



AEROSPACE ENGINEERING BULLETIN

HOSE/FITTINGS

AA

38

Supersedes AEB-230

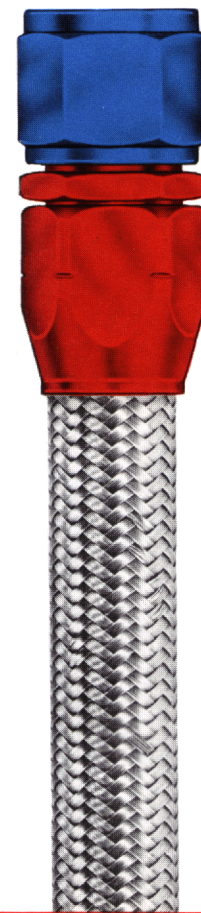
Aeroquip **AE701** Hose with *“little gem”*[®] Reusable Fittings

Featuring
THE SCIENTIFICALLY SUPERIOR ELASTOMER



AQP[®] Hose Features

- Specially-formulated compound
- Withstands elevated temperatures
- Degradation resistance
- High flexibility
- Lightweight, economical
- Full line of reusable *“little gem”* fittings
- Extremely long shelf life
- High performance at wide range of temperatures



AE701 AQP Wire-Reinforced Hose



Aeroquip AE701 AQP hose, made from a specially-formulated elastomer compound, provides unusual advantages in performance and long life. In lab and field testing, the hose out-performed existing rubber hose styles in terms of long life, fluid compatibility, temperature capability and flexibility.

Aeroquip AE701 AQP hose retains its flexibility over a long period of time and has unlimited shelf life. The tube has long-term resistance to degradation caused by various fluids used in aerospace applications. Size and complexity of hose inventory can be reduced because of hose compatibility with nearly all fluids.

How It's Made:

Inner Tube: seamless, specially-formulated synthetic compound.

Reinforcement: stainless steel wire braid consisting of partial inner braid and full coverage outer braid.

Specifications:

Fluid Compatibility: versatile inner tube is compatible with nearly all petroleum-based oils, aviation gas and JP fuels. Unaffected by alcohols, coolants and solvents commonly used in aerospace systems.

Operating Temperatures:

Fluid -65°F. to +300°F.

Ambient -65°F. to +250°F.

Testing:

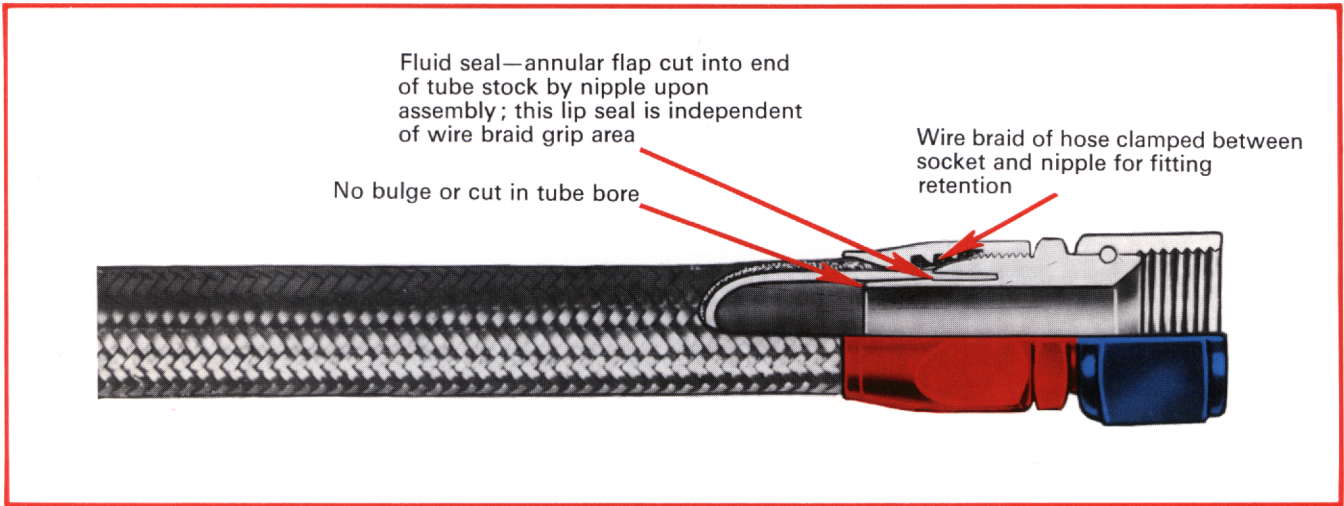
AE701 assemblies were subjected to an extensive qualification test. A copy of the test report is available upon request.

