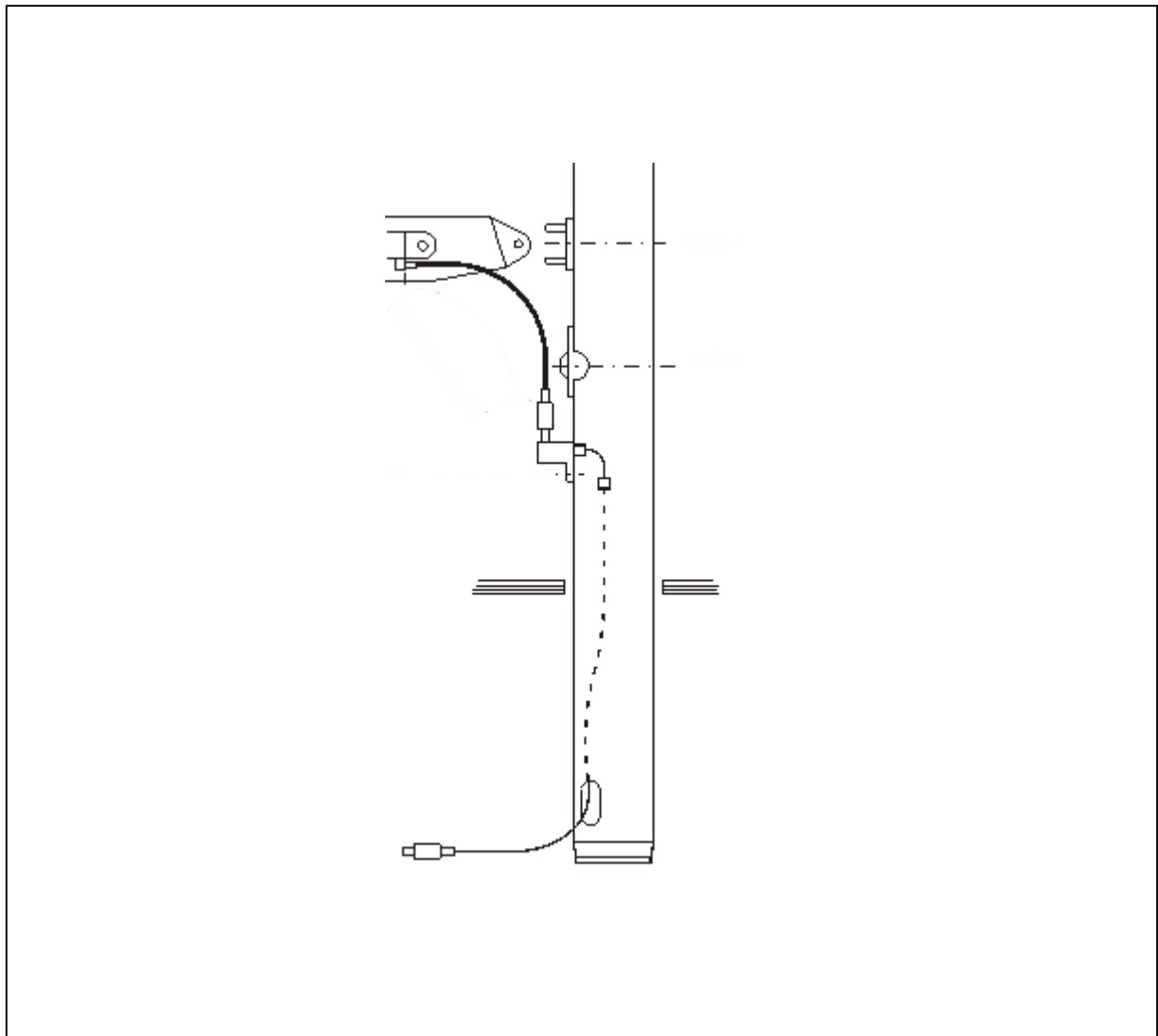


Hydraulic systems 2

Dimensioning



Hydraulic systems 2	1
Dimensioning	1
Introduction	3
1 HOSE LENGTH CALCULATION	4
1.1 Definition of hydraulic hose length	4
1.2 Hose length hydraulic outhaul	5
1.2.1 Hose length between outhaul-cylinder and deckgland	5
1.2.2 Hose length between outhaul-cylinder and mastgland	6
1.2.3 Hose length between mastgland and keel-end, hydraulic outhaul	7
1.3 Gaiter position for hydraulic outhaul	8
1.4 Hose length hydraulic In-mast furling	9
1.4.1 Hose length between hydraulic drive-unit and deckgland	9
1.4.2 Hose length between hydraulic drive-unit and mastgland	10
1.4.3 Hose length between mastgland and keel-end, in-mast furling	11
1.5 Gaiter position for in-mast furling	12
1.6 Hose length Leisure-Furl boom	13
1.6.1 Hose length between boom and mastgland, Leisure-furl	13
1.6.2 Hose length between mastgland and keel-end, Leisure-furl	14
1.7 Gaiter position for Leisure-furl	15
1.8 How to determine “Z”	16

