Homologation

Cordless Assembly Tools

Model: CTBPW05Q

Serial no.: GC0061

Contents

Homologation: CTBPW05Q SN: GC0061

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Test sheet no. 2

Machine Capability Study 30 %

Multi-stage tightening system	☑	Speed 50 rpm	1.4 %
Single-stage tightening system	☐	Speed 100 %	3525 rpm

Manufacturer: Apex Tool Group Serial no: **GC0061**

Test torque: Tq min. + 0.3 (Tq max. - Tq min.) 2.24 Nm

Hard joint (H)	13.45	Nm / Revolution	Angle degree	30°
Soft joint (L)	1.11	Nm / Revolution	Angle degree	360°

		H	**L**
a)	Tolerance down / up	2.08 - 2.40 Nm	2.08 - 2.40 Nm
	Tolerance down / up	7 %	7 %
	Average torque	2.24 Nm	2.22 Nm
	Standard deviation	0.01 Nm	0.01 Nm
	Torque scatter (99,73%)	0.09 Nm	0.08 Nm
	C_m	3.61	3.83
	C_{mk}	3.57	3.31

b)	Min. C_m hard/soft (lowest value)	3.61
	Min. C_{mk} hard/soft (lowest value)	3.31

Capability is reached if minimum C_{mk} value ≥1.67

Note:

Machine Capability Study
Control System

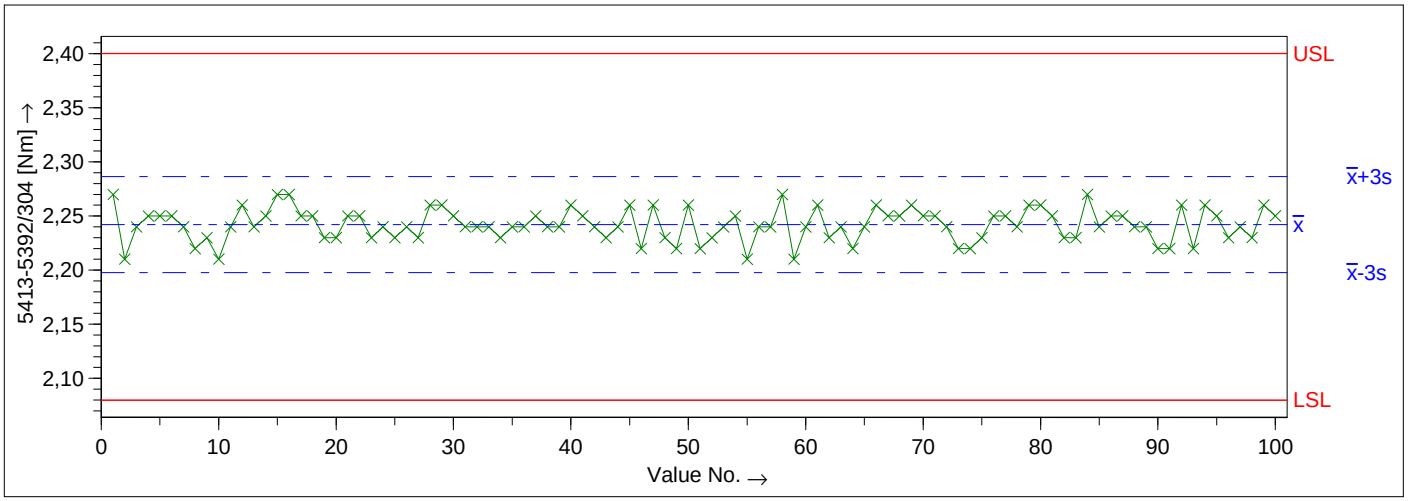
Cleco Production Tools

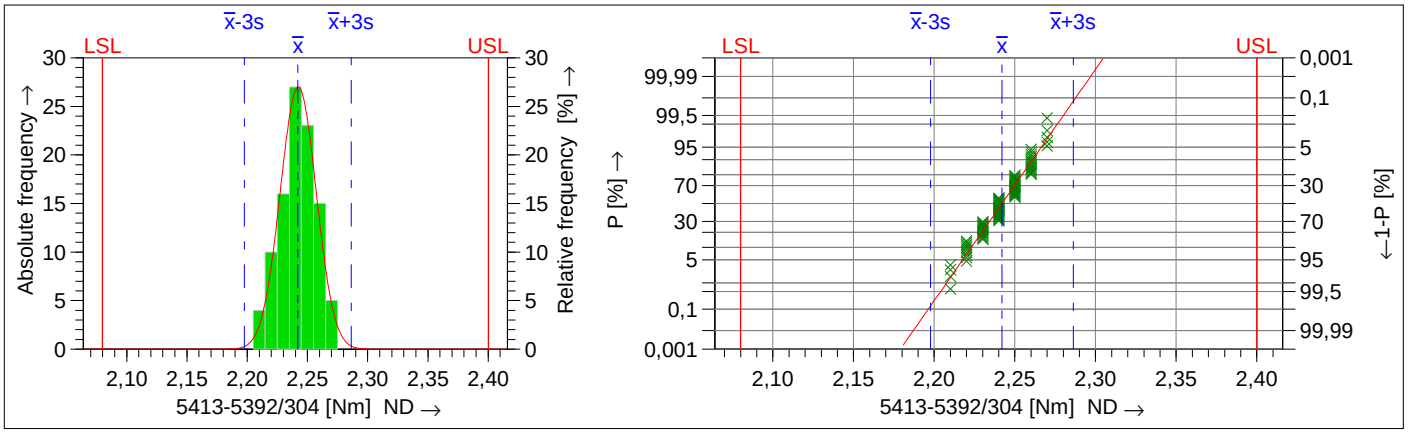
Plant	ATG Lexington	Operator Name	M. SHERMAN
Date	01.04.2021		

Ord. No.	CTBPW05Q	Part type	CTBPW05Q			Contr.item	yes
Serial No.	GC0061d	Char.Descr.	5413-5392/304	Inspection Val.	2,24	0,16	USL 2,40
		Serial No.	5376169	Unit	Nm	-0,16	LSL 2,08
Char.Type	variable			Tolerance value	7 %	Decimal Pl.	2
Cust.Name	CLECO	Reference System	5413-5392/304	Test Electronic	MPRO400GCD-P		
Contr.No.	HOMOLOGATION	Reference Transducer	10/1023806	nges.	100		

Evaluation from 01.04.2021 09:52:24 to 01.04.2021 10:14:49

Rem. TQ 30% hard +/-7% * TQ-Cal: 5.80 Nm; Cur-Cal: 0.0393 Nm/A; Speed: 1000-50 RPM;





Drawing Values		Collected Values		Statistics	
T_m	2.24			$\bar{x}$	2.2420
LSL	2.08	x_{min}	2.21	$\bar{x}$-3s	2.1977
USL	2.40	x_{max}	2.27	$\bar{x}$+3s	2.2863
T	0.32	R	0.06	6s	0.0886
		$n_{<T>}$	100	$p_{<T>}$	100.00000 %
		$n_{>USL}$	0	$p_{>USL}$	0.00000%
		$n_{<LSL}$	0	$p_{<LSL}$	0.00000%
		n_{eff}	100		
		n_{tot}	100		

Model distribution		Normal Distribution	
Calculation method		$M1_{1.4}$ $\hat{\sigma} = s_{tot}$	
Potential Capability index	=	C_m	3.61
Critical capability index	=	C_{mk}	3.57

The requirements were met (C_m,C_{mk})

APEX VDI/VDE 2647 V0.1

Machine Capability Study
Control System

Plant	ATG Lexington		Operator Name	M. SHERMAN	Date 01.04.2021

Ser.No.	GC0061d	Characteristic			
Type	CTBPW05Q	Char.Descr.	5413-5392/304	Inspection Val.	2,24
Ord. No.	CTBPW05Q	Ser.No.	5376169	LSL	2,08
				USL	2,40
Remark	TQ 30% hard +/-7% * TQ-Cal: 5.80 Nm; Cur-Cal: 0.0393 Nm/A; Speed: 1000-50 RPM;				

Char.No	Char.Descr.	x_1	x_2	x_3	x_4	x_5	x_6	x_7	x_8	x_9	x_{10}
5376169	5413-5392/304	2,27	2,21	2,24	2,25	2,25	2,25	2,24	2,22	2,23	2,21
5376169	5413-5392/304	31,25	29,50	30,25	30,25	29,75	30,25	30,00	28,75	30,25	31,00

Char.No	Char.Descr.	x_{11}	x_{12}	x_{13}	x_{14}	x_{15}	x_{16}	x_{17}	x_{18}	x_{19}	x_{20}
5376169	5413-5392/304	2,24	2,26	2,24	2,25	2,27	2,27	2,25	2,25	2,23	2,23
5376169	5413-5392/304	31,25	31,00	31,50	31,25	30,75	31,25	30,75	31,25	30,50	29,00

Char.No	Char.Descr.	x_{21}	x_{22}	x_{23}	x_{24}	x_{25}	x_{26}	x_{27}	x_{28}	x_{29}	x_{30}
5376169	5413-5392/304	2,25	2,25	2,23	2,24	2,23	2,24	2,23	2,26	2,26	2,25
5376169	5413-5392/304	29,00	29,50	29,50	30,00	30,25	30,00	29,75	30,50	29,25	29,75

Char.No	Char.Descr.	x_{31}	x_{32}	x_{33}	x_{34}	x_{35}	x_{36}	x_{37}	x_{38}	x_{39}	x_{40}
5376169	5413-5392/304	2,24	2,24	2,24	2,23	2,24	2,24	2,25	2,24	2,24	2,26
5376169	5413-5392/304	28,75	30,75	29,00	29,75	30,00	30,50	30,00	31,00	31,00	31,00

Char.No	Char.Descr.	x_{41}	x_{42}	x_{43}	x_{44}	x_{45}	x_{46}	x_{47}	x_{48}	x_{49}	x_{50}
5376169	5413-5392/304	2,25	2,24	2,23	2,24	2,26	2,22	2,26	2,23	2,22	2,26
5376169	5413-5392/304	29,25	29,75	28,75	29,25	30,00	29,00	29,50	30,75	30,50	31,50

Char.No	Char.Descr.	x_{51}	x_{52}	x_{53}	x_{54}	x_{55}	x_{56}	x_{57}	x_{58}	x_{59}	x_{60}
5376169	5413-5392/304	2,22	2,23	2,24	2,25	2,21	2,24	2,24	2,27	2,21	2,24
5376169	5413-5392/304	30,75	30,00	30,75	29,00	30,00	31,50	31,00	31,50	30,00	30,25

Char.No	Char.Descr.	x_{61}	x_{62}	x_{63}	x_{64}	x_{65}	x_{66}	x_{67}	x_{68}	x_{69}	x_{70}
5376169	5413-5392/304	2,26	2,23	2,24	2,22	2,24	2,26	2,25	2,25	2,26	2,25
5376169	5413-5392/304	30,50	29,75	30,00	30,00	29,00	29,75	30,75	30,75	31,25	30,50

Char.No	Char.Descr.	x_{71}	x_{72}	x_{73}	x_{74}	x_{75}	x_{76}	x_{77}	x_{78}	x_{79}	x_{80}
5376169	5413-5392/304	2,25	2,24	2,22	2,22	2,23	2,25	2,25	2,24	2,26	2,26
5376169	5413-5392/304	28,75	29,50	28,50	29,25	30,00	29,50	30,50	30,50	31,00	30,50

Machine Capability Study
Control System

Plant	ATG Lexington		Operator Name	M. SHERMAN	Date 01.04.2021

Ser.No.	GC0061d	Characteristic			
Type	CTBPW05Q	Char.Descr.	5413-5392/304	Inspection Val.	2,24
Ord. No.	CTBPW05Q	Ser.No.	5376169	LSL	2,08
				USL	2,40
Remark	TQ 30% hard +/-7% * TQ-Cal: 5.80 Nm; Cur-Cal: 0.0393 Nm/A; Speed: 1000-50 RPM;				

Char.No	Char.Descr.	x_{81}	x_{82}	x_{83}	x_{84}	x_{85}	x_{86}	x_{87}	x_{88}	x_{89}	x_{90}
5376169	5413-5392/304	2,25	2,23	2,23	2,27	2,24	2,25	2,25	2,24	2,24	2,22
5376169	5413-5392/304	29,50	30,00	30,00	31,25	29,50	31,00	30,00	29,75	30,00	29,00

Char.No	Char.Descr.	x_{91}	x_{92}	x_{93}	x_{94}	x_{95}	x_{96}	x_{97}	x_{98}	x_{99}	x_{100}
5376169	5413-5392/304	2,22	2,26	2,22	2,26	2,25	2,23	2,24	2,23	2,26	2,25
5376169	5413-5392/304	29,25	30,00	30,00	29,75	31,50	29,50	30,00	30,25	31,00	30,50

Machine Capability Study
Tool System

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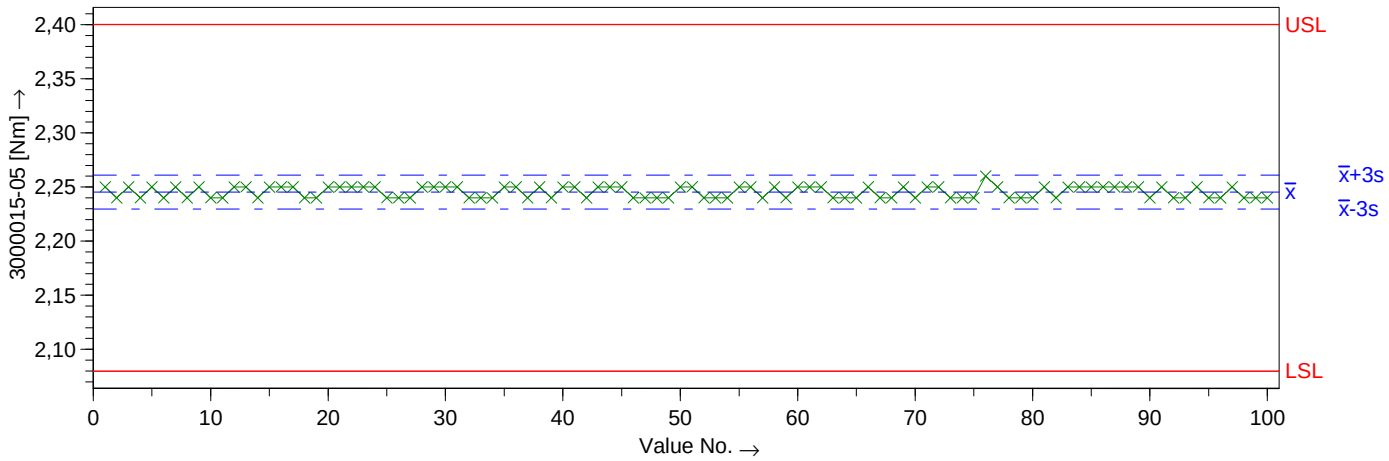
Plant ATG Lexington		Operator Name M. SHERMAN	Date 01.04.2021

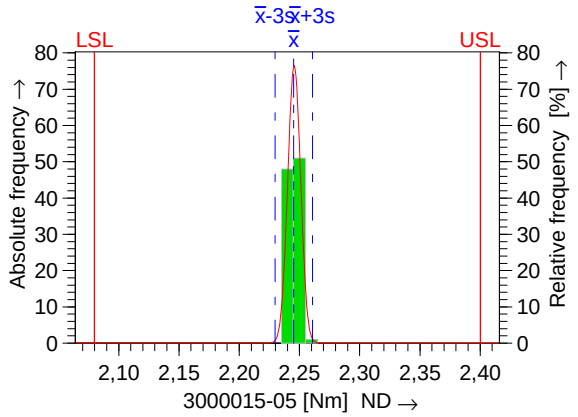
Ord. No. CTBPW05Q	Part type CTBPW05Q				Contr.item yes
Serial No. GC0061d	Char.Descr. 3000015-05	Inspection Val.	2,24	0,16	USL 2,40
	Serial No. 177721	Unit	Nm	-0,16	LSL 2,08
Char.Type variable		Tolerance value	7 %		Decimal Pl. 2

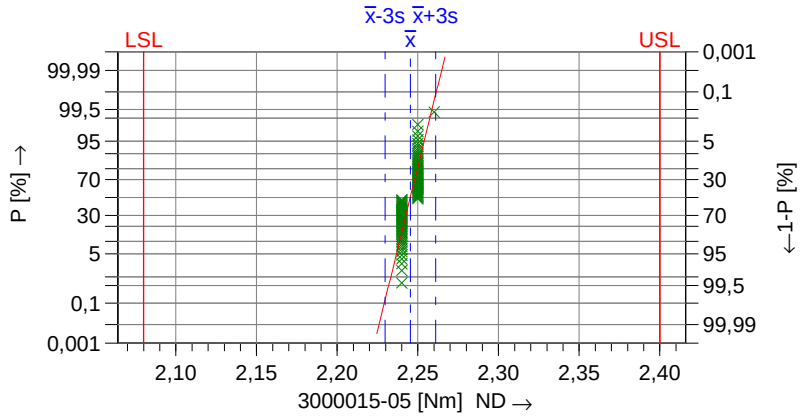
Cust.Name CLECO	Reference System 5413-5392/304	Test Electronic MPRO400GCD-P
Contr.No. HOMOLOGATION	Reference Transducer 10/1023806	nges. 100

Evaluation from 01.04.2021 09:52:23 to 01.04.2021 10:14:48

Rem. TQ 30% hard +/-7% * TQ-Cal: 5.80 Nm; Cur-Cal: 0.0393 Nm/A; Speed: 1000-50 RPM;







Drawing Values		Collected Values		Statistics	
T_m	2.24			$\bar{x}$	2.2453
LSL	2.08	x_{min}	2.24	$\bar{x}$-3s	2.2297
USL	2.40	x_{max}	2.26	$\bar{x}$+3s	2.2609
T	0.32	R	0.02	6s	0.0313
		$n_{<T>}$	100	$p_{<T>}$	100.00000 %
		$n_{>USL}$	0	$p_{>USL}$	0.00000%
		$n_{<LSL}$	0	$p_{<LSL}$	0.00000%
		n_{eff}	100		
		n_{tot}	100		

Model distribution			Normal Distribution
Calculation method			$M1_{1,4}$ $\hat{\sigma} = s_{tot}$
Potential Capability index	=	C_m	10.23
Critical capability index	=	C_{mk}	9.89

The requirements were met (C_m,C_{mk})

APEX VDI/VDE 2647 V0.1

Machine Capability Study
Tool System

Plant	ATG Lexington		Operator Name	M. SHERMAN	Date 01.04.2021

Ser.No.	GC0061d	Characteristic			
Type	CTBPW05Q	Char.Descr.	3000015-05	Inspection Val.	2,24
Ord. No.	CTBPW05Q	Ser.No.	177721	LSL	2,08
				USL	2,40
Remark	TQ 30% hard +/-7% * TQ-Cal: 5.80 Nm; Cur-Cal: 0.0393 Nm/A; Speed: 1000-50 RPM;				

Char.No	Char.Descr.	x_1	x_2	x_3	x_4	x_5	x_6	x_7	x_8	x_9	x_{10}
177721	3000015-05	2,25	2,24	2,25	2,24	2,25	2,24	2,25	2,24	2,25	2,24
177721	3000015-05	31,00	29,00	30,00	30,00	30,00	30,00	31,00	29,00	30,00	31,00

Char.No	Char.Descr.	x_{11}	x_{12}	x_{13}	x_{14}	x_{15}	x_{16}	x_{17}	x_{18}	x_{19}	x_{20}
177721	3000015-05	2,24	2,25	2,25	2,24	2,25	2,25	2,25	2,24	2,24	2,25
177721	3000015-05	31,00	31,00	31,00	32,00	31,00	31,00	31,00	31,00	31,00	29,00

Char.No	Char.Descr.	x_{21}	x_{22}	x_{23}	x_{24}	x_{25}	x_{26}	x_{27}	x_{28}	x_{29}	x_{30}
177721	3000015-05	2,25	2,25	2,25	2,25	2,24	2,24	2,24	2,25	2,25	2,25
177721	3000015-05	29,00	30,00	30,00	30,00	30,00	30,00	30,00	30,00	29,00	30,00

Char.No	Char.Descr.	x_{31}	x_{32}	x_{33}	x_{34}	x_{35}	x_{36}	x_{37}	x_{38}	x_{39}	x_{40}
177721	3000015-05	2,25	2,24	2,24	2,24	2,25	2,25	2,24	2,25	2,24	2,25
177721	3000015-05	29,00	31,00	29,00	30,00	30,00	31,00	30,00	31,00	31,00	31,00

Char.No	Char.Descr.	x_{41}	x_{42}	x_{43}	x_{44}	x_{45}	x_{46}	x_{47}	x_{48}	x_{49}	x_{50}
177721	3000015-05	2,25	2,24	2,25	2,25	2,25	2,24	2,24	2,24	2,24	2,25
177721	3000015-05	29,00	30,00	29,00	29,00	30,00	29,00	29,00	31,00	31,00	32,00

Char.No	Char.Descr.	x_{51}	x_{52}	x_{53}	x_{54}	x_{55}	x_{56}	x_{57}	x_{58}	x_{59}	x_{60}
177721	3000015-05	2,25	2,24	2,24	2,24	2,25	2,25	2,24	2,25	2,24	2,25
177721	3000015-05	31,00	30,00	31,00	29,00	30,00	32,00	31,00	32,00	30,00	30,00

Char.No	Char.Descr.	x_{61}	x_{62}	x_{63}	x_{64}	x_{65}	x_{66}	x_{67}	x_{68}	x_{69}	x_{70}
177721	3000015-05	2,25	2,25	2,24	2,24	2,24	2,25	2,24	2,24	2,25	2,24
177721	3000015-05	30,00	30,00	30,00	30,00	29,00	29,00	31,00	31,00	31,00	30,00

Char.No	Char.Descr.	x_{71}	x_{72}	x_{73}	x_{74}	x_{75}	x_{76}	x_{77}	x_{78}	x_{79}	x_{80}
177721	3000015-05	2,25	2,25	2,24	2,24	2,24	2,26	2,25	2,24	2,24	2,24
177721	3000015-05	29,00	30,00	29,00	29,00	30,00	29,00	31,00	31,00	31,00	31,00

Machine Capability Study
Tool System

Plant	ATG Lexington		Operator Name	M. SHERMAN	Date 01.04.2021

Ser.No.	GC0061d	Characteristic			
Type	CTBPW05Q	Char.Descr.	3000015-05	Inspection Val.	2,24
Ord. No.	CTBPW05Q	Ser.No.	177721	LSL	2,08
				USL	2,40
Remark	TQ 30% hard +/-7% * TQ-Cal: 5.80 Nm; Cur-Cal: 0.0393 Nm/A; Speed: 1000-50 RPM;				

Char.No	Char.Descr.	x_{81}	x_{82}	x_{83}	x_{84}	x_{85}	x_{86}	x_{87}	x_{88}	x_{89}	x_{90}
177721	3000015-05	2,25	2,24	2,25	2,25	2,25	2,25	2,25	2,25	2,25	2,24
177721	3000015-05	29,00	30,00	30,00	31,00	30,00	31,00	30,00	30,00	30,00	29,00

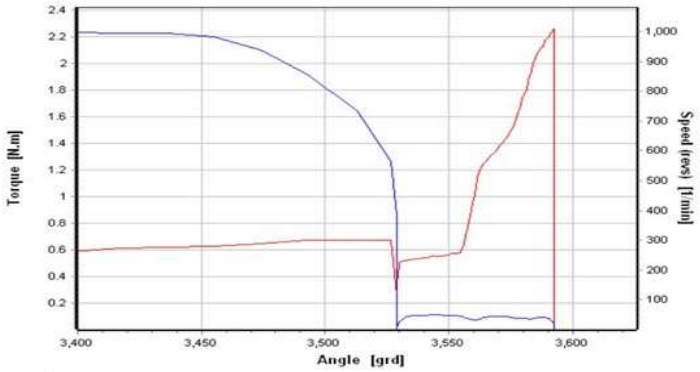
Char.No	Char.Descr.	x_{91}	x_{92}	x_{93}	x_{94}	x_{95}	x_{96}	x_{97}	x_{98}	x_{99}	x_{100}
177721	3000015-05	2,25	2,24	2,24	2,25	2,24	2,24	2,25	2,24	2,24	2,24
177721	3000015-05	30,00	30,00	30,00	30,00	32,00	30,00	30,00	30,00	31,00	30,00

Torque graphs

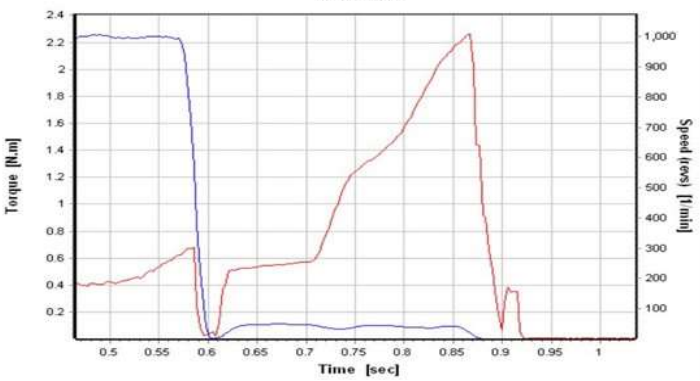
Machine Capability Study 30 %

Model: **CTBPW05Q**
Serial no: **GC0061**

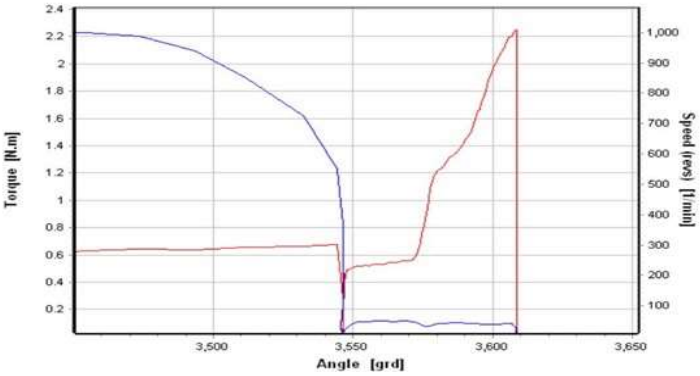
Angle degree: **30°**
Test torque: **2.2 Nm**



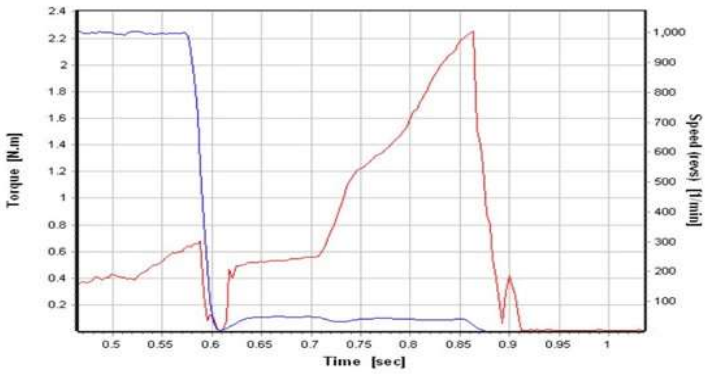
Value no. 1
Graph
Torque / Angle / Speed



Value no. 1
Graph
Torque / Time / Speed



Value no. 100
Graph
Torque / Angle / Speed



Value no. 100
Graph
Torque / Time / Speed

Machine Capability Study
Control System

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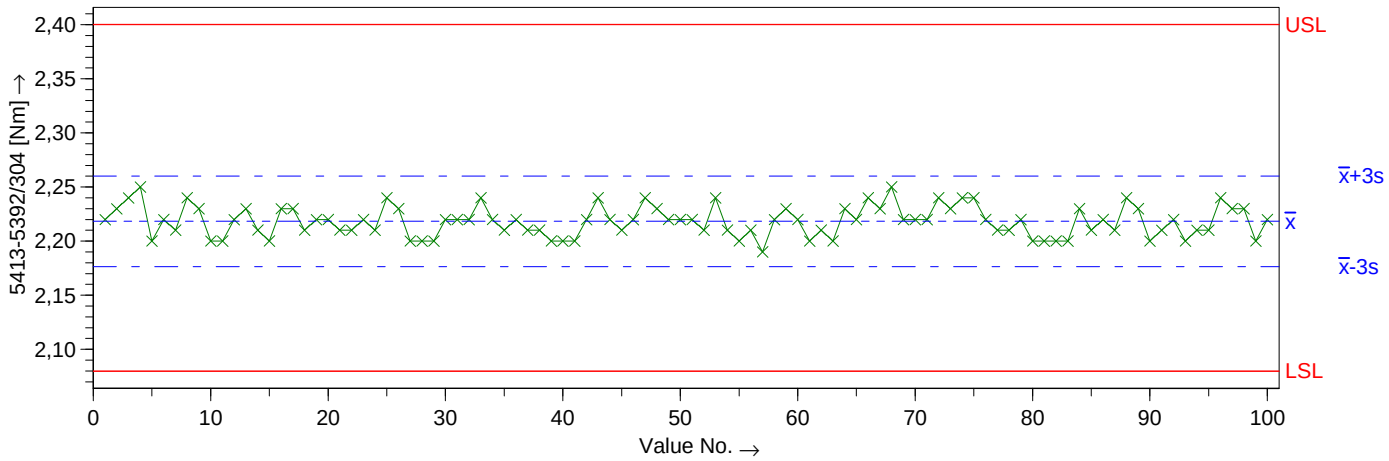
Plant ATG Lexington		Operator Name M. SHERMAN	Date 01.04.2021

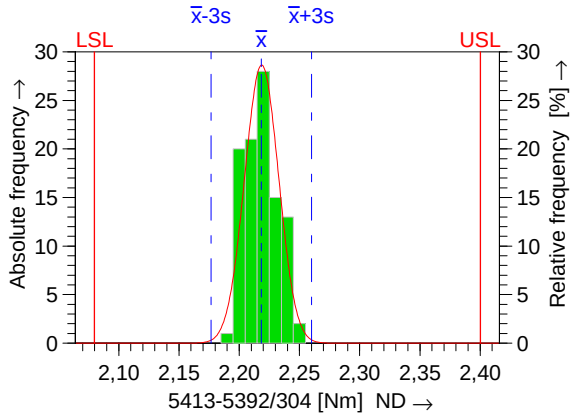
Ord. No. CTBPW05Q	Part type CTBPW05Q				Contr.item yes
Serial No. GC0061c	Char.Descr. 5413-5392/304	Inspection Val.	2,24	0,16	USL 2,40
	Serial No. 5376169	Unit	Nm	-0,16	LSL 2,08
Char.Type variable		Tolerance value	7 %		Decimal Pl. 2

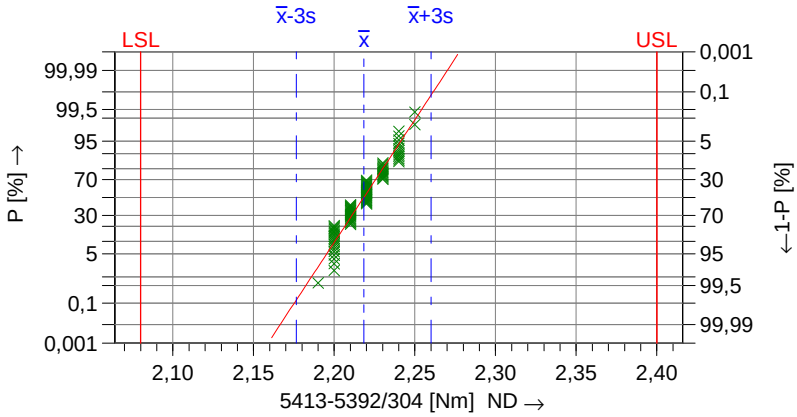
Cust.Name CLECO	Reference System 5413-5392/304	Test Electronic MPRO400GCD-P
Contr.No. HOMOLOGATION	Reference Transducer 10/1023806	nges. 100

Evaluation from 01.04.2021 10:38:10 to 01.04.2021 11:07:52

Rem. TQ 30% soft +/-7% * TQ-Cal: 5.80 Nm; Cur-Cal: 0.0393 Nm/A; Speed: 1000-50 RPM;







Drawing Values		Collected Values		Statistics	
T_m	2.24			$\bar{x}$	2.2183
LSL	2.08	x_{min}	2.19	$\bar{x}$-3s	2.1765
USL	2.40	x_{max}	2.25	$\bar{x}$+3s	2.2601
T	0.32	R	0.06	6s	0.0836
		$n_{<T>}$	100	$p_{<T>}$	100.00000 %
		$n_{>USL}$	0	$p_{>USL}$	0.00000%
		$n_{<LSL}$	0	$p_{<LSL}$	0.00000%
		n_{eff}	100		
		n_{tot}	100		

Model distribution			Normal Distribution
Calculation method			$M1_{1.4}$ $\hat{\sigma} = s_{tot}$
Potential Capability index	=	C_m	3.83
Critical capability index	=	C_{mk}	3.31

The requirements were met (C_m,C_{mk})

APEX VDI/VDE 2647 V0.1

Machine Capability Study
Control System

Plant	ATG Lexington		Operator Name	M. SHERMAN	Date 01.04.2021

Ser.No.	GC0061c	Characteristic			
Type	CTBPW05Q	Char.Descr.	5413-5392/304	Inspection Val.	2,24
Ord. No.	CTBPW05Q	Ser.No.	5376169	LSL	2,08
				USL	2,40
Remark	TQ 30% soft +/-7% * TQ-Cal: 5.80 Nm; Cur-Cal: 0.0393 Nm/A; Speed: 1000-50 RPM;				

Char.No	Char.Descr.	x_1	x_2	x_3	x_4	x_5	x_6	x_7	x_8	x_9	x_{10}
5376169	5413-5392/304	2,22	2,23	2,24	2,25	2,20	2,22	2,21	2,24	2,23	2,20
5376169	5413-5392/304	366,25	355,25	377,50	357,25	363,00	374,75	384,00	359,50	361,00	349,25

Char.No	Char.Descr.	x_{11}	x_{12}	x_{13}	x_{14}	x_{15}	x_{16}	x_{17}	x_{18}	x_{19}	x_{20}
5376169	5413-5392/304	2,20	2,22	2,23	2,21	2,20	2,23	2,23	2,21	2,22	2,22
5376169	5413-5392/304	363,00	388,00	367,25	372,50	370,00	339,50	335,50	362,50	374,50	383,75

Char.No	Char.Descr.	x_{21}	x_{22}	x_{23}	x_{24}	x_{25}	x_{26}	x_{27}	x_{28}	x_{29}	x_{30}
5376169	5413-5392/304	2,21	2,21	2,22	2,21	2,24	2,23	2,20	2,20	2,20	2,22
5376169	5413-5392/304	365,50	370,50	364,00	368,50	346,25	346,75	359,50	319,50	369,00	351,75

Char.No	Char.Descr.	x_{31}	x_{32}	x_{33}	x_{34}	x_{35}	x_{36}	x_{37}	x_{38}	x_{39}	x_{40}
5376169	5413-5392/304	2,22	2,22	2,24	2,22	2,21	2,22	2,21	2,21	2,20	2,20
5376169	5413-5392/304	365,75	356,75	365,75	365,25	365,25	369,50	363,50	364,50	378,25	374,75

Char.No	Char.Descr.	x_{41}	x_{42}	x_{43}	x_{44}	x_{45}	x_{46}	x_{47}	x_{48}	x_{49}	x_{50}
5376169	5413-5392/304	2,20	2,22	2,24	2,22	2,21	2,22	2,24	2,23	2,22	2,22
5376169	5413-5392/304	367,25	384,25	340,25	362,00	369,25	335,50	366,75	383,25	356,25	363,25

Char.No	Char.Descr.	x_{51}	x_{52}	x_{53}	x_{54}	x_{55}	x_{56}	x_{57}	x_{58}	x_{59}	x_{60}
5376169	5413-5392/304	2,22	2,21	2,24	2,21	2,20	2,21	2,19	2,22	2,23	2,22
5376169	5413-5392/304	374,75	350,00	360,25	355,50	362,25	381,25	374,50	379,50	366,50	351,00

Char.No	Char.Descr.	x_{61}	x_{62}	x_{63}	x_{64}	x_{65}	x_{66}	x_{67}	x_{68}	x_{69}	x_{70}
5376169	5413-5392/304	2,20	2,21	2,20	2,23	2,22	2,24	2,23	2,25	2,22	2,22
5376169	5413-5392/304	335,75	328,00	374,00	343,75	367,75	346,00	354,25	340,00	373,50	358,25

Char.No	Char.Descr.	x_{71}	x_{72}	x_{73}	x_{74}	x_{75}	x_{76}	x_{77}	x_{78}	x_{79}	x_{80}
5376169	5413-5392/304	2,22	2,24	2,23	2,24	2,24	2,22	2,21	2,21	2,22	2,20
5376169	5413-5392/304	351,75	363,50	368,50	370,75	362,75	354,75	363,00	371,75	351,75	374,75

Machine Capability Study
Control System

Plant	ATG Lexington		Operator Name	M. SHERMAN	Date 01.04.2021

Ser.No.	GC0061c	Characteristic			
Type	CTBPW05Q	Char.Descr.	5413-5392/304	Inspection Val.	2,24
Ord. No.	CTBPW05Q	Ser.No.	5376169	LSL	2,08
				USL	2,40
Remark	TQ 30% soft +/-7% * TQ-Cal: 5.80 Nm; Cur-Cal: 0.0393 Nm/A; Speed: 1000-50 RPM;				

Char.No	Char.Descr.	x_{81}	x_{82}	x_{83}	x_{84}	x_{85}	x_{86}	x_{87}	x_{88}	x_{89}	x_{90}
5376169	5413-5392/304	2,20	2,20	2,20	2,23	2,21	2,22	2,21	2,24	2,23	2,20
5376169	5413-5392/304	374,50	380,00	368,50	356,25	340,50	371,75	370,75	351,25	342,25	364,75

