

FEDERAL SUPPLY CLASS
5307

REV.
B

AS51989™

RATIONALE

FIGURE REDRAWN, CADMIUM PLATE NOTE ADDED, CADMIUM PLATING SPEC UPDATED AND DOCUMENT GENERALLY UPDATED.

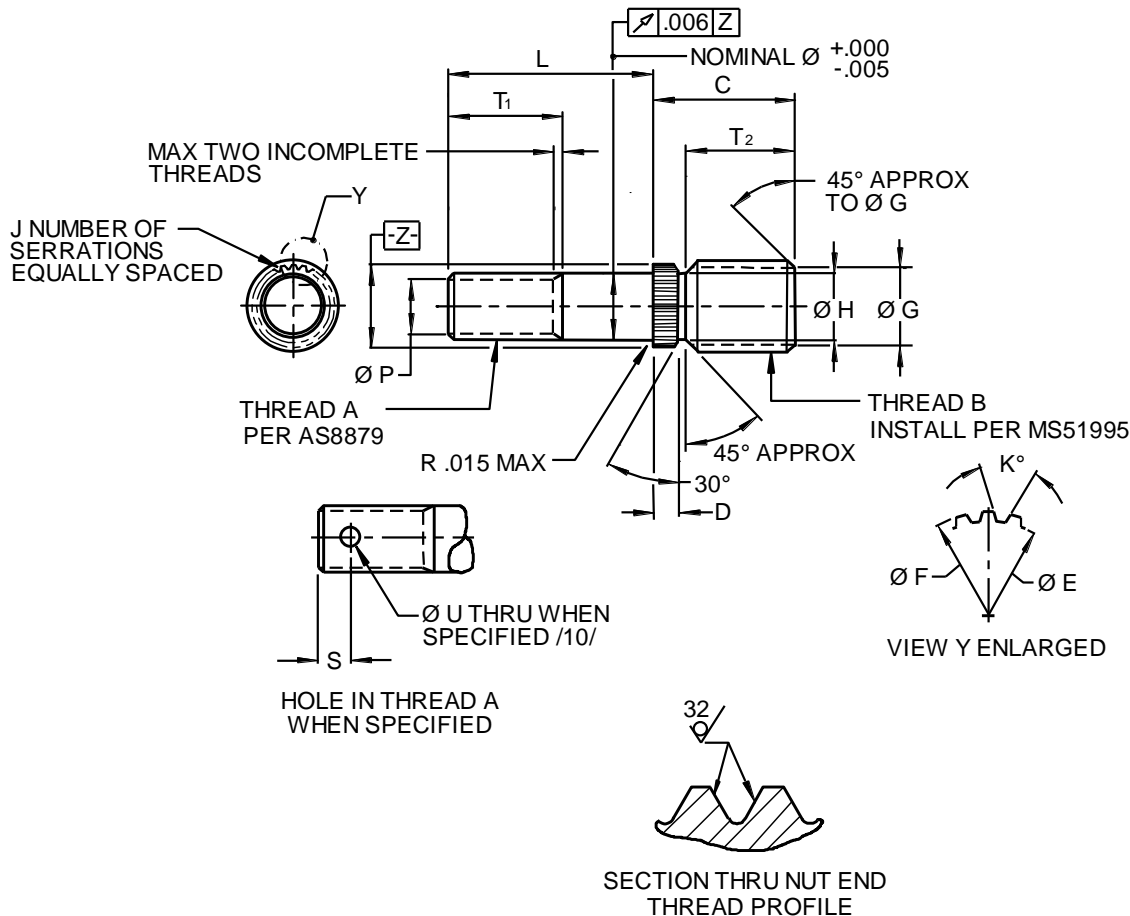
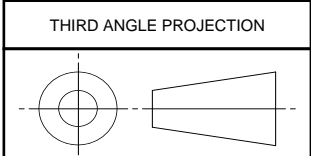


FIGURE 1

SAE values your input. To provide feedback on this Technical Report, please visit <http://www.sae.org/technical/standards/AS51989B>



CUSTODIAN: E-25

PROCUREMENT SPECIFICATION: NASM45909



AEROSPACE STANDARD

(R) STUD, LOCKED IN-RING LOCKED, SERRATED

AS51989
SHEET 1 OF 6

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ISSUED 1999-04 REAFFIRMED 2014-04 REVISED 2016-04

