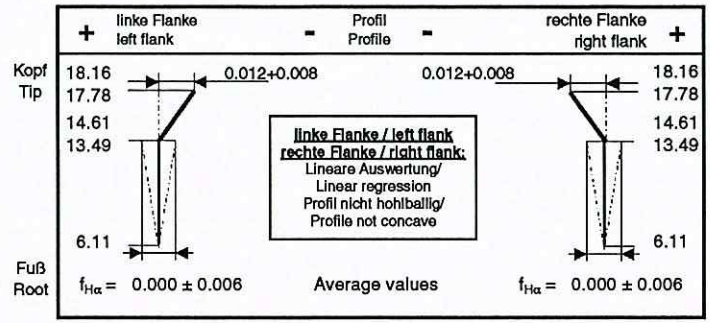
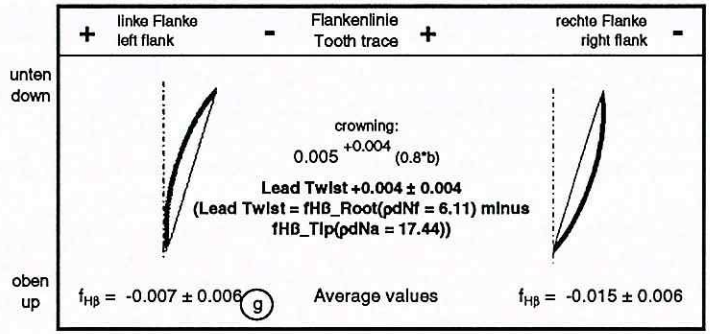
STIRNRAD / GEAR	external / außenverzahnt	Toleranzen der Verzahnung (DIN 3961 vom Aug. 1978) (8) gültig für Werte am Einzelzahn / Tolerances of gearing (DIN 3961 of Aug. 1978) valid for values at individual tooth				
Zähnezahl z / Number of teeth	18		linke Fl. / left flank	rechte Fl. / right flank		
Modul m_n / Normal module	2.450000	Profil-Formabweichung $f_{f\alpha}$ / Profile form error	0.004		Eingriffsteilungs-Abweich. f_{pe} / Normal pitch error	0.014
Eingriffswinkel α_n / Normal pressure angle	20° 0' 0"	Profil-Gesamtabweichung F_α / Total profile error			Teilungs-Einzelabweichung f_p / Adjacent pitch error	0.014
Schrägungswinkel β / Helix angle	29° 0' 0"	Profil-Winkelabweichung $f_{H\alpha}$ / Profile angle error	0.000 ± 0.010	0.000 ± 0.010	Teilungssprung f_u / Diff. bet. adjacent pitches	0.018
Steigungsrichtung / Hand of helix	LEFT	Flankenl.-Winkelabweich. $f_{H\beta}$ / Tooth alignment error (g)	-0.007 ± 0.013	-0.015 ± 0.013	Teilungs-Summenabweich. F_{pk} / Cumulative circ. pitch error	
Profilverschiebungsfaktor x / Addendum modification coeff.	0.731	Flankenl.-Gesamtabweich. F_β / Total alignment error			Rundlaufabweichung F_r / Radial run-out	0.040
Teilkreisdurchmesser d / Pitch diameter	50.422	Flankenl.-Formabweich. $f_{f\beta}$ / Longitudinal alignment err.	0.004		Zahndickenschwankung R_s / Range of tooth thickn. error	
Kopfkreisdurchmesser (c) d_a / Outside diameter	59.50 $_{-0.26}$	Teilungs-Gesamtabweich. F_p / Cumulative pitch error	0.050			
Kopfnutzkreisd. theo. max. d_{Na} / Tip diam. usable theo.	59.05	Einf.-Wälzabweichung F_i / Tangential composite error			Zweifl.-Wälzabweichung F_r / Radial composite error	0.045
Kopfnutzkreisd. theo. min. d_{Na} / Tip diam. usable theo.	58.58	Einflanken-Wälzsprung f_i / Tang. tooth to tooth comp. err.			Zweifl.-Wälzsprung f_r / Radial tooth to tooth comp. err.	0.018
Fußkreisdurchmesser (c) d_f / Root diameter	45.00 $_{-0.45}$	Radbreite im Meßkreis d_M b / Facewidth in meas. diam.	33.98		Meßkreis Krümmungsradius ρ_{dM} / Radius of curvature meas. diam.	12.49
Fußnutzkreisdurchmesser d_{Nf} / Root diameter usable	48.13					
Grundkreisradius r_b / Base circle radius	23.276					
Grundkreisdurchmesser d_b / Base diameter	46.552					
Normalzahndicke max. s_n / Normal tooth thickness	5.152					
Normalzahndicke min. s_n / Normal tooth thickness	5.122					
Meßzähnezahl k / Number of teeth spanned						
Zahnweite max. W_k / Base tangent length						
Zahnweite min. W_k / Base tangent length						
Meßkugeldurchmesser D_M / Ball diameter	3.5000					
Diam. Zweikugelmaß max. M_{dK} / Measurement o. balls	56.763					
Diam. Zweikugelmaß min. M_{dK} / Measurement o. balls	56.698					
Verdrehflankenspiel theo. / Circumferential backlash	0.072 / 0.172					



