

# **SHEMAR**

## High Strength Braced Line Post and Insulated Cross-arms (CICA)

**Line Compaction Solutions**

— upto 765kV

## SHEMAR: Industry Leader in Line Compaction Solutions

Braced line posts have enabled compact transmission lines in the voltage range of 115 kV to 230 kV. Now line compaction is being considered at progressively higher voltages (EHV range) to develop structures with better visual amenity, smaller foot print, narrow right-of-way requirements and economic benefits of lighter construction.

However, at 345 kV and above voltages as the section lengths increase due to electrical requirements, the mechanical capabilities of standard braced line posts with typical components becomes a limitation. The low working performance restrict span lengths and increase overall project cost and construction efforts.

SHEMAR is a world leader in compact line composite insulation system design and manufacturing. In cases where the strength capabilities of standard off-the-shelf braced line posts are unable to satisfy customer's requirements, SHEMAR can offer high strength (HS) braced line post or composite insulated cross-arms (CICA).

The high strength line compaction solutions include line post core rods greater than 3.5 inches, reinforced line/pole end fittings and hardware as well as three-dimensional composite insulated cross-arms (CICA). The high strength CICA differs from two-dimensional structures like braced line posts or horizontal Vees. It is composed of at least three insulators positioned in a triangulated configuration, enabling the assembly to withstand significantly higher vertical, transverse, and longitudinal loads. The CICA assemblies can be used on both lattice towers and tubular supports.

SHEMAR's HS braced line posts and CICA overcomes the limitations and technological gaps of traditional braced line post or pivoting horizontal Vee. The application of HS braced line posts and CICA deliver following additional benefits to electric utilities:

- 1- Enhance load capacity of transmission lines including longitudinal load security
- 2- Cut construction cost by allowing longer span length and lesser structures
- 3- Enable compaction upto 765 kV
- 4- Increase power transmission capacities by allowing heavier conductor bundles
- 5- Enable voltage uprating and improve ground clearance in retrofit applications

Included in this brochure are some typical designs of 345 kV HS brace line posts (BLP) and CICA and their application load curves:

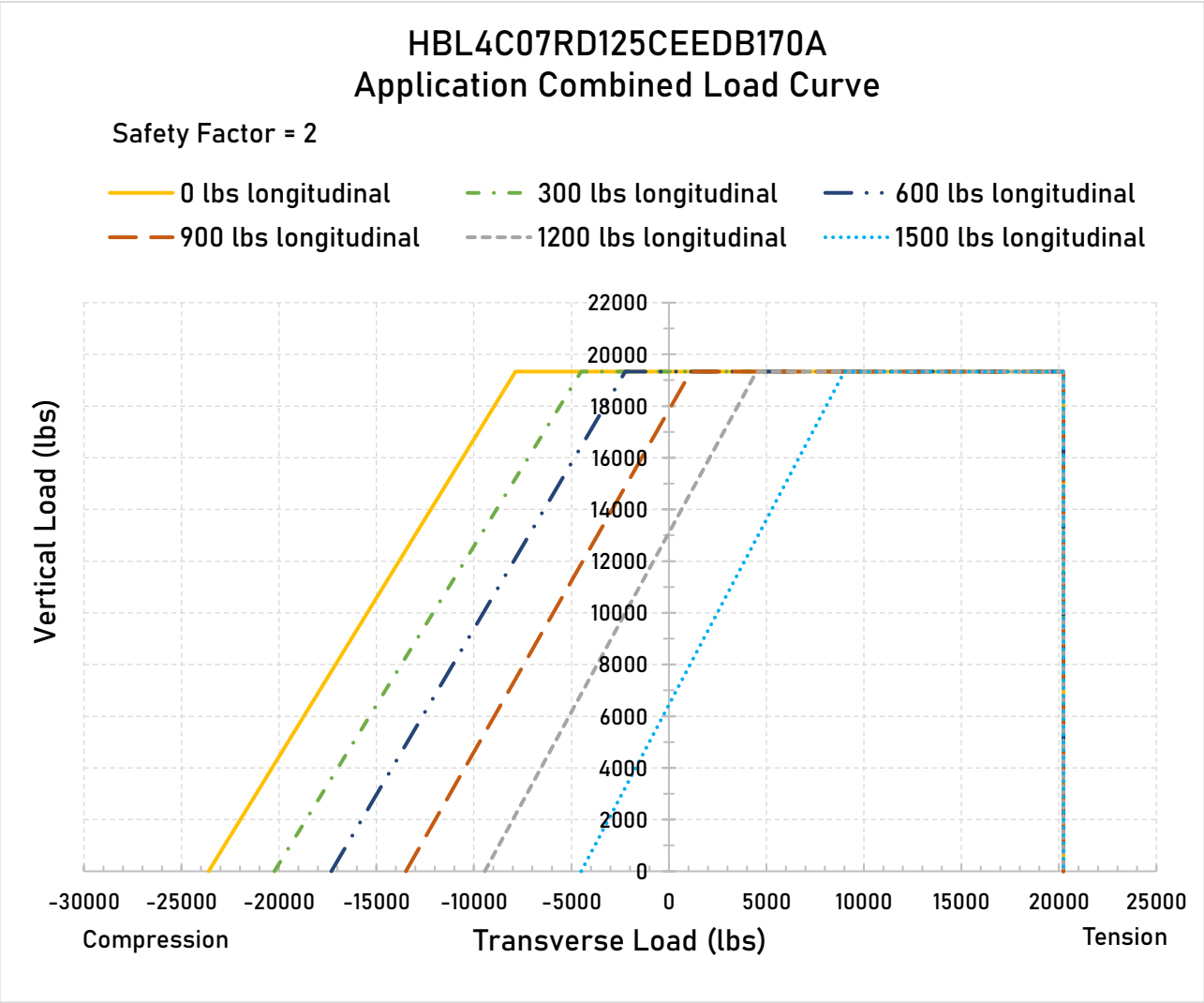
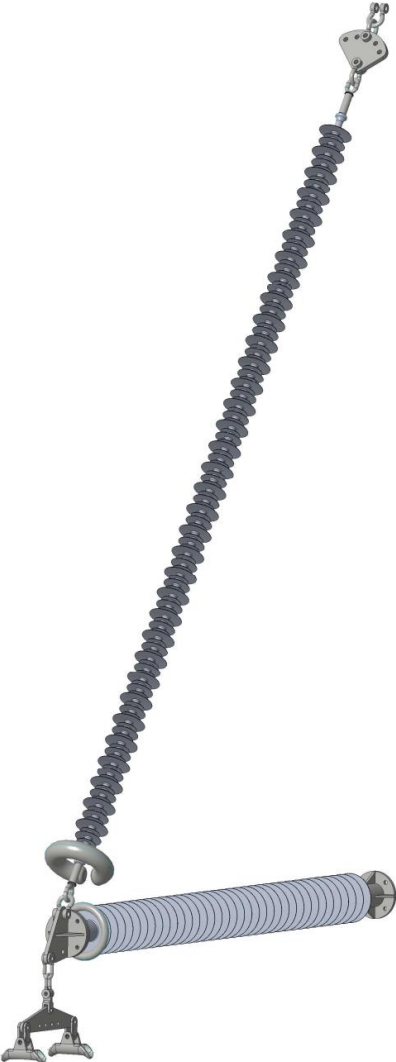
- 345 kV HS BLP – Class 350
- 345 kV HS BLP – Class 400
- 345 kV HS BLP – Class 500
- 345 kV TR CICA – Class 350

