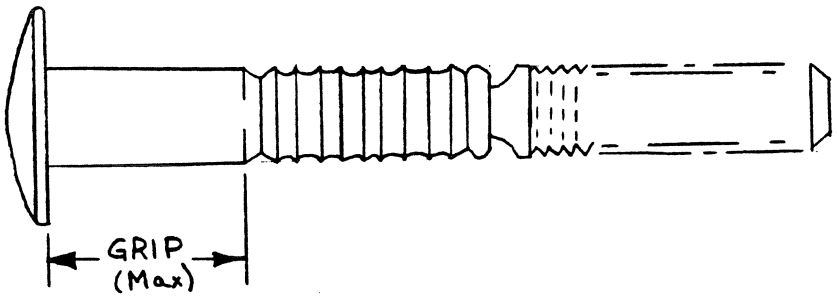
GENERAL USE PART

ORIGINAL JOB NO.	TITLE	PART NO.
	PIN, LOCKBOLT	23-9986
LAST CHG LTR: D		SHEET 1 OF 1

SKETCH:



PART NUMBERS:

NOM. DIA. (IN.)	GRIP RANGE (INCHES) MIN.	GRIP RANGE (INCHES) MAX.	HOLE DIA. (INCHES)	MATERIAL (1)	MANUFACTURERS NUMBER HBM	MANUFACTURERS NUMBER	STATUS	FREIGHTLINER PART NUMBER	
1/4	.188	.312	17/64	MILD STEEL, ZINC PLATED	C6LB-R8-4G		NC	23-9986-004	
	.250	.375			-5G		NC	-005	
	.312	.437			-6G		NC	-006	(2)
	.438	.562			-8G		NC	-008	(5)
	.563	.631			-10G		NC	-010	(5)
1/4	.188	.312	17/64	STAIN-LESS STEEL (300 SER.)	CGLB-U8-4		C	23-9986-804	
	.250	.375			-5		C	-805	(3)
	.313	.437			-6		C	-806	
	.438	.562			-8		C	-808	(4)

ENGINEERING NOTES:

(1) MATERIAL: See Table Above

(2) Use With 23-9987-0 Collar

(3) Use With 23-11315-800 Collar

(4) -104 OBS Replaced by -804
-105 OBS Replaced by -805
-106 OBS Replaced by -806
-108 OBS Replaced by -808

(5) Magna-grips 23-11036 and 23-11037 preferred.

LTR	JOB NO.	BY	DATE	CHANGE INFORMATION
D	C1692	JS	10/22/80	Revised & Redrawn

LTR	JOB NO.	BY	DATE	CHANGE INFORMATION

COMPILED	JS	DATE DRAWN		MATERIAL	
APPROVED		10-22-80		(1)	

EAC-830 Portland FREIGHTLINER CORPORATION Oregon 97208

D

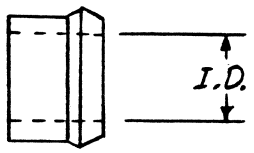
General Use Part

PRINT ISSUED	TITLE	PART NO.
3/29/71	COLLAR, LOCKBOLT	23-9987
LAST CHG. LTR. C		SHEET 1 OF 1

CHG.	BY	DATE	WAS
C	JS	10/22/80	-08-1 C to NC; Dwg. to X1; Added Notes 2 & 3; Job #C1692

CHG	BY	DATE	WAS
A	NRS	7-24-80	CHG TWS TO HBM JOB NO 66709
B	JS	10/7/80	Cad to Zinc Plating; Update Manuf. No., Job#97489

SKETCH



PART NUMBERS

NOM. I.D. (INCHES)	MATERIAL ①	MANUFACTURER'S NO. HBM				STATUS	FREIGHTLINER PART NUMBER
1/4	MILD STEEL ZINC PLT	2LC-R8				NC ②	23-9987-000
1/4	STAINLESS STEEL	2LC-2CUB				NC ③	23-9987-001

Ⓐ

ENGINEERING NOTES

① MATERIAL: SEE TABLE ABOVE

② Use with 23-9986 & 23-10121. Magna-grips 23-11036 & 23-11037 Preferred.

③ 23-11315-800 Flanged Collars Preferred.

		DATE DRAWN		MATERIAL	
COMPILED		3-16-71		①	
APPROVED					

Portland FREIGHTLINER CORPORATION Oregon 97208

X1

C A

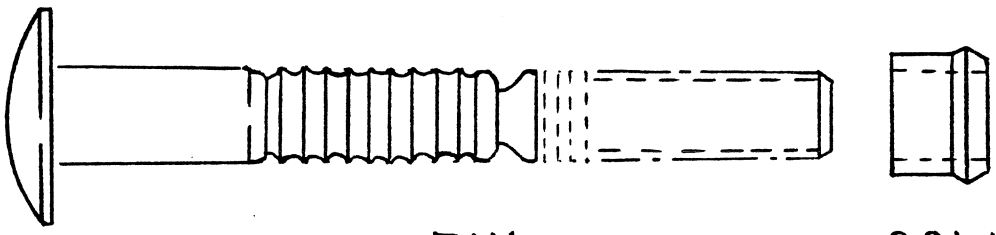
E-183

A23-9988

General Use Part

PRINT ISSUED		TITLE	PART NO.
		LOCKBOLT ASSEMBLY	A23-9988
LAST CHG. LTR.	B		SHEET 1 OF 1

SKETCH



PIN COLLAR

PART NUMBERS

PART NAME	STATUS (3)	NC	NC	NC	NC	NC	NC	NC	NC	NC
	DASH NO. A23-9988-XXX	-004	-005	-006	-008	-010	-104	-105	-106	-108
	GRIP RANGE	.188 .312	.250 .375	.312 .437	.438 .562	.563 .631	.188 .312	.250 .375	.312 .437	.438 .562
Collar, Mild Stl	23-9987-000	x	x	x	x	x				
Collar, Stainless Stl	-001						x	x	x	x
Pin, Mild Stl	23-9986-004	x								
	-005		x							
	-006			x						
	-008				x					
	-010					x				
Pin, Stainless Stl	-104						x			
	-105							x		
	-106								x	
	-108									x

ENGINEERING NOTES

1. Recommended hole diameter for application of this lockbolt assembly is 17/64.
2. Average strength: Shear = 3500 lbs.
   Tension = 3200 lbs.
3. Call Out Pin and Collar Separately.

CHG	BY	DATE	WAS
B			

CHG	BY	DATE	WAS
A	HJR	12-12-72	Add -4,-6,-10,-104,-106
			Redrawn: J #60420
B	JS	10/22/80	Added Note 3; -4 Thru -108 C to NC; Dwg. to X1; Job #C1692

ns

COMPILED	HJR	DATE DRAWN			
APPROVED	Rollins	12-12-72			

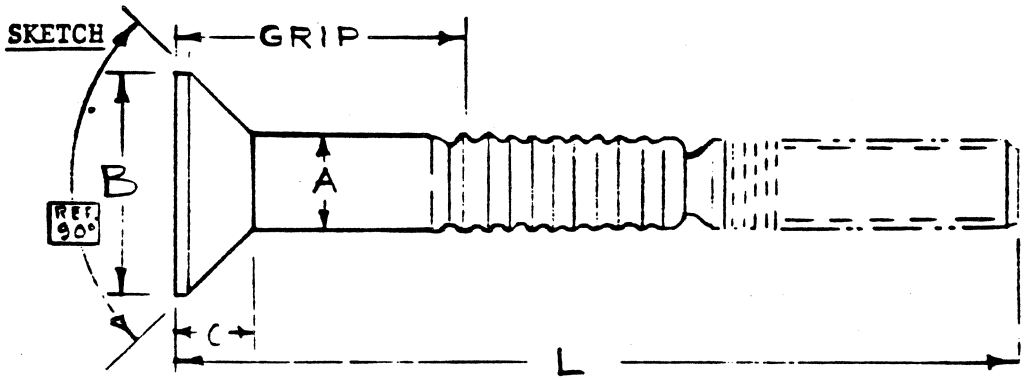
Portland FREIGHTLINER CORPORATION Oregon 97208