* Schreibbeginn
* Start of checking

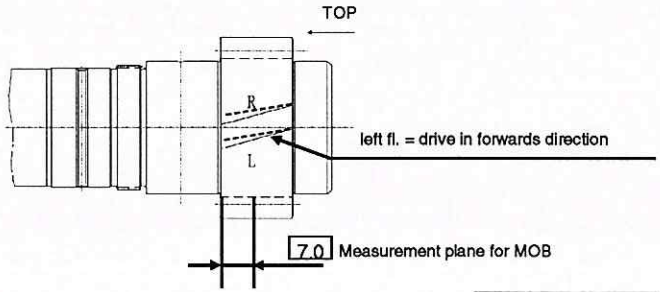
Ø = 46.81 $_{-0.30}$ ≡ 2.45



* ffα (zwischen dNf und dem Schreibbeginn ds) max ffα/2, jedoch 0.003 zulässig
* ffα (between dNf and start of checking ds) max ffα/2, 0.003 allowable.

Profil- und Flankenlinienprüfung nach VDI/VDE 2612
Tabellenwerte für F_β und $f_{H\beta}$ sind auf die gesamte Radbreite im Meßkreis d_M bezogen
Flankenlinienprüfbereich Lβ = 0.8*b hochgerechnet auf 1.0*b
Begriffe für Stirnräder nach DIN 868, 3960, 3998

Profile and helix checking according to VDI/VDE 2612
Listed tolerance data for F_β and $f_{H\beta}$ refers to the total face width in the meas. dia. d_M
Tooth trace testing area Lβ = 0.8*b calculated to 1.0*b
Terms of the tooth system according to DIN (German Industrial Standards) No. 868, 3960, 3998



Hondurchmesser = 46.81 $_{-0.30}$ ≡ 2.45
honing diameter

Der Verlauf der Profil- und Flankenlinie muss über den Messbereich stetig sein (ein- oder mehrfache Richtungsänderungen sind nicht zulässig)
The form of the profile and helix has to be continuous (one or more changes of directions are not allowed)
Für fp max. zwei Wellen zulässig
For fp max. two waves allowed

Vorbearbeitungsdaten siehe Verzahnungsblatt Vorbearbeitung gleicher Nr.
For pre-machining dimensions, see gear data sheet same number

Wkz-Profil siehe Werkzeugdatenblatt Nr. 250.6.3771.35
For Tooth profile, see tool data sheet number

Abbildungen	Anz.	Änd.Nr.		Datum	Name
g	2	35560	Siehe Änd.	20111209	Cricenti

Abbildungen sind unmaßstäblich.
Diagrams not to scale.

Ersatz für: Rev. "f" 20110606
Erstverwendung bei Getriebetype: 250.0.0053.18

	Datum	Name
gez.	2009-05-13	Cricenti, Fabrizi
gepr.		

Verzahnungsblatt Endkontrolle
Final Check Gear Data
Benennung:
Naming:
Output Shaft K2

Verteiler:

Schutzvermerk nach ISO 16016 beachten
Protection per ISO 16016

GETRAG
GETRAG Getriebe- und Zahnradfabrik Hermann Hagenmeyer GmbH & Cie KG

Remark:

Zeichnungsnummer:
Drawing number:
250.6.3771.35

GETRAG	Geardata-Sheet	D-No.: 250.6.3771.35	z = 38
	External gearing	Remark:	

