

Factory calibration document SWS18243



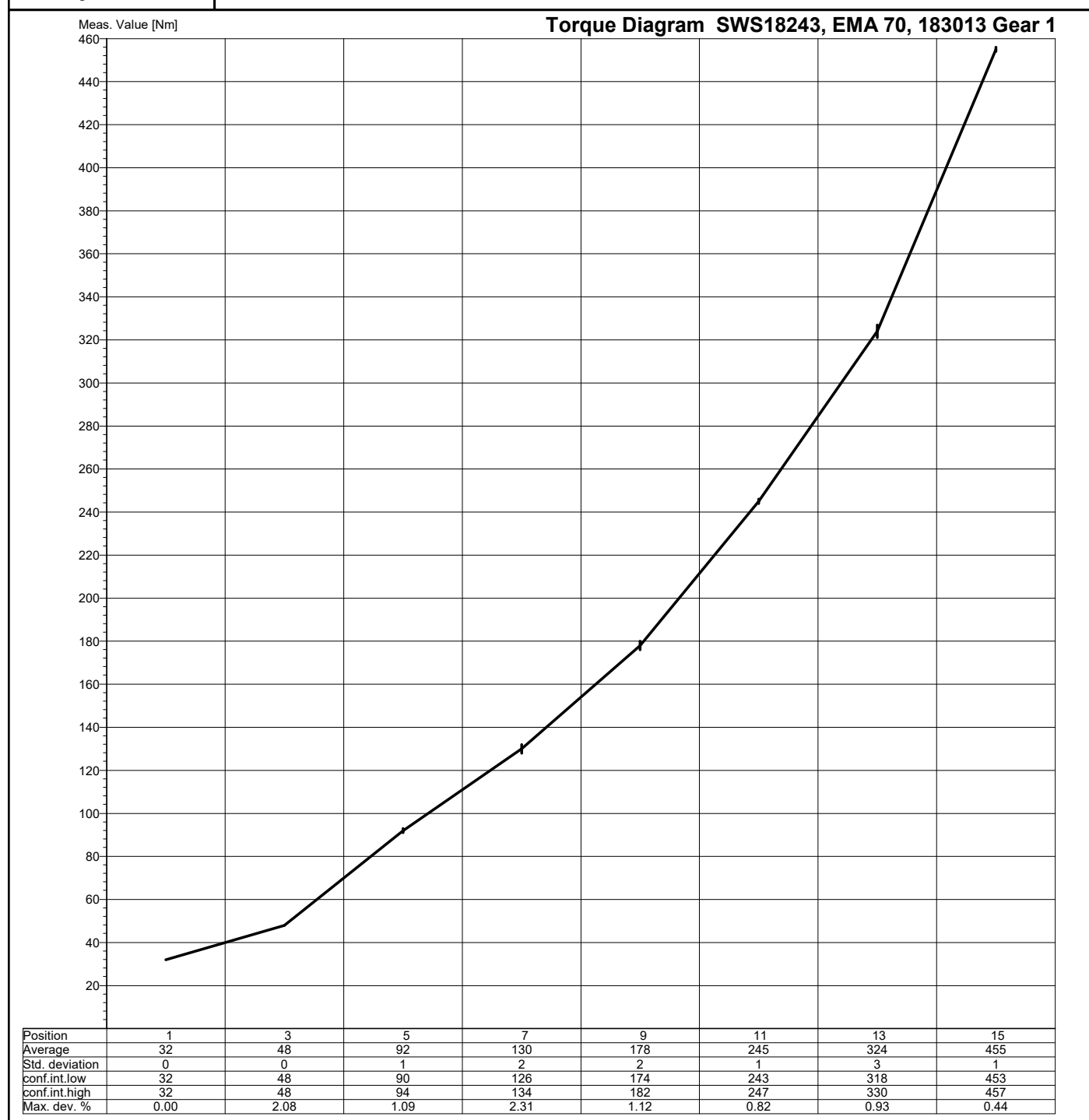
Customer Data	Customer: DEMO Tool: Electric Torque Tool Machine type: EMA 70 Serial number: 183013 Getriebe: 521
Test Laboratory	Name: Benjamin Schneider Date: 02.10.2018 Laboratory: i.e. Industrie Elektronik GmbH Oberringstraße 26 85051 Ingolstadt
Validity	Date of next Calibration is 02.10.2019
Meas. Equipment:	Transducer: DTS 20 T122 Gain1000-2 IFcalibra: DTS Vers.2.06 S/N 106 Software Version: 5.12<I Misc.: ---
Traceability	National Normals: All listed measurments were created with measurement equipment, which is regularly recalibrated. Traceability back to national normals is guaranteed thereby. Tolerances: see attachment KV
Max. Dev. %	Meas.: 2.31 % of average in gear 1 1.82 % of average in gear 2 Target: 4 % (DIN EN ISO 6789-1:2017-07) Allowed: Defined by User
Other Tests	Angle Function: n/a E-Check: n/a Optical Check: Okay Leak Tightness: n/a
Misc	Repeated Fastening n/a n/a
Misc.:	Modi: Restrictions: Calibration is only valid for modus 1 This document must not be modified or copied incomplete. Documents without signature are invalid.

Date: 27.09.2019 Signature:

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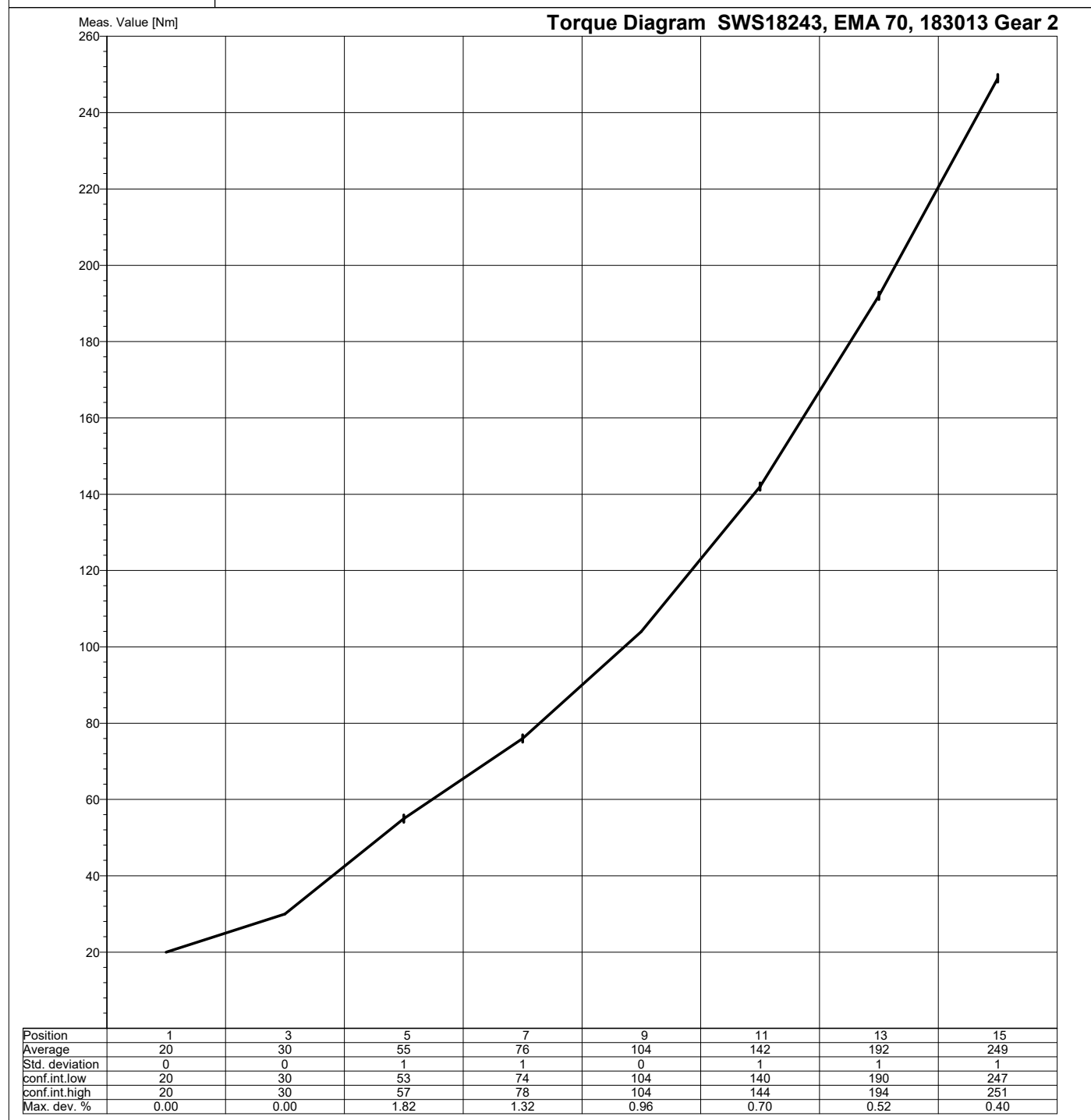
Customer Data	Customer: DEMO Tool: Electric Torque Tool Machine type: EMA 70 Serial number: 183013 Getriebe: 521
Test Laboratory	Name: Benjamin Schneider Date: 02.10.2018 Laboratory: i.e. Industrieelektronik GmbH Oberringstraße 26 85051 Ingolstadt
Validity	Date of next Calibration is 02.10.2019



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Validity	Date of next Calibration is 02.10.2019



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Validity	Date of next Calibration is 02.10.2019
Meas. Equipment:	Transducer: DTS 20 T122 Gain1000-2 IFcalibra: DTS Vers.2.06 S/N 106 Software Version: 5.12<l Misc.: ---
Traceability	National Normals: All listed measurments were created with measurement equipment, which is regularly recalibrated. Traceability back to national normals is guaranteed thereby. Tolerances: see attachment KV

computed values pressure-torque

Gang 1		Gang 2	
Stufe	Nm	Stufe	Nm
1	32	1	20
2	40	2	25
3	48	3	30
4	70	4	42
5	92	5	55
6	111	6	65
7	130	7	76
8	154	8	90
9	178	9	104
10	211	10	123
11	245	11	142
12	284	12	167
13	324	13	192
14	389	14	220
15	455	15	249

Customer Data	Customer: Demo Tool: Electric Torque Tool Machine type: EMA 150 Serial number: 193008
Test Laboratory	Name: Sebastian Walter Date: 06.09.2019 Laboratory: i.e. Industrieelektronik GmbH Oberringstraße 26 85051 Ingolstadt
Validity	Date of next Calibration is 06.09.2020
Meas. Equipment:	Transducer: DTS 20 T122 Gain1000-1 IFcalibra: DTS Vers.2.09 S/N 106 Software Version: 5.12<l Misc.: ---
Traceability	National Normals: All listed measurments were created with measurement equipment, which is regularly recalibrated. Traceability back to national normals is guaranteed thereby. Tolerances: see attachment KV
Max. Dev. %	Meas.: 2.76 % of averagein gear 1 3.07 % of averagein gear 2 3.51 % of averagein gear 3 Target: 4 % (DIN EN ISO 6789-1:2017-07) Allowed: Defined by User
Other Tests	Angle Function: n/a E-Check: n/a Optical Check: Okay Leak Tightness: n/a
Misc	Repeated Fastening n/a n/a
Misc.:	Modi: Calibration is only valid for modus 1 Restrictions: This document must not be modified or copied incomplete. Documents without signature are invalid.

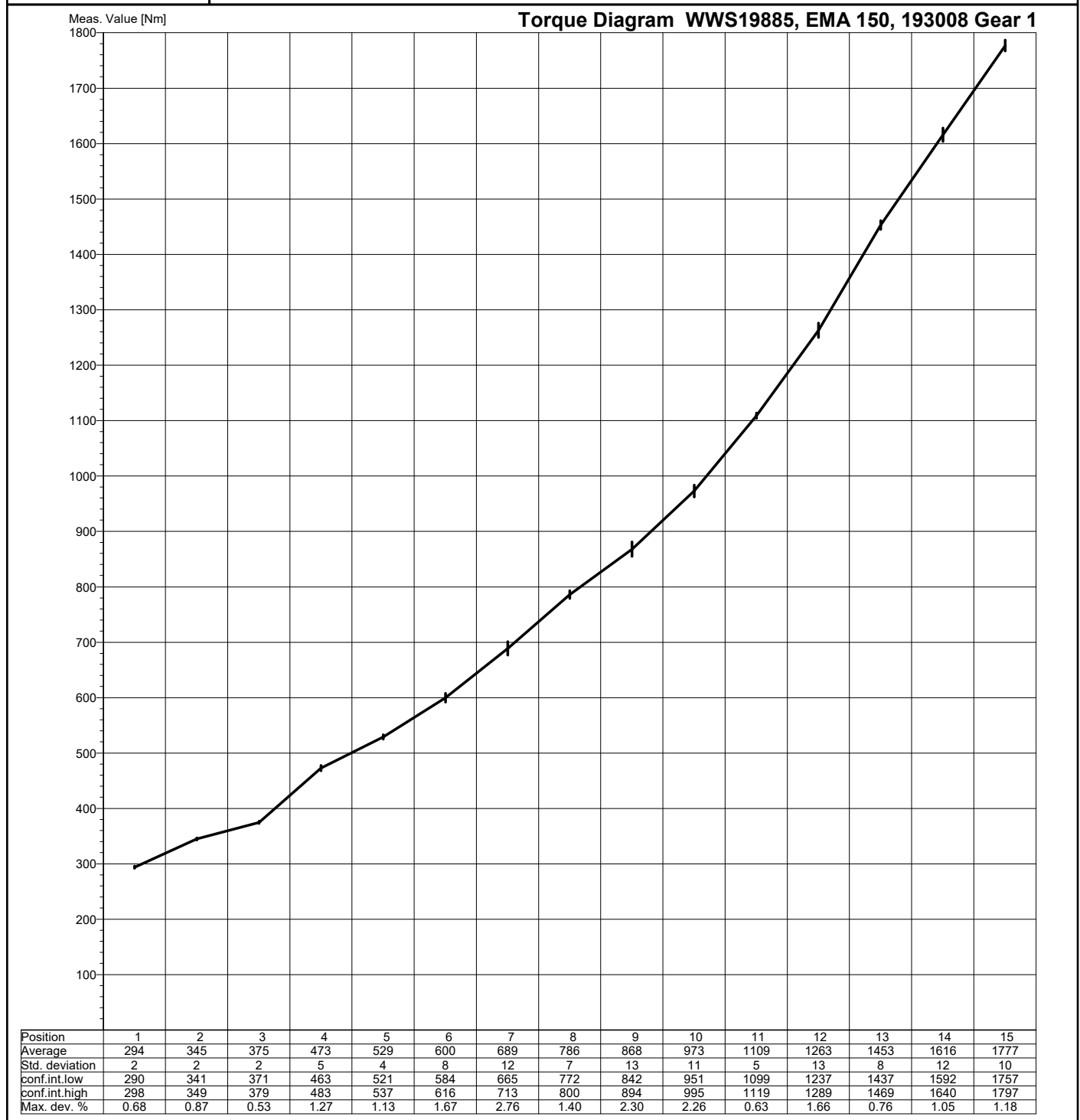
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Factory calibration document WWS19885



