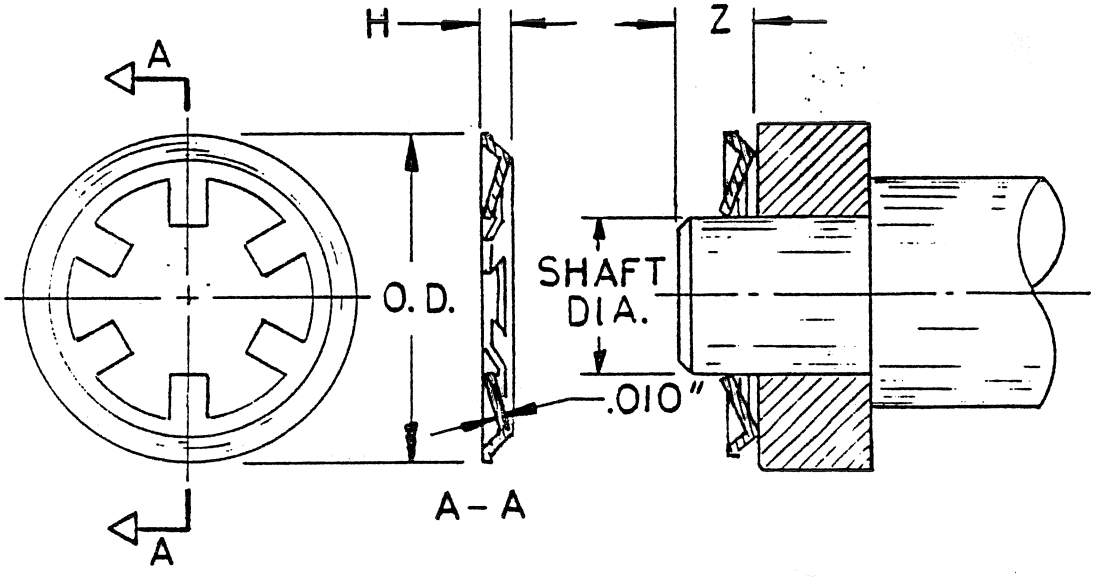
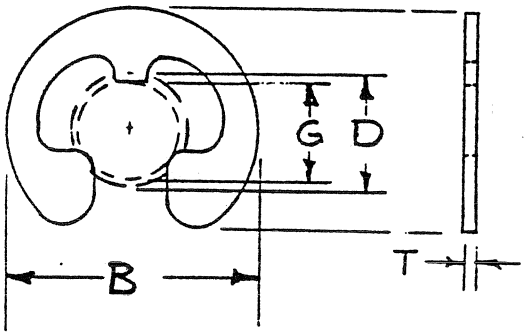
RETAINING RINGS, EXTERNAL



SHAFT DIAMETER		OD	H	ALLOW. THRUST	Z	MANUFACTURER'S NUMBER		FREIGHTLINER PART NUMBER
FROM	TO			LBS	(2)	WK1		
.091	.097	.326	.029	27	.058	5115-9		23-11035-009
.121	.129	.366	.029	38	.058	-12		-012
.152	.160	.397	.029	45	.058	-15		-015
.184	.192	.444	.031	55	.062	-18		-018
.246	.254	.522	.037	58	.074	-25		-025
.308	.316	.584	.037	60	.074	-31		-031
.371	.379	.645	.037	65	.074	-37		-037

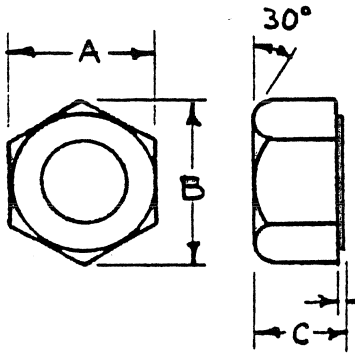
RING, RETAINING, EXTERNAL (REINFORCED "E")



D SHAFT DIAMETER	RING B (FREE	RING T ±.002	G GROOVE DIA.		MANUFACTURER'S NUMBER WKI	IRR	FREIGHTLINER PART NUMBER*
.250	.516	.025	.210		5144-25	1200-25	23-10298-C25

*Dash number is shaft diameter in hundredths of an inch.

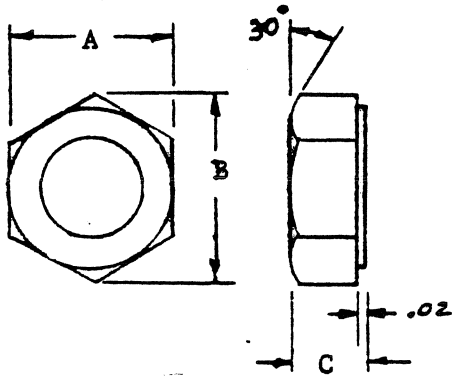
NUT, HEXAGON



THREAD	A NOM.	C NOM	GR 5 PLAIN FINISH	GR 5 CD OR GALV FINISH	GR 8 PLAIN FINISH
2-56 UNC	3/16	1/16	23-Ø9339-5Ø1	23-Ø9339-ØØ1	
2-64 UNF	3/16	1/16	23-Ø9338-5Ø1	23-Ø9338-ØØ1	
4-4Ø UNC	1/4	3/32	23-Ø9339-5Ø2	23-Ø9339-ØØ2	
4-48 UNF	1/4	3/32	23-Ø9338-5Ø2	23-Ø9338-ØØ2	
6-32 UNC	5/16	7/64	23-Ø9339-5Ø3	23-Ø9339-ØØ3	
6-4Ø UNF	5/16	7/64	23-Ø9338-5Ø3	23-Ø9338-ØØ3	
8-32 UNC	11/32	1/8	23-Ø9339-5Ø4	23-Ø9339-ØØ4	
8-36 UNF	11/32	1/8	23-Ø9338-5Ø4	23-Ø9338-ØØ4	
1Ø-24 UNC	3/8	1/8	23-Ø9339-5Ø5	23-Ø9339-ØØ5	
1Ø-32 UNF	3/8	1/8	23-Ø9338-5Ø5	23-Ø9338-ØØ5	
12-24 UNC	7/16	5/32	23-Ø9339-524	23-Ø9339-Ø24	
12-28 UNF	7/16	5/32	23-Ø9338-528	23-Ø9338-Ø28	
1/4 -2Ø UNC	7/16	7/32	23-Ø9339-5Ø6	23-Ø9339-ØØ6	23-Ø9247-1Ø4
1/4 -28 UNF	7/16	7/32	23-Ø9338-5Ø6	23-Ø9338-ØØ6	23-Ø9247-2Ø4
5/16-18 UNC	1/2	17/64	23-Ø9339-5Ø7	23-Ø9339-ØØ7	23-Ø9247-1Ø5
5/16-24 UNF	1/2	17/64	23-Ø9338-5Ø7	23-Ø9338-ØØ7	23-Ø9247-2Ø5
3/8 -16 UNC	9/16	21/64	23-Ø9339-5Ø8	23-Ø9339-ØØ8	23-Ø9247-1Ø6
3/8 -24 UNF	9/16	21/64	23-Ø9338-5Ø8	23-Ø9338-ØØ8	23-Ø9247-2Ø6
7/16-14 UNC	5/8	3/8	23-Ø9339-5Ø9	23-Ø9339-ØØ9	23-Ø9247-1Ø7
7/16-2Ø UNF	5/8	3/8	23-Ø9338-5Ø9	23-Ø9338-ØØ9	23-Ø9247-2Ø7
1/2 -13 UNC	3/4	7/16	23-Ø9339-51Ø	23-Ø9339-Ø1Ø	23-Ø9247-1Ø8
1/2 -2Ø UNF	3/4	7/16	23-Ø9338-51Ø	23-Ø9338-Ø1Ø	23-Ø9247-2Ø8
9/16-12 UNC	7/8	31/64	23-Ø9339-511	23-Ø9339-Ø11	23-Ø9247-1Ø9
9/16-18 UNF	7/8	31/64	23-Ø9338-511	23-Ø9338-Ø11	23-Ø9247-2Ø9
5/8 -11 UNC	15/16	35/64	23-Ø9339-512	23-Ø9339-Ø12	23-Ø9247-11Ø
5/8 -18 UNF	15/16	35/64	23-Ø9338-512	23-Ø9338-Ø12	23-Ø9247-21Ø
3/4 -1Ø UNC	1-1/16	21/64	23-Ø9339-513	23-Ø9339-Ø13	23-Ø9247-112
3/4 -16 UNF	1-1/16	21/64	23-Ø9338-513	23-Ø9338-Ø13	23-Ø9247-212
7/8 - 9 UNC	1-1/4	49/64	23-Ø9339-514	23-Ø9339-Ø14	23-Ø9247-114
7/8 -14 UNF	1-1/4	49/64	23-Ø9338-514	23-Ø9338-Ø14	23-Ø9247-214

1 - 8 UNC	1-7/16	7/8	23-Ø9339-515	23-Ø9339-Ø15	23-Ø9247-116
1 -14 UNF	1-7/16	7/8	23-Ø9338-515	23-Ø9338-Ø15	23-Ø9247-216
1-1/8 - 7 UNC	1-11/16	31/32			23-Ø9247-118
1-1/8 -12 UNF	1-11/16	31/32			23-Ø9247-218
1-1/4 - 7 UNC	1-7/8	1-1/16			23-Ø9247-12Ø
1-1/4 -12 UNF	1-7/8	1-1/16			23-Ø9247-22Ø

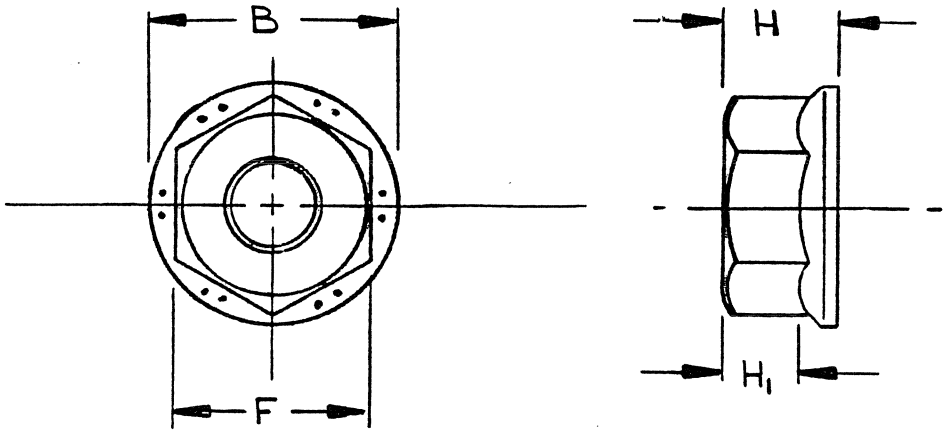
NUT, HEXAGON JAM



THREAD	A NOM	C NOM	GRADE 5 CD OR ZN UNC	GRADE 5 CD OR ZN UNF	GRADE 8 CD OR ZN
1/4 -2Ø	7/16	5/32	23-Ø9596-Ø25		23-1Ø597-1Ø1
1/4 -28	7/16	5/32		23-Ø9254-ØØ1	23-1Ø597-5Ø1
5/16-18	1/2	3/16	23-Ø9596-Ø31		23-1Ø597-1Ø2
5/16-24	1/2	3/16		23-Ø9254-ØØ2	23-1Ø597-5Ø2
3/8 -16	9/16	7/32	23-Ø9596-Ø38		23-1Ø597-1Ø3
3/8 -24	9/16	7/32		23-Ø9254-ØØ3	23-1Ø597-5Ø3
7/16-14	11/16	1/4	23-Ø9596-Ø44		23-1Ø597-1Ø4
7/16-2Ø	11/16	1/4		23-Ø9254-ØØ4	23-1Ø597-5Ø4
1/2 -13	3/4	5/16	23-Ø9596-Ø5Ø		23-1Ø597-1Ø5
1/2 -2Ø	3/4	5/16		23-Ø9254-ØØ5	23-1Ø597-5Ø5
9/16-12	7/8	5/16	23-Ø9596-Ø56		23-1Ø597-1Ø6
9/16-18	7/8	5/16		23-Ø9254-ØØ6	23-1Ø597-5Ø6
5/8 -11	15/16	3/8	23-Ø9596-Ø62		23-1Ø597-1Ø7
5/8 -18	15/16	3/8		23-Ø9254-ØØ7	23-1Ø597-5Ø7
3/4 -1Ø	1- 1/8	27/64	23-Ø9596-Ø75		23-1Ø597-1Ø8
3/4 -16	1- 1/8	27/64		23-Ø9254-ØØ8	23-1Ø597-5Ø8
7/8 - 9	15/16	31/64	23-Ø9596-Ø88		23-1Ø597-1Ø9
7/8 -14	15/16	31/64		23-Ø9254-ØØ9	23-1Ø597-5Ø9
1 - 8	1- 1/2	35/64	23-Ø9596-1ØØ		23-1Ø597-11Ø
1 -12	1- 1/2	35/64		23-Ø9254-Ø1Ø	23-1Ø597-51Ø
1-1/8 - 7	1-11/16	39/64	23-Ø9596-112		23-1Ø597-111
1-1/8 - 8	1-11/16	39/64			23-1Ø597-511
1-1/8 -12	1-11/16	39/64		23-Ø9254-Ø2Ø	23-1Ø597-611
1-1/4 - 7	1- 7/8	23/32	23-Ø9596-125		23-1Ø597-112
1-1/4 - 8	1- 7/8	23/32			23-1Ø597-512
1-1/4 -12	1- 7/8	23/32		23-Ø9254-Ø3Ø	23-1Ø597-612
1-3/8 - 6	2- 1/16	25/32	23-Ø9596-138		23-1Ø597-113
1-3/8 - 8	2- 1/16	25/32			23-1Ø597-513
1-3/8 -12	2- 1/16	25/32		23-Ø9254-Ø4Ø	23-1Ø597-613

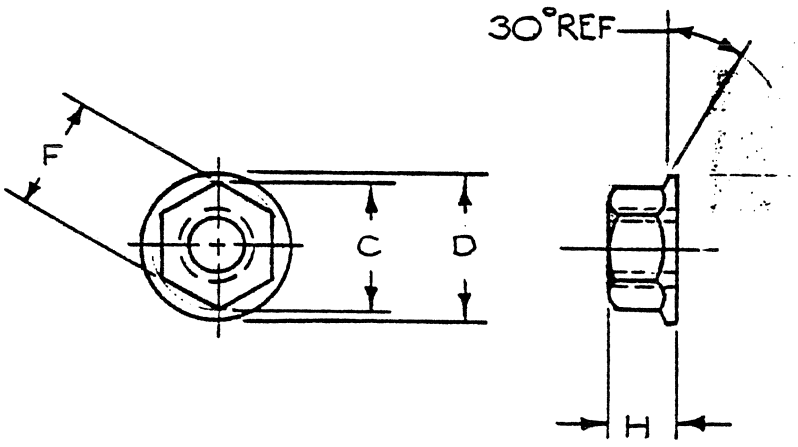
1-1/2	- 6	2- 1/4	27/32	23-Ø9596-15Ø		23-1Ø597-114
1-1/2	- 8	2- 1/4	27/32			23-1Ø597-514
1-1/2	-12	2- 1/4	27/32		23-Ø9254-Ø5Ø	23-1Ø597-614

NUT, FLANGED HEX, PREVAILING TORQUE



THREAD	ACROSS FLATS F	FLANGE DIA. B	HGT H	HEX HGT H_1	FINISH ②	PART NO.
1/4 - 20	.438 max. .427 min.	.59 max. .54 min.	.275 max. .222 min.	.14 min.	P	23-11020-004
					C	-504
5/16 - 18	.500 max. .489 min.	.68 max. .66 min.	.330 max. .268 min.	.17 min.	P	-005
					C	-505
3/8 - 16	.562 max. .551 min.	.81 max. .73 min.	.414 max. .330 min.	.20 min.	P	-006
					C	-506
7/16 - 14	.688 max. .675 min.	.94 max. .91 min.	.469 max. .375 min.	.23 min.	P	-007
					C	-507
7/16-20	11/16	.930 Max.	.495 Max.	.23 Min.	P	-007
						-107
1/2 - 13	.750 max. .736 min.	1.07 max. 1.00 min.	.538 max. .437 min.	.26 min.	P	-008
					C	-508
9/16 - 12	.872 max. .861 min.	1.19 max. 1.16 min.	.590 max. .483 min.	.29 min.	P	-009
					C	-509
5/8 - 11	.938 max. .922 min.	1.33 max. 1.25 min.	.661 max. .545 min.	.32 min.	P	-010
					C	-510
3/4 - 10	1.125 max 1.088 min	1.58 max. 1.46 min.	.757 max. .627 min.	.38 min.	P	-012
					C	-512

NUT, FLANGE
NONLOCKING GR. B



THREAD SIZE	F FLATS (NOM.)	C CORNERS (MAX)	H (MAX)	D (MAX)	MANUFACTURER'S NO.		FREIGHTLINER PART NUMBER
						MF	
3/4-16	1.125	1.299	.675	1.500		52SFS3416	23-11022-750

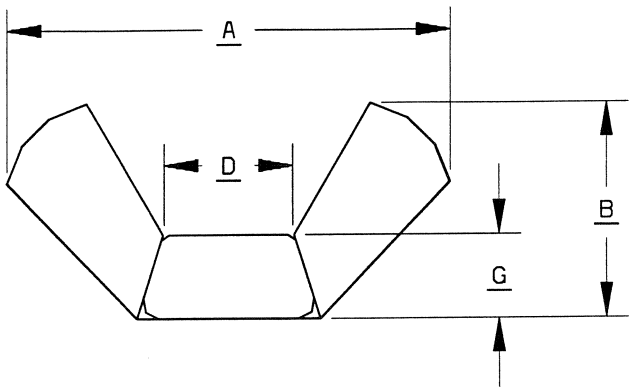
NUT, HEX SERRATED FLANGE



THREAD	F FLATS (BASIC)	H HEIGHT (MAX)	C FLANGE (MAX)	MANUFACTURES NUMBER MF		FREIGHTLINER PART NUMBER
1/4 20 UNC 28 UNF	7/16	.255	.609	32 WLF 1420 1428		23-11183-001 -002
5/16 18 UNC 24 UNF	1/2	.297	.687	51618 51624		-003 -004
3/8 16 UNC 24 UNF	9/16	.359	.750	3816 3824		-005 -006
7/16 14 UNC 20 UNF	5/8	.395	.937	71614 71620		-007 -008
1/2 13 UNC 20 UNF	3/4	.458	1.062	1213 1220		-009 -010

23-00450 , D , , NUT

DRAWN	CGD	TITLE	DRAWING NUMBER	
APPRV	DAJ	NUT WING	23-00450	
DATE	03/26/99			
CATIA ORIGINAL		FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. D



NOMINAL SIZE	A	B	D	G	THREAD	FREIGHTLINER PART NUMBER	
						STEEL	BRASS
10	.84	.41	.25	.16	32	-	23-00450-308
1/4	1.04	.50	.30	.20	20	23-00450-409	-
5/16	1.19	.60	.36	.23	18	23-00450-511	-
3/8	1.38	.72	.45	.28	14	23-00450-613	-
1/2	1.88	.94	.60	.37	13	23-00450-817	-
1/2	1.88	.94	.60	.37	20	23-00450-916	-
5/8	2.50	1.25	.75	.40	11	23-00450-920	-

ENGINEERING NOTES:

1. MATERIAL: STEEL PER SAE J995 GRADE 2.
   BRASS PER SAE J461 CA360000, ETC.

2. DIMENSIONS SHOWN ARE FOR REFERENCE ONLY EXCEPT -920. ALL OTHERS SHALL CONFORM TO ANSI B18.17.

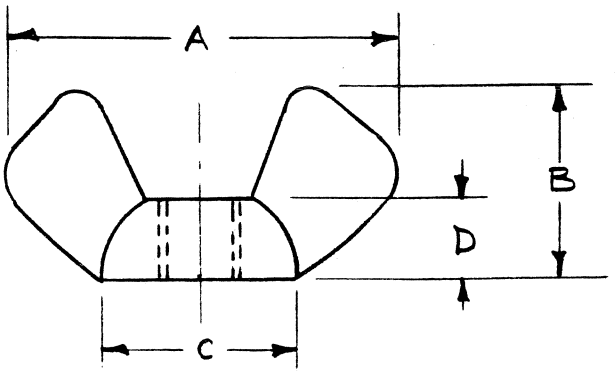
CHG	JOB NO	DATE	BY	REVISION
D	PA2042-93	03/26/99	CGD	REVISED AND REDRAWN IN CATIA.

23-00450

General Use Part

ORIGINAL JOB NO.	TITLE	PART NO.
	NUT, WING	23-00450
LAST CHG LTR B		SHEET 1 OF 1

SKETCH



SIZE	A	B	C	D
6-32, 6-40, 8-32, 8-36	21/32	11/32	5/16	1/8
10-24, 10-32	27/32	13/32	13/32	5/32
1/4 -20, 1/4 -28	1-1/32	1/2	15/32	3/16
5/16-18, 5/16-24	1-3/16	19/32	17/32	7/32
3/8 -16, 3/8 -24	1-3/8	23/32	21/32	9/32
7/16-14, 7/16-20, 1/2-13, 1/2-20	1-7/8	15/16	29/32	3/8

PART NUMBERS

UNF			UNC		
SIZE & THREAD	23-00450-#		SIZE & THREAD	23-00450-#	
	(1) STEEL	(1) BRASS		(1) STEEL	(1) BRASS
6-40	-102	-104	6-32	-103	-105
8-36	-204	-206	8-32	-205	-207
10-32	-306	-308	10-24	-307	-309
1/4 -28	-408	-410	1/4 -20	-409	-411
5/16-24	-510	-512	5/16-18	-511	-513
3/8 -24	-612	-614	3/8 -14	-613	-615
7/16-20	-814	-816	7/16-14	-715	-717
1/2 -20	-916	-918	1/2 -13	-817	-819

ENGINEERING NOTES

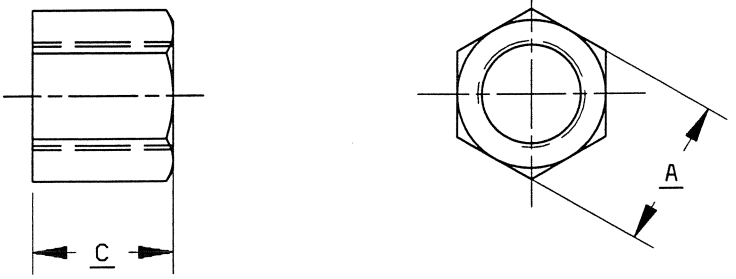
(1) Material: Steel, per SAE J995 Grade 2
Brass, per SAE J461 CA614, CA345, CA360, etc.

2. Threads shall conform to unified fine thread series Class 2B (UNF-2B) or to unified, coarse thread series Class 2B (UNC-2B)
3. Dimensions shown are intended to comply with national standards.
Ref: ANSI B18.17 1968

LTR	JOB NO.	BY	DATE	CHANGE INFORMATION
B	60806	HJR	5-12-76	Redrawn; Brass Added

COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED		5-12-76		(1)	

DRAWN	CGD	TITLE	DRAWING NUMBER	
APPRV	DAJ	NUT, HIGH SELF LOCKING DEFORMED THREAD TYPE	23-00460	
DATE	03/26/99	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. D
CATIA ORIGINAL				



THREAD	"A" FLATS	"C" HEIGHT *	FREIGHTLINER PART NUMBER
3/8-24	9/16	17/32	23-00460-001
7/16-20	5/8	39/64	23-00460-002
1/2-20	3/4	21/32	23-00460-003
9/16-18	7/8	49/64	23-00460-004
5/8-18	15/16	27/32	23-00460-005
3/4-16	1 1/16	31/32	23-00460-006
7/8-14	1 5/16	1 1/8	23-00460-007
1 -14	1 7/16	1 5/16	23-00460-008
1 1/8-12	1 5/8	1 1/2	23-00460-009
1 1/4-12	1 13/16	1 11/16	23-00460-010

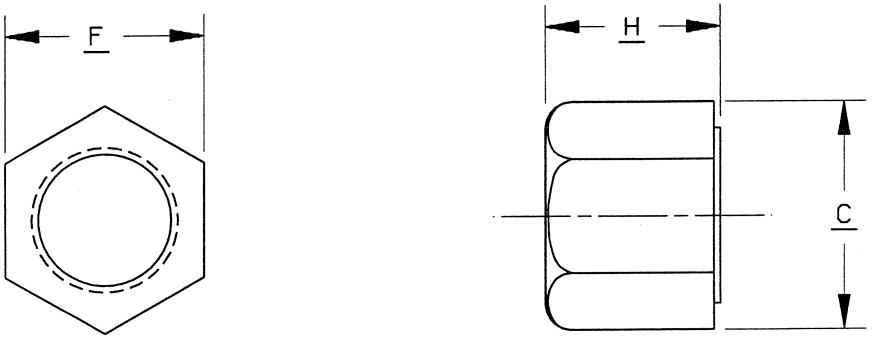
* MAY VARY SLIGHTLY AMONG MANUFACTURERS; SAE DIMENSIONS SHOWN.

ENGINEERING NOTES:

1. MATERIAL: SAE GRADE 8 NUT MATERIAL.
2. FINISH: NITRIDED.
3. LOCKING METHOD: DEFORMED TOP THREADS.

CHG	JOB NO	DATE	BY	REVISION
D	PA2042-93	03/26/99	CGD	REVISED AND REDRAWN IN CATIA.

DRAWN	S B	TITLE	DRAWING NUMBER	
APPRV	RSP	NUT-HEX HIGH	23-00461	
DATE	04/28/78	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. F
CATIA ORIGINAL				



THREAD SAE CLASS 2B	F (FLATS) MAX	F (FLATS) MIN	C (CORNERS) MAX	C (CORNERS) MIN	H (HEIGHT) MAX	H (HEIGHT) MIN	FREIGHTLINER PART NUMBERS
3/8-24	.5625	.551	.650	.628	.509	.491	23-00461-001
1/2-20	.7500	.736	.866	.840	.667	.645	-003
5/8-18	.9375	.922	1.083	1.051	.857	.831	(4) -005
3/4-16	1.125	1.088	1.299	1.240	1.015	.985	(4) -006
7/8-14	1.3125	1.269	1.516	1.447	1.172	1.140	(4) -007
1 -14	1.5000	1.450	1.732	1.653	1.330	1.294	(4) -008

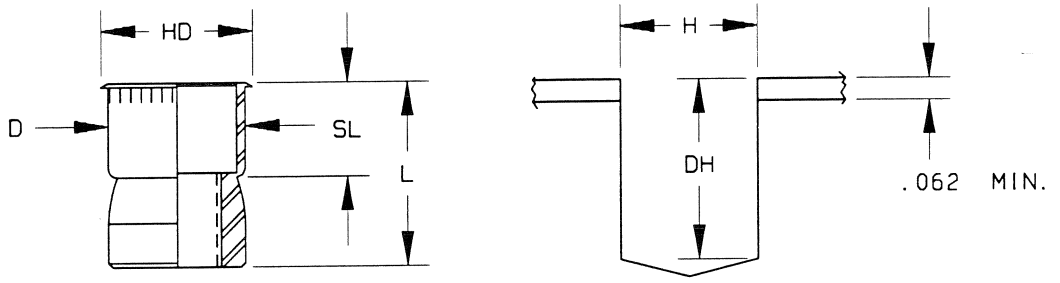
ENGINEERING NOTES:

1. MATERIAL: GRADE C (SAE GRADE 8) NUT MATERIAL; PER SAE J995
2. FINISH: PLAIN
3. GENERAL AND DIMENSIONAL SPECIFICATIONS SHALL CONFORM TO APPLICABLE PROVISIONS OF SAE STD J482, EXCEPT AS NOTED.

(4) FINISH TO BE TEXACOTE 452.

CHG	JOB NO	DATE	BY	REVISION
E	P01020-01	10/11/96	FHC	REVISED AND REDRAWN IN CATIA. ADDED NOTE 4.
F	PA2042-98	12/09/99	LFB	452 WAS 440.

DRAWN	CGD	TITLE	DRAWING NUMBER	
APPRV	DAJ	NUTSERT-BLIND STEEL, CAD PLATE	23-00495	
DATE	08/16/99	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 2	CHG. LTR. B
CATIA ORIGINAL				



THREAD SIZE	"D" MAX	"F" MIN	"SL" MAX	"L" MAX	"DH" MIN	"H"	AVK * PART NUMBER	FREIGHTLINER PART NUMBER
4-40 UNC	.187	.206	.195	.390	.400	**	ATS2-440	23-00495-504
6-32 UNC	.218	.230	.195	.390	.400		ATS2-632	23-00495-506
8-32 UNC	.249	.260	.195	.390	.400		ATS2-832	23-00495-508
10-24 UNC	.280	.301	.195	.390	.400		ATS2-1024	23-00495-510
10-32 UNF	.280	.301	.195	.390	.400		ATS2-1032	23-00495-710
1/4-20 UNC	.374	.396	.265	.530	.540		ATS2-420	23-00495-408
1/4-28 UNF	.374	.396	.265	.530	.540		ATS2-428	23-00495-608
5/16-24 UNF	.499	.521	.315	.630	.640		ATS2-524	23-00495-610
3/8-16 UNC	.561	.583	.380	.760	.770		ATS2-616	23-00495-412
3/8-24 UNF	.561	.583	.380	.760	.770		ATS2-624	23-00495-612

* AVK IS THE RECOMMENDED VENDOR.

** HOLE SIZE VARIES WITH THICKNESS AND DENSITY OF PARENT MATERIAL. EXPERIMENTATION IS REQUIRED FOR OPTIMUM PERFORMANCE.

CHG	JOB NO	DATE	BY	REVISION
B	PA2042-95	08/16/99	CGD	REVISED AND REDRAWN IN CATIA

DRAWN	CGD	TITLE	DRAWING NUMBER	
APPRV	DAJ	NUTSERT-BLIND STEEL, CAD PLATE	23-00495	
DATE	08/16/99	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 2 OF 2	CHG. LTR. B
CATIA ORIGINAL				

HOLE SIZE VS. MATERIAL THICKNESS

THREAD SIZE	.030-.090		.091-.124		.125-.186		.187 & OVER	
	DRILL	DECIMAL	DRILL	DECIMAL	DRILL	DECIMAL	DRILL	DECIMAL
4-40	3/16	.1875	#10	.1935	#10	.1935	#9	.1960
6-32	7/32	.2188	#2	.2210	#1	.2280	#1	.2280
8-32	1/4	.2500	"F"	.2570	17/64	.2656	17/64	.2656
10-24	9/32	.2812	"L"	.2900	"L"	.2900	19/64	.2969
10-32	9/32	.2812	"L"	.2900	"L"	.2900	19/64	.2969
1/4-20	3/8	.3750	3/8	.3750	"W"	.3860	25/64	.3906
1/4-28	3/8	.3750	3/8	.3750	"W"	.3860	25/64	.3906
5/16-24	1/2	.5000	1/2	.5000	33/64	.5156	17/32	.5321
3/8-16	9/16	.5625	9/16	.5625	37/64	.5781	37/64	.5781
3/8-24	9/16	.5625	9/16	.5625	37/64	.5781	37/64	.5781

TEST THE INSERTS IN THE APPLICATION BEFORE FINALIZING THE HOLE SIZE.
STANDARD HOLE SIZE TOLERANCES ARE ACCEPTABLE BUT DO NOT GO BELOW NOMINAL SIZE.

ENGINEERING NOTES:

1. MATERIAL: STEEL TYPE C-1110.
2. FINISH: CAD PLATE PER QQ-P-416 CL3 TYI.
3. DO NOT USE NUTSERTS AS RIVETS TO FASTEN TWO OR MORE SHEETS OF METAL TOGETHER.
4. USE ONLY A NUTSERT PLACEMENT TOOL TO SECURE THE NUTSERT IN THE HOLE.
5. THE NUTSERT SHOULD COME IN CONTACT WITH THE ATTACHED PART. DO NOT LEAVE A VOID OR MISMATCH BETWEEN THE NUTSERT AND THE ATTACHED PART OR THE NUTSERT MAY PULL OUT OF THE HOLE.

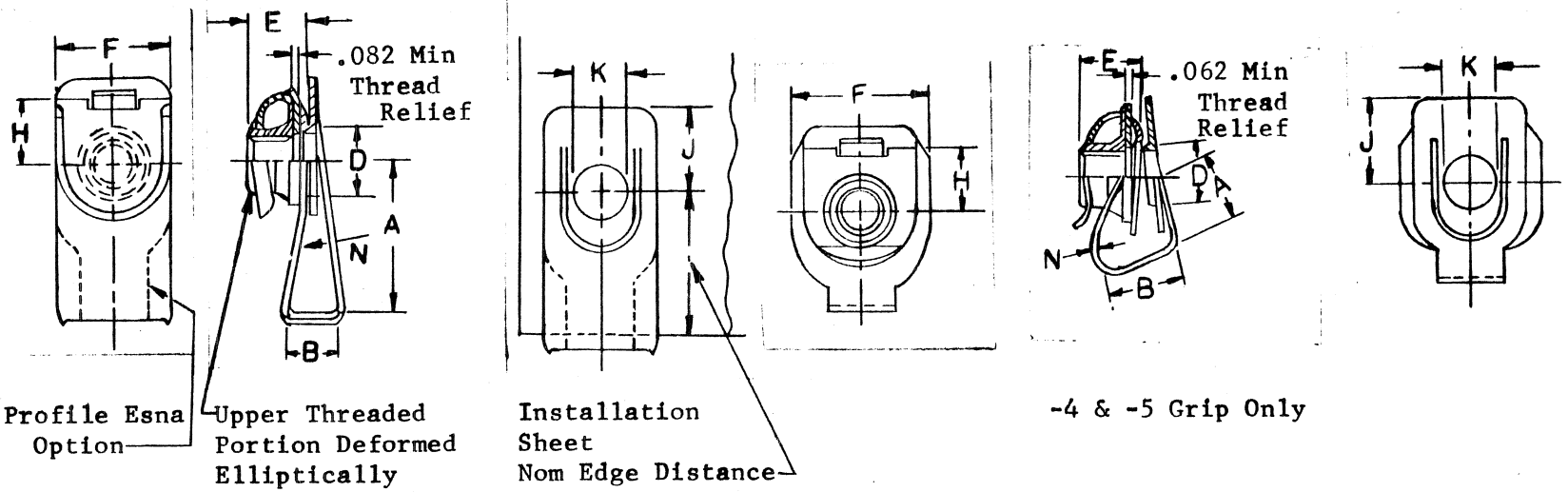
CHG	JOB NO	DATE	BY	REVISION
B	PA2042-95	08/16/99	CGD	REVISED AND REDRAWN IN CATIA

CHG	BY	DATE	WAS

CHG	BY	DATE	WAS

10-3-68

E-183



Profile Esna Option

Upper Threaded Portion Deformed Elliptically

Installation Sheet Nom Edge Distance

-4 & -5 Grip Only

(1) Material: Nut & Clip - Carbon Steel, Heat Treated

Dash No.	Part Number	Thread	A ±.010	B ±.015	C Nominal Edge Distance	D Max	E Max	F Max	H Max	J Max	K Min	N Ref	Recommended Installation Hole Dia (See Float Note)	Mounting Sheet Thickness	Approx Weight Lb/100
-000	RM52LHA4972-5-62	6-32UNC-3B	.300	.060	.281	.162	.155	.270	.163	.223	.141	.015	.163 - .173	.030-.051	.14
-001	RM52LHA4972-6-82	8-32UNC-3B	.395	.105	.375	.191	.202	.380	.225	.285	.170	.020	.191 - .202	.020-.090	.37
-002	RM52LHA4972-8-82		.520	.190	.500									.020-.160	.46
-003	RM52LHA4972-10-82		.665		.625										.51
-004	RM52LHA4972-4-02	10-32UNC-3B	.265	.234	.250	.218	.202	.500	.225	.285	.193	.020	.218 - .250	.050-.210	.41
-005	RM52LHA4972-5-02		.300		.281										
-006	RM52LHA4972-6-02		.395	.105	.375			.380						.020-.090	.35
-007	RM52LHA4972-8-02		.520	.190	.500									.020-.160	.47
-008	RM52LHA4972-10-02		.665		.625										.52

Finish:

Nut	Cadmium Plate, QQ-P-416, Type I, Class 3, and Molybdenum Disulphide Type Dry Film Lubricant
Clip	QQ-P-416, Type II, Class 3
Threads	MIL-S-7742 (Prior to Addition of Dry Film Lubricant)
Performance	MIL-N-25027(ASG) up to 550°F Temperature. Because Design is not Riveted for Attachment Exception must be made to Requirements for Push-Out Performance.
Float	When Installed in the Recommended Installation Hole, the Clip will Float .000 - .011 Radially. Additional Radial Float can be Obtained by Using Larger Hole Sizes. These Parts are Designed for a Maximum Installation Hole Dia .032 over the max recommended values

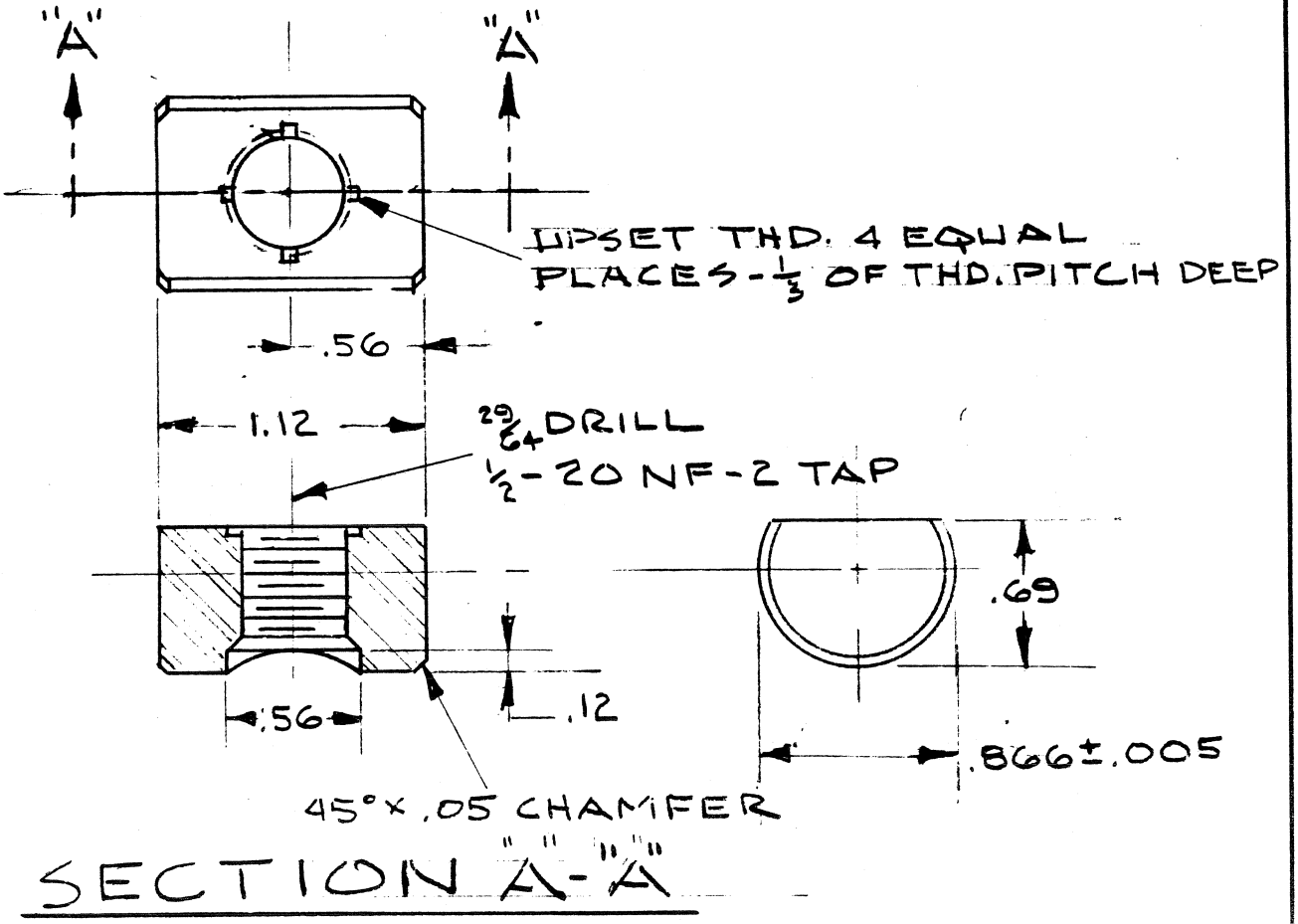
COMPILED K.T.A.
APPROVED K.T.A.
DATE DRAWN 9-5-68
MATERIAL (1)
NEXT ASSY. NO.
GENERAL USE PART

Portland FREIGHTLINER CORPORATION Oregon 97208

LAST CHG. LTR.
PRINT ISSUED
TITLE CLIP, NUT
SHEET OF
PART NO. 23-496

23-9010

PRINT ISSUED		TITLE	PART NO.
		NUT, BARREL	23-9010
LAST CHG. LTR.	A		SHEET OF



SECTION "A-A"

NOTE: A. Center of tapped hole shall not deviate from center of O.D. by more than .015.

