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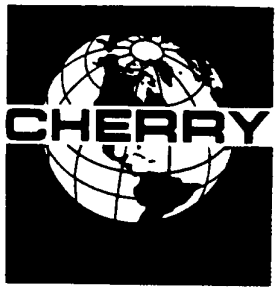

Lap Joint Fatigue Comparison of Cherry SST™, CherryMAX®, Solid Rivet and Huck Clinch® Blind Rivets

REPORT NO. : C93 - 214

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SUMMARY

The Research and Development department of the Cherry division of Textron Inc., has conducted a series of lap joint fatigue tests per MIL-STD-1312/21. This program was undertaken to study the comparative joint fatigue strength of the Cherry SST™ and CherryMAX® blind rivet designs. It was later expanded to include the Huck Clinch® and MS20470DD solid rivets.

The fasteners tested were 3/16 diameter protruding head oversize bulbed rivets having a 3/16" grip and 3/16 diameter solid rivets having a - 6 length. The test specimen used was the standard MIL-STD-1312/21 (four fastener) lap joint coupon. Coupon material was 2024-T3 clad aluminum alloy sheet having a nominal thickness of .090".

Each type of fastener was tested at three different load levels roughly corresponding to 80%, 60% and 40% of ultimate static joint strength. The load ratio (R = min / max) was 0.1. The frequency was 30 cycles per second (30 Hz).

The test results are summarized graphically in figure 1. The method of least squares was used to derive equations of the form f(x) = AX for the "Best Fit" curves. A review of figure 1 shows the following:

- The new Cherry SST™ blind rivet provides four (4) times the life of the Huck Clinch® at the higher load levels and twice the life at lower load levels.
- Only the Cherry SST™ exhibits fatigue strength in excess of MS20470DD solid rivets under these test conditions.
- The CherryMAX® rivet provides fatigue life in excess of the Huck Clinch®.

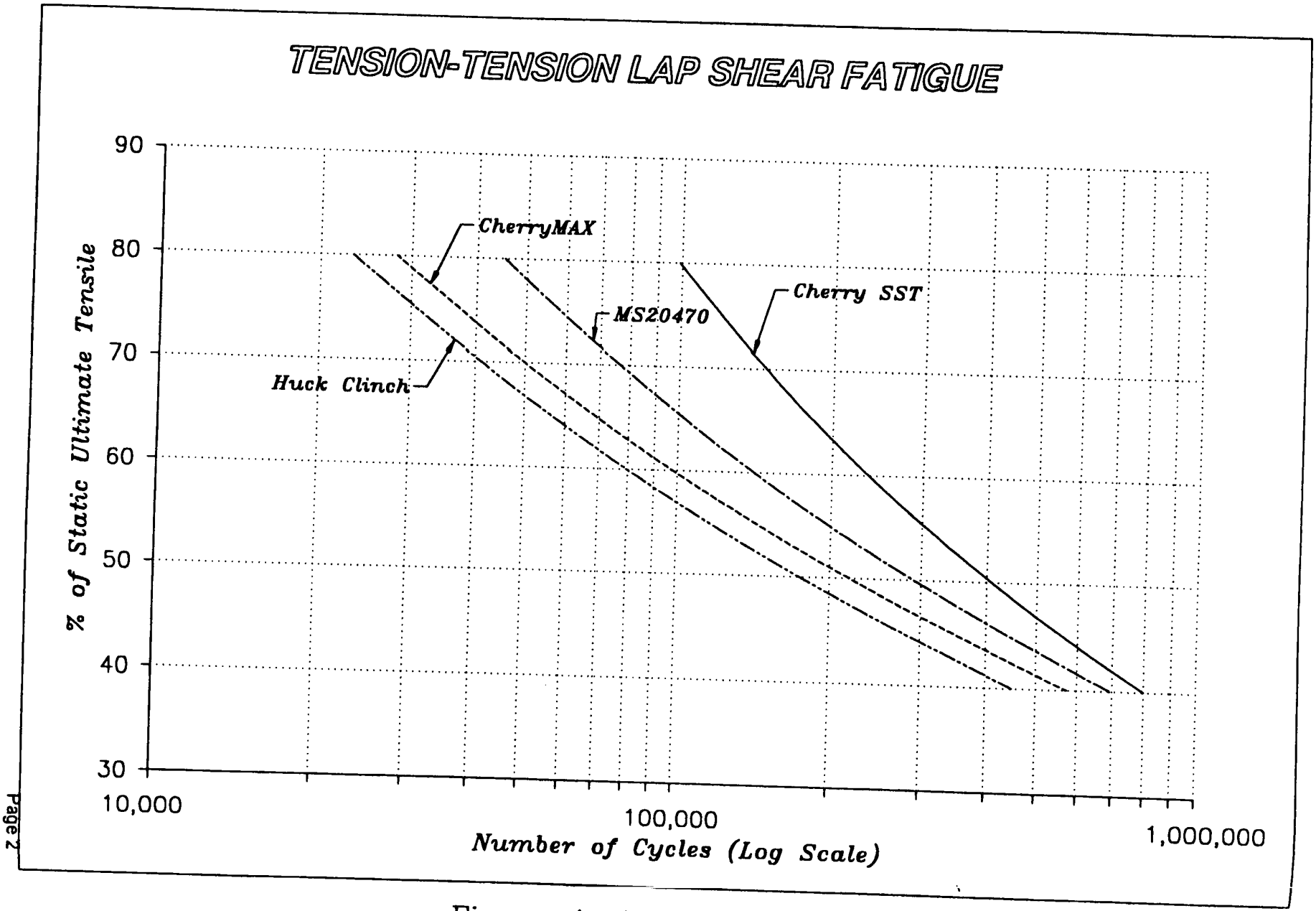

Figure 1. Average Curves

INTRODUCTION

The Cherry SST™ is designed to fit the installation envelope of existing bulb rivet systems and is installed with the standard MIL-R-85188 hand riveter (Cherry part number G704). The sleeve material is 5056 aluminum alloy which is mated with a non-magnetic, cadmium free A-286 stem. An A-286 expander, having a shape optimized for sheet take up, is wrapped on the stem. It is believed that the exceptional residual preload of the design is responsible for its superior lap joint fatigue properties. The Cherry SST™ incorporates the same proven "Safe - lock" locking collar and driving anvil concept as the original CherryMax® fastening system.

The results of this fatigue study clearly show not only that CherryMAX® rivet exceeds the fatigue strength of Huck Clinch®, but also that the new Cherry SST™ rivet provides up to four times the life of the Huck product and up to twice the fatigue life of solid rivets.

TEST PLAN

Fasteners Tested:

Protruding head oversize bulbed blind rivets:
- CR3243 - 06 - 03 (CherryMAX®)
- CR6253 - 06 - 03 (CherrySST™)
- HC3243 - 06 - 03 (Huck Clinch®)

Solid Rivets
- MS20470DD6 -06 (Aerospace rivet)

Test Coupon

MIL-STD-1312/21 coupon as shown in figure 2 below.
Material: 2024-T3 Clad sheet per QQ-A-250/5