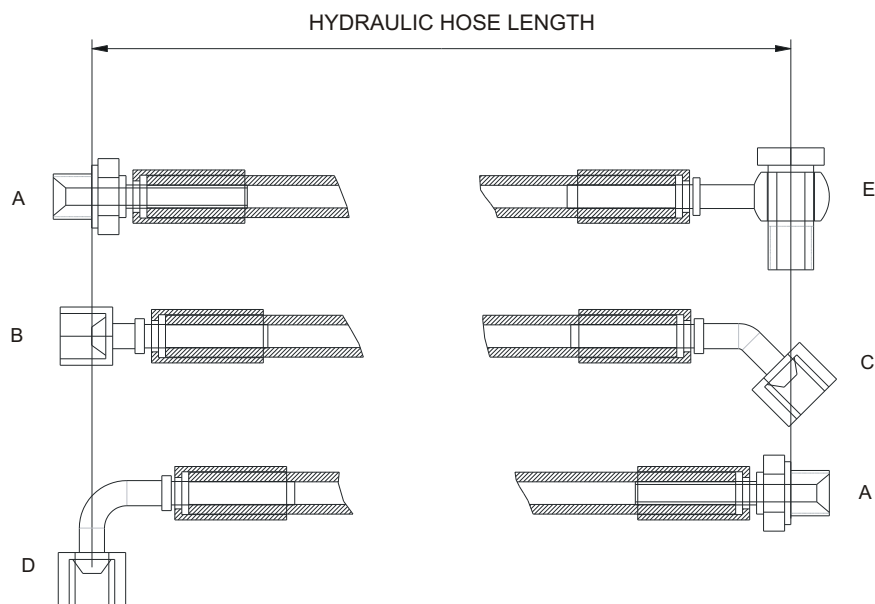
Introduction

HYDRAULIC SYSTEMS 2 – DIMENSIONING contains documentation of interest for internal use at Seldén. It's available as a pdf-file, and it can be revised without notice. The revisions are logged on the next page.

1 HOSE LENGTH CALCULATION

1.1 Definition of hydraulic hose length

The illustration below indicates how to measure the length of hydraulic hoses. These couplings are the most common and they might appear in different combinations on one hose. The couplings are attached to the hose by a pressed clamp and they are not removable. Couplings B, C and D have swivel nuts, so please measure from the center of the cone.



A = HYDR. COUPLING MALE 0°

B = HYDR. COUPLING NUT 0°

C = HYDR. COUPLING NUT 45°

D = HYDR. COUPLING NUT 90°

E = BANJO COUPLING

1.2 Hose length hydraulic outhaul

1.2.1 Hose length between outhaul-cylinder and deck gland

BOOM	Y (mm)	HOSE ASSY	GLAND
200	450	540-880-15 HOSE 1/4" MLE1/4-MLE3/8	540-907 Ø100
250	460	540-880-06 HOSE 3/8" 3/8(MLE-MLE)	540-906 Ø110
290/300	210	540-880-06 HOSE 3/8" 3/8(MLE-MLE)	540-906 Ø110

