

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

- Control group II acc. to TT 11.
- Requirements for casting are acc. to TT АБ310-11/76, wording 2. ~~to the drawing made by method of liquid casting~~ ~~to the drawing made by method of liquid casting~~
- HB 90...111.
- Non-indicated limit deviations of dimensions: holes - by H14, shafts - by h14, the rest  $\pm IT 14$ .
- Check the piston head form by a profile gauge made in accordance with nominal dimensions. Allowable clearance between the profile gauge and the piston is not more than 0.1mm.
- Deviations of dimensions  $D_1$ ;  $E_1$ ;  $H_1$ ;  $S_1$ ;  $I_1$  in a plane which is perpendicular to the hole axis for the pin for one piston is not more than 0.02 mm.
- Check the geometry of a piston skirt and end face T by cross-sections  $A_1$ ;  $A_1$ ;  $E_1$ ;  $E_1$ ;  $B_1$ ;  $B_1$ ;  $B_1$ ;  $I_1$ ;  $I_1$  in the plane which is perpendicular to the hole axis for the pin.
- Summary deviation of an actual piston skirt profile is not more than  $10 \mu m$  to a radius.
- Tolerance of parallelism of surfaces K is not more than 0.02mm at length of 30 mm, of surfaces  $I_1$  - in the limits of  $\pm 0.065mm$  by means of special gauge at length of 30 mm; measure in four diametrically opposite points.
- Tolerance of parallelism of symmetry plane C relative to surface K is not more than 0.02 mm.
- Tolerance of radial run out relative to an axis of a generating line: of surfaces M is not more than 0.05 mm, H - not more than 0.1 mm.
- Tolerance of end face run out of surface K relative to surface  $I_1$  is not more than 0.02 mm across  $\phi 144$ , make measurements in four diametrically opposite points.
- In the third groove (count from piston head) it is allowed the decrease of the groove width up to 4.8 mm.
- Tolerance of roundness of holes  $I_1$  is not more than 0.005 mm, profile tolerance of longitudinal section is not more than 0.004 mm.
- Tolerance of parallelism of the axis of holes  $I_1$  relative to surface  $I_1$  is not more than 0.03 mm along length of 200 mm.
- Tolerance of crossing of hole  $I_1$  axis and side surface of the piston skirt is not more than 0.1 mm.
- Tolerance of symmetry of dimension  $I_1$  relative to side surface P of the piston skirt is not more than 1.0 mm.
- Hicks, undercuts, notches, scores are not allowed on treated surfaces.
- Piston mass is  $2.715 \pm 0.025$  kg.
- TO PROVIDE THE REQUIRED PISTON MASS IT IS ALLOWED:
  - TO MAINTAIN THE DIMENSION  $W$  UP TO  $\phi 134$  mm. QUALITY OF DIMENSION  $W$  SHOULD NOT EXCEED 0.8mm.
  - TO MAINTAIN THE DIMENSIONS OF RADIUS WITHOUT SPECIFIED DEVIATIONS ON THE INNER SURFACE OF CASTING TOWARDS THE INCREASING SIDE UP TO 4 mm (EXCEPT FOR R6 ON SECTION  $\Gamma - \Gamma$ )
- BLUNT THE OIL-DISCHARGING HOLES, INSIDE THE PISTON AS PER STANDARD.
- A NOTCH AFTER REMOVAL OF THE CUTTING TOOL IS ALLOWED ON SURFACE  $W$  AS PER STANDARD.
- MACHINE THE GENERATING LINE OF PISTON A PER DIMENSIONS SPECIFIED ON DETAIL SECTION III. MICROGEOMETRY IS ENSURED BY TOOL. ACCEPT THE ROUGHNESS ON GENERATING LINE OF PISTON AS PER STANDARD SPIRAL DIRECTION IS INDIFFERENT.
- MARK BY CASTING ACCORDING TO GOST 2171-79:
  - GRADE OF MATERIAL A2 WITH TYPE  $\Pi 0-8$  GOST 2930-62.
  - MONTH AND YEAR OF MANUFACTURE WITH TYPE  $\Pi 0-8$  GOST 2930-62 (FIRST DIGIT - MONTH, LAST DIGIT - YEAR OF MANUFACTURE).
- MARK THE PISTON MASS WITH TYPE  $\Pi 0-5$  GOST 2930-62.
- CARRY OUT PACKING, MARKING, TRANSPORTATION AND STORAGE AS PER OST 24.062.01-83.
- MARK THE TRADE MARK 5...7mm HIGH ON PISTONS TO BE SENT AS SPARE PARTS.
- \* DIMENSIONS ARE GIVEN FOR REFERENCE.
- \*\* DIMENSIONS ARE TO BE ENSURED BY TOOL.
- \*\*\* DIMENSIONS ARE TO BE ENSURED WITH TEMPLATE.
- MARK THE DESIGNATION OF PISTON WITH DIGIT "05-20" BY TYPE  $\Pi 0-5$  GOST 2930-62 (ON PISTONS SUPPLIED AS PER AGREEMENT AND AS PER SPARES).
- VARIATION IN WALL THICKNESS OF FULLY MACHINED PISTONS IN DIAMETRICALLY OPPOSITE PLACES FOR ALL SECTIONS SHOULD NOT BE MORE THAN 0.5mm.
- TOLERANCES ON CASTING DIMENSIONS  $\sqrt{14}$  ARE AS PER OST 3-4565-80.

REPAIR SIZE DIMENSIONS.

CATEGORY	R	S	T	U	V	W	X	Y	Z
20-04-05-20 R1	149.34	149.38	149.60	149.65	149.68	149.78	149.93	149.92	150.76-0.17
20-04-05-20 R2	149.44	149.48	149.70	149.75	149.78	149.88	150.03	150.02	150.86-0.17

STAMP R1 or R2 WHERE MARKED THUS  $\phi$

Вариант ALTERNATIVE

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

EST. MASS	TO BE STAMPED OR MARKED WHERE INDICATED THUS #	DRN	AK 21M 2.5H2.5 GOST 2685-75	MATERIAL	USED ON
2.69 kg		EHD		AK 21M 2.5H2.5 GOST 2685-75	CB 20-04-00-3
ALL SHARP EDGES AND CORNERS TO BE REMOVED UNLESS OTHERWISE STATED MACHINED CORNERS TO HAVE R OUTSIDE R INSIDE EQUIVALENT CHAMFERS ARE PERMISSIBLE.		APPD		CONTROLLEDATE OF QUALITY ASSURANCE (HEAVY VEHICLES)	
		DATE	20-04-95	AVADI	
		SCALE	1:1	TITLE	PISTON
		DIMENSIONS IN mm		TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS 21C2-65	DRAWING NUMBER
		CONTR		IP S. CAT. NUMBER	20-04-05-20
		ISSUE		NATURE OF AMENDMENTS	