AE701 assemblies are approved under TSO-C53a Type A (unsleeved) and Type C (firesleeved).

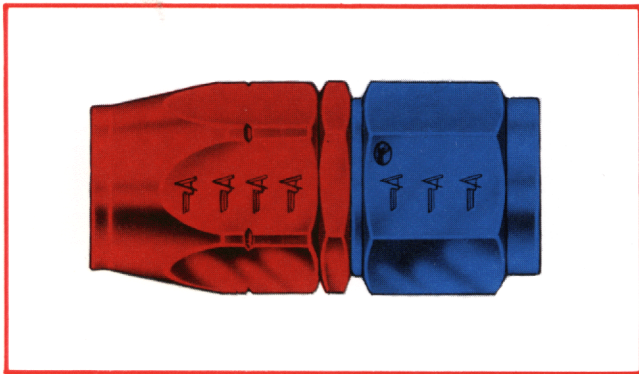
Note: Consult Aeroquip for approval before using AE701 hose in hydraulic impulse pressure applications.

Hose Size	O.D. Tube Size	I.D. Min.	O.D. Max.	Min. Tube Gage	Room Temp. Min. Burst Pressure (PSIG)	Proof Pressure (PSIG)	Operating Pressure (PSIG)	Min. Bend Radius	Weight lbs./ft.
-4	.250	.204	.461	.070	6000	3000	1000	2.00	.114
-6	.375	.329	.570	.070	6000	3000	1000	2.50	.155
-8	.500	.415	.672	.080	5000	2500	1000	3.50	.170
-10	.625	.539	.820	.080	5000	2500	1000	4.00	.207
-12	.750	.665	.961	.094	4000	2000	1000	4.50	.285
-16	1.000	.844	1.175	.094	3000	1500	750	5.50	.380
-20	1.250	1.094	1.468	.094	2000	1300	500	8.00	.490

All dimensions in inches.



“little gem” Reusable Fittings

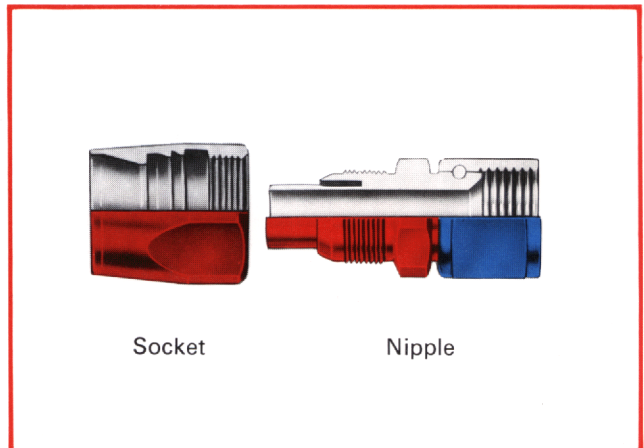


816 Hose Fitting

“little gem” fittings are noted for their outstanding performance as a result of a unique lipseal design concept. During assembly the nipple spur cuts a lip in the tube stock of the hose forming the fluid seal. The hose reinforcement is separated from this annular flap and is gripped firmly between the outside of the nipple and the serrations inside the socket.

Aeroquip ***“little gem”*** fittings offer permanent protection against leakage. They have proven themselves in thousands of applications in the aircraft industry.

<i>“little gem”</i> Fitting Standard Material Specifications	Nut: -3, -4 and -5 steel, AMS 5024 (C1137)
	Nut: -6 and up aluminum, AMS 4119 (2024)
	Nut Wire: Cres., AMS5685 (305)
	Nipple: -3, -4 and -5 steel AMS 5024 (C1137)
	Nipple: -6 and up aluminum, AMS 4119 (2024)
	Elbow: -3, -4 and -5 steel AMS5024 (C1137). -6 and up aluminum, AMS4117 (6061)
Socket: AMS4117 (6061) All sizes	

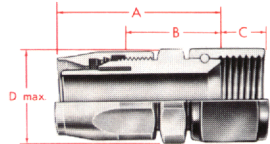


“little gem” Reusable Fittings

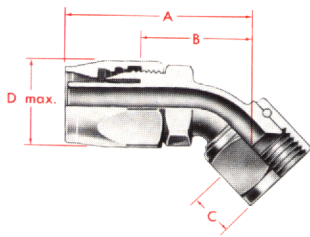
Swivel Flared UNJF Threads

all dimensions in inches

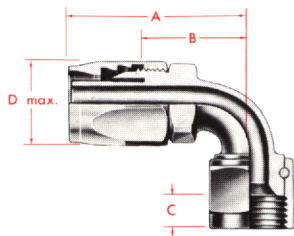
816 STRAIGHT FITTING (M83798/1-Size)