Customer Data	Customer: Demo Tool: Electric Torque Tool Machine type: EMA 150 Serial number: 193008
Test Laboratory	Name: Sebastian Walter Date: 06.09.2019 Laboratory: i.e. Industrie Elektronik GmbH Oberringstraße 26 85051 Ingolstadt
Validity	Date of next Calibration is 06.09.2020



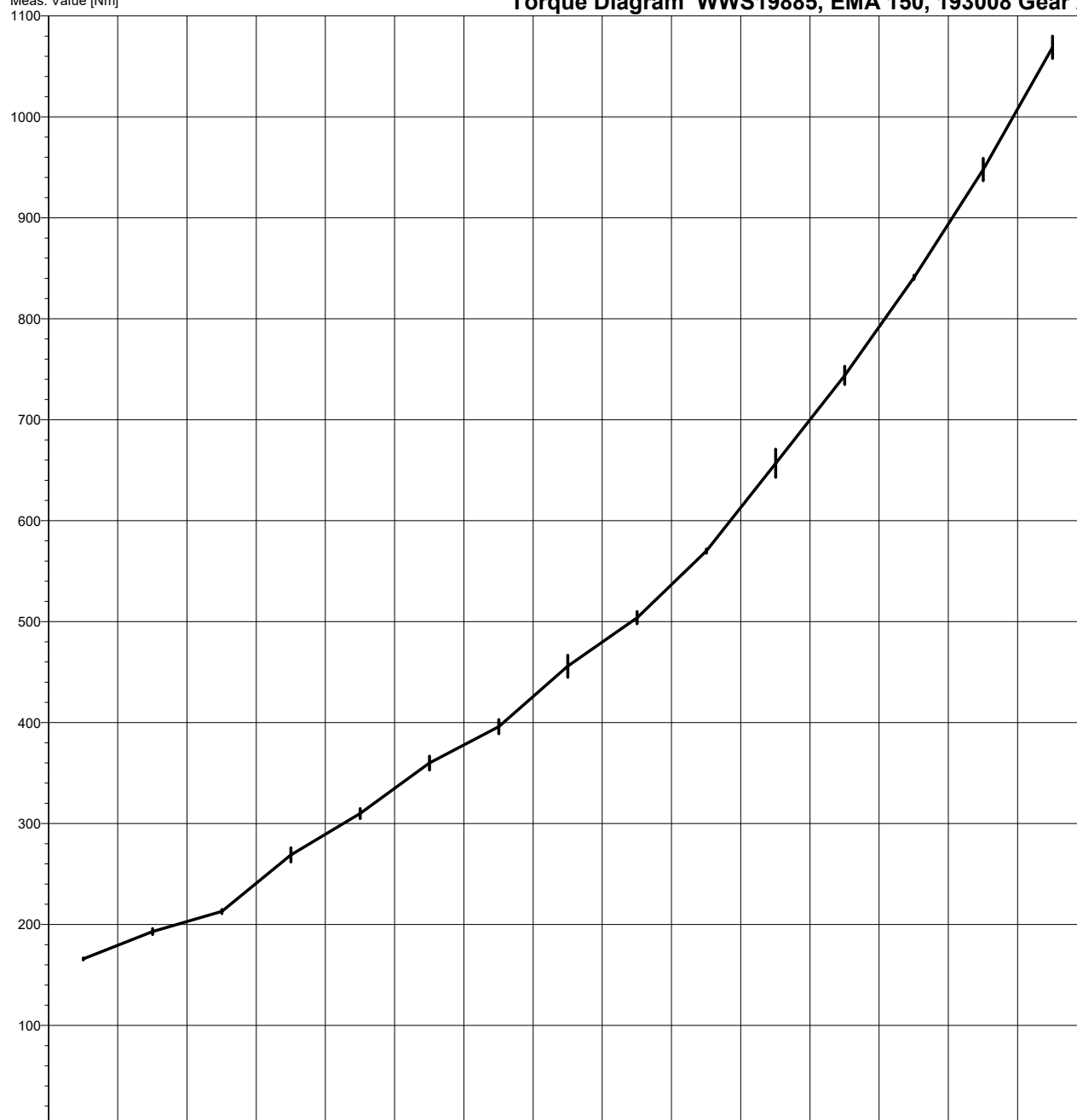
Factory calibration document WWS19885



Customer Data	Customer: Demo Tool: Electric Torque Tool Machine type: EMA 150 Serial number: 193008
Test Laboratory	Name: Sebastian Walter Date: 06.09.2019 Laboratory: i.e. Industrie Elektronik GmbH Oberringstraße 26 85051 Ingolstadt
Validity	Date of next Calibration is 06.09.2020

Meas. Value [Nm]

Torque Diagram WWS19885, EMA 150, 193008 Gear 2



Position	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Average	166	193	213	269	310	360	396	456	504	570	657	744	841	948	1069
Std. deviation	1	3	2	7	5	7	7	11	6	2	14	9	2	11	11
conf.int.low	164	187	209	255	300	346	382	434	492	566	629	726	837	926	1047
conf.int.high	168	199	217	283	320	374	410	478	516	574	685	762	845	970	1091
Max. dev. %	0.60	2.07	1.41	2.97	2.26	2.22	2.02	3.07	1.59	0.53	2.59	1.48	0.36	1.27	1.59

