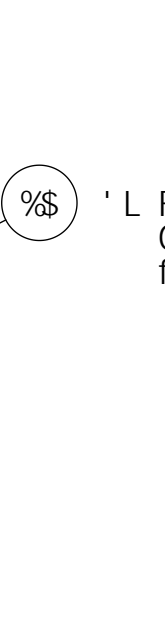
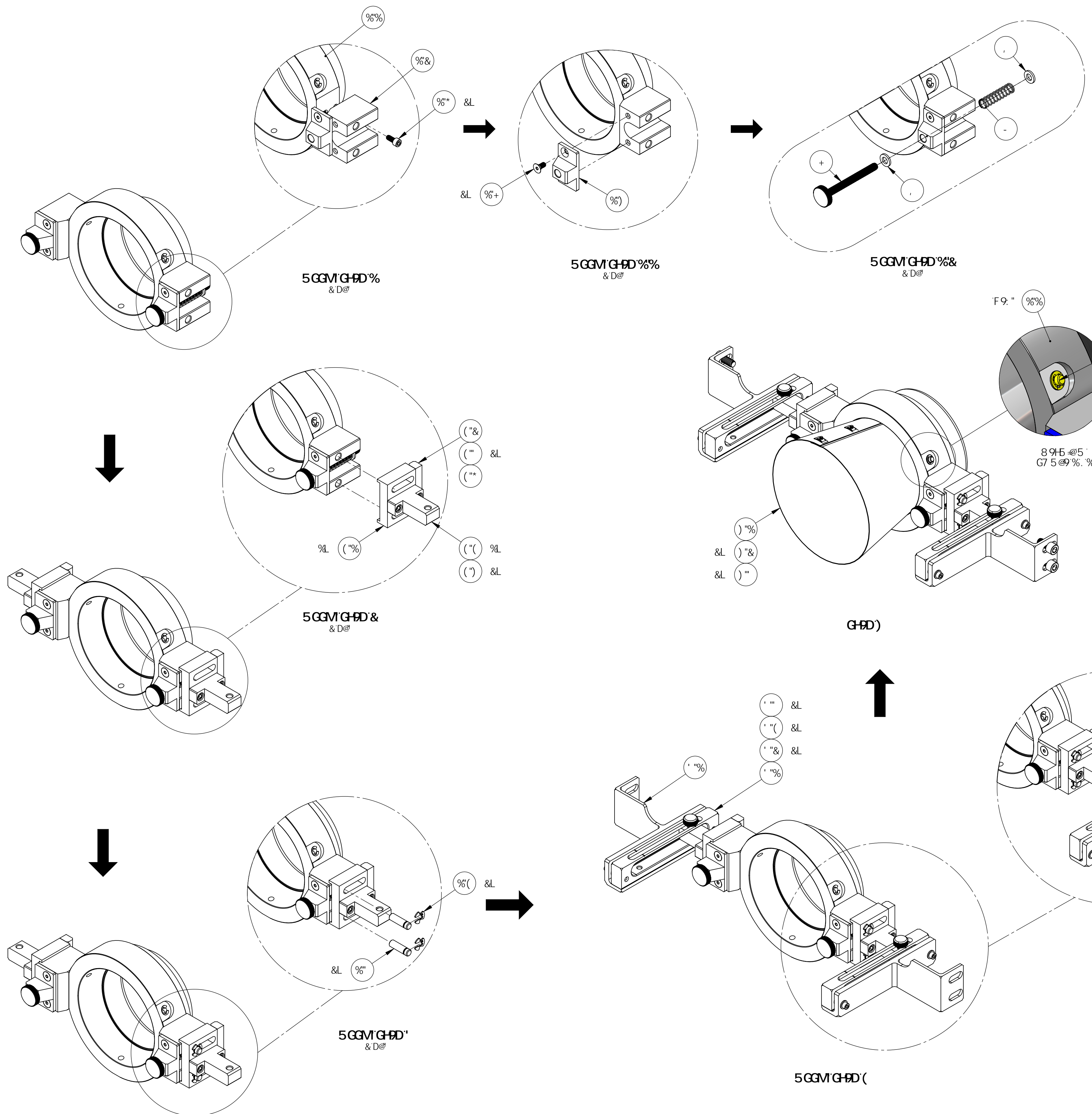
