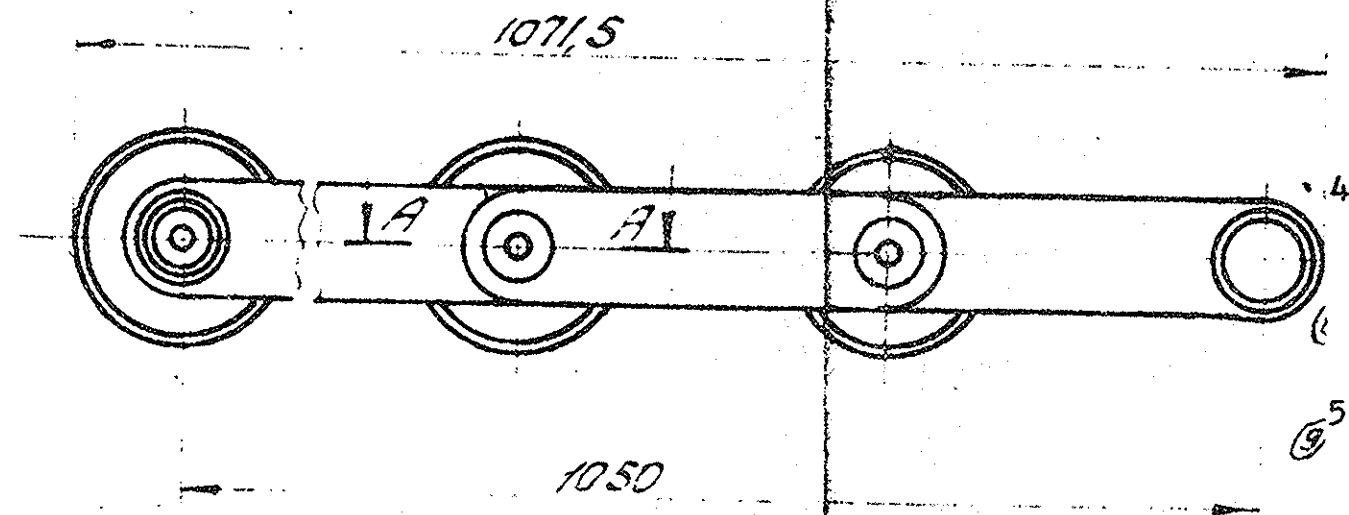
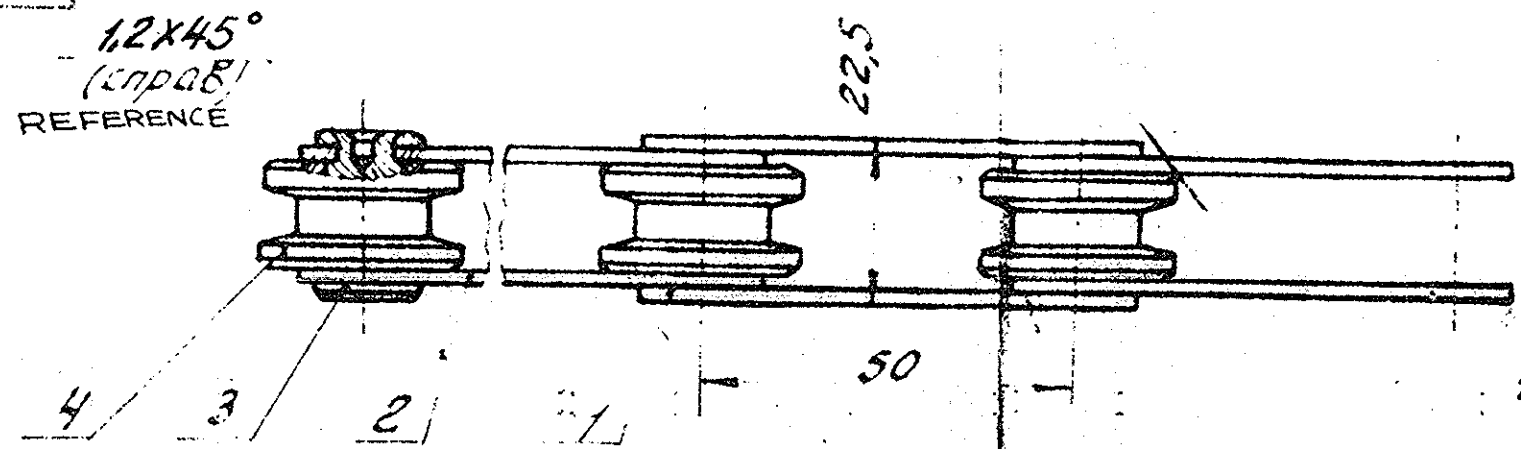


172.28.004C6-1

12x45°
(справа)
REFERENCE



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SEALED DRAWING AS ON

113/12

कृते निरीक्षक मुद्रित
FOR CONTROLLER OF QUALITY
आश्वासन (क.वा.आ) आकाश नं. 54
ASSURANCE (AVA) AVADI, CHENNAI 56

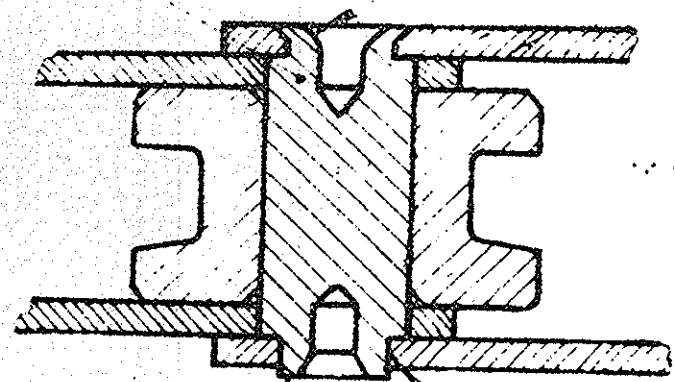
FIRST ANGLE PROJECTION.

