Alternate materials:

Drg.No.	Nomenclature	Material as quoted in the OEM Drg.	Indigenous Equivalent Material Suggested / Remarks
172.64.045-1	SPRING	Wire Б-2А-1.8 GOST 9389-75	Grade 'DM' to SPECN IS:4454 (Part I)-2001

Fax : 044-2684 1824
Phone : 044-2684 3121
Phone : 044-2684 3157
E-Mail : hvf.ofb@nic.in

Government of India
Ministry of Defence
Heavy Vehicles Factory
Avadi, Chennai 600 054.

NO.65013/AM/HVF/2018-2019/ALT MATL **Dt.31.12.2018**

The Controller,
Controllerate of Quality
Assurance (Heavy Vehicles),
AVADI,CHENNAI – 600 054

(Kind attn: **Brig S.B.Kodaru Controller, CQA(HV)**

Sub: Alternate matl for 8,10,15,20 grades of Gost specification. – Reg.

Ref: 1. Indian equivalents of Russian steels used in Articles 675/765 & Article 172 Document No.Copy No.4 cisv/id/pub/2 (Vol-1) , Dt.07.03.1986
2.HVF Ltr of Even no. Dt.22.12.18

In continuation of HVF Ltr of even no Dt.22.12.18 , the following alternate materials will be used against specified steel grades of Gost specification. The alternate matl used /purchased will beintimated to CQA(HV) on regular basis for record and and reference please.

Steel 08	HR1, HR2, HR3 to IS:1079-09
	7C4 to IS:1570-04 Pt-II
	CR1, CR2, CR3 to IS:513-08
	EN 2B to BS:970 Pt-1 1983

Steel 10	FE-330 IS:5986-02
	14C6,15C8 TO IS:2004-91
	CR1 to IS:513-08
	080M15 (EN 32) to BS:970 Pt-1 1983
	EN 2B to BS:970 Pt-1 1983

Steel 15	FE-410 IS:5986-02
	14C6,15C8,20C8 IS:2004-91
	E250 A IS:2062-11 (or) E250 C IS:2062-11(Where Impact strength is mandatory)
	070M20/ EN 3 or EN 3A to BS:970-83

Steel 20	FE-410 IS:5986-02
	20C8,25C8 IS:2004-91
	E250 A IS:2062-11 (or) E250 C IS:2062-11(Where Impact strength is mandatory)
	070M20/EN 3A or EN 4 to BS:970 Pt1 1983

(S Kadirvel)
Jt.General Manager
For Sr.General Manager

Extra Copy

वेब्साईट(Website): dgqadefence.gov.in
दूरभाष(PHONE): 044-2684 0473
फैक्स(FAX) :044-26841200
ईमेल(Email): cqahv-dgqa@nic.in

भारत सरकार(Government of India)
रक्षा मंत्रालय (गुआमनि)
Ministry of Defence(DGQA)
गुणता आश्वासन नियंत्रणालय(भारी वाहन)
Controllerate of Quality Assurance
(Heavy Vehicles)
आवडी(Avadi), चेन्नै(Chennai)-600 054

83201/TECH-GEN/EQ.MATL/HVF

05 Jan 2019

The Sr General Manager
Heavy Vehicles Factory, Avadi, **Kind attn : Shri V N R Nayudu, Jt. GM/QA)**
Chennai – 600 054

APPROVAL OF EQUIVALENT MATERIALFOR LOW CARBON STEEL -REG

1 Ref : a) HVF letters
i) 65013/HVF/2018-19/ ALT MATL dated 06 Dec 18
ii) 65013/HVF/2018-2019/ ALT MATL dated 22 Dec 18
iii) 65013 /AM/HVF/2018-2019/ ALT MATL dated 31 Dec 18
b) CQA(HV) letter No.83201/TECH GEN/ EQ MATL/HVF dated 15 Dec 2018

2. HVF Proposal for equivalent material (for low carbon steel) forwarded vide your letter under reference 1 (a) (iii) has been scrutinized and CQA (HV) is agreed with HVF proposal. This approval will be applicable for Steel Grade 8, 10, 15 & 20 only as per CQA (SV) Dehu Road book no. "CISV/ ID/ PUB/2 (Vol-I) for Indian equivalents of Russian steels used in Articles 675/765 & Article 172". The specific grade of Indian equivalent material of latest IS against specific Russian material has to be used and before use the same has to be intimated to CQA (HV).

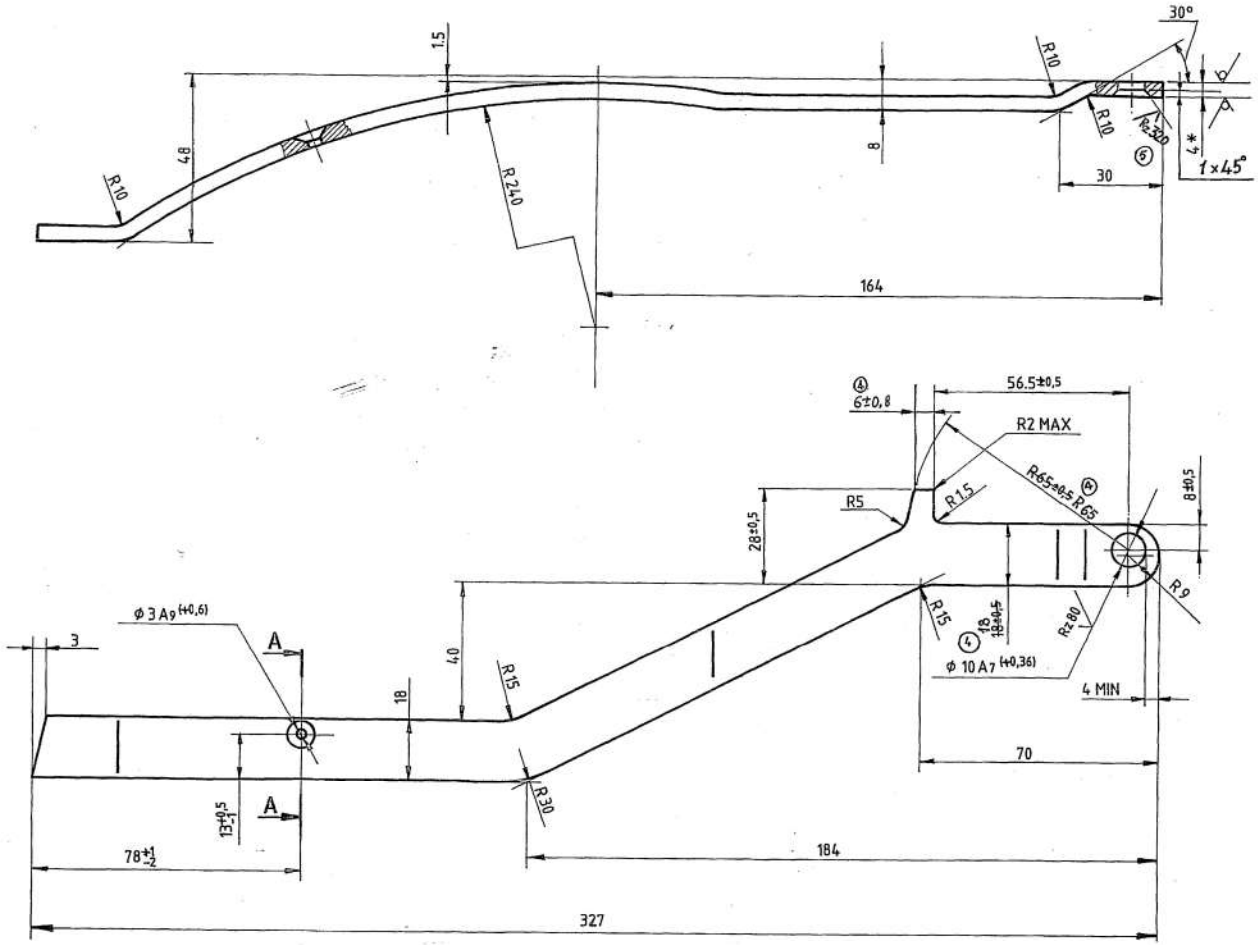
3. This is for your information and further necessary action please.

(वी. रविंद्रनाथ / V. Ravindranath)
व.वै.अ.-१/SSO-I
सहायक नियंत्रक / Asst Controller
कृते नियंत्रक / For Controller

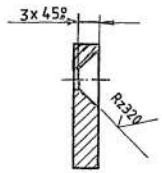
DRAWING NUMBER
172.65.033

SHEET No. 1 OF 1

Rz500 (✓)



A – A
SCALE :- 2 : 1



1. BHN 302 – 255 (DIAMETER OF INDENTATION 3.5 – 3.8).
2. DEVIATION OF COMPONENT FROM THE CONTOUR AND PROFILE TEMPLATES, CONSTRUCTED ACCORDING TO NOMINAL DIMENSIONS SHOULD NOT EXCEED 2mm.
3. ROUNDING OFF CORNERS TO R 3mm IS ALLOWED.
4. THE REST OF THE REQUIREMENTS IN ACCORDANCE WITH 520 TY 1.
5. * DIMENSION FOR REFERENCE.

EXPLANATORY NOTE :-

6. HIGH QUALITY STRUCTURAL CARBON ALLOYED HOT ROLLED STEEL STRIP OF NORMAL ROLLING ACCURACY ON THICKNESS $4.0^{+0.20}_{-0.40}$ mm AS PER TY 14 – 1 – 1830-75 FROM STEEL GRADE 30ХГСА, CATEGORY 3 TO GOST 11269-76 AND MANUFACTURED IN ACCORDANCE WITH GOST 11268-76 AND CHEMICAL COMPOSITION AS PER GOST 4543-71 AS MENTIONED IN GOST 11268-76.

a) CHEMICAL COMPOSITION :- AS PER STEEL GRADE 30ХГСА GOST 4543-71.

CONTENT OF ELEMENTS %					
C	Si	Mn	Cr	S	P
				MAX	
0.28–0.34	0.90–1.20	0.80–1.10	0.80–1.10	0.025	0.025

RESIDUAL CONTENT OF COPPER AND NICKEL SHOULD NOT EXCEED 0.30% EACH.

b) MECHANICAL PROPERTIES :- AS PER STEEL GRADE 30ХГСА, CATEGORY 3 GOST 11269-76 IN SOFT OR NORMALISED CONDITION.

TENSILE STRENGTH Kgf/mm²	ELONGATION % MIN	HARDNESS BHN
50–75	20	156–217

(5A) ALT. MATL: STEEL 709M40 (En19) / STEEL 817M40 (En24) TO BS. 970 Pt-1:1983

COMMON TO T-90 & BLT

DRG. RE – INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE-3 28.3.05

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

EST. WT. (Kg)	TO BE STAMPED OR MARKED WHERE INDICATED THUS # (LETTERS)
0.20	

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
5A	19.11.05	Authy Lr. No. 80001/CQA(HV)/GEN Dt. 7.10.05
5	28.12.88	AMDT. LIST 6, PART II, BOOK-9
4	28.12.88	AMDT. LIST 6, PART II, BOOK-9

DRN	Sd/=
CHD	Sd/=
APPD	Sd/=
DATE	28-4-86
SCALE:-	1 : 1
DIMENSIONS IN mm	
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS : 2102 - 69	
ALL THREADS TO CONFORM TO	

MATERIAL :- SHEET 4 TY14-1-1830-75 30ХГСА-3 GOST 11269-76

USED ON :- 172.65.014 ChCb

CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI

TITLE :- LEVER

D S CAT NUMBER

DRAWING NUMBER 172.65.033

F-137/52

SIZE A2

COMMON TO T-90 & BLT

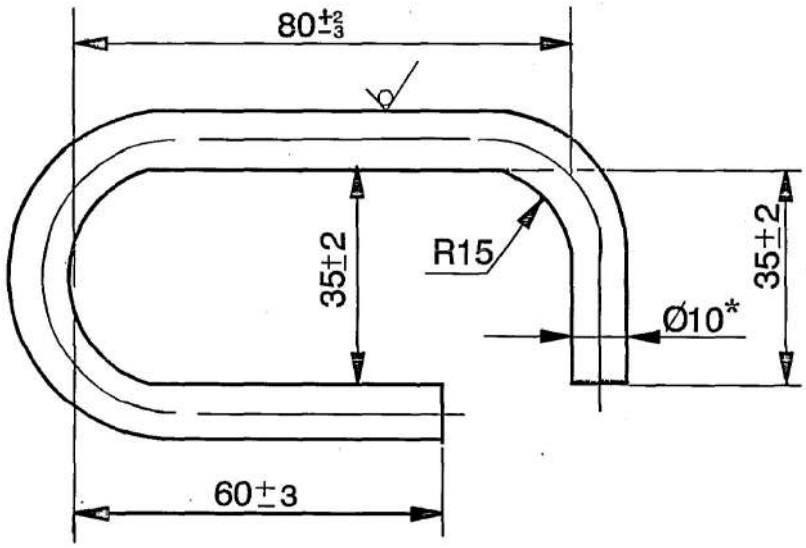
DRG. RE-INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE-NIL

REPLACES 172.65.034 VIDE AMDT. LIST No. 6/II, BOOK-9. 28.3.05

F-13B / 37

DRAWING NUMBER	SHEET No. 1 OF 1
172.65.034-1	

Rz 320



1. ALTERNATE MATERIAL : ROUND BAR — B 10 GOST 2590-71 / 20 GOST 1050-74
2. DIMENSION FOR REFERENCE.
3. DENTS TO THE DEPTH NOT MORE THAN 1mm ARE PERMITTED.
4. UNFIT TO THE PLATE AT THE MAXIMUM 2mm IS ALLOWED.
5. OTHER REQUIREMENTS ACCORDING TO 520 TY 1.

(A) ALT. MATL: STEEL 070M20(En3A) TO BS. 970 Pt-1:1983

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

ISSUE	DATE	NATURE OF AMENDMENTS
A	19.11.05	Authy Lt. No. 80001/CQA(HV)/GEN Dt. 7.10.05

DRN	Sd/-
CHD	Sd/-
APPD	Sd/-
DATE	24-12-88

SCALE :- 1 : 1

DIMENSIONS IN mm

TOLERANCE ON DIMENSIONS UNLESS OTHERWISE STATED IS : 2102 - 69

ALL THREADS TO CONFORM TO

EST. WT. (Kg) 0.12

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.

MATERIAL :- ROUND BAR B 10 GOST 2590-71 / 15-a-GOST 1050-74

USED ON :- 172.65.014

CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI

TITLE :- HANDLE

D S CAT NUMBER

DRAWING NUMBER 172.65.034-1

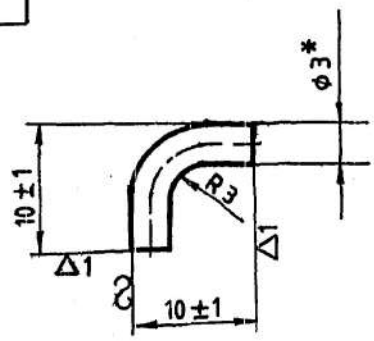
SIZE A4

DRG. RE-INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE - 2.
COMMON TO T-90
07.04.05

4	3	2	1

DRAWING NUMBER
176.65.024

SHEET No. 1 OF 1



1. *DIMENSION FOR REFERENCE

EXPLANATORY NOTE:-

2. REFERENCE MATERIAL QUOTED—
LOW CARBON STEEL WIRE OF DIAMETER 3 0 ± 0 06 mm, HEAT TREATED, BLACK SURFACE AS PER GOST 3282-74 AND MANUFACTURED FROM STEEL WIRE IN ACCORDANCE WITH GOST 14085-79 OR LOW CORBON STEEL GOST 1050-74

3 MECHANICAL PROPERTIES:-
AS PER GOST 3282-74 FOR WIRE DIAMETER 3 0 ± 0.060mm

TENSILE STRENGTH Kgf / mm²	ELONGATION %
30 - 50	20

F-137
75

(2A) ALT. MATL: STEEL 070M20(En3A) TO BS. 970 Pt-1:1983

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

ISSUE	DATE	NATURE OF AMENDMENTS
2A	19.11.05	Authy Lt. No. 80001/CQA(HV)/GEN Dt. 7.10.05

EST. WT. (Kg) 0.001

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.

MATERIAL:- WIRE 3-0-4 GOST 3282-74

USED ON:- 172.65.014 cbCb

DRN Sd/=
CHD Sd/=
APPD Sd/=
DATE 3-5-86

SCALE:- 2:1

DIMENSIONS IN mm

TOLERANCE ON DIMENSIONS UNLESS OTHERWISE STATED IS: 2102-69

ALL THREADS TO CONFORM TO

CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI

TITLE:- HOOK

D S CAT NUMBER

DRAWING NUMBER 176.65.024

SIZE A4

USED ON

(3B) 172 65 023cb-1Cb
172.65.023Cb
~~172 65 023cbCb~~
(3) 26 3 05
(3) 26 3 05

COMMON TO T-90 & BLT

IIL RE-CREATED BASED ON RUSSIAN ORIGINAL ISSUE - 2

F-137
13

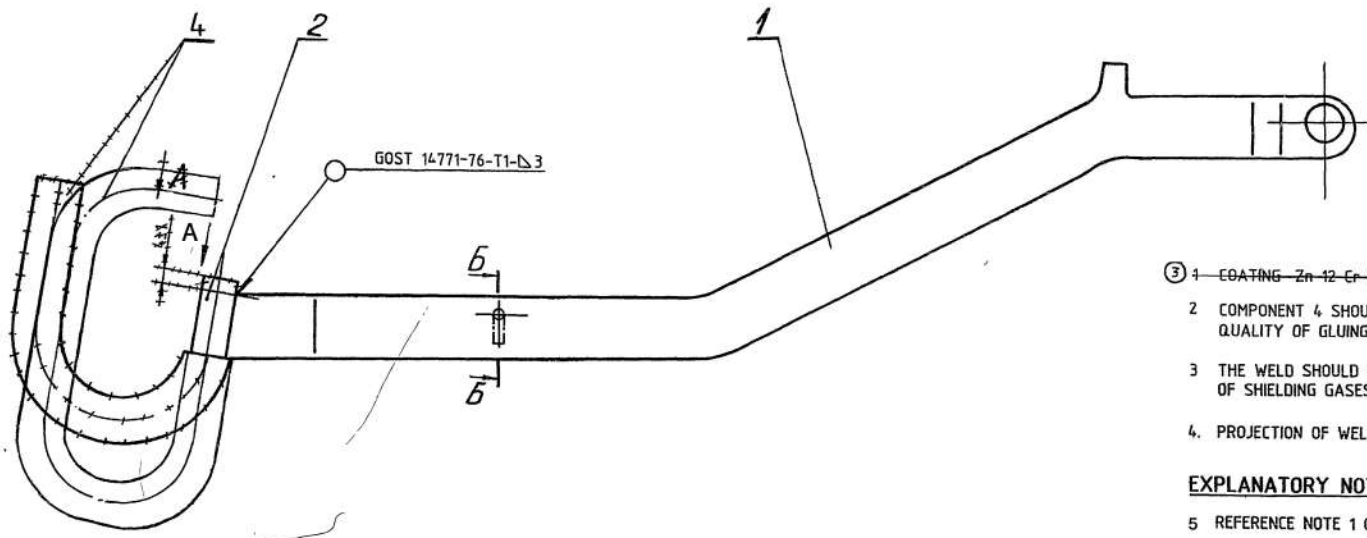
ZONE	ITEM NO	DRAWING NUMBER	D S CAT NUMBER	DESCRIPTION	QTY	REMARKS
		172 65 014 cb Cb		LEVER		
		& ITEM LIST				
	1	172 65 033		LEVER	1	
	2	172 65 034-1		HANDLE	1	
	3	176 65 024		HOOK	1	
	4	GOST-5496-78		PIPE 4c 10x2	1	L = ~~120 mm~~ 200 mm

ISSUE	DATE	NATURE OF AMENDMENTS	ISSUE	DATE	NATURE OF AMENDMENTS
3B	11.11.09	Authy·Lt No.55017/AHSP/T-72 Dt.29.10 09			
3	24 12 88	AMDT LIST No 6,PART II , BOOK - 9			

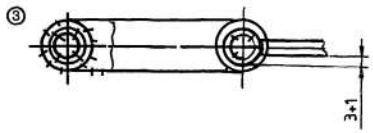
DRN	Sd.	CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI	
CHD	Sd.	TITLE **LEVER**	
APPD	Sd.		
DATE	16-4-86	SHT NO 1 OF 1	D S CAT NUMBER
			ITEM LIST FOR **172.65.014cbCb**

DRAWING NUMBER
172.65.014 cb Cb

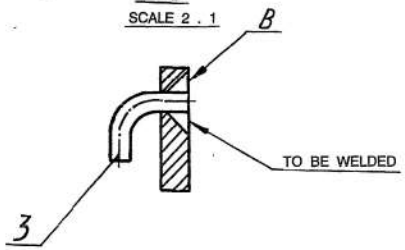
SHEET No 1 OF 1



VIEW-A REVOLVED



6-6
SCALE 2 . 1



③ ~~1 COATING Zn-12 Cr PRESENCE OF COATING IN HOLES IS NOT TO BE CHECKED.~~

2 COMPONENT 4 SHOULD BE INSTALLED ON GLUE HT-150 TY 38-105-789-75 QUALITY OF GLUING IS NOT TO BE CHECKED.

3 THE WELD SHOULD BE DONE BY ELECTRIC ARC WELDING IN ATMOSPHERE OF SHIELDING GASES

4. PROJECTION OF WELD BEYOND SURFACE 'B' IS NOT PERMISSIBLE

EXPLANATORY NOTE

5 REFERENCE NOTE 1 ON COATING:-

TO BE COATED ZINC Fe Zn 12 TO IS: 1573-70 AND FOLLOWED BY CHROMATE PASSIVATION TO IS: 1340-77.

