

VE COMMERCIAL VEHICLES LIMITED.
(UNIT : EICHER ENGINEERING COMPONENTS; DEWAS)

CONTROL PLAN

PREV. OPN. 070 - PRE. HT. INSPECTION
NEXT. OPN. 090 - TEETH CHAMFERING
SURFACE FINISH: APO4 : 160 : 20
DOC. NO. : REV-01 (DATE-05.10.17)

CONTROL PLAN NO : 3254 / 080

KEY CONTACT PERSON :- SSK

CORE TEAM :- ALM, SK, SRS, SNP, IDS, MM, RK

REVISION

EFF DATE 27.10.17 EFF DATE EFF DATE

LOCATION → REST →→→

CLAMP — N →

SPL CHAR. (CRITICAL DIMN.)

EECD

CUSTOMER.

A B C

PROTOTYPE PRELAUNCH PRODN

MATERIAL :- 1E1120A

Comp. Wt. = 23.814 Kg.

* HEAT-TREATMENT :-

MARKING ;
PRE-WASHING ;
PRE-HEATING ;
CARBURISING ;
HARDENING ;
POST-WASHING ;
TEMPERING ;
DEGREASING ;
SHOT BLASTING ;

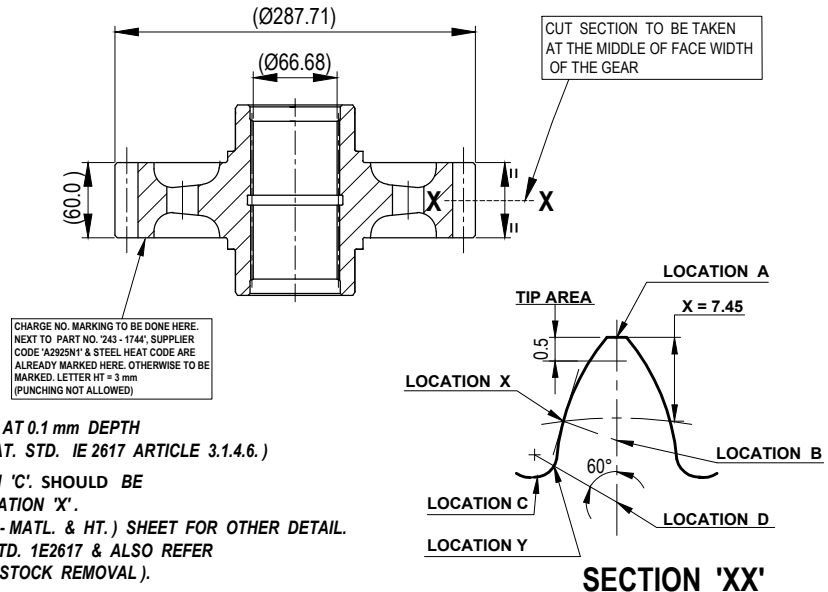
NOTE:

1) HARDNESS TO BE MEASURED AT 0.1 mm DEPTH
FORM LOCATION 'X' (REFER CAT. STD. IE 2617 ARTICLE 3.1.4.6.)

★ 2) EFF. CASE DEPTH AT LOCATION 'C'. SHOULD BE
Min. 60% OF Min. ECD. AT LOCATION 'X'.

3) REFER TECHNICAL REVIEW (TR - MATL. & HT.) SHEET FOR OTHER DETAIL.

4) FOR ECD REFER CUSTOMER STD. 1E2617 & ALSO REFER
CUSTOMER STD. 1E2261 (FOR STOCK REMOVAL).



FIXTURE.	FIX. NO.	TOOL	NO.
H.T. FIXTURE ASSLY. (WT 61.76 Kg.) APPROX.			
BASE TRAY	G. 065 - 001		
GROOVED PLATES	G. 065 - 003		
HORIZONTAL RODS, VERTICAL RODS & SLEEVES			