X1 B

General Use Part

PRINT ISSUED	TITLE	PART NO
	LOCKBOLT, 90° CSK, STEEL	23-10121
LAST CHG LTR C		SHEET 1 OF 2

SKETCH



PART NUMBERS

A DIA.	GRIP RANGE MAX.	GRIP RANGE MIN.	B	C	D HOLE (MAX.)	MFR'S NUMBER HBM	STATUS	FREIGHTLINER PART NUMBER
#6	.062	.188	11/32	5/64	13/64	C6L90-R6-2G	NC	23-10121-302
	.125	.250				-3G	NC	-303
3/16"	.188	.313				-4G	NC	-304
	.250	.375				-5G	NC	-305
.191	.313	.438				-6G	NC	-306
.195								
	.375	.500				-7G	NC	-307
	.438	.525				-8G	NC	-308
	.500	.750				-9G	NC	-309
	.563	.813				-10G	NC	-310
#8	.188	.313	15/32	7/64	17/64	C6L90-R8-4G	NC	23-10121-404
1/4"	.250	.375				-5G	NC	-405
	.313	.438				-6G	NC	-406
.254	.375	.500				-7G	NC	-407
.259	.438	.625				-8G	NC	-408
	.500	.750				-9G	NC	-409
	.563	.813				-10G	NC	-410
#10	.125	.375	37/64	9/64	21/64	C6L90-R10-4G	NC	23-10121-504
	.250	.500				-6G	NC	-506
5/16"	.375	.625				-8G	NC	-508
	.500	.750				-10G	NC	-510
.317								
.322	.625	.875				-12G	NC	-512
	.750	1.00				-14G	NC	-514

(Cont.)

COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED	[illegible]	5-6-74		See Page 2	

Portland FREIGHTLINER CORPORATION Oregon 97209

HG	BY	DATE	WAS	JOB NO.
C	JS	10/22/80	C50L to C6L 3 Places: All Dash #'s C to NC: Dwg. to X1	C1692

HG	BY	DATE	WAS	JOB NO.
A	HJR	7-22-76	Add MfrNos:Add Plating	A0831
B	JS	10/7/80	Lead to Zinc Plate;97489 Update Mfr. No.	A0614

-10121

General Use Part

PRINT ISSUED		TITLE	PART NO.
		LOCKBOLT, 90° CSK, STEEL	23-10121
LAST CHG LTR	C		SHEET 2 OF 2

HG	BY	DATE	WAS	JOB NO.
	JS	10/22/80	C50L to C6L;	C1692
			-6XX C to NC;	
			Dwg. to X1;	
			Added Notes 4 & 5	

HG	BY	DATE	WAS	JOB NO.
				A0614
A	HJR	7-22-76	Add Mfr Nos;Add Plating	A0831
B	JS	10/7/80	Cad to Zinc Plate:97489 Update Mfr. No.	

PART NUMBERS (CONT.)

	A DIA.	GRIP RANGE MAX.	GRIP RANGE MIN.	B	C	D HOLE (MAX.)	MFR'S NUMBER HBM	STATUS	FREIGHTLINER PART NUMBER
A	#12	.125	.375	11/16	5/32	25/64	C6L90-R12-4 G	NC	23-10121-604
B		.250	.500				-6 G	NC	-606
C	3/8"	.375	.625				-8 G	NC	-608
	.380	.500	.750				-10 G	NC	-610
	.385	.625	.875				-12 G	NC	-612
		.750	1.00				-14 G	NC	-614

ENGINEERING NOTES

(1) Material: Carbon steel

2. Physical properties, installed, with 2LC-R collars

	Shear (min., ult.)	Tensile (min., ult.)
3/16	= 1725 lbs.	1650 lbs.
1/4	= 3050 lbs.	3000 lbs.
5/16	= 4725 lbs.	4600 lbs.
3/8	= 6825 lbs.	6500 lbs.

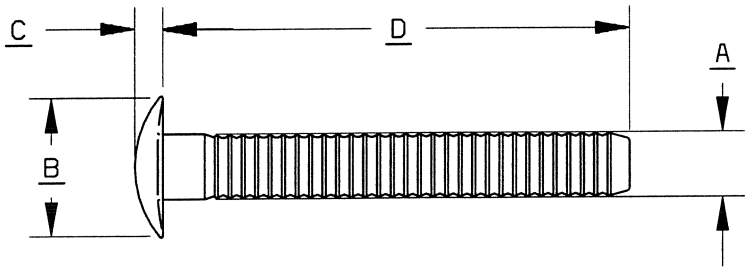
3. Finish: Zinc Plating

4. Use With 23-9987-000 Collar

5. Magna-grips 23-11316 & 23-11037 Preferred

COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED	JS	5-6-74		(1)	

DRAWN	DAJ	TITLE	DRAWING NUMBER	
APPRV	DAJ	LOCK BOLT-TRUSS & BUTTON HEAD STEEL AND ALUMINUM	23-11036	
DATE	01/08/99	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. M
CATIA ORIGINAL				



	NOM DIA	A	B	C	D +.025 -.000	GRIP RANGE	HEAD TYPE	MATL	MANUFACTURER'S NUMBERS AV	MANUFACTURER'S NUMBERS HBM	FREIGHTLINER PART NUMBER
M	3/16	.183-.187	.356-.394	.113-.125	1.788	.062-.625	B	AL		MGPB-E6-10	23-11036-631
L							B	STL		MGPB-R6-10G	23-11036-630
			.468	.093			T	STL	1901-0610	MGP98T-R6-10G	23-11036-610
							T	AL		MGP98T-E6-10	23-11036-600
M					2.370	.312-1.250	T	STL	1901-0620	MGP98T-R6-20G	23-11036-620
	1/4	.245-.249	.562	.109	1.965	.062-.625	T	STL		MGPT-R8-10G	23-11036-830
							T	AL		MGPT-E8-10G	23-11036-801
			.500	.140			B	STL	1901-0810	MGPB-R8-10G	23-11036-810
					2.560	.312-1.250	B	STL	1901-0820	MGPB-R8-20G	23-11036-820
			.475-.525	.136-.152	2.560	.312-1.250	B	AL		MGPB-E8-20	23-11036-811
M	3/8	.369-.375	.713-.787	.223-.248	2.875	.125-.875	B	AL		MGPB-E12-14	23-11036-121

NOM DIA	CLEARANCE HOLE SIZE MAX	*TENSILE STRENGTH STL	*TENSILE STRENGTH AL	*SHEAR STRENGTH STL	*SHEAR STRENGTH AL	*CLAMPING FORCE STL	*CLAMPING FORCE AL
3/16	.203(13/64)	2250	1250	2050	930	1300	900
1/4	.266(17/64)	3500	2150	2650	1650	1800	1500
3/8	.390(25/64)	7600	5400	5050	3750	4500	2900

M

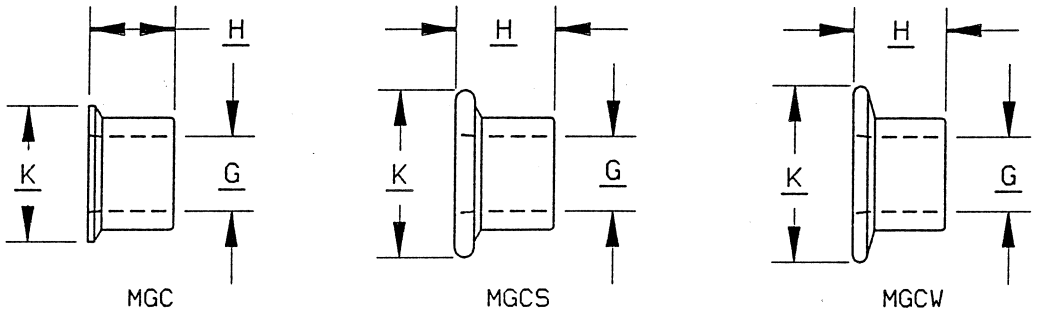
* TYPICAL STRENGTHS, IN POUNDS, OF INSTALLED FASTENER

ENGINEERING NOTES:

1. MATERIAL: STEEL ZINC PLATED
   ALUMINUM 7075 T6
2. FINISH: ZINC PLATED.
3. USE WITH 23-11037 FLANGED COLLAR.
4. HEAD STYLE: T = TRUSS HEAD, B = BUTTON HEAD.