8846 45° FITTING (M83798/2-Size)



8891 90° FITTING (M83798/3-Size)

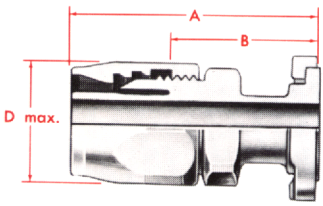
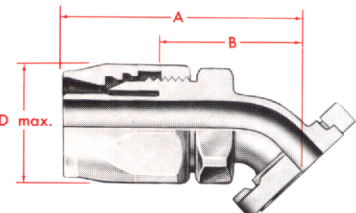
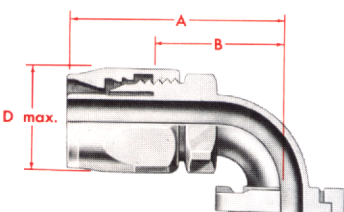


Part No.	Hose Size	Max. Dim. A	Dim. B	Dim. C	Max. Dim. D	Weigh (lbs.)
816-4	AE701-4	1.33	.65	.37	.70	.061
816-6D	AE701-6	1.51	.76	.38	.83	.046
816-8D	AE701-8	.79	.94	.43	1.04	.078
816-10D	AE701-10	1.94	.99	.50	1.18	.108
816-12D	AE701-12	2.01	1.00	.57	1.47	.168
816-16D	AE701-16	2.36	1.16	.60	1.76	.240
816-20D	AE701-20	2.64	1.34	.64	2.11	.372
8846-4	AE701-4	1.72	1.02	.37	.70	.070
8846-6D	AE701-6	2.00	1.22	.38	.83	.052
8846-8D	AE701-8	2.17	1.30	.43	.98	.085
8846-10D	AE701-10	2.42	1.44	.50	1.17	.119
8846-12D	AE701-12	2.79	1.76	.57	1.30	.179
8846-16D	AE701-16	3.06	1.83	.60	1.55	.255
8846-20D	AE701-20	3.45	2.13	.64	1.91	.376
8891-4	AE701-4	1.59	.89	.37	.70	.071
8891-6D	AE701-6	1.85	1.07	.38	.83	.053
8891-8D	AE701-8	2.01	1.14	.43	.98	.088
8891-10D	AE701-10	2.25	1.27	.50	1.17	.124
8891-12D	AE701-12	2.66	1.63	.57	1.30	.189
8891-16D	AE701-16	2.97	1.74	.60	1.55	.267
8891-20D	AE701-20	3.38	2.06	.64	1.91	.399

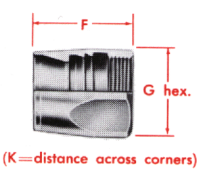
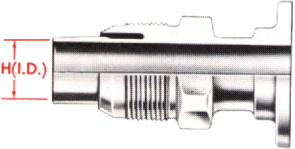
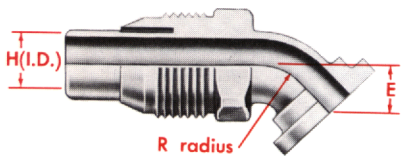
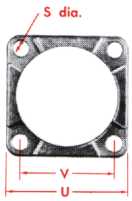
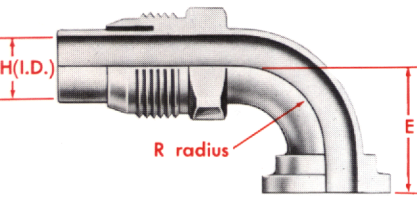
“little gem” Reusable Fittings

4-Hole Flanged (MS20756)

all dimensions in inches

	Part No.	Hose Size	Max. Dim. A	Dim. B	Max. Dim. D	Weight (lbs.)
8844 STRAIGHT FITTING (M83798/7-Size) 	8844-12D	AE701-12	2.29	1.25	1.296	.153
	8844-16D	AE701-16	2.53	1.30	1.546	.206
	8844-20D	AE701-20	2.82	1.50	1.906	.316
8845 45° FITTING (M83798/8-Size) 	8845-12D	AE701-12	2.64	1.60	1.296	.157
	8845-16D	AE701-16	2.90	1.68	1.546	.208
	8845-20D	AE701-20	3.25	1.93	1.906	.321
8890 90° FITTING (M83798/9-Size) 	8890-12D	AE701-12	2.66	1.63	1.296	.164
	8890-16D	AE701-16	2.97	1.74	1.546	.222
	8890-20D	AE701-20	3.38	2.06	1.906	.344

