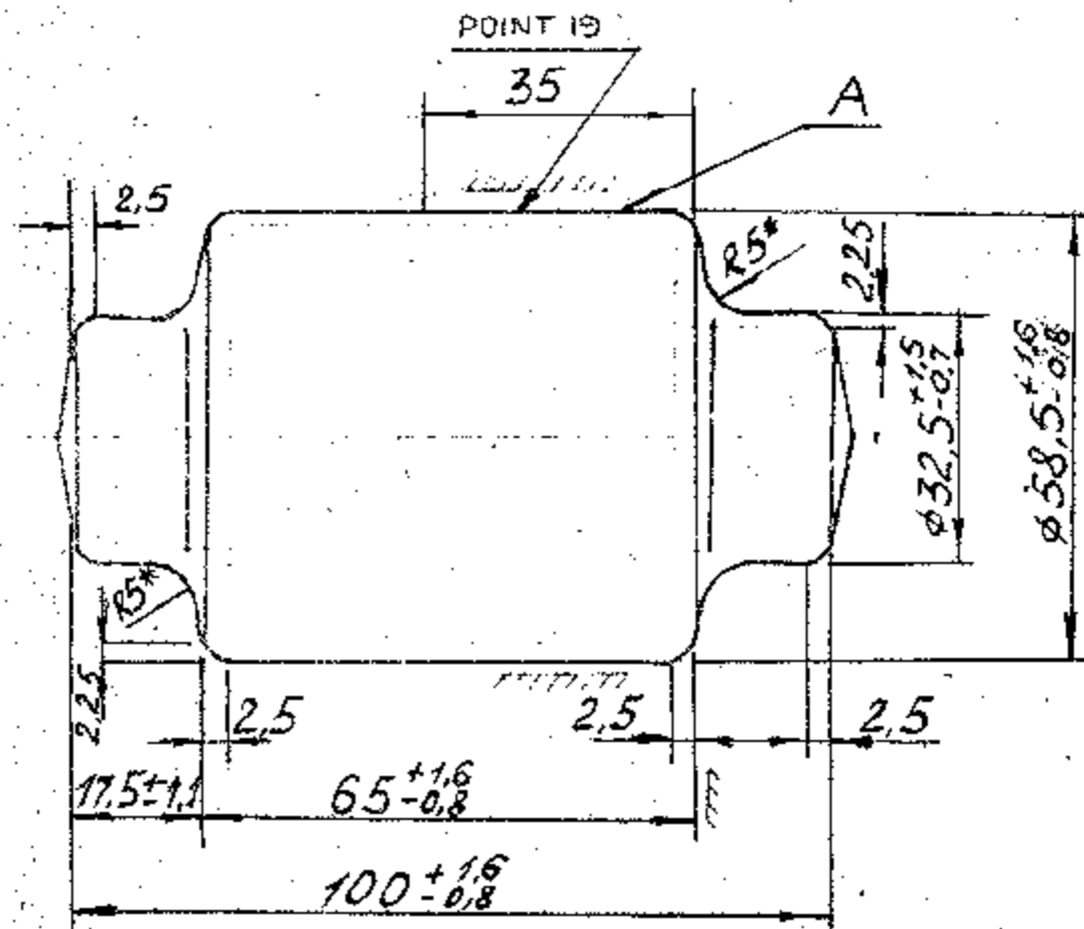


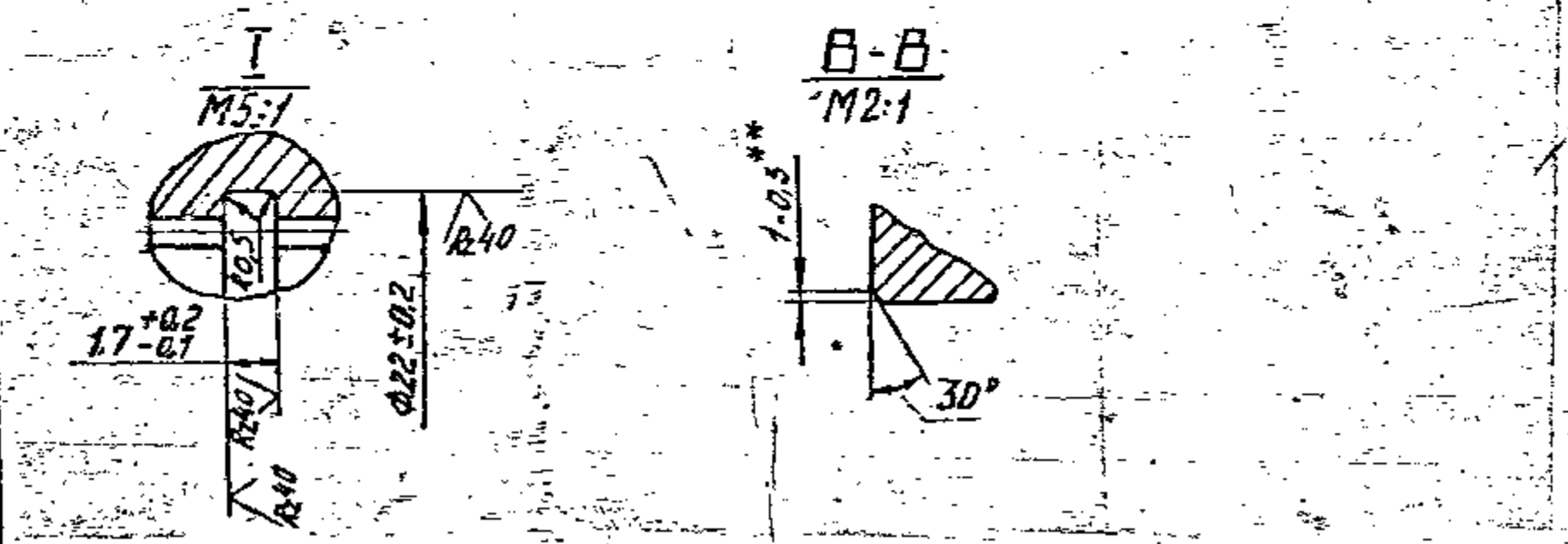