Mating gear:	./.	i 38 / 38	a ./.	Type: 250	Speed: Output Shaft 2
		i /	a	Customer: Ford	

z	38	m_n	1.000000	α	30 ° 0 ´ 0 ´´	β	0 ° 0 ´ 0 ´´ STRAIGHT
x	0.450	d	38.000	d_b	32.909	d_a	39.84 $_{-0.25}$
						d_f	37.80 $_{-0.59}$

Tolerance Class		9	Tooth thickn. sn	2.207	÷	2.167	
GO-GAGE takes priority over inspection of individual deviations			Base tangent length over 7 teeth				
Radial composite err. Fi ´´		Tangent. comp. err. Fi ´	finished:	20.005	÷	19.970	
Rad. tooth to tooth comp. err. fi ´´		Tang. tooth to tooth comp. err. fi ´	shaped: hobbed:		÷		
Profile form error ffα		Profile angle error fHα	shaved:		÷		
Total profile error Fα	0.021	Adjacent pitch err. fp	0.017	Measurement over 2 balls DM= 2.00			
Normal pitch error fpe		Diff. bet. adj. pitch. fu	finished:	42.209	÷	42.148	
Cumulative pitch error Fp	0.040	Cum. circ. pitch err. Fpk	shaped: hobbed:		÷		
Cumu. circ. pitch err. 1/8 extent Fpz/8		Radial run-out Fr	0.040	shaved:	÷		
Range of tooth thickn. error Rs		Longit. alignm. err. ffβ	usable diameter	dNa	39.59	dNf	37.94
Tooth alignment err. fHβ		Total alignment err. Fβ	0.011	rad. of curvature	ρdNa	11.00	ρdNf 9.44

Tool	Bezugsprofil	DIN 5480		
grinding wheel	h_{aP0}	ρ_{aP0}	b	

External Spline DIN 5480-W 40 x 1.00 x 38 x 9 freely selected

GAGE DIMENSION sn max. eff. = 2.230

da und dNa NON STANDARD

Ch.ind.	Ch. No.	Changes	Date	Name

VBL drawn: CRICENTI Date: 13.05.09 Subst. For:

GETRAG	Geardata-Sheet	D-No.: 250.6.3771.35	z = 38
	External gearing	Remark: IIIa	

Mating gear:	./.	i 38 / 38	a ./.	Type: 250	Speed: Output Shaft 2
		i /	a	Customer: Ford	

z	38	m_n	1.000000	α	30 ° 0 ′ 0 ″	β	0 ° 0 ′ 0 ″ STRAIGHT
x	0.450	d	38.000	d_b	32.909	d_a	39.66 $_{-0.16}$ d_f 37.60 $_{-0.59}$

Tolerance Class	9	Tooth thickn. sn	2.156	÷	2.116
GO-GAGE takes priority over inspection of individual deviations		Base tangent length over 7 teeth			
Radial composite err. Fi ″	Tangent. comp. err. Fi ′	finished:	19.961	÷	19.926
Rad. tooth to tooth comp. err. fi ″	Tang. tooth to tooth comp. err. fi ′	shaped: hobbed:		÷	
Profile form error ffα	Profile angle error fHα	shaved:		÷	
Total profile error Fα 0.021	Adjacent pitch err. fp 0.017	Measurement over 2 balls DM= 2.00			
Normal pitch error fpe	Diff. bet. adj. pitch. fu	finished:	42.132	÷	42.071
Cumulative pitch error Fp 0.040	Cum. circ. pitch err. Fpk	shaped: hobbed:		÷	
Cumu. circ. pitch err. 1/8 extent Fpz/8	Radial run-out Fr 0.040	shaved:		÷	
Range of tooth thickn. error Rs	Longit. alignm. err. ffβ	usable diameter dNa	39.44	dNf	37.94
Tooth alignment err. fHβ	Total alignment err. Fβ 0.011	rad. of curvature ρdNa	10.87	ρdNf	9.44

Tool	Bezugsprofil	DIN 5480		
grinding wheel	h_{aP0}	ρ_{aP0}	b	

External Spline DIN 5480-W 40 x 1.00 x 38 x 9 freely selected

GAGE DIMENSION sn max. eff. = 2.179

da, dNa und df NON STANDARD

Spline rolled

Ch.ind.	Ch. No.	Changes	Date	Name
a	35112	Siehe Änd.	30.04.10	Cricenti

VBL drawn: CRICENTI Date: 13.05.09 Subst. For:

GETRAG	Geardata-Sheet	D-No.: 250.6.3771.35	z = 38
	External gearing	Remark: IIIb	

Mating gear:	./.	i 38 / 38	a ./.	Type: 250	Speed: output Shaft 2
		i /	a	Customer: Ford	

z	38	m_n	1.000000	α	30 ° 0 ′ 0 ″	β	0 ° 0 ′ 0 ″ STRAIGHT
x	0.450	d	38.000	d_b	32.909	d_a	39.69 $_{-0.25}$ d_f 37.60 $_{-0.59}$

Tolerance Class	9.3	Tooth thickn. sn	2.053	÷	2.008
GO-GAGE takes priority over inspection of individual deviations		Base tangent length over 7 teeth			
Radial composite err. Fi ″	Tangent. comp. err. Fi ′	finished:	19.871	÷	19.832
Rad. tooth to tooth comp. err. fi ″	Tang. tooth to tooth comp. err. fi ′	shaped: hobbed:		÷	
Profile form error ffα	Profile angle error fHα	shaved:		÷	
Total profile error Fα 0.023	Adjacent pitch err. fp 0.019	Measurement over 2 balls DM= 2.00			
Normal pitch error fpe	Diff. bet. adj. pitch. fu	finished:	41.975	÷	41.907
Cumulative pitch error Fp 0.045	Cum. circ. pitch err. Fpk	shaped: hobbed:		÷	
Cumu. circ. pitch err. 1/8 extent Fpz/8	Radial run-out Fr 0.040	shaved:		÷	
Range of tooth thickn. error Rs	Longit. alignm. err. ffβ	usable diameter dNa	39.44	dNf	37.94
Tooth alignment err. fHβ	Total alignment err. Fβ 0.012	rad. of curvature ρdNa	10.87	ρdNf	9.44

Tool	Bezugsprofil	DIN 5480		
grinding wheel	h_{aP0}	ρ_{aP0}	b	

External Spline DIN 5480-W 40 x 1.00 x 38 x 9.3 freely selected

GAGE DIMENSION sn max. eff. = 2.079

da, dNa und df NON STANDARD

Spline rolled

Ch.ind.	Ch. No.	Changes	Date	Name
a	35112	Siehe Änd.	30.04.10	Cricenti

VBL drawn: CRICENTI Date: 13.05.09 Subst. For:

GETRAG	Geardata-Sheet	D-No.: 250.6.3771.35	z = 32
	External gearing	Remark:	

Mating gear:	./.	i 32 / 32	a ./.	Type: 250	Speed: Output Shaft 2
		i /	a	Customer: Ford	

z 32	m_n 1.000000	α 30 ° 0 ′ 0 ″	β 0 ° 0 ′ 0 ″	STRAIGHT
x -0.050	d 32.000	d_b 27.713	d_a 32.89 $_{-0.25}$	d_f 30.80 $_{-0.59}$

Tolerance Class	9	Tooth thickn. sn	1.590 ÷ 1.550
GO-GAGE takes priority over inspection of individual deviations		Base tangent length over 6 teeth	
Radial composite err. Fi ″	Tangent. comp. err. Fi ′	finished:	16.470 ÷ 16.435
Rad. tooth to tooth comp. err. fi ″	Tang. tooth to tooth comp. err. fi ′	shaped: hobbed:	÷
Profile form error ffα	Profile angle error fHα	shaved:	÷
Total profile error Fα 0.021	Adjacent pitch err. fp 0.017	Diam. Zweikugelm. MdK, DM = 2.00	
Normal pitch error fpe	Diff. bet. adj. pitch. fu	fertig:	35.245 ÷ 35.182
Cumulative pitch error Fp 0.040	Cum. circ. pitch err. Fpk	shaped: hobbed:	÷
Cumu. circ. pitch err. 1/8 extent Fpz/8	Radial run-out Fr 0.040	shaved:	÷
Range of tooth thickn. error Rs	Longit. alignm. err. ffβ	usable diameter dNa	32.64 dNf 30.94
Tooth alignment err. fHβ	Total alignment err. Fβ 0.011	rad. of curvature ρdNa	8.62 ρdNf 6.88

Tool	Bezugsprofil	DIN 5480		
grinding wheel	h_{aP0}	ρ_{aP0}	b	

External Spline DIN 5480-W 33 x 1.00 x 32 x 9 v

GAGE DIMENSION sn max. eff. = 1.613

da NON STANDARD

Ch.ind.	Ch. No.	Changes	Date	Name
a	35252	See change report	28/10/10	Cricenti

VBL drawn: CRICENTI Date: 13/05/09 Subst. For: