312993

GETRAG

Part Submission Warrant

Part Name: Input shaft Outer
Customer Part Number: 250.6.4384.35
Shown on Drawing No.: 250.6.4384.35
Organization Part #:
Engineering Change Level: a C007260_MIP_1
Dated: 10-gen-17
Additional Engineering Changes:
Dated:
Safety and/or Government Regulation: ☐ Yes ☑ No
Purchase Order No.:
Weight (kg): 1.5200
Checking Aid No.:
Checking Aid Engineering Change Level:
Dated:

ORGANIZATION MANUFACTURING INFORMATION

GETRAG MODUGNO
Organization Name & Supplier/Vendor Code

VIA DEI CICLAMINI N°4
Street Address

MODUGNO BARI 70026 ITALY
City Region Postal Code Country

CUSTOMER SUBMITTAL INFORMATION

Customer Name/Division

Buyer/Buyer Code

DCT250
Application

MATERIALS REPORTING

Has customer-required Substances of Concern information been reported? ☐ Yes ☐ No ☑ n/a

Submitted by IMDS or other customer format:

Are polymeric parts identified with appropriate ISO marking codes? ☐ Yes ☐ No ☑ n/a

REASON FOR SUBMISSION (Check at least one)

- ☐ Initial Submission
- ☑ Engineering Change(s)
- ☐ Tooling: Transfer, Replacement, Refurbishment, or additional
- ☐ Correction of Discrepancy
- ☐ Tooling Inactive > than 1 year
- ☐ Change to Optional Construction or Material
- ☐ Supplier or Material Source Change
- ☐ Change in Part Processing
- ☐ Parts Produced at Additional Location
- ☐ Other - please specify below

REQUESTED SUBMISSION LEVEL (Check one)

- ☐ Level 1 - Warrant only (and for designated appearance items, an Appearance Approval Report) submitted to customer.
- ☐ Level 2 - Warrant with product samples and limited supporting data submitted to customer.
- ☑ Level 3 - Warrant with product samples and complete supporting data submitted to customer.
- ☐ Level 4 - Warrant and other requirements as defined by customer.
- ☐ Level 5 - Warrant with product samples and complete supporting data reviewed at organization's manufacturing location.

SUBMISSION RESULTS

The results for ☑ dimensional measurements ☑ material and functional tests ☐ appearance criteria ☐ statistical process package

These results meet all drawing and specification requirements: ☑ Yes ☐ NO (If "NO" - Explanation Required)

Mold / Cavity / Production Process

DECLARATION

I hereby affirm that the samples represented by this warrant are representative of our parts which were made by a process that meets all Production Part Approval Process Manual 4th Edition Requirements. I further affirm that these samples were produced at the production rate of 2000 / 24 hours. I also certify that documented evidence of such compliance is on file and available for review. I have noted any deviations from this declaration below.

EXPLANATION / COMMENTS: **Drawing correction with standard Tip diameter tolerance used for topping machining (increased)**

Is each Customer Tool properly tagged and numbered? ☐ Yes ☐ No ☑ n/a

Organization Authorized Signature: Camarda
Date: 24/01/2017

Print Name: Camarda Ettore
Phone No.: tel 390805858220
Fax No.:

Title: Area 1 Manager
E-mail: ettore.camarda@magna.com

FOR CUSTOMER USE ONLY (IF APPLICABLE)

Part Warrant Disposition: ☑ Approved ☐ Rejected ☐ Other

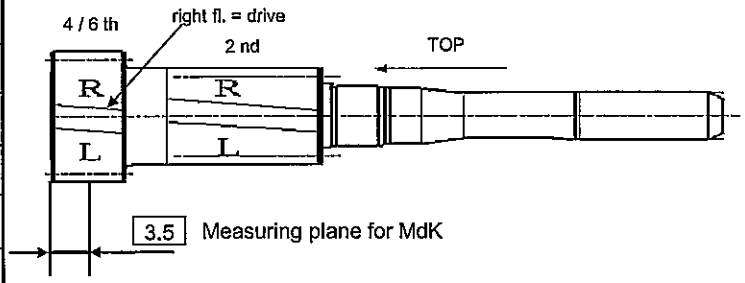
Customer Signature: L Spitzer
Date: 24.01.17

Print Name:
Customer Tracking Number (optional):