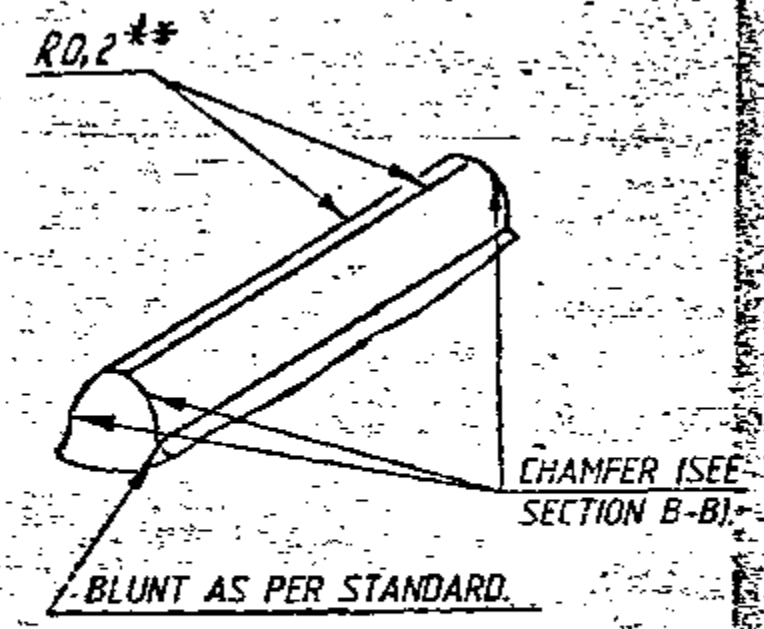
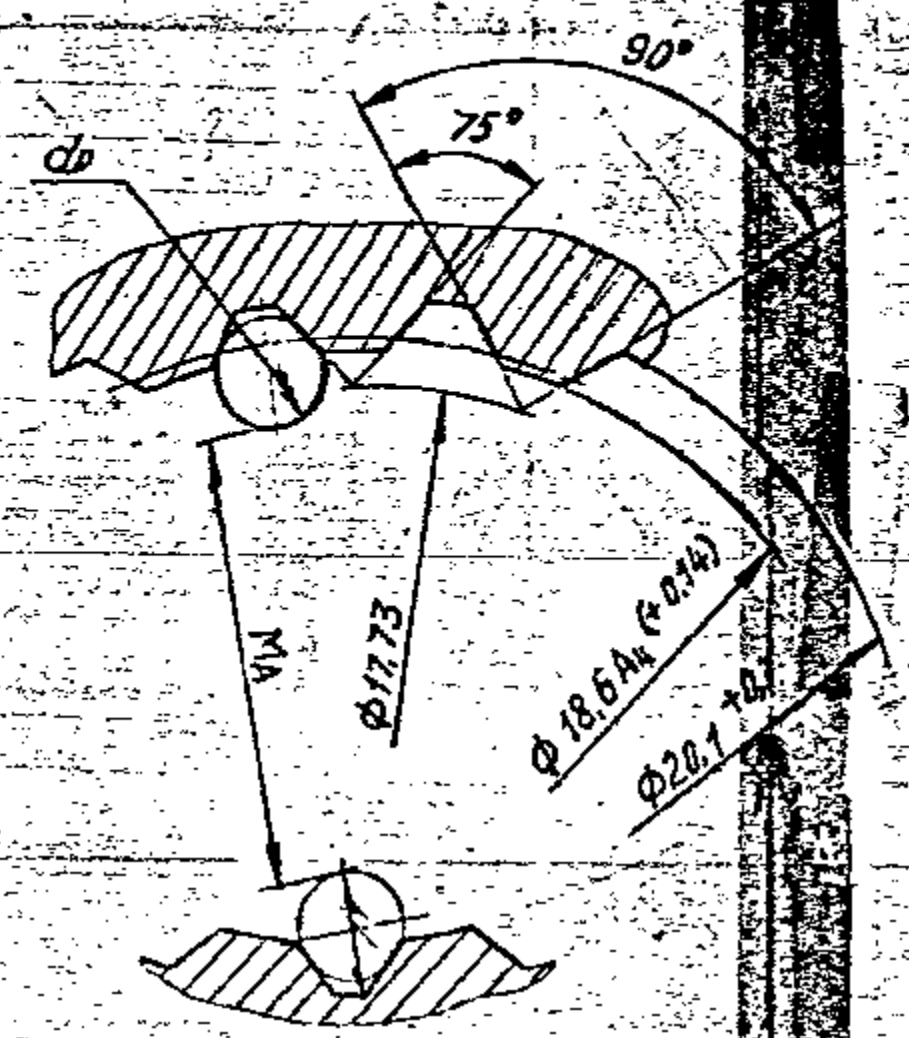
