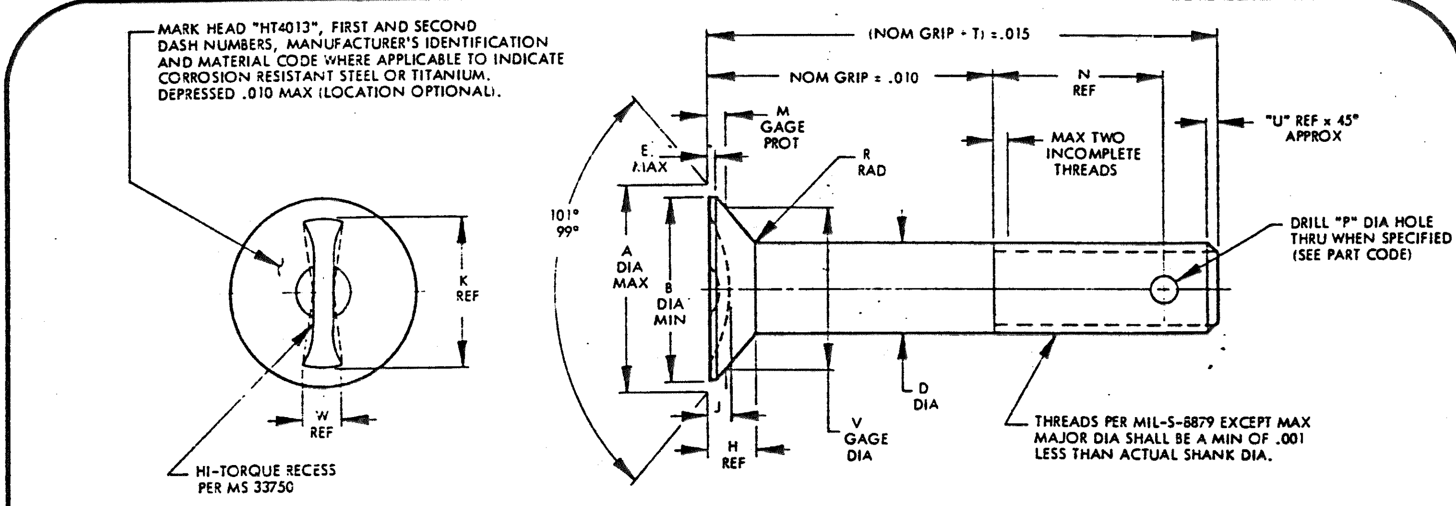
ENGINEERING STANDARDS COMMITTEE
FOR HI-TORQUE PRODUCTS

P.O. BOX 512, CULVER CITY, CA. 90230. PH. 213-838-2131

HI-SHEAR CORP. (73197)
VOI-SHAN (92215)
STANDARD PRESSED STEEL CO. (80539)
OMARK IND. P.F.S. (85495)



FIRST DASH NO. 9	THREAD	A DIA MAX	B DIA MIN	D DIA Un-Plated	D DIA Plated	E MAX	F TIR 8	H REF	M GAGE PROT	N REF	P DIA	R RAD	T Basic	U REF	V Gage Dia	Z 2		HI-TORQUE RECESS Recess No.	J	K REF	W REF	TORQUE IN/LBS MIN	ULTIMATE TENSILE STRENGTH LBS/MIN 6
-3	.1900-32 UNJF-3A	.303	.266	.1895 .1890	.1895 .1885	.012	.005	.049	.0243 .0217	.265	.080 .070	.020 .010	.363	.039	.2440 .2438	.004		2	.039 .036	.244	.100	37	2,000
-4	.2500-28 UNJF-3A	.397	.355	.2495 .2490	.2495 .2485	.014	.006	.063	.0270 .0240	.312	.086 .076	.020 .010	.403	.045	.3314 .3312	.003		3	.045 .042	.300	.100	50	3,700
-5	.3125-24 UNJF-3A	.477	.429	.3120 .3115	.3120 .3110	.016	.007	.071	.0297 .0263	.359	.086 .076	.025 .010	.501	.052	.4047 .4045	.003		4	.049 .046	.394	.134	125	5,000
-6	.3750-24 UNJF-3A	.564	.510	.3745 .3740	.3745 .3735	.018	.008	.081	.0324 .0286	.437	.116 .106	.030 .015	.594	.052	.4854 .4852	.0025		5	.064 .061	.484	.160	250	7,200
-7	.4375-20 UNJF-3A	.672	.612	.4370 .4365	.4370 .4360	.020	.009	.101	.0421 .0379	.484	.116 .106	.030 .015	.675	.062	.5698 .5696	.0025		6	.070 .066	.571	.198	430	10,000
-8	.5000-20 UNJF-3A	.755	.688	.4995 .4990	.4995 .4985	.022	.010	.109	.0431 .0385	.609	.116 .106	.030 .015	.768	.062	.6500 .6498	.002		7	.086 .082	.660	.224	925	13,500
-9	.5625-18 UNJF-3A	.838	.766	.5615 .5610	.5615 .5605	.024	.010	.119	.0488 .0438	.656	.151 .141	.030 .015	.881	.068	.7200 .7198	.002		8	.098 .094	.731	.256	1,210	17,000
-10	.6250-18 UNJF-3A	.925	.848	.6240 .6235	.6240 .6230	.026	.010	.129	.0427 .0373	.734	.151 .141	.030 .015	.981	.068	.8214 .8212	.002		9	.104 .100	.819	.300	1,760	21,000

PROCUREMENT SPEC: NAS498 FOR ALLOY STEEL; AMS7478 (MODIFIED) FOR A-286 CRES; NAS 621 FOR TITANIUM ALLOY.

