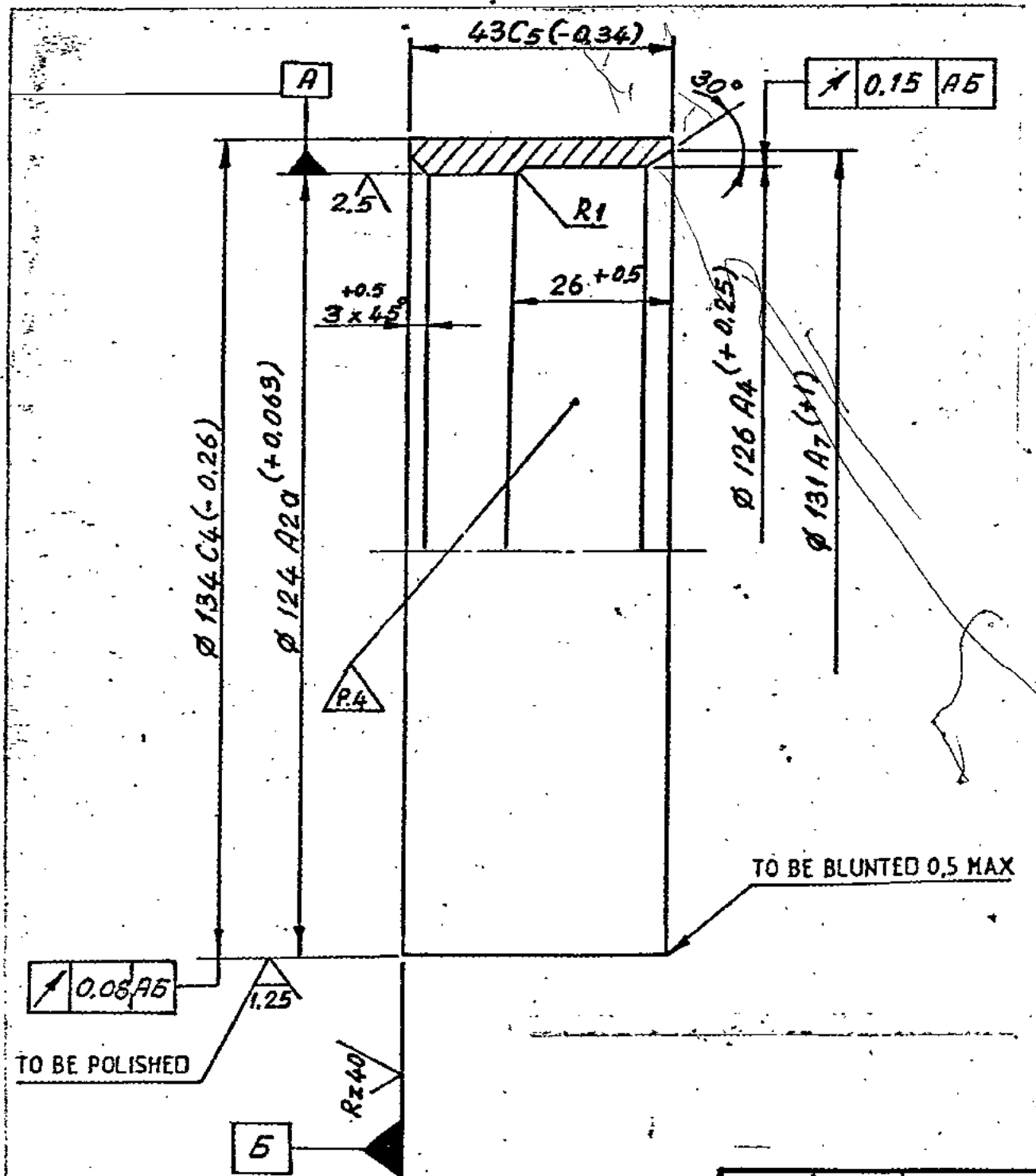


DRAWING NUMBER
172 52 126

Rz80 (✓) (✓)



1. BHN 321 269 (DIA OF INDENTATION 3,4 TO 3,7) TO BE ENSURED IN BLANK.
2. COATING OF SURFACE ϕ 134 C4 ER-30 HARD CHROMIUM LAYER MAY BE INCREASED TO 48^{72} μ THE REMAINING SURFACES MAY BE COATED BY CHEMICAL OXIDIZING/PHOSPHATING, OIL FINISHING OR CHEMICAL PHOSPHATING OIL FINISHING.
3. THE REST OF THE REQUIREMENTS ARE AS PER 520 TY 1
4. TO BE STAMPED BY ETCHING.
5. MATERIAL: ALTERNATIVE PIPE MADE OUT OF STEEL B30XPCA GOST 8731-74, STEEL 30XPCA GOST 4543-71.
2. COATING OF SURFACE ϕ 134 C4 HARD CHROMIUM PLATING 30 IT IS ALLOWED TO INCREASE THE LAYER OF CHROMIUM UPTO 72^{72} μ AND THERE MAY BE NO CHROMIUM AT A DISTANCE OF UPTO 1,5 mm FROM FACE & COATING OTHER SURFACES CHEMICAL OXIDIZING PHOSPHATING, OIL FINISHING OR CHEMICAL PHOSPHATING OIL FINISHING.

EXPLANATORY NOTE

- a) REFERENCE MATERIAL QUOTED: STEEL 38XC GOST 4543-71 STRUCTURAL CHROMIUM SILICON ALLOY STEEL OF GOOD QUALITY TO GRADE 38XC GOST 4543-71.
- b) REFERENCE NOTE 5 ON ALTERNATIVE MATERIAL : PIPE MADE OUT OF STEEL B30XPCA GOST 8731-74, STEEL 30XPCA GOST 4543-71. STRUCTURAL ALLOY HIGH QUALITY STEEL GRADE 30XPCA (CHROMIUM SILICON MANGANESE STEEL) MANUFACTURED IN ACCORDANCE WITH GOST 4543-71.
- a) CHEMICAL COMPOSITION : AS PER GOST 4543-71.

GRADE OF STEEL	CONTENT OF ELEMENTS %									
	C	Si	Mn	Cr	S	P	Cu	Ni	Cr	
38XC	0,34-0,42	1,0-1,4	0,30-0,60	1,30-1,60	0,035	0,035	0,30	0,30	0,30	
30XPCA	0,28-0,34	0,90-1,20	0,80-1,10	0,80-1,10	0,025	0,025	0,30	0,30	0,30	

b) MECHANICAL PROPERTIES : AS PER GOST 4543-71

GRADE OF STEEL	TENSILE STRENGTH	YIELD POINT	ELONGATION	REDUCTION IN AREA	IMPACT STRNGTH
	Kgf/mm ²	Kgf/mm ²	%	%	Kgm/cm ²
38XC	95	75	12	50	7
30XPCA	110	85	10	45	5

ORG. CREATED BASED ON RUSSIAN ORIGINAL ISSUE-7

COMMON TO BLT

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

EST. WT. 0,586 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 INSIDE EQUIVALENT CHAMFERS ARE PERMISSIBLE

DRN	<i>[Signature]</i>	MATERIAL:-	USED ON 172 52 051 Cb Cb 172 52 054 Cb Cb
CHK	<i>[Signature]</i>	STEEL 38XC GOST 4543-71	
TCD	<i>[Signature]</i>		
APPD	<i>[Signature]</i>	CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES)	AYAB
DATE	25-9-90		
SCALE:-	1 : 1		
		DIMENSIONS IN mm	TITLE
		TOLERANCE ON DIMS UNLESS OTHERWISE STATED IS 2102-69	HOLDER
		ALL TREATS TO CONFORM TO	D S CAT NUMBER
			DRAWING NUMBER
			172 52 126