1. THE FACES OF SPINDLES ARE TO BE FLARED FLUSH WITH THE SURFACES OF THE PLATES AND WASHERS. PROJECTION NOT EXCEEDING 0.5 MM IS ALLOWED. UNDER FILLING OF THE CHAMFERS WITH METAL, A MEASURED IN THE PLATE PLANES ALONG THE RADIUS SHOULD NOT EXCEED 0.3 MM.
2. ROLLERS AND INTERNAL PLATES 2 SHOULD TURN ON THE SPINDLES FREELY, WITHOUT SEIZING .
3. CHAIN SHOULD BE BOILED IN MIXTURE (BY WEIGHT) 90% OF PLASTIC LUBRICANT DBK GOST 19537-83 AND 10% PRESERVATION OIL HF-203 B OST 38.01436-86 AS PER INSTRUCTIONS A PK 25.008.00004.
4. FILING OF FACES OF AXES IS ALLOWED, IN THIS CASE SHARP EDGES ARE NOT ALLOWED.
5. AFTER FLARING, LOOSE FITTING OF SPINDLE TO EXTERNAL PLATE IS NOT ALLOWED.

INSPECTION NOTE :- FOR LIST OF GAUGES AND FIXTURES REFER GAUGE SHT.No.GS(W)-10090,SHT.1.

5
SCALE 2:1 A-A
M2:1

Развальцевать
с обеих сторон
TO BE FLARED ON
BOTH SIDES



12x45°
(справа) REFERENCE

4.10.80 не
развальцевать
SHOWN UNFLARED FOR
CONVENIENCE

5	172.28.179-1	Ось SPINDLE	21	
4	172.28.178-1	Ролик ROLLER	21	
3	172.28.143	Шайба WASHER	2	
2	172.28.074	Пластина PLATE	22	
1	172.28.073	Пластина PLATE	20	
ITEM No 103	PART NO. NOMENCLATURE		QTY	REMARKS
	Обозначение Наименование		Кол.	Примечание

DSCAT No. 3020-015417

0042-AVA 29-3-09	DSCAT No. ADDED	172.28.004C6-1	Group No	F.126
18214-W 22-16-83	HINDI NOMEN ADDED		40001 KA	16
16476-W 22-10-86	DRG SEALED.		SHEET	MASS
	ISSUE DATE	CHAIN चेन	10F1	1.586
	REFERENCE	(41)	SCALE	1:1

18729-W 18.12.02	INSPECTION NOTE ADDED.
16973-W 9.11.90	TECH REQUIREMENT No3 AMENDED
16752-W 25.3.89	NOTE 1-0.5 mm WAS 0.3 & NOTE 4 AMENDED.

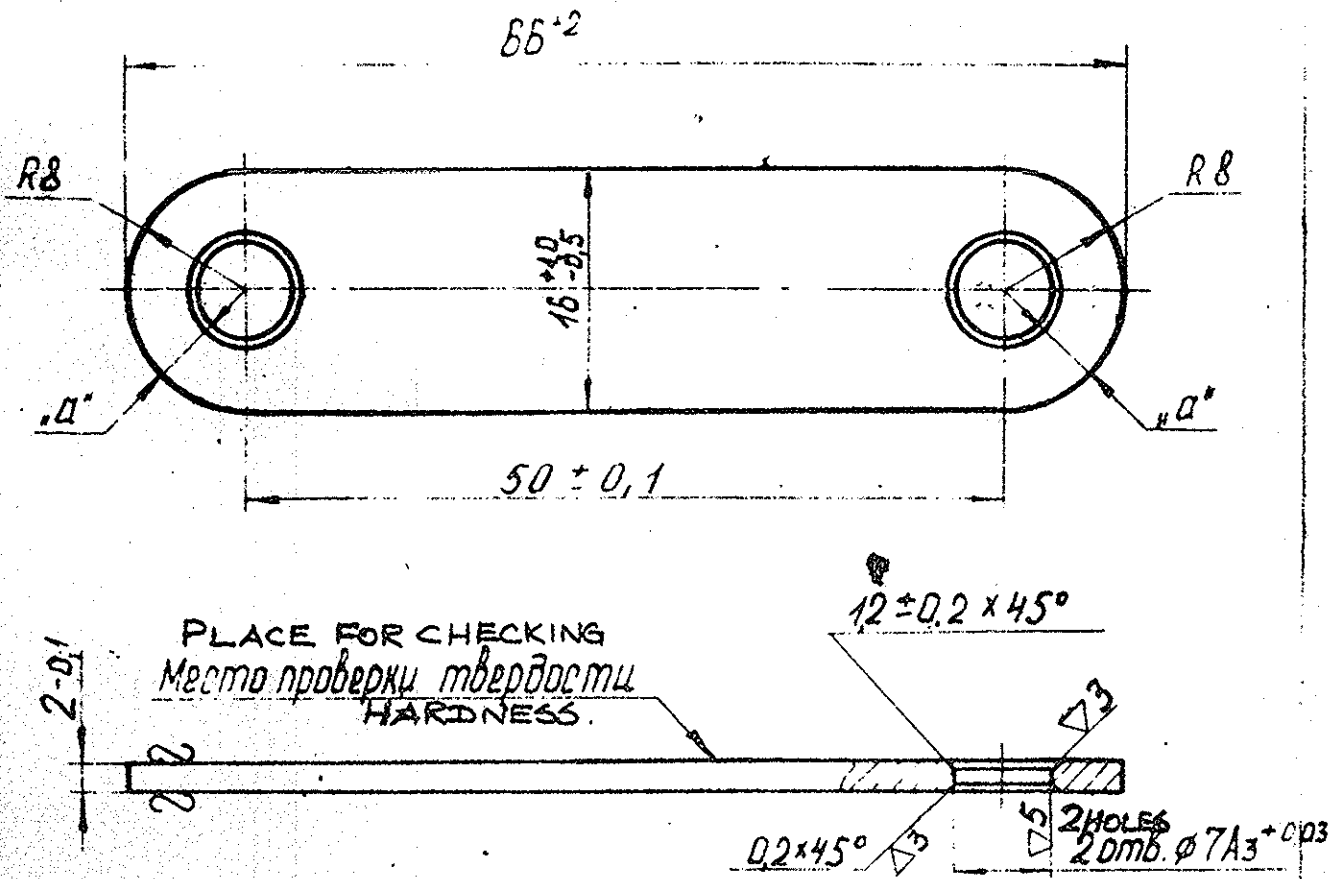
APPROVED	DATE	REFERENCE
CHECKED		
DRAWN		

MATERIAL: CQA(AVA)AVADI

172.28.073

FIRST ANGLE PROJECTION.

