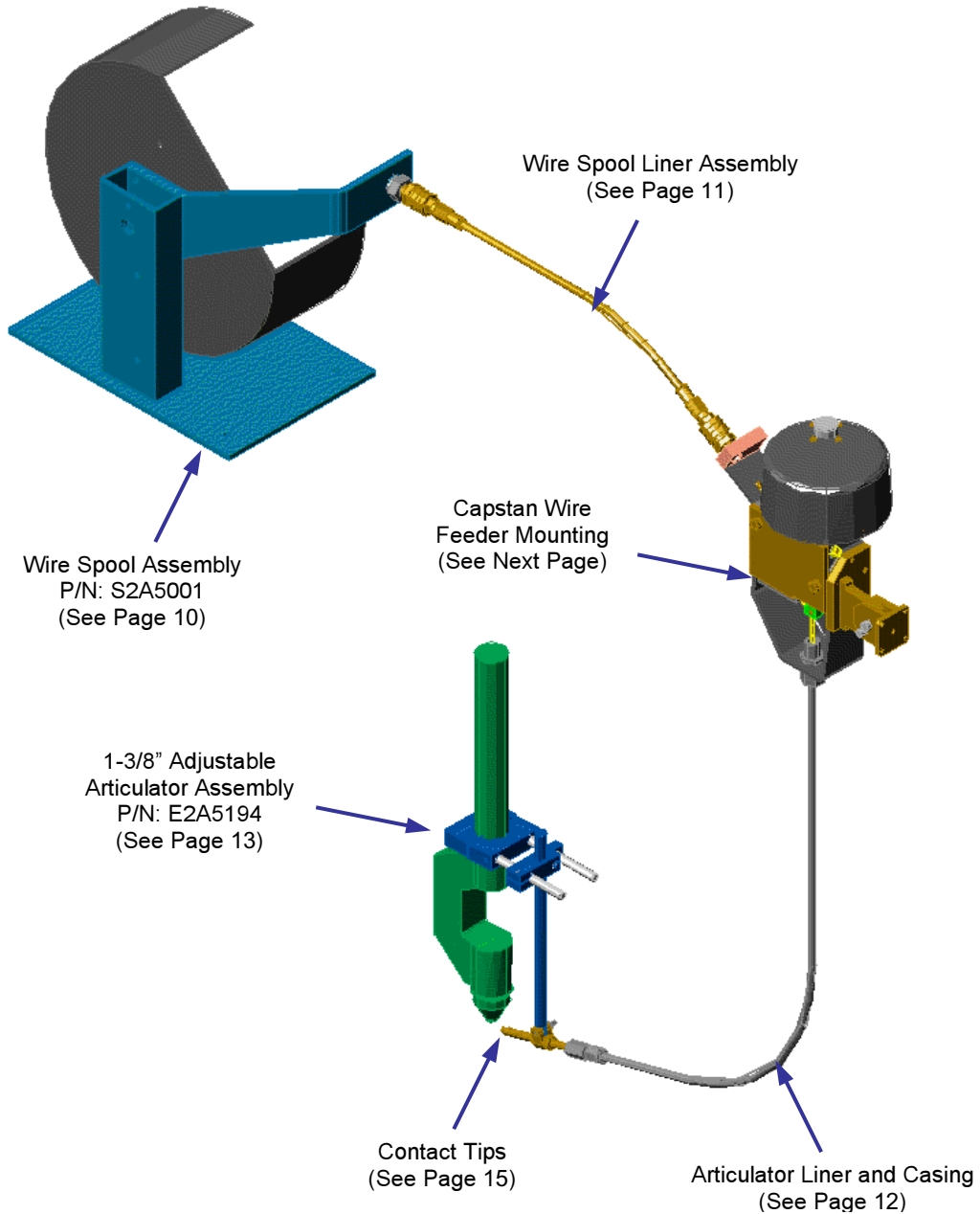
**The WF-100 Capstan Feeder is designed for the WC-1 Weld Process Controller**