B. Case Harden - .02 deep
Draw 900° - 1000° F
Core - Rockwell B65 Min.

CHG	BY	DATE	WAS

CHG	BY	DATE	WAS
A	PRJ	12-9-68	B Size Drawing

① Steel - SAE B1112

COMPLIED	PRJ	DATE DRAWN		MATERIAL	NEXT ASSY. NO.
APPROVED	R.J.A.	12-9-68		①	VEHICLE

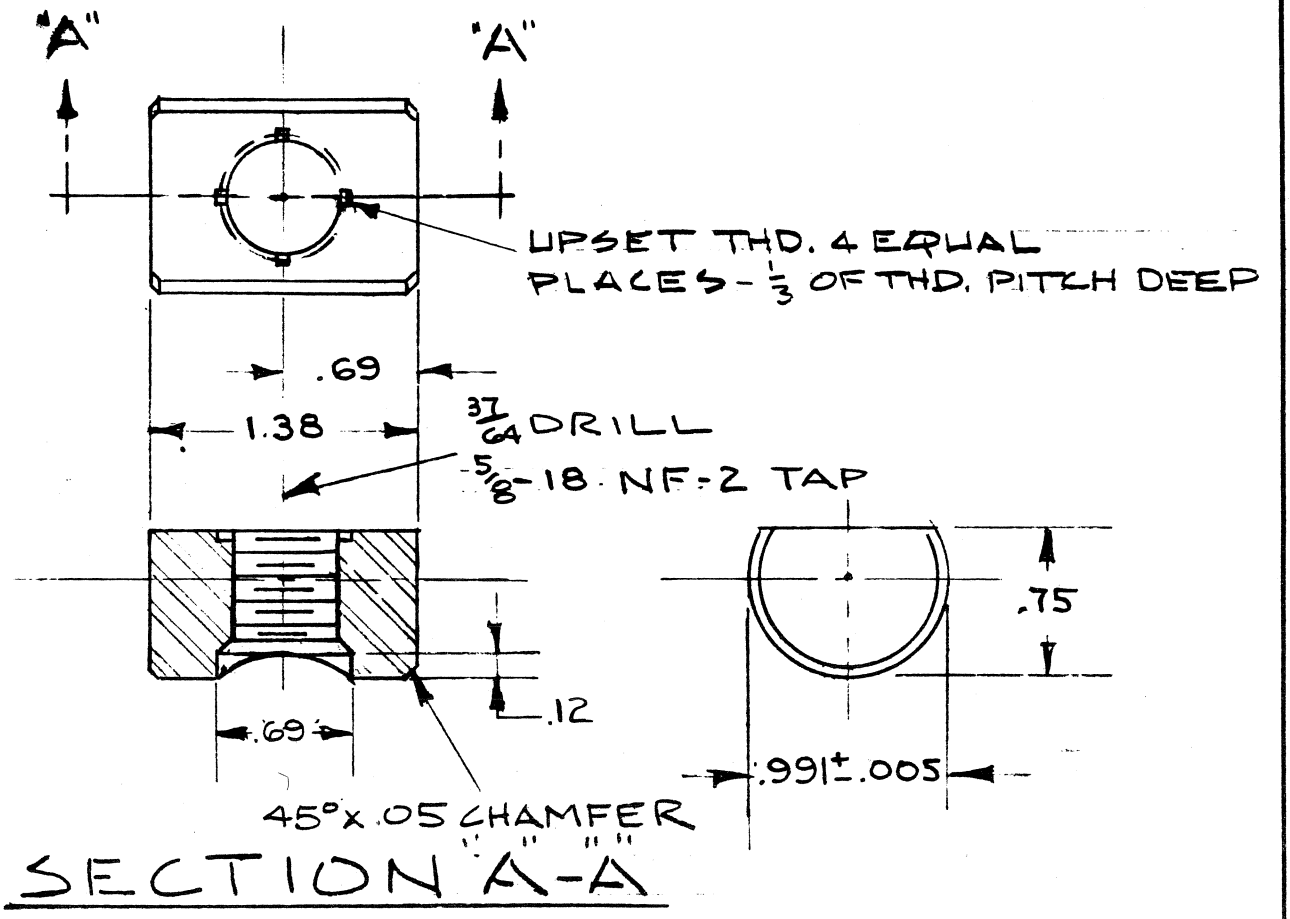
Portland FREIGHTLINER CORPORATION Oregon 97208

12-16-8

E-183

23-9011

PRINT ISSUED		TITLE	PART NO.
		NUT, BARREL	23-9011
LAST CHG. LTR.	A		SHEET OF



SECTION A-A

A. Center of tapped hole shall not deviate from center of O.D. by more than .020.

B. Case Harden--.02 Deep
Draw 900°--1000°F
Core--Rockwell B65 Min.

CHG	BY	DATE	WAS

CHG	BY	DATE	WAS
A	PRJ	12-9-68	B Size Drawing

(1) Steel - SAE B1112

COMPLIED	PRJ	DATE DRAWN		MATERIAL	NEXT ASSY. NO.
APPROVED	[illegible]	12-6-68		(1)	VEHICLE

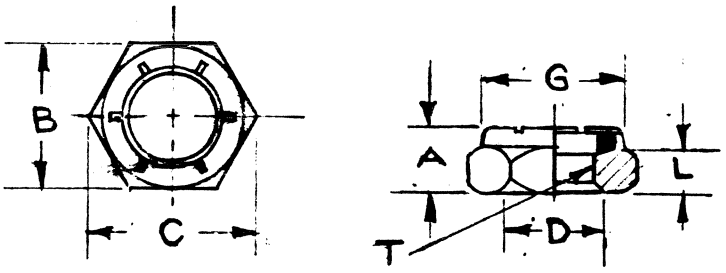
Portland FREIGHTLINER CORPORATION Oregon 97208

12-16-68

23-9119

PRINT ISSUED	TITLE	PART NO.
5/7/71	NUT, HEX, SELF-LOCKING, ELASTIC STOP, Gr. A	23-9119
LAST CHG. LTR. C		SHEET 1 OF 1

SKETCH



PART NUMBERS

THD. (NF) T	A MAX	B MAX	C MIN	D MAX	G	L	FREIGHTLINER PART NUMBER
1/4 -28	.218	.428	.488	.280	.438	.125	23-9119-001
1/4 -20	.218	.428	.488	.280	.438	.125	-101
5/16-24	.265	.490	.557	.342	.484	.158	-002
5/16-18	.265	.490	.557	.342	.484	.158	-102
3/8 -24	.281	.553	.628	.405	.463	.150	-003
3/8 -16	.281	.553	.628	.405	.463	.150	-103
7/16-20	.328	.615	.698	.472	.625	.225	-004
7/16-14	.328	.615	.698	.472	.625	.225	-104
1/2 -20	.328	.740	.840	.530	.750	.190	-005
1/2 -13	.328	.740	.840	.530	.750	.190	-105
9/16-18	.374	.865	.982	.613	.844	.225	-006
9/16-12	.374	.865	.982	.613	.844	.225	-106
5/8 -18	.406	.928	1.051	.676	.922	.285	-007
5/8 -11	.406	.928	1.051	.676	.922	.285	-107
3/4 -16	.421	1.053	1.191	.812	1.047	.288	-008
3/4 -10	.421	1.053	1.191	.812	1.047	.288	-108
7/8 -14	.484	1.240	1.403	.938	1.234	.340	-009
1 -14	.578	1.428	1.615	1.064	1.422	.405	-010
1 -9	.578	1.428	1.615	1.064	1.422	.405	-110
1-1/8 -12	.672	1.615	1.826	1.191	1.563	.500	-011
1-1/8 - 7	.672	1.615	1.826	1.191	1.563	.500	-111
1-1/4 -12	.765	1.803	2.038	1.315	1.750	.523	-012
1-1/4 -7	.765	1.803	2.038	1.315	1.750	.523	-112
1-3/8 -12	.797	1.973	2.249	1.467	1.984	.469	-013
1-3/8 - 7	.797	1.973	2.249	1.467	1.984	.469	-113
1-1/2 -12	.828	2.159	2.416	1.588	2.141	.565	-014
1-1/2 - 7	.828	2.159	2.416	1.588	2.141	.565	-114

ENGINEERING NOTES

1. Nylon Insert Locknut, Hex, Light, Thiu - TE or Equal
2. Finish: Electrogalvanize or Zinc Plate

CHG	BY	DATE	WAS

CHG	BY	DATE	AS
A	PRJ	12-9-68	B Size I
B	HJR	4-26-71	Unplated
C	NLR	7-29-83	ADDED - 1

9/1/58 AS wing ormat Rev.) THRU -114

B

COMPLIED	PRJ	DATE DRAWN		MATERIAL	
APPROVED	[illegible]	12-9-68		①	

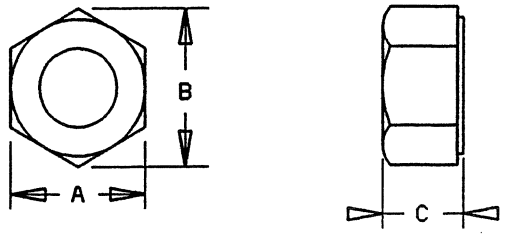
12-27-8

Portland FREIGHTLINER CORPORATION Oregon 97208

E-183

C B

DRAWN	DAJ	TITLE	DRAWING NUMBER
APPRV	DAJ	NUT-HEX PLAIN, GRADE C	23-09247
DATE	05/28/98	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1 / CHG. LTR. B
CATIA ORIGINAL			



THREAD	A FLATS (BASIC)	B CORNERS (MAX)	C THICK (BASIC)	FREIGHTLINER PART NUMBER
1/4 20 UNC 28 UNF	7/16	.505	7/32	23-09247-104 -
5/16 18 UNC 24 UNF	1/2	.577	17/64	-105 -205
3/8 16 UNC 24 UNF	9/16	.650	21/64	-106 -206
7/16 14 UNC 20 UNF	11/16	.794	3/8	- -207
1/2 13 UNC 20 UNF	3/4	.866	7/16	-108 -208
9/16 12 UNC 18 UNF	7/8	1.010	31/64	- -
5/8 11 UNC 18 UNF	15/16	1.083	35/64	-110 -210
3/4 10 UNC 16 UNF	1- 1/8	1.299	41/64	-112 -212
7/8 9 UNC 14 UNF	1- 5/16	1.516	3/4	-114 -
1 8 UNC 14 UNF	1- 1/2	1.732	55/64	- -216
1-1/8 7 UNC 12 UNF	1-11/16	1.949	31/32	- -
1-1/4 7 UNC 12 UNF	1- 7/8	2.165	1- 1/16	- -

ENGINEERING NOTES:

1. MATERIAL: STEEL, GRADE C NUT MATERIAL (= SAE GR. 8) MEETING ALL PERTINENT PROVISIONS OF THE CURRENT REVISION OF SAE STANDARD J995 MECHANICAL AND QUALITY REQUIREMENTS FOR STEEL NUTS.

2. FINISH: ZINC PHOSHATE CONVERSION COAT AND OIL (DRY TO THE TOUCH) PER PER 49-00006-041.

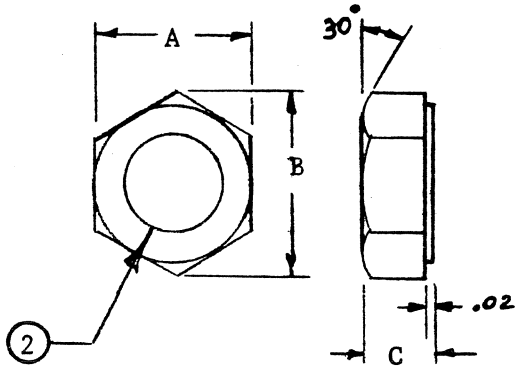
CHG	JOB NO	DATE	BY	REVISION
B	P05573-03	05/28/98	DAJ	REVISED AND REDRAWN IN CATIA.

23-9254

General Use Part

PRINT ISSUED	TITLE	PART NO.
12/5/70	NUT, HEX JAM UNF, GR. 'B'	23-9254
LAST CHG. LTR. B		SHEET 1 OF 1

SKETCH



PART NUMBERS

Size	Threads Per Inch	A			B	C			Freightliner Part Number
		Nom.	Max.	Min.		Nom.	Max.	Min.	
1/4	28	7/16	.437	.428	.488	5/32	.163	.150	23-9254-001
5/16	24	1/2	.500	.489	.557	3/16	.195	.180	002
3/8	24	9/16	.562	.551	.628	7/32	.227	.210	003
7/16	20	11/16	.688	.675	.768	1/4	.260	.240	004
1/2	20	3/4	.750	.736	.840	5/16	.323	.302	005
9/16	18	7/8	.875	.861	.982	5/16	.324	.301	006
5/8	18	15/16	.938	.922	1.051	3/8	.387	.363	007
3/4	16	1-1/8	1.125	1.088	1.240	27/64	.446	.398	008
7/8	14	15/16	1.313	1.269	1.449	31/64	.510	.458	009
1	12	1-1/2	1.500	1.450	1.653	35/64	.575	.519	010
1-1/8	12	1-11/16	1.6875	1.631	1.859	39/64	.639	.579	020
1-1/4	12	1-7/8	1.875	1.812	2.066	23/32	.751	.687	030
1-3/8	12	2-1/16	2.063	1.994	2.273	25/32	.835	.747	040
1-1/2	12	2-1/4	2.250	2.175	2.480	27/32	.880	.808	050

ENGINEERING NOTES

(1) Material: Steel per SAE Standard J995 for Grade B nut material (for use with Grade 5 bolts).

(2) Threads to conform to Unified National Fine Thread Series Class 2B (UNF-2B) per SAE Standard J475.

3 Finish: Commercial Cd or Zn plate.

4 Must meet all applicable mechanical and quality requirements for steel nuts per SAE Standard J995.

5 Must meet applicable general and dimensional requirements of SAE Standard J104.

CHG	BY	DATE	WAS

CHG	BY	DATE	WAS
A	HJR	11-19-70	Notes 3,4,5 added
B	DJL	6-11-84	A DIM -008 Revised

COMPILED	KJA	DATE DRAWN		MATERIAL	MASTER NUMBER	
APPROVED	K.J.A.	7-2-69		(1)	01300	000D1

was FC 401

Portland FREIGHTLINER CORPORATION Oregon 97208

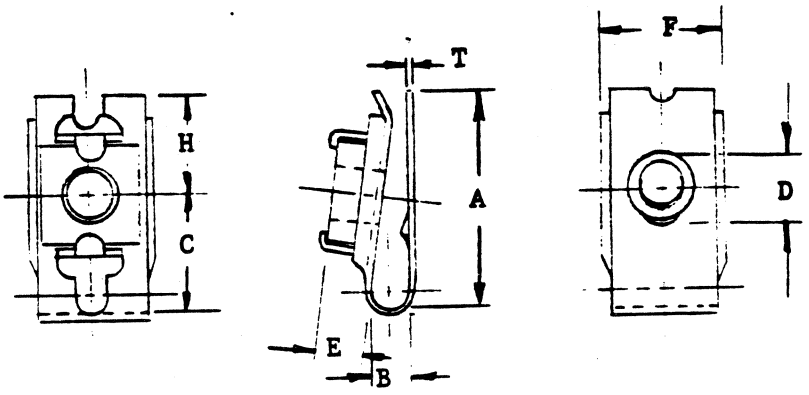
B 7-8-69

E-183

General Use Part

PRINT ISSUED	TITLE	PART NO.
11-11-69	CAGED NUT "U" TYPE CLIP	23-9287
LAST CHG. LTR. A		SHEET 1 OF 1

SKETCH



PART NUMBERS

THREAD SIZE	B PANEL RANGE	A LENGTH	F WIDTH	C CENTER TO EDGE MAX.	H CENTER TO END	E	D PANEL HOLE DIAM MIN.	T MATL THICK	FREIGHTLINER PART NO.
¼-20	.035 .062	1.13	.71	.500	.55	.31	.437	.044	23-9287-010
	.096 .141	1.11	.73	.500	.53	.31	.437	.044	23-9287-011
¼-28	.096 .141	1.11	.73	.500	.53	.31	.437	.044	23-9287-012
5/16-18	.035 .062	1.13	.71	.500	.55	.31	.437	.044	23-9287-020
	.096 .141	1.11	.73	.500	.53	.31	.437	.044	23-9287-021
5/16-24	.035 .062	1.13	.71	.500	.55	.31	.437	.044	23-9287-030
	.096 .141	1.11	.73	.500	.53	.31	.437	.044	23-9287-031
3/8-24	.110 .126	1.10	.83	.500	.53	.34	.485	.044	23-9287-040

*Available on special order only.

ENGINEERING NOTES

Suggested Vendor: Tinnerman Products Inc.
(1) Material: Spring Steel, heat treated
Finish: Soluble oil dipped or phospate and oil

COMPILED	KJA	DATE DRAWN		MATERIAL	NEXT ASSY. NO.
APPROVED		10-1-69		(1)	Vehicle

Portland FREIGHTLINER CORPORATION Oregon 97208

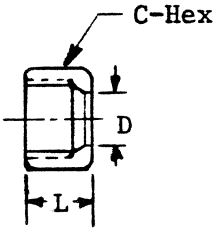
CHG	BY	DATE	
			WAS
A	HJR	1-18-72	Note added; Job #84520

CHG	BY	DATE	
			WAS

E-183

PRINT ISSUED	TITLE	PART NO.
2-26-70	COMPRESSION NUT BRASS	23-9303
LAST CHG. LTR. A		SHEET 1 OF 1

SKETCH



PART NUMBERS

	TUBE SIZE	STRAIGHT THREAD	C HEX	L		FREIGHTLINER PART NUMBER	PARKER HANNIFIN PART NO.*	
	1/8	5/16-24	3/8			23-9303-001	61C-2	
	3/16	3/8-24	7/16			-002	-3	
	1/4	7/16-24	1			-003	-4	
	5/16	1/2-24			.320	-004	-5	
	3/8	9/16-2			.383	-005	-6	
	7/16	5/8			.447	-006	-7	
	1/2		13/	.62	.511	-007	-8	
	5/8	1 8	15/16	.62	.638	-008	-10	
	3/4	1-1	1-3/16	.69	.765	-009	-12	
	7/8	1-1/8-18	1-1/4	.63	.890	-010	-14	

REMOVE & DESTROY

ENGINEERING NOTES

(1) Material: Brass, ASTM B-16, CA 360 or CA 345. *Part Number includes Brass Nut PH/61C-# and Delrin Sleeve PH/60PT-#.

2. Must meet applicable current requirements of Federal Motor Vehicle Safety Standard No. 106.

CHG	BY	DATE	WAS	JOB NO

CHG	BY	DATE	WAS	JOB NO
A	HJR	5-29-75	Add Notes 2.*	A0746

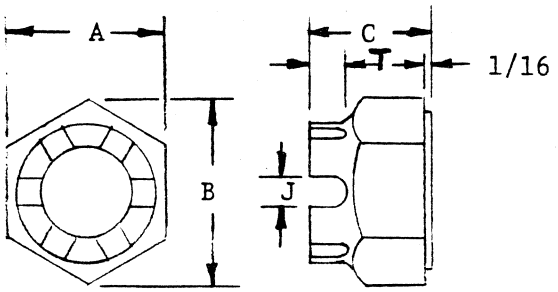
COMPILED	KJA	DATE DRAWN		MATERIAL	
APPROVED	KJA	2-12-70		(1)	

Portland Or FREIGHTLINER CORPORATION Oregon 97208 A

23-9335

PRINT ISSUED	TITLE	PART NO.
5/18/71	NUT CASTLE,	23-9335
LAST CHG LTR: C		SHEET 1 OF 1

SKETCH



PART NUMBERS

SIZE	A			B	C			J	T	F/L PART NO. 23-9335
	NOM.	MAX.	MIN.		NOM.	MAX.	MIN.			
1/4-28	7/16	.437	.428	.488	9/32	.288	.274	5/64	3/16	-001
5/16-24	1/2	.500	.489	.557	21/64	.336	.320	3/32	7/32	-002
3/8-24	9/16	.562	.551	.628	13/32	.415	.398	1/8	9/32	-003
7/16-20	11/16	.688	.675	.768	29/64	.463	.444	1/8	5/16	-004
1/2-20	3/4	.750	.736	.840	9/16	.573	.552	5/32	13/32	-005
9/16-18	7/8	.875	.861	.982	39/64	.621	.598	5/32	7/16	-006
5/8-18	15/16	.937	.922	1.051	23/32	.731	.706	3/16	1/2	-007
3/4-16	1 1/8	1.125	1.088	1.240	13/16	.827	.798	3/16	9/16	-008
7/8-14	1 5/16	1.312	1.269	1.447	29/32	.922	.890	3/16	21/32	-009
1-14	1 1/2	1.500	1.450	1.653	1	1.018	.982	1/4	23/32	-010

ENGINEERING NOTES

1. Material: Steel, SAE J995 Grade 5.
2. Finish: Electrogalvanize or cadmium plate.
3. Thread: UNF-2B (Unified National Fine Thread Series Class 2B)
4. Dimensions: SAE J104 Current standards.

CHG	BY	DATE	WAS

CHG	BY	DATE	WAS
A	HJR	4-29-71	Unplated; old format
B		?	TO MATCH IMACS
C1	FF	6-18-85	REV. TO SAE J104, J995
C2	FF	6-18-85	JOB # 1989D

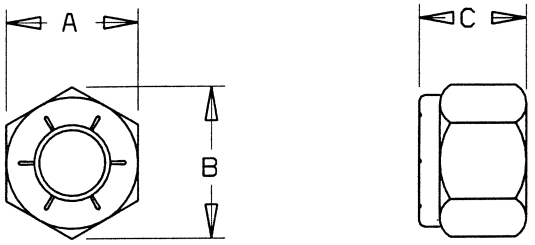
COMPILED	KJA	DATE DRAWN	U.O.M.	MATERIAL	MASTER NUMBER
APPROVED	K.J.A	5-7-90	EA	(1)	01310 000D1

WAS FC 420

Portland FREIGHTLINER CORPORATION Oregon 97208

E-183

DRAWN	DJL	TITLE	DRAWING NUMBER	
APPRV	DJL	NUT-SELF LOCKING NYLON SHOULDER, COARSE THREAD	23-09336	
DATE	07/16/86	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. G
CATIA ORIGINAL				



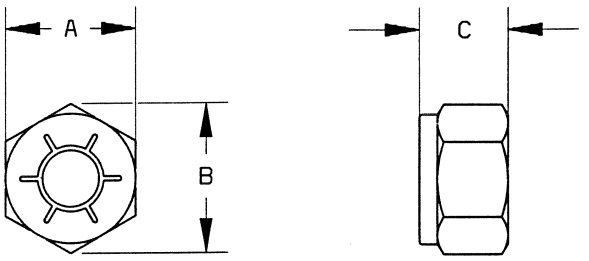
SIZE AND THREAD	A			B	C			FREIGHTLINER PART NUMBER
	NOM.	MAX.	MIN.		NOM.	MAX.	MIN.	
2-56	3/16	.187	.180	.205	9/64	.156	.141	23-09336-001
4-40	1/4	.250	.241	.275	9/64	.156	.141	23-09336-002
6-32	5/16	.312	.302	.344	11/64	.187	.172	23-09336-003
8-32	11/32	.344	.332	.378	15/64	.249	.234	23-09336-004
10-24	3/8	.375	.362	.413	15/64	.249	.234	23-09336-005
G 12-24	7/16	.438	.423	.482	5/16	.328	.148	23-09336-016
1/4-20	7/16	.438	.428	.488	5/16	.328	.298	23-09336-006
5/16-18	1/2	.500	.489	.557	11/32	.359	.329	23-09336-007
3/8-16	9/16	.563	.551	.628	29/64	.468	.438	23-09336-008
F 7/16-14	5/8	.625	.612	.698	29/64	.468	.438	23-09336-009
1/2-13	3/4	.750	.736	.840	19/32	.609	.579	23-09336-010
5/8-11	15/16	.938	.922	1.051	3/4	.765	.735	23-09336-012
3/4-10	1-1/16	1.125	1.088	1.191	7/8	.890	.860	23-09336-013
1-8	1-7/16	1.500	1.450	1.615	1-3/64	1.078	1.016	23-09336-015

ENGINEERING NOTES:

1. MATERIAL: STEEL, IFI-100 GRADE A OR SAE J995 GRADE 2 WITH NYLON INSERT.
2. FINISH: ZINC OR CAD PLATE.
3. THREAD: UNIFIED COARSE SERIES CLASS 2B (UNC-2B).

CHG	JOB NO	DATE	BY	REVISION
F	PA2042-70	06/24/96	FHC	REVISED AND REDRAWN IN CATIA.DIM. A WAS .688/.675
G	H07377-03	03/17/00	LFB	ADDED -016.

DRAWN	DJL	TITLE	DRAWING NUMBER	
APPRV	DJL	NUT-SELF LOCKING NYLON SHOULDER, FINE THREAD	23-09337	
DATE	07/16/86	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. H
CATIA ORIGINAL				



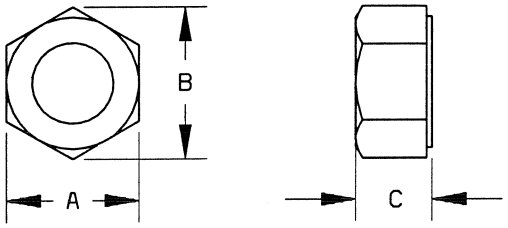
SIZE AND THREAD	A			B	C			FREIGHTLINER P/N 23-09337	
	NOM.	MAX.	MIN.		NOM.	MAX.	MIN.	PLAIN	CAD.
8-36	11/32	.344	.332	.378	15/64	.249	.234	-	-104
10-32	3/8	.375	.362	.413	15/64	.249	.234	-005	-105
1/4-28	7/16	.438	.428	.488	5/16	.328	.298	-006	-106
5/16-24	1/2	.500	.489	.557	11/32	.359	.329	-007	-107
3/8-24	9/16	.563	.551	.628	29/64	.468	.438	-008	-108
E 7/16-20	5/8	.625	.612	.698	29/64	.468	.438	-	-109
1/2-20	3/4	.750	.736	.840	19/32	.609	.579	-	-110
5/8-18	15/16	.938	.922	1.051	3/4	.765	.735	-012	-112
3/4-16	1-1/16	1.064	1.052	1.191	7/8	.890	.860	-013	-113
F 7/8-14	1-1/4	1.252	1.239	1.403	63/64	.999	.969	-014	-114

ENGINEERING NOTES:

1. MATERIAL: STEEL, IFI-100/107 GRADE A OR SAE J995 GRADE 2 WITH NYLON INSERT.
2. FINISH: ZINC OR CAD PLATE.
3. THREAD: UNIFIED FINE SERIES CLASS 2B (UNF-2B).

CHG	JOB NO	DATE	BY	REVISION
E	PA2042-70	06/24/96	FHC	REVISED AND REDRAWN IN CATIA.DIM A WAS .688/.675
F	PA2042-76	04/16/97	DAJ	REVISED DIM A ON -013 AND -014.
G	PA2042-91	04/20/99	CGD	CORRECTED TEXT THICKNESS
H	PA2042-93	07/09/99	CGD	CREATED SOLID MODEL

DRAWN	HJR	TITLE	DRAWING NUMBER	
APPRV	ROL	NUT-HEX, GRADE B FINE THREAD	23-09338	
DATE	08/24/72	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. G
CATIA ORIGINAL				



THREAD UNF	A			B	C			FINISH	FREIGHTLINER PART NUMBER
	NOM	MAX	MIN	MIN	NOM	MAX	MIN		
2-64	3/16	.187	.180	.205	1/16	.066	.057	C P	23-09338-001 -
4-48	1/4	.250	.241	.275	3/32	.098	.087	C P	- -502
10-32	3/8	.375	.362	.413	1/8	.130	.117	C P	-005 -505
1/4-28	7/16	.438	.428	.488	7/32	.226	.212	C P	-006 -506
5/16-24	1/2	.500	.489	.557	17/64	.273	.258	C P	-007 -507
3/8-24	9/16	.562	.551	.628	21/64	.337	.320	P C	-008 -508
7/16-20	11/16	.688	.675	.768	3/8	.385	.365	P C	- -509
1/2-20	3/4	.750	.736	.840	7/16	.448	.427	P C	-010 -510
9/16-18	7/8	.875	.861	.982	31/64	.496	.473	P C	- -511
5/8-18	15/16	.938	.922	1.051	35/64	.559	.535	P C	-012 -512
3/4-16	1-1/8	1.125	1.088	1.240	41/64	.665	.617	P C	-013 -513
1 -14	1-1/2	1.500	1.450	1.653	55/64	.887	.831	P C	-015 -

ENGINEERING NOTES:

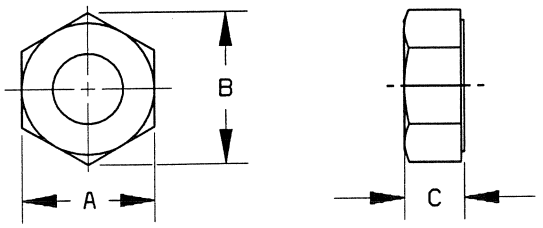
F 1. MATERIAL: STEEL, GRADE B (SAE GRADE 5) NUT MATERIAL PER SAE J995. FOR DIAMETERS 1/4" AND GREATER. STEEL, LOW CARBON (SAE GR.2) NUT MATERIAL PER SAE J995, FOR DIAMETERS LESS THAN 1/4".

2. FINISH: ZINC OR CADMIUM PLATE = C, PLAIN = P.

3. THREAD: UNIFIED FINE THREAD CLASS 2B (UNF-2B).

CHG	JOB NO	DATE	BY	REVISION
C	85950	08/24/72	HJR	REVISED AND REDRAWN:J # 85950
D	1020D	08/09/85	FHF	REV. TO SAE J995 1020D.
E	PA2042-70	06/24/96	FHC	REVISED AND REDRAWN IN CATIA.
F	PA2042-83	03/20/98	DAJ	REVISED NOTE 1.
G	PA2042-93	06/04/99	CGD	CORRECTED TEXT THICKNESS

DRAWN	HJR	TITLE	DRAWING NUMBER
APPRV	ROL	NUT-HEX, GRADE B COARSE THREAD	23-09339
DATE	08/24/72	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1 / CHG. LTR. K
CATIA ORIGINAL			



	THREAD UNC	A			B	C			FINISH	FREIGHTLINER PART NUMBER
		NOM	MAX	MIN	MIN	NOM	MAX	MIN		
	2-56	3/16	.187	.180	.205	1/16	.066	.057	C P	23-09339-001 -
	4-40	1/4	.250	.241	.275	3/32	.098	.087	C P	- -
	6-32	5/16	.312	.302	.344	7/64	.114	.102	C P	-003 -
	8-32	11/32	.344	.332	.378	1/8	.130	.117	C P	-004 -504
	10-24	3/8	.375	.362	.413	1/8	.130	.117	C P	-005 -505
	1/4-20	7/16	.437	.427	.488	7/32	.226	.212	C P	-006 -506
	5/16-18	1/2	.500	.489	.557	17/64	.273	.258	C P	-007 -507
	3/8-16	9/16	.562	.551	.628	21/64	.337	.320	P C	-008 -508
K	7/16-14	11/16	.688	.675	.768	3/8	.385	.365	P C	-009 -509
	1/2-13	3/4	.750	.736	.840	7/16	.448	.427	P C	-010 -510
	9/16-12	7/8	.875	.861	.982	31/64	.496	.473	P C	- -511
K	3/4-10	1-1/8	1.125	1.088	1.240	41/64	.665	.617	P C	-013 -513

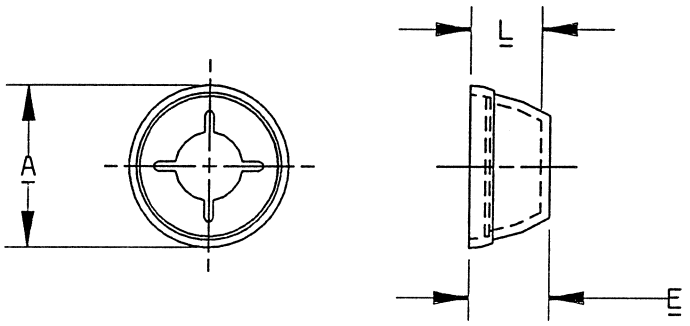
ENGINEERING NOTES:

J 1. MATERIAL: STEEL, GRADE B NUT MATERIAL (= SAE GR. 5), FOR DIAMETER 1/4" AND GREATER. STEEL, LOW CARBON (SAE GR.2) NUT MATERIAL PER SAE J995 FOR DIAMETERS LESS THAN 1/4".

2. FINISH: C = ZINC OR CADMIUM PLATE.
P = ZINC PHOSPHATE CONVERSION COAT AND OIL (DRY TO THE TO TOUCH) PER 49-00006-041.

CHG	JOB NO	DATE	BY	REVISION
H	PA2042-70	06/25/96	FHC	REVISED AND REDRAWN IN CATIA.
J	PA2042-83	03/20/98	DAJ	REVISED NOTE 1.
K	PA2042-93	07/09/99	CGD	CREATED SOLID MODEL, REVISED A,B & C DIMS.

DRAWN	DAJ	TITLE	DRAWING NUMBER	
APPRV	DAJ	NUT-PUSH CAP NUT	23-09398	
DATE	12/02/97			
CATIA ORIGINAL		FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. A



STUD DIA.	DIMENSIONS			VENDOR/PN	FREIGHTLINER PART NUMBER
	A	E	L	TINNERMAN	
.250	.835	.46	.200-.343	C60008-250-805	23-09398-425

ENGINEERING NOTES:

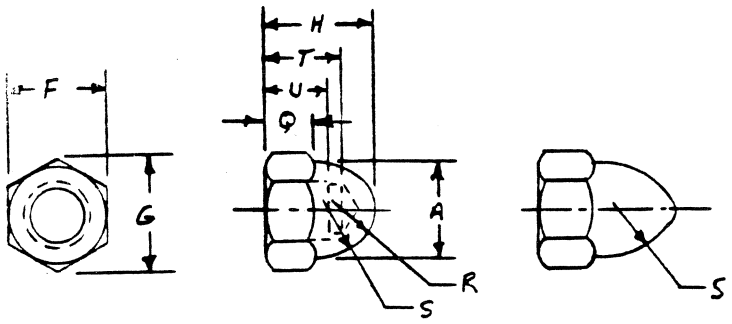
1. MATERIAL: CAP-HIGH DENSITY POLYETHYLENE
   INSERT-SPRING STEEL, HEAT-TREATED
2. COLOR: BLACK
3. DIMENSIONS ARE FOR REFERENCE ONLY.

CHG	JOB NO	DATE	BY	REVISION
A	P01210-23	12/02/97	DAJ	REVISED AND REDRAWN IN CATIA

General Use Part

PRINT ISSUED	TITLE	PART NO
3/29/71	NUT, CROWN (BLIND ACORN)	23-9399
LAST CHG LTR A		SHEET OF

SKETCH



LOW CROWN										FREIGHTLINER PART NUMBER	
SIZE	F	G MAX	A	H	Q	R	S	T MAX	U MIN	UNC	UNF
No. 6	5/16	0.361	0.30	0.34	0.16	0.08	0.17	0.25	0.16	-106	-206
No. 8	5/16	0.361	0.30	0.34	0.16	0.08	0.17	0.25	0.16	-108	-208
No.10	3/8	0.433	0.36	0.41	0.19	0.09	0.22	0.28	0.19	-110	-210
No.12	3/8	0.433	0.36	0.41	0.19	0.09	0.22	0.31	0.22	-112	-212
1/4	7/16	0.505	0.41	0.47	0.22	0.11	0.25	0.34	0.25	-125	-225
5/16	1/2	0.577	0.47	0.53	0.25	0.12	0.28	0.41	0.31	-131	-231
3/8	9/16	0.650	0.53	0.62	0.28	0.14	0.33	0.45	0.38	-138	-238
7/16	5/8	0.722	0.59	0.69	0.31	0.16	0.36	0.50	0.44	-144	-244
1/2	3/4	0.866	0.72	0.81	0.38	0.19	0.42	0.69	0.50	-150	-250
9/16	7/8	1.010	0.84	0.94	0.44	0.22	0.50	0.69	0.56	-156	-256
5/8	15/16	1.083	0.91	1.00	0.47	0.23	0.53	0.75	0.62	-162	-262
3/4	1-1/16	1.227	1.03	1.16	0.53	0.27	0.59	0.88	0.75	-175	-275

HIGH CROWN										FREIGHTLINER PART NUMBER	
SIZE	F	G MAX	A	H	Q	R	S	T MAX	U MIN	UNC	UNF
No. 6	5/16	0.361	0.30	0.42	0.17	0.05	0.25	0.28	0.19	-306	-406
No. 8	5/16	0.361	0.30	0.42	0.17	0.05	0.25	0.28	0.19	-308	-408
No.10	3/8	0.433	0.36	0.52	0.20	0.06	0.30	0.34	0.25	-310	-410
No.12	3/8	0.433	0.36	0.52	0.20	0.06	0.30	0.38	0.28	-312	-412
1/4	7/16	0.505	0.41	0.59	0.23	0.06	0.34	0.41	0.31	-325	-425
5/16	1/2	0.577	0.47	0.69	0.28	0.08	0.41	0.47	0.38	-331	-431
3/8	9/16	0.650	0.53	0.78	0.31	0.09	0.44	0.46	0.47	-338	-438
7/16	5/8	0.722	0.59	0.88	0.34	0.09	0.50	0.62	0.53	-344	-444
1/2	3/4	0.866	0.72	1.03	0.42	0.12	0.59	0.75	0.62	-350	-450
9/16	7/8	1.010	0.84	1.19	0.48	0.16	0.69	0.81	0.69	-356	-456
5/8	15/16	1.083	0.91	1.28	0.53	0.16	0.75	0.91	0.78	-362	-462
3/4	1-1/16	1.227	1.03	1.45	0.59	0.17	0.84	1.06	0.94	-375	-475

ENGINEERING NOTES

(1) Material: Brass with nickel plated. (A)

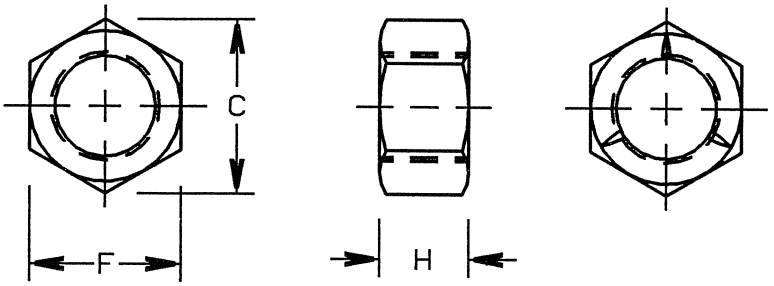
COMPILED	RWG	DATE DRAWN		MATERIAL	
APPROVED	[illegible]	3-18-71		(1)	

Portland FREIGHTLINER CORPORATION Oregon 97208 A

CHG	BY	DATE	WAS
A	SB	2-28-78	Chg'd Mat'l #65758

E-183

DRAWN	HJR	TITLE NUT - GRADE B NYLON PATCH LOCK	ITEM NUMBER **23-09400**
APPRV	ROLLINS		
DATE	03/16/71	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



IFI STD
MARKING
GRADE B

NOM SIZE & THREAD	F FLATS (NOM)	C CORNERS (MAX)	H (MAX)	FINISH		FREIGHTLINER PART NUMBERS
1/4-20 UNC	7/16	.505	.226	PLAIN		23-09400-100
1/4-20 UNC	7/16	.505	.226	ZINC		23-09400-200
5/16-18 UNC	1/2	.577	.273	ZINC		23-09400-202
5/16-24 UNF	1/2	.577	.273	ZINC		23-09400-203
7/16-20 UNF	11/16	.794	.385	ZINC		23-09400-207 (5)
5/8-11 UNC	15/16	1.083	.559	ZINC		23-09400-212

ENGINEERING NOTES

1. MATERIAL: STEEL GRADE 5 PER SAE J995.
2. FINISH: PLAIN:
   ZINC: PLATE PER FREIGHTLINER SPECIFICATION 49-00005-403.
3. DIMENSIONAL AND MECHANICAL PROPERTIES MUST CONFORM WITH ANSI B18.2.2. DIMENSIONS SHOWN ARE FOR REFERENCE ONLY.
4. LOCKING ELEMENT: NYLON PATCH PER IFI 124.

(5) 23-09400-207 FOR MBMEX USE.

CHG	JOB/RLSE NO	DATE	BY	REVISION
B	PA2042-38	08/19/93	ERK	REDRAWN; REVISED ENGINEERING NOTES.

General Use Part

PRINT ISSUED	TITLE	PART NO
9-15-70	SPEED NUT, TUBULAR	23-9401
LAST CHG LTR		SHEET 1 OF 1



MFR PART NUMBER		FOR THREAD OR STUD SIZE	GRIP * (IN.)	MTG * HOLE	O.A. * LENGTH	PART NO.
ADV						
3769		3/16" OR #10	3/32 (APPROX.)	7/32"	1/4"	23-9401-001

* APPROX.

		DATE DRAWN		MATERIAL	NEXT ASSY. NO.
COMPILED	H.J.R.	8-12-70			N12-12875
APPROVED					

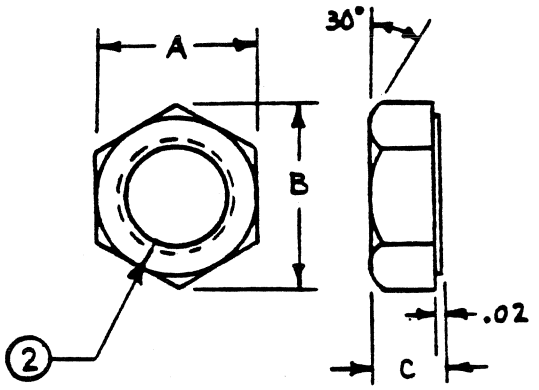
Portland FREIGHTLINER CORPORATION Oregon 97208

M/F

General Use Part

PRINT ISSUED	TITLE	PART NO
	NUT, HEX JAM UNC, GR. B	23-9596
LAST CHG LTR		SHEET 1 OF 1

SKETCH



PART NUMBERS

SIZE	THREADS PER INCH	A			B	C			FREIGHTLINER PART NUMBER
		NOM.	MAX.	MIN.		NOM.	MAX.	MIN.	
1/4	20	7/16	.437	.428	.488	5/32	.163	.150	23-9596-025
5/16	18	1/2	.500	.489	.557	3/16	.195	.180	-031
3/8	16	9/16	.562	.551	.628	7/32	.227	.210	-038
7/16	14	11/16	.688	.675	.768	1/4	.260	.240	-044
1/2	13	3/4	.750	.736	.840	5/16	.323	.302	-050
9/16	12	7/8	.875	.861	.982	5/16	.324	.301	-056
5/8	11	15/16	.938	.922	1.051	3/8	.387	.363	-062
3/4	10	1-1/8	1.062	1.045	1.240	27/64	.446	.398	-075
7/8	9	15/16	1.313	1.269	1.449	31/64	.510	.458	-088
1	8	1-1/2	1.500	1.450	1.653	35/64	.575	.519	-100
1-1/8	7	1-11/16	1.6875	1.631	1.859	39/64	.639	.579	-112
1-1/4	7	1-7/8	1.875	1.812	2.066	23/32	.751	.687	-125
1-3/8	6	2-1/16	2.063	1.994	2.273	25/32	.835	.747	-138
1-1/2	6	2-1/4	2.250	2.175	2.480	27/32	.880	.808	-150

ENGINEERING NOTES

(1) Material: Steel Per SAE Standard J995 for Grade B Nut Material (for use with Grade 5 bolts).

