



11-30-66

BENDIX SYSTEMS DIVISION ANN ARBOR, MICH.

Fuel Cask Mount Loads

NO.

ATM 584

REV. NO.

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The following ATM lists the maximum design loads of Bendix Fuel Cask struts, as well as the loads in Grumman's struts.

Prepared by Jerry Watt
Jerry Watt

Approved by T. Fenske
T. Fenske



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The load factors are as follows:

Acting simultaneously

$$N_x = 38 \text{ G's}$$

$$N_z \text{ or } N_y = 28.4 \text{ G's}$$

Non-Compatible load factors

$$N_x = 60 \text{ G's}$$

$$\mathcal{L}_x = 90 \text{ Rad/sec}^2$$

$$N_y = 37 \text{ G's}$$

$$\mathcal{L}_y = 120 \text{ Rad/sec}^2$$

$$N_z = 31 \text{ G's}$$

$$\mathcal{L}_z = 110 \text{ Rad/sec}^2$$

All load factors include a factor of safety of 1.5. The maximum weight of GE's cask and Bendix hardware is 34 lbs. The C.G. of the cask is at X = 149.00.

$$F_x = \pm 38 \text{ G's} \times 34 \text{ lbs.} = \pm 1290 \text{ lbs.}$$

$$F_z \text{ or } F_y = \pm 28.4 \text{ G's} \times 34 \text{ lbs.} = \pm 965 \text{ lbs.}$$

$$F_x = \pm 60 \text{ G's} \times 34 \text{ lbs.} = \pm 2040 \text{ lbs.}$$

$$F_y = \pm 37 \text{ G's} \times 34 \text{ lbs.} = \pm 1260 \text{ lbs.}$$

$$F_z = \pm 31 \text{ G's} \times 34 \text{ lbs.} = \pm 1060 \text{ lbs.}$$

$$I_{x-x} = 1821 \text{ lb-in}^2$$

$$T_{x-x} = \pm 425 \text{ in-lbs}$$

$$I_{y-y} = 1084 \text{ lb-in}^2$$

$$T_{y-y} = \pm 338 \text{ in-lbs.}$$

$$I_{z-z} = 2393 \text{ lb-in}^2$$

$$T_{z-z} = \pm 685 \text{ in-lbs.}$$

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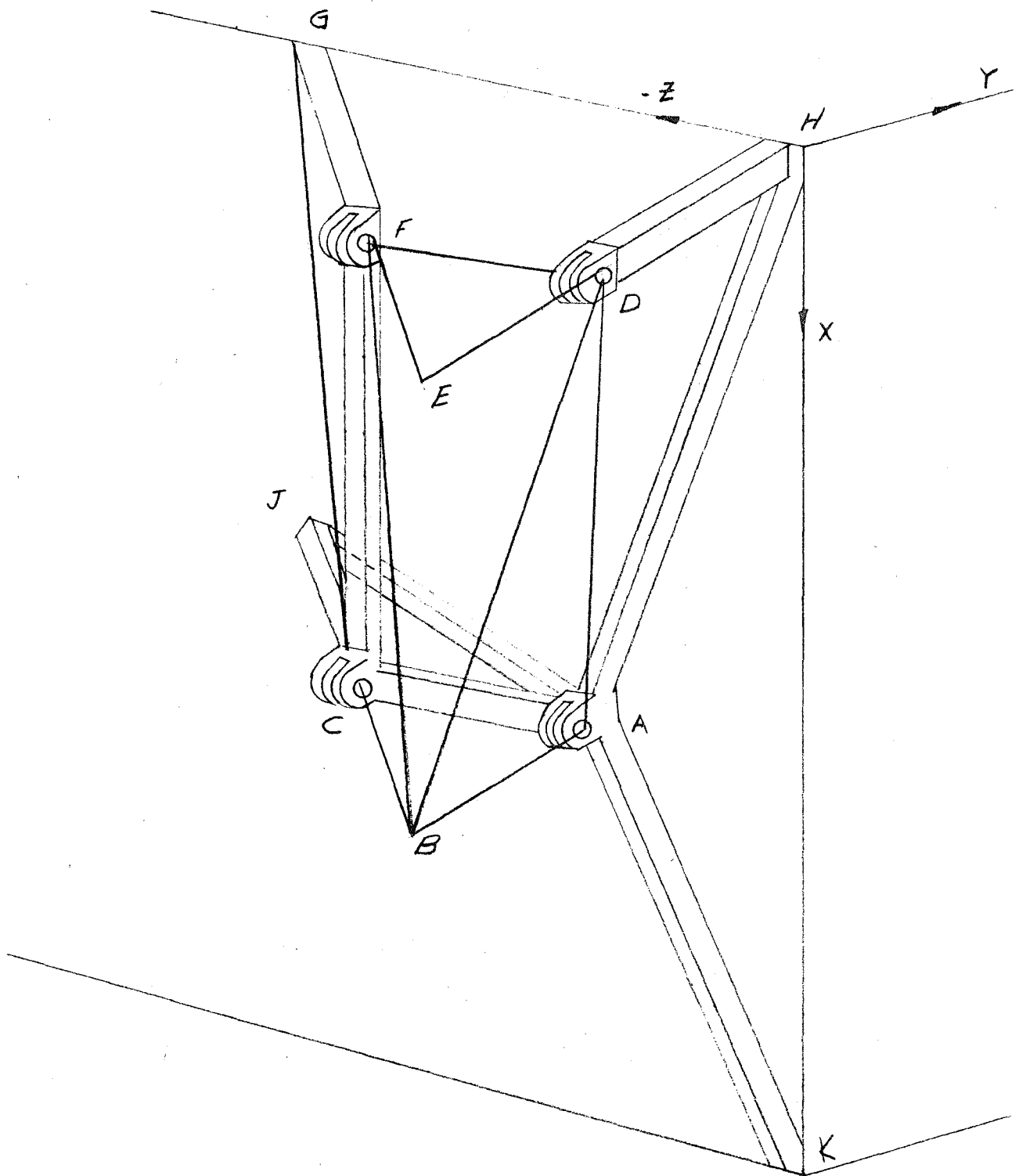


