

The specimen details

Diameter of bolt	d (mm)	20
Diameter of bolt hole	d ₀ (mm)	22
End distance	e ₁ (mm)	60
Edge distance	e ₂ (mm)	50
Spacing between centres of bolts in the direction of load transfer	p ₁ (mm)	60
Spacing between rows of bolts	p ₂ (mm)	103
Thickness of end plate	t _p (mm)	10
Horizontal distance of lever arm	B _L (mm)	490
Vertical distance of lever arm	D _L (mm)	51.7

Steel Grade		S275	S355
Dimension of Members		UB305x165x40	UC254x254x89
Depth of Section	D (mm)	303.4	260.3
Width of Section	B (mm)	165	256.3
Thickness of Web	t (mm)	6	10.3
Thickness of Flange	T (mm)	10.2	17.3
Root Radius	r (mm)	8.9	12.7
Depth between Fillets	d (mm)	265.2	200.3

Nominal Temperature

20°C

Time (minute)	Jack Displacement (mm)	Load Angle α (°)	Beam Rotation (°)	Column Rotation (°)	Connection Rotation (°)	Force Rotation (°)	F3 from F1 (kN)	F3 from F2 (kN)	F3 from Reading (kN)	Tension (kN)	Shear (kN)	Moment (kN*m)
0	-0.009											
1	-0.008											
2	-0.007											
3	-0.007	54.99	0.000	0.000	0.000	58.710	0.71	0.95	0.70	0.40	0.57	317.56
4	1.166	55.09	0.012	0.016	-0.004	58.596	1.67	2.21	1.75	1.00	1.43	791.85
5	2.539	55.15	0.071	0.047	0.024	58.484	3.97	4.07	3.60	2.06	2.96	1634.47
6	3.997	55.08	0.153	0.085	0.068	58.469	6.86	7.02	6.16	3.53	5.05	2793.87
7	5.465	55.00	0.244	0.109	0.135	58.455	9.92	9.93	9.06	5.19	7.42	4103.24
8	6.836	54.92	0.329	0.125	0.204	58.456	12.61	12.72	11.55	6.64	9.45	5230.21
9	8.156	54.82	0.433	0.136	0.298	58.447	14.63	14.83	13.46	7.76	11.00	6087.98
10	9.572	54.71	0.553	0.147	0.406	58.443	16.00	16.50	15.12	8.73	12.34	6827.65
11	11.194	54.56	0.695	0.148	0.547	58.446	17.25	17.73	16.21	9.40	13.21	7309.27
12	12.816	54.42	0.843	0.153	0.690	58.442	18.33	18.86	17.19	10.00	13.98	7738.55
13	14.273	54.26	0.998	0.159	0.839	58.444	18.79	19.48	17.95	10.48	14.57	8065.71
14	15.942	54.08	1.168	0.156	1.012	58.453	19.55	20.14	18.42	10.81	14.92	8262.12
15	17.564	53.90	1.340	0.163	1.177	58.464	20.01	20.45	18.87	11.12	15.25	8446.13
16	19.104	53.71	1.510	0.167	1.343	58.482	20.40	20.90	19.26	11.40	15.53	8603.64
17	20.613	53.51	1.688	0.167	1.521	58.500	20.91	21.25	19.60	11.65	15.75	8732.91
18	22.037	53.32	1.872	0.171	1.701	58.509	21.01	21.41	19.85	11.86	15.92	8825.92
19	23.653	53.10	2.056	0.177	1.879	58.546	21.22	21.93	20.21	12.14	16.16	8965.18
20	25.287	52.89	2.244	0.172	2.072	58.571	21.59	22.09	20.38	12.30	16.25	9017.50
21	26.906	52.70	2.408	0.181	2.227	58.594	22.93	23.50	21.72	13.16	17.28	9590.39
22	28.407	52.53	2.553	0.186	2.367	58.622	25.13	25.39	23.71	14.42	18.81	10444.31