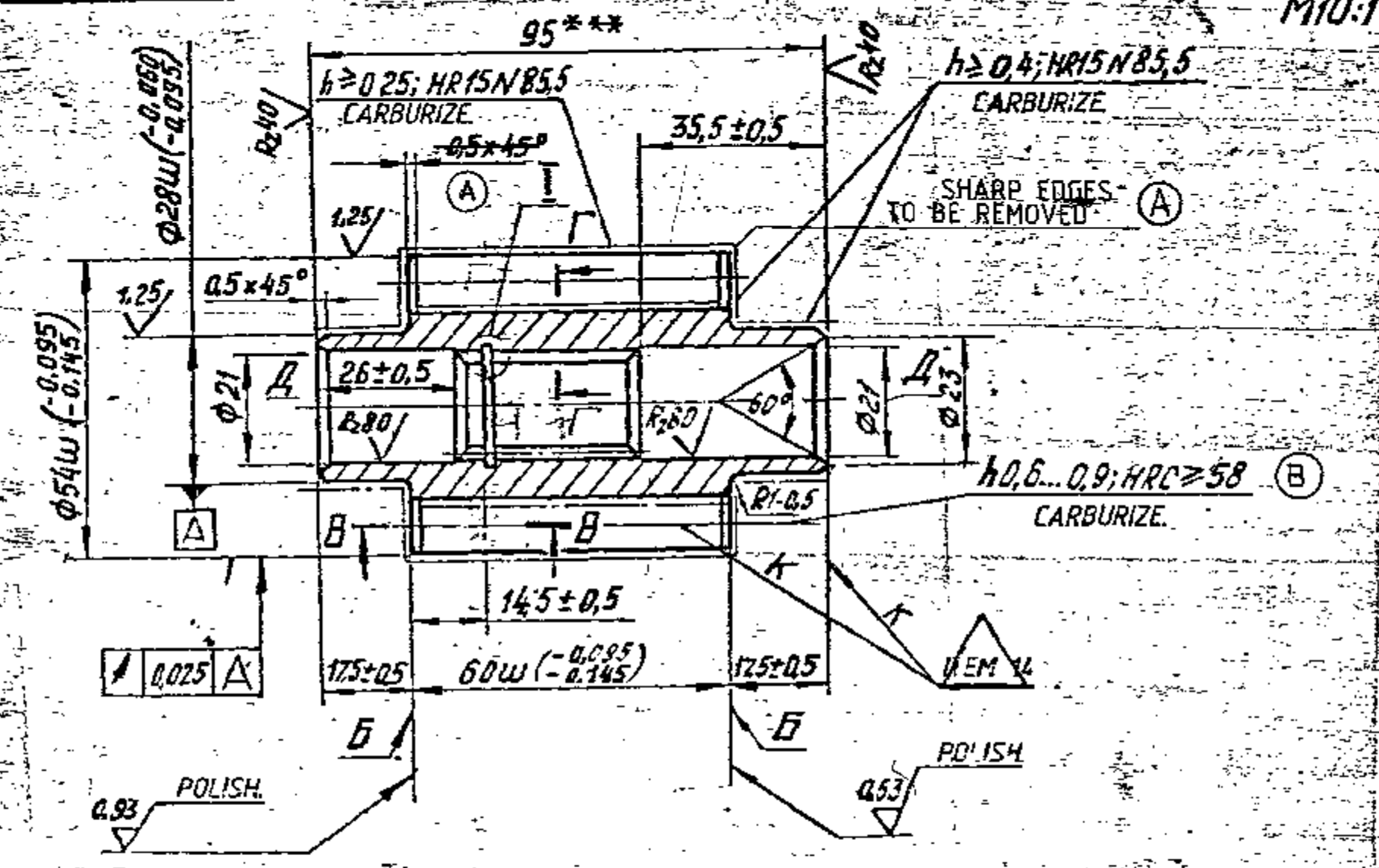
20-12-53-1, 20-12-54-2



