

INCH-POUND

MS27086D

1 May 2013

SUPERSEDING

MS27086C

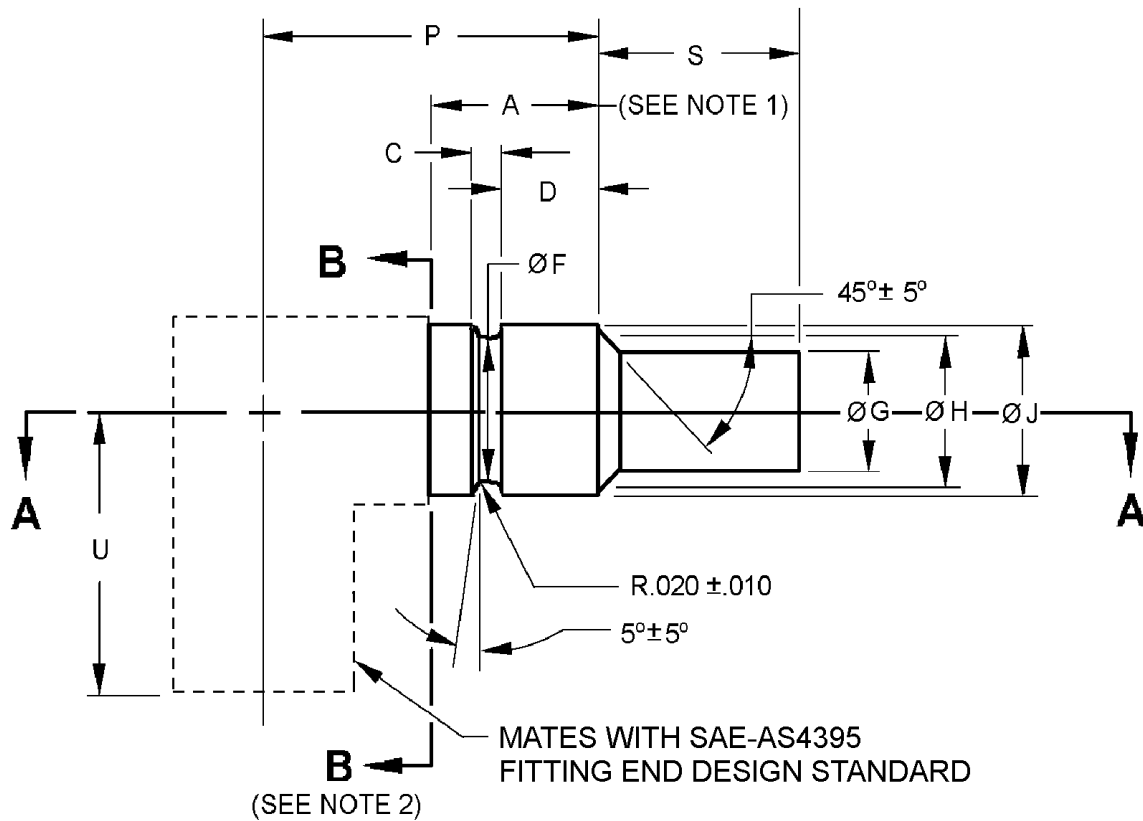
25 September 2003

## DETAIL SPECIFICATION SHEET

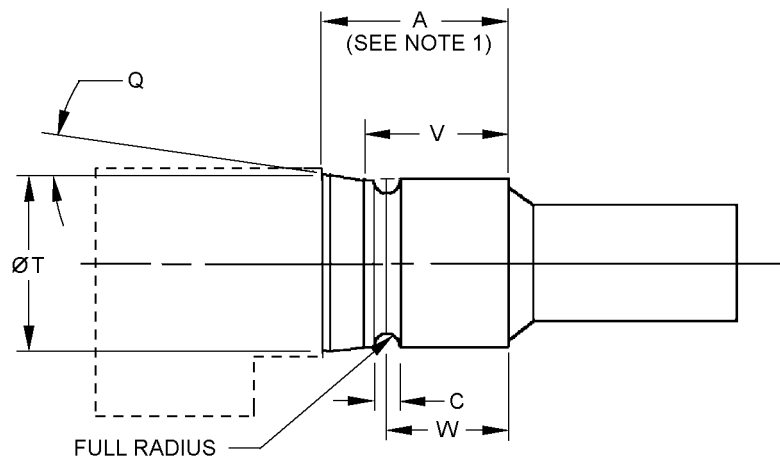
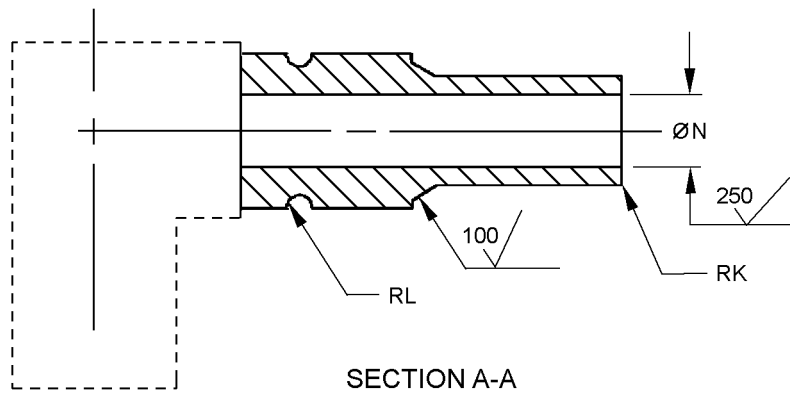
## ELBOW, NIPPLE END, FLARED, TUBE TO HOSE - 90° SWIVEL NUT

This specification sheet is approved for use by all Departments  
and Agencies of the Department of Defense.

The requirements for acquiring the product described herein  
shall consist of this specification sheet and MIL-DTL-27272.

FIGURE 1. Elbow illustration.

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-10 THRU -24 SIZE ONLY

FIGURE 1. Elbow illustration - Continued.

Size and material code		A min (see note 1)	C		D +.005 -.000	F		G +.005 -.000	H ±.005	J +.005 -.000
CRES	Al									
-3/-4C	---	.515	.106	±.010	.307	.288	+.005 -.000	.205	.295	.373
-4C	---									
-5C	---	.520	.116	±.010	.322	.316	+.005 -.000	.268	.360	.416
-6C	---	.555								
-8C	-8D	.630	.140	±.020	.335	.497	+.005 -.000	.426	.530	.616
-10C	-10D	.654	.098	+.004 -.000	---	.586		.526	.625	.706
-12C	-12D	.755	.128	+.005 -.000	---	.674	+.008 -.000	.650	.760	.826
-16C	-16D	.831			---	1.001		.900	1.040	1.150
-20C	-20D	.881			---	1.255		1.151	1.275	1.405
-24C	-24D	1.035			---	1.490		1.401	1.550	1.635

Size and material code		K		L ±.004	M (see note 1) min	N			P	Q max	S												
CRES	Al					Steel	Alum																
-3/-4C	---	.015	+.005 -.000	.036	.485	.161	---	+.005 -.000	.845	±.020	---	.480	±.010										
-4C	---																						
-5C	---																						
-6C	---																						
-8C	-8D	.020	+.005 -.000	.047	.583	.345	.345	+.006 -.000	1.235	±.035	---	.600	±.015										
-10C	-10D			---	.620	.440	.440		1.315		---	.650											
-12C	-12D	.030	±.005	---	.720	.560	.560	+.006 -.000	1.808	±.035	15.5°	.675	±.025										