Восстановленный подлинник №1



- To be heat treated to HRC 33 - 41.
- Non-flatness should not exceed 0.2 mm within the overall dimensions of the component.
- Dimension "a" should be 4.2 mm min.
- Coating: Chemical oxidizing/phosphating, oil finishing.
- It is allowed to manufacture from steel 60Г, Gost 14959-79, with machining to dimension 2-0.1; required surface roughness is $\nabla 6$. In this case, component is to be heat-treated to HRC 37-44.

ALT MATL:- STEEL 55 Si 7, GR 9 TO 15: 2507:1975
COATING:- PHOSPHATING TO JSS-0465-01: 1993,
CLASS II, FINISH 13 (9)

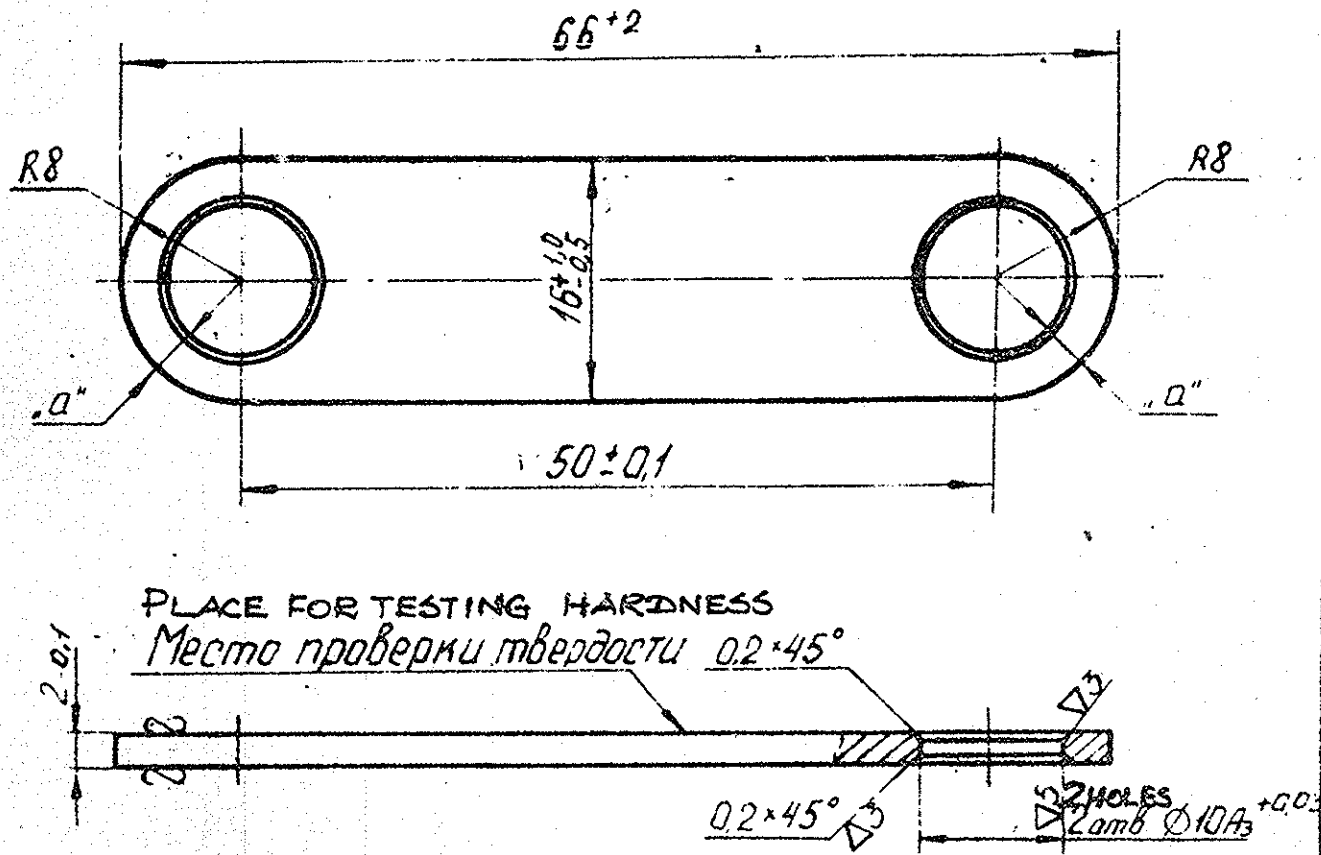
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कृते नियंत्रक गुणता
 FOR CONTROLLER OF QUALITY
 आश्वासन (क.बा.आ.) आवडि चेन्ना 54
 ASSURANCE (AVA) AVADI, CHENNAI 54

17082-W 4-7-91		D SCAT NO ADDED		FOR	193
17925-W 12.3.94		ALT MATL & COATING NOTE ADDED.		REVISED	199
16752-W 25-3-89		PARAG GOST 14959-79 WAS 1050-60		DO	AHSP
172.28.073				Group No	
D SCAT NO. 1015-003920				40001 K.D. 12	
PLATE				SHEET	MASS
				10F1	0.014 2:1
16656-W 11-6-88		NOTE No 6 AMENDED			
16476-W 22-10-86		DRG SEALED.			
ISSUE	DATE	REFERENCE			
APPROVED		21/IV	MATERIAL:		
CHECKED		11/12/91	STEEL 60C2A-T-C-H		
DRAWN	P. Maltina	26/11/89	GOST 2283-69.		
				CQA (AVA) AVADI	

1587

172.28.074



2. To be heat-treated HRC 33-41.
3. Non flatness should not exceed 0.2mm within the overall dimensions of the component.
4. Dimension "a" should be 2.7,mm minimum.
5. Coating: chemical oxidizing/phosphating, oil finishing.
6. It is allowed to manufacture from steel 60Г GOST 14959-79 with machining to dimension 2-0.1; required surface roughness is 6. In this case, it is to be heat treated to HRC 37-44.