Custom HS brace line posts and CICA assemblies can be offered according to customer's needs (including 500 kV applications). Please fill-in the information request summary form at the end of this brochure to convey the specific application requirements to our specialist engineers.

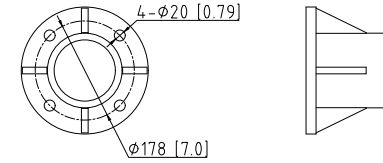
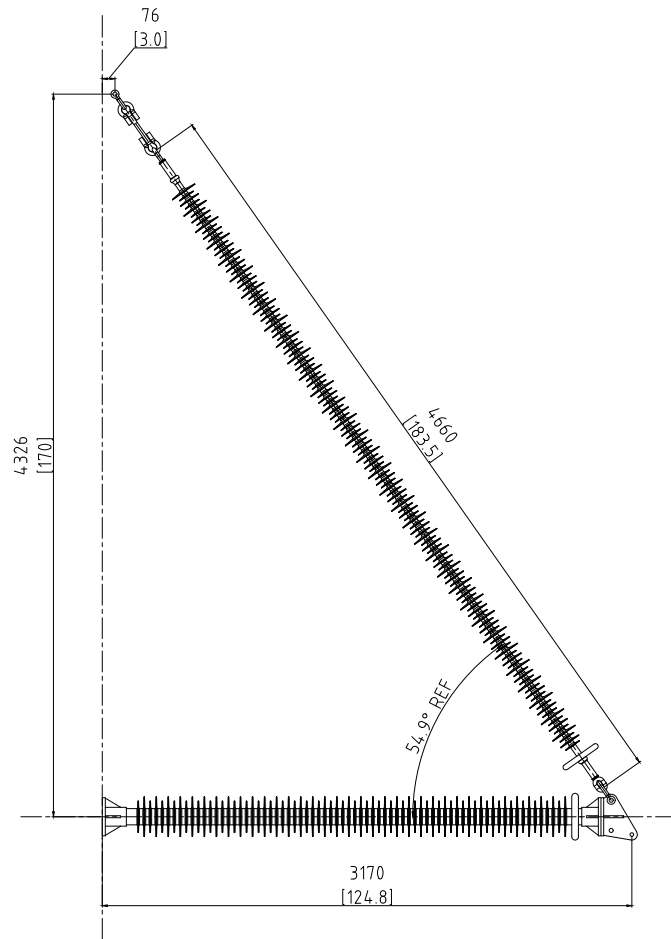
# 345kV High Strength (HS) Braced Line Post Assembly - Class 350

3.5 inch Post and 50 kip Brace Insulator

Reinforced drop-tongue line end fitting and 7-inch bolt circle pole end fitting



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MOUNTING BASE DETAIL

**ELECTRICAL VALUES AS PER ANSI C29.11**

DRY 60 Hz FLASHOVER:	928 kV
WET 60 Hz FLASHOVER:	817 kV
IMPULSE POSITIVE FLASHOVER:	1633 kV
IMPULSE NEGATIVE FLASHOVER:	1682 kV