Char.No	Char.Descr.	x_{91}	x_{92}	x_{93}	x_{94}	x_{95}	x_{96}	x_{97}	x_{98}	x_{99}	x_{100}
5376169	5413-5392/304	2,21	2,22	2,20	2,21	2,21	2,24	2,23	2,23	2,20	2,22
5376169	5413-5392/304	332,50	371,00	352,50	344,00	364,25	345,50	345,75	352,75	358,75	382,25

Machine Capability Study
Tool System

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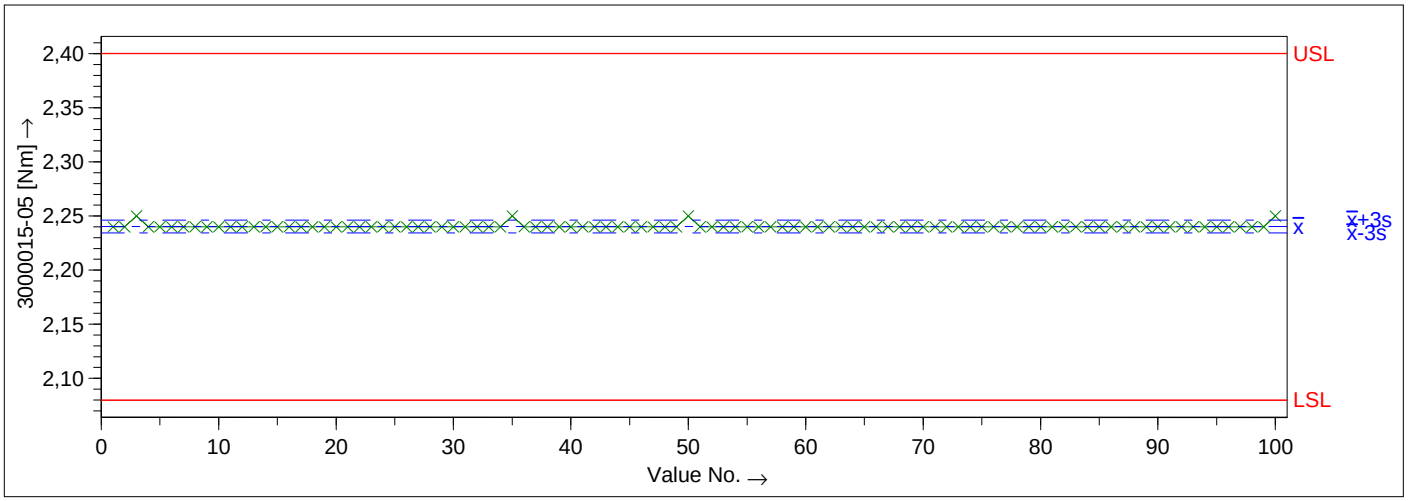
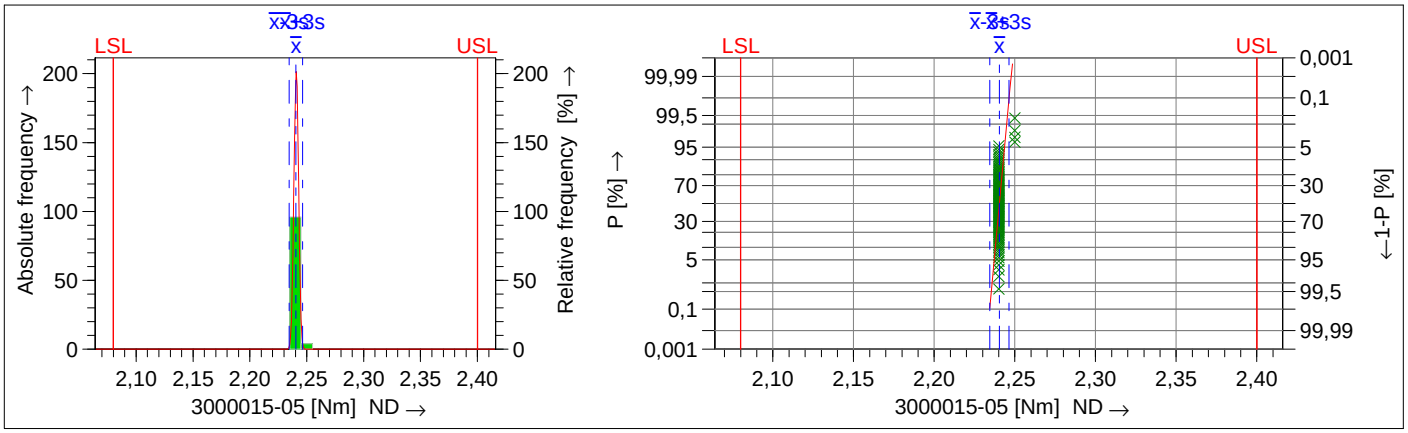
Plant	ATG Lexington	Operator Name	M. SHERMAN
Date	01.04.2021		

Ord. No.	CTBPW05Q	Part type	CTBPW05Q	Contr.item	yes
Serial No.	GC0061c	Char.Descr.	3000015-05	Inspection Val. 2,24 0,16	USL 2,40
		Serial No.	177721	Unit Nm -0,16	LSL 2,08
Char.Type	variable			Tolerance value 7 %	Decimal Pl. 2
Cust.Name	CLECO	Reference System	5413-5392/304	Test Electronic	MPRO400GCD-P
Contr.No.	HOMOLOGATION	Reference Transducer	10/1023806	nges.	100

Evaluation from 01.04.2021 10:38:09 to 01.04.2021 11:07:51

Rem. TQ 30% soft +/-7% * TQ-Cal: 5.80 Nm; Cur-Cal: 0.0393 Nm/A; Speed: 1000-50 RPM;





Drawing Values		Collected Values		Statistics	
T_m	2.24			$\bar{x}$	2.2404
LSL	2.08	x_{min}	2.24	$\bar{x}$-3s	2.2345
USL	2.40	x_{max}	2.25	$\bar{x}$+3s	2.2463
T	0.32	R	0.01	6s	0.0118
		$n_{<T>}$	100	$p_{<T>}$	100.00000 %
		$n_{>USL}$	0	$p_{>USL}$	0.00000%
		$n_{<LSL}$	0	$p_{<LSL}$	0.00000%
		n_{eff}	100		
		n_{tot}	100		

Model distribution			Normal Distribution
Calculation method			$M1_{1.4}$ $\hat{\sigma} = s_{tot}$
Potential Capability index	=	C_m	27.08
Critical capability index	=	C_{mk}	27.01

The requirements were met (C_m,C_{mk})

APEX VDI/VDE 2647 V0.1

Machine Capability Study
Tool System

Plant	ATG Lexington		Operator Name	M. SHERMAN	Date 01.04.2021

Ser.No.	GC0061c	Characteristic			
Type	CTBPW05Q	Char.Descr.	3000015-05	Inspection Val.	2,24
Ord. No.	CTBPW05Q	Ser.No.	177721	LSL	2,08
				USL	2,40
Remark	TQ 30% soft +/-7% * TQ-Cal: 5.80 Nm; Cur-Cal: 0.0393 Nm/A; Speed: 1000-50 RPM;				

Char.No	Char.Descr.	x_1	x_2	x_3	x_4	x_5	x_6	x_7	x_8	x_9	x_{10}
177721	3000015-05	2,24	2,24	2,25	2,24	2,24	2,24	2,24	2,24	2,24	2,24
177721	3000015-05	373,00	354,00	379,00	356,00	366,00	382,00	392,00	360,00	364,00	358,00

Char.No	Char.Descr.	x_{11}	x_{12}	x_{13}	x_{14}	x_{15}	x_{16}	x_{17}	x_{18}	x_{19}	x_{20}
177721	3000015-05	2,24	2,24	2,24	2,24	2,24	2,24	2,24	2,24	2,24	2,24
177721	3000015-05	371,00	392,00	373,00	378,00	376,00	341,00	338,00	368,00	382,00	392,00

Char.No	Char.Descr.	x_{21}	x_{22}	x_{23}	x_{24}	x_{25}	x_{26}	x_{27}	x_{28}	x_{29}	x_{30}
177721	3000015-05	2,24	2,24	2,24	2,24	2,24	2,24	2,24	2,24	2,24	2,24
177721	3000015-05	370,00	375,00	369,00	370,00	346,00	348,00	363,00	332,00	379,00	355,00

Char.No	Char.Descr.	x_{31}	x_{32}	x_{33}	x_{34}	x_{35}	x_{36}	x_{37}	x_{38}	x_{39}	x_{40}
177721	3000015-05	2,24	2,24	2,24	2,24	2,25	2,24	2,24	2,24	2,24	2,24
177721	3000015-05	368,00	353,00	367,00	371,00	374,00	375,00	367,00	372,00	385,00	379,00

Char.No	Char.Descr.	x_{41}	x_{42}	x_{43}	x_{44}	x_{45}	x_{46}	x_{47}	x_{48}	x_{49}	x_{50}
177721	3000015-05	2,24	2,24	2,24	2,24	2,24	2,24	2,24	2,24	2,24	2,25
177721	3000015-05	373,00	393,00	338,00	366,00	374,00	338,00	365,00	387,00	356,00	369,00

Char.No	Char.Descr.	x_{51}	x_{52}	x_{53}	x_{54}	x_{55}	x_{56}	x_{57}	x_{58}	x_{59}	x_{60}
177721	3000015-05	2,24	2,24	2,24	2,24	2,24	2,24	2,24	2,24	2,24	2,24
177721	3000015-05	379,00	354,00	360,00	360,00	372,00	389,00	383,00	387,00	371,00	353,00

Char.No	Char.Descr.	x_{61}	x_{62}	x_{63}	x_{64}	x_{65}	x_{66}	x_{67}	x_{68}	x_{69}	x_{70}
177721	3000015-05	2,24	2,24	2,24	2,24	2,24	2,24	2,24	2,24	2,24	2,24
177721	3000015-05	346,00	334,00	382,00	347,00	371,00	351,00	358,00	343,00	374,00	368,00

Char.No	Char.Descr.	x_{71}	x_{72}	x_{73}	x_{74}	x_{75}	x_{76}	x_{77}	x_{78}	x_{79}	x_{80}
177721	3000015-05	2,24	2,24	2,24	2,24	2,24	2,24	2,24	2,24	2,24	2,24
177721	3000015-05	353,00	366,00	369,00	374,00	367,00	355,00	369,00	375,00	354,00	382,00

Machine Capability Study
Tool System

Plant	ATG Lexington		Operator Name	M. SHERMAN	Date 01.04.2021

Ser.No.	GC0061c	Characteristic			
Type	CTBPW05Q	Char.Descr.	3000015-05	Inspection Val.	2,24
Ord. No.	CTBPW05Q	Ser.No.	177721	LSL	2,08
				USL	2,40
Remark	TQ 30% soft +/-7% * TQ-Cal: 5.80 Nm; Cur-Cal: 0.0393 Nm/A; Speed: 1000-50 RPM;				

Char.No	Char.Descr.	x_{81}	x_{82}	x_{83}	x_{84}	x_{85}	x_{86}	x_{87}	x_{88}	x_{89}	x_{90}
177721	3000015-05	2,24	2,24	2,24	2,24	2,24	2,24	2,24	2,24	2,24	2,24
177721	3000015-05	383,00	387,00	375,00	358,00	341,00	374,00	380,00	352,00	343,00	371,00

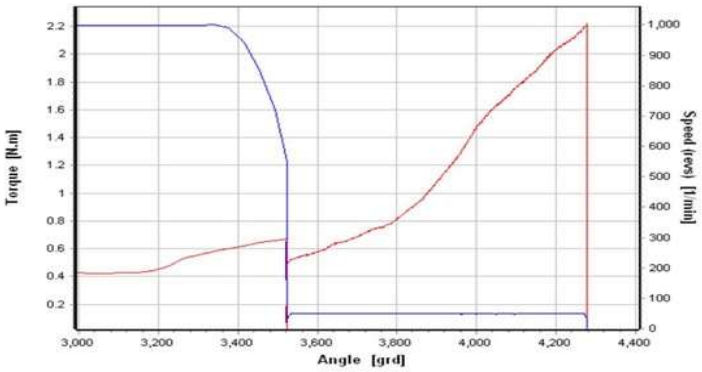
Char.No	Char.Descr.	x_{91}	x_{92}	x_{93}	x_{94}	x_{95}	x_{96}	x_{97}	x_{98}	x_{99}	x_{100}
177721	3000015-05	2,24	2,24	2,24	2,24	2,24	2,24	2,24	2,24	2,24	2,25
177721	3000015-05	340,00	376,00	356,00	346,00	369,00	346,00	348,00	353,00	367,00	388,00

Torque graphs

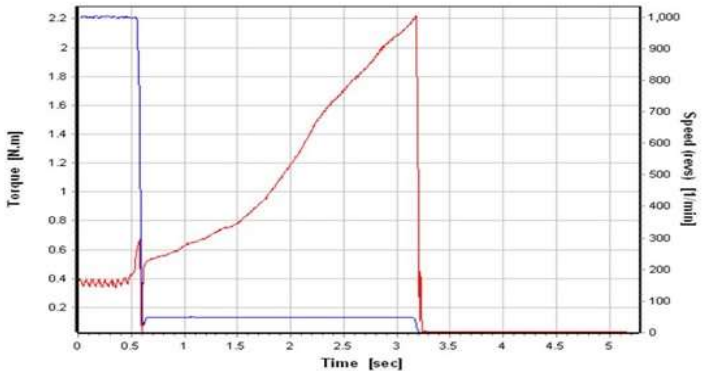
Machine Capability Study 30 %

Model: **CTBPW05Q**
Serial no: **GC0061**

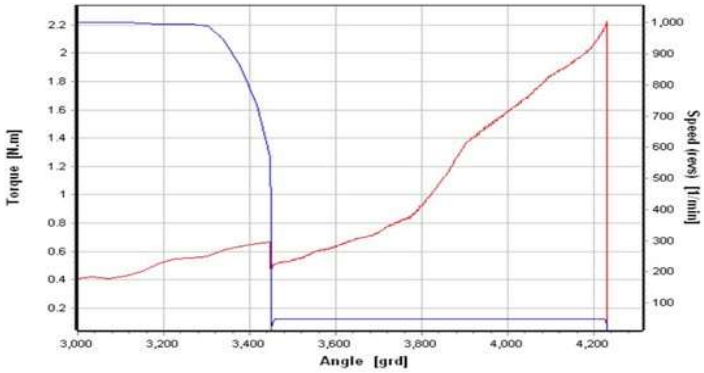
Angle degree: **360°**
Test torque: **2.2 Nm**



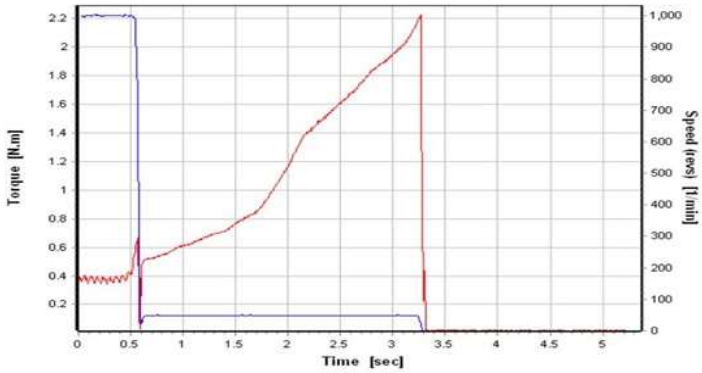
Value no. 1
Graph
Torque / Angle / Speed



Value no. 1
Graph
Torque / Time / Speed



Value no. 100
Graph
Torque / Angle / Speed



Value no. 100
Graph
Torque / Time / Speed

Test sheet no. 3

Machine Capability Study 80 %

Multi-stage tightening system	☑	Speed 50 rpm	1.4 %
Single-stage tightening system	☐	Speed 100 %	3525 rpm

Manufacturer: Apex Tool Group Serial no: **GC0061**

Test torque: Tq min. + 0.8 (Tq max. - Tq min.) 4.14 Nm

Hard joint (H)	25.07	Nm / Revolution	Angle degree	30°
Soft joint (L)	2.06	Nm / Revolution	Angle degree	360°

		H	**L**
a)	Tolerance down / up	3.85 - 4.43 Nm	3.85 - 4.43 Nm
	Tolerance down / up	7 %	7 %
	Average torque	4.18 Nm	4.12 Nm
	Standard deviation	0.02 Nm	0.02 Nm
	Torque scatter (99,73%)	0.14 Nm	0.10 Nm
	C_m	4.29	5.86
	C_{mk}	3.74	5.53

b) Min. C_m hard/soft (lowest value) 4.29
Min. C_{mk} hard/soft (lowest value) 3.74

Capability is reached if minimum C_{mk} value ≥1.67

Note:

Machine Capability Study
Control System

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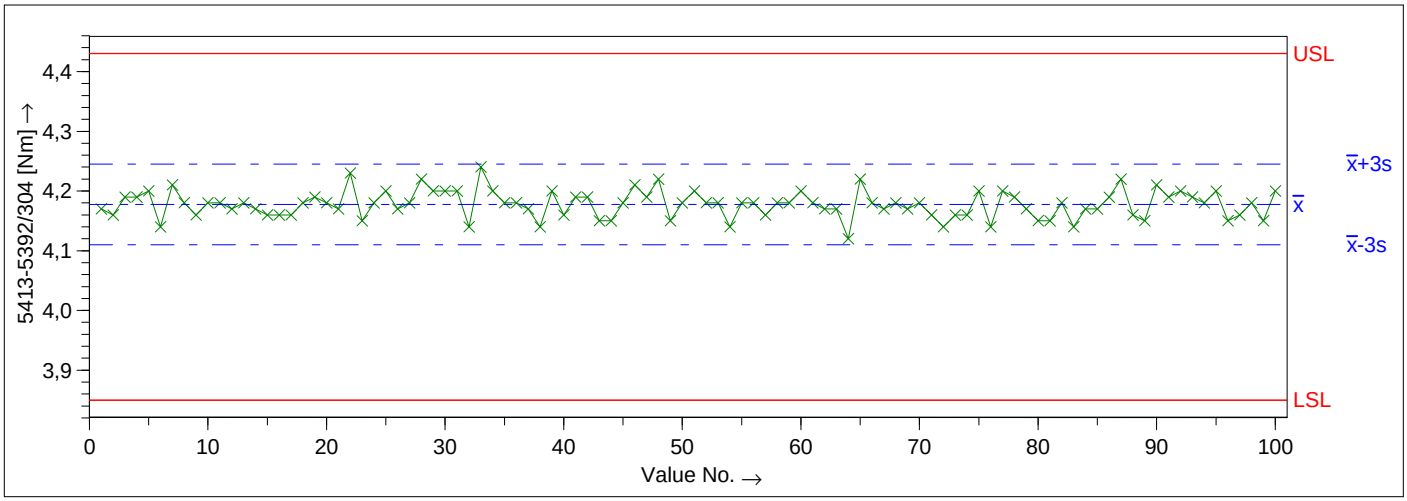
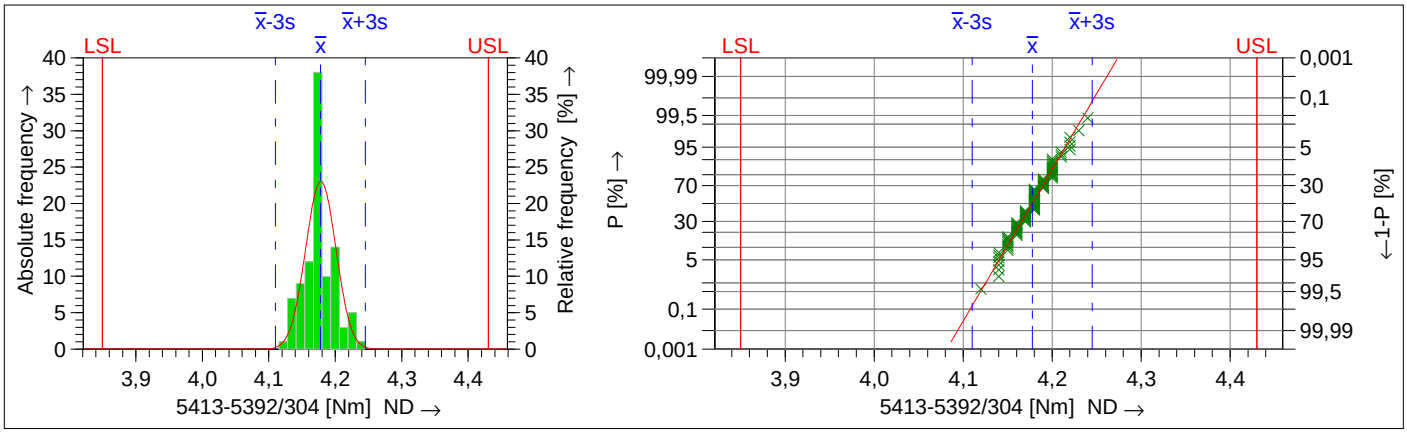
Plant ATG Lexington		Operator Name M. SHERMAN	Date 01.04.2021

Ord. No. CTBPW05Q	Part type CTBPW05Q				Contr.item yes
Serial No. GC0061h	Char.Descr. 5413-5392/304	Inspection Val.	4,14	0,29	USL 4,43
	Serial No. 5376169	Unit	Nm	-0,29	LSL 3,85
Char.Type variable		Tolerance value	7 %		Decimal Pl. 2
Cust.Name CLECO	Reference System 5413-5392/304	Test Electronic MPRO400GCD-P			
Contr.No. HOMOLOGATION	Reference Transducer 10/1023806	nges. 100			

Evaluation from 01.04.2021 11:34:14 to 01.04.2021 12:03:55

Rem. TQ 80% hard +/-7% * TQ-Cal: 5.78 Nm; Cur-Cal: 0.0393 Nm/A; Speed: 1000-50 RPM;





Drawing Values		Collected Values		Statistics	
T_m	4.14			$\bar{x}$	4.1776
LSL	3.85	x_{min}	4.12	$\bar{x}$-3s	4.1100
USL	4.43	x_{max}	4.24	$\bar{x}$+3s	4.2452
T	0.58	R	0.12	6s	0.1351
		$n_{<T>}$	100	$p_{<T>}$	100.00000 %
		$n_{>USL}$	0	$p_{>USL}$	0.00000%
		$n_{<LSL}$	0	$p_{<LSL}$	0.00000%
		n_{eff}	100		
		n_{tot}	100		

Model distribution			Normal Distribution
Calculation method			$M1_{1.4}$ $\hat{\sigma} = s_{tot}$
Potential Capability index	=	C_m	4.29
Critical capability index	=	C_{mk}	3.74

The requirements were met (C_m,C_{mk})

APEX VDI/VDE 2647 V0.1

Machine Capability Study
Control System

Plant	ATG Lexington		Operator Name	M. SHERMAN	Date 01.04.2021

Ser.No.	GC0061h	Characteristic			
Type	CTBPW05Q	Char.Descr.	5413-5392/304	Inspection Val.	4,14
Ord. No.	CTBPW05Q	Ser.No.	5376169	LSL	3,85
				USL	4,43
Remark	TQ 80% hard +/-7% * TQ-Cal: 5.78 Nm; Cur-Cal: 0.0393 Nm/A; Speed: 1000-50 RPM;				

Char.No	Char.Descr.	x_1	x_2	x_3	x_4	x_5	x_6	x_7	x_8	x_9	x_{10}
5376169	5413-5392/304	4,17	4,16	4,19	4,19	4,20	4,14	4,21	4,18	4,16	4,18
5376169	5413-5392/304	29,50	29,50	31,00	31,25	30,75	30,00	28,50	29,75	29,50	30,75

Char.No	Char.Descr.	x_{11}	x_{12}	x_{13}	x_{14}	x_{15}	x_{16}	x_{17}	x_{18}	x_{19}	x_{20}
5376169	5413-5392/304	4,18	4,17	4,18	4,17	4,16	4,16	4,16	4,18	4,19	4,18
5376169	5413-5392/304	29,25	28,50	30,25	30,75	29,25	29,75	29,75	29,50	31,00	31,00

Char.No	Char.Descr.	x_{21}	x_{22}	x_{23}	x_{24}	x_{25}	x_{26}	x_{27}	x_{28}	x_{29}	x_{30}
5376169	5413-5392/304	4,17	4,23	4,15	4,18	4,20	4,17	4,18	4,22	4,20	4,20
5376169	5413-5392/304	29,00	29,50	29,50	29,50	30,50	30,75	30,00	31,25	30,75	31,00

Char.No	Char.Descr.	x_{31}	x_{32}	x_{33}	x_{34}	x_{35}	x_{36}	x_{37}	x_{38}	x_{39}	x_{40}
5376169	5413-5392/304	4,20	4,14	4,24	4,20	4,18	4,18	4,17	4,14	4,20	4,16
5376169	5413-5392/304	31,50	30,25	28,75	30,50	29,00	29,50	29,50	31,50	30,00	31,25

Char.No	Char.Descr.	x_{41}	x_{42}	x_{43}	x_{44}	x_{45}	x_{46}	x_{47}	x_{48}	x_{49}	x_{50}
5376169	5413-5392/304	4,19	4,19	4,15	4,15	4,18	4,21	4,19	4,22	4,15	4,18
5376169	5413-5392/304	29,50	29,75	30,50	30,25	30,75	30,50	31,25	32,00	29,75	30,25

Char.No	Char.Descr.	x_{51}	x_{52}	x_{53}	x_{54}	x_{55}	x_{56}	x_{57}	x_{58}	x_{59}	x_{60}
5376169	5413-5392/304	4,20	4,18	4,18	4,14	4,18	4,18	4,16	4,18	4,18	4,20
5376169	5413-5392/304	30,00	29,00	29,75	29,50	30,75	29,75	29,50	31,25	29,75	30,50

Char.No	Char.Descr.	x_{61}	x_{62}	x_{63}	x_{64}	x_{65}	x_{66}	x_{67}	x_{68}	x_{69}	x_{70}
5376169	5413-5392/304	4,18	4,17	4,17	4,12	4,22	4,18	4,17	4,18	4,17	4,18
5376169	5413-5392/304	30,00	31,00	30,00	29,00	30,00	30,00	30,00	29,75	30,50	30,00

Char.No	Char.Descr.	x_{71}	x_{72}	x_{73}	x_{74}	x_{75}	x_{76}	x_{77}	x_{78}	x_{79}	x_{80}
5376169	5413-5392/304	4,16	4,14	4,16	4,16	4,20	4,14	4,20	4,19	4,17	4,15
5376169	5413-5392/304	29,75	29,50	30,25	31,50	30,25	30,75	30,50	28,75	30,00	30,00

Machine Capability Study
Control System

Plant	ATG Lexington		Operator Name	M. SHERMAN	Date 01.04.2021

Ser.No.	GC0061h	Characteristic			
Type	CTBPW05Q	Char.Descr.	5413-5392/304	Inspection Val.	4,14
Ord. No.	CTBPW05Q	Ser.No.	5376169	LSL	3,85
				USL	4,43
Remark	TQ 80% hard +/-7% * TQ-Cal: 5.78 Nm; Cur-Cal: 0.0393 Nm/A; Speed: 1000-50 RPM;				

Char.No	Char.Descr.	x_{81}	x_{82}	x_{83}	x_{84}	x_{85}	x_{86}	x_{87}	x_{88}	x_{89}	x_{90}
5376169	5413-5392/304	4,15	4,18	4,14	4,17	4,17	4,19	4,22	4,16	4,15	4,21
5376169	5413-5392/304	0,00	30,50	30,25	30,75	31,25	31,25	31,75	29,50	30,00	30,00

Char.No	Char.Descr.	x_{91}	x_{92}	x_{93}	x_{94}	x_{95}	x_{96}	x_{97}	x_{98}	x_{99}	x_{100}
5376169	5413-5392/304	4,19	4,20	4,19	4,18	4,20	4,15	4,16	4,18	4,15	4,20
5376169	5413-5392/304	31,00	30,00	31,00	29,75	30,75	30,25	30,00	29,75	30,50	28,75

Machine Capability Study
Tool System

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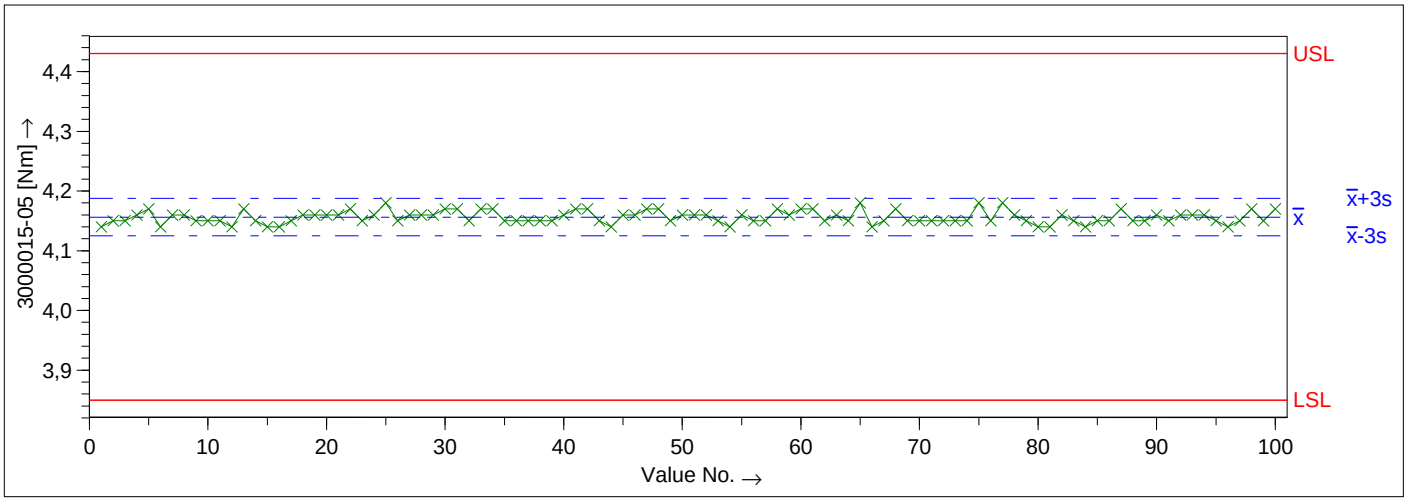
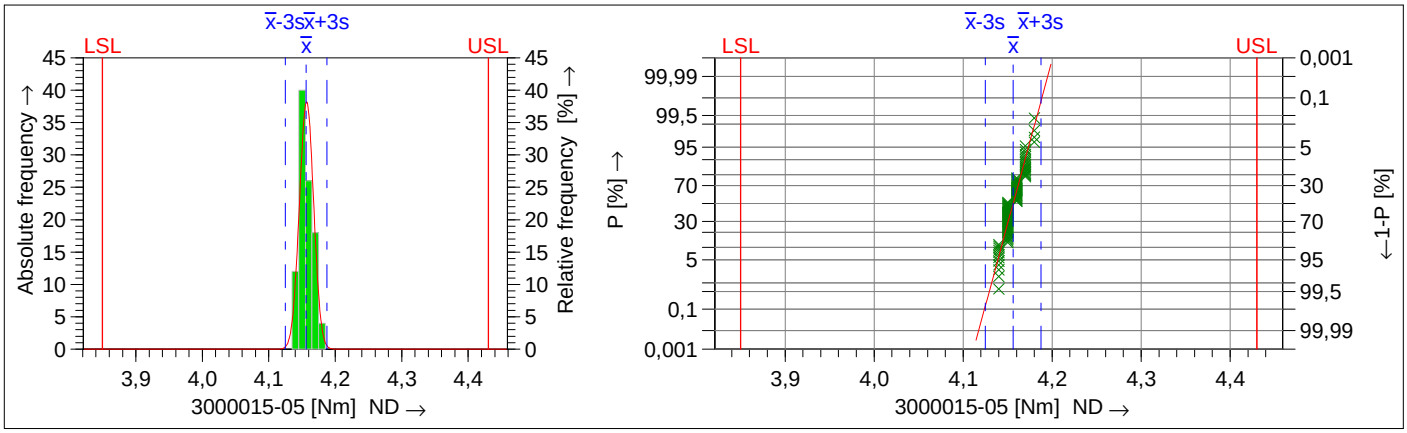
Plant ATG Lexington		Operator Name M. SHERMAN	Date 01.04.2021

Ord. No. CTBPW05Q	Part type CTBPW05Q				Contr.item yes
Serial No. GC0061h	Char.Descr. 3000015-05	Inspection Val.	4,14	0,29	USL 4,43
	Serial No. 177721	Unit	Nm	-0,29	LSL 3,85
Char.Type variable		Tolerance value	7 %		Decimal Pl. 2
Cust.Name CLECO	Reference System 5413-5392/304	Test Electronic MPRO400GCD-P			
Contr.No. HOMOLOGATION	Reference Transducer 10/1023806	nges. 100			

Evaluation from 01.04.2021 11:34:12 to 01.04.2021 12:03:55

Rem. TQ 80% hard +/-7% * TQ-Cal: 5.78 Nm; Cur-Cal: 0.0393 Nm/A; Speed: 1000-50 RPM;





Drawing Values		Collected Values		Statistics	
T_m	4.14			$\bar{x}$	4.1562
LSL	3.85	x_{min}	4.14	$\bar{x}$-3s	4.1249
USL	4.43	x_{max}	4.18	$\bar{x}$+3s	4.1875
T	0.58	R	0.04	6s	0.0625
		$n_{<T>}$	100	$p_{<T>}$	100.00000 %
		$n_{>USL}$	0	$p_{>USL}$	0.00000%
		$n_{<LSL}$	0	$p_{<LSL}$	0.00000%
		n_{eff}	100		
		n_{tot}	100		

Model distribution			Normal Distribution
Calculation method			$M1_{1,4}$ $\hat{\sigma} = s_{tot}$
Potential Capability index	=	C_m	9.27
Critical capability index	=	C_{mk}	8.76

The requirements were met (C_m,C_{mk})

APEX VDI/VDE 2647 V0.1

Machine Capability Study
Tool System

Plant	ATG Lexington		Operator Name	M. SHERMAN	Date 01.04.2021

Ser.No.	GC0061h	Characteristic			
Type	CTBPW05Q	Char.Descr.	3000015-05	Inspection Val.	4,14
Ord. No.	CTBPW05Q	Ser.No.	177721	LSL	3,85
				USL	4,43
Remark	TQ 80% hard +/-7% * TQ-Cal: 5.78 Nm; Cur-Cal: 0.0393 Nm/A; Speed: 1000-50 RPM;				

Char.No	Char.Descr.	x_1	x_2	x_3	x_4	x_5	x_6	x_7	x_8	x_9	x_{10}
177721	3000015-05	4,14	4,15	4,15	4,16	4,17	4,14	4,16	4,16	4,15	4,15
177721	3000015-05	30,00	30,00	31,00	32,00	31,00	31,00	29,00	30,00	29,00	31,00

Char.No	Char.Descr.	x_{11}	x_{12}	x_{13}	x_{14}	x_{15}	x_{16}	x_{17}	x_{18}	x_{19}	x_{20}
177721	3000015-05	4,15	4,14	4,17	4,15	4,14	4,14	4,15	4,16	4,16	4,16
177721	3000015-05	29,00	29,00	31,00	31,00	29,00	30,00	30,00	30,00	31,00	31,00

Char.No	Char.Descr.	x_{21}	x_{22}	x_{23}	x_{24}	x_{25}	x_{26}	x_{27}	x_{28}	x_{29}	x_{30}
177721	3000015-05	4,16	4,17	4,15	4,16	4,18	4,15	4,16	4,16	4,16	4,17
177721	3000015-05	29,00	30,00	30,00	30,00	31,00	31,00	30,00	32,00	31,00	31,00

Char.No	Char.Descr.	x_{31}	x_{32}	x_{33}	x_{34}	x_{35}	x_{36}	x_{37}	x_{38}	x_{39}	x_{40}
177721	3000015-05	4,17	4,15	4,17	4,17	4,15	4,15	4,15	4,15	4,15	4,16
177721	3000015-05	32,00	31,00	29,00	31,00	29,00	30,00	30,00	32,00	31,00	32,00

Char.No	Char.Descr.	x_{41}	x_{42}	x_{43}	x_{44}	x_{45}	x_{46}	x_{47}	x_{48}	x_{49}	x_{50}
177721	3000015-05	4,17	4,17	4,15	4,14	4,16	4,16	4,17	4,17	4,15	4,16
177721	3000015-05	30,00	30,00	31,00	30,00	31,00	31,00	32,00	32,00	30,00	30,00

Char.No	Char.Descr.	x_{51}	x_{52}	x_{53}	x_{54}	x_{55}	x_{56}	x_{57}	x_{58}	x_{59}	x_{60}
177721	3000015-05	4,16	4,16	4,15	4,14	4,16	4,15	4,15	4,17	4,16	4,17
177721	3000015-05	30,00	30,00	30,00	30,00	31,00	30,00	30,00	32,00	30,00	30,00

Char.No	Char.Descr.	x_{61}	x_{62}	x_{63}	x_{64}	x_{65}	x_{66}	x_{67}	x_{68}	x_{69}	x_{70}
177721	3000015-05	4,17	4,15	4,16	4,15	4,18	4,14	4,15	4,17	4,15	4,15
177721	3000015-05	30,00	31,00	30,00	29,00	30,00	30,00	30,00	30,00	31,00	31,00

Char.No	Char.Descr.	x_{71}	x_{72}	x_{73}	x_{74}	x_{75}	x_{76}	x_{77}	x_{78}	x_{79}	x_{80}
177721	3000015-05	4,15	4,15	4,15	4,15	4,18	4,15	4,18	4,16	4,15	4,14
177721	3000015-05	30,00	30,00	30,00	32,00	30,00	31,00	31,00	29,00	30,00	30,00

