

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		UB305x165 x40	UC254x25 4x89
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

550°C

Time (minute)	Thermocouple Average(°C)	Jack Displacement (mm)	Load Angle α (°)	Beam Rotation (°)	Column Rotation (°)	Connection Rotation (°)	Force Rotation (°)	F3 from F1 (kN)	F3 from F2 (kN)	F3 Average (kN)	Tension (kN)	Shear (kN)	Moment (kN*m)
0	547.240	1.201											
1	547.419	1.174											
2	547.531	1.137											
3	547.635	1.117	56.01	0.000	0.000	0.000	57.903	-3.14	-2.14	-2.64	-1.48	-2.19	-1210.29
4	547.715	2.409	56.17	0.058	0.011	0.047	57.678	-0.60	-0.03	-0.31	-0.17	-0.26	-142.38
5	547.815	3.936	56.12	0.161	0.046	0.115	57.631	0.67	0.92	0.79	0.44	0.66	363.76
6	547.897	5.573	56.00	0.170	0.038	0.133	57.740	0.85	1.13	0.99	0.55	0.82	452.03
7	547.899	7.128	56.28	0.224	0.032	0.193	57.405	1.11	1.26	1.19	0.66	0.99	544.65
8	548.036	8.634	56.24	0.295	0.048	0.247	57.372	1.37	1.85	1.61	0.89	1.34	738.30
9	548.093	9.949	56.17	0.374	0.048	0.326	57.362	1.69	1.95	1.82	1.01	1.51	834.01
10	548.158	11.474	56.06	0.508	0.061	0.447	57.342	2.14	2.39	2.26	1.26	1.88	1036.57
11	548.296	13.081	55.96	0.622	0.056	0.567	57.325	2.26	2.87	2.57	1.44	2.13	1174.20
12	548.323	14.595	55.80	0.765	0.067	0.698	57.342	2.83	3.38	3.11	1.75	2.57	1419.67
13	548.413	16.241	55.60	0.935	0.079	0.857	57.373	3.08	3.61	3.35	1.89	2.76	1527.14
14	548.483	17.873	55.40	1.125	0.077	1.048	57.383	3.08	3.68	3.38	1.92	2.78	1537.39
15	548.563	19.546	55.21	1.287	0.071	1.216	57.408	3.14	3.84	3.49	1.99	2.86	1584.12
16	548.619	21.033	54.95	1.504	0.071	1.433	57.451	3.13	3.83	3.48	2.00	2.85	1576.49
17	548.642	22.519	54.78	1.659	0.063	1.596	57.474	3.06	3.73	3.39	1.96	2.77	1534.40
