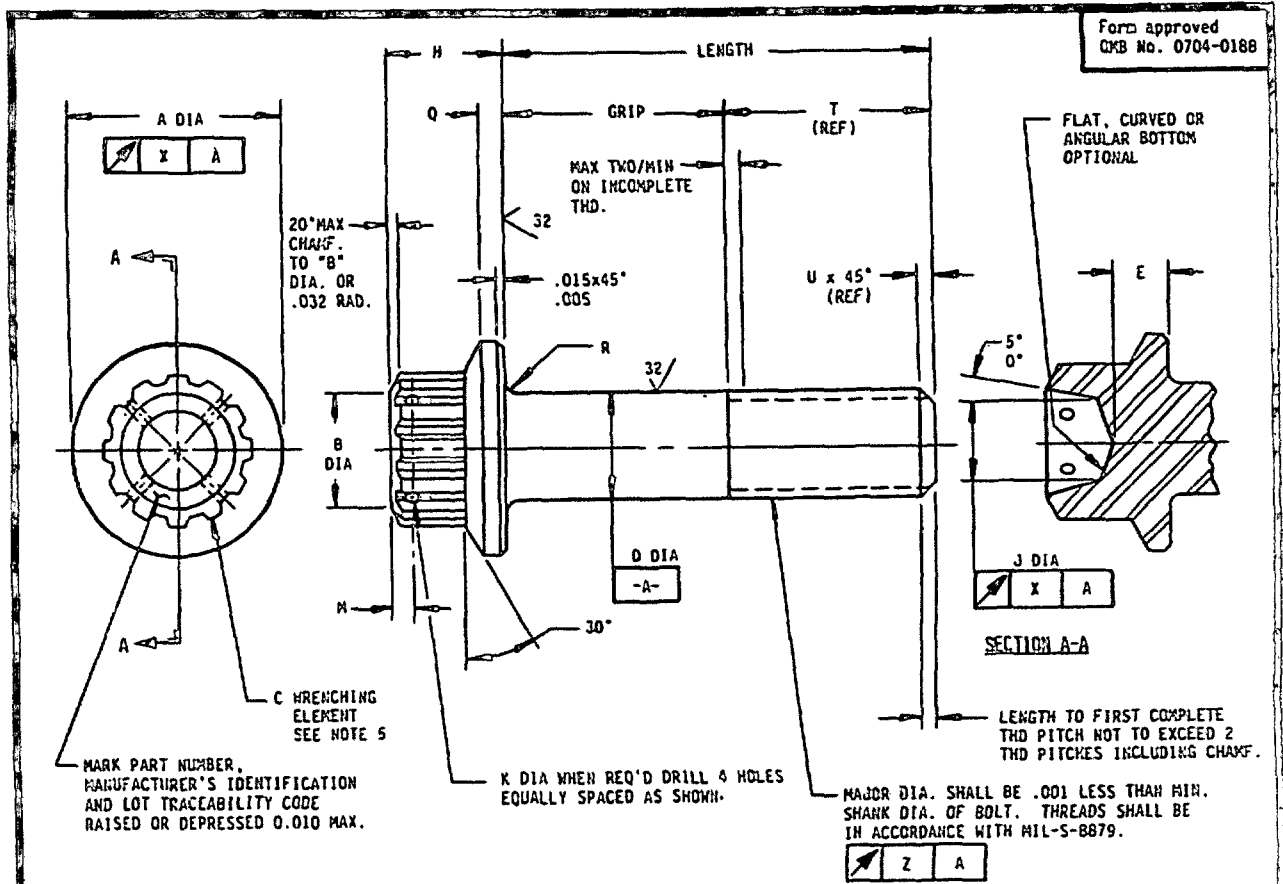


THE REQUIREMENTS FOR ACQUIRING THE PRODUCT(S) DESCRIBED HEREIN SHALL CONSIST OF THIS SPECIFICATION SHEET AND THE ISSUE OF THE FOLLOWING SPECIFICATION LISTED IN THAT ISSUE OF THE DODISS SPECIFIED IN THE SOLICITATION: MIL-B-85604

THIS SPECIFICATION IS APPROVED FOR USE BY THE NAVAL AIR SYSTEMS COMMAND, DEPARTMENT OF THE NAVY, AND IS AVAILABLE FOR USE BY ALL DEPARTMENTS AND AGENCIES OF THE DEPARTMENT OF DEFENSE.



