

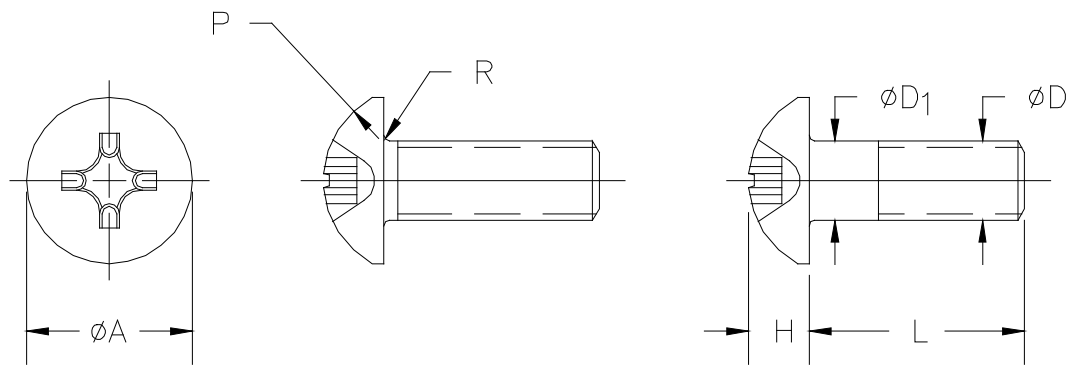
MS51957D
25 April 1997
Superseding
MS51957C
18 July 1986

MILITARY SPECIFICATION SHEET

SCREW, MACHINE, PAN HEAD, CROSS-RECESSED,
CORROSION RESISTANT STEEL, UNC-2A

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 the issue of the following specification listed
in that issue of the Department of Defense Index of Specifications and
Standards (DoDISS) specified in the solicitation: FF-S-92.



Ⓓ Entire document revised

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Table I. Dimensions and Dash Numbers.

| | | | | | | | | | |
|--------------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| ØD Nominal Size | | .0860 | .1120 | .1380 | .1640 | .1900 | .2500 | .3125 | .3750 |
| Threads Per Inch UNC-2A | | 56 | 40 | 32 | 32 | 24 | 20 | 18 | 16 |
| Ø D ₁ Body Diameter | Max | .0860 | .1120 | .1380 | .1640 | .1900 | .2500 | .3125 | .3750 |
| | Min | .0717 | .0925 | .1141 | .1399 | .1586 | .2127 | .2712 | .3287 |
| ØA Head Diameter | Max | .1670 | .2190 | .2700 | .3220 | .3730 | .4920 | .6150 | .7400 |
| | Min | .1550 | .2050 | .2560 | .3060 | .3570 | .4730 | .5940 | .7160 |
| H Head Height | Max | .0620 | .0800 | .0970 | .1150 | .1330 | .1750 | .2180 | .2610 |
| | Min | .0530 | .0700 | .0870 | .1050 | .1220 | .1620 | .2030 | .2440 |
| P Head Radius | Ref | .0100 | .0100 | .0150 | .0150 | .0200 | .0350 | .0400 | .0400 |
| R Fillet Radius | Max | .0130 | .0170 | .0210 | .0250 | .0290 | .0380 | .0470 | .0560 |
| Driver Size | | 1 | 1 | 2 | 2 | 2 | 3 | 4 | 4 |
| Tensile Strength Lbs-Min | | 300 | 480 | 730 | 1,120 | 1,400 | 2,540 | 4,190 | 6,200 |
| L Length | Tolerance | Dash No. | Dash No. | Dash No. | Dash No. | Dash No. | Dash No. | Dash No. | Dash No. |
| .125 | +0 -.031 | 1 | 11 | 24 | 39 | | | | |
| .188 | | 2 | 12 | 25 | 40 | 58 ^{1/} | | | |
| .250 | | 3 | 13 | 26 | 41 | 59 | | | |
| .312 | | 4 | 14 | 27 | 42 | 60 | 76 | | |
| .375 | | 5 | 15 | 28 | 43 | 61 | 77 | 92 | |
| .438 | | 6 | 16 | 29 | 44 | 62 | 78 | 93 | |
| .500 | | 7 | 17 | 30 | 45 | 63 | 79 | 94 | 107 |
| .562 | | 141 ^{2/} | 120 ^{2/} | 123 ^{2/} | 126 ^{2/} | 129 ^{2/} | 132 ^{2/} | 135 ^{2/} | 138 ^{2/} |
| .625 | | 8 | 18 | 31 | 46 | 64 | 80 | 95 | 108 |
| .750 | | 9 | 19 | 32 | 47 | 65 | 81 | 96 | 109 |
| .875 | 10 | 20 | 33 | 48 | 66 | 82 | 97 | 110 | |
| 1.000 | 142 ^{2/} | 21 | 34 | 49 | 67 | 83 | 98 | 111 | |
| 1.125 | +0 -.062 | | 121 ^{2/} | 124 ^{2/} | 127 ^{2/} | 130 ^{2/} | 133 ^{2/} | 136 ^{2/} | 139 ^{2/} |
| 1.250 | | | 22 ^{1/} | 35 | 50 | 68 | 84 | 99 | 112 |
| 1.375 | | | 122 ^{2/} | 125 ^{2/} | 128 ^{2/} | 131 ^{2/} | 134 ^{2/} | 137 ^{2/} | 140 ^{2/} |
| 1.500 | | | 23 | 36 | 51 | 69 | 85 | 100 | 113 |
| 1.750 | | | | 37 | 52 | 70 | 86 | 101 | 114 |
| 2.000 | | | | 38 | 53 | 71 | 87 | 102 | 115 |
| 2.250 | +0 -.094 | | | | 54 | 72 | 88 | 103 | 116 |
| 2.500 | | | | | 55 | 73 | 89 | 104 | 117 |
| 2.750 | | | | | 56 | 74 ^{1/} | 90 ^{1/} | 105 ^{1/} | 118 |
| 3.000 | | | | | 57 | 75 ^{1/} | 91 ^{1/} | 106 ^{1/} | 119 |