6 REFERENCE ITEM LIST AGAINST ITEM 4:

PIPE 4C 10x2 GOST 5496-78. l = 120 mm

OIL AND BENZINE RESISTANT RUBBER TUBE OF MEDIUM HARDNESS WITH INSIDE DIAMETER 10 ± 1,0 mm, WALL THICKNESS 2 ± 0,40 mm AND 120 mm LONG TO GOST 5496-78.

COMMON TO T-90 & BLT
DRG RE- CREATED BASED ON RUSSIAN ORIGINAL ISSUE - 2 (25.3.05)

F-137
13

SIZE A2

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

EST. WT. (Kg)	TO BE STAMPED OR MARKED WHERE INDICATED THUS # (LETTERS)
0 24 Kg	

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 /
3A	11.11 09	Authy. Lt. No. 55017/AHSP/T-72 Dt 29.10.09
3	26 12 88	AMDT LIST 6, PART II, BOOK-9

DRN	Sd.
CHD	Sd. -
APPD	Sd,
DATE	16-4-86
SCALE:-	1 1
DIMENSIONS IN. mm	
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS : 2102 - 69	
ALL THREADS TO CONFORM TO	

MATERIAL :- —

USED ON - 172.65.023 Cb
172 65 023cb-1Cb (3A)

CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES)
AVADI

TITLE :- LEVER

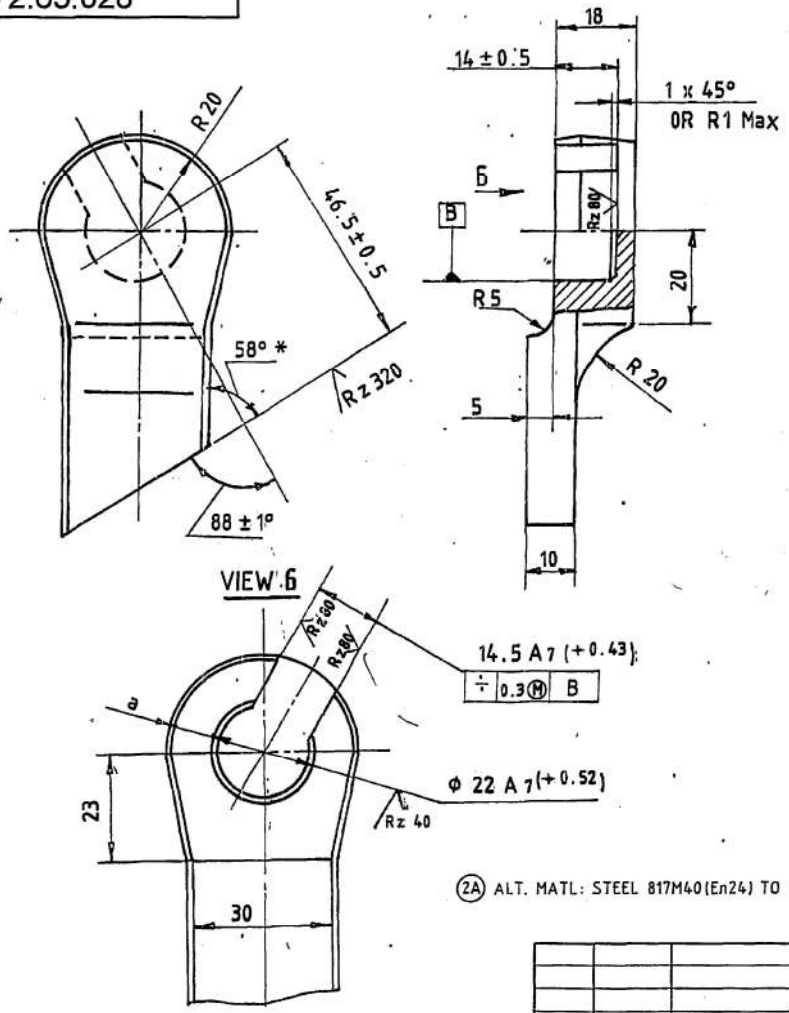
D S CAT NUMBER

DRAWING NUMBER
172.65.014 cb Cb

172-65 023 cb

DRAWING NUMBER
172.65.028

SHEET No. 1 OF 1



(2A) ALT. MATL: STEEL 817M40 (En24) TO BS. 970 Pt-1:1983

1. BHN 302 - 255 (DIA OF INDENTATION 3.5 - 3.8) ~~TO BE~~ CHECKED IN BLANK. (2) MAY BE
2. DIE PARTING LINE IS OPTIONAL,
3. LEAST THICKNESS OF WALL " a " - 7.5 mm,
4. WHILE CUTTING GROOVE 14.5 A7 TO DIMENSION 14 ± 0.5, SHOULDER UP TO 0.5 mm IS ALLOWED.
5. THE REST OF THE REQUIREMENTS ACCORDING TO 520 Ty 1.
6. *DIMENSION FOR REFERENCE.

EXPLANATORY NOTE :-

7. REFERENCE MATERIAL QUOTED :-
   STRUCTURAL ALLOY OF CHROME SILICON MANGANESE STEEL OF HIGH QUALITY GRADE 30 XГCA GOST 4543-71.
8. a) CHEMICAL COMPOSITION :-

CONTENT OF ELEMENTS %					
C	Si	Mn	Cr	S	P
				MAXIMUM	
028-0,34	0,90-1,20	0,80-1,10	0,80-1,10	0,025	0,025

RESIDUAL CONTENT OF COPPER AND NICKEL SHOULD NOT EXCEED 0.30 % EACH.

b) MECHANICAL PROPERTIES :-

TENSILE STRENGTH Kgf/mm²	YIELD POINT Kgf/mm²	ELONGATION %	REDUCTION IN AREA %	IMPACT STRENGTH Kgm/cm²
MINIMUM				
110	85	10	45	5

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

EST. WT. (Kg)	TO BE STAMPED OR MARKED WHERE INDICATED THUS # (LETTERS)
0.25	

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
2A	19.11.05	Authy Lt. No. 80001/CQA(HV)/GEN Dt. 7.10.05
2	21.03.90	172M.27.'A'-88 (AL 10/1)

DRN	Sdl=
CHD	Sdl=
APPD	Sdl=
DATE	25-4-86
SCALE:-	1 : 1
DIMENSIONS IN mm	
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS : 2102 - 69	
ALL THREADS TO CONFORM TO	

MATERIAL :- STEEL 30XГCA GOST 4543-71

USED ON :- 172.65.026; cbCb

CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI

TITLE :- BRACKET L.H.

D S CAT NUMBER

DRAWING NUMBER 172.65.028

IIL RE- INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE -1

COMMON TO T-90 & BLT

28.3.05

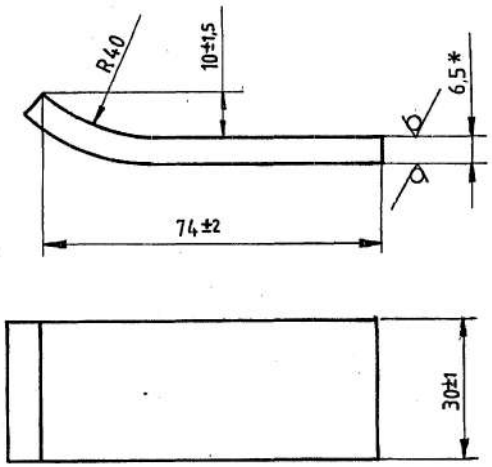
F-137
47

SIZE A3

DRAWING NUMBER
172.65.062

SHEET No. 1 OF 1

Rz630



EXPLANATORY NOTE :-

4. REFERENCE MATERIAL QUOTED :-

(2) HOT ROLLED SHEET STEEL OF BRAND 30ХГСА, WITH THICKNESS OF 6.5±0,40 mm AS PER ~~TY 14-132-140-76~~, CATEGORY 3, GOST 11269-76 AND MANUFACTURED IN ACCORDANCE WITH GOST 11268-76 AND CHEMICAL COMPOSITION AS PER GOST 4543-71 AS MENTIONED IN GOST 11268-76.

a) CHEMICAL COMPOSITION :- AS PER STEEL GRADE 30ХГСА GOST 4543-71.

CONTENT OF ELEMENTS %					
C	Si	Mn	Cr	S MAX	P MAX
0.28-0.34	0.90-1.20	0.80-1.10	0.80-1.10	0.025	0.025

RESIDUAL CONTENT OF COPPER AND NICKEL SHOULD NOT EXCEED 0.30% EACH

b) MECHANICAL PROPERTIES :- AS PER STEEL GRADE 30ХГСА, CATEGORY 3, GOST 11269-76 IN SOFTENED OR NORMALISED CONDITION.

TENSILE STRENGTH Kgf / mm²	ELONGATION % MIN	HARDNESS BHN
50-75	16	156-217

1. NON FITTING OF THE PROFILE OF BENDING TO THE TEMPLATE, CONSTRUCTED ACCORDING TO NOMINAL DIMENSIONS, SHOULD NOT EXCEED 1.5 mm.
2. * DIMENSION FOR REFERENCE.
3. THE REST OF THE REQUIREMENTS ACCORDING TO 520 TY 1.

(2A) ALT. MATL: STEEL 709M40 (En19) / STEEL 817M40 (En24) TO BS. 970 Pt-1:1983

COMMON TO T-90 & BLT

DRG. RE – INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE-1

28.3.05

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

EST. WT. (Kg)	TO BE STAMPED OR MARKED WHERE INDICATED THUS # (LETTERS)
0.124	

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

ISSUE	DATE	NATURE OF AMENDMENTS
2A	19.11.05	Authy Lt. No. 80001/CQA(HV)/GEN Dt. 7.10.05
2	26.12.88	AMDT. LIST 6/II, BOOK-9

DRN	Sd/-
CHD	Sd/-
APPD	Sd/-
DATE	03-05-86
SCALE:-	1 : 1
DIMENSIONS IN mm	
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS : 2102-69	
ALL THREADS TO CONFORM TO	

MATERIAL :- SHEET (2)
6.5 TY 14-105-490-85
30ХГСА-3 GOST 11269-76

USED ON :-
172.65.026cb Cb
172.65.027cb Cb

CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES)
AVADI

TITLE :-
STRIP

D S CAT NUMBER

DRAWING NUMBER
172.65.062

F-137
66

SIZE A3

USED ON (2A)

172.65.023Cb
172 65 023cb-1Cb

COMMON TO T-90 & BLT

I/L RE-CREATED BASED ON RUSSIAN ORIGINAL ISSUE – 1

F-137
21

ZONE	ITEM NO	DRAWING NUMBER	D S CAT NUMBER	DESCRIPTION	QTY	REMARKS
		172 65 026cbCb		**BRACKET L H**		
		& ITEM LIST				
	1	172 65 028		BRACKET L H	1	
	2	172 65 062		STRIP	1	

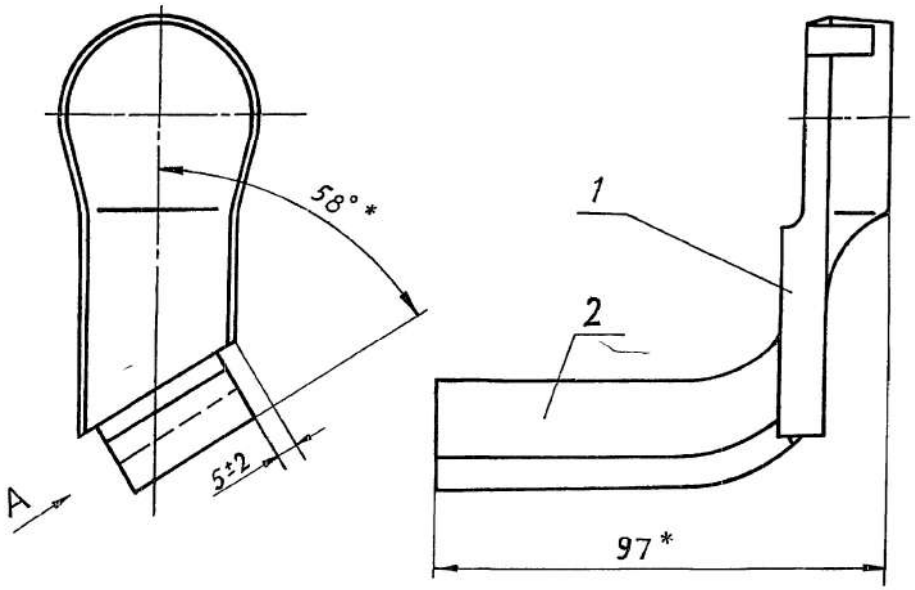
ISSUE	DATE	NATURE OF AMENDMENTS	ISSUE	DATE	NATURE OF AMENDMENTS
2A	11.11.09	Authy: Lt.No.55017/AHSP/T-72 Dt 29 10.09			
2	26 12 88	DRAWING AMENDED			

DRN	-Sd-	CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI	
CHD	-Sd-	TITLE **BRACKET L.H.**	
APPD	-Sd-		
DATE	23-4-86	SHT NO 1 OF 1	D S CAT NUMBER
			ITEM LIST FOR **172.65.026cbCb**

COMMON TO T-90 & BLT

DRG RE - INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE-1

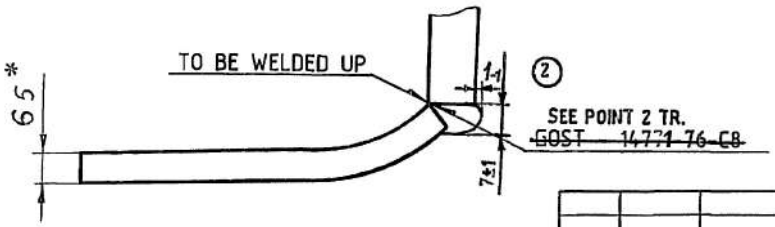
DRAWING NUMBER	SHEET No 1 OF 1
172.65.026 cb-Cb	



② 1* DIMENSION FOR REFERENCE

② 2 ARC WELDING IN SHIELDED GAS ATMOSPHERE

VIEW A (TURNED)



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

EST. WT. (Kg)	TO BE STAMPED OR MARKED WHERE INDICATED THUS # (LETTERS)
0 40	

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
2A	11.11.09	Authy:Lt.No.55017/AHSP/T-72. Dt.29.10.09
2	24 12 88	AMDT LIST No 6, PART II, BOOK-9

DRN	Sdl=
CHD	Sdl=
APPD	Sdl=
DATE	23-4-86
SCALE:-	1 1
DIMENSIONS IN mm	
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS : 2102 - 69	
ALL THREADS TO CONFORM TO	

MATERIAL :- ——

USED ON :- 172.65.023Cb
172 65 023cb-1Cb (2A)

CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI

TITLE :- BRACKET L.H.

D S CAT NUMBER

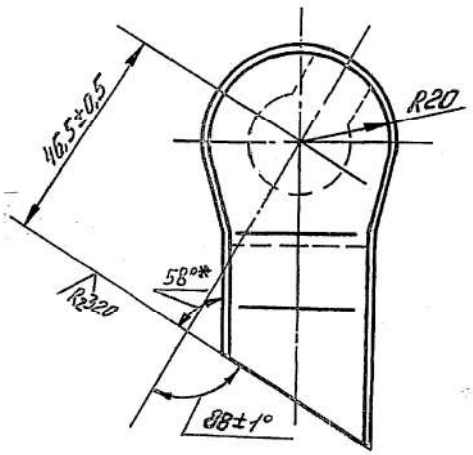
DRAWING NUMBER 172.65.026cb-Cb

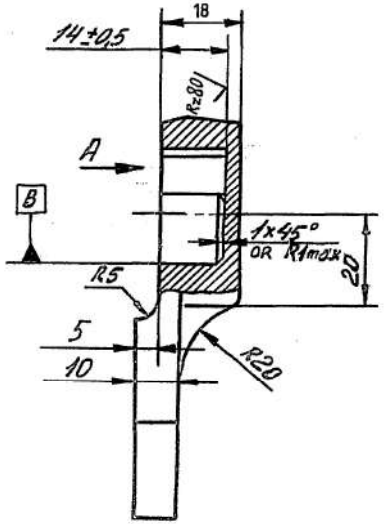
F-137
21

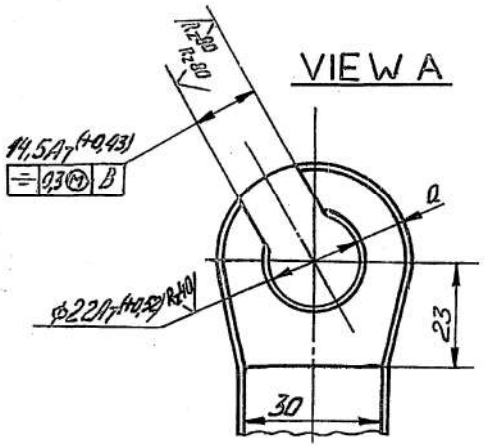
SIZE A3

DRAWING NUMBER
172.65.029

SHEET No. 1 OF 1







(2) MAY BE

1. BHN 302 - 255 (DIA OF INDENTATION 3.5 - 3.8) ~~TO BE~~ CHECKED IN BLANK.
2. DIE PARTING LINE IS OPTIONAL.
3. LEAST THICKNESS OF WALL " a " - 7.5 mm.
4. WHILE CUTTING GROOVE 14.5 A7 TO DIMENSION 14 ± 0.5 . SHOULDER UP TO 0.5 mm IS ALLOWED.
5. THE REST OF THE REQUIREMENTS ACCORDING TO 520 Ty 1.
6. *DIMENSION FOR REFERENCE.

EXPLANATORY NOTE :-

7. REFERENCE MATERIAL QUOTED :-
   STRUCTURAL ALLOY OF CHROME SILICON MANGANESE STEEL OF HIGH QUALITY GRADE 30 ХГСА GOST 4543-71.

8. a) CHEMICAL COMPOSITION:-

CONTENT OF ELEMENTS %					
C	Si	Mn	Cr	S	P
				MAXIMUM	
028-0,34	0,90-1,20	0,80-1,10	0,80-1,10	0,025	0,025

RESIDUAL CONTENT OF COPPER AND NICKEL SHOULD NOT EXCEED 0.30 % EACH.

b) MECHANICAL PROPERTIES:-

TENSILE STRENGTH Kgf/mm²	YIELD POINT Kgf/mm²	ELONGATION %	REDUCTION IN AREA %	IMPACT STRENGTH Kgm/cm²
MINIMUM				
110	85	10	45	5

(2A) ALT. MATL: STEEL 817M40(En24) TO BS. 970 Pt-1:1983

1/L RE- INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE-1
COMMON TO T-90 & BLT
28.3.05

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

EST. WT. (Kg)	TO BE STAMPED OR MARKED WHERE INDICATED THUS # (LETTERS)
0.25	

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
2A	19.11.05	Authy Lt. No. 80001/CQA(HV)/GEN Dt. 7.10.05
2	21.03.90	172M.27 'A'-88 (AL 10/1)

DRN	Sd/-
CHD	Sd/-
APPD	Sd/-
DATE	25-4-86
SCALE:- 1 : 1	
DIMENSIONS IN mm	
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS : 2102 - 69	
ALL THREADS TO CONFORM TO	

MATERIAL:-
STEEL 30ХГСА
GOST 4543-71

USED ON:-
172.65.027 сборка

CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES)
AVADI

TITLE:-
BRACKET R.H.

D S CAT NUMBER

DRAWING NUMBER
172.65.029

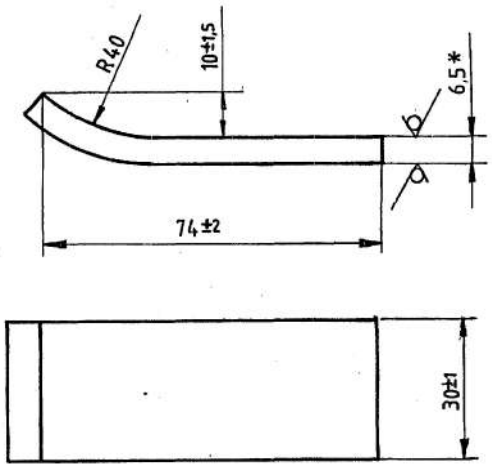
F-137
48

SIZE A3

DRAWING NUMBER
172.65.062

SHEET No. 1 OF 1

Rz630



EXPLANATORY NOTE :-

4. REFERENCE MATERIAL QUOTED :-

(2) HOT ROLLED SHEET STEEL OF BRAND 30ХГСА, WITH THICKNESS OF 6.5±0,40 mm AS PER ~~TY 14-132-140-76~~, CATEGORY 3, GOST 11269-76 AND MANUFACTURED IN ACCORDANCE WITH GOST 11268-76 AND CHEMICAL COMPOSITION AS PER GOST 4543-71 AS MENTIONED IN GOST 11268-76.

a) CHEMICAL COMPOSITION :- AS PER STEEL GRADE 30ХГСА GOST 4543-71.

CONTENT OF ELEMENTS %					
C	Si	Mn	Cr	S MAX	P MAX
0.28-0.34	0.90-1.20	0.80-1.10	0.80-1.10	0.025	0.025

RESIDUAL CONTENT OF COPPER AND NICKEL SHOULD NOT EXCEED 0.30% EACH

b) MECHANICAL PROPERTIES :- AS PER STEEL GRADE 30ХГСА, CATEGORY 3, GOST 11269-76 IN SOFTENED OR NORMALISED CONDITION.

TENSILE STRENGTH Kgf / mm²	ELONGATION % MIN	HARDNESS BHN
50-75	16	156-217

1. NON FITTING OF THE PROFILE OF BENDING TO THE TEMPLATE, CONSTRUCTED ACCORDING TO NOMINAL DIMENSIONS, SHOULD NOT EXCEED 1.5 mm.
2. * DIMENSION FOR REFERENCE.
3. THE REST OF THE REQUIREMENTS ACCORDING TO 520 TY 1.