MATERIAL: DASH (-) ALLOY STEEL PER NAS 498
CODE LETTER "C" A-286 CRES PER AMS 5735
CODE LETTER "V" 6AI-4V TITANIUM ALLOY PER NAS621

HEAT TREAT: 160,000 PSI MINIMUM TENSILE STRENGTH

FINISH CODE ALLOY STEEL PARTS: NO CODE LETTER CADMIUM PLATE PER QQ-P-416, TYPE II, CLASS 3.
A-286 CRES PARTS: NO CODE LETTER PASSIVATE PER QQ-P-35.
CODE LETTER "P" CADMIUM PLATE PER QQ-P-416, TYPE II, CLASS 2.

6AI-4V TITANIUM ALLOY PARTS: NO CODE LETTER NO FINISH

PART CODE & EXAMPLE: HT4013 - 4 D -8 - X

- NO CODE STANDARD SHANK (D) DIA
  X - 1/64 OVERSIZE SHANK (D) DIA
  Y - 1/32 OVERSIZE SHANK (D) DIA
- FINISH CODE FOR A-286
- NOMINAL GRIP LENGTH IN 16THS
- DRILL CODE:
  - - UNDRILLED
  D DRILLED THREADS
- NOMINAL DIAMETER (IN 16THS) FOR STANDARD DIAMETER BOLTS AS TABULATED
- DASH DESIGNATES ALLOY STEEL CODE LETTER IN LIEU OF DASH DESIGNATES A-286 OR TITANIUM
- BASIC PART NUMBER

GENERAL NOTES:

1. CONCENTRICITY: CONICAL SURFACE OF HEAD TO "D" DIA WITHIN .003 TIR.
   "D" DIA TO THREAD PTICH DIA WITHIN .0045 TIR FOR -3 THRU -6 WITHIN .006 TIR FOR -7 THRU -10 RECESS TO "D" DIA WITHIN .010 TIR FOR -3, WITHIN .012 TIR FOR -4 THRU -6, WITHIN .015 FOR -7 THRU -10, AND WITHIN .018 FOR -12 SIZE.
2. SHANK SHALL BE STRAIGHT WITHIN "Z" VALUES PER INCH OF BOLT LENGTH.
3. SURFACE ROUGHNESS PER ANSI B46.1. CONICAL SURFACE OF HEAD, HEAD TO SHANK FILLET, SHANK AND ALL THREAD ELEMENTS 32 MAX RHR; ALL OTHER SURFACES 125 MAX RHR.
4. MAGNETIC PARTICLE INSPECT PER MIL-I-6868 (ALLOY STEEL) OR FLUORESCENT PENETRANT INSPECT PER MIL-I-6866 (A-286 OR TITANIUM).
5. RECESS SHALL WITHSTAND THE RECESS INSPECTION TORQUE TABULATED WITH AN AXIAL END PRESSURE NOT EXCEEDING 15 POUNDS WITHOUT FAILURE OF RECESS OR APPLICABLE HI-TORQUE DRIVER.
6. MINIMUM TENSILE LOADS FOR "X" AND "Y" CODED PARTS ARE 85 PERCENT OF STANDARD LOADS TABULATED.
7. DIMENSIONS IN INCHES AND TO BE MET AFTER FINISH.
8. HEAD OUT OF ROUNDNESS SHALL NOT EXCEED "F" TIR.
9. NAS 1581 SERIES MAY BE SUPPLIED FOR STANDARD DIAMETER IN LIEU OF HI-TORQUE STANDARD.

U.S. PATENT NUMBERS: 2,745,120; 2,808,087; 2,864,418; 2,949,949; 2,954,719; 2,994,354; 3,060,565; 3,103,675; 3,388,411; OTHER U.S. AND FOREIGN PATENTS PENDING