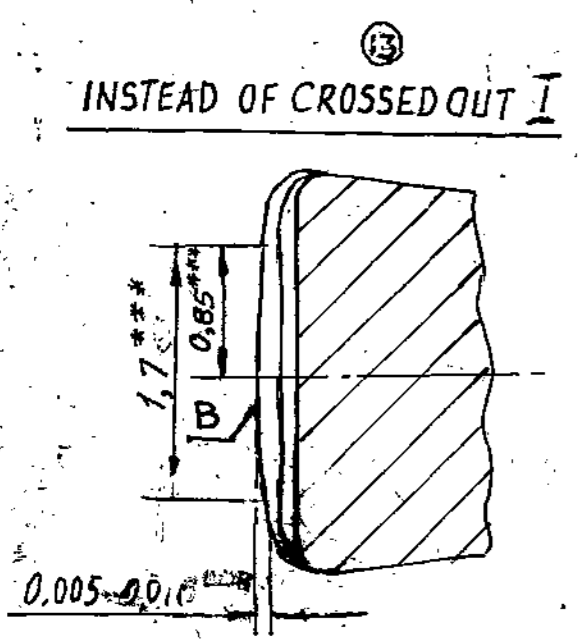
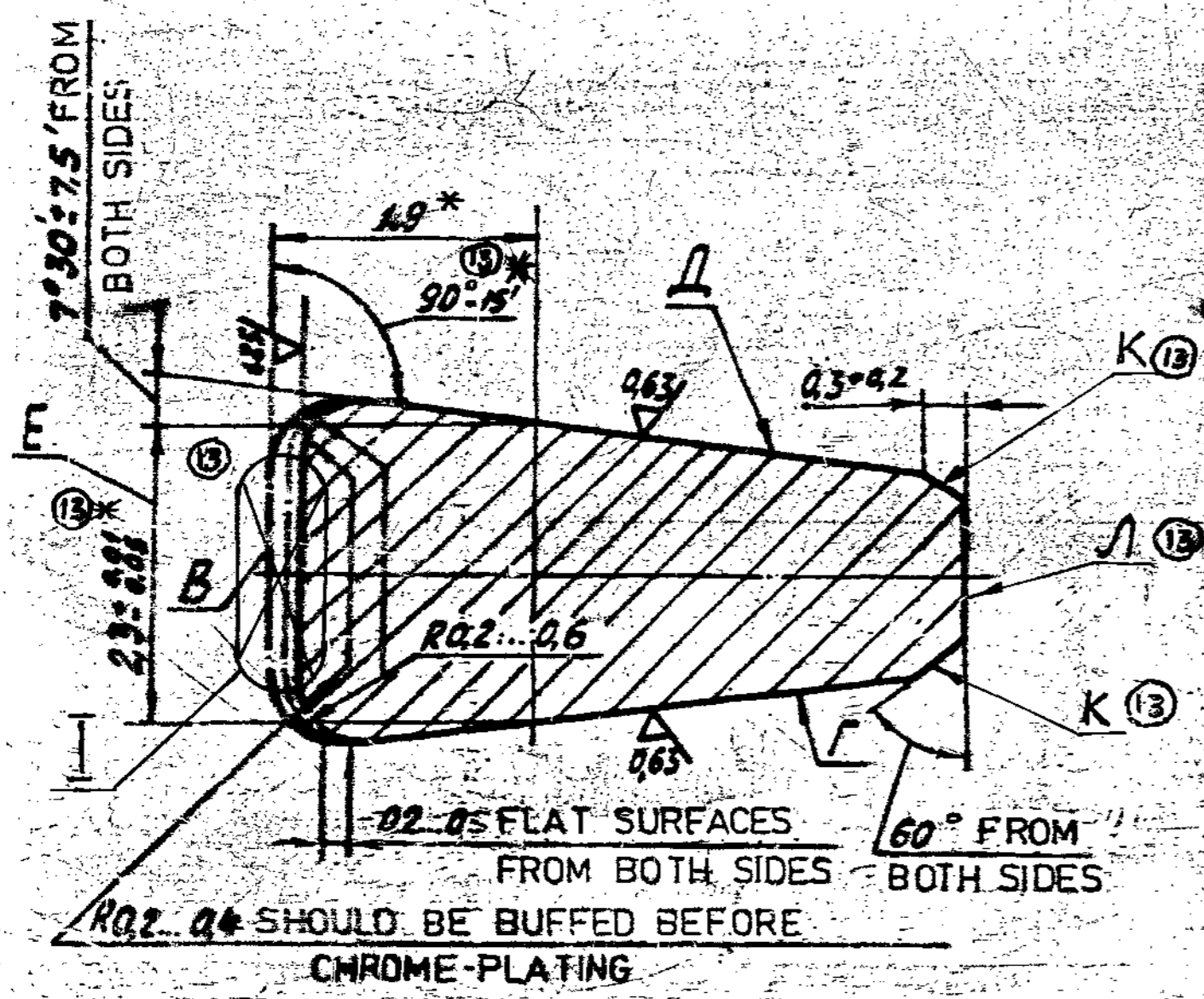
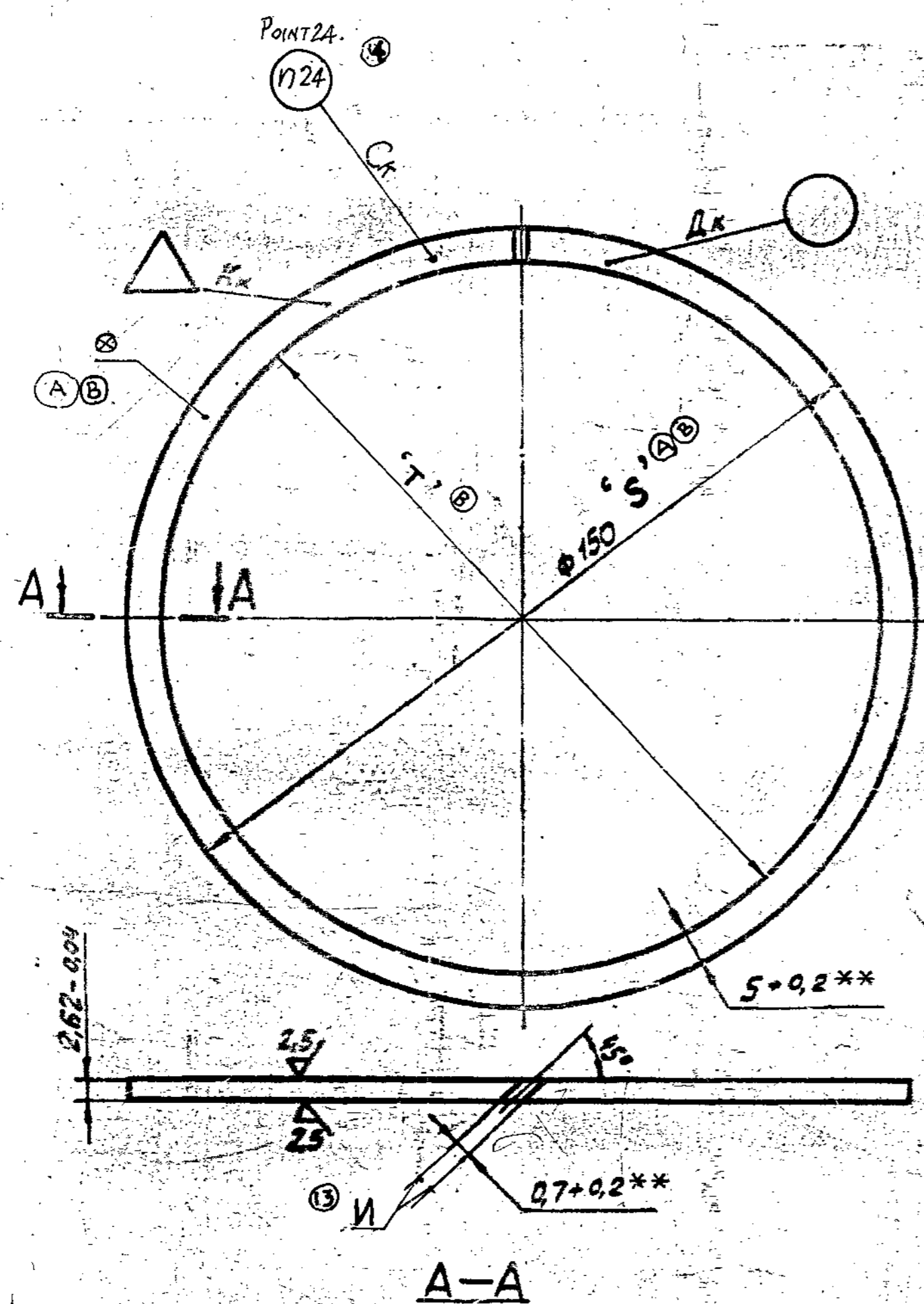


DIAGRAM No. 1

GROUP No.	INDICATOR READING	NOTE
1	+0.04...-0.01	DETERMINE THE RING GROUP NUMBER FROM THE MAXIMUM INDICATOR READING (FROM THE GREATEST MEASURING DIMENSION.)
2	below -0.01...-0.06	
3	--- -0.06...-0.10	
4	--- -0.10...-0.14	
5	--- -0.14...-0.22	

REPAIR SIZE DIMENSIONS

CATEGORY	'S'
20-04-06-1 R1	150.2

STAMP R<sub>1</sub> WHERE MARKED THUS ⊕

- INSPECTION GROUP III AS PER IT - 11, HRC 19 TO 27
- STABILIZE THE RINGS THERMALLY AS PER INSTRUCTION N-180-10/56.
- ELASTICITY OF RINGS WHEN CHECKED BY THE BARREL TYPE DEVICE SHOULD BE 1800-2600g IN CASE OF CLEARANCE IN THE JOINT OF 0.7...0.9MM.
- THE CLEARANCE IN THE LOCK SHOULD BE CHECKED BY THE GAUGE CORRESPONDING TO THE RATED DIAMETER.
- THE UNSPECIFIED LIMIT DEVIATIONS OF DIMENSIONS SHOULD BE AS FOLLOWS: HOLES - AS PER A<sub>7</sub>; SHAFTS - AS PER B<sub>7</sub>; OTHERS - AS PER CM<sub>7</sub>.
- RADIUS SHOULD SMOOTHLY MATE THE EXTERNAL DIAMETER OF THE RING BEFORE AND AFTER IT IS CHROME-PLATED.
- LOCK IN FREE CONDITION SHOULD BE 14.5 TO 18.5MM.
- THE RING BUTT END SURFACES SHOULD NOT BE WARPED FOR MORE THAN 0.03MM.
- SURFACE 'B' MAY SMOOTHLY CHANGE INTO SURFACES 'F' AND 'A'. ANY FLAT PORTIONS SHOULD BE EXCLUDED.
- WHEN CHECKING MEASUREMENT DIMENSION 'E', VARIATIONS IN INDICATOR READINGS FOR ONE RING SHOULD NOT EXCEED 0.05MM IN CASE SURFACES 'F' AND 'A' ARE COATED FOR NOT MORE THAN 0.06MM THICKNESS.
- RING SURFACES SHOULD BE FREE FROM THE CHROME CHIPPING, CRACKS, FLATS, NICKS BURRS AND DARK SPOTS.
- ROUND OFF THE LOCK BUTT ENDS AROUND PERIMETER BEFORE 0.3 TO 0.5MM CHROME-PLATING.
- VARIATIONS IN THE RADIAL THICKNESS FOR ONE RING SHOULD NOT EXCEED 0.14MM. IT MUST BE CHECKED BEFORE THE RUN IN COATING IS APPLIED.
- THE RADIAL WIDTH MAY BE REDUCED TO 4.95MM FOR A DISTANCE OF 12MM FROM LOCK EDGE.
- CHANGES OF INDICATOR READINGS FOR ONE RING WHEN MEASURING 'E' DIMENSION IS CHECKED, ACCORDING TO DIAGRAM 1 SHOULD BE NOT MORE THAN 0.03MM TAKING INTO ACCOUNT THE COAT OF 'B' SURFACE FOR RUN-IN.