1. STEEL GROUP M2 AS PER GOST 7505-74.
2. COMPLEXITY GRADE C1 AS PER GOST 7505-74.
3. MANUFACTURING ACCURACY CLASS II AS PER GOST 7505-74.
4. HOT STAMPING.
5. NORMALIZATION : BHN 170... 255 (DIA OF INDENTATION 4.6... 8.8).
6. * DIMENSIONS TO BE ENSURED BY TOOL.
7. UNSPECIFIED ROUNDING OFF RADII R 2.5 M.M.
8. UNSPECIFIED DRAFTS 5°... 7°.
9. UNFILLING OF CORNERS SHOULD NOT EXCEED 0.5 M.M.
10. MISMATCH OF PARTING LINE SHOULD NOT EXCEED 0.5 M.M.
11. FLASH ALONG PARTING LINE MAXIMUM 0.5 M.M. FOLDING OF FLASH NOT TO EXCEED 3 M.M. ON SIDES.
12. BEND MAXIMUM 0.6 M.M.
13. SCALE DEPRESSIONS AND OTHER SURFACE DEFECTS TO A DEPTH OF MAXIMUM 0.5 OF ACTUAL ALLOWANCE IS ALLOWED.
14. SHRINKAGE, HAIR LINE CRACKS AND OTHER SURFACE DEFECTS TO A DEPTH (EXCEPT CRACK) NOT TO EXCEED 0.5 OF ACTUAL ALLOWANCE IS ALLOWED. DEFECT DEPTH IS TO BE DETERMINED BY MACHINING 0.5% FROM A BATCH.
15. DRESS THE SCALES.
16. INSPECTION GROUP II AS PER GOST 8479-70.
17. ON SURFACE 'A' FLASH IS NOT ALLOWED FOR A LENGTH OF 35 M.M.
18. REST OF THE TECHNICAL REQUIREMENT AS PER GOST 8479-70 AND GOST 7505-74.
19. MARK GROUP NUMBER AS PER 110-6 GOST 2930-62.