Machine Capability Study
Tool System

Plant	ATG Lexington		Operator Name	M. SHERMAN	Date 01.04.2021

Ser.No.	GC0061h	Characteristic			
Type	CTBPW05Q	Char.Descr.	3000015-05	Inspection Val.	4,14
Ord. No.	CTBPW05Q	Ser.No.	177721	LSL	3,85
				USL	4,43
Remark	TQ 80% hard +/-7% * TQ-Cal: 5.78 Nm; Cur-Cal: 0.0393 Nm/A; Speed: 1000-50 RPM;				

Char.No	Char.Descr.	x_{81}	x_{82}	x_{83}	x_{84}	x_{85}	x_{86}	x_{87}	x_{88}	x_{89}	x_{90}
177721	3000015-05	4,14	4,16	4,15	4,14	4,15	4,15	4,17	4,15	4,15	4,16
177721	3000015-05	31,00	31,00	31,00	31,00	32,00	32,00	32,00	30,00	30,00	30,00

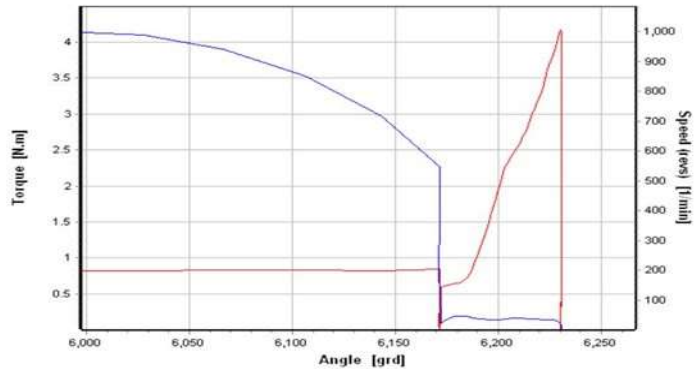
Char.No	Char.Descr.	x_{91}	x_{92}	x_{93}	x_{94}	x_{95}	x_{96}	x_{97}	x_{98}	x_{99}	x_{100}
177721	3000015-05	4,15	4,16	4,16	4,16	4,15	4,14	4,15	4,17	4,15	4,17
177721	3000015-05	31,00	30,00	31,00	30,00	31,00	30,00	30,00	30,00	31,00	29,00

Torque graphs

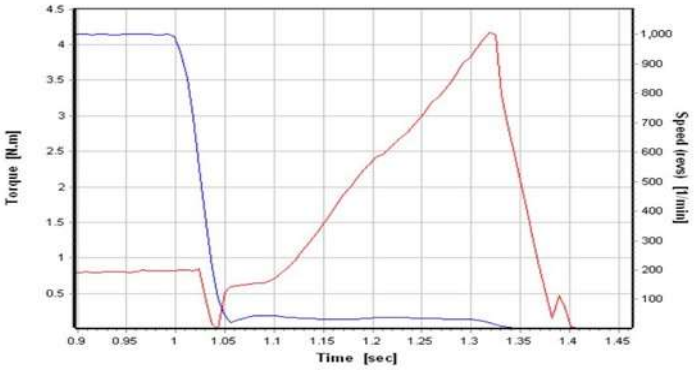
Machine Capability Study 80 %

Model: **CTBPW05Q**
Serial no: **GC0061**

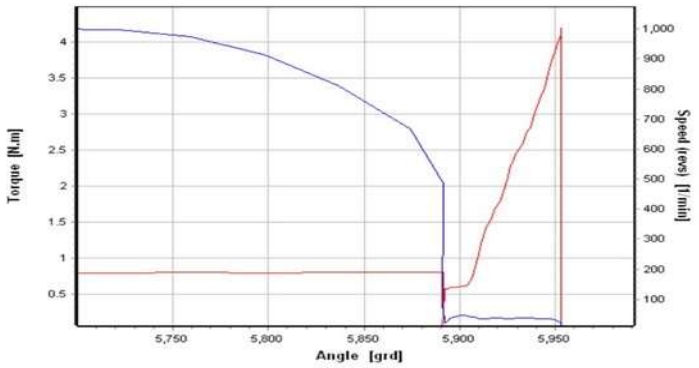
Angle degree: **30°**
Test torque: **4.1 Nm**



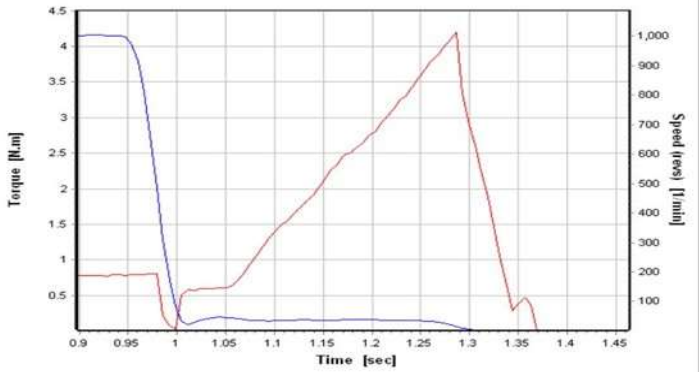
Value no. 1
Graph
Torque / Angle / Speed



Value no. 1
Graph
Torque / Time / Speed



Value no. 100
Graph
Torque / Angle / Speed



Value no. 100
Graph
Torque / Time / Speed

Machine Capability Study
Control System

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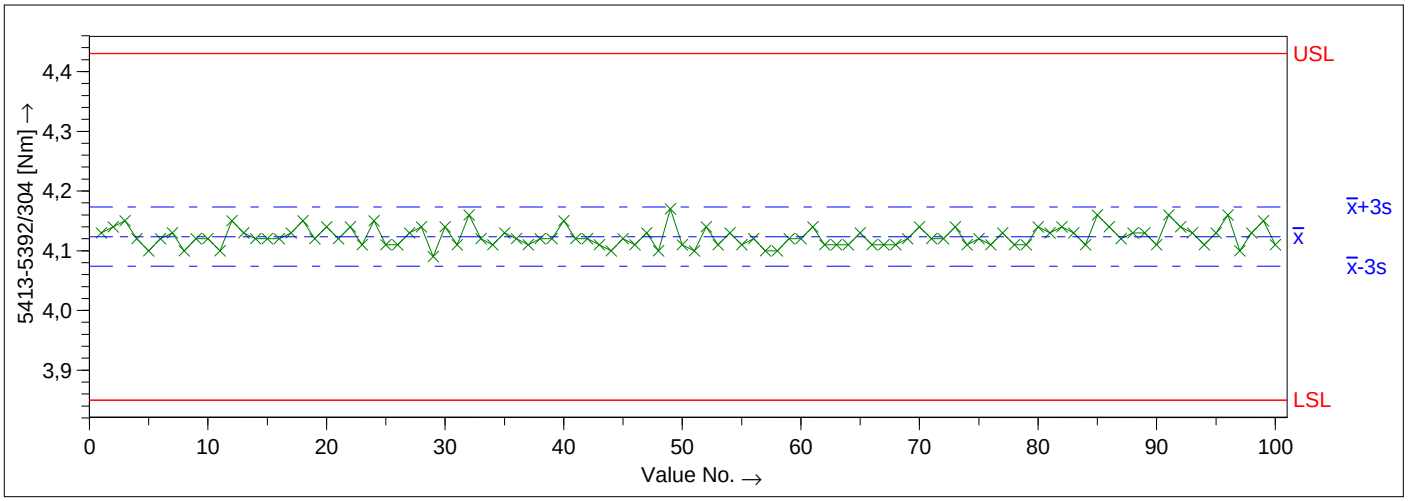
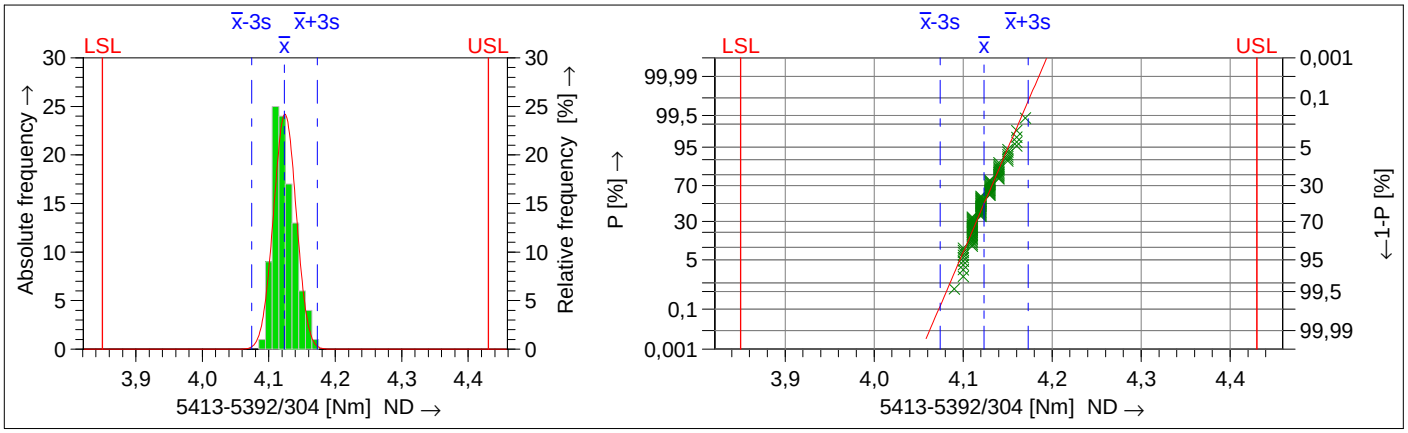
Plant	ATG Lexington	Operator Name	M. SHERMAN
Date	01.04.2021		

Ord. No.	CTBPW05Q	Part type	CTBPW05Q			Contr.item	yes
Serial No.	GC0061g	Char.Descr.	5413-5392/304	Inspection Val.	4,14	0,29	USL 4,43
		Serial No.	5376169	Unit	Nm	-0,29	LSL 3,85
Char.Type	variable			Tolerance value	7 %	Decimal Pl.	2
Cust.Name	CLECO	Reference System	5413-5392/304	Test Electronic	MPRO400GCD-P		
Contr.No.	HOMOLOGATION	Reference Transducer	10/1023806	nges.	100		

Evaluation from 01.04.2021 12:14:12 to 01.04.2021 01:47:34

Rem. TQ 80% soft +/-7% * TQ-Cal: 5.78 Nm; Cur-Cal: 0.0393 Nm/A; Speed: 1000-50 RPM;





Drawing Values		Collected Values		Statistics	
T_m	4.14			$\bar{x}$	4.1236
LSL	3.85	x_{min}	4.09	$\bar{x}$-3s	4.0741
USL	4.43	x_{max}	4.17	$\bar{x}$+3s	4.1731
T	0.58	R	0.08	6s	0.0989
		$n_{<T>}$	100	$p_{<T>}$	100.00000 %
		$n_{>USL}$	0	$p_{>USL}$	0.00000%
		$n_{<LSL}$	0	$p_{<LSL}$	0.00000%
		n_{eff}	100		
		n_{tot}	100		

Model distribution			Normal Distribution
Calculation method			$M1_{1,4}$ $\hat{\sigma} = s_{tot}$
Potential Capability index	=	C_m	5.86
Critical capability index	=	C_{mk}	5.53

The requirements were met (C_m,C_{mk})

APEX VDI/VDE 2647 V0.1

Machine Capability Study
Control System

Plant	ATG Lexington		Operator Name	M. SHERMAN	Date 01.04.2021

Ser.No.	GC0061g	Characteristic			
Type	CTBPW05Q	Char.Descr.	5413-5392/304	Inspection Val.	4,14
Ord. No.	CTBPW05Q	Ser.No.	5376169	LSL	3,85
				USL	4,43
Remark	TQ 80% soft +/-7% * TQ-Cal: 5.78 Nm; Cur-Cal: 0.0393 Nm/A; Speed: 1000-50 RPM;				

Char.No	Char.Descr.	x_1	x_2	x_3	x_4	x_5	x_6	x_7	x_8	x_9	x_{10}
5376169	5413-5392/304	4,13	4,14	4,15	4,12	4,10	4,12	4,13	4,10	4,12	4,12
5376169	5413-5392/304	366,75	363,25	353,00	365,75	362,00	362,25	365,25	353,50	360,25	358,50

Char.No	Char.Descr.	x_{11}	x_{12}	x_{13}	x_{14}	x_{15}	x_{16}	x_{17}	x_{18}	x_{19}	x_{20}
5376169	5413-5392/304	4,10	4,15	4,13	4,12	4,12	4,12	4,13	4,15	4,12	4,14
5376169	5413-5392/304	366,00	371,00	366,75	357,00	362,50	358,50	366,50	362,50	365,50	366,50

Char.No	Char.Descr.	x_{21}	x_{22}	x_{23}	x_{24}	x_{25}	x_{26}	x_{27}	x_{28}	x_{29}	x_{30}
5376169	5413-5392/304	4,12	4,14	4,11	4,15	4,11	4,11	4,13	4,14	4,09	4,14
5376169	5413-5392/304	365,00	350,25	363,25	366,00	363,75	362,25	351,25	344,00	358,75	359,00

Char.No	Char.Descr.	x_{31}	x_{32}	x_{33}	x_{34}	x_{35}	x_{36}	x_{37}	x_{38}	x_{39}	x_{40}
5376169	5413-5392/304	4,11	4,16	4,12	4,11	4,13	4,12	4,11	4,12	4,12	4,15
5376169	5413-5392/304	357,75	358,50	365,25	357,50	352,50	360,50	364,25	362,50	364,50	359,75

Char.No	Char.Descr.	x_{41}	x_{42}	x_{43}	x_{44}	x_{45}	x_{46}	x_{47}	x_{48}	x_{49}	x_{50}
5376169	5413-5392/304	4,12	4,12	4,11	4,10	4,12	4,11	4,13	4,10	4,17	4,11
5376169	5413-5392/304	356,00	367,50	360,25	360,00	367,25	362,75	350,75	360,50	368,75	362,50

Char.No	Char.Descr.	x_{51}	x_{52}	x_{53}	x_{54}	x_{55}	x_{56}	x_{57}	x_{58}	x_{59}	x_{60}
5376169	5413-5392/304	4,10	4,14	4,11	4,13	4,11	4,12	4,10	4,10	4,12	4,12
5376169	5413-5392/304	360,00	360,50	360,75	346,25	345,00	362,25	350,00	364,50	354,50	349,75

Char.No	Char.Descr.	x_{61}	x_{62}	x_{63}	x_{64}	x_{65}	x_{66}	x_{67}	x_{68}	x_{69}	x_{70}
5376169	5413-5392/304	4,14	4,11	4,11	4,11	4,13	4,11	4,11	4,11	4,12	4,14
5376169	5413-5392/304	361,25	367,00	365,25	364,00	365,00	360,50	350,25	360,25	363,50	368,50

Char.No	Char.Descr.	x_{71}	x_{72}	x_{73}	x_{74}	x_{75}	x_{76}	x_{77}	x_{78}	x_{79}	x_{80}
5376169	5413-5392/304	4,12	4,12	4,14	4,11	4,12	4,11	4,13	4,11	4,11	4,14
5376169	5413-5392/304	366,75	363,00	362,00	345,00	363,50	363,75	363,25	361,00	364,25	371,75

Machine Capability Study
Control System

Plant	ATG Lexington		Operator Name	M. SHERMAN	Date 01.04.2021

Ser.No.	GC0061g	Characteristic			
Type	CTBPW05Q	Char.Descr.	5413-5392/304	Inspection Val.	4,14
Ord. No.	CTBPW05Q	Ser.No.	5376169	LSL	3,85
				USL	4,43
Remark	TQ 80% soft +/-7% * TQ-Cal: 5.78 Nm; Cur-Cal: 0.0393 Nm/A; Speed: 1000-50 RPM;				

Char.No	Char.Descr.	x_{81}	x_{82}	x_{83}	x_{84}	x_{85}	x_{86}	x_{87}	x_{88}	x_{89}	x_{90}
5376169	5413-5392/304	4,13	4,14	4,13	4,11	4,16	4,14	4,12	4,13	4,13	4,11
5376169	5413-5392/304	365,75	363,00	366,50	355,50	368,50	360,25	371,25	368,75	367,75	354,00

Char.No	Char.Descr.	x_{91}	x_{92}	x_{93}	x_{94}	x_{95}	x_{96}	x_{97}	x_{98}	x_{99}	x_{100}
5376169	5413-5392/304	4,16	4,14	4,13	4,11	4,13	4,16	4,10	4,13	4,15	4,11
5376169	5413-5392/304	347,75	353,25	367,00	367,25	361,25	351,75	351,75	345,00	353,50	354,00

Machine Capability Study
Tool System

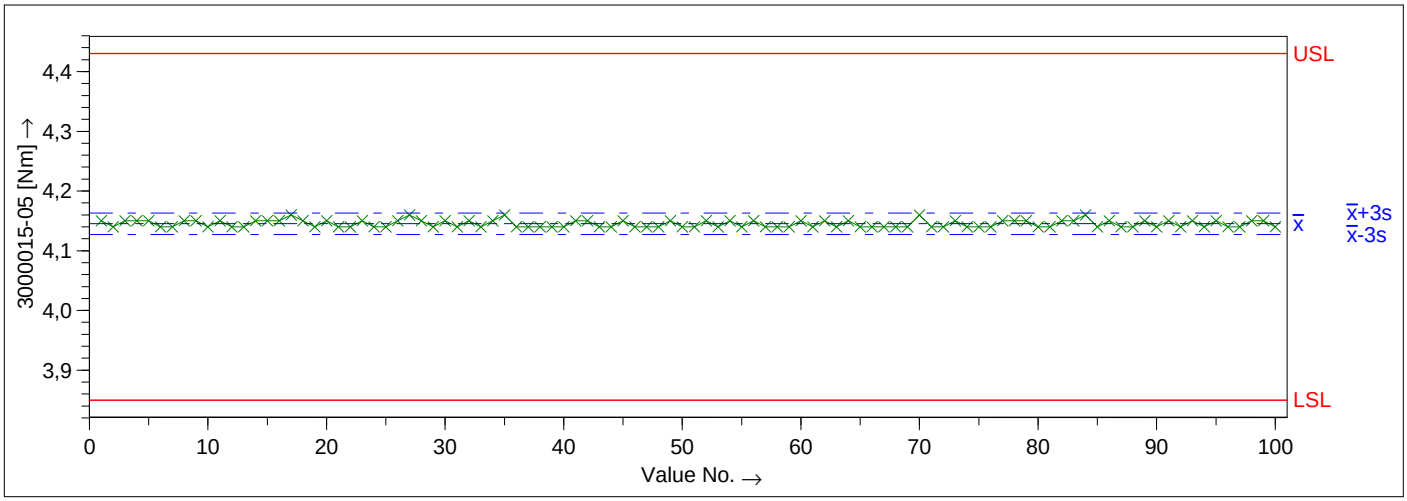
Cleco Production Tools

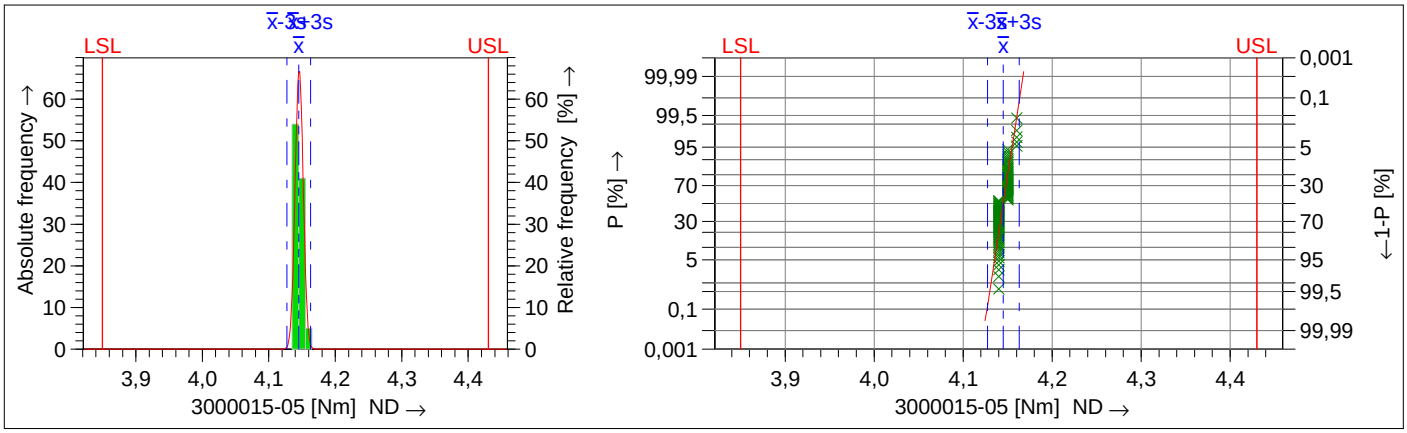
Plant	ATG Lexington	Operator Name	M. SHERMAN
Date	01.04.2021		

Ord. No.	CTBPW05Q	Part type	CTBPW05Q			Contr.item	yes
Serial No.	GC0061g	Char.Descr.	3000015-05	Inspection Val.	4,14	0,29	USL 4,43
		Serial No.	177721	Unit	Nm	-0,29	LSL 3,85
Char.Type	variable			Tolerance value	7 %	Decimal Pl.	2
Cust.Name	CLECO	Reference System	5413-5392/304	Test Electronic	MPRO400GCD-P		
Contr.No.	HOMOLOGATION	Reference Transducer	10/1023806	nges.	100		

Evaluation from 01.04.2021 12:14:10 to 01.04.2021 13:47:34

Rem. TQ 80% soft +/-7% * TQ-Cal: 5.78 Nm; Cur-Cal: 0.0393 Nm/A; Speed: 1000-50 RPM;





Drawing Values		Collected Values		Statistics	
T_m	4.14			$\bar{x}$	4.1451
LSL	3.85	x_{min}	4.14	$\bar{x}$-3s	4.1273
USL	4.43	x_{max}	4.16	$\bar{x}$+3s	4.1629
T	0.58	R	0.02	6s	0.0357
		$n_{<T>}$	100	$p_{<T>}$	100.00000 %
		$n_{>USL}$	0	$p_{>USL}$	0.00000%
		$n_{<LSL}$	0	$p_{<LSL}$	0.00000%
		n_{eff}	100		
		n_{tot}	100		

Model distribution			Normal Distribution
Calculation method			$M1_{1,4}$ $\hat{\sigma} = s_{tot}$
Potential Capability index	=	C_m	16.26
Critical capability index	=	C_{mk}	15.97

The requirements were met (C_m,C_{mk})

APEX VDI/VDE 2647 V0.1

Machine Capability Study
Tool System

Plant	ATG Lexington		Operator Name	M. SHERMAN	Date 01.04.2021

Ser.No.	GC0061g	Characteristic			
Type	CTBPW05Q	Char.Descr.	3000015-05	Inspection Val.	4,14
Ord. No.	CTBPW05Q	Ser.No.	177721	LSL	3,85
				USL	4,43
Remark	TQ 80% soft +/-7% * TQ-Cal: 5.78 Nm; Cur-Cal: 0.0393 Nm/A; Speed: 1000-50 RPM;				

Char.No	Char.Descr.	x_1	x_2	x_3	x_4	x_5	x_6	x_7	x_8	x_9	x_{10}
177721	3000015-05	4,15	4,14	4,15	4,15	4,15	4,14	4,14	4,15	4,15	4,14
177721	3000015-05	373,00	367,00	360,00	371,00	366,00	367,00	371,00	360,00	369,00	361,00

Char.No	Char.Descr.	x_{11}	x_{12}	x_{13}	x_{14}	x_{15}	x_{16}	x_{17}	x_{18}	x_{19}	x_{20}
177721	3000015-05	4,15	4,14	4,14	4,15	4,15	4,15	4,16	4,15	4,14	4,15
177721	3000015-05	367,00	373,00	368,00	366,00	368,00	362,00	373,00	367,00	374,00	367,00

Char.No	Char.Descr.	x_{21}	x_{22}	x_{23}	x_{24}	x_{25}	x_{26}	x_{27}	x_{28}	x_{29}	x_{30}
177721	3000015-05	4,14	4,14	4,15	4,14	4,14	4,15	4,16	4,15	4,14	4,15
177721	3000015-05	373,00	351,00	369,00	370,00	369,00	367,00	361,00	353,00	362,00	366,00

Char.No	Char.Descr.	x_{31}	x_{32}	x_{33}	x_{34}	x_{35}	x_{36}	x_{37}	x_{38}	x_{39}	x_{40}
177721	3000015-05	4,14	4,15	4,14	4,15	4,16	4,14	4,14	4,14	4,14	4,14
177721	3000015-05	360,00	359,00	367,00	360,00	362,00	374,00	369,00	369,00	370,00	361,00

Char.No	Char.Descr.	x_{41}	x_{42}	x_{43}	x_{44}	x_{45}	x_{46}	x_{47}	x_{48}	x_{49}	x_{50}
177721	3000015-05	4,15	4,15	4,14	4,14	4,15	4,14	4,14	4,14	4,15	4,14
177721	3000015-05	365,00	368,00	363,00	362,00	368,00	367,00	352,00	364,00	366,00	367,00

Char.No	Char.Descr.	x_{51}	x_{52}	x_{53}	x_{54}	x_{55}	x_{56}	x_{57}	x_{58}	x_{59}	x_{60}
177721	3000015-05	4,14	4,15	4,14	4,15	4,14	4,15	4,14	4,14	4,14	4,15
177721	3000015-05	364,00	361,00	363,00	347,00	347,00	367,00	354,00	375,00	360,00	353,00

Char.No	Char.Descr.	x_{61}	x_{62}	x_{63}	x_{64}	x_{65}	x_{66}	x_{67}	x_{68}	x_{69}	x_{70}
177721	3000015-05	4,14	4,15	4,14	4,15	4,14	4,14	4,14	4,14	4,14	4,16
177721	3000015-05	365,00	371,00	369,00	369,00	367,00	369,00	360,00	362,00	369,00	373,00

Char.No	Char.Descr.	x_{71}	x_{72}	x_{73}	x_{74}	x_{75}	x_{76}	x_{77}	x_{78}	x_{79}	x_{80}
177721	3000015-05	4,14	4,14	4,15	4,14	4,14	4,14	4,15	4,15	4,15	4,14
177721	3000015-05	368,00	367,00	367,00	355,00	365,00	365,00	369,00	367,00	369,00	376,00

Machine Capability Study
Tool System

Plant	ATG Lexington		Operator Name	M. SHERMAN	Date 01.04.2021

Ser.No.	GC0061g	Characteristic			
Type	CTBPW05Q	Char.Descr.	3000015-05	Inspection Val.	4,14
Ord. No.	CTBPW05Q	Ser.No.	177721	LSL	3,85
				USL	4,43
Remark	TQ 80% soft +/-7% * TQ-Cal: 5.78 Nm; Cur-Cal: 0.0393 Nm/A; Speed: 1000-50 RPM;				

Char.No	Char.Descr.	x_{81}	x_{82}	x_{83}	x_{84}	x_{85}	x_{86}	x_{87}	x_{88}	x_{89}	x_{90}
177721	3000015-05	4,14	4,15	4,15	4,16	4,14	4,15	4,14	4,14	4,15	4,14
177721	3000015-05	367,00	363,00	374,00	358,00	372,00	360,00	373,00	370,00	371,00	357,00

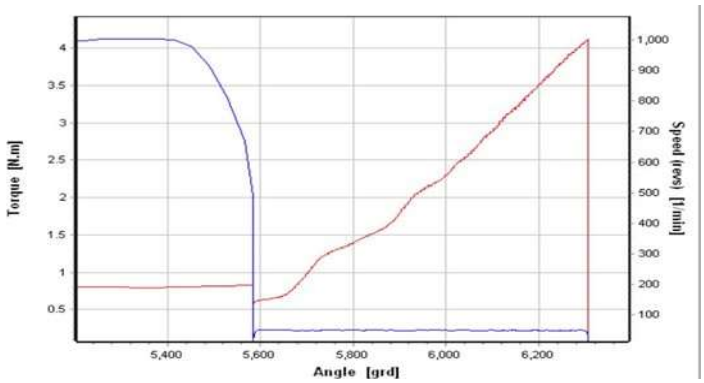
Char.No	Char.Descr.	x_{91}	x_{92}	x_{93}	x_{94}	x_{95}	x_{96}	x_{97}	x_{98}	x_{99}	x_{100}
177721	3000015-05	4,15	4,14	4,15	4,14	4,15	4,14	4,14	4,15	4,15	4,14
177721	3000015-05	351,00	360,00	372,00	369,00	362,00	352,00	360,00	346,00	355,00	356,00

Torque graphs

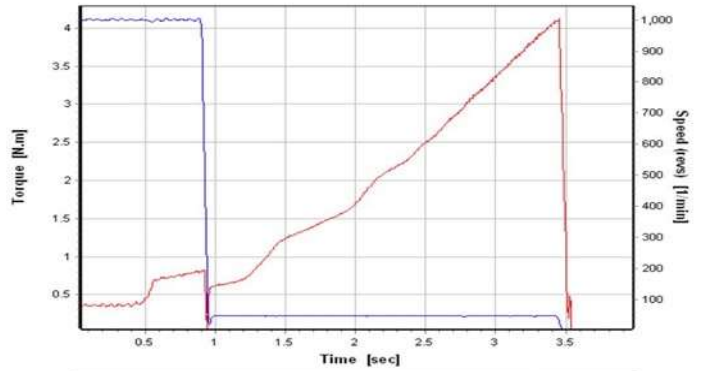
Machine Capability Study 80 %

Model: **CTBPW05Q**
Serial no: **GC0061**

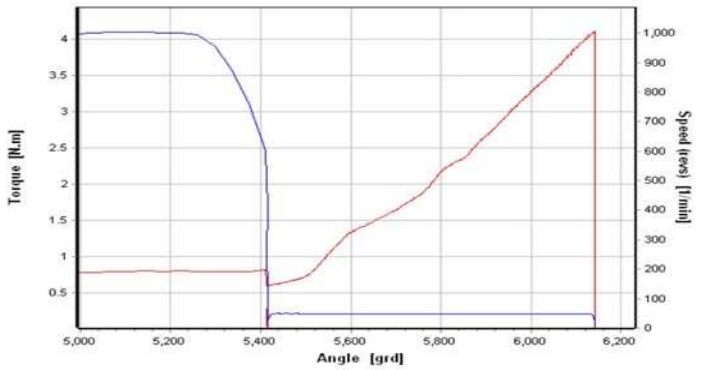
Angle degree: **360°**
Test torque: **4.1 Nm**



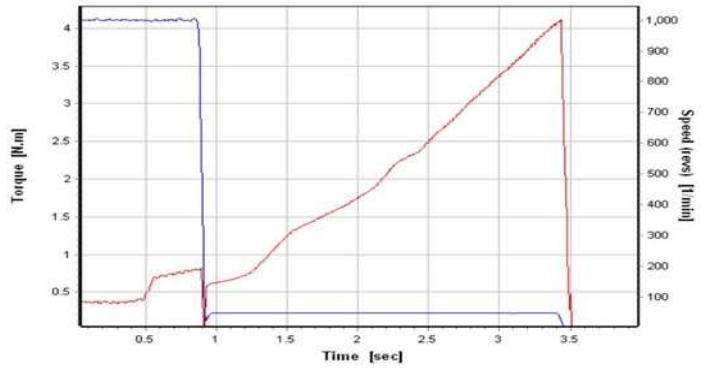
Value no. 1
Graph
Torque / Angle / Speed



Value no. 1
Graph
Torque / Time / Speed



Value no. 100
Graph
Torque / Angle / Speed



Value no. 100
Graph
Torque / Time / Speed

Test sheet no. 4

Machine Capability Study 100 %

Multi-stage tightening system	☑	Speed 50 rpm	1.4 %
Single-stage tightening system	☐	Speed 100 %	3525 rpm

Manufacturer: Apex Tool Group Serial no: **GC0061**

Test torque: Tq max. 4.90 Nm

Hard joint (H)	29.46 Nm / Revolution	Angle degree	30°
Soft joint (L)	2.43 Nm / Revolution	Angle degree	360°

		H	**L**
a)	Tolerance down / up	4.56 - 5.24 Nm	4.56 - 5.24 Nm
	Tolerance down / up	7 %	7 %
	Average torque	4.91 Nm	4.86 Nm
	Standard deviation	0.03 Nm	0.02 Nm
	Torque scatter (99,73%)	0.20 Nm	0.11 Nm
	C_m	3.35	6.46
	C_{mk}	3.26	5.73

b)	Min. C_m hard/soft (lowest value)	3.35
	Min. C_{mk} hard/soft (lowest value)	3.26

Capability is reached if minimum C_{mk} value ≥1.67

Note:

Machine Capability Study
Control System

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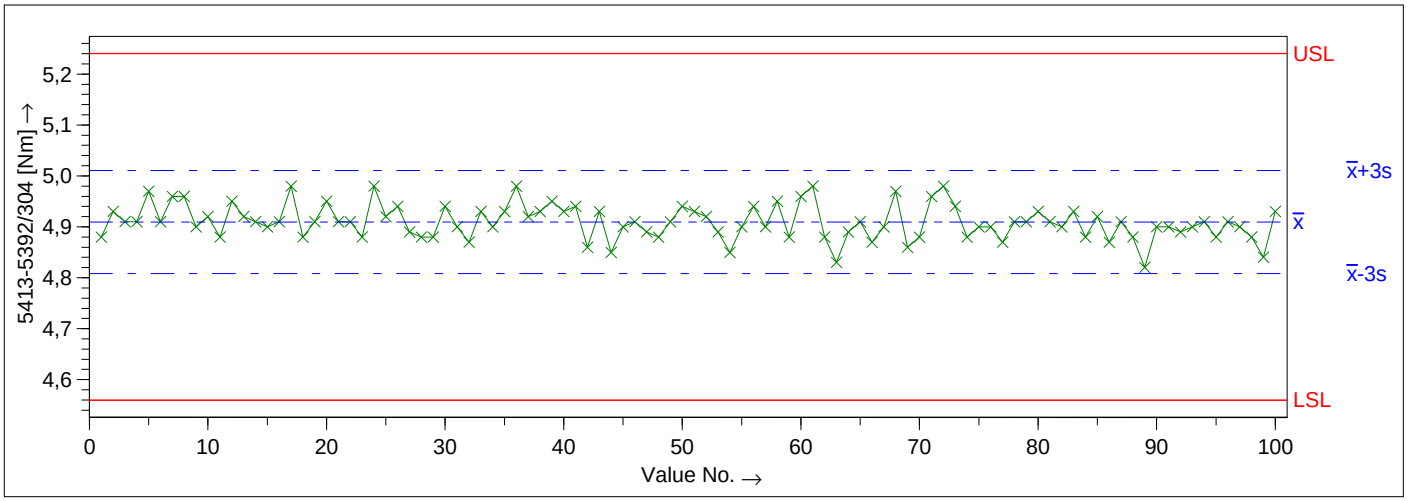
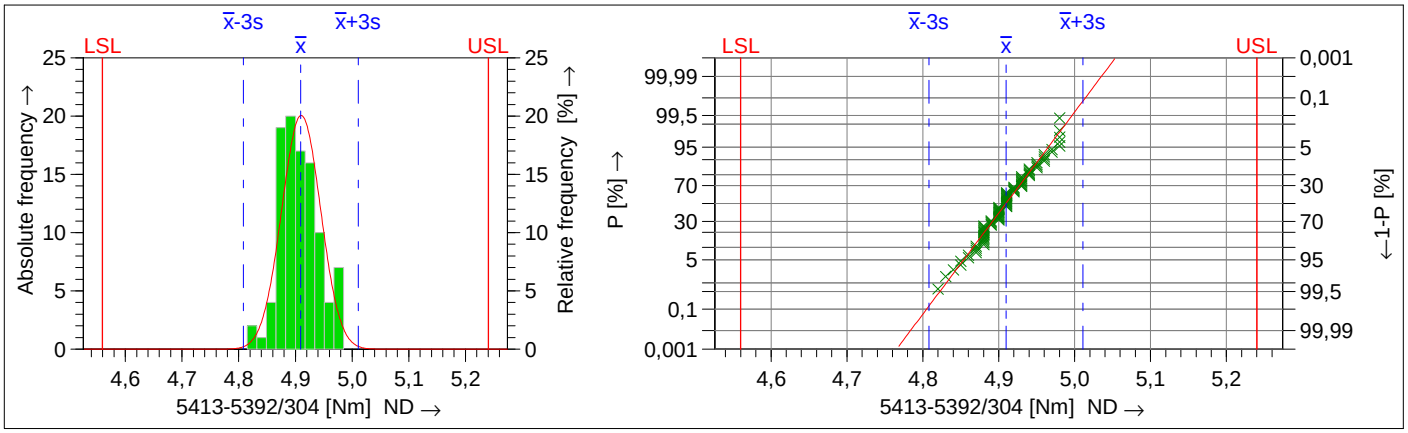
Plant	ATG Lexington	Operator Name	M. SHERMAN
Date	06.04.2021		

Ord. No.	CTBPW05Q	Part type	CTBPW05Q	Contr.item	yes
Serial No.	GC0061b	Char.Descr.	5413-5392/304	Inspection Val. 4,90 0,34	USL 5,24
		Serial No.	5376169	Unit Nm -0,34	LSL 4,56
Char.Type	variable			Tolerance value 7 %	Decimal Pl. 2
Cust.Name	CLECO	Reference System	5413-5392/304	Test Electronic	MPRO400GCD-P
Contr.No.	HOMOLOGATION	Reference Transducer	10/1023806	nges.	100