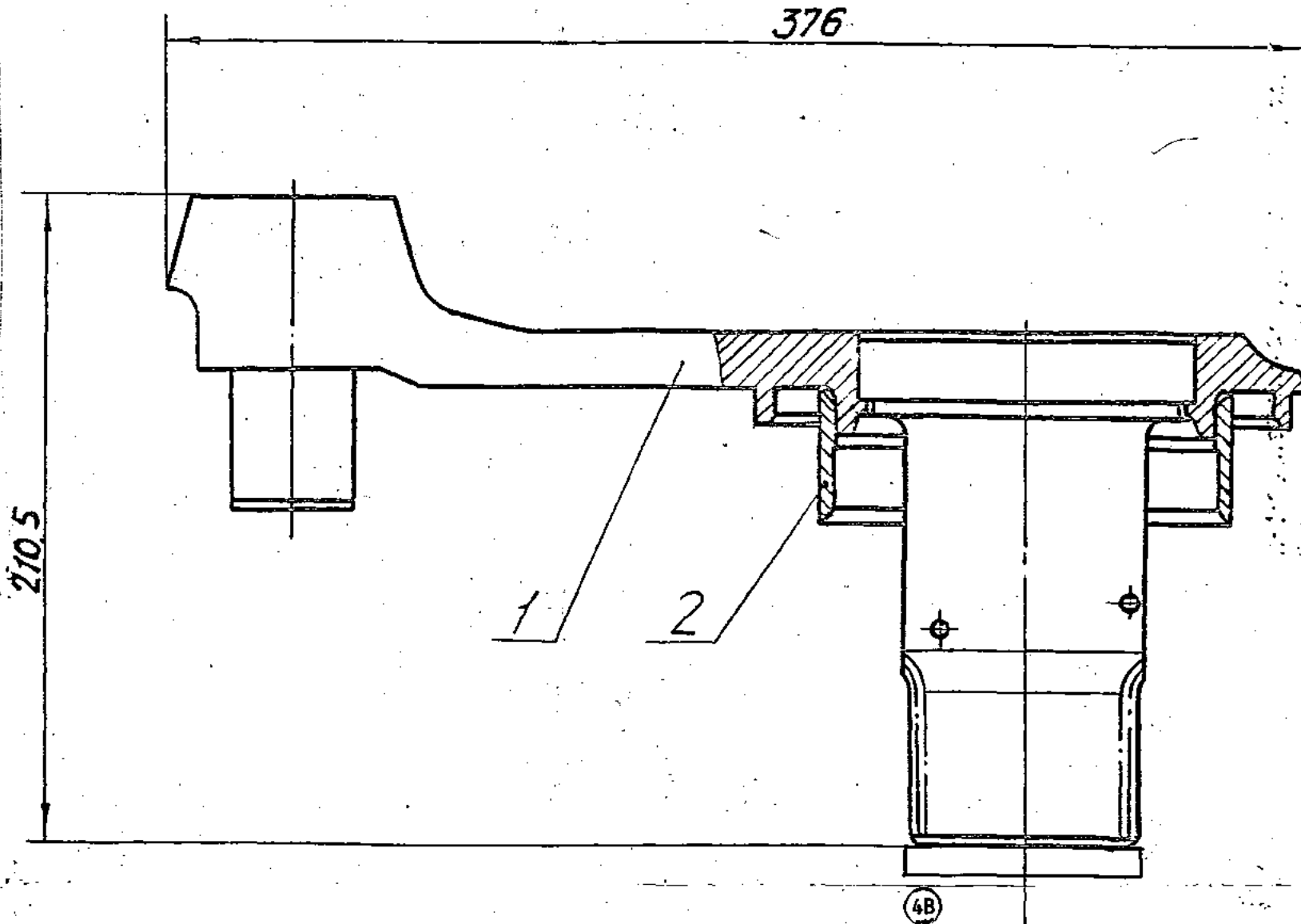
ISSUE DATE	NATURE OF AMENDMENTS
5.6 5.8.89	172 M. 75 A-87 A.L. 9/2
3.4 11.01.89	Amde List No.6/E Book-8
2.5 11.01.89	Amde List No.6/E Book-8

F2 NEW
41
SIZE A3



DRAWING NUMBER
172 52 054 C6-C6

376



- ~~1. PRIOR TO PRESS FITTING CASING 2 MATING SURFACES ARE TO BE COATED WITH ZINC WHITE PASTE PREPARED AS PER INSTRUCTIONS NO. 5 OF THE PROCESS ENGINEERING DEPARTMENT. PIGMENT PASTE MA OIL COST 4 92-77~~
- ~~3~~
- ~~4~~
- ④ 1. PRIOR TO PRESS FITTING CASING 2 MATING SURFACES ARE TO BE COATED WITH SEALANT 5-70, MADE AS PER INSTRUCTION ADK 25.064.00015.
- 2. JOINTS OF THE LEVER AND THE HOLDER ARE TO BE CHECKED FOR LEAKS BY POURING KEROSENE IN TO THE CAVITY BETWEEN HOLDER AND THE LEVER AXLE.
- 3. CLEARANCE BETWEEN THE SUPPORTING SURFACES OF THE LEVER AND THE HOLDER SHOULD NOT EXCEED 0.2 mm.
- 4. DIMENSIONS FOR REFERENCE.

* 172-52-044 C8-1A C8
④A 172-52-045 C8-1A C8

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

EST. WT. 14.97 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
4B	23.12.13	Authy Lt.No. 83202/CER/DGOF/IND-1/A Dt. 15.11.13
4A	11.4.04	N OF A - No. CSA (HV) T90/52/001
4	15-1-93	NOTN. 172 M 197 'A'-90.A.L.14/2
3	24-3-90	172 M 388 "A" 8/11-88 (A.L.10/3)

DRN	H. Gansan	MATERIAL:-	USED ON: * 172 52 044 C6-1C6 172 52 045 C6-1C6
CHD	Chanchal		
TCD	H. Gansan	CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI.	TITLE LEVER WITH HOLDER.RH.
APPD			
DATE	17-12-99	D S CAT NUMBER	DRAWING NUMBER 172 52 054 C6-C6
SCALE:-	1:2		
DIMENSIONS IN mm TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS : 2102-69.			
ALL THREADS TO CONFORM TO			

