

INCH-POUND

MS51501C

7 June 2016

SUPERSEDING

MS51501B

25 June 2015

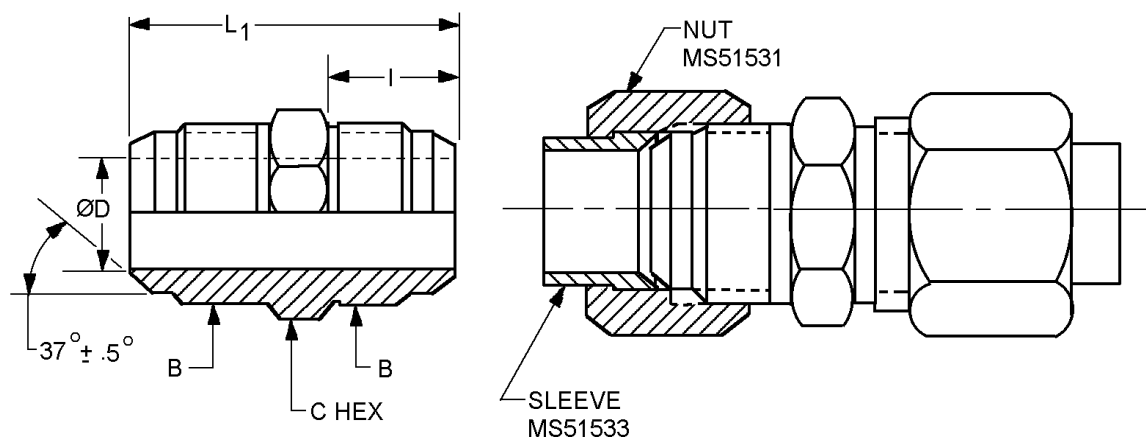
DETAIL SPECIFICATION SHEET

NIPPLE TUBE, REGULAR HEX,
37 DEGREE FLARED, SHORT

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

Inactive for new design after 17 August 1999. For new
design, use SAE-J514.

The requirements for acquiring the product described herein shall consist of this specification sheet
and MIL-DTL-18866.

FIGURE 1. Nipple, tube, short.

MS51501C

Suffix designator		Tube OD nom.	B Straight thread	C Hex flat nom.	D diameter	
Assembly	Body				Basic inches (mm)	Tolerance inches (mm)
A2	B2	.1250 (3.175)	.3125-24 UNF-2A	7/16	.062 (1.57)	±.003 (0.08)
A3	B3	.1875 (4.763)	.3750-24 UNF-2A	7/16	.125 (3.18)	
A4	B4	.2500 (6.350)	.4375-20 UNF-2A	1/2	.172 (4.37)	
A5	B5	.3125 (7.938)	.5000-20 UNF-2A	9/16	.234 (5.94)	
A6	B6	.3750 (9.525)	.5625-18 UNF-2A	5/8	.297 (7.54)	±.004 (0.10)
A8	B8	.5000 (12.700)	.7500-16 UNF-2A	13/16	.391 (9.93)	
A10	B10	.6250 (15.875)	.8750-14 UNF-2A	15/16	.484 (12.29)	
A12	B12	.7500 (19.050)	1.0625-12 UN-2A	1 1/8	.609 (15.47)	±.005 (0.13)
A14	B14	.8750 (22.225)	1.1875-12 UN-2A	1 1/4	.718 (18.24)	
A16	B16	1.0000 (25.400)	1.3125-12 UN-2A	1 3/8	.844 (21.44)	+0.007 -.005 (+0.18 - 0.13)
A20	B20	1.2500 (31.750)	1.6250-12 UN-2A	1 11/16	1.078 (27.38)	+0.008 -.005 (+0.20 -0.13)
A24	B24	1.5000 (38.100)	1.8750-12 UN-2A	2	1.312 (33.32)	+0.010 -.005 (+0.25 -0.13)
A32	B32	2.0000 (50.800)	2.500-12 UN-2A	2 5/8	1.781 (45.24)	+0.010 -.005 (+0.25 -0.13)

