INCH-POUND

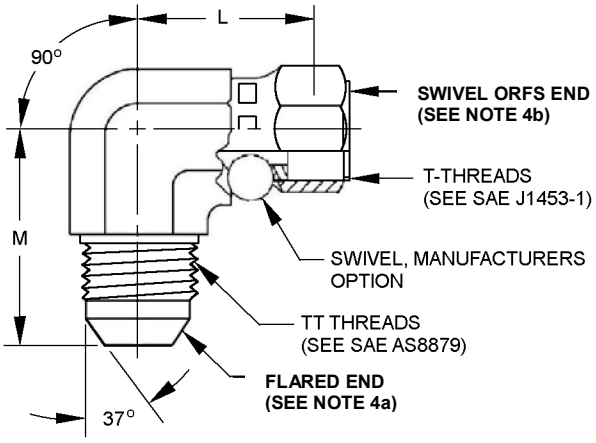
MIL-DTL-32460/9A
10 March 2020
SUPERSEDING
MIL-DTL-32460/9
22 May 2013

DETAIL SPECIFICATION SHEET

FITTING, ADAPTER, 90 DEGREE ELBOW, HYDRAULIC AND PNEUMATIC, 37 DEGREE FLARE, MALE TO ORFS, FEMALE SWIVEL

This specification 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-32460.



Dash size	Tube OD nom. inches (mm)	T ORFS SAE J1453-1	TT flared SAE AS8879
-4	.2500 (6.350)	.5625-18UNF-2A	.4375-20 UNJF-3A
-6	.3750 (9.525)	.6875-16UN-2A	.5000-20 UNJF-3A
-8	.5000 (12.700)	.8125-16UN-2A	.7500-16 UNJF-3A
-10	.6250 (15.875)	1.0000-14UN-2A	.8750-14 UNJF-3A
-12	.7500 (19.050)	1.1875-12UN-2A	1.0625-12 UNJ-3A
-16	1.0000 (25.400)	1.4375-12UN-2A	1.3125-12 UNJ-3A
-20	1.2500 (31.750)	1.6875-12UN-2A	1.6250-12 UNJ-3A
-24	1.5000 (38.100)	2.0000-12UN-2A	1.8750-12 UNJ-3A

See notes at end of figure.

FIGURE 1. 90° elbow, 37° flared to ORFS adapter.

Dash size	Y - Hex Across flats +.0, -.03 (+.0, -0.8)	L inches (mm) ±.04 (1.0)	M inches (mm) ±.04 (1.0)
-4	.4375 (11.113)	.846 (21.50)	.890 (22.60)
-6	.5625 (14.285)	.984 (25.00)	1.060 (26.90)
-8	.7500 (19.050)	1.102 (28.00)	1.250 (31.80)
-10	.8750 (22.225)	1.319 (33.50)	1.450 (36.80)
-12	1.0625 (26.988)	1.476 (37.50)	1.660 (42.20)
-16	1.3125 (33.338)	1.634 (41.50)	1.810 (46.00)
-20	1.6250 (41.275)	1.752 (44.50)	2.060 (52.30)
-24	1.8750 (47.625)	1.929 (49.00)	2.330 (59.20)

NOTES:
1. Dimensions are in inches.
2. Metric equivalents are given for information only.
3. Break all sharp edges and remove all burrs and slivers.
4. Dimensions and tolerances not shown shall be in accordance with the following:
   a. SAE AS4395 style G for flared end.
   b. SAE J1453-3*520221* for ORFS swivel end.
   c. SAE J514*070202* for body.

FIGURE 1. 90° elbow, 37° flared to ORFS adapter - Continued.

REQUIREMENTS:

Fittings shall be as specified on figure 1 and in table I.

Materials shall be in accordance with MIL-DTL-32460.

Material and finish designators. Material and finish designators shall be as specified in table I.

All plating's shall be capable of meeting a minimum of 96 hours salt spray test in accordance with ASTM B117. The fittings shall show no evidence of red corrosion after 96 hours of salt spray. Fluid passages, other openings, and internal threads shall not be subject to the plating thickness requirement and may have bare areas provided they are protected with a light film of oil.

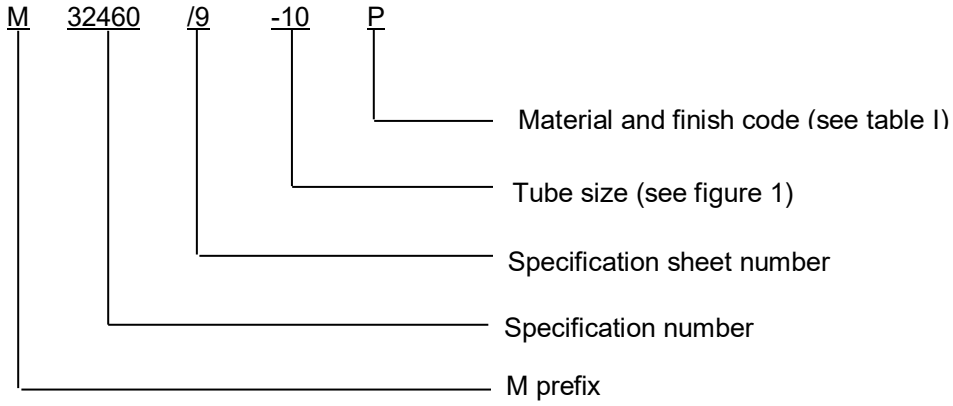
Maximum operating pressure. Maximum operating pressure shall be in accordance with MIL-DTL-32460.