March 2006 CFG-1001

Released by Fabrizio.Cricenti on 2017-01-18
Document Status: approved

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	52		linke Fl. / left flank	rechte Fl. / right flank		
Modul m_n / Normal module	1.600000	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	17° 30' 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 ± 0.007	0.000 ± 0.007	Teilungssprung f_u / Diff. bet. adjacent pitches	0.018
Steigungsrichtung / Hand of helix	RIGHT	Flankenl.-Winkelabweich. $f_{H\beta}$ / Tooth alignment error	0.000 ± 0.013	0.000 ± 0.013	Teilungs-Summenabweich. F_{pk} / Cumulative circ. pitch error	
Profilverschiebungsfaktor / Addendum modification coeff.	0.200	Flankenl.-Gesamtabweich. F_β / Total alignment error			Rundlaufabweichung F_r / Radial run-out	0.032
Teilkreisdurchmesser d / Pitch diameter	95.127	Flankenl.-Formabweich. $f_{f\beta}$ / Longitudinal alignment err.	# 0.004		Zahndickenschwankung R_s / Range of tooth thickn. error	
Kopfkreisdurchmesser d_a (a) / Outside diameter	$100.50_{-0.26}$	Teilungs-Gesamtabweich. F_p / Cumulative pitch error	0.050			
Kopfnutzkreisd. theo. max. d_{Na} / Tip diam. usable theo.	100.05	Einf.-Wälzabweichung $F_{i'}$ / Tangential composite error			Zweifl.-Wälzabweichung $F_{i''}$ / Radial composite error	0.040
Kopfnutzkreisd. theo. min. d_{Na} / Tip diam. usable theo.	99.67	Einflanken-Wälzsprung $f_{i'}$ / Tang. tooth to tooth comp. err.			Zweifl.-Wälzsprung $f_{i''}$ / Radial tooth to tooth comp. err.	0.016
Fußkreisdurchmesser d_f / Root diameter	$90.20_{-0.40}$	Radbreite im Meßkreis d_M b / Facewidth in meas. diam.	13.85		Meßkreis Krümmungsradius ρ_{dM} / Radius of curvature meas. diam.	15.16
Fußnutzkreisdurchmesser d_{Nf} / Root diameter usable	92.30					
Grundkreisradius r_b / Base circle radius	44.745					
Grundkreisdurchmesser d_b / Base diameter	89.490					
Normalzahndicke max. s_n / Normal tooth thickness	2.715					
Normalzahndicke min. s_n / Normal tooth thickness	2.685					
Meßzähnezahl k / Number of teeth spanned	8					
Zahnweite max. W_k / Base tangent length	37.297					
Zahnweite min. W_k / Base tangent length	37.269					
Meßkugeldurchmesser D_M / Ball diameter	3.0000					
Diam. Zweikugelmaß max. M_{dK} / Measurement o. balls	100.553					
Diam. Zweikugelmaß min. M_{dK} / Measurement o. balls	100.472					
Verdrehflankenspiel theo. / Circumferential backlash						



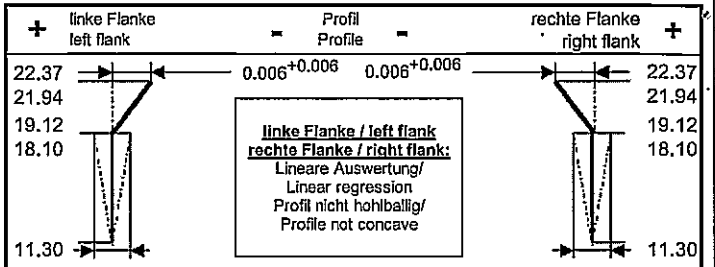
Hondurchmesser = $91.65_{-0.30}$ ≡ 9.89
honing diameter

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

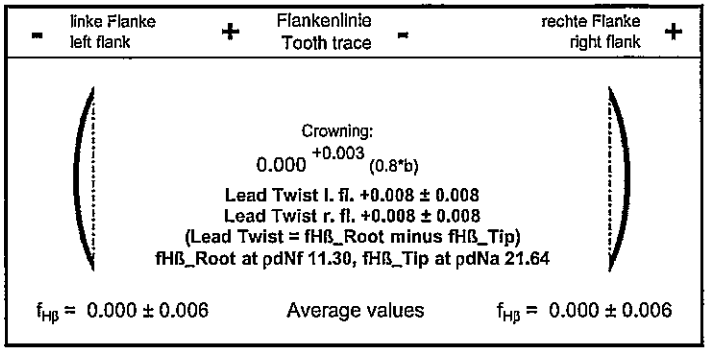
Vorbearbeitungsdaten siehe Verzahnungsblatt Vorbearbeitung gleicher Nr.
For pre-machining dimensions, see gear data sheet same number