Suffix designator		I inches (mm)	L ₁ inches (mm)
Assembly	Body	±.015 (0.38)	±.020 (0.51)
A2	B2	.448 (11.38)	1.170 (29.72)
A3	B3	.479 (12.17)	1.230 (31.24)
A4	B4	.550 (13.97)	1.370 (34.80)
A5	B5	.550 (13.97)	1.370 (34.80)
A6	B6	.556 (14.12)	1.410 (35.81)
A8	B8	.657 (16.69)	1.620 (41.15)
A10	B10	.758 (19.25)	1.880 (47.75)
A12	B12	.864 (21.95)	2.160 (54.86)
A14	B14	.890 (22.61)	2.210 (53.13)
A16	B16	.911 (23.14)	2.250 (57.15)
A20	B20	.958 (24.33)	2.430 (61.72)
A24	B24	1.083 (27.51)	2.750 (69.85)
A32	B32	1.333 (33.86)	3.400 (86.36)

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. Assemblies are only furnished to this specification (body, nut, and sleeve). Bodies are not to be stocked, stored, or issued.
5. Dimensions and tolerances not shown shall be in accordance with SAE-J514 for 37 degree flared fittings.
6. The drawing is for identification purposes only and is not intended to restrict designs and shapes not dimensioned.

FIGURE 1. Male connector - Continued.

MS51501C

REQUIREMENTS:

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

Components of the assemblies shall be of the same material and finish.

Materials shall be in accordance with MIL-DTL-18866.

Finish. Finishes shall be as specified in table I. All platings 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 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.

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. <u>1/</u>
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. <u>2/</u>
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 4. <u>3/</u>
R	Steel	Zinc plating in accordance with ASTM B633; type VI, Fe/Zn 12. <u>4/</u>
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. <u>5/</u>
TF	Titanium	Fluoride phosphate in accordance with SAE-AMS2486. <u>5/</u>
Z	Steel	Zinc plating in accordance with ASTM B633; type II or III, Fe/Zn 12, or ASTM B695, type II, class 12. <u>4/</u>
ZC	Steel	Zinc may be any zinc plating from PIN codes H, J, and R with a colored chromate coating. <u>4/</u>

1/ Embrittlement test need not be run. Cadmium shall not be used in oxygen or potable water systems.

2/ The zinc-nickel alloy plate shall contain 12% to 16% nickel. The coating thickness shall be 315µ inches (8µm) minimum coating thickness.

3/ Hexavalent chromium free. Finish shall be ROHS compliant.

4/ Not for use in aircraft. Requires approval from the Program Office for all applications.

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 FED-STD-595 colors 36076 through 36293. Titanium shall not be used in oxygen or potable water systems.

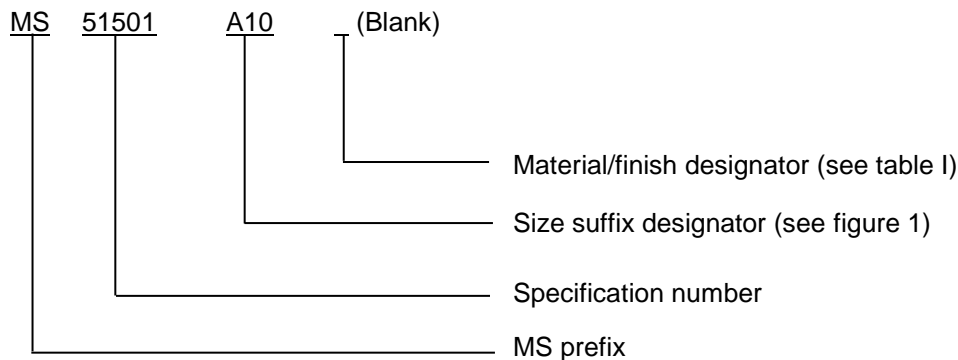
MS51501C

Trivalent wrenchability. When the finish has been damaged due to poor wrenchability, the surface of the connector shall be touched up using one of the brush plating processes below as appropriate to the primary finish. The term "trivalent wrenchability" is used to evaluate the ability of the finish to withstand abrasion from an excessive amount of wrenching.

- a. Brush plating of hard chromium by electrodeposition shall be in accordance with SAE-AMS-2451/5.
- b. Brush plating of medium-hardness, low stress nickel by electrodeposition shall be in accordance with SAE-AMS-2451/9.

Maximum operating pressure. Maximum operating pressure shall be in accordance with SAE-J514.

PIN: The PIN consists of the letters "MS", the specification number, a letter and number for nipple size, and a letter for material/finish designator.



