

										Format No:- AP04:460:10Z																			
MATERIAL LABORATORY REPORT																													
Report No : U2F31804078																													
Part No/Part ID: 825 / 1325302072				Part Name: INPUT SHAFT				Date: 2018-04-28																					
Qty: -				Customer: ZF				Batch Code: E2D18390																					
1) Raw Material : 20MnCr5				Heat No: K115918				Steel Code: U566																					
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										0.19	1.18	0.026	0.019	0.19	-	1.06	-	-	-	-	-								
2) Heat Treatment: Case carburised, hardened & tempered																													
<p style="text-align: center;">HARDNESS TRAVERSE GRAPH</p>										2.1 Hardness																			
										Location					Specification					Observation									
										GEAR FACE AND SPLINE OD					59-63 HRC					60									
										At machine area on OD					59 min.. HRC					59									
										Core AT RCD					295 HBW Min. HBW					311									
2.2 Effective Case Depth @ 610HV1																													
Location					Specification (mm)					Observation (mm)																			
PCD					0.60-1.0					0.96																			
										-																			
AT Machine area					0.55 MIN,					0.75																			
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	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0									
PCD	765	751	738					661	640	580																			
RCD																													
B/G OD	740	700	680				642	580																					
2.4 Microstructure:																													
Location										Specification										Observation									
CASE										Tempered Martensite with 5 - 30 % RA										T.M+R.A.5-10%									
Carbides Network										Nil																			
CORE										Low Carbon Martensite + Bainite with 5% ferrite Maximum										L.C.M+Bainite									
IGO- RCD										<20										17									
Disposition:- ACCEPTED																													
Remarks :- OK																													
Checked by :- Jai narayan				Verified by :- Rajvardhan gautam				Approved by :- Ravindra kale																					