TABLE 1 - FINE THREAD NUT END - COARSE THREAD STUD END

MS51989 DASH NO.	A NUT END THREAD UNJF-3A	B STUD END THREAD (COARSE) SEE THREAD NOTE		C $\pm .015$	D $\pm .015$	E DIA +.005 -.004	F DIA +.007 -.002	G DIA $\pm .010$	H DIA	J	K° +2° -1°	T ₁ $\pm .015$	T ₂ $\pm .015$	P DIA $\pm .010$	S $\pm .015$	U DIA	LOCKRING PART NO. (REF) /14/	
	SIZE	SIZE	PITCH DIA			MINOR DIA												
-102	.1380-40	.1640-32	.1461 .1446	.1280 .1215	.250	.060	.152	.175	.113	.116	14	102°	.380	.140	.096	--	--	MS51990-102P
-103	.1640-36	.1900-24	.1654 .1639	.1413 .1334	.380	.080	.178	.201	.122	.128	16	90°	.410	.230	.117	.110	.070	MS51990-103P
-104	.1900-32	.2500-20	.2204 .2187	.1915 .1824	.440	.080	.203	.230	.169	.177	13	102°	.440	.280	.137	.120	.070	MS51990-104P
-105	.2500-28	.3125-18	.2795 .2778	.2474 .2373	.560	.080	.255	.284	.222	.232	17	86°	.500	.390	.190	.160	.076	MS51990-105P
-106	.3125-24	.3750-16	.3378 .3358	.3017 .2906	.690	.080	.316	.345	.274	.285	20	102°	.560	.510	.242	.160	.076	MS51990-106P
-107	.3750-24	.4375-14	.3946 .3926	.3534 .3411	.750	.120	.380	.407	.322	.336	24	102°	.620	.520	.305	.170	.106	MS51990-107P
-108	.4375-20	.5000-13	.4537 .4512	.4093 .3963	.810	.120	.456	.487	.375	.391	26	102°	.690	.570	.354	.170	.106	MS51990-108P
-109	.5000-20	.5625-12	.5097 .5097	.4503 .4503	.880	.120	.567	.601	.427	.445	26	111°	.810	.630	.416	.190	.106	MS51990-109P
-110	.5625-18	.6250-11	.5699 .5674	.5174 .5028	1.000	.140	.567	.601	.477	.497	26	111°	.940	.720	.469	.220	.141	MS51990-109P
-111	.6250-18	.7500-10	.6891 .6866	.6314 .6156	1.120	.160	.687	.721	.588	.610	30	111°	1.000	.820	.532	.220	.141	MS51990-110P
-112	.7500-16	.8750-9	.8071 .8046	.7430 .7257	1.310	.160	.783	.820	.695	.721	30	111°	1.120	.990	.645	.220	.141	MS51990-111P

TABLE 2 - FINE THREAD NUT END - FINE THREAD STUD END

MS51989 DASH NO.	A NUT END THREAD UNJF-3A	B STUD END THREAD (FINE) SEE THREAD NOTE		C $\pm .015$	D $\pm .015$	E DIA +.005 -.004	F DIA +.007 -.002	G DIA $\pm .010$	H DIA	J	K° +2° -1°	T ₁ $\pm .015$	T ₂ $\pm .015$	P DIA $\pm .010$	S $\pm .015$	U DIA	LOCKRING PART NO. (REF) /14/	
	SIZE	SIZE	PITCH DIA			MINOR DIA												
-202	.1380-40	.1640-36	.1483 .1468	.1323 .1262	.250	.060	.152	.175	.119	.121	14	102°	.380	.140	.096	--	--	MS51990-102P
-203	.1640-36	.1900-32	.1721 .1706	.1541 .1475	.380	.080	.178	.201	.139	.143	16	90°	.410	.250	.117	.110	.070	MS51990-103P
-204	.1900-32	.2500-28	.2296 .2281	.2090 .2014	.440	.080	.203	.230	.192	.197	13	102°	.440	.310	.137	.120	.070	MS51990-104P
-205	.2500-28	.3125-24	.2884 .2869	.2643 .2559	.560	.080	.255	.284	.245	.251	17	86°	.500	.420	.190	.160	.076	MS51990-105P
-206	.3125-24	.3750-24	.3512 .3497	.3271 .3185	.690	.080	.316	.345	.307	.306	20	102°	.560	.550	.242	.160	.076	MS51990-106P
-207	.3750-24	.4375-20	.4084 .4067	.3795 .3700	.750	.120	.380	.407	.356	.365	24	102°	.620	.550	.305	.170	.106	MS51990-107P
-208	.4375-20	.5000-20	.4711 .4694	.4422 .4325	.810	.120	.456	.487	.419	.427	26	102°	.690	.610	.354	.170	.106	MS51990-108P
-209	.5000-20	.5625-18	.5301 .5284	.4980 .4873	.880	.120	.567	.601	.472	.482	26	111°	.810	.670	.416	.190	.106	MS51990-109P
-210	.5625-18	.6250-18	.5927 .5910	.5606 .5498	1.000	.140	.567	.601	.535	.545	26	111°	.940	.780	.469	.220	.141	MS51990-109P
-211	.6250-18	.7500-16	.7134 .7114	.6773 .6656	1.120	.160	.687	.721	.648	.661	30	111°	1.000	.880	.532	.220	.141	MS51990-110P
-212	.7500-16	.8750-14	.8328 .8308	.7916 .7786	1.310	.160	.783	.820	.759	.773	30	111°	1.120	1.050	.645	.220	.141	MS51990-111P

**AEROSPACE STANDARD**

(R) STUD, LOCKED IN-RING LOCKED, SERRATED

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SHEET 2 OF 6**REV.**
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TABLE 3 - COARSE THREAD NUT END - COARSE THREAD STUD END

MS51989 DASH NO.	A NUT END THREAD UNJC-3A	B STUD END THREAD (COARSE) SEE THREAD NOTE		C $\pm.015$	D $\pm.015$	E DIA $+0.005$ -0.004	F DIA $+0.007$ -0.002	G DIA $\pm.010$	H DIA	J	K° $+2^\circ$ -1°	T ₁ $\pm.015$	T ₂ $\pm.015$	P DIA $\pm.010$	S $\pm.015$	U DIA	LOCKRING PART NO. (REF) /14/	
	SIZE	SIZE	PITCH DIA															MINOR DIA
-302	.1380-32	.1640-32	.1461 .1446	.1280 .1215	.250	.060	.152	.175	.113	.116	14	102°	.380	.140	.085	--	--	MS51990-102P
-303	.1640-32	.1900-24	.1654 .1639	.1413 .1334	.380	.080	.178	.201	.122	.128	16	90°	.410	.230	.111	.110	.070	MS51990-103P
-304	.1900-24	.2500-20	.2204 .2187	.1915 .1824	.440	.080	.203	.230	.169	.177	13	102°	.440	.280	.120	.120	.070	MS51990-104P
-305	.2500-20	.3125-18	.2795 .2778	.2474 .2373	.560	.080	.255	.284	.222	.232	17	86°	.500	.390	.166	.160	.076	MS51990-105P
-306	.3125-18	.3750-16	.3378 .3358	.3017 .2906	.690	.080	.316	.345	.274	.285	20	102°	.560	.510	.219	.160	.076	MS51990-106P
-307	.3750-16	.4375-14	.3946 .3926	.3534 .3411	.750	.120	.380	.407	.322	.336	24	102°	.620	.520	.270	.170	.106	MS51990-107P
-308	.4375-14	.5000-13	.4537 .4512	.4093 .3963	.810	.120	.456	.487	.375	.391	26	102°	.690	.570	.318	.170	.106	MS51990-108P
-309	.5000-13	.5625-12	.5122 .5097	.4641 .4503	.880	.120	.567	.601	.427	.445	26	111°	.810	.630	.371	.190	.106	MS51990-109P
-310	.5625-12	.6250-11	.5699 .5674	.5174 .5028	1.000	.140	.567	.601	.477	.497	26	111°	.940	.720	.423	.220	.141	MS51990-109P
-311	.6250-11	.7500-10	.6891 .6866	.6314 .6156	1.120	.160	.687	.721	.588	.610	30	111°	1.000	.820	.473	.220	.141	MS51990-110P
-312	.7500-10	.8750-9	.8071 .8046	.7430 .7257	1.310	.160	.783	.820	.695	.721	30	111°	1.120	.990	.583	.220	.141	MS51990-111P