**MAX WORKING LOADS**

VERTICAL:	19450 lbs	86.5 kN
TRANSVERSE TENSION:	20232 lbs	90.0 kN
TRANSVERSE COMPRESSION:	23604 lbs	105.0 kN
LONGITUDINAL:	2090 lbs	9.3 kN

**DIMENSIONAL DATA**

DRY ARC DISTANCE:	102.8 inches	2612 mm
LEAKAGE DISTANCE:	392.2 inches	9962 mm
ASSEMBLY WEIGHT:	297 lbs	135 kg

**COMPONENT LIST**

Item	Description	Qty
1	3.5 in Post Insulator	1
2	50 kips Brace Insulator	1
3	Reinforced Drop Tongue	1
4	DB Adjusting Plate	1
5	Anchor Shackle	4

**NOTES**

Meets standards: ANSI C29.11, ANSI C29.12 and ANSI C29.17

VER.	LOGO	DESCRIPTION	DESIGNED	VERIFIED	APPROVED	DATE
01	-	First Issue	WH	UA	UA	Jul-23
REVISIONS						
NAME		345kV HS BRACED-POST ASSEMBLY				
SCALE	SHEMAR No. HBL4C07RD125CEEDB170A		PAGE	VERSION		
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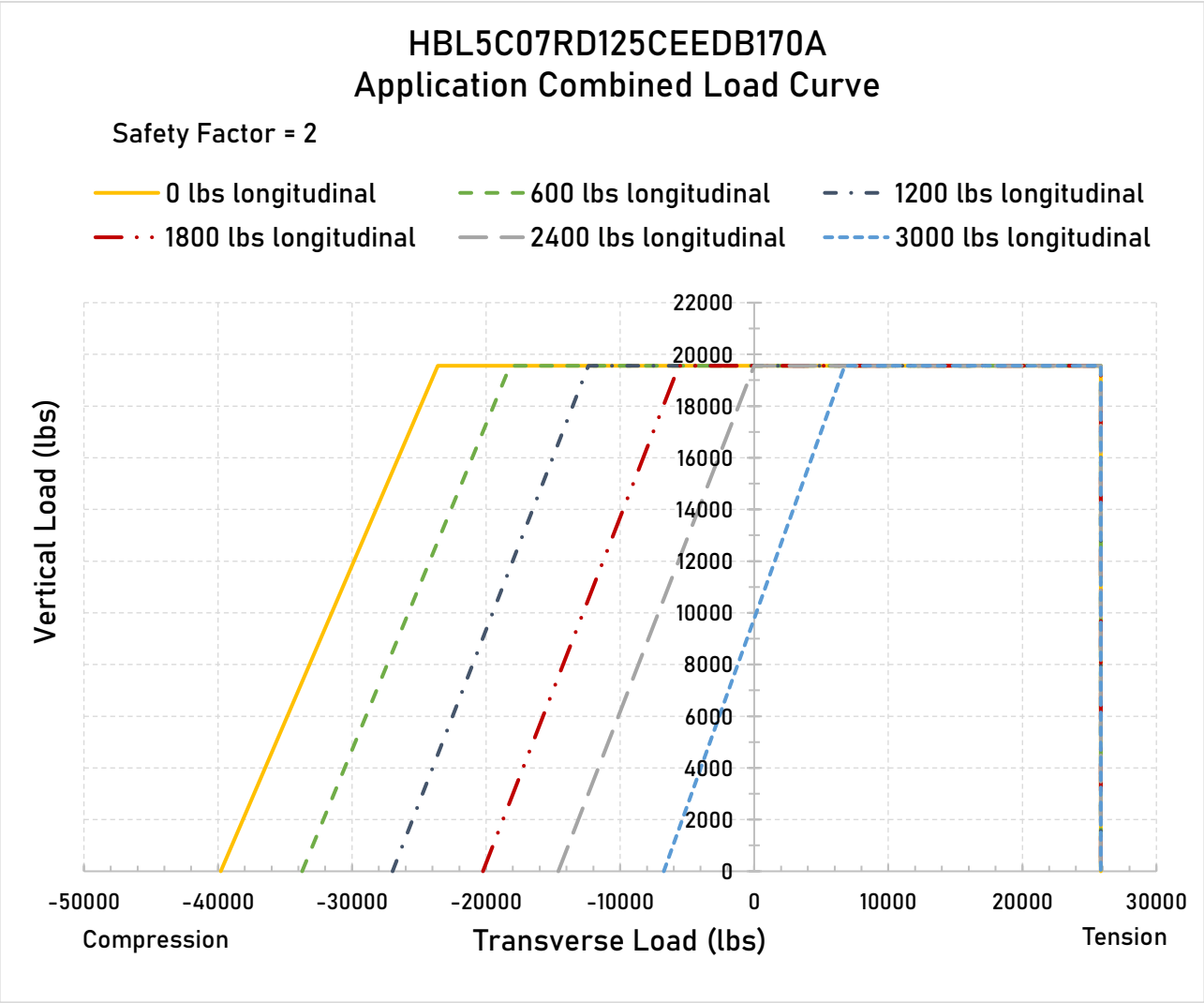
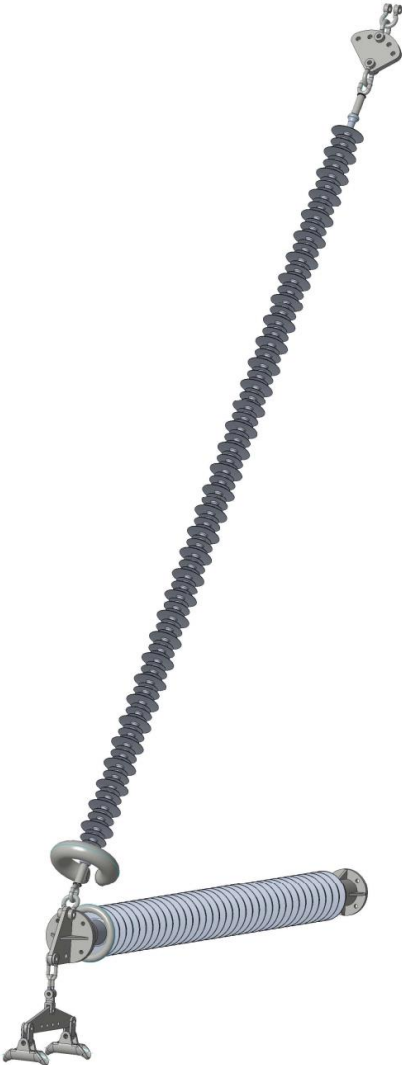


