MACHINED COMPONENTS (GROUP -IV)

Sl No	LF No	Drawing No	Nomenclature
1	6106401050	172.40.146	RING ENGAGING EXTREME RIGHT
2	6106401051	172.40.147	INITIATING RING MIDDLE R.H
3	6106401052	172.40.148	ENGAGING RING EXTREME LH
4	6106401053	172.40.149	ENGAGING RING MIDDLE, LH
5	6106401065	172.40.225	RELEASE RING III FRICTION CLUTCH
6	6101040031	172.40.225-1	3RD FRICTION CLUTCH RELEASING RING
7	6106401068	172.40.229	BOOSTER INNER
8	6106401070	172.40.231	BOOSTER
9	6106401071	172.40.232	BOOSTER
10	6106401084	172.40.246	EPICYCLE OF TRAIN IV
11	6106401085	172.40.247	GEAR CROWN 3RD PLANETORY GEAR SET
12	6106401096	172.40.270	BOOSTER
13	6101040033	172.40.270-1	BOOSTER
14	6106401097	172.40.271	CROWN
15	6106401098	172.40.308	DISCHARGE RING
16	6101040041	172.40.308-1	RELEASE RING
17	6101040042	172.40.309	CROWN GEAR OF 2ND PLANETARY GEAR SET
18	6101040043	172.40.310	CROWN GEAR OF 3RD PLANETARY GEAR SET
19	6101040044	172.40.311	EPICYCLIC GEAR OF 4TH PLANETARY SET
20	6101040052	172.40.319	DRUM
21	6101040053	172.40.320	CROWN
22	6101040054	172.40.321	BOOSTER
23	6101040055	172.40.322	INNER BOOSTER
24	6101040056	172.40.323	INNER BOOSTER
25	6101040057	172.40.324	BOOSTER
26	6101040059	172.40.326	THRUST DISK
27	6101040061	172.40.328	RIGHT HAND REAR ENGAGING RING
28	6101040062	172.40.329	RIGHT-HAND MIDDLE ENGAGING RING
29	6101040063	172.40.330	LEFT HAND REAR ENGAGING RING
30	6101040064	172.40.331	LEFT-HAND MIDDLE ENGAGING RING
31	6101040108	172.40.366	STOPPING BRAKE HOUSING (RIGHT-HAND)
32	6101040109	172.40.367	STOPPING BRAKE HOUSING (LEFT-HAND)
33	6106404014	172.43.008	PACKING COVER
34	6106401118	175.40.021	HOUSING OF MAIN BRAKE RH
35	6106401119	175.40.022	HOUSING OF MAIN BREAKE L
36	6106401120	175.40.023	BOOSTER INNER
37	6106401127	175.40.025	CROWN GEAR OF 2ND PLANETARY GEAR SET
38	6106401128	175.40.026	DRUM
39	6106401126	175.40.027-2	BOOSTER OUTER
40	6106401131	175.40.030-1	BOOSTER
41	6106401132	175.40.031	THRUST DISC
42	6106401146	175.40.052	BOOSTER BODY RIGHT
43	6106401147	175.40.053	HOUSING LH BOOSTER
44	6106402034	175.41.050	HUB FAN STEEL 38XC
45	6106402035	175.41.051	PLATE PRESSURE
46	6106406229	175.45.112	TOOTHED COUPLING
47	6101041013	188.41.006	FAN HUB

MACHINED COMPONENTS (GROUP -IV)

Sl no.	Nomenclature & drawing No.	Manufacturing technology & Testing / Inspection Facilities required to produce the item		Must be possessed by the vendor in his premises (P&M list and testing / inspection equipment list to be submitted)	May be possesed by the vendor in his premises or out sourced (Self declaration to be submitted)	FIRM Comp-liance (Y/N)	Remarks
1	Components as per enclosed list of Machined Components (Group IV) Total items = 47 Nos	**TECHNOLOGY-I**	Turning	CNC Turning dia 600mm suitable to accommodate component of diameter in the range of dia 250 to 600mm with 0.010mm accuracy			
			Milling & Drilling	HMC and/or VMC suitable to the components upto the size 630mm diameterwith 0.010 accuracy			
			Gear Hobbing		Gear Hobbing of Mod 3 x cutting ø400 with gear cutting accuracy of class of Din 7 or better accuracy		
			Gear Shaping		Gear Shaping of Mod 5 with gear cutting accuracy of class of Din 7 or better accuracy.		
		TECHNOLOGY-3	Hardening & Tempering		Hardening & Tempering furnace with Oil quenching facility		
			Protection coating		Oxidising Plant		
		TECHNOLOGY-4	Raw material		Firm should be capable to arrange the raw material like Forging, Casting, Bar material etc as per drawing specification and standard.		

(D.SATHISH KUMAR)
WM/QA(NF& QMSC)

(LUXMAN SINGH)
WM/TRG-II,HT & EP

(K.DURAIRAJ)
JWM/Trans -II

Sl no.	Nomenclature & drawing No.	Manufacturing technology & Testing / Inspection Facilities required to produce the item		Must be possessed by the vendor in his premises (P&M list and testing / inspection equipment list to be submitted)	May be possesed by the vendor in his premises or out sourced (Self declaration to be submitted)	FIRM Comp-liance (Y/N)	Remarks
1	Components as per enclosed list of Machined Components (Group IV)	**TEST / INSPECTION-1**	3D CMM	3D CMM 500 x 500mm.			
			Gear Profile Tester		Gear Profile Tester (Max module 5)		
			Surface Roughness Tester	Surface Roughness Tester for Ra &Rz values			
			Gauges	Standard Gauges for checking Holes and threads suitable to the requirement of the components. Firm should submit the undertaking in this regard that they will create the facilities within 6 months from the date of receipt of order.			
			Measuring Instruments	Gear Teeth Micrometer, Vernier Caliper, Groove Vernier, Radius gauge, Feeler Gauge etc. suitable to the requirement of the components			
		TEST / INSPECTION-2	Hardness measurement		Brinell / Rockwell Hardness Tester		

Note : Justification for alternate facilities may be shared to prove that alternate facilities can be utilised to manufacture the item wherever the facilities are mentioned above are not available, but vendor has alternate facilities.

(D.SATHISH KUMAR)
WM/QA(NF& QMSC)