MAST	H+T (mm)
F246	51+33=84
F265, 285, 305	61+44=105
R324, 370	55+20=75

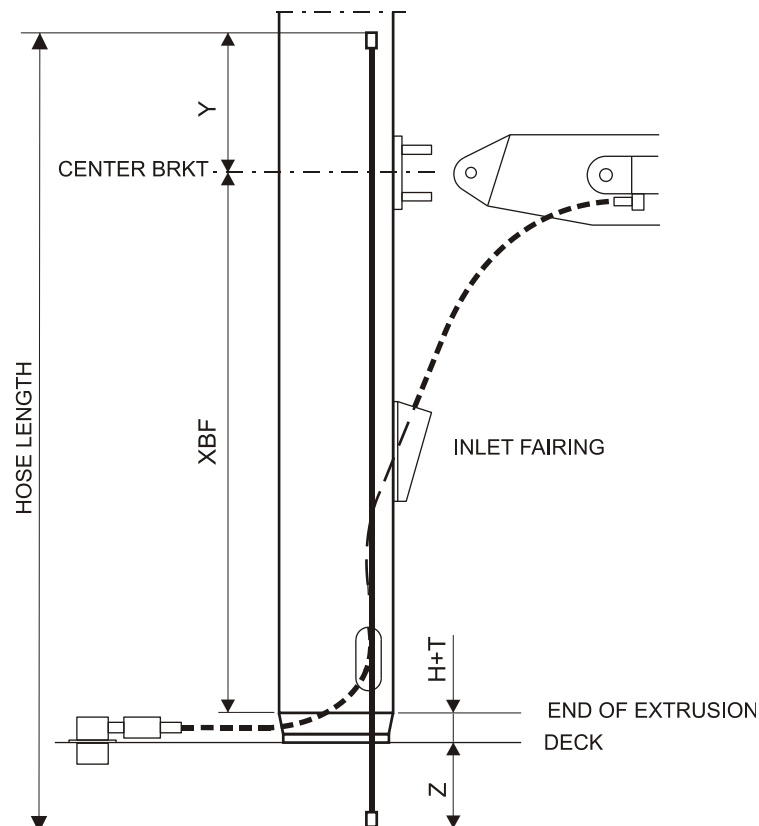
XBF boom-bracket position from mast specification

Y, (H+T) from tables above

Z empiric value. To determinate Z, position gland in relation to mast center, according to customers sketch. See paper form 595-169-E/S filled in by customer.

C difference between T-base level and deck level, if there is any.
See paper form 595-169-E/S. (C is not shown in the sketch below)

$$\text{Hose length} = \text{XBF} + \text{Y} + \text{Z} + (\text{H}+\text{T}) + \text{C}$$