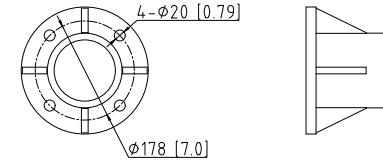
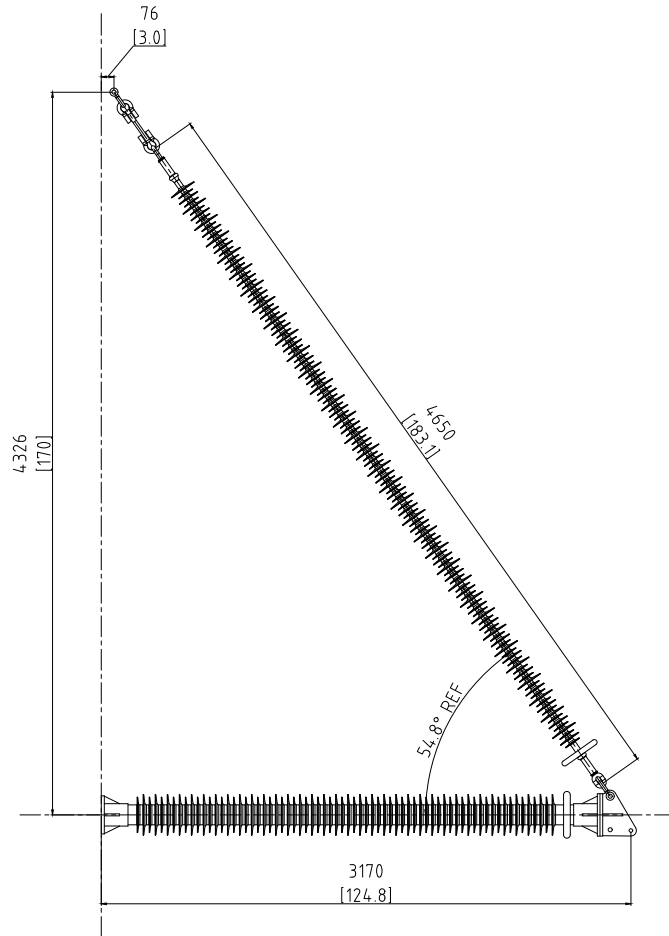
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# 345kV High Strength (HS) Braced Line Post Assembly - Class 400

4.3 inch (110 mm) Post and 50 kip Brace Insulator

Reinforced drop-tongue line end fitting and 7-inch bolt circle pole end fitting





MOUNTING BASE DETAIL

**ELECTRICAL VALUES AS PER ANSI C29.11**

DRY 60 Hz FLASHOVER:	923 kV
WET 60 Hz FLASHOVER:	812 kV
IMPULSE POSITIVE FLASHOVER:	1624 kV
IMPULSE NEGATIVE FLASHOVER:	1672 kV

**MAX WORKING LOADS**

VERTICAL:	19670 lbs	87.5 kN
TRANSVERSE TENSION:	25850 lbs	115.0 kN
TRANSVERSE COMPRESSION:	40240 lbs	179.0 kN
LONGITUDINAL:	3485 lbs	15.5 kN

**DIMENSIONAL DATA**

DRY ARC DISTANCE:	102.2 inches	2597 mm
LEAKAGE DISTANCE:	358.9 inches	9115 mm
ASSEMBLY WEIGHT:	362 lbs	164 kg

**COMPONENT LIST**

Item	Description	Qty
1	4.3 in Post Insulator	1
2	50 kips Brace Insulator	1
3	Reinforced Drop Tongue	1
4	DB Adjusting Plate	1
5	Anchor Shackle	4