^{1/} Indicates manufacturer's non-stock production items

^{2/} Inactive for new design after 18 July 1986

REQUIREMENTS:

1. **MATERIAL:** Austenitic Corrosion-Resistant Steel screws shall be manufactured from Type 302 (UNS S30200), Type 304 (UNS S30400), Type 304L (UNS S30403), Type 305 (UNS S30500), Type 316 (UNS S31600), Type 316L (UNS S31603), Type 384 (UNS S38400), or Type XM-7 (UNS S30430) in accordance with chemical composition specified in QQ-S-763. (See Material Identification Marking and Material Code).

2. **FINISH:** Passivate in accordance with QQ-P-35 or Black Oxide coating (except for Type 316 or Type 316L) in accordance with MIL-C-13924, Class 4. (See Finish Code).

3. **MECHANICAL PROPERTIES:** The minimum tensile strength in load pounds, indicated for each size in Table I, is based on 80,000 PSI Minimum Tensile Strength. Load pounds are calculated by the stress areas indicated in FED-STD-H28/2. The yield strength, based on .2 percent offset, shall be 30,000 psi minimum.

Requirements: (Continued)

4. **MAGNETIC PERMEABILITY:** When specified, screws shall have a magnetic permeability of less than 2.0 maximum (air = 1.0) for a field strength H=200 Oersteds using a magnetic permeability indicator per ASTM A 342. Note: Cold working screws may not be capable of meeting permeability and strength requirements simultaneously.
5. **THREADS:** Screw threads shall be Unified external threads Class 2A UNC in accordance with FED-STD-H28/2. Acceptability of screw threads shall be in accordance with FED-STD-H28/20. Threads shall extend to within two threads or less of the bearing surface of the head, except that all lengths over 2.000 inches shall have a minimum complete thread length of 1.750 inches.
6. **RECESS:** Recess shall be in accordance with MS9006.
7. **MATERIAL IDENTIFICATION MARKING:** Type 316 (UNS S31600) or Type 316L (UNS S31603) CRES screws nominal size #10 (.1900) and larger shall be permanently marked "316". Markings shall be raised or depressed on the screw head at manufacturer's option.
8. **MATERIAL CODE:**
 For 300 Series CRES - No code after dash number indicates any 300 Series Austenitic Corrosion-Resistant Steel listed in material requirement
 For Type 316 or Type 316L CRES - "S316" after dash number indicates Austenitic Corrosion-Resistant Steel Type 316 or Type 316L.
9. **FINISH CODE:**
 Passivate - No code letter after dash number, or after material code (if applicable) indicates passivate.
 Black Oxide - "B" after dash number, (not available for Type 316 or Type 316L CRES), indicates black oxide coating.
10. **PART NUMBER:** The part number shall consist of the basic MS number, followed by a dash number from Table I, a material code (if applicable), and a finish code (if applicable).