-16C	-16D			---	.796	.828	.828		1.901		1.5°	.730											
-20C	-20D			---	.846	1.058	1.058		2.180		---	.935											
-24C	-24D			.035	---	1.000	1.253		1.282		+.005 -.000	2.500		15.5°	.980								

FIGURE 1. Elbow illustration – Continued.

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Size and material code		T max	U	V		W +.005 -.000		
CRES	AI					CRES	AI	
-3/-4C	---	---	.530	±.020	---	---	---	---
-4C	---	---	.580		---	---	---	---
-5C	---	---	.653		---	---	---	---
-6C	---	---	.720		---	---	---	---
-8C	-8D	---	.830		---	---	---	---
-10C	-10D	---	1.126	±.035	---	---	.420	.427
-12C	-12D	.900	1.376		.625	±.010	.500	.500
-16C	-16D	1.190	1.500		.670		.545	.545
-20C	-20D	1.485	1.782		.695		.565	.571
-24C	-24D	1.750	2.032		.795		.665	.665

## NOTES:

1. Use the A dimension when the adjacent diameter to the left of plane B-B is greater than the J dimension. When the adjacent diameter is equal to or less than the J dimension, the M dimension may be used in place of the A dimension.
2. Any design of the elbow to the left of plane B-B is acceptable, provided the dimensions P and U and the requirements of this specification sheet and the procurement specification are met.
3. Any forged design is acceptable for -3/-4 through -8 size.
4. Any bent tube design is acceptable for -10 through -24 size.
5. The inside diameter (ID) of the elbow for the -10 through -24 size shall not be less than the ID of the nipple end of the adapter.
6. Unless otherwise specified, break or radius all corners .005, +.005, -.000 inch. All diameters within length A plus S must be concentric within .005 inch full indicator movement.
7. Surface roughness. Unless otherwise specified, maximum surface roughness shall not exceed 125  $\mu$ in. Ra in accordance with ASME B46.1.
8. Remove all burrs and slivers.