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23	29.969	52.37	2.701	0.194	2.507	58.634	26.81	27.20	25.47	15.55	20.17	11198.63
24	31.485	52.19	2.861	0.196	2.665	58.654	28.36	28.59	26.86	16.47	21.22	11787.13
25	33.017	52.02	3.019	0.199	2.820	58.668	29.43	29.70	27.95	17.20	22.03	12239.09
26	34.626	51.83	3.187	0.193	2.994	58.685	30.38	30.56	28.78	17.79	22.63	12576.76
27	36.118	51.63	3.361	0.203	3.158	58.710	31.54	31.59	29.71	18.44	23.29	12948.50
28	37.666	51.45	3.523	0.208	3.315	58.729	32.48	32.59	30.77	19.17	24.06	13380.10
29	39.213	51.27	3.693	0.220	3.473	58.740	33.82	33.74	31.80	19.89	24.80	13797.43
30	40.743	51.10	3.858	0.220	3.638	58.746	34.78	34.68	32.74	20.56	25.48	14177.76
31	42.226	50.91	4.022	0.222	3.800	58.771	36.22	35.93	33.94	21.40	26.34	14662.98
32	43.845	50.73	4.169	0.221	3.948	58.798	37.77	37.68	35.64	22.55	27.59	15361.50
33	45.424	50.59	4.317	0.233	4.083	58.798	39.08	39.42	37.39	23.74	28.89	16087.22
34	47.011	50.44	4.451	0.234	4.217	58.810	41.51	41.95	39.86	25.39	30.73	17119.24
35	48.516	50.33	4.561	0.262	4.299	58.812	45.77	45.73	43.61	27.84	33.57	18701.34
36	50.001	50.23	4.671	0.276	4.395	58.803	50.43	50.06	47.74	30.54	36.69	20445.87
37	51.539	50.12	4.768	0.293	4.475	58.811	55.16	54.41	52.14	33.43	40.01	22300.35
38	53.111	50.02	4.883	0.299	4.584	58.796	59.91	58.55	56.36	36.21	43.19	24077.48
39	54.586	49.95	4.986	0.324	4.662	58.763	64.12	62.38	60.14	38.70	46.04	25668.12
40	56.093	49.84	5.099	0.331	4.767	58.763	67.67	65.66	63.31	40.83	48.38	26979.93
41	57.503	49.73	5.235	0.344	4.891	58.739	69.79	67.81	65.48	42.33	49.96	27866.59
42	59.027	49.60	5.369	0.348	5.021	58.731	71.76	69.61	67.21	43.56	51.19	28556.09
43	60.637	49.49	5.500	0.353	5.147	58.710	73.90	71.19	68.81	44.69	52.31	29191.31
44	62.231	49.37	5.637	0.357	5.280	58.700	75.40	72.94	70.54	45.94	53.53	29876.15
45	63.826	49.24	5.774	0.370	5.403	58.687	77.62	75.18	72.70	47.47	55.07	30743.56
46	65.461	49.11	5.908	0.376	5.532	58.682	79.93	77.33	74.65	48.87	56.44	31513.59
47	67.050	48.99	6.043	0.390	5.653	58.668	82.14	79.22	76.60	50.26	57.80	32281.89
48	68.620	48.87	6.174	0.393	5.781	58.657	84.25	81.15	78.41	51.57	59.06	32991.19
49	70.222	48.73	6.313	0.402	5.911	58.657	86.29	82.92	80.26	52.94	60.33	33710.34
50	71.858	48.59	6.464	0.399	6.065	58.646	88.08	84.81	82.15	54.34	61.62	34438.58
51	73.348	48.50	6.592	0.403	6.189	58.611	89.81	86.62	84.06	55.70	62.96	35195.01
52	74.847	48.36	6.732	0.415	6.317	58.612	92.08	88.32	85.92	57.09	64.21	35904.17