PIN example: MS51501A10 indicates a nipple, .6250 inch (15.875 mm), steel cadmium plated.

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.

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.

Table II provides a detailed cross-reference of inactive MS51501 PIN's and for new design SAE-J514 PIN's.

MS51501 parts have threads in accordance with ASME B1.1 and the SAE parts have straight threads in accordance with SAE-J425.

Plating "P" SAE allows a range of nickel from 6% to 20%. Below 12%, ZnNi is not much better than zinc plating, which is less expensive and easier to apply. Above 16%, ZnNi becomes more cathodic and no longer acts as a sacrificial coating - if a high nickel coating is damaged the steel beneath the coating will corrode at an accelerated rate.

Users are cautioned to evaluate replacement parts for their particular application.

CAUTION: The superseding information is valid as of the date of this specification and may be superseded by subsequent revisions of the superseding document.

MS51501C

TABLE II. MS51501 to SAE-J514 cross reference.

Inactive for new design MS51501- PIN		Tube OD	For new design SAE-J514 PIN	
Assembly	Body		Assembly	Body
MS51501A2	MS51501B2	1/8	Not available	Not available
MS51501A2H	MS51501B2H	1/8	Not available	Not available
MS51501A2J	MS51501B2J	1/8	Not available	Not available
MS51501A2M	MS51501B2M	1/8	J514-2-2-070101MA	J514-2-2-070101MB
MS51501A2N	MS51501B2N	1/8	J514-2-2-070101NA	J514-2-2-070101NB
MS51501A2P	MS51501B2P	1/8	J514-2-2-070101PA	J514-2-2-070101PB
MS51501A2R	MS51501B2R	1/8	Not available	Not available
MS51501A2S	MS51501B2S	1/8	J514-2-2-070101SA	J514-2-2-070101SB
MS51501A2T	MS51501B2T	1/8	J514-2-2-070101TA	J514-2-2-070101TB
MS51501A2TF	MS51501B2TF	1/8	Not available	Not available
MS51501A2Z	MS51501B2Z	1/8	J514-2-2-070101ZA	J514-2-2-070101ZB
MS51501A2ZC	MS51501B2ZC	1/8	Not available	Not available
MS51501A3	MS51501B3	3/16	Not available	Not available
MS51501A3H	MS51501B3H	3/16	Not available	Not available
MS51501A3J	MS51501B3J	3/16	MS51501A3P	MS51501B3P
MS51501A3M	MS51501B3M	3/16	J514-3-3-070101MA	J514-3-3-070101MB
MS51501A3N	MS51501B3N	3/16	J514-3-3-070101NA	J514-3-3-070101NB
MS51501A3P	MS51501B3P	3/16	J514-3-3-070101PA	J514-3-3-070101PB
MS51501A3R	MS51501B3R	3/16	Not available	Not available
MS51501A3S	MS51501B3S	3/16	J514-3-3-070101SA	J514-3-3-070101SB
MS51501A3T	MS51501B3T	3/16	J514-3-3-070101TA	J514-3-3-070101TB
MS51501A3TF	MS51501B3TF	3/16	Not available	Not available
MS51501A3Z	MS51501B3Z	3/16	J514-3-3-070101ZA	J514-3-3-070101ZB
MS51501A3ZC	MS51501B3ZC	3/16	Not available	Not available
MS51501A4	MS51501B4	1/4	Not available	Not available
MS51501A4H	MS51501B4H	1/4	Not available	Not available
MS51501A4J	MS51501B4K	1/4	Not available	Not available
MS51501A4M	MS51501B4M	1/4	J514-4-4-070101MA	J514-4-4-070101MB
MS51501A4N	MS51501B4N	1/4	J514-4-4-070101NA	J514-4-4-070101NB
MS51501A4P	MS51501B4P	1/4	J514-4-4-070101PA	J514-4-4-070101PB
MS51501A4R	MS51501B4R	1/4	Not available	Not available
MS51501A4S	MS51501B4S	1/4	J514-4-4-070101SA	J514-4-4-070101SB
MS51501A4T	MS51501B4T	1/4	J514-4-4-070101TA	J514-4-4-070101TB
MS51501A4TF	MS51501B4TF	1/4	Not available	Not available
MS51501A4Z	MS51501B4Z	1/4	J514-4-4-070101ZA	J514-4-4-070101ZB
MS51501A4ZC	MS51501B4ZC	1/4	Not available	Not available
MS51501A5	MS51501B5	5/16	Not available	Not available
MS51501A5H	MS51501B5H	5/16	Not available	Not available
MS51501A5J	MS51501B5J	5/16	Not available	Not available
MS51501A5M	MS51501B5M	5/16	J514-5-5-070101MA	J514-5-5-070101MB
MS51501A5N	MS51501B5N	5/16	J514-5-5-070101NA	J514-5-5-070101NB
MS51501A5P	MS51501B5P	5/16	J514-5-5-070101PA	J514-5-5-070101PB
MS51501A5R	MS51501B5R	5/16	Not available	Not available
MS51501A5S	MS51501B5S	5/16	J514-5-5-070101SA	J514-5-5-070101SB
MS51501A5T	MS51501B5T	5/16	J514-5-5-070101TA	J514-5-5-070101TB
MS51501A5TF	MS51501B5TF	5/16	Not available	Not available
MS51501A5Z	MS51501B5Z	5/16	J514-5-5-070101ZA	J514-5-5-070101ZB
MS51501A5ZC	MS51501B5ZC	5/16	Not available	Not available