(LUXMAN SINGH)
WM/TRG-II,HT & EP

(K.DURAIRAJ)
JWM/Trans -II

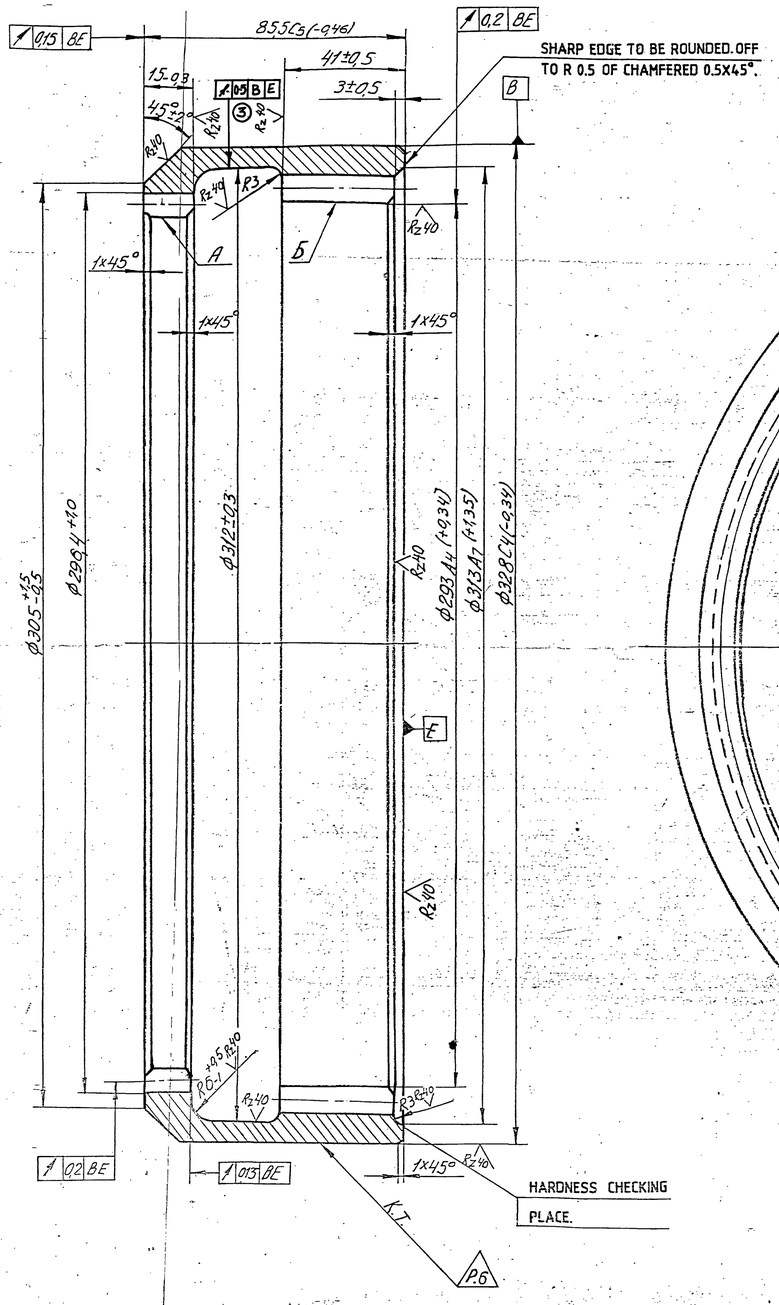
(J.P.SINGH)
GM-OPERATONS I

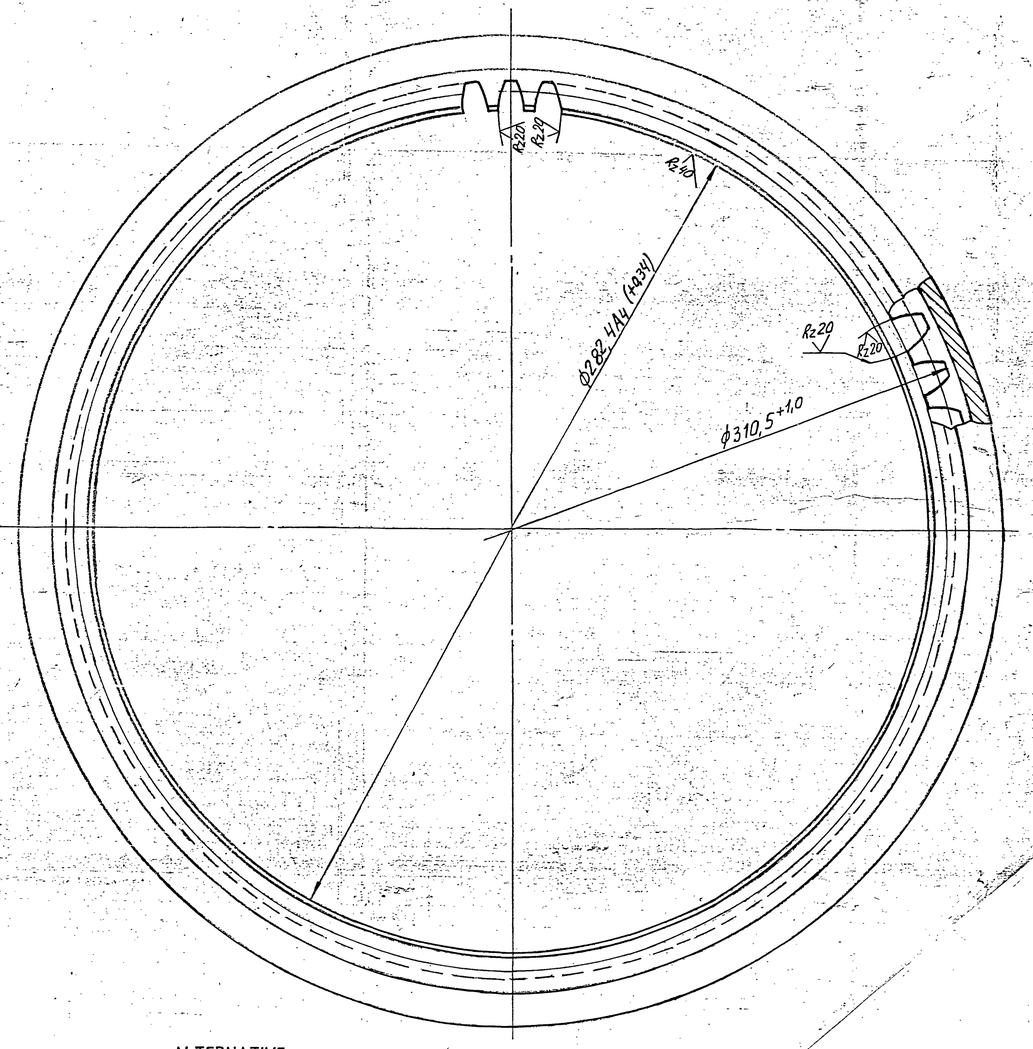
Alt to **(NEERAJ KUMAR)**
QA-RIG(OE)