- WHEN CHECKING SURFACES 'F' AND 'A' BY BLUEING USE THE GAUGE CORRESPONDING TO THE RATED DIAMETER AND SPECIAL TAPERED PLUG OF 2.5 KG. THE CLOSE-FIT MUST IN THE FORM OF CONTINUOUS 2MM-WIDE BELT ALONG THE WHOLE RING.
- RADIAL CLEARANCE BETWEEN RING AND GAUGE CORRESPONDING TO RATED DIAMETER IS NOT PERMITTED. CHECK IT BEFORE RUN-IN COATING IS APPLIED.
- SURFACE 'B' SHOULD BE COATED AS FOLLOWS: HARD CHROME-PLATING RANGING FROM 100 TO 150, POROUS CHROME-PLATING RANGING FROM 30 TO 60. VARIATIONS IN TOTAL CHROME THICKNESS FOR ONE RING SHOULD NOT EXCEED 0.04MM.
- RUN-IN COATING OF SURFACE 'B' SHOULD BE AS FOLLOWS: COPPER MOLYBDENUM DISULFATE AS PER INSTRUCTION N-270-255/73. COAT OF 'A', 'K', 'A' SURFACES IS ALLOWED.
- RINGS MAY BE MANUFACTURED WITHOUT THE COPPER-MOLYBDENUM DISULFATE COATING OF SURFACE 'B'.
- TEST METHODS SHOULD BE AS PER GOCT 7295-74.
- MARKING, PACKAGING, TRANSPORTATION AND STORAGE SHOULD BE AS PER GOCT 7133-80.
- \* DIMENSIONS AFTER RUN-IN COATING.  
\*\* DIMENSIONS AFTER POROUS CHROME-PLATING.

25. WHEN CHECKING THE MEASURING 'E' DIMENSION BY AN INDICATOR DIVIDE THE RINGS INTO GROUPS ACCORDING TO THE TABLE. ADJUST THE CONTROL DEVICE AGAINST THE STANDARD MADE TO THE 'NOMINAL' 'E' DIMENSION.

26. \*\*\* DIMENSIONS ARE ENSURED BY MANUFACTURING PROCESS.

27. STAMP MARK R<sub>1</sub> OR R<sub>2</sub> WHERE SHOWN THUS ⊕

23 EXPLANATORY NOTE :-

MATERIAL QUOTED :- WIRE 3.1x7.5 TY 14-4-229-72  
SQUARE GAGE STEEL WIRE OF SIZE 3.1mmx7.5mm TO TY 14-4-229-72 AND MATERIAL OF STEEL GRADE 65G AS PER GOST 1050-74.

a) CHEMICAL COMPOSITION %

CARBON	= 0.62 - 0.70
SILICON	= 0.17 - 0.37
MANGANESE	= 0.90 - 1.20
CHROMIUM	= 0.10 (MAX)
SULPHUR	= 0.060 (MAX)
PHOSPHORUS	= 0.035 (MAX)
NICKEL	= 0.15 (MAX)
COPPER	= 0.20 (MAX)

b) MECHANICAL PROPERTIES :-

ULTIMATE TENSILE STRENGTH	= 90 - 120 Kgf/mm <sup>2</sup>
NUMBER OF BENDS WHILE TESTING ON ROLLERS WITH A DIAMETER OF 20mm.	= 3 (MIN)

24. MARK :-

(1) GROUP NUMBER (ACCORDING TO THE TABLE)

REPAIR SIZE DIMENSIONS

CATEGORY	DIMENSIONS	
	'S'	'T'
20-04-06-1 R <sub>1</sub>	150.1	139.9
20-04-06-1 R <sub>2</sub>	150.2	140.0

STAMP R<sub>1</sub> OR R<sub>2</sub> WHERE MARKED THUS ⊕

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

EST. MASS	0.0395 Kg
TO BE STAMPED OR MARKED WHERE INDICATED THIS #	
ALL SHARP EDGES AND CORNERS TO BE REMOVED UNLESS OTHERWISE STATED MACHINED CORNERS TO HAVE R OUTSIDE R INSIDE EQUIVALENT CHAMFERS ARE PERMISSIBLE.	

DRN	23.95	MATERIAL	WIRE 3.1x7.5	USED ON	CB 20-04-00-3
ENR			TY 14-4-229-72		
YCD					
APPO					
DATE	13-5-88				
SCALE	1:1				
DIMENSIONS IN mm					
TOLERANCE ON DIMS UNLESS OTHERWISE STATED					
TITLE	COMPRESSION PISTON RING				
D S CAT NUMBER					
DRAWING NUMBER	20-04-06-1				

DRAWING NUMBER  
20-04-07

Rz20 (✓)

EXPLANATORY NOTE:

MATERIAL QUOTED: ALUMINIUM-IRON BRONZE ROD  
Бр АЖ9-4-нр35 ГОСТ 1628-78.

Бр АЖ9-4 - APPLIES TO DRAWN AND HOT ROLLED RODS MADE OUT OF TIN FREE VARIETIES OF BRONZE GRADE.

a) CHEMICAL COMPOSITION: (AS PER ГОСТ 15027-0-77 TO ГОСТ 15027-14-77) BY WEIGHT %

BASIC COMPONENT CU = THE REST.

Al = 8.0-10.0

Fe = 2.0-4.0

IMPURITIES: ELEMENTS Viz.

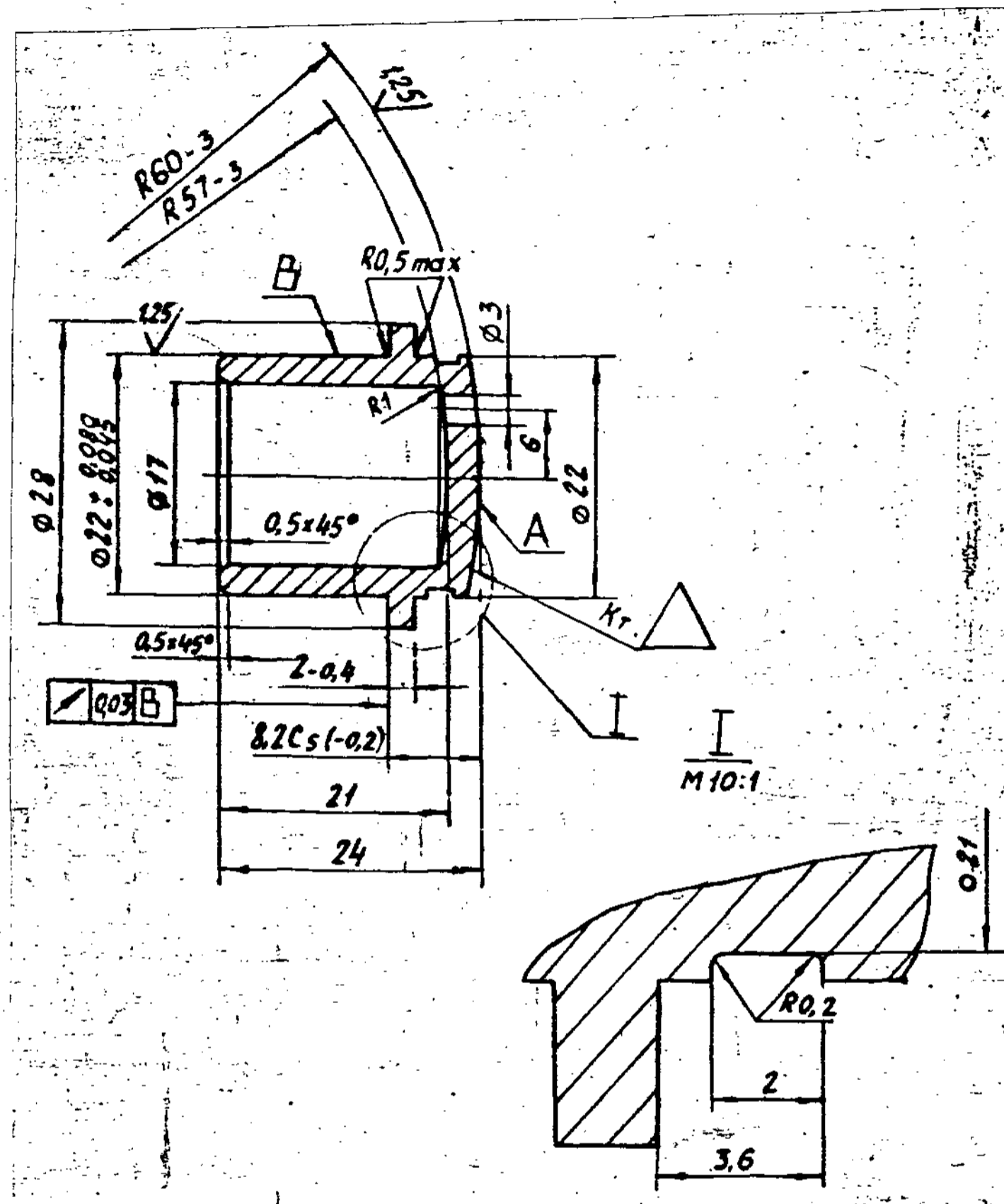
IRON, SILICON, LEAD, PHOSPHOROUS, ZINC, MANGANESE ALL PUT TOGETHER 1.7% (MAX) BY WEIGHT.

b) MECHANICAL PROPERTIES: (AS PER ГОСТ 1628-78).

ULTIMATE TENSILE STRENGTH  $\text{kgf/mm}^2$  (MIN) = 55

RELATIVE ELONGATION % (MIN) = 15

BRINELL HARDNESS HB = 110-180



NOTE:-

1. THE UNSPECIFIED LIMIT DEVIATIONS OF DIMENSIONS ARE AS FOLLOWS; HOLES - AS PER A7, SHAFTS AS PER B7, OTHERS - AS PER CM7.
2. LIMIT DEVIATIONS IN SHAPE OF CYLINDRICAL SURFACE-B SHOULD NOT BE MORE THAN: OVALITY -0.01, TAPER -0.01.
3. DISPLACEMENT OF SPHERE CENTRE IN RELATION TO THE AXIS OF SURFACE B SHOULD NOT BE MORE THAN 0.1.
4. CHECK SURFACE - A BY BLUEING IN THE SPECIAL FIXTURE. THE BLUE SHOULD BE ARRANGED EXACTLY ON THE CENTRE OF DIAMETER 3 MAX.