Wkz-Profil siehe Werkzeugdatenblatt Nr. 250.6.4384.35
For Tooth profile, see tool data sheet number



$f_{H\alpha}$ = 0.000 ± 0.005 Average values $f_{H\alpha}$ = 0.000 ± 0.005

* Schreibbeginn
* Start of checking Ø = $91.65_{-0.30}$ ≡ 9.89



$f_{H\beta}$ = 0.000 ± 0.006 Average values $f_{H\beta}$ = 0.000 ± 0.006

* ffαf (zwischen dNf und dem Schreibbeginn ds) max ffα/2, jedoch 0.003 zulässig
* ffαf (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

Buch	Anz.	Änd.Nr.		Datum	Name
a	1	2007260	See CO	20170118	Cricenti

Abbildungen sind unmaßstäblich.
Diagrams not to scale.

Ersatz für
Erstverwendung bei Getriebetype: 250

	Datum	Name
gez.	2015-11-25	Paaßen, Holger
gepr.		

Verzahnungsblatt Endkontrolle
Final Check Gear Data
Benennung:
Naming:
Input Shaft Outer 4/6 th

Verteiler:

Schutzvermerk nach ISO 16016 beachten
Protection per ISO 16016

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

Remark:

Zeichnungsnummer:
Drawing number:
250.6.4384.35

GETRAG Production Part Approval

DIMENSIONAL TEST RESULTS

Organization:	GETRAG	Part Number:	250.6.4384.35
Supplier/Vendor Code:	GETRAG Modugno	Part Name:	Input shaft Outer
INSPECTION FACILITY: NA		Design Record Change Level:	10/01/2017
		Engineering Change Documents:	a C007260_MIP_1

Organization Measurement Results (Data)

Item	Dimension/Specification	Specification / Limits		Test Date	Qty. Tested	1	2	3	4	5	controllo distruttivo	Ok	Not Ok
1	Diametro di testa Z52	100.500	100.240		5	100.319	100.313	100.323	100.322	100.320		ok	

SIGNATURE	TITLE	DATE
Vicenti D.	ME	24/01/2017

Ruota cilindrica Evolvente/Elica

Nr. prog.: STI0412_06_0	P26 B7590	Controllore:	turno b	Data:	24.01.2017 16:34
Denominazione:	Input Outer Z52	Numero denti z	52	Largh.fasc.dent. b	13.85mm
Numero disegno.:	250.6.4384.35-IG H	Modulo m	1.6mm	Tratto evolv. La	10.56mm
Commessa/serie nr.:	1	Angolo pressione	17.5°	Tratto elica LS	11.08mm
Masch.Nr.:	M001 Spindel: Formmaschine	Angolo elica	29°	Inizio elab. M1	11.38mm
Untersuchungszweck:	Laufende Messung	Ø Base db	89.4896mm	Palpatore Ø	(#2C) 1mm
Werkzeug:	Charge:	Ang. Base	27.54°	Fat.scor.pr. x	.2

Testa-Ø: 100.319mm [100.24/100.5]

VDI

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Ruota cilindrica Evolvente/Elica

Nr. prog.: STI0412 06 0	P26 B7590	Controllore:	turno b	Data:	24.01.2017 16:36
Denominazione:	Input Outer Z52	Numero denti z	52	Largh.fasc.dent. b	13.85mm
Numero disegno.:	250.6.4384.35-IG H	Modulo m	1.6mm	Tratto evolv. La	10.56mm
Commessa/serie nr.:	2	Angolo pressione	17.5°	Tratto elica LS	11.08mm
Masch.Nr.:	M001 Spindel: Formnestl	Angolo elica	29°	Inizio elab. M1	11.38mm
Untersuchungszweck:	Laufende Messung	Ø Base db	89.4896mm	Palpatore Ø	(#2C) 1mm
Werkzeug:	Charge:	Ang. Base	27.54°	Fat.scor.pr. x	.2

Testa-Ø: 100.313mm [100.24/100.5]