(2) Threads must conform to Unified National Coarse Thread Series Class 2B (UNC-2B) per Standard J475.

3. Finish: Commercial Cd or Zn plate.

4. Must meet all applicable mechanical and quality requirements for steel nuts per SAE Standard J995.

5. Must meet applicable general and dimensional requirements of SAE Standard J104.

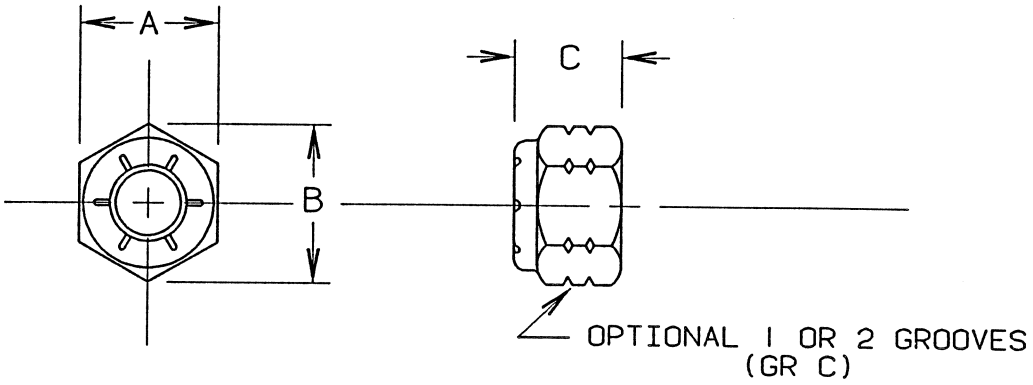
6. For fine thread series see 23-9254.

COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED		1-29-71		(1)	

Portland FREIGHTLINER CORPORATION Oregon 97208

DRAWN	HJR	TITLE NUT HEX NYLON COLLAR, GRADE C	ITEM NUMBER 23-09598
APPRV	RMJ		
DATE	02/01/71	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1

SKETCH:



PART NUMBER:

SIZE AND THREAD	A			B	C			FREIGHTLINER PART NUMBER
	NOM.	MAX.	MIN.		NOM.	MAX.	MIN.	
3/8 -24	9/16	.564	.553	.622	29/64	.468	.438	23-09598-064
1/2 -20	3/4	.752	.741	.837	19/32	.609	.579	-080
9/16-18	7/8	.877	.865	.978	41/64	.656	.626	-098
5/8 -18	15/16	.940	.928	1.051	3/4	.765	.735	-108
3/4 -16	1-1/16	1.064	1.052	1.191	7/8	.890	.860	-126
7/8 -14	1-1/4	1.252	1.239	1.403	63/64	.999	.969	-144

ENGINEERING NOTES:

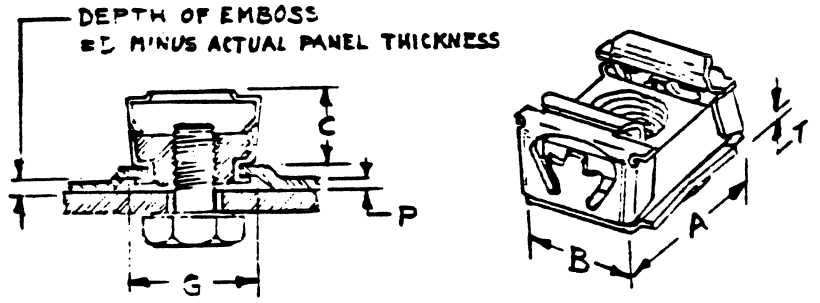
1. MATERIAL: STEEL, IFI-100 GRADE C WITH NYLON INSERT.
2. FINISH: ZINC PLATE PER FREIGHTLINER 49-00005-403.
3. LOCKING ELEMENT: NYLON COLLAR MEETING REQUIREMENTS OF IFI 100/107.
4. MANUFACTURER'S SERIES: N1610.

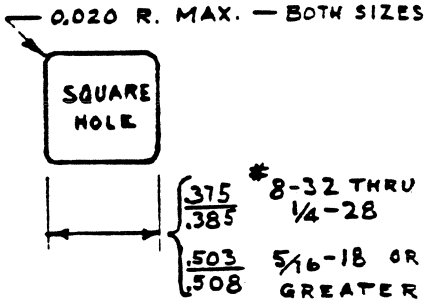
CHG	JOB/RLSE NO	DATE	BY	REVISION
D	PA2042-55	07/05/95	ERK	REDRAWN: ADDED ZINC PLATE, RMVD INACTIVE NUMBERS

General Use Part

PRINT ISSUED	TITLE	PART NO.
4/30/71	NUT, CAGED SELF ANCHORING	23-9729
LAST CHG LTR		SHEET 1 OF 1

SKETCH





HOLE SIZES

PART NUMBERS

SCREW SIZE	P PANEL RANGE	D	A	B	G	C	T	MFR'S NO. TIN	FREIGHTLINER PART NUMBER
8- 32	.025-.063	.110	.525	.46	.62	.30	.017	C30800- 832-#	23-9729-081
10- 24	.025-.063	.110	.525	.46	.62	.30	.017	-1024-#	-101
10- 32	.025-.063	.110	.525	.46	.62	.30	.017	-1032-#	-102
12- 24	.025-.063	.110	.525	.46	.62	.30	.017	-1224-#	-121
1/4-20	.025-.063	.110	.525	.46	.62	.30	.017	C30800-1420-#	-141
	.064-.105	.160						C30801-1420-#	-142
	.093-.126	.180						C30802-1420-#	-143
1/4-28	.025-.063	.110	.525	.46	.62	.30	.017	C30800-1428-#	-146
5/16-18	.028-.056	.120	.708	.60	.69	.42	.020	C30803-5618-#	-561
	.057-.092	.140						C30804-5618-#	-562
5/16-24	.028-.056	.120	.708	.60	.69	.42	.020	C30803-5624-#	-506
	.057-.092	.140						C30804-5624-#	-567
	.093-.126							C30805-5624-#	-568

-3B = Zn electroplate; -24 = Cd electroplate

ENGINEERING NOTES

(1) Material: Retainer: Spring Steel, Heat Treated
Square Nut: Cold Rolled Steel

2. Finish: Zinc or Cadmium electroplate of commercial quality

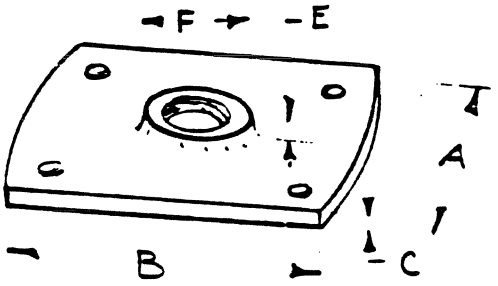
		DATE DRAWN		MATERIAL	
COMPILED	HJR	4-19-71		(1)	
APPROVED					

Portland FREIGHTLINER CORPORATION Oregon 97208

General Use Part

PRINT ISSUED	TITLE	PART NO
8/20/71	NUT, WELD	23-9761
LAST CHG LTR		SHEET 1 OF 1

SKETCH



PART NUMBERS

A. PLAIN NUT (NON-LOCKING)

SIZE	A	B	C	E	F	MANUFACTURER'S NUMBER GR			FREIGHTLINER PART NUMBER
6-32	3/8	5/8	.094	1/32	3/16	P2C- 6-S			23-9761-006
8-32	3/8	5/8	.094	1/32	13/64	P2C- 8-S			-008
10-24	3/8	5/8	.094	1/32	15/64	P2C-10-S			-010
10-32	3/8	5/8	.094	1/32	15/64	P2F-10-S			-110
1/4 -20	1/2	13/16	.105	3/64	19/64	P2C-14-S			-025
1/4 -28	1/2	13/16	.105	3/64	19/64	P2F-14-S			-125
5/16-18	5/8	1	.135	5/64	23/64	P2C-56-S			-031
5/16-24	5/8	1	.135	5/64	23/64	P2F-56-S			-131
3/8 -16	5/8	1	.135	3/32	7/16	P2C-38-S			-038
3/8 -24	5/8	1	.135	3/32	7/16	P2F-38-S			-138
1/2 -13	13/16	1-1/4	.187	1/8	19/32	P2C-12-S			-050
1/2 -20	13/16	1-1/4	.187	1/8	19/32	P2F-12-S			-150

B. LOCK NUT (PREVAILING TORQUE)

6-32	3/8	5/8	.094	1/32	3/16	TLP2C- 6-S			23-9761-506
8-32	3/8	5/8	.094	1/32	13/64	TLP2C- 8-S			-508
10-24	3/8	5/8	.094	1/32	15/64	TLP2C-10-S			-510
10-32	3/8	5/8	.094	1/32	15/64	TLP2F-10-S			-610
1/4 -20	1/2	13/16	.105	3/64	19/64	TLP2C-14-S			-525
1/4 -28	1/2	13/16	.105	3/64	19/64	TLP2F-14-S			-625
5/16-18	5/8	1	.135	5/64	23/64	TLP2C-56-S			-531
5/16-24	5/8	1	.135	5/64	23/64	TLP2F-56-S			-631
3/8 -16	5/8	1	.135	3/32	7/16	TLP2C-38-S			-538
3/8 -24	5/8	1	.135	3/32	7/16	TLP2F-38-S			-638
1/2 -13	13/16	1-1/4	.187	1/8	19/32	TLP2C-12-S			-550
1/2 -20	13/16	1-1/4	.187	1/8	19/32	TLP2F-12-S			-650

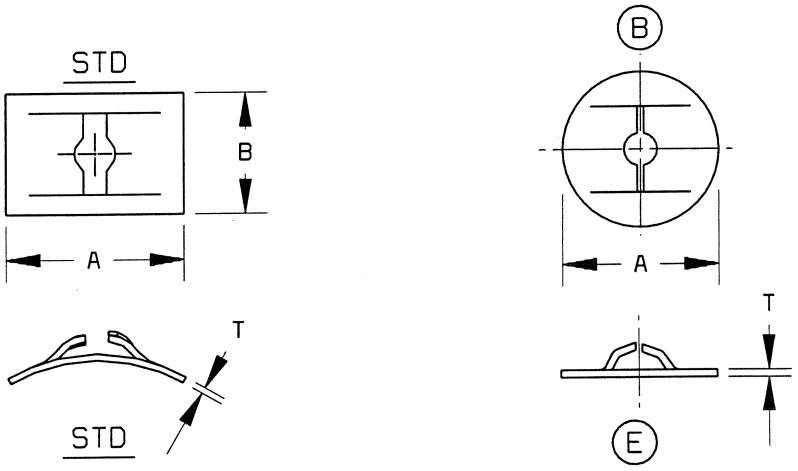
ENGINEERING NOTES

(1) Material: Steel

COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED		8-5-71		(1)	

DRAWN	CGD	TITLE	DRAWING NUMBER	
APPRV	DAJ	NUT-SPRING FLAT TYPE	23-09793	
DATE	04/02/99	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. F
CATIA ORIGINAL				

F



ENGLISH

SCREW SIZE	TYPE	DESIGN VARIATIONS	A	B	T	MAT'L △1	MANUFACTURER TIN	FREIGHTLINER PART NUMBER
4-40	RECT.	STD.	.44	.25	.012	SST	C105SS-440	23-09793-004
8-32	RECT.	STD.	.50	.31	.017	H	C7000-832	23-09793-008
8AB	RECT.	STD.	.63	.41	.028	H	C7000-8	23-09793-018
10-24	RECT.	STD.	.63	.38	.022	H	C7000-1024	23-09793-010
10A	RECT.	STD.	.75	.50	.031	H	C7000-10	23-09793-011
1/4-20	RECT.	STD.	.75	.50	.020	H	C7000-1420	23-09793-025
6A 6B	RECT.	STD.	.50	.31	.025	H	C7000-6	23-09793-006

METRIC

SCREW SIZE	TYPE	DESIGN VARIATIONS	A	B	T	MAT'L △1	MANUFACTURER TIN	FREIGHTLINER PART NUMBER
F M10	ROUND	BE	30.0	-	.360	H	C71586-M1015	23-09793-710

ENGINEERING NOTES:

△1 MATERIAL: H = CARBON STEEL
SST = STAINLESS STEEL

F 2. DESIGN VARIATIONS:
STD= RECTANGLE WITH ARCH IN BASE.
B = ROUND.
E = NO ARCH IN BASE.

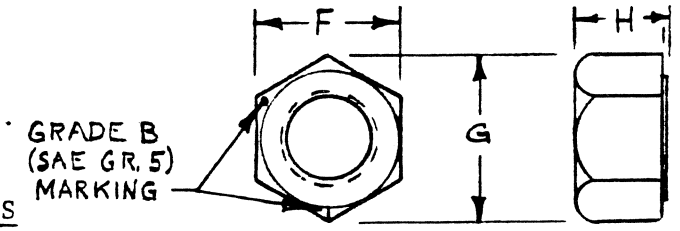
CHG	JOB NO	DATE	BY	REVISION
D	PL0413-13	04/14/95	ERK	REDRAWN; ADDED -018
E	P07042-01	04/02/99	CGD	REVISED AND REDRAWN IN CATIA; ADDED -006.
F	P09310-03	02/01/00	LFB	ADDED ROUND NUT VIEWS. ADDED -710. REVISED NOTE 2.

23-9900

General Use Part

PRINT ISSUED	TITLE	PART NO.
4/30/71	NUT, HEX, PREVAILING TORQUE (ALL METAL)	23-9900
LAST CHG LTR D	GR. B	SHEET 1 OF 1

SKETCH



PART NUMBERS

THREAD	F FLATS (BASIC)	G CORNERS (MAX)	H THICK (BASIC)		FREIGHTLINER PART NUMBER
1/4 20 UNC 28 UNF	7/16	.505	7/32		23-9900-104 -204
5/16 18 UNC 24 UNF	1/2	.577	17/64		-105 -205
3/8 16 UNC 24 UNF	9/16	.650	21/64		-106 -206
7/16 14 UNC 20 UNF	5/8	.722	3/8		-107 -207
1/2 * 13 UNC 20 UNF	3/4	.866	7/16		-108 -208
9/16* 12 UNC 18 UNF	13/16	.938	31/64		-109 -209
5/8 * 11 UNC 18 UNF	15/16	1.083	35/64		-110 -210
3/4 * 10 UNC 16 UNF	1- 1/8	1.299	41/64		-112 -212
7/8 * 9 UNC 14 UNF	1- 5/16	1.516	3/4		-114 -214
1 8 UNC 14 UNF	1- 1/2	1.732	55/64		-116 -216
1-1/8 7 UNC 12 UNF	1-11/16	1.949	31/32		-118 -218
1-1/4 7 UNC 12 UNF	1- 7/8	2.165	1- 1/16		-120 -220
1-3/8 6 UNC 12 UNF	2- 1/16	2.382	1-11/64		-122 -222
1-1/2 6 UNC 12 UNF	2- 1/4	2.598	1- 9/32		-124 -224

* 23-11020-# Flanged Coarse Thread Nuts Preferred

ENGINEERING NOTES

(1) Material: Grade B (=SAE Grade 5) Nut Material meeting all pertinent provisions of the current revision of SAE Standard J995 Mechanical and Quality Requirements for Steel Nuts

2. Finish: Cadmium Plate per 49-00012-130 or 230 and wax.

3. Must meet applicable provisions of SAE Std J104 for Hex Nuts, and applicable provisions of IFI Standard 100 for Prevailing Torque Hex Locknuts.

CHG	BY	DATE	WAS
D	FHF	7-12-85	49-00012-130 & 230
			Add Master No. (1876D)

CHG	BY	DATE	WAS
A	HJR	4-19-71	Unplated
B	HJR	12-14-72	Add IFI #100 to Note 3;
C	BL	4-8-77	Add #0600 Deferred B0679
D	FHF	7-12-85	Rev. Note 2 to inc.

COMPILED	HJR	DATE DRAWN		MATERIAL	MASTER NO.
(D) APPROVED	E.H	2-26-71		(1)	01340 000D1

Portland FREIGHTLINER CORPORATION Oregon 97208

E-183

D C

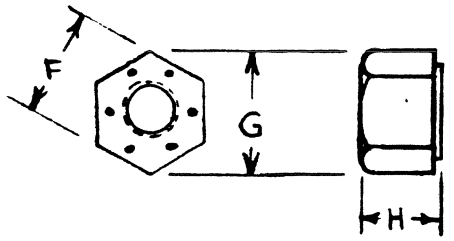
23-9901

General Use Part

PRINT ISSUED	TITLE	PART NO.
5/30/71	NUT, HEX, PREVAILING TORQUE (ALL METAL) GR. C	23-9901
LAST CHG LTR E		SHEET 1 OF 1

CHG	BY	DATE	WAS
D	VTM	3-10-81	5/8 .722 1 3/16 .938
E	DCR	5/28/84	Revised Note 2. 1458C

SKETCH



PART NUMBERS

THREAD	F FLATS (BASIC)	G CORNERS (MAX)	H THICK (BASIC)		FREIGHTLINER PART NUMBER
1/4 20 UNC 28 UNF	7/16	.505	7/32		23-9901-104 -204
5/16 18 UNC 24 UNF	1/2	.577	17/64		-105 -205
3/8 16 UNC 24 UNF	9/16	.650	21/64		-106 -206
7/16 14 UNC 20 UNF	1 1/16	.794	3/8		-107 -207
1/2* 13 UNC 20 UNF	3/4	.866	7/16		-108 -208
9/16* 12 UNC 18 UNF	7/8	1.010	31/64		-109 -209
5/8* 11 UNC 18 UNF	15/16	1.083	35/64		-110 -210
3/4* 10 UNC 16 UNF	1- 1/8	1.299	41/64		-112 -212
7/8 9 UNC 14 UNF	1- 5/16	1.516	3/4		-114 -214
1 8 UNC 14 UNF	1- 1/2	1.732	55/64		-116 -216
1-1/8 7 UNC 12 UNF	1-11/16	1.949	31/32		-118 -218
1-1/4 7 UNC 12 UNF	1- 7/8	2.165	1- 1/16		-120 -220
1-3/8 6 UNC 12 UNF	2- 1/16	2.382	1-11/64		-122 -222
1-1/2 6 UNC 12 UNF	2- 1/4	2.598	1- 9/32		-124 -224

*23-11020-# Flange Coarse Thread Nuts Preferred.

CHG	BY	DATE	WAS
A	HJR	4-19-71	Unplated
B	HJR	12-14-72	Add IFI #100 to Note 3; J #60600
C	BL	4-8-77	Add Preferred B0679

ENGINEERING NOTES

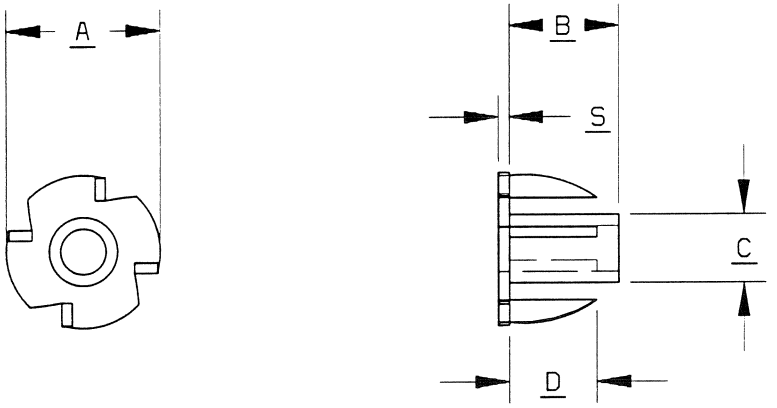
(1) **Material:** Grade C (=SAE Grade 8) Nut Material meeting all pertinent provisions of the current revision of SAE Standard J 995 Mechanical and Quality Requirements for Steel Nuts.

2. **Finish:** Cadmium plate (per F/L Spec 49-12-130) and wax.

3. Must meet applicable provisions of SAE Std J 104 for Hex Nuts, and applicable provisions of IFI Standard 100 for Prevailing Torque Locknuts.

COMPILED	HJR	DATE DRAWN		MATERIAL	MASTER NUMBER	
APPROVED		2-26-71		(1)	01340	000D1

DRAWN	HJR	TITLE NUT-TEE	DRAWING NUMBER 23-09921
APPRV	HJR		
DATE	12/30/71	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1 / CHG. LTR. B
CATIA ORIGINAL			



SIZE	DIMENSIONS (REF)					SUPPLIER NUMBER	FREIGHTLINER PART NUMBER
	A	B	C	D	S		
1/4-20	3/4	5/16	.294/.289	15/64	.042	△4 SS-59015	23-09921-250
5/16-18	7/8	5/8	.391/.386	9/32	.062	△4 SS-58708	23-09921-310
10-32	3/4	7/16	.240/.245	3/16	.040	△3 103276	23-09921-190

B

ENGINEERING NOTES:

1. MATERIAL: STEEL
2. FINISH: ZINC CLEAR PER F/L SPECIFICATION 49-00005-403

△3 RECOMMENDED SUPPLIER: STAFAST PRODUCTS

△4 RECOMMENDED SUPPLIER: AMERICAN ENGINEERED COMPONENTS (AEC)

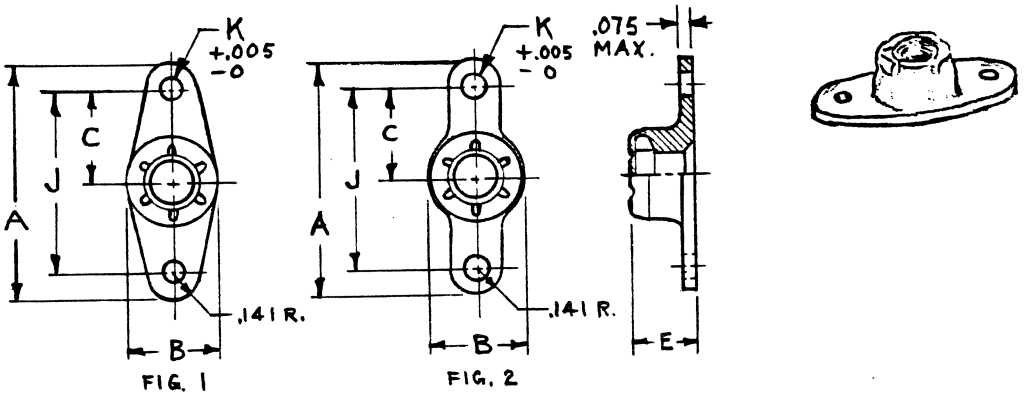
CHG	JOB NO	DATE	BY	REVISION
A	P00891-01	02/10/97	DAJ	REVISED AND REDRAWN IN CATIA
B	P04104-03	07/28/99	CGD	ADDED 23-09921-190

23-9930

General Use Part

PRINT ISSUED	TITLE	PART NO.
	NUT, ANCHOR TWO LUG, STEEL	23-9930
LAST CHG. LTR.		SHEET 1 OF 1

SKETCH



PART NUMBERS

T THREAD (CLASS 3B)	BASE TRIM FIG.	A	B	C ±.005	E	F ±.010	J ±.002	K +.005 -.000	MFR. NO. ESN	FREIGHTLINER PART NUMBER
4 -40 UNC	1	.969	.391	.344	.203	.200	.688	.098	22NA1-40	23-9930-002
4 -48 UNF									22NA1-48	-003
6 -32 UNC	1	.969	.391	.344	.219	.200	.688	.098	22NA1-62	-004
6 -40 UNF									22NA1-60	-005
8 -32 UNC	1	.969	.391	.344	.281	.200	.688	.098	22NA1-82	-006
8 -36 UNF									22NA1-86	-007
10 -24 UNC	1	.969	.391	.344	.281	.200	.688	.098	22NA1-04	-008
10 -32 UNF									22NA1-02	-009
1/4 -20 UNC	1	1.281	.500	.500	.313	.200	1.000	.098	22NA1-040	-012
1/4 -28 UNF									22NA1-048	-013
5/16-18 UNC	2	1.281	.516	.500	.359	.230	1.000	.130	22NA1-058	-014
5/16-24 UNF									22NA1-054	-015
3/8 -16 UNC	2	1.281	.625	.500	.438	.230	1.000	.130	42NA1-066	-016
3/8 -24 UNF									42NA1-064	-017

ENGINEERING NOTES

(1) Material: Steel; Red Nylon Locking Insert (250°F. Max. Performance)

2. Finish: Cadmium Plate

WAS	DATE	BY	CHG

WAS	DATE	BY	CHG
J #85220	—	—	—

ns

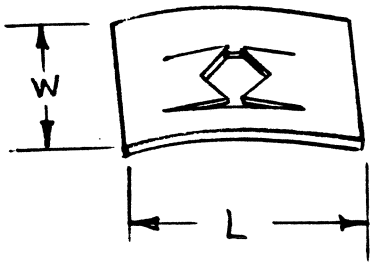
COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED	Rollins	1-20-72		(1)	

Portland FREIGHTLINER CORPORATION Oregon 97208

General Use Part

PRINT ISSUED	TITLE	PART NO.
	NUT, SPEED, PLAIN	23-9961
LAST CHG. LTR. A		SHEET / OF /

SKETCH



PART NUMBERS

SCREW SIZE	L	W	MANUFACTURER'S NUMBER AUV		FREIGHTLINER PART NUMBER
3/16	.62	.38	2103		23-9961-019 A
1/4-20	1.00	.56	1903		-025

ENGINEERING NOTES

(1) Material: Carbon Steel, Heat Treated

CHG	BY	DATE	WAS

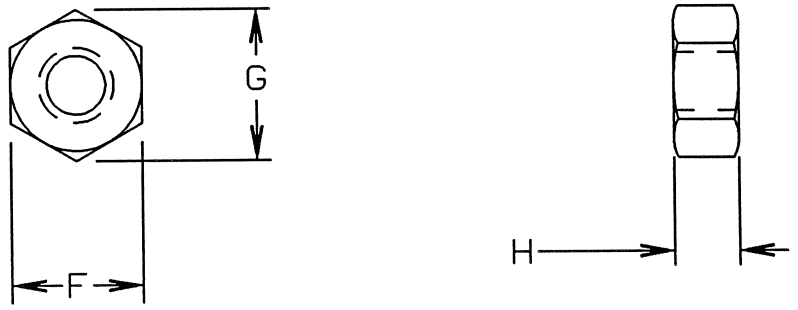
CHG	BY	DATE	WAS
—	—	—	Job No. 84540
A	DL	2-19-73	Job No. A0099;Add -019

COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED	Rollins	1-20-72		(1)	

Portland FREIGHTLINER CORPORATION Oregon 97208

ns

DRAWN	BDM	TITLE NUT - HEX JAM, STAINLESS	ITEM NUMBER 23-09982
APPRV	ERK		
DATE	02/28/96	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



THREAD	F			G MIN	H			FREIGHTLINER PART NUMBERS
	NOM	MAX	MIN		NOM	MAX	MIN	
5/16-18 UNC	1/2	.500	.489	.557	3/16	.195	.180	23-09982-031
C 3/8-16 UNC	9/16	.562	.551	.628	7/32	.227	.210	23-09982-038
1/4-20 UNC	7/16	.438	.428	.488	7/32	.226	.212	23-09982-025*
1/2-13 UNC	3/4	.750	.736	.840	7/16	.448	.427	23-09982-050*

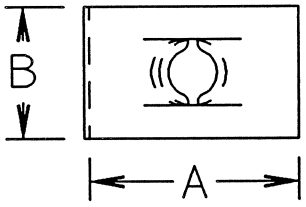
B * DO NOT USE FOR NEW DESIGN. REFER TO 23-11677.

ENGINEERING NOTES

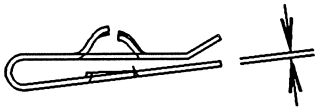
MATERIAL: STAINLESS STEEL PER ASTM F594, GROUP 1
MUST MEET ALL APPLICABLE REQUIREMENTS OF ANSI B18.2.2

CHG	JOB/RLSE NO	DATE	BY	REVISION
B	PA2042-66	02/28/96	BDM	REDRAWN; ADDED NOTE
C	PA2042-70	06/25/96	DAJ	"G" DIMENSION .628 WAS .840

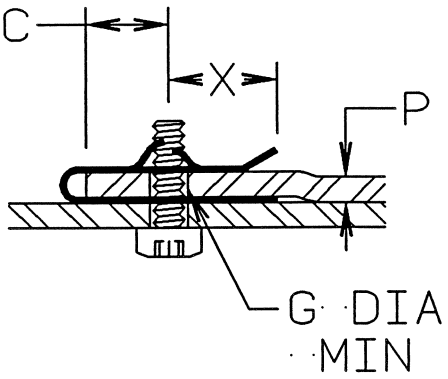
DRAWN	SJT	TITLE TINNERMAN U-TYPE FASTENERS	ITEM NUMBER 23-09984
APPRV	RDF		
DATE	11/29/90	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 2



STANDARD



HALF EXTRUSION
ON LOWER LEG

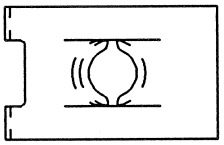


VARIATION "C"



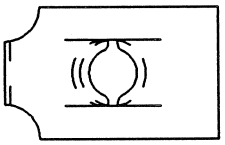
NO EXTRUSION
ON LOWER LEG

VARIATION "D"



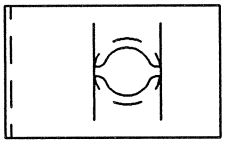
RELIEF NOTCH

VARIATION "E"



CORNERS CUT OFF

VARIATION "F"



IMPRESSION TURNED 90°

VARIATION "H"



FULL EXTRUSION ON
LOWER LEG

CHG	JOB/RLSE NO	DATE	BY	REVISION
N	P0069I-01	12/14/92	ERK	SEE SHEET #2.
P	PM0479-08	01/22/93	ERK	SEE SHEET #2.
R	P2A373-31	06/09/95	ERK	SEE SHEET #2.
S	P00302-01	06/20/96	DAJ	SEE SHEET #2.

DRAWN	SJT	TITLE TINNERMAN U-TYPE FASTENERS	ITEM NUMBER 23-09984
APPRV	RDF		
DATE	11/29/90	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 2 OF 2

PART NUMBERS:

THREAD	PANEL RANGE	A	B	C MAX	MTG HOLE	T	X	VAR	MATL	FIN-ISH	MFR'S NUMBER TIN	FREIGHTLINER PART NUMBER	
....8A	.110-.187	.670	.440	.312	.250	.028	.31	E	(1)	(4)	C17721-8A-4	23-09984-000	
8A OR B	.045-.062	.670	.410	.328	.218	.028	.32	E			C8111-8-4	.....-001	
8A OR B	.290-.310	.585	.635	.300	.187	.028	.24	C			C15286-8	.....-002	N
....8A	.045-.062	.875	.406	.515	.218	.028	.32	F			C8113-8	.....-143	S
10A OR B	.045-.062	.950	.500	.562	.250	.031	.35	E			C8125-10A-4	.....-100	
..10A	.065-.087	.640	.440	.265	.250	.031	.33	D			C9240-10A-4	.....-101	
..10A	.102-.125	.700	.630	.406	.281	.031	.25	DF			C9031-10A-4	.....-102	
10A OR B	.025-.040	.760	.500	.359	.250	.031	.33	E			C8122-10-4	.....-103	
10A OR B	.025-.150	.775	.531	.270	.280	.031	.39	DH			01-11019 (7)	.....-105	P
10A	.115-.130	.630	.440	.250	.218	.031	.32	C			C575-10A-4	.....-104	
10-24	.045-.062	.560	.631	.250	.250	.022	.25	DF			C8115-1024-4	.....-124	R
10-24	.045-.062	.95	.38	.562	.250	.022	.34	E			C8119-1024-4	.....-126	
10-24	.115-.130	.630	.440	.250	.218	.020	.32	C			C575-1024-4	.....-125	
10-32	.025-.062	.660	.440	.312	.312	.017	.32	DH			C1505-1032-4	.....-132	
..10B	.051-.064	.440	.500	.187	.218	.031	.23	CDF			C6552-10Z-4	.....-133	
..10B	.125-.160	.640	.440	.281	.281	.031	.33	STD.	(2)	(3)	C1417SS-10Z-4	.....-134	
1/4-20	.093-.125	.890	.500	.437	.375	.025	.43	STD.	(1)	(4)	C6520-1420-4	.....-142	

(6)

ENGINEERING NOTES:

(1) MATERIAL: SAE 1050 OR HIGHER, CARBON STEEL.

(2) MATERIAL: 301 STAINLESS STEEL, HALF HARD.

(3) FINISH: PLAIN.

(4) FINISH: PHOSPHATE AND OIL PER 49-00006-041.

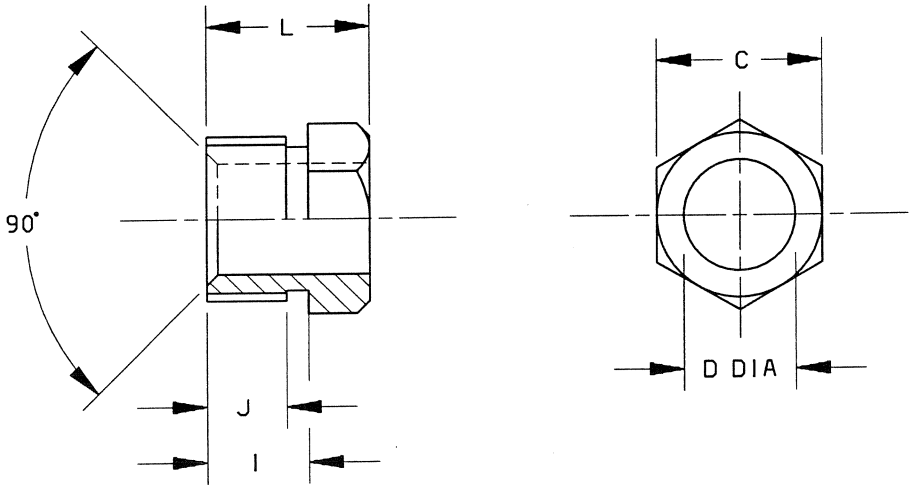
5. SHALL MEET PERTINENT PROVISIONS OF SAE STANDARD J891 FOR SPRING NUTS.

(6) VARIATIONS ARE ADDITIVE.

(7) ARDEN FASTENER PART NUMBER.

CHG	JOB/RLSE NO	DATE	BY	REVISION
N	P0069I-01	12/14/92	ERK	ADDED -002.
P	PM0479-08	01/22/93	ERK	ADDED -105.
R	P2A373-31	06/09/95	ERK	ADDED -126.
S	P00302-01	06/20/96	DAJ	ADDED -143.

DRAWN	LFB	TITLE	DRAWING NUMBER	
APPRV	DAJ	NUT-INVERTED FLARE	23-10040	
DATE	12/07/99	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. B
CATIA ORIGINAL				



TUBE SIZE	THREAD	"C" ACROSS FLATS	"D" DIA	"I"	"J" MIN. THREAD LENGTH	"L"	FREIGHTLINER PART NUMBER
1/4	7/16-24	7/16	.257	.36	.30	.56	23-10040-104
1/2	3/4-18	3/4	.506	.46	.36	.74	23-10040-108
3/4	1 1/16-16	1 1/16	.757	.54	.44	.88	PH 411FS12

ENGINEERING NOTES:

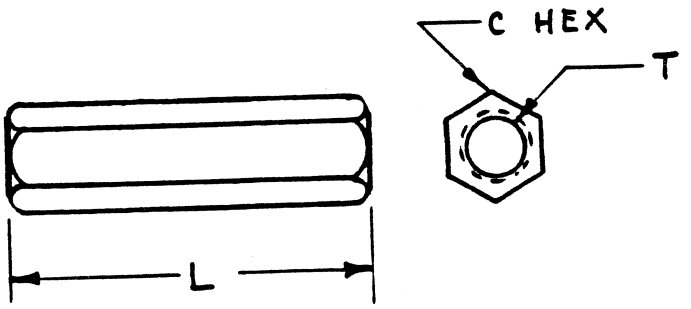
1. MATERIAL: STEEL.
2. FINISH: ZINC PLATE WITH YELLOW CHROMATE FINISH.
3. ALL DIMENSIONS ARE FOR REFERENCE ONLY.
   FOR DETAILS SEE SAE J512 040110.

CHG	JOB NO	DATE	BY	REVISION
B	PA2042-98	12/07/99	LFB	REDRAWN IN CATIA. ADDED PH 411FS12.

General Use Part

PRINT ISSUED	TITLE	PART NO.
	NUT, HIGH, HEX STEEL SPECIAL	23-10071
LAST CHG. LTR		SHEET 1 OF 1

SKETCH



PART NUMBERS

T THREAD THRU	C HEX (FLATS)	L LENGTH		FREIGHTLINER PART NUMBER
1/2-13 UNC	.750	1.75		23-10071-000

ENGINEERING NOTES

(1) Material: Grade 5 Steel Nut Material per SAE J429.

CHG	BY	DATE	WAS
			J# 95120

CHG	BY	DATE	WAS

COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED	Rollins	5-17-72		(1)	

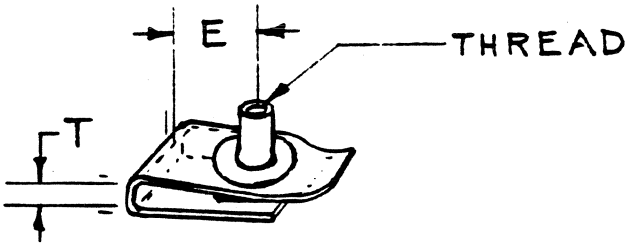
Portland FREIGHTLINER CORPORATION Oregon 97208

E-183

General Use Part

PRINT ISSUED	TITLE	PART NO.
	NUT, SPRING CLIP	23-10100
LAST CHG LTR		SHEET 1 OF 1

SKETCH



PART NUMBERS

THREAD SAE	T PANEL THICKNESS	E CENTER HOLE TO EDGE	MANUFACTURER'S NUMBER		FREIGHTLINER PART NUMBER
			AUV		
10-24	0.40-0.70	7/16	8349		23-10100-349

ENGINEERING NOTES

(1) Material: Spring Steel

2. Finish: Plain black oxide.

COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED	Rollins	8-24-72		(1)	

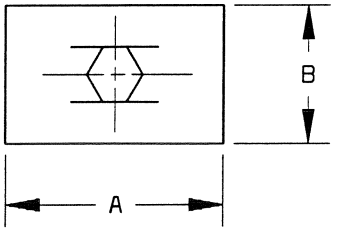
Portland FREIGHTLINER CORPORATION Oregon 97208

WAS | DATE | BY | CHG

WAS J #78030 | DATE — | BY - | CHG -

ns

DRAWN	LFB	TITLE	DRAWING NUMBER	
APPRV	DAJ	RETAINERS PUSH-ONS	23-10238	
DATE	12/20/99			
CATIA ORIGINAL		FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. F





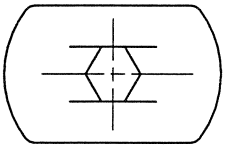
A
FOR
ROUND STUDS



B
FOR
HARDENED STUDS



STANDARD RECTANGLE



L
SIDES CUT OFF



P
TURNED UP ENDS

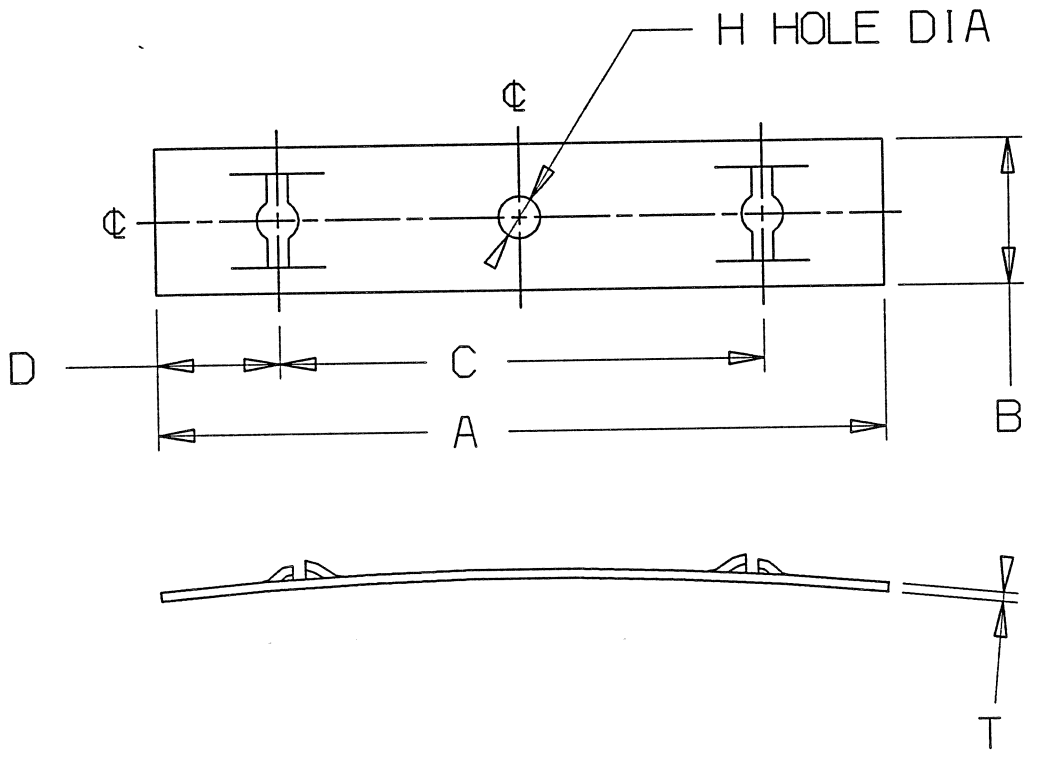
STUD SIZE (DIA.)	TYPE	DESIGN VARIATIONS	A	B	T	MANUFACTURER			FREIGHTLINER PART NUMBER
						AUV	TIN	AFJ	
.125	RECT.	A	.58	.38	.020	2099	C8625-020	-	23-10238-012
.156	RECT.	A	.56	.38	.017	1905	C12004-017	-	23-10238-015
.188	RECT.	STD.	.64	.38	.017	2426	C7859-017	-	23-10238-019
.250	RECT.	STD.	.95	.63	.017	2105	C1540-017	-	23-10238-025
F .250	RECT.	A	.98	.63	.012	-	C8165-012	-	23-10238-925
.313	RECT.	STD.	.63	.50	.014	-	-	01-12604	23-10238-031
.470	RECT.	BL	.91	.63	.017	-	-	01-00989	23-10238-047
.500	RECT.	STD.	1.23	.88	.017	-	C501-017	01-00076	23-10238-050

ENGINEERING NOTES:

1. MATERIAL: CARBON STEEL.

CHG	JOB NO	DATE	BY	REVISION
F	P00724-18	12/20/99	LFB	REDRAWN IN CATIA. ADDED -925.

