

SUMMARY

17A – LOADS, REACTIONS AND MOMENTS ON FIXING ANGLES	2
1. INSTALLATION ON FIXING ANGLES	2
1. 1. EXPLANATION AND LEGENDS OF THE REACTION TABLES	3
1. 2. EXPLANATION AND LEGENDS OF THE TABLES CONCRETE BLOCK CALCULATION.	4
1. 3. EXPLANATION AND LEGENDS OF THE TABLES PRESSURE UNDER CONCRETE BLOCKS	5
1. 4. REACTIONS ON THE FIXING ANGLES	6
MC175B – P16A – FEM	6
1. 5. CALCULATION OF THE CONCRETE BLOCKS	9
1. 6. PRESSURE UNDER THE CONCRETE BLOCKS	10

17A – LOADS, REACTIONS AND MOMENTS ON FIXING ANGLES

1. INSTALLATION ON FIXING ANGLES

The following tables define:

- ☐ the loads and the reactions applied on the fixing angles according to the conditions in service and out of service.
- ☐ the elements for the calculation of the concrete blocks
- ☐ the concrete blocks and the pressure under the recommended concrete blocks

The dimensions of the fixing angles, the setting of the fixing angles in the concrete blocks as well as the execution plans are shown in chapter 18A.



For the crane stability requirements, compulsorily observe the minimum dimensions on the ground as well as the minimum mass which are equal to those of the smallest permissible concrete block, which is compatible with the ground pressure at the erection site.