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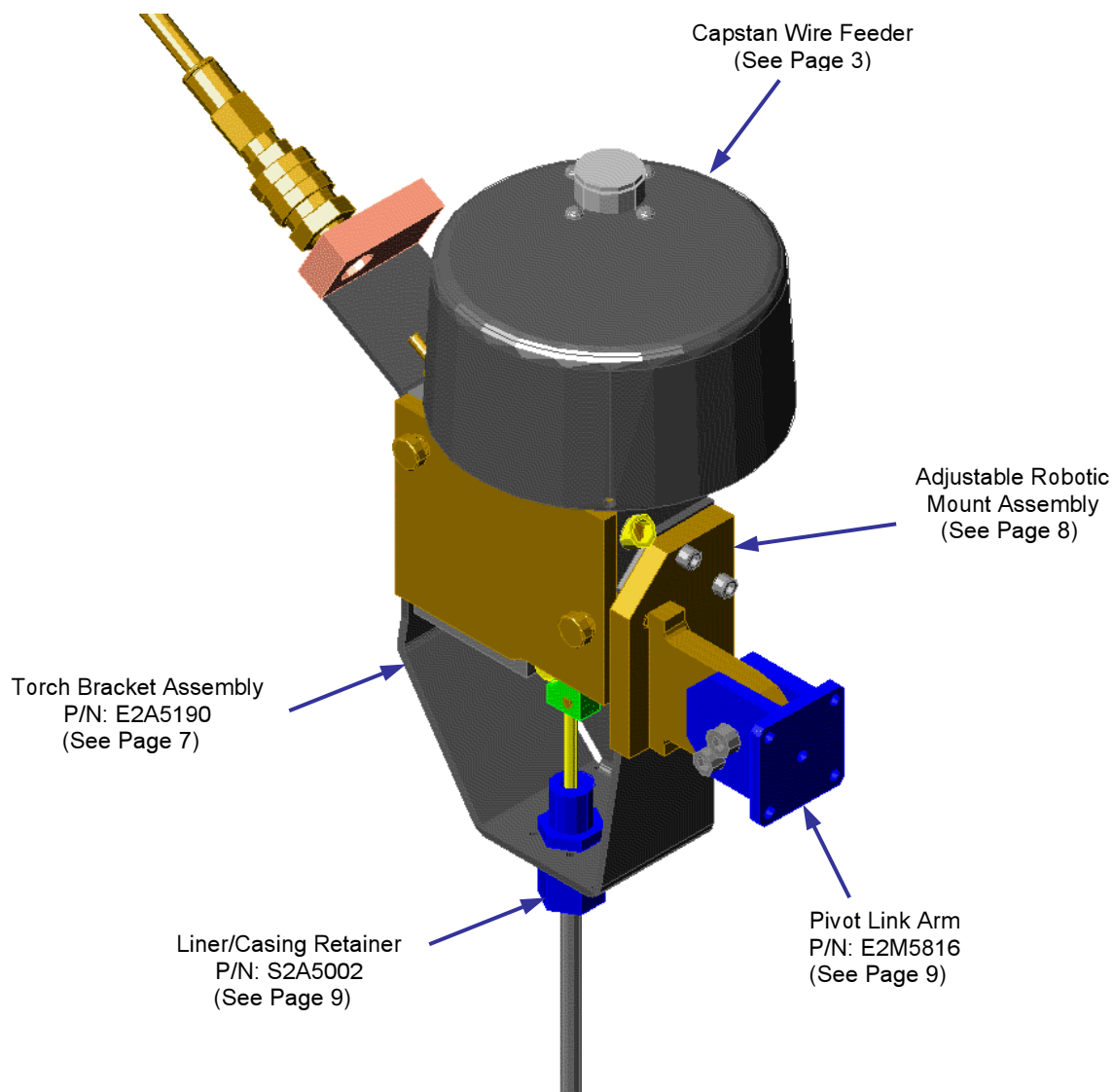
## PLASMA WELDING SYSTEM CONFIGURATION

These illustrations indicate the standard equipment required for a Plasma welding configuration.



Plasma Welding Wire Feed System Configuration

Effective 06-01-02



Capstan Wire Feeder Mounting

Effective 06-01-02

## WF-100 CAPSTAN WIRE FEEDER

### SYSTEM DESCRIPTION

The Capstan Wire Feeder is a compact, lightweight precision wire feeder for robotic or automated fixture applications. This product was introduced in 1989. Industry analysts project dramatic growth in the use of robots for arc welding in future years. In a random survey by an independent consultant 21 out of 55 people interviewed had robotic or fully automated welding operations and 12 people out of 21 who did have robotic or automated welding operations experienced problems with feeding welding wire. Major problems cited were wire cast, helix, and wire feed speed control.



The Capstan's small size and light weight (less than 6 lbs.) allows the wire feeder to be placed directly on the automated fixture or robot wrist. The Capstan also provides an increase in wire drive contact area by wrapping the wire around the wire drive wheel.

This wire drive method has three major benefits:

- Plastic deforms the filler wire, virtually eliminating existing wire cast.

- Increased drive force eliminates wire slip, flattening and damage to wire surface.

- Integral wire straightener on the discharge side of the feeder allows the Wire Drive to precisely locate the filler wire independent of wire cast.

The WF-100 Capstan wire feed drive can be used with the WC-1 Thermal Arc Process Controller

### MARKETS

- Aerospace/Aircraft
- Automotive
- Automotive Satellite Industries
- OEM's - Arc Welding Robots
- Automated Welding Systems Integrators

### ADVANTAGES OVER COMPETITION

- Wire feed speed accuracy
- Broad dynamic range
- Better/more versatile control
- Better control over wire position in the weld joint
- Ability to mount on robot arm
- Competitive price
- Process versatility (GTAW, PAW)

Effective 06-01-02

## DRIVE TYPES

The WF-100 Capstan Wire Drive can be purchased in various configurations as follows:

PART NO.	DESCRIPTION
E2A5099	WF-100 PWM Drive with 9 CM Motor  Wire Feed Range: 10 - 625 IPM (4-265 mm/s) Motor Full Load Pull Capacity: 20 LBS (9 kg) Operation / Installation Manual

Note: WF-100 Drives are not equipped with any specific wire component parts. Specific wire kits must be ordered separately for each wire diameter and filler wire material.