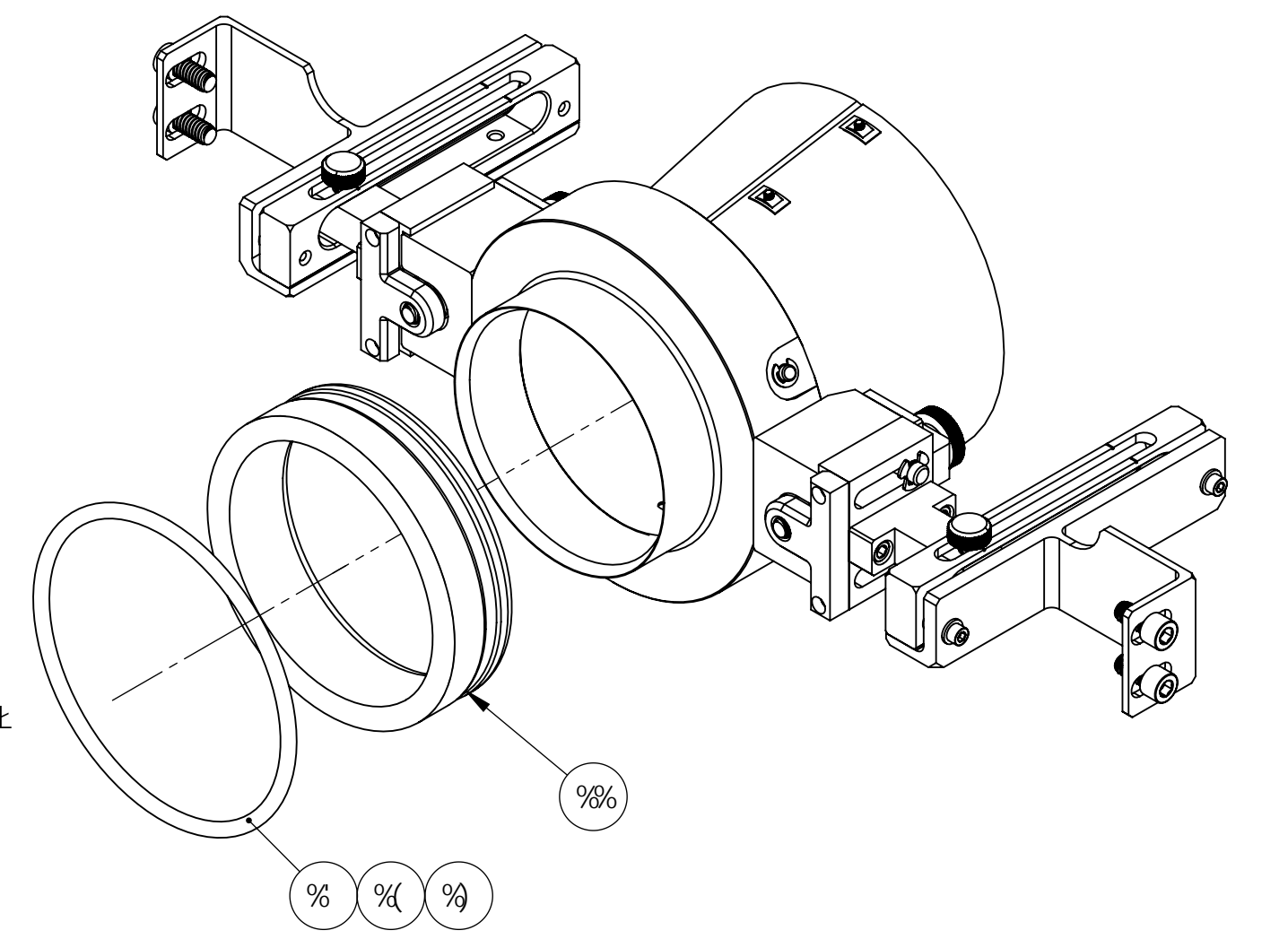