(2A) ALT. MATL: STEEL 709M40 (En19) / STEEL 817M40 (En24) TO BS. 970 Pt-1:1983

COMMON TO T-90 & BLT

DRG. RE – INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE-1

28.3.05

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

EST. WT. (Kg)	TO BE STAMPED OR MARKED WHERE INDICATED THUS # (LETTERS)
0.124	

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

ISSUE	DATE	NATURE OF AMENDMENTS
2A	19.11.05	Authy Lt. No. 80001/CQA(HV)/GEN Dt. 7.10.05
2	26.12.88	AMDT. LIST 6/II, BOOK-9

DRN	Sd/-
CHD	Sd/-
APPD	Sd/-
DATE	03-05-86
SCALE:-	1 : 1
DIMENSIONS IN mm	
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS : 2102-69	
ALL THREADS TO CONFORM TO	

MATERIAL :- SHEET (2)
6.5 TY 14-105-490-85
30ХГСА-3 GOST 11269-76

USED ON :-
172.65.026cb Cb
172.65.027cb Cb

CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES)
AVADI

TITLE :-
STRIP

D S CAT NUMBER

DRAWING NUMBER
172.65.062

F-137
66

SIZE A3

USED ON

172.65.023Cb
172 65 023cb-1Cb (2A)

IIL RE-CREATED BASED ON RUSSIAN ORIGINAL ISSUE – 1
COMMON TO T-90 & BLT

F-137
22

ZONE	ITEM NO	DRAWING NUMBER	D S CAT NUMBER	DESCRIPTION	QTY	REMARKS
		172.65 027cbCb		**BRACKET R H.**		
		& ITEM LIST				
	1	172 65 029		BRACKET R H	1	
	2	172 65 062		STRIP	1	

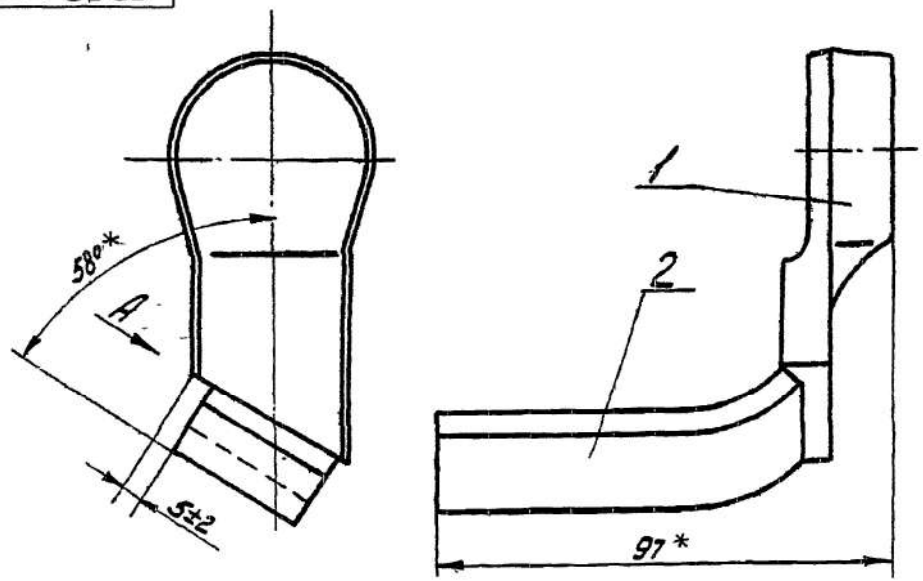
ISSUE	DATE	NATURE OF AMENDMENTS
2A	11.11.09	Authy: Lt.No. 55017/AHSP/T-72. Dt. 29.10.09
2	26 12 88	DRG AMENDED

ISSUE	DATE	NATURE OF AMENDMENTS

DRN	Sd/=	CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI	
CHD	Sd/=	TITLE **BRACKET R.H.**	
APPD	Sd/=		
DATE	14-6-86	SHT NO: 1 OF 1	D S CAT NUMBER
			ITEM LIST FOR **172.65.027cbCb**

DRAWING NUMBER 172.65.027CbCБ

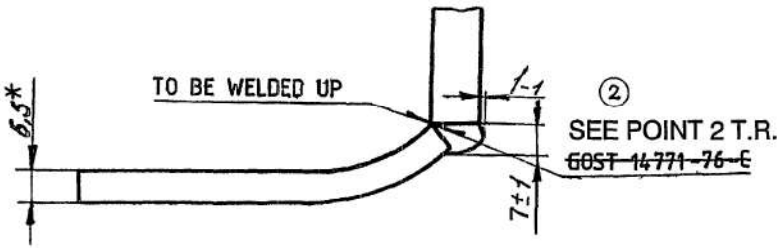
SHEET No 1 OF 1



1* DIMENSION FOR REFERENCE.

(2) 2 ARC WELDEED IN SHIELDED GAS ATMOSPHERE.

VIEW A (TURNED)



(2) SEE POINT 2 T.R. ~~GOST 14771-76-E~~

1L RE- INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE-1

COMMON TO T-90 & BLT

26 3 05 550

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

EST. WT. (Kg)	TO BE STAMPED OR MARKED WHERE INDICATED THUS # (LETTERS)
0 40	

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
2A	11 11 09	Authy:Lt No.55017/AHSP/T-72. Dt.29.10.09
2	26 12 88	AMDT LIST No 6, PART-II BOOK-9

DRN	Sdl=
CHD	Sdl=
APPD	Sdl=
DATE	18-4-86
SCALE.-	1 1
DIMENSIONS IN mm	
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS : 2102-69	
ALL THREADS TO CONFORM TO	

MATERIAL .- ——

USED ON :- 172.65.023Cb
172 65 023cb-1Cb (2A)

CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI

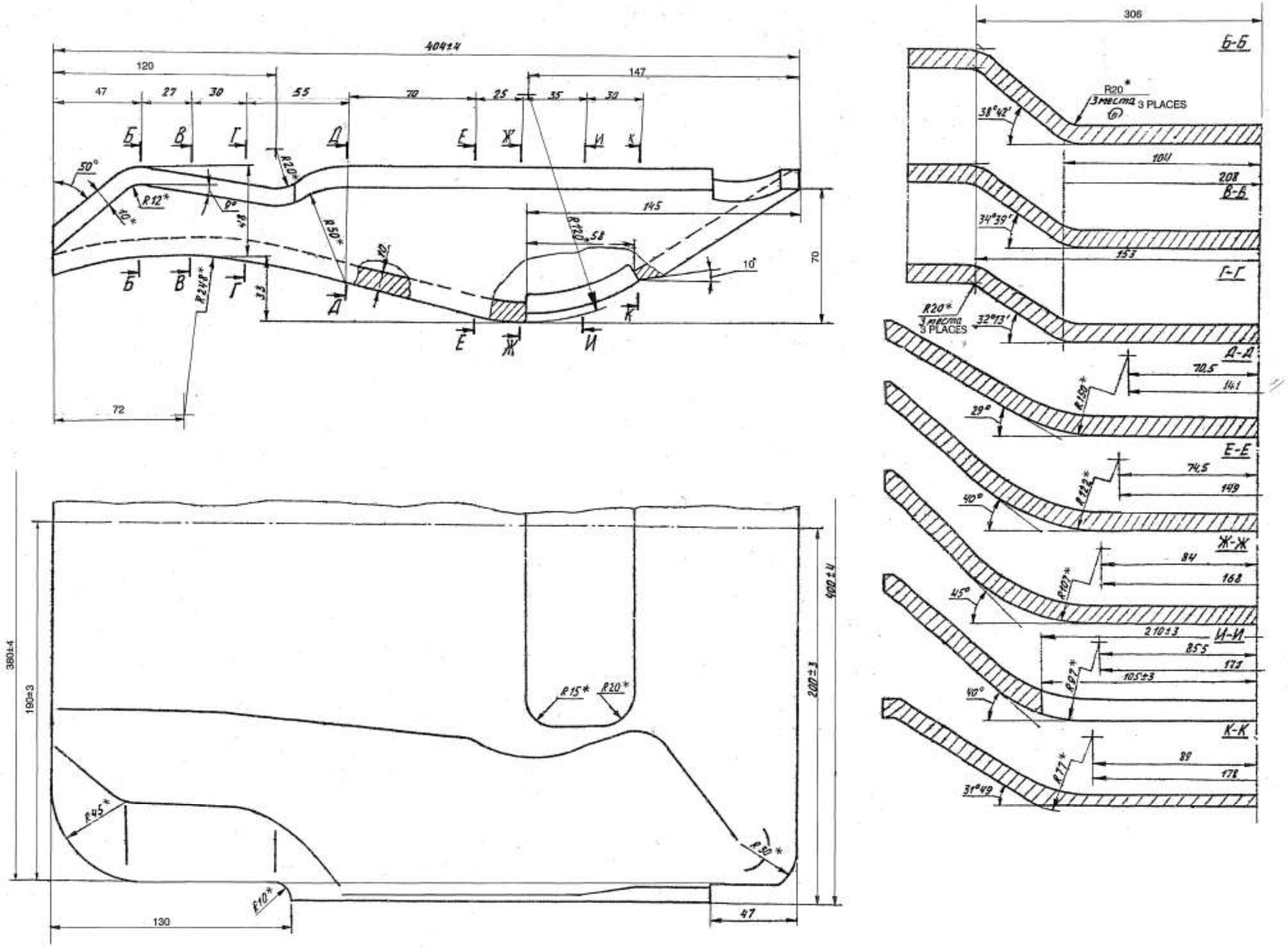
TITLE :- BRACKET RH

D S CAT NUMBER

DRAWING NUMBER 172.65.027CbCБ

F-137/22

SIZE A3



1. ALTERNATE MATERIAL : LEAD OF ANY GRADE.
2. MAY BE MANUFACTURED FROM A SET OF SHEETS 5mm.
3.* DIEMENSIONS ARE TO BE ENSURED BY TOOL.
4. CORNER OF CONTOUR MAY BE REQUIRED BY TOOL.
5. TRANSITIONS BETWEEN SECTIONS SHOULD BE SMOOTH.
6. ON COMPONENT SURFACES MARKS SCRATCHES, AND TOOL MARKS ALLOWED.
7. IN PLACES OF BENDING NATURAL THINNING OF METAL IS ALLOWED.
8.* DIEMENSIONS FOR REFERENCE.
9. POSITION OF EDGES OF CUTTING IN HOLES NEED NOT BE CHECKED.
10. OTHER REQUIREMENTS SHOULD COMPLY WITH 520 TY1.

COMMON TO T-90 & BLT

DRG. NO. - INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE-1, REPLACES 172.65.027 VIDE AMDT. LIST No. 8.

(18) ALT. MATL: COMMERCIAL AVAILABLE LEAD

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

EST. WT. (Kg) 17.80	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
1B	[illegible]	[illegible]
1A	5-6-94	[illegible]

DRN Sd/-	MATERIAL:- STEEL C3-H-10 GOST 9559-75	USED ON:- 172.65.024cb-34CБ 172.65.024cb-3Cb (18)
CHD Sd/-		
APPD Sd/-	CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI	
DATE 16-3-89		
SCALE:- 1 : 1		
DIMENSIONS IN mm	TITLE:- LINER	
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS : 2102-69		
ALL THREADS TO CONFORM TO	D S CAT NUMBER	DRAWING NUMBER 172.65.027-1

SIZE A0

USED ON

172.65.025cb-3Cb

I/L CREATED BASED ON RUSSIAN ORIGINAL ISSUE - NIL

COMMON TO T-72 & BLT

ZONE	ITEM No.	DRAWING NUMBER	D S CAT NUMBER	DESCRIPTION	QTY	REMARKS
		172.65.024cb-3Cb		**SEAT POT ASSY.**		
	1	172.65.023cb-1Cb		SEAT POT ASSY.	1	
	3	172.65.007		BUSH STEEL	4	0.0014 Kg. W/O DRG
	4	172.65.027-1		CROSS PIECE	1	
	7	GOST-6958-78		WASHER C6.01.016	4	
	8	GOST-10299-80		RIVET 5x20.37.10	4	

ISSUE	DATE	NATURE OF AMENDMENTS	ISSUE	DATE	NATURE OF AMENDMENTS

356

SUPPLY CODE

U-01-1-1

D90019

F-19/14

DRN	V Dr
CHD	L. Gangadaran
APPD	Chauchal
DATE	15-4-04

CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI.

TITLE : **SEAT POT ASSY.**

SHT. No. 1 OF 1

D S CAT NUMBER

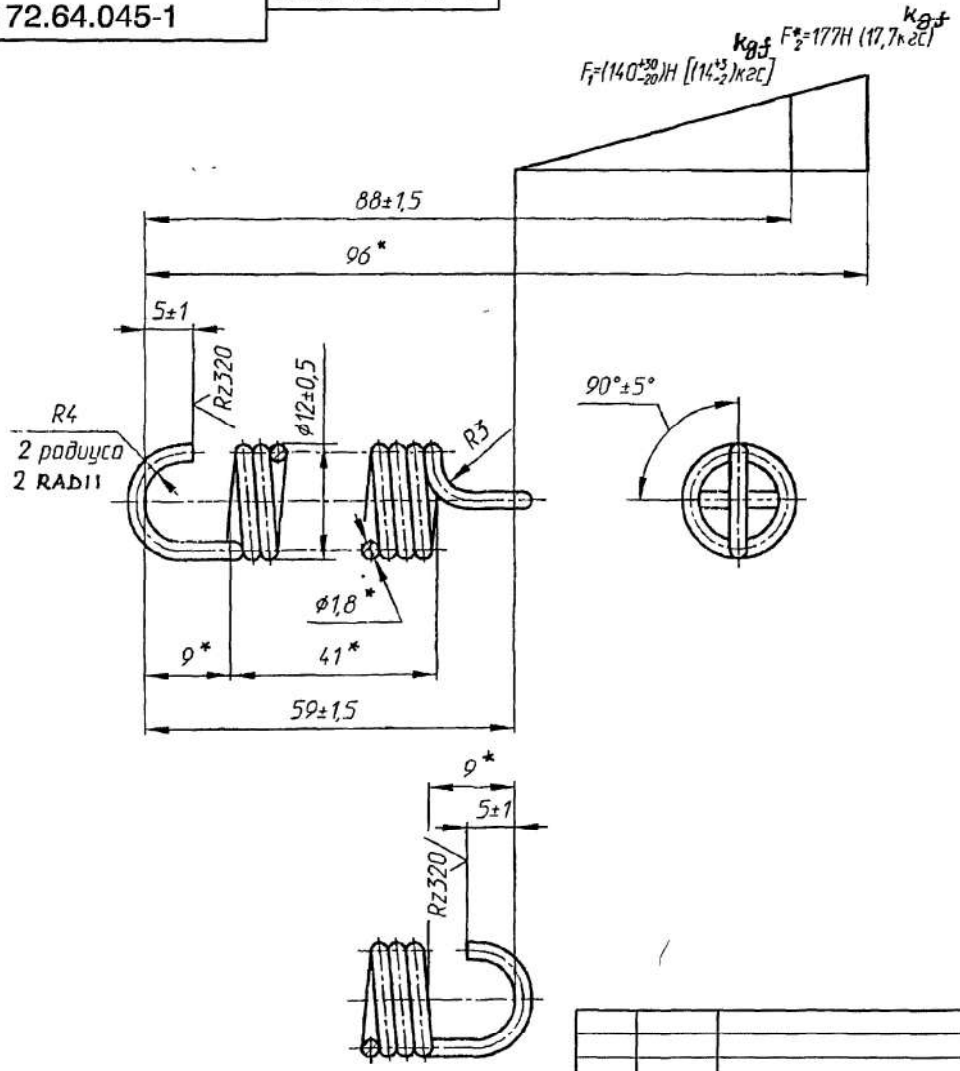
ITEM LIST FOR **172.65.024cb-3Cb**

DRG INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE - 1

COMMON TO T-72 & BLT

DRAWING NUMBER 172.64.045-1

SHEET No 1 OF 1



1 Direction of coiling of spring – any direction

2 n = 21.75

3 *Dimensions and parameters are for reference

4 Shift of spring end axis relative to the spring axis should not exceed 1 mm

5 After five fold stretching to 37 mm, residual deformations are not allowed

6 Coating Zn12, chromatizing.

7 Remaining requirements should be as per specifications 520 TY1

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

EST. WT. (Kg)	TO BE STAMPED OR MARKED WHERE INDICATED THUS # (LETTERS)
0 013	

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

DRN	
CHD	Pillai VD
APPD	Chauchal
DATE	22-03-04
SCALE:- 2 1	
DIMENSIONS IN mm	
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS : 2102 - 69	
ALL THREADS TO CONFORM TO	

MATERIAL :- WIRE B-2A-1 8 GOST 9389-75

USED ON :- 172.64.027cb-1Cb, 172.65.023cb-1Cb

CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI

TITLE :- SPRING

D S CAT NUMBER

DRAWING NUMBER 172.64.045-1

356

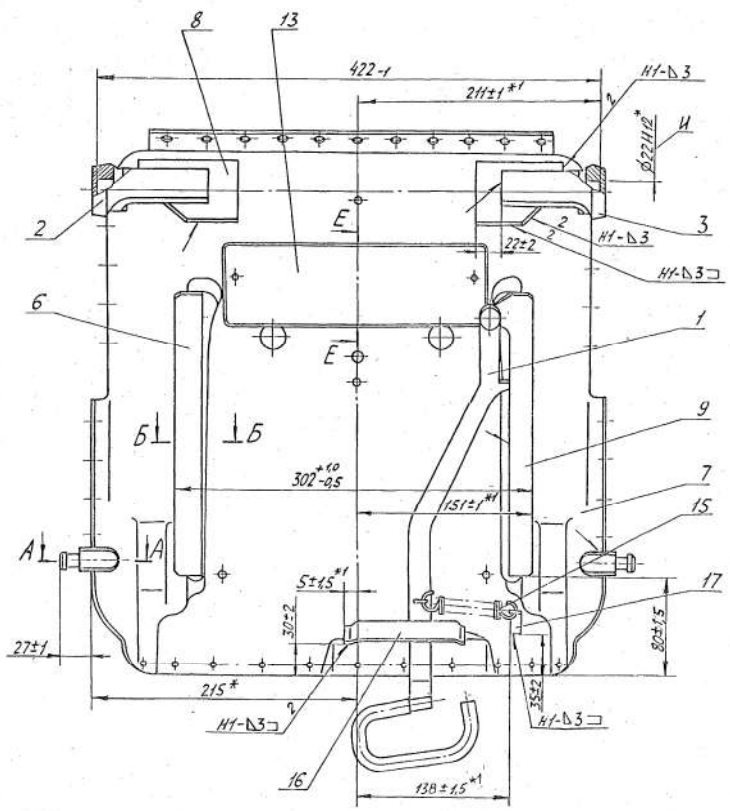
SUPPLY CODE U-01-1-1

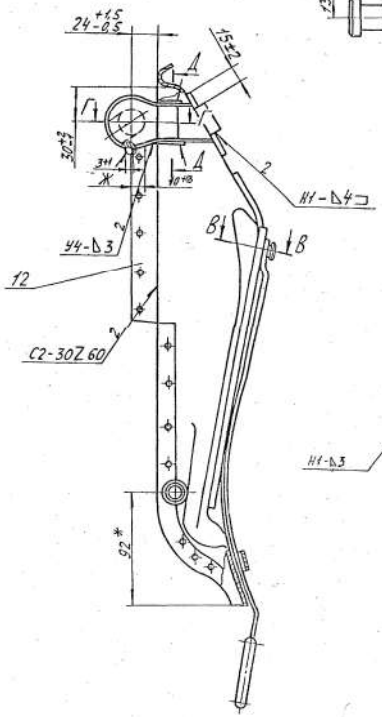
D 90018

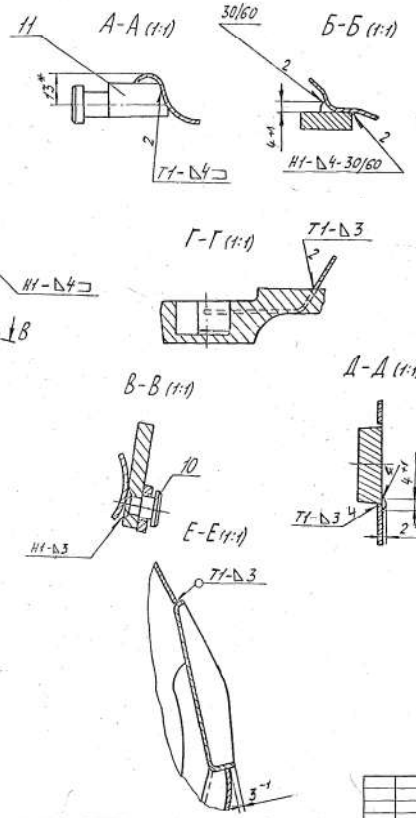
F - 16 / 54

SIZE A3

DRAWING NUMBER 172.65.023cb-1Cb | SHEET No. 1 OF 1







1. Сварные швы по ГОСТ 14771-76.
2. Нестандартные швы выполнять дуговой сваркой в среде защитных газов.
3. *Размеры для справок.
4. Несоосность и перекос отверстий И проверять на свободное проворачивание валика, изготовленного по номинальным размерам сопрягаемого узла 172.65.019сб. Допускается проверка по сопрягаемому узлу.
5. Узел проверить на свободное прохождение в макете, изготовленном по минимальным размерам сопрягаемого узла 172.65.012сб-2 с деталями 172.65.055-1.
6. Допускается подгонка деталей по месту.
7. Рычаг поз.1 должен четко возвращаться в исходное положение под действием пружины поз.15.
8. После установки детали поз. 10 сварной шов зачистить заподлицо.
9. Неплоскостность опорных поверхностей скольжения деталей поз.6 и 9 не более 1,5 мм.
10. Допускается обгорание цинкового покрытия узла поз. 1.
11. Покрытие всех поверхностей, кроме планок и пазов кронштейнов
Грунтовка ФЛ-03К
Эмаль ПФ-223 темно-серая или ПФ-115 темно-серая 894.
Требования по 520.ТУ5.
12. Ось поз. 10 при сборке устанавливать до упора в планку поз. 9.
13. *1Размеры обеспечиваются инструментом.
14. Допускается сварку в районе технологических отверстий не производить.
15. По размеру Ж допускается сварной шов не выполнять.