## Interface Control Circuit for WC-1 Process Controller

PART NO.	DESCRIPTION
C3A5005	Interface Control Circuit (Includes Wire Feed Printed Circuit Board)  Note: Must be ordered when using WC-1 Process Controller

## FILLER WIRE SPECIFICATIONS

The WF-100 requires different component parts for each diameter of filler wire used. Refer to next sections to select the correct drive wheel and inlet wire guide for the wire diameter and filler wire material required. There are four primary configurations for the WF-100.

1. 0.030" to 0.052" Steel Alloy Wire Configuration
2. 0.030" to 0.062" Aluminum Wire Pick-up Block Configuration
3. 0.030" to 0.052" Aluminum Wire Straightener Configuration
4. 0.062" Aluminum Wire Straightener Configuration

Effective 06-01-02

## 0.030" to 0.052" STEEL ALLOY WIRE CONFIGURATIONS

When using a 0.030" to 0.052" steel alloy filler wire with the capstan, a Steel Alloy Wire Kit specifically made for each size wire must be installed on the capstan. All parts that are wire size specific in these kits are marked with color codes to prevent mixing incompatible parts. Figure 1 shows all the parts that are included in these kits. The capstan drive is not part of these kits.

### CONFIGURATION KITS

WIRE SIZE	COLOR CODES	PART NO.
0.030" (0.8mm)	White	E2A5164
0.035" (0.9mm)	Red	E2A5165
0.040" (1.0mm)	Gold	E2A5166
0.045" (1.1mm)	Yellow	E2A5167
0.047" (1.2mm)	Yellow	E2A5167
0.052" (1.3mm)	Blue	E2A5168

### COMPONENT PARTS

The drawing below shows the location of the common and wire specific parts that are included in the Steel Alloy Wire Kits.