DRAWN	HJR	TITLE	DRAWING NUMBER
APPRV	ERK	NUT-SINGLE THREAD SELF LOCKING, TWIN TYPE	23-10240
DATE	10/29/73	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1 / CHG. LTR. C
CATIA ORIGINAL			



SCREW SIZE	C	A	B	D	H	T	MANUFACTURER'S NUMBER	FREIGHTLINER PART NUM
8-32	.750	1.38	.38	.310	.105	.017	TIN C6067-832-24	23-10240-020

SPECIFICATIONS:

1. MATERIAL: STAINLESS STEEL
2. FINISH: PLAIN

C

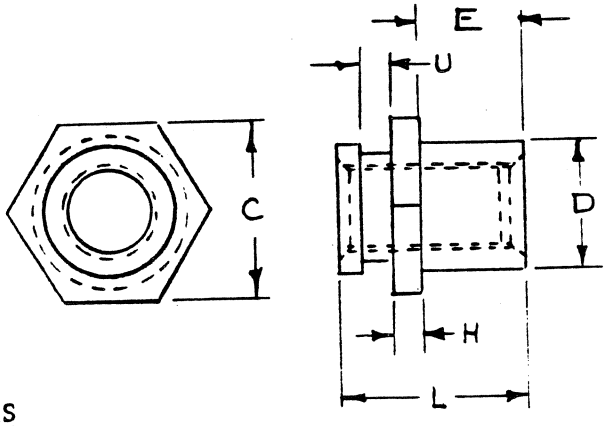
CHG	JOB NO	DATE	BY	REVISION
B	PA2042-58	08/30/95	DAJ	REVISED AND REDRAWN
C	PA2042-59	11/06/95	DAJ	REVISED MATERIAL AND FINISH CALL OUT

PRINT ISSUED	TITLE	PART NO.
	NUT, STANDOFF, BLIND HEAD PRESS	23-10259
LAST CHG. LTR.		SHEET 1 OF 1

WAS	DATE	BY	CHG

WAS	DATE	BY	CHG
J#A0551	—	—	—

SKETCH



PART NUMBERS

SIZE & THD	T PANEL THK	EXTENSION D DIA	EXTENSION E LGTH	HOLE DIA ±.002	C HEX		MFR'S NUMBER PRM	FREIGHTLINER PART NUMBER
#10-32	.062*	.261	½	.265	5/16		510 N(.062)-EXRR-8	23-10259-308

*For Panel Thickness .062:-
H=.019 U=.029 L=.308 ± .004

ENGINEERING NOTES

1. Material: Stainless Steel
2. Finish: Passivated

COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED		12-21-73		1	

Portland FREIGHTLINER CORPORATION Oregon 97208

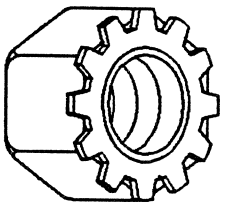
GENERAL USE PART

ORIGINAL JOB NO.		TITLE	PART NO.
7760D		KEP NUT PRE-ASSEMBLED NUT & LOCK WASHER	23-10340
LAST CHG LTR	A		SHEET 1 OF 1

LTR	JOB NO.	BY	DATE	CHANGE INFORMATION

LTR	JOB NO.	BY	DATE	CHANGE INFORMATION
1	7760D	DJL	06-05-86	REDRAWN, ADDED NOTE 2.

SKETCH



PART NUMBERS

SIZE & THREAD	OVERALL HEIGHT	O.D. OF LOCK WASHER		FREIGHTLINER PART NUMBER
4-40 UNC	7/64	9/32		23-10340-104
6-32 UNC	9/64	11/32		23-10340-106
8-32 UNC	5/32	3/8		23-10340-108
10-24 UNC	5/32	3/8		23-10340-110
12-24 UNC	13/64	1/2		23-10340-112
1/4-20 UNC	15/64	1/2		23-10340-125
5/16-18 UNC	21/64	37/64		23-10340-131
3/8-16 UNC	25/64	21/32		23-10340-138
4-48 UNF	7/64	9/32		23-10340-204
6-40 UNF	9/64	11/32		23-10340-206
8-36 UNF	5/32	3/8		23-10340-208
10-32 UNF	5/32	3/8		23-10340-210
12-28 UNF	13/64	1/2		23-10340-212
1/4-28 UNF	17/64	1/2		23-10340-225
5/16-24 UNF	21/64	37/64		23-10340-231
3/8-24 UNF	25/64	21/32		23-10340-238

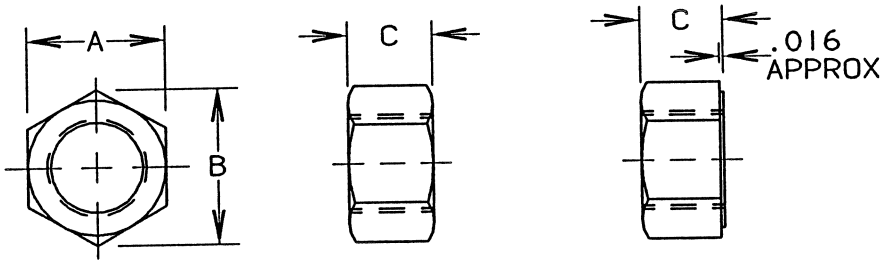
ENGINEERING NOTES:

(1) MATERIAL: CARBON STEEL WITH ZINC OR CADMIUM FINISH.

2. DO NOT USE FOR ELECTRICAL CONNECTIONS.

COMPILED	DJL	DATE DRAWN	CADAM ORIGINAL	MATERIAL	MASTER NUMBER	
APPROVED	DJL	06-05-86		(1)	01350	000D1

DRAWN	HJR	TITLE NUT, HEX, PLATED GRADE 8	ITEM NUMBER 23-10597
APPRV	ABE		
DATE	05/20/76	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



PART NUMBER

THREAD SIZE	A			B	C			FREIGHTLINER PART NUMBER
	BASIC	MAX	MIN	MIN	BASIC	MAX	MIN	
1/4 20 UNC 28 UNF	7/16	.438	.428	.488	7/32	.226	.212	23-10597-101 -501
3/8 16 UNC 24 UNF	9/16	.562	.551	.628	21/64	.337	.320	-103 -503
1/2 13 UNC 20 UNF	3/4	.750	.736	.840	7/16	.448	.427	-105
9/16 12 UNC 18 UNF	7/8	.875	.861	.982	31/64	.496	.473	-506
5/8 11 UNC 18 UNF	15/16	.938	.922	1.051	35/64	.559	.535	-107
1 8 UNC 14 UNF	1 1/2	1.500	1.450	1.653	55/64	.887	.831	-110
1 1/4 7 UNC 12 UNF	1 7/8	1.875	1.812	2.066	1 1/16	1.094	1.030	-612

ENGINEERING NOTES:

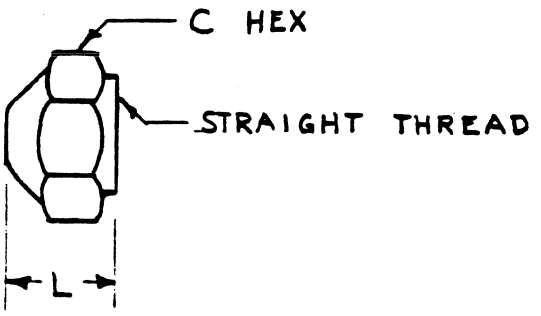
1. MATERIAL: STEEL, GRADE 8 PER SAE J995.
2. FINISH: CAD PLATE AND WAX OR ZINC PLATE.
3. NUT MUST CONFORM TO ANSI B18.2.2. DIMENSION SHOWN ARE FOR REFERENCE ONLY.

CHG	JOB/RLSE NO	DATE	BY	REVISION
C	PA2042-47	08/03/94	DAJ	REV & RDRWN: INACTIVE NUMBERS REMVD, GRADE 8 IPO C

General Use Part

PRINT ISSUED	TITLE	PART NO.
	NUT, CAP	23-10601
LAST CHG LTR		SHEET 1 OF 1

SKETCH



PART NUMBERS

STRAIGHT THREAD	TUBE SIZE	C HEX	L		MANUFACTURER'S NUMBER PH		FREIGHTLINER PART NUMBER
7/16-20	1/4	9/16	.56		640F-4		23-10601-004
5/8-18	3/8	3/4	.58		-6		-006
3/4-16	1/2	7/8	.69		-8		-008
7/8-14	5/8	1-1/16	.75		-10		-010

ENGINEERING NOTES

(1) Material: Brass

COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED		9-10-74		(1)	

Portland FREIGHTLINER CORPORATION Oregon 97208

WAS J# C0400 DATE BY CHG

WAS DATE BY CHG

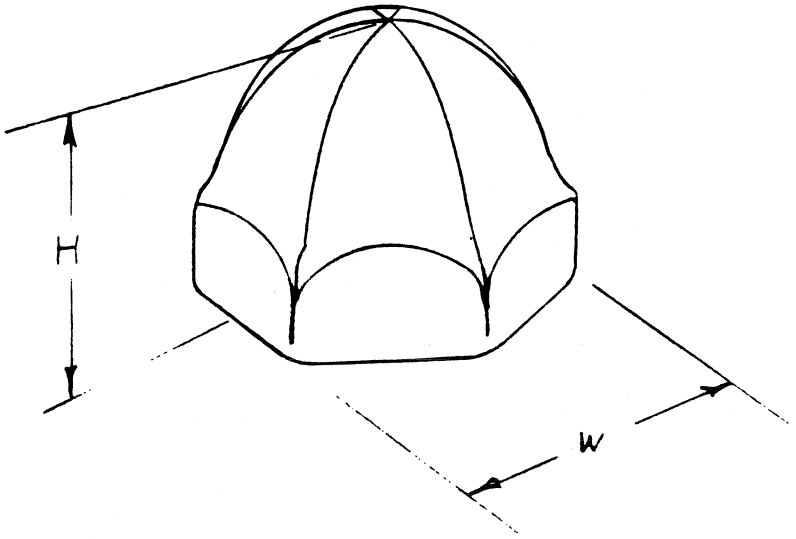
General Use Part

PRINT ISSUED		TITLE	PART NO.
		NUT, CAP, SINGLE THREAD	23-10630
LAST CHG LTR	A		SHEET 1 OF 1

CHG	BY	DATE	WAS	JOB NO.

CHG	BY	DATE	WAS	JOB NO.
	—	—	—	—
A	SW	9-22-80	Zinc or Cad	A0686 73561

SKETCH



PART NUMBERS

THREAD	W HEX	H HEIGHT	MANUFACTURER'S NUMBER PLN	FREIGHTLINER PART NUMBER
6-32	.31	.261	AC 632	23-10630-014
8-32	.34	.297	AC 832	-016
10-32	.38	.324	AC 1032	-019
10-24	.38	.324	AC 1024	-021
¼-20	.44	.380	AC 1420	-025
5/16-18	.56	.484	AC 51618	-031

ENGINEERING NOTES

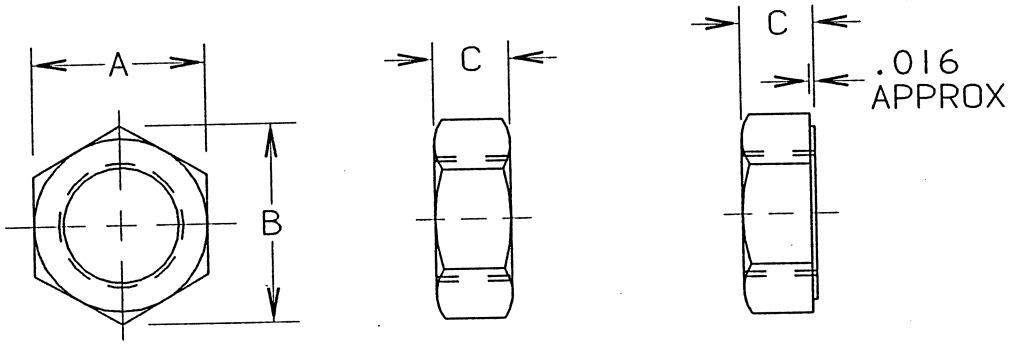
(1) MATERIAL: Steel per mfr's spec.

(A) 2. FINISH: Zinc, Cadmium, or Nickel Plated.

COMPILED	H.J.R.	DATE DRAWN		MATERIAL	
APPROVED		10-08-74		(1)	

Portland FREIGHTLINER CORPORATION Oregon 97208

DRAWN	DL	TITLE NUT - HEX LIGHT	ITEM NUMBER 23-10740
APPRV	CR		
DATE	02/07/75	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



PART NUMBER

THREAD SIZE	A			B	C			FREIGHTLINER PART NUMBER
	BASIC	MAX	MIN	BASIC	BASIC	MAX	MIN	
1-14	1 3/8	1.450	1.350	1.593	9/32	.313	.250	23-10740-100

C
B

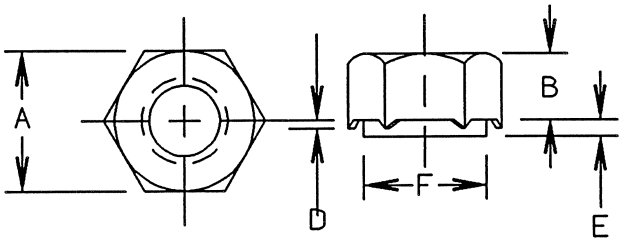
ENGINEERING NOTES:

1. MATERIAL: STEEL, GRADE 2 PER SAE J995.
2. FINISH: ZINC OR CAD PLATE.
3. ALL DIMENSIONS ARE FOR REFERENCE ONLY.

D

CHG	JOB/RLSE NO	DATE	BY	REVISION
B	PA2042-46	06/30/94	ERK	REDRAWN: DIMENSIONS REVISED TO ANSI B18.2.2.
C	PA2042-52	03/30/95	DAJ	REVERT TO DIMENSIONS NOTED ON REV LEVEL A.
D	PA2137-44	05/12/95	DAJ	REMOVE REFERENCE TO ANSI B18.2.2 FROM NOTE 3.

DRAWN	PCK	TITLE NUT-WELD, HEX NON-LOCKING	ITEM NUMBER 23-10801
APPRV	ANF		
DATE	01/31/90	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



(3) THREAD	A FLATS (MAX)	B THICK (MAX)	D	E	F	MFG NUMBER	FREIGHTLINER PART NUMBER
10-24	.500	.197	.025	.040	.406		23-10801-010
1/4-20	.500	.197	.025	.040	.406		23-10801-025
5/16-18	.562	.229	.025	.040	.469		23-10801-031
3/8-16	.625	.260	.030	.050	.531		23-10801-038
3/8-24	.562	.229	.025	.050	.469		23-10801-138
7/16-14	.750	.322	.035	.050	.656	(5)	23-10801-044
7/16-20	.750	.322	.035	.050	.656		23-10801-144
1/2-13	.813	.385	.035	.060	.719		23-10801-050

SHORT PILOT

(3) THREAD	A FLATS (MAX)	B THICK (MAX)	D	E	F	MFG NUMBER	FREIGHTLINER PART NUMBER
1/4-20	.500	.197	.025	.085	.406		23-10801-225
5/16-18	.562	.229	.025	.085	.469		23-10801-231
3/8-16	.625	.260	.030	.085	.531		23-10801-238
7/16-14	.750	.322	.035	.085	.656		23-10801-244
7/16-20	.750	.322	.035	.085	.656		23-10801-344
1/2-13	.813	.385	.035	.085	.719		23-10801-250
1/2-20	.813	.385	.035	.085	.719		23-10801-350
5/8-11	.937	.437	.035	.085	.781		23-10801-262

LONG PILOT

ENGINEERING NOTES:

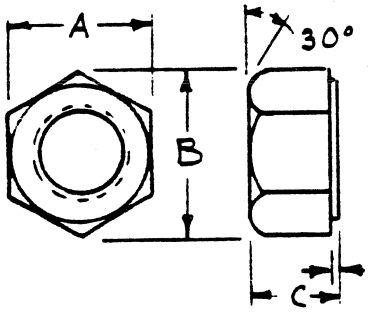
1. MATERIAL: C1008-1010 LOW CARBON STEEL
2. FINISH: PLAIN
(3) THREADS SHALL BE UNC OR UNF NON-LOCKING TYPE.
4. ADD .015 TO DIM. "F" FOR RECOMMENDED HOLE SIZE.
(5) SHORT PILOT 7/16-14 NOT AVAILABLE. USE 23-10801-244

CHG	JOB/RLSE NO	DATE	BY	REVISION
C	P7493F-01	01/31/90	PCK	REDRAWN. REVISED NOTES
D	PA2042-56	08/07/95	ERK	REDRAWN. REVISED MATERIAL
E	P5855P-01	05/21/96	DAJ	RMVD VENDOR PNS. REVISED NUT TO 6 PRONG FROM 3.
F	PC3201-02	01/22/97	DAJ	ADDED 23-10801-262 AND REVISED MATERIAL FROM C1018.

General Use Part

PRINT ISSUED	TITLE	PART NO
	NUT, HEX, BRASS	23-10887
LAST CHG LTR —		SHEET 1 OF 1

SKETCH



1/64 on 1/4 inch and larger.

PART NUMBERS

THREAD	FLATS A NOM	FLATS A MAX	FLATS A MIN	B CORNERS	THICKNESS C NOM	THICKNESS C MAX	THICKNESS C MIN		FREIGHTLINER PART NUMBER
2-64 2-56	3/16	.187	.180	.205	1/16	.066	.057		23-10887-001 -501
4-48 4-40	1/4	.250	.241	.275	3/32	.098	.087		-002 -502
6-40 6-32	5/16	.312	.302	.344	7/64	.114	.102		-003 -503
8-36 8-32	11/32	.344	.332	.378	1/8	.130	.117		-004 -504
10-32 10-24	3/8	.375	.362	.413	1/8	.130	.117		-005 -505
12-28 12-24	7/16	.437	.423	.482	5/32	.161	.148		-028 -528
1/4 -28 -20	7/16	.437	.428	.488	7/32	.226	.212		-006 -506
5/16-24 -18	1/2	.500	.489	.557	17/64	.273	.258		-007 -507
3/8 -24 -16	9/16	.562	.551	.628	21/64	.337	.320		-008 -508
7/16-20 -14	5/8	.625	.612	.698	3/8	.385	.365		-009 -509
1/2 -20 -13	3/4	.750	.736	.840	7/16	.448	.427		-010 -510
9/16-18 -12	7/8	.875	.861	.982	31/64	.496	.473		-011 -511
5/8 -18 -11	15/16	.937	.922	1.051	35/64	.559	.534		-012 -512
3/4 -16 -10	1-1/16	1.062	1.045	1.191	41/64	.670	.642		-013 -513
7/8 -14 - 9	1-1/4	1.250	1.231	1.403	49/64	.782	.750		-014 -514
1 -14 - 8	1-7/16	1.437	1.417	1.615	7/8	.893	.857		-015 -515

ENGINEERING NOTES

1. Material: Brass per SAE J461 CA614, CA345, CA360, etc.
2. Finish: Plain
3. Thread: Unified Fine Thread Class 2B (UNF-2B)
   Unified Coarse Thread Class 2B (UNC-2B)

COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED		5-12-76		(1)	

JOB NO.	WAS	DATE	BY	CHG

JOB NO.	WAS	DATE	BY	CHG
60806	—	—	—	—

Portland FREIGHTLINER CORPORATION Oregon 97208

23-10916

General Use Part

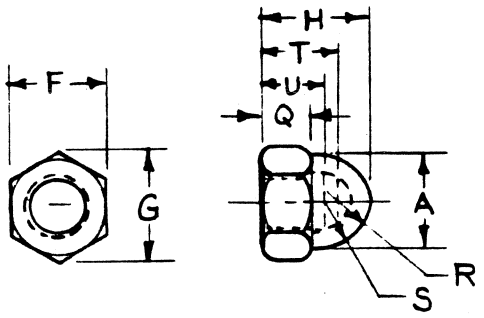
PRINT ISSUED		TITLE	PART NO.
		NUT, CROWN, LOW (BLIND ACORN) STAINLESS STEEL	23-10916
LAST CHG LTR	B		SHEET 1 OF 1

CHG	BY	DATE	WAS	JOB NO

A

CHG	BY	DATE	WAS	JOB NO
—	—	—	—	A0795
A	M.D.	1-30-80	Mat'l Chg. 18-8	76629
B	DDM	8-15-84	Type 316	0280C

SKETCH



LOW CROWN										FREIGHTLINER PART NUMBER	
SIZE	F	G MAX	A	H	Q	R	S	T MAX	U MIN	UNC	UNF
1/4	7/16	0.505	0.41	0.47	0.22	0.11	0.25	0.34	0.25	-125	-225
5/16	1/2	0.577	0.47	0.53	0.25	0.12	0.28	0.41	0.31	-131	-231
3/8	9/16	0.650	0.53	0.62	0.28	0.14	0.33	0.45	0.38	-138	-238

ENGINEERING NOTES

1. Material: Stainless steel, type 302.
   Alternate Material: Stainless Steel Type 304.
2. Thread and other dimensional characteristics shall meet pertinent provisions of SAE standard J104.

COMPILED	HJR	DATE DRAWN		MATERIAL	MASTER NUMBER	
APPROVED	CRG	12-22-75		(1)	01370	00001

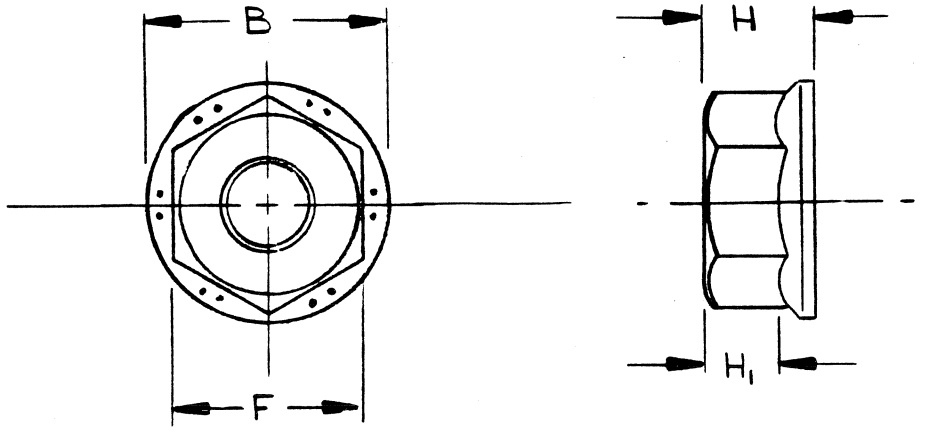
Portland FREIGHTLINER CORPORATION Oregon 97208

B M/F A

ORIGINAL JOB NO.	TITLE	PART NO.
B0679	NUT, FLANGED HEX, PREVAILING TORQUE GRADE G	23-11020
LAST CHG LTR H		SHEET 1 OF 2

LTR	JOB NO.	BY	DATE	CHANGE INFORMATION
E	71043	SK	10/20/78	Basic Dims to Min & Max
F	92892	SK	5/9/79	Revised Note (4)
G	7573C	DJL	10/17/84	Added Master Number
H	[illegible]	FF	6/[illegible]/85	

LTR	JOB NO.	BY	DATE	CHANGE INFORMATION
A	64529	JK	7-5-77	REV. NOTE (2)
B	64560	BK	7-28-77	REVISED NOTE (4)
C	65655	DS	2-2-78	Phos. & Oil to Plain
D	73467	SK	10/3/78	Rev. 'Across Flats F'



THREAD	ACROSS FLATS F	FLANGE DIA. B	HGT H	HEX HGT H_1	FINISH (2)	PART NO.
1/4 - 20	.438 max. .427 min.	.59 max. .54 min.	.275 max. .222 min.	.14 min.	P	23-11020-004
					C	-504
5/16 - 18	.500 max. .489 min.	.68 max. .66 min.	.330 max. .268 min.	.17 min.	P	-005
					C	-505
3/8 - 16	.562 max. .551 min.	.81 max. .73 min.	.414 max. .330 min.	.20 min.	P	-006
					C	-506
7/16 - 14	.688 max. .675 min.	.94 max. .91 min.	.469 max. .375 min.	.23 min.	P	-007
					C	-507
1/2 - 13	.750 max. .736 min.	1.07 max. 1.00 min.	.538 max. .437 min.	.26 min.	P	-008
					C	-508
9/16 - 12	.872 max. .861 min.	1.19 max. 1.16 min.	.590 max. .483 min.	.29 min.	P	-009
					C	-509
5/8 - 11	.938 max. .922 min.	1.33 max. 1.25 min.	.661 max. .545 min.	.32 min.	P	-010
					C	-510
3/4 - 10	1.125 max. 1.088 min.	1.58 max. 1.46 min.	.757 max. .627 min.	.38 min.	P	-012
					C	-512

COMPILED	RDW	DATE DRAWN		MATERIAL	MASTER	NUMBER
APPROVED	[illegible]	12.16.76		SEE SHEET 2	01342	000D1

FREIGHTLINER CORPORATION Oregon 97208

H-INITIF D E

ORIGINAL JOB NO.	TITLE	PART NO.
B0679	NUT, FLANGED HEX, PREVAILING TORQUE GRADE C	23-11020
LAST CHG LTR H		SHEET 2 OF 2

CHANGE INFORMATION	DATE	BY	JOB NO.
TR			

CHANGE INFORMATION	DATE	BY	JOB NO.
ADDED SHT 2	6/13/85	FF	1991D
H			

1 MATERIAL SPECIFICATIONS

A. Nuts shall conform to the Industrial Fasteners Institue Standard IFI-107, "Prevailing-Torque Type Steel Hex Flange Locknuts".

B. Acceptable finishes are:

P = Zinc Phosphate Conversion Coat and 0.1. (Dry to the touch) per 49-0006-041

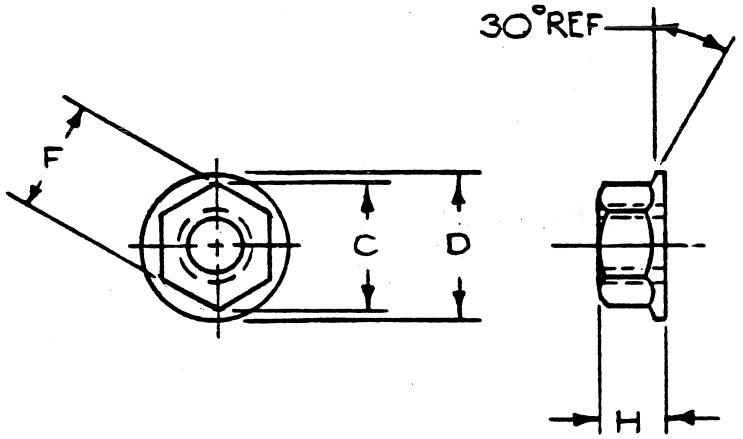
C = Cadmium Plate and Wax, per 49-00012-130 or 230.

C. Threads shall be Unified Coarse series as specified in ANSI B1.1 with Class 2B tolerances.

D. The Grade G locknuts shall have a minimum proof stress of 150,000 PSI and a maximum hardness of RC 32.

		DATE DRAWN			MASTER NUMBER	
COMPILED	FHF	12-13-85		1	01342	000D1
APPROVED						

ORIGINAL JOB NO.	TITLE	PART NO.
C0822	NUT, FLANGE NONLOCKING GR. B	23-11022
LAST CHG LTR A		SHEET 1 OF 1



PART NUMBERS

THREAD SIZE	F FLATS (NOM.)	C CORNERS (MAX)	H (MAX)	D (MAX)	MANUFACTURER'S NO.		FREIGHTLINER PART NUMBER
						MF	
3/4-16	1.125	1.299	.675	1.500		52SFS3416	23-11022-750

ENGINEERING NOTES:

1. MATERIAL: Grade B Nut Material (SAE Grade 5 per SAE standard J995b - Mechanical & Quality Standards for Steel Nuts)
2. FINISH - Cadmium Plate

COMPILED	BOBK	DATE DRAWN		MATERIAL	
APPROVED		1-28-77		(1)	

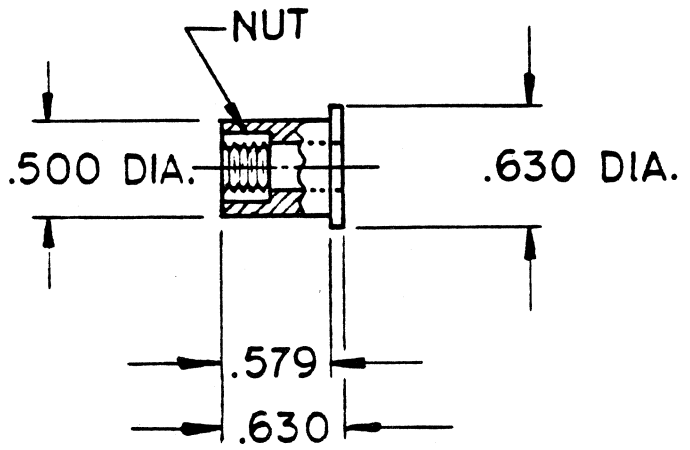
CHANGE INFORMATION

LTR	JOB NO.	BY	DATE	CHANGE INFORMATION
A	63899	DJ	4-11-77	52SFS3416 TO 52SFS34

General Use Part

ORIGINAL JOB NO.	TITLE	PART NO.
A0866	WELL-NUT	23-11048
LAST CHG LTR		SHEET 1 OF 1

SKETCH



THREAD	HOLE SIZE	PANEL THICKNESS RANGE	MFG'S NUMBER USH	FREIGHTLINER PART NUMBER
1/4-20	.500	.015"-.111"	1/4S	23-11048-000

ENGINEERING NOTES:

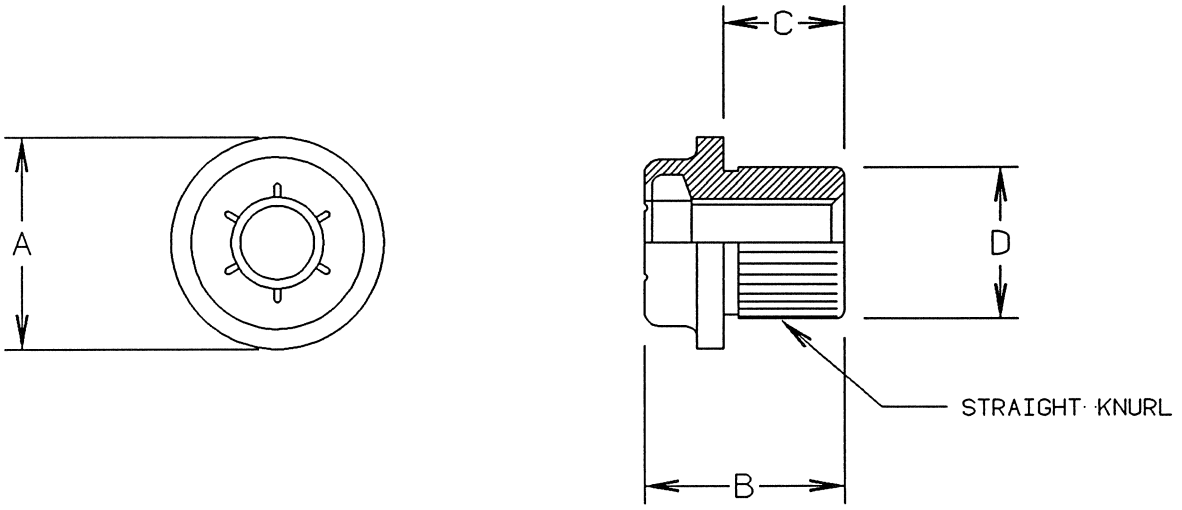
(1) MATERIAL: Neoprene body and captive brass nut.
2 DUROMETER: 60 ± 5

COMPILED	D. Le L.	DATE DRAWN		MATERIAL	
APPROVED	GABE	7-12-77		(1)	

CHANGE INFORMATION | LTR | JOB NO. | BY | DATE

CHANGE INFORMATION | LTR | JOB NO. | BY | DATE

DRAWN	NK	TITLE	ITEM NUMBER
APPRV	SJH	NUT - SPLINE ELASTIC STOP NUT	23-11054
DATE	03/01/78	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



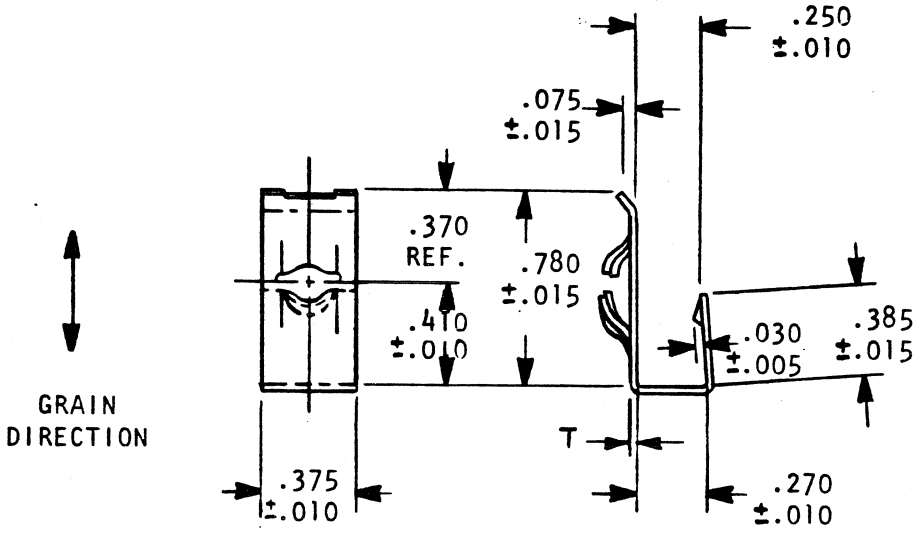
THREAD	A	B	C	D		MANUFACTURER'S NUMBER		FREIGHTLINER PART NUMBER
				MIN	MAX	ESN	GMD	
.2500-28UNJF-3B	.563	.500	.313	.384	.388	42ND20-048	ND20-428	23-11054-000
.2500-20UNJC-3B	.563	.500	.313	.384	.388	42ND20-040	ND20-420	23-11054-001
.3750-24UNJF-3B	.688	.531	.250	.509	.513	42ND16-064	ND16-624	23-11054-002
.3125-18UNJC-3B	.625	.390	.156	.446	.450	42ND10-058		23-11054-003
.3125-18UNJC-3B	.625	.547	.313	.446	.450	42ND20-058		23-11054-004

ENGINEERING NOTES:

1. MATERIAL: STEEL
2. FINISH: CADMIUM PLATE
3. LOCKING INSERT: NYLON

CHG	JOB/RLSE NO	DATE	BY	REVISION
C	P8892G-01	11/11/93	ERK	REVISED & REDRAWN; ADDED GMD PRODUCT NUMBERS
D	P00412-01	07/01/96	DAJ	ADDED -003&-004. THREAD WAS .2500-20UNJF-3B FOR -001
E	P00412-03	09/11/96	KKK	42ND10(& D20)-058 WAS 42ND10(& D20)-054
F	PA2042-73	09/25/96	DAJ	.3125-18UNJC-3B WAS .3125-24UNJF-3B ON -003 & -004

ORIGINAL JOB NO.	TITLE	PART NO.
C0910A	SPEED NUT "J" TYPE	23-11055
LAST CHG LTR B		SHEET 1 OF 2



LTR	JOB NO.	BY	DATE	CHANGE INFORMATION

LTR	JOB NO.	BY	DATE	CHANGE INFORMATION
A	C1500A	LD	4/30/80	Revised & Redrawn
A	C1500A	LD	4/30/80	ADDED -002
B	C1588	VM	4-20-82	ADDED SHT 2

PART NUMBERS

THREAD SIZE	PANEL RANGE	T	PANEL HOLE DIA. MIN.	MANUFACTURER'S NUMBER		FREIGHTLINER PART NUMBER
				TIN	FTR	
10-A	.245/.255	.031	.250	C13999-10A		23-11055-001
10-24	.245/.255	.025	.250		C13999-1024	-002 (A)

ENGINEERING NOTES

(1) Material: High Carbon Spring Steel, Heat Treated 45-50c

2 Finish: Phosphate and Oil

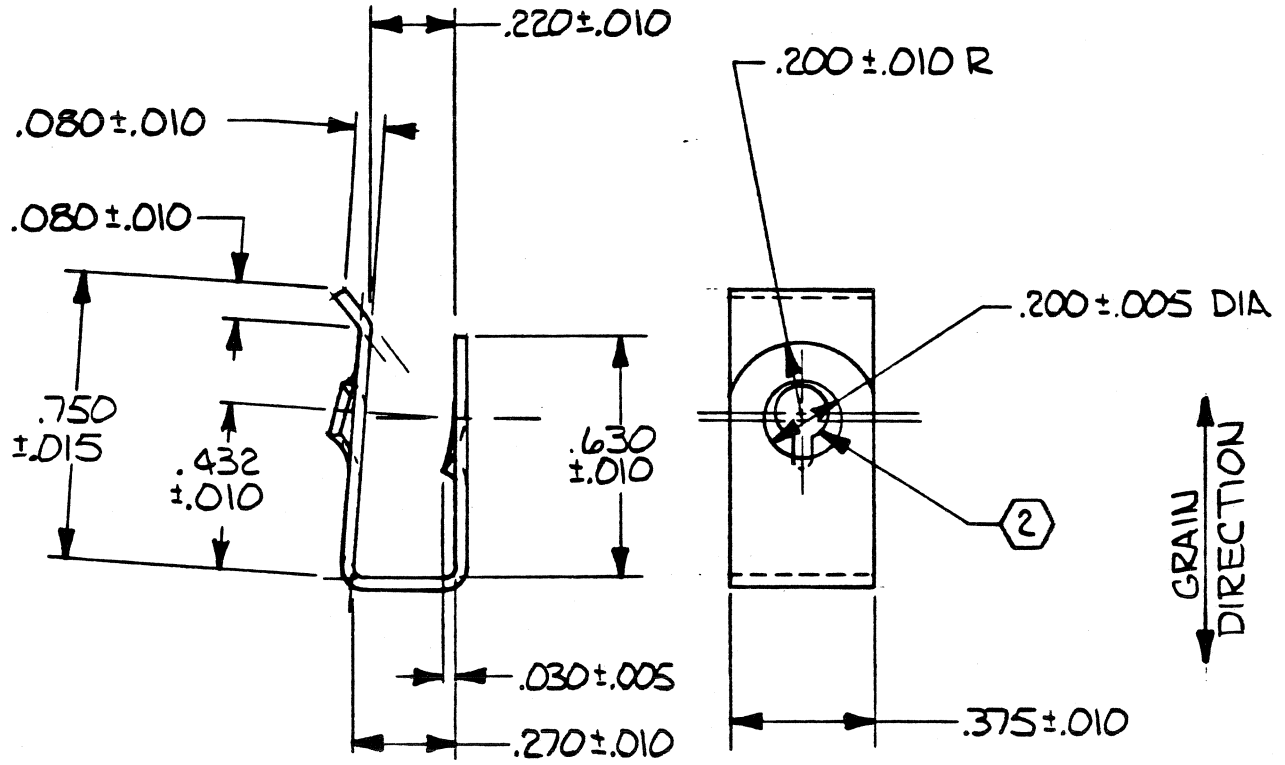
COMPILED	LD	DATE DRAWN		MATERIAL	
APPROVED		4/30/80		(1)	

EAC-830

Portland FREIGHTLINER CORPORATION Oregon 97208

B A

ORIGINAL JOB NO.	TITLE	PART NO.
C1588	SPEED NUT "U" TYPE	23 - 11055
LAST CHG LTR B		SHEET 2 OF 2



PART NUMBERS

THREAD SIZE	PANEL RANGE	T	PANEL HOLE DIA. MIN.	MANUFACTURER'S NUMBER		FREIGHTLINER PART NUMBER
				TIN	FTR	
10-Z	.245/.255	.030	.250			23-11055-003

ENGINEERING NOTES

1. Material: High Carbon Spring Steel -.030 THK.
2. Finish: Phosphate Oil

COMPILED	WTM	DATE DRAWN		MATERIAL	
APPROVED		4-20-82		1	

Portland FREIGHTLINER CORPORATION Oregon 97208

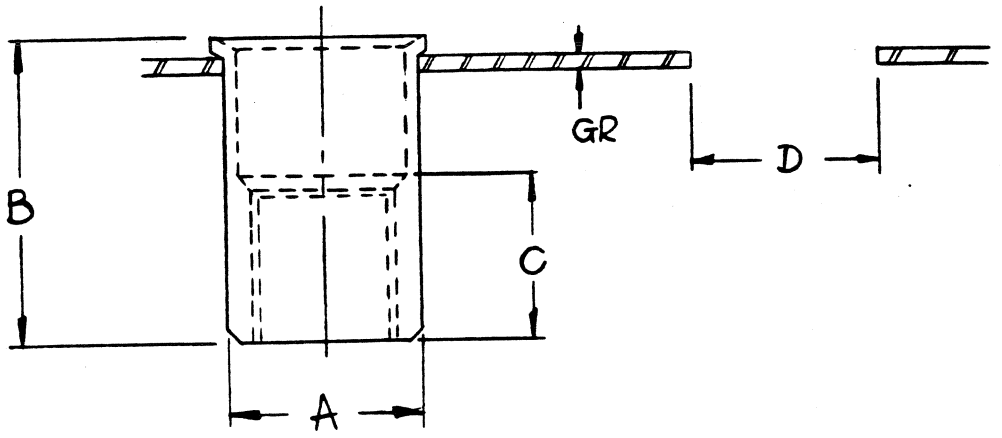
AC-826

B

LTR	JOB NO.	BY	DATE	CHANGE INFORMATION

LTR	JOB NO.	BY	DATE	CHANGE INFORMATION
B	C1588	WTM	4-20-82	ADDED "U" CLIP SHT 2

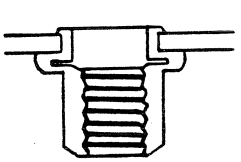
ORIGINAL JOB NO.	TITLE	PART NO.
C1190A	NUTSERT, THIN SHEET (TSN)	23-11057
LAST CHG LTR A		SHEET 1 OF 1

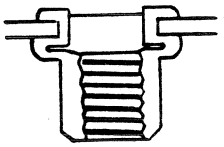


FREIGHTLINER PART NUMBER	AVDEL TSN PART NUMBER	THREAD SIZE	RECOMMENDED GRIP RANGE 'GR'		'A' MAX	'B' MAX	'C' MAX	D	
								Dr.Sz	Hole size
23-11057-506	9655-0613	6-32 UNC	STD	FORMED	.249	.410	.250	1/4	.250/.254
23-11057-508	9655-0813	8-32 UNC	.02/.08	.02/.06					
23-11057-510	9655-1015	10-24 UNC	.02/.13	.02/.1	.280	.465	.240	9/32	.281/.285
23-11057-710	9657-1015	10-32 UNF							
23-11057-408	9654-0819	1/4-20 UNC	.03/.16	.03/.13	.374	.610	.335	3/8	.375/.379
23-11057-608	9656-0819	1/4-28 UNF							
23-11057-410	9654-1023	5/16-18UNC	.04/.18	N/A	.499	.720	.395	1/2	.500/.504
23-11057-610	9656-1023	5/16-24UNF							
23-11057-308	9654-0823	1/4-20 UNC	.15/.26	N/A	.374	.710	.335	3/8	.375/.379

ENGINEERING NOTES

1. Material: 1006-1010 Low carbon steel
2. Plating: Zinc plate, type I class 3 with supplementary clear chromate.
3. Do not use nutserts as rivets to fasten two or more sheets of metal together.
4. Use only the Avdel or nutsert placement tool to secure the nutsert in the hole.
5. TSN installed with standard head tool and formed head tool respectively. (shown below)


Standard head


formed head

COMPILED	DANG	DATE DRAWN			
APPROVED	NLK	5/9/78			

CHANGE INFORMATION

LTR	JOB NO.	BY	DATE	CHANGE INFORMATION
A	76661	TD	8/24/79	See M/F History

E-183A Litho in USA Portland

FREIGHTLINER CORPORATION Oregon 97208

M/F A

23-11183

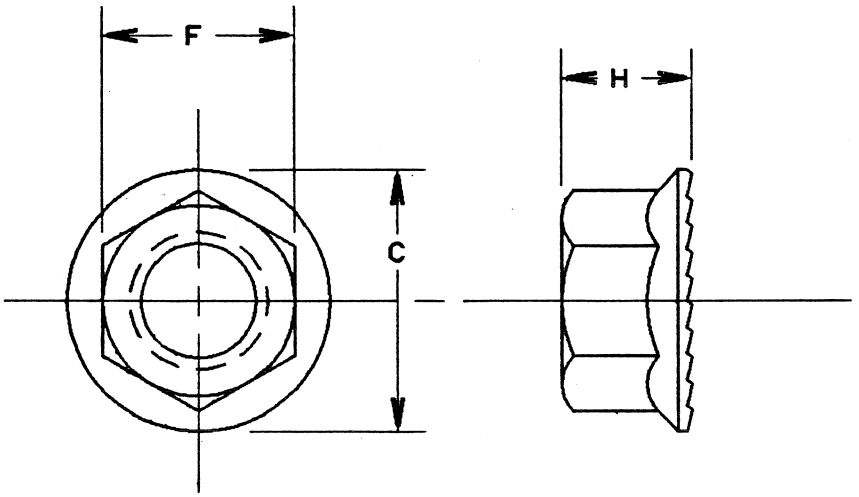
GENERAL USE PART

ORIGINAL JOB NO.	TITLE	PART NO.
N0235	NUT, HEX SERRATED FLANGE	23-11183
LAST CHG LTR: A		SHEET 1 OF 1

LTR	JOB NO.	BY	DATE	CHANGE INFORMATION

LTR	JOB NO.	BY	DATE	CHANGE INFORMATION
A1	N0235	DJL	02-07-85	REVISED & REDRAWN
A2	N0235	DJL	02-07-85	ADDED -011 & -012

SKETCH:



PART NUMBERS:

THREAD	F FLATS (BASIC)	H HEIGHT (MAX.)	C FLANGE (MAX.)	MANUFACTURER'S NUMBER MF	FREIGHTLINER PART NUMBER
#10 24 UNC	3/8	.240	.531	32 WLF 1024	23-11183-011
#10 32 UNF				32 WLF 1032	23-11182-012
1/4 20 UNC	7/16	.255	.609	32 WLF 1420	23-11183-001
1/4 28 UNF				32 WLF 1428	23-11183-002
5/16 18 UNC	1/2	.297	.687	32 WLF 51618	23-11183-003
5/16 24 UNF				32 WLF 51624	23-11183-004
3/8 16 UNC	9/16	.359	.750	32 WLF 3816	23-11183-005
3/8 24 UNF				32 WLF 3824	23-11183-006
7/16 14 UNC	5/8	.395	.937	32 WLF 71614	23-11183-007
7/16 20 UNF				32 WLF 71620	23-11183-008
1/2 13 UNC	3/4	.458	1.062	32 WLF 1213	23-11183-009
1/2 20 UNF				32 WLF 1220	23-11183-010

ENGINEERING NOTES:

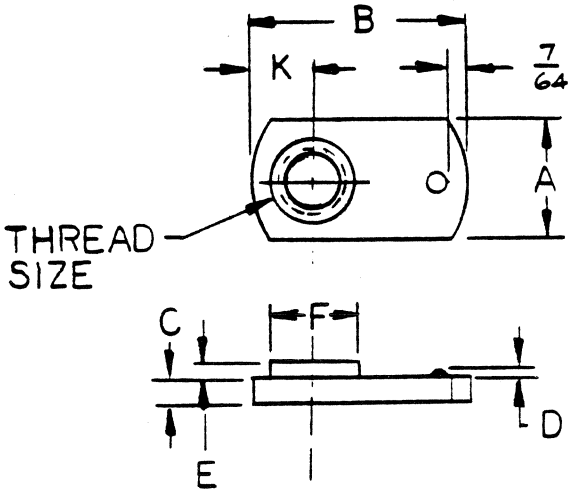
(1) MATERIAL: LOW CARBON STEEL CASE HARDENED.

