

■ ■ ■ GETRAG		Verzahnungsblatt		Z-Nr.: 251.1.1093.50	z = 54
Aussen - Verzahnung				Remark:	
Gegenrad: ./. i 54 / 54 a ./. Type: 251 Gang: SR7.Gg.		i / a		Besteller: Renault	
z 54	m_n 1.000000	α 30 ° 0 ' 0 "	β 0 ° 0 ' 0 "	GERADE	
x -0.050	d 54.000	d_b 46.765	d_a 54.80 _{-0.19}	d_f 52.80 _{-0.63}	
Toleranzklasse 9			Zahndicke sn 1.454 ÷ 1.409		
Gutlehre hat Priorität gegenüber Prüfung der Einzelabweichungen			Zahnweite Wk über k = 9 Zähne		
Zweifl.-Wälzabw. f_i "		Einfl.-Wälzabw. f_i '		fertig: 25.539 ÷ 25.500	
Zweifl.-Wälzsprung f_i "		Einfl.-Wälzsprung f_i '		gestoßen: ÷ gefräst: ÷	
Profil-Formabw. $f_{f\alpha}$		Profil-Winkelabw. $f_{H\alpha}$		geschliffen: ÷	
Profil-Gesamtabw. F_α 0.023		Teilungs-Einzelabw. f_p 0.019		Diam. Zweikugelm. MdK, DM = 2.00	
Eingriffsteil.-Abw. f_{pe}		Teilungssprung f_u		fertig: 57.048 ÷ 56.974	
Teilungs-Ges.abw. F_p 0.045		Teilungs-Span.abw. F_{pk}		gestossen: ÷ gefräst: ÷	
Teilungs-Span.abw. $F_{pz/8}$		Rundlaufabw. F_r 0.050		geschliffen: ÷	
Zahndickenschwa. R_s		Flankenl.-Formabw. $f_{f\beta}$		Nutzkreise d_{Na} 54.61 d_{Nf} 52.93	
Flankenl.-Winkelabw. $f_{H\beta}$		Flankenl.-Ges.abw. F_{β} 0.012		Messstrecken pd_{Na} 14.10 pd_{Nf} 12.40	
Werkzeug		Bezugsprofil		DIN 5480	
Schleifscheibe		h_{aP0}		ρ_{aP0} b	
<p>Zahnwelle DIN 5480-W 55 x 1.00 x 54 x 9 e</p> <p>Lehrenmaß sn max. eff. = 1.480</p>					
Buchst.	Änd.-Nr.	Änderung		Datum	Name
VBL erstellt: CRICENTI Datum: 2015-12-07 Ersatz für:					