ISSUE	DATE	REFERENCE	20-12-53-1; 20-12-54-2			
APPROVED	K.R.S.	<i>[Signature]</i>	GEAR, GEAR (FORGING)	LETTERS	MASS	SCALE
CHECKED		S.R. RATAN			1.7	1:1
DRAWN	P.R. KRAO	<i>[Signature]</i>		SHEET	SHEETS 1	
			12XH3AGOST 4543-71	ENGINE FACTORY AVADI		

20-12-54-2



- 1). INSPECTION GROUP III AS PER TECHNICAL REQUIREMENTS TT-11. HRC 26 TO 40, IF NOT SPECIFIED OTHERWISE. SPOT CARBURIZING TO A DEPTH OF UPTO 0.5 MM IS ALLOWED FOR SPLINE BY LOW CARBON SATURATION. ADDITIONAL CARBURIZING IS ALLOWED FOR HOLES. BUT ENDS OF JOURNAL WITH AN EXCEPTION OF CENTRE CHAMFERS. UNCARBURIZED SURFACE 5% OF THE PARTS FROM A BATCH ARE SUBJECTED TO HARDNESS TEST.
- 2). ALTERNATE MATERIALS STEEL 12X13A, Ty14-1-381-72.
- 3). UNSPECIFIED LIMIT DEVIATIONS OF DIMENSIONS ARE AS FOLLOWS:- FOR HOLES - AS PER A, SHAFTS - AS PER B, OTHERS - AS PER C.
- 4). TOLERANCE FOR END PLAY OF SURFACES B WITH RESPECT TO THE AXIS OF SURFACE A SHOULD BE 0.025 MM OVER DIAMETER φ 50 MM.
- 5). RADIAL RUN-OUT OF TEETH PITCH CIRCLE WITH RESPECT TO SURFACES A SHOULD NOT EXCEED 0.1 MM. CHECK WHEN THE PART IS NOT SUBJECTED TO RUN-IN WITH STANDARD.
- 6). TOLERANCE FOR RADIAL RUN-OUT OF SPLINE TEETH ALONG PITCH CIRCLE IS 0.1 MM AND TOLERANCE FOR AXES INTERSECTION OVER A LENGTH OF 100 MM IS 0.2 MM. CHECK AGAINST SPECIAL GAUGE MADE ACCORDING TO THE MAXIMUM DIMENSIONS OF SPLINES IN CONJUGATED PARTS. THE GAUGE IS DIRECTED ALONG SURFACE A.
- 7). NON-PARALLELITY OF SURFACES B IS 0.025 mm.
- 8). ** BLUNTING IS PERMITTED AS PER STANDARD.
- 9). *** DIMENSION IS GIVEN FOR REFERENCE.
- 10). MEASURING GEAR IS AS PER GOST 6512-74.