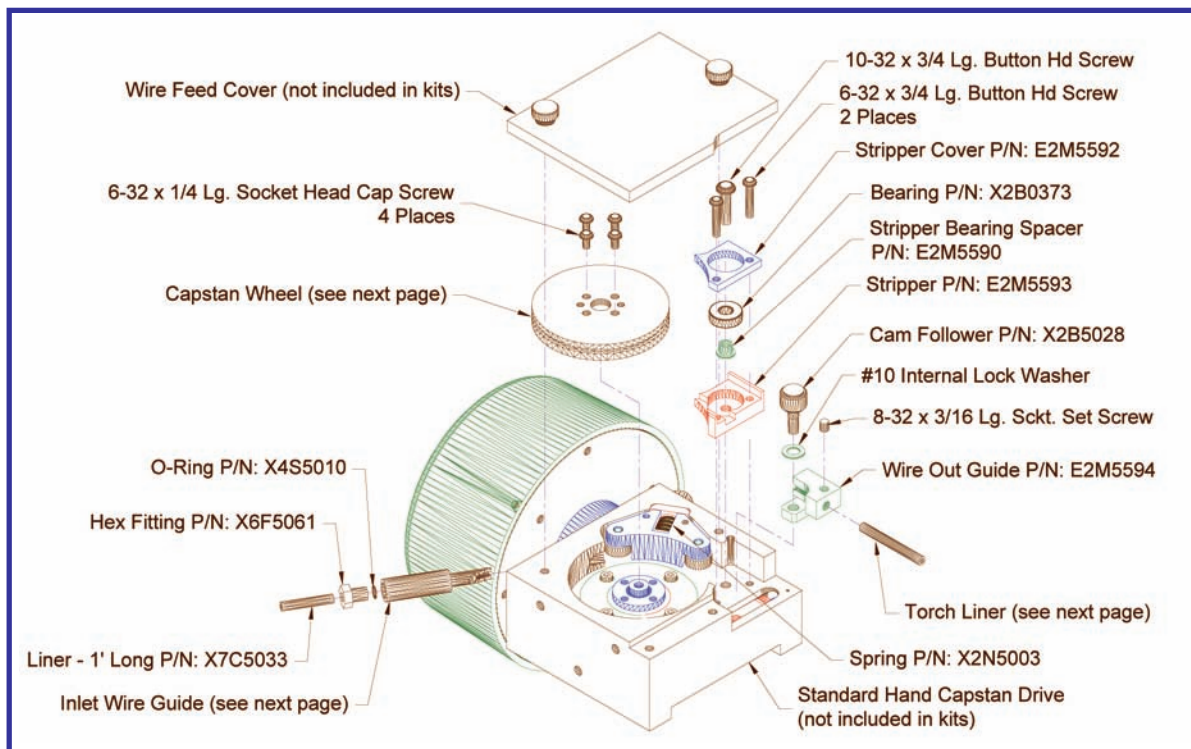


Figure 1: Steel Alloy Wire Component Parts

Effective 06-01-02

## Capstan Wire Feeder and Control Parts List



PART NO.	DESCRIPTION
E2M5583	Capstan Wheel for 0.030" (0.8mm) Wire
E2M5157	Capstan Wheel for 0.035" (0.9 mm) Wire
E2M5633	Capstan Wheel for 0.040" (1.0 mm) Wire
E2M5156	Capstan Wheel for 0.045" (1.1 mm) and 0.047" (1.2 mm) Wire
E2M5584	Capstan Wheel for 0.052" (1.3 mm) Wire
E2M5616	Inlet Wire Guide for 0.030" (0.8 mm) Wire
E2M5617	Inlet Wire Guide for 0.035" (0.9 mm) Wire
E2M5634	Inlet Wire Guide for 0.040" (1.0 mm) Wire
E2M5619	Inlet Wire Guide for 0.045" (1.1 mm) and 0.047" (1.2 mm) Wire
E2M5620	Inlet Wire Guide for 0.052" (1.3 mm) Wire
E7C5001	Torch Liner for 0.030" (0.8 mm) Wire to 0.047" (1.2 mm) Wire
E7C5002	Torch Liner for 0.052" (1.3 mm) Wire
E2M5590	Stripper Bearing Spacer
E2M5592	Stripper Cover
E2M5593	Stripper
E2M5594	Wire Out Guide
X2B0373	Bearing
X2B5028	Cam Follower
X2N5003	Pressure Roller Shoe Spring
X4S5010	O-Ring
X6F5061	Hex Fitting
X7C5033	Liner, 1 foot long

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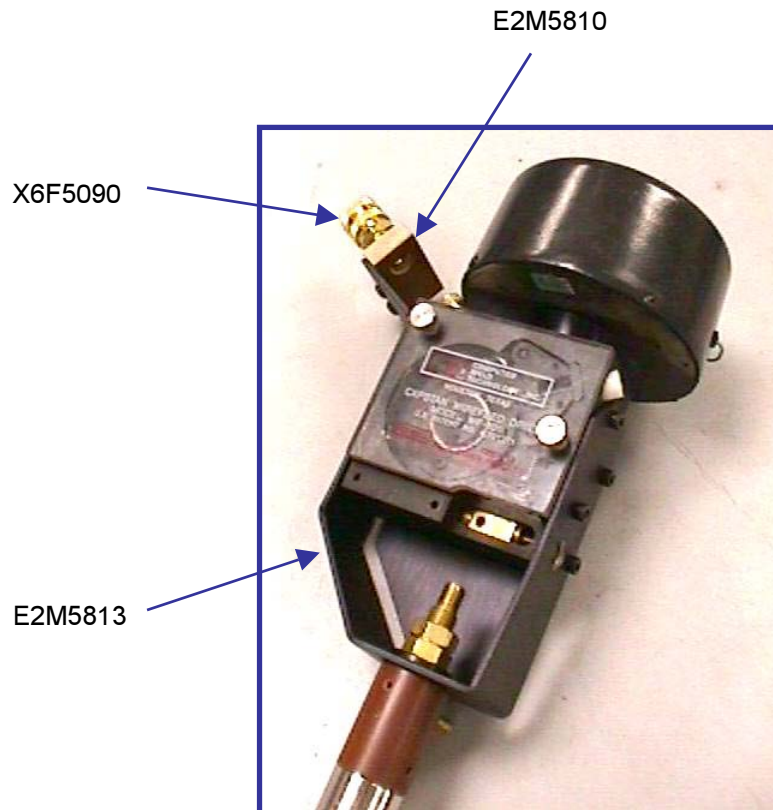


**CAPSTAN DRIVE TORCH BRACKET ASSEMBLY**

Bracket Assembly is required to install our Articulator Liner and Casing onto the Capstan Drive. It includes a quick disconnect fitting for easy installation of welding wire liner.

**ASSEMBLIES**

PART NO.	DESCRIPTION
E2A5190	Capstan Drive Torch Bracket Assembly



**COMPONENT PARTS**

PART NO.	DESCRIPTION
E2M5813	Capstan Drive Torch Bracket
E2M5810	Insulating Block
X6F5090	Quick Disconnect Fitting