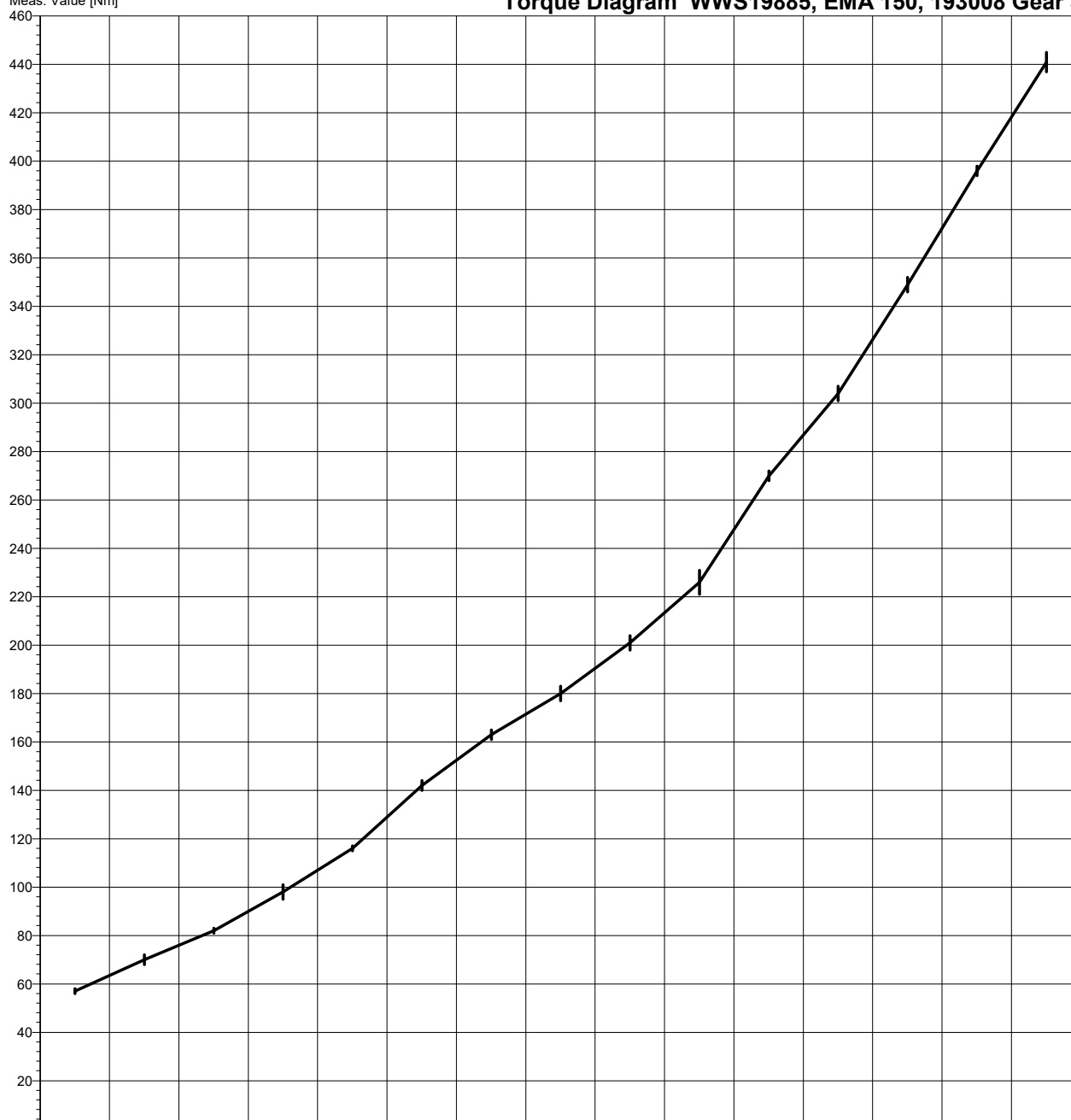
Factory calibration document WWS19885



Customer Data	Customer: Demo Tool: Electric Torque Tool Machine type: EMA 150 Serial number: 193008
Test Laboratory	Name: Sebastian Walter Date: 06.09.2019 Laboratory: i.e. Industrie Elektronik GmbH Oberringstraße 26 85051 Ingolstadt
Validity	Date of next Calibration is 06.09.2020

Meas. Value [Nm]

Torque Diagram WWS19885, EMA 150, 193008 Gear 3



Position	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Average	57	70	82	98	116	142	163	180	201	226	270	304	349	396	441
Std. deviation	1	2	1	3	1	2	2	3	3	5	2	3	3	2	4
conf.int.low	55	66	80	92	114	138	159	174	195	216	266	298	343	392	433
conf.int.high	59	74	84	104	118	146	167	186	207	236	274	310	355	400	449
Max. dev. %	3.51	2.86	2.44	3.06	0.86	1.41	1.84	2.22	1.99	2.21	0.74	1.32	0.86	0.76	0.91

Customer Data	Customer: Demo Tool: Electric Torque Tool Machine type: EMA 150 Serial number: 193008
Test Laboratory	Name: Sebastian Walter Date: 06.09.2019 Laboratory: i.e. Industrieelektronik GmbH Oberringstraße 26 85051 Ingolstadt
Validity	Date of next Calibration is 06.09.2020
Meas. Equipment:	Transducer: DTS 20 T122 Gain1000-1 IFcalibra: DTS Vers.2.09 S/N 106 Software Version: 5.12<l Misc.: ---
Traceability	National Normals: All listed measurments were created with measurement equipment, which is regularly recalibrated. Traceability back to national normals is guaranteed thereby. Tolerances: see attachment KV

computed values pressure-torque

Gang 1		Gang 2		Gang 3	
Stufe	Nm	Stufe	Nm	Stufe	Nm
1	294	1	166	1	57
2	345	2	193	2	70
3	375	3	213	3	82
4	473	4	269	4	98
5	529	5	310	5	116
6	600	6	360	6	142
7	689	7	396	7	163
8	786	8	456	8	180
9	868	9	504	9	201
10	973	10	570	10	226
11	1109	11	657	11	270
12	1263	12	744	12	304
13	1453	13	841	13	349
14	1616	14	948	14	396
15	1777	15	1069	15	441