VDI

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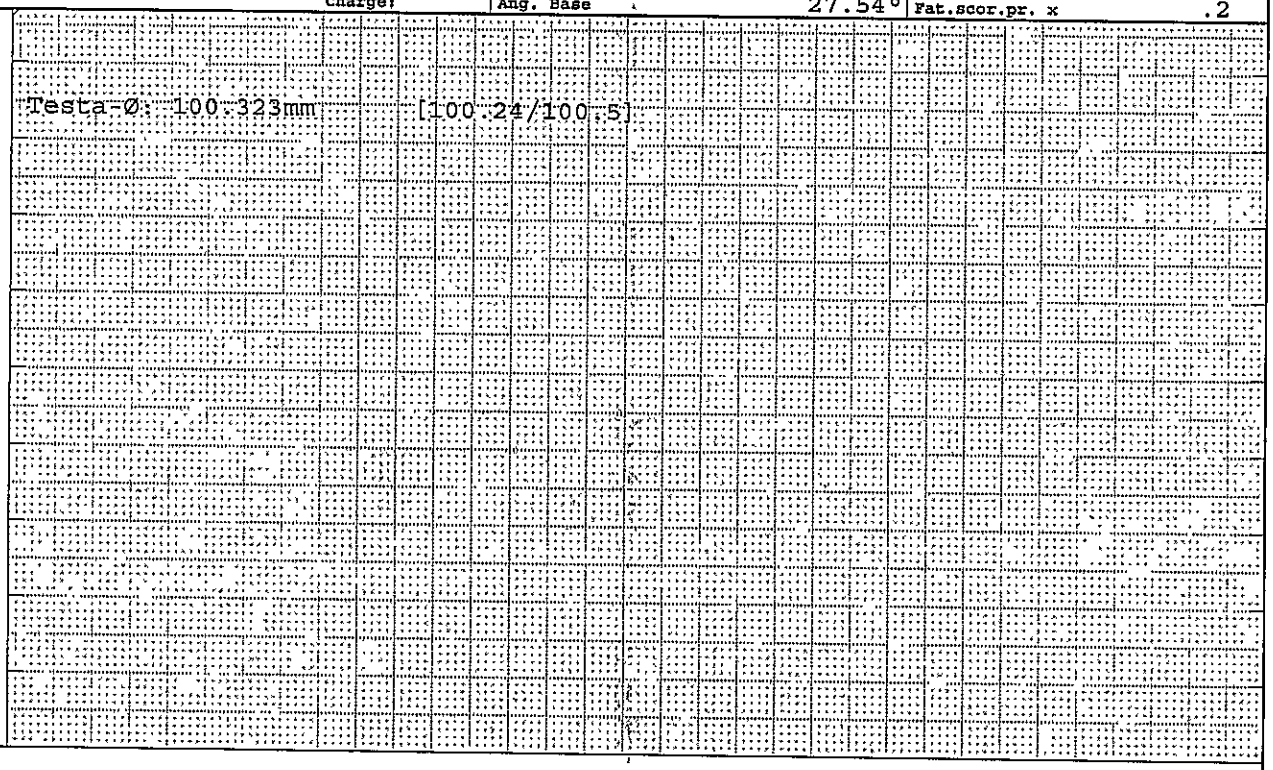
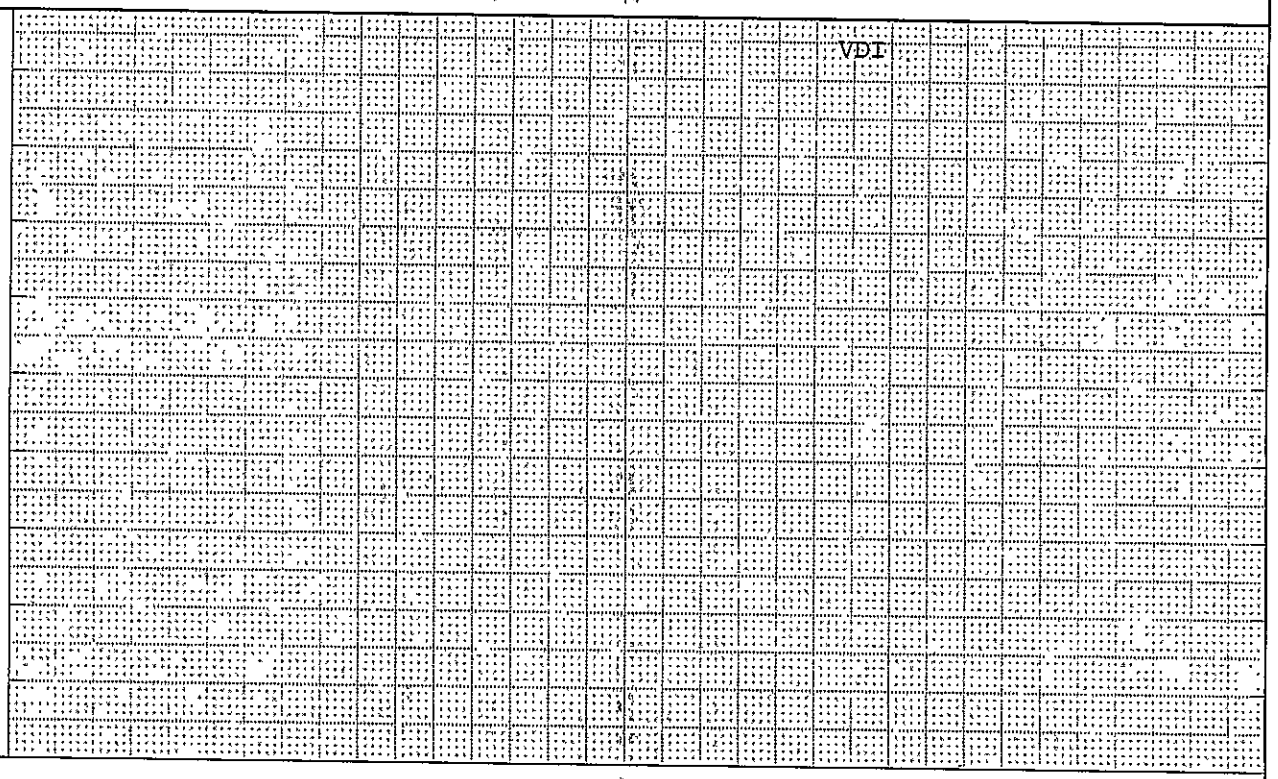
Ruota cilindrica Evolvente/Elica