CHG	JOB NO	DATE	BY	REVISION
K	PA2042-95	01/08/99	DAJ	REVISED AND REDRAWN IN CATIA
L	P03724-07	12/15/99	LFB	ADDED -630.
M	P11003-03	03/24/00	LFB	.312 WAS .937, 2.875 WAS 3.500, .125-.875 WAS
				.812-1.625. REVISED TYP. STRENGTHS FOR 3/8 NOM DIA.
				ADDED -631.

DRAWN	DAJ	TITLE	DRAWING NUMBER	
APPRV	DAJ	COLLAR - LOCK BOLT WIDE GRIP, STEEL AND ALUMINUM	23-11037	
DATE	10/23/97	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. K
CATIA ORIGINAL				



SIZE	TYPE	G	H	K	MAT'L	VENDOR/PN		FREIGHTLINER PART NUMBER
						AV	HBM	
3/16	MGC	.190- .194	.270- .280	.368- .382	STEEL	1981-0600	MGC-R6U	23-11037-600
	MGCW	.184- .197	.308- .358	.640- .763	STEEL	-	MGCW-R6U	23-11037-601
	MGCS	.189- .195	.290- .320	.500- .530	STEEL	1981-0600	MGCS-R6U	23-11037-602
	MGC	.190- .194	.270- .280	.368- .382	AL	-	MGC-F6	23-11037-603
1/4	MGC	.252- .255	.370- .380	.490- .510	STEEL	1981-0800	MGC-R8U	23-11037-800
	MGCW	.252- .255	.432- .462	.855- 1.000	STEEL	-	MGCW-R8U	23-11037-801
	MGCW	.252- .255	.432- .462	.855- 1.000	AL	-	MGCW-F8	23-11037-802
	MGC	.252- .255	.370- .380	.490- .510	AL	-	MGC-F8	23-11037-803
3/8	MGC	.378- .382	.500- .510	.740- .760	AL	-	MGC-F12	23-11037-120
C 5/16	MGC	.314- .318	.432- .444	.612- .637	STEEL	-	MGC-R10U	23-11037-100

ENGINEERING NOTES:

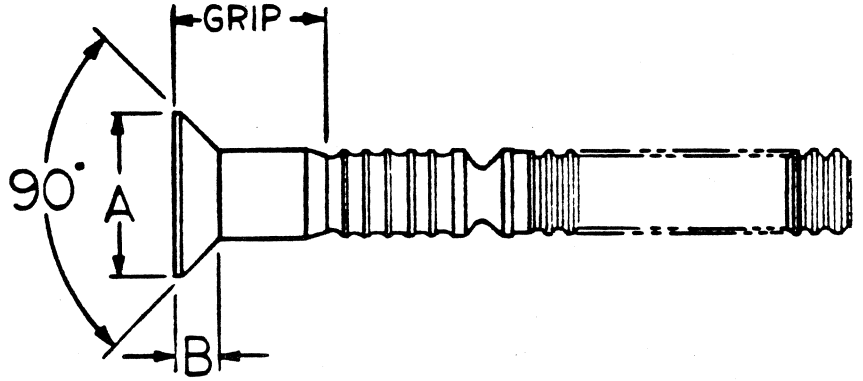
1. DIMENSIONS SHOWN ARE FOR REFERENCE ONLY.
2. FINISH: STEEL - ZINC/YELLOW DICHROMATE, ACCEPTABLE ALT. CAD PLATE.
   ALUMINUM - PLAIN.

CHG	JOB NO	DATE	BY	REVISION
K	P03725-01	10/23/97	DAJ	REVISED AND REDRAWN IN CATIA, ADDED -100.

DUPLICATE TRACING, ORIGINAL LOST

ORIGINAL JOB NO.	TITLE	PART NO.
64680	LOCKBOLT	23-11049
LAST CHG LTR E		SHEET 1 OF 1

SKETCH



NOM. DIA. INCHES	GRIP RANGE	MAX. HOLE SIZE	INTERFERENCE FIT HOLE SIZE	A	B	MFR. NO. HBM	STATUS	FREIGHTLINER PART NUMBER	
1/4	.38 ± .06	7/64	.250 .254	.469	.177- .101	C6L90-U8-6 (1)	C	23-11049-806	6 3
1/4	1/4 to 1/2	17/64	.250 .254	.469	.177- .101	C6L90-R8-5G (4) (C)	NC (7)	23-11049-005	5
1/4	.31 ± .06	17/64	.250 .254	(C) .450 .470	.177 .101	C6L90-U8-5X (1)	C	23-11049-805	3 6

ENGINEERING NOTES:

(1.) MATERIAL: 300 SERIES STAINLESS STEEL

2. MINIMUM STRENGTH OF INSTALLED FASTENER:

	-105	-005
-006: SHEAR	3550 lbs.	3050 lbs.
TENSION	2750 lbs.	3000 lbs.

(3.) SEE 23-11315-300 FOR COLLAR

D (4.) MATERIAL -005(CARBON STEEL - (ZINC PLATE)(A)

(5) SEE 23-9987-000 FOR COLLAR(A)

(6) -006 OBS REPLACED BY -806
-105 OBS REPLACED BY -805

(7) Magna-grips 23-11316 & 23-11037 Preferred

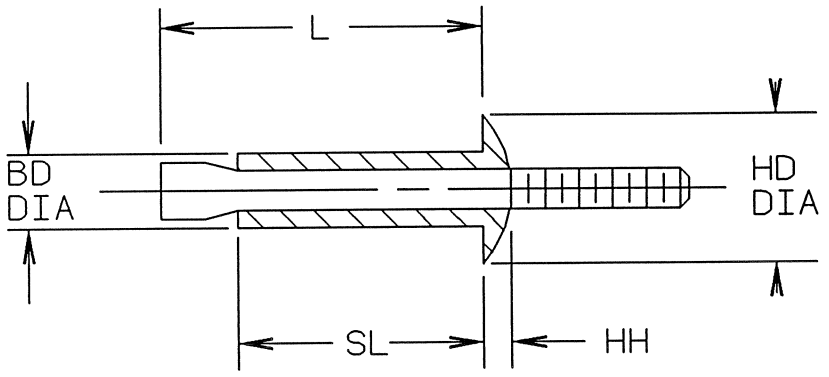
COMPILED	S.B.	DATE DRAWN		MATERIAL	
APPROVED	NLK	9/6/77		(1) (4)	

CHANGE INFORMATION

JOB NO.	BY	DATE	
			E
			D
C1692	JS	10/22/80	Revise Note (3) -005 C to NC; Added Note (6) (7); Huck bolt to Lockbolt
B1057	RLE	6/16/78	Added -105
C1188	GEH	9/8/78	CHG "A" DIM ON -105
			ADD "X" TO HUCK P/N
D 97489	JS	10/7/80	Cad to Zinc Plate; Update Mfr. No.