Factory calibration document SWS19618



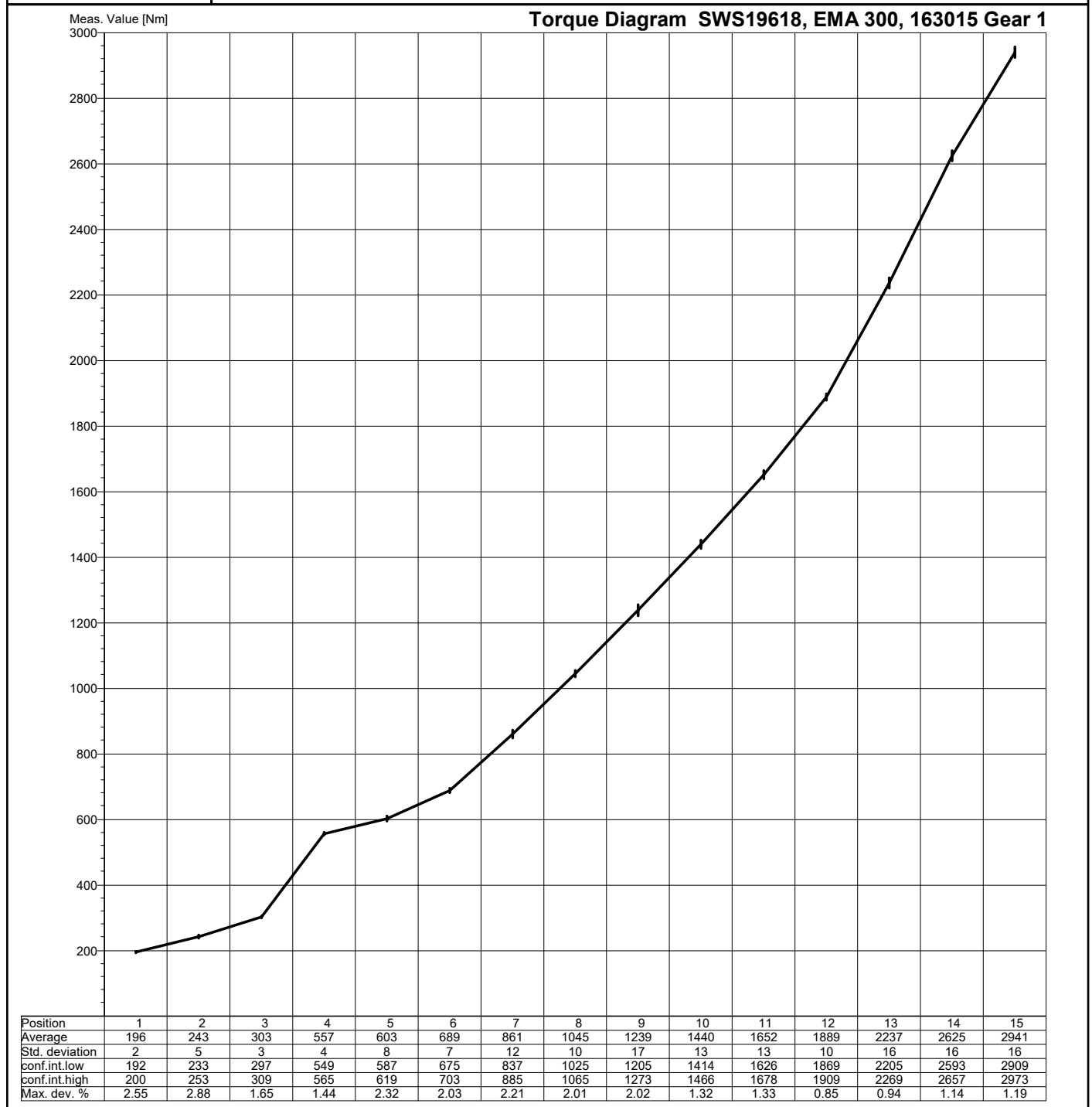
Customer Data	Customer: Demo Tool: Electric Torque Tool Machine type: EMA 300 Serial number: 163015 Getriebe Nr.: 1731-95
Test Laboratory	Name: Benjamin Schneider Date: 18.09.2019 Laboratory: i.e. Industrie Elektronik GmbH Oberringstraße 26 85051 Ingolstadt
Validity	Date of next Calibration is 18.09.2020
Meas. Equipment:	Transducer: DTS50 T108 Gain1000-1 IFcalibra: DTS Vers.2.09 S/N 115 Software Version: 5.12<l Misc.: ---
Traceability	National Normals: All listed measurments were created with measurement equipment, which is regularly recalibrated. Traceability back to national normals is guaranteed thereby. Tolerances: see attachment KV
Max. Dev. %	Meas.: 2.88 % of averagein gear 1 3.31 % of averagein gear 2 3.56 % of averagein gear 3 Target: 4 % (DIN EN ISO 6789-1:2017-07) Allowed: Defined by User
Other Tests	Angle Function: n/a E-Check: n/a Optical Check: Okay Leak Tightness: n/a
Misc	Repeated Fastening n/a n/a
Misc.:	Modi: Calibration is only valid for modus 1 Restrictions: This document must not be modified or copied incomplete. Documents without signature are invalid.

Date: 27.09.2019 Signature:

Factory calibration document SWS19618



Customer Data	Customer:	Demo
	Tool:	Electric Torque Tool
Test Laboratory	Machine type:	EMA 300
	Serial number:	163015
	Getriebe Nr.:	1731-95
Validity	Name:	Benjamin Schneider
	Date:	18.09.2019
	Laboratory:	i.e. Industrieelektronik GmbH Oberringstraße 26 85051 Ingolstadt
Date of next Calibration is 18.09.2020		



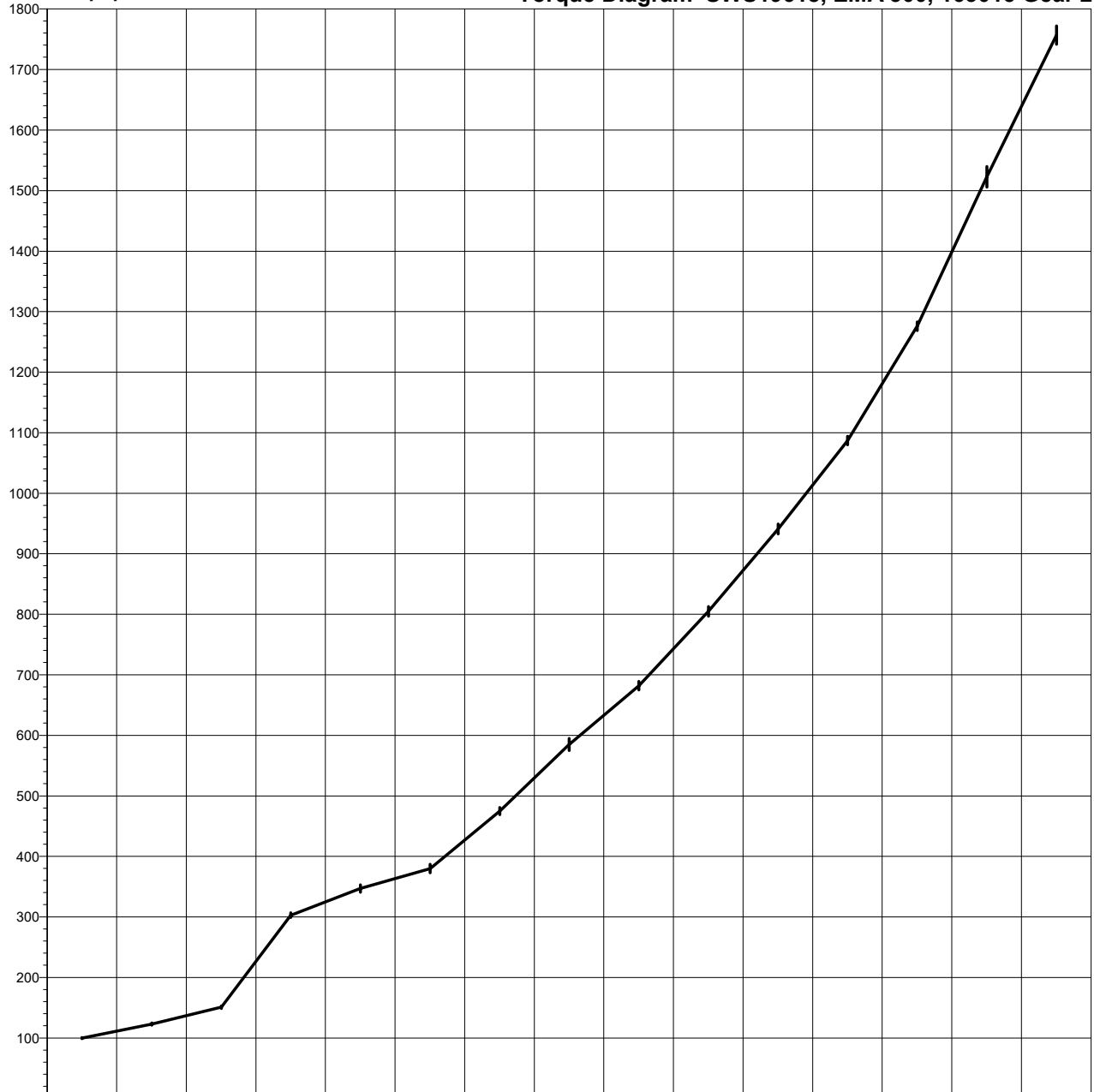
Factory calibration document SWS19618



Customer Data	Customer: Demo Tool: Electric Torque Tool Machine type: EMA 300 Serial number: 163015 Getriebe Nr.: 1731-95
Test Laboratory	Name: Benjamin Schneider Date: 18.09.2019 Laboratory: i.e. Industrieelektronik GmbH Oberringstraße 26 85051 Ingolstadt
Validity	Date of next Calibration is 18.09.2020