Nr. prog.:	STI0412_06 0 P26 B7590	Controllore:	turno b	Data:	24.01.2017 16:37
Denominazione:	Input Outer Z52	Numero denti z	52	Largh.fasc.dent. b	13.85mm
Numero disegno.:	250.6.4384.35-IG H	Modulo m	1.6mm	Tratto evolv. La	10.56mm
Commessa/serie nr.:	3	Angolo pressione	17.5°	Tratto elica Lß	11.08mm
Masch.Nr.:	M001 Spindel: Formmaschine	Angolo elica	29°	Inizio elab. M1	11.38mm
Untersuchungszweck:	Laufende Messung	Ø Base db	89.4896mm	Palpatore Ø	(#2C) 1mm
Werkzeug:	Charge:	Ang. Base	27.54°	Fat.scor.pr. x	.2





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Ruota cilindrica Evolvente/Elica

Nr. prog.: STI0412_06_0	P26 B7590	Controllore:	turno b	Data:	24.01.2017 16:38
Denominazione:	Input Outer Z52	Numero denti z	52	Largh.fasc.dent. b	13.85mm
Numero disegno.:	250.6.4384.35-IG H	Modulo m	1.6mm	Tratto evolv. La	10.56mm
Commessa/serie nr.:	4	Angolo pressione	17.5°	Tratto elica Lß	11.08mm
Masch.Nr.:	M001 Spindel: Formnest	Angolo elica	29°	Inizio elab. M1	11.38mm
Untersuchungszweck:	Laufende Messung	Ø Base db	89.4896mm	Palpatore Ø	(#2C) 1mm
Werkzeug:	Charge:	Ang. Base	27.54°	Fat.scor.pr. x	.2

Testa-Ø: 100.322mm [100.24/100.5]