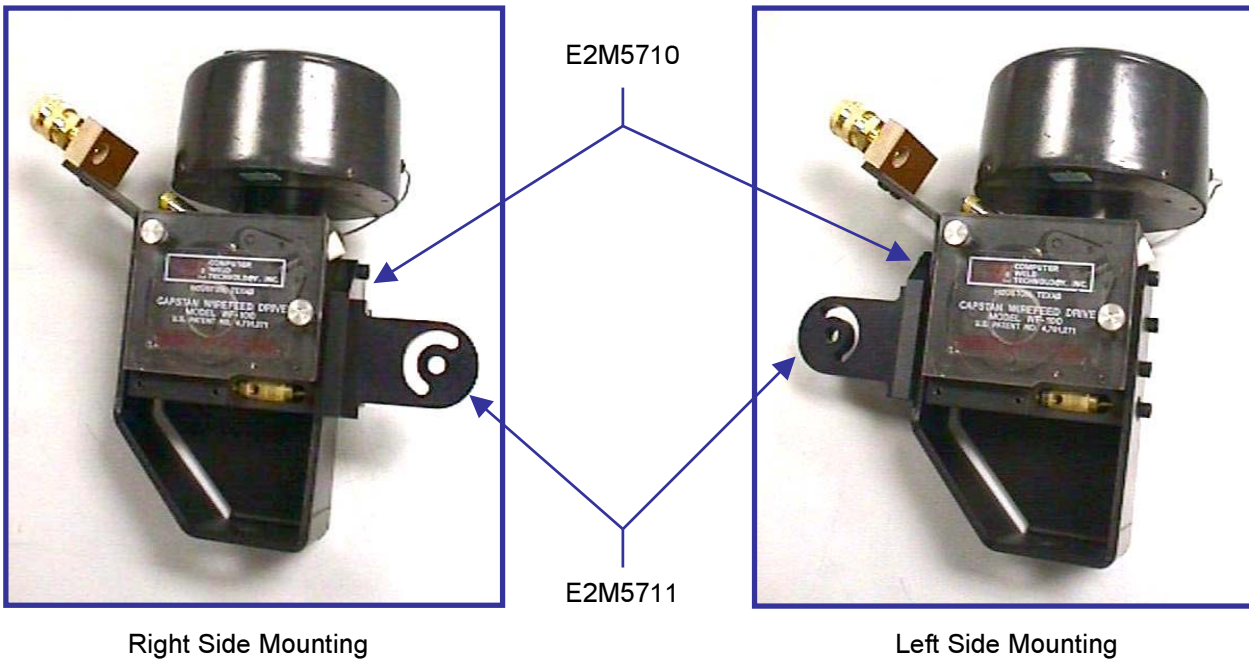
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**ADJUSTABLE ROBOTIC MOUNT ASSEMBLY**

Robotic Mount can be installed onto Capstan with or without the Torch Bracket installed. Also, it can be installed on either side of Capstan.

**ASSEMBLIES**

PART NO.	DESCRIPTION
E2M5646	Adjustable Robotic Mount Assembly for Right Side Mounting
E2A5120	Adjustable Robotic Mount Assembly for Left Side Mounting



**COMPONENT PARTS**

PART NO.	DESCRIPTION
E2M5710	Bracket Base
E2M5711	Bracket Arm

Note: Both right and left side mountings use the same component parts.

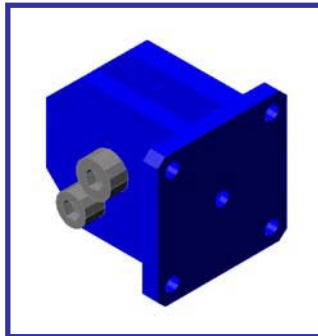
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### PIVOT LINK ARM

Pivot Link Arm operates with the Robotic Mount to make pivot adjusts for the Capstan Wire Feeder. The Arm has five mounting holes for installation onto your fixture.

#### ASSEMBLIES

PART NO.	DESCRIPTION
E2M5816	Pivot Link Arm

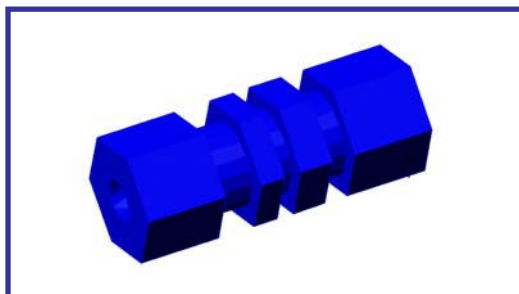


### LINER/CASING RETAINER

This retainer is an inexpensive way to capture welding wire liner and casing.