SR. NO.	CHARACTERISTICS		SPL CHAR CLASS	PRODUCT SPECIFICATIONS	EVALUATION MEASUREMENT TECHNIQUE		SAMPLING		RESP.	CONTROL METHOD	CORRECTIVE ACTION / REACTION PLAN
	PRODUCT	PROCESS			INSTRUMENT	NO.	SIZE	FREQ			
1.	AS QUENCHED HARDNESS			60 HRC MIN.	HARDNESS TESTER	---	1 PC	PER CHARGE	INSP.	TESTING	CHECK FURNACE SETTING DATA & CONFIRM.
2.	EFF. CASE DEPTH AT 50 HRC. AT LOCATION 'X' (SEE TOOTH VIEW FOR LOCATION)			PROCESS 0.7 ~ 1.1 mm. FINAL REQ. 0.5 ~ 1.0 mm.	MICRO-HARDNESS TESTER	---	1 PC	PER CHARGE			
3.	EFF. CASE DEPTH AT LOCATION 'C'			0.30 mm. MIN.		---					
4.	SURFACE HARDNESS #			77 HR 30 MIN.	HARDNESS TESTER	---	1 PC	PER CHARGE			
5.	HARDNESS AT 1.0 mm DEPTH AT LOCATION 'X'			30 MIN. HRC.		---					
6.	HARDNESS AT MID TOOTH AT LOCATION 'B'			25 ~ 48 HRC.		---					
7.	CORE HARDNESS AT LOCATION 'D'			48 HRC. Max.		---					
8.	MICROSTRUCTURE			AS PER CUSTOMER STD 1E2318 ACCEPTABLE BAINITE AT - 0.02 MM DEPTH MAX. LOC. "X" B1 LOC. "C" B7	MICROSCOPE	---	1 PC	PER CHARGE			
9.	SHOT BLAST			FREE FROM RUST & SCALE	VISUAL	---	100%				
DRN BY		AMARDEEP		CHKD BY		R. PATHAK		APRD BY		B. LEVA	

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CONTROL PLAN

PREV. OPN.	NEXT. OPN.	SURFACE FINISH :	DOC. NO. :
070 - PRE. HT. INSPECTION	090 - TEETH CHAMFERING		AP04 : 160 : 20 REV- 01 (DATE- 05.10.17)

CONTROL PLAN NO : 3254 / 080

KEY CONTACT PERSON :- SSK

CORE TEAM :- ALM, SK, SRS, SNP, IDS, MM, RK

REVISION

EFF DATE	27.10.17	EFF DATE		EFF DATE	
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LOCATION →

REST →→→

CLAMP → N →

SPL CHAR.
(CRITICAL DIMN.)

B

EECD

◇

CUSTOMER.

REVISION

PROTOTYPE	✓	PRELAUNCH		PRODN	
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O.E.

EXPORT

PART NO. **ED 3254** (243 - 1744 / REV. - 03)PART NAME GEAR - OUTPUT OPN. NO. **080**

CUSTOMER CATERPILLAR

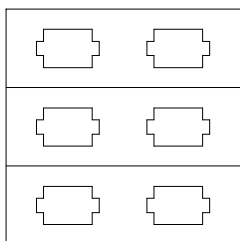
OPERATION *** HEAT - TREATMENT**

CELL [OPTIONAL]	M/C.	M / C NO.
	S.Q.F. - 3 & 6	(OPTIONAL)

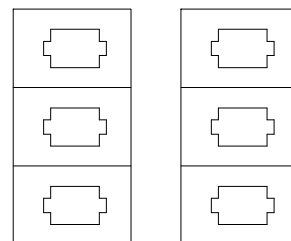
FIXTURE.	FIX. NO.	TOOL	NO.
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LOADING PATTERN

(TRAY LOADING) (MAX. 12 PARTS LOAD ONLY)



FRONT VIEW



SIDE VIEW

SR. NO.	CHARACTERISTICS		SPL CHAR CLASS	PRODUCT / PROCESS SPECIFICATIONS	EVALUATION MEASUREMENT TECHNIQUE		SAMPLING		CONTROL METHOD	CORRECTIVE ACTION/ REACTION PLAN
	PRODUCT	PROCESS			INSTRUMENT	NO.	SIZE	FREQ		
10.		TEMPER DELAY		2 HOUR MAX.						
11.		CHARGE NO. MARKING		REFER MARKING W.I. NO. <u>AP03 : 460 : 02</u> FOR SQF.						
12.		CARBURISING & HARDENING		REFER H. T. W.I. NO. <u>AP03 : 460 : 05</u> . STANDARD CYCLE SHEET No. <u>AP03 : 460 : 44</u> , H.T. PROCESS SHEET No. <u>AP04 : 460 : 02</u>						
13.		TEMPERING / PRE HEATING		REFER H. T. W.I. No. <u>AP03 : 460 : 16</u> , STANDARD CYCLE SHEET No. <u>AP03 : 460 : 44</u>						
14.		SHOT BLASTING		REFER H. T. W.I. No. <u>AP03 : 460 : 06</u>						
15.		WASHING		GENERAL PROCEDURE , REFER H.T. W.I. No. <u>AP03 : 460 : 04</u>						