18	548.775	24.056	54.56	1.837	0.079	1.758	57.512	2.87	3.99	3.43	1.99	2.79	1545.67
19	548.965	25.664	54.37	2.007	0.090	1.917	57.528	3.37	4.08	3.72	2.17	3.03	1676.06
20	548.953	27.187	54.17	2.181	0.097	2.084	57.558	4.23	4.99	4.61	2.70	3.74	2070.92
21	548.999	28.836	54.00	2.326	0.120	2.206	57.581	4.60	5.52	5.06	2.98	4.10	2268.58
22	549.138	30.418	53.71	2.573	0.092	2.481	57.629	4.09	5.25	4.67	2.76	3.76	2085.04

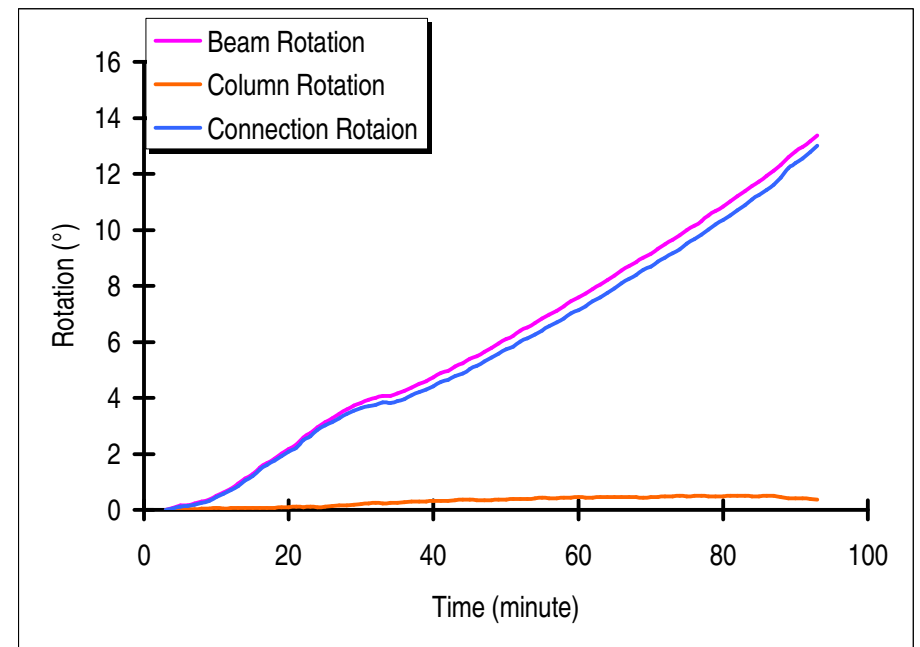
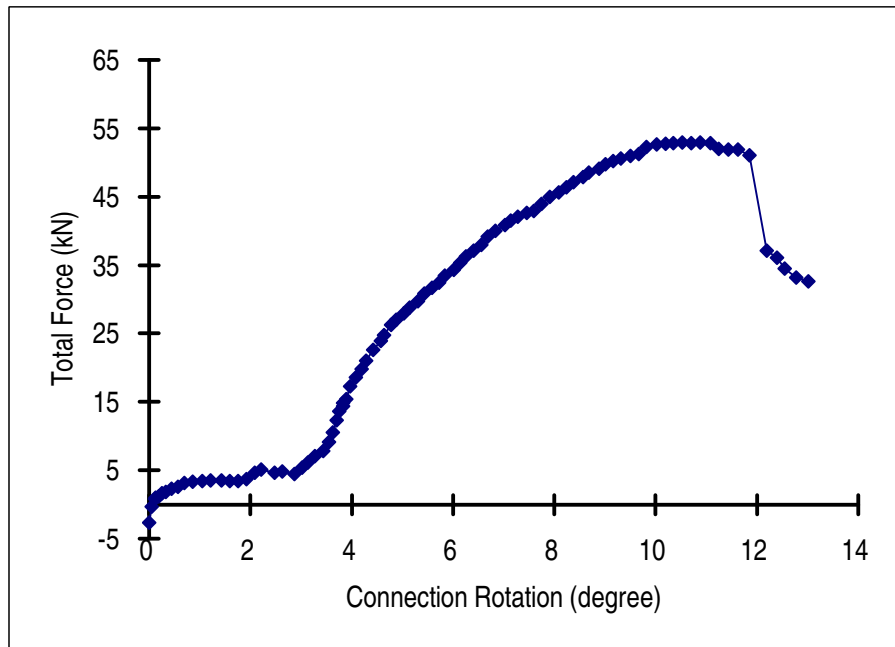
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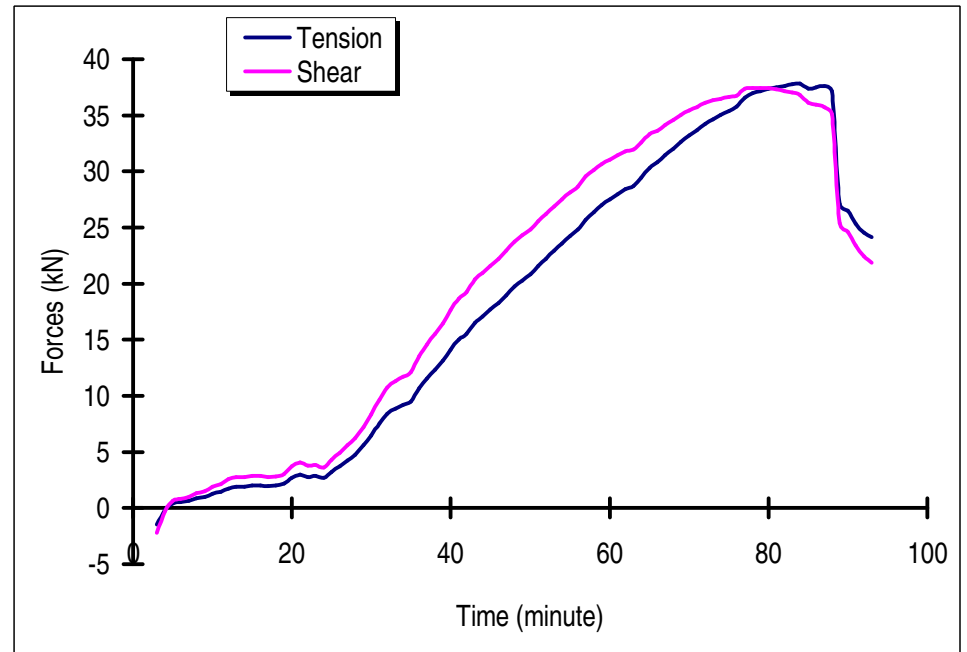
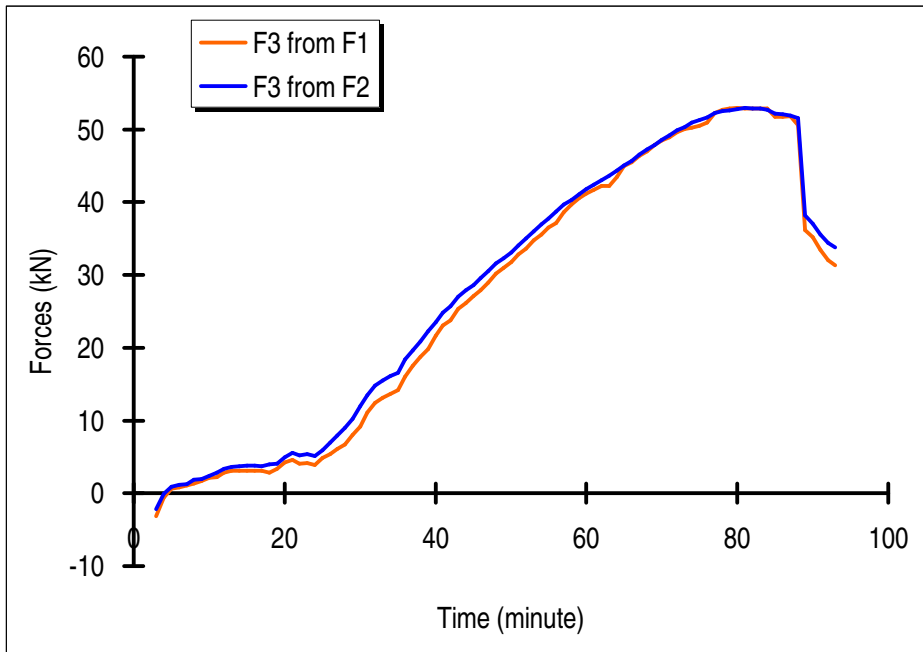
23	549.153	32.074	53.49	2.735	0.103	2.632	57.680	4.20	5.41	4.80	2.86	3.86	2139.90
24	549.263	33.619	53.22	2.954	0.087	2.866	57.739	3.88	5.10	4.49	2.69	3.59	1992.86
25	549.311	35.237	53.00	3.131	0.115	3.016	57.780	4.86	5.89	5.38	3.24	4.29	2382.20
26	549.455	36.744	52.84	3.266	0.126	3.139	57.800	5.35	6.96	6.15	3.72	4.90	2721.00
27	549.481	38.275	52.65	3.427	0.152	3.275	57.829	6.14	7.92	7.03	4.26	5.59	3100.71
28	549.518	39.829	52.47	3.582	0.149	3.433	57.861	6.67	9.01	7.84	4.78	6.22	3451.40
29	549.588	41.424	52.29	3.730	0.180	3.550	57.892	8.01	10.26	9.13	5.59	7.23	4012.76
30	549.660	42.883	52.17	3.822	0.197	3.625	57.920	9.20	11.94	10.57	6.48	8.35	4638.33
31	549.707	44.350	52.06	3.924	0.218	3.705	57.925	11.07	13.49	12.28	7.55	9.69	5380.85
32	549.813	45.712	51.97	4.006	0.253	3.753	57.936	12.43	14.80	13.62	8.39	10.73	5959.36
33	549.894	47.058	51.90	4.069	0.239	3.830	57.941	13.17	15.52	14.34	8.85	11.29	6272.63
34	549.979	48.309	51.92	4.078	0.252	3.826	57.912	13.67	16.10	14.89	9.18	11.72	6510.79
35	550.039	49.535	51.83	4.156	0.261	3.895	57.919	14.21	16.58	15.40	9.51	12.10	6727.33
36	550.041	51.051	51.74	4.247	0.283	3.964	57.927	16.02	18.44	17.23	10.67	13.53	7520.12