Evaluation from 06.04.2021 08:58:23 to 06.04.2021 09:28:06

Rem. TQ 100% hard +/-7% * TQ-Cal: 5.82 Nm; Cur-Cal: 0.0393 Nm/A; Speed: 1000-50 RPM;





Drawing Values		Collected Values		Statistics	
T_m	4.90			$\bar{x}$	4.9095
LSL	4.56	x_{min}	4.82	$\bar{x}$-3s	4.8081
USL	5.24	x_{max}	4.98	$\bar{x}$+3s	5.0109
T	0.68	R	0.16	6s	0.2028
		$n_{<T>}$	100	$p_{<T>}$	100.00000 %
		$n_{>USL}$	0	$p_{>USL}$	0.00000%
		$n_{<LSL}$	0	$p_{<LSL}$	0.00000%
		n_{eff}	100		
		n_{tot}	100		

Model distribution			Normal Distribution
Calculation method			M1 1.4 $\hat{\sigma} = s_{tot}$
Potential Capability index	=	C_m	3.35
Critical capability index	=	C_{mk}	3.26

The requirements were met (C_m,C_{mk})

APEX VDI/VDE 2647 V0.1

Machine Capability Study
Control System

Plant	ATG Lexington		Operator Name	M. SHERMAN	Date 06.04.2021

Ser.No.	GC0061b	Characteristic			
Type	CTBPW05Q	Char.Descr.	5413-5392/304	Inspection Val.	4,90
Ord. No.	CTBPW05Q	Ser.No.	5376169	LSL	4,56
				USL	5,24
Remark	TQ 100% hard +/-7% * TQ-Cal: 5.82 Nm; Cur-Cal: 0.0393 Nm/A; Speed: 1000-50 RPM;				

Char.No	Char.Descr.	x_1	x_2	x_3	x_4	x_5	x_6	x_7	x_8	x_9	x_{10}
5376169	5413-5392/304	4,88	4,93	4,91	4,91	4,97	4,91	4,96	4,96	4,90	4,92
5376169	5413-5392/304	30,00	31,00	30,75	30,00	30,25	30,00	31,25	30,75	30,75	30,00

Char.No	Char.Descr.	x_{11}	x_{12}	x_{13}	x_{14}	x_{15}	x_{16}	x_{17}	x_{18}	x_{19}	x_{20}
5376169	5413-5392/304	4,88	4,95	4,92	4,91	4,90	4,91	4,98	4,88	4,91	4,95
5376169	5413-5392/304	30,50	31,00	30,75	29,25	30,75	29,50	31,00	29,75	31,00	30,75

Char.No	Char.Descr.	x_{21}	x_{22}	x_{23}	x_{24}	x_{25}	x_{26}	x_{27}	x_{28}	x_{29}	x_{30}
5376169	5413-5392/304	4,91	4,91	4,88	4,98	4,92	4,94	4,89	4,88	4,88	4,94
5376169	5413-5392/304	31,00	31,50	30,25	31,25	31,00	30,75	29,75	30,25	30,25	30,25

Char.No	Char.Descr.	x_{31}	x_{32}	x_{33}	x_{34}	x_{35}	x_{36}	x_{37}	x_{38}	x_{39}	x_{40}
5376169	5413-5392/304	4,90	4,87	4,93	4,90	4,93	4,98	4,92	4,93	4,95	4,93
5376169	5413-5392/304	30,25	30,75	30,25	30,75	30,50	30,50	30,50	31,50	30,25	30,00

Char.No	Char.Descr.	x_{41}	x_{42}	x_{43}	x_{44}	x_{45}	x_{46}	x_{47}	x_{48}	x_{49}	x_{50}
5376169	5413-5392/304	4,94	4,86	4,93	4,85	4,90	4,91	4,89	4,88	4,91	4,94
5376169	5413-5392/304	30,50	30,00	30,25	30,50	30,00	30,75	30,50	30,00	30,50	30,50

Char.No	Char.Descr.	x_{51}	x_{52}	x_{53}	x_{54}	x_{55}	x_{56}	x_{57}	x_{58}	x_{59}	x_{60}
5376169	5413-5392/304	4,93	4,92	4,89	4,85	4,90	4,94	4,90	4,95	4,88	4,96
5376169	5413-5392/304	31,25	30,00	30,50	30,00	31,00	29,75	30,75	31,00	31,00	30,50

Char.No	Char.Descr.	x_{61}	x_{62}	x_{63}	x_{64}	x_{65}	x_{66}	x_{67}	x_{68}	x_{69}	x_{70}
5376169	5413-5392/304	4,98	4,88	4,83	4,89	4,91	4,87	4,90	4,97	4,86	4,88
5376169	5413-5392/304	31,25	30,25	29,75	30,75	30,25	29,50	29,75	30,50	30,00	30,25

Char.No	Char.Descr.	x_{71}	x_{72}	x_{73}	x_{74}	x_{75}	x_{76}	x_{77}	x_{78}	x_{79}	x_{80}
5376169	5413-5392/304	4,96	4,98	4,94	4,88	4,90	4,90	4,87	4,91	4,91	4,93
5376169	5413-5392/304	30,75	30,50	30,75	29,00	30,00	30,50	30,25	30,75	30,50	30,50

Machine Capability Study
Control System

Plant	ATG Lexington		Operator Name	M. SHERMAN	Date 06.04.2021

Ser.No.	GC0061b	Characteristic			
Type	CTBPW05Q	Char.Descr.	5413-5392/304	Inspection Val.	4,90
Ord. No.	CTBPW05Q	Ser.No.	5376169	LSL	4,56
				USL	5,24
Remark	TQ 100% hard +/-7% * TQ-Cal: 5.82 Nm; Cur-Cal: 0.0393 Nm/A; Speed: 1000-50 RPM;				

Char.No	Char.Descr.	x_{81}	x_{82}	x_{83}	x_{84}	x_{85}	x_{86}	x_{87}	x_{88}	x_{89}	x_{90}
5376169	5413-5392/304	4,91	4,90	4,93	4,88	4,92	4,87	4,91	4,88	4,82	4,90
5376169	5413-5392/304	30,25	30,00	29,50	30,00	29,50	29,75	29,75	30,25	30,00	30,50

Char.No	Char.Descr.	x_{91}	x_{92}	x_{93}	x_{94}	x_{95}	x_{96}	x_{97}	x_{98}	x_{99}	x_{100}
5376169	5413-5392/304	4,90	4,89	4,90	4,91	4,88	4,91	4,90	4,88	4,84	4,93
5376169	5413-5392/304	30,75	30,25	29,75	30,00	29,75	30,50	30,75	30,25	30,50	30,00

Machine Capability Study
Tool System

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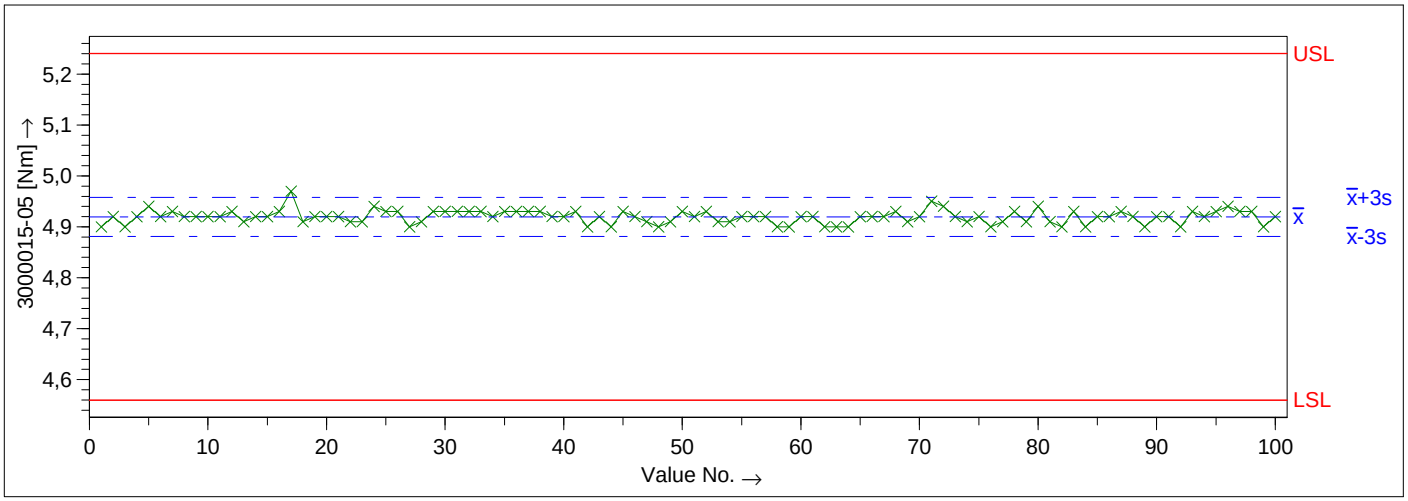
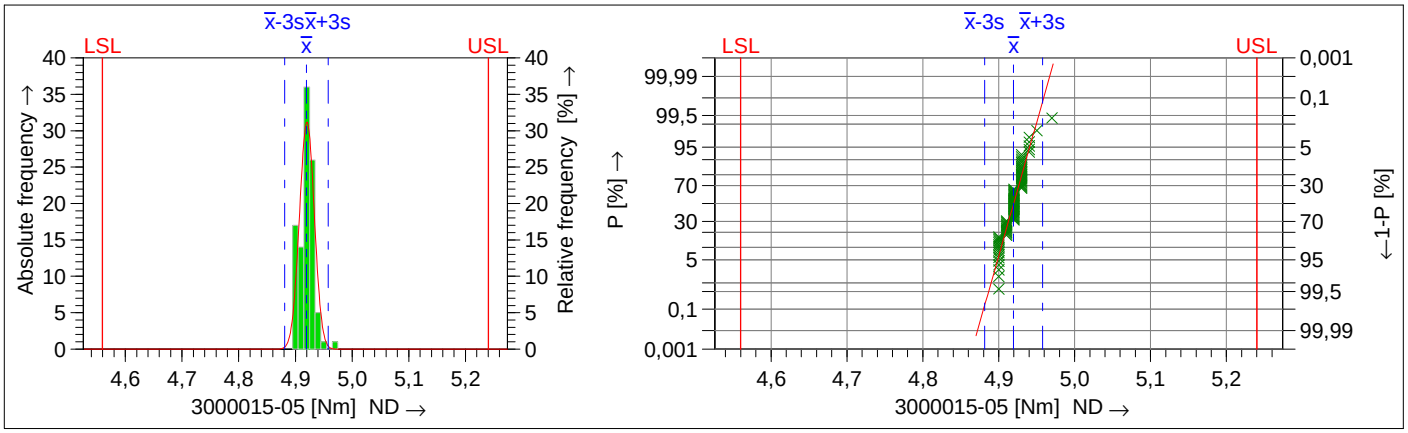
Plant ATG Lexington		Operator Name M. SHERMAN	Date 06.04.2021

Ord. No. CTBPW05Q	Part type CTBPW05Q				Contr.item yes
Serial No. GC0061b	Char.Descr. 3000015-05	Inspection Val. 4,90	0,34	USL 5,24	
	Serial No. 177721	Unit Nm	-0,34	LSL 4,56	
Char.Type variable		Tolerance value 7 %		Decimal Pl. 2	
Cust.Name CLECO	Reference System 5413-5392/304	Test Electronic MPRO400GCD-P			
Contr.No. HOMOLOGATION	Reference Transducer 10/1023806	nges. 100			

Evaluation from 06.04.2021 08:58:22 to 06.04.2021 09:28:04

Rem. TQ 100% hard +/-7% * TQ-Cal: 5.82 Nm; Cur-Cal: 0.0393 Nm/A; Speed: 1000-50 RPM;





Drawing Values		Collected Values		Statistics	
T_m	4.90			$\bar{x}$	4.9196
LSL	4.56	x_{min}	4.90	$\bar{x}$-3s	4.8812
USL	5.24	x_{max}	4.97	$\bar{x}$+3s	4.9580
T	0.68	R	0.07	6s	0.0767
		$n_{<T>}$	100	$p_{<T>}$	100.00000 %
		$n_{>USL}$	0	$p_{>USL}$	0.00000%
		$n_{<LSL}$	0	$p_{<LSL}$	0.00000%
		n_{eff}	100		
		n_{tot}	100		

Model distribution			Normal Distribution
Calculation method			M1 1.4 $\hat{\sigma} = s_{tot}$
Potential Capability index	=	C_m	8.86
Critical capability index	=	C_{mk}	8.35

The requirements were met (C_m,C_{mk})

APEX VDI/VDE 2647 V0.1

Machine Capability Study
Tool System

Plant	ATG Lexington		Operator Name	M. SHERMAN	Date 06.04.2021

Ser.No.	GC0061b	Characteristic			
Type	CTBPW05Q	Char.Descr.	3000015-05	Inspection Val.	4,90
Ord. No.	CTBPW05Q	Ser.No.	177721	LSL	4,56
				USL	5,24
Remark	TQ 100% hard +/-7% * TQ-Cal: 5.82 Nm; Cur-Cal: 0.0393 Nm/A; Speed: 1000-50 RPM;				

Char.No	Char.Descr.	x_1	x_2	x_3	x_4	x_5	x_6	x_7	x_8	x_9	x_{10}
177721	3000015-05	4,90	4,92	4,90	4,92	4,94	4,92	4,93	4,92	4,92	4,92
177721	3000015-05	31,00	31,00	31,00	30,00	31,00	31,00	32,00	32,00	31,00	31,00

Char.No	Char.Descr.	x_{11}	x_{12}	x_{13}	x_{14}	x_{15}	x_{16}	x_{17}	x_{18}	x_{19}	x_{20}
177721	3000015-05	4,92	4,93	4,91	4,92	4,92	4,93	4,97	4,91	4,92	4,92
177721	3000015-05	31,00	32,00	31,00	30,00	32,00	30,00	32,00	30,00	32,00	32,00

Char.No	Char.Descr.	x_{21}	x_{22}	x_{23}	x_{24}	x_{25}	x_{26}	x_{27}	x_{28}	x_{29}	x_{30}
177721	3000015-05	4,92	4,91	4,91	4,94	4,93	4,93	4,90	4,91	4,93	4,93
177721	3000015-05	32,00	32,00	31,00	32,00	32,00	31,00	30,00	31,00	31,00	31,00

Char.No	Char.Descr.	x_{31}	x_{32}	x_{33}	x_{34}	x_{35}	x_{36}	x_{37}	x_{38}	x_{39}	x_{40}
177721	3000015-05	4,93	4,93	4,93	4,92	4,93	4,93	4,93	4,93	4,92	4,92
177721	3000015-05	31,00	31,00	31,00	31,00	31,00	31,00	31,00	32,00	31,00	31,00

Char.No	Char.Descr.	x_{41}	x_{42}	x_{43}	x_{44}	x_{45}	x_{46}	x_{47}	x_{48}	x_{49}	x_{50}
177721	3000015-05	4,93	4,90	4,92	4,90	4,93	4,92	4,91	4,90	4,91	4,93
177721	3000015-05	31,00	30,00	31,00	31,00	31,00	31,00	31,00	31,00	31,00	31,00

Char.No	Char.Descr.	x_{51}	x_{52}	x_{53}	x_{54}	x_{55}	x_{56}	x_{57}	x_{58}	x_{59}	x_{60}
177721	3000015-05	4,92	4,93	4,91	4,91	4,92	4,92	4,92	4,90	4,90	4,92
177721	3000015-05	32,00	30,00	31,00	31,00	31,00	31,00	32,00	32,00	32,00	31,00

Char.No	Char.Descr.	x_{61}	x_{62}	x_{63}	x_{64}	x_{65}	x_{66}	x_{67}	x_{68}	x_{69}	x_{70}
177721	3000015-05	4,92	4,90	4,90	4,90	4,92	4,92	4,92	4,93	4,91	4,92
177721	3000015-05	32,00	31,00	30,00	31,00	31,00	30,00	30,00	31,00	30,00	31,00

Char.No	Char.Descr.	x_{71}	x_{72}	x_{73}	x_{74}	x_{75}	x_{76}	x_{77}	x_{78}	x_{79}	x_{80}
177721	3000015-05	4,95	4,94	4,92	4,91	4,92	4,90	4,91	4,93	4,91	4,94
177721	3000015-05	32,00	31,00	31,00	29,00	31,00	31,00	31,00	32,00	31,00	31,00

Machine Capability Study
Tool System

Plant	ATG Lexington		Operator Name	M. SHERMAN	Date 06.04.2021

Ser.No.	GC0061b	Characteristic			
Type	CTBPW05Q	Char.Descr.	3000015-05	Inspection Val.	4,90
Ord. No.	CTBPW05Q	Ser.No.	177721	LSL	4,56
				USL	5,24
Remark	TQ 100% hard +/-7% * TQ-Cal: 5.82 Nm; Cur-Cal: 0.0393 Nm/A; Speed: 1000-50 RPM;				

Char.No	Char.Descr.	x_{81}	x_{82}	x_{83}	x_{84}	x_{85}	x_{86}	x_{87}	x_{88}	x_{89}	x_{90}
177721	3000015-05	4,91	4,90	4,93	4,90	4,92	4,92	4,93	4,92	4,90	4,92
177721	3000015-05	31,00	30,00	30,00	31,00	30,00	30,00	30,00	31,00	31,00	31,00

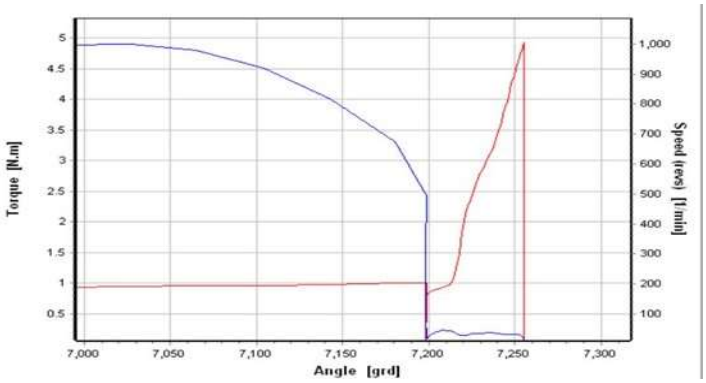
Char.No	Char.Descr.	x_{91}	x_{92}	x_{93}	x_{94}	x_{95}	x_{96}	x_{97}	x_{98}	x_{99}	x_{100}
177721	3000015-05	4,92	4,90	4,93	4,92	4,93	4,94	4,93	4,93	4,90	4,92
177721	3000015-05	31,00	31,00	31,00	31,00	30,00	31,00	32,00	31,00	31,00	30,00

Torque graphs

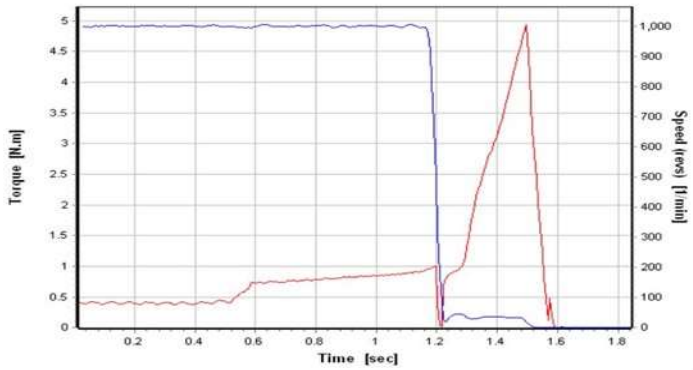
Machine Capability Study 100 %

Model: **CTBPW05Q**
Serial no: **GC0061**

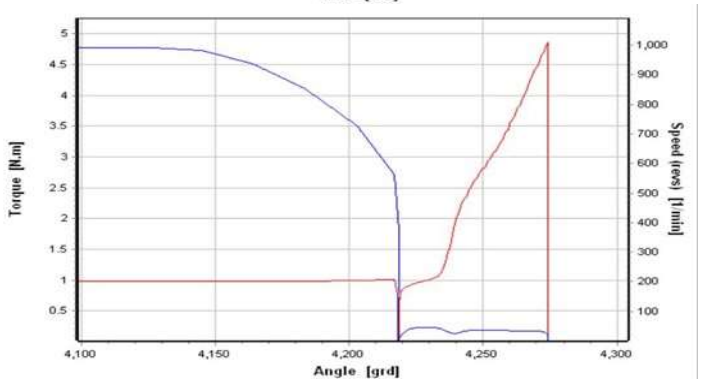
Angle degree: **30°**
Test torque: **4.9 Nm**



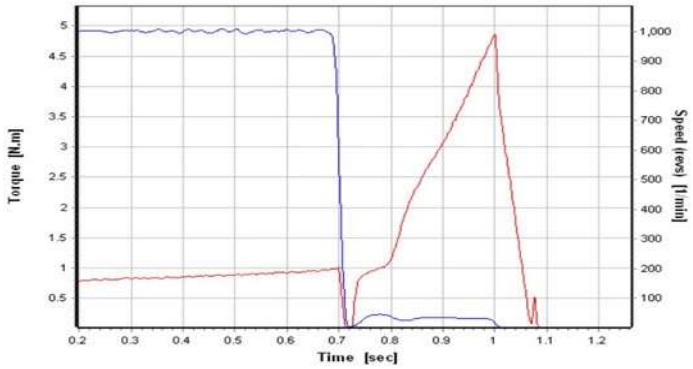
Value no. 1
Graph
Torque / Angle / Speed



Value no. 1
Graph
Torque / Time / Speed



Value no. 100
Graph
Torque / Angle / Speed



Value no. 100
Graph
Torque / Time / Speed

Machine Capability Study
Control System

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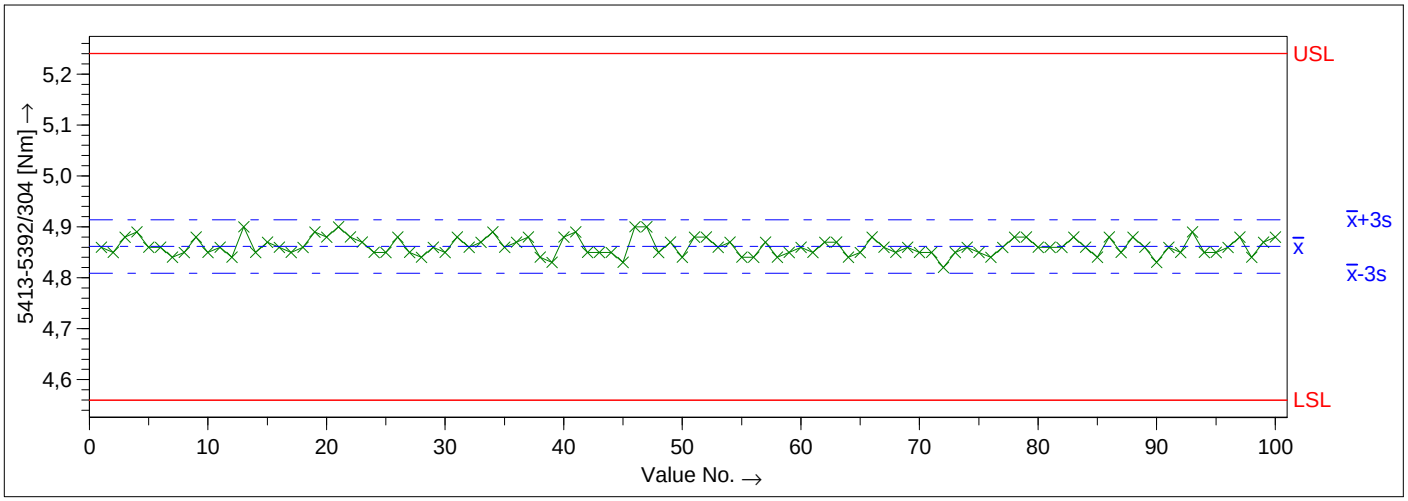
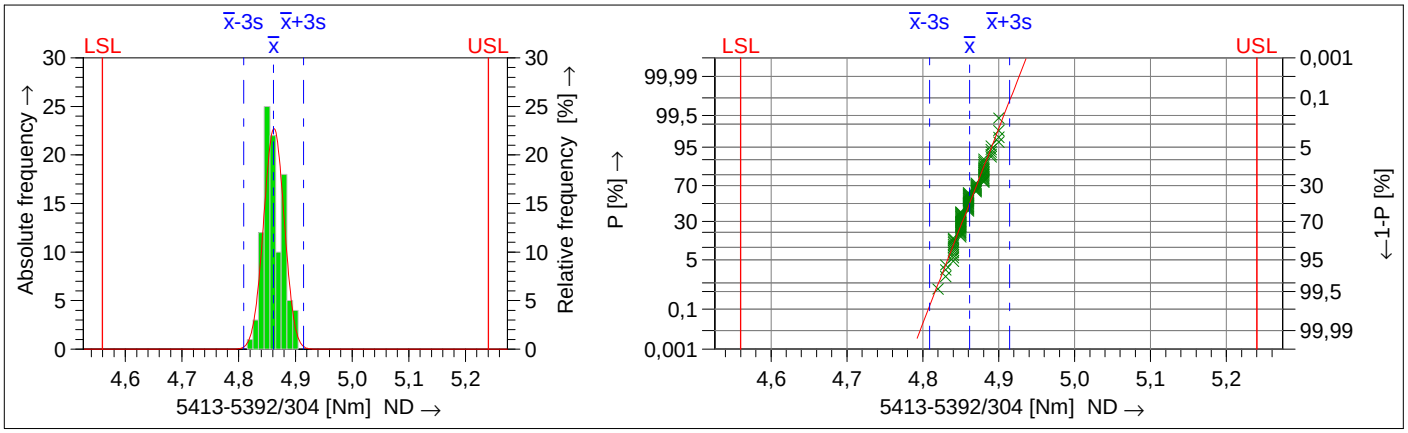
Plant	ATG Lexington	Operator Name	M. SHERMAN
Date	01.04.2021		

Ord. No.	CTBPW05Q	Part type	CTBPW05Q			Contr.item	yes
Serial No.	GC0061a	Char.Descr.	5413-5392/304	Inspection Val.	4,90	0,34	USL 5,24
		Serial No.	5376169	Unit	Nm	-0,34	LSL 4,56
Char.Type	variable			Tolerance value	7 %		Decimal Pl. 2
Cust.Name	CLECO	Reference System	5413-5392/304	Test Electronic	MPRO400GCD-P		
Contr.No.	HOMOLOGATION	Reference Transducer	10/1023806	nges.	100		

Evaluation from 01.04.2021 03:49:57 to 01.04.2021 05:17:23

Rem. TQ 100% soft +/-7% * TQ-Cal: 5.82 Nm; Cur-Cal: 0.0393 Nm/A; Speed: 1000-50 RPM;





Drawing Values		Collected Values		Statistics	
T_m	4.90			$\bar{x}$	4.8615
LSL	4.56	x_{min}	4.82	$\bar{x}$-3s	4.8089
USL	5.24	x_{max}	4.90	$\bar{x}$+3s	4.9141
T	0.68	R	0.08	6s	0.1053
		$n_{<T>}$	100	$p_{<T>}$	100.00000 %
		$n_{>USL}$	0	$p_{>USL}$	0.00000%
		$n_{<LSL}$	0	$p_{<LSL}$	0.00000%
		n_{eff}	100		
		n_{tot}	100		

Model distribution			Normal Distribution
Calculation method			M1 1.4 $\hat{\sigma} = s_{tot}$
Potential Capability index	=	C_m	6.46
Critical capability index	=	C_{mk}	5.73

The requirements were met (C_m,C_{mk})

APEX VDI/VDE 2647 V0.1

Machine Capability Study
Control System

Plant	ATG Lexington		Operator Name	M. SHERMAN	Date 01.04.2021

Ser.No.	GC0061a	Characteristic			
Type	CTBPW05Q	Char.Descr.	5413-5392/304	Inspection Val.	4,90
Ord. No.	CTBPW05Q	Ser.No.	5376169	LSL	4,56
				USL	5,24
Remark	TQ 100% soft +/-7% * TQ-Cal: 5.82 Nm; Cur-Cal: 0.0393 Nm/A; Speed: 1000-50 RPM;				

Char.No	Char.Descr.	x_1	x_2	x_3	x_4	x_5	x_6	x_7	x_8	x_9	x_{10}
5376169	5413-5392/304	4,86	4,85	4,88	4,89	4,86	4,86	4,84	4,85	4,88	4,85
5376169	5413-5392/304	352,50	354,75	356,00	358,00	351,25	355,25	352,00	359,25	357,75	353,00

Char.No	Char.Descr.	x_{11}	x_{12}	x_{13}	x_{14}	x_{15}	x_{16}	x_{17}	x_{18}	x_{19}	x_{20}
5376169	5413-5392/304	4,86	4,84	4,90	4,85	4,87	4,86	4,85	4,86	4,89	4,88
5376169	5413-5392/304	355,50	351,25	365,75	349,50	359,75	354,25	350,25	358,00	359,00	353,00

Char.No	Char.Descr.	x_{21}	x_{22}	x_{23}	x_{24}	x_{25}	x_{26}	x_{27}	x_{28}	x_{29}	x_{30}
5376169	5413-5392/304	4,90	4,88	4,87	4,85	4,85	4,88	4,85	4,84	4,86	4,85
5376169	5413-5392/304	360,00	356,75	352,50	359,25	360,00	360,50	357,50	348,50	363,00	352,75

Char.No	Char.Descr.	x_{31}	x_{32}	x_{33}	x_{34}	x_{35}	x_{36}	x_{37}	x_{38}	x_{39}	x_{40}
5376169	5413-5392/304	4,88	4,86	4,87	4,89	4,86	4,87	4,88	4,84	4,83	4,88
5376169	5413-5392/304	359,75	353,25	356,00	364,00	356,75	359,75	360,25	347,50	352,75	362,50

Char.No	Char.Descr.	x_{41}	x_{42}	x_{43}	x_{44}	x_{45}	x_{46}	x_{47}	x_{48}	x_{49}	x_{50}
5376169	5413-5392/304	4,89	4,85	4,85	4,85	4,83	4,90	4,90	4,85	4,87	4,84
5376169	5413-5392/304	360,25	356,75	353,50	354,00	357,75	359,75	360,25	356,00	350,00	357,25

Char.No	Char.Descr.	x_{51}	x_{52}	x_{53}	x_{54}	x_{55}	x_{56}	x_{57}	x_{58}	x_{59}	x_{60}
5376169	5413-5392/304	4,88	4,88	4,86	4,87	4,84	4,84	4,87	4,84	4,85	4,86
5376169	5413-5392/304	352,75	354,50	359,00	353,50	359,25	359,25	361,75	352,75	359,00	358,50

Char.No	Char.Descr.	x_{61}	x_{62}	x_{63}	x_{64}	x_{65}	x_{66}	x_{67}	x_{68}	x_{69}	x_{70}
5376169	5413-5392/304	4,85	4,87	4,87	4,84	4,85	4,88	4,86	4,85	4,86	4,85
5376169	5413-5392/304	362,25	359,50	359,25	348,00	360,00	356,75	357,75	354,00	355,25	355,25

Char.No	Char.Descr.	x_{71}	x_{72}	x_{73}	x_{74}	x_{75}	x_{76}	x_{77}	x_{78}	x_{79}	x_{80}
5376169	5413-5392/304	4,85	4,82	4,85	4,86	4,85	4,84	4,86	4,88	4,88	4,86
5376169	5413-5392/304	362,50	352,25	351,25	355,50	347,25	356,00	355,25	364,00	356,50	355,75

Machine Capability Study
Control System

Plant	ATG Lexington		Operator Name	M. SHERMAN	Date 01.04.2021

Ser.No.	GC0061a	Characteristic			
Type	CTBPW05Q	Char.Descr.	5413-5392/304	Inspection Val.	4,90
Ord. No.	CTBPW05Q	Ser.No.	5376169	LSL	4,56
				USL	5,24
Remark	TQ 100% soft +/-7% * TQ-Cal: 5.82 Nm; Cur-Cal: 0.0393 Nm/A; Speed: 1000-50 RPM;				

Char.No	Char.Descr.	x_{81}	x_{82}	x_{83}	x_{84}	x_{85}	x_{86}	x_{87}	x_{88}	x_{89}	x_{90}
5376169	5413-5392/304	4,86	4,86	4,88	4,86	4,84	4,88	4,85	4,88	4,86	4,83
5376169	5413-5392/304	354,25	351,25	359,75	360,25	358,25	354,75	359,75	361,50	355,75	351,75

Char.No	Char.Descr.	x_{91}	x_{92}	x_{93}	x_{94}	x_{95}	x_{96}	x_{97}	x_{98}	x_{99}	x_{100}
5376169	5413-5392/304	4,86	4,85	4,89	4,85	4,85	4,86	4,88	4,84	4,87	4,88
5376169	5413-5392/304	355,50	352,25	360,50	357,75	351,50	352,25	360,75	354,50	358,50	358,50

Machine Capability Study
Tool System

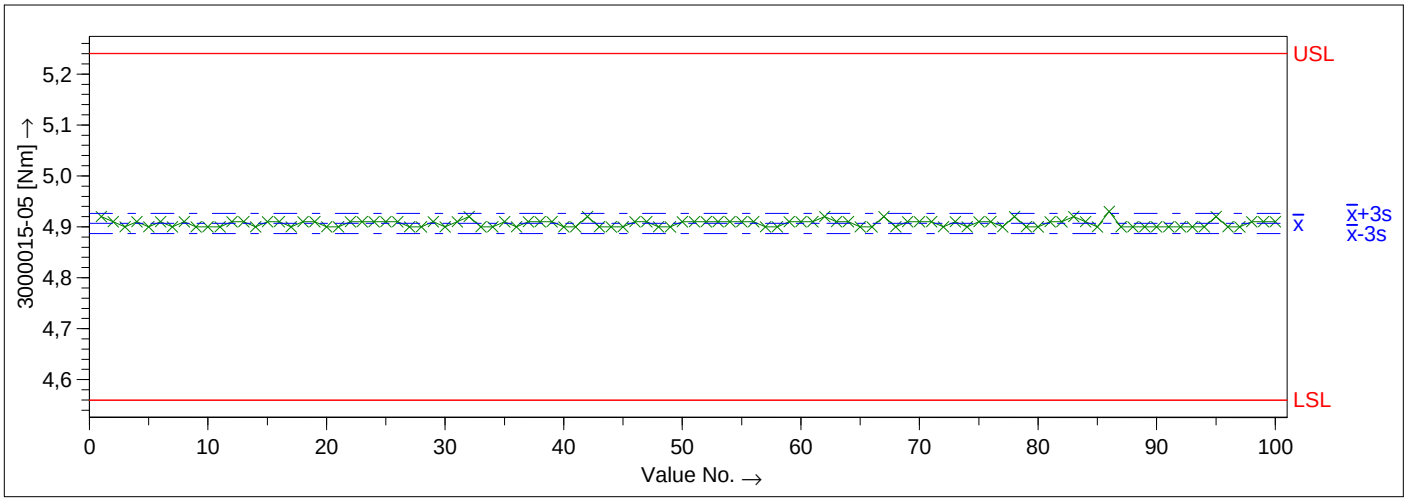
Cleco Production Tools

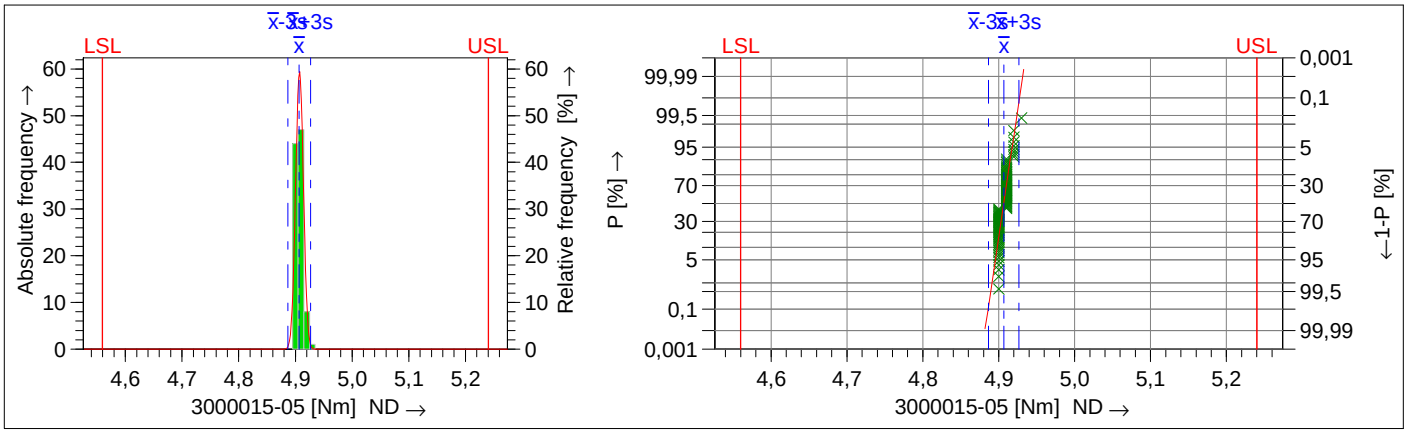
Plant	ATG Lexington	Operator Name	M. SHERMAN
Date	01.04.2021		

Ord. No.	CTBPW05Q	Part type	CTBPW05Q			Contr.item	yes
Serial No.	GC0061a	Char.Descr.	3000015-05	Inspection Val.	4,90	0,34	USL 5,24
		Serial No.	177721	Unit	Nm	-0,34	LSL 4,56
Char.Type	variable			Tolerance value	7 %	Decimal Pl.	2
Cust.Name	CLECO	Reference System	5413-5392/304	Test Electronic	MPRO400GCD-P		
Contr.No.	HOMOLOGATION	Reference Transducer	10/1023806	nges.	100		