DRAWN	RDF	TITLE MONOBOLT/MAGNA-LOK PROTRUDING HEAD	ITEM NUMBER 23-11052
APPRV	PCK		
DATE	09/28/89	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1

SKETCH



PART NUMBERS:

NOM DIA	BD DIA	SL	HD DIA	HH	L MAX	GRIP RANGE	HOLE SIZE	MFR/PART NUMBER	FREIGHTLINER PART NUMBER
3/16	.186 TO .1905	.400 TO .415	.360 TO .400	.067 TO .095	.716	.064 TO .270	.191 TO .201	HBM/UMGLP-R6-4 CHERRY/SSPI-06-04	23-11052-001
3/16	.186 TO .1905	.525 TO .590	.360 TO .400	.067 TO .095	.962	.064 TO .437	.191 TO .201	HBM/UMGLP-R6-E CHERRY/SSPI-E06-07	..........-002
1/4	.2546 TO .2570	.544 TO .560	.500 TO .525	.096 TO .127	.970	.080 TO .375	.261 TO .272	HBM/UMGLP-R8-6 CHERRY/SSPI-08-06	..........-101
1/4	.2546 TO .2570	.744 TO .810	.500 TO .525	.096 TO .127	1.405	.080 TO .625	.261 TO .272	HBM/UMGLP-R8-E CHERRY/SSPI-08-10	..........-102

ENGINEERING NOTES:

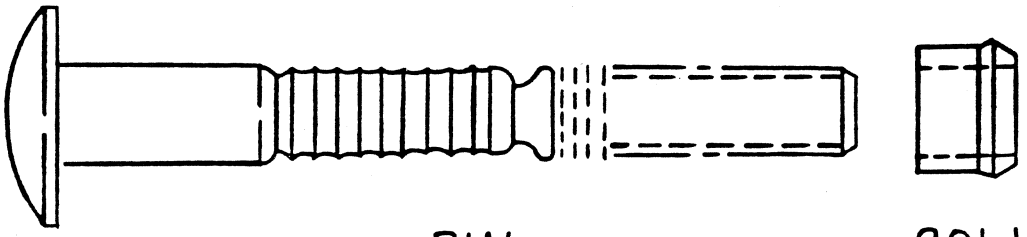
1. MATERIAL: STEEL, ZINC PLATED.
2. FOR 1/4" MONOBOLT/MAGNALOK ..... : MINIMUM SHEAR STRENGTH 2400 LBS.
   ..... MINIMUM TENSILE STRENGTH 1850 LBS.
   FOR 3/16" MONOBOLT/MAGNALOK ..... : MINIMUM SHEAR STRENGTH 1300 LBS.
   ..... MINIMUM TENSILE STRENGTH 1000 LBS.

CHG	JOB/RLSE NO	DATE	BY	REVISION
F	P4386F-01	09/28/89	RDF	REVISED TO CONFORM W/ SPECIFICATIONS OF HUCK & AVDEL MAGNA-LOK FROM MGLP-XX TO UMGLP-XX
G	P2A220-46	02/13/95	DAJ	REMOVED AVDEL PART NUMBERS.
H	PA2042-73	09/30/96	DAJ	ADDED CHERRY PART NUMBERS AND REVISED NOTE 2.

General Use Part

ORIGINAL JOB NO.	TITLE	PART NO.
74125	LOCKBOLT ASSEMBLY	A23-11123
LAST CHG LTR: A		SHEET 1 OF 1

SKETCH



PIN COLLAR

PART NUMBERS	STATUS ③	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
	DASH NO. A23-11123-XXX	-002	-003	-004	-005	-006	-102	-103	-104	-105	-106
	GRIP RANGE	.06 .19	.12 .25	.19 .31	.25 .38	.31 .44	.06 .19	.12 .25	.19 .31	.25 .38	.31 .44
COLLAR, MILD STL.	23-11125-000	X	X	X	X	X					
COLLAR, STAINLESS STEEL	-001						X	X	X	X	X
PIN, MILD STEEL	23-11124-002	X									
	-003		X								
	-004			X							
	-005				X						
	-006					X					
PIN, STAINLESS STEEL	23-11124-102						X				
	-103							X			
	-104								X		
	-105									X	
	-106										X

ENGINEERING NOTES

1. Recommended hole diameter for application of this lockbolt assembly is 13/64.
2. Minimum Ultimate Load: Mild Steel, Shear=1725 lbs., Tensile=1650 lbs. Stainless Steel, Shear=2000 lbs., Tensile=1455 lbs.

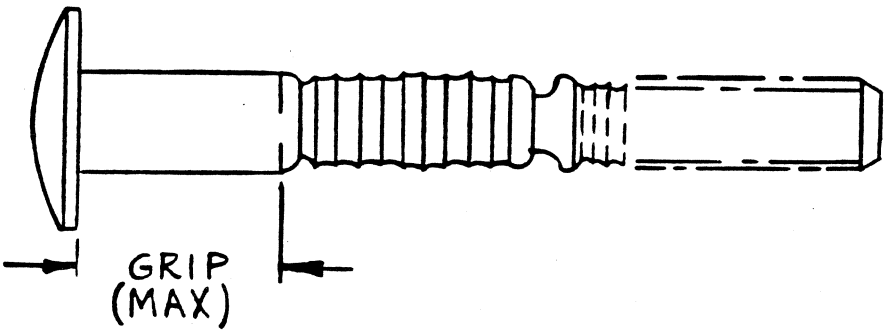
③ Call Out Pin and Collar Separately.

CHANGE INFORMATION	DATE	BY	JOB NO.

General Use Part

ORIGINAL JOB NO.	TITLE	PART NO.
74125	PIN, LOCKBOLT	23-11124
LAST CHG LTR B		SHEET 1 OF 1

SKETCH



PART NUMBERS

NOMINAL DIA. (INCHES)	GRIP RANGE (INCHES) MIN.	GRIP RANGE (INCHES) MAX.	RECOMMENDED HOLE DIA. (INCHES)	MATERIAL 1	MANUFACTURERS NUMBER HBM	FREIGHTLINER PART NUMBER	STATUS	
3/16	.06	.19	13/64	MILD STEEL ZINC PLATED	C6LB-R6-2G	23-11124-002	NC	
	.12	.25			-3G	-003	NC	
	.13	.31			-4G	-004	NC	(3)
	.25	.38			-5G	-005	NC	
	.31	.44			-6G	-006	NC	
3/16	.06	.19	13/64	STAINLESS STEEL	C6LB-U6-2	-602	C	
	.12	.25			-3	-603	C	(4) (5)
	.19	.31			-4	-604	C	
	.25	.38			-5	-605	C	
	.31	.44			-6	-606	C	

ENGINEERING NOTES:

B (3) Magna-grips 23-11036 & 23-11037 Preferred

B (4) Use with 23-11315 Collars

B (5) -102 OBS Replaced by -602
-103 OBS Replaced by -603
-104 OBS Replaced by -604
-105 OBS Replaced by -605
-106 OBS Replaced by -606

(1) MATERIAL: See Table Above

2. ULTIMATE LOAD: Mild Steel, Shear=1725 lbs., Tensile=1650 lbs.
Stainless Steel, Shear=2000 lbs., Tensile=1455 lbs.

COMPILED	JSJ	DATE DRAWN		Material	
APPROVED	JFEM	8-21-78		(1)	

CHANGE INFORMATION

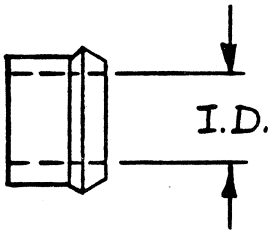
A	97489	JS	10/7/80
B	C1692	JS	10/22/80

Cad to Zinc Plate:Updat
Mfr. No.
Removed Next Assy. No.;
-00X C to NC; Added Notes (3) (4) & (5)