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

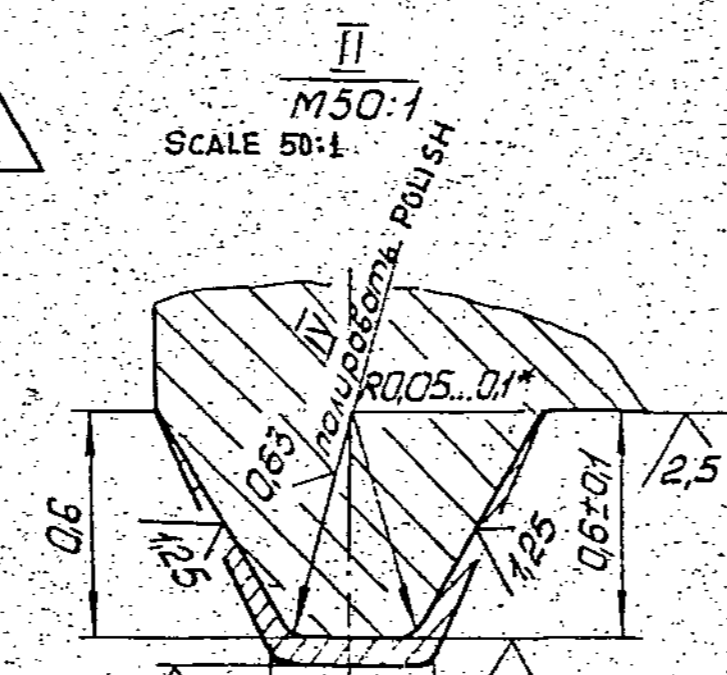
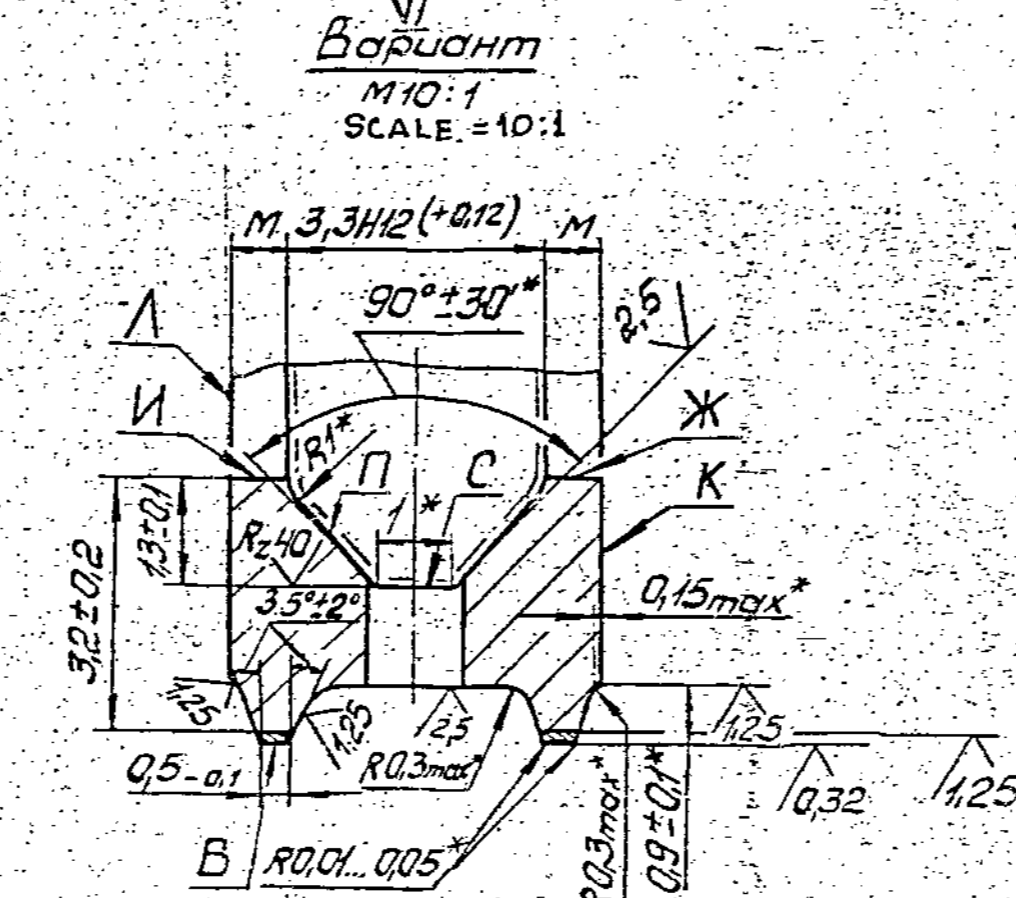
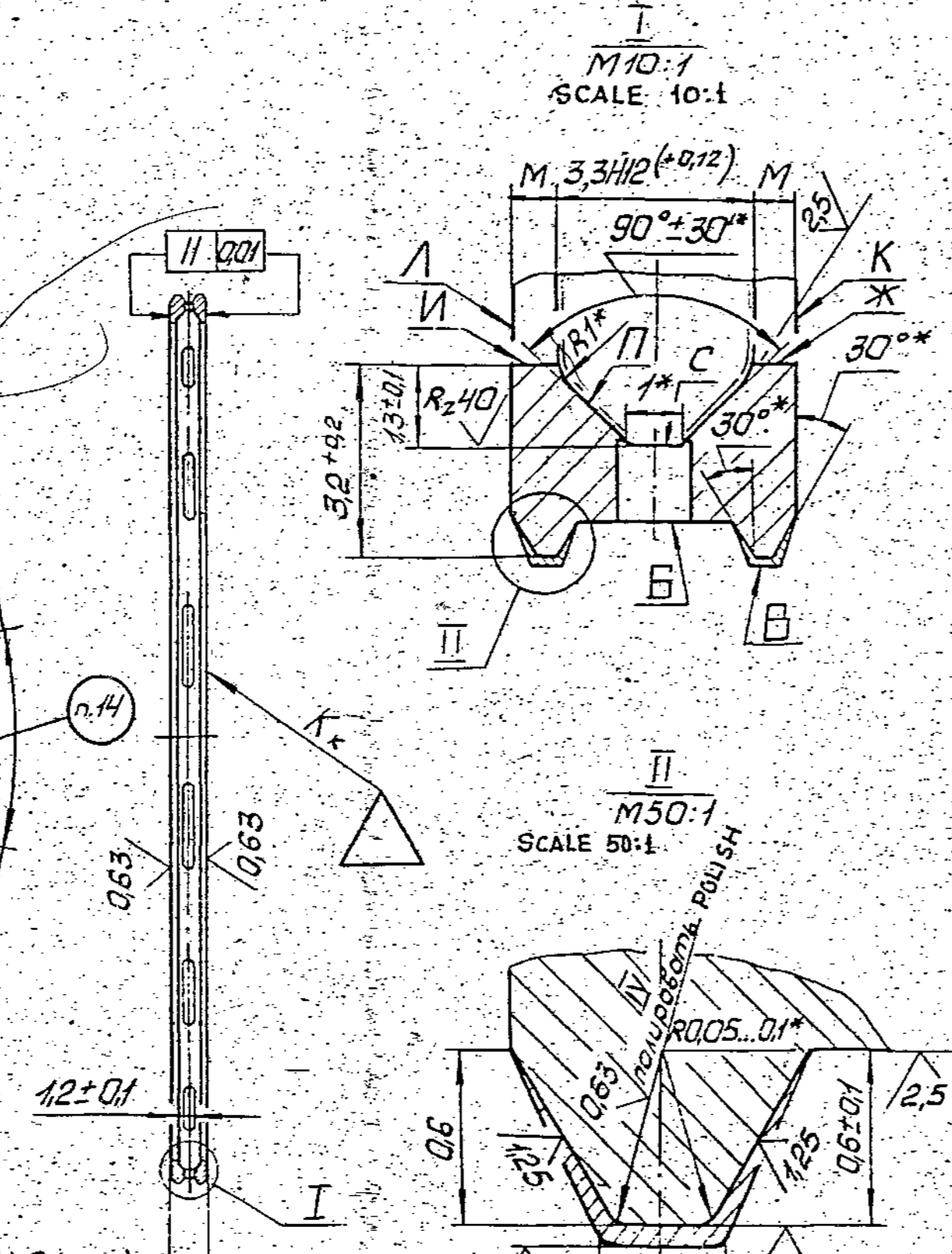
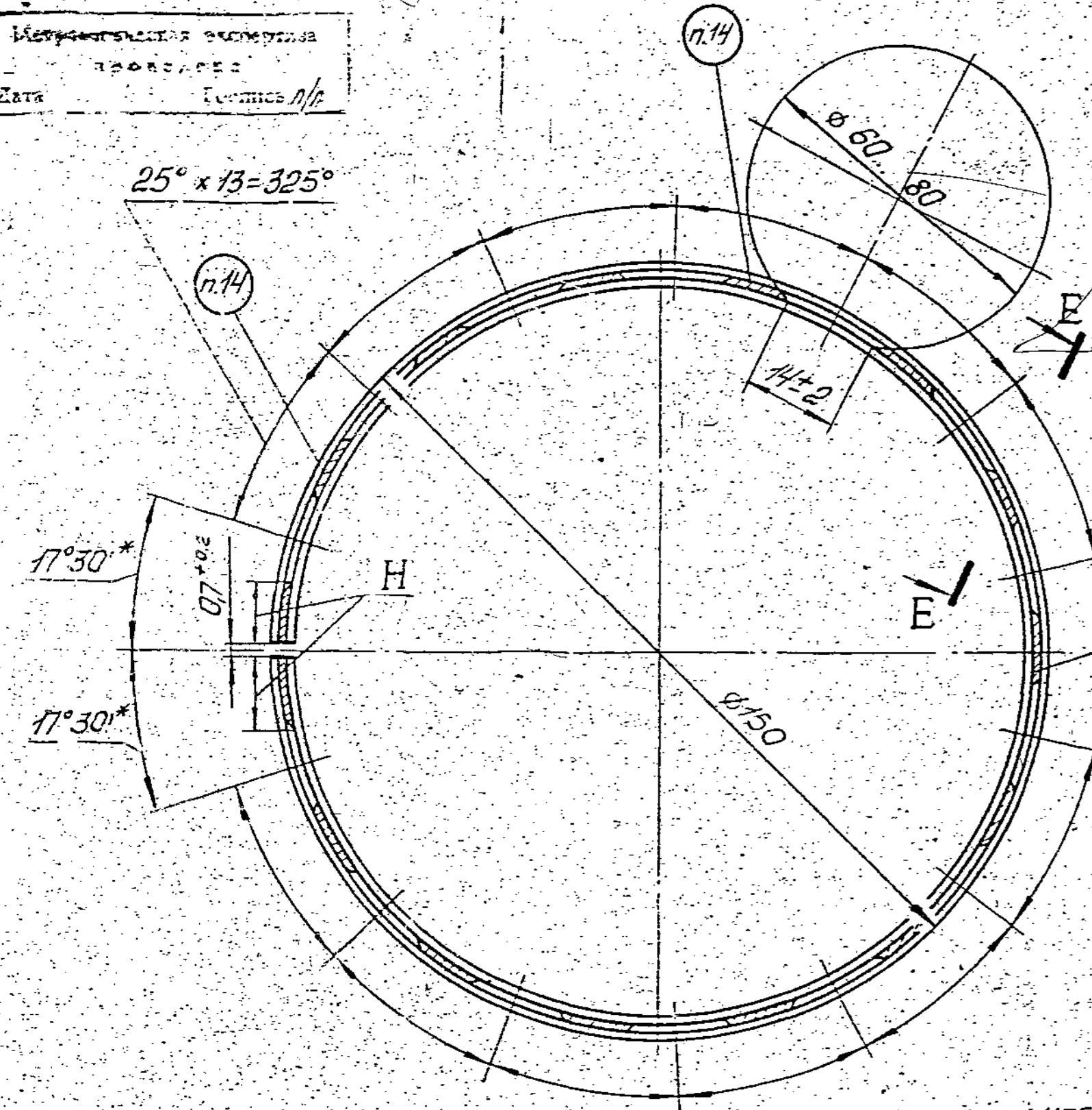
EST. WT. 0.035 Kg. TO BE STAMPED OR MARKED WHERE INDICATED THUS # (LETTERS)