ALT MATL:- STEEL SS SI 7, GR 9 TO IS: 2507-1975
COATING:- PHOSPHATING TO JSS: 0465-01: 1993,
CLASS II, FINISH 13 (8)

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113/12

कृते नियंत्रक मुपाता
 FOR CONTROLLER OF QUALITY
 आशवासन (क वा आ) आवाडि चेन्ने 54
 ASSURANCE (AVA) AVADI CHENNA. 54

SCA
 AS

200

17088-W D S CAT NO ADDED 4-7-91		GROUP NO F-129	
17925-W ALT MATL & COATING 12-3-94 NOTE ADDED.		40001 K.D. 13	
16752-W GOST 14959-79 WAS 1050-60 25-3-89		SHEET MASS SCALE	
172.28.074		10F1 0.013 2:1	
DS CAT NO 1015-003921		CQA (AVA) AVADI	
PLATE		MATERIAL: STEEL 60C2AT.C.H GOST 2283-69.	
16476-W 22-10-86	DRG SEALED		
ISSUE	DATE	REFERENCE	
APPROVED		21/12	
CHECKED	Annupurna	11/12/87	
DRAWN	J. Mathiraj	26/11/85	

4-6 N код. 1582

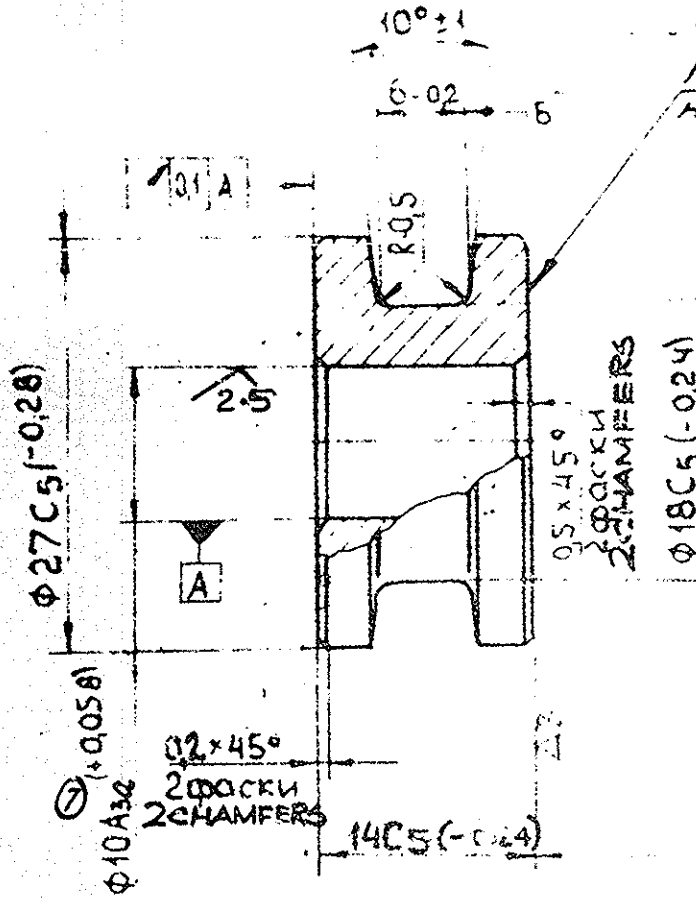
FIRST ANGLE PROJECTION.

203

172.28.178-1

Rz 40 (V)

восстановленный подлинник №1



PLACE FOR TESTING
Место испытания
для твердости
HARDNESS

ALT MATL:-
STEEL 530 M 40 OR 709 M 40
OR 708 M 40 TO BS-970 Pt 1:
B3. MECHANICAL PROPERTIES
TO BE ACHIEVED. HARDNESS
TO 311 TO 415 BHN
COATING:-
PHOSPHATING TO JSS-
0465-01:1993, CLASS II/
III, FINISH 13(8)

0.35	B
0.1	A

1. BHN 302-255 (IND. DIA 3.5-3.8) Hardness may be checked in blank.
2. Coating:- CHEMICAL OXIDISING PHOSPHATING, OIL FINISHING
3. On surface of hole separate marks to a depth not exceeding that of marks on the standard, are allowed.

INSPECTION NOTE:-
FOR LIST OF GAUGES AND FIXTURE REFER
GAUGE SHT. No. GS(W)-10150 SHT. 1.

18814-W 22-10-03	HINDI NOMEN ADDED	7/10	
18773-W 05-8-2003	INSPECTION NOTE ADDED.	7/10 DAC	
17925-W 12-3-94	ALT MATL & COATING NOTE ADDED.	15/11/10 S/P	
17814-W 26.11.93	DS CAT No. 3020- 002593 WAS 1015-002967		DS CAT No. 3020-002593
			16752 W IN PARA 2 "CHEMICAL" ADDED 25.3.89
			16476-W 22-10-86 DRG. SEALED-
17088-W 4.7.91	DS CAT No. ADDED		Group No F129
16168-W 6-3-90	2.5 WAS Δ6, Rz 40 (V) WAS ∇4 (∇) & DIMN. 14 C5 (-0.24) WAS 14 C4 (-0.12)		40001 K.D. 62
D.O.	ISSUE	REFERENCE	SHEET MASS SCALE 10F1 0.036 2:1
APPROVED	<i>[Signature]</i>	21/11	MATERIAL: STEEL 38XC GOST 4543-71
CHECKED	<i>[Signature]</i>	12/11/89	C.QA(AVA)AVADI
DRAWN	<i>[Signature]</i>	28/11/89	

172.28.178-1

रोलर
ROLLER

203

FIRST ANGLE PROJECTION.