General Use Part

PRINT ISSUED	TITLE	PART NO
74125	COLLAR, LOCKBOLT	23-11125
LAST CHG LTR: B		SHEET 1 OF 1

SKETCH



PART NUMBERS

	NOMINAL I.D. (INCHES)	MATERIAL 1	MFG. NUMBER HBM	FREIGHTLINER PART NUMBER	STATUS
B	3/16	MILD STEEL ZINC PLATED	2LC - R6	23-11125-000	NC
A					
B	3/16	STAINLESS STEEL	2LC - 2CU6	-001	NC (2)

ENGINEERING NOTES

(1) MATERIAL: See Table Above

(2) Flanged Collar 23-11315 Preferred

WAS	DATE	BY	MG

WAS	DATE	BY	MG
Cad to Zinc Plate; Job#97489	10/7/80	JS	
-08-1 C to NC; Added Note (2); Dwg. to X1; Job #C1692	10/22/80	JS	
			B

COMPILED	JSJ	DATE DRAWN		Material	Next Assy. No.
APPROVED	[illegible]	8-21-78		(1)	A23-11123

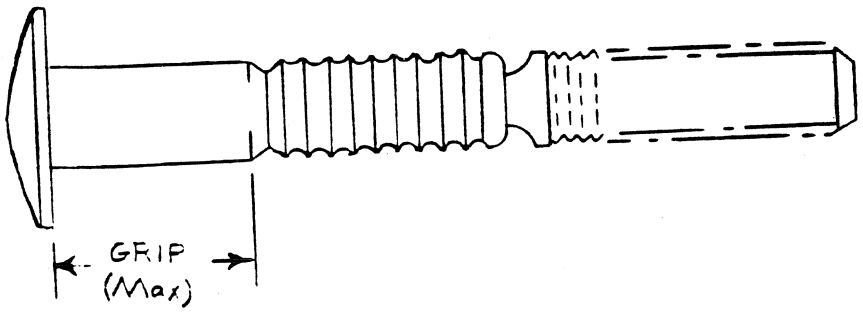
General Use Part

ORIGINAL JOB NO.	TITLE	PART NO.
C 1369	PIN, LOCK BOLT TRUSS HEAD	23 - 11171
LAST CHG LTR		SHEET 1 OF 1

CHANGE INFORMATION

JOB NO.	BY	DATE

SKETCH



PART NUMBERS

NOM. DIA.	GRIP RANGE (INCHES) MIN.	GRIP RANGE (INCHES) MAX.	RECOMMENDED HOLE DIA. (INCHES)	MATERIAL (1)	MFR'S NUMBER HBM	FREIGHTLINER PART NUMBER
1/4	.06	.19	17/64	MILD STEEL, CAD. PLATED	C6LT-R8-2	23-11171 - 002
	.12	.25			-3	- 003
	.19	.31			-4	- 004
	.25	.38			-5	- 005
	.31	.44			-6	- 006
	.38	.50			-7	- 007
	.44	.56			-8	- 008
	.50	.62			-9	- 009
	.56	.69			-10	- 010
	.62	.75			-11	- 011
	.69	.81			-12	- 012
	.75	.88			-13	- 013
	.81	.94			-14	- 014
	.88	1.00			-15	- 015

CHANGE INFORMATION

JOB NO.	BY	DATE

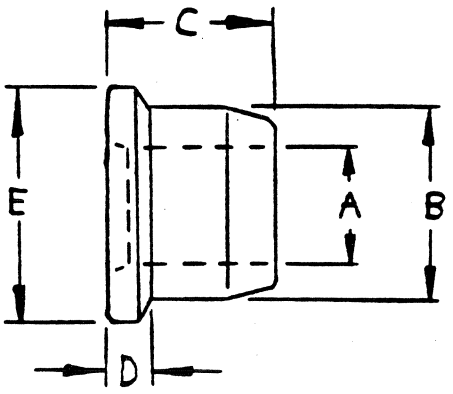
ENGINEERING NOTES:

(1) Material: See Table Above

COMPILED	JSJ	DATE DRAWN		MATERIAL	
APPROVED	GEH	11/21/78		(1)	

ORIGINAL JOB NO.	TITLE	PART NO.
C1692	COLLAR, LOCKBOLT, FLANGED, STAINLESS STEEL	23-11315
LAST CHG LTR		SHEET 1 OF 1

SKETCH:



SPECIFICATIONS:

DIA.	A	B	C	D	E		MANUFACTURERS NO. HBM		FREIGHTLINER SPECIFICATION NUMBER
3/16	.187-.196	.311-.304	.280-.250	.062-.031	.391-.359		3LC-2CU-6		23-11315-600
1/4	.256-.267	.409-.402	.379-.349	.078-.047	.516-.484		3LC-2CU-8		-800

NOTES:

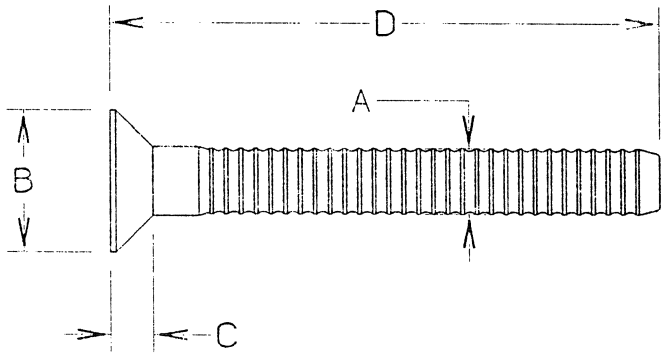
1. MATERIAL: Stainless Steel
2. For use with 23-9986-8XX and 23-11049-806 & 805.

CHANGE INFORMATION	DATE	BY	JOB NO.	LTR

CHANGE INFORMATION	DATE	BY	JOB NO.	LTR

COMPILED	JS	DATE DRAWN			
APPROVED		9/29/80			

DRAWN	PTF	TITLE	ITEM NUMBER
APPRV	BKA	LOCK BOLT-90° FLUSH HEAD MAGNA-GRIP	23-11316
DATE	08/09/97	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



NOM DIA	MANUFACTURER PART NUMBER	GRIP RANGE	"A" DIM	"B" DIM	"C" DIM	"D" DIM	MATL	FREIGHTLINER PART NUMBER
3/16	MGP90-R6-10G	.062-.625	.183-.187	.323-.359	.092-.102	1.788	STL	23-11316-610
3/16	MGP90-R6-20G	.312-1.250	.183-.187	.323-.359	.076-.087	2.370	STL	23-11316-620
1/4	MGP90 R8-10G	.062-.625	.245-.249	.433-.478	.119-.128	1.965	STL	23-11316-810
1/4	MGP90-R8-20G	.312-1.250	.245-.249	.433-.478	.102-.115	2.560	STL	23-11316-820
1/4	MGP90-E8-10	.062-.625	.245-.249	.433-.478	.119-.128	1.965	AL	23-11316-811

ENGINEERING SPECIFICATIONS:

NOM DIA	CLEARANCE HOLE SIZE MAX	* TENSILE STRENGTH		* SHEAR STRENGTH		* CLAMPING FORCE	
		STL	AL	STL	AL	STL	AL
3/16	.203(13/64)	1400	900	1725	750	925	550
1/4	.266(17/64)	2550	1620	2200	1200	1200	950