FIXING ANGLE – PREPARATION OF THE CONCRETE BLOCK

Pressure under the concrete blocks – during erection

Pressure under the concrete blocks – in service – out of service

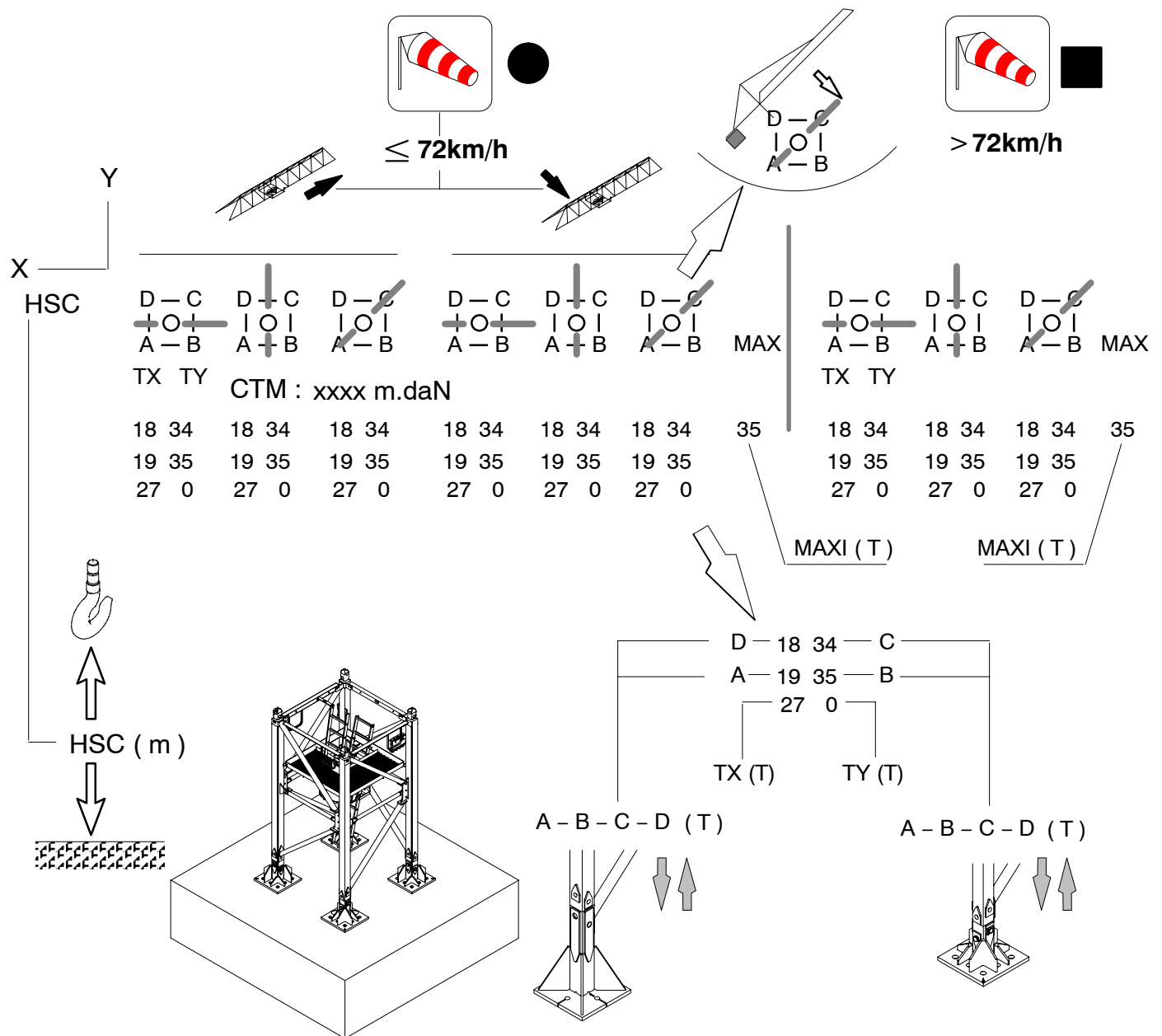


18 A



For any other dimensions which do not observe these recommendations, please consult us.

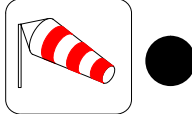
1. 1. EXPLANATION AND LEGENDS OF THE REACTION TABLES




CTM = Maximum torsional moment


TX – TY = Total shearing force (torsion not included)

**1. 2. EXPLANATION AND LEGENDS OF THE TABLES
CONCRETE BLOCK CALCULATION.**

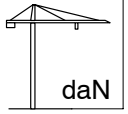


≤ 72km/h

HSC			"MT"	"CR"	"E.T."
10.90	92061.		22050.	138805.	2285.
12.57	92956.		24926.	138805.	2359.



daN



daN

m.daN

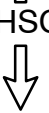
m.daN


daN

HSC (m)


↑


↓





> 72km/h

		"MT"	"CR"	"E.T."
		80061.	51273.	158254.
		80956.	58276.	158254.

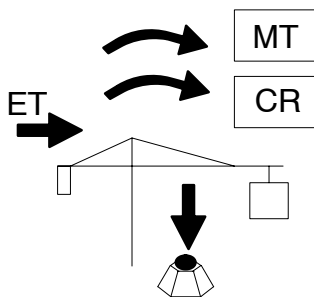


daN

m.daN

m.daN

daN

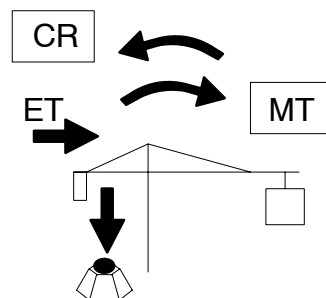


Cumulated moment = MT + CR

Cumulated shearing force on fixing angle = $\frac{ET}{2} + \frac{CTM}{d}$

CTM = Max. torsional moments on the masts
(see 17A – § 1.5)

d = mast width



Adding the moments depend on the values of the dead weight moment (CR) and the wind moment (MT):

If MT < 2 x CR then max. moment = CR

If MT > 2 x CR then max. moment = MT – CR

Max. cumulated shearing force on
fixing angle

In out of service condition, the crane is in
weathervaning position. CTM = 0

$$= \frac{ET}{2}$$

MT – Wind moment in m.daN

CR – Moment resulting from dead weight + load in m.daN

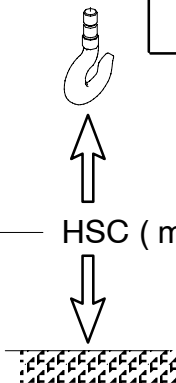
ET – Shearing force except the mast torsional moment in daN

**1. 3. EXPLANATION AND LEGENDS OF THE TABLES
PRESSURE UNDER CONCRETE BLOCKS**

HSC	CONCRETE BLOCK						
	81.T	101.T	126.T	142.T	169.T	205.T	278.T
10.90	2.0	1.5	1.1	1.4	1.2	1.0	0.9
12.57	2.0	1.5	1.2	1.4	1.2	1.0	0.9
14.23	2.0	1.5	1.2	1.4	1.2	1.0	0.9