FINISH: CADMIUM PLATE.

COMPILED	DJL	DATE DRAWN	CADAM ORIGINAL	MATERIAL	MASTER NUMBER	
APPROVED	DJL	02-07-85		(1)	01320	000D1

ORIGINAL JOB NO.	TITLE	PART NO.
C0910 B	NUT, WELD, OFFSET	23-11190
LAST CHG LTR		SHEET 1 OF 1

CHANGE INFORMATION | DATE | BY | JOB NO.



PART NUMBERS

SIZE	MFR. PART NUMBER ①	A WIDTH	B LNGTH	C THKNS	K	PILOT E	PILOT F	G PLT HOLE DIA.	D PROJ. HT.	WEIGHT PER M (LBS.)	FREIGHTLINER PART NUMBER
6-32	P1C-6-S	7/16	5/8	.094	3/16	1/32	3/16	13/64	.020	6.40	23-11190-006
8-32	P1C-8-S	7/16	5/8	.094	3/16	1/32	16/64	7/32	.020	6.25	-008
10-24	P1C-10-S	7/16	5/8	.094	3/16	1/32	15/64	1/4	.020	6.13	-010
10-32	P1F-10-S	7/16	5/8	.094	3/16	1/32	15/64	1/4	.020	6.13	-110
1/4-20	P1C-14-S	1/2	13/16	.105	1/4	3/64	19/64	5/16	.025	10.24	-025
1/4-28	P1F-14-S	1/2	13/16	.105	1/4	3/64	19/64	5/16	.025	10.24	-125
5/16-18	P1C-56-S	5/8	1 1/8	.135	11/32	5/64	23/64	3/8	.030	23.36	-031
5/16-24	P1F-56-S	5/8	1 1/8	.135	11/32	5/64	23/64	3/8	.030	23.36	-131
3/8-16	P1C-38-S	5/8	1 1/8	.135	11/32	3/32	7/16	29/64	.030	22.74	-038
3/8-24	P1F-38-S	5/8	1 1/8	.135	11/32	3/32	7/16	29/64	.030	22.74	-138

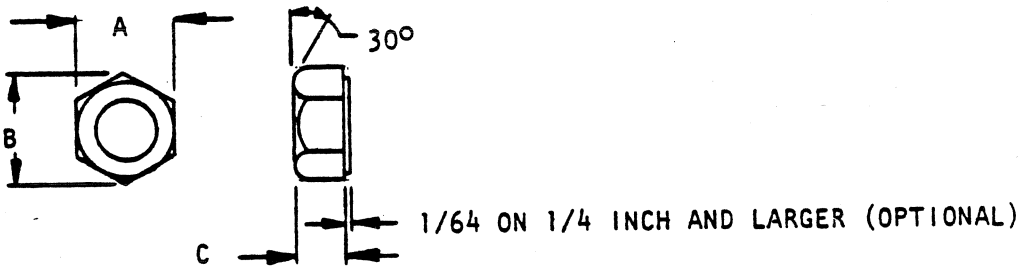
WITH THREADLOCKING FEATURE

SIZE	MFR. PART NUMBER ①	A WIDTH	B LNGTH	C THKNS	K	PILOT E	PILOT F	G PLT HOLE DIA.	D PROJ. HT.	WEIGHT PER M (LBS.)	FREIGHTLINER PART NUMBER
6-32	TLP1C6S	7/16	5/8	.094	3/16	1/32	3/16	13/64	.020	6.40	23-11190-506
8-32	TLP1C8S	7/16	5/8	.094	3/16	1/32	13/64	7/32	.020	6.25	-508
10-24	TLP1C10S	7/16	5/8	.094	3/16	1/32	15/64	1/4	.020	6.13	-510
10-32	TLP1F10S	7/16	5/8	.094	3/16	1/32	15/64	1/4	.020	6.13	-610
1/4-20	TLP1014S	1/2	13/16	.105	1/4	3/64	19/64	5/16	.024	10.24	-525
1/4-28	TLP1F14S	1/2	1 1/8	.105	1/4	3/64	19/64	5/16	.025	10.24	-625
5/16-18	TLP1C56S	5/8	1 1/8	.135	11/32	5/64	23/64	3/8	.030	23.36	-531
5/16-24	TLP1F56S	5/8	1 1/8	.135	11/32	5/64	23/64	3/8	.030	23.36	-631
3/8-16	TLP1C38S	5/8	1 1/8	.135	11/32	3/32	7/16	28/64	.030	22.74	-538
3/8-24	TLP1F38S	5/8		.135	11/32	3/32	7/16	28/64	.030	22.74	-638

MATERIAL: 1010-1012 STEEL ① MANUFACTURER: GR

		DATE DRAWN			
COMPILED	[illegible]	2/22/79			
APPROVED	[illegible]				

ORIGINAL JOB NO.	TITLE	PART NO.
D1391	NUT, HEX GRADE A FINE THREAD, LEFT HAND	23-11191
LAST CHG LTR: A		SHEET 1 OF 1



THREAD UNF-2B-LH	A			B	B			FREIGHTLINER PART NO.
	NOM	MAX	MIN		NOM	MAX	MIN	
5/16-24	1/2	.500	.489	.557	17/64	.273	.258	23-11191-007

CHANGE INFORMATION

JR	JOB NO.	BY	DATE	CHANGE INFORMATION

CHANGE INFORMATION

JR	JOB NO.	BY	DATE	CHANGE INFORMATION
	D1391	LD	7/5/79	REVISED TO GRADE A. REVISED DRAWING

Engineering Notes

1. Material: Steel, Grade A (SAE Grade 2), Nut material per SAE J995.
   Optional Material: Steel Grade B (SAE Grade 5), Nut material per SAE J995.
   Optional Material: Steel, Meets Standard AN-315-5L.
2. Finish: Electrogalvanize or cadmium plate.
3. Thread: Unified fine thread Class 2B left hand (UNF-2B-LH).
4. Manufacturer: FTR

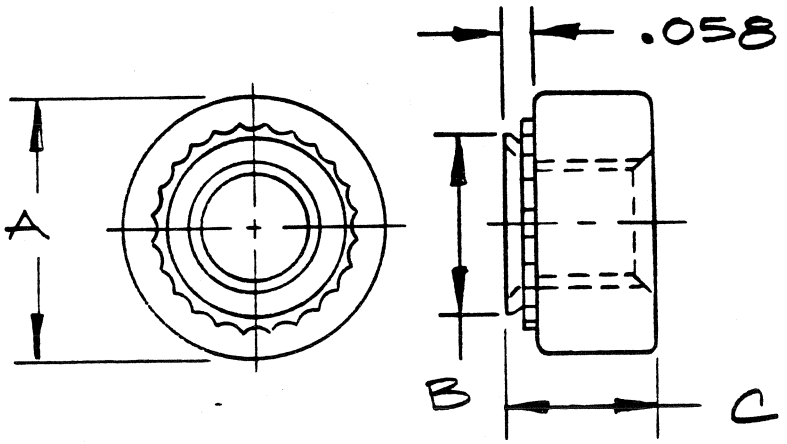
COMPILED	DE40	DATE DRAWN			
APPROVED	DCR	4-2-79			

ORIGINAL JOB NO.	TITLE	PART NO.
	NUT, SELF-CLINCHING CAPTIVE	23-11199
LAST CHG LTR A		SHEET 1 OF 1

SCOPE THIS SPECIFICATION IDENTIFIES A METALLIC, INTERNALLY THREADED CAPTIVE NUT

APPLICATION TO PROVIDE LOAD BEARING THREADS IN SHEET METAL TOO THIN TO THREAD

SKETCH



SPECIFICATION NUMBERS

THREAD SIZE	A	B	C	M (1)	MINIMUM SHEET THICKNESS	MANUFACTURER'S NUMBER		FREIGHTLINER SPECIFICATION NUMBER
						PEM		
10-24	.34	.249	.144	S	.056	SS-024-2		23-11199-001
¼-20 (2)	.50	.343	.247	S	.058	HNL-0420-CI		23-11199-002

(1) MATERIAL - CARBON STEEL-S

(2) SELF-LOCKING THREADS

3 The use of this fastener is to be restricted to applications that require a flush mounting surface on the side opposite the nut. For all other applications use 23-11275. (A)

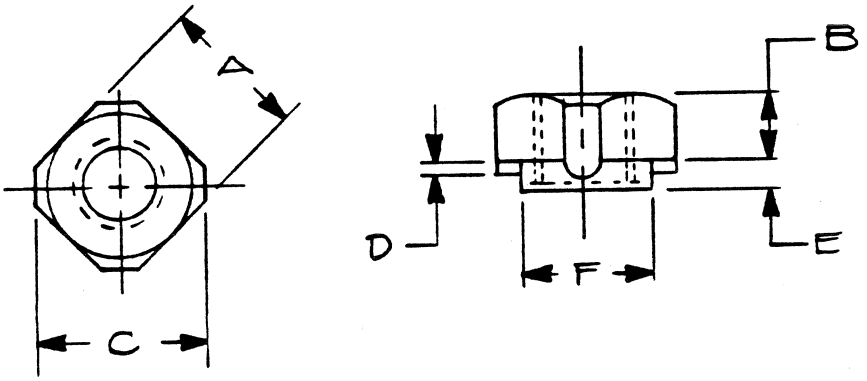
CHANGE INFORMATION	DATE	BY	JOB NO.
ADDED NOTE 3.	4-30-80	PWS	218000

COMPILED	PWS	DATE DRAWN		MATERIAL	
APPROVED	NJA	3/6/79		(1)	

23-11221 Sheet 1 of 2

ORIGINAL JOB NO.	TITLE	PART NO.
76005	NUT, WELD, SQUARE	23-11221
LAST CHG LTR		SHEET 1 OF 2

SKETCH:



PART NUMBERS:

THD 3	A FLATS (MAX.)	B* THICK. (MAX.)	D	E*	F	MANUFACTURER'S NO. MF**		FREIGHTLINER PART NUMBER
1/4 - 20 1/4 - 28	.500	.169	.046	.060	.406	29SPS1420 1428		23-11221-025 -125
5/16- 18 5/16- 24	.562	.197		.065	.469	51618 51624		-031 -131
3/8 - 16 3/8 - 24	.625	.258			.531	3816 3824		-038 -138
7/16- 14 7/16- 20	.750	.319			.656	71614 71620		-044 -144
1/2 - 13 1/2 - 20	.813	.385			.719	1213 1220		-050 -150

*Short pilot; for long pilot see P.2
**Non-locking type must be specified when ordering.

Engineering Notes

1. Material: C1110 steel.
2. Finish: plain
3. Threads shall be UNC or UNF, non-locking type.

COMPILED	TD	DATE DRAWN		MATERIAL	
APPROVED	GCB	6/22/79		1	

CHANGE INFORMATION | DATE | BY | JOB NO.

CHANGE INFORMATION | DATE | BY | JOB NO.

SHEET 1 OF 2

ORIGINAL JOB NO.	TITLE	PART NO.
76005	NUT, WELD, SQUARE	23-11221
LAST CHG LTR		SHEET 2 OF 2

PART NUMBERS (CONT.)

THD 3	A FLATS (MAX.)	B* THICK (MAX.)	D	E*	F	MANUFACTURER'S NO. MF**		FREIGHTLINER PART NUMBER
1/4 - 20 1/4 - 28	.500	.135	.046	.090	.406	29LPS1420 1428		23-11221-225 -325
5/16-18 5/16-24	.562	.197			.469	51618 51624		-231 -331
3/8-16 3/8-24	.625	.258			.531	3816 3824		-238 -338
7/16-14 7/16-20	.750	.319			.656	71614 71620		-244 -344
1/2-13 1/2-20	.813	.385			.719	1213 1220		-250 -350

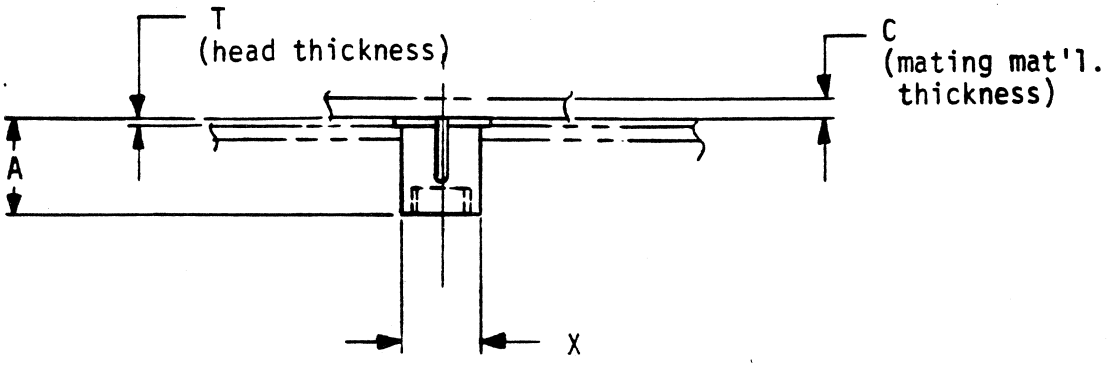
*Long pilot, for short pilot see P.1
**Non-locking type must be specified when ordering.

CHANGE INFORMATION | DATE | BY | JOB NO.

CHANGE INFORMATION | DATE | BY | JOB NO.

COMPILED	TD	DATE DRAWN		MATERIAL	
APPROVED	GEBO	6/22/79		(1) P.1	

ORIGINAL JOB NO.	TITLE	PART NO.
C1500D	NUT, BLIND	23-11281
LAST CHG LTR		SHEET 1 OF 1



Thread	A	C	T	Hole size X	Average Pull out	Max. Install. Torque	Mfg's. P/N CEM	Freightliner Part No.
6-32 UNC	3/8	(1)	.030	+.004 5/16-.000	220 Lbs.	30 in.Lbs	BN21/6-32	23-11281-1
6-40 UNF	3/8	(1)	.030	+.004 5/16-.000	220 Lbs.	30 in.Lbs	BN21/6-40	-2
8-32 UNC	1/2	(1)	.030	+.005 13/32-.000	375 Lbs.	50 in.Lbs	BN31/8-32	-3
8-36 UNF	1/2	(1)	.030	+.005 13/32-.000	375 Lbs.	50 in.Lbs	BN31/8-36	-4
10-24 UNC	1/2	(1)	.030	+.005 13/32-.000	375 Lbs	50 in.Lbs	BN31/10-24	-5
10-32 UNF	1/2	(1)	.030	+.005 13/32-.000	375 Lbs	50 in.Lbs	BN31/10-32	-6
1/4-20 UNC	5/8	(1)	.030	+.006 1/2 -.000	600 Lbs	65 in.Lbs	BN41/1/4-20	-7
1/4-28 UNF	5/8	(1)	.030	+.006 1/2 -.000	600 Lbs	65 in.Lbs	BN41/1/4-28	23-11281-8

(1) Recommended screw length for use with nut:

#6 nut = 3/8 + C #10 nut = 1/2 + C

#8 nut = 1/2 + C 1/4 nut = 9/16 + C

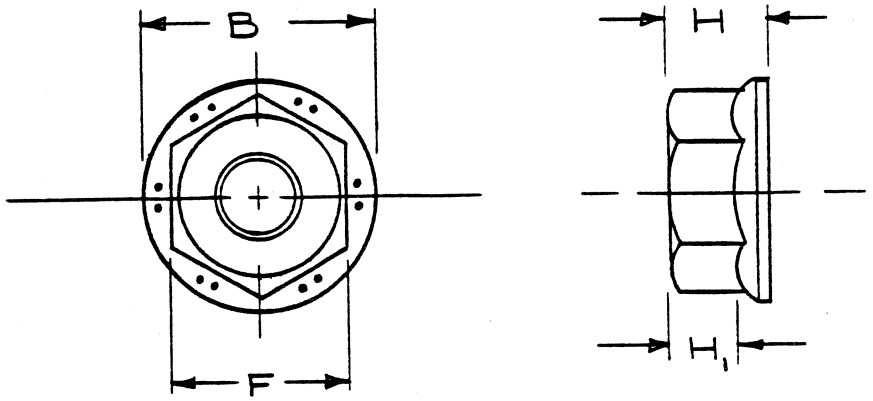
2. Material: Nylon cage & aluminum nut.

COMPILED	RCF	DATE DRAWN			
APPROVED	RDS	4-4-80			

CHANGE INFORMATION | DATE | BY | JOB NO. | LTR

CHANGE INFORMATION | DATE | BY | JOB NO. | LTR

ORIGINAL JOB NO.	TITLE	PART NO.
B-1409	NUT, FLANGED HEX, PREVAILING TORQUE GRADE C, FINE THREAD	23-11284
LAST CHG LTR		SHEET 1 OF 1



THREAD	FLATS (BASIC) F	FLANGE DIA B	HGT H	HEX HGT H_1	FINISH (3)	PART NO.
						23-11284-004
						-104
						-005
						-105
						-006
						-106
7/16-20	11/16	.930 Max.	.495 Max.	.23 Min.	P	-007
						-107
						-008
						-108
						-009
						-109
						-010
						-110
						-011
						-111

ENGINEERING NOTES

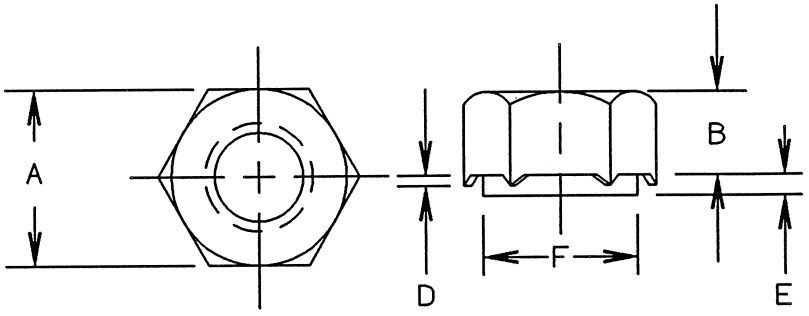
1. The nut shall conform to Industrial Fastners Institute IFI-107.
2. Material: Grade C (= SAE Grade 8) nut material meeting all pertinent provisions of the current revision of SAE Standard J995 Mechanical & Quality Requirements for Steel Nuts.
3. Finish: P = Plain C = Cadium Plate
4. Thread: Unified Fine Thread Class 2B

COMPILED	D. Hunt	DATE DRAWN		MATERIAL	
APPROVED	HADDOCK	4/29/80		(2)	

CHANGE INFORMATION	DATE	BY	JOB NO.	LTR

CHANGE INFORMATION	DATE	BY	JOB NO.	LTR

DRAWN	D.LEL	TITLE NUT - WELD, HEX SELF LOCKING	ITEM NUMBER 23-11318
APPRV	PWS		
DATE	05/21/81	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



(3) THREAD	A FLATS (MAX)	B THICK (MAX)	D	E	F	MFG NUMBER	FREIGHTLINER PART NUMBER
10-24	.500	.197	.025	.040	.406		23-11318-010
10-32	.500	.197	.025	.040	.406		23-11318-110
1/4-20	.500	.197	.025	.040	.406		23-11318-025
5/16-18	.562	.229	.025	.040	.469		23-11318-031
3/8-16	.625	.260	.030	.050	.531		23-11318-038
7/16-20	.750	.322	.035	.050	.656		23-11318-144
1/2-13	.813	.385	.035	.060	.719		23-11318-050

SHORT PILOT

(3) THREAD	A FLATS (MAX)	B THICK (MAX)	D	E	F	MFG NUMBER	FREIGHTLINER PART NUMBER
10-24	.500	.197	.025	.085	.406		23-11318-210
1/4-20	.500	.197	.025	.085	.406		23-11318-225
5/16-18	.562	.229	.025	.085	.469		23-11318-231
3/8-16	.625	.260	.030	.085	.531		23-11318-238
7/16-14	.750	.322	.035	.085	.656		23-11318-244
1/2-13	.813	.385	.035	.085	.719		23-11318-250

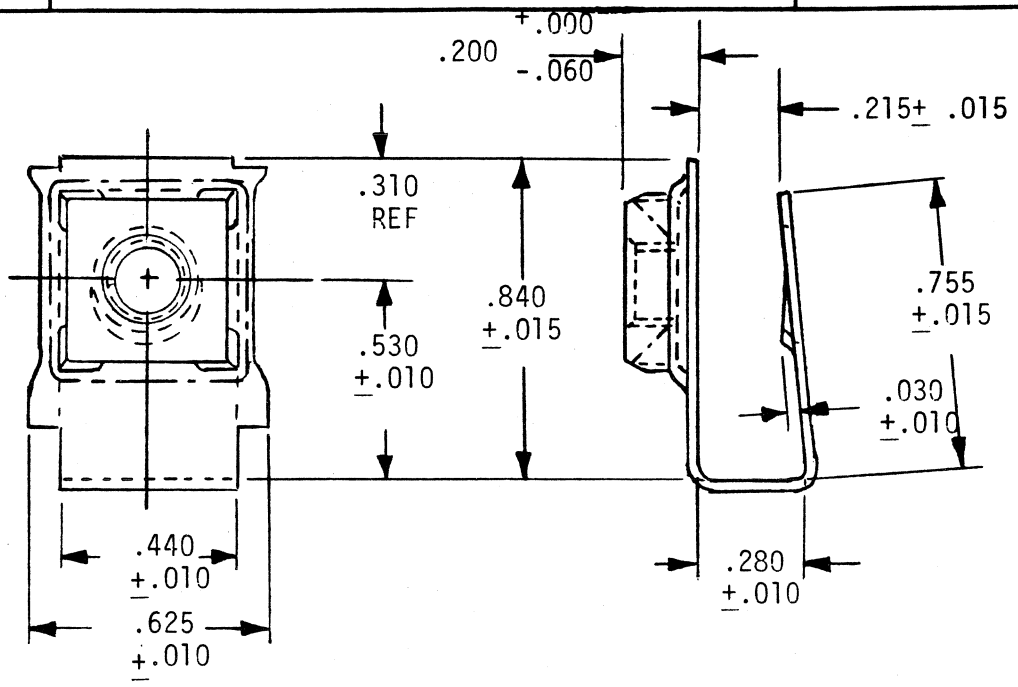
LONG PILOT

ENGINEERING NOTES:

1. MATERIAL: C1018 LOW CARBON STEEL
2. FINISH: PLAIN
3. NUTS SHALL MEET ALL METAL PREVAILING TORQUE REQUIREMENTS OF IFI 100/107.
4. ADD .015 TO DIM. "F" FOR RECOMMENDED HOLE SIZE.
5. SHORT PILOT RECOMMENDED FOR USE WITH 14 GAGE METAL OR THINNER.

CHG	JOB/RLSE NO	DATE	BY	REVISION
C	PA2042-56	07/19/95	ERK	REDRAWN: REMVD INACTIVE NUMBERS, REVISED MATERIAL
D	P5855P-01	05/21/96	DAJ	RMVD VENDOR PNS. REVISED NUT TO 6 PRONG FROM 3.
E	PA2042-70	06/24/96	DAJ	ADDED NOTE 5.

ORIGINAL JOB NO.	TITLE	PART NO.
C-1765	CAGED NUT - 'U' TYPE	23-11343
LAST CHG LTR	.25 PANEL THICKNESS	SHEET 1 OF 1



THREAD SIZE	PANEL RANGE	HOLE SIZE (MIN)	TO EDGE OF PART (MAX)	VENDOR PN (TIN)	FREIGHTLINER PART NO.
10-24	.240 .270	.305	.500	L33893-1024	23-11343-0

MATERIAL - CLIP - HIGH CARBON SPRING STEEL .025 THK
NUT - SAE 1108 STEEL

CHANGE INFORMATION	DATE	BY	JOB NO.	LTR

CHANGE INFORMATION	DATE	BY	JOB NO.	LTR

COMPILED	DEYO	DATE DRAWN			
APPROVED		7-29-81			

Portland **FREIGHTLINER CORPORATION** M/F Oregon 97208

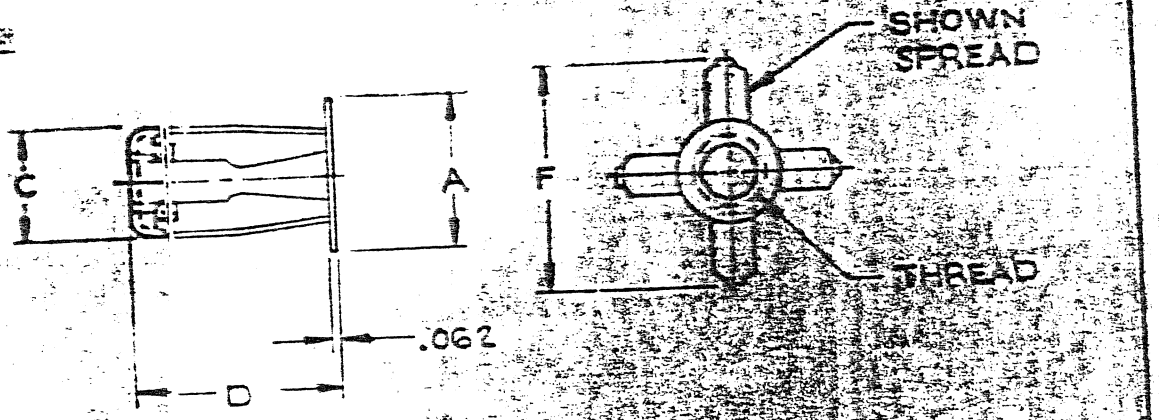
TITLE

NUT, JACK

PART NO. 23-11362

SHEET 1 OF 1

SKETCH



PART NUMBERS

St'd. Thread	A Head Dia.	C Body Dia.	D Oall. Length	F* Spr'd.	Grip	Hole Size	Mfgs No. USH	Freightliner's Part Number
6-32	.469	.312	.641	.688 .562	0 .188	.344	4S JN	23-11362-000
6-32	.469	.312	.828	.750 .531	.188 .375	.344	4L JN	-001
10-24	.531	.375	.638	.750 .594	0 .188	.406	6S JN	-002
10-24	.531	.375	.875	.781 .562	.188 .375	.406	6L JN	-003
1/4-20	.625	.438	.750	.844 .688	0 .188	.469	8S JN	-004
1/4-20	.625	.438	.938	.875 .656	.188 .375	.469	8L JN	-005

ENGINEERING NOTES

1. Material: .010 steel, zinc plated.
*2. Spread Range; Varies according to material thickness.

		DATE DRAWN			
COMPILED	D. Le L.	8-31			
APPROVED	RS				

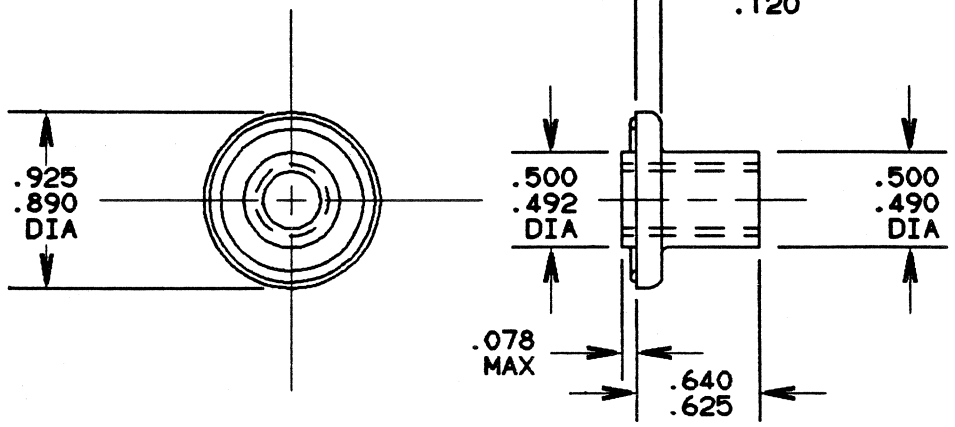
CHANGE INFORMATION | DATE | BY | JOB NO.

CHANGE INFORMATION | DATE | BY

GENERAL USE PART

ORIGINAL JOB NO.	TITLE	PART NO.
	WELD NUT, WIDE FLANGE	
LAST CHG LTR: E		SHEET 1 OF 1

SKETCH:



PART NUMBERS:

SIZE		MANUFACTURERS NUMBER		FREIGHTLINER PART NUMBER
3/8-16		OPC-0209-WF		23-11428-375

ENGINEERING NOTES:

(1) MATERIAL: C1008-1010 HIGH WELD QUALITY, LOW CARBON STEEL

2. FINISH: PLAIN

LTR	JOB NO.	BY	DATE	CHANGE INFORMATION
E1	2480C	DJL	11-20-84	REVISED & REDRAWN
E2	2480C	DJL	11-20-84	.187/.177 TO .078 MAX

LTR	JOB NO.	BY	DATE	CHANGE INFORMATION

COMPILED	DJL	DATE DRAWN	CADAM ORIGINAL	MATERIAL	MASTER NUMBER	
APPROVED	DJL	11-20-84		(1)	01420	000D1

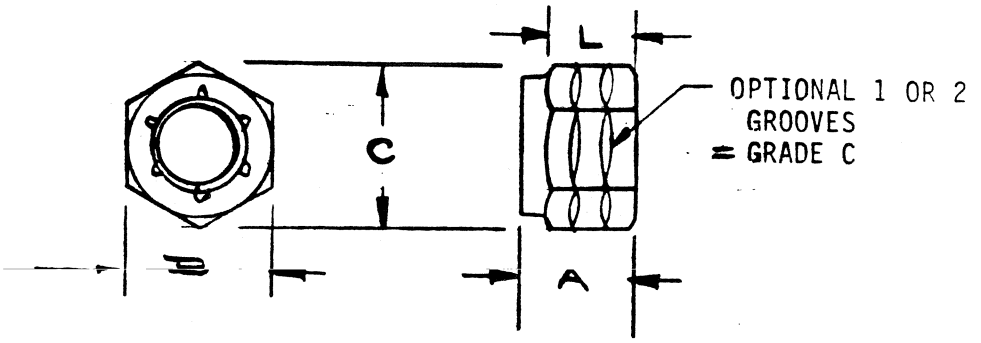
PORTLAND FREIGHTLINER CORPORATION OREGON 97208

AC-826

General Use Part

ORIGINAL JOB NO.	TITLE	PART NO.
H0142	NUT, HEX ELASTIC STOP, GR. C OR SAE GR. 8 PLATED	23-11480
LAST CHG LTR: B		SHEET 1 OF 1

SKETCH:



PART NUMBERS:

THREAD	MANUFAC. NO. GREER (6)	A MAX	A MIN	B MAX	B MIN	C REF	L REF	FREIGHTLINER PART NUMBER
10-32 UNF-3B	INE-1032	.249	.219	.376	.367	.410	.140	23-11480-020
1/4-28 UNF-3B	- 428	.328	.298	.439	.430	.482	.225	-048
5/16-24 UNF-3B	- 524	.359	.329	.502	.492	.552	.250	-054
3/8-24 UNF-3B	- 624	.468	.438	.564	.553	.622	.335	-064
7/16-20 UNF-3B	- 720	.468	.438	.627	.616	.694	.324	-070
1/2-20 UNF-3B	- 820	.609	.579	.752	.741	.837	.464	-080
9/16-18 UNF-3B	- 918	.656	.626	.877	.865	.978	.469	-098
5/8-18 UNF-3B	-1018	.765	.735	.940	.928	1.051	.593	-108
3/4-16 UNF-3B	-1216	.890	.860	1.064	1.052	1.191	.742	-126
7/8-14 UNF-3B	-1414	.999	.969	1.252	1.239	1.403	.790	-144
1 -14 UNF-3B	-1614	1.078	1.016	1.440	1.427	1.615	.825	-164
1-1/4-12 UNF-3B	-2012	1.422	1.360	1.814	1.801	2.038	1.125	-202
1-1/2-12 UNF-3B	-2412	1.640	1.578	2.197	2.159	2.444	1.313	-242

ENGINEERING NOTES:

1. MATERIAL: Steel, AISI C-1137, FED-STD-66
2. FINISH: Cadmium plate (per F/L Spec 49-12-130) and wax.
3. LOCKING INSERT: Nylon (250°F. Max. Performance)
4. HARDNESS: R_C 26-34 (= Grade C Nut = SAE Grade 8)
5. PHYSICAL SYSTEM: Limited to 3 Digits for Dash Number
   Size in 16ths. | X | X | X | X | Drop 10's Digit
   Thread/Inch
6. REFERENCE ONLY - SUPPLIER OPTIONAL

CHANGE INFORMATION	DATE	BY	JOB NO.
ADDED NOTE 6	8/17/83	BT	9903B
REVISED NOTE 3 & TITLE	8/17/83	BT	9903B
Revised Note 2	5/28/84	DCR	11458C

TR	CHANGE INFORMATION	DATE	BY	JOB NO.

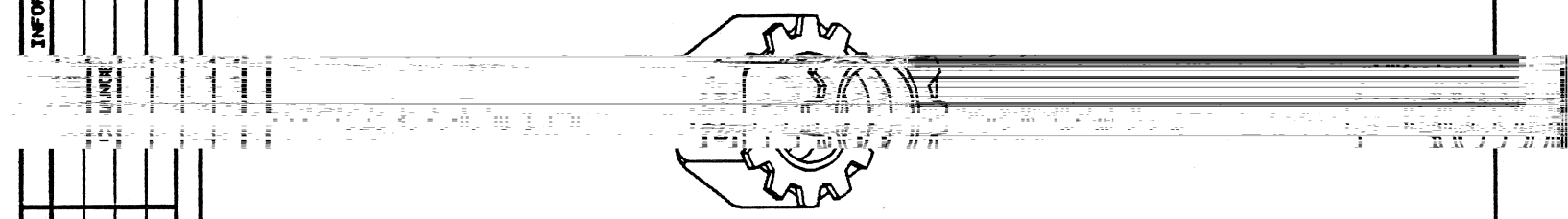
COMPILED	Dorsey	DATE DRAWN		MATERIAL	MASTER NUMBER	
APPROVED		7/1/83		①	01340	000D1

GENERAL USE PART

ORIGINAL JOB NO.	TITLE	PART NO.
7760D	KEP NUT, STAINLESS STEEL PRE-ASSEMBLED NUT & LOCK WASHER	23-11488
LAST CHG LTR: B		SHEET 1 OF 1

LTR	JOB NO.	BY	DATE	INFORMATION

SKETCH



PART NUMBERS

SIZE & THREAD	OVERALL HEIGHT	O.D. OF LOCK WASHER		FREIGHTLINER PART NUMBER
4-40 UNC	7/64	9/32		23-11488-104
6-32 UNC	9/64	11/32		23-11488-106
8-32 UNC	5/32	3/8		23-11488-108
10-24 UNC	5/32	3/8		23-11488-110
12-24 UNC	13/64	1/2		23-11488-112
1/4-20 UNC	15/64	1/2		23-11488-125
5/16-18 UNC	21/64	37/64		23-11488-131
3/8-16 UNC	25/64	21/32		23-11488-138
4-48 UNF	7/64	9/32		23-11488-204
6-40 UNF	9/64	11/32		23-11488-206
8-36 UNF	5/32	3/8		23-11488-208
10-32 UNF	5/32	3/8		23-11488-210
12-28 UNF	13/64	1/2		23-11488-212
1/4-28 UNF	17/64	1/2		23-11488-225
5/16-24 UNF	21/64	37/64		23-11488-231
3/8-24 UNF	25/64	21/32		23-11488-238

LTR	JOB NO.	BY	DATE	CHANGE INFORMATION
A	7760D	DJL	06-05-86	REDRAWN, ADDED NOTE 2.