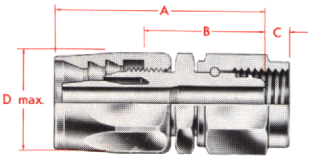
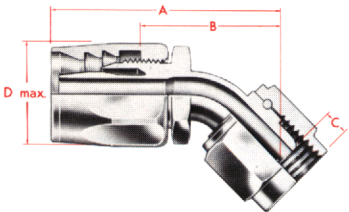
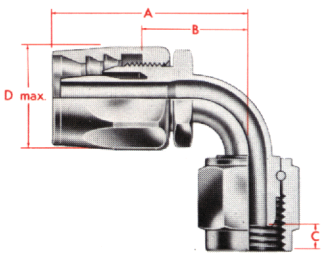
**Socket and Flange for Fitting
8844, 8845 and 8890**

<i>all dimensions in inches</i>	Part No.	Dim. E	Dim. H	Dim. R	SOCKET	Part No.	Dim. F	Dim. G	Max. Dim. K
	NIPPLE	8714-12D	—	.576		—	 <p>(K=distance across corners)</p>	516-12D	1.245
	8714-16D	—	.781	—	516-16D	1.485		1.438	1.546
	8714-20D	—	1.026	—	516-20D	1.650		1.750	1.906
NIPPLE	8745-12D	.468	.576	.844	FLANGE	Part No.	Dim. S	Dim. U	Dim. V
	8745-16D	.505	.781	.969		9644-12D	.205	1.594	1.156
	8745-20D	.569	1.026	1.188		9644-16D	.205	1.750	1.312
							9644-20D	.266	2.188
NIPPLE	8790-12D	1.156	.576	.844					
	8790-16D	1.282	.781	.969					
	8790-20D	1.500	1.026	1.188					

“little gem” Reusable Fittings

Swivel Flareless UNJF Threads

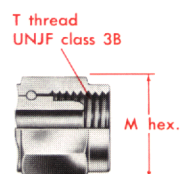
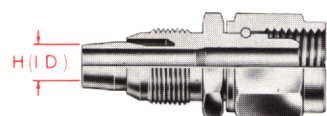
all dimensions in inches

	Part No.	Hose Size	Max. Dim. A	Dim. B	Dim. C	Max. Dim. D	Weight (lbs.)
826 STRAIGHT FITTING (M83798/4-Size) 	826-4	AE701-4	1.48	.80	.22	.70	.064
	826-6D	AE701-6	1.71	.96	.19	.83	.048
	826-8D	AE701-8	2.02	1.17	.21	1.04	.082
	826-10D	AE701-10	2.22	1.26	.24	1.18	.115
	826-12D	AE701-12	2.28	1.27	.31	1.47	.175
	826-16D	AE701-16	2.64	1.44	.32	1.76	.254
	826-20D	AE701-20	2.92	1.62	.37	2.11	.368
880112 45° FITTING (M83798/5-Size) 	880112-6D	AE701-6	2.13	1.36	.19	.83	.054
	880112-8D	AE701-8	2.32	1.45	.21	.98	.088
	880112-10D	AE701-10	2.61	1.63	.24	1.17	.125
	880112-12D	AE701-12	2.97	1.93	.31	1.30	.189
	880112-16D	AE701-16	3.25	2.03	.32	1.55	.270
	880112-20D	AE701-20	3.65	2.33	.37	1.91	.408
880114 90° FITTING (M83798/6-Size) 	880114-6D	AE701-6	1.85	1.07	.19	.83	.057
	880114-8D	AE701-8	2.01	1.14	.21	.98	.092
	880114-10D	AE701-10	2.25	1.27	.24	1.17	.130
	880114-12D	AE701-12	2.66	1.63	.31	1.30	.199
	880114-16D	AE701-16	2.97	1.74	.32	1.55	.282
	880114-20D	AE701-20	3.38	2.06	.37	1.91	.431

**Socket for Fitting
826, 880112 and 880114**

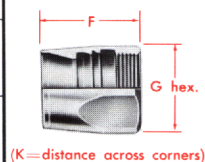
all dimensions in inches

NIPPLE



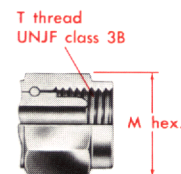
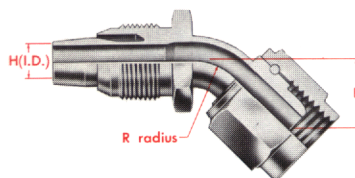
Part No.	Dim. E	Min. Dim. H	Dim. R	Hex M	Thread T
536-4	—	.150	—	.562	7/16-20
536-6D	—	.274	—	.688	9/16-18
536-8D	—	.366	—	.875	3/4-16
536-10D	—	.472	—	1.000	7/8-14
536-12D	—	.576	—	1.250	1 1/16-12
536-16D	—	.781	—	1.500	1 5/16-12
536-20D	—	1.026	—	1.812	1 7/8-12