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MODEL 2332235

MEMBER	TRUE LENGTH	X PROJ.	Y PROJ.	Z PROJ.
AB	5.90	0	5.90	0
BC	5.90	0	3.7	4.6
AD	10.27	10.27	0	0
CF	10.27	10.27	0	0
DE	5.90	0	5.90	0
EF	5.90	0	3.7	4.6
FD	6.88	0	3.0	6.2
BD	12.00	10.27	5.90	0
BF	12.00	10.27	3.70	4.60
AK	10.80	10.40	3.00	0
AH	10.18	9.65	3.20	0
AC	6.88	0	3.0	6.2
AJ	13.85	.79	2.85	13.55
CI	8.26	.79	5.10	6.45
CG	12.40	8.65	5.50	7.00
FG	1.75	0	4.80	6.08
DH	2.20	0	2.20	0

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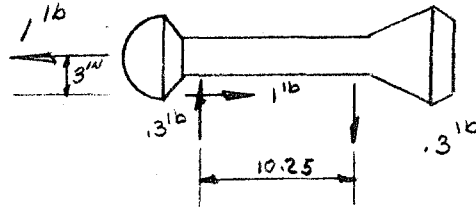
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CASE 1 LOAD IN -X DIRECTION



JOINT-B						
MEMBER	BA	BC	BD	BF		
LOAD	-.120	-.120	+.585	+.585		
JOINT-E						
MEMBER	ED	EF				
LOAD	+.166	+.166				
JOINT-F						
MEMBER	FE	FB	FC	FD	FG	
LOAD	+.166	+.585	-.50	0	+.454	
JOINT-D						
MEMBER	DA	DB	DE	DF	DH	
LOAD	-.50	+.585	+.166	0	+.454	
JOINT-A						
MEMBER	AB	AD	AC	AK	AH	AJ
LOAD	-.120	-.50	0	-.480	+.0411	0
JOINT-C						
MEMBER	CB	CF	CG	CA	CJ	
LOAD	-.120	-.50	+.640	0	-.580	

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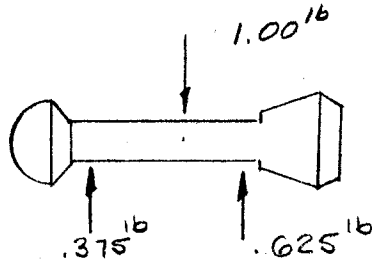
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CASE 2 LOAD IN Y DIRECTION



JOINT-B MEMBER LOAD	BA - .375	BC 0	BD 0	BF 0		
JOINT-E MEMBER LOAD	ED - .625	EF 0				
JOINT-F MEMBER LOAD	FE 0	FB 0	FC 0	FD 0	FG 0	
JOINT-D MEMBER LOAD	DA 0	DB 0	DE - .625	DF 0	DH - .625	
JOINT-A MEMBER LOAD	AB - .375	AD 0	AC 0	AK - .585	AH - .585	AJ 0
JOINT-C MEMBER LOAD	CB 0	CF 0	CG 0	CA 0	CJ 0	