1. Welds as per GOST 14771-76.
2. Non-standard welds should be made by arc welding in shielded gas medium.
3. * Dimensions for reference.
4. Mis-alignment and squeness of holes if to be tested for smooth passage of shaft, made as per nominal dimensions of mating unit 172.65.019 сб. Testing along mating unit is permitted.
5. Test the unit for smooth passage in dummy model made as per nominal dimenions of mating unit 172.65.012sb-2 with parts 172.65.055-1.
6. Adjustment of parts to suit is permitted.
7. Lever item 1 must return to starting position under the effect of spring item 15.
8. After setting the parts item 10, dress the welds in flush with.
9. Non-flatness of bearing surfaces of slipping parts item 6 and 9 should not exceed 1.5 mm.
10. Burning (charring) of zinc coating, unit item 1 is permitted.
11. Coating of all surfaces, except straps and slots of brackets.
Primer ФЛ-03К
Enamel ПФ-223 dark-grey, ПФ-115 dark-grey 894.
Requirements as per 520.TY5.
12. During assembly set axle item 10 up to stop into the strap item 9.
13. *1 Dimensions to be ensured by tool.
14. Welding may not be done in area of technological holes.
15. Welds may not be carried out along dimension Ж.

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

EST. WT (kg)	TO BE STAMPED OR MARKED WHERE INDICATED THUS ? (LETTERS)
4.554	

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

ISSUE	DATE	NATURE OF AMENDMENTS

DRN	
CHD	B. Ponin
APPD	Chanchal
DATE	14-6-04
SCALE:- 1 : 2	
DIMENSIONS IN mm	
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS : 2102 - 69	
ALL THREADS TO CONFORM TO	

MATERIAL :- —— | USED ON :- 172.65.024cb-3Cb, 172.65.024cb-3ACb

CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI

TITLE :- SEAT CUP ASSY.

D S CAT NUMBER

DRAWING NUMBER 172.65.023cb-1Cb

DRG. INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE-5
COMMON TO T-72 & BLT

356

SUPPLY CODE
U-01-1-4
D 90213

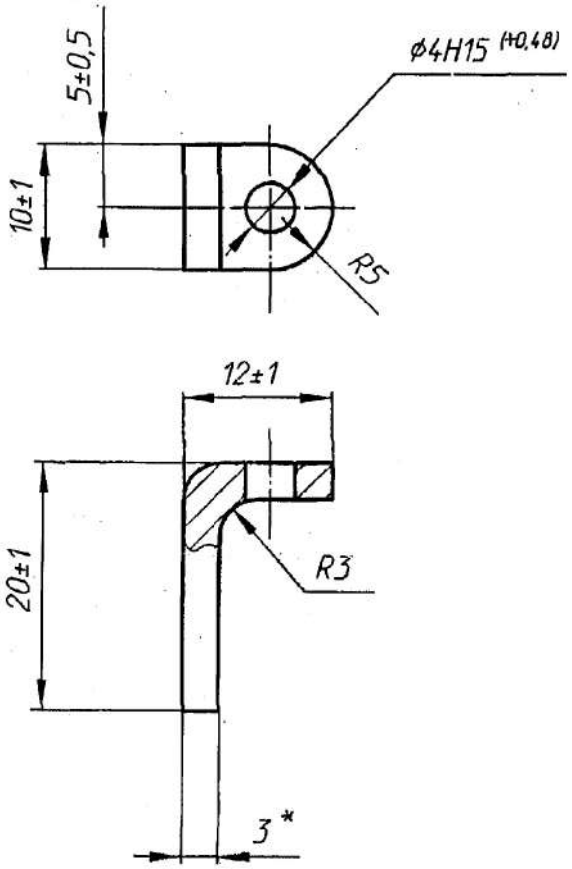
F-107
114

SIZE A3x3

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

SUPPLY CODE
U-01-1-2
D90053
356
F - 74
71

DRAWING NUMBER	SHEET No. 1 OF 1
54.30.461	



1. *Dimensions for reference.
2. Other requirements should be as per specification 520.TY1.

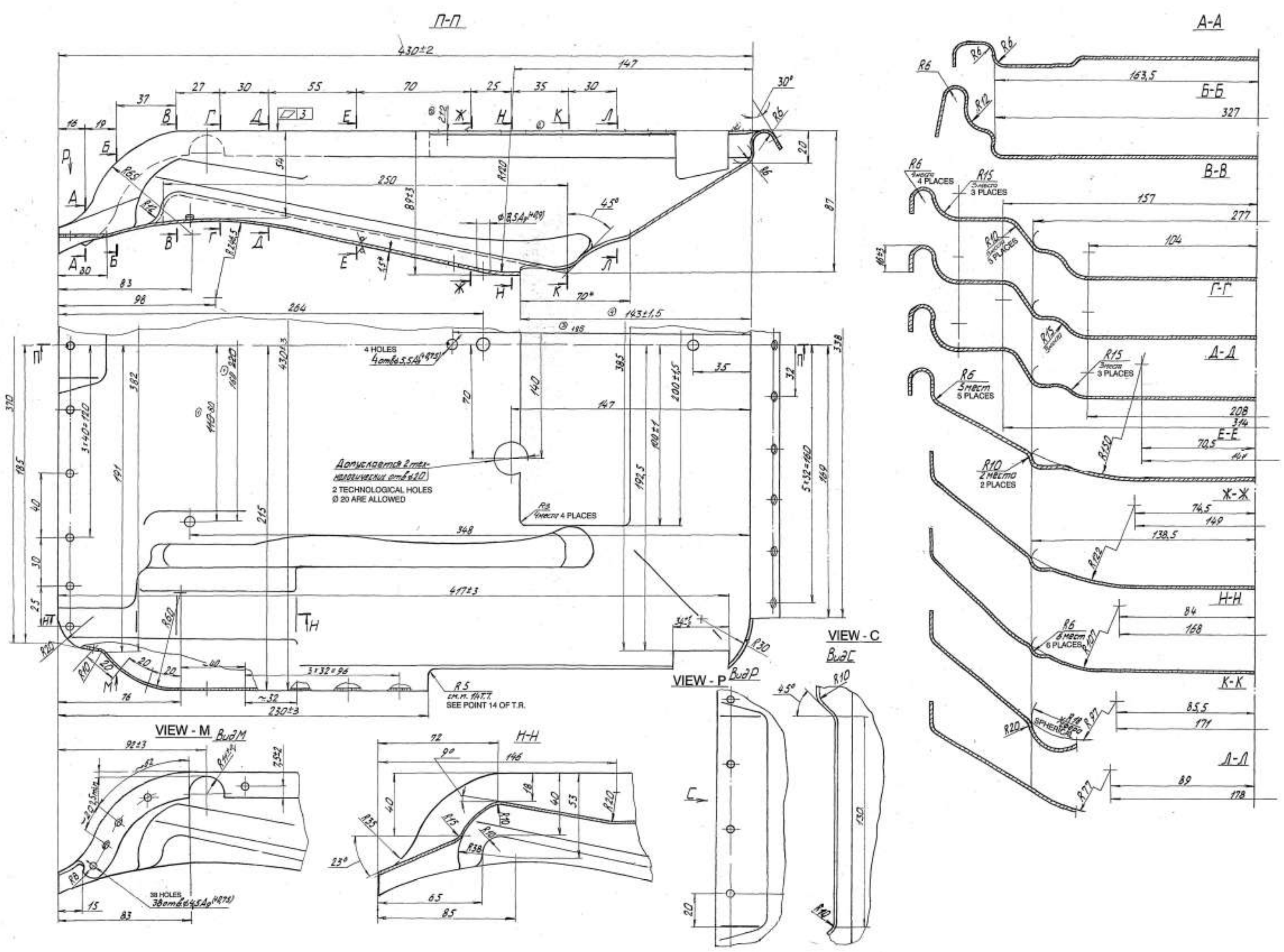
PILOT SAMPLE SHOULD BE APPROVED BY A H S P BEFORE BULK PRODUCTION.

ISSUE	DATE	NATURE OF AMENDMENTS
A	11.11.09	Authy: Lt.No.55017/AHSP/T-72. Dt.29.10.09

EST. WT. (Kg) 0.006	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.	
MATERIAL :- SHEET 3 GOST 19903-74 / K270B5-III-10kn GOST16523-97	USED ON :- 166.30.105Cb, 172.65.023cb-1Cb, 175.01.182cbCb, 172.65.023Cb (A)
DRN	SCALE :- 2 : 1
CHD	DIMENSIONS IN mm
APPD	TOLERANCE ON DIMENSIONS UNLESS OTHERWISE STATED IS : 2102 - 69
DATE 15-06-04	ALL THREADS TO CONFORM TO
	CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI
	TITLE :- CLAMP
	D S CAT NUMBER
	DRAWING NUMBER 54.30.461

SIZE A4

COMMON TO T-90 & BLT
DRG. RE-REDRAWN BASED ON RUSSIAN ORIGINAL ISSUE-4
REPLACES 172.65.026 VIDE AMDT. LIST No. 8



1. ALTERNATE MATERIAL — SHEET 1.5 GOST 19904-74 / 5-III-10KП GOST 16523-70
2. ON CUTTING SURFACE ALONG OUTER CONTOUR PROJECTION ON EDGES ARE ALLOWED UPTO 3 mm.
3. TRANSITION FROM SECTION TO SECTION SHOULD BE SMOOTH.
4. IN PLACES OF BEADING CORRUGATIONS AND WRINKLES ARE ALLOWED.
5. BENDING OF BEADINGS AT PLACES OF TRANSITION ON PLACES FROM VERTICAL TO SURFACE, FORMED BY R246.5 mm SHOULD CORRESPOND TO MATING SURFACES.
6. OVALITY OF HOLES Ø 5.5A9 SHOULD NOT EXCEED 1 mm.
7. ALL DIMENSIONS WITHOUT TOLERANCES, UNLESS OTHERWISE SPECIFIED, ARE TO BE ENSURED WITH TOOL.
8. IN PLACES OF BENDING, NATURAL THINNING OF METAL IS ALLOWED.
9. CRACKS AND FISSURES IN PLACES OF STAMPED OUT RECESSES AND BEADING WITH SUBSEQUENT WELDING UP ARE ALLOWED.
10. SMOOTH TRANSITION FROM R10 TO R20 IS TO BE MAINTAINED ON PORTIONS BETWEEN SECTION FROM Ж-Ж TO К-К.
11. WHEN MARKING HOLES Ø 4.5A9 BY STAMPING ELLIPTICITY AND NON-SQUARENESS OF EDGES OF HOLES TO SURFACE OF BEAD ARE ALLOWED, IN THIS CASE, THE SMALLER AXIS OF ELLIPSE SHOULD NOT LESS THAN 4 mm. THE LARGER AXIS NOT MORE THAN 7 mm.
12. LOCAL INCREASE OF HEIGHT OF HEAD 16±3 MAY BE UPTO 5mm BEYOND THE TOLERANCE.
13. IN PLACE FROM SECTION Л-Л TO CENTRE R30 SMOOTH TRANSITION SHOULD BE PROVIDED.
14. RADIUS 5 mm IS TO BE ENSURED IN PATTERN. IN FINISHED COMPONENTS R5 AND BULGING OF THE EDGE ON THE BEAD IS NOT TO BE CHECKED.
15.* DIEMENSION FOR REFERENCE.
16. OTHER REQUIREMENTS SHOULD BE COMPLY WITH 520 TY 1.
17. REMAINDER OF HOLE Ø 6.5 FROM SPACES OF OPENING, ALONG DIEMENSION 200±1.5 IS PERMITTED.

(4A) ALT. MATL: STEEL 070M20(En3A) TO BS 970 Pt-1:1983

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

EST. WT. Kg: 2.36	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
4A	19.11.05	[illegible]

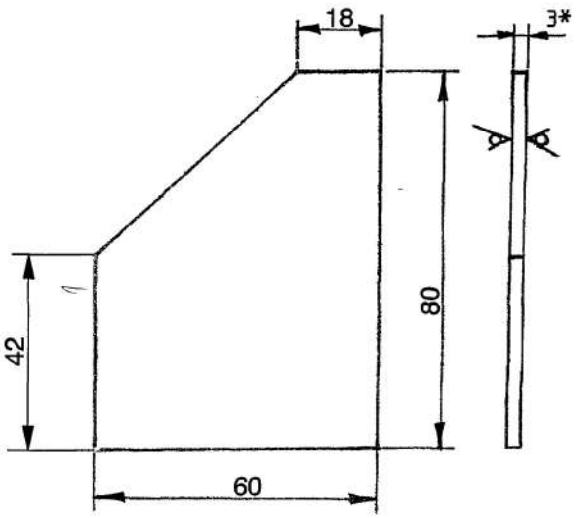
DRN	Sd/-	MATERIAL:- STEEL 1.5 GOST 19904-74 / 5-III-10KП GOST 16523-70	USED ON:- 172.65.028cb-1Cb
CHD	Sd/-	CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI	
APPD	Sd/-		
DATE	18-5-89		
SCALE:- 1 : 1			
DIMENSIONS IN mm		TITLE:- SEAT PAN	
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS: 2102-69			
ALL THREADS TO CONFORM TO		D S CAT NUMBER	DRAWING NUMBER 172.65.026-1

SIZE A0

DRAWING NUMBER 172.65.030 | SHEET No 1 OF 1

Rz320 √(√)

EXPLANATORY NOTE :-



6) a. REFERENCE MATERIAL QUOTED :

HOT ROLLED SHEET OF THICKNESS 3 0±0 19mm TO GOST 19903-74 OF QUALITY CARBON STEEL GRADE 10КП CATEGORY 4, GROUP III SUPERIOR FINISH ON QUALITY OF SURFACE GOST 16523-70 AND MANUFACTURED IN ACCORDANCE WITH STEEL GRADE 10КП GOST 1050-74

b REFERENCE NOTE 1 ON ALTERNATIVE MATERIAL .
HOT ROLLED SHEET OF THICKNESS 3 0±0 19mm TO GOST 19903-74 OF QUALITY CARBON STEEL OF GRADE 15, CATEGORY 4, GROUP III SUPERIOR FINISH TO GOST 16523-70 AND MANUFACTURED IN ACCORDANCE WITH STEEL GRADE 15 GOST 1050-74

a CHEMICAL COMPOSITION .- AS PER STEEL GRADES 10КП & 15 GOST 1050-74

GRADE OF STEEL	CONTENT OF ELEMENTS %					
	C	Si	Mn	Cr	S	P
				MAXIMUM		
10КП	0 07-0 14	0 07 MAX	0 25-0 50	0 15	0 040	0 035
15	0 12-0 19	0 17-0 37	0 35-0 65	0 25	0 040	0 035

RESIDUAL CONTENT OF COPPER & NICKEL SHOULD NOT EXCEED 0 25 % EACH

b MECHANICAL PROPERTIES AS PER STEEL GRADES 10КП & 15 GOST 16523-70

GRADE OF STEEL	TENSILE STRENGTH Kgf / mm²	ELONGATION % MIN	BEND TEST 180° IN COLD STATE
10КП	28-40	26	ONE THICKNESS
15	28-40	24	ONE THICKNESS

1. ALTERNATE MATERIAL SHEET 3 GOST 19903-74 / 15-4-III GOST 16523-70
2. DEVIATION OF COMPONENT FROM OUTLINE TEMPLATE, CONSTRUCTED ACCORDING TO NOMINAL DIEMENSIONS SHOULD NOT EXCEED 1.5mm.
3. ROUNDING OF CORNERS TO R5mm IS ALLOWED.
4. OTHER REQUIREMENTS ACCORDING TO 520 TY1
5. * DIMENSION FOR REFERENCE.

(A) ALT MATL STEEL 070M20(En3A) TO BS 970 Pt-1 1983

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

EST. WT. (Kg) 0 091

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
B	11 11 09	Authy:Lt.No 55017/AHSP/T-72. Dt.29.10.09
A	19 11 05	Authy Lt No 80001/CQA(HV)/GEN Dt 7 10 05

DRN	Sd/=
CHD	Sd/=
APPD	Sd/=
DATE	07-4-86
SCALE:-	1 1
DIMENSIONS IN mm	
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS : 2102 - 69	
ALL THREADS TO CONFORM TO	

MATERIAL :- SHEET 3 GOST 19903-74 / 10КП-4-III GOST 16523-70

USED ON :- 172 65.023Cb (B) 172 65 023cb-1Cb

CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI

TITLE :- STRIP

D S CAT NUMBER

DRAWING NUMBER 172.65.030

DRG RE - INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE -NIL COMMON TO T-90 & BLT

28.3.05

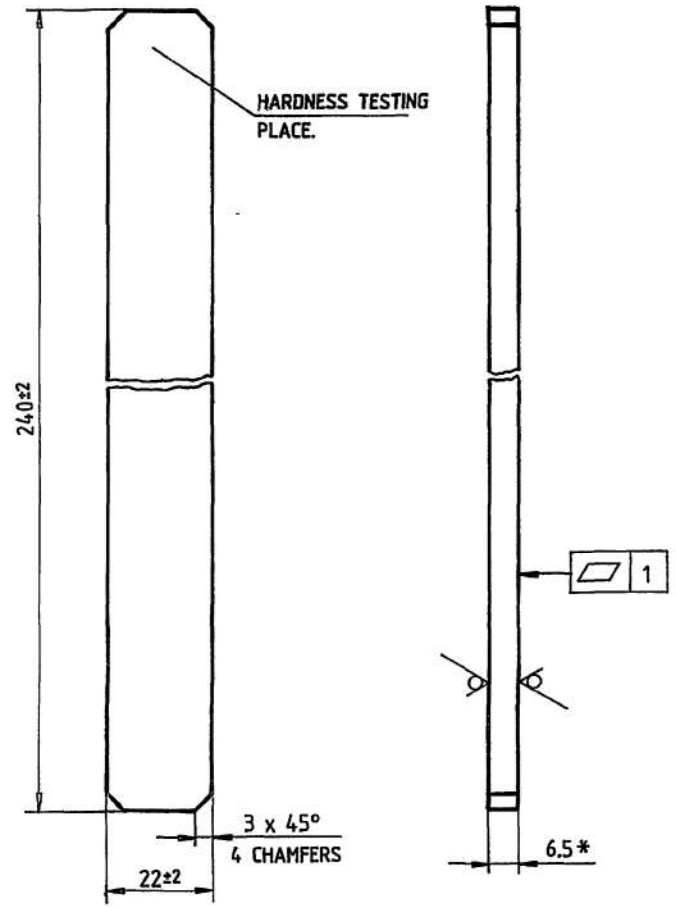
F-137 / 49

SIZE A3

DRAWING NUMBER 172.65.025

SHEET No 1 OF 1

Rz 630



1. BHN 302 - 255 (DIA OF INDENTATION 3.5 - 3.8).
2. INSTEAD OF CHAMFERS 3 x 45°, ROUNDING OFF CORNERS UP TO R 4 mm IS PERMISSIBLE.
3. DRAFTS AND SHRINKED EDGES ARE ALLOWED.
4. * DIMENSION FOR REFERENCE.

EXPLANATORY NOTE :-

5. REFERENCE MATERIAL QUOTED :-

HOT ROLLED SHEET STEEL OF BRAND 30ХГСА, WITH THICKNESS 6.5±0,40 mm (3) AS PER ~~TY 14-132-140-76;~~ CATEGORY 3, GOST 11269-76 AND MANUFACTURED IN ACCORDANCE WITH GOST 11268-76 AND CHEMICAL COMPOSITION AS PER GOST 4543-71 AS MENTIONED IN GOST 11268-76.

a) CHEMICAL COMPOSITION :- AS PER STEEL GRADE 30ХГСА GOST 4543-71.

CONTENT OF ELEMENTS %					
				S	P
C	Si	Mn	Cr	MAX	
0.28-0.34	0.90-1.20	0.80-1.10	0.80-1.10	0.025	0.025

RESIDUAL CONTENT OF COPPER AND NICKEL SHOULD NOT EXCEED 0.30% EACH

b) MECHANICAL PROPERTIES :- AS PER STEEL GRADE 30ХГСА, CATEGORY 3, GOST 11269-76 IN SOFTENED OR NORMALISED CONDITION.

TENSILE STRENGTH Kgf / mm2	ELONGATION % MIN	HARDNESS BHN
50-75	16	156-217

(3A) ALT MATL STEEL 709M40(En19) TO BS 970 Pt-1 1983

COMMON TO T-90 & BLT
DRG RE INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE-2
COMMON TO T-90

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

EST. WT. (Kg) 0.28

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
3B	11.11.09	Authy Lt No 55017/AHSP/T-72. Dt.29.10.09
3A	19.11.05	Authy Lt No 80001/CQA(HV)/GEN Dt 7.10.05
3	31.12.88	AMDT LIST 7

DRN	Sd/-
CHD	Sd/-
APPD	Sd/-
DATE	30-4-86
SCALE:-	1' 1
DIMENSIONS IN mm	
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS : 2102 - 69	
ALL THREADS TO CONFORM TO	

MATERIAL :- SHEET (3) 65 TY-14-105-490-85 ~~- 65 TY 132 140-76~~ 30ХГСА-3 GOST 11269-76

USED ON - 172.65.023Cb, 172 65 023cb-1Cb (3B)

CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI

TITLE :- STRIP

D S CAT NUMBER

DRAWING NUMBER 172.65.025

F-137 44

SIZE A3

DRAWING NUMBER
172.65.032

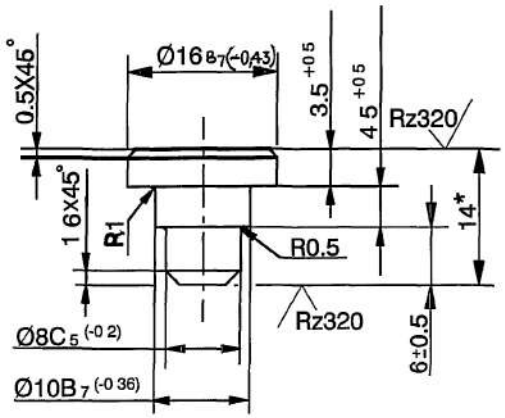
SHEET No 1 OF 1

Rz 80 (√)

DRG RE- INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE-2

COMMON TO T-90 & BLT

28.3.05



1 BHN 302 -255 (DIAMETER OF INDENTATION 3.5-3.8)

2. *DIMENSION FOR REFERENCE.