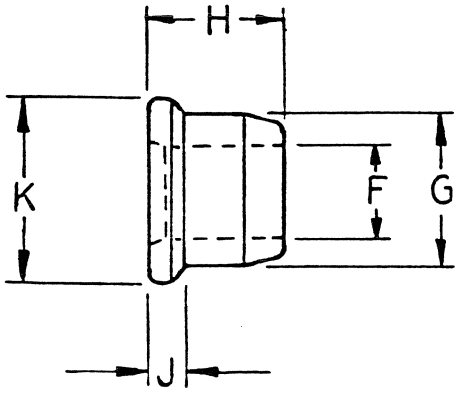
* TYPICAL STRENGTHS, IN POUNDS, OF INSTALLED FASTENER

1. MATERIAL: STEEL ZINC PLATED
   ALUMINUM 7075 T6
2. USE WITH 11-11037 COLLARS

CHG	JOB/RLSE NO	DATE	BY	REVISION
C	P02829-13	08/09/97	PTF	REDRAWN ON CADAM, ADDED -811, UPDATE ENG SPEC

ORIGINAL JOB NO.	TITLE	PART NO.
M0268	COLLAR, HUCKBOLT TYPE 3LC	23-11654
LAST CHG LTR		SHEET 1-3/ OF 1

Collars. HPCF R12 1/8
R16 1/2
R20 5/8
R24 3/4



Grip Range
12 - 1/2 - 1
16 - 3/4 - 1 1/4
20 - 1 - 1 1/2
28 1/2 - 2

NOM. DIA.	F DIA.	G DIA.	H LENGTH	J DIM.	K DIA.	MANUFACTURER'S NUMBER (HBM)	FREIGHTLINER PART NUMBER
.188 (No. 6)	.187 / .196	.311 / .304	.280 / .250	.062 / .031	.391 / .359	3LC120-2R6	23-11654-006
.250 (No. 8)	.256 / .267	.409 / .402	.379 / .349	.078 / .047	.516 / .484	3LC120-2R8	-008
.312 (No.10)	.304 / .312	.507 / .498	.426 / .394	.094 / .062	.641 / .609	3CL120-2R10	-010
.375 (No.12)	.378 / .390	.610 / .599	.532 / .502	.125 / .062	.781 / .719	3LC120-2R12	-012

Bolts (HBM) HP8F DT 12 = 3/8 DT 16 = 1/2 - grip range -
DT 20 = 5/8
DT 24 = 3/4

ENGINEERING NOTES:

(1) Material: Low carbon steel

2. Finish: Zinc plated

52 - 3 - 3 1/2
60 - 3 1/2 - 4"

-8 = 1/4 - 3/4 grip range
-12 = 1/2 - 1"
-16 = 3/4 - 1 1/4"
-20 = 1 - 1 1/2"
-28 - 1 1/2 - 2"
-36 - 2 - 2 1/2
-44 - 2 1/2 - 3

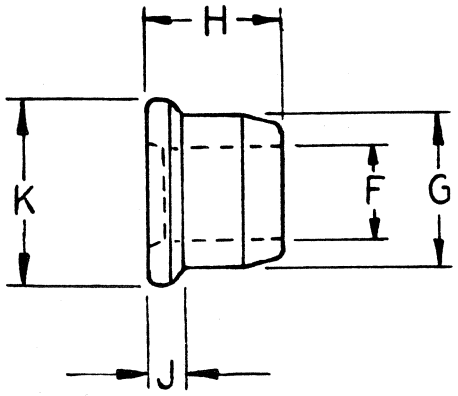
COMPILED	D.LeL.	DATE DRAWN		MATERIAL	
APPROVED		3-20-84		(1)	

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

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

ORIGINAL JOB NO.	TITLE	PART NO.
M0268	COLLAR, HUCKBOLT TYPE 3LC	23-11654
LAST CHG LTR		SHEET 1 OF 1

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



NOM. DIA.	F DIA.	G DIA.	H LENGTH	J DIM.	K DIA.	MANUFACTURER'S NUMBER HBM	FREIGHTLINER PART NUMBER
.188 (No. 6)	.187 / .196	.311 / .304	.280 / .250	.062 / .031	.391 / .359	3LC120-2R6	23-11654-006
.250 (No. 8)	.256 / .267	.409 / .402	.379 / .349	.078 / .047	.516 / .484	3LC120-2R8	-008
.312 (No.10)	.304 / .312	.507 / .498	.426 / .394	.094 / .062	.641 / .609	3CL120-2R10	-010
.375 (No.12)	.378 / .390	.610 / .599	.532 / .502	.125 / .062	.781 / .719	3LC120-2R12	-012

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

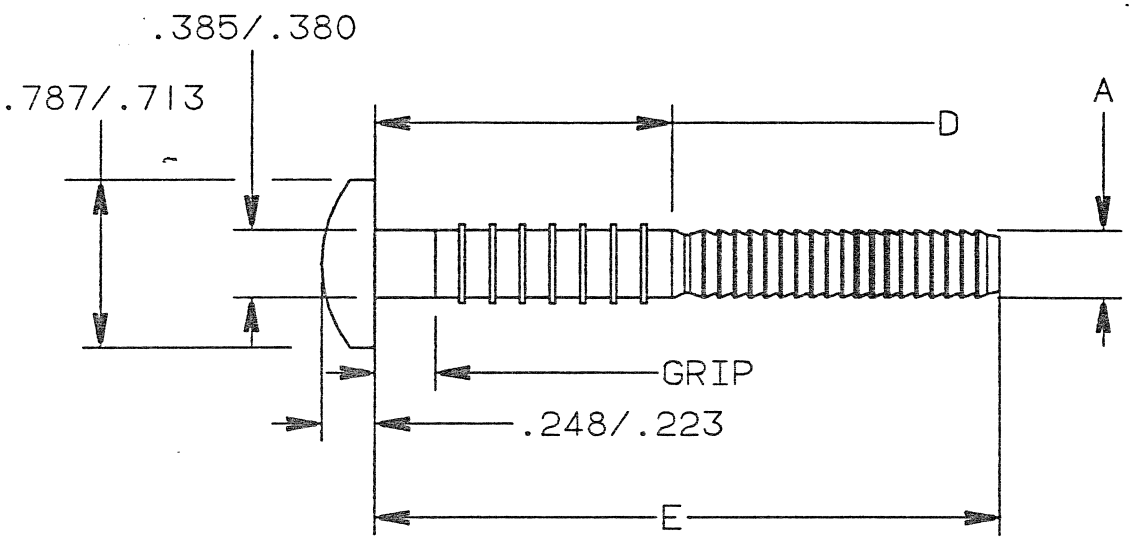
ENGINEERING NOTES:

(1) Material: Low carbon steel

2. Finish: Zinc plated

COMPILED	D.LeL.	DATE DRAWN		MATERIAL	
APPROVED		3-20-84		(1)	

DRAWN	PCK	TITLE	ITEM NUMBER
APPRV	ANF	PIN, HUCKBOLT TYPE C120L	23-11655
DATE	08/27/90	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



A NOM DIA	MAX. GRIP	MIN GRIP	GRIP NO.	D±.031	E +.125 -.000	MANUFACTURER'S NUMBERS HBM	FREIGHTLINER PART NUMBER
3/8	.375	.125	4	.809	2.125	C120LB-R12-4	23-11655-004
	.500	.250	6	.934	2.250	C120LB-R12-6G	23-11655-006
	.625	.375	8	1.059	2.375	C120LB-R12-8	23-11655-008
	.750	.500	10	1.184	2.500	C120LB-R12-10	23-11655-010
	.875	.625	12	1.309	2.625	C120LB-R12-12	23-11655-012

ENGINEERING SPECIFICATIONS:

DIA.	HOLE SIZE MAX/MIN	* TENSILE STRENGTH	* SHEAR STRENGTH	* CLAMPING FORCE
3/8	.390/.385	9300	9600	5980

* MINIMUM STRENGTHS, IN POUNDS, OF INSTALLED FASTENER
1. MATERIAL, CARBON STEEL
2. FINISH: 23-11655-004, -008, -010 AND -012 BLACK OILED FINISH.
23-11655-006 MUST BE ZINC PLATED PER FREIGHTLINER SPECIFICATION 49-00005-403

CHG	JOB/RLSE NO	DATE	BY	REVISION
A	P7328G-01	08/27/90	PCK	REDRAWN. REVISED FINISH DETAILS

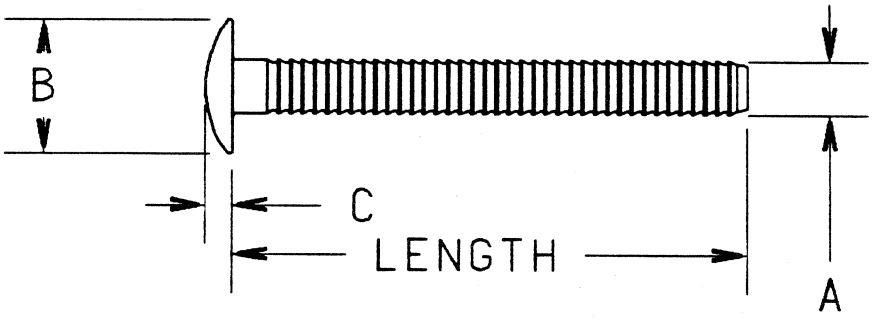
GENERAL USE PART

23-11686

ORIGINAL JOB NO.	TITLE	PART NO.
K0183	LOCK BOLT, WIDE GRIP RANGE & PRIMED	23-11686
LAST CHG LTR		SHEET 1 OF 1

SCOPE: THIS SPECIFICATION DESCRIBES A LOCK BOLT THAT ALLOWS AN EXTENDED GRIP RANGE AND HAS A PRE-PRIMED HEAD.

APPLICATION: A FASTENER USED AFTER E-COAT ON THE CAB EXTERIOR THAT CAN BE TOP COAT PAINTED.



SPECIFICATION NUMBERS:

DIA.	MIN. GRIP	MAX. GRIP	LENGTH	MANUFACTURER'S NUMBERS		FREIGHTLINER SPECIFICATION NUMBER
				HBM		
3/16	.06	.62	1.788	MGP98T-R6-10G-PG		23-11686-610
1/4	.06	.62	1.788			23-11686-810

ENGINEERING SPECIFICATIONS:

DIA.	A	B	C	HOLES SIZE MAX	**TENSILE	**SHEAR	**CLAMP FORCE	
3/16	.187 / .183	15/32	3/32	13/64	1350*	1250*	800*	23-11686-610
1/4	.251 / .245	9/16	1/8	17/64	2450*	2200*	1400*	23-11686-810

* WITH WIDE GRIP RANGE LOCK BOLT COLLAR, 23-11037-###, FOR ALL OTHER COMBINATIONS CONTACT THE MANUFACTURERS.

** MINIMUM STRENGTHS (WITH PLATING).

1. NOTE: MATERIAL, ZINC PLATED, THAN ZINC PHOSPHATED AND PRIMED PER F/L SPECIFICATION 49-00023-104.

CHANGE INFORMATION	DATE	BY	JOB NO.	LTR

CHANGE INFORMATION	DATE	BY	JOB NO.	LTR

COMPILED	CAJ	DATE DRAWN	CADAM ORIGINAL	UNIT OF MEASURE	MASTER NUMBER	
APPROVED	BEL	7-23-84		EA	01270	000D1

M/F

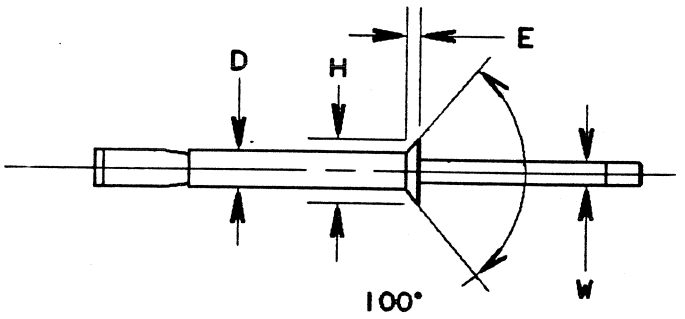
PORTLAND FREIGHTLINER CORPORATION OREGON 97208

GENERAL USE PART

23-11731

ORIGINAL JOB NO.	TITLE	PART NO.
9658C	MONOBOLT, COUNTERSUNK, HD	23-11731
LAST CHG LTR -		SHEET 1 OF 1

SKETCH:



PART NUMBERS:

NOM DIA	W DIA	D DIA	H DIA	E DIM		GRIP RANGE	HOLE SIZE	MANUFACTURER'S NUMBER TWS		FREIGHTLINER PART NUMBER
3/16	.118	.187	.335	.070		.125 TO .331	.191 TO .201	SSCV-66		23-11731-001

SPECIFICATIONS:

1. MATERIAL: STEEL, ZINC PLATED.
2. FOR 3/16" MONOBOLT: AVERAGE SHEAR STRENGTH 1300 LBS.
   AVERAGE TENSILE STRENGTH 1000 LBS.
   MANDREL PUSH-OUT 100 LBS.

CHANGE INFORMATION	DATE	BY	JOB NO.	LTR

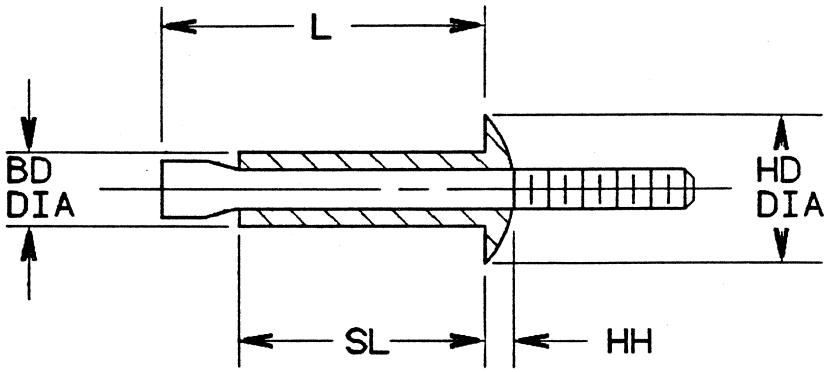
CHANGE INFORMATION	DATE	BY	JOB NO.	LTR

COMPILED	SJF	DATE DRAWN	CADAM ORIGINAL	UNIT OF MEASURE	MASTER NUMBER	
APPROVED	DJL	06-01-85		EA.	01270	00001

GENERAL USE PART

ORIGINAL JOB NO.	TITLE	PART NO.
L0224	MONOBOLT, STAINLESS STEEL	23-11784
LAST CHG LTR		SHEET 1 OF 1

SKETCH



PART NUMBERS:

NOM DIA	BD DIA	SL	HD DIA	HH	L	GRIP RANGE	HOLE SIZE	MANUFACTURER'S NUMBER TWS		FREIGHTLINER PART NUMBER
1/4	.257	.556	.515	.100	.924	.080 TO .375	.261 TO .276	CCPV-86		23-11784-000

ENGINEERING NOTES:

(1) MATERIAL: STAINLESS STEEL

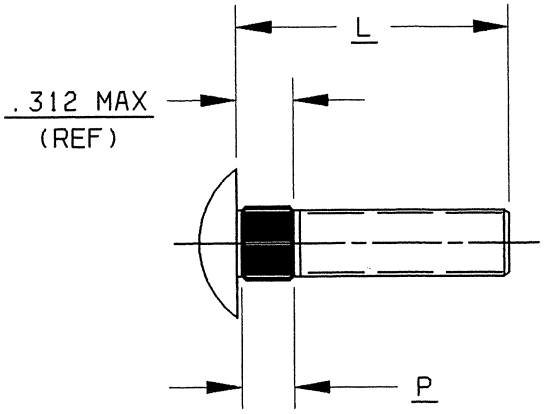
2. FOR 1/4" MONOBOLT: AVERAGE SHEAR STRENGTH 2650 LBS.
AVERAGE TENSILE STRENGTH 2350 LBS.