Evaluation from 01.04.2021 15:49:56 to 01.04.2021 17:17:23

Rem. TQ 100% soft +/-7% * TQ-Cal: 5.82 Nm; Cur-Cal: 0.0393 Nm/A; Speed: 1000-50 RPM;





Drawing Values		Collected Values		Statistics	
T_m	4.90			$\bar{x}$	4.9066
LSL	4.56	x_{min}	4.90	$\bar{x}$-3s	4.8865
USL	5.24	x_{max}	4.93	$\bar{x}$+3s	4.9267
T	0.68	R	0.03	6s	0.0402
		$n_{<T>}$	100	$p_{<T>}$	100.00000 %
		$n_{>USL}$	0	$p_{>USL}$	0.00000%
		$n_{<LSL}$	0	$p_{<LSL}$	0.00000%
		n_{eff}	100		
		n_{tot}	100		

Model distribution			Normal Distribution
Calculation method			M1 1.4 $\hat{\sigma} = s_{tot}$
Potential Capability index	=	C_m	16.92
Critical capability index	=	C_{mk}	16.59

The requirements were met (C_m,C_{mk})

APEX VDI/VDE 2647 V0.1

Machine Capability Study
Tool System

Plant	ATG Lexington		Operator Name	M. SHERMAN	Date 01.04.2021

Ser.No.	GC0061a	Characteristic			
Type	CTBPW05Q	Char.Descr.	3000015-05	Inspection Val.	4,90
Ord. No.	CTBPW05Q	Ser.No.	177721	LSL	4,56
				USL	5,24
Remark	TQ 100% soft +/-7% * TQ-Cal: 5.82 Nm; Cur-Cal: 0.0393 Nm/A; Speed: 1000-50 RPM;				

Char.No	Char.Descr.	x_1	x_2	x_3	x_4	x_5	x_6	x_7	x_8	x_9	x_{10}
177721	3000015-05	4,92	4,91	4,90	4,91	4,90	4,91	4,90	4,91	4,90	4,90
177721	3000015-05	359,00	362,00	359,00	358,00	360,00	361,00	359,00	366,00	362,00	361,00

Char.No	Char.Descr.	x_{11}	x_{12}	x_{13}	x_{14}	x_{15}	x_{16}	x_{17}	x_{18}	x_{19}	x_{20}
177721	3000015-05	4,90	4,91	4,91	4,90	4,91	4,91	4,90	4,91	4,91	4,90
177721	3000015-05	365,00	359,00	369,00	354,00	367,00	361,00	356,00	367,00	364,00	360,00

Char.No	Char.Descr.	x_{21}	x_{22}	x_{23}	x_{24}	x_{25}	x_{26}	x_{27}	x_{28}	x_{29}	x_{30}
177721	3000015-05	4,90	4,91	4,91	4,91	4,91	4,91	4,90	4,90	4,91	4,90
177721	3000015-05	360,00	360,00	354,00	360,00	366,00	367,00	364,00	362,00	371,00	359,00

Char.No	Char.Descr.	x_{31}	x_{32}	x_{33}	x_{34}	x_{35}	x_{36}	x_{37}	x_{38}	x_{39}	x_{40}
177721	3000015-05	4,91	4,92	4,90	4,90	4,91	4,90	4,91	4,91	4,91	4,90
177721	3000015-05	361,00	360,00	360,00	365,00	360,00	361,00	367,00	360,00	360,00	364,00

Char.No	Char.Descr.	x_{41}	x_{42}	x_{43}	x_{44}	x_{45}	x_{46}	x_{47}	x_{48}	x_{49}	x_{50}
177721	3000015-05	4,90	4,92	4,90	4,90	4,90	4,91	4,91	4,90	4,90	4,91
177721	3000015-05	361,00	367,00	359,00	365,00	361,00	366,00	365,00	365,00	355,00	361,00

Char.No	Char.Descr.	x_{51}	x_{52}	x_{53}	x_{54}	x_{55}	x_{56}	x_{57}	x_{58}	x_{59}	x_{60}
177721	3000015-05	4,91	4,91	4,91	4,91	4,91	4,91	4,90	4,90	4,91	4,91
177721	3000015-05	358,00	361,00	369,00	355,00	367,00	361,00	369,00	361,00	369,00	367,00

Char.No	Char.Descr.	x_{61}	x_{62}	x_{63}	x_{64}	x_{65}	x_{66}	x_{67}	x_{68}	x_{69}	x_{70}
177721	3000015-05	4,91	4,92	4,91	4,91	4,90	4,90	4,92	4,90	4,91	4,91
177721	3000015-05	367,00	367,00	366,00	355,00	365,00	363,00	362,00	361,00	360,00	365,00

Char.No	Char.Descr.	x_{71}	x_{72}	x_{73}	x_{74}	x_{75}	x_{76}	x_{77}	x_{78}	x_{79}	x_{80}
177721	3000015-05	4,91	4,90	4,91	4,90	4,91	4,91	4,90	4,92	4,90	4,90
177721	3000015-05	367,00	362,00	360,00	367,00	356,00	361,00	360,00	367,00	362,00	362,00

Machine Capability Study
Tool System

Plant	ATG Lexington		Operator Name	M. SHERMAN	Date 01.04.2021

Ser.No.	GC0061a	Characteristic			
Type	CTBPW05Q	Char.Descr.	3000015-05	Inspection Val.	4,90
Ord. No.	CTBPW05Q	Ser.No.	177721	LSL	4,56
				USL	5,24
Remark	TQ 100% soft +/-7% * TQ-Cal: 5.82 Nm; Cur-Cal: 0.0393 Nm/A; Speed: 1000-50 RPM;				

Char.No	Char.Descr.	x_{81}	x_{82}	x_{83}	x_{84}	x_{85}	x_{86}	x_{87}	x_{88}	x_{89}	x_{90}
177721	3000015-05	4,91	4,91	4,92	4,91	4,90	4,93	4,90	4,90	4,90	4,90
177721	3000015-05	363,00	355,00	360,00	362,00	366,00	360,00	362,00	364,00	368,00	364,00

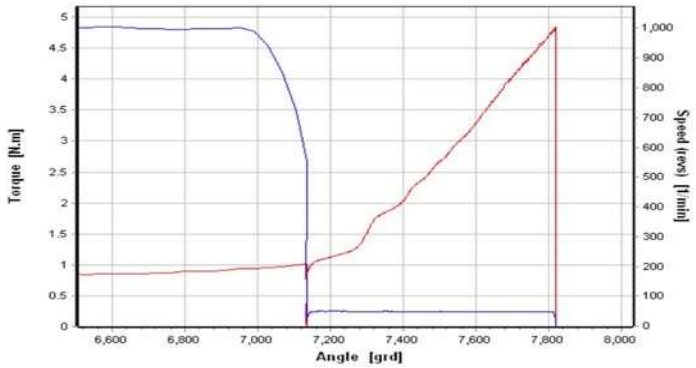
Char.No	Char.Descr.	x_{91}	x_{92}	x_{93}	x_{94}	x_{95}	x_{96}	x_{97}	x_{98}	x_{99}	x_{100}
177721	3000015-05	4,90	4,90	4,90	4,90	4,92	4,90	4,90	4,91	4,91	4,91
177721	3000015-05	360,00	360,00	367,00	367,00	362,00	360,00	367,00	367,00	362,00	364,00

Torque graphs

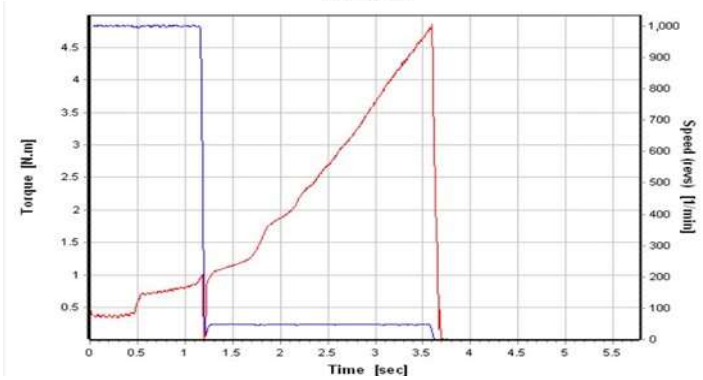
Machine Capability Study 100 %

Model: **CTBPW05Q**
Serial no: **GC0061**

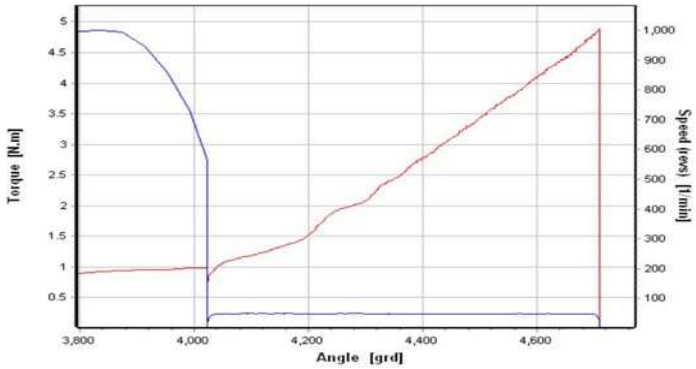
Angle degree: **360°**
Test torque: **4.9 Nm**



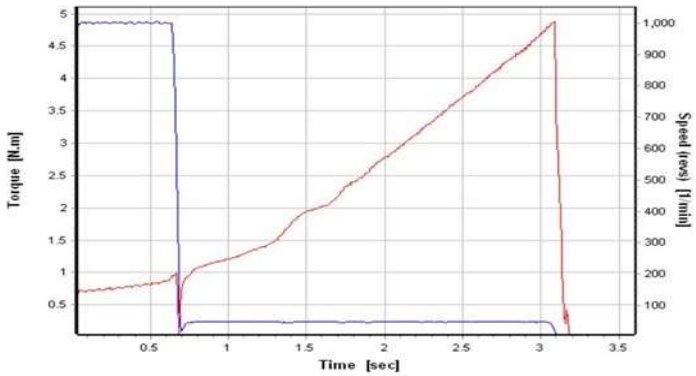
Value no. 1
Graph
Torque / Angle / Speed



Value no. 1
Graph
Torque / Time / Speed



Value no. 100
Graph
Torque / Angle / Speed



Value no. 100
Graph
Torque / Time / Speed

Document no: 004/2021
Date: 8/3/2021

General Specifications

Manufacturer: Apex Tool Group **Tool type:** Cordless Assembly Tools

Model: CTBPW05Q **Serial no:** GC0061

Torque range: **1.1 Nm to 4.9 Nm**

Difference evaluation: Reference/Tool at 40° / 60 %

Capability examination

Snugfit value: 0.98 Nm **Torque tolerance ±** 7 %

Target torque: 2.94 Nm Tolerance: 3.92 % ± **1.96 %**

Angle degree: 40° Tolerance: 2.1° ± **1.0°**

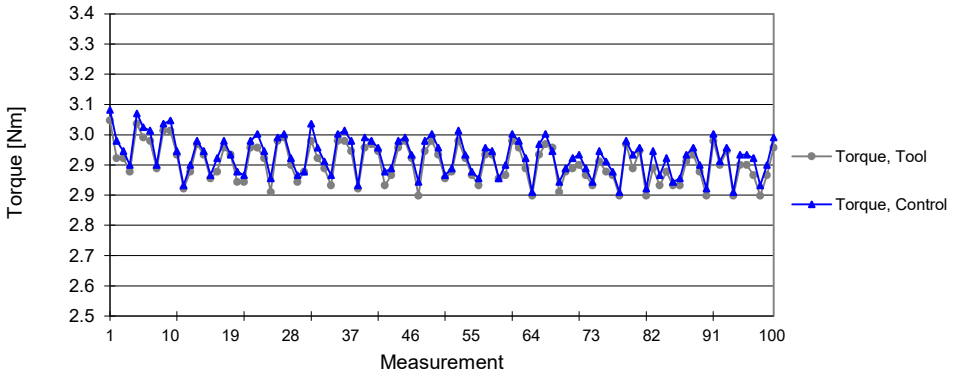
Formula derivation: $C_m = \frac{T}{6\,s}$ $T = C_m * 6\,s$

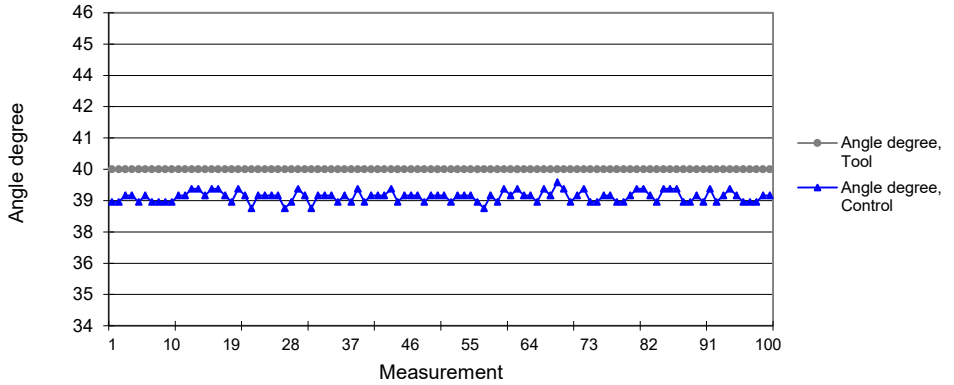
Tool without angle correction

Measurement	Tool data		Control data		Difference	
No.	Torque	Angle	Torque	Angle	Torque	Angle
1	3.07	40.00	3.10	38.75	0.03	1.25
2	2.96	40.00	3.01	38.75	0.05	1.25
3	2.96	40.00	2.98	39.00	0.02	1.00
4	2.92	40.00	2.94	39.00	0.02	1.00
5	3.06	40.00	3.09	38.75	0.03	1.25
6	3.02	40.00	3.05	39.00	0.03	1.00
7	3.01	40.00	3.04	38.75	0.03	1.25
8	2.93	40.00	2.94	38.75	0.01	1.25
9	3.04	40.00	3.06	38.75	0.02	1.25
10	3.04	40.00	3.07	38.75	0.03	1.25
11	2.97	40.00	2.98	39.00	0.01	1.00
12	2.87	40.00	2.88	39.00	0.01	1.00
13	2.92	40.00	2.94	39.25	0.02	0.75
14	3.00	40.00	3.01	39.25	0.01	0.75
15	2.97	40.00	2.98	39.00	0.01	1.00
16	2.90	40.00	2.91	39.25	0.01	0.75
17	2.92	40.00	2.96	39.25	0.04	0.75
18	2.99	40.00	3.01	39.00	0.02	1.00
19	2.97	40.00	2.97	38.75	0.00	1.25
20	2.89	40.00	2.92	39.25	0.03	0.75
21	2.89	40.00	2.91	39.00	0.02	1.00
22	2.99	40.00	3.01	38.50	0.02	1.50
23	2.99	40.00	3.03	39.00	0.04	1.00
24	2.96	40.00	2.98	39.00	0.02	1.00
25	2.86	40.00	2.90	39.00	0.04	1.00
26	3.01	40.00	3.02	39.00	0.01	1.00
27	3.02	40.00	3.03	38.50	0.01	1.50
28	2.94	40.00	2.96	38.75	0.02	1.25
29	2.89	40.00	2.91	39.25	0.02	0.75
30	2.92	40.00	2.92	39.00	0.00	1.00
31	3.01	40.00	3.06	38.50	0.05	1.50
32	2.96	40.00	2.99	39.00	0.03	1.00
33	2.93	40.00	2.95	39.00	0.02	1.00
34	2.88	40.00	2.91	39.00	0.03	1.00
35	3.01	40.00	3.03	38.75	0.02	1.25
36	3.01	40.00	3.04	39.00	0.03	1.00
37	2.98	40.00	3.01	38.75	0.03	1.25
38	2.87	40.00	2.88	39.25	0.01	0.75
39	2.99	40.00	3.02	38.75	0.03	1.25
40	3.00	40.00	3.01	39.00	0.01	1.00
41	2.98	40.00	2.99	39.00	0.01	1.00
42	2.88	40.00	2.92	39.00	0.04	1.00
43	2.91	40.00	2.93	39.25	0.02	0.75
44	2.99	40.00	3.01	38.75	0.02	1.25
45	3.01	40.00	3.02	39.00	0.01	1.00
46	2.96	40.00	2.97	39.00	0.01	1.00
47	2.85	40.00	2.89	39.00	0.04	1.00
48	2.98	40.00	3.01	38.75	0.03	1.25
49	3.01	40.00	3.03	39.00	0.02	1.00
50	2.97	40.00	2.99	39.00	0.02	1.00
51	2.90	40.00	2.91	39.00	0.01	1.00
52	2.92	40.00	2.93	38.75	0.01	1.25
53	3.01	40.00	3.04	39.00	0.03	1.00
54	2.96	40.00	2.97	39.00	0.01	1.00
55	2.91	40.00	2.92	39.00	0.01	1.00
56	2.88	40.00	2.90	38.75	0.02	1.25
57	2.97	40.00	2.99	38.50	0.02	1.50
58	2.97	40.00	2.98	39.00	0.01	1.00
59	2.90	40.00	2.90	38.75	0.00	1.25
60	2.91	40.00	2.94	39.25	0.03	0.75
61	3.01	40.00	3.03	39.00	0.02	1.00
62	2.99	40.00	3.01	39.25	0.02	0.75
63	2.93	40.00	2.96	39.00	0.03	1.00
64	2.85	40.00	2.86	39.00	0.01	1.00
65	2.97	40.00	3.00	38.75	0.03	1.25
66	3.00	40.00	3.03	39.25	0.03	0.75
67	2.99	40.00	2.98	39.00	0.01	1.00
68	2.86	40.00	2.89	39.50	0.03	0.50
69	2.92	40.00	2.93	39.25	0.01	0.75
70	2.93	40.00	2.96	38.75	0.03	1.25
71	2.94	40.00	2.97	39.00	0.03	1.00
72	2.91	40.00	2.93	39.25	0.02	0.75
73	2.88	40.00	2.89	38.75	0.01	1.25
74	2.95	40.00	2.98	38.75	0.03	1.25
75	2.92	40.00	2.95	39.00	0.03	1.00
76	2.91	40.00	2.92	39.00	0.01	1.00
77	2.85	40.00	2.86	38.75	0.01	1.25
78	3.00	40.00	3.01	38.75	0.01	1.25
79	2.93	40.00	2.97	39.00	0.04	1.00
80	2.98	40.00	2.99	39.25	0.01	0.75
81	2.85	40.00	2.87	39.25	0.02	0.75
82	2.93	40.00	2.98	39.00	0.05	1.00
83	2.88	40.00	2.91	38.75	0.03	1.25
84	2.92	40.00	2.96	39.25	0.04	0.75
85	2.88	40.00	2.89	39.25	0.01	0.75
86	2.88	40.00	2.90	39.25	0.02	0.75
87	2.95	40.00	2.97	38.75	0.02	1.25
88	2.97	40.00	2.99	38.75	0.02	1.25
89	2.92	40.00	2.94	39.00	0.02	1.00
90	2.85	40.00	2.87	38.75	0.02	1.25
91	3.01	40.00	3.03	39.25	0.02	0.75
92	2.94	40.00	2.95	38.75	0.01	1.25
93	2.98	40.00	2.99	39.00	0.01	1.00
94	2.85	40.00	2.86	39.25	0.01	0.75
95	2.94	40.00	2.97	39.00	0.03	1.00
96	2.94	40.00	2.97	38.75	0.03	1.25
97	2.91	40.00	2.96	38.75	0.05	1.25
98	2.85	40.00	2.88	38.75	0.03	1.25
99	2.91	40.00	2.94	39.00	0.03	1.00
100	2.99	40.00	3.02	39.00	0.03	1.00
				Standard deviation:	**0.011**	**0.207**

Graphical representation

Model:	**CTBPW05Q**	Serial no:	**GC0061**
Target torque:	**2.94 Nm**	60 % of max. torque	
Angle degree:	**40°**	Tool without angle correction	





Machine Capability Study
Control System

Page 1 / 1

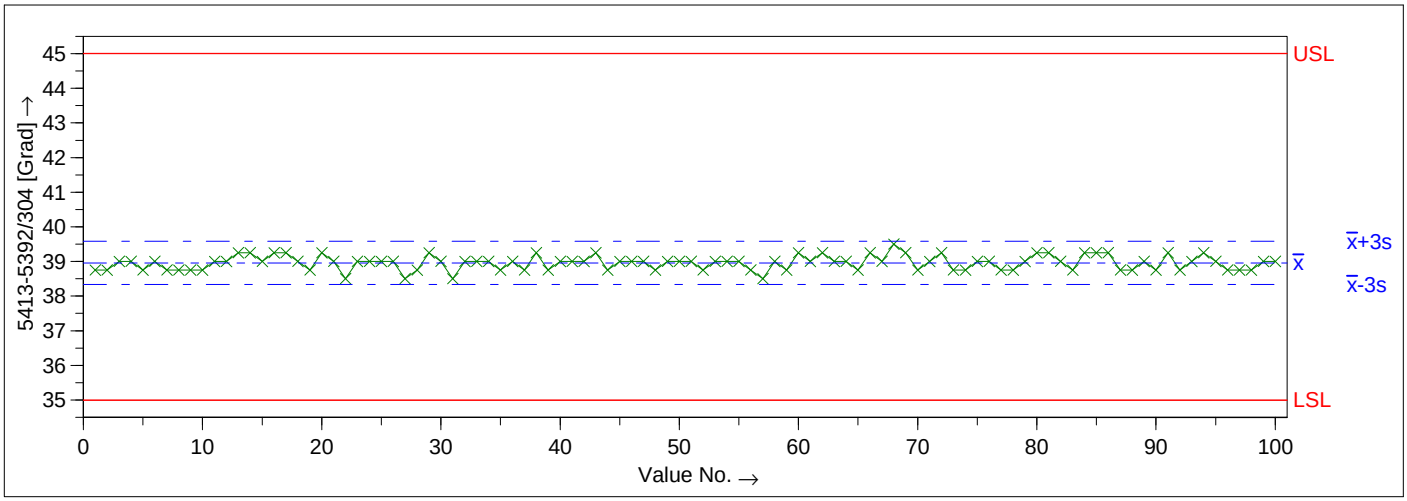
Plant ATG Lexington		Operator Name M. SHERMAN	Date 04.08.2021

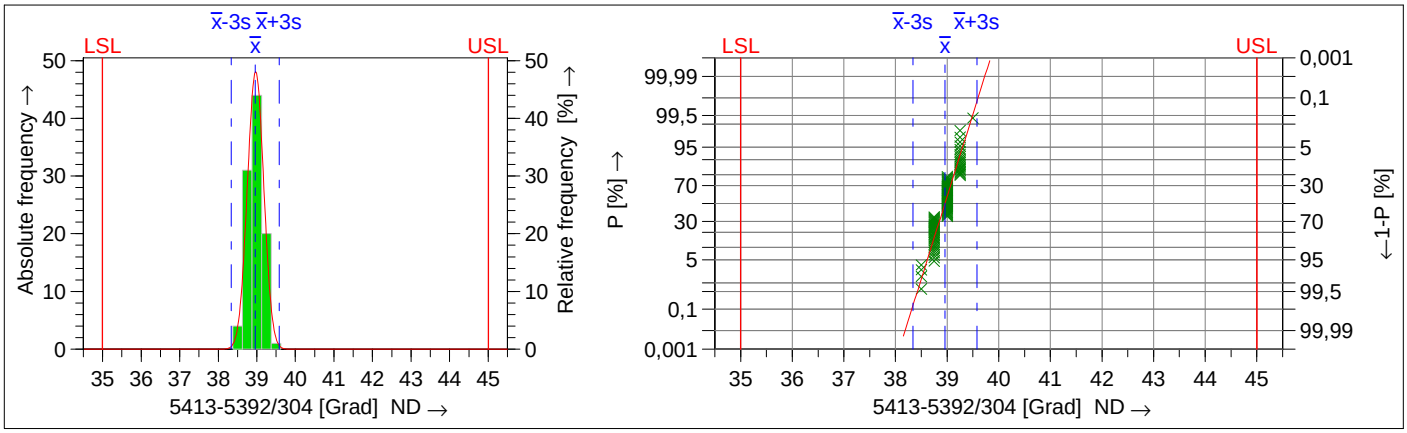
Ord. No. CTBPW05Q	Part type CTBPW05Q				Contr.item yes
Serial No. GC0061k	Char.Descr. 5413-5392/304	Inspection Val.	40,00	5,00	USL 45,00
	Serial No. 5376169	Unit	Grad	-5,00	LSL 35,00
Char.Type variable		Tolerance value	12 %		Decimal Pl. 2

Cust.Name CLECO	Reference System 5413-5392/304	Test Electronic MPRO400GCD-P
Contr.No. HOMOLOGATION	Reference Transducer 10/1023806	nges. 100

Evaluation from 04.08.2021 01:43:31 to 04.08.2021 02:22:55

Rem. TQ 60% angle 40 +/-5° * TQ-Cal: 5.86 Nm; Cur-Cal: 0.0393 Nm/A; Speed: 100-50 RPM





Drawing Values		Collected Values		Statistics	
T_m	40.00			$\bar{x}$	38.9575
LSL	35.00	x_{min}	38.50	$\bar{x}$-3s	38.3354
USL	45.00	x_{max}	39.50	$\bar{x}$+3s	39.5796
T	10.00	R	1.00	6s	1.2442
		$n_{<T>}$	100	$p_{<T>}$	100.00000 %
		$n_{>USL}$	0	$p_{>USL}$	0.00000%
		$n_{<LSL}$	0	$p_{<LSL}$	0.00000%
		n_{eff}	100		
		n_{tot}	100		

Model distribution			Normal Distribution
Calculation method			$M1_{1.4}$ $\hat{\sigma} = s_{tot}$
Potential Capability index	=	C_m	8.04
Critical capability index	=	C_{mk}	6.36

The requirements were met (C_m,C_{mk})

APEX VDI/VDE 2647 V0.1

Machine Capability Study
Control System

Plant	ATG Lexington		Operator Name	M. SHERMAN	Date 04.08.2021

Ser.No.	GC0061k	Characteristic			
Type	CTBPW05Q	Char.Descr.	5413-5392/304	Inspection Val.	2,97
Ord. No.	CTBPW05Q	Ser.No.	5376169	LSL	2,28
				USL	3,72
Remark	TQ 60% angle 40 +/-5°* TQ-Cal: 5.86 Nm; Cur- Cal: 0.0393 Nm/A; Speed: 100-50 RPM;				

Char.No	Char.Descr.	x_1	x_2	x_3	x_4	x_5	x_6	x_7	x_8	x_9	x_{10}
5376169	5413-5392/304	3,10	3,01	2,98	2,94	3,09	3,05	3,04	2,94	3,06	3,07
5376169	5413-5392/304	38,75	38,75	39,00	39,00	38,75	39,00	38,75	38,75	38,75	38,75

Char.No	Char.Descr.	x_{11}	x_{12}	x_{13}	x_{14}	x_{15}	x_{16}	x_{17}	x_{18}	x_{19}	x_{20}
5376169	5413-5392/304	2,98	2,88	2,94	3,01	2,98	2,91	2,96	3,01	2,97	2,92
5376169	5413-5392/304	39,00	39,00	39,25	39,25	39,00	39,25	39,25	39,00	38,75	39,25

Char.No	Char.Descr.	x_{21}	x_{22}	x_{23}	x_{24}	x_{25}	x_{26}	x_{27}	x_{28}	x_{29}	x_{30}
5376169	5413-5392/304	2,91	3,01	3,03	2,98	2,90	3,02	3,03	2,96	2,91	2,92
5376169	5413-5392/304	39,00	38,50	39,00	39,00	39,00	39,00	38,50	38,75	39,25	39,00

Char.No	Char.Descr.	x_{31}	x_{32}	x_{33}	x_{34}	x_{35}	x_{36}	x_{37}	x_{38}	x_{39}	x_{40}
5376169	5413-5392/304	3,06	2,99	2,95	2,91	3,03	3,04	3,01	2,88	3,02	3,01
5376169	5413-5392/304	38,50	39,00	39,00	39,00	38,75	39,00	38,75	39,25	38,75	39,00

Char.No	Char.Descr.	x_{41}	x_{42}	x_{43}	x_{44}	x_{45}	x_{46}	x_{47}	x_{48}	x_{49}	x_{50}
5376169	5413-5392/304	2,99	2,92	2,93	3,01	3,02	2,97	2,89	3,01	3,03	2,99
5376169	5413-5392/304	39,00	39,00	39,25	38,75	39,00	39,00	39,00	38,75	39,00	39,00

Char.No	Char.Descr.	x_{51}	x_{52}	x_{53}	x_{54}	x_{55}	x_{56}	x_{57}	x_{58}	x_{59}	x_{60}
5376169	5413-5392/304	2,91	2,93	3,04	2,97	2,92	2,90	2,99	2,98	2,90	2,94
5376169	5413-5392/304	39,00	38,75	39,00	39,00	39,00	38,75	38,50	39,00	38,75	39,25

Char.No	Char.Descr.	x_{61}	x_{62}	x_{63}	x_{64}	x_{65}	x_{66}	x_{67}	x_{68}	x_{69}	x_{70}
5376169	5413-5392/304	3,03	3,01	2,96	2,86	3,00	3,03	2,98	2,89	2,93	2,96
5376169	5413-5392/304	39,00	39,25	39,00	39,00	38,75	39,25	39,00	39,50	39,25	38,75

Char.No	Char.Descr.	x_{71}	x_{72}	x_{73}	x_{74}	x_{75}	x_{76}	x_{77}	x_{78}	x_{79}	x_{80}
5376169	5413-5392/304	2,97	2,93	2,89	2,98	2,95	2,92	2,86	3,01	2,97	2,99
5376169	5413-5392/304	39,00	39,25	38,75	38,75	39,00	39,00	38,75	38,75	39,00	39,25

Machine Capability Study
Control System

Plant	ATG Lexington		Operator Name	M. SHERMAN	Date 04.08.2021

Ser.No.	GC0061k	Characteristic			
Type	CTBPW05Q	Char.Descr.	5413-5392/304	Inspection Val.	2,97
Ord. No.	CTBPW05Q	Ser.No.	5376169	LSL	2,28
				USL	3,72
Remark	TQ 60% angle 40 +/-5°* TQ-Cal: 5.86 Nm; Cur- Cal: 0.0393 Nm/A; Speed: 100-50 RPM;				

Char.No	Char.Descr.	x_{81}	x_{82}	x_{83}	x_{84}	x_{85}	x_{86}	x_{87}	x_{88}	x_{89}	x_{90}
5376169	5413-5392/304	2,87	2,98	2,91	2,96	2,89	2,90	2,97	2,99	2,94	2,87
5376169	5413-5392/304	39,25	39,00	38,75	39,25	39,25	39,25	38,75	38,75	39,00	38,75

Char.No	Char.Descr.	x_{91}	x_{92}	x_{93}	x_{94}	x_{95}	x_{96}	x_{97}	x_{98}	x_{99}	x_{100}
5376169	5413-5392/304	3,03	2,95	2,99	2,86	2,97	2,97	2,96	2,88	2,94	3,02
5376169	5413-5392/304	39,25	38,75	39,00	39,25	39,00	38,75	38,75	38,75	39,00	39,00

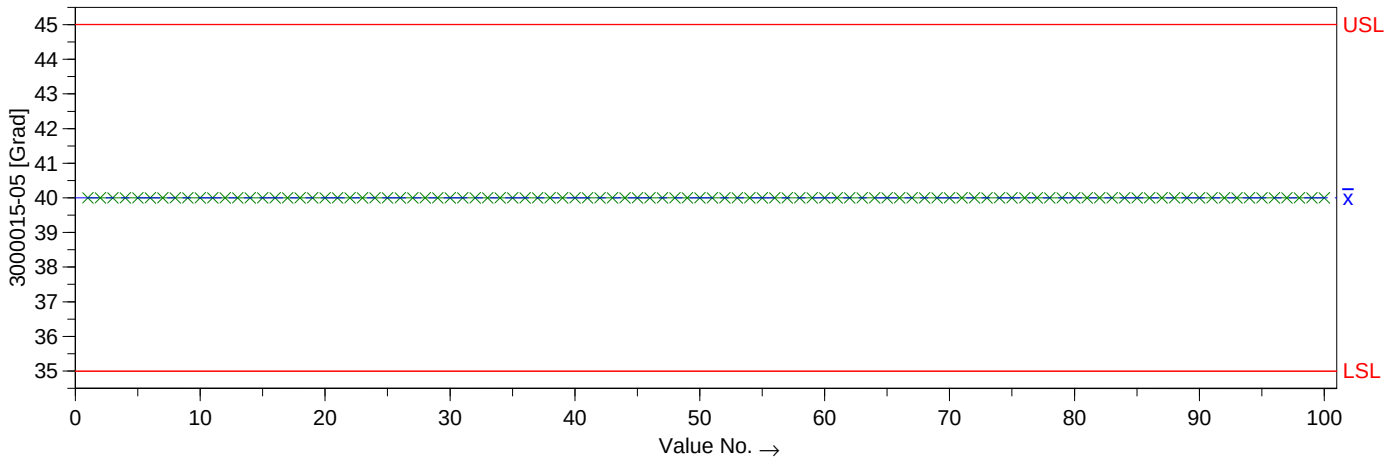
Machine Capability Study
Tool System

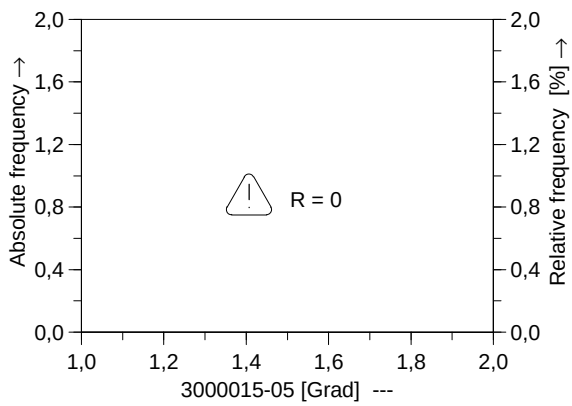
Plant	ATG Lexington	Operator Name	M. SHERMAN
Date	04.08.2021		

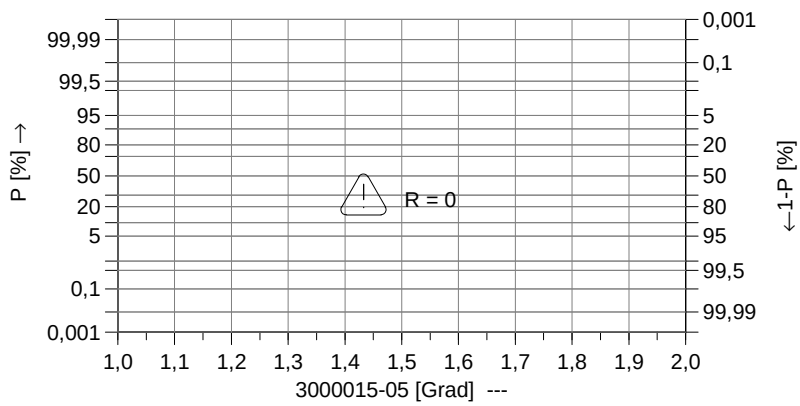
Ord. No.	CTBPW05Q	Part type	CTBPW05Q			Contr.item	yes
Serial No.	GC0061k	Char.Descr.	3000015-05	Inspection Val.	40,00 5,00	USL	45,00
		Serial No.	177721	Unit	Grad -5,00	LSL	35,00
Char.Type	variable			Tolerance value	12 %	Decimal Pl.	2
Cust.Name	CLECO	Reference System	5413-5392/304	Test Electronic	MPRO400GCD-P		
Contr.No.	HOMOLOGATION	Reference Transducer	10/1023806	nges.	100		

Evaluation from 04.08.2021 13:43:30 to 04.08.2021 14:22:54

Rem. TQ 60% angle 40 +/-5° * TQ-Cal: 5.86 Nm; Cur-Cal: 0.0393 Nm/A; Speed: 100-50 RPM;







Drawing Values		Collected Values		Statistics	
T_m	40.00			$\bar{x}$	40.0000
LSL	35.00	x_{min}	40.00		
USL	45.00	x_{max}	40.00		
T	10.00	R	0.00		
		$n_{<T>}$	100		
		$n_{>USL}$	0		
		$n_{<LSL}$	0		
		n_{eff}	100		
		n_{tot}	100		

--- R = 0 ---

APEX VDI/VDE 2647 V0.1

Machine Capability Study
Tool System

Plant	ATG Lexington		Operator Name	M. SHERMAN	Date 04.08.2021

Ser.No.	GC0061k	Characteristic			
Type	CTBPW05Q	Char.Descr.	3000015-05	Inspection Val.	1,53
Ord. No.	CTBPW05Q	Ser.No.	177721	LSL	0,00
				USL	3,68
Remark	TQ 60% angle 40 +/-5°* TQ-Cal: 5.86 Nm; Cur- Cal: 0.0393 Nm/A; Speed: 100-50 RPM;				

Char.No	Char.Descr.	x_1	x_2	x_3	x_4	x_5	x_6	x_7	x_8	x_9	x_{10}
177721	3000015-05	3,07	2,96	2,96	2,92	3,06	3,02	3,01	2,93	3,04	3,04
177721	3000015-05	40,00	40,00	40,00	40,00	40,00	40,00	40,00	40,00	40,00	40,00

Char.No	Char.Descr.	x_{11}	x_{12}	x_{13}	x_{14}	x_{15}	x_{16}	x_{17}	x_{18}	x_{19}	x_{20}
177721	3000015-05	2,97	2,87	2,92	3,00	2,97	2,90	2,92	2,99	2,97	2,89
177721	3000015-05	40,00	40,00	40,00	40,00	40,00	40,00	40,00	40,00	40,00	40,00