Form approved QMB No. 0704-0188

REQUIREMENTS:

1. MATERIAL: NICKEL ALLOY 718; CHEMISTRY PER AMS 5662 (UNS N07718) OR AMS 5663 (UNS N07718); BUT MUST BE CAPABLE OF 220 KSI MINIMUM ULTIMATE TENSILE STRENGTH.
2. FINISH: PASSIVATE PER QQ-P-35 EXCEPT CADMIUM PLATED PARTS. CADMIUM PLATED PARTS PER QQ-P-416, TYPE II, CLASS 2, UP TO 450° F APPLICATION ENVIRONMENT.
3. SURFACE TEXTURE: PER ANSI/ASME B46.1.
4. PERFORMANCE: PER MIL-B-85604 EXCEPT AS FOLLOWS:
 - (a) STRESS RUPTURE VALUES AS TABULATED IN TABLE 1.
 - (b) ELEVATED TEMPERATURE TENSILE STRENGTH VALUES AS TABULATED IN TABLE 1.
5. FOR CADMIUM PLATED PARTS, ELEVATED TEMPERATURE TENSILE STRENGTH AND STRESS RUPTURE TESTS NOT REQUIRED.
6. LUBRICANT: DRY FILM LUBRICANT PER MIL-L-46010, TYPE 1.

NOTES:

1. DIMENSIONS IN INCHES; UNLESS OTHERWISE SPECIFIED, TOLERANCES: DECIMALS $\pm .010$; ANGLE: $\pm 2^\circ$.
2. DESIGN AND USAGE INFORMATION: THESE BOLTS ARE DESIGNED TO BE USED WITH MS14182 NUTS AND MS14183 WASHERS.
3. REFERENCE DIMENSIONS ARE FOR DESIGN PURPOSES ONLY AND ARE NOT INSPECTION OR MANUFACTURING REQUIREMENTS.
4. GRIP LENGTH OF BOLT SHALL BE MEASURED FROM UNDERSIDE OF HEAD TO THE END OF FULL CYLINDRICAL PORTION OF SHANK.
5. WRENCHING ELEMENT PER MS33787. WRENCHES PER MIL-W-8982.
6. DIAMETER DASH NO. AT TOP OF TABLE 11, PLUS GRIP DASH NO. CONSTITUTES A COMPLETE PART NUMBER OF A GIVEN BOLT.
7. ADD LETTER "H" BEFORE DASH NO. TO DESIGNATE DRILLED HEAD. FIRST TWO DASH NUMBERS DESIGNATE DIAMETER IN SIXTEENTH INCH INCREMENTS. LAST THREE DASH NUMBERS DESIGNATE GRIP LENGTH IN SIXTEENTH INCH INCREMENTS. ADD "L" AFTER GRIP LENGTH DASH NUMBERS TO DESIGNATE PASSIVATION. ADD "P" AFTER GRIP LENGTH DASH NUMBERS TO DESIGNATE CADMIUM PLATING.
8. EXAMPLES OF PART NUMBER:
 - MS14181-04016P = 0.2500-28 BOLT; 1.520 LQNS; 1.000 GRIP; UNDRILLED HEAD; CADMIUM PLATED.
 - MS14181H04016L = 0.2500-28 BOLT; 1.520 LQNS; 1.000 GRIP; DRILLED HEAD; PASSIVATED COAT WITH DRY FILM LUBE PER MIL-L-46010; TYPE 1.
 - MS14181-04016 = 0.2500-28 BOLT; 1.520 LONG; 1.000 GRIP; UNDRILLED HEAD. (INACTIVE FOR NEW DESIGN)
 - MS14181H04016 = 0.2500-28 BOLT; 1.520 LONG; 1.000 GRIP; DRILLED HEAD. (INACTIVE FOR NEW DESIGN)
9. FOR DESIGN PURPOSES; THIS STANDARD TAKES PRECEDENCE OVER PROCUREMENT DOCUMENTS REFERENCED HEREIN.
10. REFERENCED DOCUMENTS SHALL BE OF THE ISSUE IN EFFECT ON DATE OF INVITATIONS FOR BID OR REQUEST FOR PROPOSAL EXCEPT THAT REFERENCED ADOPTED INDUSTRY DOCUMENTS SHALL GIVE THE DATE OF THE ISSUE ADOPTED.