SOCKET



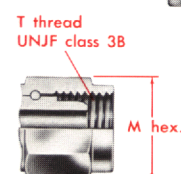
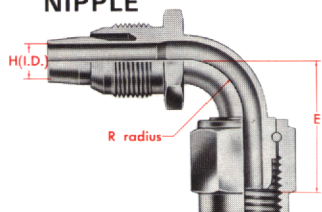
Part No.	Dim. F	Hex G	Max. Dim. K
516-4D	.800	.625	.703
516-6D	.900	.750	.827
516-8D	1.090	.875	.984
516-10D	1.175	1.062	1.171
516-12D	1.245	1.188	1.296
516-16D	1.485	1.438	1.546
516-20D	1.650	1.750	1.906

NIPPLE



885112-6D	.578	.274	.50	.688	9/16-18
885112-8D	.610	.366	.50	.875	3/4-16
885112-10D	.725	.472	.62	1.000	7/8-14
885112-12D	.800	.576	.84	1.250	1 1/16-12
885112-16D	.854	.781	.97	1.500	1 5/16-12
885112-20D	.962	1.026	1.19	1.812	1 7/8-12

NIPPLE



885114-6D	1.112	.274	.50	.688	9/16-18
885114-8D	1.156	.366	.50	.875	3/4-16
885114-10D	1.392	.472	.62	1.000	7/8-14
885114-12D	1.626	.576	.84	1.250	1 1/16-12
885114-16D	1.776	.781	.97	1.500	1 5/16-12
885114-20D	2.056	1.026	1.19	1.812	1 7/8-12

Part numbering system makes it easy for you to order AE701 Hose assemblies with UNJF Threads

Straight and single elbow assemblies

In order to properly specify the correct hose assembly you need, please use the simple numbering system shown on these two pages. Straight and single elbow assemblies are identified by the number on this page beginning with AE701, and double elbow assemblies are identified by a number beginning with the number AE7XXX as shown on the right hand page. Any assembly you wish to specify can be ordered using one of the two numbers on these pages.

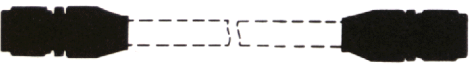
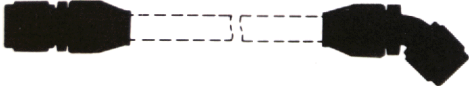
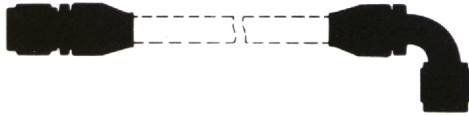
AE7010000E0184

Base number for all straight and single elbow assemblies

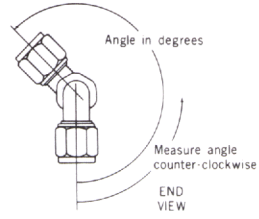
Assembly length in inches always four digits, last digit indicates fractional length in 1/8's of an inch

SIZE CODE

Hose Dash Size	-4	-6	-8	-10	-12	-16	-20
Letter Code	E	G	H	J	K	M	N

Fitting Configuration	Fitting Ends	Sleeving (see page 14)	
		Unsleeved	With AE102/624 Firesleeve
 straight to straight	37° Flared	0000	0001
	Flareless	0010	0011
 straight to 45° elbow	37° Flared	0100	0101
	Flareless	0110	0111
 straight to 90° elbow	37° Flared	0200	0201
	Flareless	0210	0211

Double elbow assemblies



Elbow position angle expressed in three digits

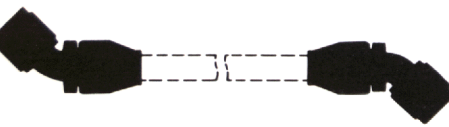
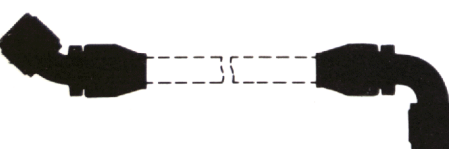
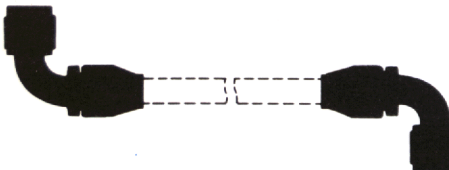
AE7000E0184-225