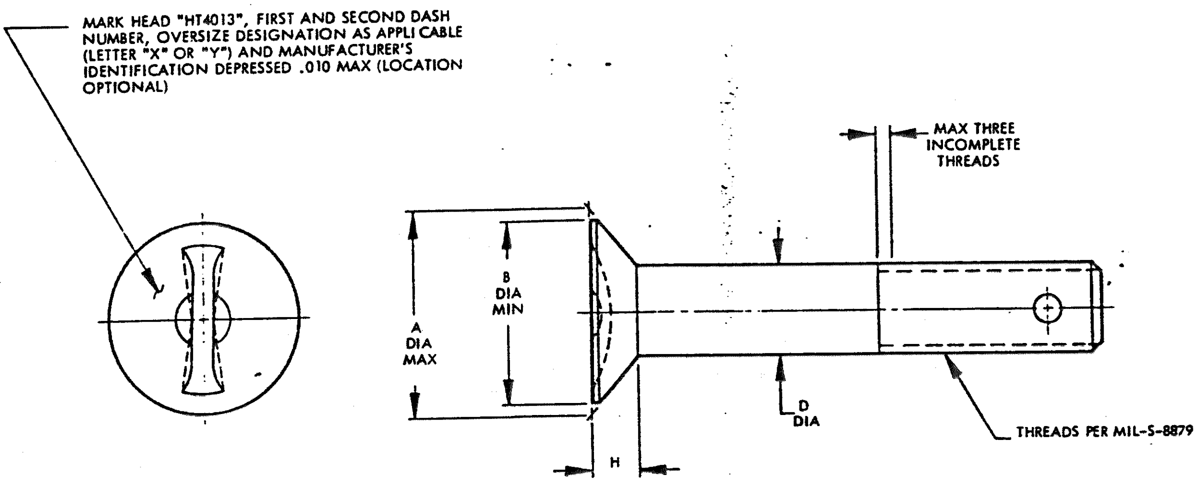
DRAWN	HI-TORQUE®	DRAWING NUMBER
4 FEBRUARY 1972	BOLT, 100° REDUCED HEAD CLOASE TOLERANCE, LONG THREAD 160 KSI MIN TENSILE	HT 4013
REV. LETTER AND DATE D 11 JULY 1973		SHEET 1 OF 2

ENGINEERING STANDARDS COMMITTEE
FOR HI-TORQUE PRODUCTS
P.O. BOX 512, CULVER CITY, CA. 90230. PH. 213-838-2131

HI-SHEAR CORP. (73197)
VOI-SHAN (92215)
STANDARD PRESSED STEEL CO. (80539)
OMARK IND. P.F.S. (85495)

RESTRICTED USAGE FOR REPAIR WORK ONLY

.0156 AND .0312 OVERSIZE SHANK FOR REPLACEMENT OF BOLTS SHOWN ON SHEET 1



.0156 OVERSIZE ⚠10

PART NUMBER	A DIA MAX	B DIA MIN	D DIA Unplated	D DIA Plated	H REF	M GAGE PROT	
HT4013-3( )( )X	.303	.266	.2026 .2021	.2026 .2016	.043	.0243 .0217	
HT4013-4( )( )X	.397	.355	.2651 .2646	.2651 .2641	.057	.0270 .0240	
HT4013-5( )( )X	.477	.429	.3276 .3271	.3276 .3266	.065	.0297 .0263	
HT4013-6( )( )X	.564	.510	.3901 .3896	.3901 .3891	.075	.0324 .0286	
HT4013-7( )( )X	.672	.612	.4526 .4521	.4526 .4516	.095	.0421 .0379	
HT4013-8( )( )X	.755	.688	.5151 .5146	.5151 .5141	.103	.0431 .0385	
HT4013-9( )( )X	.838	.766	.5771 .5766	.5771 .5761	.113	.0488 .0438	
HT4013-10( )( )X	.925	.848	.6396 .6391	.6396 .6386	.123	.0427 .0373	

.0312 OVERSIZE ⚠10

PART NUMBER	A DIA MAX	B DIA MIN	D DIA Unplated	D DIA Plated	H REF	M GAGE PROT	
HT4013-3( )( )Y	.334	.297	.2182 .2177	.2182 .2172	.049	.0376 .0346	
HT4013-4( )( )Y	.428	.386	.2807 .2802	.2807 .2797	.063	.0403 .0369	
HT4013-5( )( )Y	.508	.460	.3432 .3427	.3432 .3422	.071	.0429 .0393	
HT4013-6( )( )Y	.595	.541	.4057 .4052	.4057 .4047	.081	.0455 .0417	
HT4013-7( )( )Y	.703	.643	.4682 .4677	.4682 .4672	.101	.0556 .0506	
HT4013-8( )( )Y	.786	.719	.5307 .5302	.5307 .5297	.109	.0564 .0514	
HT4013-9( )( )Y	.869	.797	.5927 .5922	.5927 .5917	.119	.0620 .0568	
HT4013-10( )( )Y	.956	.879	.6552 .6547	.6552 .6542	.129	.0562 .0500	

⚠10 FOR MATERIAL, FINISH, PROCUREMENT INFORMATION AND DIMENSIONS NOT SHOWN SEE SHEET 1.

U.S. PATENT NUMBERS: 2,745,120; 2,808,087; 2,864,418; 2,949,949; 2,954,719; 2,994,354; 3,060,565; 3,103,675; 3,388,411; OTHER U.S. AND FOREIGN PATENTS PENDING

DRAWN	HI-TORQUE®	DRAWING NUMBER
4 FEBRUARY 1972	BOLT, 100° REDUCED HEAD CLOSE TOLERANCE, LONG THREAD 160 KSI MIN TENSILE	HT 4013
REV. LETTER AND DATE (D) 11 JULY 1973		SHEET 2 OF 2