Meas. Value [Nm]

Torque Diagram SWS19618, EMA 300, 163015 Gear 2

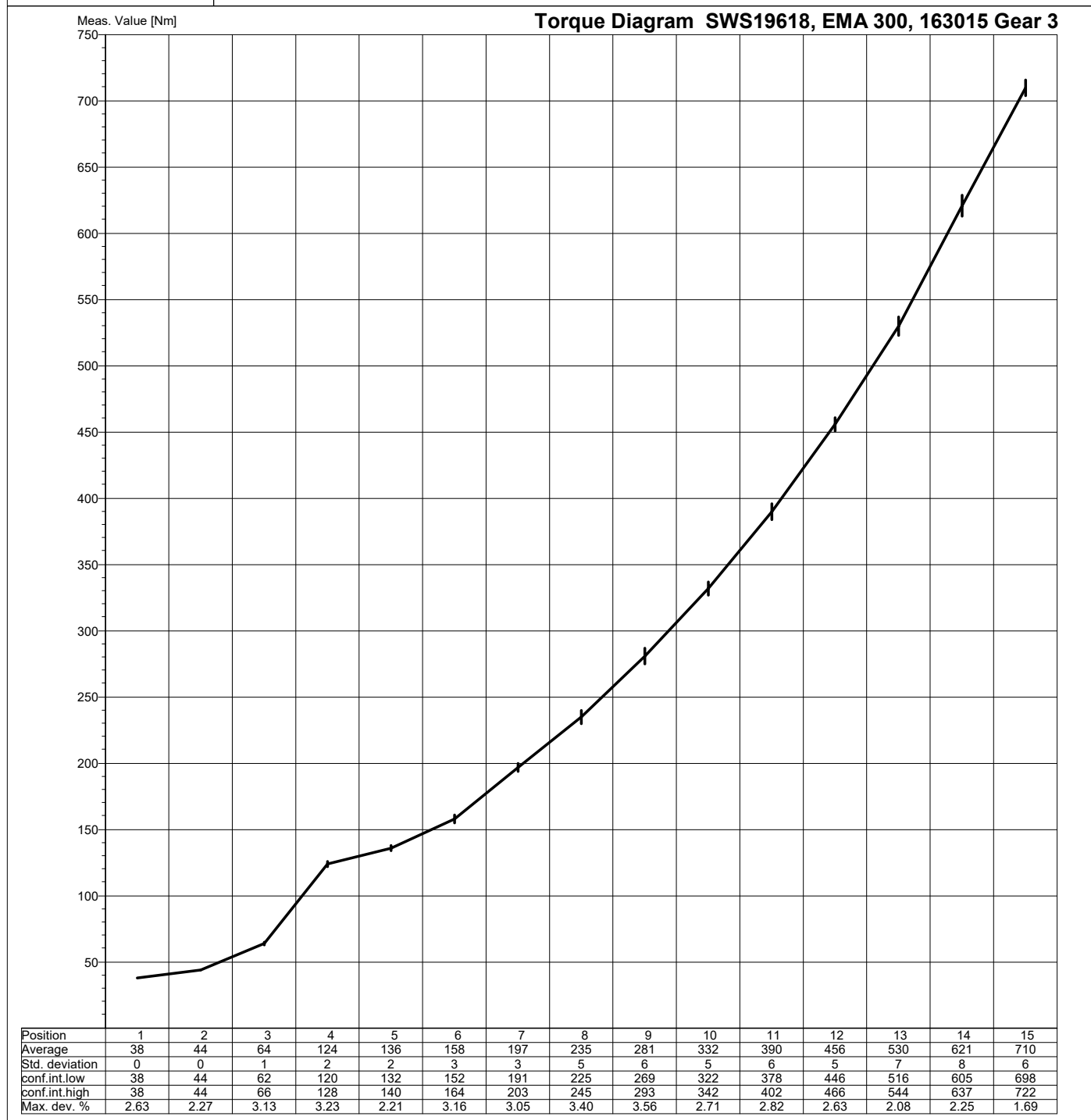


Position	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Average	100	123	151	303	347	380	475	585	682	805	941	1087	1276	1523	1757
Std. deviation	1	2	2	4	6	7	6	10	7	8	8	7	7	17	15
conf.int.low	98	119	147	295	335	366	463	565	668	789	925	1073	1262	1489	1727
conf.int.high	102	127	155	311	359	394	487	605	696	821	957	1101	1290	1557	1787
Max. dev. %	3.00	3.25	3.31	3.30	3.17	3.16	2.11	3.25	1.91	1.49	1.49	1.01	0.86	1.71	1.42

Factory calibration document SWS19618



Customer Data	Customer: Demo Tool: Electric Torque Tool Machine type: EMA 300 Serial number: 163015 Getriebe Nr.: 1731-95
Test Laboratory	Name: Benjamin Schneider Date: 18.09.2019 Laboratory: i.e. Industrie Elektronik GmbH Oberringstraße 26 85051 Ingolstadt
Validity	Date of next Calibration is 18.09.2020



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Test Laboratory	Name: Benjamin Schneider Date: 18.09.2019 Laboratory: i.e. Industrieelektronik GmbH Oberringstraße 26 85051 Ingolstadt
Validity	Date of next Calibration is 18.09.2020
Meas. Equipment:	Transducer: DTS50 T108 Gain1000-1 IFcalibra: DTS Vers.2.09 S/N 115 Software Version: 5.12<l Misc.: ---
Traceability	National Normals: All listed measurments were created with measurement equipment, which is regularly recalibrated. Traceability back to national normals is guaranteed thereby. Tolerances: see attachment KV

computed values pressure-torque

Gang 1		Gang 2		Gang 3	
Stufe	Nm	Stufe	Nm	Stufe	Nm
1	196	1	100	1	38
2	243	2	123	2	44
3	303	3	151	3	64
4	557	4	303	4	124
5	603	5	347	5	136
6	689	6	380	6	158
7	861	7	475	7	197
8	1045	8	585	8	235
9	1239	9	682	9	281
10	1440	10	805	10	332
11	1652	11	941	11	390
12	1889	12	1087	12	456
13	2237	13	1276	13	530
14	2625	14	1523	14	621
15	2941	15	1757	15	710

Factory calibration document LWS17394



Customer Data	Customer: Demo Tool: Electric Torque Tool Machine type: EMA 400 Serial number: 173015 Getriebe Nr.: 5281
Test Laboratory	Name: Philipp Luckert Date: 28.06.2018 Laboratory: i.e. Industrieelektronik GmbH Oberringstraße 26 85051 Ingolstadt
Validity	Date of next Calibration is 28.06.2019
Meas. Equipment:	Transducer: DTS 50_T108_Gain1000-7 IFcalibra: DTS Vers.2.06 S/N 102 Software Version: 5.12<l Misc.: ---
Traceability	National Normals: All listed measurments were created with measurement equipment, which is regularly recalibrated. Traceability back to national normals is guaranteed thereby. Tolerances: see attachment KV
Max. Dev. %	Meas.: 3.13 % of averagein gear 1 2.01 % of averagein gear 2 2.10 % of averagein gear 3 Target: 4 % (DIN EN ISO 6789-1:2017-07) Allowed: Defined by User
Other Tests	Angle Function: n/a E-Check: n/a Optical Check: Okay Leak Tightness: n/a
Misc	Repeated Fastening n/a n/a
Misc.:	Modi: Calibration is only valid for modus 1 Restrictions: This document must not be modified or copied incomplete. Documents without signature are invalid.