AE7000 series applies to double elbow assemblies

Assembly length always four digits, last digit indicates fractional length in 1/8's of an inch

SIZE CODE

Hose Dash Size	-4	-6	-8	-10	-12	-16	-20
Letter Code	E	G	H	J	K	M	N

Fitting Configuration	Fitting Ends	Sleeving (see page 14)	
		Unsleeved	With AE102/624 Firesleeve
 <p>45° elbow to 45° elbow</p>	37° Flared	7000	7001
	Flareless	7003	7004
 <p>45° elbow to 90° elbow</p>	37° Flared	7012	7013
	Flareless	7015	7016
 <p>90° elbow to 90° elbow</p>	37° Flared	7027	7028
	Flareless	7030	7031

Part numbering system makes it easy for you to order AE701 Hose assemblies with UNJF Threads and 4-hole flanged fittings

In order to properly specify the correct hose assembly you need, please use the simple numbering system shown on these two pages. Straight and single elbow assemblies are identified by the number on this page beginning with AE701, and double elbow assemblies are identified by a number beginning with the number AE7XXX as shown on the right hand page. Any assembly you wish to specify can be ordered using one of the two numbers on these pages.

AE7010000E0184

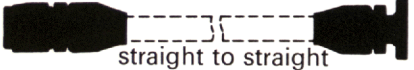
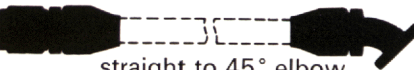
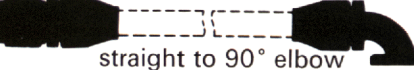
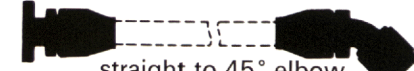
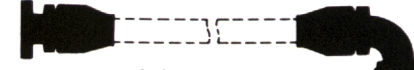
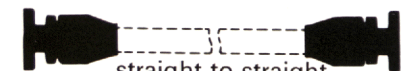
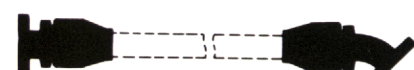
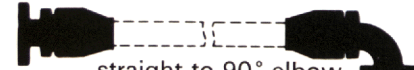
Base number for all straight and single elbow assemblies

Assembly length in inches
always four digits, last digit indicates fractional length in 1/8's of an inch

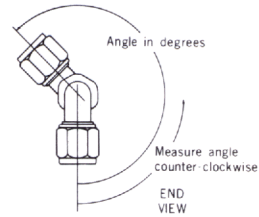
SIZE CODE

Hose Dash Size	-12	-16	-20
Letter Code	K	M	N

Sleeving (see page 14)

Fitting Configuration	Fitting A	Fitting B	Unsleeved	With AE102/624 Firesleeve
 straight to straight	37° Flared	Flange	0030	0031
 straight to 45° elbow	37° Flared	Flange	0130	0131
 straight to 90° elbow	37° Flared	Flange	0230	0231
 straight to 45° elbow	37° Flared	Flange	0140	0141
 straight to 90° elbow	37° Flared	Flange	0240	0241
 straight to straight	Flange	Flange	0020	0021
 straight to 45° elbow	Flange	Flange	0120	0121
 straight to 90° elbow	Flange	Flange	0220	0221

Double elbow assemblies



Elbow position angle expressed in three digits

AE7000E0184-225

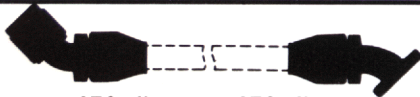
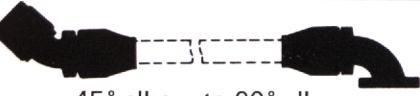
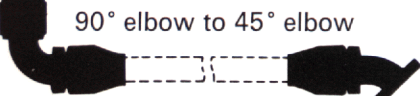
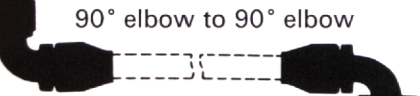
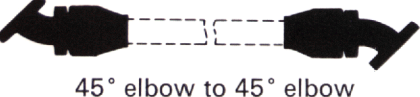
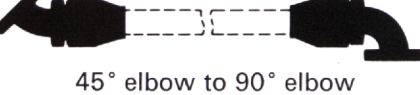
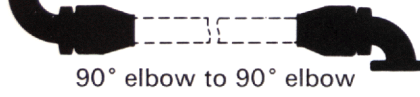
AE7000 series applies to double elbow assemblies