Char.No	Char.Descr.	x_{21}	x_{22}	x_{23}	x_{24}	x_{25}	x_{26}	x_{27}	x_{28}	x_{29}	x_{30}
177721	3000015-05	2,89	2,99	2,99	2,96	2,86	3,01	3,02	2,94	2,89	2,92
177721	3000015-05	40,00	40,00	40,00	40,00	40,00	40,00	40,00	40,00	40,00	40,00

Char.No	Char.Descr.	x_{31}	x_{32}	x_{33}	x_{34}	x_{35}	x_{36}	x_{37}	x_{38}	x_{39}	x_{40}
177721	3000015-05	3,01	2,96	2,93	2,88	3,01	3,01	2,98	2,87	2,99	3,00
177721	3000015-05	40,00	40,00	40,00	40,00	40,00	40,00	40,00	40,00	40,00	40,00

Char.No	Char.Descr.	x_{41}	x_{42}	x_{43}	x_{44}	x_{45}	x_{46}	x_{47}	x_{48}	x_{49}	x_{50}
177721	3000015-05	2,98	2,88	2,91	2,99	3,01	2,96	2,85	2,98	3,01	2,97
177721	3000015-05	40,00	40,00	40,00	40,00	40,00	40,00	40,00	40,00	40,00	40,00

Char.No	Char.Descr.	x_{51}	x_{52}	x_{53}	x_{54}	x_{55}	x_{56}	x_{57}	x_{58}	x_{59}	x_{60}
177721	3000015-05	2,90	2,92	3,01	2,96	2,91	2,88	2,97	2,97	2,90	2,91
177721	3000015-05	40,00	40,00	40,00	40,00	40,00	40,00	40,00	40,00	40,00	40,00

Char.No	Char.Descr.	x_{61}	x_{62}	x_{63}	x_{64}	x_{65}	x_{66}	x_{67}	x_{68}	x_{69}	x_{70}
177721	3000015-05	3,01	2,99	2,93	2,85	2,97	3,00	2,99	2,86	2,92	2,93
177721	3000015-05	40,00	40,00	40,00	40,00	40,00	40,00	40,00	40,00	40,00	40,00

Char.No	Char.Descr.	x_{71}	x_{72}	x_{73}	x_{74}	x_{75}	x_{76}	x_{77}	x_{78}	x_{79}	x_{80}
177721	3000015-05	2,94	2,91	2,88	2,95	2,92	2,91	2,85	3,00	2,93	2,98
177721	3000015-05	40,00	40,00	40,00	40,00	40,00	40,00	40,00	40,00	40,00	40,00

Machine Capability Study
Tool System

Plant	ATG Lexington		Operator Name	M. SHERMAN	Date 04.08.2021

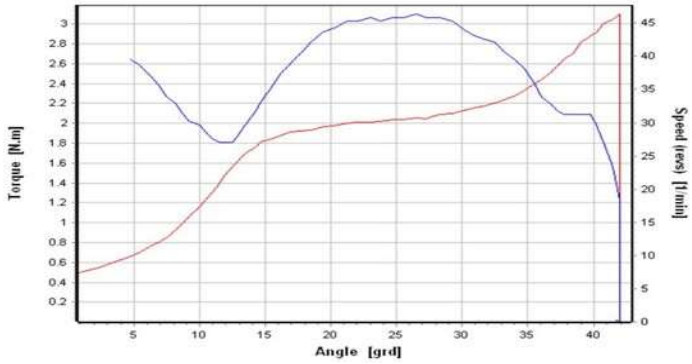
Ser.No.	GC0061k	Characteristic			
Type	CTBPW05Q	Char.Descr.	3000015-05	Inspection Val.	1,53
Ord. No.	CTBPW05Q	Ser.No.	177721	LSL	0,00
				USL	3,68
Remark	TQ 60% angle 40 +/-5°* TQ-Cal: 5.86 Nm; Cur- Cal: 0.0393 Nm/A; Speed: 100-50 RPM;				

Char.No	Char.Descr.	x_{81}	x_{82}	x_{83}	x_{84}	x_{85}	x_{86}	x_{87}	x_{88}	x_{89}	x_{90}
177721	3000015-05	2,85	2,93	2,88	2,92	2,88	2,88	2,95	2,97	2,92	2,85
177721	3000015-05	40,00	40,00	40,00	40,00	40,00	40,00	40,00	40,00	40,00	40,00

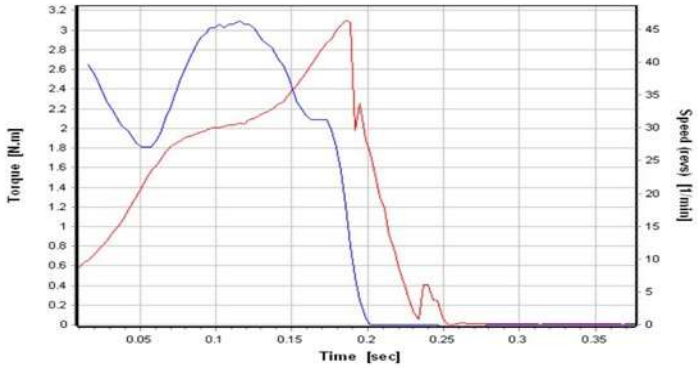
Char.No	Char.Descr.	x_{91}	x_{92}	x_{93}	x_{94}	x_{95}	x_{96}	x_{97}	x_{98}	x_{99}	x_{100}
177721	3000015-05	3,01	2,94	2,98	2,85	2,94	2,94	2,91	2,85	2,91	2,99
177721	3000015-05	40,00	40,00	40,00	40,00	40,00	40,00	40,00	40,00	40,00	40,00

Torque graphs

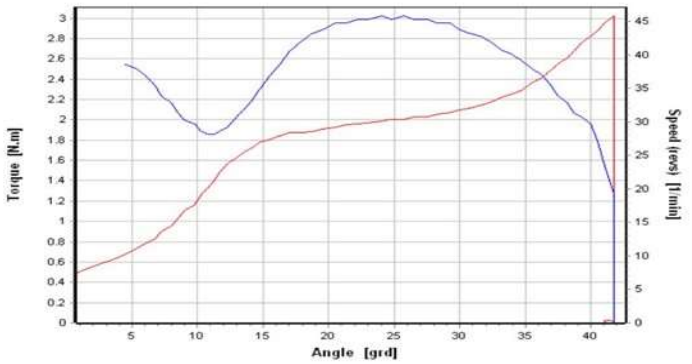
Model:	**CTBPW05Q**	Serial no:	**GC0061**
Target torque:	**2.94 Nm**	60 % of max. torque	
Angle degree:	**40°**	Tool without angle correction	



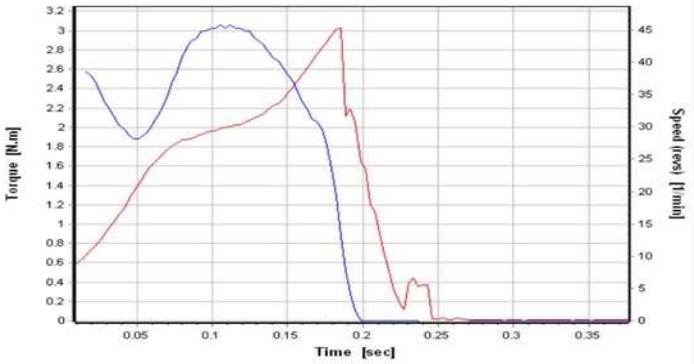
Value no. 1
Graph
Torque / Angle / Speed



Value no. 1
Graph
Torque / Time / Speed



Value no. 100
Graph
Torque / Angle / Speed



Value no. 100
Graph
Torque / Time / Speed

General Specifications

Manufacturer: Apex Tool Group **Tool type:** Cordless Assembly Tools

Model: CTBPW05Q **Serial no:** GC0061

Torque range: **1.1 Nm to 4.9 Nm**

Difference evaluation: Reference/Tool at 40° / 60 %

Capability examination

Snugfit value: 0.98 Nm **Torque tolerance ±** 7 %

Target torque: 2.94 Nm Tolerance: 9.57 % ± **4.78 %**

Angle degree: 40° Tolerance: 6.8° ± **3.4°**

Formula derivation: $C_m = \frac{T}{6\,s}$ $T = C_m * 6\,s$

Tool with angle correction

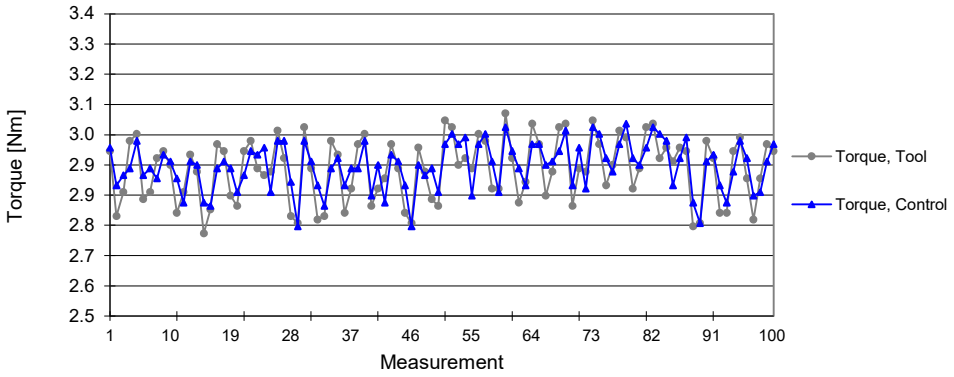
For measurements, the screwdriver must be held by hand and alternately moved.
In the column "Move +", the angle range in the screw direction,
In the column "Move -" of the direction opposite the direction of tightening,
within this range, the tool has to be moved.
Pay attention to changing angle values and directions of movement.
The indicated maximum values for "Move +" and "Move -"
have per measurement series minimum 5 times.

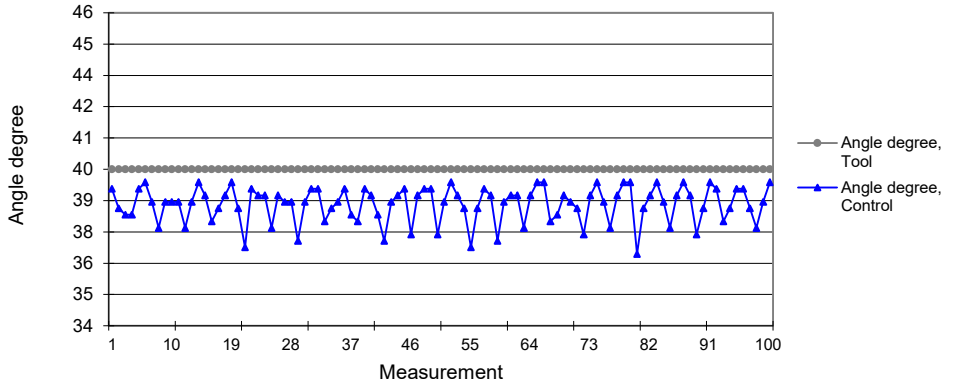
Move		Test conditions
+	-	0
0-25°	0-45°	Tool hand held

Measurement	Tool data		Control data		Difference	
No.	Torque	Angle	Torque	Angle	Torque	Angle
1	2.98	40.00	2.99	39.25	0.01	0.75
2	2.79	40.00	2.88	38.50	0.09	1.50
3	2.86	40.00	2.91	38.25	0.05	1.75
4	3.01	40.00	2.93	38.25	0.08	1.75
5	3.03	40.00	3.01	39.25	0.02	0.75
6	2.84	40.00	2.91	39.50	0.07	0.50
7	2.86	40.00	2.93	38.75	0.07	1.25
8	2.96	40.00	2.90	37.75	0.06	2.25
9	2.98	40.00	2.97	38.75	0.01	1.25
10	2.94	40.00	2.95	38.75	0.01	1.25
11	2.80	40.00	2.90	38.75	0.10	1.25
12	2.86	40.00	2.83	37.75	0.03	2.25
13	2.97	40.00	2.95	38.75	0.02	1.25
14	2.92	40.00	2.94	39.50	0.02	0.50
15	2.74	40.00	2.83	39.00	0.09	1.00
16	2.81	40.00	2.82	38.00	0.01	2.00
17	3.00	40.00	2.93	38.50	0.07	1.50
18	2.98	40.00	2.95	39.00	0.03	1.00
19	2.85	40.00	2.93	39.50	0.08	0.50
20	2.82	40.00	2.86	38.50	0.04	1.50
21	2.98	40.00	2.91	37.00	0.07	3.00
22	3.01	40.00	2.98	39.25	0.03	0.75
23	2.93	40.00	2.97	39.00	0.04	1.00
24	2.91	40.00	2.99	39.00	0.08	1.00
25	2.92	40.00	2.86	37.75	0.06	2.25
26	3.04	40.00	3.01	39.00	0.03	1.00
27	2.96	40.00	3.01	38.75	0.05	1.25
28	2.79	40.00	2.89	38.75	0.10	1.25
29	2.77	40.00	2.76	37.25	0.01	2.75
30	3.05	40.00	3.01	38.75	0.04	1.25
31	2.93	40.00	2.95	39.25	0.02	0.75
32	2.78	40.00	2.88	39.25	0.10	0.75
33	2.79	40.00	2.82	38.00	0.03	2.00
34	3.01	40.00	2.93	38.50	0.08	1.50
35	2.97	40.00	2.96	38.75	0.01	1.25
36	2.80	40.00	2.88	39.25	0.08	0.75
37	2.87	40.00	2.93	38.25	0.06	1.75
38	3.00	40.00	2.93	38.00	0.07	2.00
39	3.03	40.00	3.01	39.25	0.02	0.75
40	2.82	40.00	2.85	39.00	0.03	1.00
41	2.87	40.00	2.94	38.25	0.07	1.75
42	2.90	40.00	2.83	37.25	0.07	2.75
43	3.00	40.00	2.97	38.75	0.03	1.25
44	2.93	40.00	2.95	39.00	0.02	1.00
45	2.80	40.00	2.88	39.25	0.08	0.75
46	2.77	40.00	2.76	37.50	0.01	2.50
47	2.99	40.00	2.94	39.00	0.05	1.00
48	2.92	40.00	2.91	39.25	0.01	0.75
49	2.84	40.00	2.93	39.25	0.09	0.75
50	2.82	40.00	2.86	37.50	0.04	2.50
51	3.07	40.00	3.00	38.75	0.07	1.25
52	3.05	40.00	3.03	39.50	0.02	0.50
53	2.94	40.00	3.00	39.00	0.06	1.00
54	2.96	40.00	3.02	38.50	0.06	1.50
55	2.93	40.00	2.85	37.00	0.08	3.00
56	3.03	40.00	3.00	38.50	0.03	1.50
57	3.01	40.00	3.03	39.25	0.02	0.75
58	2.87	40.00	2.95	39.00	0.08	1.00
59	2.87	40.00	2.86	37.25	0.01	2.75
60	3.09	40.00	3.05	38.75	0.04	1.25
61	2.96	40.00	2.98	39.00	0.02	1.00
62	2.83	40.00	2.93	39.00	0.10	1.00
63	2.89	40.00	2.88	37.75	0.01	2.25
64	3.06	40.00	3.00	39.00	0.06	1.00
65	3.00	40.00	3.00	39.50	0.00	0.50
66	2.85	40.00	2.94	39.50	0.09	0.50
67	2.92	40.00	2.95	38.00	0.03	2.00
68	3.05	40.00	2.98	38.25	0.07	1.75
69	3.06	40.00	3.04	39.00	0.02	1.00
70	2.82	40.00	2.88	38.75	0.06	1.25
71	2.93	40.00	2.99	38.50	0.06	1.50
72	2.92	40.00	2.87	37.50	0.05	2.50
73	3.07	40.00	3.05	39.00	0.02	1.00
74	3.00	40.00	3.03	39.50	0.03	0.50
75	2.88	40.00	2.96	38.75	0.08	1.25
76	2.94	40.00	2.92	37.75	0.02	2.25
77	3.04	40.00	3.00	39.00	0.04	1.00
78	3.02	40.00	3.06	39.50	0.04	0.50
79	2.87	40.00	2.96	39.50	0.09	0.50
80	2.93	40.00	2.94	36.75	0.01	3.25
81	3.05	40.00	2.99	38.50	0.06	1.50
82	3.06	40.00	3.05	39.00	0.01	1.00
83	2.96	40.00	3.03	39.50	0.07	0.50
84	2.99	40.00	3.01	38.75	0.02	1.25
85	2.95	40.00	2.88	37.75	0.07	2.25
86	2.99	40.00	2.96	39.00	0.03	1.00
87	2.98	40.00	3.02	39.50	0.04	0.50
88	2.76	40.00	2.83	39.00	0.07	1.00
89	2.77	40.00	2.77	37.50	0.00	2.50
90	3.01	40.00	2.95	38.50	0.06	1.50
91	2.96	40.00	2.97	39.50	0.01	0.50
92	2.80	40.00	2.88	39.25	0.08	0.75
93	2.80	40.00	2.83	38.00	0.03	2.00
94	2.98	40.00	2.92	38.50	0.06	1.50
95	3.02	40.00	3.01	39.25	0.01	0.75
96	2.90	40.00	2.96	39.25	0.06	0.75
97	2.78	40.00	2.85	38.50	0.07	1.50
98	2.90	40.00	2.86	37.75	0.04	2.25
99	3.00	40.00	2.95	38.75	0.05	1.25
100	2.98	40.00	3.00	39.50	0.02	0.50
				Standard deviation:	**0.028**	**0.681**

Graphical representation

Model:	**CTBPW05Q**	Serial no:	**GC0061**
Target torque:	**2.94 Nm**	60 % of max. torque	
Angle degree:	**40°**	Tool with angle correction	





Machine Capability Study
Control System

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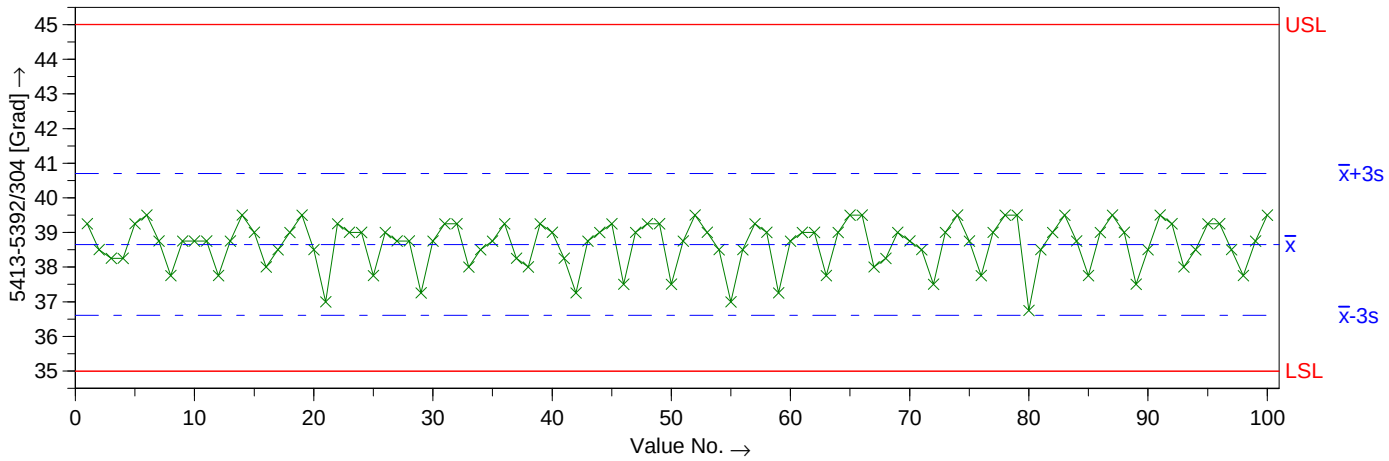
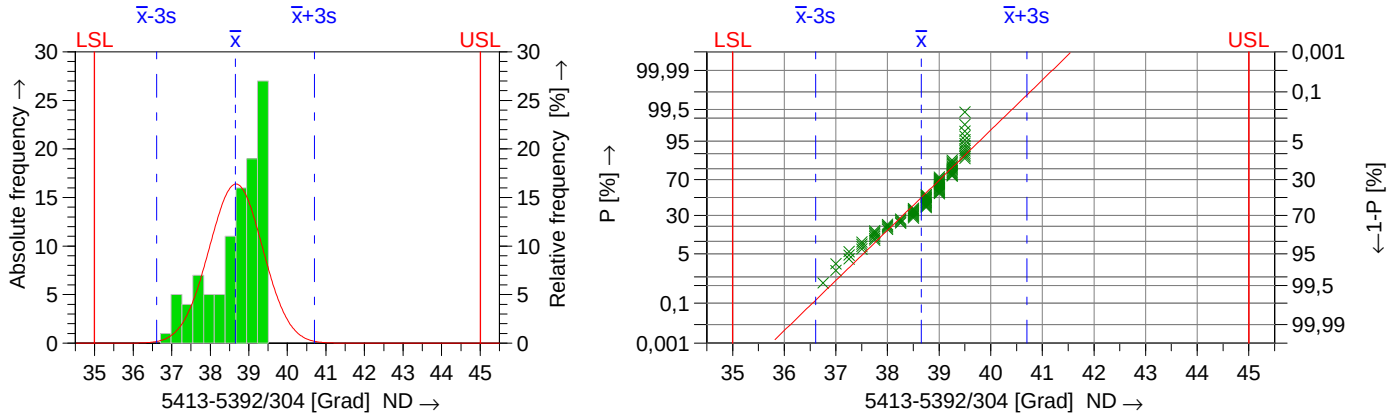
Plant ATG Lexington		Operator Name M. SHERMAN	Date 04.08.2021

Ord. No. CTBPW05Q	Part type CTBPW05Q				Contr.item yes
Serial No. GC0061m	Char.Descr. 5413-5392/304	Inspection Val.	40,00	5,00	USL 45,00
	Serial No. 5376169	Unit	Grad	-5,00	LSL 35,00
Char.Type variable		Tolerance value	12 %		Decimal Pl. 2
Cust.Name CLECO	Reference System 5413-5392/304	Test Electronic MPRO400GCD-P			
Contr.No. HOMOLOGATION	Reference Transducer 10/1023806	nges. 100			

Evaluation from 04.08.2021 03:06:55 to 04.08.2021 03:44:51

Rem. TQ 60% angle 40 +/-5° * TQ-Cal: 5.86 Nm; Cur-Cal: 0.0393 Nm/A; Speed: 100-50 RPM; with Gyroscope





Drawing Values		Collected Values		Statistics	
T_m	40.00			$\bar{x}$	38.6550
LSL	35.00	x_{min}	36.75	$\bar{x}$-3s	36.6107
USL	45.00	x_{max}	39.50	$\bar{x}$+3s	40.6993
T	10.00	R	2.75	6s	4.0887
		$n_{<T>}$	100	$p_{<T>}$	100.00000 %
		$n_{>USL}$	0	$p_{>USL}$	0.00000%
		$n_{<LSL}$	0	$p_{<LSL}$	0.00000%
		n_{eff}	100		
		n_{tot}	100		

Model distribution			Normal Distribution
Calculation method			$M1_{1,4}$ $\hat{\sigma} = s_{tot}$
Potential Capability index	=	C_m	2.45
Critical capability index	=	C_{mk}	1.79

The requirements were met (C_m,C_{mk})

APEX VDI/VDE 2647 V0.1

Machine Capability Study
Control System

Plant	ATG Lexington		Operator Name	M. SHERMAN	Date 04.08.2021

Ser.No.	GC0061m	Characteristic			
Type	CTBPW05Q	Char.Descr.	5413-5392/304	Inspection Val.	2,91
Ord. No.	CTBPW05Q	Ser.No.	5376169	LSL	2,19
				USL	3,71
Remark	TQ 60% angle 40 +/-5°* TQ-Cal: 5.86 Nm; Cur- Cal: 0.0393 Nm/A; Speed: 100-50 RPM; with Gyroscope				

Char.No	Char.Descr.	x_1	x_2	x_3	x_4	x_5	x_6	x_7	x_8	x_9	x_{10}
5376169	5413-5392/304	2,99	2,88	2,91	2,93	3,01	2,91	2,93	2,90	2,97	2,95
5376169	5413-5392/304	39,25	38,50	38,25	38,25	39,25	39,50	38,75	37,75	38,75	38,75

Char.No	Char.Descr.	x_{11}	x_{12}	x_{13}	x_{14}	x_{15}	x_{16}	x_{17}	x_{18}	x_{19}	x_{20}
5376169	5413-5392/304	2,90	2,83	2,95	2,94	2,83	2,82	2,93	2,95	2,93	2,86
5376169	5413-5392/304	38,75	37,75	38,75	39,50	39,00	38,00	38,50	39,00	39,50	38,50

Char.No	Char.Descr.	x_{21}	x_{22}	x_{23}	x_{24}	x_{25}	x_{26}	x_{27}	x_{28}	x_{29}	x_{30}
5376169	5413-5392/304	2,91	2,98	2,97	2,99	2,86	3,01	3,01	2,89	2,76	3,01
5376169	5413-5392/304	37,00	39,25	39,00	39,00	37,75	39,00	38,75	38,75	37,25	38,75

Char.No	Char.Descr.	x_{31}	x_{32}	x_{33}	x_{34}	x_{35}	x_{36}	x_{37}	x_{38}	x_{39}	x_{40}
5376169	5413-5392/304	2,95	2,88	2,82	2,93	2,96	2,88	2,93	2,93	3,01	2,85
5376169	5413-5392/304	39,25	39,25	38,00	38,50	38,75	39,25	38,25	38,00	39,25	39,00

Char.No	Char.Descr.	x_{41}	x_{42}	x_{43}	x_{44}	x_{45}	x_{46}	x_{47}	x_{48}	x_{49}	x_{50}
5376169	5413-5392/304	2,94	2,83	2,97	2,95	2,88	2,76	2,94	2,91	2,93	2,86
5376169	5413-5392/304	38,25	37,25	38,75	39,00	39,25	37,50	39,00	39,25	39,25	37,50

Char.No	Char.Descr.	x_{51}	x_{52}	x_{53}	x_{54}	x_{55}	x_{56}	x_{57}	x_{58}	x_{59}	x_{60}
5376169	5413-5392/304	3,00	3,03	3,00	3,02	2,85	3,00	3,03	2,95	2,86	3,05
5376169	5413-5392/304	38,75	39,50	39,00	38,50	37,00	38,50	39,25	39,00	37,25	38,75

Char.No	Char.Descr.	x_{61}	x_{62}	x_{63}	x_{64}	x_{65}	x_{66}	x_{67}	x_{68}	x_{69}	x_{70}
5376169	5413-5392/304	2,98	2,93	2,88	3,00	3,00	2,94	2,95	2,98	3,04	2,88
5376169	5413-5392/304	39,00	39,00	37,75	39,00	39,50	39,50	38,00	38,25	39,00	38,75

Char.No	Char.Descr.	x_{71}	x_{72}	x_{73}	x_{74}	x_{75}	x_{76}	x_{77}	x_{78}	x_{79}	x_{80}
5376169	5413-5392/304	2,99	2,87	3,05	3,03	2,96	2,92	3,00	3,06	2,96	2,94
5376169	5413-5392/304	38,50	37,50	39,00	39,50	38,75	37,75	39,00	39,50	39,50	36,75

Machine Capability Study
Control System

Plant	ATG Lexington		Operator Name	M. SHERMAN	Date 04.08.2021

Ser.No.	GC0061m	Characteristic			
Type	CTBPW05Q	Char.Descr.	5413-5392/304	Inspection Val.	2,91
Ord. No.	CTBPW05Q	Ser.No.	5376169	LSL	2,19
				USL	3,71
Remark	TQ 60% angle 40 +/-5°* TQ-Cal: 5.86 Nm; Cur- Cal: 0.0393 Nm/A; Speed: 100-50 RPM; with Gyroscope				

Char.No	Char.Descr.	x_{81}	x_{82}	x_{83}	x_{84}	x_{85}	x_{86}	x_{87}	x_{88}	x_{89}	x_{90}
5376169	5413-5392/304	2,99	3,05	3,03	3,01	2,88	2,96	3,02	2,83	2,77	2,95
5376169	5413-5392/304	38,50	39,00	39,50	38,75	37,75	39,00	39,50	39,00	37,50	38,50

Char.No	Char.Descr.	x_{91}	x_{92}	x_{93}	x_{94}	x_{95}	x_{96}	x_{97}	x_{98}	x_{99}	x_{100}
5376169	5413-5392/304	2,97	2,88	2,83	2,92	3,01	2,96	2,85	2,86	2,95	3,00
5376169	5413-5392/304	39,50	39,25	38,00	38,50	39,25	39,25	38,50	37,75	38,75	39,50

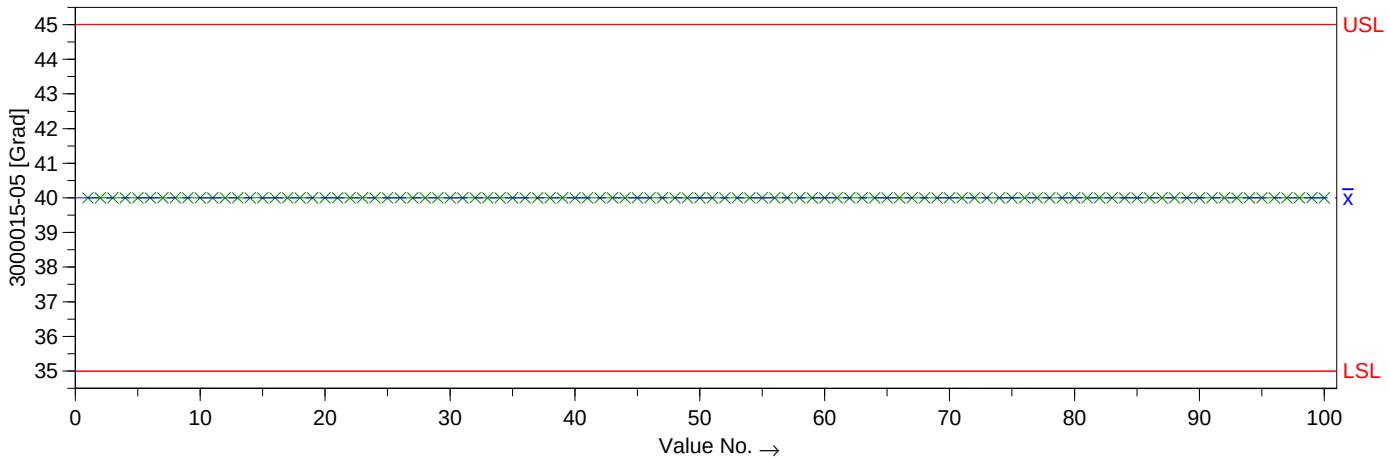
Machine Capability Study
Tool System

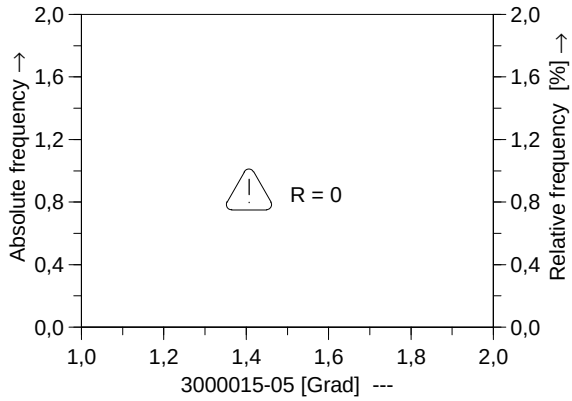
Plant	ATG Lexington	Operator Name	M. SHERMAN
Date	04.08.2021		

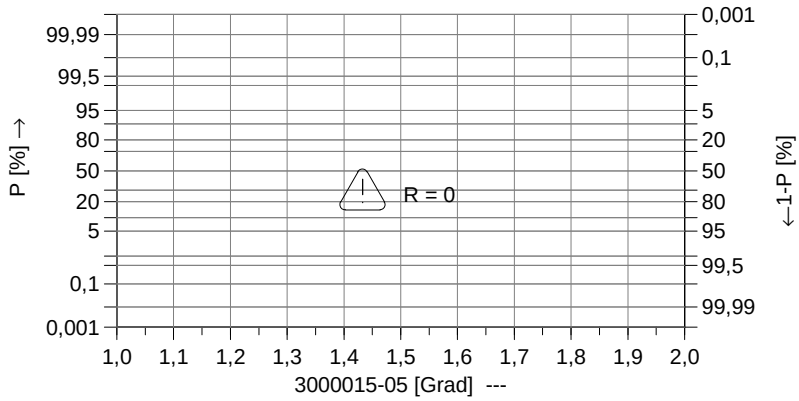
Ord. No.	CTBPW05Q	Part type	CTBPW05Q			Contr.item	yes
Serial No.	GC0061m	Char.Descr.	3000015-05	Inspection Val.	40,00	5,00	USL 45,00
		Serial No.	177721	Unit	Grad	-5,00	LSL 35,00
Char.Type	variable			Tolerance value	12 %		Decimal Pl. 2
Cust.Name	CLECO	Reference System	5413-5392/304	Test Electronic	MPRO400GCD-P		
Contr.No.	HOMOLOGATION	Reference Transducer	10/1023806	nges.	100		

Evaluation from 04.08.2021 15:06:54 to 04.08.2021 15:44:50

Rem. TQ 60% angle 40 +/-5° * TQ-Cal: 5.86 Nm; Cur-Cal: 0.0393 Nm/A; Speed: 100-50 RPM; with Gyroscope







Drawing Values		Collected Values		Statistics	
T_m	40.00			$\bar{x}$	40.0000
LSL	35.00	x_{min}	40.00		
USL	45.00	x_{max}	40.00		
T	10.00	R	0.00		
		$n_{<T>}$	100		
		$n_{>USL}$	0		
		$n_{<LSL}$	0		
		n_{eff}	100		
		n_{tot}	100		

--- R = 0 ---

APEX VDI/VDE 2647 V0.1

Machine Capability Study
Tool System

Plant	ATG Lexington		Operator Name	M. SHERMAN	Date 04.08.2021

Ser.No.	GC0061m	Characteristic			
Type	CTBPW05Q	Char.Descr.	3000015-05	Inspection Val.	1,54
Ord. No.	CTBPW05Q	Ser.No.	177721	LSL	0,00
				USL	3,71
Remark	TQ 60% angle 40 +/-5°* TQ-Cal: 5.86 Nm; Cur- Cal: 0.0393 Nm/A; Speed: 100-50 RPM; with Gyroscope				

Char.No	Char.Descr.	x_1	x_2	x_3	x_4	x_5	x_6	x_7	x_8	x_9	x_{10}
177721	3000015-05	2,98	2,79	2,86	3,01	3,03	2,84	2,86	2,96	2,98	2,94
177721	3000015-05	40,00	40,00	40,00	40,00	40,00	40,00	40,00	40,00	40,00	40,00

Char.No	Char.Descr.	x_{11}	x_{12}	x_{13}	x_{14}	x_{15}	x_{16}	x_{17}	x_{18}	x_{19}	x_{20}
177721	3000015-05	2,80	2,86	2,97	2,92	2,74	2,81	3,00	2,98	2,85	2,82
177721	3000015-05	40,00	40,00	40,00	40,00	40,00	40,00	40,00	40,00	40,00	40,00

Char.No	Char.Descr.	x_{21}	x_{22}	x_{23}	x_{24}	x_{25}	x_{26}	x_{27}	x_{28}	x_{29}	x_{30}
177721	3000015-05	2,98	3,01	2,93	2,91	2,92	3,04	2,96	2,79	2,77	3,05
177721	3000015-05	40,00	40,00	40,00	40,00	40,00	40,00	40,00	40,00	40,00	40,00

Char.No	Char.Descr.	x_{31}	x_{32}	x_{33}	x_{34}	x_{35}	x_{36}	x_{37}	x_{38}	x_{39}	x_{40}
177721	3000015-05	2,93	2,78	2,79	3,01	2,97	2,80	2,87	3,00	3,03	2,82
177721	3000015-05	40,00	40,00	40,00	40,00	40,00	40,00	40,00	40,00	40,00	40,00

Char.No	Char.Descr.	x_{41}	x_{42}	x_{43}	x_{44}	x_{45}	x_{46}	x_{47}	x_{48}	x_{49}	x_{50}
177721	3000015-05	2,87	2,90	3,00	2,93	2,80	2,77	2,99	2,92	2,84	2,82
177721	3000015-05	40,00	40,00	40,00	40,00	40,00	40,00	40,00	40,00	40,00	40,00

Char.No	Char.Descr.	x_{51}	x_{52}	x_{53}	x_{54}	x_{55}	x_{56}	x_{57}	x_{58}	x_{59}	x_{60}
177721	3000015-05	3,07	3,05	2,94	2,96	2,93	3,03	3,01	2,87	2,87	3,09
177721	3000015-05	40,00	40,00	40,00	40,00	40,00	40,00	40,00	40,00	40,00	40,00

Char.No	Char.Descr.	x_{61}	x_{62}	x_{63}	x_{64}	x_{65}	x_{66}	x_{67}	x_{68}	x_{69}	x_{70}
177721	3000015-05	2,96	2,83	2,89	3,06	3,00	2,85	2,92	3,05	3,06	2,82
177721	3000015-05	40,00	40,00	40,00	40,00	40,00	40,00	40,00	40,00	40,00	40,00

Char.No	Char.Descr.	x_{71}	x_{72}	x_{73}	x_{74}	x_{75}	x_{76}	x_{77}	x_{78}	x_{79}	x_{80}
177721	3000015-05	2,93	2,92	3,07	3,00	2,88	2,94	3,04	3,02	2,87	2,93
177721	3000015-05	40,00	40,00	40,00	40,00	40,00	40,00	40,00	40,00	40,00	40,00