MS51501C

TABLE II. MS51501 to SAE-J514 cross reference - Continued.

Inactive for new design MS51501- PIN		Tube OD	For new design SAE-J514 PIN	
Assembly	Body		Assembly	Body
MS51501A6	MS51501B6	3/8	Not available	Not available
MS51501A6H	MS51501B6H	3/8	Not available	Not available
MS51501A6J	MS51501B6J	3/8	Not available	Not available
MS51501A6M	MS51501B6M	3/8	J514-6-6-070101MA	J514-6-6-070101MB
MS51501A6N	MS51501B6N	3/8	J514-6-6-070101NA	J514-6-6-070101NB
MS51501A6P	MS51501B6P	3/8	J514-6-6-070101PA	J514-6-6-070101PB
MS51501A6R	MS51501B6R	3/8	Not available	Not available
MS51501A6S	MS51501B6S	3/8	J514-6-6-070101SA	J514-6-6-070101SB
MS51501A6T	MS51501B6T	3/8	J514-6-6-070101TA	J514-6-6-070101TB
MS51501A6TF	MS51501B6TF	3/8	Not available	Not available
MS51501A6Z	MS51501B6Z	3/8	J514-6-6-070101ZA	J514-6-6-070101ZB
MS51501A6ZC	MS51501B6ZC	3/8	Not available	Not available
MS51501A8	MS51501B8	1/2	Not available	Not available
MS51501A8H	MS51501B8H	1/2	Not available	Not available
MS51501A8J	MS51501B8J	1/2	Not available	Not available
MS51501A8M	MS51501B8M	1/2	J514-8-8-070101MA	J514-8-8-070101MB
MS51501A8N	MS51501B8N	1/2	J514-8-8-070101NA	J514-8-8-070101NB
MS51501A8P	MS51501B8P	1/2	J514-8-8-070101PA	J514-8-8-070101PB
MS51501A8R	MS51501B8R	1/2	Not available	Not available
MS51501A8S	MS51501B8S	1/2	J514-8-8-070101SA	J514-8-8-070101SB
MS51501A8T	MS51501B8T	1/2	J514-8-8-070101TA	J514-8-8-070101TB
MS51501A8TF	MS51501B8TF	1/2	Not available	Not available
MS51501A8Z	MS51501B8Z	1/2	J514-8-8-070101ZA	J514-8-8-070101ZB
MS51501A8ZC	MS51501B8ZC	1/2	Not available	Not available
MS51501A10	MS51501B10	5/8	Not available	Not available
MS51501A10H	MS51501B10H	5/8	Not available	Not available
MS51501A10J	MS51501B10J	5/8	Not available	Not available
MS51501A10M	MS51501B10M	5/8	J514-10-10-070101MA	J514-10-10-070101MB
MS51501A10N	MS51501B10N	5/8	J514-10-10-070101NA	J514-10-10-070101NB
MS51501A10P	MS51501B10P	5/8	J514-10-10-070101PA	J514-10-10-070101PB
MS51501A10R	MS51501B10R	5/8	Not available	Not available
MS51501A10S	MS51501B10S	5/8	J514-10-10-070101SA	J514-10-10-070101SB
MS51501A10T	MS51501B10T	5/8	J514-10-10-070101TA	J514-10-10-070101TB
MS51501A10TF	MS51501B10TF	5/8	Not available	Not available
MS51501A10Z	MS51501B10Z	5/8	J514-10-10-070101ZA	J514-10-10-070101ZB
MS51501A10ZC	MS51501B10ZC	5/8	Not available	Not available
MS51501A12	MS51501B12	3/4	Not available	Not available
MS51501A12H	MS51501B12H	3/4	Not available	Not available
MS51501A12J	MS51501B12J	3/4	Not available	Not available
MS51501A12M	MS51501B12M	3/4	J514-12-12-070101MA	J514-12-12-070101MB
MS51501A12N	MS51501B12N	3/4	J514-12-12-070101NA	J514-12-12-070101NB
MS51501A12P	MS51501B12P	3/4	J514-12-12-070101PA	J514-12-12-070101PB
MS51501A12R	MS51501B12R	3/4	Not available	Not available
MS51501A12S	MS51501B12S	3/4	J514-12-12-070101SA	J514-12-12-070101SB
MS51501A12T	MS51501B12T	3/4	J514-12-12-070101TA	J514-12-12-070101TB
MS51501A12TF	MS51501B12TF	3/4	Not available	Not available
MS51501A12Z	MS51501B12Z	3/4	J514-12-12-070101ZA	J514-12-12-070101ZB
MS51501A12ZC	MS51501B12ZC	3/4	Not available	Not available