**NOTES**

Meets standards: ANSI C29.11, ANSI C29.12 and ANSI C29.17

VER.	LOGO	DESCRIPTION	DESIGNED	VERIFIED	APPROVED	DATE
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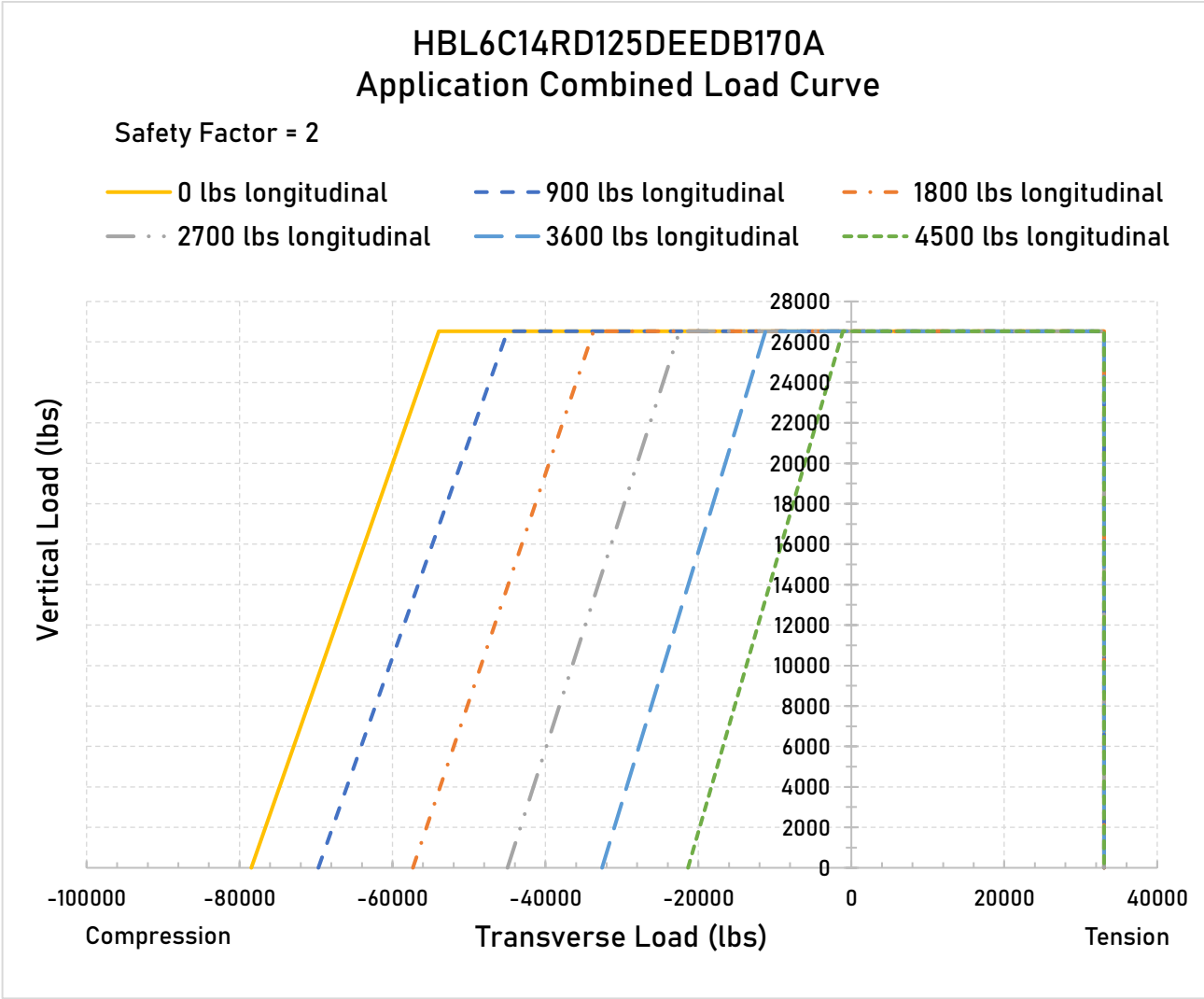
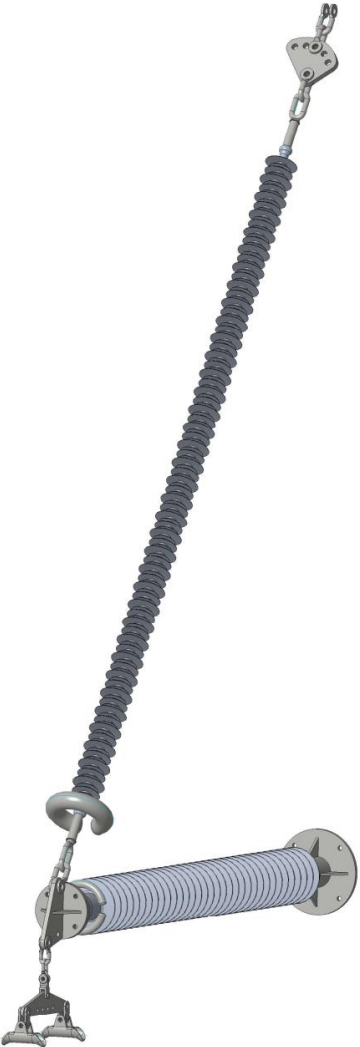
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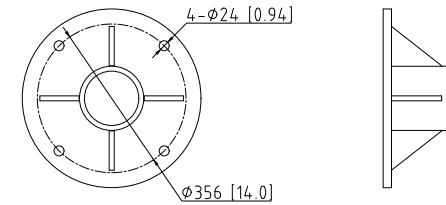
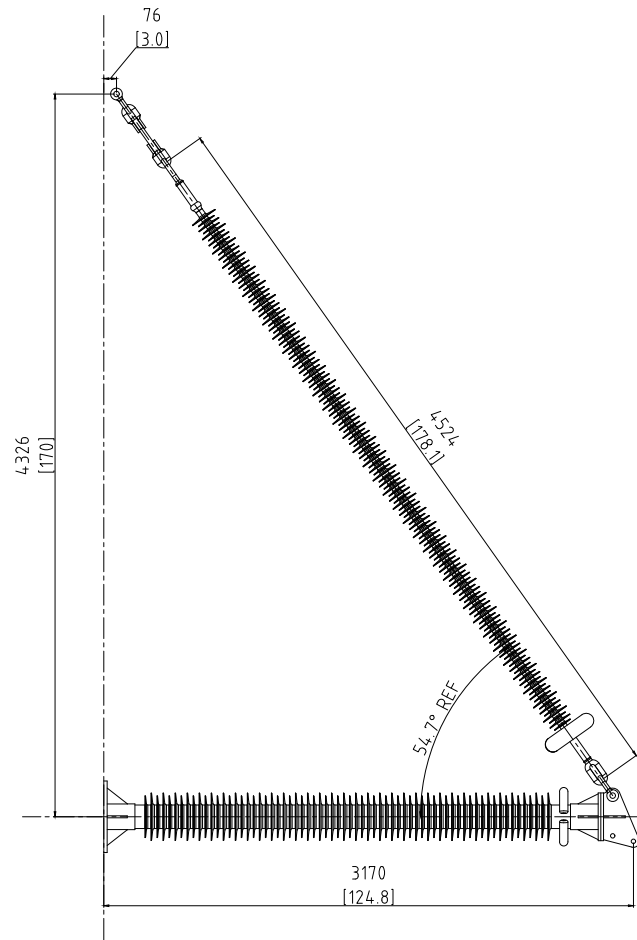
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# 345kV High Strength (HS) Braced Line Post Assembly - Class 500