(ANIMESH PAIK)
DGM/CA,TRG & RG

DRAWING NUMBER
172 40 246

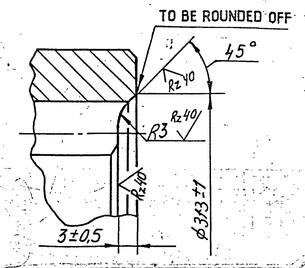
Rz 80





ALTERNATIVE

SCALE 2 : 1



		A	Б
BASIC RACK — MODULE	m	4	5
BASIC RACK — NUMBER OF TEETH	Z	72	60
BASIC RACK — PROFILE ANGLE	α_o	20°	20°
BASIC RACK — COEFFICIENT OF ADDENDUM	f'	0,7	0,7
BASIC RACK — COEFFICIENT OF DEDENDUM	f''	1,05	1,05
COEFFICIENT OF ADDENDUM MODIFICATION.	ξ_p	0	0
ACCURACY AS PER GOST 1643-56.	—	—	8-9-9
BASE TANGENT LENGTH	L	$104,04^{+0,5}_{+0,27}$	$100,144^{+0,15}_{+0,035}$
BASE TANGENT LENGTH TOLERANCE	δ_{oL}	—	0,075
COMPOSITE ERROR DOUBLE FLANK — TOTAL	δ_{oa}	—	0,19
COMPOSITE ERROR DOUBLE FLANK — TOOTH TO TOOTH	δ'_{ia}	—	0,11
TOTAL ERROR OF DISTORTION.	$\delta_{\beta o}$	—	0,025
MATING COMPONENT	—	175401.20	175401.40
FILLET RADIUS OF BASIC RACK.	ρ_i	0,2	$1^{+0,2}_{-0,1}$

1. BHN 341-285 (DIA OF INDENTATION 3.3-3,6).
2. RUN-OUT OF UNSPECIFIED SURFACES RELATIVE TO DATUM SRUFACES 'B' AND 'E' NOT TO EXCEED 0.3mm.
3. RELATIVE POSITION OF TEETH IS OPTIONAL.
4. COATING: CHEMICALOXIDIZING OIL FINISHED.
5. IN ABSENCE OF INSTRUMENT AND MASTER GERRS FOR RUN-OUT CHECRING, CHECK THE RUN-OUT OF RING 'Б' USING ROLLER . IN THIS CASE RUN-OUT OF REFERENCE CIRCLE RELATIVE TO ROLLER SHOULD NOT EXCEED 0,15 mm.
6. TO BE MARKED. BY IMPACT METHOD ON FACE OF GEAR RING 'A'
7. IT IS ALLOWED CHECK TOOTH M=4 USING MASTER GEAR IN WHICH CASE RUN-OUT RELATIVE TO DATUM SURFACES MUST NOT EXCEED 0.25 mm.
8. HAND-OF -HELIX TOLERANCE MAY INCREASE BY 0.03mm.