F9J"	85H9	87B	8F5K-B; 1F99
j %	%>5B &\$%	!	!
j &	\$(: 96 &\$%	9% \$\$\$&- !! \$!
j'	\$, : 96 &\$%	9% \$\$\$&\$!! \$!



' L F9H5 B-B; F-B: G
G DD@98 K " #9A %S
#H9A BC " % A 5M691 G98 5GF9D@7 9A 9B.H



GC J -SK ZF95F @ H

%	. (\$ 5%8* A WA 5GHF175FFCF9E "	F9H5-B-B; F-B: 2' #8' G<5: H8-5'ZG89A H	5 #F
%	D5F?9F'BC" &' ((C1F-B: 2' #8' K @9	%
%(D5F?9F'BC" &' (C1F-B: 2' #8' K @9	%
%	D5F?9F'BC" &' (&	C1F-B: 2' #8' K @9	%
%&	-&&\$5) ' + A WA 5GHF175FFCF9E "	G7F9K 2G<7Z'!(L&L") \$ @ " Z	(
%&	8% \$\$\$8%	5 @ C 2G Q<-GGGF1 7H F9Z: 7 GDF5M; 1 5F82F9I G56@7 F K I9965B8	%
%&	-&+) 5%&S A WA 5GHF175FFCF9E "	7 @J GD&BZ' #8' 8-5" L") @ "TK #9H5-B-B; F-B: L	*
-	-(')?+* A WA 5GHF175FFCF9E "	7 C A DF9GGC B GDF-B: 2" " C 8' L") \$ @ " L" S' & K F 9	&
.	-S () 5+*%	%@: @5HK 5G<9F2B5G'&S17 (%Z A 7 -S -()) 5+*%	(
+	-%(*5+* A WA 5GHF175FFCF9E "	H: I A 6 G7 F9K 2' #8' (L&L") @ "	&
*	-(') 5' + A WA 5GHF175FF	F9H57H56@9 GDF-B: D@ B: 9F2' #8' (L&S	&
*)	-\$) & 5%8S A WA 5GHF175FFCF9E "	G998 B1 H (L(\$	&
)%	-& (-5%) A WA 5GHF175FFCF9E "	G7 F9K 2G<7Z'!(L \$ " %' @ "	&
)%	8% &S-) %8%	5 @ C 2G Q<-GG: 7 GDF5M; 1 5F8297C @5F Tk F G89%	%
)	8% &S-) %8)	5 @ C 2G Q<-GG@G@G: 7 GDF5M; 1 5F82C<G<F G89	%
(**	') () (98) \$\$ 9A <5FHCF9E "	<9@7 C @%#(L&L") @ "	%
(')	A G8' -) 1&' CF 9E "	G7 F9K 2G<7Z'!(L & L") \$ @ "	&
(('	8% &S* S' 1%8%	5 @ C 27 C 7 2' 9A #8A : 7 GDF5M; 1 5F8 5GGM2F9HD@ B: 9F A H	%
("	A G8' -) 1%8% CF 9E "	G7 F9K 2G<7Z'!(L \$ " , @ "	&
("&	8% &S* S' 1%8&	5 @ C 27 C 7 2' 9A #8A : 7 GDF5M; 1 5F8 5GGM2H-F95898 6@C 7?	%
(%)	8% &S* S' 1%8%	5 @ C 27 C 7 2' 9A #8A : 7 GDF5M; 1 5F8 5GGM275FF5: 9	%
(8% &S* S*	5 @ C 27 C 7 2' 9A #8A : 7 GDF5M; 1 5F8275FF5: 9 5GGM	&
'*)	8% \$\$\$% 1%8%	5 @ C 2G Q<-GGGF1 7H F9Z: 7 GDF5M; 1 5F8 A H 6F5779H@ H	%
'('	A G8' ++) ! \$) CF 9E "	K 5G<9F2: @5HBC**	&
'**	A G8' -) 1&S CF 9E "	G7 F9K 2G<7Z'!(L & L") @ "	&
'&-	&-) 5+ %S A WA 5GHF175FFCF9E "	75DHJ 9GD57 9F2BC** L %8%) @ "	&
'%&	8% \$\$\$%	5 @ C 2G Q<-GG@G@GGF1 7H F9Z: 7 GDF5M; 1 5F8 G@89	%
'	8% \$\$\$% 1%	5 @ C 2G Q<-GGGF1 7H F2: 7 GDF5M; 1 5F8 A H 6F5779H@ H	%
&')	A G8' ++) ! \$) CF 9E "	K 5G<9F2: @5HBC**	&
&'('	A G8' -) 1&S CF 9E "	G7 F9K 2G<7Z'!(L & L") @ "	&
&"	-&-) 5+ %S A WA 5GHF175FFCF9E "	75DHJ 9GD57 9F2BC** L %8%) @ "	&
&%&	8% \$\$\$%	5 @ C 2G Q<-GG@G@GGF1 7H F9Z: 7 GDF5M; 1 5F8 G@89	%
& &	8% \$\$\$% 1&	5 @ C 2G Q<-GGGF1 7H F9Z: 7 GDF5M; 1 5F8 A H 6F5779H@ F+ <H	%
%+	A G8' (+) 98% CF 9E "	G7 F9K 2G<7Z'!(L & L") @ "	(
%@	A G8' -) 1&' CF 9E "	G7 F9K 2G<7Z'!(L & L") @ "	(
%@)	8% \$\$\$% 1%8%	5 @ C 2G Q<-GGGF1 7H F9Z: 7 GDF5M; 1 5F82GF 29D@H9	&
%@)	8% \$\$\$% 1%8&	5 @ C 2G Q<-GGGF1 7H F9Z: 7 GDF5M; 1 5F8 5GGM28CK 9@DB 1' FCC J 98L	(
%@)	8% \$\$\$% 1%8%	5 @ C 2G Q<-GGGF1 7H F9GDF5M; 1 5F8 : 1 @9F5 @	&
%) %&	8% \$\$\$% 1%8%	5 @ C 2G Q<-GGGF1 7H F9GDF5M; 1 5F8 A H F B;	%
%) %&	8% \$\$\$% 1%8%	5 @ C 2G Q<-GGGF1 7H F9Z: 7 GDF5M; 1 5F8 A H F B;	%
+9A	D5FHBI A 6F	89G7 F-HCB	HCB@
BC*			