TABLE I. Material and finish identification codes.

PIN code material/plating finish	Material	Plating finish
Blank	Steel	Cadmium plating in accordance with SAE-AMS-C-81562, type II, class 2 or SAE-AMS-QQ-P-416, type II, class 2. 1/ 4/ 6/
H	Steel	Zinc-aluminum in accordance with ASTM F1136/F1136M, grade 3, NC.
J	Steel	Zinc-nickel in accordance with SAE-AMS2417, type 2, grade B. 2/
K	Steel	Zinc plating with a colored chromate conversion in accordance with ASTM B633; type II, Fe/Zn 8, or ASTM B695, type II, class 8. 3/ 4/
M	Nickel-copper alloy UNS N04400	No additional finish.
N	High-chromium nickel alloy UNS N06690	No additional finish.
P	Steel	Zinc phosphate finish in accordance MIL-DTL-16232 type Z, class 1. 3/
R	Steel	Zinc plating in accordance with ASTM B633, type III or V, Fe/Zn 8. 3/ 4/
S	Corrosion resistant steel	No additional finish. Passivation in accordance with SAE-AMS2700, method 1, type 6 or 7.
T	Titanium	Anodize in accordance with SAE-AMS2488 type 2. 5/ 7/
TF	Titanium	Fluoride phosphate in accordance with SAE-AMS2486. 5/ 7/
Z	Steel	Zinc plating in accordance with ASTM B695, type II, class 8. 3/ 4/
ZC	Steel	Zinc may be any zinc plating from PIN codes J and R with a colored chromate coating. 3/ 4/

1/ Embrittlement test need not be run.
2/ The zinc-nickel alloy plate shall contain 12% to 16% nickel. The coating thickness shall be 315µ inches (8µm) minimum.
3/ Not for use in aircraft. Requires approval from the Program Office for all applications. Zinc-plated materials should be avoided in hydraulic systems with water-glycol fluids. Reference ASTM MNL37 - Fuels and Lubricants Handbook.
4/ These finishes have a chromate conversion coating which includes hexavalent chromium and are not recommended for Army ground systems. The use of coatings depositing hexavalent chromium for Army vehicles is prohibited unless otherwise explicated stated in the contract as a requirement. For new designs PIN codes Blank, K, R, and ZC are not to be supplied to Army and Marine ground forces.
5/ A pretreatment, a modification of the fluoride treatment, or a post treatment shall be applied so the final color of the fittings shall be similar to SAE AMS-STD-595 colors 36076 through 36293.
6/ Cadmium shall not be used in oxygen or potable water systems. Cadmium is prohibited from use in NAVSEA-owned shipboard systems in accordance with the requirements of T9070-AL-DPC-020/077-2, unless otherwise approved by NAVSEA. The use of cadmium plating for Army vehicles is prohibited unless otherwise explicitly stated in the contract as a requirement.
7/ Titanium shall not be used in oxygen or potable water systems.

PIN: The PIN consists of the letter M, the basic specification number, the specification sheet number, a number for fitting size, and a letter for the material finish designator.



PIN example: M32460/9-10P indicates a 90°, male to female, adapter, .6250 inch (.1588 mm), steel with zinc phosphate finish.

O-ring is not supplied. Order separately, see SAE J515.

Cadmium is not recommended. To the users of this document, it is recommended that the use of carbon steel material with cadmium plating be used only when other materials and finishes specified in this document cannot meet performance requirements.

Class I and II ozone depleting substances (ODS) shall not be used in MIL-DTL32460/9 or any referenced procedures.

Cadmium is prohibited from use in NAVSEA-owned shipboard systems in accordance with the requirements of T9070-AL-DPC-020/077-2, unless otherwise approved by NAVSEA.

The use of cadmium plating or coatings depositing hexavalent chromium for Army vehicles is prohibited unless otherwise explicitly stated in the contract as a requirement.

For new designs PIN codes Blank, K, R, Z, and ZC are not to be supplied to Army and Marine ground forces.

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-32460, this document references the following:

MIL-DTL-16232	SAE AMS-STD-595/36118	SAE AMS2417
ASTM B117	SAE AMS-STD-595/36134	SAE AMS2486
ASTM B633	SAE AMS-STD-595/36152	SAE AMS2488
ASTM B695	SAE AMS-STD-595/36170	SAE AMS2700
ASTM F1136/F1136M	SAE AMS-STD-595/36173	SAE AS4395
ASTM MNL37	SAE AMS-STD-595/36176	SAE AS8879
SAE AMS-C-81562	SAE AMS-STD-595/36231	SAE-J514
SAE AMS-QQ-P-416	SAE AMS-STD-595/36251	SAE J515
SAE AMS-STD-595/36076	SAE AMS-STD-595/36270	SAE J1453-1
SAE AMS-STD-595/36081	SAE AMS-STD-595/36280	SAE J1453-3
SAE AMS-STD-595/36099	SAE AMS-STD-595/36293	T9070-AL-DPC-020/077-2

CONCLUDING MATERIAL

Custodians:
Army - AT
Navy - AS
Air Force - 71
DLA - CC

Review activities:
Army - AR
Navy - CG, SA, SH

Preparing activity:
DLA - CC

(Project 4730-2020-035)

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.