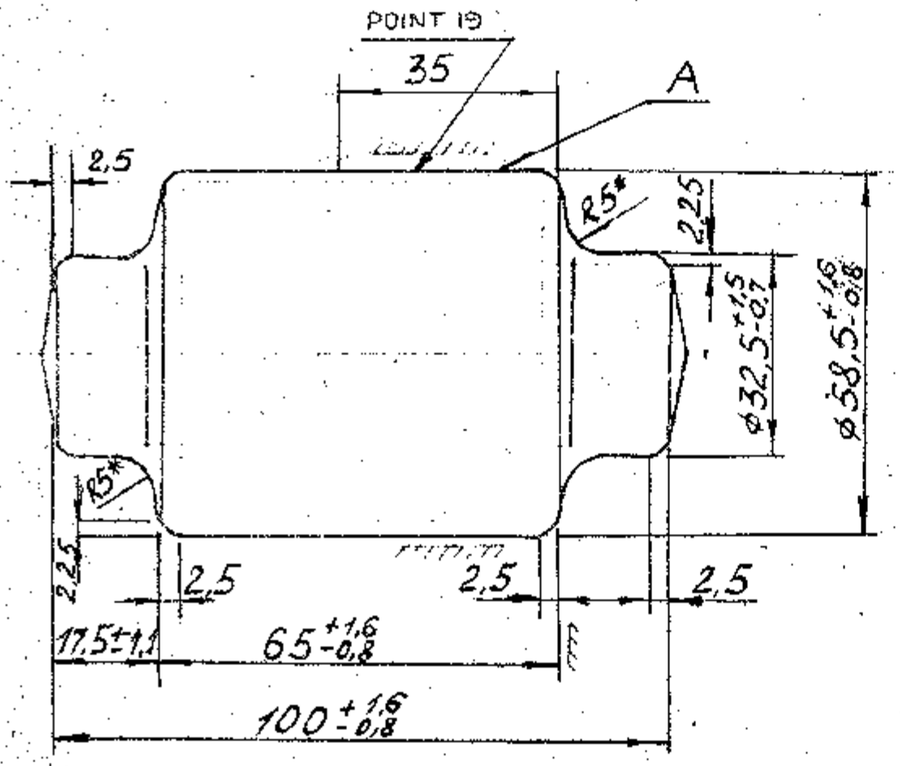
20-12-53-1, 20-12-54-2



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...5·8).
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 0·6 M·M.
11. FLASH ALONG PARTING LINE MAXIMUM 0·9 M·M. FOLDING OF FLASH NOT TO EXCEED 5 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 ADLOWANCE IS ALLOWED.
14. SHRINKAGE, HAIR LINE CRACKS AND OTHER SURFACE DEFECTS TO A DEPTH (EXCEPT CRACK) NOT TO EXCEED 0·5 OF ACTUAL ALLOW--ANCE 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 LENTH 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