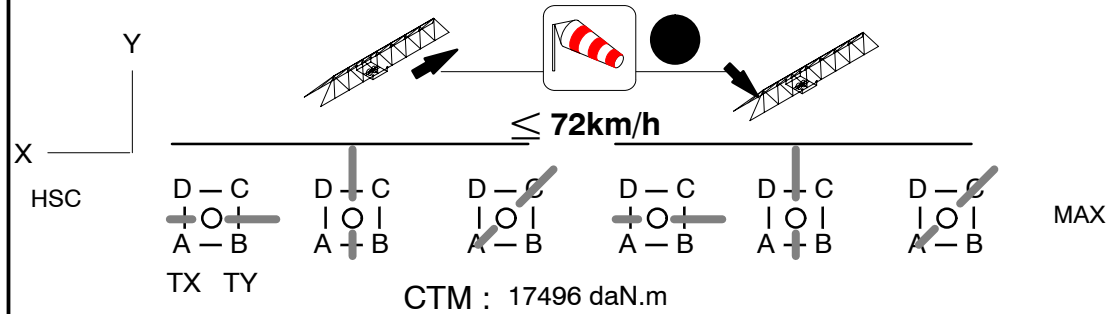
Pressure under the concrete blocks (daN/cm²).

HSC (m)

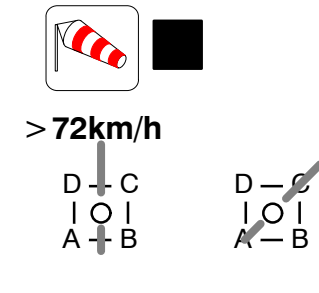


1. 4. REACTIONS ON THE FIXING ANGLES

MC175B – P16A – FEM



MAX



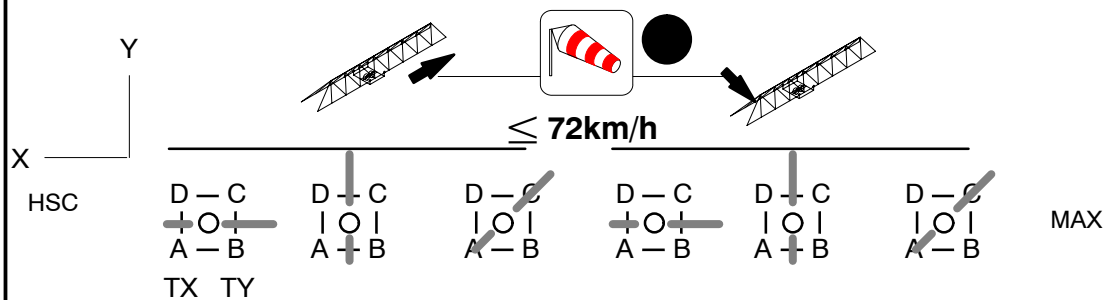
MAX

LOADS AND REACTIONS
ON FIXING ANGLES

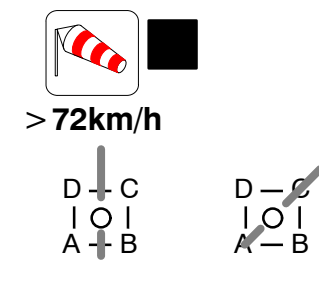
Manitowoc
Crane Care

ERECTION DISMANTLING

CTM : 17496 daN.m																				
	IX	TY												IX	TY					
8.0	10	-37	-37	-37	-12	-47	-5	-43	-22	-43	-12	-45	-47	-33	9	9	9	-12	18	-42
	9	-37	10	9	23	-12	16	-22	16	-5	21	-12		-33	9	-33	-33	-42	-12	
	1.6	0.0	0.0	1.6	1.0	1.0	0.0	3.3	3.3	0.0	2.9	1.1		4.2	0.0	0.0	4.2	3.1	3.1	
11.0	11	-38	-38	-39	-14	-49	-8	-46	-19	-46	-14	-47	-49	-33	9	9	9	-12	18	-42
	10	-39	11	10	21	-14	18	-19	18	-8	19	-14		-33	9	-33	-33	-42	-12	
	1.7	0.0	0.0	1.7	1.3	1.3	0.0	3.4	3.4	0.0	0.5	3.4		4.6	0.0	0.0	4.6	3.4	3.4	
14.0	12	-40	-40	-41	-14	-51	-12	-50	-17	-50	-14	-50	-51	-33	9	9	9	-12	18	-42
	12	-41	12	12	23	-14	21	-17	21	-12	22	-14		-33	9	-33	-33	-42	-12	
	1.8	0.0	0.0	1.8	1.4	1.4	0.0	3.5	3.5	0.0	3.6	0.2		4.9	0.0	0.0	4.9	3.7	3.7	
17.0	13	-42	-42	-42	-15	-54	-15	-53	-14	-53	-15	-54	-54	-34	9	9	9	-13	17	-43
	13	-42	13	13	25	-15	24	-14	24	-15	25	-15		-34	9	-34	-34	-43	-13	
	2.0	0.0	0.0	2.0	1.5	1.5	0.0	3.6	3.6	0.0	0.1	3.7		5.3	0.0	0.0	5.3	4.0	4.0	
20.0	15	-44	-44	-45	-15	-57	-19	-57	-11	-57	-15	-58	-58	-34	8	8	8	-13	17	-43
	14	-45	15	14	27	-15	28	-11	28	-19	28	-15		-34	8	-34	-34	-43	-13	
	2.1	0.0	0.0	2.1	1.6	1.6	0.0	3.7	3.7	0.0	0.5	3.8		6.5	0.0	0.0	6.5	4.9	4.9	



23.0	16	-46	-46	-47	-15	-60	-23	-61	-7	-61	-15	-62	-62