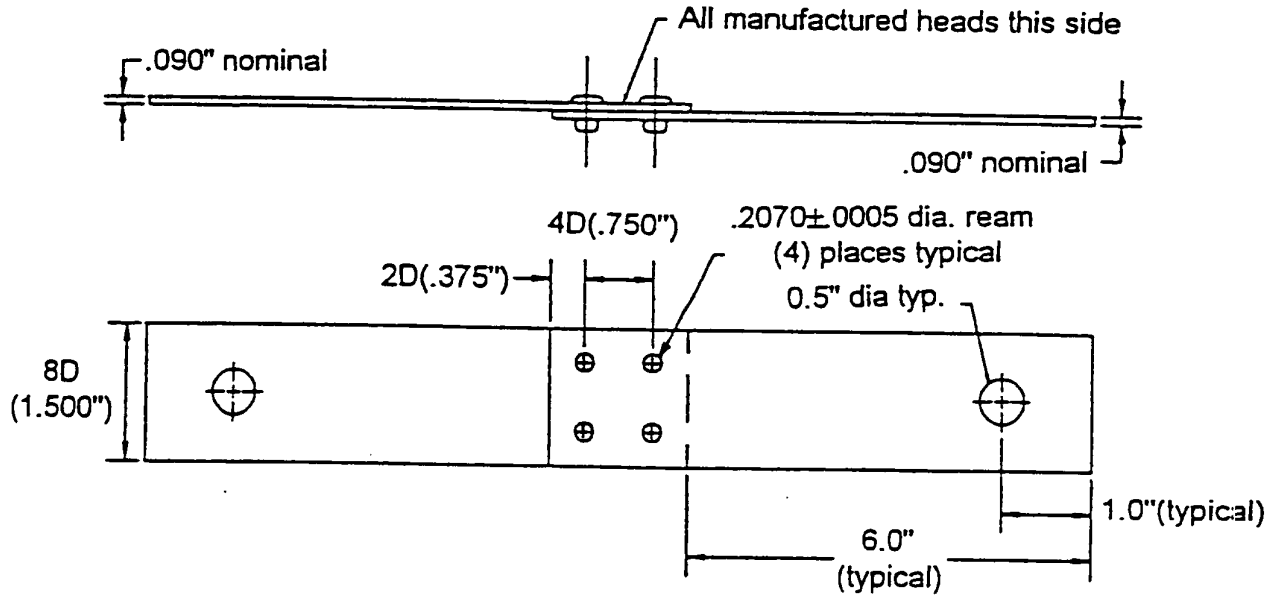

Figure 2. Shear Joint Fatigue Coupon

TEST PLAN (continued)

Test Equipment

The fatigue testing was conducted on an MTS model 810 fatigue machine using an Instron model 8500 amplitude controler.

Static testing was performed on a Satec model 20UD universal testing machine (UTM).

A Cherry model G704 riveter with model H701B456 nose assembly was used for installation of the blind rivets. The solid rivets were squeezed on the Satec UTM.

TEST PROCEDURE

To establish the static ultimate strength, one of the Cherry SST coupons was loaded to failure in accordance with MIL-STD-1312, test method 4 on the Satec UTM. Failure load was 4690 lbs from which the maximum fatigue loads corresponding to 80%, 60% and 40% were derived.

The fatigue tests were conducted in accordance with MIL-STD-1312, test method 21. Figure 3 below shows a typical coupon under test.

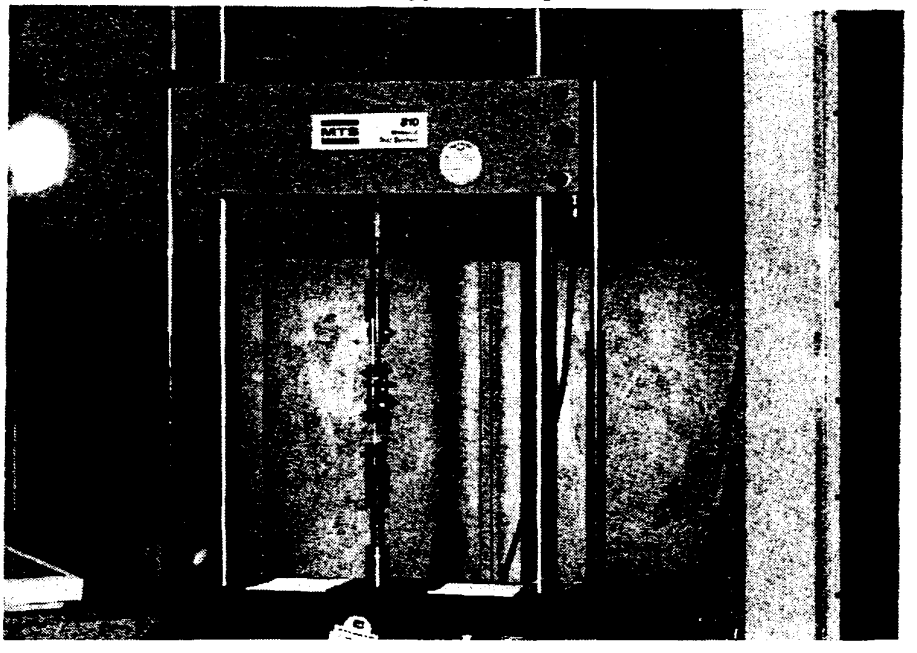

Figure 3

TEST PROCEDURE *(continued)*

All tests were conducted under ambient conditions at a frequency of 30 Hz.

The solid rivet installations were carried out as follows:

1. The rivets were solution treated at 920°F and water quenched per MIL-H-6088G to provide rivets in the 2024-W condition. Rivets were then chilled to -109°F by packing in dry ice where they remained until used.

2. The rivets were squeezed to an upset height of 0.4D with the resulting tail diameter of approximately 1.5D on the Satec UTM. These installations took place on the same day as the solution treatment and with fifteen (15) minutes of removal from the dry ice box.

3. The installed rivets were allowed to age at room temperature for a minimum of 96 hours before testing commenced (except for specimen #36 which was aged for 88 hours prior to test). Rivets were thus in the T3 condition at the time of test.

Dynamic testing was performed at loads roughly corresponding to 80%, 60% and 40% of the maximum static load. A load ratio 0.1 was used for all tests. Three (3) coupons of each fastener type were tested at each load level in order to examine the scatter of results (which turned out to be minimal).

RESULTS

The actual results are tabulated in tables 1 through 4 for Cherry SST™, CherryMAX®, Huck Clinch® and the solid rivets respectively. S-N curves for the results are shown in figures 4 through 7 for the four fastener types. The averages of all four fasteners are shown in figure 1.

An examination of figure 1 leads one to the following conclusions:

- CherryMAX® exceeds the fatigue strength of Huck Clinch® at all load levels.

- The CherrySST exhibits fatigue life up to 4 times that of the Huck Clinch® at high load levels and twice the life at lower load levels.

RESULTS *(continued)*

- The CherrySST™ exhibits fatigue strength equal to or greater than 'DD' solid rivets under these test conditions.

Examination Of Failure Modes

Figure 8 through 11 show the typical coupon failures experienced during this study. The following observations are apparent.

- CherrySST™ ___ All coupons showed faying surface fretting adjacent to the fastener holes. This is indicative of high residual tension (preload) in the installed fastener. See figure 8.

- Huck Clinch® ___ Faying surface fretting occurred away from the fastener holes, notably midway between the holes as shown in figure 10. This is indicative of low residual tension.

- Except for one instance, the origins of fracture started from points along the coupon faying surface.

CONCLUSIONS

The industry standard CherryMAX® rivet provides lap joint fatigue properties in excess of the Huck Clinch® rivet.

The Cherry SST™ product exhibits **exceptional** fatigue characteristics compared to other bulbed rivets and solid rivets. Further comparisons to solid rivet are planned in the near future.

Table 1 Cherry SST Blind Rivet Lapshear Fatigue Test Results

ATIGUE TEST TYPE:	*LAP JOINT SHEAR FATIGUE, FULL LOAD TRANSFER*								FASTENER TYPE
OAD RATIO:	*R = 0.1*								
EST STATION:	*MTS*								
EST SPEED:	*30 Cycles / Sec*								
PECIFICATION:	*Mil-Std-1321/21*								
HEET MATERIAL:	*2024-T3 Clad*								
TEST NO.	% OF STATIC ULT. TENSILE	THICKNESS T1	THICKNESS T2	TEST LOAD (lbs.) MAX.	TEST LOAD (lbs.) MIN.	FATIGUE LIFE (CYCLES)	DATE & OPERATOR	FAILURE LOCATION ① PLATE	FAILURE LOCATION ① HOLE NO.	TYPE OF FAILURE
4	80%	0.0901	0.0901	3750	375	94,736	11/10/93 G.F	BP	1,2	MO, Predominantly @ 2
5		0.0902	0.0904			93,565	11/11/93 G.F	BP	1,2	MO, Predominantly @ 1
6		0.0903	0.0901			94,029	11/11/93 G.F	BP	1,2	MO, Predominantly @ 2
10	60%	0.0903	0.0898	2800	280	240,327	11/11/93 G.F	TP	3,4	Multiple Origin
11		0.0900	0.0900			257,804	11/12/93 G.F	TP	3,4	MO, Predominantly @ 4
12		0.0900	0.0902			390,971	11/15/93 D.P	TP	3	Multiple Origin
28	40%	0.0900	0.0900	1870	187	689,454	11/15/93 D.P	BP	1	Multiple Origin
29		0.0903	0.0902			698,513	11/16/93 G.F	BP	1	Multiple Origin
30		0.0900	0.0903			760,542	11/17/93 G.F	BP	-	Multiple Origin