APPROVED	K·R·S	
CHECKED		G·R·RATAN
DRAWN	P·R·K·RAO	

20-12-53-1 ; 20-12-54-2

GEAR ; GEAR

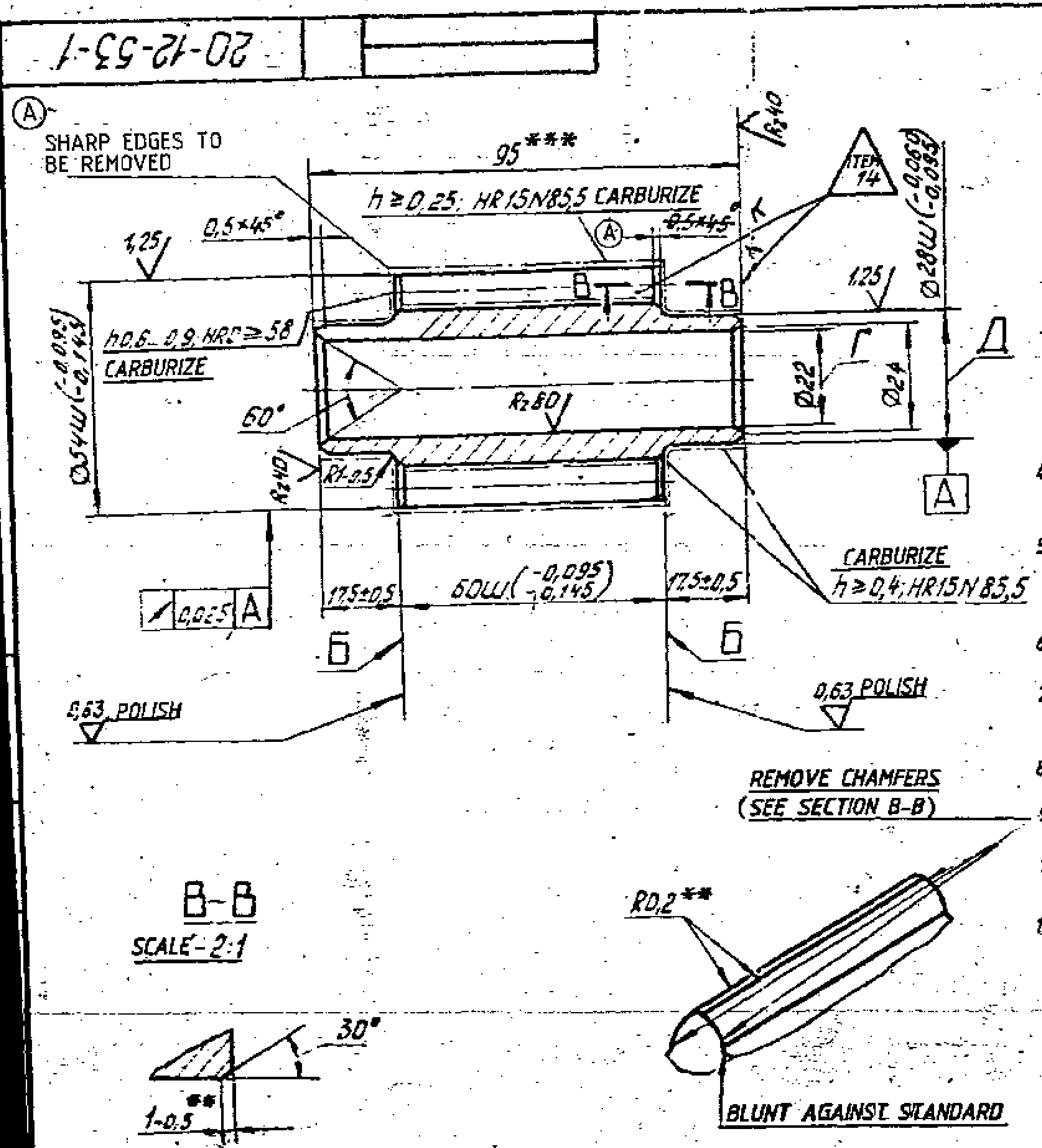
(FORGING)

