

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.	448		
CHALLAN NO.					DATE	02.02.2018		
HEAT NO.		U-63545			SECTION SIZE	90 RCS		
GRADE		1E1120			NO. OF BARS/BILLET			
QTY.		31115/31123			LENGTH RANGE	4.5 TO 5.5 MTRS		
PART NO.					COLOUR CODE	WHITE BASE+RED DOT		
CHEMICAL PROPERTIES								
SPEC.	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	0.215	1.07	0.135	0.017	0.013	0.66	0.0500	0.105
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	39.5	24					
REMARKS	MILL T. C. ENCLOSED							
AUTHORISED SIGNATURE								