DRG. REINDIANISED BASED ON RUSSIAN ORIGINAL ISSUE - 2

COMMON TO BLT

NEWF-2
19

SIZE A3

THE
MOUNTAIN
VIEW
HOTEL



THE
MOUNTAIN
VIEW
HOTEL

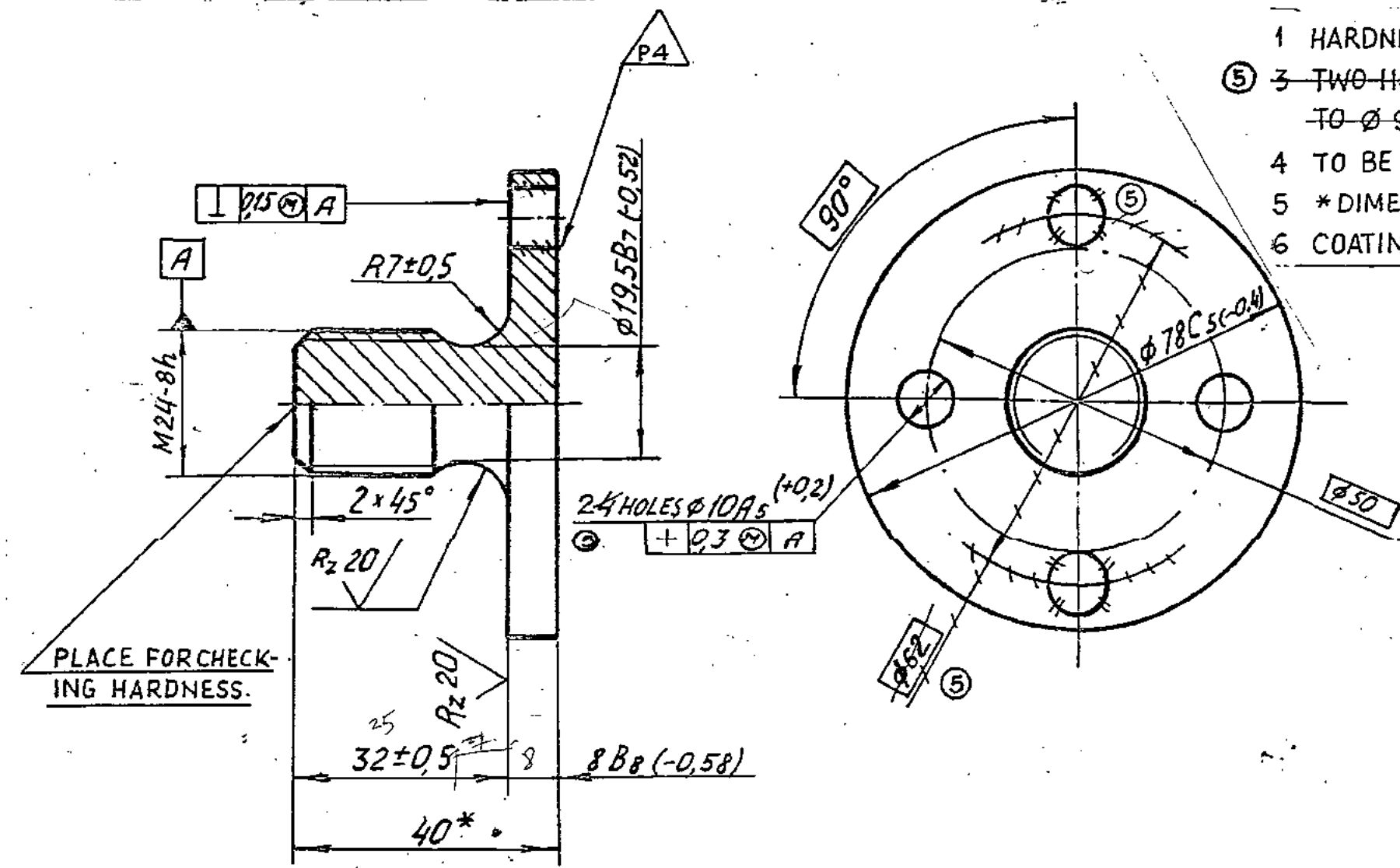






DRAWING NUMBER
172 52 090-A

Rz80 (✓)



- 1 HARDNESS BHN 302 TO 255 (DIA OF INDENTATION 3.5 TO 3.8).
- ⑤ 3 TWO HOLES LOCATED ON DIAMETER 62mm MAY BE DRILLED TO $\phi 9.8 A_{1(+0.36)}$ mm.
- 4 TO BE MARKED.
- 5 * DIMENSIONS FOR REFERENCE.
- 6 COATING: CHEMICAL OXIDIZING/PHOSPHATING OIL FINISH.

- ⑤B 172.52.053cbCb
- 172.52.056cbCb
- ** 172.52.043cbCb-1AcCb
- ⑤B ⑤A 172.52.044cbCb-1AcCb
- 172.52.045cbCb-1AcCb

DRG. RE-INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE:- 4
COMMON TO BLT

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

EST. WT. 0.38 kg TO BE STAMPED OR MARKED WHERE INDICATED THUS # (LETTERS)

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

ISSUE	DATE	NATURE OF AMENDMENTS
SB	14.11.13	Authy. Lt.No. 83202/CER/DGOF/IND-16 IND-1/A Dt 15.11.13
5A	11.4.04	N OF A. No. COA (HY) T90/52/001
5	8-11-90	NOTN. No. 172M, 551. "A" 88 AL.11/1

DRN	M. Ganesan	MATERIAL:-	USED ON:- 172.52.043cbCb-1AcCb
CHD	Chanchal	STEEL 38XC	** ⑤B 172.52.044cbCb-1AcCb
TCD	M. Ganesan	GOST 4543-71	172.52.045cbCb-1AcCb
APPD	lc		
DATE	17-12-99	CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI.	
SCALE:-	1:1		
DIMENSIONS IN	mm		
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS:	2102-69.	TITLE PLUG	
ALL THREADS TO CONFORM TO IS: 4216-Part IV		D S CAT NUMBER	DRAWING NUMBER 172 52 090-A

F-94
8

SIZE A3

30





**RESTRICTED
(DRAFT/PROVISIONAL)
QUALITY ASSURANCE PLAN**

FOR

(LEVER WITH HOLDER RH)

DRG.NO.172.52.054CBCB

(LF NO: 6206412088)

No. HVF/T-72/QAP/52/LEVER WITH HOLDER RH/243720-00

ISSUE No: 00

DATE: NOV-2023

QUALITY ASSURANCE (RIG-OP)

HEAVY VEHICLES FACTORY

AVADI CHENNAI – 600 054

QUALITY ASSURANCE PLAN (QAP)

FOR


LEVER WITH HOLDER RH

DRG. NO. 172.52.054CBCB

PREPARED BY


(C.NANDA KUMAR)
JWM/QA (RIG-OE&OH)

REVIEWED BY


(AWNEESH YADAV)
JWM/QA (RIG- OP/TA)

APPROVED BY


(NEERAJ KUMAR)
JT.GM/QA (RIG-OP)

ISSUED BY

QUALITY ASSURANCE (RIG- OP)
HEAVY VEHICLES FACTORY
AVADI CHENNAI – 600 054

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1. IMPORTANT NOTES

Note-1

This is only a provisional and will be amended from time to time according to the requirement. No addition, deletion and reproduction will be done without permission of The Chief General Manager, Heavy Vehicles Factory, Avadi, Chennai – 54.

Note-2

Any instruction contained in this does not prejudice the terms and conditions of the contract what so ever. In case of any contradiction between the contents of this QAP and the clause in the contract, the latter will prevail.

Note-3

The stores should be manufactured strictly only as per the drawings supplied by the Inspection Authority and not as per the samples, if any received by the manufacturer for guidance purpose.

Note-4

Any amendment issued by the Inspection Authority shall be incorporated in the QAP and the records for the amendments carried out should be maintained as per the Performa at Appendix-"A".

Note-5

In case of any contradiction between the contents of this QAP and drawings /specification/GOST issued along with the contract, the latter only will prevail.

2. INTRODUCTION

1. This quality plan lays down the inspection and testing procedure to be carried out on the component **LEVER WITH HOLDER RH TO DRG.NO 172.52.054CBCB** being procured indigenously. This is prepared, based on the acceptance standards and inspection parameters laid down in collaborators documents and on the inspection test standards followed in respect of similar indigenous items.
2. This QAP is the property of Government of India and is liable for amendments as and when required. The Chief General Manager, Heavy Vehicles Factory, Avadi, Chennai – 600 054, is the inspecting Authority for this assembly. Any query / clarification on the content of this QAP shall be referred to this Factory. Any departure from these instructions is allowed only after written approval from the above authority. Notwithstanding the tests indicated in this QAP, the inspecting Officer has the right to carry out any test to check conformance to the paper particulars quoted in the Supply Order, which he may consider necessary to satisfy himself about the stores which he has to accept.

3. AIM

This QAP is aimed at standardizing the Inspection procedure and acceptance norm for **LEVER WITH HOLDER RH TO DRG.NO:172.52.054CBCB**.

It also aims at giving adequate information to the manufacturer on the quality requirements so that the required quality control methods are established. This is also meant to guide authorized Inspection Officer in his routine inspection

and to set out main points to which his attention must be drawn to ensure that the accepted stores meet the stipulated standards.

4. SCOPE:

This QAP outlines in general terms, the checks and methods to be used during inspection of **LEVER WITH HOLDER RH TO DRG. NO. 172.52.054CBCB** including the technical requirements of the drawings, the recommended Quality Plan stipulated herein is mandatory and should be strictly adhered to.

For inspection purpose, only the latest issue of this QAP will be made applicable and copies of this QAP can be obtained from the issuing authority i.e. The Chief General Manager, Heavy Vehicles Factory, Avadi, and Chennai.

Note:

- i. Tender enquiry (TE) and supply order (S.O) will be issued with QAP stating that inspection will be done as per QAP.
- ii. In case of TE, It is responsibility of the vendor to obtain the copy of QAP and give the statement of compliance that vendor will abide by the QAP in case supply order is placed.
- iii. In case of S.O, it is the responsibility of the vendor to obtain copy of QAP and give the statement of compliance that the vendor will follow QAP. However, CGM/HVF reserves the right to revise/update the QAP from time to time.

5. DOCUMENTS:

- a) On placement of firm supply order, One set of relevant technical documents for manufacturing (includes details about material, casting/forging, machining, heat processes, QAP against relevant items of this assembly, etc. and up to final inspection) the components like GOST/Drawing/Specification, Technical data book, process sheet etc., and technical instructions on the subject item is to be obtained by the contractor from AHSP through DDO/HVF.
- b) Any clarification required on these documents to be obtained from the Inspecting Authority i.e. The Chief General Manager, Heavy Vehicles Factory, Avadi, Chennai – 600 054. Equivalent to the collaborators specifications and standards will be decided only by the Inspecting Authority and should not be unilaterally decided. For any change in the specifications, standards or written approval, any alterations in specification can be affected and not otherwise.
- c) The process instruction sheets supplied by the collaborators are available with the Authority Holding Sealed Particulars, i.e. The Controller at Quality Assurance (Heavy Vehicles), Avadi, Chennai for the reference. The relevant process sheets may be studied at the premises of the AHSP after obtaining necessary permission.
- d) The supplier after scrutiny of the concerned process sheets and connected paper particulars should establish the necessary production and inspection facilities. Particularly the inspection test rigs, stands, fixtures, template, gauges etc., should be provided as recommended in these process sheets. If process sheet / Process Book is not available the details particulars/parameters available in the drawings to be strictly adhered.