5.1 inch (130 mm) Post and 67 kip Brace Insulator

Reinforced drop-tongue line end fitting and 14-inch bolt circle pole end fitting





MOUNTING BASE DETAIL

**ELECTRICAL VALUES AS PER ANSI C29.11**

DRY 60 Hz FLASHOVER:	893 kV
WET 60 Hz FLASHOVER:	785 kV
IMPULSE POSITIVE FLASHOVER:	1569 kV
IMPULSE NEGATIVE FLASHOVER:	1617 kV

**MAX WORKING LOADS**

VERTICAL:	26730 lbs	118.9 kN
TRANSVERSE TENSION:	33050 lbs	147.0 kN
TRANSVERSE COMPRESSION:	78460 lbs	349.0 kN
LONGITUDINAL:	5845 lbs	26.0 kN

**DIMENSIONAL DATA**

DRY ARC DISTANCE:	98.8 inches	2509 mm
LEAKAGE DISTANCE:	393.5 inches	9995 mm
ASSEMBLY WEIGHT:	521 lbs	236 kg

**COMPONENT LIST**

Item	Description	Qty
1	5.1 in Post Insulator	1
2	67 kips Brace Insulator	1
3	Reinforced Drop Tongue	1
4	DB Adjusting Plate	1
5	Anchor Shackle	4

**NOTES**

Meets standards: ANSI C29.11, ANSI C29.12 and ANSI C29.17

REVISIONS						
VER.	LOGO	DESCRIPTION	DESIGNED	VERIFIED	APPROVED	DATE
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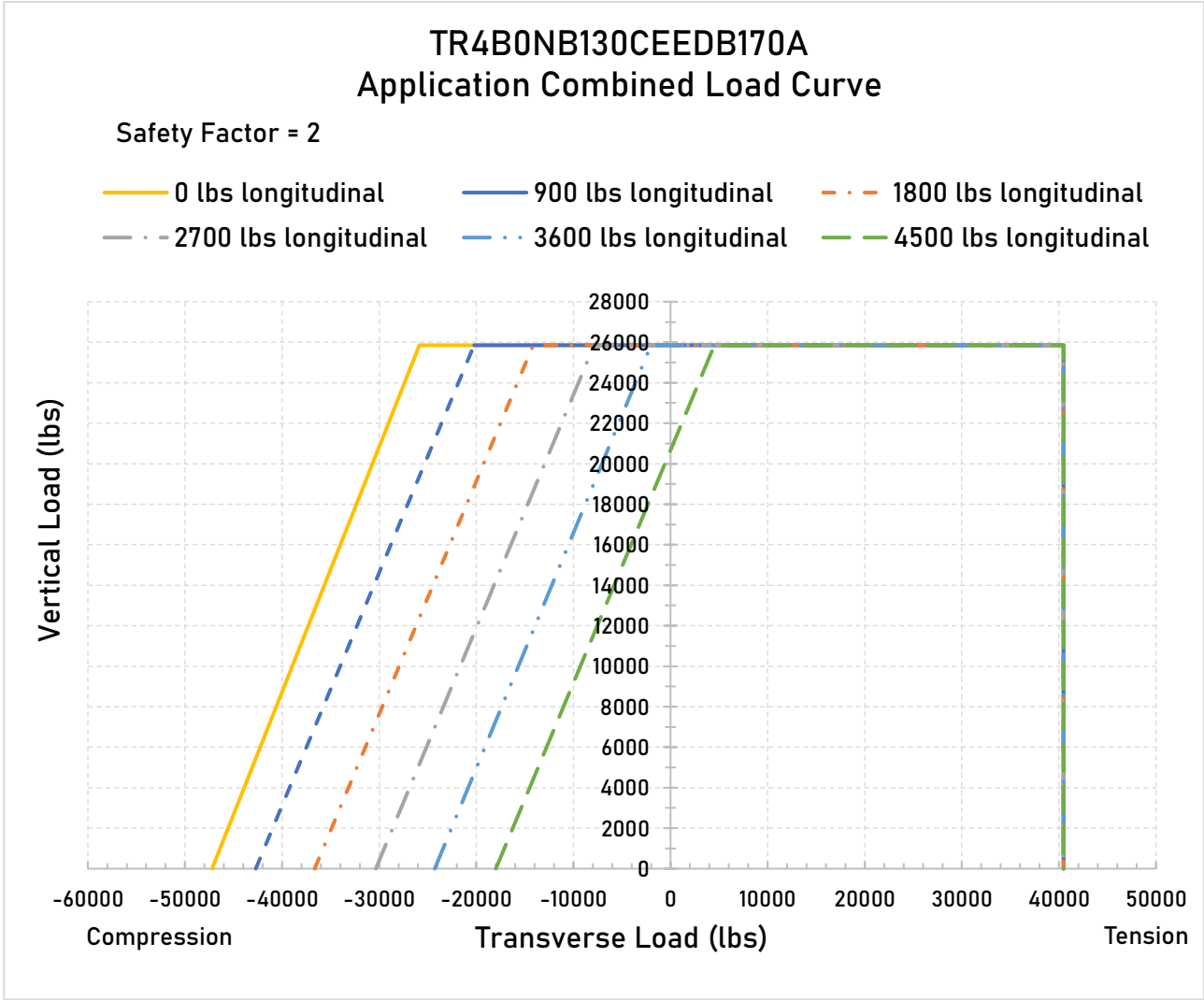
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# 345 kV Tripod Composite Insulated Cross-arm (CICA) Assembly - Class 350