FIGURE 1. Elbow illustration - Continued

## REQUIREMENTS

Elbow illustration, see figure 1.

Intended use. This part is a component of elbow subassemblies MS27068 for sizes -3/-4 through -8, and MS27065 for sizes -10 through -24. This is a design standard for manufacturing purposes. The item is only procured as an integral part of adapter assemblies.

Materials. Material and material codes see table I.

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TABLE I. Materials and material codes.

Material code	Material
C	CRES, class 304 or 321 cold drawn or cold rolled, in accordance with SAE-AMS-QQ-S-763, SAE-AMS5639 or SAE-AMS-5645.
D	Aluminum alloy, 6061-T6 or T651, in accordance with SAE-AMS-QQ-A-367, SAE-AMS-4117 or alloy 7075-T73, 7075-T7351 in accordance with SAE-AMS-QQ-A-225/9 or alloy 7055-T7351 in accordance with SAE-AMS-4124.

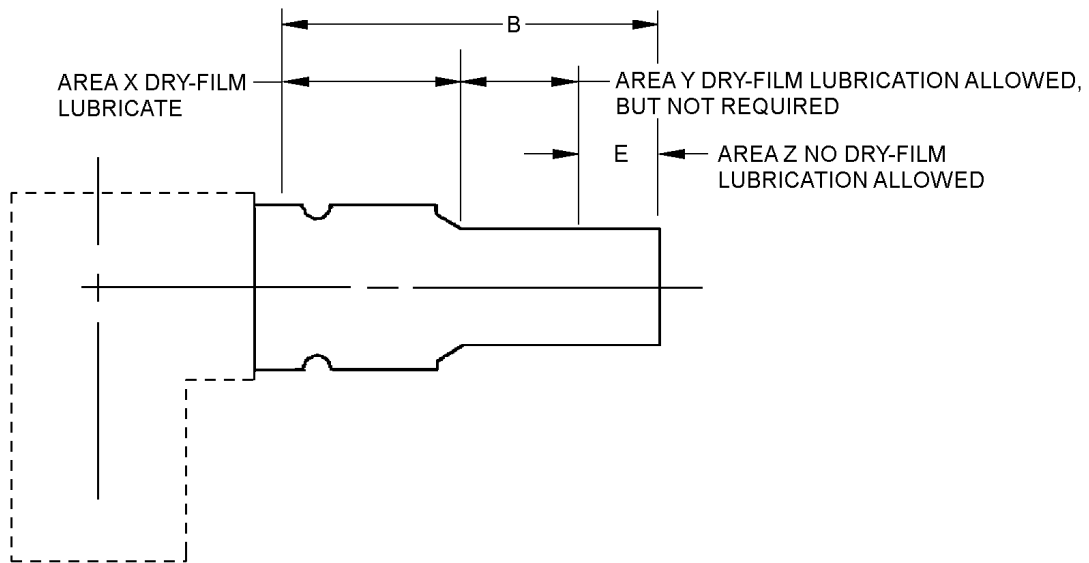
Finish. Corrosion-resistant steel, passivate in accordance with SAE-AMS2700, method 1, type 6 or 7.

Aluminum alloy. Anodize in accordance with MIL-A-8625, type II, dye blue.

NOTE: Avoid using graphite dry film lubes with aluminum elbow, nipple end because in a wet environment, graphite becomes corrosive to the aluminum.

Dry film lubricant. Dry film lubricate in accordance with figure 2 and table II.

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Size and material code		B min	E	
CRES	Al			
-3/-4C	---	.870	.25	±.05
-4C	---			
-5C	---	.890		
-6C	---			
-8C	-8D	1.030	.32	±.12
-10C	-10D	1.130	.35	±.15
-12C	-12D	1.240		
-16C	-16D	1.340	.39	±.19
-20C	-20D	1.570	.48	±.28
-24C	-24D	1.720	.50	±.30

FIGURE 2. Dry-film lubrication area.