ENGINEERING NOTES:

(1) MATERIAL: STAINLESS STEEL

2. DO NOT USE FOR ELECTRICAL CONNECTIONS.

COMPILED	DJL	DATE DRAWN	CADAM	MATERIAL	MASTER NUMBER	
APPROVED	DJL	06-05-86	ORIGINAL	(1)	01350	000D1

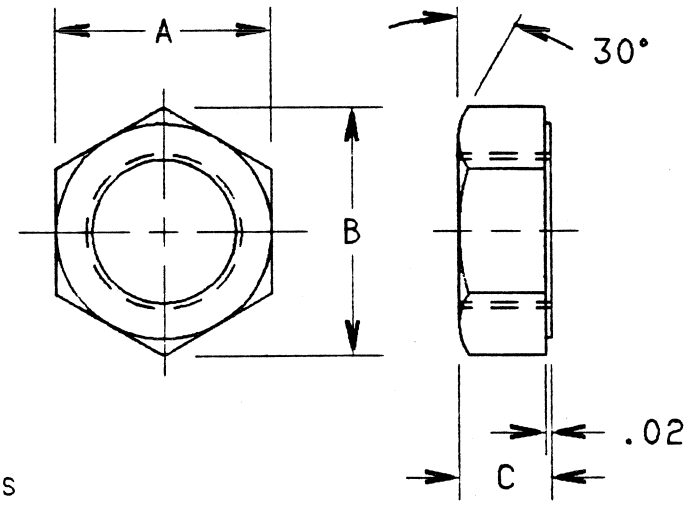
PORTLAND FREIGHTLINER CORPORATION OREGON 97208

23-11552

ORIGINAL JOB NO.	TITLE	PART NO.
0312C	NUT, HEX JAM, STAINLESS STEEL UNF, GRADE B	23-11552
LAST CHG LTR		SHEET 1 OF 1

CHANGE INFORMATION	DATE	BY	JOB NO.	LTR

SKETCH



PART NUMBERS

THREAD SIZE	A			B	C			FREIGHTLINER PART NUMBER
	NOM	MAX	MIN		NOM	MAX	MIN	
1/4-28	7/16	.437	.428	.488	5/32	.163	.150	23-11552-001
5/16-24	1/2	.500	.489	.557	3/16	.195	.180	-002
3/8-24	9/16	.562	.551	.628	7/32	.227	.210	-003
7/16-20	11/16	.688	.675	.768	1/4	.260	.240	-004
1/2-20	3/4	.750	.736	.840	5/16	.323	.302	-005
9/16-18	7/8	.875	.861	.982	5/16	.324	.301	-006
5/8-18	15/16	.938	.922	1.051	3/8	.387	.363	-007
3/4-16	1 1/8	1.062	1.045	1.240	27/64	.446	.398	-008
7/8-14	15/16	1.313	1.269	1.449	31/64	.510	.458	-009
1 -12	1 1/2	1.500	1.450	1.653	35/64	.575	.519	-010
1 1/8-12	1 11/16	1.688	1.631	1.859	39/64	.639	.579	-020
1 1/4-12	1 7/8	1.875	1.812	2.066	23/32	.751	.687	-030
1 3/8-12	2 1/16	2.063	1.994	2.273	25/32	.835	.747	-040
1 1/2-12	2 1/4	2.250	2.175	2.480	27/32	.880	.808	-050

ENGINEERING NOTES:

(1) MATERIAL: STAINLESS STEEL, TYPE 316.

2. THREADS TO CONFORM TO UNIFIED NATIONAL FINE THREAD SERIES CLASS 2B (UNF-2B) PER SAE STANDARD J475.

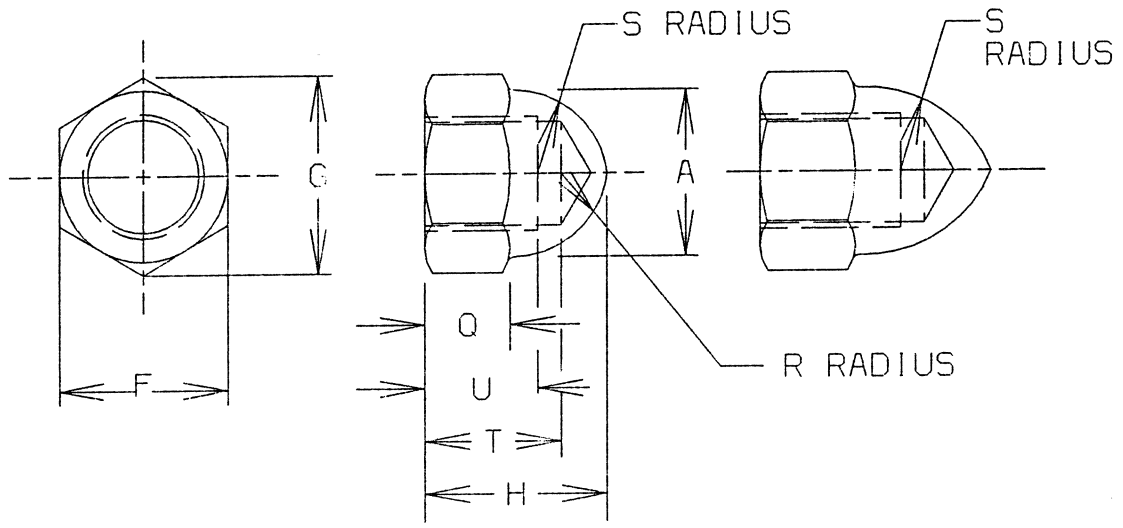
3. MUST MEET APPLICABLE GENERAL AND DIMENSIONAL REQUIREMENTS OF SAE STANDARD J104.

CHANGE INFORMATION	DATE	BY	JOB NO.	LTR

COMPILED	FEF	DATE DRAWN	CADAM ORIGINAL	MATERIAL	MASTER NUMBER	
APPROVED		11-29-83		(1)	01300	000D1

ORIENNE CHILBERG

DRAWN	FEF	TITLE NUT, CROWN STAINLESS STEEL	DRAWING NUMBER 23-11553
APPRV	FEF		
DATE	12-01-83	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1 / CHG. LTR. D
CATIA ORIGINAL			



NOM SIZE	LOW CROWN F	G MAX	A	H	Q	R	S	T MAX	U MIN	FREIGHTLINER PART NUMBER UNC	UNF
NO 10	3/8	.433	.36	.41	.19	.09	.22	.28	.19	23-11553-110 (2)	
1/4	7/16	.505	.41	.47	.22	.11	.25	.34	.25	23-11553-125	23-11553-225
5/16	1/2	.577	.47	.53	.25	.12	.28	.41	.31	23-11553-131	23-11553-231
3/8	9/16	.650	.53	.62	.28	.14	.33	.45	.38	23-11553-138	23-11553-238
7/16	5/8	.722	.59	.69	.31	.16	.36	.52	.44		23-11553-244
5/8	15/16	1.083	.91	1.00	.47	.23	.53	.75	.62	23-11553-162	

NOM SIZE	HIGH CROWN F	G MAX	A	H	Q	R	S	T MAX	U MIN	FREIGHTLINER PART NUMBER UNC	UNF
D 1/4	7/16	.505	.41	.59	.23	.06	.34	.41	.31	23 11553-325	
1/4	7/16	.505	.41	.59	.23	.06	.34	.41	.31	23 11678-125 (2)	
5/16	1/2	.577	.47	.69	.28	.08	.41	.47	.38	23 11678-131 (2)	
3/8	9/16	.650	.53	.78	.31	.09	.44	.56	.47		23 11553-438

ENGINEERING NOTES;

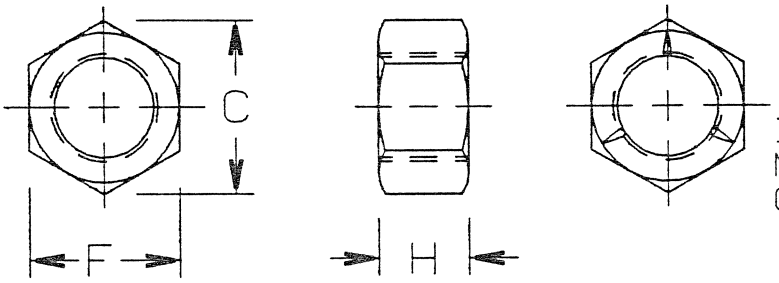
1. MATERIAL: STAINLESS STEEL, TYPE 302
C (2) LOCKING ELEMENT (MATERIAL) PER 1F1 124.

CHG	JOB NO	DATE	BY	REVISION
B	P6684P-01	03/26/96	FHC	REVISED AND REDRAWN. ADDED-110
C	PA2042-70	06/25/96	FHC	REVISED NOTE 2. ADDED "MATERIAL."
D	P03193-01	06/26/97	DAJ	ADDED 23-11553-325, 23-11678-125/131.

DRAWN	SJT	TITLE	ITEM NUMBER
APPRV	RDF	NUT, SELF LOCKING, STAINLESS STEEL NYLON PATCH, GRADE B	23-11600
DATE	09/17/90	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1

UNLESS OTHERWISE NOTED, ALL DIMENSIONS IN INCHES.

SKETCH



PART NUMBERS

(DIM FOR REF ONLY)

NOM SIZE & THREAD	F FLATS (NOM)	C CORNERS (MAX)	H (MAX)		FREIGHTLINER PART NUMBERS
1/4-20 UNC 1/4-28 UNF	7/16	.505	.226		23-11600-100 -101
5/16-18 UNC 5/16-24 UNF	1/2	.577	.273		-102 -103
3/8-16 UNC 3/8-24 UNF	9/16	.650	.337		-104 -105
7/16-14 UNC 7/16-20 UNF	11/16	.722	.385		-106 -107
1/2-13 UNC 1/2-20 UNF	3/4	.866	.448		-108 -109
9/16-12 UNC 9/16-18 UNF	7/8	.938	.496		-110 -111
5/8-11 UNC 5/8-18 UNF	13/16	1.083	.559		-112 -113
3/4-10 UNC 3/4-16 UNF	1-1/8	1.299	.665		-114 -115
7/8-9 UNC 7/8-14 UNF	1-5/16	1.516	.776		-116 -117
1 -8 UNC 1 -14 UNF	1-1/2	1.732	.887		-118 -119

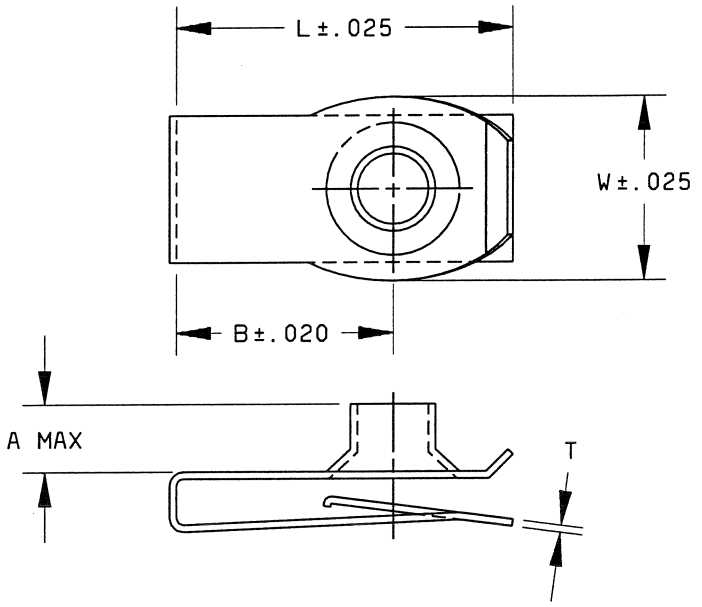
ENGINEERING NOTES

1. MATERIAL : STAINLESS STEEL PER ASTM F593, GRUOP 1, COND. C.W. (TYPE 302, 304).
2. FINISH : PLAIN.
3. DIMENSIONS : PER IFI-100/107 - OR ANSI B18.2.2.
4. LOCKING ELEMENT: NYLON PATCH PER IFI 100/107.

CHG	JOB/RLSE NO	DATE	BY	REVISION
A	P4391F-01	09/17/90	SJT	REVISED NOTES 1, 2, 3, & ADDED 4.

DEBBIE

DRAWN	DAJ	TITLE NUT-SPRING U-TYPE, PREVAILING TORQUE	DRAWING NUMBER 23-11663
APPRV	DAJ		
DATE	03/11/98	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1 / CHG. LTR. E
CATIA ORIGINAL			



	THREAD SIZE	DIMENSIONS					EDGE DISTANCE	PNL HOLE SIZE	PNL THK	VENDOR/PN	FREIGHTLINER PART NUMBER
		A	B	T	W	L				CIP	
D,E	1/4-20	.295	.052	.032	.570	0.9	.500 MAX	.375 MIN	.025-.150	13404	23-11663-000
E C	1/4-20	.295	.052	.032	.570	0.9	.500 MAX	.375 MIN	.025-.150	- (6)	23-11663-001

ENGINEERING NOTES:

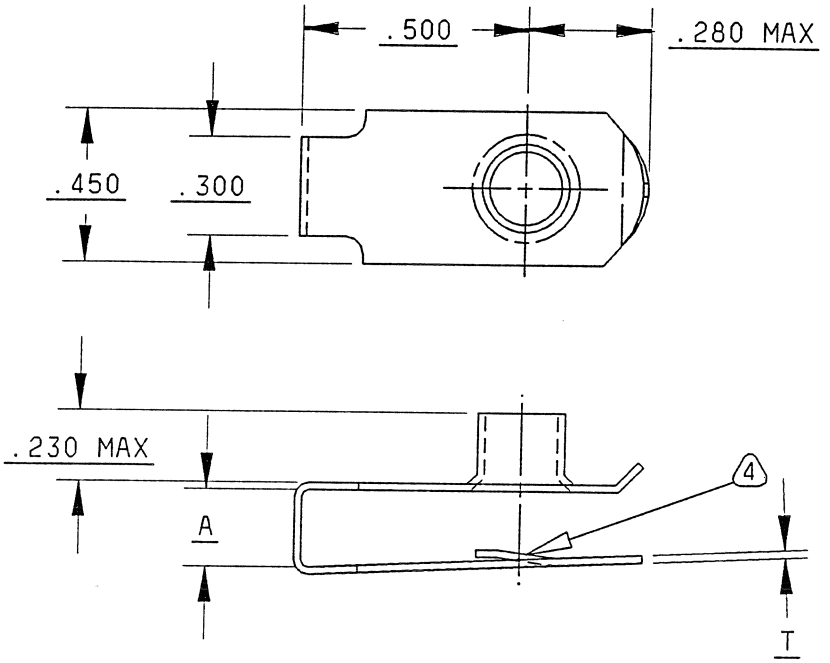
1. MATERIAL: 1050 SPRING STEEL, TEMPERED
2. FINISH: PHOSPHATE, GRAY TO BLACK (DRY TO TOUCH)
3. DIMENSIONS ARE FOR REFERENCE ONLY.
4. PREVAILING TORQUE: 22 IN/LB MAX, FIRST ON
   3.5 IN/LB MIN, FIFTH OFF
5. E APPROVED VENDORS: CALIFORNIA INDUSTRIAL PRODUCTS.

(6) FINISH: DACROMET 320 SILVER

CHG	JOB NO	DATE	BY	REVISION
C	P2D241-33	03/11/98	DAJ	REVISED AND REDRAWN IN CATIA, ADDED -001.
D	PA2042-85	10/21/98	DAJ	RELOCATED DIMENSION B & REVISED VALUES ACCORDINGLY.
E	PA2042-98	11/26/99	LFB	REVISED A, B, T AND L VALUES. REVISED APP. VENDOR.

ADRIENNE CHILBERG

DRAWN	DAJ	TITLE NUT-SPEED U-TYPE	DRAWING NUMBER 23-11668	
APPRV	DAJ			
DATE	08/20/97			
CATIA ORIGINAL		FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. L



THREAD SIZE	DIMENSIONS		PNL HOLE DIA (MIN)	PNL THK	VENDOR/PN	FREIGHTLINER PART NUMBER
	A	T			CIP	
(3)	.300	.030	.250	.225-.275	19360	23-11668-000
(3)	.185	.030	.250	.150-.170	-	23-11668-001

L

ENGINEERING NOTES:

1. MATERIAL: HIGH CARBON STEEL - .030 THK, R/C 45-50
2. FINISH: PHOSPHATE, GRAY TO BLACK (DRY TO TOUCH)

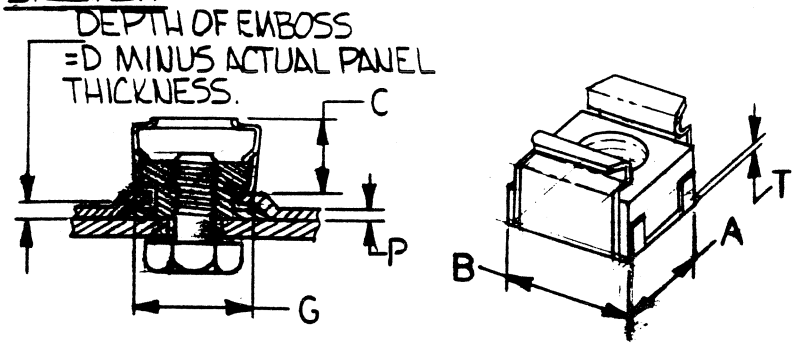
(3) 10-16 N.S. THREAD

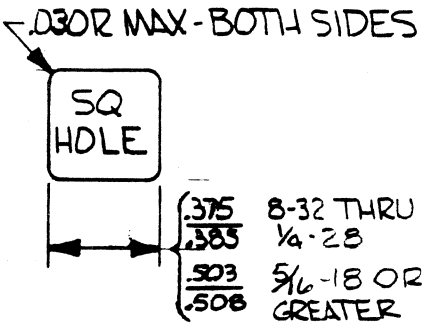
(4) LOCKING TAB MUST FIT IN .250 DIA HOLE IN PANEL. CLEARANCE HOLE MUST BE LARGE ENOUGH TO CLEAR #10 MAX DIA SCREW. THIS HOLE MUST BE IN LINE WITH THE THREADED HOLE.

CHG	JOB NO	DATE	BY	REVISION
L	P03575-01	08/20/97	DAJ	REVISED AND REDRAWN IN CATIA, ADDED -001.

ORIGINAL JOB NO.	TITLE	PART NO.
K0187	NUT, CAGED, NON-LOCKING	23-11676
LAST CHG LTR		SHEET 1 OF 1

SKETCH





HOLE SIZES

SCREW SIZE	P PANEL RANGE	D	A	B	G	C	T	MFR'S NO TIN	FREIGHTLINER PART NUMBER
8-32	.025-.063	.100	.52	.52	.53	.25	.020	C7931-832-#	23-11676-081
10-24	.025-.063	.100	.52	.52	.53	.25	.020	C7931-1024-#	-101
10-32	.025-.063	.100	.52	.52	.53	.25	.020	C7931-1032-#	-102
10-24	.064-.105	.140	.52	.52	.53	.25	.020	C7941-1024-#	-103
12-24	.025-.063	.100	.52	.52	.53	.25	.020	C7931-1224-#	-121
1/4-20	.025-.063	.100	.52	.52	.53	.25	.020	C7931-1420-#	-141
	.064-.105	.140						C7941-1420-#	-142
	.093-.126	.160						C7951-1420-#	-143
1/4-28	.025-.063	.100	.52	.52	.53	.25	.020	C7931-1428-#	-146
5/16-18	.028-.056	.095	.66	.66	.734	.30	.025	C7937-5618-#	-561
	.057-.092	.135						C7953-5618-#	-562
5/16-24	.028-.056	.095	.66	.66	.734	.30	.025	C7937-5624-#	-506
	.057-.092	.135						C7953-5624-#	-567
	.093-.162	.175						C7957-5624-#	-568

ENGINEERING NOTES

1. MATERIAL: RETAINER: SPRING STEEL, HEAT TREATED
   SQUARE NUT: COLD ROLLED STEEL

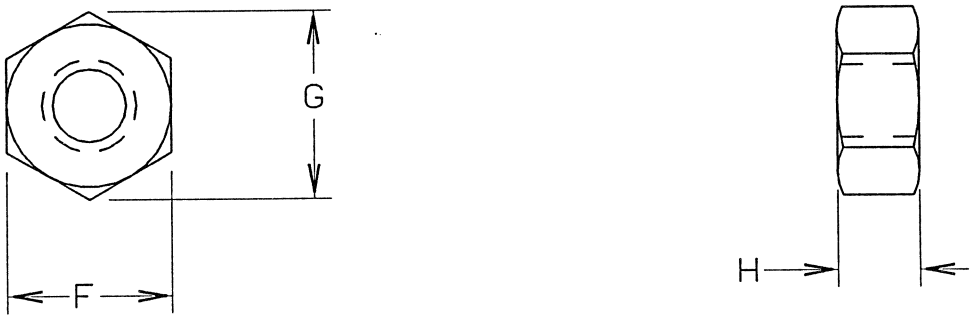
2. FINISH: #-3B = ZN ELECTROPLATE
   -4 = PHOSPHATE & OIL
   -29 = CD ELECTROPLATE

CHANGE INFORMATION	LTR	JOB NO.	BY	DATE

CHANGE INFORMATION	LTR	JOB NO.	BY	DATE

COMPILED	PLD	DATE DRAWN		MATERIAL	MASTER NO.	
APPROVED	R. Morrison	7-16-84		(1)	01430	014D1

DRAWN	PCK	TITLE	ITEM NUMBER
APPRV	ANF	NUT, HEX, STAINLESS STEEL COARSE THREAD	23-11677
DATE	03/12/90	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



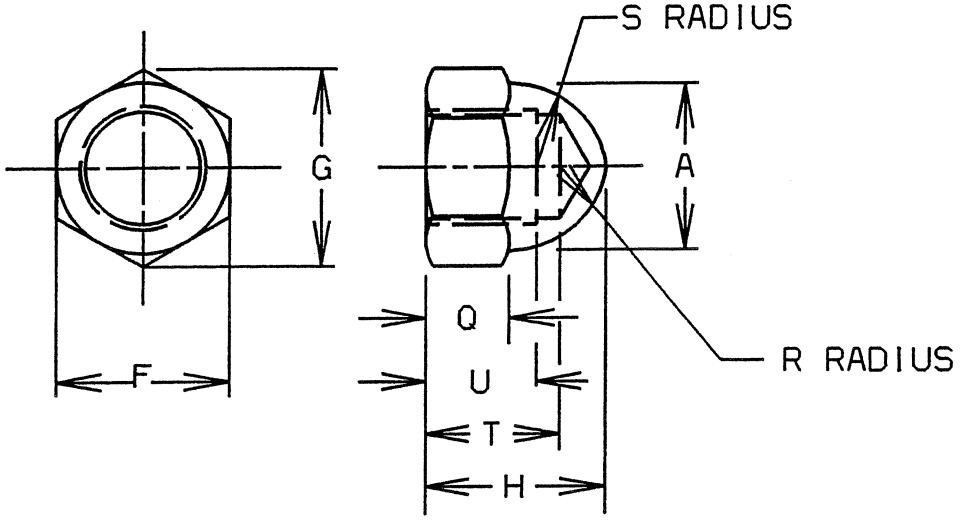
THREAD	F			G MIN	H			FREIGHTLINER PART NUMBER
	NOM	MAX	MIN		NOM	MAX	MIN	
# 10-24 UNC	3/8	.375	.362	.413	1/8	.130	.117	23-11677-003
1/4-20 UNC	7/16	.438	.428	.488	7/32	.226	.212	23-11677-000
5/16-18 UNC	1/2	.500	.489	.557	17/64	.273	.258	23-11677-001
3/8-16 UNC	9/16	.562	.551	.628	21/64	.337	.320	23-11677-002
C 1/2-13 UNC	3/4	.750	.736	.840	7/16	.448	.427	23-11677-004

ENGINEERING NOTES

MATERIAL: STAINLESS STEEL PER ASTM F594, GROUP 1
MUST MEET ALL APPLICABLE REQUIREMENTS OF ANSI B18.2.2
EXCEPT -003 WHICH MUST MEET REQUIREMENTS OF ANSI B18.6.3

CHG	JOB/RLSE NO	DATE	BY	REVISION
B	P4395F-01	03/12/90	PCK	REDRAWN.3/8-16 WAS 3/8-18
C	PA2042-66	03/27/96	ERK	ADDED -004.

DRAWN	DAJ	TITLE	DRAWING NUMBER
APPRV	DAJ	NUT-CROWN, HIGH (ACORN) SST, LOCKING	23-11678
DATE	12/22/97	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1 / CHG. LTR. E
CATIA ORIGINAL			



NOT FOR NEW CONSTRUCTION, USE 23-11553.

	NOM SIZE	F	G MAX	A	H	Q	R	S	T MAX	U MIN	FREIGHTLINER PART NUMBER
	1/4-20 UNC	7/16	.505	.41	.59	.23	.06	.34	.41	.31	23 11678-125
D	5/16-18 UNC	1/2	.577	.47	.69	.28	.08	.41	.520	.38	23 11678-131

ENGINEERING NOTES;

D 1. MATERIAL: STAINLESS STEEL, TYPE 303
ULTIMATE STRENGTH: 80,000 PSI MIN
YIELD STRENGTH: 40,000 PSI MIN

E 2 LOCKING ELEMENT: NYLON PATCH OR NYLON PELLET MEETING PREVAILING TORQUE REQUIREMENTS OF IFI 124.

CHG	JOB NO	DATE	BY	REVISION
C	PA2042-82	12/22/97	DAJ	REVISED AND REDRAWN. ADDED ADVISORY NOTE.
D	PA2042-83	03/23/98	DAJ	.520 WAS .47, AND MATERIAL 303 WAS 302 OR 304.
E	PA2042-84	07/30/98	DAJ	REVISED NOTE 2. REMOVING ALL METAL REF.

GENERAL USE PART

23-11692

ORIGINAL JOB NO.	TITLE	PART NO.
L0203	NUT, SELF THREADING	23-11692
LAST CHG LTR –		SHEET 1 OF 1

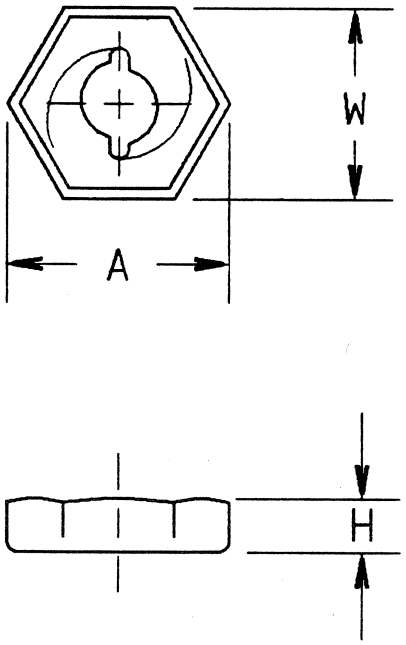
CHANGE INFORMATION

LTR	JOB NO.	BY	DATE

CHANGE INFORMATION

LTR	JOB NO.	BY	DATE

SKETCH:



PART NUMBERS:

DIMENSIONS					MANUFACTURER'S NO	FREIGHTLINER PART NUMBER
STL THK	W	A	H	STUD DIA	TRW	
.026	.500	.578	.140	.250	SR250000 SOH	23-11692-000

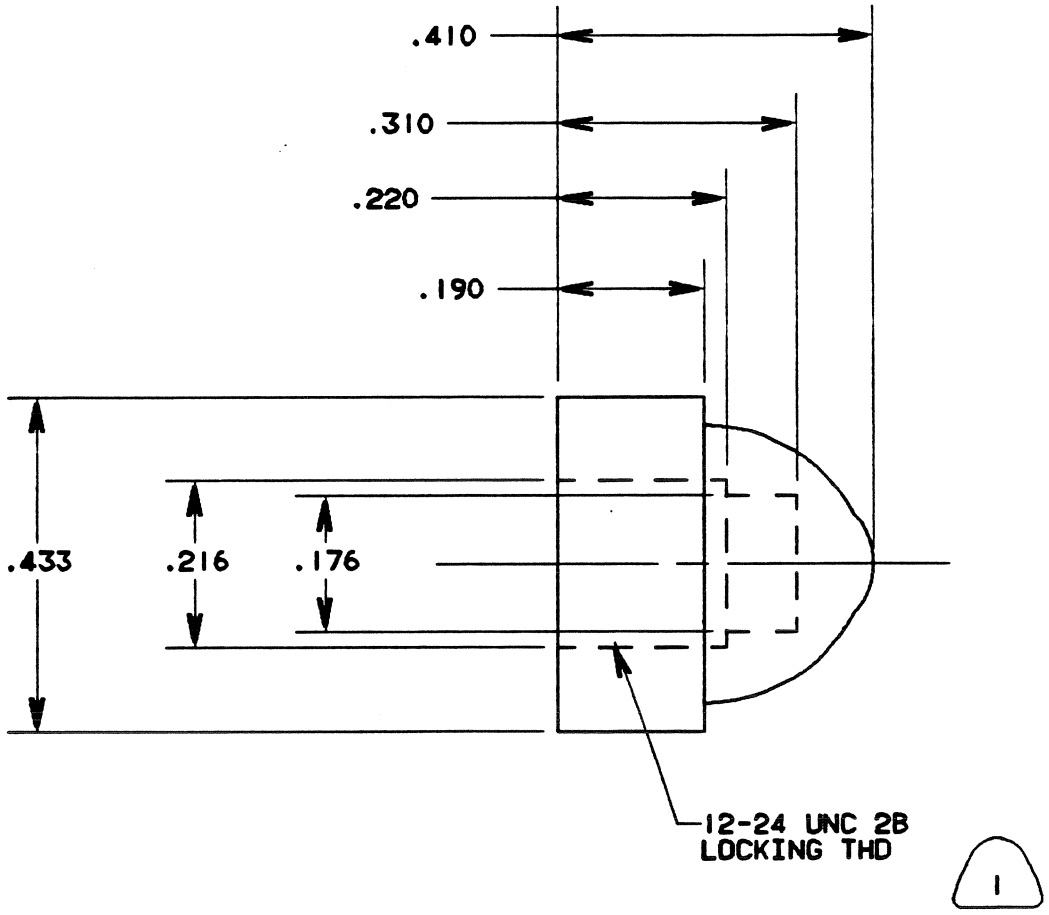
ENGINEERING NOTES:

1. ALT MFG MUST BE APPROVED BY CORPORATE ENGINEERING.

COMPILED	RJN	DATE DRAWN	CADAM ORIGINAL		MASTER NUMBER	
APPROVED	RDF	09-17-84			01400	000D1

DRAWN	TAG	TITLE	DRAWING NUMBER
APPRV	KRH	ACORN NUT LOW CROWN LOCKING	23-11860
DATE	06-27-87	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1 / CHG. LTR. -
CADAM ORIGINAL			

UNLESS OTHERWISE NOTED, DIMENSIONS ARE IN INCHES | UNIT OF MEASURE: EA



MAT'L: BLACK ZINC PHOSPHATE TREATED SAE J995 GRADE 5 STEEL

ALL DIM REF SAE J483A

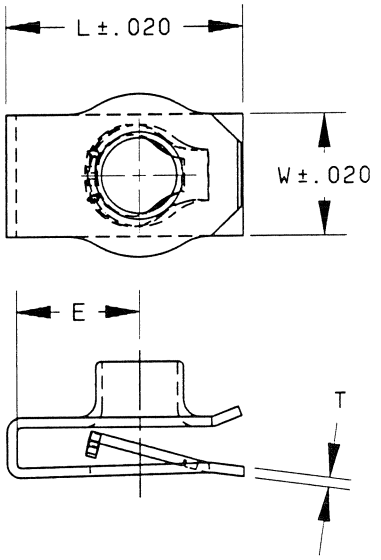
SCALE: 4X

1 LOCKING ELEMENT TO CONSIST OF NYLON PELLET WITH PERFORMANCE AS FOLLOWS:

FIRST INSTALLATION: 30 LB-IN MAX
FIRST REMOVAL: 5 LB-IN MIN BREAKAWAY
FIFTH REMOVAL: 3.5 LB-IN MIN BREAKAWAY

CHG	JOB NO	DATE	BY	REVISION
-	K0176	06-27-87	TAG	ORIGINAL RELEASE

DRAWN	DAJ	TITLE	DRAWING NUMBER	
APPRV	DAJ	NUT-SPRING U-TYPE	23-11865	
DATE	06/25/97	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. F
CATIA ORIGINAL				



	THREAD SIZE	DIMENSIONS T	W	L	E EDGE DISTANCE	PNL HOLE SIZE	PNL THK	VENDOR/PN CIP	FREIGHTLINER PART NUMBER
	10-16	.032/.028	.531	.768	.374/.413	.327/.358	.024-.150	11475	23-11865-000
	10-24	.032/.028	.530	.760	.374/.413	.327/.358	.025-.150	11429	23-11865-001
F	1/4-20	.035(NOM)	.545	1.19	.492/.531	.402/.422	.025-.150	8359 (6)	23-11865-004
E	1/4-20	.035(NOM)	.545	1.19	.760/.800	.402/.422	.090-.210	13466	23-11865-003
	5/16-18	.040(NOM)	.667	.980	.492/.531	.445/.476	.025-.150	13668 (5)	23-11865-002

ENGINEERING NOTES:

1. MATERIAL: 1050 SPRING STEEL, TEMPERED
2. FINISH: PHOSPHATE, GRAY TO BLACK (DRY TO TOUCH)
3. DIMENSIONS ARE FOR REFERENCE ONLY.
4. VENDOR: CIP OR ENGINEERING APPROVED EQUIVALENT

(5) FINISH: PHOSPHATE, BLACK PAINT AND OIL

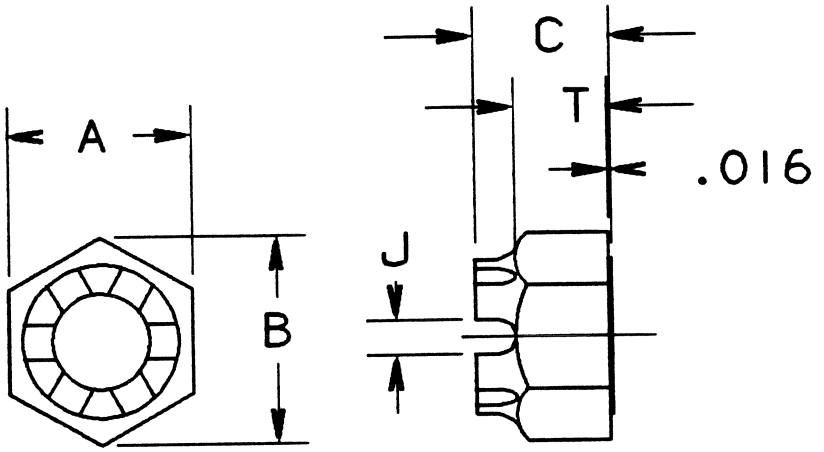
(6) VENDOR: AU-VE-CO PRODUCTS

CHG	JOB NO	DATE	BY	REVISION
-	PM0241-16	08/26/87	ERK	INITIAL RELEASE
C	P02506-03	06/25/97	DAJ	REVISED AND REDRAWN IN CATIA, ADDED -002.
D	P01634-04	12/19/97	DAJ	ADDED -003.
E	PA2042-85	10/21/98	DAJ	.402/.422 WAS .302/.312
F	P08024-01	05/25/99	CGD	ADDED 23-11865-004 AND NOTE *6.

ORIGINAL JOB NO.	TITLE	PART NO.
PH0295	NUT, CASTLE	23-12002
LAST CHG LTR		SHEET 1 OF 1

CHANGE INFORMATION	DATE	BY	JOB NO.

SKETCH:



PART NUMBER:

SIZE	A			B	C			J	T	F/L PART NO. 23-12002
	NOM.	MAX.	MIN.	MAX.	NOM.	MAX.	MIN.			
5/8-11	15/16	.938	.922	1.083	23/32	.731	.706	3/16	1/2	-001

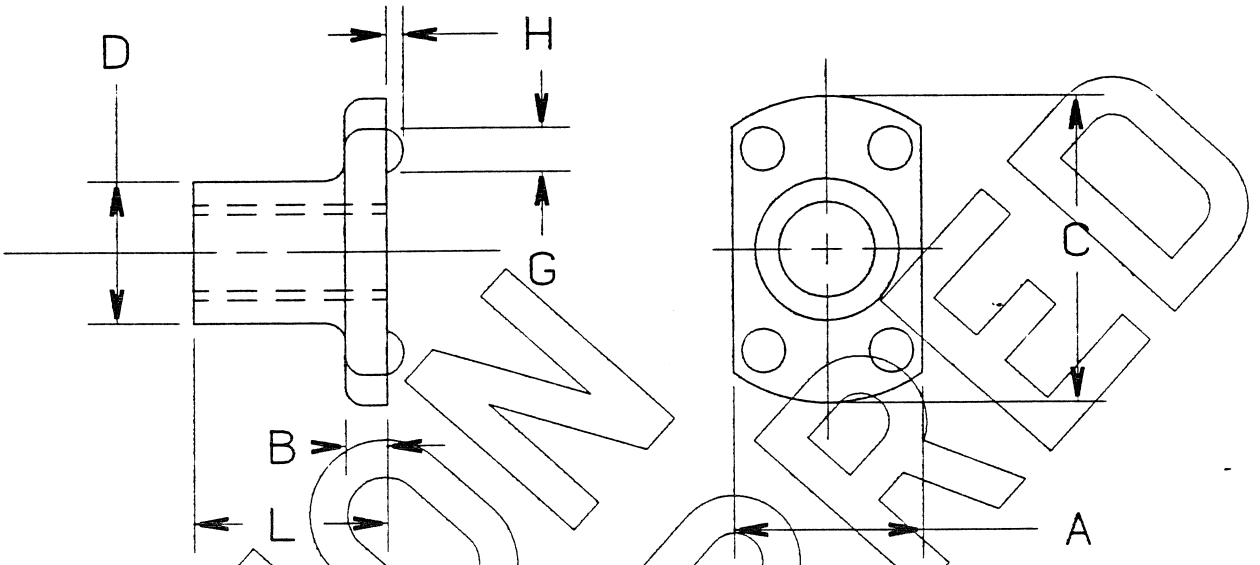
CHANGE INFORMATION	DATE	BY	JOB NO.
INITIAL RELEASE	09-24-87	PMK	PH0295

ENGINEERING NOTES

1. MATERIAL: STEEL - SAE J995 GRADE 5.
2. FINISH: ELECTROGALVANIZE OR CADMIUM PLATE.
3. THREAD: UNC-2B (UNIFIED NATIONAL COARSE THREAD SERIES CLASS 2B)
4. DIMENSIONS: SAE J104 CURRENT STANDARDS.

COMPILED	PMK	DATE DRAWN	CADAM ORIGINAL	MATERIAL	MASTER NUMBER	
APPROVED	GHA	09-24-87		1		

DRAWN	RDF	TITLE NUT-WELD, STAINLESS STEEL	ITEM NUMBER 23-12019
APPRV	PCK		
DATE	10/14/88	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



NON PREFERRED

SPECIFICATIONS

SIZE	HEIGHT (OVERALL) L	FLANGE WIDTH A	FLANGE LENGTH C	FLANGE THK B	PROJECTION DIA G	PROJECTION HT H	BODY DIA D	FREIGHTLINER PART NUMBER
1/4-20	.505 ±.010	.493 ±.007	.805 ±.010	.109 ±.005	.115 ±.005	.043 ±.002	.373 ±.005	23-12019-001

MATERIAL: 18-8 STAINLESS STEEL, 35 KSI YIELD, 80 KSI TENSILE.
FINISH : PASSIVATED
THREADS : 2B ANSI B1.1

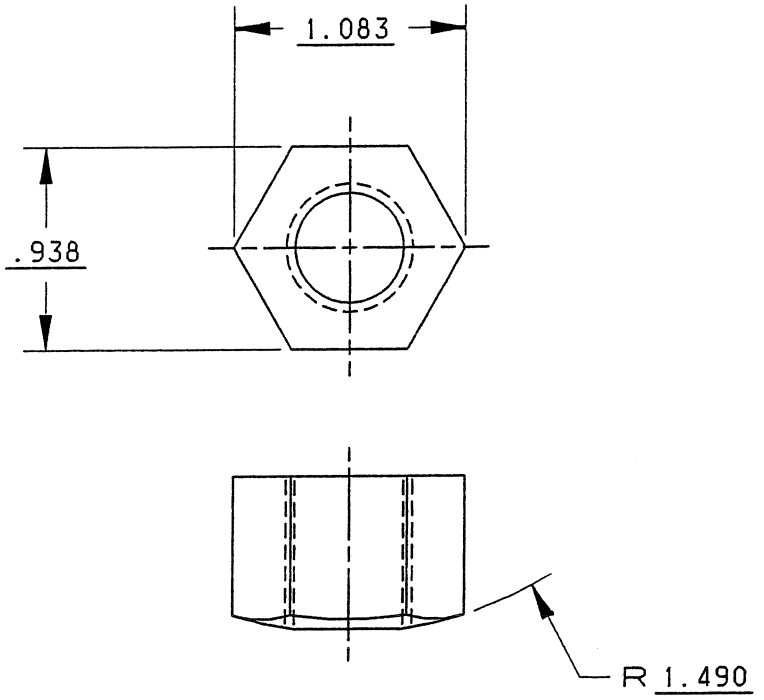
VENDOR INFORMATION

MFR CODE	ONB				FREIGHTLINER PN
MFR PN	WTZ 2150				23-12019-001

ALL DIMENSIONS ARE IN INCHES

CHG	JOB/RLSE NO	DATE	BY	REVISION
-	P6005E-01	10/14/88	RDF	DOCUMENTED
A	P6005E-03	02/20/89	ANF	NON PREFERRED NOTE ADDED

DRAWN	DAJ	TITLE	DRAWING NUMBER	
APPRV	DAJ	NUT-SPHERICAL GRADE 5, ZN	23-12063	
DATE	04/01/98	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. C
CATIA ORIGINAL				



-000, -001 SHOWN

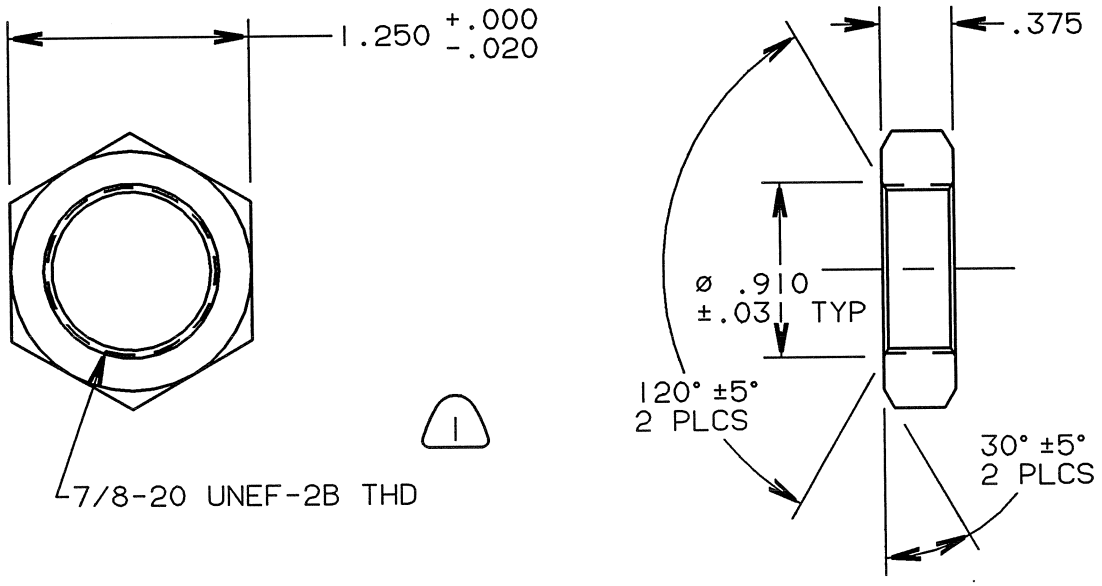
ENGINEERING NOTES:

1. MATERIAL: STEEL, GRADE 5 PER SAE J995
2. FINISH: ZINC AND WAX PLATED PER F/L SPEC 49-00005-403
3. THREAD: 5/8-11 UNC-2B PER ANSI B1.1.
4. UNTOLERANCED DIMENSIONS PER ANSI B18.2.2.
5. -001 TO HAVE INTERNALLY APPLIED NYLON LOCKING PATCH WITH PREVAILING TORQUE PERFROMANCE PER IFI 124, 1987 TABLE 1, 5/8 NOMINAL SIZE. NUT TO TURN FREELY ONE OMCPLETE REVOLUTION WHEN INSTALLED FROM SPHERICAL END.