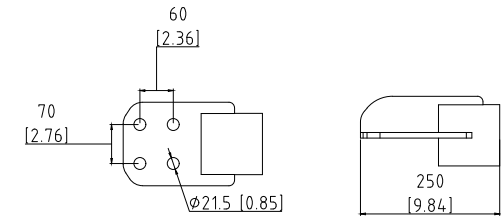
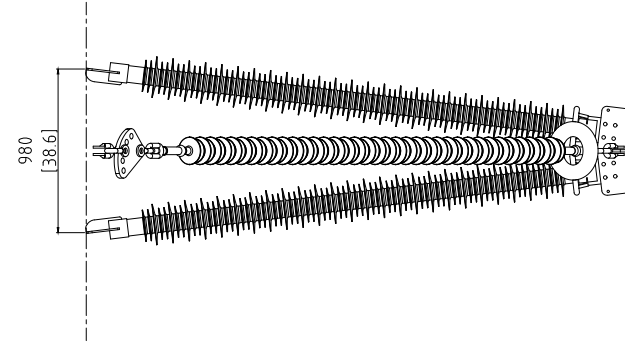
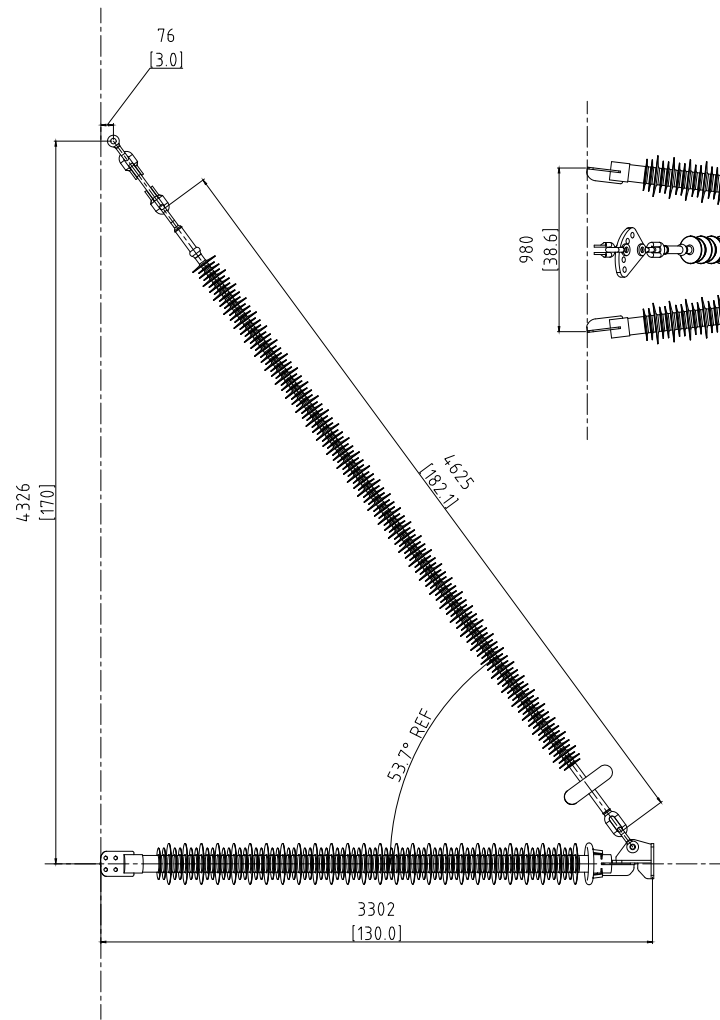
2 x 3.5 inch Post and 50 kip Brace Insulator