ALL SHARP EDGES AND CORNERS TO BE REMOVED UNLESS OTHERWISE STATED MACHINED CORNERS TO HAVE R OUTSIDE R INSIDE EQUIVALENT CHAMFERS ARE PERMISSIBLE.

DRN	CHD	TCD	APPD	DATE	SCALE	DIMENSIONS	TOLERANCE	STATED IS	DRN	CHD	TCD	APPD	DATE	SCALE	DIMENSIONS	TOLERANCE	STATED IS	DRN	CHD	TCD	APPD	DATE	SCALE	DIMENSIONS	TOLERANCE	STATED IS
				16-10-89	2:1	IN mm.	ON DIMNS	2102-69																		
					MATERIAL - ALUMINIUM - IRON BRONZE ROD Бр АЖ9-4-нр35 ГОСТ 1628-78					USED ON :- CB 20-04-00-2																
										CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) A V A D I																
										TITLE PISTON PIN STOPPER																
										D S CAT NUMBER					DRAWING NUMBER 20-04-07											
ISSUE					DATE					NATURE OF AMENDMENTS																

9-60-10-07

Материал: сталь 40Х  
 Дата: 25.10.95



DIFFERENCE  $\Delta$  IN MEASUREMENT OF DIMENSIONS  $\Delta$  IS NOT MORE THAN 0.3mm.  
 $\Delta$  не более 0,3мм  
 DIMENSIONS  $\Delta$  IS NOT MORE THAN 0.3mm.  
 R0,6\*

VARIANT  
 Вариант  
 M10:1  
 SCALE = 10:1

1. Control group IV acc. to TT 11.
2. Requirements for a casting are acc. to TT ЧД-14/88. Check the hardness selectively but not less than 5% from each heat-treated batch.
3. HRB 98...110. Hardness variations are not more than 4 units for one ring.
4. Non-indicated limit deviations of dimensions: H14;h14;± t/2
5. Radial thickness variations are not more than 0.1 mm in one ring.
6. Check by blueing the tolerance of planarity of end faces between two plates. Upper plate weight is 1.7 kg. Paint should cover the ring surface, by means of continuous band of 2 mm min. wide along the whole circumference. Check selectively but not less than 10%.
7. Tolerance of planarity of end faces should be 0.04 mm max.
8. Check a clearance in a lock by a gauge corresponding to a nominal diameter.
9. Radial clearance with technological expander between a ring and a checking gauge corresponding to a nominal diameter is not allowable before coating O1.
10. Coating O1; on surfaces B and B, absence of coating is allowed.
11. Coating of surfaces B: X60...90 mb. Presence of chromium on surface B is allowable.
12. Presence of chromium on surfaces K and A is not allowed.
13. Cracks, voids, porosities, flats, burrs, nicks, spalling of chromium on working bands are not allowed.
14. Test methods acc. to GOST 621-87 besides measuring of hardness measure the hardness by three sections of 1st surface on an average line of the ring through 90°. Three measurements minimum should be made on each section. Hardness is determined as arithmetic mean value of three measurements.

15. Rings intended to mount on the products of own production besides the rings delivering as spare parts and acc. to co-operative trade are allowed to be installed without coating O1.
16. Marking, packing, transportation and storage are acc. to GOST 621-87.
17. Difference in measurement of dimension M is not more than 0.2 mm.
18. Traces of flaked dendrites with going out on working bands acc. to a standard are allowed on chromium plated radiuses.
19. Difference in measurement of crosspieces H is not more than 1.5 mm.
20. \* Dimensions are provided by the instrument.
21. Coating of surface II: X 10...50 mb.
22. Gas cavities, notches on surface II are not allowed.
23. Presence of chromium is allowed on surfaces A, K.
24. Sheres on sharp lock angles are allowed if being fettled their dimensions do not exceed 0.5 mm with inner surface and 0.2 mm with outer surface.
25. Absence of chromium is allowed on surface C.
26. Demagnetise the rings after final treatment.

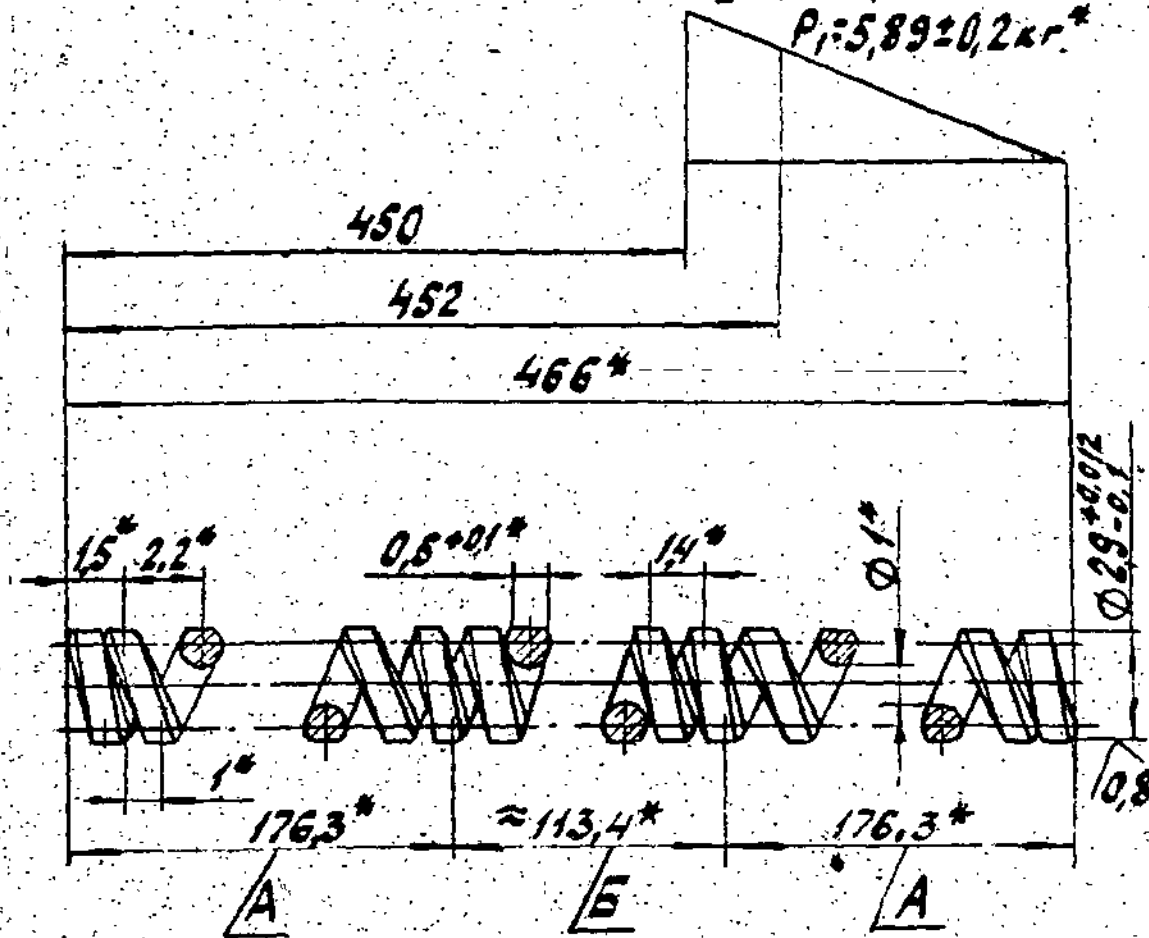
PILOT-SAMPLE SHOULD BE APPROVED BY A H S P BEFORE BULK PRODUCTION.