3. THE REST OF THE REQUIREMENTS ACCORDING TO S20 Ty 1.

EXPLANATORY NOTE:-

4. REFERENCE MATERIAL QUOTED:-

STRUCTURAL ALLOY OF CHROME SILICON MANGANESE STEEL OF HIGH QUALITY GRADE 30XГCA GOST 4543 -71.

5. a) CHEMICAL COMPOSITION:-

CONTENT OF ELEMENTS %					
C	Si	Mn	Cr	S	P
				MAXIMUM	
0.28-0.34	0.90-1.20	0.80-1.10	0.80-1.10	0.035	0.035

RESIDUAL CONTENT OF COPPER AND NICKEL SHOULD NOT EXCEED 0.30 % EACH

b) MECHANICAL PROPERTIES:-

TENSILE STRENGTH Kgf/mm²	YIELD POINT Kgf/mm²	ELONGATION %	REDUCTION IN AREA %	IMPACT STRENGTH Kgm/Cm²
MINIMUM				
110	85	10	45	5

(2A) ALT MATL STEEL 709M40(En19)/STEEL 817M40(En24) TO BS 970 Pt-1 1983

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

EST. WT. (Kg) 0.011

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
2B	11.11.09	Authy:Lt No.55017/AHSP/T-72. Dt.29.10.09
2A	19.11.05	Authy Lt No 80001/CQA(HV)/GEN Dt 7.10.05

DRN	Sd/-
CHD	Sd/-
APPD	Sd/-
DATE	09-4-86
SCALE	2 1
DIMENSIONS IN mm	
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS : 2102-69	
ALL THREADS TO CONFORM TO	

MATERIAL:- STEEL 30XГCA GOST 4543-71

USED ON:- 172.65.023Cb, 172.65.028cb-1Cb (2B)

CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI

TITLE:- AXLE

D S CAT NUMBER

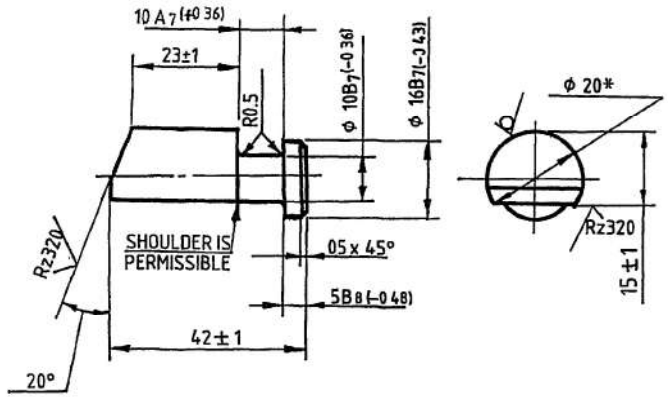
DRAWING NUMBER 172.65.032

F-137 / 51

SIZE A3

DRAWING NUMBER	SHEET No 1 OF 1
172.65.035	

Rz80 (V)



EXPLANATORY NOTE:

4. a. REFERENCE MATERIAL QUOTED·
SIZED. STEEL ROUND ACCURACY CLASS 5 ON DIAMETER. 20 mm
AS PER GOST 7417-75 OF STEEL GRADE 15 GOST 1051-73 AND
MANUFACTURED IN ACCORDANCE WITH GOST 1050-74

b. REFERENCE NOTE 1 ON ALTERNATIVE MATERIAL:
CARBON STRUCTURAL STEEL GRADE 20 GOST 1050-74 OPEN HEARTH

5 CHEMICAL COMPOSITION· AS PER STEEL GRADES 15 & 20 GOST 1050-74

GRADE OF STEEL	CONTENT OF ELEMENTS %					
	C	Si	Mn	Cr	S	P
				MAXIMUM		
15	0 12-0.19	0.17-0.37	0 35-0.65	0.25	0.040	0.035
20	0 17-0 24	0.17-0 37	0.35-0 65	0.25	0.040	0.035

RESIDUAL CONTENT OF COPPER AND NICKEL SHOULD NOT EXCEED
0 25% EACH

MECHANICAL PROPERTIES AS PER STEEL GRADES 15 & 20 GOST 1050-74

GRADE OF STEEL	TENSILS STRENGTH Kgf/mm²	YIELD POINT Kgf/mm²	ELONGATION %	REDUCTION IN AREA %
	MINIMUM			
15	38	23	27	55
20	42	25	25	55

1, ALTERNATIVE MATERIAL· STEEL GRADE 20 GOST 1050-74
OPEN-HEARTH

2 * DIMENSION FOR REFERENCE

3 THE REST OF THE REQUIREMENTS IN ACCORDANCE WITH
520 Ty 1

(A) ALT MATL STEEL 070M20(En3A) TO BS 970 Pt-1 1983

COMMON TO T-90 & BLT

DRG RE.- INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE - NIL

28 3 05

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

EST. WT. (Kg)	TO BE STAMPED OR MARKED WHERE INDICATED THUS # (LETTERS)
0 055	

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
B	11.11.09	Authy:Lt.No.55017/AHSP/T-72. Dt.29.10.09
A	19 11 05	Authy Lt No 80001/CQA(HV)/GEN Dt 7 10 05

DRN	Sd/=
CHD	Sd/=
APPD	Sd/=
DATE	11-4-86
SCALE:- 1 : 1	
DIMENSIONS IN mm	
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS : 2102 - 69	
ALL THREADS TO CONFORM TO	

MATERIAL:- ROUND BAR
20-5 GOST 7417-75
15 GOST 1051-73

USED ON:- 172.65.023Cb
172 65 023cb-1Cb (B)

CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES)
AVADI

TITLE:-
AXLE

D S CAT NUMBER

DRAWING NUMBER
172.65.035

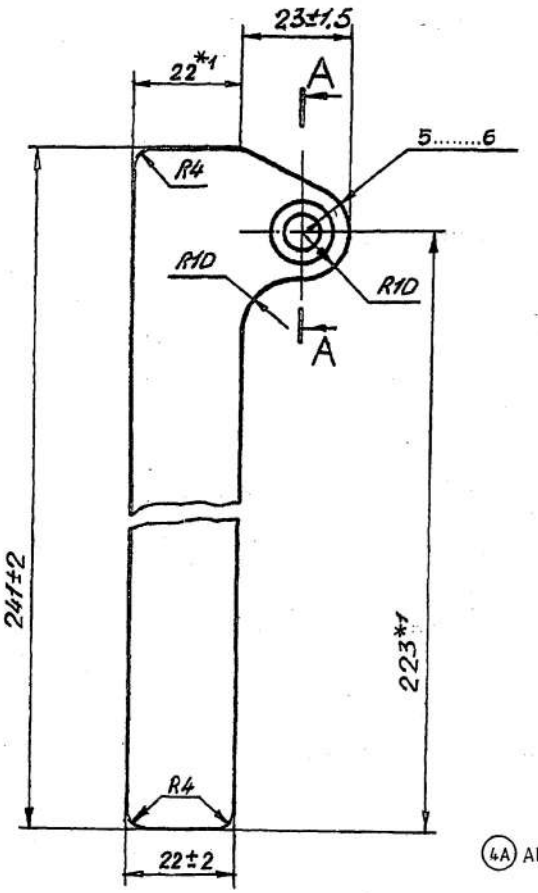
F-137
54

SIZE A3

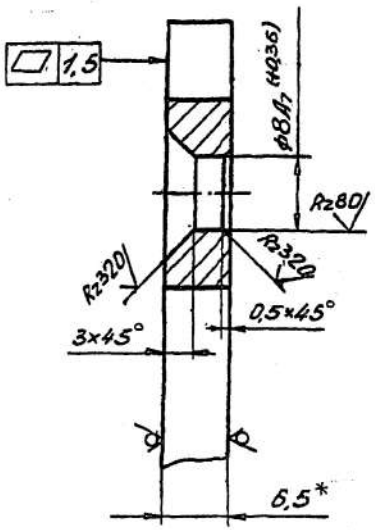
DRAWING NUMBER
172.65.031-A

SHEET No. 1 OF 1

Rz630 (√)



A - A
SCALE 2 : 1



(4A) ALT. MATL: STEEL 817M40(En24)/STEEL 709M40(En19) TO BS.970 Pt-1:1983

(4) 1. BHN 302-255 (DIAMETER OF INDENTATION 3.5 - 3.8) TO BE CHECKED IN BLANK.
2. *DIMENSION FOR REFERENCE.
3. *1 DIMENSIONS ARE TO BE ENSURED BY TOOL.
4. THE REST OF THE REQUIREMENTS ACCORDING TO 520 TY 1.

EXPLANATORY NOTE:-

5. REFERENCE MATERIAL QUOTED:-
HOT ROLLED SHEET STEEL OF BRAND 30ХГСА, WITH THICKNESS OF 6,5 ± 0.4 mm AS PER TY 14-132-140-76, CATEGORY 3 INTENDED FOR COLD STAMPING (GROUP a) GOST 11269-76 AND MANUFACTURED IN ACCORDANCE WITH GOST 11268-76 AND CHEMICAL COMPOSION AS PER GOST 4543-71 AS MENTIONED IN GOST 11268-76.

a) CHEMICAL COMPOSITION:-
AS PER STEEL GRADE 30ХГСА GOST 4543-71.

CONTENT OF ELEMENTS %					
C	Si	Mn	Cr	S	P
				MAXIMUM	
0,28 - 0,34	0,90 - 1,20	0,80 - 1,10	0,80 - 1,10	0,025	0,025

RESIDUAL CONTENT OF COPPER AND NICKEL SHOULD NOT EXCEED 0.30 % EACH.

b) MECHANICAL PROPERTIES:-
AS PER STEEL GRADE 30ХГСА, CATEGORY 3 GOST 11269-76 IN SOFTENED OR NOMALISED CONDITION

TENSILE STRENGTH Kgf/mm²	ELONGATION %	HARDNESS BHN
50 - 75	16	156 - 217

DRG. RE - INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE-2
COMMON TO T-90 & BLT

28.3.05

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

EST. WT. (Kg) 0.281

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	11.11.09	Authy: Lt.No.55017/AHSP/T-72. Dt.29.10.09
4A	19.11.05	Authy Lt. No. 80001/CQA(HV)/GEN Dt. 7.10.05
4	22.5.89	172M.320 `A'-87 (A.L. 9/3)
3	29.12.88	AMDT. LIST. 6, PART II, BOOK-9

DRN	Sd/=
CHD	Sd/=
APPD	Sd/=
DATE	29-4-86
SCALE:-	1 : 1
DIMENSIONS IN mm	
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS : 2102 - 69	
ALL THREADS TO CONFORM TO	

MATERIAL:- (3) 105-490-85
SHEET 6.5 TY 14-~~132-140-76~~
30ХГСА-3-Д GOST 11269-76

USED ON:- 172.65.023Cb
172.65.023cb-1Cb (4B)

CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI

TITLE:-
STRIP

D S CAT NUMBER

DRAWING NUMBER
172.65.031-A

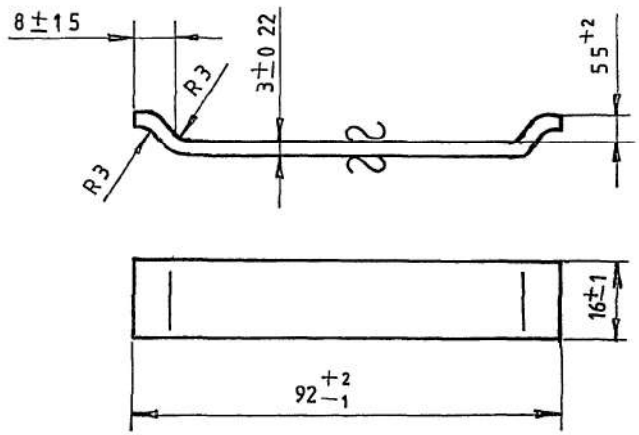
F-137
50

SIZE A3

DRAWING NUMBER 176.65.020

SHEET No 1 OF 1

▽1(▽)



DRG,RE INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE - 2
COMMON TO T-90
07.04.05

1 ALTERNATIVE MATERIAL STEEL, GRADE ~~20-4-Ⅱ GOST 16523-70~~
(3) ~~OPENHEARTH~~ 10КП-4-Ⅲ, 20-4-Ⅱ GOST 16523-70 OPEN HEARTH.

2. DRAFTS AND SHRINKED EDGES ARE ALLOWED.

3. IN PLACES OF BENDING NATURAL THINNING OF METAL IS ALLOWED.

EXPLANATORY NOTE :-

4 a) REFERENCE MATERIAL QUOTED :-
COLD ROLLED STEEL SHEET OF CATEGORY 4, GROUP Ⅲ SUPERIOR FINISH ON SURFACE QUALITY OF QUALITY CARBON STEEL OF GRADE 15 GOST 16523-70. AND MANUFACTURED FROM GOST 1050-74 OPENHEARTH.

b) COLD ROLLED STEEL SHEET OF CATEGORY 4, GROUP Ⅱ, HIGHFINISH. ON SURFACE QUALITY OF QUALITY CARBON STEEL OF GRADE 20 GOST 16523-70 AND MANUFACTURED INACCORDANCE WITH GOST 1050-74 OPENHEARTH.

5, a) *CHEMICAL COMPOSITION* :- AS PER STEEL GRADES 15 & 20 GOST 1050-74. OPENHEARTH.

GRADE OF STEEL	CONTENT OF ELEMENTS %					
	C	Si	Mn	Cr	S	P
				MAXIMUM		
15	0.12 - 0 19	0.17 - 0 37	0.35 - 0.65	0.25	0.040	0.035
20	0.17 - 0.24	0.17 - 0 37	0.35 - 0. 65	0.25	0.040	0.035

RESIDUAL CONTENT OF COPPER AND NICKEL SHOULD NOT EXCEED 0.25 % EACH.

b) MECHANICAL PROPERTIES :- AS PER STEEL GRADES 15 & 20, CATEGORY 4 GOST 16523-70.

GRADE OF STEEL	TENSILE STRENGTH Kgf / mm²	ELONGATION % MIN.	BEND TEST BY 180° IN COLD STATE
15	34 - 47	25	ONE THICKNESS
20	36 - 51	24	ONE THICKNESS

(3A) ALT. MATL STEEL 070M20(En3A) TO BS 970 Pt-1 1983

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

EST. WT. (Kg) 0 033

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
3B	11.11.09	Authy:Lt.No.55017/AHSP/T-72 Dt 29.10 09
3A	19 11 05	Authy Lt No 80001/CQA(HV)/GEN Dt 7 10 05
3	30-12-88	AMDT LIST 6 Pt Ⅱ, BOOK-9

DRN	Sd / =
CHD	Sd / =
APPD	Sd / =
DATE	11-4-86
SCALE:-	1 1
DIMENSIONS IN mm	
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS : 2102 - 69	
ALL THREADS TO CONFORM TO	

MATERIAL :- OPENHEARTH STEEL 15-4-Ⅲ GOST 16523-70.

USED ON :- 172.65.023Cb
172 65 023cb-1Cb (3B)

CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI

TITLE :- STRIP

D S CAT NUMBER

DRAWING NUMBER 176.65.020

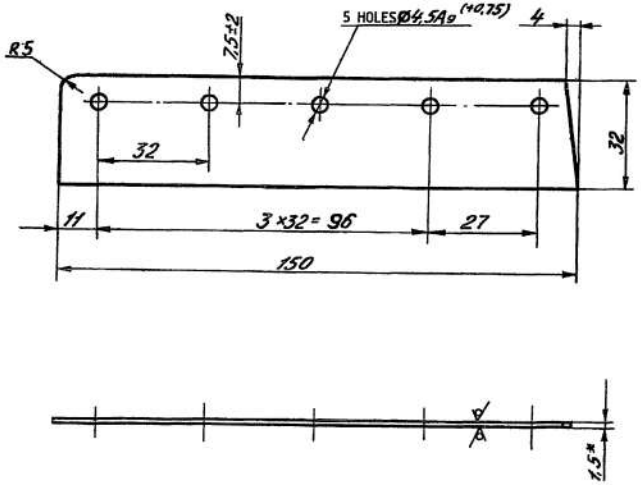
F-137 / 72

SIZE A3

DRAWING NUMBER
172.65.063-1

SHEET No 1 OF 1

Rz320 (✓)



1 ALTERNATIVE MATERIAL :- SHEET 1.5 GOST 19904-74
5 III Г - 10 Kn GOST 16523-70

(2) ~~2. DEVIATION OF COMPONENT, FROM THE OUTLINE TEMPLATE, CONSTRUCTED ACCORDING TO NOMINAL DIMENSIONS SHOULD NOT EXCEED 1.5 mm.~~

3 ROUNDING OFF OF ANGLES TO R 3 mm IS ALLOWED

4 SHIFT OF AXIS OF HOLES ϕ4.5 A9 FROM THE TRUE POSITION IS NOT TO BE CHECKED.

5. THE REST OF THE REQUIREMENTS ACCORDING TO 520 TY 1.

6. * DIMENSION FOR REFERENCE.

(2) 2 CONTOUR OF COMPONENT MAY BE CHECKED BY TEMPLATE (GAUGE) DESIGNED AS PER THE NOMINAL DIMENSION OF COMPONENT.
DEVIATION SHOULD NOT EXCEED 1.5 mm

EXPLANATORY NOTE :-

7. a) REFERENCE MATERIAL QUOTED :-
COLD ROLLED STEEL SHEET WITH NORMAL ROLLING ACCURACY ON THICKNESS 1.50±0,11 mm AS PER GOST 19904-74 OF STEEL GRADE 10 Kn, CATEGORY 5, GROUP II HIGH FINISH ON SURFACE QUALITY, DEEP DRAWN, GOST 16523-70 AND MANUFACTURED IN ACCORDANCE WITH GOST 1050-74.

b) REFERENCE NOTE : 1 ON ALTERNATIVE MATERIAL :-
COLD ROLLED STEEL SHEET WITH NORMAL ROLLING ACCURACY ON THICKNESS 1.50±0,11 mm AS PER GOST 19904-74 OF STEEL GRADE 10 Kn, CATEGORY 5, GROUP III SUPERIOR FINISH ON SURFACE QUALITY DEEP DRAWN GOST 16523-70 AND MANUFACTURED IN ACCORDANCE WITH GOST 1050-74.

8 a) CHEMICAL COMPOSITION :- AS PER STEEL GRADE 10 Kn GOST 1050-74, OPEN HEARTH.

CONTENT OF ELEMENTS %					
C	Si	Mn	Cr	S	P
			MAX		
0.07 - 0.14	0.07 MAX	0.25 - 0.50	0.15	0.040	0.035

RESIDUAL CONTENT OF COPPER AND NICKEL SHOULD NOT EXCEED 0.25 % EACH.

b) MECHANICAL PROPERTIES :- AS PER STEEL GRADE 10 Kn, CATEGORY 5, GROUP II Г & III Г GOST 16523-70

TENSILE STRENGTH Kgf/mm²	ELONGATION %	CUPPING TEST DEPTH SPHERICAL HOLE MINIMUM	BEND TEST 180° IN COLD STATE
28-40	25	11.2	CLOSE

(2A) ALT MATL STEEL 070M20(En3A) TO BS 970 Pt-1 1983

COMMON TO T-90 & BLT
DRG RE - INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE-1 01.4.05

F-137
SIZE A2

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

EST. WT. (Kg)	TO BE STAMPED OR MARKED WHERE INDICATED THUS # (LETTERS)
0.054	

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

ISSUE	DATE	NATURE OF AMENDMENTS
2B	11.11.09	Authy:Lt No 55017/AHSP/T-72, Dt.29.10.09
2A	19.11.05	Authy Lt No 80001/CQA(HV)/GEN Dt 7.10.05
2	26-12-88	AMDT LIST G/II, BOOK-9

DRN	Sd/-
CHD	Sd/-
APPD	Sd/-
DATE	09-04-86
SCALE:-	1 1
DIMENSIONS IN mm	
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS : 2102-69	
ALL THREADS TO CONFORM TO	

MATERIAL :- SHEET 1.5 GOST 19904-74 5-II Г-10KП GOST 16523-70

USED ON :- 172.65.023Cb 172 65 023cb-1Cb (2B)

CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI

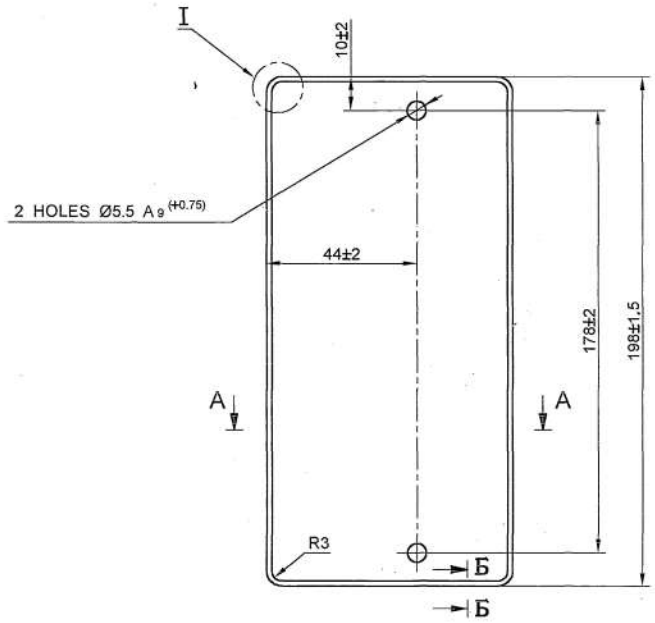
TITLE :- STRIP

D S CAT NUMBER

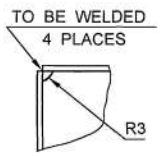
DRAWING NUMBER 172.65.063-1

DRAWING NUMBER
172.65.084

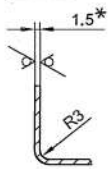
Rz 320



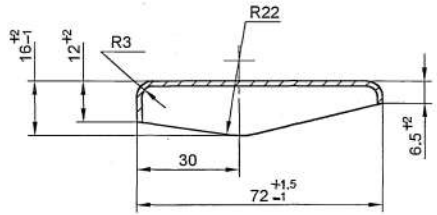
ALTERNATE I



Б-Б



A - A



1. ALTERNATE MATERIAL : SHEET 1.5 GOST - 19904 - 74 / 4 - II - 15 GOST 16523 - 70
2. * DIMENSION FOR REFERENCE.
3. OTHER REQUIREMENTS SHOULD COMPLY WITH 520 TY1

(1A) ALT. MATL: GRADE D TO IS: 513-86

MATERIAL :-

SHEET 1.5 GOST 19904 - 74 / 5 - IIГ - 10 КП GOST 16523-70

COMMON TO T-90 & BLT
DRG-RE INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE - 1.
INTRODUCED VIDE AMDT LIST No. - 8.