Examples:

- MS51957-1 indicates Screw, Machine-Pan Head, Cross-Recessed, Optional 300 Series CRES, Passivated; .0860-56 UNC-2A Nominal Thread Size, .125 Length
- MS51957-1B indicates Screw, Machine-Pan Head, Cross-Recessed, Optional 300 Series CRES, Black Oxide Coated; .0860-56 UNC-2A Nominal Thread Size, .125 Length
- MS51957-1S316 indicates Screw, Machine - Pan Head, Cross-Recessed, Type 316 or Type 316L CRES, Passivated; .0860-56 UNC-2A Nominal Thread Size, .125 Length

NOTES:

- All dimensions are in inches.
- Interpret drawing in accordance with ASME Y14.5M.
- In the event of a conflict between the text of this document and the references cited herein, the text of this document shall take precedence.
- Unless otherwise specified, issues of referenced documents are those in effect at the time of solicitation.
- MS51957 Pan Head Machine Screws manufactured prior to 25 April 1997 may be used until stock is depleted.

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The screws covered by dash numbers given in MS16200, MS35216, MS35233, AN515 in part and AN526 in part are canceled/inactive after the dates indicated on the documents. Use the dash numbers given in the preceding sheets. The canceled screws cannot always replace the new screws and should be used until existing stock are depleted. Use only the new screws for design and replacement. Replacement should be in accordance with this table.