Assembly length always four digits, last digit indicates fractional length in 1/8's of an inch

SIZE CODE

Hose Dash Size	-12	-16	-20
Letter Code	K	M	N

Sleeving (see page 14)

Fitting Configuration	Fitting A	Fitting B	Unsleeved	With AE102/624 Firesleeve
 45° elbow to 45° elbow	37° Flared	Flange	7009	7010
 45° elbow to 90° elbow	37° Flared	Flange	7021	7022
 90° elbow to 45° elbow	37° Flared	Flange	7024	7025
 90° elbow to 90° elbow	37° Flared	Flange	7036	7037
 45° elbow to 45° elbow	Flange	Flange	7006	7007
 45° elbow to 90° elbow	Flange	Flange	7018	7019
 90° elbow to 90° elbow	Flange	Flange	7033	7034

Protective Sleeves for AE701 Hose

AE102/624 Fire Resistant Sleeve

This sleeve is a uniform layer of braided fiberglass tubing overlaid with a flame-resistant silicone rubber. AE102/624 firesleeve is identified by its orange-colored outer surface. AE701 hose assemblies protected with AE102/624 firesleeve meet fire resistance requirements of FAA TSO-C53a. AE102/624 firesleeve has a continuous operating temperature range of -65°F. to +450°F.



Silicone-Coated Fiberglass Firesleeve.

AE138 (646) Abrasion-Resistant Sleeve

A tough, synthetic rubber scuff cover which is fuel, oil and ozone resistant. AE138 abrasion-resistant sleeve offers protection for ground-servicing or airborne applications. It is black in color and has a temperature range of -65°F. to +250°F.

AE138 (646)



Synthetic Rubber Abrasion-Resistant Sleeve.

Hose Size	Sleeve Size	Sleeve I.D.	Sleeve Gauge	Weight lbs./ft.
AE701-4	-8	.50	.125	.112
AE701-6	-10	.62	.125	.142
AE701-8	-12	.75	.125	.166
AE701-10	-16	1.00	.125	.195
AE701-12	-20	1.25	.125	.248
AE701-16	-22	1.38	.125	.286
AE701-20	-26	1.62	.125	.325
AE701-4	-8	.453	.035	.035
AE701-6	-12	.562	.040	.047
AE701-8	-16	.671	.040	.055
AE701-10	-20	.827	.050	.082
AE701-12	-24	.967	.050	.094
AE701-16	-28	1.188	.050	.123
AE701-20	-34	1.470	.070	.200

AE401



AE401 hose consists of AE701 hose with an extruded silicone outer cover. This hose/sleeve combination has successfully met the fire test requirements of TSO-C53a

Type C. For more information on AE401 hose, request AEB-251.

AE501



This hose style consists of AE701 hose with an integral abrasion-resistant, braided polyester cover. It is designed for maximum abrasion resistance while maintaining

light weight, low profile and the same bend radius as AE701 hose. For more information on AE501 hose, request AEB-244A.

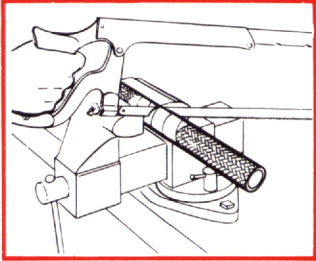
NOTES:

All sleeve sizes listed above are for use on assemblies with a straight reusable fitting. Double elbow assemblies require larger sizes. For securing firesleeves to hose assemblies, ask for ASB-69, on band clamp tools.

How to assemble AE701 Hose Assemblies with “*little gem*” Straight Fittings and Elbows

To make hose assembly of length “L”, cut hose to length “J”. Obtain “J” length by subtracting proper fitting allowances. See “B” dimensions on fitting pages.

STRAIGHT FITTINGS

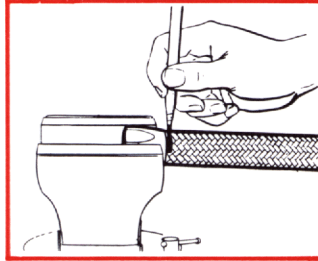


Step 1

Cut hose squarely to length. Use hose cut-off machine or fine tooth hacksaw. To minimize wire braid flare-out, wrap hose with masking tape and saw through tape. Remove tape before step 2.

Step 2

Insert hose in socket with a twisting, pushing motion until hose is in line with back of socket threads.

