

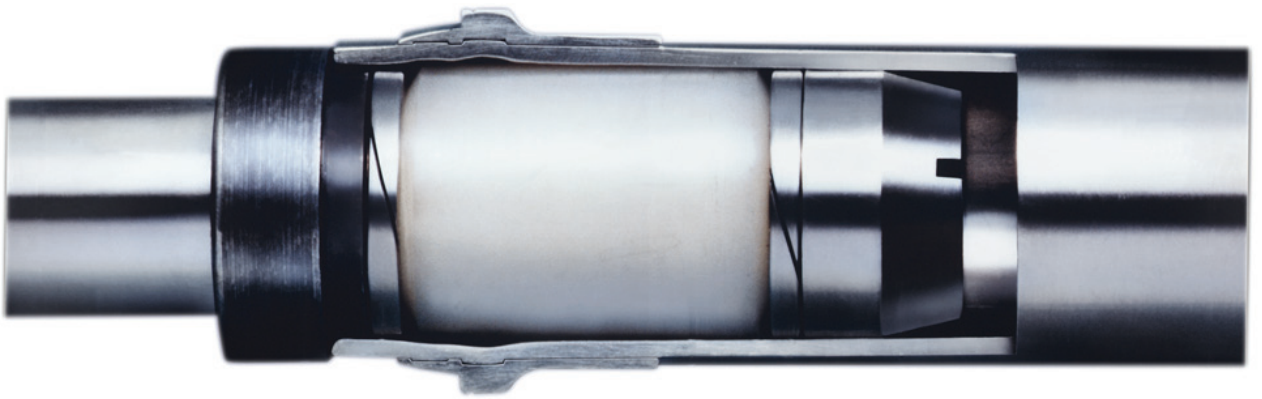


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Eaton internal elastomeric swage fittings were developed to provide a simple, yet reliable method to attach separable end fittings to rigid tubes for the demanding aerospace environment. These fittings provide a lightweight and cost effective alternative to welding, brazing, or other mechanically attached methods.

Advantages of Internal Swaging

Internal swaging is a mechanical method for the attachment of fittings to tubing. This is accomplished by forming tubing outward into grooves within the fitting. The following advantages can be realized from this technique.

Advantages

- No special tube end preparation (cleaning or sizing)
- Very rapid fabrication (seconds per connection)
- No X-ray inspection required
- No flushing or ball-check test required
- Reduces scrap rate
- Improved fatigue performance vs. braze
- No heat-affected zones or heat-induced distortion
- No stress-relieving required

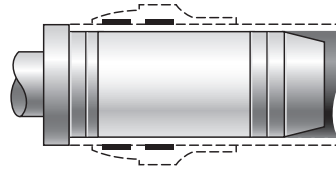
These advantages can result in significant installed cost savings. The use of Eaton internal swage fittings is ideally compatible with

CAD/CAM systems for tube assembly production. Mechanical attachment at room temperature is a plus in situations where flammability is a concern.

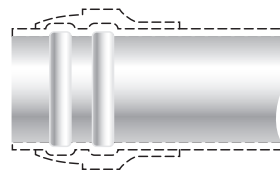
Fitting Features

- Fittings are made of high-strength alloys (15-5 CRES, 7075 Aluminum, 6AL-4V Titanium)
- Flared fitting with machined metal sealing surface eliminates tube flare cracking
- Flared fitting uses a 2-angle face which results in a line-contact seal allowing up to 4° angular misalignment
- Various Flareless styles are available which are compatible with all flareless systems in use today
- Lipseal fittings provide excellent sealing due to a flexible beam surface plus maximum fitting interface clearance
- Available in sizes from 1/4" (6.35mm) through 1-1/2" (38 mm).