DRN BY

AMARDEEP

CHKD BY

R. PATHAK

APRD BY

B. LEVA

PAGE
02 / 02

VE Commercial Vehicles Ltd. Unit : Eicher Engineering Components, Dewas			S.Q.F 3 STANDARD CYCLE SHEET FOR CAT				Doc No	AP03:460:44		
							Rev. No.	0 (03.01.2012)		
							Rev. Date	01.10.2017		
S.N.	Process Parameter		Set Value	Process Tolerance		S.N.	Parameters		Set Value	Process Tolerance
1	Endo Flow (NM3/HR)		10	± 2		7	Prewashing Temp		70°C	± 10
2	LPG Flow (LPH)		400	± 200		8	Prewashing Time		30 Min	± 10
3	Endo Generator Temp.		1020°C	± 5		9	Preheating Temp		400°C	± 20
4	Endo Generator Dew poin		5	± 2		10	Preheating Time		90 min	± 30
5	Tempering Temperature		170°C	± 10°C		11	Soaking Time		30 min	± 10
6	Carbon Potential (Cp)	Carburising	1.10	± 0.10		12	Quenching Time		30 mins	± 10
		Diffusion 1	0.90	± 0.10	13	Tempering Time		90 mins	± 30	
		Diffusion 2	1.10	± 0.10	14	Residual Temp		75 -110°C	--	
		Soaking	0.90	± 0.10	15	Tempering Dealy Time		2 Hr maximum		
S.N.	ITEM CODE	EECD PART NO.	Material Grade	Carb+Diff Temp. (± 10°C)	Soaking Temp (± 10°C)	Quench Oil Temp (± 2°C)	Carb Time (±20 mins)	Diff Time (± 10 Mins)	Agitation (± 200 RPM)	Remarks
1	2087635	3204	1E1120A	930	840	43	115	55+20	1000	
2	2802139	3205	1E1120A	930	840	43	210	55+20	1000	
3	2S7832	3206	1E1120A	930	840	43	210	55+20	1000	
4	3P2983	3207	1E1120A	930	840	43	230	55+20	1000	
5	3P3059	3208	1E1120A	930	850	43	230	100+30	1000	
6	3P8014	3209	1E1120A	930	840	43	210	55+20	1000	
7	3T3072	3211	1E1120A	930	850	43	230	55+30	1000	
8	3T3077	3212	1E1120A	930	840	43	230	55+30	1000	
9	5S7065	3213	1E1120A	930	840	43	100	55+20	1000	
10	7G1137	3214	1E1120A	930	840	43	230	55+30	1000	
11	9G327	3216	1E1120A	930	840	45	115	55+20	1000	
12	9P3709	3218	1E1120A	930	840	43	115	55+20	1000	
13	419-0183	3229	20MnCr5	930	840	43	250	55+20	1000	
14	246-8757	3222	1E1120A	930	840	43	210	55+20	1000	
15	8E1682	3224	1E1120A	930	840	43	210	55+20	1000	
16	4665108	3226	20MnCr5	930	850	42	120	55+30	1000	
17	4665109	3227	20MnCr5	930	850	42	120	55+30	1000	
18	2G7244	3228	1E1120A	930	850	43	270	140+30	1000	
19	9G9621	3267	1E1120A	930	850	42	180	55+20	1000	
20	1110329	3268	1E1120A	930	850	42	180	55+20	1000	
21	8P7245	3215	1E1120A							
22	9G1918	3217	1E1120A	930	850	43	220	60+20	1000	
23	9S8839	3219	1E1120A	930	850	43	115	55+20	1000	
24	8E1894	3221	1E1120A	930	850	43	220	60+30	1000	
25	3233933	3223	1E1120A	930	850	43	130	55+20	1000	
26	1317419	3252	1E1120A	930	850	43	160	55+30	1000	
27	1941021	3253	1E1120A	930	850	42	180	55+20	1000	
28	2431744	3254	1E1120A	930	850	42	210	55+20	1000	
29	2531337	3255	1E1120A	930	850	43	115	55+20	1000	
30	3412037	3257	1E1120A	930	850	42	210	55+20	1000	
31	3859268	3258	1E1120A	930	850	42	210	55+20	1000	
32	7T-1662	3262	1E1120A	930	850	43	140	60+20	1000	
33	3P8163	3210	1E1120A	930	850	43	260	130+30	1000	
34	389-3085	3263	1E1120A	930	850	43	130	60+20	1000	