VDI

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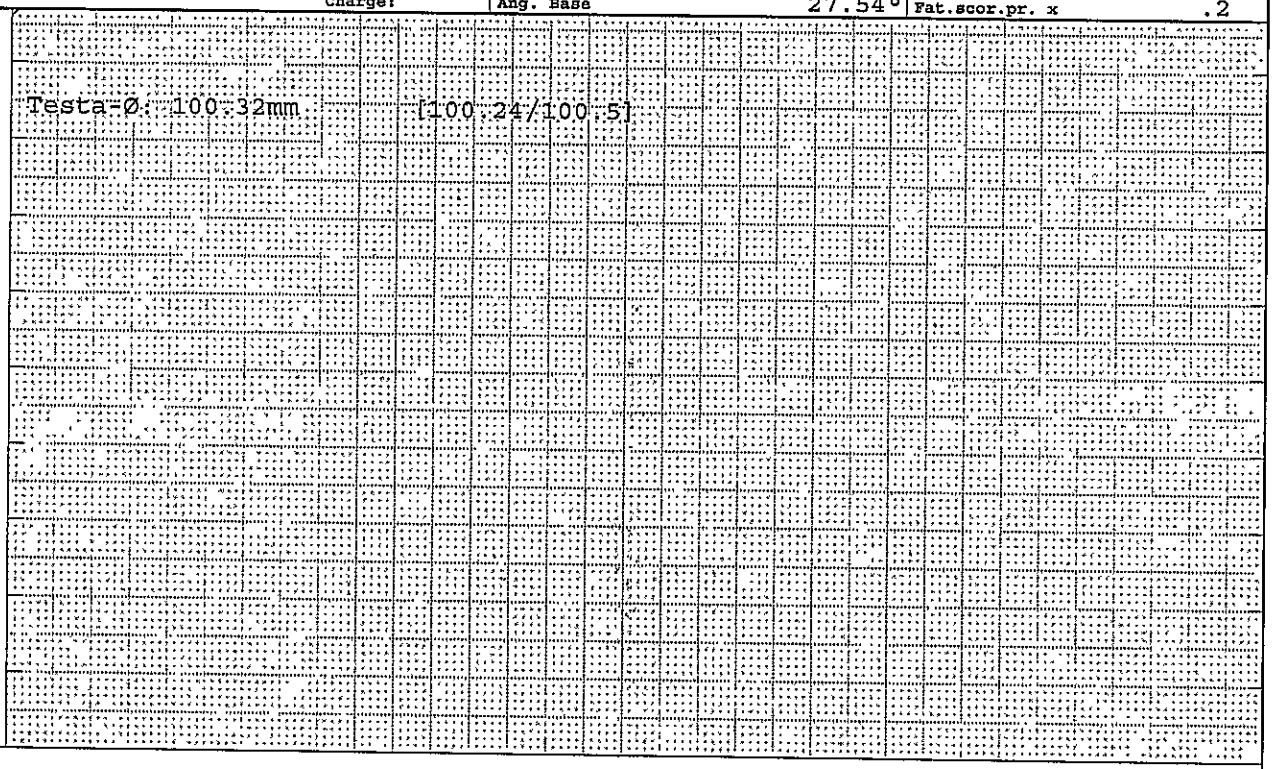
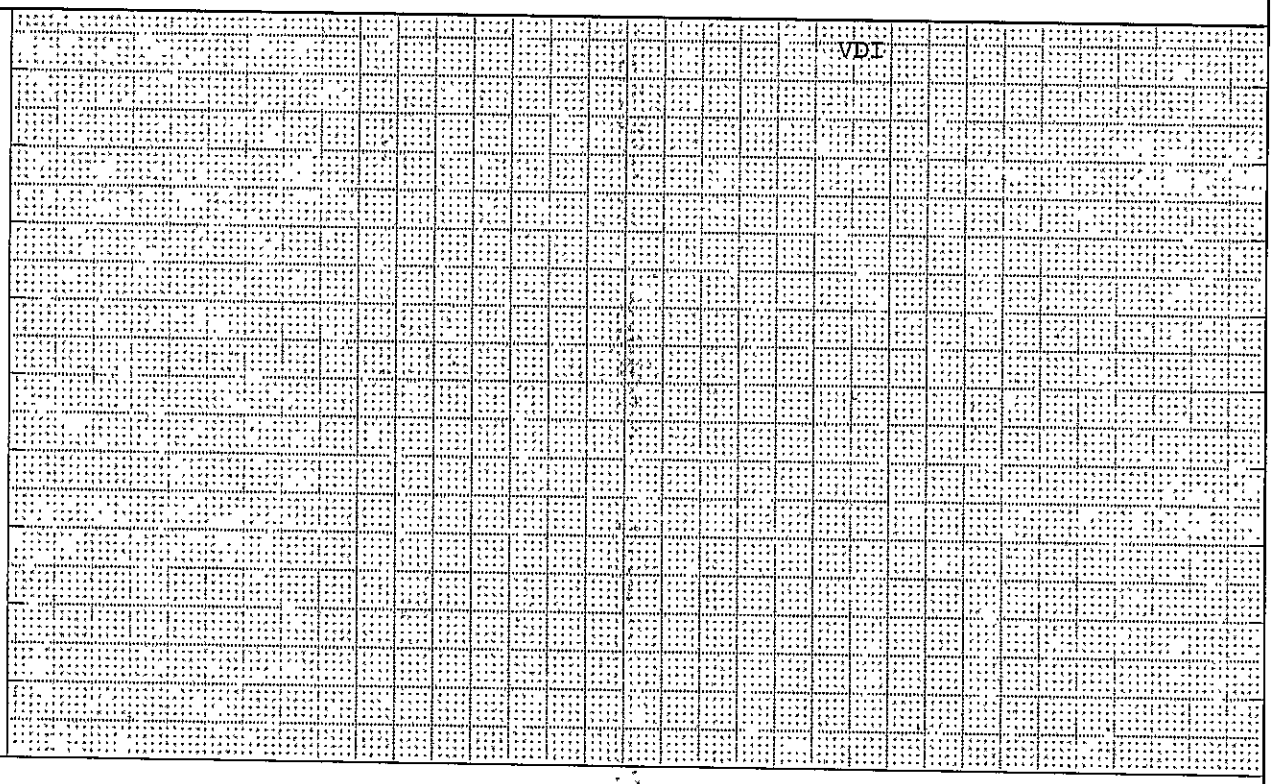
Ruota cilindrica Evolvente/Elica