		Geardata-Sheet			D-No.: 251.1.1093.50		z = 30																
External gearing				Remark:																			
Mating gear: ./.		i 0 / 30		a ./.		Type: 251		Speed: SR 7Gg															
		i /		a		Customer: RSA																	
z 30 -		m _n 1.850000		α 17 ° 30 ' 0 "		β 31 ° 0 ' 0 "		LEFT															
x -0.050		d 64.748		d _b 60.767		d _a 69.70 _{-0.20}		d _f 58.00 _{-0.35}															
Gear quality; Tolerance zone					Tooth thckn. sn [2.847 ÷ 2.817]																		
Test group acc. to DIN 3961 of Aug. 78 -					Base tangent length over 5 teeth																		
Radial composite err. F _i ''		Tangent. comp. err. F _i '		finished: [25.700 ÷ 25.672]																			
Rad. tooth to tooth comp. err. f _i ''		Tang. tooth to tooth comp. err. f _i '		shaped: 25.907 ÷ 25.872																			
Profile form error f _{fα}		Profile angle error fHα		ground: ÷																			
Total profile error Fα		Adjacent pitch err. fp		Measurement over 2 balls DM= 3.00																			
Normal pitch error f _{pe}		Diff. bet. adj. pitch. fu		finished: [68.305 ÷ 68.215]																			
Cumulative pitch error F _p		Cum. circ. pitch err. F _{pk}		shaped: 68.934 ÷ 68.829																			
Cum. circ. pitch err. 1/8 extent F _{pz} /8		Radial run-out Fr		ground: ÷																			
Range of tooth thckn. error Rs		Longit. alignm. err. f _{fβ}		usable diameter dNa		68.50		dNf 61.99															
Tooth alignment err. fHβ		Total alignment err. Fβ		rad. of curvature pdNa		15.81		pdNf 6.13															
Tool		FRW - 329593		m _{n0} 1.810787		α _{n0} 12.7165 °		β ₀ 30.2730 °															
grinding wheel		h _{aP0} 3.300		ρ _{aP0} 0.562		b																	
FOR PREMACHINING ONLY (HARD CONDITION) !																							
Final measurement dimensions (gear errors and modifications) see final check gear data !																							
Correction dimensions for machining in hard and soft condition in accordance with final measurement dim. !																							
Root diam. (soft): d _f = 57.95 -0.26 Premachining with comma chip (soft): fHα = 15 μm Measurement according to the tool data, fHα ca. 0 μm																							
Feedback soft - hard analysis necessary?																							
<table border="1"> <tr> <td>Ch.ind.</td> <td>Ch. No.</td> <td colspan="3">Changes</td> <td>Date</td> <td>Name</td> </tr> <tr> <td> </td> <td> </td> <td colspan="3"> </td> <td> </td> <td> </td> </tr> </table>										Ch.ind.	Ch. No.	Changes			Date	Name							
Ch.ind.	Ch. No.	Changes			Date	Name																	
VBL created: CRICENTI Date: 2015-12-07 Subst. for:																							

soft- hard analysis on date:

no
yes X

Feedback soft - hard analysis necessary?

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Date: 28/10/16
Author: M. Corsini

Reason for analysis: <i>Motivo dell'indagine:</i>	PPAP
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Requester: <i>Richiedente:</i>	WLQ - Stefano Picerno
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Part Name: <i>Nome particolare:</i>	SPEED GEAR 7th / Schaltrad 7. Gg.
Material: <i>Materiale:</i>	GCG_805000 Part 2
State of part: <i>Stato del particolare:</i>	Finito

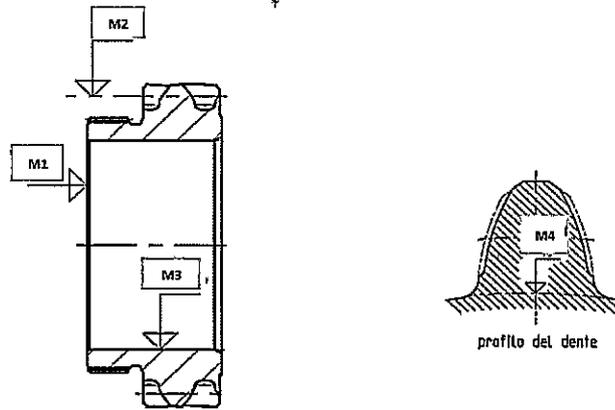
P/N:	251.1.1093.50
S/N:	-
Customer: <i>Cliente:</i>	-

Result: <i>Risultato:</i>	OK
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Distribution list: <i>Lista di distribuzione:</i>	WLQ - S. Picerno ME - L. Landriscina ME - G. Dachille
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Notes: <i>Note:</i>	
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Drawing (Disegno)



Picture 1: estratto del disegno del particolare, posizione dei punti di misura per le caratteristiche metallurgiche.