#### ASSEMBLIES

PART NO.	DESCRIPTION
S2A5002	Casing/Liner Retainer



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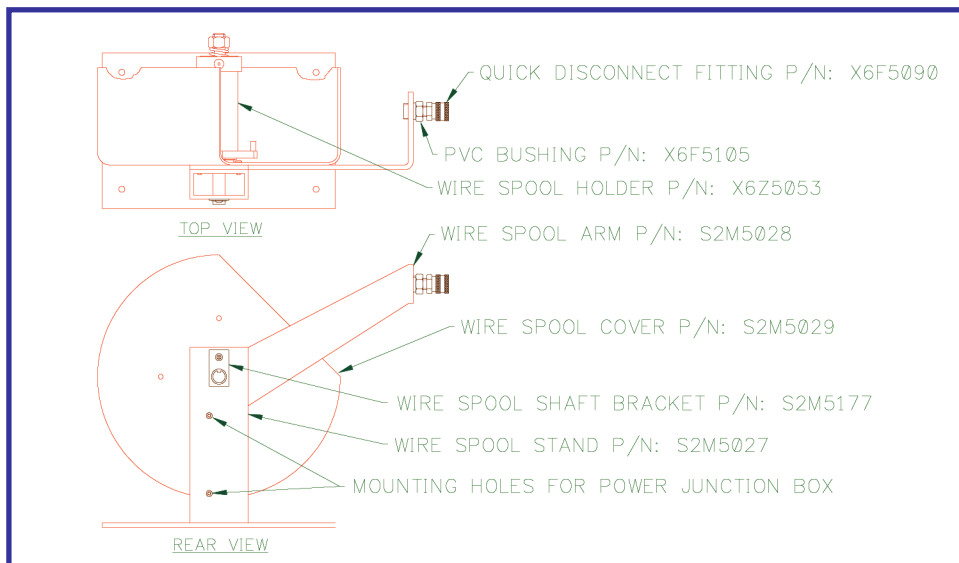
## WIRE SPOOL ASSEMBLY

This assembly will accommodate a 12" diameter welding wire spool. It is supplied with a quick disconnect fitting for easy installation of welding wire liner and casing.



### ASSEMBLIES

PART NO.	DESCRIPTION
S2A5001	Wire Spool Assembly



### COMPONENT PARTS

PART NO.	DESCRIPTION
S2M5027	Wire Spool Stand
S2M5028	Wire Spool Arm
S2M5029	Wire Spool Cover
S2M5177	Wire Spool Shaft Bracket
X6Z5053	Spool Holder Assembly
X6F5090	Female Quick Disconnect Fitting
X6F5105	1/4" NPT Female x 1/2" NPT Male PVC Schedule 80 Bushing

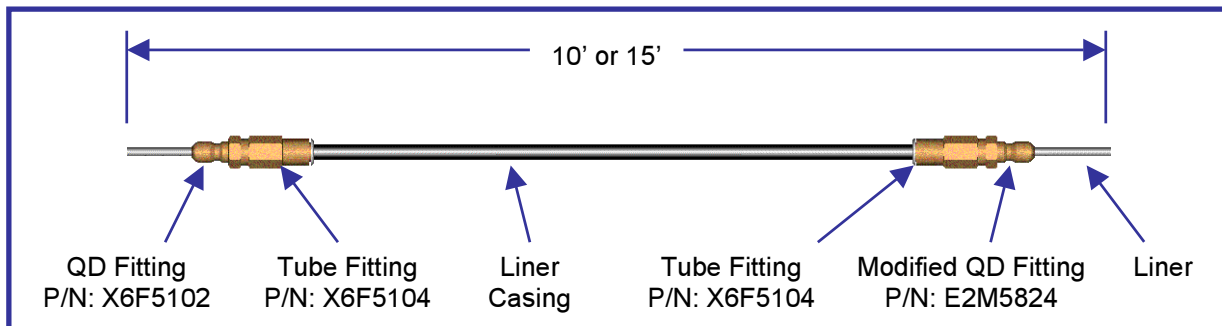
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## WIRE SPOOL LINER ASSEMBLIES

Our Wire Spool Liner Assemblies are supplied in 10' and 15' lengths for both steel alloy and aluminum wire. They are supplied with quick disconnect fittings for ease of installation to Wire Spool Assembly and Capstan Wire Feeder.

### ASSEMBLIES

PART NO.	DESCRIPTION
E7A5001	10' Long Assembly for 0.030" – 0.047" Steel Alloy Wire
E7A5002	15' Long Assembly for 0.030" – 0.047" Steel Alloy Wire
E7A5003	10' Long Assembly for 0.052" – 0.062" Steel Alloy Wire
E7A5004	15' Long Assembly for 0.052" – 0.062" Steel Alloy Wire
E7A5005	10' Long Assembly for 0.030" – 0.035" Aluminum Wire
E7A5006	15' Long Assembly for 0.030" – 0.035" Aluminum Wire
E7A5007	10' Long Assembly for 0.040" – 0.052" Aluminum Wire
E7A5008	15' Long Assembly for 0.040" – 0.052" Aluminum Wire
E7A5009	10' Long Assembly for 0.062" Aluminum Wire
E7A5010	15' Long Assembly for 0.062" Aluminum Wire



### COMPONENT PARTS

PART NO.	DESCRIPTION
E7C5007	10' Long Liner for 0.030" – 0.047" Steel Alloy Wire
E7C5008	15' Long Liner for 0.030" – 0.047" Steel Alloy Wire
E7C5009	10' Long Liner for 0.052" Steel Alloy Wire
E7C5010	15' Long Liner for 0.052" Steel Alloy Wire
E7C5011	10' Long Liner for 0.030" – 0.035" Aluminum Wire
E7C5012	15' Long Liner for 0.030" – 0.035" Aluminum Wire
E7C5013	10' Long Liner for 0.040" – 0.052" Aluminum Wire
E7C5014	15' Long Liner for 0.040" – 0.052" Aluminum Wire
E7C5015	10' Long Liner for 0.062" Aluminum Wire
E7C5016	15' Long Liner for 0.062" Aluminum Wire
E7C5017	10' Long Liner Casing
E7C5018	15' Long Liner Casing
X6F5104	Tube Fitting
E2M5824	Modified Quick Disconnect Fitting
X6F5102	Male Quick Disconnect Fitting