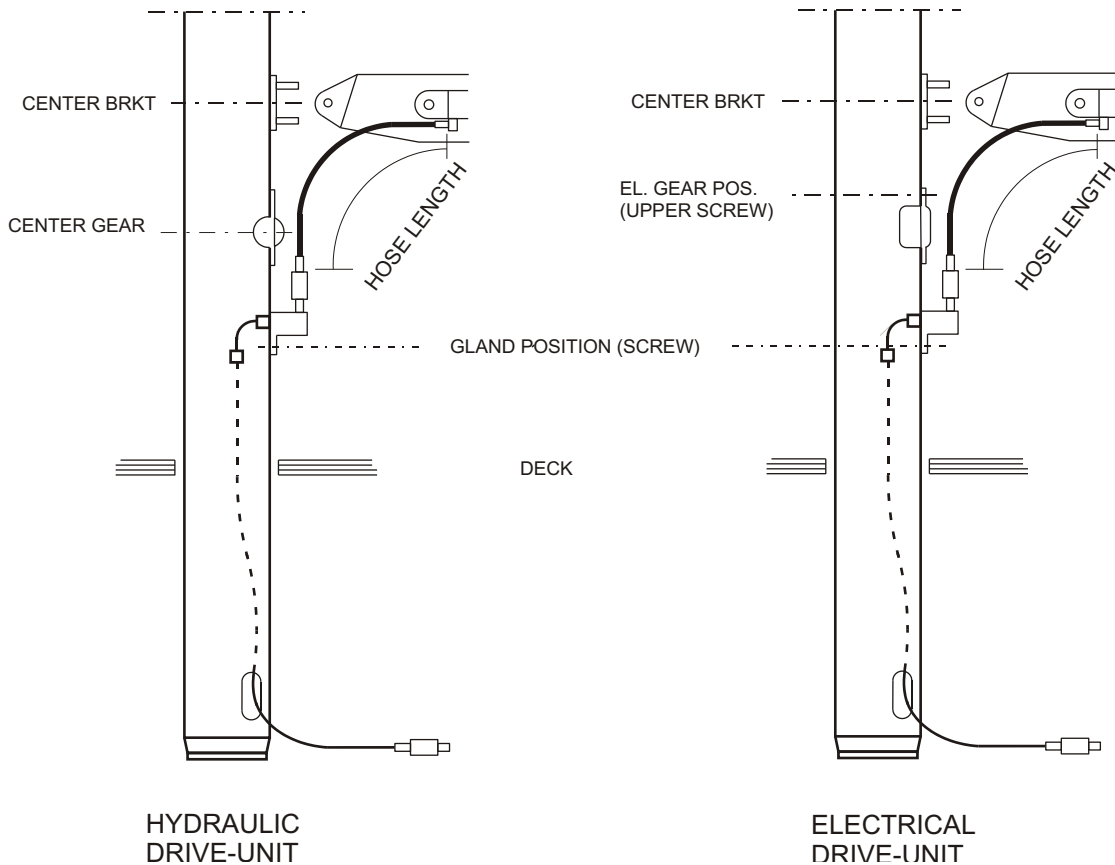


1.2.2 Hose length between outhaul-cylinder and mast gland

		BRACKET- 1) GEAR	GEAR- 2) MASTGLAND	HOSE LENGTH		
				200-BOOM 540-880-15 HOSE 1/4" (MLE1/4-MLE3/8) (mm)	250-BOOM 540-880-06 HOSE.3/8" 3/8(MLE-MLE) (mm)	290/300-BOOM HOSE 540-880-06 HOSE 3/8" 3/8(MLE-MLE) (mm)
HYDRAULIC FURLIN	F246 RB	300	280	870	890	-----
	F265, 286, 305 RB	350	280	920	940	-----
	F265, 286, 305 RC	340	280	910	930	-----
	F305 RD					
	R324 RC, RD	600	280	1170	1190	940
	R370 RD	600	280	-----	1190	940
	F406 RD	565	333	-----	-----	958
ELECTR. FURLIN	F246 RB	210	550	1050	1070	940
	F265, 286, 305 RB RC	260	550	1100	1120	-----
	F305 RD	510	550	1350	1370	-----
	R324 RC,RD	510	550	1350	1370	1230

1) HY; Center bracket – center gear
2) HY; Center gear – gland screw

EL; Center bracket – upper screw
EL; Upper screw – gland screw



1.2.3 Hose length between mast gland and keel-end, hydraulic outhaul

HOSE ASSY: 540-880-20 HDR.HOSE 3/8"(NUT90/MALE) ST

		BRACKET- 1) GEAR	GEAR- 2) MASTGLAND	Y (mm)
HYDRAULIC FURLIN	F246 RB	300	280	580
	F265, 286, 305 RB	350	280	630
	F265, 286, 305 RC	340	280	620
	F305 RD R324 RC, RD	600	280	880
	R370 RD			
	F406	565	300	865
ELECTR. FURLIN	F246 RB	210	550	970
	F265, 286, 305 RB RC	260	550	990
	F305 RD	510	550	990
	R324 RC,RD			

- 1) HY; Center bracket – center gear
EL; Center bracket – upper screw
- 2) HY; Center gear – gland screw
EL; Upper screw – gland screw

XBF boom-bracket position from mast specification

Y from table above

33 correction, see sketch

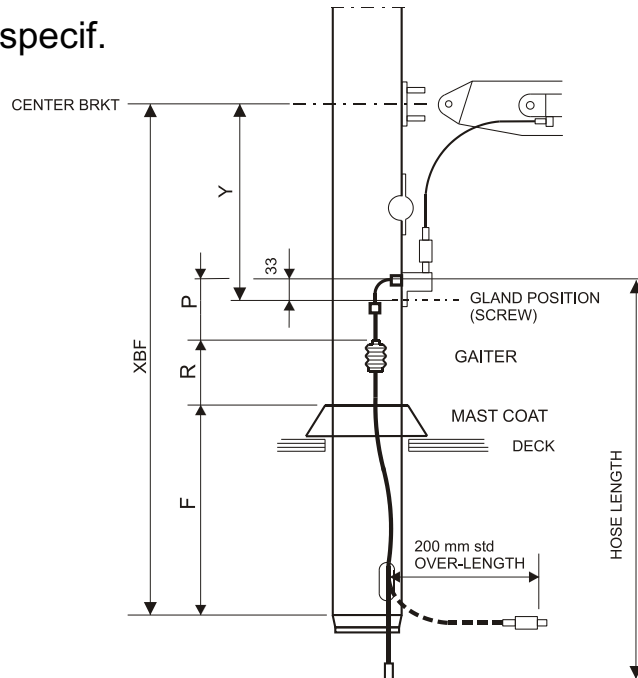
50 reduction for bending radius

200 standard over-length, or other specified by customer. See paper form 595-170-E/S.

We get hose length= $XBF - Y + 33 - 50 + 200$ or specif.
or approximately;

Hose length = $XBF - Y + 200$ or specif.

(Gaiter position on hose,
see next page)



1.3 Gaiter position for hydraulic outhaul

HOSE ASSY 540-880-20

See sketch on previous page.