Table II. Interchangeability

| CROSS REFERENCE OF PART NUMBERS | | | | | | |
|---------------------------------|---------|-----------------|-----------------|---------|---------|-------------------|
| CANCELED | | | | | | NEW |
| MS16200 MS35233 | MS35216 | AN515 | | AN526 | | MS51957 |
| DASH NUMBER | | | | | | |
| 1 | 1 | C2R2 | C2-2 | | | 1 |
| 2 | 2 | C2R3 | C2-3 | | | 2 |
| 3 | 3 | C2R4 | C2-4 | | | 3 |
| 4 | 4 | C2R5 | C2-5 | | | 4 |
| 5 | 5 | C2R6 | C2-6 | | | 5 |
| 6 | 6 | C2R7 | C2-7 | | | 6 |
| 7 | 7 | C2R8 | C2-8 | | | 7 |
| 8 | 8 | C2R10 | C2-10 | | | 8 |
| 9 | 9 | C2R12 | C2-12 | | | 9 |
| 10 | | | | | | 10 |
| | | C3R2 thru C3R16 | C3-2 thru C3-16 | | | 2/ |
| 11 | 10 | | | | | 11 |
| 12 | 11 | C4R3 | C4-3 | | | 12 |
| 13 | 12 | C4R4 | C4-4 | | | 13 |
| 14 | 13 | C4R5 | C4-5 | | | 14 |
| 15 | 14 | C4R6 | C4-6 | | | 15 |
| 16 | 15 | C4R7 | C4-7 | | | 16 |
| 17 | 16 | C4R8 | C4-8 | | | 17 |
| 18 | 17 | C4R10 | C4-10 | | | 18 |
| 19 | 18 | C4R12 | C4-12 | | | 19 |
| 20 | 19 | C4R14 | C4-14 | | | 20 |
| 21 | 20 | C4R16 | C4-16 | | | 21 |
| | | C4R18 | C4-18 | | | 121 ^{1/} |
| 22 | | C4R20 | C4-20 | | | 22 |
| | | C4R22 | C4-22 | | | 122 ^{1/} |
| 23 | | C4R24 | C4-24 | | | 23 |
| | | C4R26 | C4-26 | | | 2/ |
| | | C4R28 | C4-28 | | | 2/ |
| 24 | 21 | C5R3 thru C5R28 | C5-3 thru C5-28 | | | 2/ |
| | | | | | | 24 |
| 25 | 22 | C6R3 | C6-3 | | | 25 |
| 26 | 23 | C6R4 | C6-4 | C632R4 | C632-4 | 26 |
| 27 | 24 | C6R5 | C6-5 | C632R5 | C632-5 | 27 |
| 28 | 25 | C6R6 | C6-6 | C632R6 | C632-6 | 28 |
| 29 | 26 | C6R7 | C6-7 | C632R7 | C632-7 | 29 |
| 30 | 27 | C6R8 | C6-8 | C632R8 | C632-8 | 30 |
| | | | | C632R9 | C632-9 | 123 ^{1/} |
| 31 | 28 | C6R10 | C6-10 | C632R10 | C632-10 | 31 |
| 32 | 29 | C6R12 | C6-12 | C632R12 | C632-12 | 32 |
| 33 | 30 | C6R14 | C6-14 | C632R14 | C632-14 | 33 |
| 34 | 31 | C6R16 | C6-16 | C632R16 | C632-16 | 34 |
| | | C6R18 | C6-18 | C632R18 | C632-18 | 124 ^{1/} |
| 35 | 32 | C6R20 | C6-20 | C632R20 | C632-20 | 35 |
| | | C6R22 | C6-22 | C632R22 | C632-22 | 125 ^{1/} |
| 36 | 33 | C6R24 | C6-24 | C632R24 | C632-24 | 36 |
| | | C6R26 | C6-26 | C632R26 | C632-26 | 2/ |
| 37 | 34 | C6R28 | C6-28 | C632R28 | C632-28 | 37 |
| | | C6R30 | C6-30 | C632R30 | C632-30 | 2/ |
| 38 | 35 | C6R32 | C6-32 | C632R32 | C632-32 | 38 |
| | | C6R36 | C6-36 | C632R36 | C632-36 | 2/ |
| | | C6R40 | C6-40 | C632R40 | C632-40 | 2/ |
| | | | | C632R44 | C632-44 | 2/ |
| | | | | C632R48 | C632-48 | 2/ |

1/ New dash numbers added 26 August 1968

2/ No replacement

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Table II. Interchangeability (Continued)