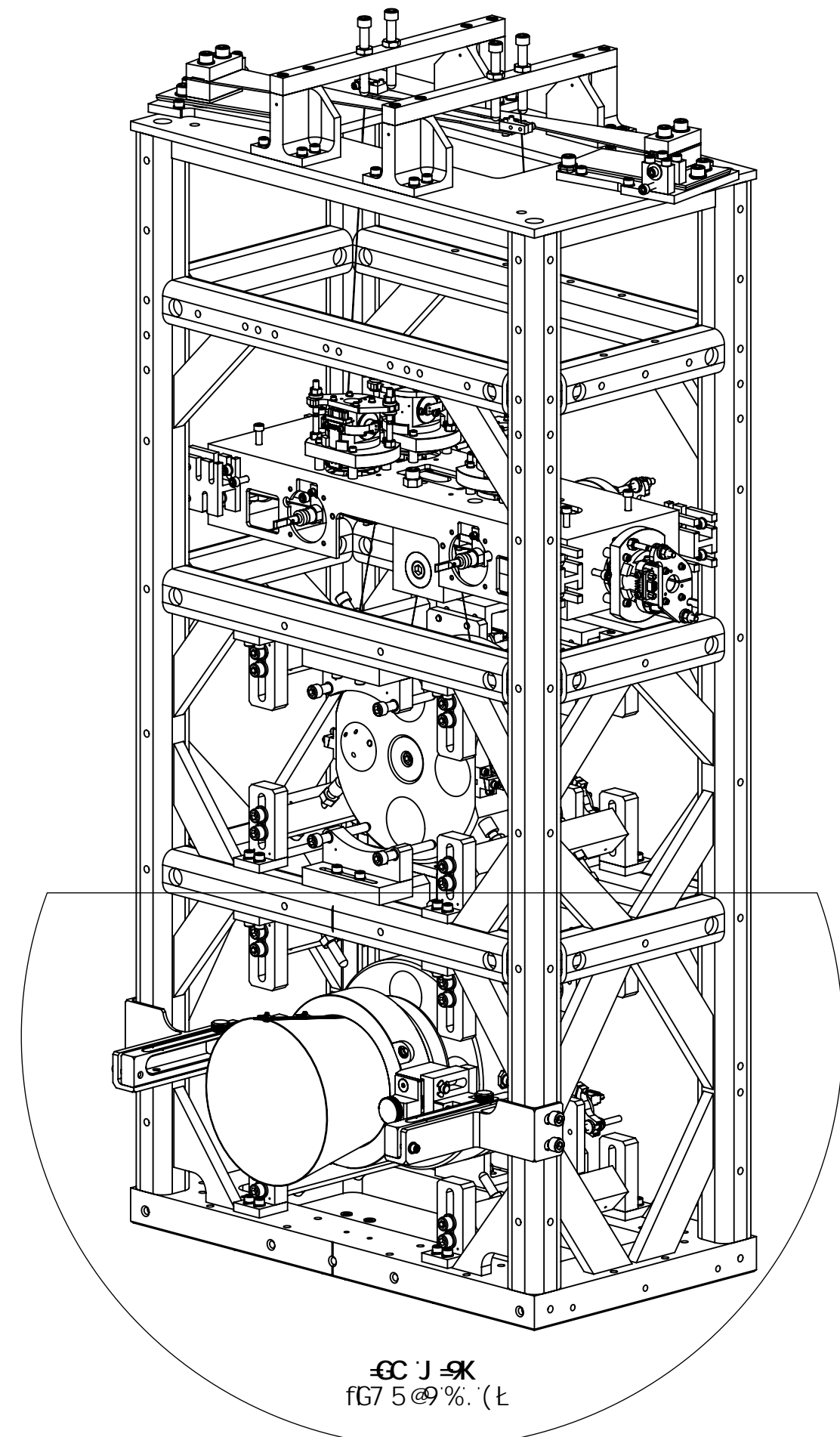
BCHG5B8 HC @F5B7 9G 11 B @GGCH 9FK -G9GD7 = 98L