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PART # : CR6253-6-3

Note:
① See figure below for failure code

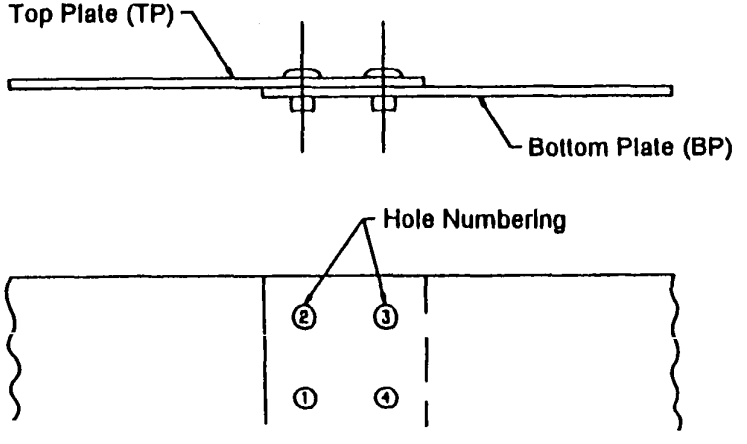

Table 2 CherryMAX Blind Rivet Lapshear Fatigue Test Results

TIGUE TEST TYPE:	*LAP JOINT SHEAR FATIGUE, FULL LOAD TRANSFER*								FASTENER TYPE
AD RATIO:	*R = 0.1*								
ST STATION:	*MTS*								
ST SPEED:	*30 Cycles / Sec*								
ECIFICATION:	*Mil-Std-1321/21*								
IEET MATERIAL:	*2024-T3 Clad*								

EST NO.	% OF STATIC ULT. TENSILE	THICKNESS T1	THICKNESS T2	TEST LOAD (lbs.) MAX.	TEST LOAD (lbs.) MIN.	FATIGUE LIFE (CYCLES)	DATE & OPERATOR	FAILURE LOCATION (1) PLATE	FAILURE LOCATION (1) HOLE NO.	TYPE OF FAILURE
A	80%	0.0902	0.0902	3750	375	26,562	11/12/93 G.F	TP	3,4	MO, Predominantly @ 3
B		0.0900	0.0902			25,303	11/12/93 G.F	TP	3,4	Multiple Origin
C		0.0903	0.0898			28,556	11/12/93 G.F	BP	1,2	Fatigue Failure @ 2
5	60%	0.0902	0.0904	2800	280	102,050	11/12/93 G.F	TP	3,4	Fatigue Failure @ 3
6		0.0898	0.0902			120,833	11/15/93 G.F	BP	1,2	Fatigue Failure @ 1
7		0.0903	0.0902			190,637	11/16/93 G.F	BP	1,2	Fatigue Failure @ 2
3	40%	0.0902	0.0901	1870	187	461,891	11/18/93 G.F	TP	3,4	MO, Predominantly @ 4
4		0.0903	0.0903			248,249	11/19/93 G.F	BP	1,2	Fatigue Failure @ 2
5		0.0904	0.0901			725,193	11/19/93 G.F	BP	1,2	MO, Predominantly @ 1

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PART # : CR3243-6-3

Note:

(1) See figure below for failure code

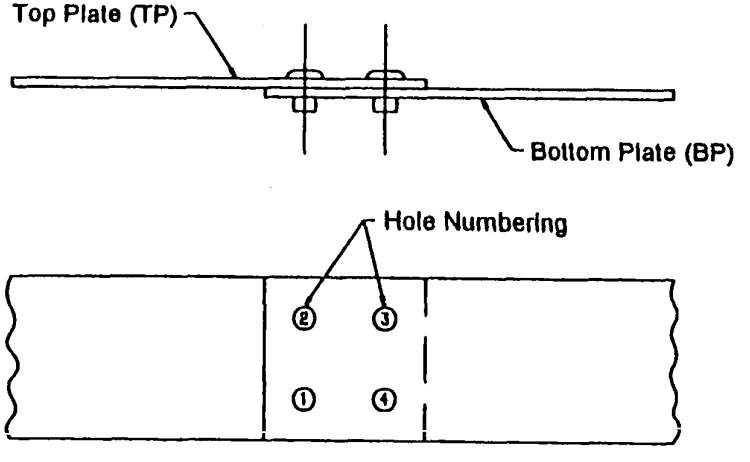

Table 3 Huck Clinch Blind Rivet Lapshear Fatigue Test Results

FATIGUE TEST TYPE:	*LAP JOINT SHEAR FATIGUE, FULL LOAD TRANSFER*								FASTENER TYPE
LOAD RATIO:	*R = 0.1*								
TEST STATION:	*MTS*		*CHERRY TEXTRON* *1224 E. WARNER AVE.* *SANTA ANA, CA 92707*						*PART # : HC3243-6-3*
TEST SPEED:	*30 Cycles / Sec*								
SPECIFICATION:	*Mil-Std-1321/21*								
SHEET MATERIAL:	*2024-T3 Clad*								
TEST NO.	% OF STATIC ULT. TENSILE	THICKNESS		TEST LOAD (lbs.)		FATIGUE LIFE (CYCLES)	DATE & OPERATOR	FAILURE LOCATION (1)		TYPE OF FAILURE
		T1	T2	MAX.	MIN.			PLATE	HOLE NO.	
7	80%	0.0901	0.0901	3750	375	24,651	11/10/93 G.F	BP	1,2	Multiple Origin
8		0.0903	0.0899			24,397	11/11/93 G.F	BP	1,2	Multiple Origin
9		0.0900	0.0900			31,400	11/11/93 G.F	BP	1,2	Fatigue Failure @ 1
16	60%	0.0902	0.0902	2800	280	69,103	11/12/93 G.F	BP	1,2	Multiple Origin
17		0.0900	0.0901			47,594	11/12/93 G.F	BP	1,2	Multiple Origin
18		0.0901	0.0901			123,840	11/15/93 G.F	BP	1,2	Fatigue Failure @ 1
30	40%	0.0903	0.0900	1870	187	368,176	11/18/93 G.F	BP	1,2	Fatigue Failure @ 1
31		0.0897	0.0897			316,832	11/18/93 G.F	BP	1,2	Multiple Origin
32		0.0901	0.0903			647,949	11/18/93 G.F	BP	1,2	Multiple Origin

Note:

(1) See figure below for failure code

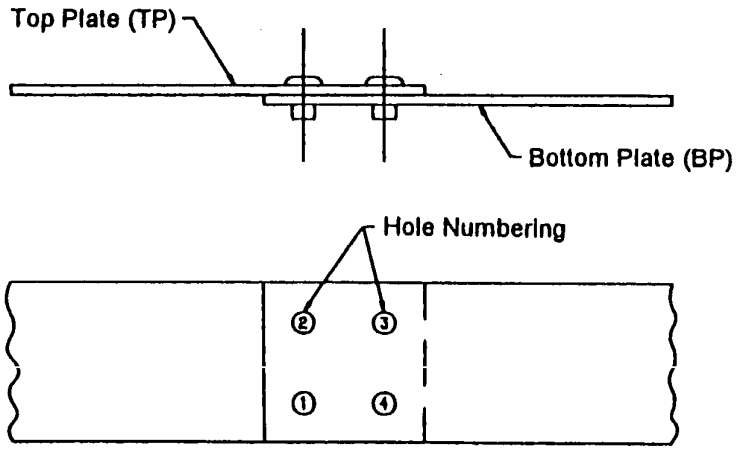

Table 4 MS20470DD Solid Rivet Lapshear Fatigue Test Results

ATIGUE TEST TYPE:	*LAP JOINT SHEAR FATIGUE, FULL LOAD TRANSFER*								FASTENER TYPE
)AD RATIO:	*R = 0.1*								
:ST STATION:	*MTS*								
:ST SPEED:	*30 Cycles / Sec*								
'ECIFICATION:	*Mil-Std-1321/21*								
IEET MATERIAL:	*2024-T3 Clad*								
EST	% OF STATIC	THICKNESS		TEST LOAD (lbs.)		FATIGUE LIFE	DATE &	FAILURE LOCATION (1)		TYPE OF
IO.	ULT. TENSILE	T1	T2	MAX.	MIN.	(CYCLES)	OPERATOR	PLATE	HOLE NO.	FAILURE
36	80%	0.0901	0.0902	3750	375	52,699	11/22/93 G.F	TP	3,4	Multiple Origin
37		0.0898	0.0895			29,247	11/23/93 G.F	TP	3,4	Multiple Origin
38		0.0897	0.0902			63,927	11/23/93 G.F	TP	3,4	Multiple Origin
39	60%	0.0897	0.0895	2800	280	139,397	11/23/93 G.F	TP	3,4	Multiple Origin
40		0.0895	0.0895			229,546	11/23/93 G.F	BP	-	Failed In Midway Of Plate
41		0.0895	0.0900			144,898	11/23/93 G.F	TP	3,4	Multiple Origin
42	40%	0.0900	0.0895	1870	187	453,542	11/24/93 G.F	TP	3,4	MO, Predominantly @ 4
43		0.0905	0.0899			581,283	11/24/93 G.F	BP	1	Multiple Origin
46		0.0898	0.0898			809,187	11/29/93 G.F	TP	3	MO, Predominantly @ 3

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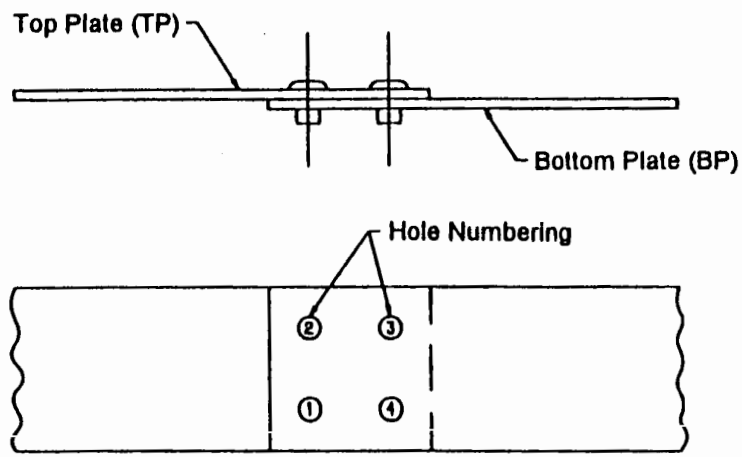
PART#: MS20470dd6-6

Note:

(1) See figure below for failure code



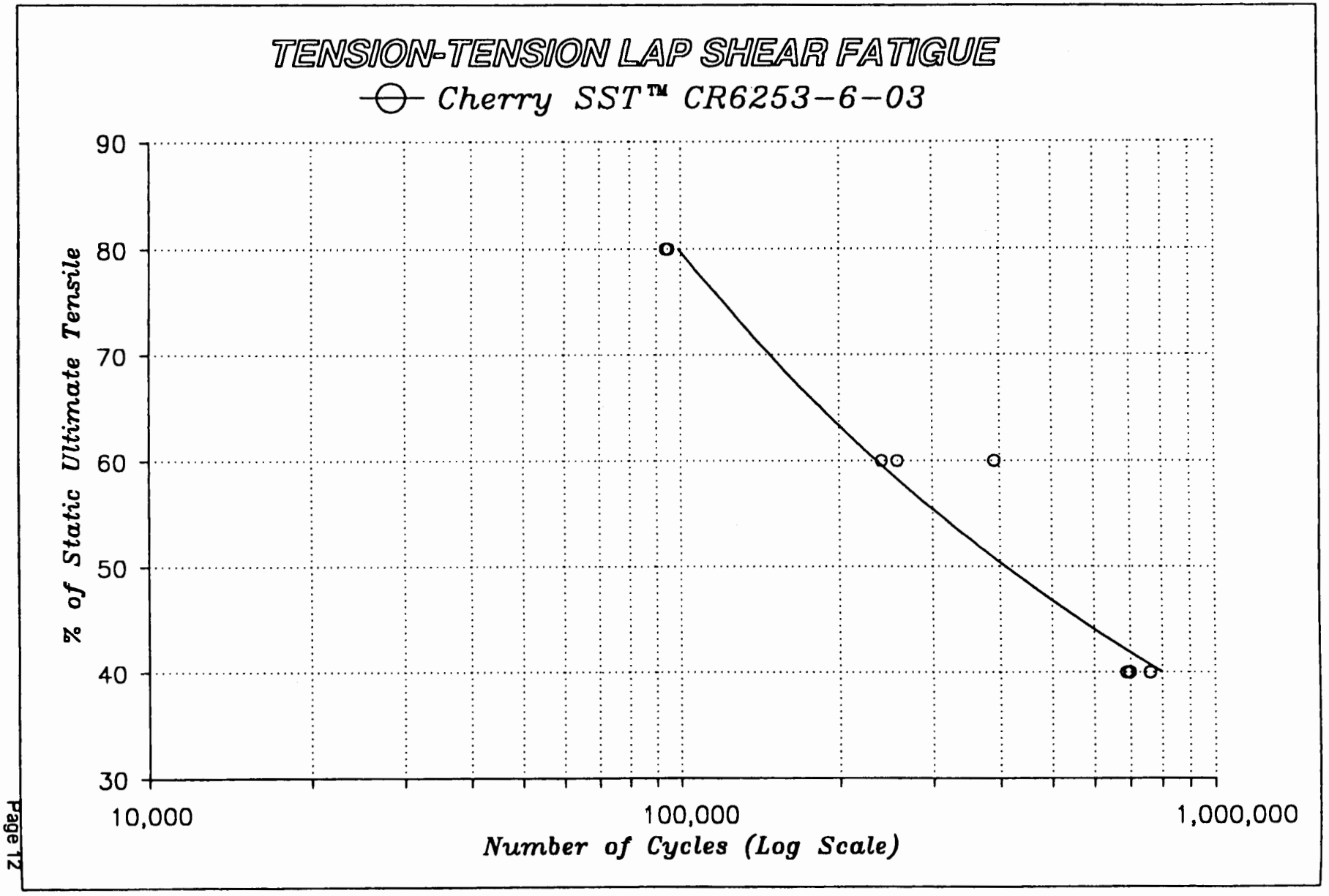


Figure 4. Cherry SST™ Results

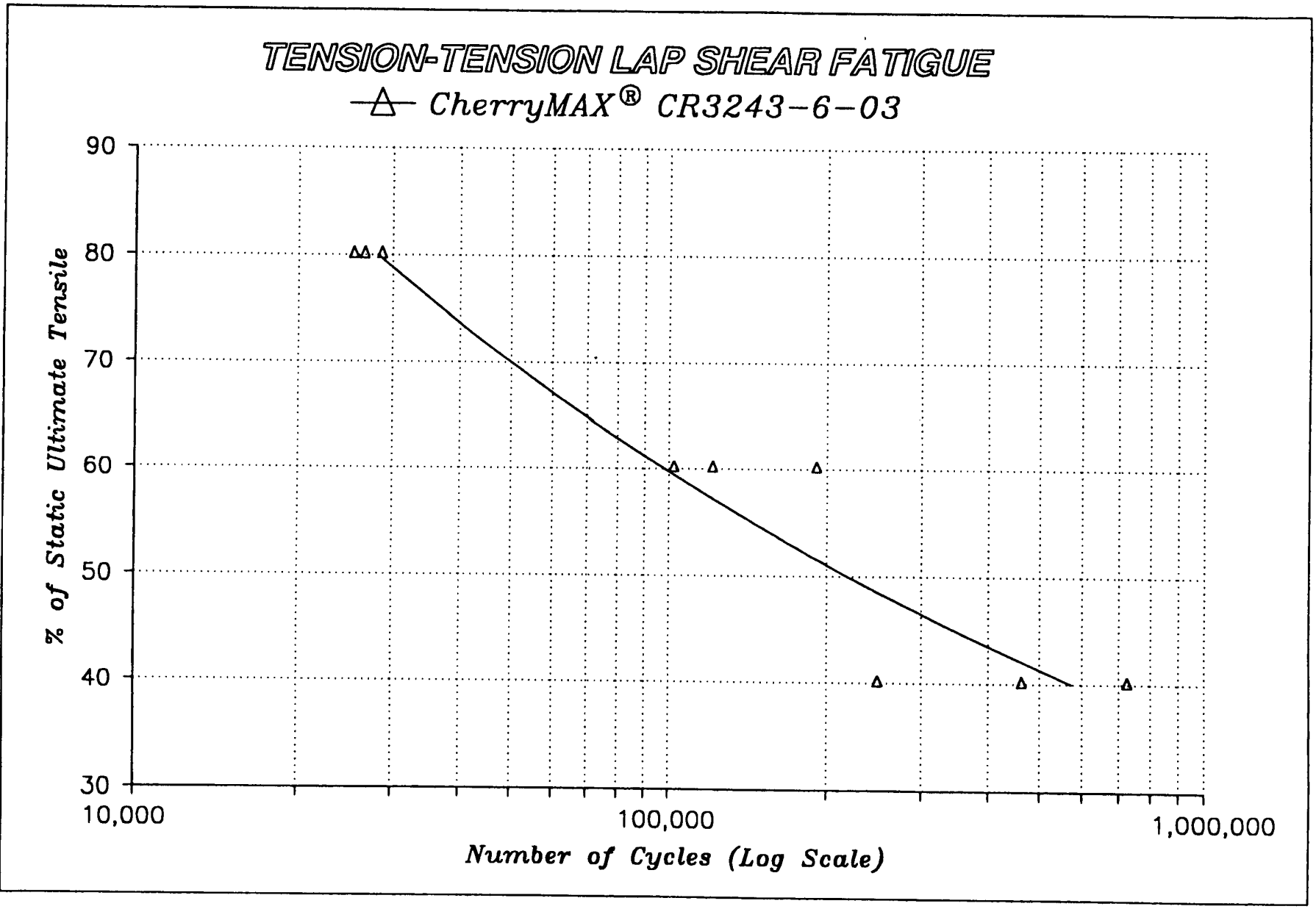


Figure 5. CherryMAX® Results

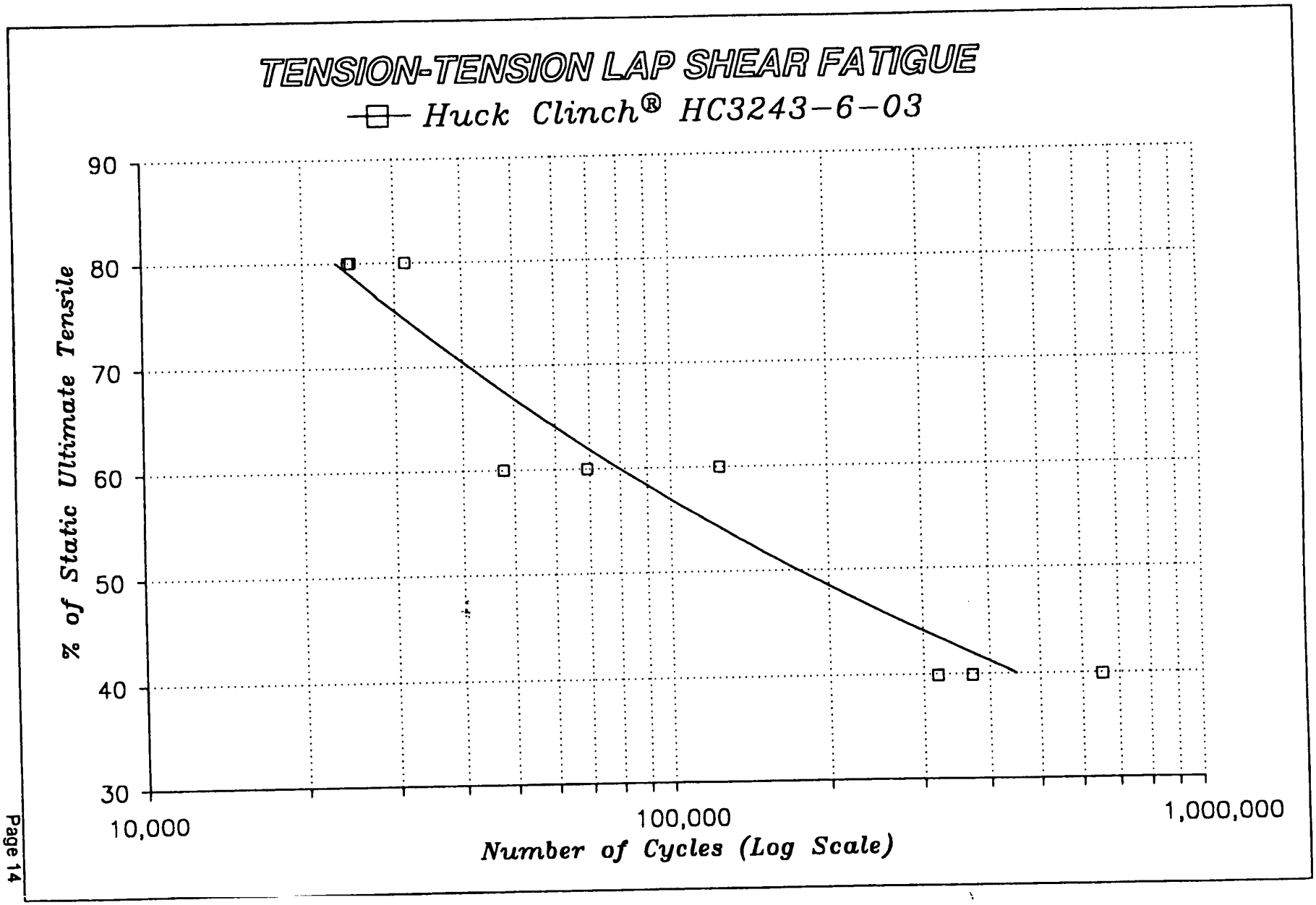


Figure 6. Huck Clinch® Results

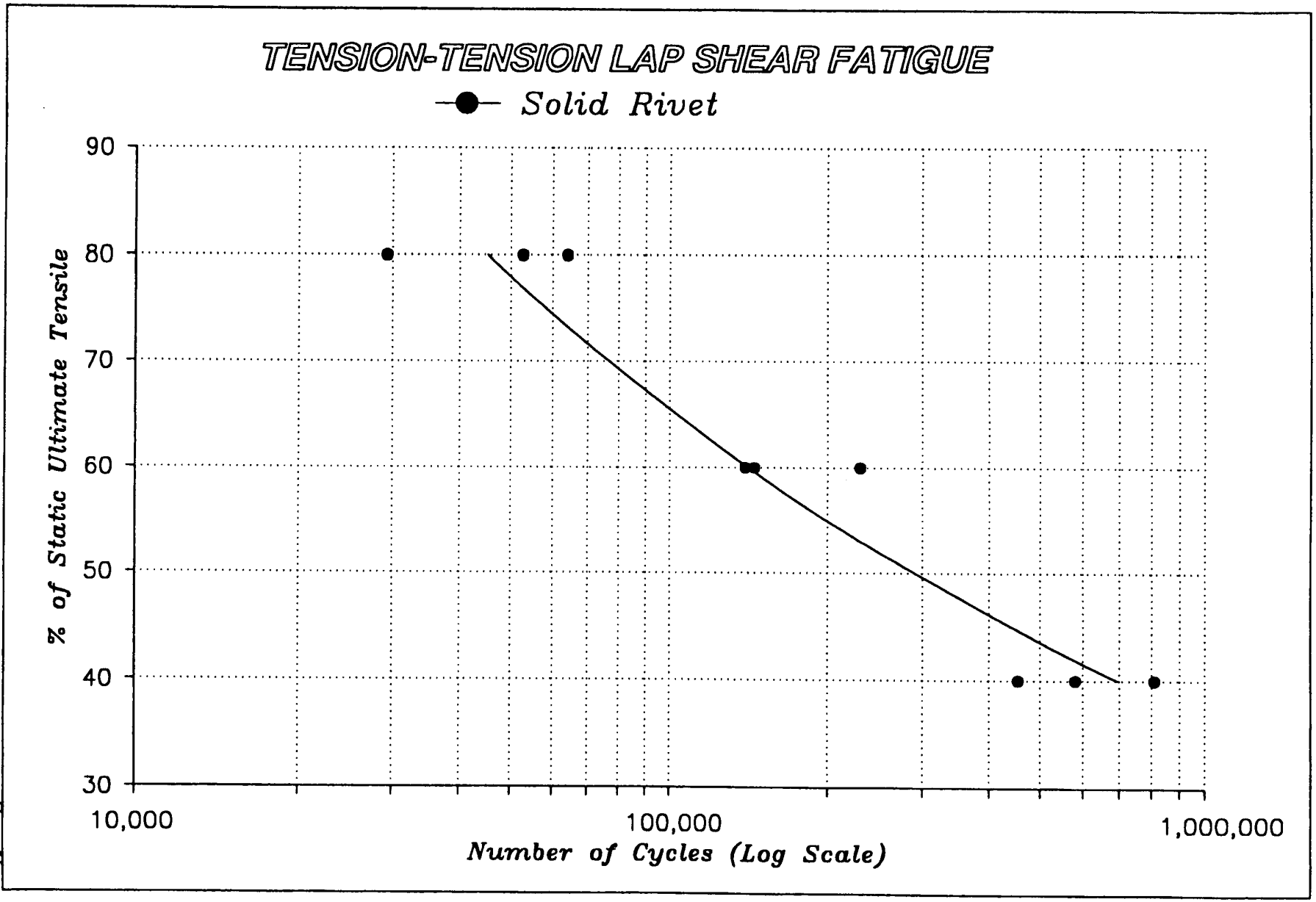
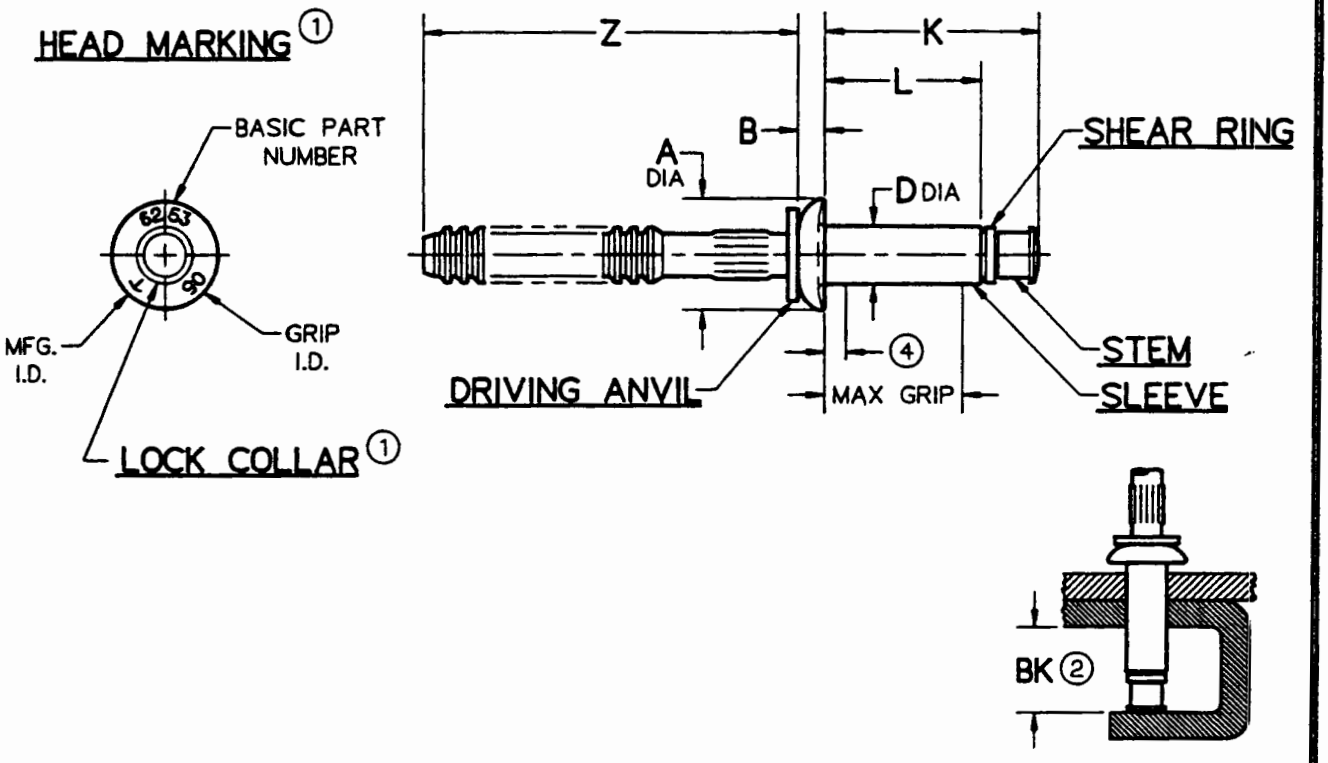


Figure 7. Solid Rivet Results

U.S. PATENT #4,012,984 #5,052,870 #5,056,973 #5,131,107	**CHERRY TEXTRON** AEROSPACE FASTENING SYSTEMS	FEDERAL IDENTIFICATION CODE 11815



DIA. DASH NO.	A		B	D	Z	BK	RECOMMENDED HOLE LIMITS
	NOM.	TOL.	±.005	±.002	REF	MIN ②	
-4	.250	±.012	.059	.141	.87	.390	.143/.146
-5	.312	±.016	.072	.174	.94	.395	.176/.180
-6	.375	±.019	.085	.202	.94	.410	.205/.209
-8	.500	±.025	.112	.268	.97	.490	.271/.275

MATERIAL ③				FINISH			
SLEEVE	STEM	LOCK COLLAR	SHEAR RING	SLEEVE	STEM	LOCK COLLAR	SHEAR RING
5056 ALUM. PER QQ-A-430	A-286 CRES PER AMS 5731	A-286 CRES PER AMS 5731 OR INCONEL 718 PER AMS 5664	A-286 CRES PER AMS 5731	CHEM. FILM PER MIL-C-5541 PLAIN COLOR	PASSIVATE PER QQ-P-35	NONE	NONE

NOTICE : ALL DIMENSIONS IN INCHES AND APPLY AFTER FINISH AND BEFORE LUBRICATION.

WARNING : FASTENERS MAY NOT PERFORM PROPERLY IF ALTERED FROM THE MANUFACTURER'S AS-SHIPPED CONDITION OR INSTALLED IN CONDITIONS OTHER THAN SPECIFIED HEREIN.