| CROSS REFERENCE OF PART NUMBERS | | | | | | |
|---------------------------------|---------|---------|---------|-------------------|-------------------|-------------------------|
| CANCELED | | | | | | NEW |
| MS16200 MS35233 | MS35216 | AN515 | | AN526 | | MS51957 |
| DASH NUMBER | | | | | | |
| 39 | 36 | | | | | 39 |
| 40 | 37 | | | | | 40 |
| 41 | 38 | C8R4 | C8-4 | C832R4 | C832-4 | 41 |
| 42 | 39 | C8R5 | C8-5 | C832R5 | C832-5 | 42 |
| 43 | 40 | C8R6 | C8-6 | C832R6 | C832-6 | 43 |
| 44 | 41 | C8R7 | C8-7 | C832R7 | C832-7 | 44 |
| 45 | 42 | C8R8 | C8-8 | C832R8 | C832-8 | 45 |
| 46 | 43 | C8R10 | C8-10 | C832R9 C832R10 | C832-9 C832-10 | 126 ^{1/} 46 |
| 47 | 44 | C8R12 | C8-12 | C832R12 | C832-12 | 47 |
| 48 | 45 | C8R14 | C8-14 | C832R14 | C832-14 | 48 |
| 49 | 46 | C8R16 | C8-16 | C832R16 | C832-16 | 49 |
| | | C8R18 | C8-18 | C832R18 | C832-18 | 127 ^{1/} |
| 50 | 47 | C8R20 | C8-20 | C832R20 | C832-20 | 50 |
| | | C8R22 | C8-22 | C832R22 | C832-22 | 128 ^{1/} |
| 51 | 48 | C8R24 | C8-24 | C832R24 | C832-24 | 51 |
| | | C8R26 | C8-26 | C832R26 | C832-26 | 2/ |
| 52 | 49 | C8R28 | C8-28 | C832R28 | C832-28 | 52 |
| | | C8R30 | C8-30 | C832R30 | C832-30 | 2/ |
| 53 | 50 | C8R32 | C8-32 | C832R32 | C832-32 | 53 |
| 54 | | C8R36 | C8-36 | C832R36 | C832-36 | 54 |
| 55 | | C8R40 | C8-40 | C832R40 | C832-40 | 55 |
| 56 | | C8R44 | C8-44 | C832R44 | C832-44 | 56 |
| 57 | | C8R48 | C8-48 | C832R48 | C832-48 | 57 |
| 58 | | | | | | 58 |
| 59 | 51 | C10R4 | C10-4 | C1024R4 | C1024-4 | 59 |
| 60 | 52 | C10R5 | C10-5 | C1024R5 | C1024-5 | 60 |
| 61 | 53 | C10R6 | C10-6 | C1024R6 | C1024-6 | 61 |
| 62 | 54 | C10R7 | C10-7 | C1024R7 | C1024-7 | 62 |
| 63 | 55 | C10R8 | C10-8 | C1024R8 | C1024-8 | 63 |
| | | | | | | 129 ^{1/} |
| 64 | 56 | C10R10 | C10-10 | C1024R10 | C1024-10 | 64 |
| 65 | 57 | C10R12 | C10-12 | C1024R12 | C1024-12 | 65 |
| 66 | 58 | C10R14 | C10-14 | C1024R14 | C1024-14 | 66 |
| 67 | 59 | C10R16 | C10-16 | C1024R16 | C1024-16 | 67 |
| | | C10R18 | C10-18 | C1024R18 | C1024-18 | 130 ^{1/} |
| 68 | 60 | C10R20 | C10-20 | C1024R20 | C1024-20 | 68 |
| | | C10R22 | C10-22 | C1024R22 | C1024-22 | 131 ^{1/} |
| 69 | 61 | C10R24 | C10-24 | C1024R24 | C1024-24 | 69 |
| | | C10R26 | C10-26 | C1024R26 | C1024-26 | 2/ |
| 70 | 62 | C10R28 | C10-28 | C1024R28 | C1024-28 | 70 |
| | | C10R30 | C10-30 | C1024R30 | C1024-30 | 2/ |
| 71 | 63 | C10R32 | C10-32 | C1024R32 | C1024-32 | 71 |
| 72 | 64 | C10R36 | C10-36 | C1024R36 | C1024-36 | 72 |
| 73 | 65 | C10R40 | C10-40 | C1024R40 | C1024-40 | 73 |
| 74 | | C10R44 | C10-44 | C1024R44 | C1024-44 | 74 |
| 75 | | C10R48 | C10-48 | C1024R48 | C1024-48 | 75 |
| 76 | 66 | C416R5 | C416-5 | | | 76 |
| 77 | 67 | C416R6 | C416-6 | C420R6 | C420-6 | 77 |
| 78 | 68 | C416R7 | C416-7 | C420R7 | C420-7 | 78 |
| 79 | 69 | C416R8 | C416-8 | C420R8 | C420-8 | 79 |
| | | | | C420R9 | C420-9 | 132 ^{1/} |
| 80 | 70 | C416R10 | C416-10 | C420R10 | C420-10 | 80 |
| 81 | 71 | C416R12 | C416-12 | C420R12 | C420-12 | 81 |
| 82 | 72 | C416R14 | C416-14 | C420R14 | C420-14 | 82 |
| 83 | 73 | C416R16 | C416-16 | C420R16 | C420-16 | 83 |
| | | C416R18 | C416-18 | C420R18 | C420-18 | 133 ^{1/} |