Nr. prog.: STI0412_06 0	P26 B7590	Controllore:	turno b	Data:	24.01.2017 16:40
Denominazione:	Input Outer Z52	Numero denti z	52	Largh.fasc.dent. b	13.85mm
Numero disegno.:	250.6.4384.35-IG H	Modulo m	1.6mm	Tratto evolv. La	10.56mm
Commessa/serie nr.:	5	Angolo pressione	17.5°	Tratto elica Lß	11.08mm
Masch.Nr.:	M001 Spindel: Formnext	Angolo elica	29°	Inizio elab. M1	11.38mm
Untersuchungszweck:	Laufende Messung	ø Base db	89.4896mm	Palpatore ø	(#2C) 1mm
Werkzeug:	Charge:	Ang. Base	27.54°	Fat.scor.pr. x	.2





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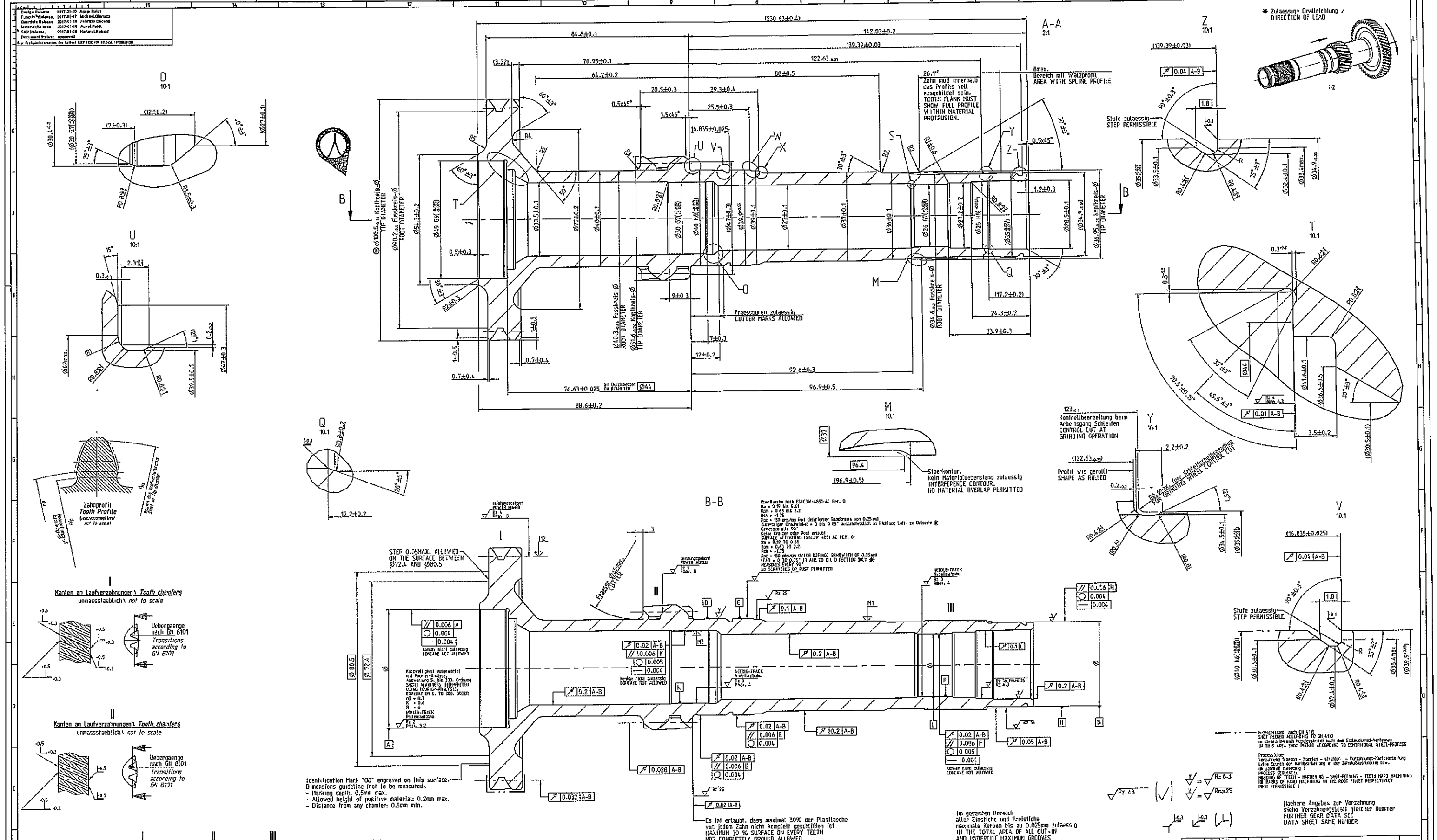
Drawing 4384 update from index "-" to "a"					
Short description:	a	1x	1007260_NIP_1	VIEW A-A: Konikkreis-Ø/TIP DIAMETER Ø100.5-0.26 was/WAS Ø100.5-0.2	20170110