TABLE 4 - COARSE THREAD NUT END - FINE THREAD STUD END

MS51989 DASH NO.	A NUT END THREAD UNJC-3A	B STUD END THREAD (FINE) SEE THREAD NOTE		C $\pm.015$	D $\pm.015$	E DIA $+0.005$ -0.004	F DIA $+0.007$ -0.002	G DIA $\pm.010$	H DIA	J	K° $+2^\circ$ -1°	T ₁ $\pm.015$	T ₂ $\pm.015$	P DIA $\pm.010$	S $\pm.015$	U DIA	LOCKRING PART NO. (REF) /14/	
	SIZE	SIZE	PITCH DIA															MINOR DIA
-402	.1380-32	.1640-36	.1483 .1468	.1323 .1262	.250	.060	.152	.175	.119	.121	14	102°	.380	.140	.085	--	--	MS51990-102P
-403	.1640-32	.1900-32	.1721 .1706	.1541 .1475	.380	.080	.178	.201	.139	.143	16	90°	.410	.250	.111	.110	.070	MS51990-103P
-404	.1900-24	.2500-28	.2296 .2281	.2090 .2014	.440	.080	.203	.230	.192	.197	13	102°	.440	.310	.120	.120	.070	MS51990-104P
-405	.2500-20	.3125-24	.2884 .2869	.2643 .2559	.560	.080	.255	.284	.245	.251	17	86°	.500	.420	.166	.160	.076	MS51990-105P
-406	.3125-18	.3750-24	.3512 .3497	.3271 .3185	.690	.080	.316	.345	.307	.306	20	102°	.560	.550	.219	.160	.076	MS51990-106P
-407	.3750-16	.4375-20	.4084 .4067	.3795 .3700	.750	.120	.380	.407	.356	.365	24	102°	.620	.550	.270	.170	.106	MS51990-107P
-408	.4375-14	.5000-20	.4711 .4694	.4422 .4325	.810	.120	.456	.487	.419	.427	26	102°	.690	.610	.318	.170	.106	MS51990-108P
-409	.5000-13	.5625-18	.5301 .5284	.4980 .4873	.880	.120	.567	.601	.472	.482	26	111°	.810	.670	.371	.190	.106	MS51990-109P
-410	.5625-12	.6250-18	.5927 .5910	.5606 .5498	1.000	.140	.567	.601	.535	.545	26	111°	.940	.780	.423	.220	.141	MS51990-109P
-411	.6250-11	.7500-16	.7134 .7114	.6773 .6656	1.120	.160	.687	.721	.648	.661	30	111°	1.000	.880	.473	.220	.141	MS51990-110P
-412	.7500-10	.8750-14	.8328 .8308	.7916 .7786	1.310	.160	.783	.820	.759	.773	30	111°	1.120	1.050	.583	.220	.141	MS51990-111P



AEROSPACE STANDARD

(R) STUD, LOCKED IN-RING LOCKED, SERRATED

AS51989™
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NOTES:

NOTICE

THIS DOCUMENT REFERENCES A PART WHICH CONTAINS CADMIUM AS A PLATING MATERIAL. CONSULT LOCAL OFFICIALS IF YOU HAVE QUESTIONS CONCERNING CADMIUM'S USE.