Cleanliness Analysis (Analisi della Pulizia)

Sampler	G. Ferrara	Spray equipment	Flushing cabinet Hydac CTU-1230-M-Z-R
Sampling point	ORE 11033 washing machine outlet	Spray method	QPS WLQ2_034
Sampling date & time	27/10/2016 - ore 12:00	Membrane material	cellulose nitrate
Wetted surface [cm²]	169,12	Pore size [µm]	5,0
Gravimetric evaluation [mg/1000cm²]	0,72	Max allowable residual dirt [mg/1000cm²]	2,5

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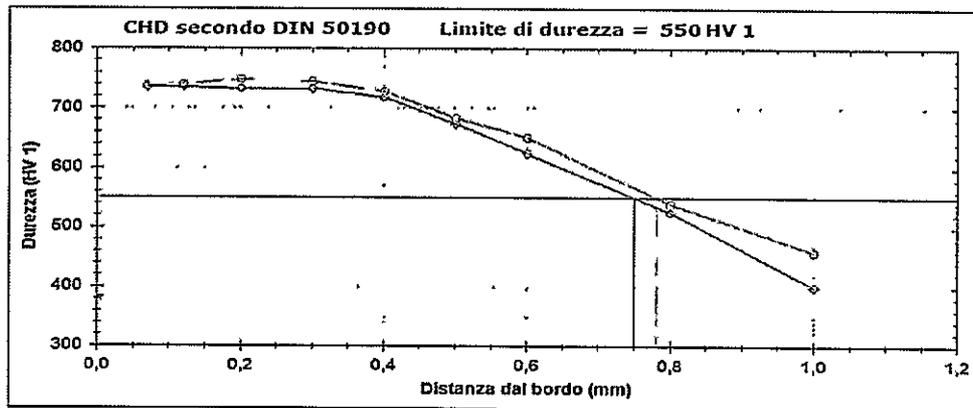
Date: 28/10/16
Author: M. Corsini

Surface Hardness Verification (Verifica Durezza Superficiale)

Scale	Position	Values [mm]	Range	Component
HRC	M1	60,7	-	Gear
HRA	M1	81,8	80.5 + 2.5	Gear

CHD Verification (Verifica CHD)

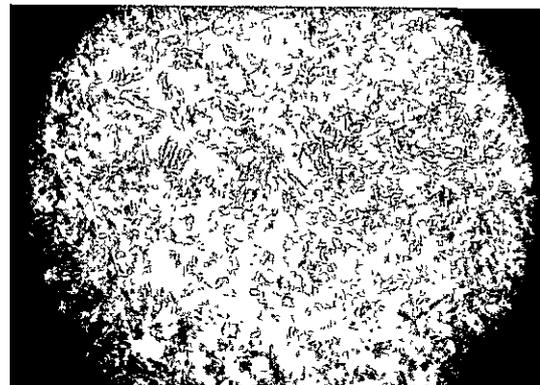
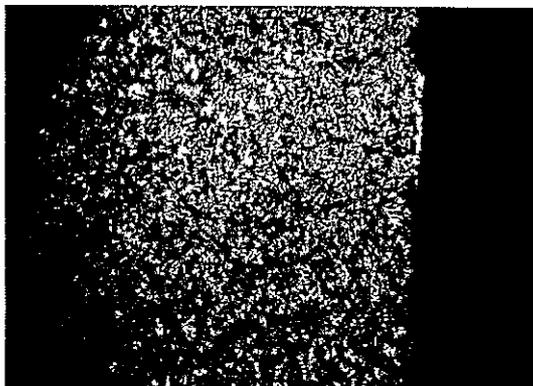
	Sample	Position	Measured Value	Range
CHD 550 HV1	3354/16	M2	0,78	0.50 + 0.40 mm
CHD 550 HV1	3354/16	M3	0,75	min. 0.30 mm
Core hardness HV10	3354/16	M4	382	≥ 300



Picture 2: profili di durezza.

Analysis at Metallographic Microscope (Analisi al Microscopio Metallografico)

Sample # 3354/16	
Gear - Tooth flank surface structure:	10% austenite residua
Gear - Tooth base core structure:	martensite + bainite



Picture 3: Microstruttura sul fianco dente (a sinistra) ed a cuore sulla base dente (a destra), ingrandimento 500x.