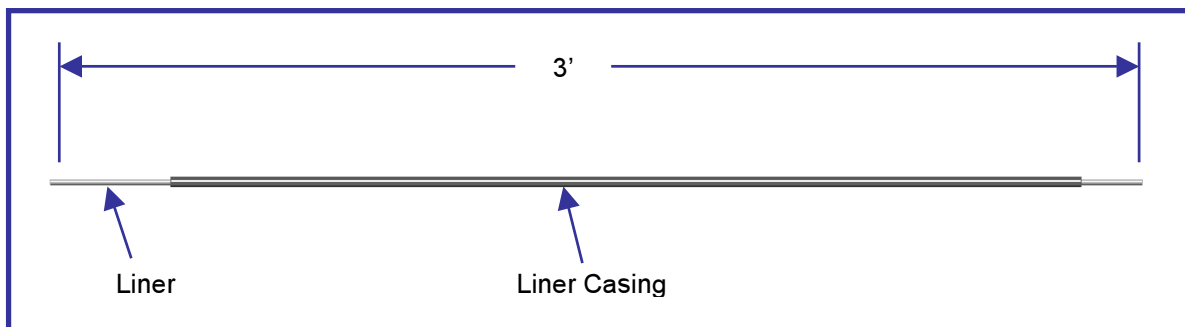
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**ARTICULATOR LINER AND CASING**

These Articulator Liners and Casings are 3 foot long but can be supplied in longer lengths as required for both steel alloy and aluminum wire.

**ASSEMBLIES**

PART NO.	DESCRIPTION
E7A5011	3' Long Assembly for 0.030" – 0.047" Steel Alloy Wire
E7A5012	3' Long Assembly for 0.052" – 0.062" Steel Alloy Wire
E7A5013	3' Long Assembly for 0.030" – 0.035" Aluminum Wire
E7A5014	3' Long Assembly for 0.040" – 0.052" Aluminum Wire
E7A5015	3' Long Assembly for 0.062" Aluminum Wire



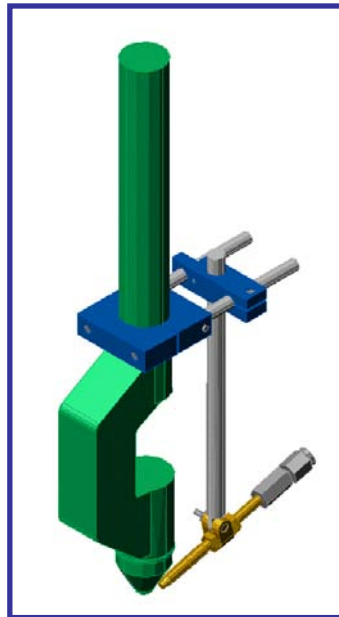
**COMPONENT PARTS**

PART NO.	DESCRIPTION
E7C5019	Liner for 0.030" – 0.047" Steel Alloy Wire
E7C5020	Liner for 0.052" Steel Alloy Wire
E7C5021	Liner for 0.030" – 0.035" Aluminum Wire
E7C5022	Liner for 0.040" – 0.052" Aluminum Wire
E7C5023	Liner for 0.062" Aluminum Wire
E7C5024	Liner Casing

Effective 06-01-02

## COLD WIRE PLASMA TORCH ARTICULATOR ASSEMBLY

The Articulator Assembly provides a convenient means for adjusting the position of the cold wire with respect to the PAW welding torch. The articulator provides X –Y– Z-axis motion and a pivot axis for wire impingement angle. The cold wire feed guide assembly is isolated from the torch mount and uses a replaceable contact tip. The articulator may be used as a hot wire torch by connecting a power cable to the wire guide assembly.