CHANGE INFORMATION	DATE	BY	JOB NO.	LTR

CHANGE INFORMATION	DATE	BY	JOB NO.	LTR

COMPILED	RJN	DATE DRAWN	CADAM ORIGINAL	MATERIAL	MASTER NUMBER	
APPROVED	RWM	09-27-85		(1)	01270	000D1

DRAWN	ERK	TITLE	DRAWING NUMBER	
APPRV	DAM	BOLT-ROUND HEAD RIBBED NECK	23-12177	
DATE	05/14/97	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. E
CATIA ORIGINAL				



THREAD SIZE	P DEPTH OVER RIBS (IN)	FREIGHTLINER PART NUMBERS*
3/8-16	.594	23-12549-L
3/8-16	.250	23-12561-L
5/16-18	.250±.031	23-12177-L (4)

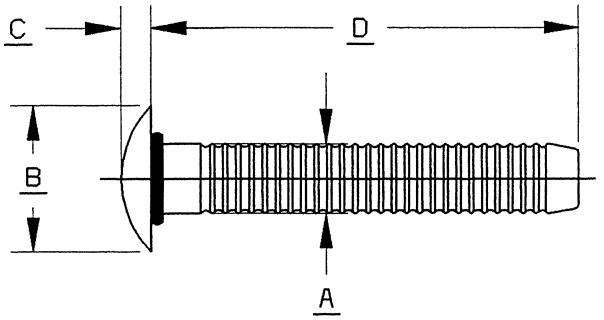
* THREE-DIGIT DASH NUMBER INDICATES LENGTH IN INCHES.
E.G.: 23-12177-300 IS A 5/16-18 RIBBED NECK BOLT
3 INCHES LONG.

ENGINEERING NOTES:

1. MATERIAL: STEEL, GRADE 5 PER SAE J429.
2. THREADS: UNRC-2A
3. FINISH: ZINC PLATE WITH YELLOW DICHROMATE PER FL 49-00005-203.
4. SHALL CONFORM TO ANSI B18.5 EXCET FOR "P".
5. SHALL CONFORM TO ANSI B18.5.

CHG	JOB NO	DATE	BY	REVISION
B	P00401-03	05/27/97	DAJ	REVISED AND REDRAWN IN CATIA. ADDED -125 & -150.
C	P00560-03	04/21/98	DAJ	REMOVED L COLUMN IN TABLE, REPLACED BY P/N NOTE.
D	PC3202-40	09/28/98	DAJ	ADDED 23-12549 AND NOTE 5.
E	P06842-01	11/03/98	DAJ	ADDED 23-12561.

DRAWN	DAJ	TITLE	DRAWING NUMBER	
APPRV	DAJ	BOLT - LOCK STEEL AND ALUMINUM W/SEAL	23-12209	
DATE	10/23/97	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. D
CATIA ORIGINAL				



	NOM DIA	A	B	C	D +.000 -.020	GRIP RANGE	HEAD TYPE	MAT'L	VENDOR/PN HBM	FREIGHTLINER PART NUMBER
	1/4	.245-.249	.500	.140	1.965	.062-.625	B	STL	MGPB-R8-10G-S1	23-12209-001
					2.560	.312-1.250	B	STL	MGPB-R8-20G-S1	23-12209-003
			.937	.150	1.965	.156-.625	T	STL	MGP30-R8-10G-S1	23-12209-006
D				.109	2.810	.625-1.500	T	STL	MGP30-R8-24G-S1	23-12209-007
	3/16	.183-.187	.468	.093	1.788	.062-.625	T	AL	MGP98T-E6-10-S1	23-12209-000
							T	STL	MGP98T-R6-10G-S1	23-12209-002
	5/16	.307-.311	.703-.797	.127-.141	2.340	.125-.750	T	STL	MGPT-R10-12G-S1	23-12209-004
C					2.840	.625-1.375	T	STL	MGPT-R10-22G-S1	23-12209-005

NOM DIA	CLEARANCE HOLE SIZE (MAX)	*TENSILE STRENGTH		*SHEAR STRENGTH		*CLAMPING FORCE	
		STL	AL	STL	AL	STL	AL
1/4	.266 (17/64)	3500	2150	2650	1650	1800	1500
3/16	.230 (13/64)	2250	1250	2050	930	1300	900
5/16	.328 (21/64)	3910	-	3000	-	2150	-

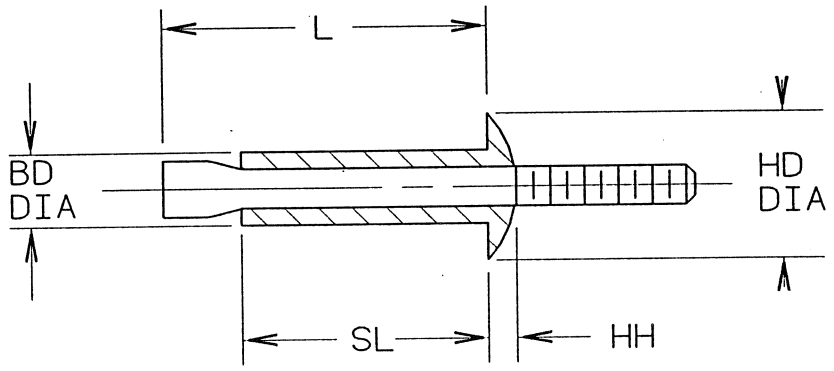
* TYPICAL STRENGTHS IN POUNDS OF INSTALLED FASTNER.

ENGINEERING NOTES:

1. MATERIAL: STEEL ZINC PLATED
   ALUMINUM 7075-T6
   SEAL - PVC
2. USE WITH 23-11037 FLANGED COLLAR.
3. HEAD STYLE: T - DENOTES TRUSS HEAD; B - DENOTES BUTTON HEAD.

CHG	JOB NO	DATE	BY	REVISION
C	P03725-01	10/23/97	DAJ	REVISED AND REDRAWN IN CATIA, ADDED -004 & -005.
D	P03725-08	09/22/98	DAJ	ADDED -006 AND -007.

DRAWN	DAJ	TITLE MONOBOLT/MAGNA-LOK PROTRUDING HEAD	ITEM NUMBER 23-12211
APPRV	ERK		
DATE	02/06/95	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



PART NUMBERS:

NOM DIA	BD DIA	SL	HD DIA	HH	L MAX	GRIP RANGE	HOLE SIZE	MANUFACTURER'S NUMBER HBM MAGNA-LOK	FREIGHTLINER PART NUMBER
3/16	.186 TO .1905	.400 TO .415	.360 TO .395	.067 TO .095	.716	.064 TO .270	.193 TO .201	UMGLP-B6-4	23-12211-000
A 1/4	.2546 TO .2570	.544 TO .560	.500 TO .525	.096 TO .127	.970	.080 TO .375	.261 TO .272	UMGLP-B8-6	-100

ENGINEERING NOTES:

1 MATERIAL: ALUMINIUM

2. FOR 3/16" MONOBOLT/MAGNALOK: MINIMUM SHEAR STRENGTH 700 LBS.
MINIMUM TENSILE STRENGTH 500 LBS.

3. FOR 1/4" MONOBOLT/MAGNALOK: MINIMUM SHEAR STRENGTH 1300 LBS.
MINIMUM TENSILE STRENGTH 890 LBS.

CHG	JOB/RLSE NO	DATE	BY	REVISION
-	P2A220-46	02/06/95	DAJ	INITIAL LOAD
A	P2A230-39	06/12/95	ERK	ADDED -100