XBF	boom-bracket position from mast specification
Y	from table above (previous page)
33	correction, see sketch
F	top of mast coat, from mast specification
R	fixed distance between top of coat and top of gaiter F246-305 R=160 R324-370 R=125
P	Gaiter position, also see drw PS581 (file H060/A4)

We get

$$\mathbf{P = XBF - F - R - Y + 33}$$

1.4 Hose length hydraulic In-mast furling

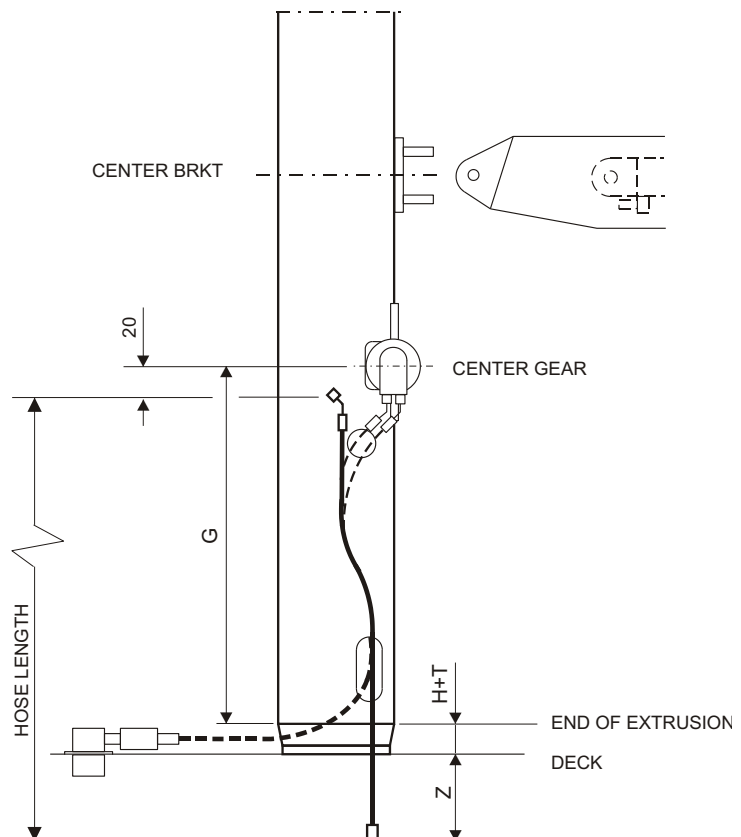
1.4.1 Hose length between hydraulic drive-unit and deck gland

HOSE ASSY: 540-880-54 HDR HOSE 1/4"(NUT-45°/F-MLE Q) ST
 DECKGLAND ASSY: 540-889-01

MAST	H+T (mm)
F246	51+33=84
F265, 285, 305	61+44=105
R324, 370	55+20=75

- G** center gear position from mast specification
- 20** empiric value from center gear to straight hose
- Z** empiric value. To determinate Z, position gland in relation to mast center, according to customers sketch. See paper form 595-171-E/S filled in by customer.
- H+T** from table above
- C** difference between T-base level and deck level, if there is any. See paper form 595-171-E/S. (C is not shown in the sketch below)

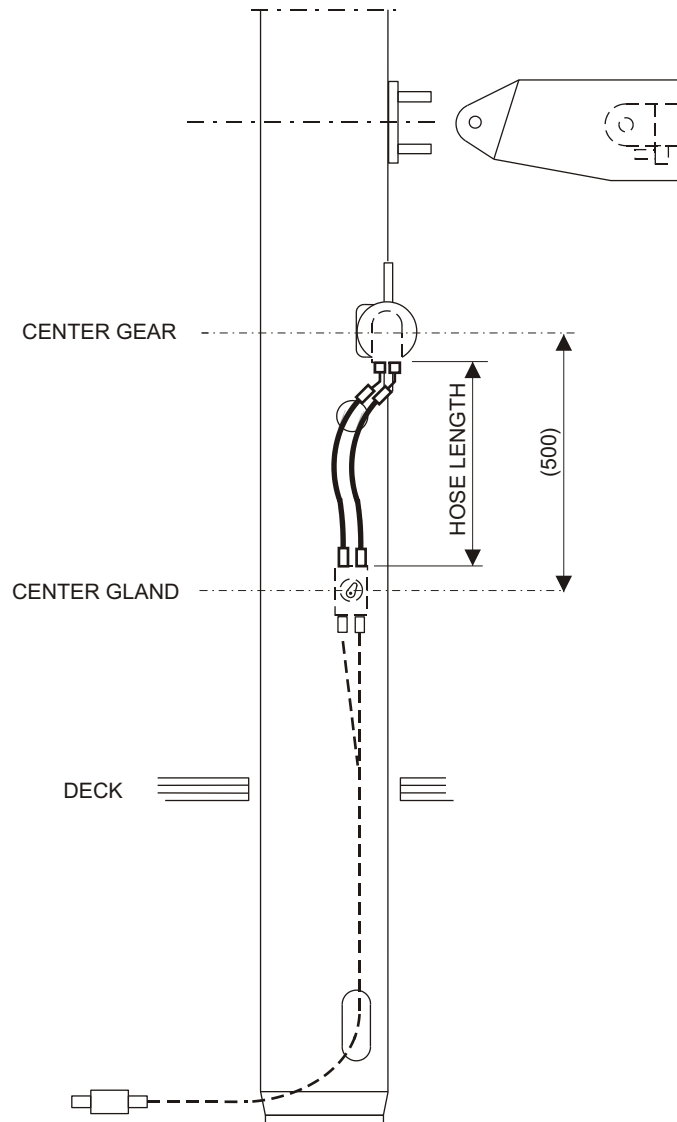
$$\text{Hose length} = G - 20 + Z + (H+T) + C$$