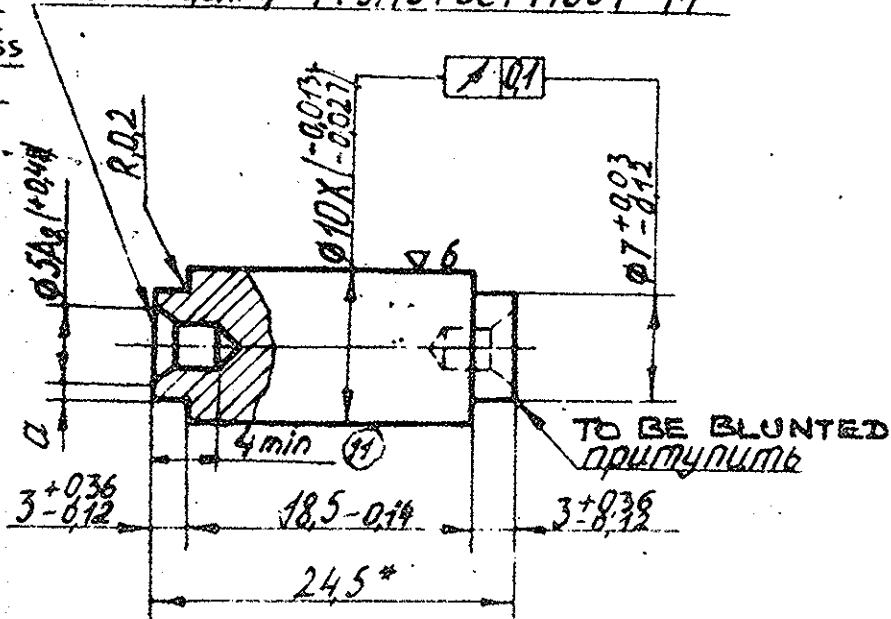
1-017 80 017

▽4/▽

ALT MATL: STEEL 708 M 40, CONDITION 'T' TO
BS-970 Pt 1: 1983

COATING: PHOSPHATING
TO JSS-0465-
01:1993, CLASS
II / III, FINISH
13(8)

2 CENTRE HOLES AS $\phi 15$ * GOST 14034-74
2 отв. центр. А $\phi 15$ * ГОСТ 14034-74



- BHN 302 - 255 (IND. DIA 3.5 - 3.8). To be checked in Blank.
- Through-hole $\phi 3.15 (+ 0.25)$ and reducing the cone to 50° are allowed.
- Coating: Chemical oxidizing/oil finishing, chemical oxidizing/phosphating, oil-finishing is allowed.
- *Dimension for reference.
- Variation in measurements of dimension "a" should not exceed 0.3 mm.

126

DS CAT No.
5315-050187

16476-W
22-10-86 DRG SEALED.

172.28.179.1

Group No. F129
40001 K.D. 63

0042-AVA 29-3-09	DS CAT No ADDED	
17932-W 18-3-94	ALT MATL & COATING NOTE ADDED.	15/12/94 9/0

SHEET MASS SCALE
10F1 0.0124 2:1

SPINDLE

ISSUE	DATE	REFERENCE
APPROVED		2/1/14
CHECKED	12/12/14	
DRAWN		

MATERIAL:
STEEL 38 X C

C.Q.A(AVA)AVADI

1. Проверка в бланке
 2. Проверка в бланке
 3. Проверка в бланке
 4. Проверка в бланке
 5. Проверка в бланке

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

FOR

(CHAIN)

DRG.NO.172.28.004cb-1

(LF NO: 6206890015)

No: HVF/T-72C/QAP/28/CHAIN/240636- 00

ISSUE No: 00

DATE: OCT-2021

QUALITY ASSURANCE (RIG-SUB ASSEMBLY)

HEAVY VEHICLES FACTORY

AVADI CHENNAI – 600 054

QUALITY ASSURANCE PLAN (QAP)

FOR


CHAIN

DRG. NO. 172.28.004cb-1

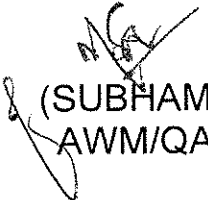
PREPARED BY

REVIEWED BY


(C.NANDA KUMAR)
JWM/QA (RIG-SA)


(HANUMANTHA RAO GOLLA)
JWM/QA (RIG-SA /TA)

APPROVED BY


(SUBHAM BIJLWAN)
AWM/QA-RIG-(SA)

ISSUED BY

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

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5.	DOCUMENTS	5
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12.	DIMENSIONAL CHECKS	8-10
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15.	FITMENT AND PERFORMANCE TEST	14
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18.	MARKING/IDENTIFICATION	15
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1. IMPORTANT NOTE

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 Sr. 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 issued along with the contract, the latter will prevail.

2. INTRODUCTION

1. This quality plan lays down the inspection and testing procedure to be carried out on the component **CHAIN TO DRG.NO: 172.28.004cb-1** 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 Sr. 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

The QAP is aimed at standardizing the Inspection procedure and acceptance norm for **CHAIN TO DRG.NO: 172.28.004cb-1**.

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 **CHAIN TO DRG. NO.172.28.004cb-1** 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 Sr. 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 responsible of the vendor to obtained copy of QAP and give the statement of compliance that the vendor will follow QAP. However, GM/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 specification and technical instructions on the subject item can be obtained by the contractor from AHSP through DDO/HVF
- b) Any clarification required on these documents should be obtained from the Inspecting Authority i.e. The Sr. 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 Controllerate of 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. 172.28.003SB-1 - CELL LIFTING MECHANISM.
2. 172.28.066CB-3CB – CELL LIFTING MECHANISM. Etc.,

7. LIST OF DRAWINGS:

SI. NO.	DRG. NO	NOMENCLATURE	REMARKS
1.	172.28.004cb-1	CHAIN	-
2.	172.28.073	PLATE	-
3.	172.28.074	PLATE	-
4.	172.28.143	WASHER	-
5.	172.28.178-1	ROLLER	-
6.	172.28.179-1	SPINDLE	-

8. BILL OF MATERIALS: (Individual items as mentioned in table to Para 7).

SI. NO	DRG. NO	NOMENCLATURE	MATERIAL SPECIFICATIONS	Qty
1	172.28.004cb-1	CHAIN	-----	01
2	172.28.073	PLATE	STEEL 60C2A-T-C-H GOST 2283-69	20
3	172.28.074	PLATE	STEEL 60C2A-T-C-H GOST 2283-69	22
4	172.28.143	WASHER	As per Drawing	02
5	172.28.178-1	ROLLER	STEEL 38XC GOST 4543-71	21
6	172.28.179-1	SPINDLE	STEEL 38XC GOST 4543-71	21