37	550.111	52.581	51.62	4.373	0.289	4.084	57.921	17.55	19.66	18.60	11.55	14.58	8106.28
38	550.145	54.056	51.52	4.500	0.305	4.195	57.886	18.80	20.85	19.83	12.34	15.52	8629.82
39	550.281	55.610	51.45	4.594	0.305	4.289	57.868	19.84	22.28	21.06	13.13	16.47	9158.64
40	550.317	57.110	51.31	4.730	0.309	4.421	57.866	21.65	23.55	22.60	14.13	17.64	9811.73
41	550.344	58.671	51.16	4.895	0.317	4.577	57.859	23.04	24.83	23.93	15.01	18.64	10371.49
42	550.347	60.179	51.10	4.967	0.330	4.637	57.844	23.78	25.68	24.73	15.53	19.25	10708.79
43	550.357	61.781	50.93	5.126	0.344	4.782	57.856	25.39	27.06	26.22	16.53	20.36	11331.84
44	550.419	63.369	50.83	5.238	0.358	4.880	57.846	26.12	27.87	27.00	17.05	20.93	11650.37
45	550.551	64.925	50.69	5.386	0.358	5.028	57.830	27.15	28.64	27.90	17.67	21.59	12019.91
46	550.591	66.575	50.60	5.485	0.337	5.148	57.826	27.92	29.61	28.77	18.26	22.23	12378.51
47	550.659	68.089	50.46	5.643	0.339	5.304	57.811	28.98	30.51	29.74	18.94	22.94	12776.89
48	550.647	69.780	50.27	5.785	0.354	5.431	57.852	30.18	31.57	30.88	19.73	23.75	13231.62
49	550.724	71.335	50.14	5.944	0.363	5.581	57.826	31.02	32.29	31.65	20.29	24.30	13542.78
50	550.747	72.994	49.99	6.095	0.366	5.729	57.827	31.77	33.05	32.41	20.84	24.82	13839.81
51	550.765	74.467	49.88	6.217	0.384	5.833	57.816	32.83	34.05	33.44	21.55	25.57	14258.04
52	550.904	76.055	49.70	6.395	0.381	6.014	57.813	33.64	34.99	34.32	22.19	26.17	14598.21

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53	550.883	77.643	49.57	6.526	0.391	6.135	57.810	34.74	35.95	35.35	22.92	26.91	15011.69
54	550.937	79.229	49.42	6.673	0.412	6.260	57.813	35.52	36.95	36.23	23.57	27.52	15358.45
55	550.977	80.767	49.26	6.838	0.430	6.407	57.808	36.55	37.74	37.15	24.24	28.15	15711.94