LIGO 75@CFB-5-BG-H HPC: H97 <BC @: M
A 5GG57 <1 G@H-BG-H HPC: H97 <BC @: M

D5FH5A 9
5 @ C 2' G Q<-GGGF1 7H F9Z: 7 GDF5M; 1 5F8 5GGM

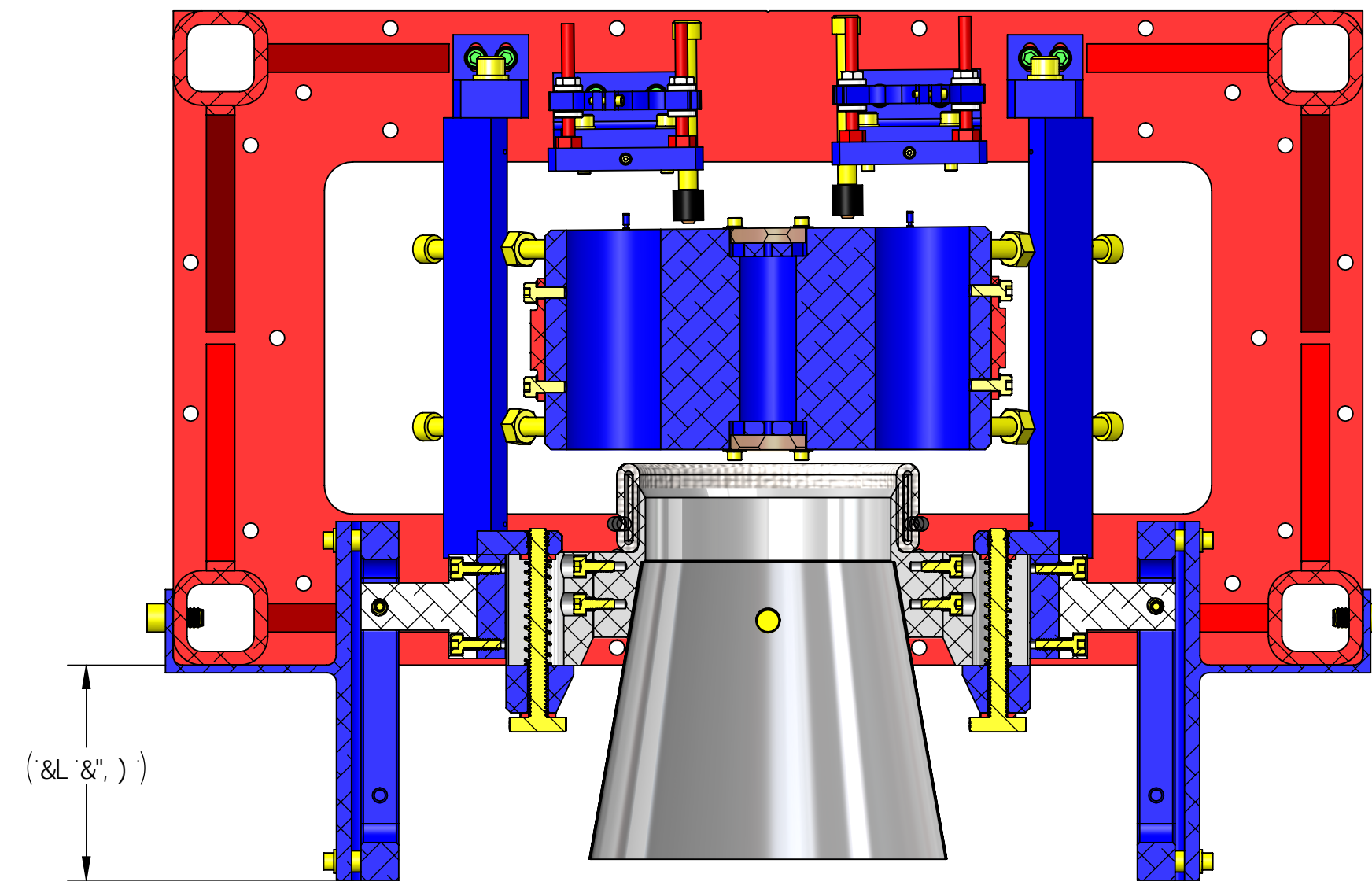
A 5HF-5@	B #5	: B-G:	B #5 σ]bW	B 9LH5GGM	A I @H@9	89G: B 9'	9G5B7 <9N	%>5B 85%	GAP 8K: " BC"	F9J"
						8F5: HF	9G5B7 <9N	%>5B 85%	8	j'
						7 <97 9F	099 877	099 877		
						5DDFC J 5@	099 877	099 877	G75@2 % &	G<99H% C: &

8% \$\$\$&U@ C 2G Q<-GGGF1 7H F9Z: 7 GDF5M; 1 5F8 5GGM25FH9A F9J LISS-Z9F5K B: D8A F9J LISS*



GC J 5K
FG7 5 @% (L)