Note: Vendor/Contractor may use approved alternate material if any specified in drawing/specification. *Also refer Para No: 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.
 - (iv) Delivery Slip with Inspector's Acceptance Mark.
 - (v) Undertaking letter/ 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
(i)	Visual Inspection	100%	100%
(ii)	Dimensional Inspection	100%	General Inspection level III, single sampling, Normal Inspection, AQL 2.5 of IS 2500 (Part-I)-2000
(iii)	Material Inspection	1 No	1 No. for each batch of raw material or heat treatment lot as required by specifications.
(iv)	Acceptance test	100%	100%
(v)	Machining / Fitment/ Performance trial on higher assembly / Tank	02 Nos.	2 No's for a batch of 200 No's and 2No's there on for every 200 No's
(vi)	Interchangeability Test	02 Nos.	02 Nos. per batch on randomly basis.
(vii)	Test stand/Jigs/ Fixtures/Gauges/Man drels/etc.	100 %	100 %
(viii)	Marking/Identification	100%	100%
(ix)	Packing/ Preservation	100%	100%

Note:-

* This clause is applicable if mentioned in supply order or project sanction order.

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.

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 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.

12.1 CHAIN TO DRG.NO 172.28.004cb-1

SI. NO.	DIMENSIONS
1.	22.5 mm
2.	1.2X45°
3.	50 mm
4.	1071.5 mm
5.	1050 mm
6.	1.2X45°
7.	Surface Finish/ roughness should be confirmed as per the drawing / specification.
8.	For other details & parameters refer Drawing

12.2 PLATE TO DRG.NO 172.28.073

SI. NO.	DIMENSIONS
1.	66 ⁺² mm
2.	50±0.1 mm
3.	16(+0.1 / -0.5) mm
4.	R8
5.	R8
6.	2 _{-0.1} mm
7.	1.2±0.2X45°
8.	0.2X45°
9.	Ø7A ₃ ^{+0.03} mm (2HOLES)
10.	Surface Finish/ roughness should be confirmed as per the drawing / specification.
11.	For other details & parameters refer Drawing

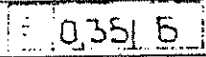
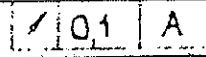
12.3 PLATE TO DRG.NO 172.28.074

SI. NO.	DIMENSIONS
1.	66 ⁺² mm
2.	50±0.1 mm
3.	16(+0.1 / -0.5) mm
4.	R8
5.	R8
6.	2 _{-0.1} mm
7.	0.2X45°
8.	0.2X45°
9.	Ø10A ₃ ^{+0.03} mm (2HOLES)
10.	Surface Finish/ roughness should be confirmed as per the drawing / specification.
11.	For other details & parameters refer Drawing

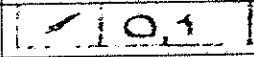
12.4 WASHER TO DRG.NO 172.28.143

1. All dimensions shall be confirmed as per drawing/specification.
2. Surface finish/Roughness should be confirmed as per drawing and specification.
3. For admissible alternate method for manufacture in dimensions/material if any, refer drawing/specification.

12.5 ROLLER TO DRG.NO 172.28.178-1

SI. NO.	DIMENSIONS
1.	0.2X45° (2CHAMFERS)
2.	14C ₅ (-0.24) mm
3.	0.5X45°(2 CHAMFERS)
4.	Ø18C ₅ ^(-0.24) mm
5.	R0.5
6.	6 _{-0.2} mm
7.	10°±1 mm
8.	Ø27C ₅ (-0.28) mm
9.	Ø10A ₃ ^(+0.058) mm
10.	
11.	
12.	Surface Finish/ roughness should be confirmed as per the drawing / specification.
13.	For other details & parameters refer Drawing

12.6 SPINDLE TO DRG.NO 172.28.179-1.

SI. NO.	DIMENSIONS
1.	'a'
2.	3(+0.36 / -0.12) mm
3.	24.5* mm
4.	18.5 _{-0.14} mm
5.	Ø5A ₈ ^(+0.4) mm
6.	4 min
7.	3(+0.36 / -0.12) mm
8.	R0.2
9.	2 CENTER HOLES AS 15* GOST 14034-74
10.	Ø10X(-0.013 / -0.027) mm
11.	
12.	Ø7(+0.03 / -0.12) mm
13.	Surface Finish/ roughness should be confirmed as per the drawing / specification.
14.	For other details & parameters refer Drawing

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 PLATE TO DRG.NO 172.28.073

a) The component should be manufactured from

STEEL 60C2AT-C-H GOST 2283-69.

b) **Chemical properties:** As per STEEL 60C2AT-C-H GOST 2283-69.

CONTENT OF ELEMENTS%							
C	Si	Mn	Cr	S	P	Ni	cu
MAX							
0.58 to 0.63	1.60 to 2.00	0.60 to 0.90	Not more than 0.30	0.025	0.025	0.025	0.20

Note: For mass fraction of other elements refer GOST 2283-69.

Coating: Chemical oxidizing Phosphating, oil finishing.

c) **Mechanical properties:** As per STEEL 60C2AT-C-H GOST 2283-69.
Ultimate strength,- 1570(160) N/mm² (Kgf/mm²)

d) **Hardness (HRC)=33-41**

Note: For other properties refer GOST 2283-69.

13.2 PLATE TO DRG.NO 172.28.074

a) The component should be manufactured from

STEEL 60C2AT-C-H GOST 2283-69.

b) **Chemical properties:** As per STEEL 60C2AT-C-H GOST 2283-69.

CONTENT OF ELEMENTS%					
C	Si	Mn	Cr	S	P
MAX					
0.58 to 0.63	1.60 to 2.00	0.60 to 0.90	Not more than 0.30	0.025	0.025

Note: For mass fraction of other elements refer GOST 2283-69.

Coating: Chemical oxidizing Phosphating, oil finishing.

c) **Mechanical properties:** As per STEEL 60C2AT-C-H GOST 2283-69.

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				
1375 (140)	1570 (160)	6	20	(69) 7

d) Hardness (HRC)=33-41

Note: For other properties refer GOST 2283-69.

13.3 WASHER TO DRG.NO 172.28.143

a) The component should be manufactured as per drawing:172.28.143.

b) Chemical properties: As per drawing:172.28.143.

c) Mechanical properties: As per drawing:172.28.143.

