

HAPPY FORGINGS LIMITED, LUDHIANA				METTALURGICAL TEST REPORT					
				RAW MATERIAL BILLET/FORGINGS					
				(FROM SUB CONTRACTOR)					
				(DOC. NO. FM:HT-LB-11)					
CUSTOMER	M/s	VE Commercial Vehicles Ltd. (DEWAS)							
STEEL MILL	M/S	VARDHMAN			REPORT NO.	652			
CHALLAN NO.					DATE	05.02.2018			
HEAT NO.		U-63551			SECTION SIZE	70 DIA			
GRADE		1E1120			NO. OF BARS/BILLET				
QTY.	E	31105/31107/3149			LENGTH RANGE	4.5 TO 5.5 MTRS			
PART NO.					COLOUR CODE	WHITE BASE+RED DOT			
CHEMICAL PROPERTIES									
SPE		C%	Mn%	Si%	S%	P%	Cr%	Ni%	Mo%
MIN.		0.19	0.80		0.015	-	0.45		0.08
MAX		0.23	1.10	0.18	0.025	0.050	0.70		0.25
HFL OBSERVED		0.203	1.08	0.147	0.018	0.019	0.663	0.083	0.113
PHYSICAL PROPERTIES									
INTERNAL SOUNDNESS		C2 R1 S1							
GRAIN FLOW									
SURFACE HARDNESS(BHN)									
UPSETTING TESTING		OK							
METALLOGRAPHY									
GRAIN SIZE-ASTM E-112		ASTM-7							
INCLUSION RATING WORST FIELD AS PER ASTM E-45		A		B		C		D	
		TK	TN	TK	TN	TK	TN	TK	TN
		0	1.5	0	0.5	0	0	0	1
JOMINY TRASVELET									
DISTT.		J1.5MM	J5MM	J13MM					
SPEC.		43-48	34 MIN	29 MAX					
HFL OBSERVED HRC		44	41	25					
REMARKS									
MILL T. C. ENCLOSED									
AUTHORISED SIGNATURE									