1. MATERIAL: STEEL, ALLOY, COMPOSITION 4130 PER AMS-S-6758 STEEL.
CORROSION RESISTANT, A286 (UNS S66286) PER AMS5731, AMS5732, AMS5734, OR AMS5737.
2. PROTECTIVE COATING: STEEL, ALLOY, SHALL BE CADMIUM PLATED IN ACCORDANCE WITH AMS2400.
STEEL, CORROSION RESISTANT, SHALL BE PASSIVATED IN ACCORDANCE WITH, METHOD 1, TYPE 2 OR TYPE 8.
3. SURFACE TEXTURE: SYMBOLS PER ASME Y14.36M. REQUIREMENTS PER ASME B46.1. UNLESS OTHERWISE SPECIFIED,
SURFACE TO BE 125 MICROINCHES Ra, EXCEPT SERRATED COLLAR.
4. THREADS: THE STUD END THREAD HAS A SPECIAL PITCH DIAMETER AND MINOR DIAMETER WHICH INSTALLS INTO A
NATIONAL CLASS 3 TAPPED HOLE. THREADS SHALL BE IN ACCORDANCE WITH PROCUREMENT SPECIFICATION.
5. FILLETS: .015 R MAXIMUM.
6. EDGES: BREAK SHARP EDGES .003 TO .015 UNLESS OTHERWISE SPECIFIED.
7. DIMENSIONS: DIMENSIONS IN INCHES TO BE MET AFTER PLATING.
DIMENSIONING AND TOLERANCING PER ANSI Y14.5M-1982 (ASME PUBLICATION).
8. TOLERANCES: LINEAR DIMENSIONS ± 0.005 , ANGULAR DIMENSIONS $\pm 2^\circ$.
9. PROCUREMENT SPECIFICATION: NASM45909
- /10/. PART NUMBERS: THE MS PART NUMBER CONSISTS OF THE MS NUMBER, PLUS THE DASH NUMBER, PLUS THE LENGTH DASH
NUMBER (TABLE 5). ADD "E" IN LIEU OF THE FIRST "DASH" FOR CORROSION RESISTANT STEELS. ADD "D" IN
LIEU OF THE SECOND "DASH" FOR DRILLED HOLE IN NUT END. EXAMPLE:
MS51989-105-24 STUD, ALLOY STEEL, 1.5 INCH NUT END LENGTH
MS51989E105-24 STUD, CRES, 1.5 INCH NUT END LENGTH
MS51989-105D24 STUD, ALLOY STEEL, DRILLED HOLE, 1.5 INCH NUT END LENGTH
MS51989E105D24 STUD, CRES, DRILLED HOLE, 1.5 INCH NUT END LENGTH
11. FOR DESIGN FEATURE PURPOSES, THIS STANDARD TAKES PRECEDENCE OVER PROCUREMENT DOCUMENTS REFERENCED
HEREIN.
12. REFERENCED DOCUMENTS SHALL BE OF THE ISSUE IN EFFECT ON DATE OF INVITATION FOR BID.
13. THE DASH NUMBERS "C100, C200, C300, AND C400" SERIES CRES STUDS IN THE ORIGINAL ISSUE OF THIS MS51989 STANDARD
ARE CANCELLED/INACTIVATED AFTER THE APPROVAL DATE OF REVISION "A" INDICATED ON THIS DOCUMENT. THE
CANCELLED STUDS SHOULD BE USED ON EXISTING CALLOUTS UNTIL STOCK IS DEPLETED. USE THE NEW "E100, E200, E300,
AND E400" SERIES CRES STUDS FOR REPLACEMENT OF "C100, C200, C300, AND C400" SERIES CRES STUDS IN ACCORDANCE
WITH TABLE 6.
- /14/ FOR APPLICABLE LOCKRING DASH NUMBER CODING USE AS51990.
15. REVISION INDICATOR: A CHANGE BAR (I) LOCATED IN THE LEFT MARGIN IS FOR THE CONVENIENCE OF THE USER IN
LOCATING AREAS WHERE TECHNICAL REVISIONS, NOT EDITORIAL CHANGES, HAVE BEEN MADE TO THE PREVIOUS ISSUE OF
THIS DOCUMENT. AN (R) SYMBOL TO THE LEFT OF THE DOCUMENT TITLE INDICATES A COMPLETE REVISION OF THE
DOCUMENT, INCLUDING TECHNICAL REVISIONS. CHANGE BARS AND (R) ARE NOT USED IN ORIGINAL PUBLICATIONS NOR IN
DOCUMENTS THAT CONTAIN EDITORIAL CHANGES ONLY.
16. INVENTORIES OF PARTS MANUFACTURED PRIOR TO SEPTEMBER 2005 HAVING NUT END THREAD PER MIL-S-7742 USING UNR
CONFIGURATION THREAD ROLL DIES ARE ACCEPTABLE UNTIL DEPLETION. PREREQUISITE: MEETING ALL PERFORMANCE
REQUIREMENTS OF THE PROCUREMENT SPECIFICATION.
17. UNLESS OTHERWISE SPECIFIED, PART INVENTORY MANUFACTURED TO PREVIOUS REVISIONS OF THE APPLICABLE DRAWING
OR SPECIFICATION MAY BE PROCURED AND USED UNTIL STOCK IS DEPLETED.