Note: For other Details and Parameters refer Drawing.

13.4 ROLLER TO DRG.NO 172.28.178-1

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

b) Chemical properties: As per STEEL 38XC GOST 4543 –71.

CONTENT OF ELEMENTS%							
C	Si	Mn	Cr	S	P	Cu	Ni
				MAX			
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.

Coating: Chemical oxidizing Phosphating, oil finishing.

c) Mechanical properties: As per STEEL 38XC 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

d) Hardness (HRC)=311-415

Note: For other properties refer GOST 4543-71.

13.5 SPINDLE TO DRG.NO 172.28.179-1

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

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

CONTENT OF ELEMENTS%							
C	Si	Mn	Cr	S	P	Cu	Ni
				MAX			
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.

Coating: Chemical oxidizing Phosphating, oil finishing.

c) Mechanical properties: As per STEEL 38XC 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

d) Hardness (HRC)=311-415

Note: For other properties refer GOST 4543-71.

14) PERFORMANCES/ACCEPTANCE TEST: CHAIN TO
DRG.NO.172.28.004cb-1

FIRST ANGLE PROJECTION.

1. THE FACES OF SPINDLES ARE TO BE FLARED FLUSH WITH THE SURFACES OF THE PLATES AND WASHERS. PROJECTION NOT EXCEEDING 0.5 MM IS ALLOWED. UNDER FILLING OF THE CHAMFERS WITH METAL, A MEASURED IN THE PLATE PLANES ALONG THE RADIUS SHOULD NOT EXCEED 0.3 MM.
2. ROLLERS AND INTERNAL PLATES 2 SHOULD TURN ON THE SPINDLES FREELY, WITHOUT SEIZING .
3. CHAIN SHOULD BE BOILED IN MIXTURE (BY WEIGHT) 90% OF PLASTIC LUBRICANT DBK GOST 19537-83 AND 10% PRESERVATION OIL HF-203 B OST 38.01486-88 AS PER INSTRUCTIONS A AK 25.008.00004.
4. FILING OF FACES OF AXES IS ALLOWED, IN THIS CASE SHARP EDGES ARE NOT ALLOWED.
5. AFTER FLARING, LOOSE FITTING OF SPINDLE TO EXTERNAL PLATE IS NOT ALLOWED.

14.1 PERFORMANCES/ACCEPTANCE TEST:

SI. NO	DRG. NO	NOMENCLATURE	PERFORMANCES/ACCEPTANCE TEST
1	172.28.004cb-1	CHAIN	All technical requirements (T.R) points to be confirmed as per relevant drawing/specifications
2	172.28.073	PLATE	
3	172.28.074	PLATE	
4	172.28.143	WASHER	
5	172.28.178-1	ROLLER	
6	172.28.179-1	SPINDLE	

15) FITMENT AND PERFORMANCE TEST:

- a. Pilot samples should be checked for fitment 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.

Explanatory Note

1. Stage wise inspection and process of the component as specified in TD Book / Process Book / illustration book is to be confirmed by the supplier during manufacturing the components.
2. Firm shall submit the inspection process details/reports 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.

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 as per sampling plan.

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

The supplier / Contractor should have suitable Instruments, 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.

19) PRESERVATION CHECK

a) Preservative coatings are to be strictly adhered to as called for in the drawing. However, equivalent BIS 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 polyethylene sheet or bags.

21) DOCUMENTATION

- 1) Firm has to maintain all the documents as per QAP with respect to the SI.No.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)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) Pre inspection reports (PIR) of firm like, 1. Chemical analysis (NABL Certificate), 2. Mechanical properties (NABL Certificate), 3. Pre-forming process, 4. Coating certification (wherever applicable), 5. Calibration reports of instruments and 6. 100 % Dimensional inspection reports.

22) REFERENCE:

- a) Drawing No: 172.28.004cb-1.
b) Material specification as per drawing:

SI. NO	DRG. NO	NOMENCLATURE	MATERIAL SPECIFICATIONS	ALTERNATE MATERIALS	HARDNES S (HRC)	COATING
1	172.28.004cb-1	CHAIN	-----	-----	-----	
2	172.28.073	PLATE	STEEL 60C2A-T-C-H GOST 2283-69	STEEL 55 Si 7,GR9 TO IS :2507-1975	33-41	Chemical oxidizing Phosphatin g, oil finishing
3	172.28.074	PLATE	STEEL 60C2A-T-C-H GOST 2283-69	STEEL 55 Si 7,GR9 TO IS :2507-1975	33-41	Chemical oxidizing Phosphatin g, oil finishing
4	172.28.143	WASHER	As per Drawing	As per Drawing	REFER DRAWING	REFER DRAWING
5	172.28.178-1	ROLLER	STEEL 38XC GOST 4543-71	STEEL 530 M40 OR 709 M40 OR 708 M40 TO BS- 970 Pt 1:1983	311-415	Chemical oxidizing Phosphatin g, oil finishing
6	172.28.179-1	SPINDLE	STEEL 38XC GOST 4543-71	STEEL 708 M40, CONDITION 'T' TO BS-970 Pt 1:1983	311-415	Chemical oxidizing Phosphatin g, oil finishing

INSPECTION NOTE:

For List Of Gauges And Fixtures Refer Gauge Sht.No.Gs(W)-10090,Sht-1

ANNEXURE-A

SL. NO.	CATEGORY	ASSEMBLY/ SUB ASSEMBLY	TESTS/ INSPECTIONPARAM ETERS	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.	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	Refer QAP Para no: 8 or item list.	Confirm to QAP	P	V	R	100% by firm/ vendor.
3		Material tests	Chemical composition & Mechanical / Physical Properties	Refer QAP Para no: 13.1 to 13.5	All the values to confirm with QAP Para no: 13.1 to 13.5	P	W/V	R	SP followed by HVF.
4	CHAIN TO DRG. NO 172.28.004cb-1	Hardness check	Hardness	Refer QAP Para no: 13.1 (c), 13.2(c), 13.4(c), 13.5(c)	Confirm to QAP Para no: 13.1 (c), 13.2(c), 13.4(c), 13.5(c)	P	W/V	R	SP followed by HVF.
5		Coating check	Coating	Refer QAP Para no: 13.1 (b), 13.2(b), 13.4(b), 13.5(b)	Confirm to QAP Para no: 13.1 (b), 13.2(b), 13.4(b), 13.5(b)	P	W/V	R	SP followed by HVF.
6		Dimensional checks	Dimensions as per the drawing	Refer drawing / QAP Para no: 12.1 to 12.6	Confirm to drawing and QAP	P	W/P	R	100% by firm/ vendor. SP followed by HVF.
7		Marking / traceability	Marking / traceability	Refer QAP Para no: 18	Confirm to QAP Para no: 18	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.