Internal Swaging Technique



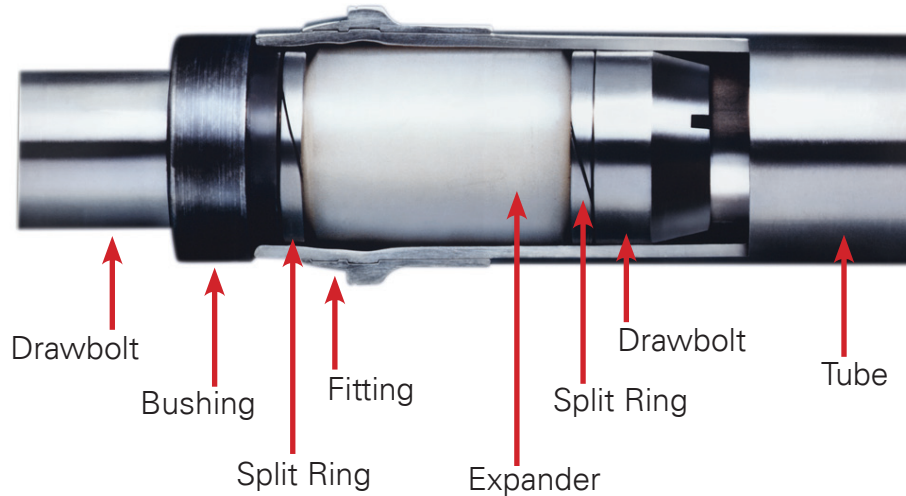
Before swaging, with drawbolt/expander assembly inserted



After swaging, with tube formed into fitting grooves

Internal Elastomeric Swaging Equipment

Elastomeric Drawbolt Assembly



Elastomeric Swaging Equipment

MODEL 5420A – Dual-Head Automated Power Swage Machine

The Model 5420A is designed for high volume elastomeric power swaging of aircraft fittings to aluminum, steel or titanium tubing. It features two heads for high productivity, a capacity range of .25" (6.35mm) O.D. through 1.50" (38mm) O.D., and a cycle time as fast as 10 seconds per swage. Each head on Model 5420A has a separate set of controls which allows one operator to use one head independently of the other, or two operators to use both heads simultaneously. The unit's motor also provides sufficient pressure so that both heads can operate off the same relief valve and hydraulic pump. All internal components are housed in a rugged welded steel body.



Model 5420A

MODEL 6520 – Semi-Automatic Power Swage Machine

The Model 6520 is designed for high production runs of tube assemblies in tubing sizes of .25" (6.35mm) O.D. through .75" (19mm) O.D. this semi-automatic swage machine uses a hydraulically actuated drawbolt with an elastomeric expander to hydrostatically form the tube outward into machined grooves within the fitting, which is captured by metal jaws during swaging. This power swage machine can elastomerically swage fittings to tubing in 15 to 20 seconds, for high volume tube assembly production. CRES, aluminum and CP titanium can be swaged in all industry-standard wall thickness. Power swaging machines are housed in steel carts complete with tool storage.

MODEL 6530 – Semi-Automatic Power Swage Machine

The Model 6530 is designed for high production runs of tube assemblies in tubing sizes of .750" (19mm) O.D. through 1.50" (38mm) O.D. This semi-automatic swage machine uses a hydraulically actuated drawbolt with an elastomeric expander to hydrostatically form the tube outward into machined grooves within the fitting, which is captured by metal jaws during swaging. This power swage machine can elastomerically swage fittings to tubing in 15 to 20 seconds, for high volume tube assembly production. CRES, aluminum and CP titanium can be swaged in all industry-standard wall thickness. Power swaging machines are housed in steel carts complete with tool storage.

Internal Elastomeric Swage Tools - Model 5175

TOOLING

5175	Eaton Part Number	Length
Pump Assembly	5798	
Swaging Head	5806	
Hose Assembly*	5804-1	40 in (1016mm)
	5804-2	76 in (1930mm)
	5804-3	124 in (3149mm)
	5804-4	148 in (3759mm)
Retaining Ring	5728	

For use in fastening fittings to .250 O.D. thru .500 O.D. tubing.

Internal tooling requirements for this unit are listed in applicable swaging supplements and/or the operation manual.

*5175 comes with only one hose. Length specified by customer.