6. ITEM USED ON:

1. 172.52.044CB-1CB - HYDRAULIC SHOCK ABSORER OF 1ST AND 2ND RH SUSPENSIONS.

2. 172.52.045CB-1CB - HYDRAULIC SHOCK ABSORER OF 6TH RH SUSPENSIONS.

7. LIST OF DRAWINGS:

SI. NO.	DRG. NO	NOMENCLATURE	REMARKS
	172.52.054CBCB	LEVER WITH HOLDER RH	-
1	172.52.055CBCB	LEVER WITH PIN R.H	-
2	172.52.126	HOLDER	-
	172.52.055CBCB	RIGHT HAND LEVER WITH PIN ASSY	-
1	172.52.056CBCB	RIGHT LEVER WITH PIN ASSY	-
2	172.52.103	PIN	-
	172.52.056CBCB	LEVER WITH AXLE, R.H	-
1	172.52.124	LEVER	-
2	172.52.125	AXLE	-
3	172.52.090-A	PLUG	-

8. BILL OF MATERIALS:

SI. NO	DRG. NO	NOMENCLATURE	MATERIAL SPECIFICATION	QTY
	172.52.054CBCB	LEVER WITH HOLDER RH	-	-
1	172.52.055CBCB	LEVER WITH PIN R.H	-	1
2	172.52.126	HOLDER	STEEL 38XC GOST 4543-71	1
	172.52.055CBCB	RIGHT HAND LEVER WITH PIN ASSY	-	-
1	172.52.056CBCB	RIGHT LEVER WITH PIN ASSY	-	1
2	172.52.103	PIN	STEEL 20X2H4A GOST 4543-71	1
	172.52.056CBCB	LEVER WITH AXLE, R.H	-	-
1	172.52.124	LEVER	STEEL 20X2H4A GOST 4543-71	1
2	172.52.125	AXLE	STEEL 20X2H4A-Ш GOST 4543-71	1
3	172.52.090-A	PLUG	STEEL 38XC GOST 4543-71	1

Note: Vendor/Contractor may use approved alternate material if any specified in drawing/ specification. *Also refer Para 13.

9. CONDITIONS OF USE/STORAGE INSTRUCTIONS

This assembly/item should be properly packed to protect from transit / handling damage and influence of atmospheric precipitations. In addition, the following parameters should be ensured:

- (a) The threaded parts if any should be covered with suitable plastic caps to prevent damages.
- (b) If the item consists of assemblies, each assembly should be packed separately.
- (c) The stores are to be suitably covered for preventing ingress of dust and Dirt/entry of sunlight / moisture.
- (d) The packaging slip shall contains
 - (i) Certificate of testing- NABL Certificate.
 - (ii) Guarantee/ Warranty Certificate.
 - (iii) Service and maintenance instructions (if applicable).
 - (iv) Delivery Slip with Inspector's Acceptance Mark.
 - (v) Undertaking and certificate of conformance. (As applicable)
- (e) The stores are not permitted to be stored together with oils. Petrol, acids, alkaline and other substances to avoid damage to the metal / rubber components.

10. SAMPLING PLAN:

Sl. No.	Sampling Plan	Pilot	Bulk (individual components)	Bulk (Total Assembly component)
Acceptance test (As below)				
(i)	Visual Inspection	100%	100%	100%
(ii)	Dimensional Inspection(Including Hardness)	100%	General Inspection level III, single sampling, Normal Inspection, AQL 2.5 of IS 2500 (Part-I)-2000	
(iii)	Material Inspection (Including Chemical, Mechanical & Physical properties)	1 No	1 No. or qty as specified in specification, GOST for each batch of raw material or heat treatment lot / As required for confirmation of material.	
(iv)	Pressure testing	-----	-----	-----
(v)	Machining/Fitment/ Performance trial on higher assembly	01 No.	-----	01 No. per batch / As required.

	/ Tank			
(vi)	Interchangeability Test	02 Nos.	----	02 Nos. Per batch on randomly basis, except selective assembly.
vii)	Calibration reports/certificate of Test stand/Jigs/Equipment's/Fixtures/Gauges/Mandrels/etc.,	100 %		100 %
viii)	Marking/ Identification	100%		100%
ix)	Packing/ Preservation	100%		100%

Note:-

A New (First time supplier of this item) supplier should obtain clearance from HVF for bulk production which will be issued only after inspection/evaluation of pilot samples by HVF (Refer process book, TD book and related specification for acceptance test of the component)

During acceptance of components, the following are to be checked as per Specification, drawings.

- Chemical composition of material;
- Mechanical properties of material;
- External view (absence of defects)
- Dimensions;
- Hardness as applicable;
- Absence of internal defects & Etc.

11. VISUAL INSPECTION [Sampling plan as per Para- 10 (i)]

The stores are to be visually examined on 100 % of pilot /bulk and same should be free from any defects and all the finishing requirements shall satisfy as indicated in technical conditions of the assembly / component drawing.

The components shall be checked for the following and should be free from the defects:

- Defects in construction
- Cracks/Dents/Scratches
- Fitment of all components
- Presence of foreign particles
- Moisture and dust
- Corrosion of metal parts
- Mechanical imperfections & distortion
- Any form of deterioration of material and finishing.

Packing and preservation should be ensured as per drawings/relevant TY specification (To be ensured on receipt at consignee end).

12. DIMENSIONAL CHECK [Sampling plan as per Para- 10(ii)]

The dimensions including geometrical parameters of individual component, sub assembly and major assembly shall be checked and ensured as per respective drawing. Dimensional check should be carried out as per sampling plan. However, the inspecting authority/rep. may at his discretion, tighten the inspection level and acceptance quality level on the critical items and adopt check point during manufacture.

Sl. NO.	DRG. NO	NOMENCLATURE	REMARKS
	172.52.054CBCB	LEVER WITH HOLDER RH	All dimensions including geometrical parameters should be confirmed against each item as per relevant drawing/GOST/specification
1	172.52.055CBCB	LEVER WITH PIN R.H	
2	172.52.126	HOLDER	
	172.52.055CBCB	RIGHT HAND LEVER WITH PIN ASSY	
1	172.52.056CBCB	RIGHT LEVER WITH PIN ASSY	
2	172.52.103	PIN	
	172.52.056CBCB	LEVER WITH AXLE, R.H	
1	172.52.124	LEVER	
2	172.52.125	AXLE	
3	172.52.090-A	PLUG	

Sl. No	Drawing Dimensions 172.52.054CBCB Complete (Final) Assembly. (Contradiction if any between the dimensions mentioned in this QAP and Drawing the later only will prevail)
1.	210.5 mm
2.	376 mm

NOTE:

1. Surface finish/Roughness should be confirmed as per drawing and Specification.
2. For admissible alternate method for manufacture in dimensions/material if any refer drawing/specification.
3. Welding/Solder parameters to be confirmed as per Drawing/ Specification / GOST specified against relevant component/assemblies.
4. Gear / Spline dimensions shall be confirmed as per drawing against relevant components.

13) MATERIAL CHECKS [SAMPLING PLAN AS PARA – 10 (iii)].

Material specimen /test bars of the components shall be in conformity as per the material mentioned in the relevant documents/drawing. NABL test reports for all the parameters as per relevant specifications to be submitted. Test samples to be submitted by the vendor to HVF, if required. The material check will be carried out

as per sampling plan. * However, if the manufacturer proposes any alternative material at the stage of tender enquiry, the same has to be approved and a written concurrence should be obtained from AHSP through DDO/HVF, before usage of such materials.

13.1 HOLDER TO DRG.NO: 172.52.126

a) The component should be manufactured from STEEL 38XC TO GOST 4543-71.

b) **Chemical properties:** As per STEEL GRADE 38XC TO GOST 4543-71.

Grade	CONTENT OF ELEMENTS%							
	C	Si	Mn	Cr	S	P	Cu	Ni
	MAX							
38XC	0.34 to 0.42	1.00 to 1.40	0.30 to 0.60	1.30 to 1.60	0.035	0.035	0.30	0.30

Note: For mass fraction of other elements refer GOST 4543-71.

c) **Mechanical properties:** As per STEEL GRADE 38XC TO GOST 4543 –71.