CHG	JOB NO	DATE	BY	REVISION
C	P04138-02	04/01/98	DAJ	REVISED AND REDRAWN IN CATIA, REMOVED SLOT.

DRAWN	SJT	TITLE NUT STEERING WHEEL	ITEM NUMBER 23-12077
APPRV	RDF		
DATE	12/17/90	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1

UNLESS OTHERWISE NOTED, ALL DIMENSIONS IN INCHES.



-000 SKETCH

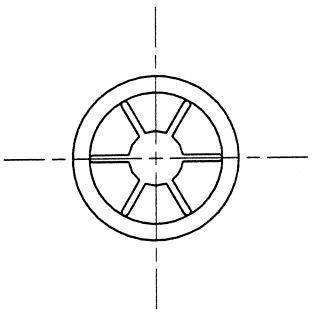
1. APPLY NYLON THREAD LOCKING PATCH - MAINTAIN 2-3 THREAD CLEAR LEAD ONE SIDE ONLY. MINIMUM FIFTH REMOVAL PREVAILING TORQUE: 40 IN LB.
2. MATERIAL: STEEL, GRADE 8 (C) PER SAE J995.
3. FINISH: PLAIN.
4. THREADS: PER ANSI B1.1.

CHG	JOB/RLSE NO	DATE	BY	REVISION
-	P9519G-01	12/17/90	SJT	DOCUMENTED
A	P9519G-04	02/07/91	SJT	REVISED PREVAILING TORQUE PARAMETERS. CHANGED FROM LOCKING COMPOUND TO NYLON PATCH.
B	P2607H-01	07/08/91	SJT	REVISED PREVAILING TORQUE FROM 50 TO 40 IN LBS.
C	PA2042-44	02/25/94	ERK	REVISED NOTE 2 FROM SAE J429 TO SAE J995.

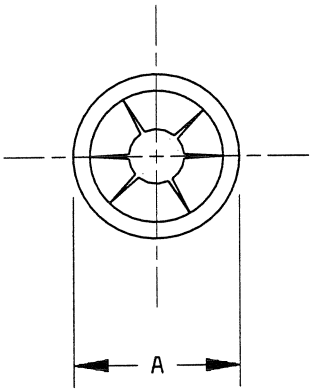
DEBBIE

DRAWN	LFB	TITLE	DRAWING NUMBER	
APPRV	DAJ	NUT-ROUND, PUSH SMOOTH ROUND STUDS	23-12091	
DATE	01/06/00	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. C
CATIA ORIGINAL				

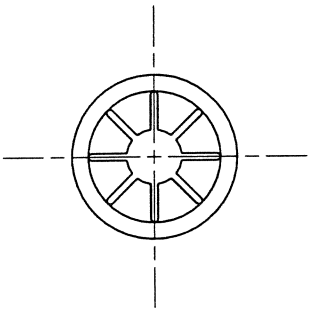
STYLE 1



STYLE 2



STYLE 3



STUD SIZE	"A" DIA	STYLE	"H"	MATERIAL THICKNESS	MAT'L	MANUFACTURERS PART NUMBER	FREIGHTLINER PART NUMBER
.312	.630	3	-	.010	SS	TIN C17022SS-010-27	23-12091-031
.138	.263	3	-	.010	STEEL	ARDEN 8063-13-01 (2)	23-12273-013
.250	.938	1	.083	.015	SPRING	PALNUT PV 250015 SOH	23-12744-025

C

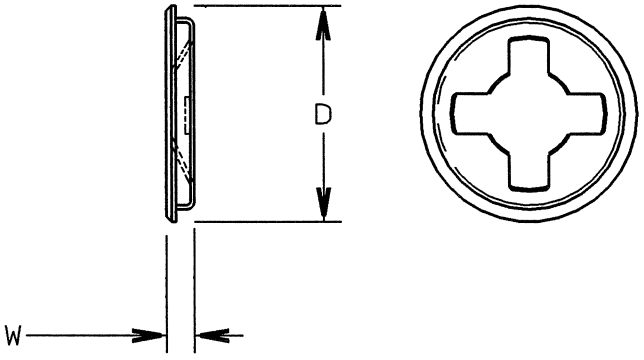
ENGINEERING NOTES:

1. MATERIAL: SS- TYPE 301 STAINLESS STEEL. HALF HARD.
   STEEL- HARDENED STEEL.
   SPRING- SPRING STEEL 1050.

(2) FINISH: PLAIN.

CHG	JOB NO	DATE	BY	REVISION
C	P10962-01	01/06/00	LFB	REDRAWN IN CATIA. ADDED -025.

DRAWN	ERK	TITLE NUT, PUSH-ON SPRING STEEL	ITEM NUMBER 23-12140
APPRV	TAG		
DATE	02/15/93	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



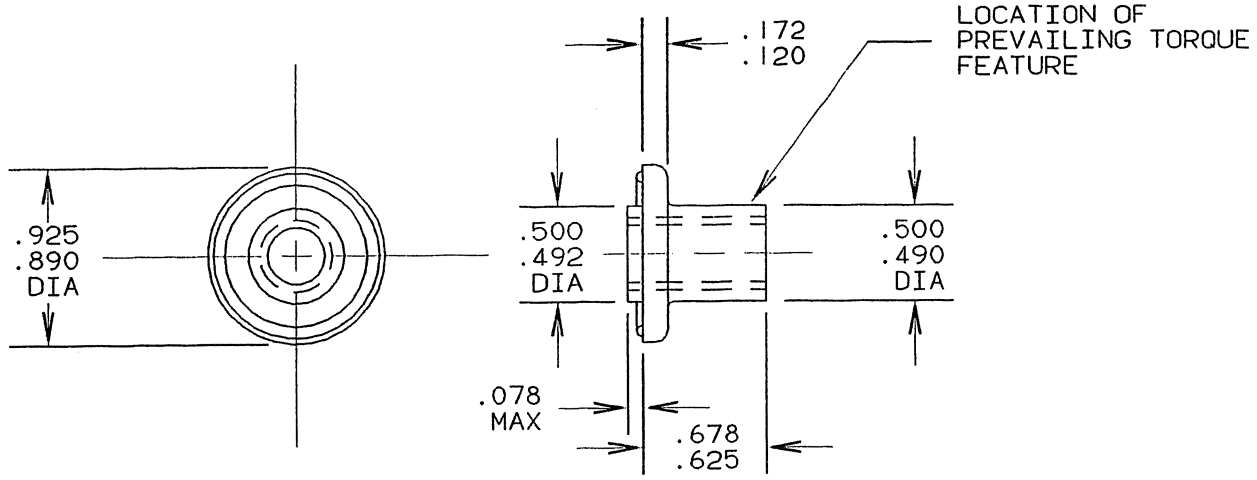
STUD SIZE	D	W	VENDOR AFJ		FREIGHTLINER PART NUMBER
.188	.500	.074	01-11953		23-12140-001

1. MATERIAL: HIGH CARBON SPRING STEEL.
2. HEAT TREAT: R45-50C.

CHG	JOB/RLSE NO	DATE	BY	REVISION
-	PK0371-24	02/15/93	ERK	INITIAL RELEASE

DRAWN	ERK	TITLE	ITEM NUMBER
APPRV	REW	WELD NUT-WIDE FLANGE LOCK NUT	23-12142
DATE	03/09/93	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1

SKETCH:



PART NUMBERS:

SIZE		MANUFACTURERS NUMBER		FREIGHTLINER PART NUMBER
		ONB		
3/8-16		OPC-0209-WF		23-12142-375

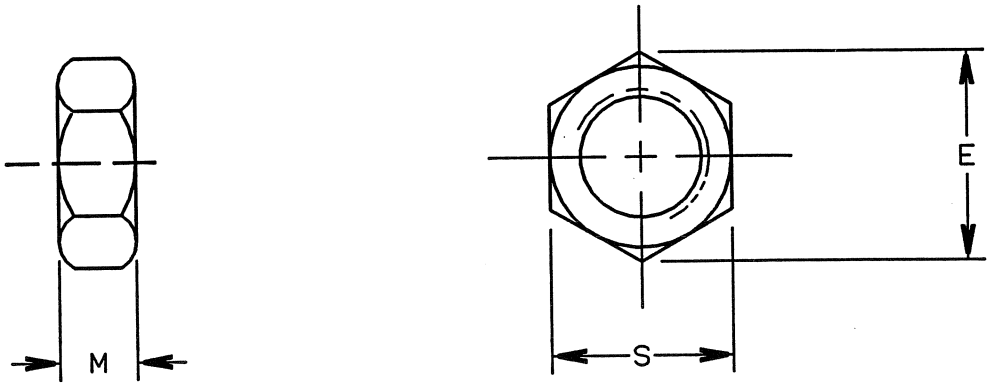
ENGINEERING NOTES:

1. MATERIAL: C1008-1010 HIGH WELD QUALITY, LOW CARBON STEEL
2. FINISH: PLAIN
3. MUST MEET THE FOLLOWING PREVAILING TORQUE REQUIREMENTS PER IFI 100/107 (GRADE A):

   FIRST ON: 80 IN. LB. MAX
   FIRST OFF W/O REACHING CLAMP LOAD:
   HIGEST: 12 IN. LB.
   LOWEST: 5 IN. LB.

CHG	JOB/RLSE NO	DATE	BY	REVISION
-	P7372H-01	03/09/93	ERK	INITIAL RELEASE
A	PA2042-36	06/07/93	ERK	RESTATED PREVAILING TORQUE REQUIREMENT
B	PA2042-52	03/30/95	DAJ	.678/.625 WAS .640/.625 & .172/.120 WAS .130/.120

DRAWN	ERK	TITLE NUT-HEX, JAM METRIC, ZINC PLATED	ITEM NUMBER 23-12183
APPRV	MKN		
DATE	06/02/94	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



SIZE	M		S		E	FREIGHTLINER PART NUMBER
	MAX	MIN	MAX	MIN	MIN	
M20 X 2.5	10.00	9.10	30.00	29.16	32.95	23-12183-204

NOTE: NUTS SHALL CONFORM TO REQUIREMENTS OF DIN 439 OR ANSI B18.2.4.5M. DIMENSIONS SHOWN ARE REFERENCE ONLY.

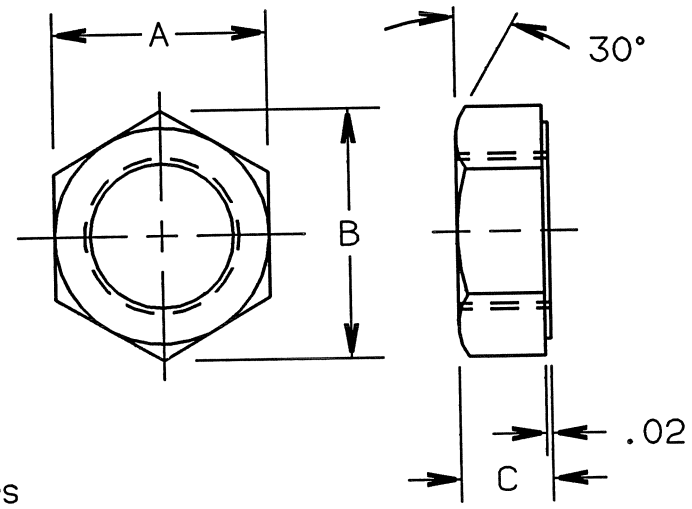
MATERIAL: CLASS 4 PER ISO 898/2.

FINISH: PLATED IN ACCORDANCE WITH FREIGHTLINER SPECIFICATION 49-00005-403.

CHG	JOB/RLSE NO	DATE	BY	REVISION
-	PH0596-01	06/02/94	ERK	INITIAL RELEASE.

DRAWN	ERK	TITLE NUT - LEFT HAND JAM, FINE THREAD	ITEM NUMBER 23-12184
APPRV	ERK		
DATE	06/22/94	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1

SKETCH



PART NUMBERS

THREAD SIZE	A			B	C			FREIGHTLINER PART NUMBER
	NOM	MAX	MIN	MIN	NOM	MAX	MIN	
3/8-24	9/16	.562	.551	.628	7/32	.227	.210	23-12184-038

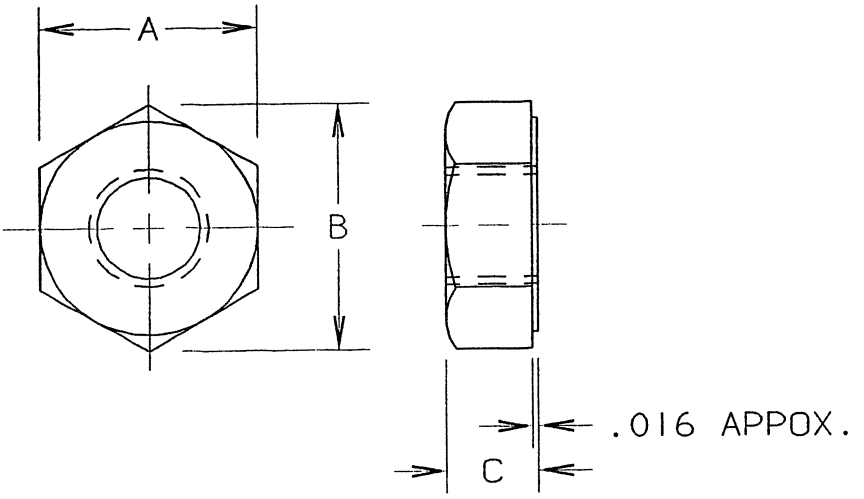
ENGINEERING NOTES:

1. MATERIAL: STEEL, GRADE B (5) PER SAE J995.
2. FINISH: ZINC OR CAD PLATE.
3. THREAD: UNIFIED FINE SERIES LH CLASS 2B (UNF-2B-LH) PER ANSI/ASME B1.1.
4. ALL DIMENSIONS ARE FOR REFERENCE ONLY. SEE ANSI B18.2.2 FOR DETAILS.

LEFT HAND THREAD

CHG	JOB/RLSE NO	DATE	BY	REVISION
-	PA2026-54	06/22/94	ERK	INITIAL RELEASE.

DRAWN	DAJ	TITLE NUT-HEAVY HEX ALL METAL PREVAILING TORQUE	ITEM NUMBER 23-12190
APPRV	ERK		
DATE	09/14/94	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



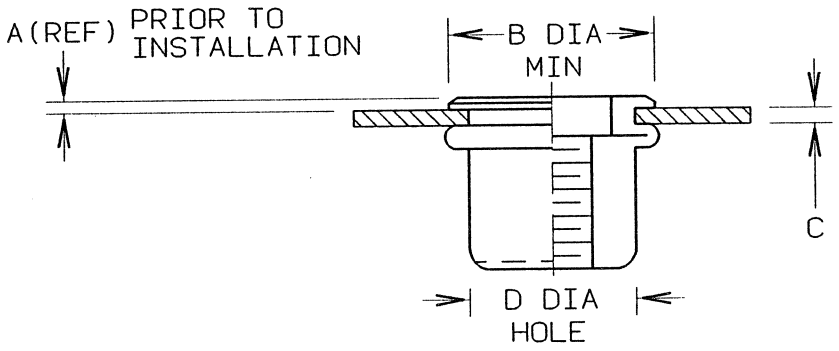
THREAD SIZE	A			B	C			FREIGHTLINER PART NUMBER
	NOM	MAX	MIN	MIN	NOM	MAX	MIN	
3/8-16	11/16	.688	.669	.763	23/64	.377	.341	23-12190-038

ENGINEERING NOTES:

1. MATERIAL: STEEL, GRADE 2H PER ASTM A 194
2. FINISH: ZINC OR CAD PLATE
3. THREAD: UNIFIED COARSE SERIES (UNC-2B) PER ANSI/ASME B1.1
4. ALL DIMENSIONS ARE FOR REFERENCE ONLY. SEE ANSI/ASME B18.2.2 FOR DETAILS.
5. PREVAILING TORQUE TO MEET ALL METAL CLASS C REQUIREMENTS OF IFI 100/107 AND IFI 101.

CHG	JOB/RLSE NO	DATE	BY	REVISION
-	P2A220-21	09/14/94	DAJ	INITIAL RELEASE.
A	P2A220-27	09/30/94	DAJ	REVISED NOTE 1,3, & 4.
B	P2A220-32	10/25/94	DAJ	REVISED TITLE AND ADDED NOTE 5.
C	P2A220-46	02/28/95	DAJ	REVISED NOTE 1 TO GRADE A FROM GRADE 2H.
D	P2A220-58	03/29/95	ERK	MTL TO 2H FROM GRADE A, REVISED NOTE 5

DRAWN	DAJ	TITLE NUT-INSERT WEDGE SERIES	ITEM NUMBER 23-12202
APPRV	ERK		
DATE	12/05/94	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



THREAD SIZE	"A" DIM MAX	"B" DIA NOM	"D" DIA		"C" DIM	VENDOR PART NUMBER	FREIGHTLINER PART NUMBER
			NOM DRILL SIZE	HOLE SIZE			
1/4-20	.050	.500	25/64	.391/ .395	.250/ .375	AVK2000-420	23-12202-250

ENGINEERING NOTES

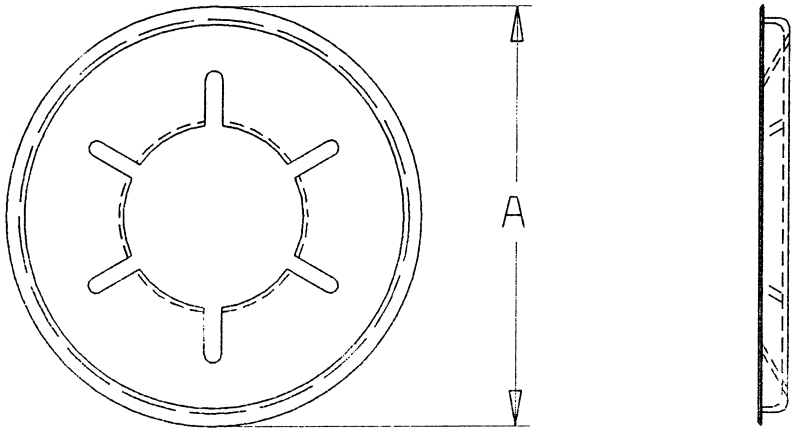
MATERIAL: STEEL, AISI 1008/1010.

FINISH: CADMIUM PLATE AND CLEAR CHROMATE PER MIL QQ-P-416 TYPE 1.

CHG	JOB/RLSE NO	DATE	BY	REVISION
-	P4235K-01	12/05/94	DAJ	INITIAL LOAD

ADRIENNE CHILBERG

DRAWN	ERK	TITLE	DRAWING NUMBER	
APPRV	REW	NUT PUSH-ON	23-12228	
DATE	03/31/95	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. B
CATIA ORIGINAL				



NOM. O.D. A	STUD DIA.	SUPPLIER/NUMBER	MATERIAL THK(REF)	FREIGHTLINER PART NUMBER
1.15	.500	ARDEN/01-02930-500	.016	23-12228-500
1.62	24MM	BAKER AND FINNEMORE LIMITED/D6832	.020	23-12228-024

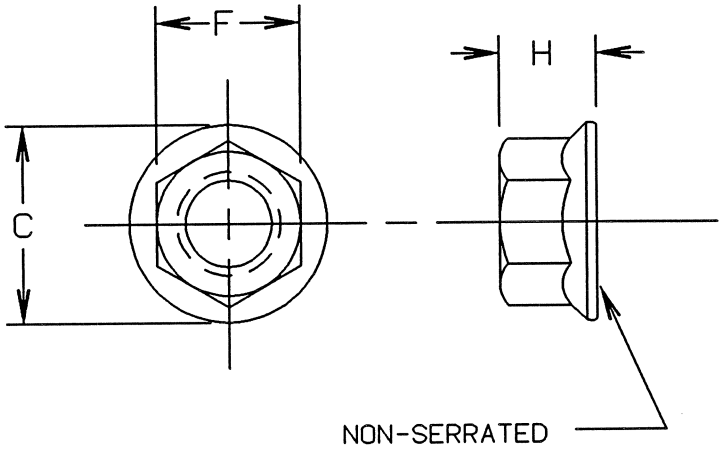
B

ENGINEERING NOTES:

1. MATERTIAL: SPRING STEEL
2. FINISH: ZINC PLATED
3. SIX SLOTS EQUALLY SPACED SHOWN FOR REFERENCE ONLY. SIZE AND QUANTITY MAY VARY WITH MANUFACTURER.

CHG	JOB NO	DATE	BY	REVISION
-	P2A262-46	03/31/95	ERK	INITIAL RELEASE
A	P00426-01	07/11/96	FHC	REVISED AND REDRAWN IN CATIA. ADDED -024
B	PA2042-76	04/19/97	DAJ	SUPPLIER NUMBER ON -024 WAS 6832.

DRAWN	ERK	TITLE NUT-WIDE FLANGE GRADE 5 STEEL, GRADE F LOCK	ITEM NUMBER 23-12328
APPRV	ERK		
DATE	03/11/96	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



PART NUMBERS:

THREAD	F FLATS (BASIC)	H HEIGHT (MAX.)	C FLANGE (MAX.)	MANUFACTURER'S NUMBER MF	FREIGHTLINER PART NUMBER
3/8-16	.562	.406	.900	29LFFL3816	23-12328-038

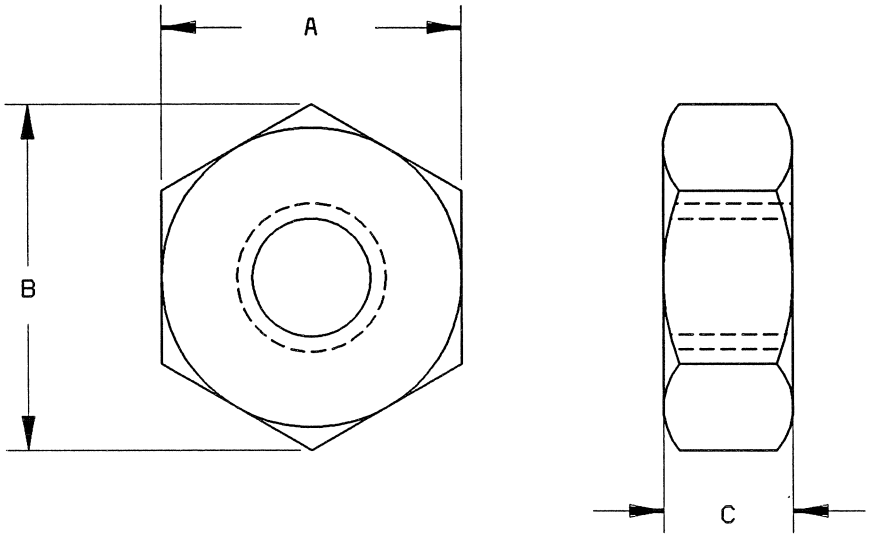
ENGINEERING NOTES:

1. MATERIAL: STEEL-GRADE 5
2. LOCK: IFI 100/107 GRADE F REQUIREMENTS
3. FINISH: ZINC PLATE PER FTL 49-00005-403
4. EQUIVALENT ACCEPTABLE WITH ENGINEERING APPROVAL.

CHG	JOB/RLSE NO	DATE	BY	REVISION
-	P5925P-01	03/11/96	ERK	INITIAL RELEASE
A	PA2042-70	06/25/96	DAJ	DIMENSION "H" WAS .398

DRIENNE CHILBERG

DRAWN	FHC	TITLE NUT-HEX, MACHINE ALL METAL PREVAILING TORQUE	DRAWING NUMBER 23-12388
APPRV	DAJ		
DATE	07/31/96	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1 / CHG. LTR. -
CATIA ORIGINAL			



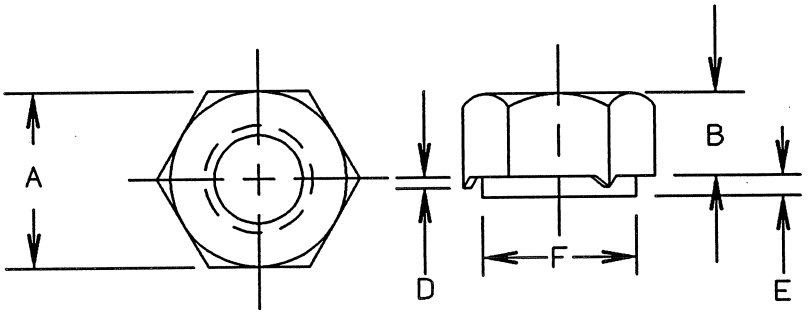
THREAD SIZE	A		B		C		FREIGHTLINER PART NUMBER
	MAX	MIN	MAX	MIN	MAX	MIN	
10-24	.375	.362	.433	.413	.130	.117	23-12388-010

ENGINEERING NOTES:

1. MATERIAL: MILD STEEL
2. FINISH: ZINC OR CAD PLATE
3. THREAD: UNIFIED COARSE SERIES CLASS 2B (UNC-2B) PER ANSI/ASME B1.1
4. ALL DIMENSIONS ARE FOR REFERENCE ONLY. SEE ANSI/ASME B18.6.3 FOR DETAILS.
5. PREVAILING TORQUE TO MEET ALL METAL CLASS A REQUIREMENTS IFI 100/107.

CHG	JOB NO	DATE	BY	REVISION
-	P00320-01	07/31/96	FHC	INITIAL RELEASE

DRAWN	DAJ	TITLE	ITEM NUMBER
APPRV	DAJ	NUT - WELD HEX, SELF LOCKING, GRADE B	23-12372
DATE	05/14/96	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



THREAD	A FLATS (MAX)	B THICK (MAX)	D	E	F	MFG NUMBER	FREIGHTLINER PART NUMBER
5/16-18	.562	.302	.025	.040	.469		23-12372-031

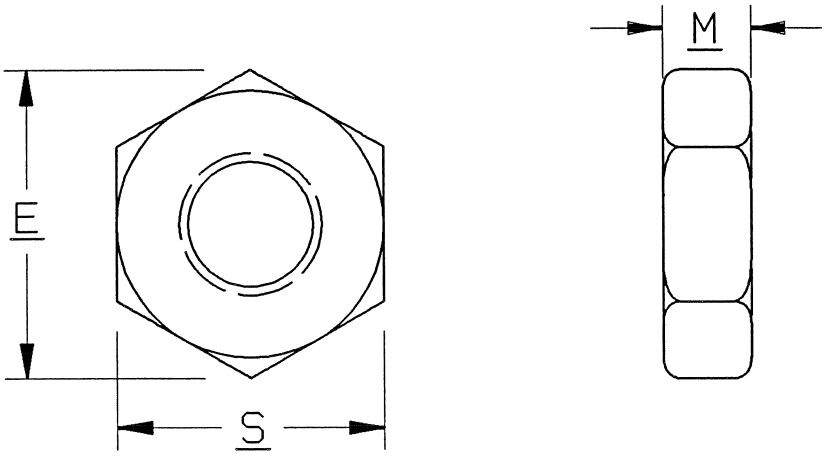
ENGINEERING NOTES:

1. MATERIAL: C1018 LOW CARBON STEEL
2. FINISH: PLAIN
3. NUTS SHALL MEET ALL METAL PREVAILING TORQUE REQUIREMENTS OF IFI 100/107 (GRADE B).
4. ADD .015 TO DIM. "F" FOR RECOMMENDED HOLE SIZE.

CHG	JOB/RLSE NO	DATE	BY	REVISION
-	P2829F-01	05/14/96	DAJ	INITIAL LOAD

)RIENNE CHILBERG

DRAWN	FHC	TITLE	DRAWING NUMBER	
APPRV	DAJ	NUT-HEX, THIN LKG, STEERING WHEEL	23-12396	
DATE	09/09/96	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. -
CATIA ORIGINAL				



THREAD SIZE	S		E		M		FREIGHTLINER PART NUMBER
	MAX	MIN	MAX	MIN	MAX	MIN	
M20 X 1.5	30.00	29.16	34.64	32.95	10.00	9.10	23-12396-000

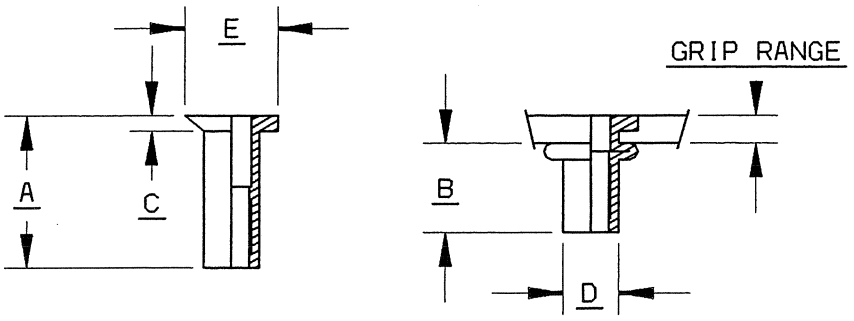
ENGINEERING NOTES:

1. MATERIAL: PROPERTY CLASS 05 PER DIN 267/ISO 898
2. FINISH: PLAIN
3. ALL DIMENSIONS ARE FOR REFERENCE ONLY, SEE DIN 439
4. LOCKING ELEMENT: NYLON THREAD LOCKING PATCH-MATERIAL PER IFI 524 MAINTAIN 2-3 THREAD CLEAR LEAD ONE SIDE ONLY MINIMUM FIFTH REMOVAL PREVAILING TORQUE: 4.5 NEWTON METERS.
5. PROOF LOAD: 136 KN
6. HARDNESS, ROCKWELL: RC 26-36

CHG	JOB NO	DATE	BY	REVISION
-	P2A367-16	09/09/96	FHC	INITIAL RELEASE

ADRIENNE CHILBERG

DRAWN	DAJ	TITLE	DRAWING NUMBER	
APPRV	DAJ	NUT-INSERT, THREADED RIVET NUT, COUNTERSUNK, KEYED	23-12401	
DATE	10/31/96	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. -
CATIA ORIGINAL				



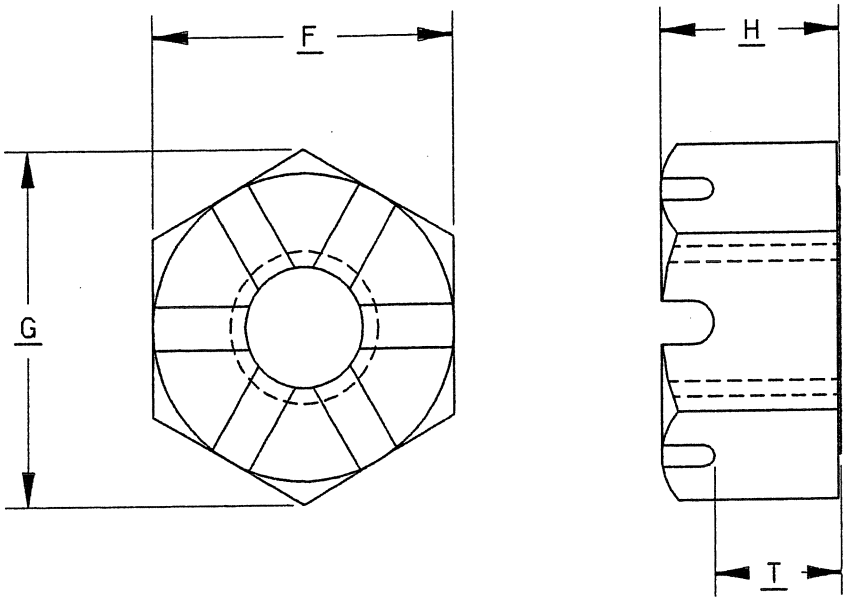
THREAD SIZE	DIMENSIONS					GRIP RANGE	F/L SPEC NO.
	A	B	C	D	E		
1/4-20 UNC	.687	.440	.089	.332	.529	.089-.151	23-12401-000
1/4-20 UNC	.875	.435	.089	.332	.529	.271-.331	23-12401-001
10-32 UNF	.625	.385	.065	.250	.391	.116-.166	23-12401-002

ENGINEERING NOTES:

1. Material: Aluminum
2. Finish: Plain
3. Supplier: AVK or an Engineering approved equivalent.
4. Above dimensions for reference only.

CHG	JOB NO	DATE	BY	REVISION
-	PB4501-20	10/31/96	DAJ	INITIAL RELEASE

DRAWN	DAJ	TITLE NUT-HEX SLOTTED	DRAWING NUMBER 23-12417
APPRV	DAJ		
DATE	02/03/97	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1 / CHG. LTR. A
CATIA ORIGINAL			



THREAD SIZE	F		G		H		T		FREIGHTLINER PART NUMBER
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	
1/2-13	.750	.736	.866	.840	.448	.427	.29	.27	23-12417-004
3/4-16	1.125	1.088	1.299	1.240	.665	.617	.40	.38	23-12417-008

A

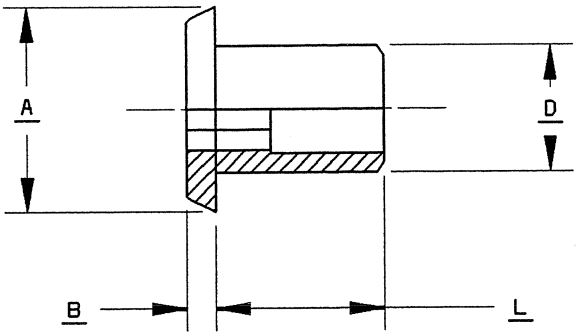
ENGINEERING NOTES:

1. MATERIAL: STEEL, SAE J995 GRADE 5
2. FINISH: ZINC OR CAD PLATE
3. THREAD: UNIFIED FINE SERIES CLASS 2B (UNF-2B) PER ANSI/ASME B1.1
4. ALL DIMENSIONS ARE FOR REFERENCE ONLY. SEE ANSI/ASME B18.2.2 FOR DETAILS.

CHG	JOB NO	DATE	BY	REVISION
-	P01153-20	02/03/97	DAJ	INITIAL RELEASE
A	P2D253-35	06/05/98	DAJ	ADDED -004.

ADRIENNE CHILBERG

DRAWN	DAJ	TITLE	DRAWING NUMBER	
APPRV	DAJ	NUT-JOINT CONNECTOR FLAT HEAD	23-12438	
DATE	05/29/97	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. -
CATIA ORIGINAL				



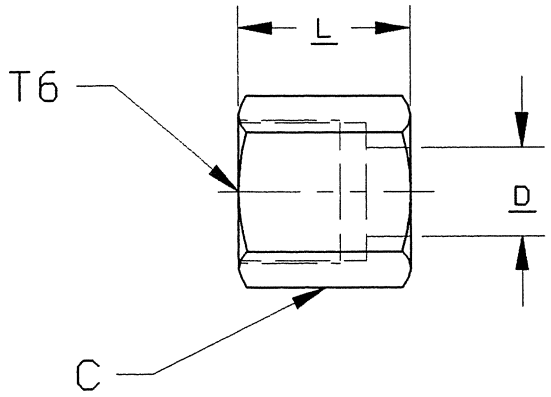
THREAD SIZE	DIMENSIONS				FREIGHTLINER PART NUMBER
	A	B	D	L	
1/4-20	.590	.083	.354	.472	23-12438-000

ENGINEERING NOTES:

1. MATERIAL: STEEL
2. FINISH: BLACK OXIDE
3. ALL DIMENSIONS ARE FOR REFERENCE ONLY.
4. APPROVED VENDOR: ENGINEERED FASTENER (RFN142012HD)

CHG	JOB NO	DATE	BY	REVISION
-	P01636-16	05/29/97	DAJ	INITIAL RELEASE

DRAWN	IP	TITLE	DRAWING NUMBER	
APPRV	LKG	NUT FLARE TUBE END, STEEL	23-12470	
DATE	09/18/98	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. -
CATIA ORIGINAL				



TUBE O.D.	T6 THREADS	C HEX	D	L	MFR'S NO. PH	FREIGHTLINER PART NUMBER
5/8	7/8-14	1	0.70	0.98	10BTX-S	23-12470-010
1-1/4	1-5/8-12	2	1.35	1.23	20BTX-S	23-12470-020

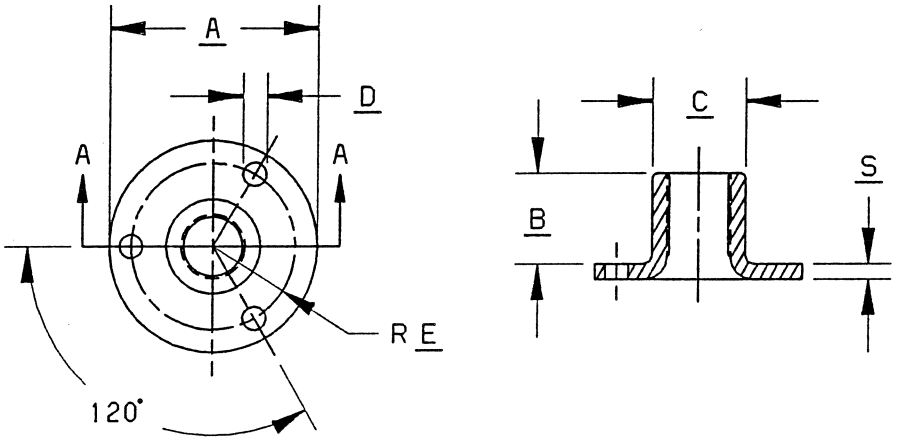
ENGINEERING NOTES:

1. MATERIAL: STEEL
2. FINISH: ZINC PLATING WITH YELLOW CHROMATE
3. INDUSTRY STANDARD: REF SAE J514, FIGURE 070110
4. DIMENSIONS SHOWN ABOVE ARE FOR REFERENCE ONLY

CHG	JOB NO	DATE	BY	REVISION
-	P03175-93	09/18/98	IP	INITIAL LOAD

ADRIENNE CHILBERG

DRAWN	DAJ	TITLE	DRAWING NUMBER	
APPRV	DAJ	NUT-STAKE HOLE TYPE	23-12495	
DATE	02/20/98	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. -
CATIA ORIGINAL				



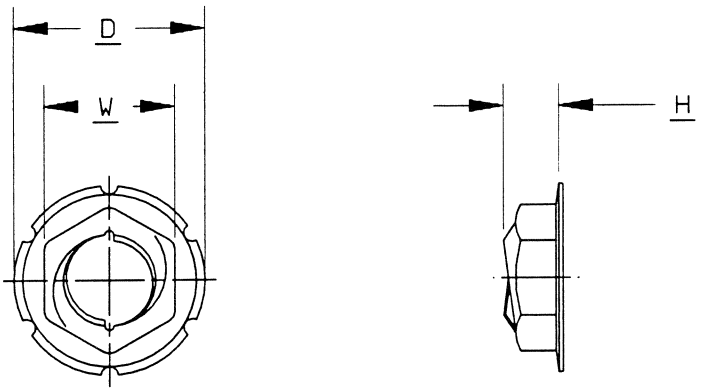
THREAD SIZE	DIMENSIONS						VENDOR/PN	FREIGHTLINER PART NUMBER
	A	B	C	D	E	S	AMERICAN ENGINEERED COMPONENTS	
5/16-18	7/8	7/32	.391	.098	11/32	.062	NTN-5618103T	23-12495-000

ENGINEERING NOTES:

1. MATERIAL: STEEL
2. DIMENSIONS ARE FOR REFERENCE ONLY.

CHG	JOB NO	DATE	BY	REVISION
-	P00954-01	02/20/98	DAJ	INITIAL RELEASE

DRAWN	DAJ	TITLE NUT-SELF THREADING	DRAWING NUMBER 23-12500
APPRV	DAJ		
DATE	03/11/98	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1 / CHG. LTR. B
CATIA ORIGINAL			



ENGLISH

STUD DIA.	DIMENSIONS W	DIMENSIONS D	DIMENSIONS H	STL THK	VENDOR/PN PALNUT	FREIGHTLINER PART NUMBER
.330	1/2	0.75	.314	.023	SP 330012	23-12500-000

A

METRIC

5 mm	10	18	6.35	.51	SK 050018	23-12695-000

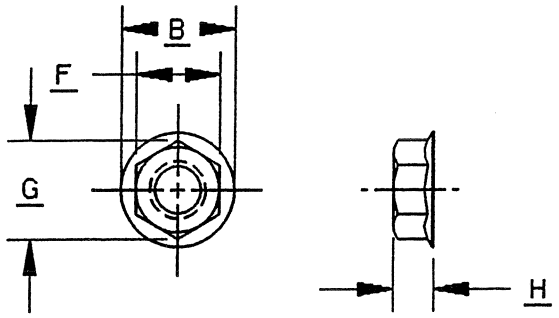
B

ENGINEERING NOTES:

1. MATERIAL: CARBON STEEL
2. FINISH: ZINC PLATED PER FL 49-00005-201
3. DIMENSIONS ARE FOR REFERENCE ONLY.
4. FOR USE ON TOUGH PLASTIC ONLY, SUCH AS ABS OR POLYPROPYLENE FOR WHICH 45-50 IN/LBS TORQUE DEVELOPS APPROX. 100LB TENSION.