	16	-47	16	16	30	-15	31	-7	31	-23	32	-15	
	2.2	0.0	0.0	2.2	1.7	1.6	0.0	3.9	3.9	0.0	0.7	3.9	
26.0	18	-48	-48	-49	-15	-63	-27	-65	-4	-65	-15	-67	-67
	17	-49	18	17	32	-15	34	-4	34	-27	36	-15	
	2.3	0.0	0.0	2.3	1.8	1.7	0.0	4.0	4.0	0.0	1.0	4.0	
29.0	20	-51	-51	-51	-16	-67	-31	-69	-69	-1	-16	-72	-72
	19	-51	20	19	35	-16	38	-1	-31	38	41	-16	
	2.5	0.0	0.0	2.5	1.9	1.8	0.0	4.1	4.1	0.0	4.1	1.2	
32.0	22	-53	-53	-54	-16	-70	-35	-73	3	-73	-16	-77	-77
	21	-54	22	21	38	-16	41	3	41	-35	45	-16	
	2.6	0.0	0.0	2.6	1.9	1.9	0.0	4.2	4.2	0.0	1.4	4.2	
35.0	24	-56	-56	-57	-16	-74	-39	-78	7	-78	-16	-83	-83
	23	-57	24	23	42	-16	45	7	45	-39	51	-16	
	2.7	0.0	0.0	2.7	2.0	2.0	0.0	4.4	4.4	0.0	1.7	4.2	
38.0	26	-59	-59	-59	-17	-78	-44	-82	10	-82	-17	-89	-89
	25	-59	26	25	45	-17	49	10	49	-44	56	-17	
	2.8	0.0	0.0	2.8	2.1	2.1	0.0	4.5	4.5	0.0	1.8	4.3	



-34	8	8	8	-13	17	-43
-34	8	-34	-34	-43	-13	
7.1	0.0	0.0	7.1	5.3	5.3	
12	-39	-39	-39	-13	-53	-53
12	-39	12	12	26	-13	
7.6	0.0	0.0	7.6	5.7	5.7	
20	-48	-48	-48	-14	-66	-66
20	-48	20	20	38	-14	
8.1	0.0	0.0	8.1	6.2	6.2	
28	-56	-56	-56	-14	-79	-79
28	-56	28	28	51	-14	
8.7	0.0	0.0	8.7	6.6	6.6	
37	-66	-66	-66	-14	-93	-93
37	-66	37	37	64	-14	
9.2	0.0	0.0	9.2	7.0	7.0	
46	-75	-75	-75	-15	-107	-107
46	-75	46	46	78	-15	
9.7	0.0	0.0	9.7	7.4	7.4	

ERECTION DISMANTLING



LOADS AND REACTIONS ON FIXING ANGLES

Diagram illustrating the crane configuration for wind speeds $\leq 72\text{km/h}$. The crane is shown in a horizontal position, with the main boom and jib extending horizontally. The diagram includes a coordinate system with X and Y axes and a label HSC.