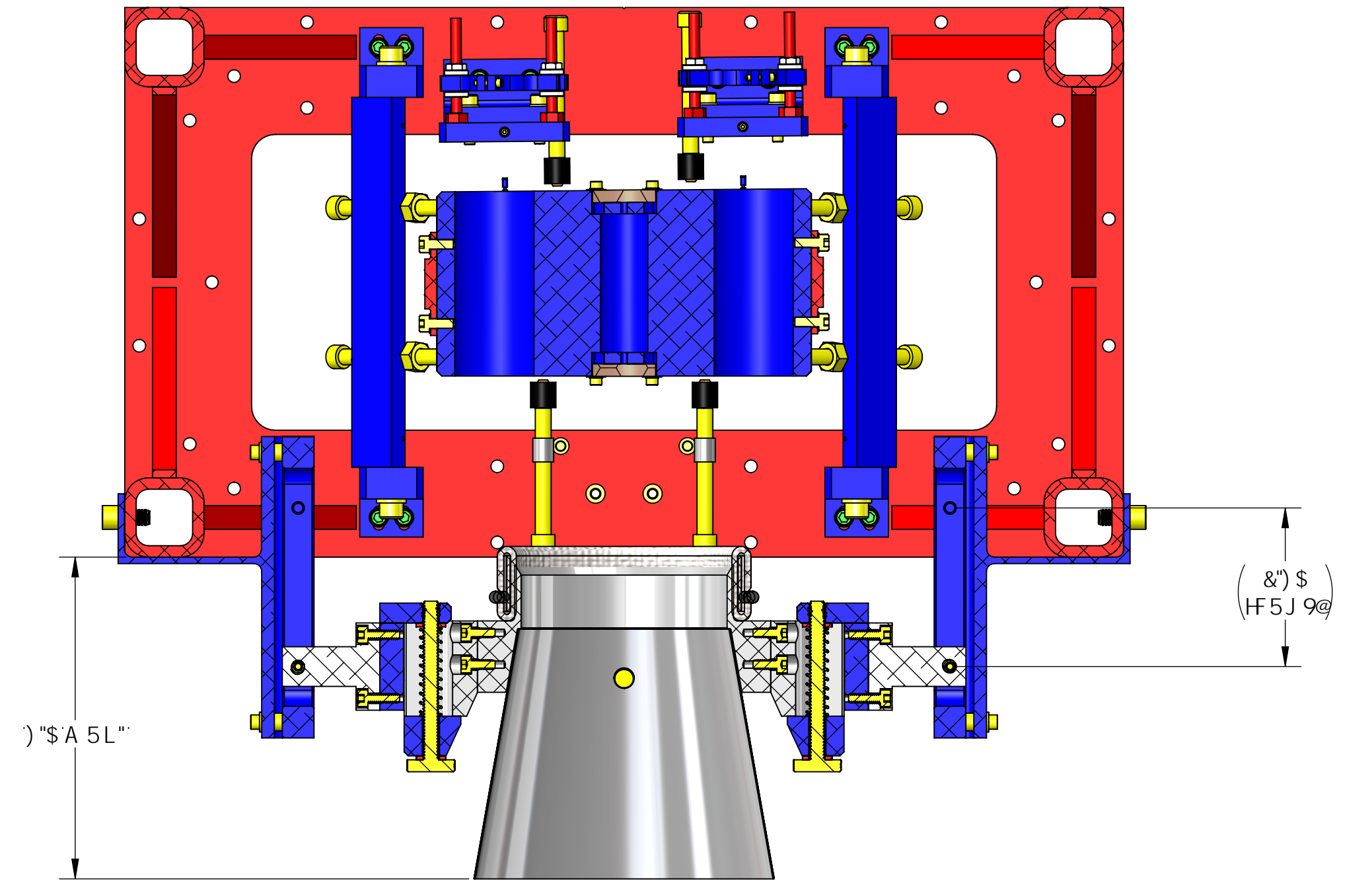
GDF5M; I 5F8Z-B G9FJ 7 9



(L & L,)

