

### Vibration comparison test on brake devices

Measurement Result 1-1

Measurement Result 1-2

10/03/2015



Brake: BSB-65(Air Brake)/Speed(load):10rpm				Sq.Drive Shank: 1"												
Date: 03/03/2015		Model: UW-251P		Serial Number: RX6511		Rotational speed: 5500rpm										
Main Handle						Support Handle										
Test	Operator	Test run	$a_{hwx}$	$a_{hwy}$	$a_{hwz}$	$a_{hv}$	Statistics for Operator			Statistics for Operator						
							$S_{n-1}$	$C_v$				$S_{n-1}$	$C_v$			
1	A	1	2.969	3.383	3.242	5.55	5.68	0.13	0.02	2.651	3.451	2.862	5.21	5.22	0.11	0.02
2		3.101	3.51	3.115	5.62	2.846				3.985	2.114	5.33				
3		2.577	3.45	3.614	5.62	2.654				3.665	2.514	5.18				
4		2.999	3.94	3.156	5.87	2.609				4.024	2.326	5.33				
5		3.027	3.556	3.341	5.74	2.014				4.065	2.245	5.06				
6	B	1	2.988	3.544	3.082	5.57	5.60	0.06	0.01	3.097	3.634	2.273	5.29	5.23	0.11	0.02
7		2.824	3.561	3.311	5.62	2.896				3.663	2.237	5.18				
8		3.123	3.768	2.609	5.55	3.051				3.804	2.335	5.41				
9		3.156	3.869	2.469	5.57	3.082				3.64	2.015	5.18				
10		3.212	3.72	2.88	5.70	2.897				3.499	2.36	5.12				
11	C	1	3.103	3.45	2.883	5.46	5.47	0.29	0.05	2.996	3.825	2.184	5.33	5.23	0.14	0.03
12		2.335	3.82	2.669	5.21	2.789				3.469	2.464	5.09				
13		3.662	2.565	3.102	5.44	3.102				3.664	2.258	5.31				
14		3.112	3.29	3.858	5.95	2.933				3.78	2.41	5.36				
15		2.735	3.69	2.563	5.26	2.894				3.636	1.997	5.06				

Vibration Total Value (on Main Handle)	5.6	Vibration Total Value (on Support Handle)	5.2
Determination of uncertainty	1.0	Determination of uncertainty	1.0

Brake: ISO28927-2 Annex C/Speed(load):10rpm				Sq.Drive Shank: 1"												
Date: 03/03/2015		Model: UW-251P		Serial Number: RX6511		Rotational speed: 5500rpm										
Main Handle						Support Handle										
Test	Operator	Test run	$a_{hwx}$	$a_{hwy}$	$a_{hwz}$	$a_{hv}$	Statistics for Operator			Statistics for Operator						
							$S_{n-1}$	$C_v$				$S_{n-1}$	$C_v$			
1	A	1	3.852	3.668	2.49	5.87	5.57	0.28	0.05	3.026	3.555	2.41	5.25	5.36	0.19	0.03
2		2	3.608	2.888	2.69	5.35				3.286	3.68	2.63	5.59			
3		3	3.326	3.018	2.92	5.36				3.143	2.38	3.88	5.53			
4		4	3.074	3.325	2.93	5.39				3.487	2.639	2.73	5.16			
5		5	3.372	3.834	2.92	5.88				3.283	3.323	2.49	5.29			
6	B	1	3.102	2.785	3.1	5.20	5.55	0.22	0.04	3.079	3.379	2.7	5.31	5.54	0.27	0.05
7		2	3.509	3.178	3.29	5.77				3.713	3.92	2.63	6.01			
8		3	3.201	3.567	3.01	5.66				3.224	3.791	2.4	5.53			
9		4	2.7	3.034	3.77	5.54				3.514	2.777	2.99	5.39			
10		5	2.731	3.244	3.64	5.59				3.238	3.311	2.9	5.46			
11	C	1	2.976	3.402	2.85	5.34	5.07	0.28	0.06	4.026	2.365	2.49	5.29	5.22	0.23	0.04
12		2	3.289	3.026	2.3	5.03				3.64	2.151	2.31	4.82			
13		3	2.655	2.685	2.72	4.65				3.607	3.143	2.53	5.41			
14		4	2.96	3.26	2.98	5.32				3.69	3.143	1.97	5.23			
15		5	3.76	2.395	2.27	5.00				3.148	3.379	2.65	5.32			

Vibration Total Value (on Main Handle)	5.4	Vibration Total Value (on Support Handle)	5.4
Determination of uncertainty	1.0	Determination of uncertainty	1.0

Measurement Result 2-1

Measurement Result 2-2



Brake: BSB-65(Air Brake)/Speed(load):10rpm				Sq.Drive Shank: 1"												
Date: 04/03/2015		Model: UW-381		Serial Number: RZ2282		Rotational speed: 4700rpm										
Main Handle						Support Handle										
Test	Operator	Test run	$a_{hwx}$	$a_{hwy}$	$a_{hwz}$	$a_{hv}$	Statistics for Operator			Statistics for Operator						
							$S_{n-1}$	$C_v$				$S_{n-1}$	$C_v$			
1	A	1	5.012	3.99	3.92	7.51	7.50	0.27	0.04	4.12	2.88	3.15	5.93	5.93	0.07	0.01
2		2	4.653	3.95	4.11	7.36				3.97	3.31	3.12	6.04			
3		3	5.183	4.27	4.26	7.95				4.17	2.97	2.92	5.89			
4		4	4.786	4.23	3.86	7.46				3.89	3.17	3.21	5.96			
5		5	4.824	3.84	3.77	7.23				3.73	3.12	3.26	5.85			
6	B	1	5.057	4.29	3.96	7.72	7.63	0.19	0.02	3.68	4.02	3.19	6.31	6.02	0.24	0.04
7		2	4.858	4.21	4.07	7.61				4.01	3.86	2.64	6.16			
8		3	4.923	3.44	4.31	7.39				3.74	3.92	2.64	6.03			
9		4	4.926	4.29	4.41	7.88				3.63	3.49	2.71	5.72			
10		5	5.161	3.98	3.78	7.53				3.49	3.88	2.67	5.86			
11	C	1	5.176	4.22	4.08	7.83	7.58	0.27	0.04	4.12	3.01	2.48	5.67	5.75	0.26	0.04
12		2	4.935	3.84	3.82	7.33				3.83	3.59	2.43	5.78			
13		3	5.299	3.63	4.17	7.66				3.2	3.92	2.54	5.66			
14		4	5.382	3.96	4.06	7.82				3.49	3.39	2.53	5.48			
15		5	4.772	3.43	4.25	7.25				3.73	3.73	3.2	6.17			

Vibration Total Value (on Main Handle)	7.6	Vibration Total Value (on Support Handle)	5.9
Determination of uncertainty	1.2	Determination of uncertainty	1.1

Brake: ISO28927-2 Annex C/Speed(load):10rpm				Sq.Drive Shank: 1"												
Date: 04/03/2015		Model: UW-381		Serial Number: RZ2282		Rotational speed: 4700rpm										
Main Handle						Support Handle										
Test	Operator	Test run	$a_{hwx}$	$a_{hwy}$	$a_{hwz}$	$a_{hv}$	Statistics for Operator			Statistics for Operator						
							$S_{n-1}$	$C_v$				$S_{n-1}$	$C_v$			
1	A	1	5.45	4.24	2.96	7.51	7.68	0.29	0.04	4.375	2.903	2.83	5.96	6.11	0.27	0.04
2		2	5.61	4.561	2.501	7.65				3.668	3.293	3.92	6.30			
3		3	5.79	3.967	2.891	7.59				3.891	3.482	3.17	6.11			
4		4	6.03	4.447	3.311	8.19				3.687	3.203	3.02	5.74			
5		5	5.54	3.898	3.13	7.46				4.093	3.291	3.69	6.42			
6	B	1	5.18	4.256	3.94	7.78	7.63	0.27	0.04	4.921	3.065	2.28	6.23	6.03	0.21	0.03
7		2	4.906	4.471	3.13	7.34				4.054	4.108	2.12	6.15			
8		3	5.24	4.399	3.516	7.69				3.311	3.726	2.74	5.69			
9		4	4.311	4.685	3.69	7.36				4.316	3.677	2.08	6.04			
10		5	5.383	4.48	3.81	7.97				4.376	3.445	2.37	6.05			
11	C	1	5.089	4.371	3.64	7.63	7.64	0.29	0.04	4.311	3.47	2.34	6.01	6.40	0.29	0.05
12		2	5.233	3.265	3.84	7.27				4.525	3.489	2.65	6.30			
13		3	5.136	4.83	3.68	7.95				4.796	3.528	2.07	6.30			
14		4	5.853	3.914	3.54	7.88				4.593	4.02	2.7	6.67			
15		5	5.356	3.421	3.89	7.45				4.716	3.518	3.21	6.70			

Vibration Total Value (on Main Handle)	7.6	Vibration Total Value (on Support Handle)	6.2
Determination of uncertainty	1.3	Determination of uncertainty	1.1