28.3.05

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

EST. WT. (Kg)	TO BE STAMPED OR MARKED WHERE INDICATED THUS # (LETTERS)
0.24	

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
1A	19.11.05	Authy Lt. No. 80001/CQA(HV)/GEN Dt. 7.10.05

DRN	Sd/-
CHD	Sd/-
APPD	Sd/-
DATE	14-03-89
SCALE:-	1 : 1
DIMENSIONS IN mm	
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS : 2102 - 69	
ALL THREADS TO CONFORM TO	

MATERIAL :- SEE ABOVE

USED ON :- 172.65.023cb-1Cb

CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI

TITLE :- INSERT

D S CAT NUMBER

DRAWING NUMBER 172.65.084

F - 7C / 45

SIZE A2

USED ON	ZONE	ITEM NO	DRAWING NUMBER	D S CAT NUMBER	DESCRIPTION	QTY	REMARKS
		15	172.64.045-1		SPRING	1	
		16	176.65.020		STRAP	1	
		17	54.30.461		CLAMP	1	

I/L CREATED BASED ON RUSSIAN ORIGINAL ISSUE -2
COMMON TO T-72 & BLT

356
SUPPLY CODE
U-01-1-4

D90213

F-107
115

ISSUE	DATE	NATURE OF AMENDMENTS	ISSUE	DATE	NATURE OF AMENDMENTS

DRN	G Rusyaraj	CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI.	
CHD	G Rusyaraj	TITLE : **SEAT CUP ASSY.**	
APPD	Chauchal		
DATE	22-6-04	SHT. NO. 2 OF 2	D S CAT NUMBER / ITEM LIST FOR **172.65.023cb-1Cb**

USED ON	ZONE	ITEM NO	DRAWING NUMBER	D S CAT NUMBER	DESCRIPTION	QTY	REMARKS
172.65.024cb-3Cb 172.65.024cb-3ACb			**172.65.023cb-1Cb**		**SEAT CUP ASSY.**		
		1	172.65.014cbCb		LEVER ASSY	1	
		2	172.65.026cbCb		LH BRACKET ASSY	1	
		3	172.65.027cbCb		RH BRACKET ASSY	1	
		6	172.65.025		STRAP	1	
		7	172.65.026-1		SEAT PAN	1	
		8	172.65.030		STRAP	2	
		9	172.65.031A		STRAP	1	
		10	172.65.032		AXLE	1	
		11	172.65.035		AXLE	2	
		12	172.65.063-1		STRAP	2	
		13	172.65.084		INSERT	1	

I/L CREATED BASED ON RUSSIAN ORIGINAL ISSUE – 2
COMMON TO T-72 & BLT

356
SUPPLY CODE
U-01-1-4

D90213
F-107
115

ISSUE	DATE	NATURE OF AMENDMENTS	ISSUE	DATE	NATURE OF AMENDMENTS

DRN	G Rusparaj	CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI.		
CHD	G Rusparaj	TITLE : **SEAT CUP ASSY.**		
APPD	Chanchal			
DATE	22-6-04	SHT. NO. 1 OF 2	D S CAT NUMBER	ITEM LIST FOR **172.65.023cb-1Cb**

ENLARGED WASHERS
ACCURACY CLASS A AND C

TECHNICAL SPECIFICATIONS

GOST 6958-78

EXTRACT

CONTRACT
№ PB/835606213601

ENLARGED WASHERS
ACCURACY CLASS A AND C

TECHNICAL SPECIFICATIONS

GOST 6958-78

EXTRACT

Enlarged washers
Accuracy classes A and C

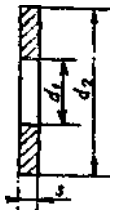
Technical specifications

GOST 6958-78
EXTRACT

Present standard deals with enlarged washers of accuracy classes A and C for fasten parts with thread diameter ranging from 1 to 48 mm.

1. DESIGN AND DIMENSIONS

1.1. Design and dimensions of washer should correspond to drawing and table.



mm

Thread diameter of fastened parts	d_1		d_2	s
	Accuracy class			
	A	C		
1.0	1.1	1.2	4.0	0.3
1.2	1.3	1.4	4.0	0.3
1.6	1.7	1.8	5.0	0.3
2.0	2.2	2.4	6.0	0.5
2.5	2.7	2.9	8.0	0.5
3.0	3.2	3.4	9.0	0.8
3.5	3.7	3.9	11.0	0.8
4.0	4.3	4.5	12.0	1.0
5.0	5.3	5.5	15.0	1.2
6.0	6.4	6.6	18.0	1.6
8.0	8.4	9.0	24.0	2.0
10.0	10.5	11.0	30.0	2.5
12.0	13.0	13.5	37.0	3.0
14.0	15.0	15.5	44.0	3.0
16.0	17.0	17.5	50.0	3.0
18.0	19.0	20.0	56.0	4.0
20.0	21.0	22.0	60.0	4.0
22.0	03.0	24.0	66.0	6.0
24.0	25.0	26.0	72.0	5.0
27.0	28.0	30.0	85.0	6.0
30.0	31.0	33.0	92.0	6.0
36.0	37.0	39.0	110.0	8.0
42.0	-	45.0	125.0	10.0
48.0	-	52.0	145.0	10.0

Example of conventional designation of enlarged washers for fastened parts with thread diameter 12 mm, with thickness, established in standard, made of steel of grade 08кп, with zinc plated with thickness 6 microns chromotized:

Washer 12.01.08кп.016 GOST 6958-78

1.2. As per agreement between manufacturer and user washers may be manufactured:

With other thickness;

With internal diameters 12.5; 14.5 and 16.5 mm.

2. TECHNICAL REQUIREMENTS

2.1. Technical requirements – as per GOST 18123-82.

The State Standard of USSR

Rivets with semi- circular head.

Technical specification

GOST 10299-80

Official Publication

State Committee of USSR on standards

MOSCOW

Group Г 34

Amendment No. 2 GOST 10299-80 Rivets with semi- circular head. Technical Specification

Approve and put into operation by the decision of state committee of USSR on management of quality of production and standard dated 25.06.90 No. 1793

Date of introduction 01.01.91

Name of standard after word “head” is added with words: “ class accuracy B and C, << classes B and C >>.

(Continuation of amendment to GOST 10299-80)

Drawing. Excludes code of surface finish.

Table2. Change lengths: 7-70 to 9-70; 38-180 to 38-170.

Point 1.2. Remove first paragraph

Annexure. For d=3 replace the weight; 1.887 to 2.065 for d= 8 delete weight 6.112; 6.507; for d = 10 change the weight: 26.03 to 29.03.

(ИУС No. 10 1990)

<< Rivet >>. GOST 10299-80 (СТ СЭВ 1019-78)

In which place	Printed	Should be
GOST 10299-80. Annexure for reference. Graph of theoretical weight of 1000 pcs. of rivets in kg, with nominal diameter of rod d 10 mm.	26.03	29.03

УДК 621.884.091.3:006.354 Group Г34

STATE STANDARD OF USSR

Rivets with semi- circular head.

GOST

Technical specification

10299-80*
[СТ СЭВ 1019-78]
Superseded
GOST 10299-68

Set by the state committee of USSR on standard dated 6 May 1980 No. 2009, period of introduction.

From 01.01.81

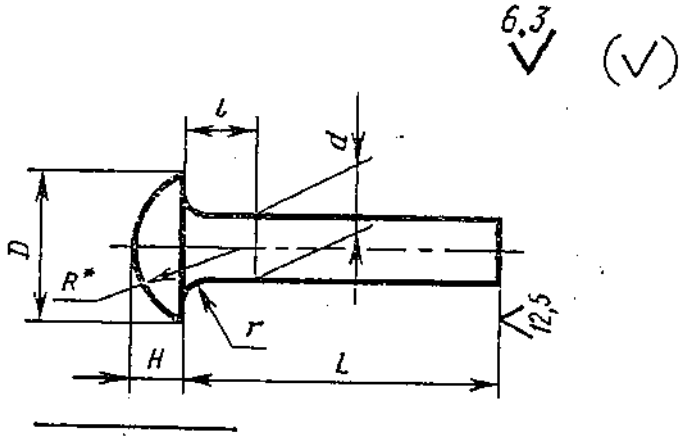
This standard pertains to rivets with semi - circular head for complete machine - building use with diameter of rod from 1 to 36 mm with class of accuracy B and C.

Standard completely corresponds to СТ СЭВ 1019-78.

Rivets with semi- circular should satisfy all requirements of GOST- 10304-84 and requirements, presented in appropriate sections of this standard.

1. DIMENSIONS

1.1. Dimensions of rivets should correspond to those specified on drawing and in table 1 and 2.



* Dimensions for reference

* Republished (June 1986 (ИУС 7-85) with amendment No.1, approved in April 1985 (ИУС 7-85).

1.2. Parameters of surface finish of all surface of rivet with class of accuracy C-Ra ≤ 50 MKM.

Table 1

MM

Diameter of rod d.	1	1.2	(1.4)	1.6	2	2.5	3	(3.5)	4	5	6	8	10
Diameter of head D.	1.8	2.1	2.5	2.9	3.5	4.4	5.3	6.3	7.1	8.8	11	14	16
Height of head H.	0.6	0.7	0.8	1.0	1.2	1.5	1.8	2.1	2.4	3.0	3.6	4.8	6.0
Radius for head r, maximum.	0.2							0.4			0.5		0.6
Radius of sphere of head R	1	1.2	1.4	1.6	1.9	2.4	2.9	3.4	3.8	4.7	6	7.5	8.3
Distance from the base of head up to place of measuring the diameter l.	1.5					3				4			6

Continuation to table 1

MM

Diameter of rod d.	12	(14)	16	(18)	20	(22)	24	30	36
Diameter of head D.	19	22	25	27	30	35	37	45	55
Height of head H.	7.2	8.4	9.5	11	12	13	16	20	24
Radius for head r, maximum.	0.8		1.0				1.2		1.6
Radius of sphere of head R	9.8	11.4	13	13.8	15.4	18.3	18.7	22.7	27.8
Distance from the base of head up to place of measuring the diameter l.	6			8				10	

Note. It is not recommended to use dimensions, specified in brackets.

Table 2

MM

Diameter of rod d	Length L	Diameter of rod d	Length L
1.0	2-8	10	14-100
1.2	2-10	12	18-110
(1.4)	3-12	(14)	20-140
1.6	3-12	16	20-140
2.0	3-16	(18)	28-140
2.5	3-20	20	34-160
3.0	4-40	(22)	38-180
(3.5)	5-40	24	40-180
4.0	5-50	30	55-180
5.0	7-60	36	55-180
6.0	7-60		
8.0	7-70		

Length of rivets should be selected from following numbers: 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 45, 48, 50, 52, 55, 58, 60, 65, 70, 75, 80, 85, 90, 95, 100, 110, 120, 130, 140, 150, 160, 170, 180 mm.

Example of conventional code of rivets with semi- circular head with class of accuracy B, diameter of rod- d = 8 mm, length L = 20 mm, made of material from group 00, without coating:

Rivets 8 X 20.00 GOST 10299-80

(Amended edition, Amendment No. 1).

1.3. Theoretical weight of rivets is specified in reference annexure.

2. TECHNICAL REQUIREMENTS

2.1. Maximum deflections of height, head for dimensions H < 1 mm – plus 0.28, minus 0.16 mm; for H= 1 mm - ± 0.28 mm.

Weight of steel rivets

Length	Theoretical weight of 100 pcs. of rivets in kg,										
	1	1.2	(1.4)	1.6	2	2.5	3	(3.5)	4	5	6
2	0,019	0,029									
3	0,025	0,038	0,054	0,077	0,127	0,218					
4	0,031	0,047	0,066	0,093	0,151	0,257	0,401				
5	0,038	0,056	0,078	0,109	0,176	0,295	0,457	0,670	0,924		
6	0,044	0,064	0,090	0,125	0,201	0,334	0,512	0,746	1,023		
7	0,050	0,073	0,102	0,140	0,225	0,372	0,568	0,821	1,121	1,906	3,084
8	0,056	0,082	0,114	0,156	0,251	0,411	0,623	0,896	1,220	2,060	3,306
9		0,091	0,126	0,172	0,275	0,449	0,679	0,972	1,319	2,214	3,528
10		0,100	0,138	0,188	0,299	0,488	0,734	1,048	1,417	2,368	3,751
12			0,163	0,219	0,349	0,565	0,845	1,199	1,615	2,676	4,194
14					0,398	0,642	0,956	1,350	1,812	2,985	4,638
16					0,447	0,737	1,067	1,501	2,009	3,293	5,082
18						0,796	1,178	1,652	2,207	3,601	5,526
20						0,873	1,289	1,803	2,404	3,909	5,970
22							1,400	1,954	2,601	4,218	6,414
24							1,511	2,105	2,798	4,526	6,858
26							1,622	2,256	2,996	4,834	7,302
28							1,733	2,407	3,193	5,142	7,746
30							1,844	2,558	3,390	5,451	8,190
32							1,955	2,709	3,588	5,759	8,633
34							1,887	2,860	3,785	6,067	9,077
36							2,177	3,011	3,982	6,375	9,521
38							2,288	3,162	4,179	6,684	9,965
40							2,399	3,313	4,377	6,992	10,40
42									4,574	7,300	10,85

ANNEXURE

Reference

with nominal diameter of rod d, in mm.										
8	10	12	(14)	16	(18)	20	(22)	24	30	36
6,112										
6,507										
6,902										
7,296										
8,085										
8,874	14,23									
9,663	15,47									
10,452	16,70	25,50								
11,242	17,93	27,28	39,11	53,33						
12,203	19,17	29,05	41,53	56,49						
12,820	20,40	30,83	43,94	59,65						
13,609	21,63	32,61	46,36	62,80						
14,398	22,87	34,38	48,78	65,96	86,07					
15,187	24,10	36,16	51,19	69,12	90,07					
15,977	25,33	37,93	53,61	72,27	94,06					
16,766	26,56	39,71	56,03	75,43	98,06	124,2				
17,555	27,80	41,48	58,44	78,59	102,10	129,1				
18,344	26,03	43,26	60,86	81,74	106,04	134,0	171,4			
19,13	30,26	45,03	63,28	84,90	110	139,0	177,3	226,2		
19,92	31,50	46,81	65,69	88,06	114	143,9	192,3	233,3		

2 order 2921

Length	Theoretical weight of 100 pcs. of rivets in kg,										
L, mm	1	1.2	(1.4)	6	2	2.5	3	(3.5)	4	5	6
45									4.870	7.763	11.52
48									5.166	8.225	12.19
50									5.363	8.533	12.63
52										8.842	13.07
55										9.304	13.74
58										9.766	14.40
60										10.075	14.85
65											
70											
75											
80											
85											
90											
95											
100											
110											
120											
130											
140											
150											
160											
170											
180											

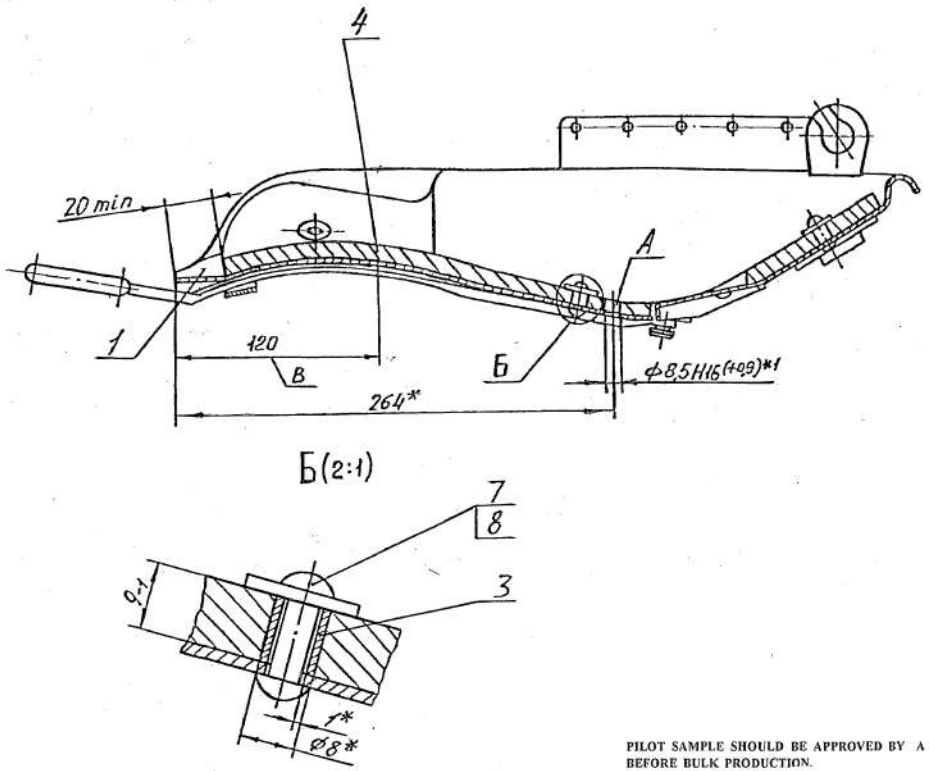
Note. For determining the weight of rivets manufactured from other materials, value of weights, specified in table should be multiplied to coefficients: 0.356- for aluminum alloy; 1.080-for brass; 1.134- for copper.

(Amended edition, Amendment No. 1).

with nominal diameter of rod d, in mm.										
8	10	12	(14)	16	(18)	20	(22)	24	30	36
21,11	33,35	49,47	69,32	92,80	120	151,3	201,2	244,0		
22,29	35,20	52,14	72,95	97,53	126	158,7	207,2	254,6		
23,08	36,43	53,91	75,36	100,70	130	163,6	213,1	261,8		
23,87	37,66	55,69	77,78	103,80	134	168,6	222,1	268,9		
25,05	39,51	58,35	81,40	108,60	140	176,0	231,1	279,5	462,7	719,7
26,24	41,36	61,02	85,03	113,30	146	183,3	237,0	290,6	481,5	743,7
27,03	42,59	62,79	87,45	116,50	150	188,3	251,9	297,3	490,5	759,7
29,00	45,68	67,23	93,49	124,40	160	200,6	266,9	315,0	518,2	799,6
30,97	48,76	71,67	99,53	132,20	170	213,0	281,8	332,8	546,0	839,6
	51,84	76,11	105,60	140,10	180	225,3	296,7	350,5	573,7	879,5
	54,93	80,55	111,60	148,00	190	237,6	311,6	368,3	601,5	919,6
	58,01	84,99	117,70	155,90	200	250,0	326,5	386,0	629,2	959,4
	61,09	89,43	123,70	163,80	210	262,3	341,5	403,8	657,0	999,4
	64,17	93,86	129,70	171,70	220	274,6	356,4	421,6	684,7	1039,3
	67,25	98,30	135,80	179,60	230	287,0	386,2	439,3	712,4	1079,3
		107,20	147,90	195,40	250	311,6	416,1	474,8	769,9	1159,2
			160,00	211,20	270	336,3	445,9	510,3	823,4	1239,1
			172,00	226,90	290	360,9	475,7	545,8	878,9	1319,0
			184,10	242,74	310	385,6	505,6	581,4	934,4	1398,9
						410,2	535,6	616,9	989,9	1478,8
						434,9	565,3	652,4	1045,4	1558,7
							595,1	687,9	1100,9	1638,6
								723,4	1156,3	1718,5

DRAWING NUMBER
172.65.024cb-3Cb

SHEET No. 1 OF 1



1. Alternative material for part item 3 is Pipe 8 x 1 GOST 8734-75 / B10 GOST 8733-74
2. * Dimensions for reference.
3. * 1 machine as per part item 1. Hole 'A' to be made after riveting.
4. Crosspiece should not project beyond the overall dimensions of frame/pot. Crosspiece may be adjusted to suit.
5. Nonbutting of cross item 4 over dimension 'B' should be maximum 1.5 mm. Not to be checked in other places.
6. Other requirements are as per 520 TY 1.

DRG. INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE - NIL

COMMON TO T-72 & BLT

356

SUPPLY CODE U-01-1-1

F-19 / 13

SIZE A4 x 3

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

EST. WT. (kg)	TO BE STAMPED OR MARKED WHERE INDICATED THUS # (LETTERS)
22.4	

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

DRN	V.Gopinath
CHD	K.Gunapalan
APPD	Chanchal
DATE	17-4-04
SCALE:- 1 : 2	
DIMENSIONS IN mm	
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS : 2102 - 69	
ALL THREADS TO CONFORM TO	

MATERIAL:- —

USED ON:- 172.65.025 CB-3CB

CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI

TITLE:- SEAT POT ASSY.