	HSC												MAX
	D-C		D-C		D-C		D-C		D-C		D-C		
	A-B	A-B	A-B	A-B	A-B	A-B	A-B	A-B	A-B	A-B	A-B	A-B	
	TX	TY	TX	TY	TX	TY	TX	TY	TX	TY	TX	TY	
41.0	29	-61	-61	-62	-17	-82	-48	-87	14	-87	-17	-95	-95
	28	-62	29	28	49	-17	53	14	53	-48	61	-17	
	2.9	0.0	0.0	2.9	2.2	2.2	0.0	4.6	4.6	0.0	2.0	4.3	
44.0	31	-64	-64	-65	-17	-87	-53	-91	18	-91	-17	-102	-102
	30	-65	31	30	53	-17	57	18	57	-53	67	-17	
	3.1	0.0	0.0	3.1	2.3	2.3	0.0	4.7	4.7	0.0	4.4	2.2	





Diagram illustrating the crane configuration for wind speeds $> 72\text{km/h}$. The crane is shown in a horizontal position, with the main boom and jib extending horizontally. The diagram includes a coordinate system with X and Y axes and a label HSC.

	HSC												MAX
	D-C		D-C		D-C		D-C		D-C		D-C		
	A-B	A-B	A-B	A-B	A-B	A-B	A-B	A-B	A-B	A-B	A-B	A-B	
	TX	TY	TX	TY	TX	TY	TX	TY	TX	TY	TX	TY	
	56	-86	-86	-86	-15	-123							-123
	56	-86	56	56	93	-15							
	10.3	0.0	0.0	10.3	7.8	7.8							
	66	-97	-97	-97	-15	-139							-139
	66	-97	66	66	109	-15							
	10.8	0.0	0.0	10.8	8.2	8.2							

LOADS AND REACTIONS ON FIXING ANGLES

ERECTION DISMANTLING

1. 5. CALCULATION OF THE CONCRETE BLOCKS

HSC								
		$\leq 72\text{km/h}$ "MT" "CR" "E.T."				$> 72\text{km/h}$ "MT" "CR" "E.T."		
8.04	54806.	13055.	56319.	1644.	46806.	32387.	63506.	4401.
11.04	55956.	17243.	56319.	1776.	47956.	43211.	63506.	4826.
14.03	57106.	21829.	56319.	1909.	49106.	55312.	63506.	5251.
17.03	58256.	26814.	56319.	2042.	50256.	68688.	63506.	5677.
20.03	59406.	32198.	56319.	2175.	51406.	101657.	63506.	6913.
23.03	60556.	37981.	56319.	2308.	52556.	124293.	63506.	7535.
26.03	61706.	44162.	56319.	2441.	53706.	147950.	63506.	8120.
29.03	62856.	50742.	56319.	2574.	54856.	173361.	63506.	8705.
32.03	64006.	57722.	56319.	2707.	56006.	200528.	63506.	9290.
35.03	65156.	65099.	56319.	2840.	57156.	229448.	63506.	9875.
38.03	66306.	72876.	56319.	2973.	58306.	260124.	63506.	10460.
41.03	67456.	81052.	56319.	3106.	59456.	292555.	63506.	11044.
44.03	68606.	89626.	56319.	3239.	60606.	326740.	63506.	11629.

1. 6. PRESSURE UNDER THE CONCRETE BLOCKS

HSC	52.T	64.T	74.T	81.T	101.T	126.T
8.04	1.7	1.3	1.1	1.0	0.9	0.7
11.04	1.8	1.4	1.2	1.1	0.9	0.7
14.03	1.9	1.4	1.2	1.1	0.9	0.8
17.03	2.0	1.5	1.3	1.2	0.9	0.8
20.03	2.2	1.6	1.3	1.2	1.0	0.8
23.03	2.3	1.7	1.4	1.3	1.0	0.8
26.03	2.6	1.8	1.5	1.4	1.1	0.9
29.03	*****	2.1	1.7	1.5	1.1	0.9
32.03	*****	2.8	2.1	1.8	1.3	1.0
35.03	*****	*****	2.6	2.2	1.5	1.2
38.03	*****	*****	*****	2.8	1.8	1.3
41.03	*****	*****	*****	*****	2.2	1.5
44.03	*****	*****	*****	*****	2.7	1.7