5798 Hand Pump & Hose



5806 Small Swage Head with 5728 Adapter Ring



Swage Kit Available



Swage Tooling - For Use With 35235 Sleeve

Tube Size	Assembly	Replacement Components					Jaw Sets & Anvil's		
	Drawbolt Assembly	Drawbolt P/N	Expander P/N	Split Ring P/N	Bushing P/N	Anti-Extrusion Ring	Anvil P/N	Jaw Set P/N	Adapter P/N
-04	6742-04XXXL	5642-1XXX	5945-04XXX	5937-04XXX	6150-04XXX	None Required	5284-2	5598	5329 & 5930
-05	6743-05XXXL	5643-1XXX	5945-05XXX	5937-05XXX	6150-05XXX	None Required	5285-2	5599	5329 & 5930
-06	6744-06XXXL	5902-1XXX	5945-06XXX	5937-06XXX	5264-06XXX	5942-06	5286-2	5600	5930
-08	6745-08XXXL	5645-1XXX	5945-08XXX	5937-08XXX	5264-08XXX	5942-08	5288-2	5601	5930

XXX designates Tube Wall thickness (i.e. 6744-06028L)

Swage Tooling - For Use With 35056 Union

Tube Size	Assembly	Replacement Components					Jaw Sets & Anvil's		
	Drawbolt Assembly	Drawbolt P/N	Expander P/N	Split Ring P/N	Bushing P/N	Anti-Extrusion Ring	Anvil P/N	Jaw Set P/N	Adapter P/N
-04	6751-04XXXL	5642-1XXX	5945-04XXX	5937-04XXX	5264-04XXX	None Required	5876-04	5877	5329 & 5930
-05	-	-	-	-	-	None Required	-	-	-
-06	6753-06XXXL	5902-1XXX	5945-06XXX	5937-06XXX	5264-06XXX	5942-06	5876-06	5879	5930
-08	6754-08XXXL	5645-1XXX	5945-08XXX	5937-08XXX	5264-08XXX	5942-08	5876-08	6053	5930

XXX designates Tube Wall thickness (i.e. 6753-06028L)

Swage Tooling - For Use With 35066 Union

Tube Size	Assembly	Replacement Components					Jaw Sets & Anvil's		
	Drawbolt Assembly	Drawbolt P/N	Expander P/N	Split Ring P/N	Bushing P/N	Anti-Extrusion Ring	Anvil P/N	Jaw Set P/N	Adapter P/N
-04	6751-04XXXL	5642-1XXX	5945-04XXX	5937-04XXX	5264-04XXX	None Required	5876-04	5995	5329 & 5930
-05	6752-05XXXL	5643-1XXX	5945-05XXX	5937-05XXX	5264-05XXX	None Required	5876-05	5996	5329 & 5930
-06	6753-06XXXL	5902-1XXX	5945-06XXX	5937-06XXX	5264-06XXX	5942-06	5876-06	5997	5930
-08	6754-08XXXL	5645-1XXX	5945-08XXX	5937-08XXX	5264-08XXX	5942-08	5876-08	5998	5930

XXX designates Tube Wall thickness (i.e. 6753-06028L)

Internal Elastomeric Swage Tools - Model 5720

TOOLING

5720	Eaton Part Number	Length
Head	5724	
Pump Assembly	5800	
Hose Assembly*	5804-1	40 in (1016mm)
	5804-2	76 in (1930mm)
	5804-3	124 in (3149mm)
	5804-4	148 in (3759mm)

For use in fastening sleeves and other fittings to .625 O.D. thru 1.500 O.D. tubing by swaging the tube into grooves in the fitting.

Maximum operating pressure = 6,000 psi

For internal tooling requirements for this unit see the applicable swaging supplements listed in your swage machine operation manual.

*5720 comes with only one hose. Length specified by customer.

5724 Large Swage Head



5720 Hand Pump



Swage Tooling For Use With 35235 Sleeve (Long)

Tube Size	Assembly	Replacement Components					Jaw Sets & Anvil's		
	Drawbolt Assembly	Drawbolt P/N	Expander P/N	Split Ring P/N	Bushing P/N	Anti-Extrusion Ring	Anvil P/N	Jaw Set P/N	Adapter P/N
-10	6746-10XXXL	5642-1XXX	5945-10XXX	5937-10XXX	5264-10XXX	5942-10	5310-2	5602	5307 & 5990
-12	6747-12XXXL	5647-1XXX	5945-12XXX	5937-12XXX	6150-12XXX	5942-12	5311-2	5603	5307 & 5990
-16	6748-16XXXL	5986-1XXX	5945-16XXX	5937-16XXX	6150-16XXX	5942-16	5312-2	5604	5990
-20	6749-20XXXL	5649-1XXX	5945-20XXX	5937-20XXX	6150-20XXX	5942-20	5313-2	5605	5990
-24	6750-24XXXL	5650-1XXX	5945-24XXX	5937-24XXX	6150-24XXX	5942-24	5314-2	5606	5990