CHG	JOB NO	DATE	BY	REVISION
-	P2D190-22	03/11/98	DAJ	INITIAL LOAD
A	P2D190-28	05/08/98	DAJ	DIMENSION D WAS 1.0 AND SP 330012 WAS SP 300016.
B	P05733-19	10/11/99	LFB	ADDED METRIC TABLE FOR P/N 23-12695-000.

DRAWN	DAJ	TITLE	DRAWING NUMBER	
APPRV	DAJ	NUT-LOCKING, FLG HEX, 10.9, ORGANIC SILVER	23-12529	
DATE	07/02/98			
CATIA ORIGINAL		FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. -



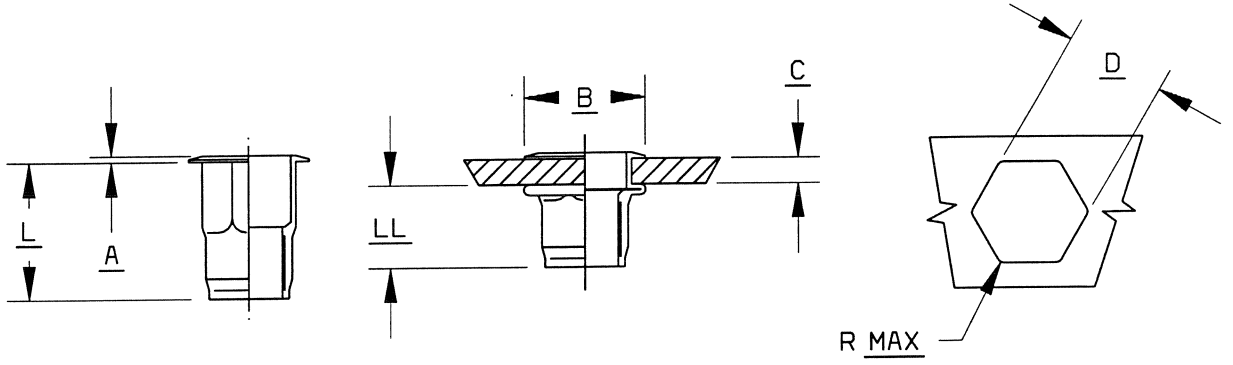
NOMINAL SIZE	DIMENSIONS				FREIGHTLINER PART NUMBER
	F (MAX)	G (MIN)	H (MAX)	B (MAX)	
M8 X 1.25	13.00	14.51	9.1	17.6	23-12529-000

ENGINEERING NOTES:

1. MATERIAL: STEEL, PROPERTY CLASS 10.9 PER ISO 898/2.
2. STANDARD: NUTS SHALL CONFORM TO DIN 6927.
3. FINISH: ASTM F1136-88; GRADE 2: CHROMIUM/ZINC PROTECTIVE COATING FOR FASTENERS. (SILVER)
4. DIMENSIONS SHOWN ARE FOR REFERENCE ONLY.

CHG	JOB NO	DATE	BY	REVISION
-	A80512-02	07/02/98	DAJ	INITIAL LOAD

DRAWN	DAJ	TITLE	DRAWING NUMBER	
APPRV	DAJ	NUT - INSERT HEX	23-12560	
DATE	10/22/98	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. B
CATIA ORIGINAL				



	ENGLISH									
	THREAD SIZE	REF A	REF B	HOLE SIZE D +.004/-.000	HOLE SIZE R RADIUS	C GRIP	REF L	LL MAX	AVK PART NUMBER	FREIGHTLINER PART NUMBER
A	5/16-18	.035	.655	.500	.040	.027/ .150	.685	.530	AHS4-518-150	23-12560-000

	METRIC									
B	M8X1.25	0.89	16.64	12.7	1.0	0.70/ 3.80	17.4	13.46	AHS4-8125-3.8	23-12560-100
	M8X1.25	0.89	16.64	12.7	1.0	3.80/ 7.90	21.46	13.08	AHS4-8125-7.9	23-12560-101

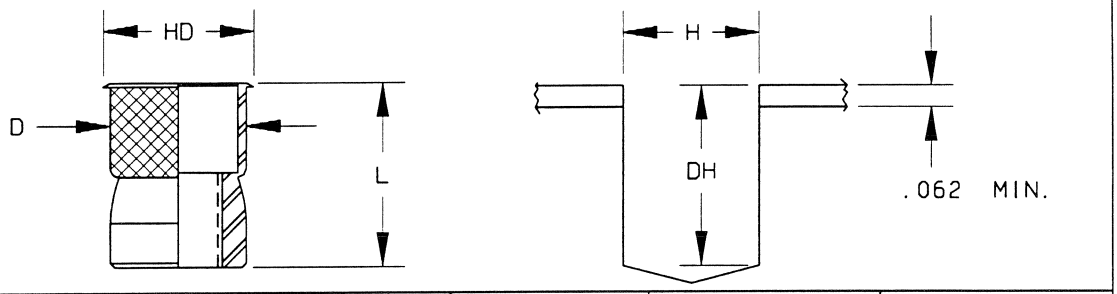
ENGINEERING NOTES:

1. MATERIAL: STEEL, AISI 1008/1010

2. FINISH: ZINC PLATE AND YELLOW DICHROMATE MEETING 96 HOUR SALT SPRAY REQUIREMENT IN ACCORDANCE WITH ASTM B633 TYPE II

CHG	JOB NO	DATE	BY	REVISION
-	P2D220-S6	10/22/98	DAJ	INITIAL LOAD
A	P04103-01	11/27/98	DAJ	C GRIP WAS .115. VENDOR & FTL PART NUM WERE REVISED.
B	P07362-05	08/30/99	CGD	ADDED 23-12560-100/-101.

DRAWN	CGD	TITLE	DRAWING NUMBER	
APPRV	DAJ	NUTSERT-BLIND STEEL, CAD PLATE	23-12619	
DATE	04/29/99			
CATIA ORIGINAL		FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. A



	THREAD SIZE	"D" MAX	"HD" ±.0051	"L" MAX	"DH" MIN	"H"	AVK * PART NUMBER	FREIGHTLINER PART NUMBER
A	6-32 UNC	.233	.255	.370	.400	**	AWS2-632	23-12619-632
	8-32 UNC	.264	.285	.370	.400	**	AWS2-832	23-12619-832
	10-24 UNC	.295	.320	.370	.400	**	AWS2-1024	23-12619-124
	1/4-20 UNC	.389	.415	.515	.540	**	AWS2-420	23-12619-420
	5/16-18 UNC	.528	.550	.615	.640	**	AWS2-518	23-12619-518

* AVK IS THE RECOMMENDED VENDOR.

** HOLE SIZE VARIES WITH THICKNESS AND DENSITY OF PARENT MATERIAL. EXPERIMENTATION IS REQUIRED FOR OPTIMUM PERFORMANCE.

HOLE SIZE VS. MATERIAL THICKNESS

THREAD SIZE	.030-.090		.091-.124		.125-.186		.187 & OVER	
	DRILL	DECIMAL	DRILL	DECIMAL	DRILL	DECIMAL	DRILL	DECIMAL
6-32 UNC	7/32	.2188	#2	.2210	#1	.2280	#1	.2280
8-32 UNC	1/4	.2500	"F"	.2570	17/64	.2656	17/64	.2656
10-24 UNC	9/32	.2812	"L"	.2900	"L"	.2900	19/64	.2969
1/4-20 UNC	3/8	.3750	3/8	.3750	"W"	.3860	25/64	.3906
5/16-18 UNC	1/2	.5000	1/2	.5000	33/64	.5156	17/32	.5321

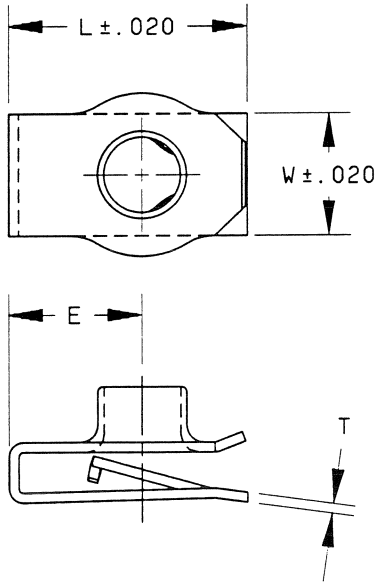
TEST THE INSERTS IN THE APPLICATION BEFORE FINALIZING THE HOLE SIZE.
STANDARD HOLE SIZE TOLERANCES ARE ACCEPTABLE BUT DO NOT GO BELOW NOMINAL SIZE.

ENGINEERING NOTES:

1. MATERIAL: STEEL TYPE C-1110.
2. FINISH: CAD PLATE PER QQ-P-416 CL3 TYI.
3. DO NOT USE NUTSERTS AS RIVETS TO FASTEN TWO OR MORE SHEETS OF METAL TOGETHER.
4. USE ONLY A NUTSERT PLACEMENT TOOL TO SECURE THE NUTSERT IN THE HOLE.
5. THE NUTSERT SHOULD COME IN CONTACT WITH THE ATTACHED PART. DO NOT LEAVE A VOID OR MISMATCH BETWEEN THE NUTSERT AND THE ATTACHED PART OR THE NUTSERT MAY PULL OUT OF THE HOLE.

CHG	JOB NO	DATE	BY	REVISION
-	P06183-10	04/29/99	CGD	INITIAL RELEASE
A	P01207-32	08/17/99	BMB	ADDED -124, -832, -632

DRAWN	CGD	TITLE	DRAWING NUMBER	
APPRV	DAJ	NUT-SPRING METRIC, U-TYPE	23-12625	
DATE	06/18/99	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. A
CATIA ORIGINAL				



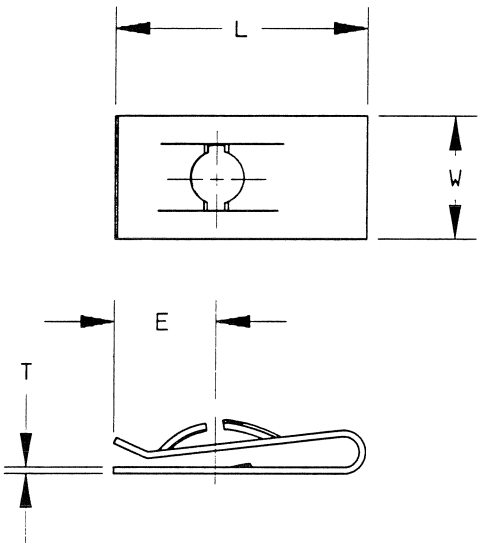
THREAD SIZE	DIMENSIONS			E EDGE DISTANCE	PNL HOLE SIZE	PNL THK	VENDOR/PN	FREIGHTLINER PART NUMBER
	T	W	L				CIP	
M6 X 1	1.0/0.8	15.0/14.0	24.0/23.0	13.0/14.0	11.0/12.0	0.8-4.0	12660	23-12625-000
M8 X 1	1.04 NOM	17.0 NOM	25.0 NOM	14.0/15.0	11.3/12.1	0.8-4.0	14300	23-12625-001

ENGINEERING NOTES:

1. MATERIAL: 1050 SPRING STEEL, TEMPERED
2. FINISH: PHOSPHATE, GRAY TO BLACK (DRY TO TOUCH)
3. DIMENSIONS ARE FOR REFERENCE ONLY.
4. VENDOR: CIP OR ENGINEERING APPROVED EQUIVALENT

CHG	JOB NO	DATE	BY	REVISION
-	P05733-06	06/18/99	CGD	INITIAL RELEASE
A	P09474-02	11/09/99	LFB	ADDED 23-12625-001.

DRAWN	CGD	TITLE NUT-SPRING U-TYPE	DRAWING NUMBER 23-12653
APPRV	DAJ		
DATE	06/15/99	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1 / CHG. LTR. -
CATIA ORIGINAL			



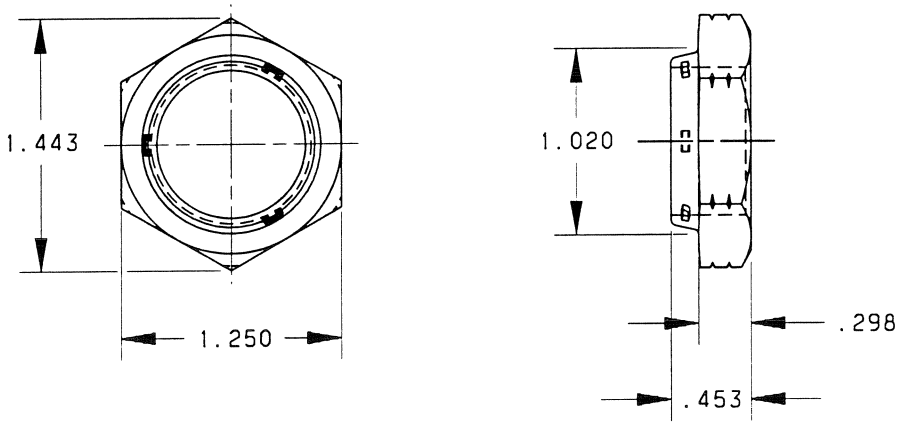
THREAD SIZE	PANEL RANGE	DESIGN VARIATION	DIMENSIONS			E EDGE DIST	PNL HOLE SIZE	MANU-FACTURER TIN	FREIGHTLINER PART NUMBER
			T	W	L				
M6x1	1.630-3.180	STD	.640	12.70	26.64	10.92	8.71	C1303-M61	23-12653-000

ENGINEERING NOTES:

1. MATERIAL: SPRING STEEL, TEMPERED.
2. FINISH: PHOSPHATE, GRAY TO BLACK (DRY TO TOUCH)
3. DIMENSIONS ARE FOR REFERENCE ONLY.
4. VENDOR: EATON, OR APPROVED ENGINEERING EQUIVALENT.

CHG	JOB NO	DATE	BY	REVISION
-	P05733-06	06/15/99	CGD	INITIAL RELEASE

DRAWN	CGD	TITLE	DRAWING NUMBER	
APPRV	DAJ	NUT-HEX, COLLAR, LOCKING, ALL METAL, STEERING WHEEL	23-12669	
DATE	07/13/99	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. -
CATIA ORIGINAL				



-000 SHOWN

ENGINEERING NOTES:

1. MATERIAL: STEEL, 1035-1045
2. HARDNESS: HEAT TREAT Rc 30-36
3. FINISH: ZINC/YELLOW DICHROMATE PER F/L SPECIFICATION 49-00005-203
4. THREADS: 13/16-20 UNF CLASS 2B
5. PREVAILING TORQUE:
   FIRST INSTALLATION: 150 IN/LB MAX
   FIRST REMOVAL: 22 IN/LB MIN
   FIFTH REMOVAL: 15 IN/LB MIN

CHG	JOB NO	DATE	BY	REVISION
-	P09167-01	07/13/99	CGD	INITIAL RELEASE

DRAWN	BMB	TITLE	DRAWING NUMBER	
APPRV	DAJ	NUT-CLINCH ZINC PLATED	23-12689	
DATE	09/24/99	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. -
CATIA ORIGINAL				



THREAD SIZE	HOLE SIZE IN SHEET	D ±.005	K MAX	C +.015 -.000	SHEET THCKNSS (MIN)	FINISH	PROOF TORQUE (LB IN)	PROOF PUSH OUT (LBS)	MFR CAMCAR P/N	FREIGHTLINER PART NUMBER
7/16-20	.581 .577	.790 .780	.134	.338 .323	.134	CLEAR	TBD	TBD	EXP-091599-05	23-12689-000

ENGINEERING NOTES:

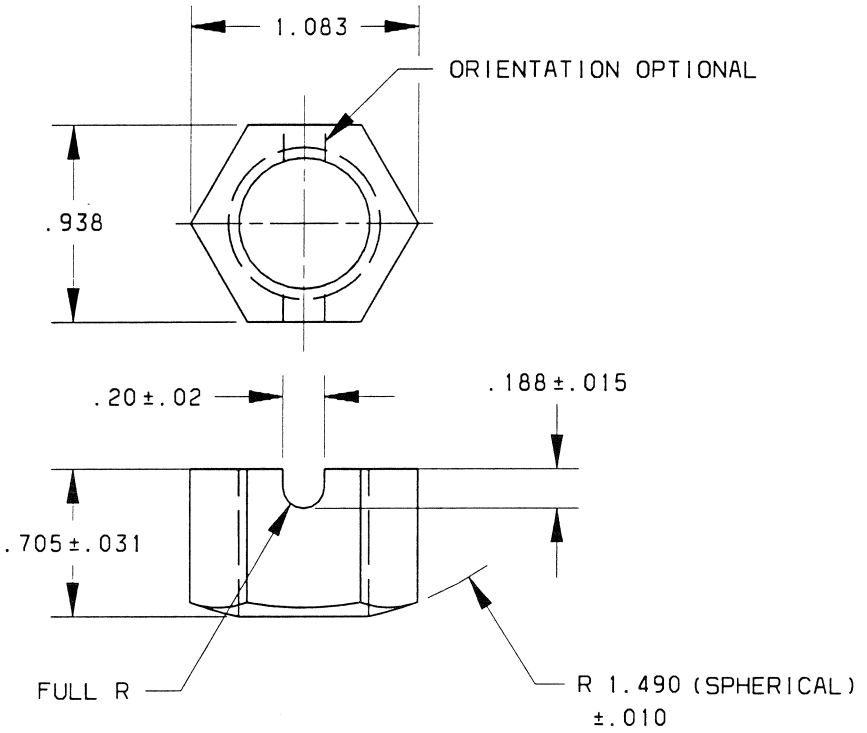
1. MATERIAL: STEEL, GRADE 8
2. FINISH: CLEAR: ZINC AND CLEAR CHROMATE PER FL SPEC 49-00005-403
   YELLOW: ZINC AND YELLOW CHROMATE PER FL SPEC 49-00005-203
3. THREAD FORM: UNC 2B
4. VENDOR: CAMCAR

(5) MUST MEET FOLLOWING PREVAILING TORQUE REQUIREMENTS PER IFI 00/107 (GR C)

6. 'K MAX' NOT TO EXCEED MATERIAL THICKNESS.

CHG	JOB NO	DATE	BY	REVISION
-	P07044-01	09/24/99	BMB	INITIAL RELEASE

DRAWN	LFB	TITLE NUT-SPHERICAL 5/8-11, GRADE 5 ZN	DRAWING NUMBER 23-12699
APPRV	DAJ		
DATE	10/22/99		
CATIA ORIGINAL		FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1 / CHG. LTR. -



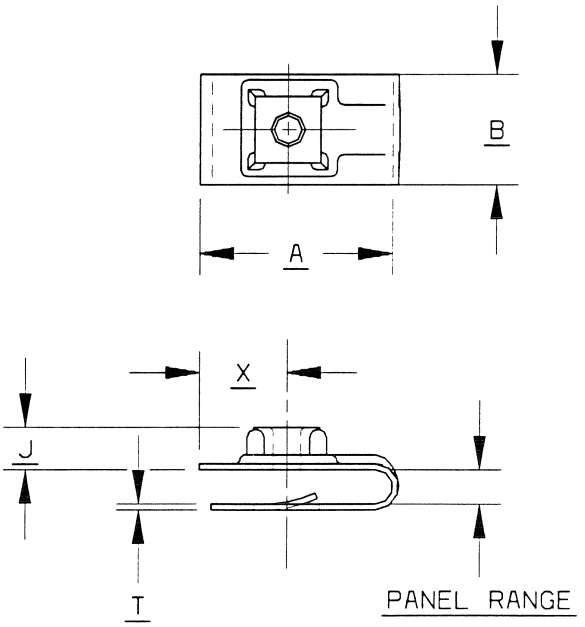
-000

ENGINEERING NOTES:

1. MATERIAL: STEEL, GRADE 5 PER SAE J995
2. FINISH: ZINC PLATE PER F/L SPEC 49-00005-403 AND WAX.
3. THREAD: 5/8-11 UNC-2B PER ANSI B1.1.
4. UNTOLERANCED DIMENSIONS PER ANSI B18.2.2.
5. ALL DIMENSIONS ARE FOR REFERENCE ONLY.

CHG	JOB NO	DATE	BY	REVISION
-	F82684-02	10/22/99	LFB	INITIAL LOAD.

DRAWN	ETM	TITLE	DRAWING NUMBER	
APPRV	DAJ	NUT-STAKED U-TYPE	23-12703	
DATE	10/28/99	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. -
CATIA ORIGINAL				



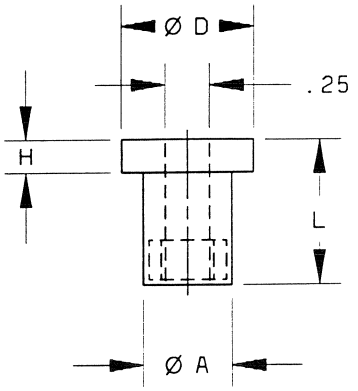
THREAD	PANEL RANGE	DIMENSIONS						MFR NUMBER	FREIGHTLINER PART NUMBER
		A	B	T	X	VAR	J		
M6-1	2.28-4.82	28.0	16.0	.860	12.7	STD	6.17	C33823-M61-3B	23-12703-006

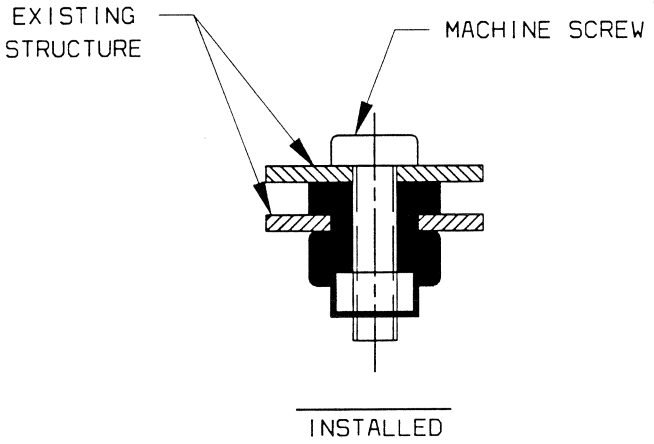
ENGINEERING NOTES:

1. MATERIAL: SPRING STEEL, HEAT TREATED
2. FINISH: ZINC PLATE PER F/L SPEC. 49-00005-403.
3. DISTANCE FROM CENTER OF HOLE TO PANEL EDGE IS 12.70 MAX.
4. PANEL HOLE DIAMETER IS 9.50

CHG	JOB NO	DATE	BY	REVISION
-	P07658-65	10/28/99	ETM	INITIAL RELEASE

DRAWN	LFB	TITLE	DRAWING NUMBER	
APPRV	DAJ	WELL-NUT FASTENER	23-12705	
DATE	11/01/99			
CATIA ORIGINAL		FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. -





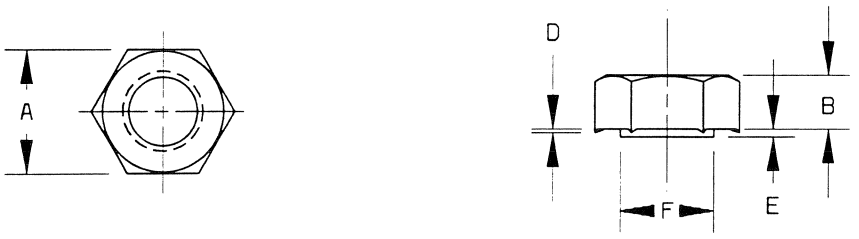
THREAD	GRIP RANGE (MIN.-MAX.)	"A"	"D"	"H"	"L"	HOLE SIZE	SUGGESTED MFR'S NO. POP	FREIGHTLINER PART NUMBER
1/4-20	.031/.187	.500	.750	.187	.829	.500	D1420	23-12705-000

ENGINEERING NOTES:

1. MATERIAL: NEOPRENE WITH BRASS INSERT.
2. DIMENSIONS PROVIDED ARE FOR REFERENCE ONLY.

CHG	JOB NO	DATE	BY	REVISION
-	P06868-86	11/01/99	LFB	INITIAL RELEASE

DRAWN	LFB	TITLE	DRAWING NUMBER	
APPRV	DAJ	NUT-WELD, HEX SELF LOCKING	23-12710	
DATE	11/10/99			
CATIA ORIGINAL		FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. -
UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN MM				



SHORT PILOT

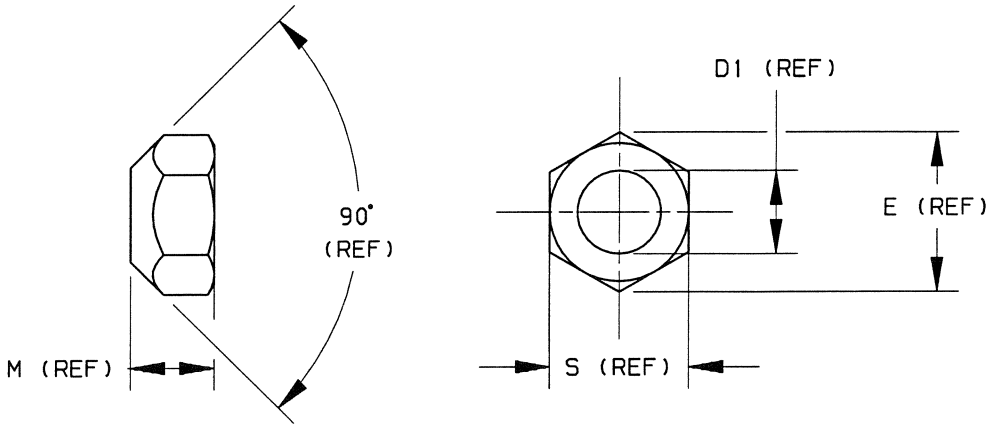
THREAD	A FLATS (MAX)	B THICK (MAX)	D	E	F	FREIGHTLINER PART NUMBER
M10X1.5	18.00	7.80	0.55	1.16	13.45	23-12710-010

ENGINEERING NOTES:

1. MATERIAL: C1018-1010 LOW CARBON STEEL.
2. FINISH: PLAIN
3. NUTS SHALL MEET ALL METAL PREVAILING TORQUE REQUIREMENTS OF IFI 100/107.
4. ADD .015 TO DIM "F" FOR RECOMMENDED HOLE SIZE.

CHG	JOB NO	DATE	BY	REVISION
-	P10252-11	11/10/99	LFB	INITIAL RELEASE

DRAWN	LFB	TITLE NUT-HEX, LOCKING, ALLMETAL CADMIUM AND WAX FINISH	DRAWING NUMBER 23-12725
APPRV	DAJ		
DATE	11/09/99	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1 / CHG. LTR. -
CATIA ORIGINAL			
UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN MM			



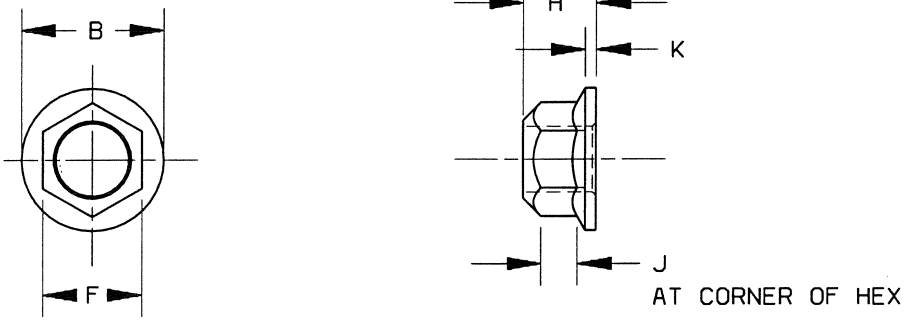
D1 BASIC SIZE	E MIN	S		M		FREIGHTLINER PART NUMBER
		MAX	MIN	MAX	MIN	
M6 X 1.00	11.05	10	9.78	6	5.7	210980 006010
M8 X 1.25	14.38	13	12.73	8	7.5	210980 008010
M10 X 1.50	18.90	17	16.73	10	9	210980 010010
M12 X 1.75	21.10	19	18.67	12	11	210980 012010
M16 X 2.00	26.75	24	23.67	16	14	210980 016010
M20 X 2.50	32.95	30	29.16	20	18	23-12725-020

ENGINEERING NOTES:

1. MATERIAL: SIZE M6 AND M8 PROPERTY CLASS 8 PER ISO 898/2.
   SIZE M10 AND ABOVE PROPERTY CLASS 10 PER ISO 898/2.
2. FINISH: CADMIUM PLATE AND WAX PER FREIGHTLINER SPECIFICATION 49-00012-130.
3. NUTS SHALL CONFORM TO DIN 980V OR ISO 7719.
   NOTE: DIM ACROSS FLATS IS BIGGER FOR DIN 980V NUTS THAN ANSI OR ISO SPECS FOR SIZES M10, M12 AND M14.
4. NUTS MUST BE TREATED FOR RELIEF OF HYDROGEN EMBRITTLEMENT.
5. PROPERTY CLASS TO BE EMBOSSED OR INDENTED ON THE FACE NUTS OR ON THE FLATS

CHG	JOB NO	DATE	BY	REVISION
-	P10600-01	11/12/99	LFB	INITIAL RELEASE.

DRAWN	LFB	TITLE NUT-FLANGED, HEX PREVAILING TORQUE	DRAWING NUMBER 23-12735
APPRV	DAJ		
DATE	12/10/99	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1 / CHG. LTR. -
CATIA ORIGINAL			



THREAD SIZE	"F" ACROSS FLATS		"B" FLANGE O.D.		"K" FLANGE THICKNESS (MIN)	"H" THKNS (MAX)	"J" HEX HEIGHT (MIN)	FREIGHTLINER PART NUMBER
	MAX.	MIN.	MAX.	MIN.				
3/8-16	.5645	.5510	.810	.728	.060	.420	.200	23-12735-375

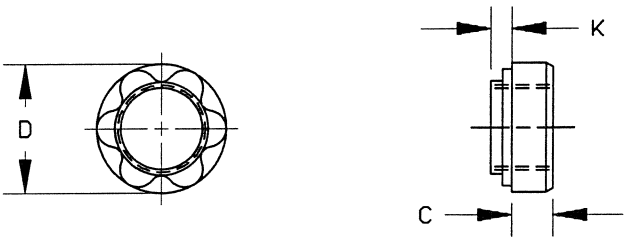
ENGINEERING NOTES

1. MATERIAL: GRADE B (SAE GRADE 5) NUT MATERIAL, PER SAE J995.
2. FINISH: TEXACOTE 452.
3. THREAD: UNIFIED FINE THREAD CLASS 2B (UNF-2B).
4. DIMENSIONS SHOWN ARE FOR REFERENCE ONLY.
5. MUST MEET APPLICABLE PROVISIONS OF IFI STANDARD 100 FOR PREVAILING TORQUE HEX LOCKNUTS.

CHG	JOB NO	DATE	BY	REVISION
-	P07725-10	12/10/99	LFB	INITIAL LOAD.

DEBBIE

DRAWN	LFB	TITLE	DRAWING NUMBER	
APPRV	DAJ	NUT-CLINCH, METRIC ZINC PLATED, ALL METAL LOCKING	23-12742	
DATE	12/21/99			
CATIA ORIGINAL		FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. -
UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN MM				



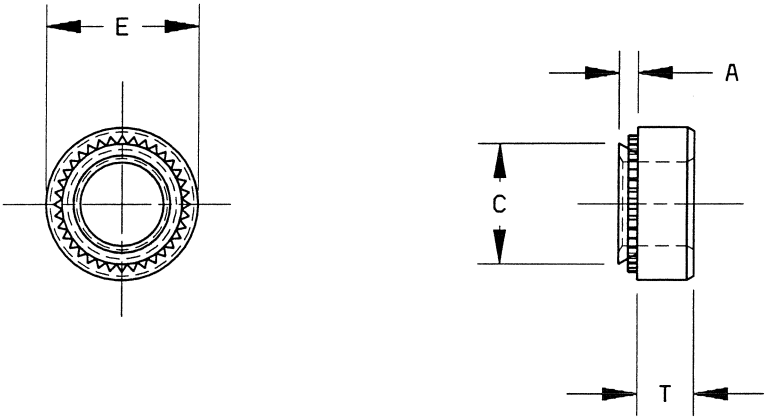
THREAD SIZE	HOLE SIZE IN SHEET	D ±.13	K MAX	C ±.19	SHEET THCKNSS (MIN)	FINISH	PROOF TORQUE (NM)	PROOF PUSH OUT (KG)	MFR CAMCAR P/N	FREIGHTLINER PART NUMBER
M6X1.0	8.73±.05	14.10	2.3	4.71	2.3	YELLOW	TBD	TBD	TBD	23-12742-006

ENGINEERING NOTES:

1. MATERIAL: STEEL, CLASS 10.9
2. FINISH: CLEAR: ZINC AND CLEAR CHROMATE PER FL SPEC 49-00005-403
   YELLOW: ZINC AND YELLOW CHROMATE PER FL SPEC 49-00005-203
3. THREAD FORM: UNC 2B
4. VENDOR: CAMCAR
5. FOR FLUSH APPLICATIONS 'K REF' NOT TO EXCEED MATERIAL THICKNESS.
6. PREVAILING TORQUE TO MEET ALL METAL CLASS C REQUIREMENTS OF IFI 100/107 AND IFI 101.

CHG	JOB NO	DATE	BY	REVISION
-	P10252-14	12/21/99	LFB	INITIAL RELEASE

DRAWN	LFB	TITLE NUT-CLINCH	DRAWING NUMBER 23-12753
APPRV	DAJ		
DATE	01/25/00	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1 / CHG. LTR. -
CATIA ORIGINAL			
UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN MM			



THREAD SIZE	HOLE DIA IN SHEET +.08	"E" DIA ±.25	"C" DIA	"A"	"T"	SUGGESTED MANUFACTURER'S PART NUMBER	FREIGHTLINER PART NUMBER
M6 X 1.00	8.75	11.05	8.72	1.37	4.08	CAPTIVE FASTENER CM6-1	23-12753-006 (4)
M8 X 1.25	10.5	12.65	10.44	1.37	5.47	PEM SM-8-1	680 990 05 91 (3)

ENGINEERING NOTES:

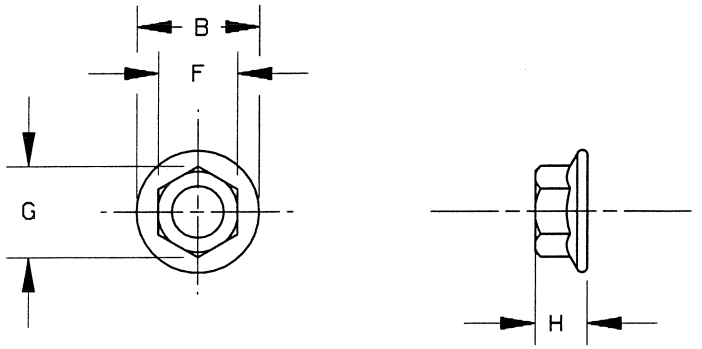
1. MATERIAL: CARBON STEEL, HEAT TREAT TO R15N 82 ± 5.
2. FINISH: ZINC PLATE FOR FREIGHTLINER SPEC 49-00005-403. PART MUST BE FREE FROM HYDROGEN EMBRITTLEMENT.

(3) IN COLD ROLLED STEEL, PUSHOUT IS 1870 NEWTONS. TORQUE OUT IS 26.0 NEWTON-METERS (NOMINAL VALUES).

(4) IN COLD ROLLED STEEL, PUSHOUT IS 1755 NEWTONS. TORQUE OUT IS 11.8 NEWTON-METERS (NOMINAL VALUES).

CHG	JOB NO	DATE	BY	REVISION
-	P07366-05	01/25/00	LFB	INITIAL RELEASE

DRAWN	LFB	TITLE NUT-LOCKING, FLG HEX, CLASS 8.8	DRAWING NUMBER 23-12769
APPRV	DAJ		
DATE	02/24/00	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1 / CHG. LTR. -
CATIA ORIGINAL			
UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN MM			



NOMINAL SIZE	DIMENSIONS				FREIGHTLINER PART NUMBER
	F (MAX)	G (MIN)	H (MAX)	B (MAX)	
M5 X 0.8	8.00	8.79	5.00	11.8	23-12769-005

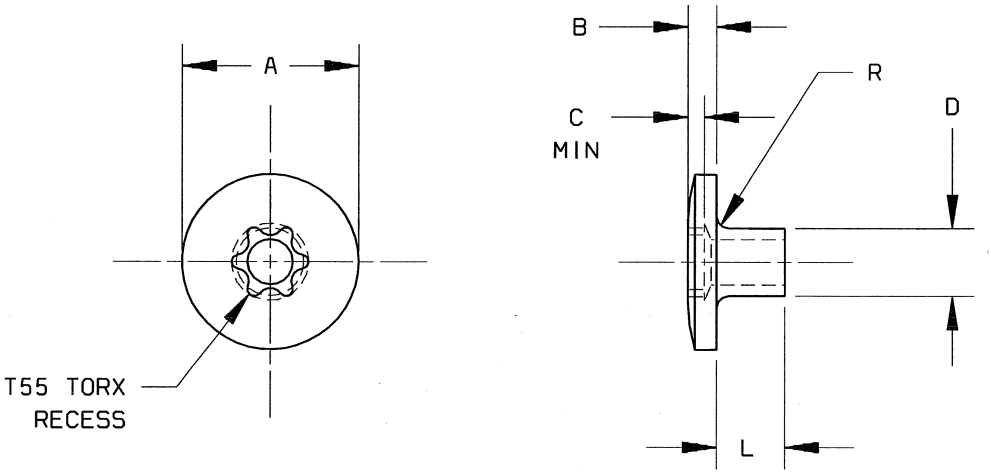
ENGINEERING NOTES:

1. MATERIAL: STEEL, PROPERTY CLASS 8.8.
2. FINISH: PHOS & OIL PER FREIGHTLINER SPEC 49-00006-041.
3. DIMENSIONS SHOWN ARE FOR REFERENCE ONLY.

CHG	JOB NO	DATE	BY	REVISION
-	P10252-01	02/24/00	LFB	INITIAL RELEASE

DRAWN	EWR	TITLE	DRAWING NUMBER	
APPRV	AWP	NUT CAMTAINER	23-13174	
DATE	12/13/02	FREIGHTLINER LLC	SHEET 1 OF 1	CHG. LTR. -
CATIA ORIGINAL				

UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN MM



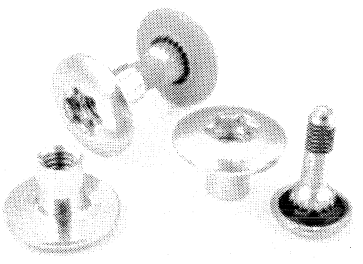
INTERNAL THREAD SIZE	A	B	C	D	R	L	SUGGESTED SUPPLIER	FREIGHTLINER PART NUMBER
	MAX MIN	MAX MIN	MIN	MAX MIN	MAX MIN	MAX MIN	TEXTRON FASTENING SYSTEMS	
5/16-18 UNC	1.010 0.990	.165 .150	.095	.390 .383	.070 .060	.390 .360	890-59000-297	23-13174-000
5/16-18 UNC	1.010 0.990	.165 .150	.095	.390 .383	.070 .060	.640 .610	890-60050-297	AVU300006

also 396-8003-00

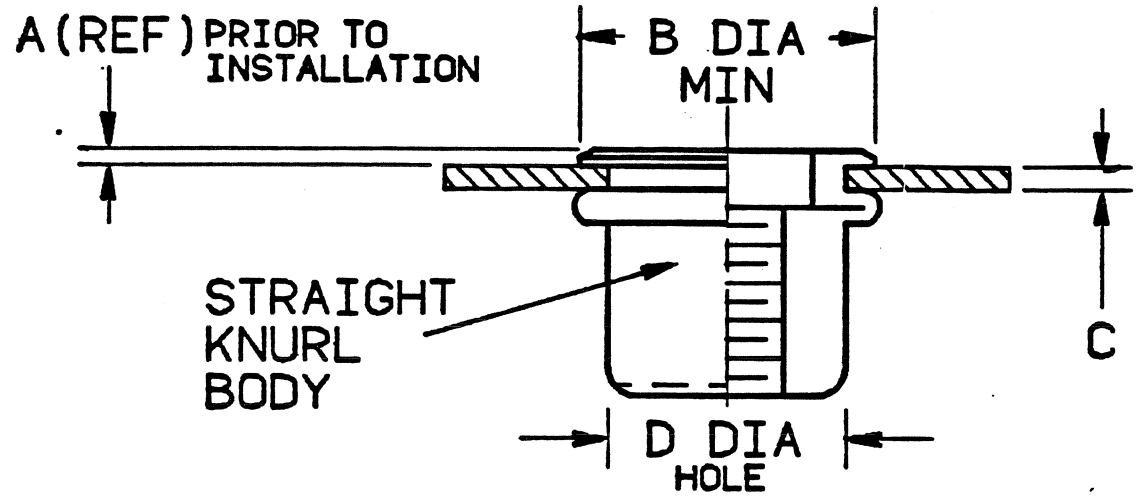
ENGINEERING NOTES:

1. MATERIAL: LOW CARBON STEEL, THROUGH HARDENED TO RC 25-32
2. FINISH: ZINC AND YELLOW WITH JS600 (.00035 MIN.) 500 HR. SALTSPRAY
3. DIMENSIONS SHOWN ARE FOR REFERENCE ONLY AND ARE IN INCHES.

CHG	JOB NO	DATE	BY	RE
-	P18269-08	12/13/02	EWR	INITIAL RELEASE



DRAWN	PCK	TITLE	ITEM NUMBER
APPRV	ANF	INSERT-THREADED KNURLED	213330 025101
DATE	07/12/88	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 2



THREAD SIZE	"A" DIM	"B" DIA	"D" DIA		"C" DIM	FREIGHTLINER PART NUMBER
			NOM DRILL SIZE	HOLE SIZE		
10-24	.016	.326	19/64	.297/ .300	.020/ .130	213330 019101
					.125/ .225	23-12014-225
10-32					.020/ .250	213330 019103
1/4-20	.016	.420	25/64	.391/ .395	.027/ .165	213330 025101
					.150/ .260	23-12026-260
5/16-18	.016	.560	17/32	.531/ .535	.027/ .150	213330 031101

ALL DIMENSIONS ARE IN INCHES

CHG	JOB/RLSE NO	DATE	BY	REVISION
C	P*A078-36	07/12/88	PCK	REDRAWN/DOCUMENTED
D	P*A078-53	08/31/88	PCK	REVISED TO LATEST VENDOR INFO
E	PL0269-06	12/23/88	RDF	CHART REV'D (SHEET 1) 23-12026-260 ADDED (SHEET 2)