Yield point, N/mm ² / (kgf/mm ²)	Ultimate strength, N/mm ² (Kgf/mm ²)	Elongation %	Relative reduction of area %	Impact strength KCU / (Kgm/cm ²)
Not less than				
735 (75)	930 (95)	12	50	69 (7)

Note: For details of other properties & parameters refer GOST 4543-71.

13.2 PIN TO DRG.NO: 172.52.103.

a) The component should be manufactured from STEEL 20X2H4A GOST 4543 - 71.

b) **Chemical properties:** As per STEEL 20X2H4A GOST 4543 - 71.

GRADE OF STEEL	C	Si	Mn	Cr	Ni	P	S	Cu	Ni	Cr
	MAXIMUM									
	20X2H4A	0,16 - 0,22	0,17 - 0,37	0,30 - 0,60	1,25 - 1,65	3,25 - 3,65	0,025	0,025	0,30	0,30

Note: For mass fraction of other elements refer GOST 4543-71.

c) Mechanical properties: As per STEEL 20X2H4A GOST 4543 - 71.

GRADE OF STEEL	YIELD POINT Kgf/mm ²	ULTIMATE STRENGTH Kgf/mm ²	RELATIVE ELONGATION %	RELATIVE REDUCTION ALONG CROSS SECTION %	IMPACT STRENGTH Kgm/cm ²
NOT LESS THAN					
20X2H4A	110	130	9	45	8

Note: For details of other parameters & properties refer GOST 4543-71.

13.3 LEVER TO DRG.NO: 172.52.124.

a) The component should be manufactured from STEEL 20X2H4A GOST 4543 - 71.

b) Chemical properties: As per STEEL 20X2H4A GOST 4543 - 71.

GRADE OF STEEL	C	Si	Mn	Cr	Ni	P	S	Cu	Ni	Cr
						MAXIMUM				
20X2H4A	0,16 - 0,22	0,17 - 0,37	0,30 - 0,60	1,25 - 1,65	3,25 - 3,65	0,025	0,025	0,30	0,30	0,30

Note: For mass fraction of other elements refer GOST 4543-71.

c) Mechanical properties: As per STEEL 20X2H4A GOST 4543 - 71.

GRADE OF STEEL	YIELD POINT Kgf/mm ²	ULTIMATE STRENGTH Kgf/mm ²	RELATIVE ELONGATION %	RELATIVE REDUCTION ALONG CROSS SECTION %	IMPACT STRENGTH Kgm/cm ²
NOT LESS THAN					
20X2H4A	110	130	9	45	8

Note: For details of other parameters & properties refer GOST 4543-71.

13.4 AXLE TO DRG.NO: 172.52.125.

a) The component should be manufactured from STEEL 20X2H4A-ш GOST 4543 - 71.

b) Chemical properties: As per STEEL 20X2H4A-ш GOST 4543 - 71.

GRADE OF STEEL	C	Si	Mn	Cr	Ni	P	S	Cu	Ni	Cr
						MAXIMUM				
20X2H4A	0,16 - 0,22	0,17 - 0,37	0,30 - 0,60	1,25 - 1,65	3,25 - 3,65	0,025	0,025	0,30	0,30	0,30

Note: For mass fraction of other elements refer GOST 4543-71.

c) Mechanical properties: As per STEEL 20X2H4A-ш GOST 4543 - 71.

GRADE OF STEEL	YIELD POINT Kgf/mm ²	ULTIMATE STRENGTH Kgf/mm ²	RELATIVE ELONGATION %	RELATIVE REDUCTION ALONG CROSS SECTION %	IMPACT STRENGTH Kgm/cm ²
NOT LESS THAN					
20X2H4A	110	130	9	45	8

Note: For details of other parameters & properties refer GOST 4543-71.
13.5 PLUG TO DRG.NO: 172.52.125.

a) The component should be manufactured from STEEL 38XC TO GOST 4543-71.

b) **Chemical properties:** As per STEEL GRADE 38XC TO GOST 4543-71.

Grade	CONTENT OF ELEMENTS%							
	C	Si	Mn	Cr	S	P	Cu	Ni
38XC	0.34	1.00	0.30	1.30	0.035	0.035	0.30	0.30
	to 0.42	to 1.40	to 0.60	to 1.60				

Note: For mass fraction of other elements refer GOST 4543-71.

c) **Mechanical properties:** As per STEEL GRADE 38XC TO GOST 4543 -71.

Yield point, N/mm ² / (kgf/mm ²)	Ultimate strength, N/mm ² (Kgf/mm ²)	Elongation %	Relative reduction of area %	Impact strength KCU / (Kgm/cm ²)
Not less than				
735 (75)	930 (95)	12	50	69 (7)

Note: For details of other properties & parameters refer GOST 4543-71.

14) PERFORMANCES/ACCEPTANCE TEST/ TR POINTS OF LEVER WITH HOLDER RH TO DRG NO: 172.52.054CBCB

(The following shall be ensured/followed during manufacturing the components)

1. **PRIOR TO PRESS FITTING CASING 2 MATING SURFACES ARE TO BE COATED WITH SEALANT 5-70, MADE AS PER INSTRUCTION ADK 25.064.00015.**
2. **JOINTS OF THE LEVER AND THE HOLDER ARE TO BE CHECKED FOR LEAKS BY POURING KEROSENE IN TO THE CAVITY BETWEEN HOLDER AND THE LEVER AXLE.**

3. CLEARANCE BETWEEN THE SUPPORTING SURFACES OF THE LEVER AND THE HOLDER SHOULD NOT EXCEED 0.2 mm.

4. DIMENSIONS FOR REFERENCE.

SI. NO.	DRG. NO	NOMENCLATURE	REMARKS
1	172.52.055CBCB	LEVER WITH PIN R.H	All technical requirements should be confirmed against each item as per relevant drawing/GOST/specification
2	172.52.126	HOLDER	
	172.52.055CBCB	RIGHT HAND LEVER WITH PIN ASSY	
1	172.52.056CBCB	RIGHT LEVER WITH PIN ASSY	
2	172.52.103	PIN	
	172.52.056CBCB	LEVER WITH AXLE, R.H	
1	172.52.124	LEVER	
2	172.52.125	AXLE	
3	172.52.090-A	PLUG	

15) FITMENT AND PERFORMANCE TEST:

- a. Pilot samples should be checked for fitment Performance trial at HVF and Performance test to ascertain the efficacy of the system under different operating conditions by fitting in higher assembly and repeating it for functional checks, wherever required.
- b. Items of Bulk supplies may be subjected to performance trial in tank in case of repeated failure/defects during exploitation.
- c. Components will be cleared for bulk supplies only after acceptance of the components in Fitment / performance trials at HVF

EXPLANATORY NOTE:

- 1) Stage wise process and inspection of the component as specified in TD Book/ Process Book/ illustration book/specification is to be confirmed by the supplier during manufacturing the components.
- 2) Firm shall submit details of manufacturing process, inspection process and also reports for the same to HVF.
- 3) If required/applicable HVF shall witness/verify stage wise inspection /process details during manufacturing of the components.
- 4) The component may be subject to endurance test, when fitted in higher assembly as specified in process / illustration /TD book.
- 5) Apart from above, all other relevant test for acceptance of the item i e.,(i) For individual items of the assembly component,(ii) For sub-assemblies of the component,(iii) whole assembly component as specified in GOST/Specifications/Drawing shall be carried out by the firm and the report/certificates for the same shall be submitted to HVF. If applicable/Required,

HVF shall witness/verify the testing parameters specified against components at 5(i), 5(ii), 5(iii).

- 6) Manufacturing of components required Forging/Casting, Machining, Heat Treatment process, such as hardening / case hardening, dimensional inspection, Assembly of component, Coating, etc., as referred in drawing/Specification.
- 7) Firm has to follow the manufacturing details/parameters for producing the component as specified in the technical data / process book and confirm as per the TD/Process Book/Specification and drawing. The inspection reports carried out for the same is to be submitted to HVF. HVF will carry out verification for cross confirmation if required.

16) INTERCHANGEABILITY:

The assemblies/component should be interchangeable component wise and assembly wise, except the Component are to be supplied as a set and to be assembled selectively.