PREPARING ACTIVITY: NAVY - AS	MILITARY SPECIFICATION SHEET	SPECIFICATION SHEET NUMBER
CUSTODIANS: ARMY- AV NAVY-	TITLE BOLT, TENSION; NICKEL ALLOY 718, 220 KSI F _{tu} ; EXTERNAL WRENCHING, SPLINE DRIVE, FLANGED HEAD	MS14181 C 30 JAN 89
AIR FORCE- 99 DLA-		SUPERSEDING MS14181 B 21 SEP 87
REVIEW: DLA - IS, ARMY - AT, USAF - 82		AMSC- N/A FSC 5305
USER: ARMY - MI		
PROJECT NUMBER: 5305-1207		
DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.		Page 1 of 4

TABLE I

DIA DASH NO.	NOMINAL SIZE	THREAD UNF-3A	A-DIA		B-DIA		C WRENCHING ELEMENT	D-DIA	
			MAX	MIN	MAX	MIN		MAX	MIN
03	NO. 10	.1900-32	.359	.349	.188	.173	8	.1895	.1885
04	1/4	.2500-28	.470	.460	.250	.235	10	.2495	.2485
05	5/16	.3125-24	.585	.575	.375	.360	12	.3120	.3110
06	3/8	.3750-24	.701	.691	.438	.423	14	.3745	.3735
07	7/16	.4375-20	.817	.807	.500	.485	16	.4370	.4360
08	1/2	.5000-20	.932	.922	.562	.547	20	.4995	.4985
09	9/16	.5625-18	1.047	1.037	.625	.610	22	.5615	.5605
10	5/8	.6250-18	1.163	1.153	.688	.673	24	.6240	.6230
12	3/4	.7500-16	1.394	1.384	.812	.797	28	.7490	.7480
14	7/8	.8750-14	1.625	1.615	.938	.923	32	.8740	.8730
16	1.0	1.0000-12	1.856	1.846	1.062	1.047	38	.9990	.9980

TABLE I CONT'D

DIA DASH NO.	E MIN	H ±.010	J-DIA +.010 -0.030	K ±.005	N	Q		R-RAD		T MIN REF
						MAX	MIN	MAX	MIN	
03	.113	.205	.100	.037	.062	.037	.017	.022	.016	.408
04	.149	.250	.125			.046	.026	.028	.022	.495
05	.187	.312	.215			.055	.035	.035	.029	.589
06	.224	.337	.260	.070	.070	.064	.044	.043	.033	.659
07	.262	.393	.320			.073	.053	.049	.039	.763
08	.299	.450	.380			.032	.062	.055	.045	.838
09	.336	.505	.440	.065	.094	.091	.071	.061	.051	.935
10	.374	.562	.500			.100	.080	.068	.058	1.005
12	.499	.600	.570			.118	.098	.080	.070	1.173
14	.523	.700	.650	.125	.125	.136	.116	.093	.083	1.348
16	.599	.800	.740			.154	.134	.105	.095	1.546

TABLE I CONT'D

DIA DASH NO.	U REF	BEARING AREA (MEAN DIA) SQ. IN.	TENSILE STRENGTH			DOUBLE SHEAR STRENGTH LB. MIN.	STRESS RUPTURE AT 800°F (LBS)	TOLERANCE	
			ROOM TEMPERATURE		AT 800°F			X	Z
			MAX. (LBS)	MIN. (LBS)	MIN. (LBS)				
03	.039	.0517	5,640	4,770	3,810	7,100	2,670	.004	.004
04	.045	.0914	10,080	8,540	6,830	12,300	4,780	.005	
05	.052	.1442	15,960	13,500	10,800	19,200	7,560	.006	
06		.2106	24,700	20,900	16,720	27,650	11,700	.008	
07	.063	.2896	33,480	28,300	22,640	37,600	15,840	.009	.006
08		.3786	44,640	37,800	30,240	49,100	21,160	.010	
09	.089	.4808	56,570	47,900	38,320	62,150	26,820	.011	
10		.5945	70,820	59,900	47,920	76,700	33,540	.012	
12		.7512	100,800	86,900	69,500	109,857	48,700	.015	
14		1.1673	137,000	119,000	95,000	149,640	66,600	.018	.009
16	.100	1.5465	179,000	155,000	124,000	195,565	86,800	.020	

PREPARING ACTIVITY: NAVY-AS
 CUSTODIANS: ARMY- AV NAVY-
 AIR FORCE- 99 DLA-
 REVIEW: DLA-IS, ARMY-AT, USAF-82
 USER: ARMY-MI
 PROJECT NUMBER: 5306-1207