	PPAP Requirements	Required	Note for ind. "b"	PPAP Docs updated
1	Design Records	Yes		Yes
2	Authorized Engineering change documents	Yes	see dwg	Yes
3	Customer Engineering approval	n.a.		
4	DFMEA	NO		
5	Process flow diagram(s)	NO		
6	PFMEA	NO	only drawing correction with increased tolerance	
7	Control plan	Yes	Correlation sheet change	Yes
8	Measurement system analysis studies	NO		
9	Dimensional results	Yes		Yes
10	Records of Material / Performance test results	NO		
11	Initial process studies	NO		
12	Qualified laboratory documentation	NO		
13	Appearance Approval Report (A.A.R.)	n.a.		
14	Sample Production Parts	Yes		Yes
15	Master sample	Yes		Yes
16	Checking aids	n.a.		
17	Customer-Specific Requirements	NO		
18	Part Submission Warrant (PSW)	Yes		Yes

	Other requirements			
1	PSW Raw part	NO		
2	PSW E.P. part	NO		
3	PSW Engagement Rings	NO		

Design Release	2017-01-10	Agapi Baldi
Functio Release	2017-01-17	Michael Glienicke
Geometr Release	2017-01-18	Fabrizio Criscuolo
Material Release	2017-01-20	Agapi Baldi
SAP Release	2017-01-26	Hartmut Kobold
Document Status: approved		

Nur Freigabeinformation für Software STEP FILE FOR RELEASE INFORMATION!



	I	II	III
Aussenverzahnung / EXTERNAL GEAR			
Zahnwelle/ SPLINE DATA EXTERNAL			SAE PIPs 32164
Bezugsdurchmesser / REFERENCE DIAMETER D_B			
Modul / NORMAL MODULE m_n	1.600	2.000	0.793750
Zahnezahl / NUMBER OF TEETH z	52	21	46
Eingriffswinkel / NORMAL PRESSURE ANGLE α_n	17.5°	20.0°	30.0°
Grundschraegungswinkel / HELIX ANGLE β	29°	22.0°	0°
Richtung / HAND OF HELIX	RIGHT, rechts	RIGHT, rechts	STRAIGHT, gerade
Bezugsprofil / BASIC RACK			
Profilverschiebung/-Faktor MODIFICATION FACTOR	Nominal / nominal	0.320	0.780	-0.166
Qualitaet / GEAR TOOTH QUALITY DIN/ISO		8	8	
Toleranzklasse / TOLERANCE CLASS				
Zahndicke / TOOTH THICKNESS s_n	effective meas.			1.056
Gleitmaß / BASE DIMENSION				
Zahndicke / TOOTH THICKNESS s_n	max.	2.715	3.709	1.013
Eingriffsmaß / ACTUAL	min.	2.685	3.679	0.978
Messkugel D / BALL DIA D_M		3.00	3.00	1.50
Messmaß / MEASUREMENT OVER BALLS M_{DK}	max.	100.553	49.712	38.441
Eingriffsmaß / ACTUAL	min.	100.472	49.643	38.382