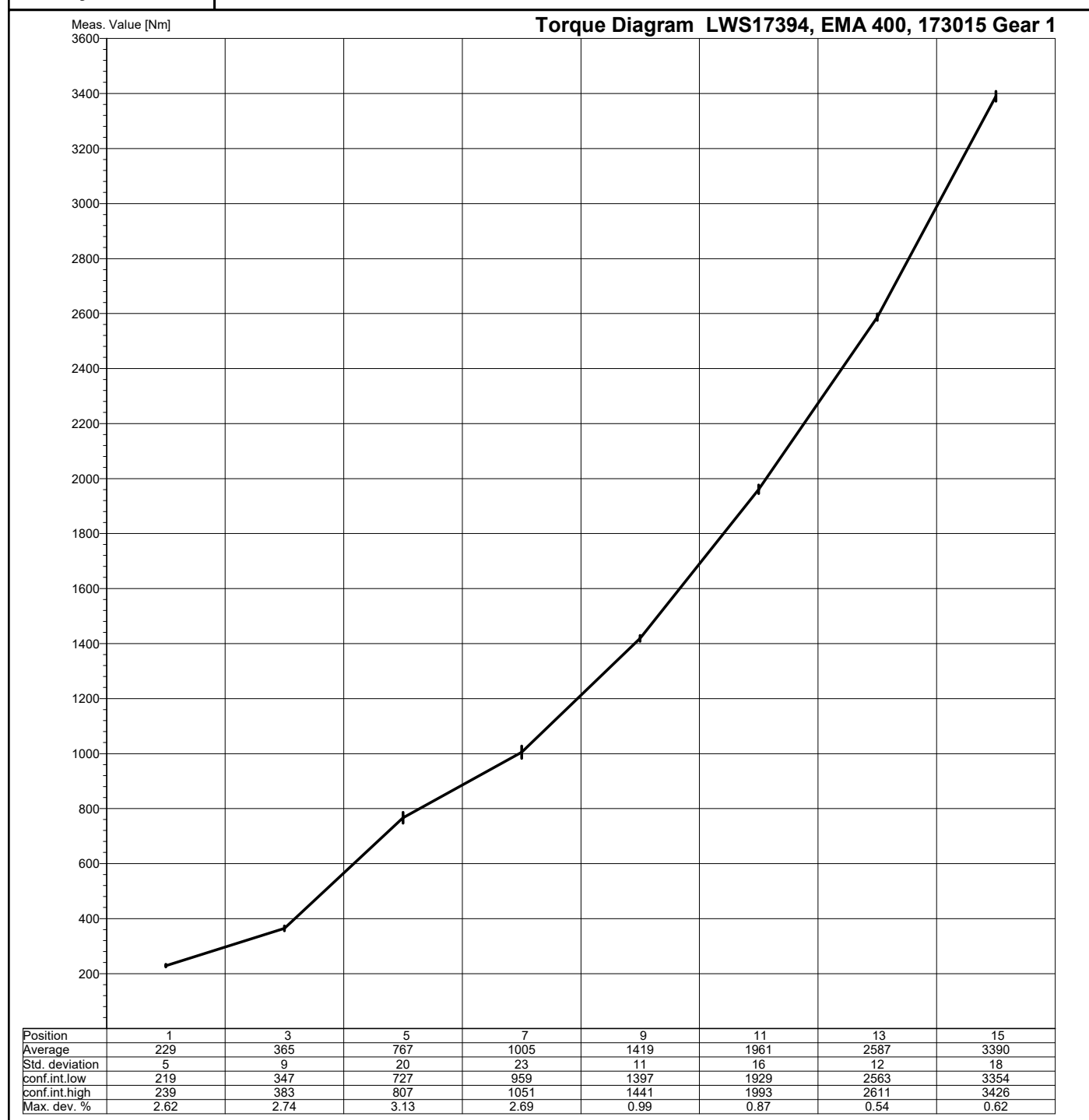
Date: 27.09.2019 Signature:

Philipp Luckert

Factory calibration document LWS17394



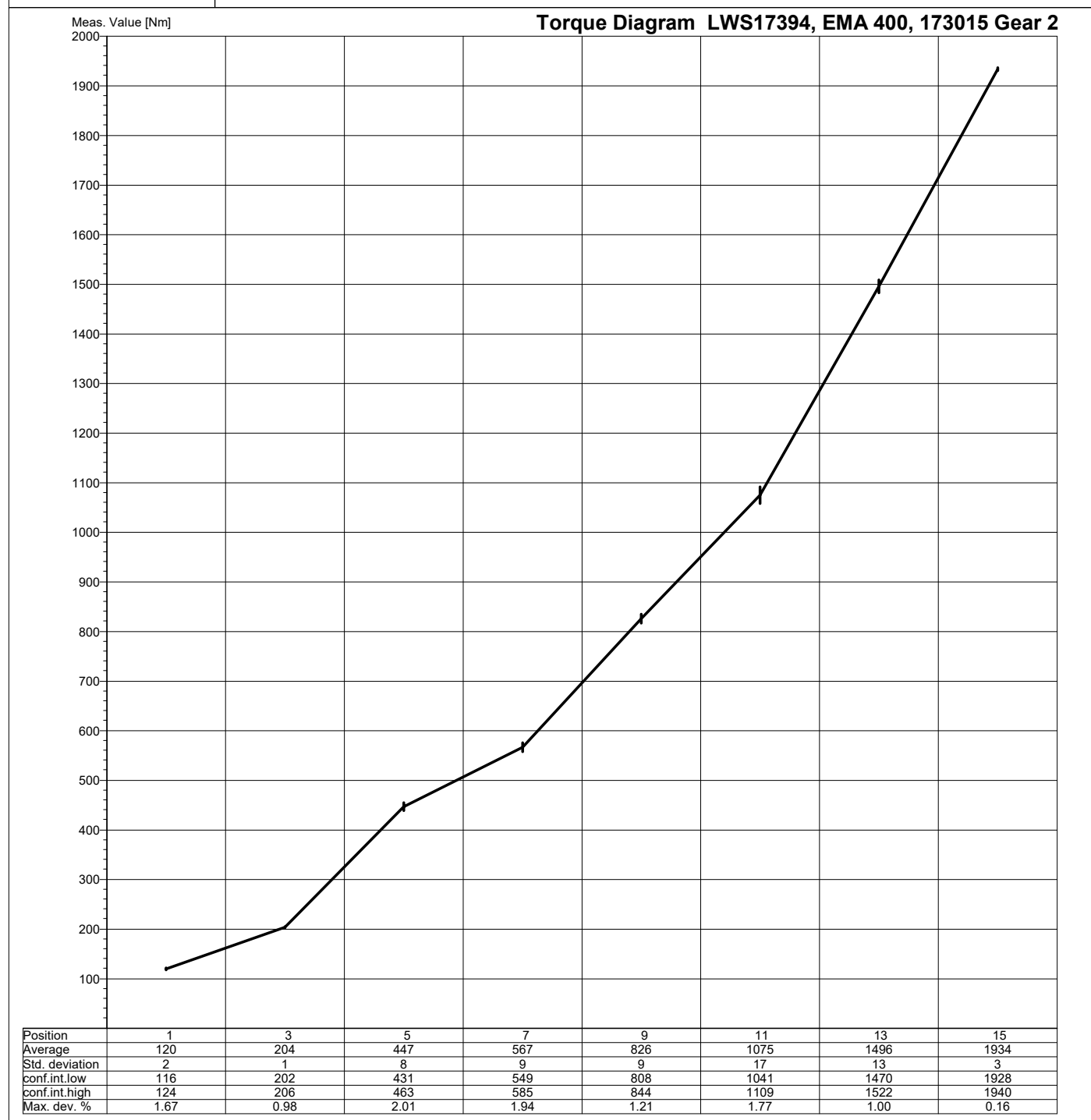
Customer Data	Customer: Demo Tool: Electric Torque Tool Machine type: EMA 400 Serial number: 173015 Getriebe Nr.: 5281
Test Laboratory	Name: Philipp Luckert Date: 28.06.2018 Laboratory: i.e. Industrie Elektronik GmbH Oberringstraße 26 85051 Ingolstadt
Validity	Date of next Calibration is 28.06.2019