**17) CALIBRATION CHECKS
(TEST STANDS/JIGS/FIXTURES/GAUGES/INSTRUMENTS):**

The supplier / Contractor should have suitable Instruments/equipments, Test Stand, jigs, fixture, mandrels and gauges to carry out quality checks, to ensure conformance of components/assembly as per drawing and Specification /T.R points.

The supplier/contractor should submit calibration reports for instruments/fixtures/gauges/mandrels etc., which are used during process of inspection activities.

18) MARKING/IDENTIFICATION.

Marking of the items is to be carried out as called for in the relevant drawing, drawing/T.R points.

Inscription if any on the components is to be carried out as called for in the drawing/T.R points. Unless otherwise specified in the drawing/ specification, marking should not be carried out over the components.

For traceability, marking of part No., Manufacturer name, supply order No, Serial No/Qty., batch No. and manufacture date & year are to be carried out. Suitable method can be adopted, provided that the above parameters are legible and considering the parameters mentioned in the drawing and specification(Refer QAP Para No:14).

19) PRESERVATION CHECK

- a) Preservative coatings are to be strictly adhered to as called for in the drawing. However, equivalent BIS/IS Standards can also be followed, subject to the thickness of the coating/preservative is maintained as per the drawing/specification.
- b) Other preservations as necessary to prevent damages due to moisture and dust during process, storage and transit are to be carried out. Conventional Methods can also be resorted to.

20) PACKING CHECK

Components / Assemblies are to be packed separately to avoid damages during transit / handling of the same. Part No. and No. of sets are to be marked on the packing.

Packing and preservation should be ensured as per drawings/relevant TY specification (To be ensured on receipt at consignee end).

Finished products shall be wrapped / packed using black and opaque sheet or bags.

21) DOCUMENTATION

1. Firm has to maintain all the documents as per QAP with respect to the Sl. No. of Components to have traceability.
2. Vendor has to submit Bill of materials, Material test reports, Class 'C' /Endurance test reports (wherever specified in drawing/TY specification/QAP) and Complete PIR (pre-inspection report) against relevant items at the time of offering the item for inspection. HVF will commence inspection only after scrutiny of these documents.
3. The testing/inspection responsibility to test all the parameters as per QAP and drawing specifications as mentioned in Annexure –A (enclosed).
4. Documents to be submitted as Pre inspection reports (PIR) by firm against the individual / Sub Assembly / Assembly.

Sl. No	Documents
1	Chemical analysis (NABL)
2	Mechanical properties (NABL)
3	Pre-forming process
4	Coating/Varnish certification (wherever applicable),
5	Calibration reports of instruments and gauges etc.
6	100% Dimensional (Including geometrical features)inspection reports
7	Pressure test (leakage test) if applicable,
8	Hardness checks reports
9	Guarantee/ Warranty Certificate.(Final)
10	Service and maintenance instructions (If applicable). (Final)
11	Undertaking letter / Certificate of Conformance (As applicable). (Final)
12	Other relevant reports for acceptance of the item as specified in GOST/ Specification / drawings etc.

22) REFERENCE

- a) Drawing No. 172.52.054CBCB, 172.52.053CBCB & 172.52.056CBCB.
- b) Material Specification as per drawing – Refer QAP Para No.8.
- c) GOST 4543-71, GOST 2246-70, GOST 10052-72, GOST 8479-70, GOST 7505-74, GOST 14034-68, GOST 2930-62.
- d) 520 TY, 520 TY5 & ADK 25.064.00015.
- e) Equivalent / Alternate Material:

Sl. NO	DRG. NO	NOMENCLATURE	EQUIVALENT / ALTERNATE MATERIAL SPECIFICATION
1	172.52.126	HOLDER	1) STEEL B30XГCA GOST 8731-74. 2) STEEL 30XГCA GOST 4543-71.

SL NO.	CATEGORY	ASSEMBLY/ SUB ASSEMBLY	TESTS/ INSPECTION PARAMETERS	STANDARDS TO BE REFERRED	ACCEPTANCE CRITERIA	INSPECTION RESPONSIBILITY			REMARKS
						Firm	HVF	DGQA	
1		Pre inspection reports (PIR) of firm	Firm has to produce all the document as per QAP	As per the relevant drawing and QAP 21(4)	Confirm to drawing and QAP as per bill of material	P	V	R	100% by firm/ vendor.
2		Bill of material (BOM)	Firm has to prepare the BOM as per QAP	As per the relevant drawing/specification/TD book/process book and QAP.	Confirm to relevant drawing/specification/TD book/process book and QAP as per bill of material	P	V	R	100% by firm/ vendor.
3		Dimensional checks	Dimensions as per the drawing	Refer drawing / QAP Para no: 12	Confirm to drawing and QAP	P	W/V	R	100% by firm/ vendor SP followed by HVF.
4	LEVER WITH HOLDER RH TO DRG. NO 17252.054CBGB	Material tests	Chemical composition & Mechanical / Physical Properties	As per-Relevant GOST/specification/ Drawing	Confirm to drawings/ specifications/ GOST against relevant item.	P	W/V/P	R	As per SP of HVF by firm and SP followed by HVF.
5		Hardness test	Hardness test	As per-Relevant GOST/specification/ Drawing	Confirm to drawings/ specifications/ GOST against relevant item.	P	W/V/P	R	As per SP of HVF by firm and SP followed by HVF.
6		Coating checks	Coating.	As per-Relevant GOST/specification/ Drawing	Confirm to drawings/ specifications/ GOST against relevant item.	P	W/V/P	R	100% by firm/ vendor SP followed by HVF.
7		Marking / traceability	Marking / traceability	Refer QAP Para no:18 & 14	Confirm to QAP Para no: 18 & 14	P	V	R	100% by firm/ vendor.
8		Preservation & packing	Preservation & packing	Refer QAP Para no 19 & 20	Confirm to QAP Para no 19 & 20	P	V	R	100% by firm/ vendor.
9		Other relevant test for acceptance of item / Specification / process / TD book.	As per drawing/specification/TD book/ Process Book GOST	Refer drawing/specification TD book/ Process Book GOST	Confirm to drawings/specification/GOST	P	V	R	As per SP of HVF by firm and SP followed by HVF.

Note:

- For conformity of the items (Chemical/Physical/Mechanical properties).
- One sample per heat / batch shall be tested under NABL Lab/Govt. Approved lab by firm. In case of non-compliance to standards entire lot shall be rejected or not to use in production further.
 - For cross conformation of material, manufacturer has to submit test sample pieces for the items used / test slab and button for rubber items / HVF will draw samples from supplied lot for Witnessing (W) at HVF premises. In case of non-compliance to standards entire lot will be rejected.
 - As apart from the above test, pressure test (100%) of item individually, of sub-assemblies and item as a whole assembly is to be carried out as per relevant drawings/ specification/GOST.
 - All other relevant tests is specified in GOST/ Specifications/ Drawing is to be carried out by firm and to be confirmed.