Machine Capability Study
Tool System

Plant	ATG Lexington		Operator Name	M. SHERMAN	Date 04.08.2021

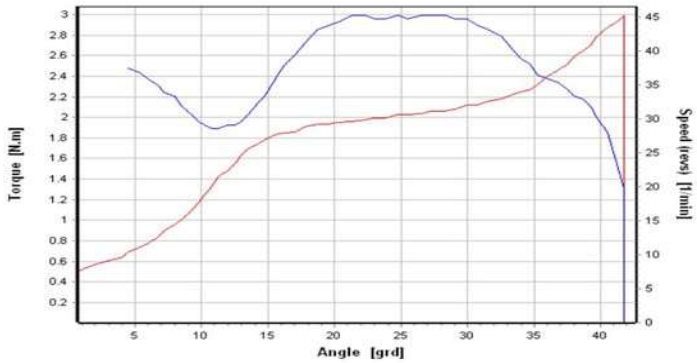
Ser.No.	GC0061m	Characteristic			
Type	CTBPW05Q	Char.Descr.	3000015-05	Inspection Val.	1,54
Ord. No.	CTBPW05Q	Ser.No.	177721	LSL	0,00
				USL	3,71
Remark	TQ 60% angle 40 +/-5°* TQ-Cal: 5.86 Nm; Cur- Cal: 0.0393 Nm/A; Speed: 100-50 RPM; with Gyroscope				

Char.No	Char.Descr.	x_{81}	x_{82}	x_{83}	x_{84}	x_{85}	x_{86}	x_{87}	x_{88}	x_{89}	x_{90}
177721	3000015-05	3,05	3,06	2,96	2,99	2,95	2,99	2,98	2,76	2,77	3,01
177721	3000015-05	40,00	40,00	40,00	40,00	40,00	40,00	40,00	40,00	40,00	40,00

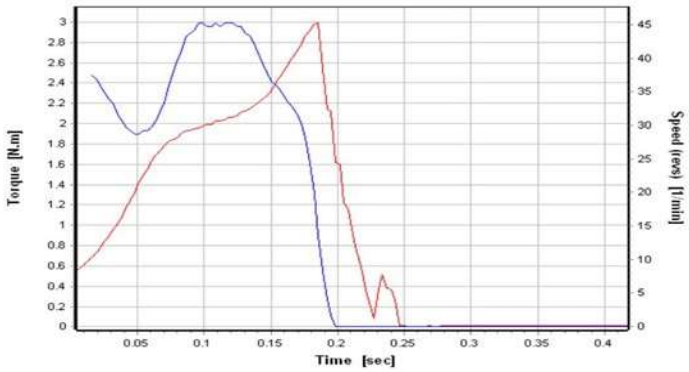
Char.No	Char.Descr.	x_{91}	x_{92}	x_{93}	x_{94}	x_{95}	x_{96}	x_{97}	x_{98}	x_{99}	x_{100}
177721	3000015-05	2,96	2,80	2,80	2,98	3,02	2,90	2,78	2,90	3,00	2,98
177721	3000015-05	40,00	40,00	40,00	40,00	40,00	40,00	40,00	40,00	40,00	40,00

Torque graphs

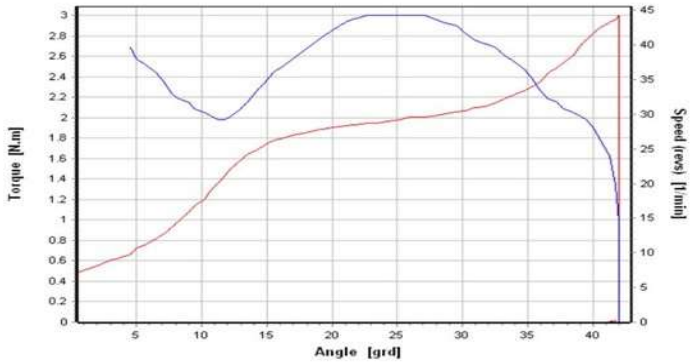
Model:	**CTBPW05Q**	Serial no:	**GC0061**
Target torque:	**2.94 Nm**	60 % of max. torque	
Angle degree:	**40°**	Tool with angle correction	



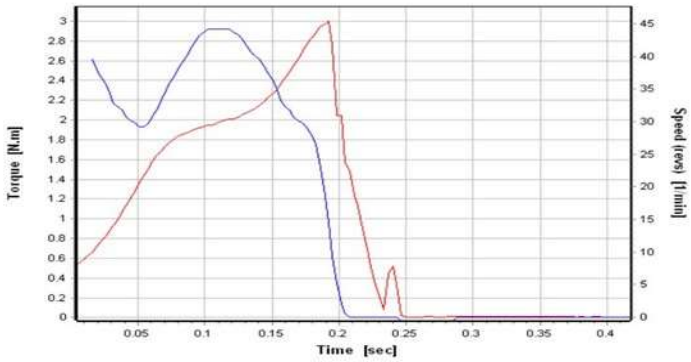
Value no. 1
Graph
Torque / Angle / Speed



Value no. 1
Graph
Torque / Time / Speed



Value no. 100
Graph
Torque / Angle / Speed



Value no. 100
Graph
Torque / Time / Speed

General Specifications

Manufacturer: Apex Tool Group **Tool type:** Cordless Assembly Tools

Model: CTBPW05Q **Serial no:** GC0061

Torque range: **1.1 Nm to 4.9 Nm**

Difference evaluation: Reference/Tool at 180 ° / 80%

Capability examination

Snugfit value: 0.98 Nm **Torque tolerance ±** 7 %

Target torque: 3.92 Nm Tolerance: 4.41 % ± **2.21 %**

Angle degree: 180° Tolerance: 4.9° ± **2.4°**

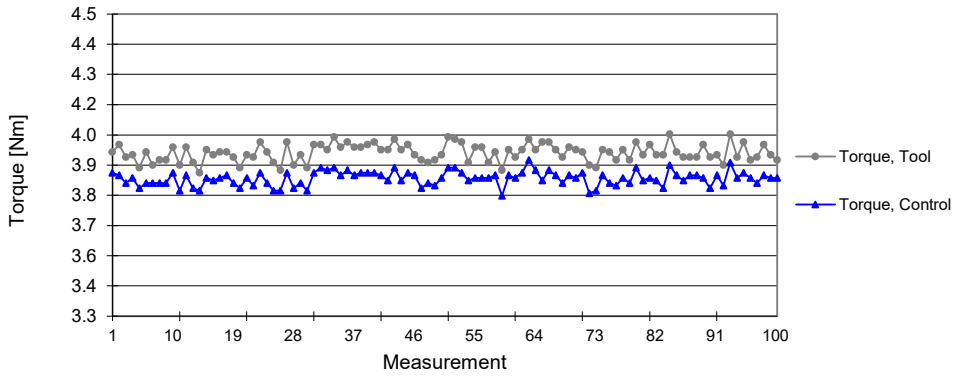
Formula derivation: $C_m = \frac{T}{6\,s}$ $T = C_m * 6\,s$

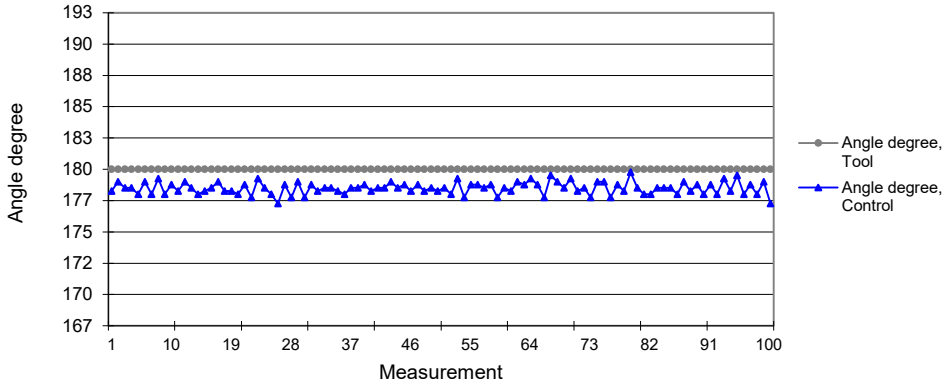
Tool without angle correction

Measurement	Tool data		Control data		Difference	
No.	Torque	Angle	Torque	Angle	Torque	Angle
1	3.97	180.00	3.89	178.25	0.08	1.75
2	4.00	180.00	3.88	179.00	0.12	1.00
3	3.95	180.00	3.85	178.50	0.10	1.50
4	3.96	180.00	3.87	178.50	0.09	1.50
5	3.91	180.00	3.83	178.00	0.08	2.00
6	3.97	180.00	3.85	179.00	0.12	1.00
7	3.92	180.00	3.85	178.00	0.07	2.00
8	3.94	180.00	3.85	179.25	0.09	0.75
9	3.94	180.00	3.85	178.00	0.09	2.00
10	3.99	180.00	3.89	178.75	0.10	1.25
11	3.92	180.00	3.82	178.25	0.10	1.75
12	3.99	180.00	3.88	179.00	0.11	1.00
13	3.93	180.00	3.83	178.50	0.10	1.50
14	3.89	180.00	3.82	178.00	0.07	2.00
15	3.98	180.00	3.87	178.25	0.11	1.75
16	3.96	180.00	3.86	178.50	0.10	1.50
17	3.97	180.00	3.87	179.00	0.10	1.00
18	3.97	180.00	3.88	178.25	0.09	1.75
19	3.95	180.00	3.85	178.25	0.10	1.75
20	3.91	180.00	3.83	178.00	0.08	2.00
21	3.96	180.00	3.87	178.75	0.09	1.25
22	3.95	180.00	3.84	177.75	0.11	2.25
23	4.01	180.00	3.89	179.25	0.12	0.75
24	3.97	180.00	3.85	178.50	0.12	1.50
25	3.93	180.00	3.82	178.00	0.11	2.00
26	3.90	180.00	3.82	177.25	0.08	2.75
27	4.01	180.00	3.89	178.75	0.12	1.25
28	3.92	180.00	3.83	177.75	0.09	2.25
29	3.96	180.00	3.85	179.00	0.11	1.00
30	3.91	180.00	3.82	177.75	0.09	2.25
31	4.00	180.00	3.89	178.75	0.11	1.25
32	4.00	180.00	3.91	178.25	0.09	1.75
33	3.98	180.00	3.90	178.50	0.08	1.50
34	4.03	180.00	3.91	178.50	0.12	1.50
35	3.99	180.00	3.88	178.25	0.11	1.75
36	4.01	180.00	3.90	178.00	0.11	2.00
37	3.99	180.00	3.88	178.50	0.11	1.50
38	3.99	180.00	3.89	178.50	0.10	1.50
39	4.00	180.00	3.89	178.75	0.11	1.25
40	4.01	180.00	3.89	178.25	0.12	1.75
41	3.98	180.00	3.88	178.50	0.10	1.50
42	3.98	180.00	3.86	178.50	0.12	1.50
43	4.02	180.00	3.91	179.00	0.11	1.00
44	3.98	180.00	3.86	178.50	0.12	1.50
45	4.00	180.00	3.89	178.75	0.11	1.25
46	3.96	180.00	3.88	178.25	0.08	1.75
47	3.94	180.00	3.83	178.75	0.11	1.25
48	3.93	180.00	3.85	178.25	0.08	1.75
49	3.94	180.00	3.84	178.50	0.10	1.50
50	3.96	180.00	3.87	178.25	0.09	1.75
51	4.03	180.00	3.91	178.50	0.12	1.50
52	4.02	180.00	3.91	178.00	0.11	2.00
53	4.01	180.00	3.89	179.25	0.12	0.75
54	3.93	180.00	3.86	177.75	0.07	2.25
55	3.99	180.00	3.87	178.75	0.12	1.25
56	3.99	180.00	3.87	178.75	0.12	1.25
57	3.93	180.00	3.87	178.50	0.06	1.50
58	3.97	180.00	3.88	178.75	0.09	1.25
59	3.90	180.00	3.80	177.75	0.10	2.25
60	3.98	180.00	3.88	178.50	0.10	1.50
61	3.95	180.00	3.87	178.25	0.08	1.75
62	3.98	180.00	3.89	179.00	0.09	1.00
63	4.02	180.00	3.94	178.75	0.08	1.25
64	3.98	180.00	3.90	179.25	0.08	0.75
65	4.01	180.00	3.86	178.75	0.15	1.25
66	4.01	180.00	3.90	177.75	0.11	2.25
67	3.98	180.00	3.88	179.50	0.10	0.50
68	3.95	180.00	3.85	179.00	0.10	1.00
69	3.99	180.00	3.88	178.50	0.11	1.50
70	3.98	180.00	3.87	179.25	0.11	0.75
71	3.97	180.00	3.89	178.25	0.08	1.75
72	3.92	180.00	3.81	178.50	0.11	1.50
73	3.91	180.00	3.82	177.75	0.09	2.25
74	3.98	180.00	3.88	179.00	0.10	1.00
75	3.97	180.00	3.85	179.00	0.12	1.00
76	3.94	180.00	3.84	177.75	0.10	2.25
77	3.98	180.00	3.87	178.75	0.11	1.25
78	3.94	180.00	3.85	178.25	0.09	1.75
79	4.01	180.00	3.91	179.75	0.10	0.25
80	3.96	180.00	3.86	178.50	0.10	1.50
81	4.00	180.00	3.87	178.00	0.13	2.00
82	3.96	180.00	3.86	178.00	0.10	2.00
83	3.96	180.00	3.83	178.50	0.13	1.50
84	4.04	180.00	3.92	178.50	0.12	1.50
85	3.97	180.00	3.88	178.50	0.09	1.50
86	3.95	180.00	3.86	178.00	0.09	2.00
87	3.95	180.00	3.88	179.00	0.07	1.00
88	3.95	180.00	3.88	178.25	0.07	1.75
89	4.00	180.00	3.87	178.75	0.13	1.25
90	3.95	180.00	3.83	178.00	0.12	2.00
91	3.96	180.00	3.88	178.75	0.08	1.25
92	3.92	180.00	3.84	178.00	0.08	2.00
93	4.04	180.00	3.93	179.25	0.11	0.75
94	3.95	180.00	3.87	178.25	0.08	1.75
95	4.01	180.00	3.89	179.50	0.12	0.50
96	3.94	180.00	3.87	178.00	0.07	2.00
97	3.95	180.00	3.85	178.75	0.10	1.25
98	4.00	180.00	3.88	178.00	0.12	2.00
99	3.96	180.00	3.87	179.00	0.09	1.00
100	3.94	180.00	3.87	177.25	0.07	2.75
				Standard deviation:	**0.017**	**0.485**

Graphical representation

Model:	**CTBPW05Q**	Serial no:	**GC0061**
Target torque:	**3.92 Nm**	80 % of max. torque	
Angle degree:	**180°**	Tool without angle correction	





Machine Capability Study
Control System

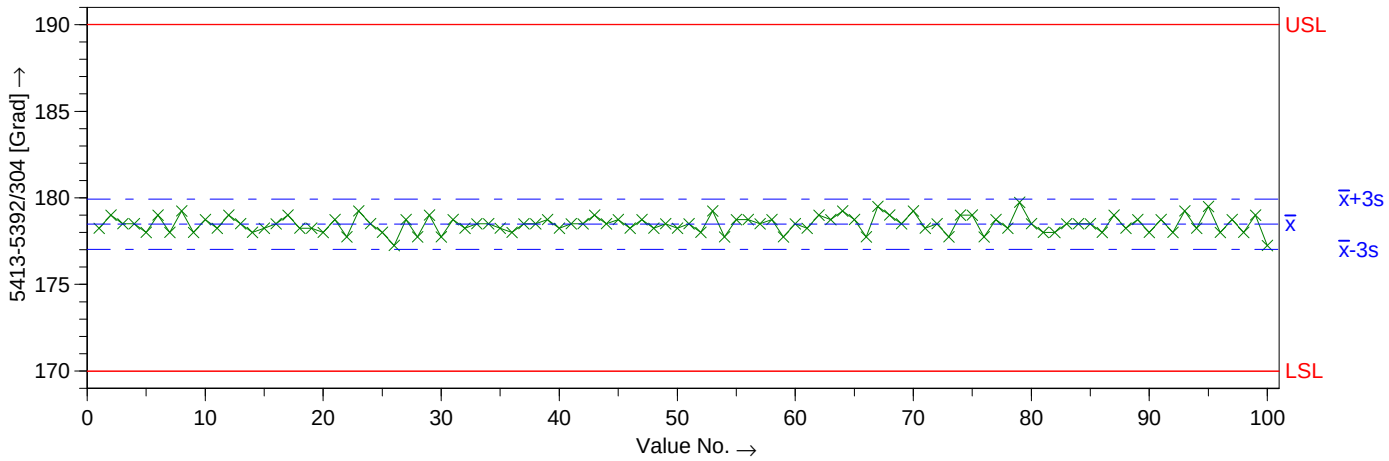
Page 1 / 1

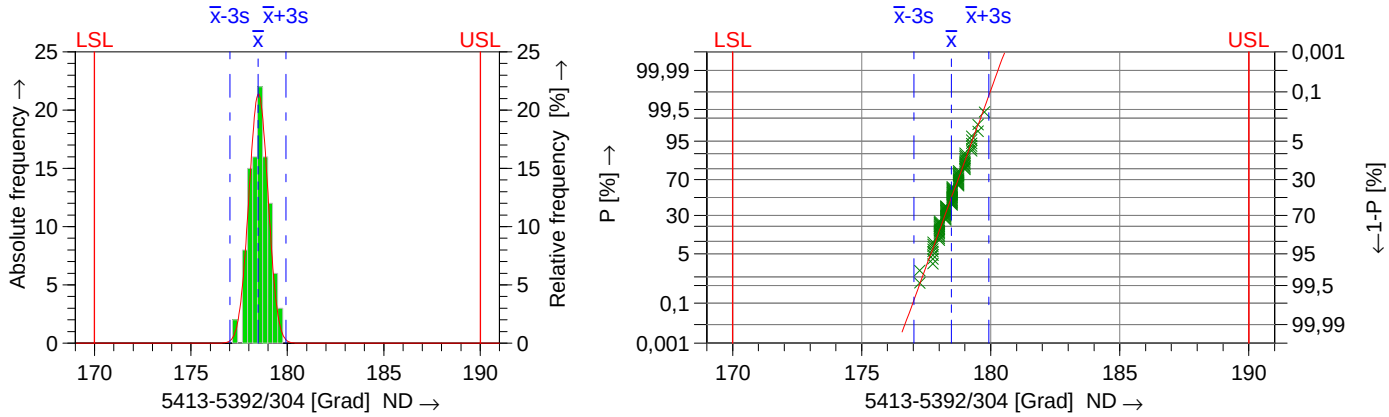
Plant	ATG Lexington	Operator Name	M. SHERMAN
Date	09.07.2021		

Ord. No.	CTBPW05Q	Part type	CTBPW05Q			Contr.item	yes
Serial No.	GC0061l	Char.Descr.	5413-5392/304	Inspection Val.	180,00 10,00	USL	190,00
		Serial No.	5376169	Unit	Grad -10,00	LSL	170,00
Char.Type	variable			Tolerance value	6 %	Decimal Pl.	2
Cust.Name	CLECO	Reference System	5413-5392/304	Test Electronic	MPRO400GCD-P		
Contr.No.	HOMOLOGATION	Reference Transducer	10/1023806	nges.	100		

Evaluation from 09.07.2021 02:46:24 to 09.07.2021 03:16:05

Rem. TQ 80% angle 180 +/-10° * TQ-Cal: 5.96 Nm; Cur-Cal: 0.0393 Nm/A; Speed: 100-50 RPM





Drawing Values		Collected Values		Statistics	
T_m	180.00			$\bar{x}$	178.4775
LSL	170.00	x_{min}	177.25	$\bar{x}$-3s	177.0233
USL	190.00	x_{max}	179.75	$\bar{x}$+3s	179.9317
T	20.00	R	2.50	6s	2.9084
		$n_{<T>}$	100	$p_{<T>}$	100.00000 %
		$n_{>USL}$	0	$p_{>USL}$	0.00000%
		$n_{<LSL}$	0	$p_{<LSL}$	0.00000%
		n_{eff}	100		
		n_{tot}	100		

Model distribution			Normal Distribution
Calculation method			$M1_{1.4}$ $\hat{\sigma} = s_{tot}$
Potential Capability index	=	C_m	6.88
Critical capability index	=	C_{mk}	5.83

The requirements were met (C_m,C_{mk})

APEX VDI/VDE 2647 V0.1

Machine Capability Study
Control System

Plant	ATG Lexington		Operator Name	M. SHERMAN	Date 09.07.2021

Ser.No.	GC0061l	Characteristic			
Type	CTBPW05Q	Char.Descr.	5413-5392/304	Inspection Val.	3,92
Ord. No.	CTBPW05Q	Ser.No.	5376169	LSL	3,04
				USL	4,85
Remark	TQ 80% angle 180 +/-10°* TQ-Cal: 5.96 Nm; Cu r-Cal: 0.0393 Nm/A; Speed: 100-50 RPM				

Char.No	Char.Descr.	x_1	x_2	x_3	x_4	x_5	x_6	x_7	x_8	x_9	x_{10}
5376169	5413-5392/304	3,89	3,88	3,85	3,87	3,83	3,85	3,85	3,85	3,85	3,89
5376169	5413-5392/304	178,25	179,00	178,50	178,50	178,00	179,00	178,00	179,25	178,00	178,75

Char.No	Char.Descr.	x_{11}	x_{12}	x_{13}	x_{14}	x_{15}	x_{16}	x_{17}	x_{18}	x_{19}	x_{20}
5376169	5413-5392/304	3,82	3,88	3,83	3,82	3,87	3,86	3,87	3,88	3,85	3,83
5376169	5413-5392/304	178,25	179,00	178,50	178,00	178,25	178,50	179,00	178,25	178,25	178,00

Char.No	Char.Descr.	x_{21}	x_{22}	x_{23}	x_{24}	x_{25}	x_{26}	x_{27}	x_{28}	x_{29}	x_{30}
5376169	5413-5392/304	3,87	3,84	3,89	3,85	3,82	3,82	3,89	3,83	3,85	3,82
5376169	5413-5392/304	178,75	177,75	179,25	178,50	178,00	177,25	178,75	177,75	179,00	177,75

Char.No	Char.Descr.	x_{31}	x_{32}	x_{33}	x_{34}	x_{35}	x_{36}	x_{37}	x_{38}	x_{39}	x_{40}
5376169	5413-5392/304	3,89	3,91	3,90	3,91	3,88	3,90	3,88	3,89	3,89	3,89
5376169	5413-5392/304	178,75	178,25	178,50	178,50	178,25	178,00	178,50	178,50	178,75	178,25

Char.No	Char.Descr.	x_{41}	x_{42}	x_{43}	x_{44}	x_{45}	x_{46}	x_{47}	x_{48}	x_{49}	x_{50}
5376169	5413-5392/304	3,88	3,86	3,91	3,86	3,89	3,88	3,83	3,85	3,84	3,87
5376169	5413-5392/304	178,50	178,50	179,00	178,50	178,75	178,25	178,75	178,25	178,50	178,25

Char.No	Char.Descr.	x_{51}	x_{52}	x_{53}	x_{54}	x_{55}	x_{56}	x_{57}	x_{58}	x_{59}	x_{60}
5376169	5413-5392/304	3,91	3,91	3,89	3,86	3,87	3,87	3,87	3,88	3,80	3,88
5376169	5413-5392/304	178,50	178,00	179,25	177,75	178,75	178,75	178,50	178,75	177,75	178,50

Char.No	Char.Descr.	x_{61}	x_{62}	x_{63}	x_{64}	x_{65}	x_{66}	x_{67}	x_{68}	x_{69}	x_{70}
5376169	5413-5392/304	3,87	3,89	3,94	3,90	3,86	3,90	3,88	3,85	3,88	3,87
5376169	5413-5392/304	178,25	179,00	178,75	179,25	178,75	177,75	179,50	179,00	178,50	179,25

Char.No	Char.Descr.	x_{71}	x_{72}	x_{73}	x_{74}	x_{75}	x_{76}	x_{77}	x_{78}	x_{79}	x_{80}
5376169	5413-5392/304	3,89	3,81	3,82	3,88	3,85	3,84	3,87	3,85	3,91	3,86
5376169	5413-5392/304	178,25	178,50	177,75	179,00	179,00	177,75	178,75	178,25	179,75	178,50

Machine Capability Study
Control System

Plant	ATG Lexington		Operator Name	M. SHERMAN	Date 09.07.2021

Ser.No.	GC0061l	Characteristic			
Type	CTBPW05Q	Char.Descr.	5413-5392/304	Inspection Val.	3,92
Ord. No.	CTBPW05Q	Ser.No.	5376169	LSL	3,04
				USL	4,85
Remark	TQ 80% angle 180 +/-10°* TQ-Cal: 5.96 Nm; Cu r-Cal: 0.0393 Nm/A; Speed: 100-50 RPM				

Char.No	Char.Descr.	x_{81}	x_{82}	x_{83}	x_{84}	x_{85}	x_{86}	x_{87}	x_{88}	x_{89}	x_{90}
5376169	5413-5392/304	3,87	3,86	3,83	3,92	3,88	3,86	3,88	3,88	3,87	3,83
5376169	5413-5392/304	178,00	178,00	178,50	178,50	178,50	178,00	179,00	178,25	178,75	178,00

Char.No	Char.Descr.	x_{91}	x_{92}	x_{93}	x_{94}	x_{95}	x_{96}	x_{97}	x_{98}	x_{99}	x_{100}
5376169	5413-5392/304	3,88	3,84	3,93	3,87	3,89	3,87	3,85	3,88	3,87	3,87
5376169	5413-5392/304	178,75	178,00	179,25	178,25	179,50	178,00	178,75	178,00	179,00	177,25

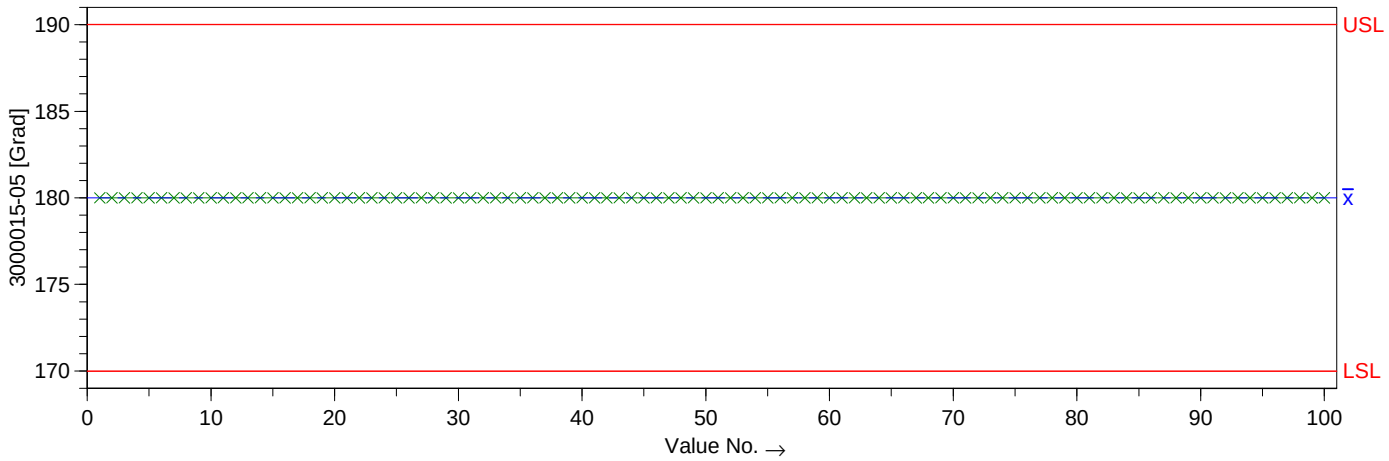
Machine Capability Study
Tool System

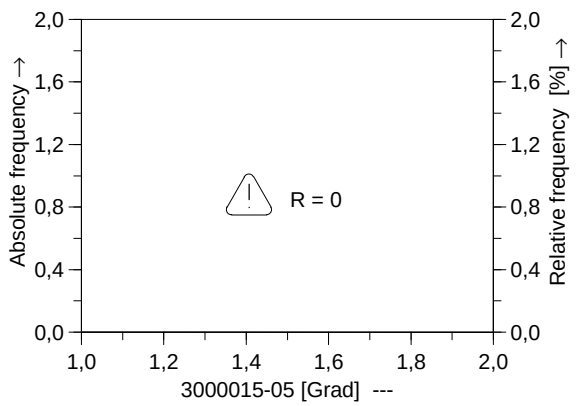
Plant ATG Lexington		Operator Name M. SHERMAN	Date 09.07.2021

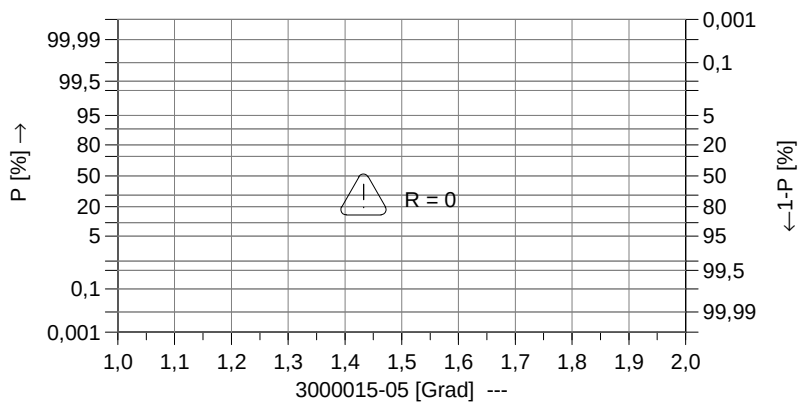
Ord. No. CTBPW05Q	Part type CTBPW05Q				Contr.item yes
Serial No. GC0061l	Char.Descr. 3000015-05	Inspection Val. 180,00	10,00	USL 190,00	
	Serial No. 177721	Unit Grad	-10,00	LSL 170,00	
Char.Type variable		Tolerance value 6 %		Decimal Pl. 2	
Cust.Name CLECO	Reference System 5413-5392/304	Test Electronic MPRO400GCD-P			
Contr.No. HOMOLOGATION	Reference Transducer 10/1023806	nges. 100			

Evaluation from 09.07.2021 14:46:22 to 09.07.2021 15:16:05

Rem. TQ 80% angle 180 +/-10° * TQ-Cal: 5.96 Nm; Cur-Cal: 0.0393 Nm/A; Speed: 100-50 RPM







Drawing Values		Collected Values		Statistics	
T_m	180.00			$\bar{x}$	180.0000
LSL	170.00	x_{min}	180.00		
USL	190.00	x_{max}	180.00		
T	20.00	R	0.00		
		$n_{<T>}$	100		
		$n_{>USL}$	0		
		$n_{<LSL}$	0		
		n_{eff}	100		
		n_{tot}	100		

--- R = 0 ---

APEX VDI/VDE 2647 V0.1

Machine Capability Study
Tool System

Plant	ATG Lexington		Operator Name	M. SHERMAN	Date 09.07.2021

Ser.No.	GC0061l	Characteristic			
Type	CTBPW05Q	Char.Descr.	3000015-05	Inspection Val.	2,02
Ord. No.	CTBPW05Q	Ser.No.	177721	LSL	0,00
				USL	4,85
Remark	TQ 80% angle 180 +/-10°* TQ-Cal: 5.96 Nm; Cu r-Cal: 0.0393 Nm/A; Speed: 100-50 RPM				

Char.No	Char.Descr.	x_1	x_2	x_3	x_4	x_5	x_6	x_7	x_8	x_9	x_{10}
177721	3000015-05	3,97	4,00	3,95	3,96	3,91	3,97	3,92	3,94	3,94	3,99
177721	3000015-05	180,00	180,00	180,00	180,00	180,00	180,00	180,00	180,00	180,00	180,00

Char.No	Char.Descr.	x_{11}	x_{12}	x_{13}	x_{14}	x_{15}	x_{16}	x_{17}	x_{18}	x_{19}	x_{20}
177721	3000015-05	3,92	3,99	3,93	3,89	3,98	3,96	3,97	3,97	3,95	3,91
177721	3000015-05	180,00	180,00	180,00	180,00	180,00	180,00	180,00	180,00	180,00	180,00

Char.No	Char.Descr.	x_{21}	x_{22}	x_{23}	x_{24}	x_{25}	x_{26}	x_{27}	x_{28}	x_{29}	x_{30}
177721	3000015-05	3,96	3,95	4,01	3,97	3,93	3,90	4,01	3,92	3,96	3,91
177721	3000015-05	180,00	180,00	180,00	180,00	180,00	180,00	180,00	180,00	180,00	180,00

Char.No	Char.Descr.	x_{31}	x_{32}	x_{33}	x_{34}	x_{35}	x_{36}	x_{37}	x_{38}	x_{39}	x_{40}
177721	3000015-05	4,00	4,00	3,98	4,03	3,99	4,01	3,99	3,99	4,00	4,01
177721	3000015-05	180,00	180,00	180,00	180,00	180,00	180,00	180,00	180,00	180,00	180,00

Char.No	Char.Descr.	x_{41}	x_{42}	x_{43}	x_{44}	x_{45}	x_{46}	x_{47}	x_{48}	x_{49}	x_{50}
177721	3000015-05	3,98	3,98	4,02	3,98	4,00	3,96	3,94	3,93	3,94	3,96
177721	3000015-05	180,00	180,00	180,00	180,00	180,00	180,00	180,00	180,00	180,00	180,00

Char.No	Char.Descr.	x_{51}	x_{52}	x_{53}	x_{54}	x_{55}	x_{56}	x_{57}	x_{58}	x_{59}	x_{60}
177721	3000015-05	4,03	4,02	4,01	3,93	3,99	3,99	3,93	3,97	3,90	3,98
177721	3000015-05	180,00	180,00	180,00	180,00	180,00	180,00	180,00	180,00	180,00	180,00

Char.No	Char.Descr.	x_{61}	x_{62}	x_{63}	x_{64}	x_{65}	x_{66}	x_{67}	x_{68}	x_{69}	x_{70}
177721	3000015-05	3,95	3,98	4,02	3,98	4,01	4,01	3,98	3,95	3,99	3,98
177721	3000015-05	180,00	180,00	180,00	180,00	180,00	180,00	180,00	180,00	180,00	180,00

Char.No	Char.Descr.	x_{71}	x_{72}	x_{73}	x_{74}	x_{75}	x_{76}	x_{77}	x_{78}	x_{79}	x_{80}
177721	3000015-05	3,97	3,92	3,91	3,98	3,97	3,94	3,98	3,94	4,01	3,96
177721	3000015-05	180,00	180,00	180,00	180,00	180,00	180,00	180,00	180,00	180,00	180,00

Machine Capability Study
Tool System

Plant	ATG Lexington		Operator Name	M. SHERMAN	Date 09.07.2021

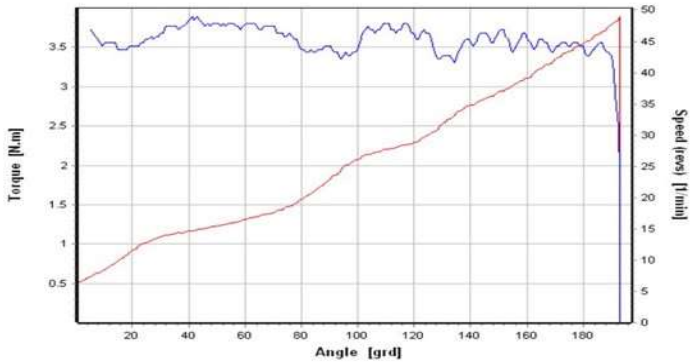
Ser.No.	GC0061l	Characteristic			
Type	CTBPW05Q	Char.Descr.	3000015-05	Inspection Val.	2,02
Ord. No.	CTBPW05Q	Ser.No.	177721	LSL	0,00
				USL	4,85
Remark	TQ 80% angle 180 +/-10°* TQ-Cal: 5.96 Nm; Cu r-Cal: 0.0393 Nm/A; Speed: 100-50 RPM				

Char.No	Char.Descr.	x_{81}	x_{82}	x_{83}	x_{84}	x_{85}	x_{86}	x_{87}	x_{88}	x_{89}	x_{90}
177721	3000015-05	4,00	3,96	3,96	4,04	3,97	3,95	3,95	3,95	4,00	3,95
177721	3000015-05	180,00	180,00	180,00	180,00	180,00	180,00	180,00	180,00	180,00	180,00

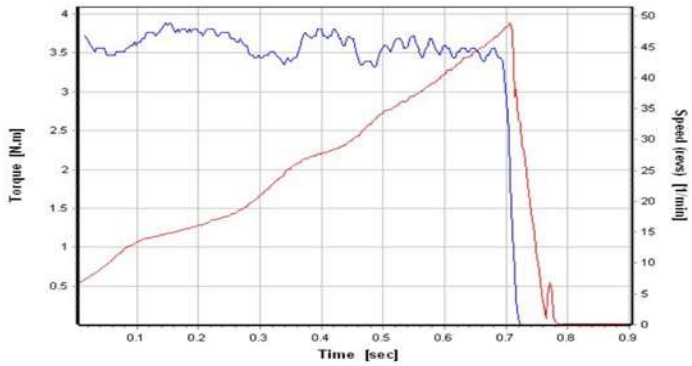
Char.No	Char.Descr.	x_{91}	x_{92}	x_{93}	x_{94}	x_{95}	x_{96}	x_{97}	x_{98}	x_{99}	x_{100}
177721	3000015-05	3,96	3,92	4,04	3,95	4,01	3,94	3,95	4,00	3,96	3,94
177721	3000015-05	180,00	180,00	180,00	180,00	180,00	180,00	180,00	180,00	180,00	180,00

Torque graphs

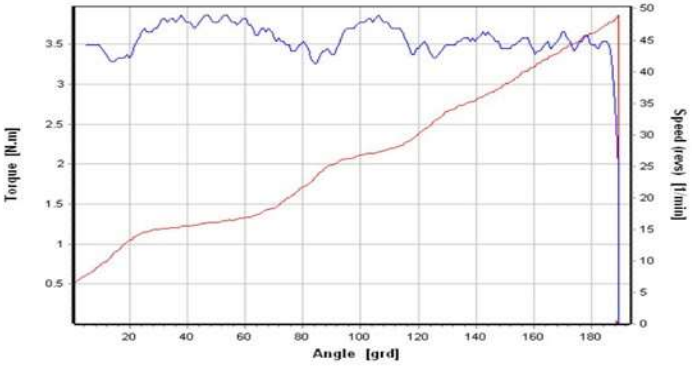
Model:	**CTBPW05Q**	Serial no:	**GC0061**
Target torque:	**3.92 Nm**	80 % of max. torque	
Angle degree:	**180°**	Tool without angle correction	



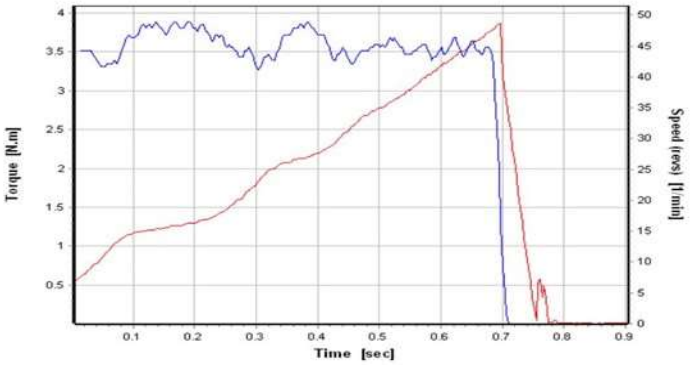
Value no. 1
Graph
Torque / Angle / Speed



Value no. 1
Graph
Torque / Time / Speed



Value no. 100
Graph
Torque / Angle / Speed



Value no. 100
Graph
Torque / Time / Speed

General Specifications

Manufacturer: Apex Tool Group **Tool type:** Cordless Assembly Tools

Model: CTBPW05Q **Serial no:** GC0061

Torque range: **1.1 Nm to 4.9 Nm**

Difference evaluation: Reference/Tool at 180 ° / 80%

Capability examination

Snugfit value: 0.98 Nm **Torque tolerance ±** 7 %

Target torque: 3.92 Nm Tolerance: 7.63 % ± **3.81 %**

Angle degree: 180° Tolerance: 11.6° ± **5.8°**

Formula derivation: $C_m = \frac{T}{6\,s}$ $T = C_m * 6\,s$

Tool with angle correction

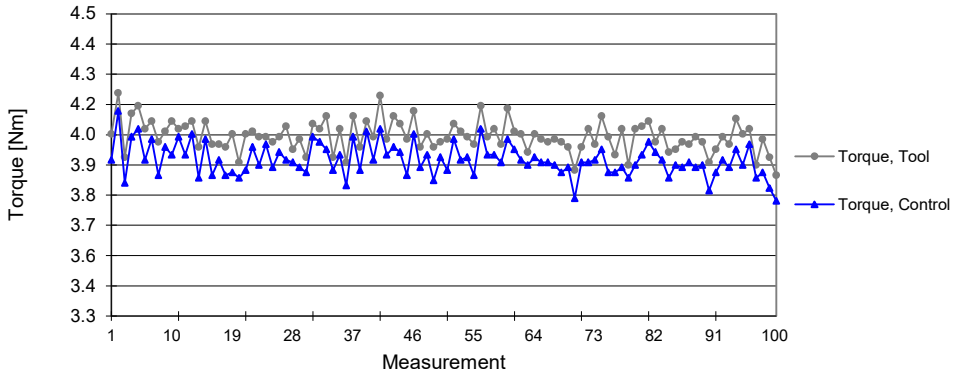
For measurements, the screwdriver must be held by hand and alternately moved.
In the column "Move +", the angle range in the screw direction,
In the column "Move -" of the direction opposite the direction of tightening,
within this range, the tool has to be moved.
Pay attention to changing angle values and directions of movement.
The indicated maximum values for "Move +" and "Move -"
have per measurement series minimum 5 times.