EST. WT. 0.040 kg.	TO BE STAMPED OR MARKED WHERE INDICATED THUS (LETTERS)
ALL SHARP EDGES AND CORNERS TO BE REMOVED. UNLESS OTHERWISE STATED MACHINED CORNERS TO HAVE R OUT - SIDE R - INSIDE. EQUIVALENT CHAMFERS ARE PERMISSIBLE.	
ISSUE	DATE
NATURE OF AMENDMENTS	

ORN. CHD	APPD. [Signature]	MATERIAL: B4 60 GOST 7293-85	USED ON: 20-04-08-6
TCD	DATE: 25 Jan 95	CONTROL RATE OF QUALITY ASSURANCE (HEAVY VEHICLES)	
SCALE: 1:1		A V A 01	
DIMENSIONS IN mm		TITLE: PISTON OIL SCRAPER RING	
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS 2102-69		D S CAT. NUMBER	DRAWING NUMBER: 20-04-09-5
ALL THREADS TO CONFORM TO			

DRAWING NUMBER  
20-04-10-2

$P_2 = 6,73 \pm 0,2 \text{ кг}^*$   
 $P_1 = 5,89 \pm 0,2 \text{ кг}^*$



ALLOWABLE II VARIANT  
Допустимый вариант  
концов пружины  
OF SPRING ENDS

NOTES

1. LENGTH OF DEVELOPED BLANK IS 1594 mm.
2. TECHNICAL REQUIREMENTS FOR A WIRE SURFACE ARE ACCORDING TO GOST 14959-79.
3. SUBJECT TO LONG-TERM LOADING BY FORCE AT A TEMPERATURE OF  $200^{+20}_{-10}$  °C TO COMPRESS UP TO THE LENGTH OF 450 mm FOR 12 HOURS.
4. BURRS ARE NOT ALLOWABLE.
5. COATING: XIM. OKC.
6. CHECK BY CHARACTERISTIC THE SPRING SUBJECTED TO LONG-TERM LOADING BY FORCE. IT IS ALLOWED TO CHECK THE ELASTICITY IN RING 20-04-09-5. THE RING ELASTICITY WITH THE EXPANDER ON A BAND INSTRUMENT WITH A CLEARANCE OF 0.7...0.9 mm. IN JOINT SHOULD BE 6000-7800 g.
7. \* DIMENSIONS FOR REFERENCES.

NUMBER OF WORKING COILS	n	240*
NUMBER OF FULL COILS	n <sub>1</sub>	242*
NUMBER OF COILS IN SECTIONS 'A'		161*
NUMBER OF COILS IN SECTIONS 'B'		81*
DIRECTION OF SPRING COILING		LEFT-HAND ONE

THIS DRG. SUPERSEDES 20-04-10 ВИДЕ 1756-86.  
RECEIVED ВИДЕ Notification No 1756-86

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

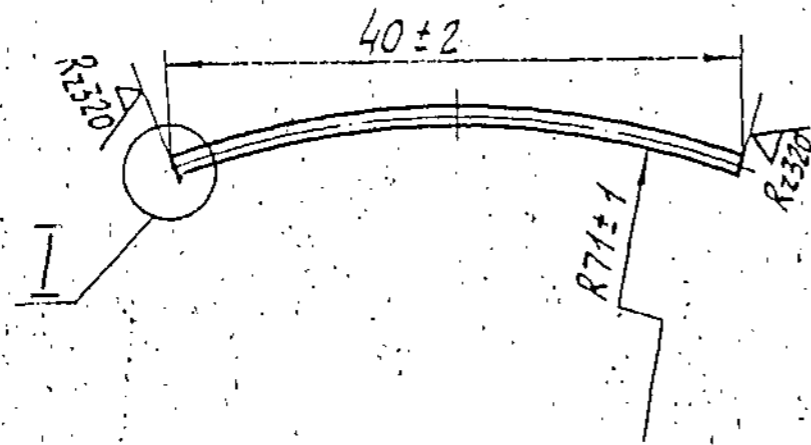
EST. WT. 0.0095 kg. TO BE STAMPED OR MARKED WHERE INDICATED THUS #1 LETTERS)

ALL SHARP EDGES AND CORNERS TO BE REMOVED UNLESS OTHERWISE STATED MACHINED CORNERS TO HAVE R OUT SIDE R INSIDE EQUIVALENT CHAMFERS ARE PERMISSIBLE.

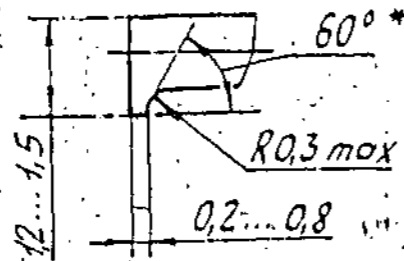
DRN	CHD	TCO	APPD	DATE	SCALE	DIMENSIONS IN mm	TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS : 2102-69.	ALL THREADS TO CONFORM TO	MATERIAL:- WIRE II-1 GOST 9389-75 TO GOST 14959-79	USED ON CB 20-04-28-2	CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI.	TITLE	D. S. CAT NUMBER	DRAWING NUMBER
				23-1-95	5:1							SPRING		20-04-10-2
ISSUE	DATE	NATURE OF AMENDMENTS												

SIZE A3

DRAWING NUMBER  
20-04-11



I REVOLVED  
M10:1



1. coating : chemically - oxidized.
- 2.\* Dimension is given for reference.

EXPLANATORY NOTE :

Material quoted : wire II-1 GOST 9389-75.  
70 GOST 1050-74.

carbon steel cold drawn spring wire of normal accuracy II wire dia = 1mm.  
Grade of steel = 70 GOST 1050-74.

Chemical composition (as per GOST 1050-74)

C = 0.67-0.75, Cr = 0.25 (max), Ni = 0.25 (max)  
Si = 0.17-0.37, S = 0.040 (max), Cu = 0.25 (max)  
Mn = 0.60-0.80, P = 0.030 (max),

Mechanical Properties (as per GOST 9389-75)

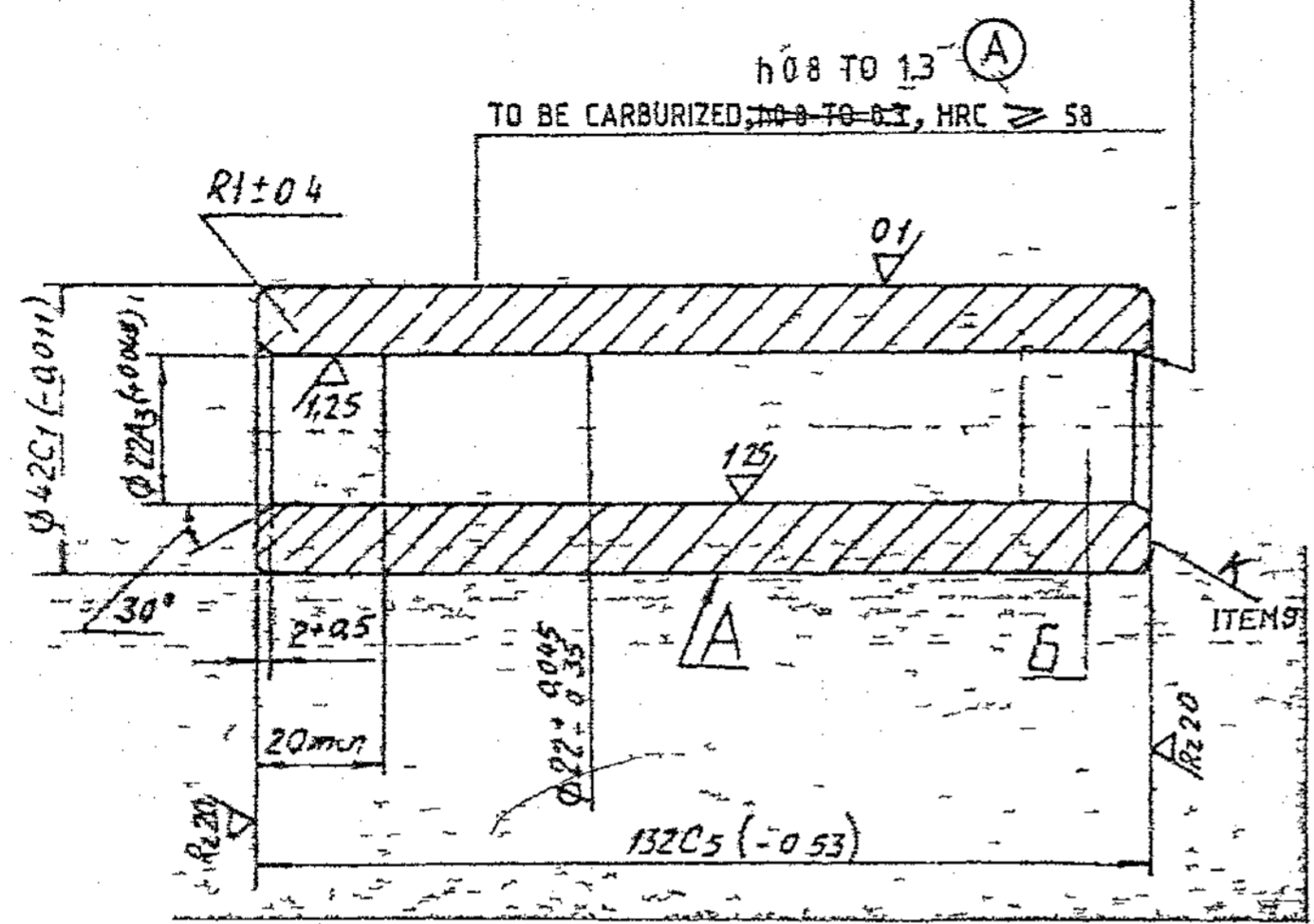
Tensile strength  $\text{kgf/mm}^2 = 190-230.$