PROCUREMENT SPECIFICATION : PS-CMR-6000	BULB RIVET-CHERRYMAX® II 1/64 OVERSIZE DIAMETER UNIVERSAL HEAD	SHEET 1 OF 2	PART NUMBER
NAS 523 CODE : NONE		ISSUE 07-23-92 REV. C 05-03-93	CR6253

Figure 8. Typical Cherry SST™ Failure

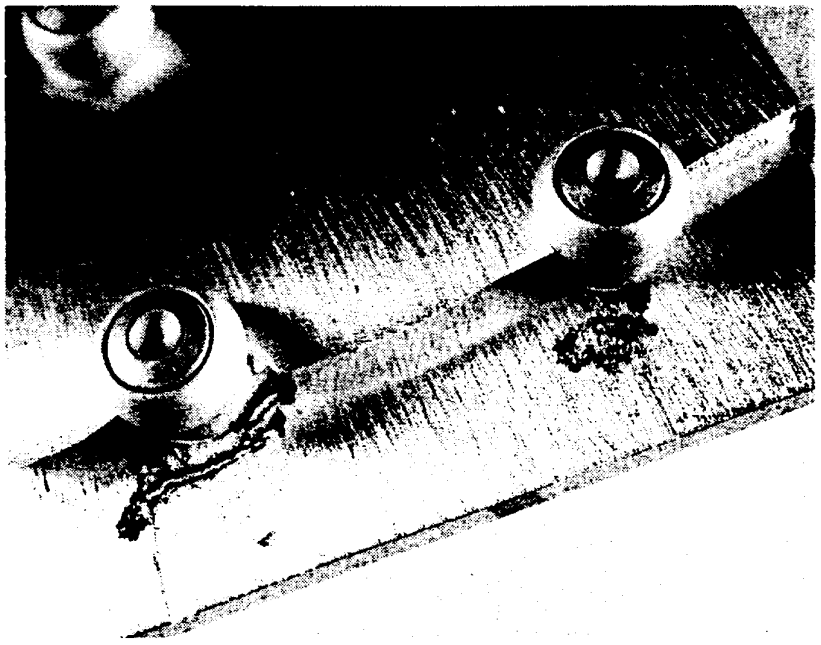


Figure 9. Typical CherryMAX® Failure

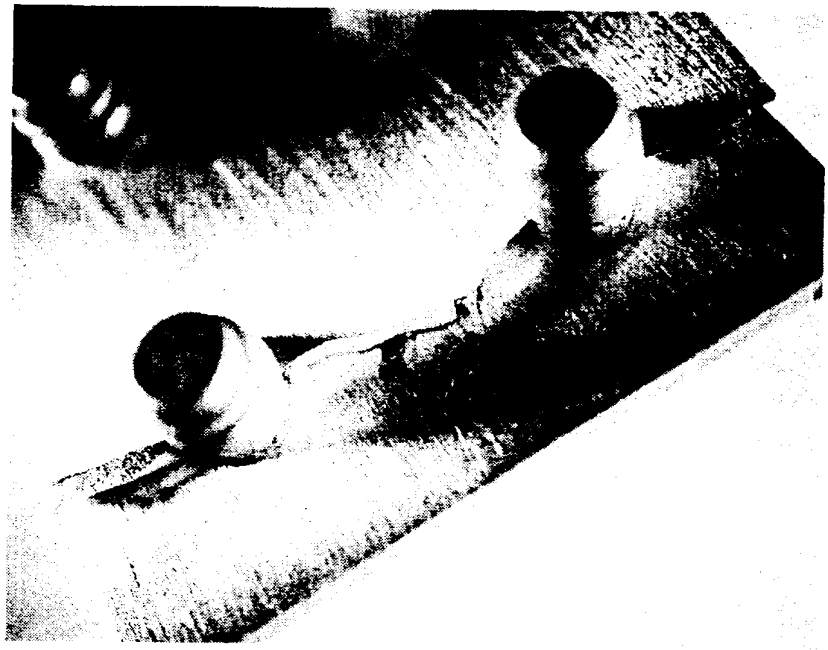


Figure 10. Typical Huck Clinch® Failure

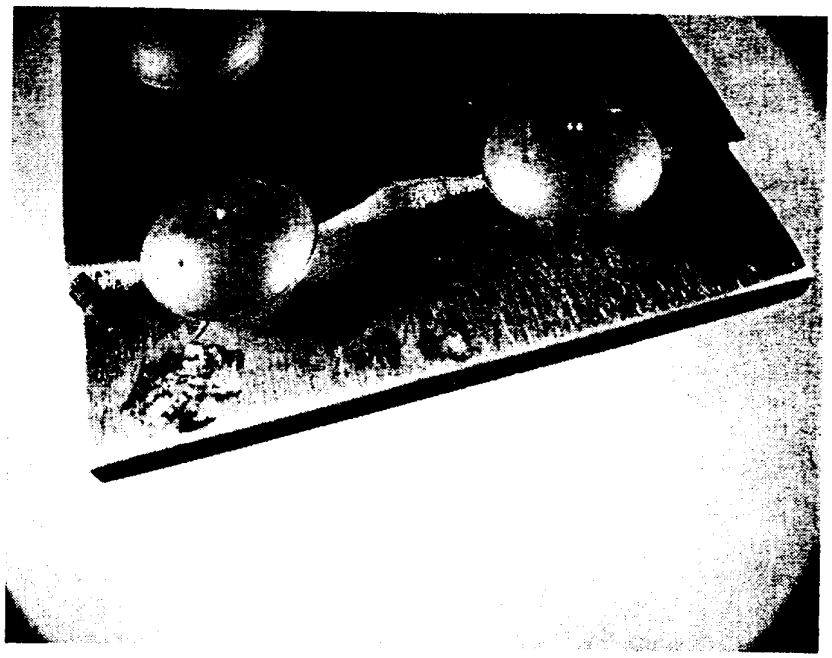


Figure 11. Typical Solid Rivet Failure

GRIP DASH NO.	GRIP LIMITS		-4 DIA		-5 DIA		-6 DIA		-8 DIA	
	MIN	MAX	L REF	K REF	L REF	K REF	L REF	K REF	L REF	K REF
-02	.063	.125	.238	.46	.246	.47	.265	.50	---	---
-03	.126	.187	.301	.52	.309	.53	.328	.55	.375	.64
-04	.188	.250	.363	.58	.371	.60	.390	.62	.437	.70
-05	.251	.312	.426	.65	.434	.66	.453	.68	.500	.77
-06	.313	.375	.488	.71	.496	.72	.515	.74	.562	.83
-07	.376	.437	.551	.78	.559	.79	.578	.82	.625	.89
-08	.438	.500	.613	.84	.621	.85	.640	.89	.687	.95
-09	.501	.562	.676	.90	.684	.91	.703	.95	.750	1.02
-10	.563	.625	---	---	.746	.98	.765	1.01	.812	1.08
-11	.626	.687	---	---	.809	1.04	.828	1.07	.875	1.14
-12	.688	.750	---	---	---	---	.890	1.14	.937	1.20
-13	.751	.812	---	---	---	---	---	---	1.000	1.27
-14	.813	.875	---	---	---	---	---	---	1.062	1.33

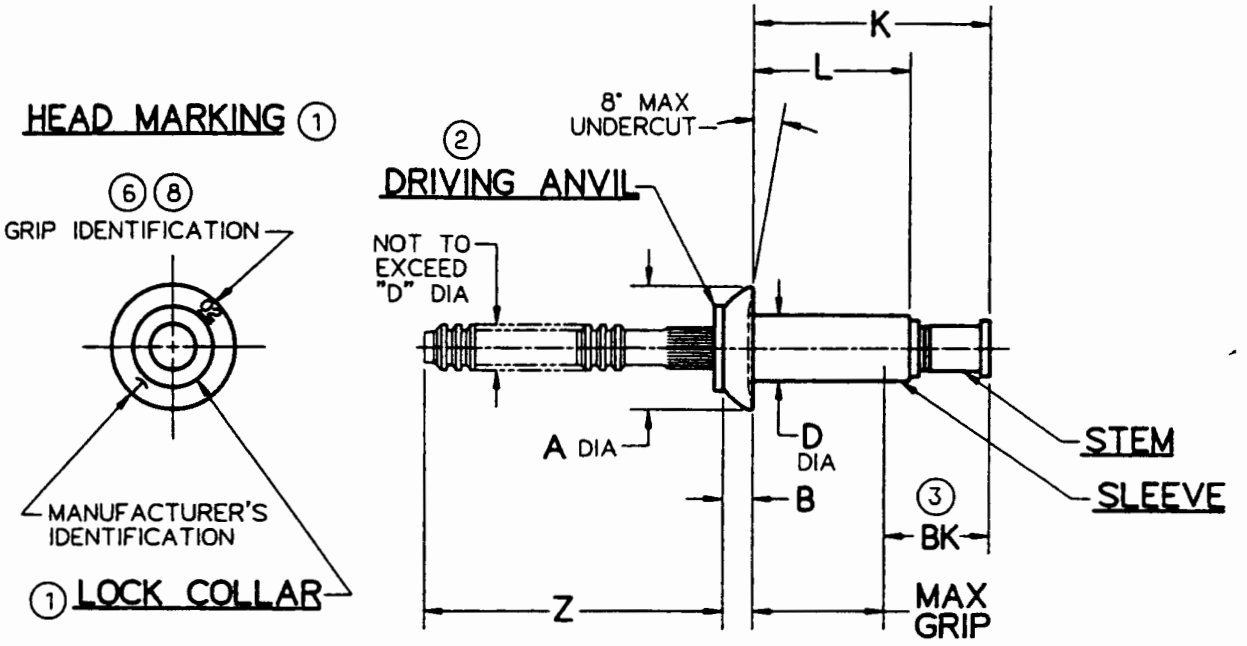
NOTES : ① HEAD MARKINGS AND LOCK COLLAR VISIBLE AFTER INSTALLATION.
② MINIMUM BLIND SIDE CLEARANCE FOR SATISFACTORY INSTALLATION.
③ MATERIAL DESIGNATION REFERS TO CHEMICAL COMPOSITION ONLY.
④ AN INCREASE OF .001 IN "D" DIAMETER IS PERMISSIBLE FOR A DISTANCE OF .100 UNDER THE MANUFACTURED HEAD.