- 11). CHECK THE TEETH FOR PROPER MESHING BY PRUSSIAN BLUE DURING RUNNING-IN WITH THE STANDARD IN THE ABSENCE OF CLEARANCE AS SPECIFIED IN INSTRUCTIONS UB-42. THE BEARING PATTERN SHOULD COMPLY WITH THE VALUES GIVEN IN TABLE 2, AS TO THE FACE WIDTH AND TOOTH HEIGHT. TWO OR THREE ADJECENT GEAR TEETH MAY FIT EACH OTHER BY 30 TO 50% OF THE FACE WIDTH AS INDICATED BY PRUSSIAN BLUE.
- 12). CHECK SURFACES B BY PRUSSIAN BLUE WITH SPECIAL GAUGE MADE TO SUIT. MINIMUM DIAMETER OF CONJUGATED PART. A CIRCULAR BEARING PATTERN SHOULD NOT BE LESS THAN 2 MM IN WIDTH.
- 13). CHECK THE PART ON MAGNETIC FLAW DETECTOR AS PER INSTRUCTIONS UB 20-17.
- 14). APPLY ELECTRO-CHEMICAL STAMP ON TEETH PROFILE OR METALLIC STAMP ON THE BUTT-END. ELECTRO CHEMICAL STAMP IS ALLOWED ON JOURNAL.

NUMBER OF TEETH	Z	24
DIAMETER OF ROLLER	dp	14.41
DIMENSION AS PER ROLLER	MA	16.8±0.35
SPACE WIDTH ALONG PITCH CIRCLE CHORD	SA	-
DIAMETER OF PITCH CIRCLE	da	19.62

TABLE 1

MODULE	M	4.5	
NUMBER OF TEETH	Z	10	
BASIC RACK PROFILE ANGLE	α ₀	25°	
ADDENDUM CO-EFFICIENT	ha*	1	
BOTTOM CLEARANCE CO-EFFICIENT	c*	0.2	
ADDENDUM MODIFICATION CO-EFFICIENT	x	0	
DEGREE OF ACCURACY AS PER GOST 1643-72	-	-	
BASIC TANGENT LENGTH	W	20.43±0.09	
TOLERANCE FOR BASIC TANGENT LENGTH VARIATION	Y _W	0.1	
COMPOSITE ERROR DOUBLE FLANK	TOTAL	F _t	0.13
	TOOTH TO TOOTH	f _t	0.07
TOLERANCE FOR RADIAL RUN-OUT OF TOOTHED RIM	F _r	0.065	
BASE PITCH	NOMINAL VALUE		13.254
	LIMIT DEVIATIONS	±f _{pb}	±0.018
TOTAL BEARING PATTERN OF STANDARD GEAR TEETH	IN FACE WIDTH	%	AT LEAST 50
	IN HEIGHT	%	AT LEAST 40
TOLERANCE FOR TOOTH PROFILE ERROR	f _p	0.020	
TOLERANCE FOR TOTAL ERROR OF DISTORTION	F _B	0.019	
BASE-CIRCLE DIAMETER	d ₀	40.78	
RADIUS OF INVOLUTE CURVATURE AT THE BEGINNING OF CONTACT PROFILE	ρ ₀	0	
RADIUS OF INVOLUTE CURVATURE AT THE END OF CONTACT PROFILE	ρ _c	36.681	
INVOLUTE DEVELOPMENT ANGLE	γ	51°32'	

*** 12X13A GOST 4543-71

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

EST. MASS	0.620 Kg	TO BE STAMPED OR MARKED WHERE INDICATED THUS # LETTERS
DATE	10-02-08	D.O. CORRECTION
ISSUE DATE	12-11-07	IC/GER/IND-IL DT. 02-11-07
DRG. NO.	154	SCALE: 1:1
CHD	154	DIMENSIONS IN mm
YCD	154	TOLERANCE ON DIMS UNLESS OTHERWISE STATED
APPD	154	ALL THREADS TO CONFORM TO
DATE	30-12-07	

CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI

TITLE: GEAR

DRAWING NUMBER: 20-12-54-2