Reinforced yoke line end fitting and blade flange pole/tower end fitting



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DIMENSION millimeter [inches]



MOUNTING BASE DETAIL

**ELECTRICAL VALUES AS PER ANSI C29.11**

DRY 60 Hz FLASHOVER:	919 kV
WET 60 Hz FLASHOVER:	809 kV
IMPULSE POSITIVE FLASHOVER:	1617 kV
IMPULSE NEGATIVE FLASHOVER:	1665 kV

**MAX WORKING LOADS**

VERTICAL:	25920 lbs	115.3 kN
TRANSVERSE TENSION:	40466 lbs	180.0 kN
TRANSVERSE COMPRESSION:	47210 lbs	210.0 kN
LONGITUDINAL:	6969 lbs	31.0 kN

**DIMENSIONAL DATA**

DRY ARC DISTANCE:	101.8 inches	2586 mm
LEAKAGE DISTANCE:	392.2 inches	9962 mm
ASSEMBLY WEIGHT:	503 lbs	228 kg

**COMPONENT LIST**

Item	Description	Qty
1	3.5 in Post Insulator	2
2	50 kips Brace Insulator	1
3	Line End Fitting (Type B Yoke)	1
4	DB Adjusting Plate	1
5	Anchor Shackle	4

**NOTES**

Meets standards: ANSI C29.11, ANSI C29.12 and ANSI C29.17

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## Custom High Strength (HS) Braced Line Post and CICA Designs

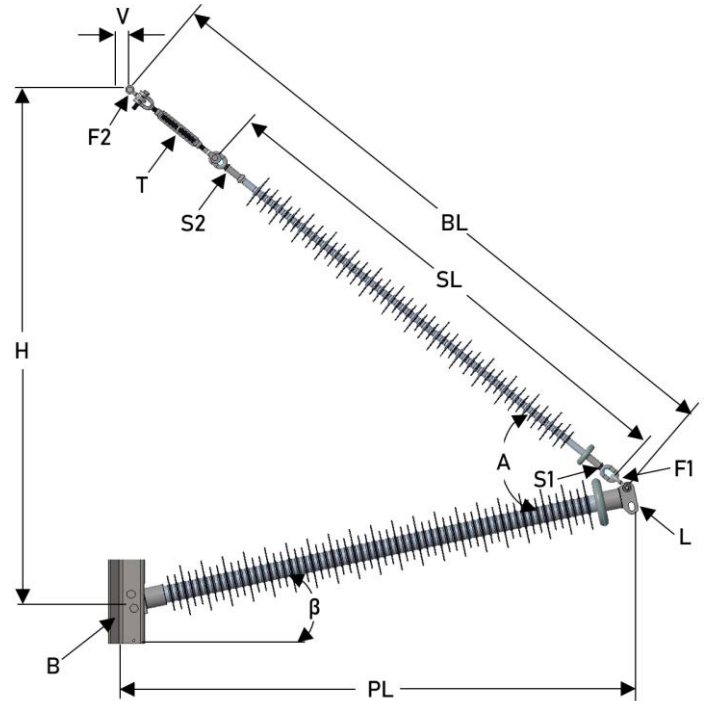
### Information Request Summary

General Information	
Inquirer Name:	Company:
Contact Information:	Project Details:
Quantity Required:	System Voltage (kV):

Dimensions				
Item	Description	Nominal	Min.	Max.
PL	Assembly Section Length			
H	Assembly Height			
BL	Brace Section Length			
SL	Suspension Section Length			
V	Vang Bracket Length			
A	Assembly Internal Angle			
$\beta$	Upsweep Angle			
W	Width of Pole/Tower Body		* for HS CICA only	

Electrical Requirements		
Parameter	Units	Min. Value
Dry Arc Distance	inch	
Leakage Distance	inch	
Low Freq. Wet Flashover Voltage	kV	
Low Freq. Dry Flashover Voltage	kV	
Pos. Critical Imp. Flashover Voltage	kV	
Neg. Critical Imp. Flashover Voltage	kV	
Arc Withstand	Yes or No	

Mechanical Requirements		
Working Loads	Units	Min. Value
Vertical	lbs.	
Tension	lbs.	
Compression	lbs.	
Longitudinal	lbs.	
Conductor Information	Units	Info.
Code Name	-	
Outer Diameter	inch	
Bundle Sub-conductors	No.s	
Armor Rods	Yes or No	



Hardware and Fitting Requirements		
Item	Description	Requirement
B	Post Base Mount Type	
L	Post Line End Fitting	
S1	Suspension Line End Fitting	
S2	Suspension Ground End Fitting	
F1	Suspension to Post Fitting	
F2	Suspension to Support Fitting	
T	Extension of Brace (tick one)	None, Turnbuckle, Other

#### Notes

Custom braced line post and engineered high strength CICA solutions are available if the standard designs of braced post assemblies given in this catalogue do not meet the requirements of your application.

Please fill-in this request sheet with the necessary information to convey the specific requirements of the custom braced line post or CICA design to SHEMAR. Our application engineers utilize the provided information on this form to develop a tailored design that precisely aligns with customer's needs.

For the assembly dimensions, indicate which dimensions are critical for the application.