PART NUMBER EXAMPLE :

CR6253 -6 -05

- -05 — GRIP DASH NUMBER (MAXIMUM GRIP IN 1/16 INCREMENTS)
- -6 — DIAMETER DASH NUMBER (NOMINAL DIAMETER IN 1/32 INCREMENTS)
- CR6253 — BASIC PART NUMBER (MATERIALS, HEAD STYLE, AND DIAMETER SERIES)

U.S. PATENT (OTHER PATENT PENDING)	CHERRY TEXTRON AEROSPACE FASTENING SYSTEMS	FEDERAL IDENTIFICATION CODE 11815



DIA. DASH NO.	A ±.010	B +.010 -.000	D +.003 -.001	Z MIN	BK MIN	HOLE LIMITS MIN	HOLE LIMITS MAX
-4	.250	.054	.140	.87	.390	.143	.146
-5	.312	.067	.173	.94	.395	.176	.180
-6	.375	.080	.201	.94	.410	.205	.209
-8	.500	.107	.267	.96	.490	.271	.275

SEE SHEET 2 FOR LENGTH DIMENSIONS, MATERIALS AND FINISHES

SEE SHEET 3 FOR NOTES AND PART NUMBER EXAMPLE

NOTICE : ALL DIMENSIONS IN INCHES AND APPLY AFTER FINISH AND BEFORE LUBRICATION.

WARNING : FASTENERS MAY NOT PERFORM PROPERLY IF ALTERED FROM THE MANUFACTURER'S AS-SHIPPED CONDITION OR INSTALLED IN CONDITIONS OTHER THAN SPECIFIED HEREIN.

PROCUREMENT SPECIFICATION : PS-CMR-3000	CHERRYMAX® RIVET UNIVERSAL HEAD LOCKED SPINDLE (OVERSIZE)	SHEET 1 OF 3	PART NUMBER
NAS 523 CODE : SEE SHEET 2		ISSUE 06-24-92	CR3243
		REV. S 06-24-92	

GRIP DASH NO. ⑥	GRIP LIMITS 1/16 RANGE		-4 DIA		-5 DIA		-6 DIA ⑦		-8 DIA	
	MIN	MAX	L +.000 -.030	K MAX	L +.000 -.030	K MAX	L +.000 -.030	K MAX	L +.000 -.030	K MAX
-01	④	.062	.175	.39	.203	.43	.242	.45	----	----
-02	.063	.125	.238	.46	.246	.47	.265	.50	.313	.57
-03	.126	.187	.301	.52	.309	.53	.328	.55	.375	.64
-04	.188	.250	.363	.58	.371	.60	.390	.62	.437	.70
-05	.251	.312	.426	.65	.434	.66	.453	.68	.500	.77
-06	.313	.375	.488	.71	.496	.72	.515	.74	.562	.83
-07	.376	.437	.551	.78	.559	.79	.578	.82	.625	.89
-08	.438	.500	.613	.84	.621	.85	.640	.89	.687	.95
-09	.501	.562	.676	.90	.684	.91	.703	.95	.750	1.02
-10	.563	.625	----	----	.746	.98	.765	1.01	.812	1.08
-11	.626	.687	----	----	.809	1.04	.828	1.07	.875	1.14
-12	.688	.750	----	----	----	----	.890	1.14	.937	1.20
-13	.751	.812	----	----	----	----	.953	1.20	1.000	1.27
-14	.813	.875	----	----	----	----	----	----	1.062	1.60

FINISH CODE	NAS 523 CODE	MATERIAL ⑤			FINISH		
		SLEEVE	STEM	LOCK COLLAR	SLEEVE	STEM	LOCK COLLAR
----	ARE	5056 ALUM. PER QQ-A-430	8740 STEEL PER AMS 6322	A-286 CRES PER AMS 5731	CHEM. FILM PLAIN COLOR PER MIL-C-5541	CAD. PLATE PER QQ-P-416 TYPE II CL.2	PASSIVATE PER QQ-P-35
A	----	5056 ALUM. PER QQ-A-430	8740 STEEL PER AMS 6322	A-286 CRES PER AMS 5731	CHEM. FILM GOLD COLOR PER MIL-C-5541	CAD. PLATE PER QQ-P-416 TYPE II CL.2	PASSIVATE PER QQ-P-35
⑨ PR	ARE	5056 ALUM. PER QQ-A-430	8740 STEEL PER AMS 6322	A-286 CRES PER AMS 5731	CHEM. FILM PLAIN COLOR PER MIL-C-5541	CAD. PLATE PER QQ-P-416 TYPE II CL.2	PASSIVATE PER QQ-P-35
⑩ T	----	5056 ALUM. PER QQ-A-430	8740 STEEL PER AMS 6322	A-286 CRES PER AMS 5731	CHEM. FILM PLAIN COLOR PER MIL-C-5541	CAD. PLATE PER QQ-P-416 TYPE II CL.2	PASSIVATE PER QQ-P-35

NOTES:
1. HEAD MARKINGS AND LOCK COLLAR VISIBLE AFTER INSTALLATION.
2. SILVER COLORED DRIVING ANVIL IDENTIFIES OVERSIZE DIAMETER RIVETS.
3. MINIMUM BLIND SIDE CLEARANCE FOR SATISFACTORY INSTALLATION.
4. MINIMUM GRIP FOR -4 DIA. IS .025; FOR -5 IS .031; AND FOR -6 IS .037.
5. MATERIAL DESIGNATION REFERS TO CHEMICAL COMPOSITION ONLY.
6. SINGLE DIGIT HEAD MARKING IS PERMISSIBLE, AT MANUFACTURER'S OPTION, FOR GRIP DASH NUMBERS LESS THAN 10.
7. SIZES BELOW HEAVY LINE ARE AVAILABLE ON SPECIAL ORDER ONLY.
8. A DASH MAY BE MARKED UNDER OR TO THE RIGHT SIDE OF THE GRIP IDENTIFICATION AT MANUFACTURER'S OPTION.
9. "PR" CODE - PARTS ARE MANUFACTURED BARE; IF LUBE IS REQUIRED, USE PAR 90 ONLY.
10. "T" CODE - PARTS ARE MANUFACTURED BARE; IF LUBE IS REQUIRED, USE TRANSLUBE 20204 ONLY. TRANSLUBE ("T" CODE) WILL BE UNAVAILABLE FOR PROCUREMENT AS OF 01-01-92.

PART NUMBER EXAMPLE:

CR3243 A -5 -05

- -05 — GRIP DASH NUMBER (MAX GRIP IN 1/16 INCREMENTS)
- -5 — DIAMETER DASH NUMBER (NOMINAL DIAMETER IN 1/32 INCREMENTS)
- A — FINISH CODE, IF ANY
- CR3243 — BASIC PART NUMBER (MATERIALS, HEAD STYLE, AND DIAMETER SERIES)