Factory calibration document LWS17394



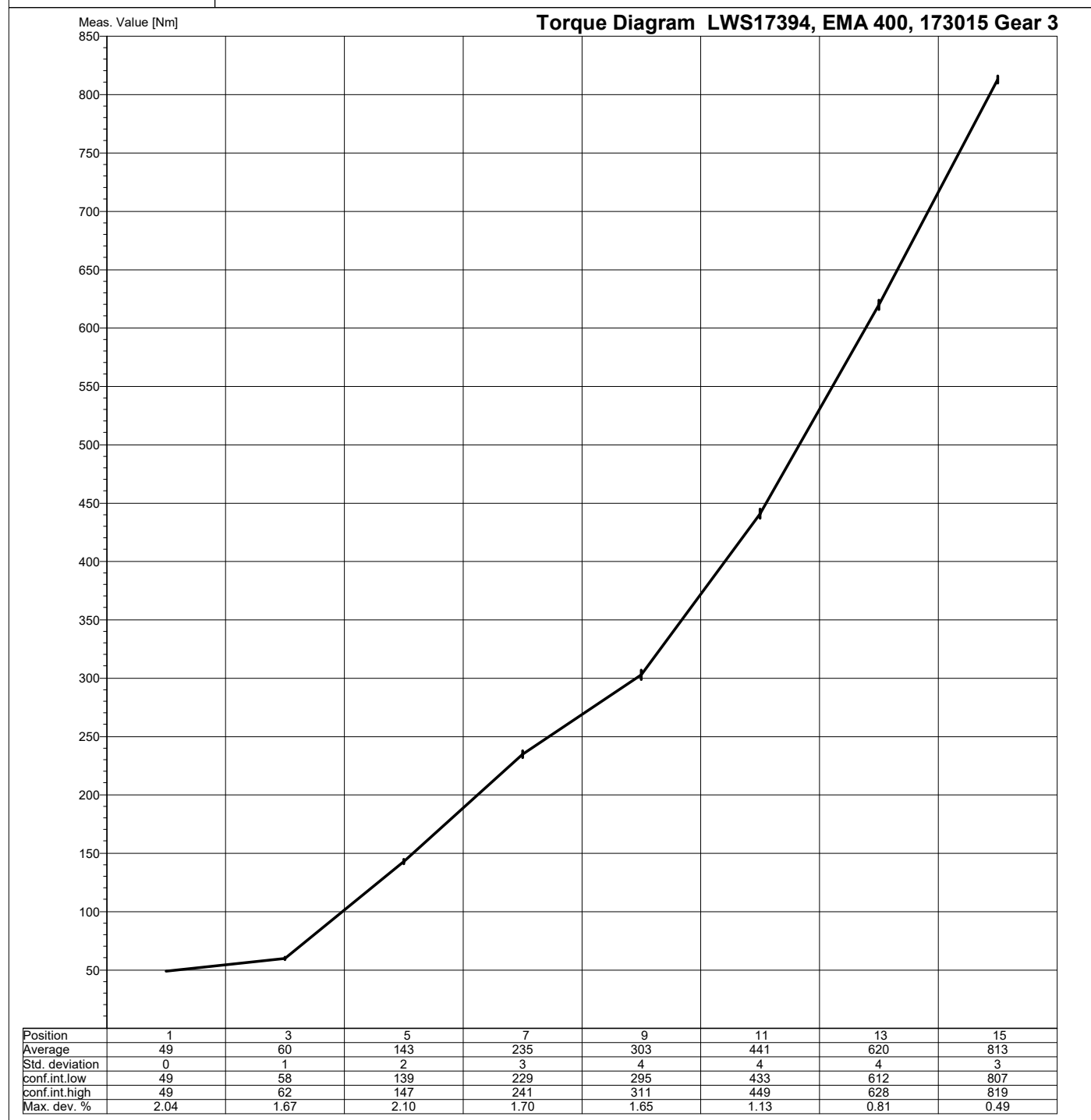
Customer Data	Customer: Demo Tool: Electric Torque Tool Machine type: EMA 400 Serial number: 173015 Getriebe Nr.: 5281
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Validity	Date of next Calibration is 28.06.2019



Factory calibration document LWS17394



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Test Laboratory	Name: Philipp Luckert Date: 28.06.2018 Laboratory: i.e. Industrie Elektronik GmbH Oberringstraße 26 85051 Ingolstadt
Validity	Date of next Calibration is 28.06.2019



Customer Data	Customer: Demo Tool: Electric Torque Tool Machine type: EMA 400 Serial number: 173015 Getriebe Nr.: 5281
Test Laboratory	Name: Philipp Luckert Date: 28.06.2018 Laboratory: i.e. Industrieelektronik GmbH Oberringstraße 26 85051 Ingolstadt
Validity	Date of next Calibration is 28.06.2019
Meas. Equipment:	Transducer: DTS 50_T108_Gain1000-7 IFcalibra: DTS Vers.2.06 S/N 102 Software Version: 5.12<I Misc.: ---
Traceability	National Normals: All listed measurments were created with measurement equipment, which is regularly recalibrated. Traceability back to national normals is guaranteed thereby. Tolerances: see attachment KV

computed values pressure-torque

Gang 1		Gang 2		Gang 3	
Stufe	Nm	Stufe	Nm	Stufe	Nm
1	229	1	120	1	49
2	297	2	162	2	54
3	365	3	204	3	60
4	566	4	325	4	101
5	767	5	447	5	143
6	886	6	507	6	189
7	1005	7	567	7	235
8	1212	8	696	8	269
9	1419	9	826	9	303
10	1690	10	950	10	372
11	1961	11	1075	11	441
12	2274	12	1285	12	530
13	2587	13	1496	13	620
14	2988	14	1715	14	716
15	3390	15	1934	15	813