D S CAT NUMBER

DRAWING NUMBER 172.65.024cb-3Cb

RESTRICTED

(DRAFT/PROVISIONAL)

QUALITY ASSURANCE PLAN

FOR

(SEAT POT ASSY)

DRG. NO. 172.65.024cb-3cb

(LF NO: 6206214238)

No. HVF/T-72/QAP/65/ SEAT POT ASSY /390537-00

ISSUE No: 00 DATE: JULY 2021

QUALITY ASSURANCE (RIG-ASSEMBLY)

HEAVY VEHICLES FACTORY

AVADI, CHENNAI – 600 054

QUALITY ASSURANCE PLAN (QAP)

FOR

(SEAT POT ASSY)

DRG. No: 172.65.024cb-3cb

PREPARED BY

(V. BHASKAR)
JWM/QA (RIG-A)

REVIEWED BY

(D. ARUMUKAJITHKAR.
JWM/ QA (RIG-A)

APPROVED BY

( )
JT.GM/QA-RIG-(A)

ISSUED BY

QUALITY ASSURANCE (RIG-ASSEMBLY)

HEAVY VEHICLES FACTORY

AVADI, CHENNAI – 600 054

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 the permission of The 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 as per the drawings supplied by the Inspection Authority only 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:

a) This quality plan lays down the inspection and testing procedure to be carried out on the **SEAT POT ASSY. TO DRG.NO. 172.65.024cb-3cb** 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.

b) This QAP is the property of Government of India and is liable for amendments as and when required. The 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 norms for **SEAT POT ASSY. TO DRG.NO. 172.65.024CB-3CB** 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 **SEAT POT ASSY. TO DRG.NO. 172.65.024cb-3cb** including the technical requirements of the drawings. The recommended Quality Plan stipulated herein is mandatory and should be strictly adhered to.

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, 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 certified drawings will be forwarded to the Contractor. One set of relevant specification and technical instructions on the subject item can be obtained from AHSP through DDO/HVF.
b) Any clarification required on these documents should be obtained from the Inspecting Authority i.e. The General Manager, Heavy Vehicles Factory, Avadi, Chennai – 600 054. Equivalents to the collaborators specifications and standards will be decided only by the Inspecting Authority and should not be unilaterally decided.
c) The process instruction sheets supplied by the collaborators are available with the DDO/HVF, Avadi, Chennai for reference (i.e. Forging, casting, machining, extrusion, forming, manufacturing, heat treatment and plating process etc.) Where ever applicable.
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, templates, gauges etc should be provided as recommended in these process sheets.

6. USED ON HIGHER ASSY;

The SEAT POT ASSY to DRG.NO.172.65.024CB-3CB is commonly used on 172.65.025cb-3cb (SEAT CUSHION).

7. BILL OF MATERIAL:

SL.NO	DRG.NO	NOMENCLATURE	MATERIAL SPECIFICATION	QTY	REMARKS
	172.65.024cb-3cb	SEAT PAN ASSY.(SEAT POT ASSY)	---		1 piece is permitted to replace on item 2
1	172.65.023cb-1cb	SEAT POT ASSY.(SEAT CUP ASSY)	--	1	
1.1	172.65.014cbcb	LEVER ASSY.	--	1	
1.1.1	172.65.033	LEVER	SHEET 4 TY14-1-1830-75 (30ХГСА-3 GOST 11269-76)	1	
1.1.2	172.65.034-1	HANDLE	ROUND BAR B 10 GOST 2590-71(15-a-GOST 1050-74)	1	
1.1.3	176.65.024	HOOK	WIRE 3-0-ц GOST 3282-74	1	
1.1.4	GOST-5496-78	PIPE 4C 10x2	GOST-5496-78	1	L=200mm
1.2	172.65.026cbcb	LH BRACKET ASSY.	--	1	
1.2.1	172.65.028	BRACKET LH	STEEL 30ХГСА GOST 4543-71	1	
1.2.2	172.65.062	STRIP	SHEET 6.5 TY 14-105-490-85(30ХГСА-3 GOST 11269-76)	1	
1.3	172.65.027cbcb	RH BRACKET ASSY.	--	1	
1.3.1	172.65.029	BRACKET RH	STEEL 30ХГСА GOST 4543-71	1	
1.3.2	172.65.062	STRIP	SHEET 6.5 TY 14-105-490-85(30ХГСА-3 GOST 11269-76)	1	
1.6	172.65.025	STRAP(STRIP)	SHEET 6.5 TY 14-105-490-85(30ХГСА-3 GOST 11269-76)	1	
1.7	172.65.026-1	SEAT PAN	SHEET 1.5 GOST 19904-90(5-II-10КП GOST 16523-97)	1	

1.8	172.65.030	STRAP (STRIP)	SHEET 3 GOST 19903-74(10КП-4-III GOST 16523-70)	2	
1.9	172.65.031A	STRAP (STRIP)	SHEET 6.5 TY 14-105-490-85(30ХГСА-3-GOST 11269-76)	1	
1.10	172.65.032	AXLE	STEEL 30ХГСА GOST 4543-71	1	
1.11	172.65.035	AXLE	ROUND BAR 20-5 GOST 7417-75(15 GOST 1051-73)	2	
1.12	172.65.063-1	STRAP(STRIP)	SHEET 1.5 GOST 19904-74(5-II-Г-10КП GOST 16523-70)	2	
1.13	172.65.084	INSERT	SHEET 1.5 GOST 19904-74(5-II-Г-10КП GOST 16523-70)	1	
1.12	172.64.045-1	SPRING	172.64.045 DRG ONLY AVAILABLE	1	
1.13	176.65.020	STRAP(STRIP)	OPEN HEARTH STEEL 15-4-III GOST 16523-70	1	
1.14	54.30.461	CLAMP	SHEET 3 GOST 19903-74(K270B5-III-10kn-Gost 16523-97)	1	
3	172.65.007	BUSH STEEL	NO DRG.	4	0.0014kg W/O DRG.
4	172.65.027-1	CROSS PIECE(LINER)	STEEL C3-H-10 GOST 9559-75	1	
7	GOST-6958-78	WASHER C6 01 016	GOST-6958-78	4	
8	GOST-10299-80	RIVET 5x20 37 10	GOST-10299-80	4	

Note: Vendor/Contractor may use approved alternate material issued by the tender/ supply order issuing authority in writing (if available).

8. CONDITIONS OF USE/STORAGE INSTRUCTIONS:

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

a) The threaded parts are to be covered with suitable plastic caps to prevent Injury & damages.
b) Each assy shall be separately packed properly.
c) The stores are to be suitably covered for preventing ingress of dust and Dirt/entry of sunlight and moisture.

d) The packaging slip shall contains

i. Certificate of testing (NABL)
ii. Guarantee/ Warranty Certificate
iii. Delivery Slip with Inspector's Acceptance Mark
iv. Under taking certificate/certificate of conformance

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.

9. SAMPLING PLAN:

Sl. No.	Sampling Plan	Pilot*	Bulk
(i)	Visual Inspection	100%	100%
(ii)	Dimensional Check	100%	General Inspection level II, single sampling, Normal Inspection, AQL 1.5 as per IS 2500 (Part-I)-2000
(iii)	Material Check	1 No	1 No For each batch of raw material or heat treatment lot as required by specification.
(iv)	Fitment/Performance test/trial	1 No	1 No as and when required
(v)	Interchangeability Test	2 No's	2 No's on 100 no's, except selective assy.
(vi)	Test stands/jigs/ fixtures/ gauges and calibration checks	100%	100%
(vii)	Marking/ Identification	100%	100%
(viii)	Packing/ preservation	100%	100%

* This clause is applicable if mentioned in supply order or project sanction order in case of Make-II.

Note:- A New supplier should supply bulk only after pilot sample inspection/ evaluation by HVF and obtain bulk production clearance from HVF.

10. VISUAL INSPECTION [SAMPLING PLAN AS PER PARA- 9(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/requirements of the assy / components drawing respectively.

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

- Defects in construction
- Fitment of all components
- Dents, scratches and cracks etc
- 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).

11. DIMENSIONAL CHECKS [SAMPLING PLAN AS PER PARA- 9(ii)]

The dimensions of individual component, sub assy and major assy shall be checked and ensured as per respective drawings. Dimensional checks 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.

11.01) 172.65.024cb-3Cb(SEAT POT ASSY)

a) All the dimensions and geometrical parameters should be confirmed as per drawing specifications.
b) All Technical requirements (T.R) points to be ensured as per drawing and is given below.

1. Alternative material for part item 3 is Pipe $\frac{8 \times 1 \text{ GOST } 8734\text{-}75}{\text{B10 GOST } 8733\text{-}74}$
2. * Dimensions for reference.
3. * 1 machine as per part item 1. Hole 'A' to be made after riveting.
4. Crosspiece should not project beyond the overall dimensions of frame/pot. Crosspiece may be adjusted to suit.
5. Non butting of cross item 4 over dimension 'B' should be maximum 1.5 mm. Not to be checked in other places.
6. Other requirements are as per 520 TY 1.

11.02) 172.65.023cb-1Cb(SEAT POT ASSY)(SEAT CUP ASSY)

a) All the dimensions and geometrical parameters should be confirmed as per drawing specifications.

b) All Technical requirements (T.R) points to be ensured as per drawing and is given below.

1 Welds as per GOST 14771-76
2. Non-standard welds should be made by arc welding in shielded gas medium.
3 * Dimensions for reference
4. Mis-alignment and squeness of holes // to be tested for smooth passage of shaft, made as pe nominal dimensions of mating unit 172 65 019 СБ Testing along mating unit is permitted.
5. Test the unit for smooth passage in dummy model made as per nominal dimenions of matinç unit 172 65 012sb-2 with parts 172.65.055-1.
6 Adjustment of parts to suit is permitted
7. Lever item 1 must return to starting position under the effect of spring item 15.
8 After setting the parts item 10, dress the welds in flush-with
9. Non-flatness of bearing surfaces of slipping parts item 6 and 9 should not exceed 1.5 mm.
10 Burning (charring) of zinc coating, unit item 1 is permitted.
11. Coating of all surfaces, except straps and slots of brackets.
Primer ФЛ-03K
Enamel ПФ-223 dark-grey, or ПФ-115 dark-grey 894.
Requirements as per 520 TY5.
12 During assembly set axle item 10 up to stop into the strap item 9
13. *1 Dimensions to be ensured by tool.
14 Welding may not be done in area of technological holes
15. Welds may not be carried out along dimension Ж

11.03) <u>172.65.014cbCb(LEVER ASSY)</u>

a) All the dimensions and geometrical parameters should be confirmed as per drawing specifications.
b) All Technical requirements (T.R) points to be ensured as per drawing and is given below.

2 COMPONENT 4 SHOULD BE INSTALLED ON GLUE HT-150 TY 38-105-789-75 QUALITY OF GLUING IS NOT TO BE CHECKED.

3 THE WELD SHOULD BE DONE BY ELECTRIC ARC WELDING IN ATMOSPHERE OF SHIELDING GASES

4. PROJECTION OF WELD BEYOND SURFACE 'B' IS NOT PERMISSIBLE

11.04) <u>172.65.033(LEVER)</u>

a) All the dimensions and geometrical parameters should be confirmed as per drawing specifications.
b) All Technical requirements (T.R) points to be ensured as per drawing and is given below.

1. BHN 302 - 255 (DIAMETER OF INDENTATION 3.5 - 3.8).
2. DEVIATION OF COMPONENT FROM THE CONTOUR AND PROFILE TEMPLATES, CONSTRUCTED ACCORDING TO NOMINAL DIMENSIONS SHOULD NOT EXCEED 2mm.
3. ROUNDING OFF CORNERS TO R 3mm IS ALLOWED.
4. THE REST OF THE REQUIREMENTS IN ACCORDANCE WITH 520 TY 1.
5. * DIMENSION FOR REFERENCE.

11.05) 172.65.034-1(HANDLE)

a) All the dimensions and geometrical parameters should be confirmed as per drawing specifications.
b) All Technical requirements (T.R) points to be ensured as per drawing and is given below.

1. ALTERNATE MATERIAL : ROUND BAR $\frac{\text{B 10 GOST 2590-71}}{\text{20 GOST 1050-74}}$
2. DIMENSION FOR REFERENCE.
3. DENTS TO THE DEPTH NOT MORE THAN 1mm ARE PERMITTED.
4. UNFIT TO THE PLATE AT THE MAXIMUM 2mm IS ALLOWED.
5. OTHER REQUIREMENTS ACCORDING TO 520 TY 1.

11.06) 176.65.024 (HOOK)

a) All the dimensions and geometrical parameters should be confirmed as per drawing specifications.
b) All Technical requirements (T.R) points to be ensured as per drawing

*DIMENSION FOR REFERENCE

11.07) GOST 5496-78 (PIPE 4c 10x2)

a) All the dimensions and geometrical parameters should be confirmed as per GOST 5496-78.

11.08) 172.65.026cbCb(LH BRACKET ASSY)

a) All the dimensions and geometrical parameters should be confirmed as per drawing specifications.

b) All Technical requirements (T.R) points to be ensured as per drawing and is given below.

② 1* DIMENSION FOR REFERENCE

② 2 ARC WELDING IN SHIELDED GAS ATMOSPHERE

11.09) 172.65.028(BRACKET LH)

a) All the dimensions and geometrical parameters should be confirmed as per drawing specifications.
b) All Technical requirements (T.R) points to be ensured as per drawing and is given below.

1. BHN 302 - 255 (DIA OF INDENTATION 3.5 - 3.8) ~~TO BE~~ ② MAY BE CHECKED IN BLANK.
2. DIE PARTING LINE IS OPTIONAL,
3. LEAST THICKNESS OF WALL " a " - 7.5 mm,
4. WHILE CUTTING GROOVE 14.5 A1 TO DIMENSION 14 ± 0.5, SHOULDER UP TO 0.5 mm IS ALLOWED.
5. THE REST OF THE REQUIREMENTS ACCORDING TO 520 Ty 1.
6. *DIMENSION FOR REFERENCE.

11.10) 172.65.062(STRIP)

a) All the dimensions and geometrical parameters should be confirmed as per drawing specifications.
b) All Technical requirements (T.R) points to be ensured as per drawing and is given below.

1. NON FITTING OF THE PROFILE OF BENDING TO THE TEMPLATE, CONSTRUCTED ACCORDING TO NOMINAL DIMENSIONS, SHOULD NOT EXCEED 1.5 mm.
2. * DIMENSION FOR REFERENCE.
3. THE REST OF THE REQUIREMENTS ACCORDING TO 520 TY 1.

11.11) 172.65.027cbCb(RH BRACKET ASSY)

a) All the dimensions and geometrical parameters should be confirmed as per drawing specifications.
b) All Technical requirements (T.R) points to be ensured as per drawing and is given below.

1* DIMENSION FOR REFERENCE.

② 2 ARC WELDEED IN SHIELDED GAS ATMOSPHERE.

11.12) 172.65.029 (BRACKET RH)

a) All the dimensions and geometrical parameters should be confirmed as per drawing specifications.
b) All Technical requirements (T.R) points to be ensured as per drawing and is given below.

1. BHN 302 - 255 (DIA OF INDENTATION 3.5 - 3.8) ~~TO BE~~ ② MAY BE CHECKED IN BLANK.
2. DIE PARTING LINE IS OPTIONAL.
3. LEAST THICKNESS OF WALL " a " - 7.5 mm.
4. WHILE CUTTING GROOVE 14.5 A7 TO DIMENSION 14 ± 0.5. SHOULDE UP TO 0.5 mm IS ALLOWED.
5. THE REST OF THE REQUIREMENTS ACCORDING TO 520 Ty 1.
6 *DIMENSION FOR REFERENCE.

11.13) 172.65.062 (STRIP)

a) All the dimensions and geometrical parameters should be confirmed as per drawing specifications.
b) All Technical requirements (T.R) points to be ensured as per drawing and is given below.

1. NON FITTING OF THE PROFILE OF BENDING TO THE TEMPLATE, CONSTRUCTED ACCORDING TO NOMINAL DIMENSIONS, SHOULD NOT EXCEED 1.5 mm.
2. * DIMENSION FOR REFERENCE.
3. THE REST OF THE REQUIREMENTS ACCORDING TO 520 TY 1.

11.14) 172.65.025(STRAP /STRIP)

a) All the dimensions and geometrical parameters should be confirmed as per drawing specifications.

b) All Technical requirements (T.R) points to be ensured as per drawing and is given below.

1. BHN 302 – 255 (DIA OF INDENTATION 3.5 – 3.8).
2. INSTEAD OF CHAMFERS 3 x 45°, ROUNDING OFF CORNERS UP TO R 4 mm IS PERMISSIBLE.
3. DRAFTS AND SHRINKED EDGES ARE ALLOWED.
4. * DIMENSION FOR REFERENCE.

11.15) <u>172.65.026-1(SEAT PAN)</u>

a) All the dimensions and geometrical parameters should be confirmed as per drawing specifications.
b) All Technical requirements (T.R) points to be ensured as per drawing and is given below.

1. ALTERNATE MATERIAL — SHEET 1.5 GOST 19904-74 / 5-Ш-10КП GOST 16523-70
2. ON CUTTING SURFACE ALONG OUTER CONTOUR PROJECTION ON EDGES ARE ALLOWED UPTO 3 mm.
3. TRANSITION FROM SECTION TO SECTION SHOULD BE SMOOTH.
4. IN PLACES OF BEADING CORRUGATIONS AND WRINKLES ARE ALLOWED.
5. BENDING OF BEADINGS AT PLACES OF TRANSITION ON PLACES FROM VERTICAL TO SURFACE, FORMED BY R246.5 mm SHOULD CORRESPOND TO MATING SURFACES.
6. OVALITY OF HOLES Ø 5.5A9 SHOULD NOT EXCEED 1 mm.
7. ALL DIEMENSIONS WITHOUT TOLERANCES, UNLESS OTHERWISE SPECIFIED, ARE TO BE ENSURED WITH TOOL.
8. IN PLACES OF BENDING, NATURAL THINNING OF METAL IS ALLOWED.
9. CRACKS AND FISSURES IN PLACES OF STAMPED OUT RECESSES AND BEADING WITH SUBSEQUENT WELDING UP ARE ALLOWED.
10. SMOOTH TRANSITION FROM R10 TO R20 IS TO BE MAINTAINED ON PORTIONS BETWEEN SECTION FROM Ж-Ж TO K-K.
11. WHEN MARKING HOLES Ø 4.5A9 BY STAMPING ELLIPTICITY AND NON-SQUARENESS OF EDGES OF HOLES TO SURFACE OF BEAD ARE ALLOWED, IN THIS CASE, THE SMALLER AXIS OF ELLIPSE SHOULD NOT LESS THAN 4 mm. THE LARGER AXIS NOT MORE THAN 7 mm.

12. LOCAL INCREASE OF HEIGHT OF HEAD 16±3 MAY BE UPTO 5mm BEYOND THE TOLERANCE.
13. IN PLACE FROM SECTION Л-Л TO CENTRE R30 SMOOTH TRANSITION SHOULD BE PROVIDED.
14. RADIUS 5 mm IS TO BE ENSURED IN PATTERN. IN FIN ISHED COMPONENTS R5 AND BULGING OF THE EDGE ON THE BEAD IS NOT TO BE CHECKED.
15. * DIEMENSION FOR REFERENCE.
16. OTHER REQUIREMENTS SHOULD BE COMPLY WITH 520 TY 1.
17. REMAINDER OF HOLE Ø 5.5 FROM SPACES OF OPENING, ALONG DIEMENSION 200±1.5 IS PERMITTED.

11.16) 172.65.030(STRAP)

a) All the dimensions and geometrical parameters should be confirmed as per drawing specifications.
b) All Technical requirements (T.R) points to be ensured as per drawing and is given below.

1. ALTERNATE MATERIAL SHEET $\frac{\text{3 GOST 19903-74}}{\text{15-4-III GOST 16523-70}}$
2. DEVIATION OF COMPONENT FROM OUTLINE TEMPLATE, CONSTRUCTED ACCORDING TO NOMINAL DIEMENSIONS SHOULD NOT EXCEED 1.5mm.
3. ROUNDING OF CORNERS TO R5mm IS ALLOWED.
4. OTHER REQUIREMENTS ACCORDING TO 520 TY1
5. * DIMENSION FOR REFERENCE.

11.17) 172.65.031A(STRAP)

a) All the dimensions and geometrical parameters should be confirmed as per drawing specifications.
b) All Technical requirements (T.R) points to be ensured as per drawing and is given below.

④ 1. BHN 302-255 (DIAMETER OF INDENTATION 3.5 - 3.8)
TO BE CHECKED IN BLANK.

2. *DIMENSION FOR REFERENCE.

3. #1 DIMENSIONS ARE TO BE ENSURED BY TOOL.

4. THE REST OF THE REQUIREMENTS ACCORDING TO 520 TY 1.

11.18) 172.65.032(AXLE)

a) All the dimensions and geometrical parameters should be confirmed as per drawing specifications.
b) All Technical requirements (T.R) points to be ensured as per drawing and is given below.

1 BHN 302 -255 (DIAMETER OF INDENTATION 3.5-3.8)

2. *DIMENSION FOR REFERENCE.

3. THE REST OF THE REQUIREMENTS ACCORDING TO 520 Ty 1.

11.19) 172.65.035(AXLE)

a) All the dimensions and geometrical parameters should be confirmed as per drawing specifications.

b) All Technical requirements (T.R) points to be ensured as per drawing and is given below.