G97 HC B 7 17

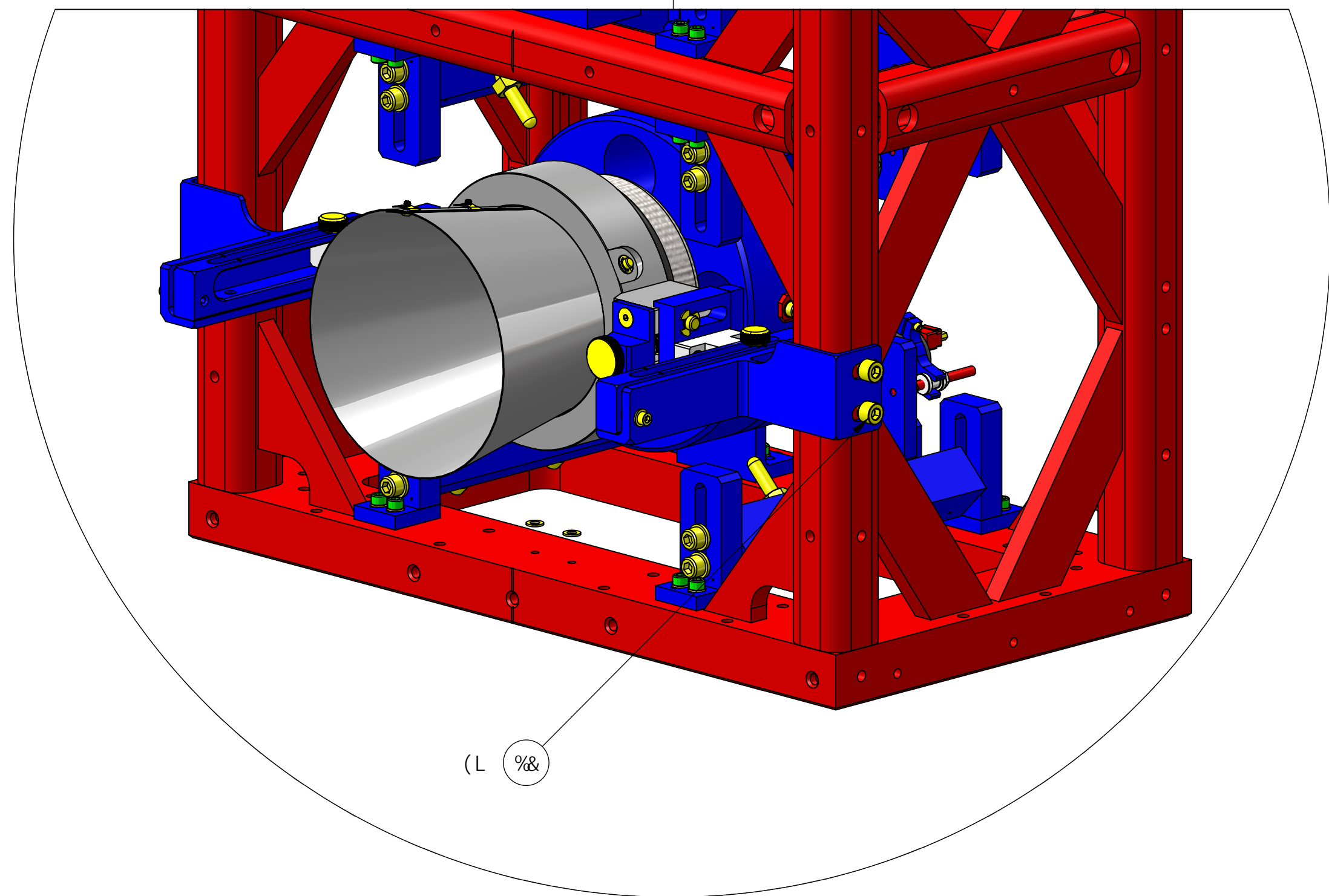
GDF5M; I 5F8ZF9F57H8



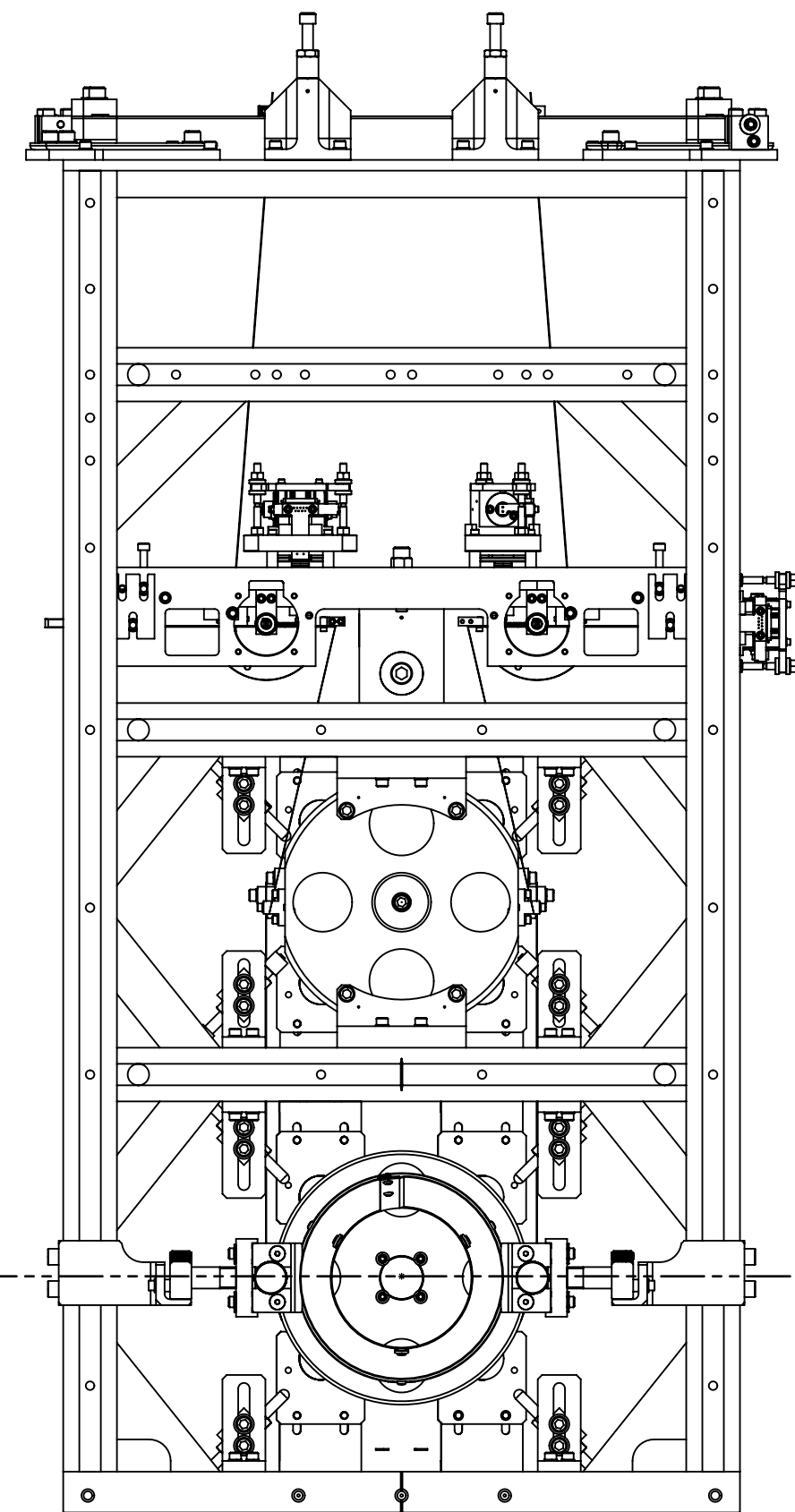
) "A 5L"