56	551.003	82.273	49.13	6.972	0.420	6.552	57.812	37.15	38.70	37.92	24.82	28.67	16010.96
57	551.118	83.813	48.99	7.111	0.421	6.690	57.813	38.64	39.67	39.16	25.70	29.54	16500.83
58	551.122	85.359	48.82	7.270	0.429	6.841	57.823	39.68	40.34	40.01	26.34	30.11	16822.43
59	551.124	87.146	48.63	7.458	0.437	7.021	57.823	40.56	41.12	40.84	26.99	30.65	17128.16
60	551.126	88.589	48.50	7.584	0.449	7.135	57.823	41.15	41.80	41.48	27.48	31.07	17366.26
61	551.199	90.281	48.38	7.716	0.441	7.275	57.815	41.74	42.45	42.09	27.96	31.46	17593.77
62	551.269	91.962	48.20	7.893	0.443	7.450	57.816	42.21	42.99	42.60	28.40	31.76	17764.25
63	551.376	93.398	48.05	8.046	0.448	7.598	57.812	42.26	43.60	42.93	28.70	31.93	17865.92
64	551.423	95.074	47.87	8.211	0.461	7.750	57.833	43.44	44.37	43.90	29.45	32.56	18222.96
65	551.445	96.653	47.71	8.368	0.454	7.914	57.830	44.95	45.09	45.02	30.29	33.30	18645.30
66	551.440	98.263	47.50	8.538	0.448	8.090	57.869	45.50	45.70	45.60	30.80	33.62	18830.29
67	551.496	99.963	47.34	8.700	0.460	8.240	57.866	46.34	46.51	46.42	31.46	34.14	19128.69
68	551.614	101.480	47.18	8.849	0.467	8.382	57.881	47.02	47.25	47.13	32.04	34.57	19376.94
69	551.625	103.121	47.02	9.011	0.445	8.565	57.877	47.83	47.89	47.86	32.63	35.01	19631.58
70	551.677	104.619	46.87	9.152	0.466	8.686	57.888	48.51	48.59	48.55	33.19	35.43	19872.84
71	551.739	106.257	46.69	9.336	0.459	8.877	57.879	48.90	49.22	49.06	33.65	35.70	20029.69
72	551.776	107.714	46.54	9.478	0.470	9.008	57.895	49.66	49.89	49.78	34.24	36.13	20276.10
73	551.795	109.173	46.37	9.637	0.481	9.156	57.904	50.03	50.36	50.20	34.64	36.33	20397.78
74	551.836	110.929	46.18	9.815	0.506	9.309	57.918	50.24	50.90	50.57	35.02	36.49	20493.11