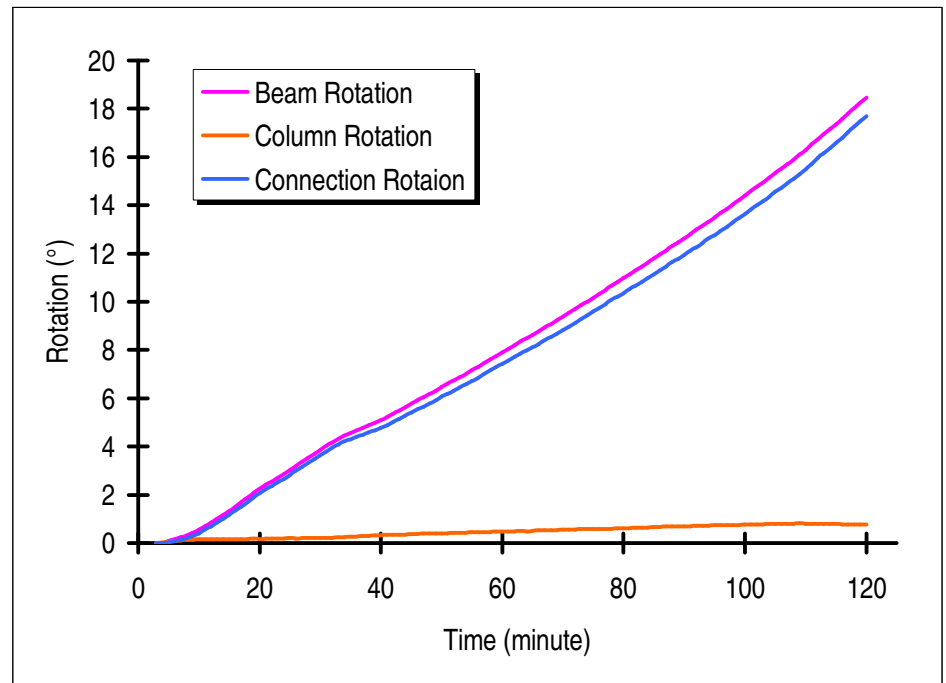
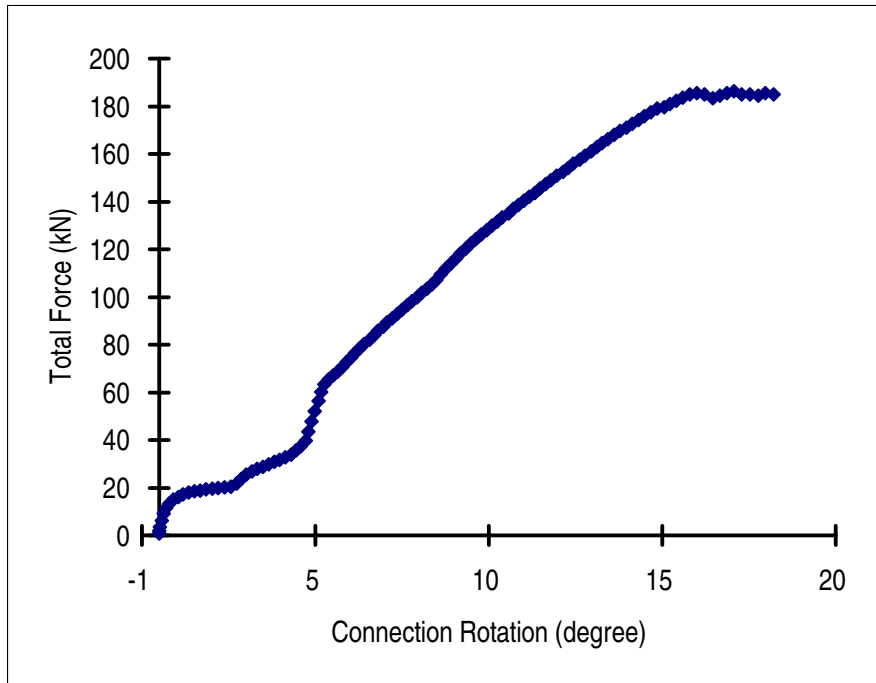
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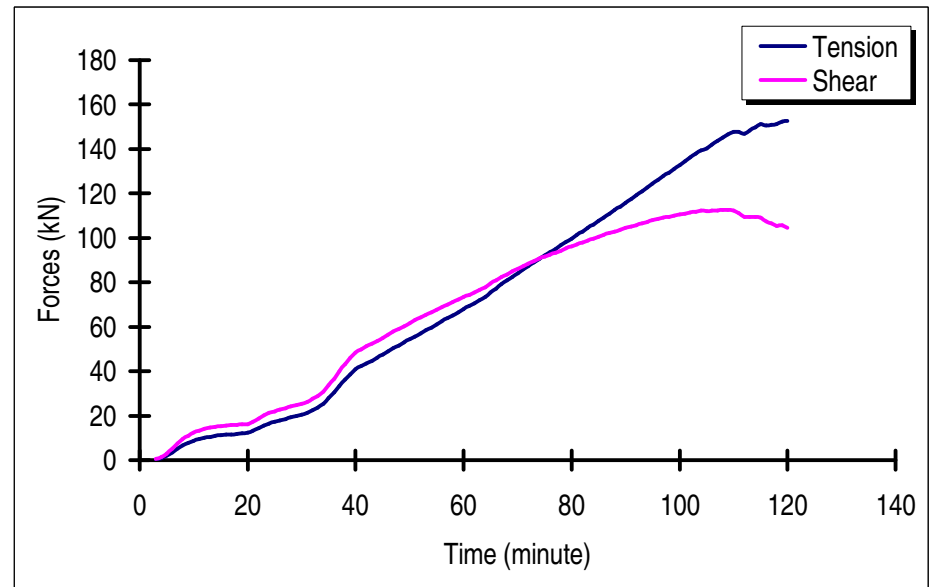
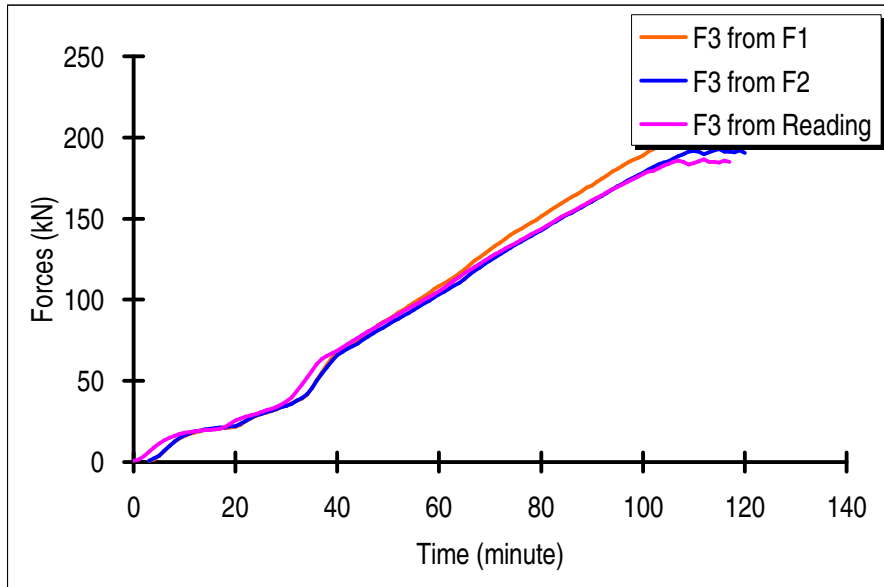
53	76.266	48.21	6.877	0.424	6.453	58.614	94.03	90.45	87.59	58.37	65.30	36526.94
54	77.862	48.09	7.007	0.434	6.573	58.604	96.15	91.96	89.36	59.68	66.50	37203.97
55	79.377	47.93	7.163	0.444	6.719	58.610	98.00	94.01	91.13	61.06	67.64	37857.11
56	80.907	47.79	7.298	0.443	6.855	58.611	100.17	95.92	92.93	62.43	68.83	38531.68
57	82.389	47.64	7.453	0.446	7.007	58.610	102.01	97.60	94.69	63.80	69.97	39180.18
58	84.105	47.49	7.604	0.451	7.153	58.608	104.18	99.54	96.52	65.22	71.15	39851.51
59	85.747	47.33	7.752	0.467	7.285	58.616	106.36	101.42	98.28	66.61	72.27	40491.36
60	87.368	47.20	7.893	0.468	7.425	58.614	108.26	103.22	99.96	67.93	73.34	41104.78
61	88.938	47.04	8.043	0.478	7.565	58.621	110.05	104.99	101.73	69.33	74.45	41737.26