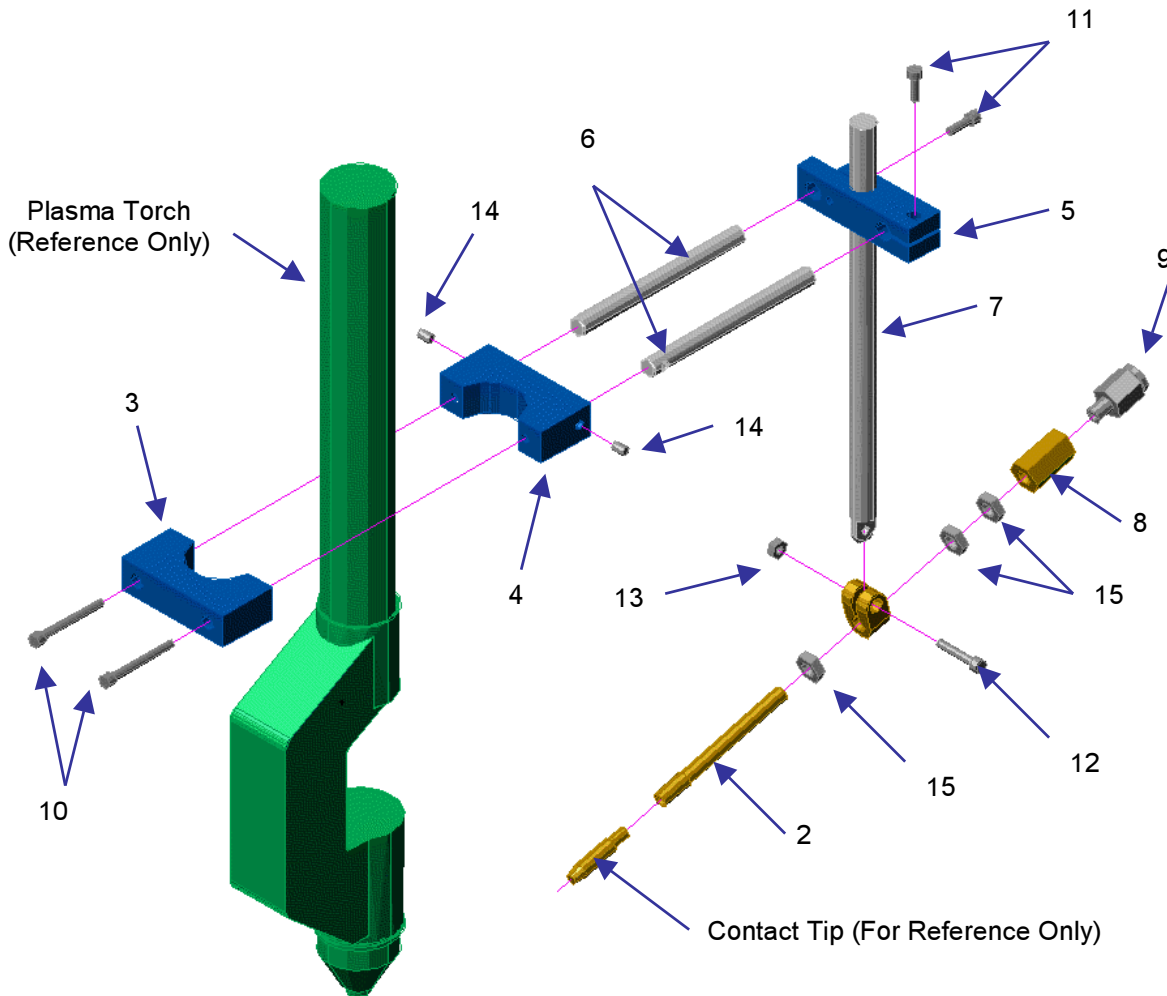


### COMPLETE ASSEMBLIES

PART NO.	DESCRIPTION
E2A5194	1-3/8" Adjustable Articulator Assembly

Note: Contact tips are not supplied with assemblies. See Component Parts below for a list of contact tips.

Effective 06-01-02



**COMPONENT PARTS**

ITEM	PART NO.	DESCRIPTION
1	E2M5762	Articulator "Y" Adjust Clamp
2	E2M5763	Articulator Tip Retainer
3	E2M5838	1-3/8" Articulator Front Torch Barrel Clamp
4	E2M5839	1-3/8" Articulator Rear Torch Barrel Clamp
5	E2M5840	Articulator "XY" Adjust Clamp
6	E2M5841	Articulator "X" Adjust Shaft
7	E2M5842	Articulator "Y" Adjust Shaft
8	E2M5843	Hex Adaptor
9	X6F5085	5/16" Tube Fitting
10		#8-32 x 1-1/2" Long Socket Cap Head Screw
11		#8-32 x 1/2" Long Socket Cap Head Screw
12		#8-32 x 7/8" Long Socket Cap Head Screw
13		#8-32 Hex Nut
14		#10-32 x 1/4" Long Socket Set Screw
15		#5/16-18 Hex Nut

Effective 06-01-02



**CONTACT TIPS**

Listed below are the contact tips for the Articulator Assembly.

**COMPONENT PARTS**

<b>PART NO.</b>	<b>DESCRIPTION</b>	
X7T5005	0.030" Solid or Flux Core Wire	
X7T5003	0.035" Solid or Flux Core Wire	
X7T5004	0.045"/0.047" Solid or Flux Core Wire	
X7T5033	0.052" Solid or Flux Core Wire	
X7T5034	0.030" Aluminum or Stainless Steel Wire	
X7T5026	0.035" Aluminum or Stainless Steel Wire	
X7T5002	0.045"/0.047" Aluminum or Stainless Steel Wire	
X7T5035	0.052" Aluminum or Stainless Steel Wire	
X7T5027	0.062" Aluminum or Stainless Steel Wire	

NOTE: Consult factory for additional required components and pricing.

Effective 06-01-02





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