75	551.856	112.380	45.97	9.991	0.484	9.507	57.953	50.53	51.33	50.93	35.40	36.61	20574.11
76	551.897	113.957	45.78	10.156	0.494	9.662	57.969	50.93	51.64	51.29	35.77	36.76	20663.80
77	551.906	115.441	45.62	10.319	0.498	9.821	57.969	52.28	52.28	52.28	36.56	37.36	21010.62
78	551.889	117.092	45.37	10.507	0.485	10.022	58.034	52.71	52.55	52.63	36.98	37.46	21074.50
79	552.001	118.655	45.19	10.686	0.489	10.197	58.032	52.87	52.63	52.75	37.18	37.42	21065.33
80	552.111	120.121	45.03	10.841	0.487	10.354	58.041	53.00	52.75	52.88	37.37	37.41	21063.63
81	552.106	121.588	44.84	11.022	0.498	10.524	58.044	52.88	52.94	52.91	37.51	37.31	21016.34
82	552.052	123.150	44.64	11.193	0.494	10.699	58.079	52.92	52.84	52.88	37.63	37.15	20937.79

83	552.188	124.720	44.41	11.374	0.498	10.876	58.122	52.89	52.91	52.90	37.79	37.02	20875.37
84	552.110	126.301	44.25	11.556	0.481	11.075	58.107	52.85	52.73	52.79	37.81	36.83	20776.86
85	552.143	127.912	44.04	11.734	0.482	11.252	58.138	51.75	52.16	51.95	37.35	36.12	20382.44
86	552.125	129.483	43.80	11.929	0.498	11.431	58.177	51.75	52.12	51.93	37.48	35.95	20299.21
87	552.186	131.149	43.55	12.117	0.496	11.621	58.246	51.84	51.91	51.87	37.60	35.74	20193.74
88	552.272	132.694	43.35	12.314	0.460	11.854	58.247	50.63	51.55	51.09	37.15	35.07	19825.04
89	552.299	134.564	43.09	12.603	0.406	12.197	58.213	36.12	38.18	37.15	27.13	25.38	14358.55
90	552.302	136.133	42.88	12.792	0.403	12.389	58.241	35.18	37.07	36.13	26.47	24.58	13912.16
91	552.301	137.897	42.69	12.953	0.408	12.545	58.269	33.43	35.56	34.50	25.36	23.39	13243.47
92	552.478	139.564	42.44	13.175	0.395	12.780	58.297	32.01	34.43	33.22	24.52	22.42	12701.45
93	552.455	141.127	42.18	13.380	0.370	13.010	58.349	31.34	33.82	32.58	24.14	21.88	12404.84





Photographs after Test