62	90.524	46.89	8.191	0.482	7.709	58.617	112.02	106.74	103.43	70.68	75.52	42350.53
63	92.008	46.74	8.348	0.492	7.856	58.616	114.02	108.69	105.17	72.08	76.59	42964.75
64	93.579	46.60	8.481	0.489	7.992	58.621	116.14	110.57	107.09	73.58	77.81	43664.15
65	95.118	46.44	8.629	0.507	8.122	58.628	118.83	112.90	109.50	75.45	79.36	44545.85
66	96.753	46.30	8.779	0.519	8.260	58.621	121.41	115.38	111.83	77.26	80.85	45397.18
67	98.339	46.13	8.933	0.528	8.405	58.637	124.06	117.72	114.09	79.07	82.25	46203.02
68	99.845	45.98	9.084	0.533	8.551	58.641	126.22	119.95	116.25	80.79	83.59	46971.14
69	101.458	45.83	9.224	0.538	8.686	58.647	128.63	122.07	118.33	82.45	84.88	47706.21
70	102.949	45.66	9.386	0.546	8.840	58.653	131.02	124.08	120.27	84.05	86.02	48366.93
71	104.495	45.51	9.538	0.559	8.979	58.656	133.33	126.30	122.34	85.74	87.27	49088.17
72	106.065	45.35	9.699	0.566	9.133	58.655	135.39	128.20	124.30	87.36	88.43	49755.55
73	107.614	45.18	9.857	0.583	9.274	58.669	137.74	130.27	126.27	89.01	89.56	50410.85
74	109.081	45.00	10.009	0.572	9.437	58.689	140.00	132.20	128.09	90.57	90.58	51006.11
75	110.562	44.83	10.170	0.576	9.594	58.703	141.96	134.06	129.92	92.14	91.59	51595.66
76	112.037	44.67	10.319	0.586	9.733	58.711	143.71	135.79	131.63	93.61	92.54	52151.25
77	113.536	44.48	10.487	0.592	9.895	58.736	145.67	137.49	133.29	95.11	93.39	52653.20
78	115.116	44.28	10.663	0.593	10.070	58.755	147.54	139.36	134.98	96.63	94.25	53159.18
79	116.638	44.13	10.820	0.616	10.204	58.755	149.14	141.00	136.85	98.23	95.28	53764.47
80	118.008	43.96	10.974	0.620	10.354	58.768	151.51	142.88	138.49	99.69	96.13	54263.55
81	119.538	43.76	11.141	0.622	10.519	58.798	153.54	144.81	140.27	101.31	97.02	54793.53
82	121.070	43.56	11.303	0.634	10.669	58.836	155.54	146.55	141.99	102.89	97.85	55285.92