MILITARY SPECIFICATION SHEET
 TITLE BOLT, TENSION, NICKEL ALLOY 718, 220 KSI Ft_u; EXTERNAL WRENCHING, SPLINE DRIVE, FLANGED HEAD

SPECIFICATION SHEET NUMBER
MS14181 C 30 JAN 89
 SUPERSEDING
 MS14181 B 21 SEP 87
 AMSC- N/A FSC 5306

TABLE II

GRIP DASH NO.	GRIP ±.010	DIAMETER DASH NUMBERS										
		03	04	05	06	07	08	09	10	12	14	16
		LENGTH ±.015										
004	.250	0.683	0.770	0.864	0.934	1.038	1.113	1.210	1.280	1.448	1.623	1.821
006	.375	0.808	0.895	0.989	1.059	1.163	1.238	1.335	1.405	1.573	1.748	1.946
008	.500	0.933	1.020	1.114	1.184	1.288	1.363	1.460	1.530	1.698	1.873	2.071
010	.625	1.058	1.145	1.239	1.309	1.413	1.488	1.585	1.655	1.823	1.998	2.196
012	.750	1.183	1.270	1.364	1.434	1.538	1.613	1.710	1.780	1.948	2.123	2.321
014	.875	1.308	1.395	1.489	1.559	1.663	1.738	1.835	1.905	2.073	2.248	2.446
016	1.000	1.433	1.520	1.614	1.684	1.778	1.863	1.960	2.030	2.198	2.373	2.571
018	1.125	1.558	1.645	1.739	1.809	1.913	1.988	2.085	2.155	2.323	2.498	2.696
020	1.250	1.683	1.770	1.864	1.934	2.038	2.113	2.210	2.280	2.448	2.623	2.821
022	1.375	1.808	1.895	1.989	2.059	2.163	2.238	2.335	2.405	2.573	2.748	2.946
024	1.500	1.933	2.020	2.114	2.184	2.288	2.363	2.460	2.530	2.698	2.873	3.071
026	1.625	2.058	2.145	2.239	2.309	2.413	2.488	2.585	2.655	2.823	2.998	3.196
028	1.750	2.183	2.270	2.364	2.434	2.538	2.613	2.710	2.780	2.948	3.123	3.321
030	1.875	2.308	2.395	2.489	2.559	2.663	2.738	2.835	2.905	3.073	3.248	3.446
032	2.000	2.433	2.520	2.614	2.684	2.788	2.863	2.960	3.030	3.198	3.373	3.571
034	2.125	2.558	2.645	2.739	2.809	2.913	2.988	3.085	3.155	3.323	3.498	3.696
036	2.250	2.683	2.770	2.864	2.934	3.038	3.113	3.210	3.280	3.448	3.623	3.821
038	2.375	2.808	2.895	2.989	3.059	3.163	3.238	3.335	3.405	3.573	3.748	3.946
040	2.500	2.933	3.020	3.114	3.184	3.288	3.363	3.460	3.530	3.698	3.873	4.071
042	2.625	3.058	3.145	3.239	3.309	3.413	3.488	3.585	3.655	3.823	3.998	4.196
044	2.750	3.183	3.270	3.364	3.434	3.538	3.613	3.710	3.780	3.948	4.123	4.321
046	2.875	3.308	3.395	3.489	3.559	3.663	3.738	3.835	3.905	4.073	4.248	4.446
048	3.000	3.433	3.520	3.614	3.684	3.788	3.863	3.960	4.030	4.198	4.373	4.571
050	3.125	3.558	3.645	3.739	3.809	3.913	3.988	4.085	4.155	4.323	4.498	4.696
052	3.250	3.683	3.770	3.864	3.934	4.038	4.113	4.210	4.280	4.448	4.623	4.821
054	3.375	3.808	3.895	3.989	4.059	4.163	4.238	4.335	4.405	4.573	4.748	4.946
056	3.500	3.933	4.020	4.114	4.184	4.288	4.363	4.460	4.530	4.698	4.873	5.071
058	3.625	4.058	4.125	4.239	4.309	4.413	4.488	4.585	4.655	4.823	4.998	5.196
060	3.750	4.183	4.270	4.364	4.434	4.538	4.613	4.710	4.780	4.948	5.123	5.321
062	3.875	4.308	4.395	4.489	4.559	4.663	4.738	4.835	4.905	5.073	5.248	5.446
064	4.000	4.433	4.520	4.614	4.684	4.788	4.863	4.960	5.030	5.198	5.373	5.571
066	4.125	4.558	4.645	4.739	4.809	4.913	4.988	5.085	5.155	5.323	5.498	5.696
068	4.250	4.683	4.770	4.864	4.934	5.038	5.113	5.210	5.280	5.448	5.623	5.821
070	4.375	4.803	4.895	4.989	5.059	5.163	5.238	5.335	5.405	5.573	5.748	5.946
072	4.500	4.933	5.020	5.114	5.184	5.288	5.363	5.460	5.530	5.698	5.873	6.071
074	4.625	5.058	5.145	5.239	5.309	5.413	5.488	5.585	5.655	5.823	5.998	6.196
076	4.750	5.183	5.270	5.364	5.434	5.538	5.613	5.710	5.780	5.948	6.123	6.321