MS51501C

TABLE II. MS51501 to SAE-J514 cross reference - Continued.

Inactive for new design MS51501- PIN		Tube OD	For new design SAE-J514 PIN	
Assembly	Body		Assembly	Body
MS51501A14	MS51501B14	7/8	Not available	Not available
MS51501A14H	MS51501B14H	7/8	Not available	Not available
MS51501A14J	MS51501B14J	7/8	Not available	Not available
MS51501A14M	MS51501B14M	7/8	J514-14-14-070101MA	J514-14-14-070101MB
MS51501A14N	MS51501B14N	7/8	J514-14-14-070101NA	J514-14-14-070101NB
MS51501A14P	MS51501B14P	7/8	J514-14-14-070101PA	J514-14-14-070101PB
MS51501A14R	MS51501B14R	7/8	Not available	Not available
MS51501A14S	MS51501B14S	7/8	J514-14-14-070101SA	J514-14-14-070101SB
MS51501A14T	MS51501B14T	7/8	J514-14-14-070101TA	J514-14-14-070101TB
MS51501A14TF	MS51501B14TF	7/8	Not available	Not available
MS51501A14Z	MS51501B14Z	7/8	J514-14-14-070101ZA	J514-14-14-070101ZB
MS51501A14ZC	MS51501B14ZC	7/8	Not available	Not available
MS51501A16CN	MS51501B16CN	1	Not available	Not available
MS51501A16H	MS51501B16H	1	Not available	Not available
MS51501A16J	MS51501B16J	1	Not available	Not available
MS51501A16M	MS51501B16M	1	J514-16-16-070101MA	J514-16-16-070101MB
MS51501A16N	MS51501B16N	1	J514-16-16-070101NA	J514-16-16-070101NB
MS51501A16P	MS51501B16P	1	J514-16-16-070101PA	J514-16-16-070101PB
MS51501A16R	MS51501B16R	1	Not available	Not available
MS51501A16S	MS51501B16S	1	J514-16-16-070101SA	J514-16-16-070101SB
MS51501A16T	MS51501B16T	1	J514-16-16-070101TA	J514-16-16-070101TB
MS51501A16TF	MS51501B16TF	1	Not available	Not available
MS51501A16Z	MS51501B16Z	1	J514-16-16-070101ZA	J514-16-16-070101ZB
MS51501A16ZC	MS51501B16ZC	1	Not available	Not available
MS51501A20	MS51501B20	1 1/4	Not available	Not available
MS51501A20H	MS51501B20H	1 1/4	Not available	Not available
MS51501A20J	MS51501B20J	1 1/4	Not available	Not available
MS51501A20M	MS51501B20M	1 1/4	J514-20-20-070101MA	J514-20-20-070101MB
MS51501A20N	MS51501B20N	1 1/4	J514-20-20-070101NA	J514-20-20-070101NB
MS51501A20P	MS51501B20P	1 1/4	J514-20-20-070101PA	J514-20-20-070101PB
MS51501A20R	MS51501B20R	1 1/4	Not available	Not available
MS51501A20S	MS51501B20S	1 1/4	J514-20-20-070101SA	J514-20-20-070101SB
MS51501A20T	MS51501B20T	1 1/4	J514-20-20-070101TA	J514-20-20-070101TB
MS51501A20TF	MS51501B20TF	1 1/4	Not available	Not available
MS51501A20Z	MS51501B20Z	1 1/4	J514-20-20-070101ZA	J514-20-20-070101ZB
MS51501A20ZC	MS51501B20ZC	1 1/4	Not available	Not available
MS51501A24	MS51501B24	1 1/2	Not available	Not available
MS51501A24H	MS51501B24H	1 1/2	Not available	Not available
MS51501A24J	MS51501B24J	1 1/2	Not available	Not available
MS51501A24M	MS51501B24M	1 1/2	J514-24-24-070101MA	J514-24-24-070101MB
MS51501A24N	MS51501B24N	1 1/2	J514-24-24-070101NA	J514-24-24-070101NB
MS51501A24P	MS51501B24P	1 1/2	J514-24-24-070101PA	J514-24-24-070101PB
MS51501A24R	MS51501B24R	1 1/2	Not available	Not available
MS51501A24S	MS51501B24S	1 1/2	J514-24-24-070101SA	J514-24-24-070101SB
MS51501A24T	MS51501B24T	1 1/2	J514-24-24-070101TA	J514-24-24-070101TB
MS51501A24TF	MS51501B24TF	1 1/2	Not available	Not available
MS51501A24Z	MS51501B24Z	1 1/2	J514-24-24-070101ZA	J514-24-24-070101ZB
MS51501A24ZC	MS51501B24ZC	1 1/2	Not available	Not available