1.4.2 Hose length between hydraulic drive-unit and mast gland

HOSE ASSY: 540-880-11 HDR.HOSE 1/4"(NUT 0/NUT45) ST

Hose length = 400 mm



1.4.3 Hose length between mast gland and keel-end, in-mast furling

HOSE ASSY: 540-880-65 HDR.HOSE 3/8"(MLE/NUT0°)

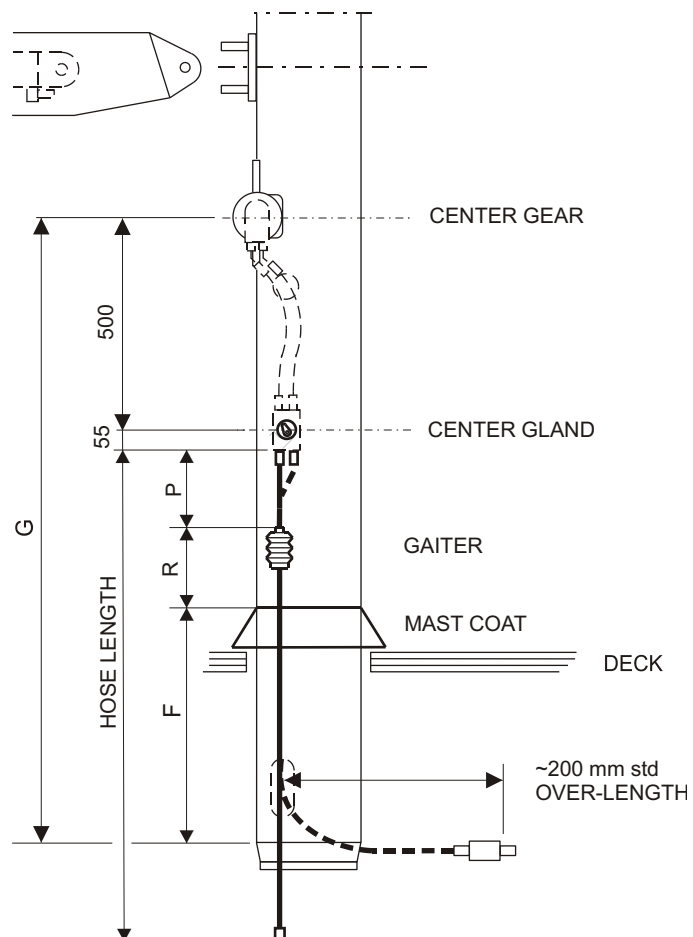
- G** center gear position from mast specification
- 500** center mast gland, see sketch
- 55** correction, see sketch
- 50** reduction for bending radius
- 200** standard over-length, or other specified by customer.
See paper form 595-172-E/S.

We get hose length = $G - 500 - 55 - 50 + 200$ or specified

or approximately

Hose length = $G - 600 + 200$ or specified

(Gaiter position on hose, see next page)



1.5 Gaiter position for in-mast furling

HOSE ASSY 540-880-65

See sketch on previous page.