EXPLANATORY NOTE:

a) Reference material quoted.
Structural chromium silicon alloy steel good quality grade 38 XC gost 4543-71

a) Chemical composition: As per steel grade 38 XC gost 4543-71.

GRADE OF STEEL	CONTENT OF ELEMENTS %					
	C	Si	Mn	Cr	S MAX	P MAX
38XC	0,34-0,42	1,0-1,4	0,30-0,60	1,30-1,60	0,035	0,035

Residual content of copper and nickel should not exceed 0.30% each.

b) Mechanical properties: As per steel grade 38XC gost 4543-71.

GRADE OF STEEL	TENSILE STRENGTH kgf/mm²	YIELD POINT kgf/mm²	ELONGATION %	REDUCTION IN AREA %	IMPACT STRENGTH kgm/cm²
	MINIMUM				
38XC	95	75	12	50	7

PILOT SAMPLE SHOULD BE APPROVED BY A H S P BEFORE BULK PRODUCTION.

EST. MASS 7.7 Kg	TO BE STAMPED OR MARKED WHERE INDICATED THUS # (LETTERS)			DRN	MATERIAL : STEEL 38 X C GOST 4543-71
ALL SHARP EDGES AND CORNERS TO BE REMOVED UNLESS OTHERWISE STATED MACHINED CORNERS TO HAVE R OUTSIDE R INSIDE EQUIVALENT CHAMFERS ARE PERMISSIBLE				CHD	USED ON :- 172.40 023 Cb
				TCD	
				APPD	CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI
				DATE 11-09-88	
				SCALE - 1:1	
				DIMENSIONS IN mm.	TITLE
				TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS 2102-69	EPICYCLE OF TRAIN IV
ALL THREADS TO CONFORM TO					
5.	29.9.90	172 M. 429 'A' 88. Amdt. 11/3.		D S CAT NUMBER	DRAWING NUMBER 172 40 246
ISSUE	DATE	NATURE OF AMENDMENTS			

INDIANISED DRAWING PREPARED BASED ON ISSUE-2.
COMMON TO BLT

F-76
7

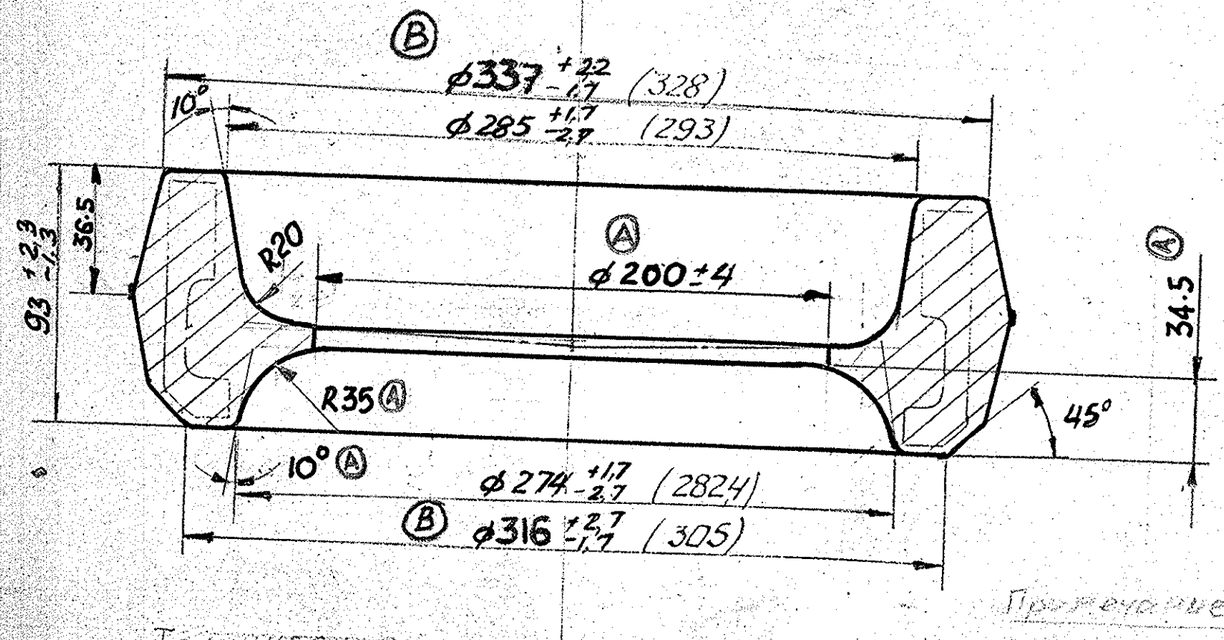
SIZE A1.