MS51501C

TABLE II. MS51501 to SAE-J514 cross reference - Continued.

Inactive for new design MS51501- PIN		Tube OD	For new design SAE-J514 PIN	
Assembly	Body		Assembly	Body
MS51501A32	MS51501B32	2	Not available	Not available
MS51501A32H	MS51501B32H	2	Not available	Not available
MS51501A32J	MS51501B32J	2	Not available	Not available
MS51501A32M	MS51501B32M	2	J514-32-32-070101MA	J514-32-32-070101MB
MS51501A32N	MS51501B32N	2	J514-32-32-070101NA	J514-32-32-070101NB
MS51501A32P	MS51501B32P	2	J514-32-32-070101PA	J514-32-32-070101PB
MS51501A32R	MS51501B32R	2	Not available	Not available
MS51501A32S	MS51501B32S	2	J514-32-32-070101SA	J514-32-32-070101SB
MS51501A32T	MS51501B32T	2	J514-32-32-070101TA	J514-32-32-070101TB
MS51501A32TF	MS51501B32TF	2	Not available	Not available
MS51501A32Z	MS51501B32Z	2	J514-32-32-070101ZA	J514-32-32-070101ZB
MS51501A32ZC	MS51501B32ZC	2	Not available	Not available

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-18866, this document references the following:

FED-STD-595/36076	FED-STD-595/36231	ASTM B117	SAE-AMS2486
FED-STD-595/36081	FED-STD-595/36251	ASTM B633	SAE-AMS2488
FED-STD-595/36099	FED-STD-595/36270	ASTM B695	SAE-AMS2700
FED-STD-595/36118	FED-STD-595/36280	ASTM F1136/F1136M	SAE-J425
FED-STD-595/36134	FED-STD-595/36293	SAE-AMS-C-81562	SAE-J514
FED-STD-595/36152	MIL-DTL-16232	SAE-AMS-QQ-P-416	
FED-STD-595/36170	MS51531	SAE-AMS2417	
FED-STD-595/36173	MS51533	SAE-AMS2451/5	
FED-STD-595/36176	ASME B1.1	SAE-AMS2451/9	

CONCLUDING MATERIAL

Custodians:

Army - AT
Navy - SH
Air Force - 99
DLA - CC

Preparing activity:
DLA - CC

(Project 4730-2016-036)

Review activities:

Army - AR, AV, MI
Navy - AS, CG, SA
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>.