- G** center gear position from mast specification
- 500** center mast gland, see sketch
- 55** correction, see sketch
- F** top of mast coat, from mast specification
- R** fixed distance between top of coat and top of gaiter
F246-305 R=160
R324-370 R=125
F406 R=130
- P** Gaiter position, also see drw PS581 (file H060/A4)

We get $P = G - 500 - 55 - R - F$

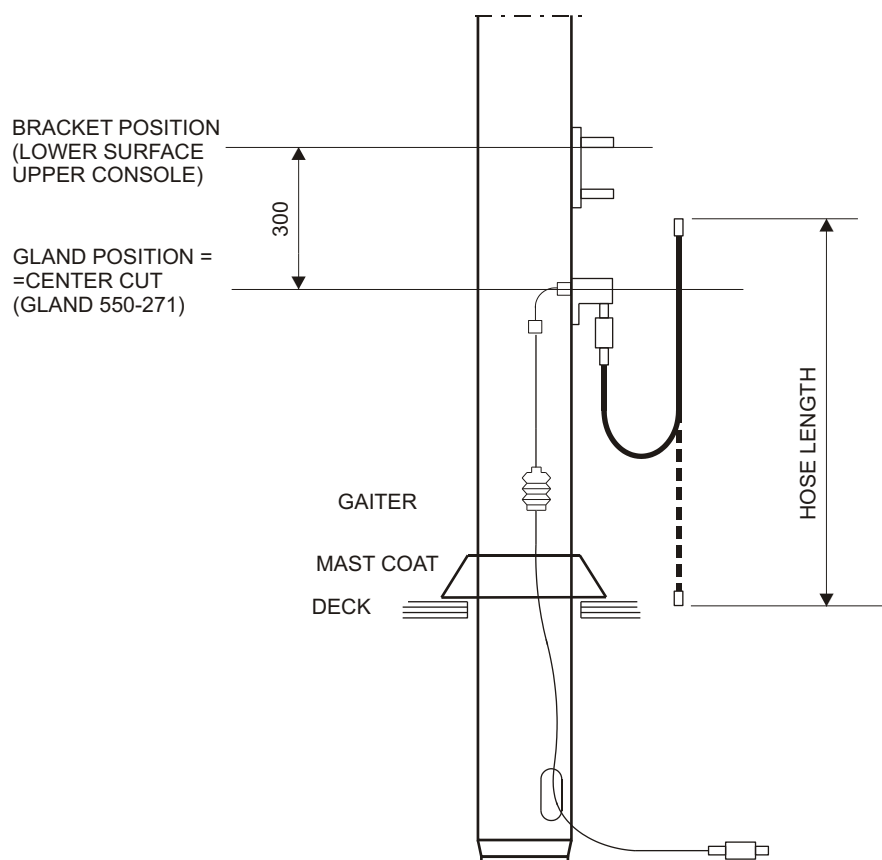
$$P = G - F - R - 555$$

MINIMUM REQUIRED BOOM HEIGHT for this application is found in MB 50:5.

1.6 Hose length Leisure-Furl boom

1.6.1 Hose length between boom and mast gland, Leisure-furl

Boom	Hose assy	Hose length (mm)	Note
18-6/H		1020	?
20-7/H	540-880-18	1020	3/8 JIC9/16 NUT0°/M
25-8/H		1020	?