PLOT SAMPLE SHOULD BE APPROVED BY A H S.P BEFORE BULK PRODUCTION		DRN	Grayer	MATERIAL:-	USED ON
EST. WT.	TO BE STAMPED OR MARKED WHERE INDICATED THUS # ( LETTERS)	CHD	Grayer	II-1 GOST 9389-75	CE 20-04-28-2
0.0003 kg		TCD	Grayer	70 GOST 1050-74	
ALL SHARP EDGES AND CORNERS TO BE REMOVED UNLESS OTHERWISE STATED MACHINED CORNERS TO HAVE R OUT SIDE INSIDE EQUIVALENT CHAMFERS ARE PERMISSIBLE		APPO		CONTROLLERATE OF QUALITY ASSURANCE(HEAVY VEHICLES)	
		DATE	21-11-87	AVAD	
		SCALE:-	2:1	TITLE	
		DIMENSIONS IN mm TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS:2102-69		LOCK	
		ALL THREADS TO CONFORM TO		D S CAT NUMBER	DRAWING NUMBER
		2	1086-81		20-04-11
		ISSUE DATE	NATURE OF AMENDMENTS		

SIZE A3

DRAWING NUMBER  
304-10-2

REMOVE SHARP EDGES BY POLISHING FROM TWO SIDES



**EXPLANATORY NOTE :**

10. MATERIAL QUOTED : 12XH3A TY. 14-1-381-72.

CHROMIUM NICKEL STEEL TO TY. 14-1-138-72.

12XH3A = STEEL GRADE.

a) CHEMICAL COMPOSITION : % (AS PER GOST 4543-71)

C = 0.09 - 0.16	P = 0.025 (max)	A
Si = 0.17 - 0.37	S = 0.025 (max)	
Mn = 0.30 - 0.60	Cu = 0.30 (max)	
Cr = 0.60 - 0.90		
Ni = 2.75 - 3.15		

b) MECHANICAL PROPERTIES :

YIELD POINT Kgf/mm<sup>2</sup> = 70 (min)

ULTIMATE STRENGTH Kgf/mm<sup>2</sup> = 95 (min)

% RELATIVE ELONGATION = 11 (min)

% RELATIVE REDUCTION ALONG CROSS SECTION = 55 (min)

IMPACT STRENGTH Kgf.m/cm<sup>2</sup> = 9 (min)

1. INSPECTION GROUP III AS PER TECHNICAL REQUIREMENTS HRC 26 TO 40, EXCEPT FOR SURFACE A.
2. IT IS PERMITTED TO CARBURIZE ALL OVER h0.8 TO 1.3, HRC ≥ 58.
3. INTERNAL SURFACE MAY BE CARBURIZED TO A DEPTH OF UP TO 1.5mm.
4. POLISH OR SUPER-FINISH SURFACE A.
5. WALL THICKNESS DIFFERENCE AS PER DIMENSION B SHOULD NOT EXCEED 0.2mm.
6. SURFACE A FROM LIMIT DEVIATIONS SHOULD NOT EXCEED :
  - 0.002 mm - LOBING.
  - 0.008 mm - BARREL AND BOW.
  - 0.006 mm - OVALITY AND TAPER.
  - 0.004 mm - CAMBER.
7. NOTCHES AND NICKS ON THE SURFACE OF PISTON PIN ARE NOT PERMITTED.
8. CHECK THE PART BY USING A MAGNETIC FLAW-DETECTOR CARRYOUT ACCEPTANCE IN COMPLIANCE WITH INSTRUCTIONS TT B-17.
9. APPLY STAMP WITH HAMMER OR BY ENGRAVING. IT IS PERMITTED TO APPLY STAMP BY USING ELECTRO-CHEMICAL METHOD.

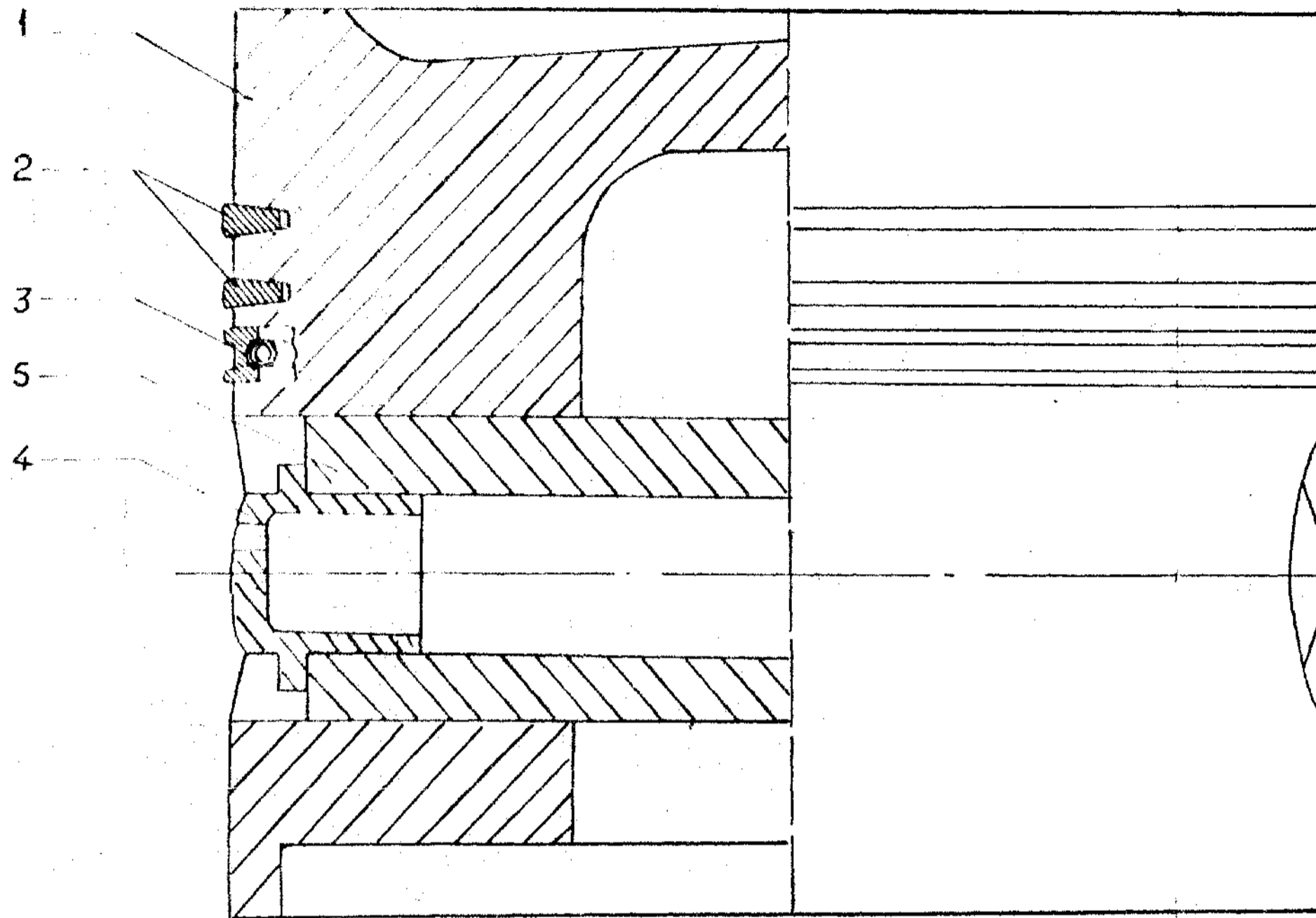
PILOT SAMPLE SHOULD BE APPROVED BY A H S P BEFORE BULK PRODUCTION.

EST. WT. 1.040 Kg	TO BE STAMPED OR MARKED WHERE INDICATED THIS $\neq$ LETTERS
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ALL SHARP EDGES AND CORNERS TO BE REMOVED UNLESS OTHERWISE STATED MACHINED CORNERS TO HAVE R OUT-SIDE R INSIDE EQUIVALENT CHAMFERS ARE PERMISSIBLE.