12XH3A GOST 4543-71

LETTERS	MASS	SCALE
	1·7	1:1

SHEET | SHEETS 1

ENGINE FACTORY AVADI



1. INSPECTION GROUP III AS PER TECHNICAL REQUIREMENTS TT-11.
   H R C 26 TO 40, IF NOT SPECIFIED OTHERWISE.
   ADDITIONAL LIGHT CARBURIZING OF HOLE Г IS ALLOWED AT SEPERATE POINTS TO A DEPTH OF UPTO 0.5 mm.
   HARDNESS TEST OF NON-CARBURIZED SURFACE IS CARRIED OUT ON 5% OF PARTS FROM THE BATCH.
2. ALTERNATE MATERIAL IS STEEL 12XH3A, TY 14-1-381-72.
3. UNSPECIFIED LIMIT DEVIATIONS OF DIMENSIONS ARE AS FOLLOWS :-
   FOR HOLES - AS PER A7.
   SHAFTS - AS PER B7.
   OTHERS - AS PER CM7.
4. TOLERANCE FOR END PLAY OF SURFACE Б WITH RESPECT TO AXIS OF SURFACE A IS 0.025 mm OVER ϕ 50 mm.
5. TOLERANCE OF RADIAL RUN-OUT OF THE TEETH PITCH CIRCLE WITH RESPECT TO SURFACES A IS 0.1 mm,
   CHECK WHEN NO RUNIN WITH STANDARD IS PERFORMED.
6. TOLERANCE FOR PARALLELISM OF SURFACE Б IS 0.025 mm.
7. STEP ALONG Г OF UPTO 0.5 mm IS ALLOWED, PROVIDED IT IS OUTSIDE ZONE Д AND THE JOURNAL THICKNESS OF AT LEAST 2.5 mm.
8. ** BLUNT AGAINST STAND.
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 BY RUNNING-IN WITH STANDARD IN THE ABSENCE OF CLEARANCE AS PER INSTRUCTIONS U B - 42. BEARING PATTERN ALONG THE SPACE WIDTH AND HEIGHT OF TEETH SHOULD CORRESPOND TO THAT INDICATED IN THE TABLE. TWO TO THREE ADJOINING TEETH OF THE GEARS MAY FIT EACH OTHER BY 30 TO 50% OF THE TOOTH SPACE WIDTH AS CHECKED BY PRUSSIAN BLUE.
12. CHECK SURFACES Б BY PRUSSIAN BLUE WITH SPECIAL GAUGE, MADE AS PER MINIMUM DIAMETER OF MATED PARTS. THE ANNULAR BEARING PATTERN SHOULD HAVE A WIDTH OF AT LEAST 2.0 mm.
13. CHECK THE PART ON MAGNETIC FLAW DETECTOR AS PER INSTRUCTIONS U B 20 - 17.
14. APPLY ELECTROCHEMICAL STAMPING ON THE PROFILE OF TOOTH ON THE BUTT END OF JOURNAL.
    ELECTROCHEMICAL STAMP IS ALLOWED ON THE JOURNAL.

MODULE		m	4.5
NUMBER OF TEETH		Z	10
BASE RACK	PROFILE ANGLE	α_a	25°
	ADDENDUM COEFFICIENT	ha*	1
	RADIAL CLEARANCE COEFFICIENT	C*	0.2
ADDENDUM MODIFICATION COEFFICIENT		X	0
DEGREE OF ACCURACY AS PER GOST 1643-72		-	-
BASE TANGENT LENGTH		W	20.43 $^{-0.09}_{-0.21}$
TOLERANCE FOR BASE TANGENT LENGTH VARIATION		V_W	0.1
COMPOSITE ERROR DOUBLE FLANK	TOTAL	F"i	~~0.13~~
	TOOTH-TO-TOOTH	f"i	0.07
TOLERANCE FOR RADIAL RUN-OUT OF TOOTHED RIM		F_Z	0.065
BASE PITCH	NOMINAL VALUE		13.254
	LIMIT DEVIATIONS	± fpb	±0.018
TOTAL BEAING PATTERN OF STANDARD GEAR TEETH	IN FACE WIDTH	%	AT LEAST 50
	IN HEIGHT	%	AT LEAST 40
TOLERANCE FOR TOOTH PROFILE ERROR		ff	0.020
TOLERANCE FOR TOTAL ERROR OF DISTORATION		F_B	0.019
BASE CIRCLE DIAMETER		do	40.78
RADIUS OF INVOLUTE CURVATURE AT THE BEGINNING OF CONTACT PROFILE		po	0
RADIUS OF INVOLUTE CURVATURE AT THE END OF CONTACT PROFILE		pc	36.681
INVOLUTE DEVELOPMENT ANGLE		φ	51°32'

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

A	12-11-07	TC/GEN/IND-III DT 02-11-07	EST. MASS 0,590 Kg	TO BE STAMPED OR MARKED WHERE INDICATED THUS ✱ LETTERS
ISSUE	DATE	NATURE OF AMENDMENTS	ALL SHARP EDGES AND CORNERS TO BE REMOVED UNLESS OTHERWISE STATED MACHINED CORNERS TO HAVE R OUTSIDE R INSIDE EQUIVALENT CHAMFERS ARE PERMISSIBLE	
DRN		SCALE :- 1 : 1	MATERIAL :- 12XH3A GOST 4543-71	USED ON :- C6 20-12-01-13
CHD		DIMENSIONS IN mm	CONTROLLERATE OF INSPECTION (HEAVY VEHICLES) AVADI	
TCB		TOLERANCE ON DIMNS UNLESS OTHERWISE STATED	TITLE: GEAR	
APPD				
DATE		ALL THREADS TO CONFORM TO	D S CAT NUMBER	DRAWING NUMBER 20-12-53-1