

<b>JOHN DEERE</b>										Format No:- AP04:460:10J													
<b>MATERIAL LABORATORY REPORT</b>																							
Report No:- CGCF20171205007																							
Part No/Part ID:				1306 / SU 30991				Part Name				HEL GEAR 4TH RANGE DRIVE				Date:		2017-12-05					
Qty				256				Customer:				JOHN DEERE				Batch Code		D17M04					
Furnace ID				CGCF				Quench Media/Grade:															
<b>Process Parameter</b>																							
PARAMETRS		CARBURIZING		DIFFUSION 1/2		HARDENING		QUENCH OIL		TEMPERING		Remark											
		SET	ACTUAL	SET	ACTUAL	SET	ACTUAL	SET	ACTUAL	SET	ACTUAL	remark											
TEMP°C		910	2	1	2	12	2	12	12	t1	t2												
TIME1(Minute)		12	8	12	2	1	2			12	2												
CP		1.10	2	1	2	12	2																
1) Raw Material:				20MnCr5				Steel Code:				r2j											
1.1 Chemistry																							
Elements (%) →										C	Mn	S	P	Si	Ni	Cr	Mo	V	Al	B	Cu		
Min										0.17	1.10	--	--	--	-	1.00	-	-	-	-	-		
Max										0.22	1.40	0.035	0.035	0.40	-	1.30	-	-	-	-	-		
Observation										0.17	0.84	0.006	0.012	0.24	0	0.97	0.002	0	0.026	0	0		
1.2 Inclusion Rating : (Worst Field Rating)										Specification				Type →				A	B	C	D		
														T/H				Max	3/2	3/2	1/1	2/1.5	
										Observation								1.0/0	0.5/0	/0	1.0/0		
2) Heat Treatment: JDV2 HT10T per JDV 21-Case carburised, hardened & tempered																							
										2.1 Hardness													
										Location		Specification				Observation							
										SURFACE		58-61 HRC				60							
										RCD		25-45 HRC				42							
												80 MIN.HRA				-							
										2.2 Effective Case Depth at													
Location		Specification (mm)				Observation (mm)																	
PCD		0.6-1.0				0.90																	
RCD		0.36				0.80																	
BORE		0.50 MIN,				-																	
2.3 Hardness traverse report (Distance from surface )																							
in mm	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0			
→																							
PCD	724	706	687	679	668	634	598	551	514	501													
RCD	720	704	672	651	614	584	540	515	496														
B/G ID	704	682	644	600	562	530	514	490															
2.4 Microstructure: Inspect as per JDV21																							
Microstructure Photographs										Location				Specification				Observation					
500x										Case				Fully Tempered Martensite R.A				Fully Tempered Martensite					
										Case				T.M.+R.A.<25%				T.M+R.A.5-10%					
										Carbides Network				Nil				Nil					
										% ITP at Surface				Nil				Nil					
200x										PCD				0.30 MIN.				-					
										RCD				0.15 MIN,				-					
										RCD				<25				-					
500x										CORE				LCM+BAINITE				L.C.M+Bainite					
Magnetic Particle Inspection										No Crack Allowed				5 part/lot				No Crack Found					
*- In case RA is more than 25%, check Hardness(with 100 gm load) at 0.1 mm it should be 58 HRC Min.																							
Disposition:- ACCEPTED																							
Remarks :- OK																							
Checked by :-								Verified by :-				Chandrpal singh ranawat				Approved by :-				Ravindra kale			