XXX designates Tube Wall thickness (i.e. 6746-10049L)

Swage Tooling For Use With 35056 Union (Long)

Tube Size	Assembly	Replacement Components					Jaw Sets & Anvil's		
	Drawbolt Assembly	Drawbolt P/N	Expander P/N	Split Ring P/N	Bushing P/N	Anti-Extrusion Ring	Anvil P/N	Jaw Set P/N	Adapter P/N
-10	6755-10XXXL	5646-1XXX	5945-10XXX	5937-10XXX	5264-10XXX	5942-10	8030-10	6055	5307 & 5990
-12	6756-12XXXL	5647-1XXX	5945-12XXX	5937-12XXX	5264-12XXX	5942-12	8030-12	6056	5307 & 5990
-16	6757-16XXXL	5986-1XXX	5945-16XXX	5937-16XXX	5264-16XXX	5942-16	8030-16	6057	5990
-20	6758-20XXXL	5649-1XXX	5945-20XXX	5937-20XXX	5264-20XXX	5942-20	8030-20	6058	5990
-24	6759-24XXXL	5650-1XXX	5945-24XXX	5937-24XXX	5264-24XXX	5942-24	8030-24	6059	5990

XXX designates Tube Wall thickness (i.e. 6755-10049L)

Swage Tooling 35066 Union (Long)

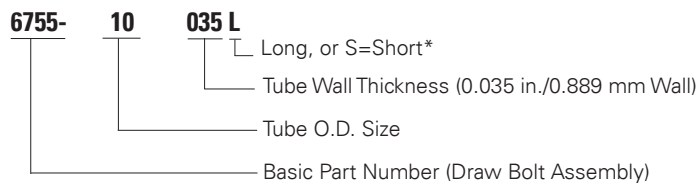
Assembly		Replacement Components					Jaw Sets & Anvil's		
Tube Size	Drawbolt Assembly	Drawbolt P/N	Expander P/N	Split Ring P/N	Bushing P/N	Anti-Extrusion Ring	Anvil P/N	Jaw Set P/N	Adapter P/N
-10	6755-10XXXL	5646-1XXX	5945-10XXX	5937-10XXX	5264-10XXX	5942-10	8030-10	8031-10-1	5307 & 5990
-12	6756-12XXXL	5647-1XXX	5945-12XXX	5937-12XXX	5264-12XXX	5942-12	8030-12	8031-12-1	5307 & 5990
-16	6757-16XXXL	5986-1XXX	5945-16XXX	5937-16XXX	5264-16XXX	5942-16	8030-16	8031-16-1	5990
-20	6758-20XXXL	5649-1XXX	5945-20XXX	5937-20XXX	5264-20XXX	5942-20	8030-20	8031-20-1	5990
-24	6759-24XXXL	5650-1XXX	5945-24XXX	5937-24XXX	5264-24XXX	5942-24	8030-24	8031-24-1	5990

Ref. Airbus NSA855034

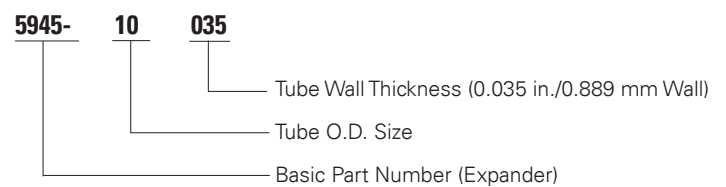
XXX designates Tube Wall thickness (i.e. 675510049L)

HOW TO ORDER

Part Number Example - Draw Bolt Assembly



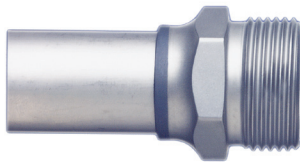
Part Number Example - Component



* Short to be used in special circumstances where fitting is too close to bend in tube

FITTING REFERENCES

Union 35056, 35066



OEM Cross Reference

Eaton Part Number	Airbus Part Number	Boeing Part Number
35066()XX	NSA855010	—
35056()XX	—	BACU24AB

Sleeve 35235



Eaton Part Number	Airbus Part Number	Boeing Part Number
35235()XX	NSA855034	BACS13BX

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