1/ New dash numbers added 26 August 1968

2/ No replacement

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Table II. Interchangeability (Continued)

| CROSS REFERENCE OF PART NUMBERS | | | | | | |
|---------------------------------|---------|---------|---------|---------|---------|------------------|
| CANCELED | | | | | | NEW |
| MS16200 MS35233 | MS35216 | AN515 | | AN526 | | MS51957 |
| DASH NUMBER | | | | | | |
| 84 | 74 | C416R20 | C416-20 | C420R20 | C420-20 | 84 |
| | | C416R22 | C416-22 | C420R22 | C420-22 | 134 ¹ |
| 85 | 75 | C416R24 | C416-24 | C420R24 | C420-24 | 85 |
| | | C416R26 | C416-26 | C420R26 | C420-26 | 2/ |
| 86 | 76 | C416R28 | C416-28 | C420R28 | C420-28 | 86 |
| | | C416R30 | C416-30 | C420R30 | C420-30 | 2/ |
| 87 | 77 | C416R32 | C416-32 | C420R32 | C420-32 | 87 |
| 88 | 78 | C416R36 | C416-36 | C420R36 | C420-36 | 88 |
| 89 | 79 | C416R40 | C416-40 | C420R40 | C420-40 | 89 |
| 90 | | C416R44 | C416-44 | C420R44 | C420-44 | 90 |
| 91 | | C416R48 | C416-48 | C420R48 | C420-48 | 91 |
| 92 | 80 | | | | | 92 |
| 93 | 81 | | | | | 93 |
| 94 | 82 | C516R8 | C516-8 | | | 94 |
| 95 | 83 | C516R10 | C516-10 | | | 95 |
| 96 | 84 | C516R12 | C516-12 | | | 96 |
| 97 | 85 | C516R14 | C516-14 | | | 97 |
| 98 | 86 | C516R16 | C516-16 | | | 98 |
| | | C516R18 | C516-18 | | | 136 ¹ |
| 99 | 87 | C516R20 | C516-20 | | | 99 |
| | | C516R22 | C516-22 | | | 137 ¹ |
| 100 | 88 | C516R24 | C516-24 | | | 100 |
| | | C516R26 | C516-26 | | | 2/ |
| 101 | 89 | C516R28 | C516-28 | | | 101 |
| | | C516R30 | C516-30 | | | 2/ |
| 102 | 90 | C516R32 | C516-32 | | | 102 |
| 103 | 91 | C516R36 | C516-36 | | | 103 |
| 104 | 92 | C516R40 | C516-40 | | | 104 |
| 105 | | C516R44 | C516-44 | | | 105 |
| 106 | | C516R48 | C516-48 | | | 106 |
| 107 | 93 | C616R6 | C616-6 | | | 107 |
| 108 | 94 | C616R10 | C616-10 | | | 108 |
| 109 | 95 | C616R12 | C616-12 | | | 109 |
| 110 | 96 | C616R14 | C616-14 | | | 110 |
| 111 | 97 | C616R16 | C616-16 | | | 111 |
| | | C616R18 | C616-18 | | | 139 ¹ |
| 112 | 98 | C616R20 | C616-20 | | | 112 |
| | | C616R22 | C616-22 | | | 140 ¹ |
| 113 | 99 | C616R24 | C616-24 | | | 113 |
| | | C616R26 | C616-26 | | | 2/ |
| 114 | 100 | C616R28 | C616-28 | | | 114 |
| | | C616R30 | C616-30 | | | 2/ |
| 115 | 101 | C616R32 | C616-32 | | | 115 |
| 116 | 102 | C616R36 | C616-36 | | | 116 |
| 117 | 103 | C616R40 | C616-40 | | | 117 |
| 118 | 104 | C616R44 | C616-44 | | | 118 |
| 119 | 105 | C616R48 | C616-48 | | | 119 |

1/ New dash numbers added 26 August 1968

2/ No replacement

Military Interests:

Custodians:

Army - AR
Navy - YD1
Air Force - 99

Preparing activity:

DLA - IS

(Project 5305-2128)

Reviewer:

Army - AV, AT, GL, ME, MI
Navy -MC, SH
National Security Agency - NSA