Note:

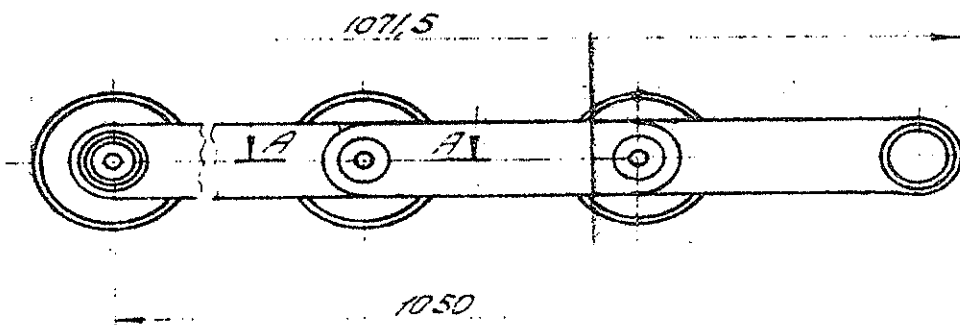
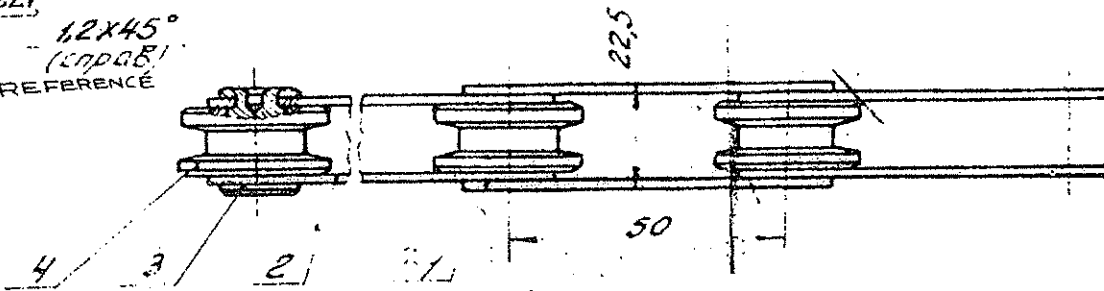
For conformity of the items (Chemical/Physical/Mechanical properties).

- 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.

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

172.28

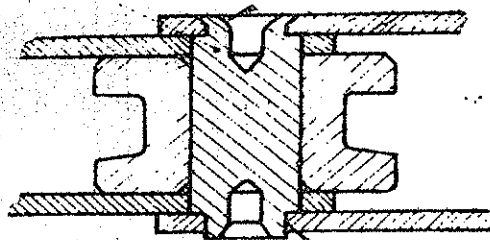
12x45°
(конус)
REFERENCE



5

SCALE 2:1 A-A 1:2:1

Развальцевать
с обеих сторон
TO BE FLARED ON
BOTH SIDES



Показано не
развальцовано
SHOWN UNFLARED FOR
CONVENIENCE

12x45°
(конус) REFERENCE

FIG: CHAIN TO DRG. NO 172.28.004cb-1

(For reference only)

RECORD OF AMENDMENTS

Sl. No	Amendment No. & date	Amended by	Date of Insertion	Initial

FORMAT FOR THE METHOD OF MANUFACTURE/ INFRASTRUCTURE AVAILABLE

Nomenclature & Drawing No: _____

1	2	3	4	5	6	Remarks
<p>MANUFACTURING TECHNOLOGY&TESTING/ INSPECTION FACILITIES REQUIRED TO PRODUCE THE ITEM</p>	<p>POSSESSED BY THE VENDOR IN HIS OWN PREMISES –(P&M LIST &TESTING/INSPECTION EQUIPMENT LIST TO BE SUBMITTED)</p>	<p>PROVIDE DETAILS OF THE FACILITIES ASKED IN COLUMN (3)THAT ARE AVAILABLE IN-HOUSE (SELE-DECLARED P&M LIST (Nomenclature of machine, make/model, capacity/size & accuracy, date of installation, vintage of machine /year of manufacturing of machine)AND TESTING/INSPECTION EQUIPMENT,LIST (Nomenclature of the testing/inspection equipment make/model, size & range, Date of calibration)also to be submitted)</p>	<p>IF NOT POSSESSED BY THE VENDOR IN HIS OWN PREMISES IT MAY BE OUT SOURCED.(MOU/TIE-UP WITH THE OUTSOURCING VENDOR/SUB-VENDOR AND THEIR P&M LIST &TESTING/INSPECTIN EQUIPMENT LIST TO BE SUBMITTED)</p>	<p>PROVIDE DETAILS OF THE FACILITIES ASKED IN COLUMN (5)OUT-SOURCED FIRMS(NAME &ADDRESS OF THE OUTSOURCING VENDOR TO BE DECLARED BY THE FIRM IN FIRM'S LETTERHEAD, SELF-DECLARED P&M LIST (Nomenclature of machine, make/model, capacity/size& accuracy, date of installation, vintage of machine /year of manufacturing of machine)AND TESTING/INSPECTION EQUIPMENT,LIST (Nomenclature of the testing/inspection equipment make/model, size& range, date of calibration)AND MOU/TIE-UP ALSO TO BE SUBMITTED)</p>		
Technology 1						
Technology 2						
Technology 3						

Test/ inspection1						
Test/ Inspection2						
Test/ Inspection3						

*The above details furnished by the vendor is to be self-certified for technical evaluation

*Inspection of item will be carried out at par with QAP, which is attached along with TE

SIGNATURE OF AUTHORIZED PERSON WITH SEAL