P-Perform W-Witness V-Verify R-Review SP-Sampling Plan

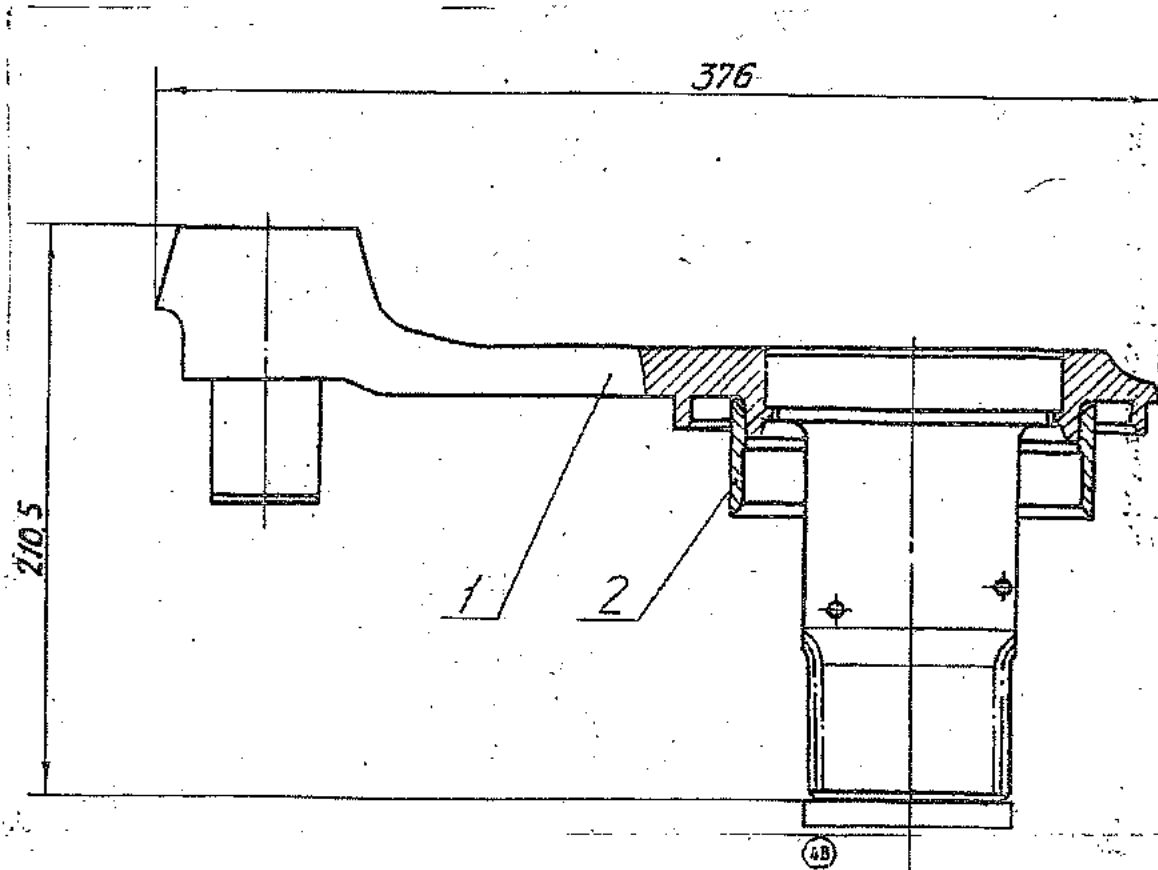


FIG: LEVER WITH HOLDER RH TO DRG.NO.172.52.054CBCB
(For reference only)

SL. NO	NOMENCLATURE & DRAWING NO	MANUFACTURING TECHNOLOGY & TESTING/INSPECTION FACILITIES REQUIRED TO PRODUCED THE ITEM	MUST BE POSSESSED BY THE VENDOR IN HIS OWN PREMISES - (LIST OF PLANT AND MACHINERY AND TESTING/INSPECTION FACILITY TO BE SUBMITTED)	MAY BE POSSESSED BY THE VENDOR IN HIS OWN PREMISES OR MAY BE OUT SOURCED (NAME AND ADDRESS OF SUB-CONTRACTOR, LIST OF PLANT & MACHINERY AND TESTING/INSPECTION FACILITY TO BE SUBMITTED)	FIRM COMPLIANCE (Y/N)	REMARKS	
1	DRG NO 172.52.054CB CB/PL (172.52..124LEVER 172.52.125 AXLE 172.52.103 PIN 172.52.126 HOLDER)	TECHNOLOGY - 1	FORGING	MIN 1TON CAPACITY BELT DROP OR PNEUMATIC OR HYDRAULIC HAMMER. TRIMMING USING SUITABLE POWER PRESS			
		TECHNOLOGY - 2	HEAT TREATMENT	SUITABLE FURNACE CARBURISING : 940 °c CASE HARDENING : 820 °c HARDENING : 850 °c TEMPERING STRESS RELIEF			
		TECHNOLOGY - 3	ELECTRO PLATING		CHROME PLATING (30 - 60 MICRON) PHOSPATING (15 - 20 MICRON)		
		TECHNOLOGY - 4	MACHINING	TURNING CENTRE (SWING OVER 600 DIA) MILLING 1000 X 400 OR MORE GRINDING DIA 150 or More (EXTRNAL GRINDING) GEAR HOBBING DIA 250 DRILLING MACHINE HYDRAULIC PRESSING MACHINE : 20 TON CO2 WELDING 600 AMP			

SIGNATURE WITH SEAL

	TEST / INSPECTION - 5	DIMENSIONAL CHECKING HARDNESS TEST CRACK TEST	SUITABLE STANDARD CALIBRATED GAUGES AND INSTRUMENTS	SUITABLE 3D CMM CRACK TESTING MACHINE ROCKWELL HARDNESS TESTER & DIGITAL PORTABLE HARDNESS TESTER. CHROMIUM PLATING THICKNESS CHECKING METER / DEVICE - RANGE: 0-100 MICRONS.		
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NOTE:

- 1 If the firm is not having any particular facility as mentioned in VQC, but able to meet the requirement as per drawing with alternative methods, the details of the alternative methods has to be provided with proper justification.
- 2 Firm has to develop all essential jigs, fixtures and gauges as per manufacturing process books of OEM, undertaking to be given.

[Signature]
MURUGAN V
JWM/QA(OE) RG

[Signature]
21/11/23
MANISH KUMAR YADAV
AWM/RG

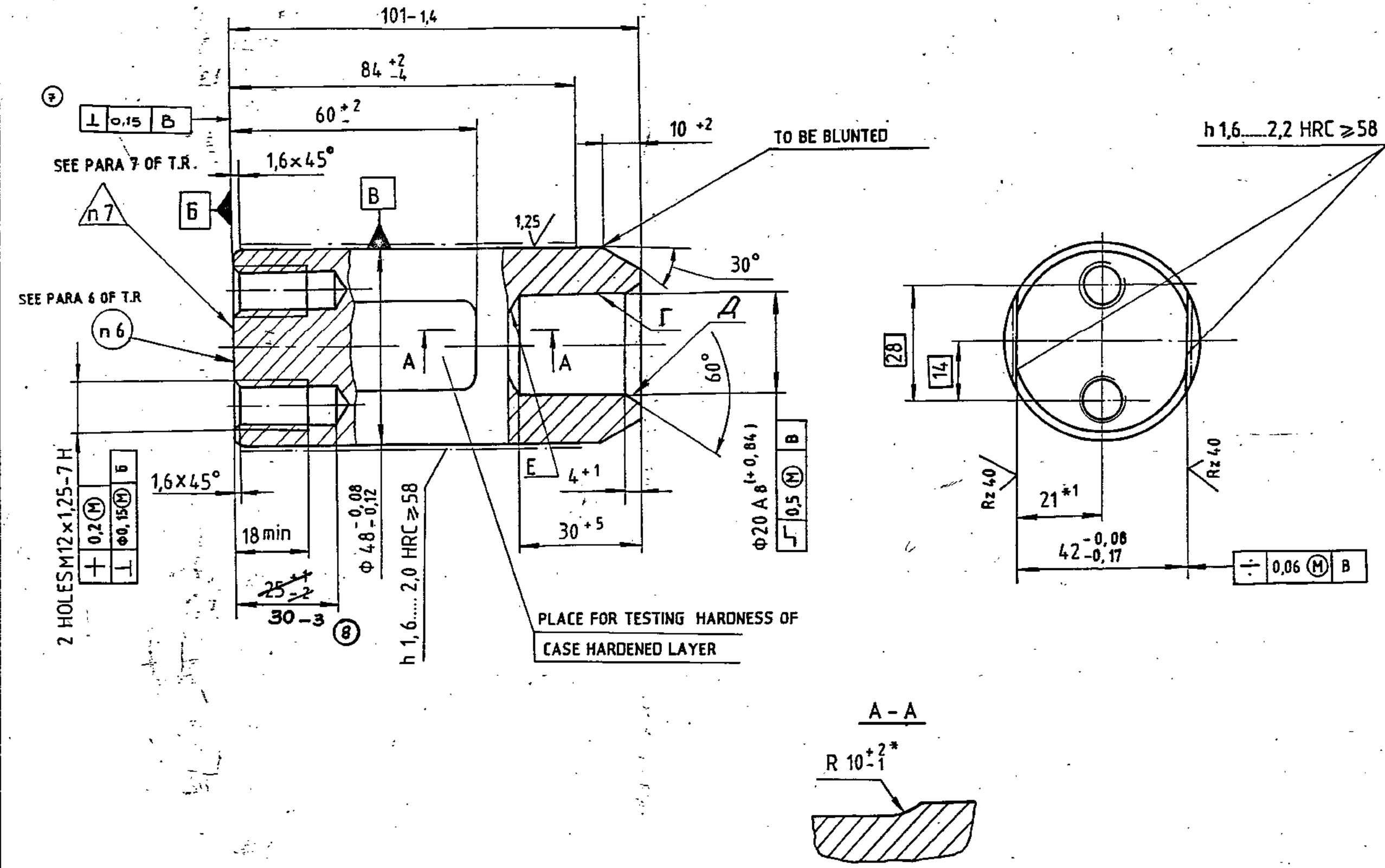
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HOS/RG