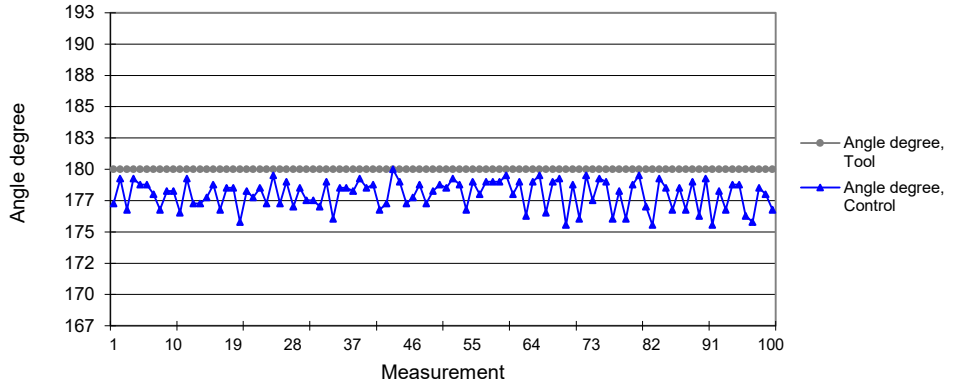
Move		Test conditions
+	-	0
0-25°	0-45°	Tool hand held

Measurement	Tool data		Control data		Difference	
No.	Torque	Angle	Torque	Angle	Torque	Angle
1	4.04	180.00	3.94	177.25	0.10	2.75
2	4.20	180.00	4.13	179.25	0.07	0.75
3	3.95	180.00	3.85	176.75	0.10	3.25
4	4.12	180.00	4.03	179.25	0.09	0.75
5	4.15	180.00	4.06	178.75	0.09	1.25
6	4.06	180.00	3.94	178.75	0.12	1.25
7	4.09	180.00	4.02	178.00	0.07	2.00
8	4.01	180.00	3.88	176.75	0.13	3.25
9	4.05	180.00	3.99	178.25	0.06	1.75
10	4.09	180.00	3.96	178.25	0.13	1.75
11	4.06	180.00	4.03	176.50	0.03	3.50
12	4.07	180.00	3.96	179.25	0.11	0.75
13	4.09	180.00	4.04	177.25	0.05	2.75
14	3.99	180.00	3.87	177.25	0.12	2.75
15	4.09	180.00	4.02	177.75	0.07	2.25
16	4.00	180.00	3.88	178.75	0.12	1.25
17	4.00	180.00	3.94	176.75	0.06	3.25
18	3.99	180.00	3.88	178.50	0.11	1.50
19	4.04	180.00	3.89	178.50	0.15	1.50
20	3.93	180.00	3.87	175.75	0.06	4.25
21	4.04	180.00	3.90	178.25	0.14	1.75
22	4.05	180.00	3.99	177.75	0.06	2.25
23	4.03	180.00	3.92	178.50	0.11	1.50
24	4.03	180.00	4.00	177.25	0.03	2.75
25	4.01	180.00	3.91	179.50	0.10	0.50
26	4.03	180.00	3.97	177.25	0.06	2.75
27	4.07	180.00	3.94	179.00	0.13	1.00
28	3.98	180.00	3.93	177.00	0.05	3.00
29	4.02	180.00	3.91	178.50	0.11	1.50
30	3.95	180.00	3.89	177.50	0.06	2.50
31	4.08	180.00	4.03	177.50	0.05	2.50
32	4.06	180.00	4.01	177.00	0.05	3.00
33	4.11	180.00	3.98	179.00	0.13	1.00
34	3.95	180.00	3.90	176.00	0.05	4.00
35	4.06	180.00	3.96	178.50	0.10	1.50
36	3.93	180.00	3.84	178.50	0.09	1.50
37	4.11	180.00	4.03	178.25	0.08	1.75
38	3.99	180.00	3.90	179.25	0.09	0.75
39	4.09	180.00	4.05	178.50	0.04	1.50
40	4.03	180.00	3.94	178.75	0.09	1.25
41	4.19	180.00	4.06	176.75	0.13	3.25
42	4.02	180.00	3.96	177.25	0.06	2.75
43	4.11	180.00	3.99	180.00	0.12	0.00
44	4.08	180.00	3.97	179.00	0.11	1.00
45	4.02	180.00	3.88	177.25	0.14	2.75
46	4.13	180.00	4.04	177.75	0.09	2.25
47	3.99	180.00	3.91	178.75	0.08	1.25
48	4.04	180.00	3.96	177.25	0.08	2.75
49	3.99	180.00	3.86	178.25	0.13	1.75
50	4.01	180.00	3.95	178.75	0.06	1.25
51	4.02	180.00	3.90	178.50	0.12	1.50
52	4.08	180.00	4.02	179.25	0.06	0.75
53	4.05	180.00	3.94	178.75	0.11	1.25
54	4.03	180.00	3.95	176.75	0.08	3.25
55	4.00	180.00	3.88	179.00	0.12	1.00
56	4.15	180.00	4.06	178.00	0.09	2.00
57	4.03	180.00	3.96	179.00	0.07	1.00
58	4.06	180.00	3.96	179.00	0.10	1.00
59	4.00	180.00	3.93	179.00	0.07	1.00
60	4.14	180.00	4.02	179.50	0.12	0.50
61	4.05	180.00	3.98	178.00	0.07	2.00
62	4.04	180.00	3.94	179.00	0.10	1.00
63	3.97	180.00	3.92	176.25	0.05	3.75
64	4.04	180.00	3.95	179.00	0.09	1.00
65	4.02	180.00	3.93	179.50	0.09	0.50
66	4.01	180.00	3.93	176.50	0.08	3.50
67	4.02	180.00	3.92	179.00	0.10	1.00
68	4.01	180.00	3.89	179.25	0.12	0.75
69	3.99	180.00	3.91	175.50	0.08	4.50
70	3.90	180.00	3.79	178.75	0.11	1.25
71	3.99	180.00	3.93	176.00	0.06	4.00
72	4.06	180.00	3.93	179.50	0.13	0.50
73	4.00	180.00	3.94	177.50	0.06	2.50
74	4.11	180.00	3.98	179.25	0.13	0.75
75	4.03	180.00	3.89	179.00	0.14	1.00
76	3.96	180.00	3.89	176.00	0.07	4.00
77	4.06	180.00	3.91	178.25	0.15	1.75
78	3.92	180.00	3.87	176.00	0.05	4.00
79	4.06	180.00	3.92	178.75	0.14	1.25
80	4.07	180.00	3.96	179.50	0.11	0.50
81	4.09	180.00	4.01	177.00	0.08	3.00
82	4.01	180.00	3.97	175.50	0.04	4.50
83	4.06	180.00	3.94	179.25	0.12	0.75
84	3.97	180.00	3.87	178.50	0.10	1.50
85	3.98	180.00	3.92	176.75	0.06	3.25
86	4.01	180.00	3.91	178.50	0.10	1.50
87	4.00	180.00	3.93	176.75	0.07	3.25
88	4.03	180.00	3.91	179.00	0.12	1.00
89	4.01	180.00	3.92	176.25	0.09	3.75
90	3.93	180.00	3.82	179.25	0.11	0.75
91	3.98	180.00	3.89	175.50	0.09	4.50
92	4.03	180.00	3.94	178.25	0.09	1.75
93	4.00	180.00	3.91	176.75	0.09	3.25
94	4.10	180.00	3.98	178.75	0.12	1.25
95	4.04	180.00	3.92	178.75	0.12	1.25
96	4.06	180.00	4.00	176.25	0.06	3.75
97	3.92	180.00	3.87	175.75	0.05	4.25
98	4.02	180.00	3.89	178.50	0.13	1.50
99	3.95	180.00	3.83	178.00	0.12	2.00
100	3.88	180.00	3.78	176.75	0.10	3.25
				Standard deviation:	**0.030**	**1.153**

Graphical representation

Model:	**CTBPW05Q**	Serial no:	**GC0061**
Target torque:	**3.92 Nm**	80 % of max. torque	
Angle degree:	**180°**	Tool with angle correction	





Machine Capability Study
Control System

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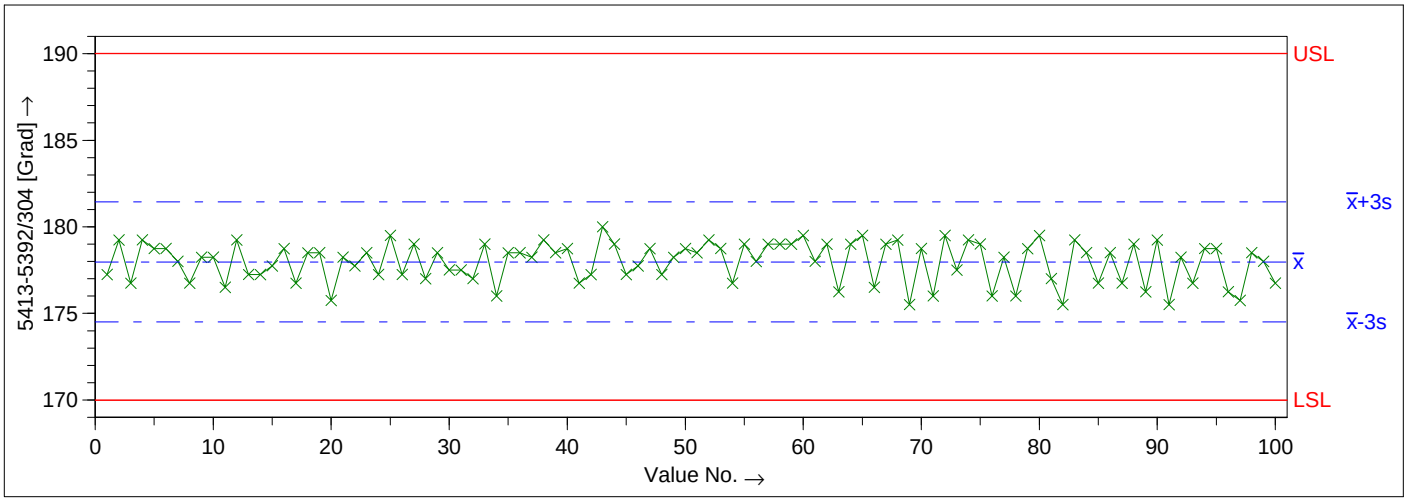
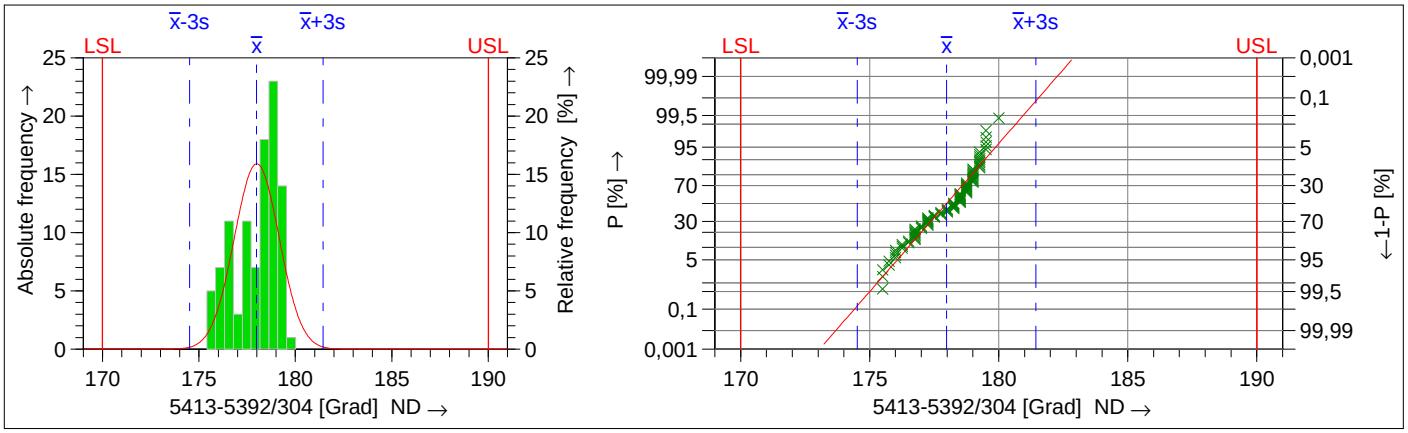
Plant	ATG Lexington	Operator Name	M. SHERMAN
Date	13.07.2021		

Ord. No.	CTBPW05Q	Part type	CTBPW05Q			Contr.item	yes
Serial No.	GC0061n	Char.Descr.	5413-5392/304	Inspection Val.	180,00 10,00	USL	190,00
		Serial No.	5376169	Unit	Grad -10,00	LSL	170,00
Char.Type	variable			Tolerance value	6 %	Decimal Pl.	2
Cust.Name	CLECO	Reference System	5413-5392/304	Test Electronic	MPRO400GCD-P		
Contr.No.	HOMOLOGATION	Reference Transducer	10/1023806	nges.	100		

Evaluation from 13.07.2021 09:14:40 to 13.07.2021 09:31:55

Rem. TQ 80% angle 180 +/-10° * TQ-Cal: 5.96 Nm; Cur-Cal: 0.0393 Nm/A; Speed: 100-50 RPM; with Gyroscope





Drawing Values		Collected Values		Statistics	
T_m	180.00			$\bar{x}$	177.9750
LSL	170.00	x_{min}	175.50	$\bar{x}$-3s	174.5150
USL	190.00	x_{max}	180.00	$\bar{x}$+3s	181.4350
T	20.00	R	4.50	6s	6.9200
		$n_{<T>}$	100	$p_{<T>}$	100.00000 %
		$n_{>USL}$	0	$p_{>USL}$	0.00000%
		$n_{<LSL}$	0	$p_{<LSL}$	0.00000%
		n_{eff}	100		
		n_{tot}	100		

Model distribution			Normal Distribution
Calculation method			$M1_{1.4}$ $\hat{\sigma} = s_{tot}$
Potential Capability index	=	C_m	2.89
Critical capability index	=	C_{mk}	2.30

The requirements were met (C_m,C_{mk})

APEX VDI/VDE 2647 V0.1

Machine Capability Study
Control System

Plant	ATG Lexington		Operator Name	M. SHERMAN	Date 13.07.2021

Ser.No.	GC0061n	Characteristic			
Type	CTBPW05Q	Char.Descr.	5413-5392/304	Inspection Val.	3,99
Ord. No.	CTBPW05Q	Ser.No.	5376169	LSL	3,02
				USL	5,04
Remark	TQ 80% angle 180 +/-10°* TQ-Cal: 5.96 Nm; Cu r-Cal: 0.0393 Nm/A; Speed: 100-50 RPM; with Gyroscope				

Char.No	Char.Descr.	x_1	x_2	x_3	x_4	x_5	x_6	x_7	x_8	x_9	x_{10}
5376169	5413-5392/304	3,94	4,13	3,85	4,03	4,06	3,94	4,02	3,88	3,99	3,96
5376169	5413-5392/304	177,25	179,25	176,75	179,25	178,75	178,75	178,00	176,75	178,25	178,25

Char.No	Char.Descr.	x_{11}	x_{12}	x_{13}	x_{14}	x_{15}	x_{16}	x_{17}	x_{18}	x_{19}	x_{20}
5376169	5413-5392/304	4,03	3,96	4,04	3,87	4,02	3,88	3,94	3,88	3,89	3,87
5376169	5413-5392/304	176,50	179,25	177,25	177,25	177,75	178,75	176,75	178,50	178,50	175,75

Char.No	Char.Descr.	x_{21}	x_{22}	x_{23}	x_{24}	x_{25}	x_{26}	x_{27}	x_{28}	x_{29}	x_{30}
5376169	5413-5392/304	3,90	3,99	3,92	4,00	3,91	3,97	3,94	3,93	3,91	3,89
5376169	5413-5392/304	178,25	177,75	178,50	177,25	179,50	177,25	179,00	177,00	178,50	177,50

Char.No	Char.Descr.	x_{31}	x_{32}	x_{33}	x_{34}	x_{35}	x_{36}	x_{37}	x_{38}	x_{39}	x_{40}
5376169	5413-5392/304	4,03	4,01	3,98	3,90	3,96	3,84	4,03	3,90	4,05	3,94
5376169	5413-5392/304	177,50	177,00	179,00	176,00	178,50	178,50	178,25	179,25	178,50	178,75

Char.No	Char.Descr.	x_{41}	x_{42}	x_{43}	x_{44}	x_{45}	x_{46}	x_{47}	x_{48}	x_{49}	x_{50}
5376169	5413-5392/304	4,06	3,96	3,99	3,97	3,88	4,04	3,91	3,96	3,86	3,95
5376169	5413-5392/304	176,75	177,25	180,00	179,00	177,25	177,75	178,75	177,25	178,25	178,75

Char.No	Char.Descr.	x_{51}	x_{52}	x_{53}	x_{54}	x_{55}	x_{56}	x_{57}	x_{58}	x_{59}	x_{60}
5376169	5413-5392/304	3,90	4,02	3,94	3,95	3,88	4,06	3,96	3,96	3,93	4,02
5376169	5413-5392/304	178,50	179,25	178,75	176,75	179,00	178,00	179,00	179,00	179,00	179,50

Char.No	Char.Descr.	x_{61}	x_{62}	x_{63}	x_{64}	x_{65}	x_{66}	x_{67}	x_{68}	x_{69}	x_{70}
5376169	5413-5392/304	3,98	3,94	3,92	3,95	3,93	3,93	3,92	3,89	3,91	3,79
5376169	5413-5392/304	178,00	179,00	176,25	179,00	179,50	176,50	179,00	179,25	175,50	178,75

Char.No	Char.Descr.	x_{71}	x_{72}	x_{73}	x_{74}	x_{75}	x_{76}	x_{77}	x_{78}	x_{79}	x_{80}
5376169	5413-5392/304	3,93	3,93	3,94	3,98	3,89	3,89	3,91	3,87	3,92	3,96
5376169	5413-5392/304	176,00	179,50	177,50	179,25	179,00	176,00	178,25	176,00	178,75	179,50

Machine Capability Study
Control System

Plant	ATG Lexington		Operator Name	M. SHERMAN	Date 13.07.2021

Ser.No.	GC0061n	Characteristic			
Type	CTBPW05Q	Char.Descr.	5413-5392/304	Inspection Val.	3,99
Ord. No.	CTBPW05Q	Ser.No.	5376169	LSL	3,02
				USL	5,04
Remark	TQ 80% angle 180 +/-10°* TQ-Cal: 5.96 Nm; Cu r-Cal: 0.0393 Nm/A; Speed: 100-50 RPM; with Gyroscope				

Char.No	Char.Descr.	x_{81}	x_{82}	x_{83}	x_{84}	x_{85}	x_{86}	x_{87}	x_{88}	x_{89}	x_{90}
5376169	5413-5392/304	4,01	3,97	3,94	3,87	3,92	3,91	3,93	3,91	3,92	3,82
5376169	5413-5392/304	177,00	175,50	179,25	178,50	176,75	178,50	176,75	179,00	176,25	179,25

Char.No	Char.Descr.	x_{91}	x_{92}	x_{93}	x_{94}	x_{95}	x_{96}	x_{97}	x_{98}	x_{99}	x_{100}
5376169	5413-5392/304	3,89	3,94	3,91	3,98	3,92	4,00	3,87	3,89	3,83	3,78
5376169	5413-5392/304	175,50	178,25	176,75	178,75	178,75	176,25	175,75	178,50	178,00	176,75

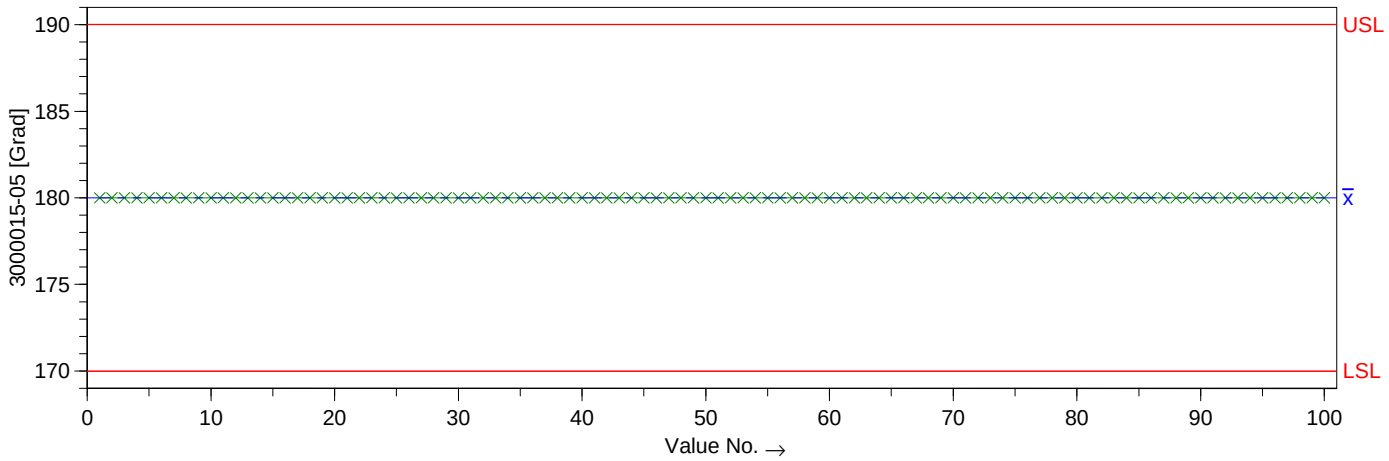
Machine Capability Study
Tool System

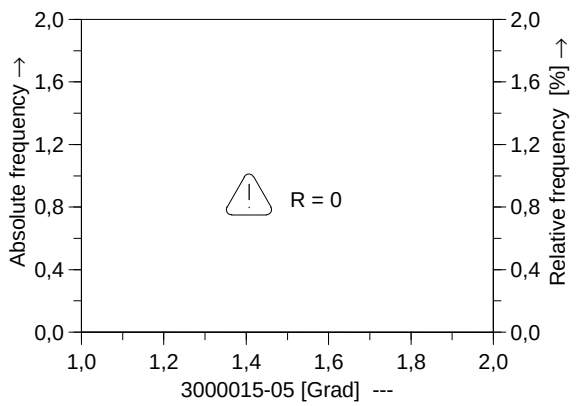
Plant ATG Lexington		Operator Name M. SHERMAN	Date 13.07.2021

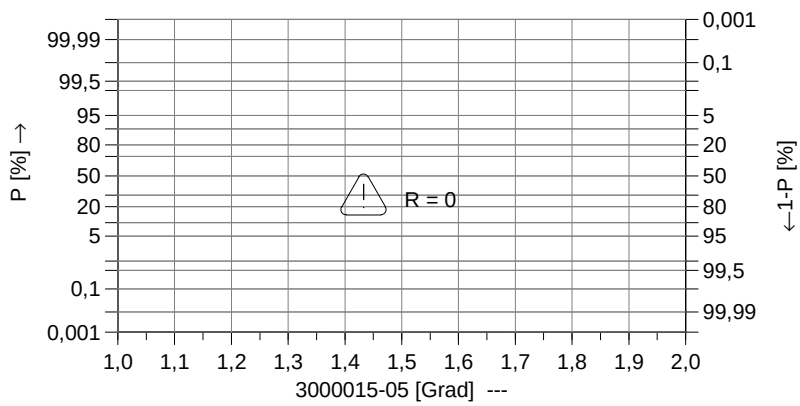
Ord. No. CTBPW05Q	Part type CTBPW05Q				Contr.item yes
Serial No. GC0061n	Char.Descr. 3000015-05	Inspection Val. 180,00	10,00	USL 190,00	
	Serial No. 177721	Unit Grad	-10,00	LSL 170,00	
Char.Type variable		Tolerance value 6 %		Decimal Pl. 2	
Cust.Name CLECO	Reference System 5413-5392/304	Test Electronic MPRO400GCD-P			
Contr.No. HOMOLOGATION	Reference Transducer 10/1023806	nges. 100			

Evaluation from 13.07.2021 09:14:39 to 13.07.2021 09:31:54

Rem. TQ 80% angle 180 +/-10° * TQ-Cal: 5.96 Nm; Cur-Cal: 0.0393 Nm/A; Speed: 100-50 RPM; with Gyroscope







Drawing Values		Collected Values		Statistics	
T_m	180.00			$\bar{x}$	180.0000
LSL	170.00	x_{min}	180.00		
USL	190.00	x_{max}	180.00		
T	20.00	R	0.00		
		$n_{<T>}$	100		
		$n_{>USL}$	0		
		$n_{<LSL}$	0		
		n_{eff}	100		
		n_{tot}	100		

--- R = 0 ---

APEX VDI/VDE 2647 V0.1

Machine Capability Study
Tool System

Plant	ATG Lexington		Operator Name	M. SHERMAN	Date 13.07.2021

Ser.No.	GC0061n	Characteristic			
Type	CTBPW05Q	Char.Descr.	3000015-05	Inspection Val.	2,10
Ord. No.	CTBPW05Q	Ser.No.	177721	LSL	0,00
				USL	5,04
Remark	TQ 80% angle 180 +/-10°* TQ-Cal: 5.96 Nm; Cu r-Cal: 0.0393 Nm/A; Speed: 100-50 RPM; with Gyroscope				

Char.No	Char.Descr.	x_1	x_2	x_3	x_4	x_5	x_6	x_7	x_8	x_9	x_{10}
177721	3000015-05	4,04	4,20	3,95	4,12	4,15	4,06	4,09	4,01	4,05	4,09
177721	3000015-05	180,00	180,00	180,00	180,00	180,00	180,00	180,00	180,00	180,00	180,00

Char.No	Char.Descr.	x_{11}	x_{12}	x_{13}	x_{14}	x_{15}	x_{16}	x_{17}	x_{18}	x_{19}	x_{20}
177721	3000015-05	4,06	4,07	4,09	3,99	4,09	4,00	4,00	3,99	4,04	3,93
177721	3000015-05	180,00	180,00	180,00	180,00	180,00	180,00	180,00	180,00	180,00	180,00

Char.No	Char.Descr.	x_{21}	x_{22}	x_{23}	x_{24}	x_{25}	x_{26}	x_{27}	x_{28}	x_{29}	x_{30}
177721	3000015-05	4,04	4,05	4,03	4,03	4,01	4,03	4,07	3,98	4,02	3,95
177721	3000015-05	180,00	180,00	180,00	180,00	180,00	180,00	180,00	180,00	180,00	180,00

Char.No	Char.Descr.	x_{31}	x_{32}	x_{33}	x_{34}	x_{35}	x_{36}	x_{37}	x_{38}	x_{39}	x_{40}
177721	3000015-05	4,08	4,06	4,11	3,95	4,06	3,93	4,11	3,99	4,09	4,03
177721	3000015-05	180,00	180,00	180,00	180,00	180,00	180,00	180,00	180,00	180,00	180,00

Char.No	Char.Descr.	x_{41}	x_{42}	x_{43}	x_{44}	x_{45}	x_{46}	x_{47}	x_{48}	x_{49}	x_{50}
177721	3000015-05	4,19	4,02	4,11	4,08	4,02	4,13	3,99	4,04	3,99	4,01
177721	3000015-05	180,00	180,00	180,00	180,00	180,00	180,00	180,00	180,00	180,00	180,00

Char.No	Char.Descr.	x_{51}	x_{52}	x_{53}	x_{54}	x_{55}	x_{56}	x_{57}	x_{58}	x_{59}	x_{60}
177721	3000015-05	4,02	4,08	4,05	4,03	4,00	4,15	4,03	4,06	4,00	4,14
177721	3000015-05	180,00	180,00	180,00	180,00	180,00	180,00	180,00	180,00	180,00	180,00

Char.No	Char.Descr.	x_{61}	x_{62}	x_{63}	x_{64}	x_{65}	x_{66}	x_{67}	x_{68}	x_{69}	x_{70}
177721	3000015-05	4,05	4,04	3,97	4,04	4,02	4,01	4,02	4,01	3,99	3,90
177721	3000015-05	180,00	180,00	180,00	180,00	180,00	180,00	180,00	180,00	180,00	180,00

Char.No	Char.Descr.	x_{71}	x_{72}	x_{73}	x_{74}	x_{75}	x_{76}	x_{77}	x_{78}	x_{79}	x_{80}
177721	3000015-05	3,99	4,06	4,00	4,11	4,03	3,96	4,06	3,92	4,06	4,07
177721	3000015-05	180,00	180,00	180,00	180,00	180,00	180,00	180,00	180,00	180,00	180,00

Machine Capability Study
Tool System

Plant	ATG Lexington		Operator Name	M. SHERMAN	Date 13.07.2021

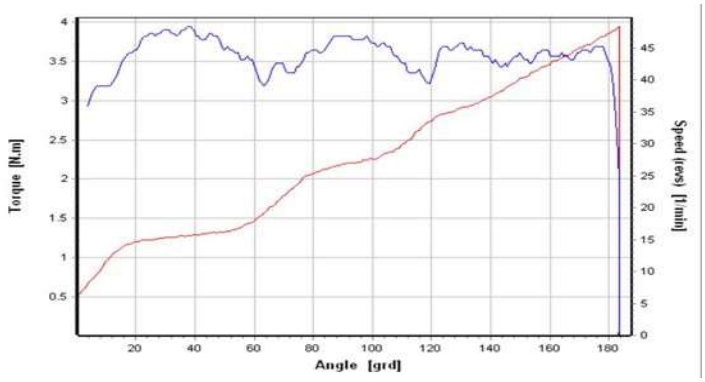
Ser.No.	GC0061n	Characteristic			
Type	CTBPW05Q	Char.Descr.	3000015-05	Inspection Val.	2,10
Ord. No.	CTBPW05Q	Ser.No.	177721	LSL	0,00
				USL	5,04
Remark	TQ 80% angle 180 +/-10°* TQ-Cal: 5.96 Nm; Cu r-Cal: 0.0393 Nm/A; Speed: 100-50 RPM; with Gyroscope				

Char.No	Char.Descr.	x_{81}	x_{82}	x_{83}	x_{84}	x_{85}	x_{86}	x_{87}	x_{88}	x_{89}	x_{90}
177721	3000015-05	4,09	4,01	4,06	3,97	3,98	4,01	4,00	4,03	4,01	3,93
177721	3000015-05	180,00	180,00	180,00	180,00	180,00	180,00	180,00	180,00	180,00	180,00

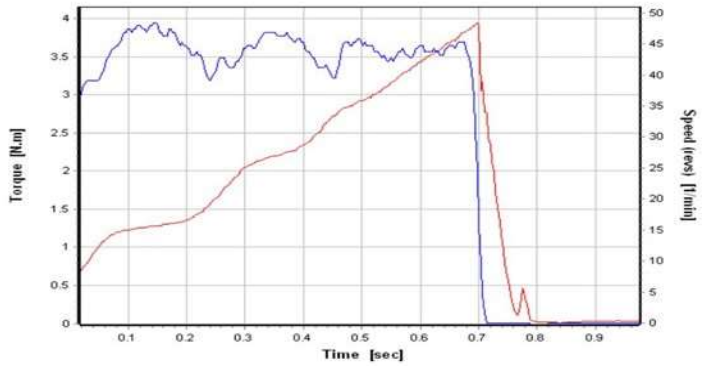
Char.No	Char.Descr.	x_{91}	x_{92}	x_{93}	x_{94}	x_{95}	x_{96}	x_{97}	x_{98}	x_{99}	x_{100}
177721	3000015-05	3,98	4,03	4,00	4,10	4,04	4,06	3,92	4,02	3,95	3,88
177721	3000015-05	180,00	180,00	180,00	180,00	180,00	180,00	180,00	180,00	180,00	180,00

Torque graphs

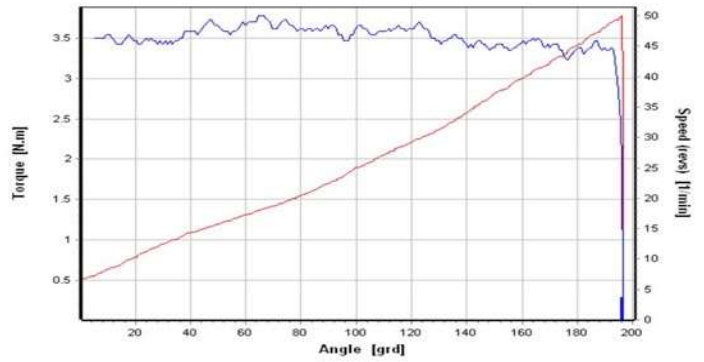
Model:	**CTBPW05Q**	Serial no:	**GC0061**
Target torque:	**3.92 Nm**	80 % of max. torque	
Angle degree:	**180°**	Tool with angle correction	



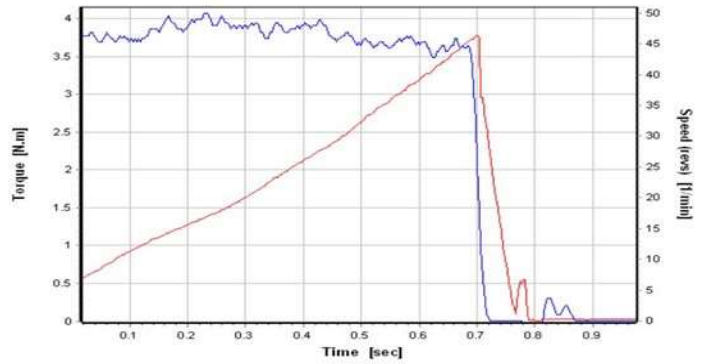
Value no. 1
Graph
Torque / Angle / Speed



Value no. 1
Graph
Torque / Time / Speed



Value no. 100
Graph
Torque / Angle / Speed



Value no. 100
Graph
Torque / Time / Speed