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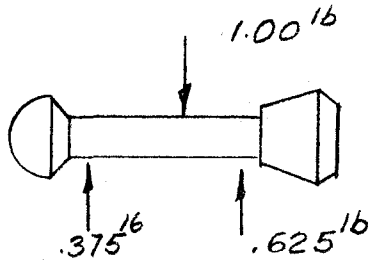
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CASE 3 LOAD IN Z DIRECTION



JOINT-B
MEMBER	BA	BC	BD	BF		
LOAD	.296	-.477	0	0		
JOINT-E	.	.				
MEMBER	ED	EF				
LOAD	.495	-.794				
JOINT-F	.	.	.	.	.	.
MEMBER	FE	FB	FC	FD	FG	
LOAD	-.794	0	0	0	-.794	
JOINT-D	.	.	.	.	.	.
MEMBER	DA	DB	DE	DF	DH	
LOAD	0	0	.495	0	.495	
JOINT-A	.	.	.	.	.	.
MEMBER	AB	AD	AC	AK	AH	AJ
LOAD	.296	0	0	.463	.463	0
JOINT-C
MEMBER	CB	CF	CG	CA	CJ	
LOAD	-.477	0	-.06	0	-.437	

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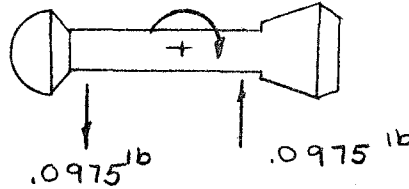
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CASE 4 MOMENT IN +Z DIRECTION



JOINT-B		
MEMBER	BA	BC	BD	BF		
LOAD	+0.0975	0	0	0		
JOINT-E	.	.				
MEMBER	ED	EF				
LOAD	-0.0975	0				
JOINT-F	.	.	.	.	.
MEMBER	FE	FB	FC	FD	FG	
LOAD	0	0	0	0	0	
JOINT-D	.	.	.	.	.
MEMBER	DA	DB	DE	DF	DH	
LOAD	0	0	-0.0975	0	-0.0975	
JOINT-A	.	.	.	.	.	.
MEMBER	AB	AD	AC	AK	AH	AJ
LOAD	+0.0975	0	0	+0.159	+0.161	0
JOINT-C	
MEMBER	CB	CF	CG	CA	CJ	
LOAD	0	0	0	0	0	

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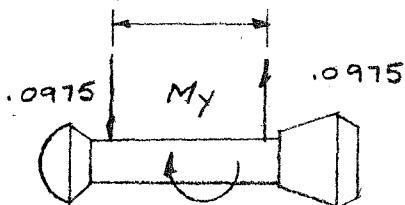
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CASE 5 MOMENT IN +Y DIRECTION



JOINT-B						
MEMBER	BA	BC	BD	BF		
LOAD	+0.077	-124	0	0		
JOINT-E						
MEMBER	ED	EF				
LOAD	-0.077	+124				
JOINT-F						
MEMBER	FE	FB	FC	FD	FG	
LOAD	+124	0	0	0	+124	
JOINT-D						
MEMBER	DA	DB	DE	DF	DH	
LOAD	0	0	-0.077	0	-0.077	
JOINT-A						
MEMBER	AB	AD	AC	AK	AH	AJ
LOAD	+0.077	0	0	.120	+120	0
JOINT-C						
MEMBER	CB	CF	CG	CA	CJ	
LOAD	-124	0	-0.015	0	-114	

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CASE 6 MOMENT IN + X DIRECTION



JOINT-B							
MEMBER	BA	BC	BD	BF			
LOAD	-	-	-	-			
JOINT-E							
MEMBER	ED	EF					
LOAD	-	-					
JOINT-F							
MEMBER	FE	FB	FC	FD	FG		
LOAD	-	-	-	+0.0326	+0.082		
JOINT-D							
MEMBER	DA	DB	DE	DF	DH	DH	FORCE ACTING IN
LOAD	-	-	-	+0.0326	-0.051	.0642	(+2)
JOINT-A							
MEMBER	AB	AD	AC	AK	AH	AJ	
LOAD	-	-	+0.0324	-0.0625	-0.062	-0.0655	
JOINT-C							
MEMBER	CB	CF	CG	CA	CJ		
LOAD	-	-	0	+0.0324	+0.082		

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MAX. ULTIMATE DESIGN LOADS

MEMBER	LOADS ±	
AB	517 lbs	
BC	615 lbs	
AD	1020 lbs	
CF	1020 lbs	
DE	818 lbs	
EF	979 lbs	
FD	14 lbs	
BD	1200 lbs	
BF	1200 lbs	
AK	1185 lbs	
AH	736 lbs	
AC	14 lbs	
AJ	28 lbs	
CJ	1180 lbs	
CG	1310 lbs	
FG	1350 lbs	
DH	1189 lbs	

27° (Z DIRECTION)