(L & L) \$
HF5 J 9@

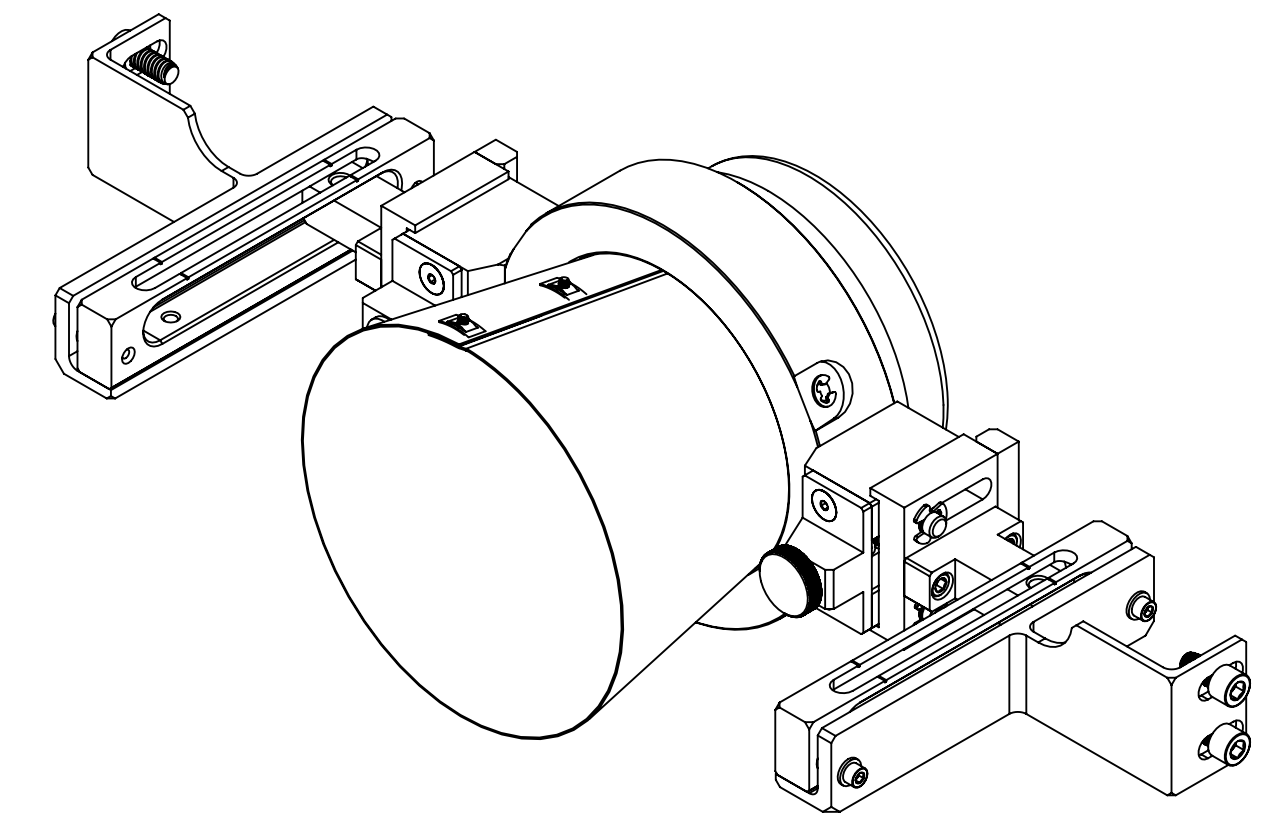
G97 HC B 7 17



(L %&



<F'G89
FG7 5 @% (L)



GC J 5K

8 9H 5 @6
fF9A C J 9' &L '9E : 5 7 9 5 G M Z D F C F H C GDF5M; I 5F8 B G H 5 @ B C H G C K B E

LIGO		75@CFB-5-BGHIHC: 1H7 <BC@C; M	A 5G57 <I G9HC-BGHIHC: 1H7 <BC@C; M
GA9 BK; "BC"	8	8 % \$\$\$&\$	F9J "
G7 5 @% &	DFC >97 HCB.	G-99H&C: &	j'

8% \$\$\$& US; C7G Q; G6GCF 7H F9; 7 GDF5M; I 5F8 5GMMZDFHDBA F9J; L155-2875K B; DBA F9J; L155*