PREPARING ACTIVITY: NAVY - AS
 CUSTODIANS: ARMY- AY NAVY-
 AIR FORCE- 99 DLA-
 REVIEW: DLA-15, ARMY-AT, USAF-82
 USER: ARMY-MI
 PROJECT NUMBER: 5306-1207

MILITARY SPECIFICATION SHEET

TITLE BOLT, TENSION, NICKEL ALLOY 718, 220
 KSI Ftw, EXTERNAL WRENCHING, SPLINE
 DRIVE, FLANGED HEAD

SPECIFICATION SHEET NUMBER
MS14181 C 30 JAN 89

SUPERSEDING
 HSI14181 B 21 SEP 87

AMSC- N/A FSC 5306

DISTRIBUTION STATEMENT

A Approved for public release; distribution is unlimited.

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TABLE II CONT'D

GRIP DASH NO.	GRIP ±.010	DIAMETER DASH NUMBERS										
		03	04	05	06	07	08	09	10	12	14	16
		LENGTH ±.015										
078	4.875	5.308	5.395	5.489	5.559	5.663	5.738	5.835	5.905	6.073	6.248	6.446
080	5.000	5.433	5.520	5.614	5.684	5.788	5.863	5.960	6.030	6.198	6.373	6.571
082	5.125	5.558	5.645	5.739	5.809	5.913	5.988	6.085	6.155	6.323	6.498	6.696
084	5.250	5.683	5.770	5.864	5.934	6.038	6.113	6.210	6.280	6.448	6.623	6.821
085	5.375	5.808	5.895	5.989	6.059	6.163	6.238	6.335	6.405	6.573	6.748	6.946
088	5.500	5.933	6.020	6.114	6.184	6.288	6.363	6.460	6.530	6.698	6.873	7.071
090	5.625	6.058	6.145	6.239	6.309	6.413	6.488	6.585	6.655	6.823	6.998	7.196
092	5.750	6.183	6.270	6.364	6.434	6.538	6.613	6.710	6.780	6.948	7.123	7.321
094	5.875	6.308	6.395	6.489	6.559	6.663	6.738	6.835	6.905	7.073	7.248	7.446
096	6.000	6.433	6.520	6.614	6.684	6.788	6.863	6.960	7.030	7.198	7.373	7.571
098	6.125	6.558	6.645	6.739	6.809	6.913	6.988	7.085	7.155	7.323	7.498	7.696
100	6.250	6.683	6.770	6.864	6.934	7.038	7.113	7.210	7.280	7.448	7.623	7.821
102	6.375	6.808	6.895	6.989	7.059	7.163	7.238	7.335	7.405	7.573	7.748	7.946
104	6.500	6.933	7.020	7.114	7.184	7.288	7.363	7.460	7.530	7.698	7.873	8.071
106	6.625	7.058	7.145	7.239	7.309	7.413	7.488	7.585	7.655	7.823	7.998	8.196
108	6.750	7.183	7.270	7.364	7.434	7.538	7.613	7.710	7.780	7.948	8.123	8.321
110	6.875	7.308	7.395	7.489	7.559	7.663	7.738	7.835	7.905	8.073	8.248	8.446
112	7.000	7.433	7.520	7.614	7.684	7.788	7.863	7.960	8.030	8.198	8.373	8.571

PREPARING ACTIVITY: NAVY-AS
 CUSTODIANS: ARMY- AV NAVY-
 AIR FORCE- 99 DLA-
 REVIEW: DLA-IS, ARMY-AT, USAF-82
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MILITARY SPECIFICATION SHEET
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 KSI FtU, EXTERNAL WRENCHING, SPLINE
 DRIVE, FLANGED HEAD

SPECIFICATION SHEET NUMBER
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