DRG. NO.

172-40-246/F

ISS.	MODIFICATION	DATE
B	DIA. 337 WAS DIA. 335 DIA. 316 WAS DIA. 313 REF. 07271/TRANS/MAT-22 PLG/40/07-08 DT 23/11/07	

ISS.	MODIFICATION	DATE
A	PIERCING DIA. 200 ±4 WAS 250 ±4 DIMN'S 34.5 WAS 10.0, R35 WAS 40-36.5 ADDED MODIFIED IN RELEVANT TO THE COLLABORATORS SD DRG. NO. ADK 1300 5836	



TECHNICAL REQUIREMENTS

1. HEAT TREAT: DIA OF INDN. ≯ 3.8 MM (255 BHN)
2. DESCALE (PICKLE)
3. IN MACHINING SURFACES, SURFACE DEFECTS AND SCALE PITS ARE ALLOWED UPTO 0.5 OF ACTUAL MACHINING ALLOWANCE. IN UNMACHINED SURFACES, WITHIN TOLERANCE LIMITS.
4. MISMATCH SHOULD NOT EXCEED 1.3 MM
5. RESIDUAL FIN ALONG THE PARTING LINE SHOULD NOT EXCEED 1.7 MM
6. BUCKLING SHOULD NOT EXCEED 1.5 MM
7. UNSPECIFIED DRAFTS: 7°
8. UNSPECIFIED RADII R: 4.0 MM
9. MACHINING DIMENSIONS ARE SHOWN IN BRACKETS
10. UNTOLERANCED DIMENSIONS ARE FOR CONSTRUCTION, NOT TO BE CHECKED
11. FOLDING OF FIN IN PIERCED HOLE / ALONG THE CONTOUR IS ALLOWED.
12. ECCENTRICITY OF PIERCED HOLE SHOULD NOT EXCEED 2.8 mm
13. MARK PART No. & STEEL GRADE.
14. TO BE COATED WITH RED OXIDE PAINT

Технические требования

1. Термообработать / $d_{отп} \geq 3,8$ /.
2. Очистить от окалины / Травить /
   Допускается !
3. Поверхностные дефекты и углубления от окалины до 0,5 фактического припуска не обрабатывать.
4. Перекос / сдвиг осей штампов / до 1,3 мм.
5. Высота от среза заусенца по линии разъема штампов до 1,7 мм.

Примечание

1. Неуказанные штамповочные уклоны до 7°
2. Неуказанные радиусы скруглений R 4 мм
3. Размеры без допусков для справок
4. Размеры в скобках для механообработки

TOOL NO.	TOOL DESCRIPTION	MACHINE	REMARKS
20368	PIERCING TOOL	6007	
20367	TRIMMING TOOL	6007	
20366	STAMPING DIES	DG-13	

DG-13

256

MATERIAL & GOST	FORGING WT. In KG
38XC 4543-71	22.6 Kg
ALTERNATE MATERIAL	
CHECKED Ramu 12/12/07	APPROVED S. Jarres 17/12
DRG. NO.	172-40-246/F
TITLE.	RIM, EPICYCLIC

HEAVY VEHICLES FACTORY AVADI MADRAS