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83	122.625	43.40	11.467	0.640	10.827	58.836	157.34	148.21	143.72	104.43	98.75	55816.00
84	124.100	43.20	11.622	0.643	10.979	58.878	159.30	150.08	145.43	106.01	99.56	56300.54
85	125.527	43.00	11.793	0.653	11.140	58.906	161.34	152.12	147.27	107.70	100.44	56828.70
86	127.067	42.86	11.960	0.662	11.298	58.879	163.20	153.50	149.11	109.29	101.43	57408.11
87	128.580	42.64	12.134	0.684	11.450	58.923	164.71	155.32	150.86	110.97	102.20	57876.51
88	130.133	42.44	12.310	0.677	11.633	58.954	166.93	157.08	152.54	112.57	102.93	58321.16
89	131.697	42.22	12.474	0.690	11.784	59.004	169.01	158.85	154.18	114.18	103.62	58742.87
90	133.381	42.04	12.634	0.695	11.939	59.025	170.46	160.60	155.93	115.80	104.43	59230.37
91	134.879	41.82	12.814	0.700	12.114	59.070	172.71	162.61	157.69	117.52	105.14	59670.40
92	136.515	41.60	12.985	0.722	12.263	59.113	174.53	164.22	159.30	119.12	105.77	60063.96
93	138.078	41.38	13.156	0.712	12.444	59.162	176.67	166.11	161.16	120.92	106.54	60536.86
94	139.609	41.16	13.329	0.714	12.615	59.209	178.93	168.13	162.88	122.62	107.21	60954.06
95	141.204	40.94	13.500	0.730	12.770	59.258	180.71	169.93	164.63	124.35	107.88	61373.30
96	142.749	40.71	13.674	0.740	12.934	59.315	182.46	171.51	166.26	126.03	108.45	61734.55
97	144.135	40.50	13.847	0.739	13.108	59.356	184.59	173.35	168.04	127.78	109.13	62159.52
98	145.826	40.26	14.031	0.741	13.290	59.410	186.26	175.07	169.54	129.38	109.57	62453.14
99	147.278	40.01	14.215	0.751	13.464	59.474	187.32	176.48	171.12	131.06	110.03	62758.63
100	148.720	39.77	14.395	0.765	13.630	59.538	189.06	178.19	172.68	132.73	110.46	63053.10
101	150.372	39.52	14.587	0.775	13.812	59.594	191.18	180.05	174.34	134.49	110.94	63374.46
102	151.983	39.29	14.762	0.769	13.993	59.649	192.94	181.64	175.97	136.19	111.44	63700.37
103	153.466	39.06	14.945	0.780	14.165	59.700	194.72	183.49	177.47	137.81	111.82	63967.76
104	155.085	38.87	15.133	0.788	14.345	59.702	195.85	184.46	179.10	139.45	112.39	64329.68
105	156.591	38.58	15.335	0.785	14.550	59.787	196.98	185.46	179.58	140.38	111.99	64156.85
106	158.178	38.31	15.511	0.790	14.721	59.878	198.72	187.09	180.97	141.99	112.19	64329.79
107	159.694	38.05	15.706	0.794	14.912	59.945	199.96	188.41	182.41	143.64	112.43	64522.27
108	161.272	37.79	15.897	0.798	15.099	60.015	201.39	189.80	183.65	145.13	112.53	64634.68
109	162.795	37.51	16.100	0.813	15.287	60.093	202.93	191.10	184.86	146.64	112.55	64707.69
110	164.374	37.24	16.299	0.804	15.495	60.164	203.31	191.76	185.59	147.75	112.31	64624.91
111	165.896	36.95	16.519	0.809	15.710	60.235	202.94	191.25	184.93	147.80	111.16	64028.85
112	167.516	36.65	16.745	0.786	15.959	60.312	201.08	189.62	183.23	147.01	109.36	63059.50

113	168.935	36.38	16.957	0.791	16.166	60.361	202.54	190.76	184.33	148.40	109.34	63107.38
114	170.297	36.11	17.158	0.788	16.370	60.436	203.62	191.85	185.51	149.88	109.32	63158.98
115	171.892	35.84	17.354	0.783	16.571	60.510	204.69	192.67	186.35	151.07	109.11	63094.92
116	173.439	35.52	17.574	0.778	16.796	60.612	203.17	191.40	184.88	150.49	107.40	62184.38
117	174.922	35.21	17.800	0.779	17.021	60.689	203.26	191.44	184.88	151.05	106.60	61793.69
118	176.612	34.92	18.031	0.771	17.260	60.755	202.46	190.76	184.36	151.17	105.52	61235.68
119	178.206	34.76	18.242	0.773	17.469	60.696	203.15	192.17	185.57	152.44	105.81	61439.12
120	179.770	34.40	18.462	0.759	17.703	60.843	203.29	190.55	184.96	152.62	104.49	60760.27





Photographs after Test