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TABLE 5 - TABULATED LENGTHS (NUT END)

L ± .015 NUT END	LENGTH DASH NUMBER (TABLE APPLICABLE TO TABLES 1, 2, 3, AND 4)										
	COARSE (UNJC) OR FINE (UNJF) SERIES 3A THREADS										
	.1380	.1640	.1900	.2500	.3125	.3750	.4375	.5000	.5625	.6250	.7500
.250	-4										
.312	-5	-5									
.375	-6	-6	-6	-6							
.438	-7	-7	-7	-7							
.500	-8	-8	-8	-8	-8						
.562	-9	-9	-9	-9	-9	-9					
.625	-10	-10	-10	-10	-10	-10	-10				
.688	-11	-11	-11	-11	-11	-11	-11				
.750	-12	-12	-12	-12	-12	-12	-12	-12			
.812	-13	-13	-13	-13	-13	-13	-13	-13	-13		
.875	-14	-14	-14	-14	-14	-14	-14	-14	-14		
.938	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	
1.000	-16	-16	-16	-16	-16	-16	-16	-16	-16	-16	
1.062	-17	-17	-17	-17	-17	-17	-17	-17	-17	-17	
1.125	-18	-18	-18	-18	-18	-18	-18	-18	-18	-18	-18
1.188	-19	-19	-19	-19	-19	-19	-19	-19	-19	-19	-19
1.250	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20
1.312	-21	-21	-21	-21	-21	-21	-21	-21	-21	-21	-21
1.375	-22	-22	-22	-22	-22	-22	-22	-22	-22	-22	-22
1.438		-23	-23	-23	-23	-23	-23	-23	-23	-23	-23
1.500		-24	-24	-24	-24	-24	-24	-24	-24	-24	-24
1.562		-25	-25	-25	-25	-25	-25	-25	-25	-25	-25
1.625		-26	-26	-26	-26	-26	-26	-26	-26	-26	-26
1.688		-27	-27	-27	-27	-27	-27	-27	-27	-27	-27
1.750		-28	-28	-28	-28	-28	-28	-28	-28	-28	-28
1.812		-29	-29	-29	-29	-29	-29	-29	-29	-29	-29
1.875		-30	-30	-30	-30	-30	-30	-30	-30	-30	-30
1.938		-31	-31	-31	-31	-31	-31	-31	-31	-31	-31
2.000		-32	-32	-32	-32	-32	-32	-32	-32	-32	-32
2.125			-34	-34	-34	-34	-34	-34	-34	-34	-34
2.250			-36	-36	-36	-36	-36	-36	-36	-36	-36
2.375			-38	-38	-38	-38	-38	-38	-38	-38	-38
2.500			-40	-40	-40	-40	-40	-40	-40	-40	-40
2.625			-42	-42	-42	-42	-42	-42	-42	-42	-42
2.750			-44	-44	-44	-44	-44	-44	-44	-44	-44
2.875			-46	-46	-46	-46	-46	-46	-46	-46	-46
3.000			-48	-48	-48	-48	-48	-48	-48	-48	-48
3.125			-50	-50	-50	-50	-50	-50	-50	-50	-50
3.250			-52	-52	-52	-52	-52	-52	-52	-52	-52
3.375			-54	-54	-54	-54	-54	-54	-54	-54	-54
3.500			-56	-56	-56	-56	-56	-56	-56	-56	-56
3.625			-58	-58	-58	-58	-58	-58	-58	-58	-58
3.750			-60	-60	-60	-60	-60	-60	-60	-60	-60
3.875				-62	-62	-62	-62	-62	-62	-62	-62
4.000				-64	-64	-64	-64	-64	-64	-64	-64

DASH NUMBERED PARTS ABOVE THE HEAVY STEPPED LINE ARE THREADED TO THE SERRATED COLLAR AS SPECIFIED HEREIN. THE MAXIMUM DISTANCE FROM THE SERRATED COLLAR TO THE FIRST FULL THREAD SHALL BE EQUAL TO THE SUM OF THE MAXIMUM FILLET RADIUS (.015) AND A MAXIMUM OF TWO INCOMPLETE THREADS. INCOMPLETED THREADS NOT TO ENTER THE FILLET AREA.

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TABLE 6 - INTERCHANGEABILITY
SEE NOTE 13

PART NUMBERS	
CANCELLED (CRES 17-10P)	NEW (CRES A-286)
MS51989	MS51989
C102	E102
C103	E103
C104	E104
C105	E105
C106	E106
C107	E107
C108	E108
C109	E109
C110	E110
C111	E111
C112	E112
C202	E202
C203	E203
C204	E204
C205	E205
C206	E206
C207	E207
C208	E208
C209	E209
C210	E210
C211	E211
C212	E212
C302	E302
C303	E303
C304	E304
C305	E305
C306	E306
C307	E307
C308	E308
C309	E309
C310	E310
C311	E311
C312	E312
C402	E402
C403	E403
C404	E404
C405	E405
C406	E406
C407	E407
C408	E408
C409	E409
C410	E410
C411	E411
C412	E412



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