DRN	DESIGNED BY	MATERIAL -	USED ON :-
CHD	CHKD BY	STEEL 12XH3A	CB 20-04-00-2
TED	TRD BY	TY 14-1-381-72	
APPO	APPROVED BY	CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES)	
DATE	DATE	A V A O I	
SCALE :- 1 : 1		DIMENSIONS IN mm	
TOLERANCE ON DIMS UNLESS OTHERWISE STATED IS 2102-69		TITLE	
ALL THREADS TO CONFORM TO		PISTON PIN	
A	30.7.08	111258/IND-III/1732 Dt. 25-07-08.	D S CAT NUMBER
ISSUE	DATE	NATURE OF AMENDMENTS	DRAWING NUMBER
			304-10-2

**PARTS LIST**



ITEM No.	STANDARD PART No	REPAIR SIZE PART No.	DESCRIPTION	No.OFF	REMARKS
1	20-04-05-20	20-04-05-20R <sub>1</sub> 20-04-05-20R <sub>2</sub>	PISTON	1	FOR REPAIR SIZE DETAILS REFER STANDARD PART No DRGS
2	20-04-06-1	20-04-06-1 R <sub>1</sub> 20-04-06-1 R <sub>2</sub>	COMPRESSION PISTON RING	2	''
3	C520-04-08-6 & ITEM LIST	* C520-04-08-6 & ITEM LIST	OIL SCRAPER PISTON RING WITH EXPANDER ASSY	1	* STANDARD PART IS TO BE USED FOR OVERHAULING ALSO.
4	20-04-07	* 20-04-07	PISTON PIN STOPPER	2	''
5	304-10-2	* 304-10-2	PISTON PIN	1	''

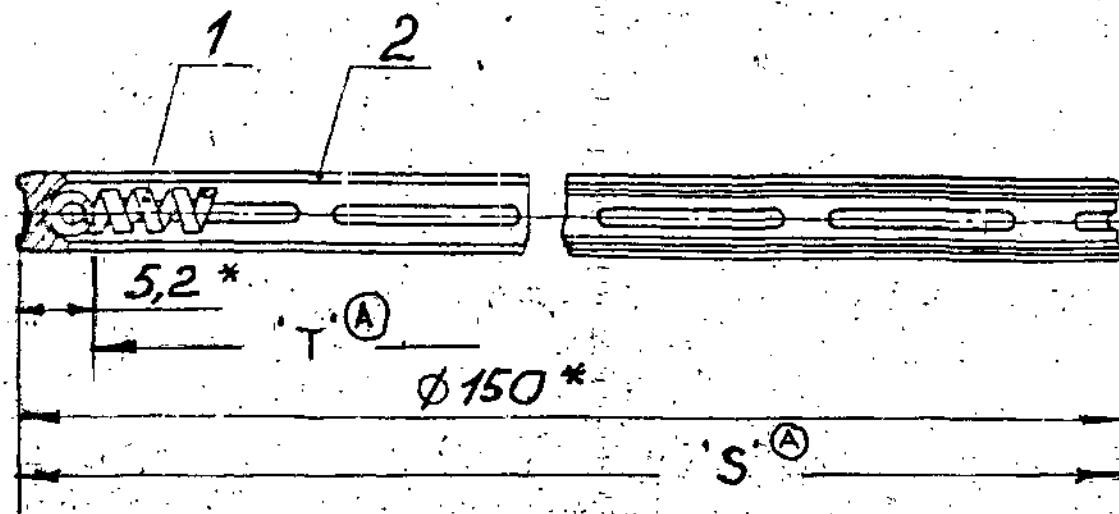
PILOT SAMPLE SHOULD BE APPROVED BY A H S P BEFORE BULK PRODUCTION.

EST. WT. - TO BE STAMPED OR MARKED WHERE INDICATED THUS # (LETTERS)

ALL SHARP EDGES AND CORNERS TO BE REMOVED UNLESS OTHERWISE STATED MACHINED CORNERS TO HAVE R OUT SIDE R INSIDE EQUIVALENT CHAMFERS ARE PERMISSIBLE.

DRN	CHD	TCD	APPD	DATE	SCALE	DIMENSIONS IN mm	TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS 2102 - 69	MATERIAL :-	USED ON :-
				21-Feb-99	NTS				
CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI								TITLE : PISTON ASSY-UTD-20	
ISSUE DATE NATURE OF AMENDMENTS								DRAWING NUMBER CQAHV 506400E	

DRAWING NUMBER  
CS20-04-08-6



1. ELASTICITY OF THE RING WITH THE EXPANDER ON A BAND INSTRUMENT WITH A CLEARANCE OF 0.7 ... 0.9 IN JOINT SHOULD BE 6000 ... 7800 g FOR REFERENCES.
2. THE EXPANDER SHOULD TURN IN THE RING WITHOUT SEIZING.
3. SPRING JOINT SHOULD BE PLACED AT AN ANGLE OF 180° TO THE RING LOCK.
4. \* DIMENSIONS ARE FOR REFERENCES.

(A) REPAIR SIZES.

REPAIR SIZE DRG. No.s.	DIMENSIONS	
	S	T
20-04-08-6 R <sub>1</sub>	150.1	139.7
20-04-08-6 R <sub>2</sub>	150.2	139.8

SUPERSEDES CS 20-04-08

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

EST. WT. 0.05 Kg TO BE STAMPED OR MARKED WHERE INDICATED THUS # ( LETTERS)

ALL SHARP EDGES AND CORNERS TO BE REMOVED UNLESS OTHERWISE STATED MACHINED CORNERS TO HAVE R OUT SIDE R INSIDE EQUIVALENT CHAMFERS ARE PERMISSIBLE.

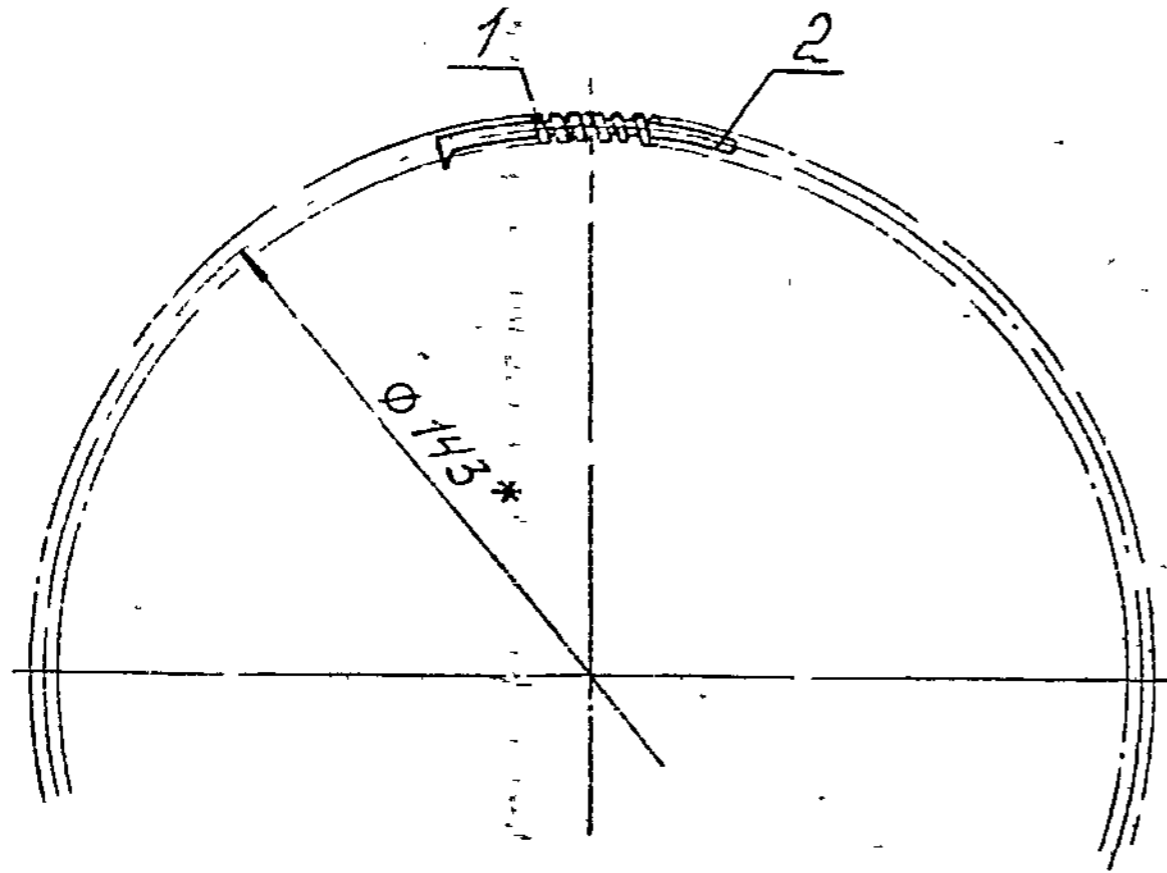
DRN	<i>De Paul</i>	MATERIAL:-	USED ON
CHD	<i>ms</i>	=	CS 20-04-00-3
TEO	<i>De Paul</i>		
APPD	<i>ox</i>		
DATE	23-11-95	CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES)	
SCALE:-	2:1	AVADL	
DIMENSIONS IN mm			TITLE
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS : 2102-69.			OIL SCRAPER PISTON RING WITH EXPANDER ASSY
ALL THREADS TO CONFORM TO		D S CAT NUMBER	DRAWING NUMBER
A	4-2-99	AUTHY LT.No. 93720/IND/III/318 dt.24/9/98	CS20-04-08-6
ISSUE	DATE	NATURE OF AMENDMENTS	

SIZE A3



DRAWING NUMBER  
CS 20-04-28-2

S'echm c020-04-28 vidi 1756-86



1. SCREW A CLINCHED LOCK END IN ONE OF SPRING ENDS PER 1/2 OF LENGTH. THE LOCK SHOULD BE SCREWED IN EASILY WITHOUT SEIZING.
2. \* DIMENSION WITHOUT REFERENCES.

SIZE A3

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

EST. WT.  
0.0098 kg.

TO BE STAMPED OR MARKED WHERE INDICATED THUS # (      ) LETTERS)

ALL SHARP EDGES AND CORNERS TO BE REMOVED UNLESS OTHERWISE STATED MACHINED CORNERS TO HAVE R OUT SIDE. R INSIDE EQUIVALENT CHAMFERS ARE PERMISSIBLE.

			DRN	<i>mk</i>	MATERIAL:-	USED ON
			CHD	<i>mk</i>		CS 20-04-08-6
			TCD			
			APPD	<i>mk</i>	CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) - AVADL	
			DATE	23-1-95		
			SCALE:-	1:1		
			DIMENSIONS IN mm		TITLE <b>EXPANDER ASSY</b>	
			TOLERANCE ON DIMS UNLESS OTHERWISE STATED IS : 2102-69.			
			ALL THREADS TO CONFORM TO		D S CAT NUMBER	DRAWING NUMBER
						CS 20-04-28-2
8	7	6	ISSUE	DATE	NATURE OF AMENDMENTS	