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SIGNATURE WITH SEAL

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T/C RG





- 1 Core hardness HRC 35 to 49, hardness should be checked on surface B for which grinding of a flat to a depth of 0,5mm is allowed
- 3 On surface B, centre hole A5 GOST 14034-68 is allowed.
- 4* Dimension is to be ensured by tool.
- 5 Other requirements in accordance with 520 Ty1.
- 6 On the material, mark '2 C' with type as per П0-5 GOST 2930-62
- 7 To be marked.
- 8*1 Dimension for reference.
- 9 Case hardening of surfaces Г, Д, Е is allowed.
- 10 Presence of scales on the surfaces Г & Е is allowed.
- 2 Deleted

EXPLANATORY NOTE :-

11. THE COMPONENT SHOULD BE MANUFACTURED FROM HIGH QUALITY "A" STRUCTURAL ALLOY Cr - Ni STEEL OF GRADE 20X2H4A TO GOST 4543-71. CHEMICAL COMPOSITION AND MECHANICAL PROPERTIES AS PER GOST 4543-71 ARE AS UNDER.

12. a) CHEMICAL COMPOSITION %

GRADE OF STEEL	C	Si	Mn	Cr	Ni	P	S	Cu	Ni	Cr
						MAXIMUM				
20X2H4A	0,16 - 0,22	0,17 - 0,37	0,30 - 0,60	1,25 - 1,65	3,25 - 3,65	0,025	0,025	0,30	0,30	0,30

b) MECHANICAL PROPERTIES :-

GRADE OF STEEL	YIELD POINT Kgf/mm ²	ULTIMATE STRENGTH Kgf/mm ²	RELATIVE ELONGATION %	RELATIVE REDUCTION ALONG CROSS SECTION %	IMPACT STRENGTH Kgm/cm ²
NOT LESS THAN					
20X2H4A	110	130	9	45	6

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

EST. WT. 1,2Kg 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	DRN	MATERIAL :-	USED ON :-
EHD	EHD	STEEL 20X2H4A	172 52 052 Cb Cb
TCD	TCD	GOST 4543-71	172 52 055 Cb Cb
APPD	APPD	CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES)	
DATE	DATE	A V A D I	
SCALE :- 1:1		TITLE	
DIMENSIONS IN mm.		PIN	
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS 2102-69		D S CAT NUMBER	
8	3.8.89	Mater. 172M.75.A.87, Amdt. List No.9/Book-2	DRAWING NUMBER
7	10.01.89	AMDT LIST No.6/II, Book-8	172 52 103
ISSUE	DATE	NATURE OF AMENDMENTS	
		IS : 4218 PF IV	

DRAWING INDIANISED BASED RUSSIAN ORIGINAL ISSUE-6

COMMON TO BLT



DRAWING NUMBER
172.52.055cbCb

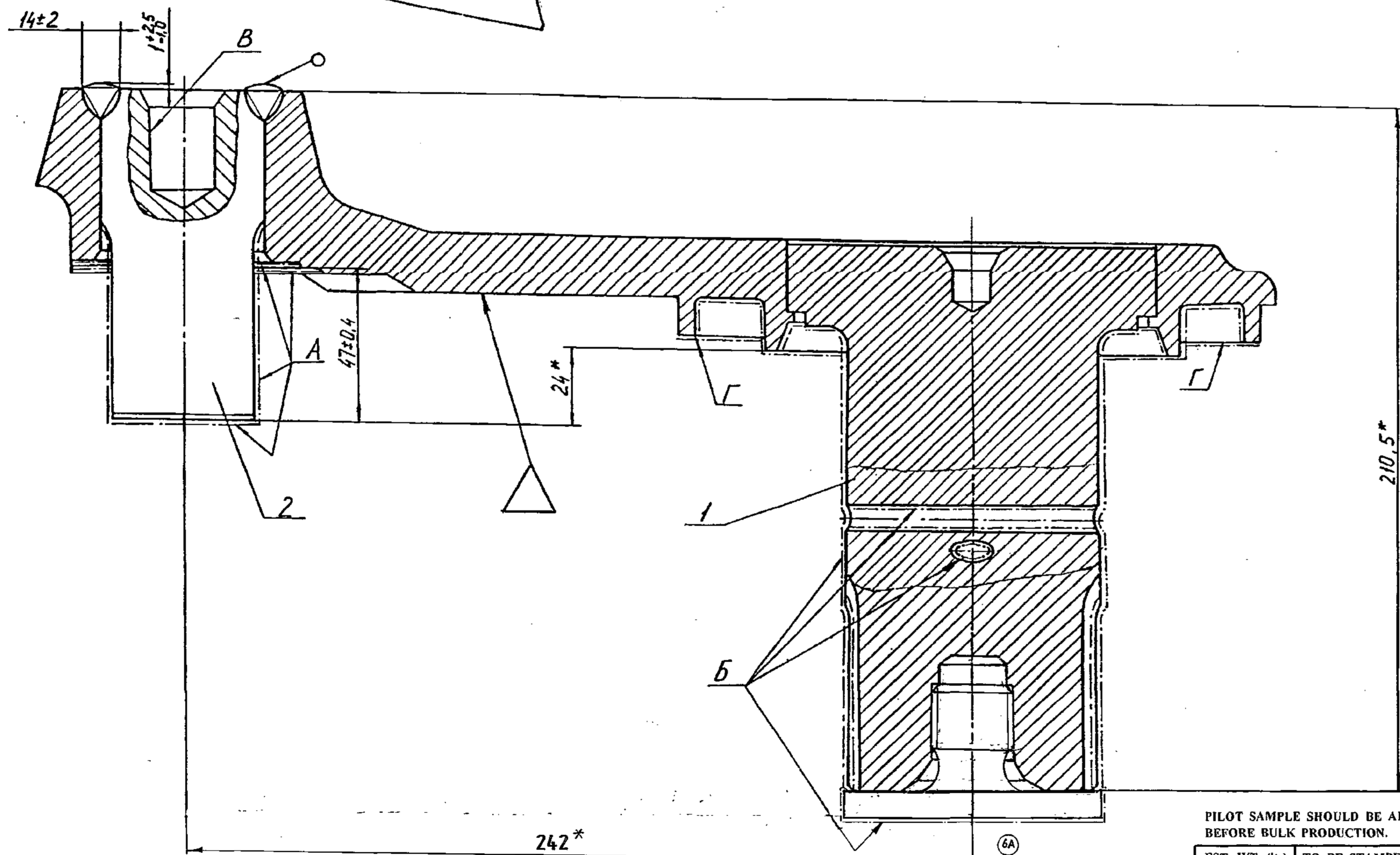
SHEET No. 1 OF 1

90°±3°

28*

Holes
2omb.M12x1,25-7H*
(C.M. n. 2TT)

(See para 2 of technical requirements)



1. In the hole of lever, pin 172.52.103 is to be press fitted. Before press fitting, pin is to be cooled in liquid nitrogen.
2. After welding, threaded holes to be checked with thread gauge.
3. Welds to be made in gas shielded arc welding medium.
4. Coating: Chemical Phosphotizing, oxidizing and oiling or Chemical phosphotizing, oiling.
5. All surfaces to be coated except surfaces A and B;
Compound: 70-75% of Varnish KO-815 and 30-25% of Enamel ПФ-115 dark green.
Quality of coating in holes B need not be checked.
Requirements as are per 520.TY5.
Falling of paint on face Γ is allowed.
7. *Dimensions for reference.
8. Other requirements are as per 520.TY1.

DRG. INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE - 6 /
COMMON TO T-72 & BLT

356

SUPPLY CODE
U-01-1-4
D 90212

F-106
03

SIZE A3x3

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

EST. WT (kg) 14.38
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	APPD	DATE	SCALE	DIMENSIONS IN mm	TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS : 2102-69	ALL THREADS TO CONFORM TO	ISSUE	DATE	NATURE OF AMENDMENTS	MATERIAL:-	USED ON:- 172.52.054cbCb
CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI												
TITLE:- RIGHT HAND LEVER WITH PIN ASSY.												
D S CAT NUMBER												
DRAWING NUMBER 172.52.055cbCb												