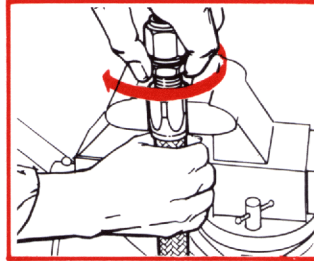


Step 3

Important—mark hose position around hose at rear of socket. Use a grease pencil, painted line or tape.

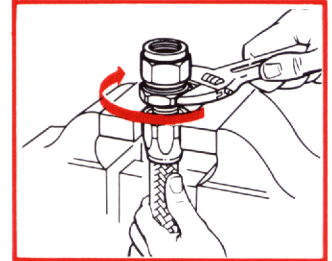
Step 4

Lubricate inside of hose and nipple threads liberally. Use SAE30 lubricating oil. Avoid getting oil in the cutting spur of the nipple.



Step 5

Carefully insert nipple and engage nipple and socket threads while holding hose in position with other hand. Make sure that hose does not push out of socket by observing mark made in step 3.



Step 6

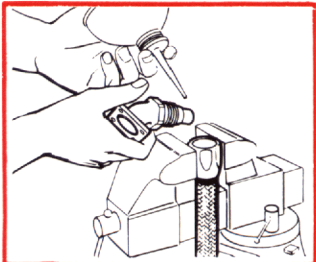
Complete assembly using wrench while continuing to hold in position. Maximum allowable gap is .041 inches in sizes 3, 4 and 5, and .031 inches in size 6 and up.

Step 7

IMPORTANT—check for hose push-out by observing hose position mark. None should be evident. Clean, inspect and proof test.

Note: Hose push-out after proof test should not exceed 1/32 inch on size 12 and up. None is allowable on smaller sizes.

ELBOW FITTINGS



Step 1

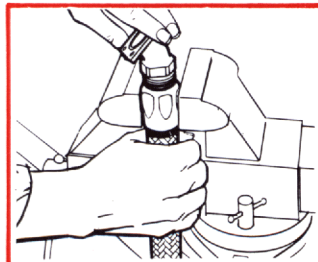
Follow through steps 1, 2, and 3, above.

Step 2

Flange elbow fittings. Drop flange over threaded end of nipple. Nipple shoulder must fit into counterbore of flange.

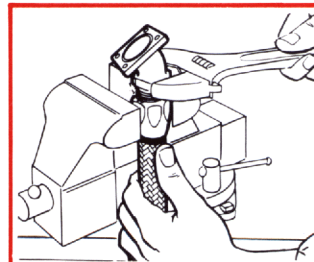
Step 3

Lubricate inside of hose and nipple threads liberally. Use SAE30 lubricating oil. Avoid getting oil in the cutting spur of the nipple.



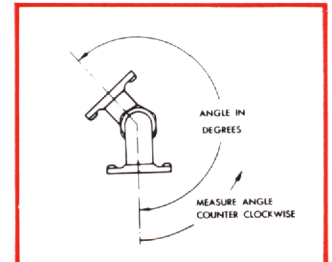
Step 4

Carefully insert nipple and engage nipple and socket threads while holding hose in position with other hand. Make sure hose does not push out of socket by observing mark.



Step 5

Complete assembly using wrench on elbow hex while continuing to hold hose in position. Tighten until hex is snug against socket. On forged elbow, use wrench on forging flats. Tighten until shoulder is snug against socket.



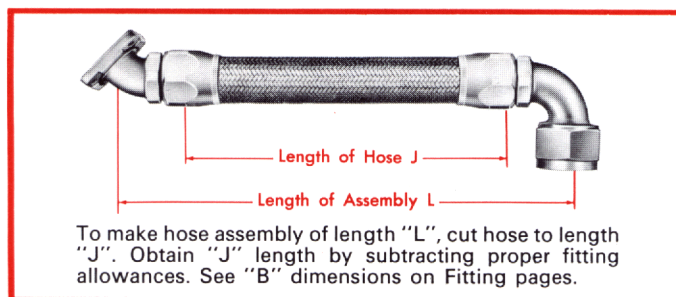
Step 6

Adjustments may be necessary to obtain the desired position angle between two elbows. In order to minimize backing off elbows to position, the following procedure should supplement step 5:

- Tighten both elbows to within .031 inches of socket then start to position for relative angle between elbows.
- Finish assembly by adjusting both elbows. Backing-off to position should be avoided and in no case should exceed 1/4 turn. Maximum allowable gap between hex and socket is .031 inches.

Step 7

IMPORTANT—check for hose push-out. See step 6 above. Clean, inspect and proof test.



Note: Hose push-out after proof test should not exceed 1/32 inch on size 12 and up. None is allowable in smaller sizes.