1.6.2 Hose length between mast gland and keel-end, Leisure-furl

HOSE ASSY: 540-880-20 HDR.HOSE 3/8"(NUT90/MALE)ST

XBF boom-bracket position from mast specification

300 distance bracket – gland

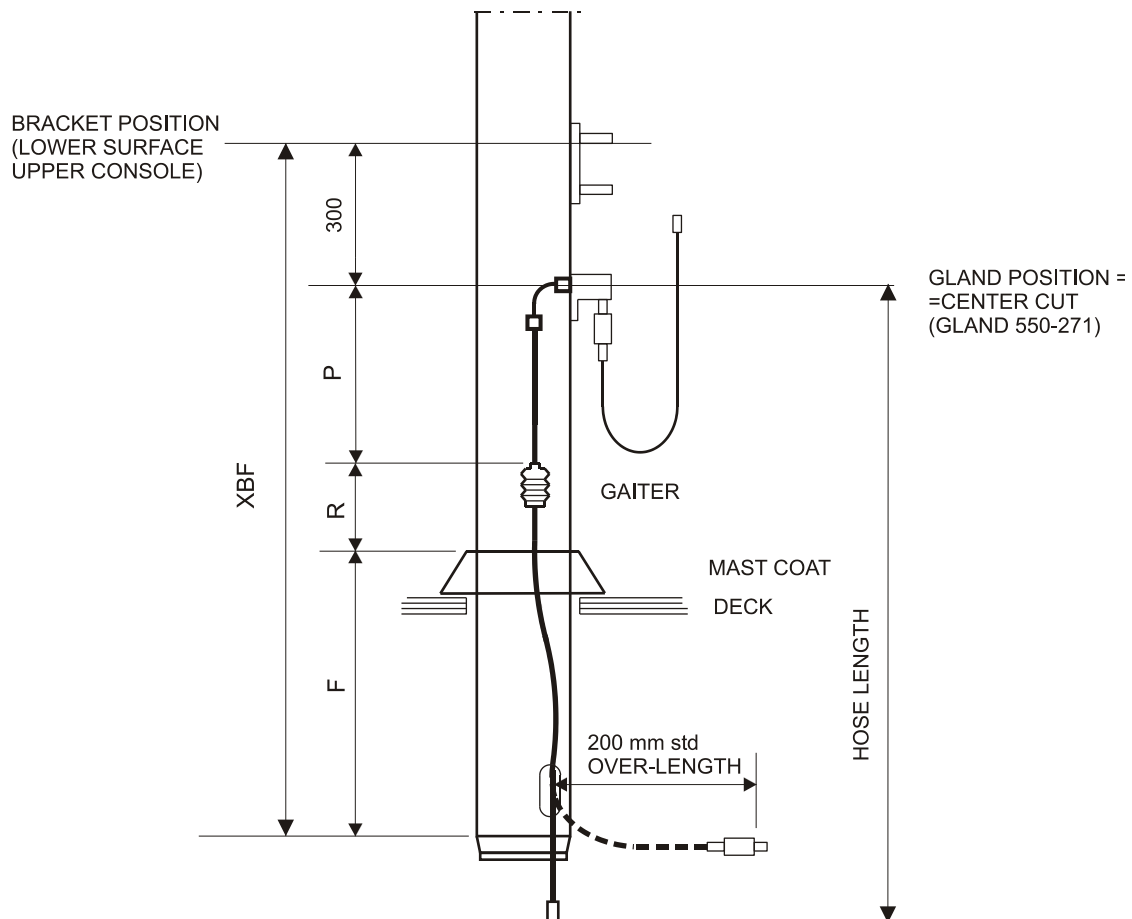
50 reduction for bending radius

200 standard over-length, or other specified by customer. See paper form XXXXXXXX.

We get hose length= $XBF - 300 - 50 + 200$ or specif.

Hose length = $XBF - 350 + 200$ or specif.

(Gaiter position on hose, see next page)



1.7 Gaiter position for Leisure-furl

HOSE ASSY 540-880-20

See sketch on previous page.

XBF	boom-bracket position from mast specification
300	distance bracket – gland
F	top of mast coat, from mast specification
R	fixed distance between top of coat and top of gaiter C245-304 R=190 E321-365 R=125
P	Gaiter position, also see drw PS581 (file H060/A4)

We get

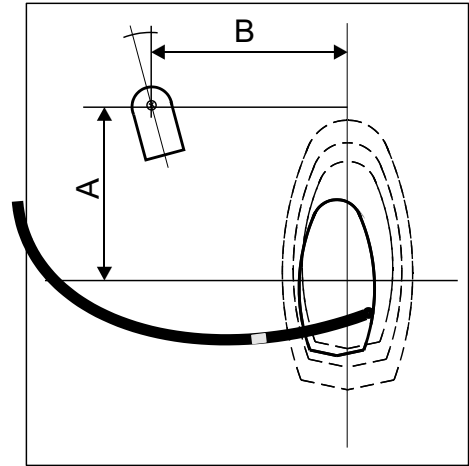
$$\mathbf{P = XBF - F - R - 300}$$

1.8 How to determine "Z"

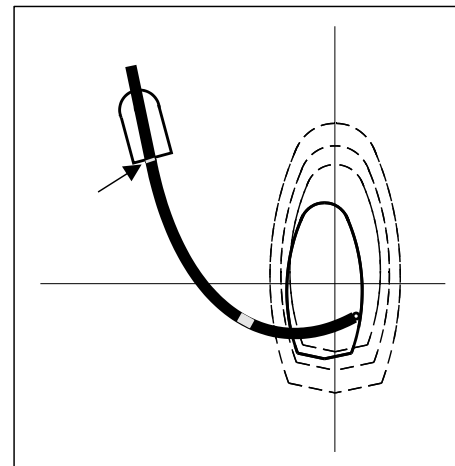
Z is used in the formula when calculating the length of hydraulic hoses for deck stepped masts. Both for hydraulic outhaul and for in-mast furling.

The jig used to determine the length Z, consists of a mounting board, a mast extrusion with an attached hose and a "deck gland".

1. Fix the mast at the position for right mast size.
2. Put the deck gland in the right position, according to the inquire forms filled in by the customer, and fix it with the screw.



3. Apply the hose in a smooth bend to reach the deck gland. Note the minimum bending radius.
4. Mark out the point on the hose shown by the arrow in the picture.



5. "Z" is the distance between permanent tapemark and the point at the arrow. (tape is marking end of extrusion, see picture)