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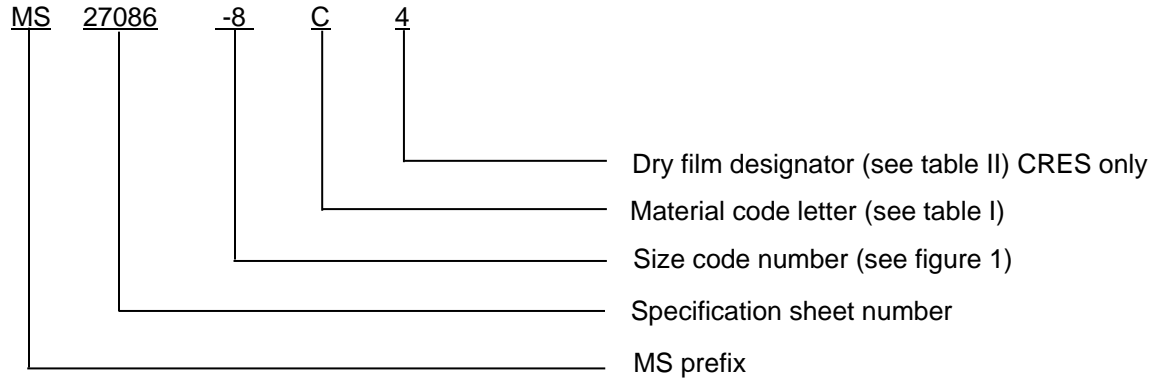
TABLE II. Dry film designator.

Dry film designator	SAE class or type designator	Dry film characteristics
Blank	Any SAE class or type below	N/A
SAE-AS1701	SAE-AS1701 class	SAE-AS1701 temperature ranges °F (°C)
4	4	-65° to +1400°F (-54° to 760°C)
5	5	-65° to +850°F (-54° to 454°C)
6	6	-375° to +850°F (-226° to 454°C)
SAE-AS5272	SAE-AS5272 type	SAE-AS5272 temperature ranges. °F (°C)
7	Type I	-90° to 400°F (-68 to 204°C) endurance life of 250 min minimum
8	Type II	-90° to 400°F (-68° to 204°C) endurance life of 450 min minimum
9	Type III	Color 1 - Natural product color -90° to 400°F (-68 to 204°C) low Volatile organic compound with an endurance life of 450 min minimum
10	Type III	Color 2 - Black color -90° to 400°F (-68 to 204°C) low Volatile organic compound with an endurance life of 450 min minimum
Dry film designator	MIL classification	Dry film characteristics
MIL-PRF-46010 1/	---	MIL-PRF-46010 temperature ranges. °F (°C)
11	1	Color 1 natural product color, -90° to 400°F (-68 to 204°C) solvent resisting
12	2	Color 2 - Black color -90° to 400°F (-68 to 204°C) solvent resisting

1/ Not for aerospace usage.

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Part or Identifying Number (PIN): The PIN consists of prefix "MS," the specification sheet number, dash number for 90° elbow, nipple size, letter for material, and a blank or number for dry film lubricant. Unassigned PIN's shall not be used.



## PIN examples:

- MS27086-10C indicates a 90° elbow, nipple end size 10, CRES with dry film class designator "blank".
- MS27086-10C4 indicates a 90° elbow, nipple end size 10, CRES with dry film class designator 4.

Order of precedence. Unless otherwise noted herein or in the contract, in the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

Referenced documents shall be of the issue in effect on date of invitations for bid.

Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue, due to the extent of the changes.

Referenced documents. In addition to MIL-DTL-27272, this document references the following:

MIL-A-8625	SAE-AMS2700
MIL-PRF-46010	SAE-AMS-4117
MS27065	SAE-AMS-4124
MS27068	SAE-AMS5639
ASME B46.1	SAE-AMS-5645
SAE-AMS-QQ-A-225/9	SAE-AS1701
SAE-AMS-QQ-A-367	SAE-AS4395
SAE-AMS-QQ-S-763	SAE-AS5272



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CONCLUDING MATERIAL

Custodians:

Army - AV  
Navy - AS  
Air Force - 99  
DLA - CC

Preparing activity:

DLA - CC

(Project 4730-2013-027)

Review activities:

Army - AR, AT, MI  
Navy - MC, SA, SH  
Air Force - 71

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online database at <https://assist.dla.mil>.