1, ALTERNATIVE MATERIAL: STEEL GRADE 20 GOST 1050-74
OPEN-HEARTH

2 * DIMENSION FOR REFERENCE

3 THE REST OF THE REQUIREMENTS IN ACCORDANCE WITH
520 Ty 1

11.20) 172.65.063-1(STRAP)

a) All the dimensions and geometrical parameters should be confirmed as per drawing specifications.
b) All Technical requirements (T.R) points to be ensured as per drawing and is given below.

1 ALTERNATIVE MATERIAL :- SHEET 1.5 GOST 19904-74
5 III Г - 10 Кп GOST 16523-70

(2) ~~2. DEVIATION OF COMPONENT, FROM THE OUTLINE TEMPLATE, CONSTRUCTED ACCORDING TO NOMINAL DIMENSIONS SHOULD NOT EXCEED 1.5 mm.~~

3 ROUNDING OFF OF ANGLES TO R 3 mm IS ALLOWED

4 SHIFT OF AXIS OF HOLES ϕ4.5 A9 FROM THE TRUE POSITION IS NOT TO BE CHECKED.

5. THE REST OF THE REQUIREMENTS ACCORDING TO 520 TY 1.

6. * DIMENSION FOR REFERENCE.

(2) 2 CONTOUR OF COMPONENT MAY BE CHECKED BY TEMPLATE (GAUGE) DESIGNED AS PER THE NOMINAL DIMENSION OF COMPONENT.

DEVIATION SHOULD NOT EXCEED 1.5 mm

11.21) 172.65.084(INSERT)

a) All the dimensions and geometrical parameters should be confirmed as per drawing specifications.
b) All Technical requirements (T.R) points to be ensured as per drawing and is given below.

1. ALTERNATE MATERIAL : SHEET $\frac{1.5 \text{ GOST} - 19904 - 74}{4 - \text{II} - 15 \text{ GOST } 16523 - 70}$

2. * DIMENSION FOR REFERENCE.

3. OTHER REQUIREMENTS SHOULD COMPLY WITH 520 TY1

11.22) 172.64.045-1(SPRING)

a) All the dimensions and geometrical parameters should be confirmed as per drawing specifications.
b) All Technical requirements (T.R) points to be ensured as per drawing and is given below.

1 DIRECTION OF SPRING TURN ANY DIRECTION
2 Π = 21 75
3. SHIFT OF AXIS OF LUGS RELATIVE TO AXIS OF SPRINC SHOULD NOT EXCEED 1 mm
4 AFTER BEING STRETCHED FOR 5 TIMES AT 50 mm RESIDUAL DEFORMATIONS ARE NOT ALLOWED
5 COATING · Zn 12 Cr
6 * DIMENSIONS AND PARAMETERS FOR REFERENCE

11.23) 176.65.020(STRIP)

a) All the dimensions and geometrical parameters should be confirmed as per drawing specifications.
b) All Technical requirements (T.R) points to be ensured as per drawing and is given below.

1 DRAFTS. AND SHRINKED EDGES ARE ALLOWED.
2. IN PLACES OF BENDING NATURAL THINNING OF METAL IS ALLOWED.

11.24) 54.30.461(CLAMP)

a) All the dimensions and geometrical parameters should be confirmed as per drawing specifications.
b) All Technical requirements (T.R) points to be ensured as per drawing and is given below.

1 *Dimensions for reference
2 Other requirements should be as per specification 520 TY1

11.25) 172.65.027-1(CROSS PIECE /LINER)

a) All the dimensions and geometrical parameters should be confirmed as per drawing specifications.
b) All Technical requirements (T.R) points to be ensured as per drawing and is given below.

1. ALTERNATE MATERIAL : LEAD OF ANY GRADE.
2. MAY BE MANUFACTURED FROM A SET OF SHEETS 5mm.
3.* DIEMENSIONS ARE TO BE ENSURED BY TOOL.
4. CORNER OF CONTOUR MAY BE REQUIRED BY TOOL.
5. TRANSITIONS BETWEEN SECTIONS SHOULD BE SMOOTH.
6. ON COMPONENT SURFACES MARKS SCRATCHES, AND TOOL MARKS ALLOWED.
7. IN PLACES OF BENDING NATURAL THINNING OF METAL IS ALLOWED.
8.* DIEMENSIONS FOR REFERENCE.
9. POSITION OF EDGES OF CUTTING IN HOLES NEED NOT BE CHECKED.
10. OTHER REQUIREMENTS SHOULD COMPLY WITH 520 TY1.

11.26) GOST 6958-78(WASHER C6.01.016)

a) All the dimensions and geometrical parameters should be confirmed as per GOST 6958-78.

11.27) GOST 10299-80(RIVET 5x20.37.10)

a) All the dimensions and geometrical parameters should be confirmed as per GOST 10299-80.

12) MATERIAL CHECKS [SAMPLING PLAN AS PARA – 9 (iii)]

Material specimen /test bars of the components shall be in conformity as per the material mentioned in the relevant documents/drawings as per the bill of materials (BOM). 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..

12.1 (LEVER) 172.65.033

a) The component should be manufactured from SHEET
4 TY-14-1-1830-75
30ХГСА-3 GOST 11269-76

b) Alt.Matl:Steel 709M40(EN19)/Steel 817M40(EN24) To BS970 Pt-1 1983.

a) CHEMICAL COMPOSITION :- AS PER STEEL GRADE 30ХГСА GOST 4543-71.

CONTENT OF ELEMENTS %					
C	Si	Mn	Cr	S	P
				MAX	
0.28-0.34	0.90-1.20	0.80-1.10	0.80-1.10	0.025	0.025

RESIDUAL CONTENT OF COPPER AND NICKEL SHOULD NOT EXCEED 0.30% EACH.

b) MECHANICAL PROPERTIES :- AS PER STEEL GRADE 30ХГСА, CATEGORY 3 GOST 11269-76 IN SOFT OR NORMALISED CONDITION.

TENSILE STRENGTH Kgf/mm²	ELONGATION % MIN	HARDNESS BHN
50-75	20	156-217

12.2 172.65.034-1(HANDLE)

a) The component should be manufactured from ROUND BAR
B 10 GOST2590-71
(15-a-GOST 1050-74)

b) Alt.Matl:ROUND BAR B 10 GOST 2590-71
20-GOST 1050-74

c) Alt.Matl: Steel 070M20(EN3A) To BS.970 Pt-1 : 1983

d) Chemical composition and mechanical properties of above mentioned grade should be conformed as per GOST 1050-74.

12.3 176.65.024 (HOOK)

a) The component should be manufactured from WIRE 3-0-ц GOST 3282-74.

b) Alt.Matl: Steel 070M20(EN3A) To BS.970 Pt-1 : 1983

3 MECHANICAL PROPERTIES :-
AS PER GOST 3282-74 FOR WIRE DIAMETER 3.0 ± 0.060mm

TENSILE STRENGTH Kgf / mm²	ELONGATION %
30 - 50	20

12.4 GOST 5496-78 (PIPE 4c 10x2)

a) The component PIPE 4c 10x2 should be manufactured from GOST 5496-78.
b) Chemical composition and mechanical properties of above mentioned grade should be conformed as per GOST 5496-78.

12.5 172.65.028(BRACKET LH)

a) The component should be manufactured from STEEL 30ХГСА GOST 4543-71.
b) Alt.Matl:817 M40 (EN24) To BS.970 Pt-1 :1983
c) Chemical composition and mechanical properties of above mentioned grade should be conformed as per GOST 4543-71.

8. a) CHEMICAL COMPOSITION:-

CONTENT OF ELEMENTS %					
C	Si	Mn	Cr	S	P
				MAXIMUM	
028-0,34	0,90-1,20	0,80-1,10	0,80-1,10	0,025	0,025

RESIDUAL CONTENT OF COPPER AND NICKEL SHOULD NOT EXCEED 0.30 % EACH.

b) MECHANICAL PROPERTIES:-

TENSILE STRENGTH Kgf/mm²	YIELD POINT Kgf/mm²	ELONGATION %	REDUCTION IN AREA %	IMPACT STRENGTH Kgm/cm²
1983 M I N I M U M				
110	85	10	45	5

12.6 172.65.062(STRIP)

a) The component should be manufactured from SHEET
6.5 TY 14-105-490-85
30ХГСА-3-GOST 11269-76
b) Alt.Matl: Steel 709M40(EN19)/Steel 817M40(EN24) To BS970 Pt-1 1983
c) Chemical composition and mechanical properties of above mentioned grade should be conformed as per GOST 11269-76.

12.7 172.65.029 (BRACKET RH)

a) The component should be manufactured from STEEL 30ХГСА GOST 4543-71.
b) Alt.Matl: Steel 817M40(EN24) To BS970 Pt-1 1983
c) Chemical composition and mechanical properties of above mentioned grade should be conformed as per GOST 4543-71.

8. a) CHEMICAL COMPOSITION:-

CONTENT OF ELEMENTS %					
C	Si	Mn	Cr	S	P
				MAXIMUM	
028-0,34	0,90-1,20	0,80-1,10	0,80-1,10	0,025	0,025

RESIDUAL CONTENT OF COPPER AND NICKEL SHOULD NOT EXCEED 0.30 % EACH.

b) MECHANICAL PROPERTIES:-

TENSILE STRENGTH Kgf/mm²	YIELD POINT Kgf/mm²	ELONGATION %	REDUCTION IN AREA %	IMPACT STRENGTH Kgm/cm²
MINIMUM				
110	85	10	45	5

12.8 172.65.025(STRAP /STRIP)

a) The component should be manufactured from SHEET 6.5 TY 14-105-490-85
30ХГСА-3 GOST 11269-76
b) Alt.Matl: Steel 709M40(EN19) To BS 970 Pt-1:1983
c) Chemical composition and mechanical properties of above mentioned grade should be conformed as per GOST 11269-76 .

12.9 172.65.026-1(SEAT PAN)

a) The component should be manufactured from SHEET 1.5 GOST 19904-74
5-II-10КП GOST 16523-97
b) Alt.Matl: SHEET 1.5 GOST 19904-74
5-III-10КП GOST 16523-70
c) Alt.Matl: Steel 070M20(EN3A) To BS.970 Pt-1 : 1983
d) Chemical composition and mechanical properties of above mentioned grade should be conformed as per GOST 16523-97.

12.10 172.65.030(STRAP/ STRIP)

a) The component should be manufactured from SHEET
3 GOST 19903-74
10КП-4-III GOST 16523-70

b) Alt.Matl: SHEET 3 GOST 19903-74
15-4-III GOST 16523-70

c) Chemical composition and mechanical properties of above mentioned grade should be conformed as per GOST 1050-74 and GOST 16523-70.

a CHEMICAL COMPOSITION :- AS PER STEEL GRADES 10КП & 15 GOST 1050-74

GRADE OF STEEL	CONTENT OF ELEMENTS %					
	C	Si	Mn	Cr	S	P
				MAXIMUM		
10КП	0 07-0 14	0 07 MAX	0 25-0 50	0 15	0 040	0 035
15	0 12-0 19	0 17-0 37	0 35-0 65	0 25	0 040	0 035

RESIDUAL CONTENT OF COPPER & NICKEL SHOULD NOT EXCEED 0 25 % EACH

b MECHANICAL PROPERTIES AS PER STEEL GRADES 10КП & 15 GOST 16523-70

GRADE OF STEEL	TENSILE STRENGTH Kgf / mm^2	ELONGATION % MIN	BEND TEST 180° IN COLD STATE
10КП	28-40	26	ONE THICKNESS
15	28-40	24	ONE THICKNESS

12.11 172.65.031A(STRIP)

a) The component should be manufactured from SHEET
6.5 TY 14-105-490-85
30ХГСА-3-GOST 11269-76

b) Alt.Matl: Steel 709M40(EN19)/Steel 817M40(EN24) To BS970 Pt-1 1983

c) Chemical composition and mechanical properties of above mentioned grade should be conformed as per GOST 11269-76.

12.12 172.65.032(AXLE)

a) The component should be manufactured from STEEL 30ХГСА GOST 4543-71.
b) Alt.Matl: Steel 709M40(EN19)/Steel 817M40(EN24) To BS970 Pt-1 1983
c) Chemical composition and mechanical properties of above mentioned grade should be conformed as per GOST 4543-71.

5. a) CHEMICAL COMPOSITION :-

CONTENT OF ELEMENTS %					
C	Si	Mn	Cr	S	P
				MAXIMUM	
0.28–0.34%	0.90–1.20	0.80–1.10	0.80–1.10	0.035	0.035

RESIDUAL CONTENT OF COPPER AND NICKEL SHOULD NOT EXCEED 0.30 % EACH

b) MECHANICAL PROPERTIES :-

TENSILE STRENGTH Kgf/mm²	YIELD POINT Kgf/mm²	ELONGATION %	REDUCTION IN AREA %	IMPACT STRENGTH Kgm/Cm²
MINIMUM				
110	95	10	45	5

12.13 172.65.035(AXLE)

a) The component should be manufactured from ROUND BAR
20-5 GOST 7417-75
15 GOST 1051-73
b) Alt.Matl:Steel Grade 20 Gost 1050-74 open hearth
c) Alt.Matl: Steel 070M20(EN3A) To BS-970 Part-1:1983
d) Chemical composition and mechanical properties of above mentioned grade should be conformed as per GOST 1050-74.

5 CHEMICAL COMPOSITION· AS PER STEEL GRADES 15 & 20 GOST 1050-74

GRADE OF STEEL	CONTENT OF ELEMENTS %					
	C	Si	Mn	Cr	S	P
					MAXIMUM	
15	0 12–0.19	0.17–0.37	0 35–0.65	0.25	0.040	0.035
20	0 17–0 24	0.17–0 37	0.35–0 65	0.25	0.040	0.035

RESIDUAL CONTENT OF COPPER AND NICKEL SHOULD NOT EXCEED 0 25% EACH

MECHANICAL PROPERTIES AS PER STEEL GRADES 15 & 20 GOST 1050-74

GRADE OF STEEL	TENSILS STRENGTH Kgf/mm²	YIELD POINT Kgf/mm2	ELONGATION %	REDUCTION IN AREA %
	MINIMUM			
15	38	23	27	55
20	42	25	25	55

12.14 172.65.063-1(STRAP)

a) The component should be manufactured from SHEET
1.5 GOST 19904-74
5-II-Г-10КП GOST 16523-70

b) Alt.Matl: SHEET 1.5 GOST 19904-74
5-III-Г-10КП GOST 16523-70

c) Alt.Matl: Steel 070M20(EN3A) To BS-970 Part-1:1983

d) Chemical composition and mechanical properties of above mentioned grade should be conformed as per GOST 1050-74 and GOST 16523-70.

a) CHEMICAL COMPOSITION :- AS PER STEEL GRADE 10 Kn GOST 1050-74, OPEN HEARTH.

CONTENT OF ELEMENTS %					
C	Si	Mn	Cr	S	P
			MAX		
0.07 - 0.14	0.07 MAX	0.25 - 0.50	0.15	0.040	0.035

RESIDUAL CONTENT OF COPPER AND NICKEL SHOULD NOT EXCEED 0.25 % EACH.

b) MECHANICAL PROPERTIES :- AS PER STEEL GRADE 10 Kn, CATEGORY 5, GROUP II Г & III Г GOST 16523-70

TENSILE STRENGTH Kgf/mm²	ELONGATION %	CUPPING TEST DEPTH SPHERICAL HOLE MINIMUM	BEND TEST 180° IN COLD STATE
28-40	25	11.2	CLOSE

12.15 172.65.084(INSERT)

a) The component should be manufactured from SHEET
1.5 GOST 19904-74
5-II-Г-10КП GOST 16523-70.

b) Alt.Matl: SHEET 1.5 GOST 19904-74
4-II-15 GOST 16523-70

c) ALT. MATL: Grade D To IS:513-86

d) Chemical composition and mechanical properties of above mentioned grade should be conformed as per GOST 16523-70.

12.16 172.64.045-1(SPRING)

a) The component should be manufactured from WIRE Б-2А-1.8 GOST 9389-75.
b) Chemical composition and mechanical properties of above mentioned grade should be conformed as per GOST 9389-75.

12.17 176.65.020(STRAP)

a) The component should be manufactured from OPEN HEARTH STEEL 15-4-III GOST 16523-70.
b) ALT.MATL:STEEL, GRADE 10кП-4-III-, 20-4-II GOST 16523-70 open hearth
c) Alt.Matl: Steel 070M20(EN3A) To BS-970 Part-1:1983
d) Chemical composition and mechanical properties of above mentioned grade should be conformed as per GOST 16523-70.

5, a) *CHEMICAL COMPOSITION :- AS PER STEEL GRADES 15 & 20 GOST 1050-74. OPENHEARTH.*

GRADE OF STEEL	CONTENT OF ELEMENTS %					
	C	Si	Mn	Cr	S	P
				MAXIMUM		
15	0.12 - 0 19	0.17- 0 37	0.35 - 0.65	0. 25	0.040	0.035
20	0.17 - 0.24	0.17 - 0 37	0.35 - 0. 65	0.25	0. 040	0.035

RESIDUAL CONTENT OF COPPER AND NICKEL SHOULD NOT EXCEED 0.25 % EACH.

b) MECHANICAL PROPERTIES :- AS PER STEEL GRADES 15 & 20, CATEGORY 4 GOST 16523-70.

GRADE OF STEEL	TENSILE STRENGTH Kgf / mm^2	ELONGATION % MIN.	BEND TEST BY 180° IN COLD STATE
15	34 - 47	25	ONE THICKNESS
20	36 - 51	24	ONE THICKNESS

12.18 54.30.461(CLAMP)

a) The component should be manufactured from
SHEET 3 GOST 19903-74
K270B5-III-10kn-Gost 16523-97.
b) Chemical composition and mechanical properties of above mentioned grade should be conformed as per GOST 16523-97.

12.19 172.65.027-1(CROSS PIECE/LINER)

a) The component should be manufactured from STEEL C3-H-10 GOST 9559-75.
b) Alt.Matl: Lead of any grade.
c) Alt.Matl: Commercial available lead.
d) Chemical composition and mechanical properties of above mentioned grade should be conformed as per GOST 9559-75.

12.20 GOST 6958-78(WASHER C6.01.016)

a) The component WASHER C6.01.016 should be manufactured from GOST 6958-78.
b) Chemical composition and mechanical properties of above mentioned grade should be conformed as per GOST 6958-78.

12.21 GOST 10299-80(RIVET 5x20.37.10)

a) The component RIVET 5x20.37.10 should be manufactured from GOST 10299-80.
b) Chemical composition and mechanical properties of above mentioned grade should be conformed as per GOST10299-80.

13) FITMENT/PERFORMANCE TEST/TRIAL;

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 & performance to be monitored, wherever required.
b) Bulk supply may be subjected to performance trial in higher assembly in case of repeated failure/defects during exploitation.

14) INTERCHANGEABILITY;

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

15) TEST STANDS/JIGS/FIXTURES/GAUGES & CALIBRATION CHECKS;

a) The supplier / Contractor should manufactured a suitable Test Stand, jigs, fixture & mandrels and gauges as per process sheet to carry out quality checks/performance test and to ensure conformance of components/assy as per drawing specification / T.R points.

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

16) MARKING/IDENTIFICATION CHECKS;

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 in all components. Suitable method of marking can be adopted, provided the above details are legible. Inscription if any as called for in the relevant drawing is also to be carried out.

17) PRESERVATION CHECKS;

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

18) PACKING CHECKS;

a) 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.
b) Packing and preservation should be ensured as per drawings/relevant TY specification (To be ensured on receipt at consignee end).
c) Finished products shall be wrapped / packed using black and opaque polyethylene sheet or bags.

19) DOCUMENTATION;

a) Firm has to maintain all the documents as per QAP with respect to the Sl.No.to have traceability.
b) Vendor has to submit Bill of materials, Material test reports, Class 'C' /Endurance test reports (wherever specified in drg/TY specification/QAP) and Complete PIR (pre-inspection report)at the time of offering the item for inspection. HVF will commence the inspection only after scrutiny of these documents.

c) Pre inspection reports (PIR) of firm like,

1. Chemical analysis, Mechanical properties obtained from NABL as per bill of material (BOM) with respect to material specification,
2. Pre-forming process report as per process sheet,
3. Coating certificates, hardness report, heat treatment certificates (wherever applicable).
4. Calibration reports of instruments and gauges,
5. 100% Dimensional inspection reports (including T.R points) 6. Pressure test reports are to be submitted.

d) The testing/inspection responsibility to test all the parameters as per QAP and drawing specifications as mentioned in Annexure -A (enclosed).

20) <u>REFERENCE:</u>

a) All relevant drawings to 172.65.024cb-3cb.(Drawing dated 17-04-04).
b) Refer all material specifications like, GOST, IS & TY etc... refer dimensional and material checks clause in this QAP.

SEAT POT ASSY. DRG.No:172.65.024cb-3Cb

ANNEXURE-A;

SL. NO	CATEGORY	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.	Conform 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: 7 or item list.	Conform to QAP	P	V	R	100% by firm/ vendor.
3.	**Dimensional checks**	Dimensions as per the drawing	Refer drawing/QAP Para no: 11	Conform to drawing and QAP	P	W/P	R	100% by firm/ vendor, SP followed by HVF.
4.	**Material tests**	Chemical composition& Mechanical Properties	As per the relevant drawing and QAP	All the values to conform with QAP and Drawings	P	W/V	R	Refer note.
5.	**Coating checks**	Coating & Painting	Refer QAP Para no 11	conform to QAP Para no 11	P	V	R	100% by firm/ vendor.
6.	**Marking / traceability checks**	Marking / traceability	Refer QAP Para no 16	Conform to QAP Para no 16	P	V	R	100% by firm/ vendor.
7.	**Preservation & packing checks**	Preservation & packing	Refer QAP Para no 17 & 18	Conform to QAP Para no 17 & 18	P	V	R	100% by firm/ vendor.

Note:

1. 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 will be rejected or not to use in production further.
2. For cross conformation, manufacturer has to submit test samples /HVF will draw samples from supplied lot on receipt 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

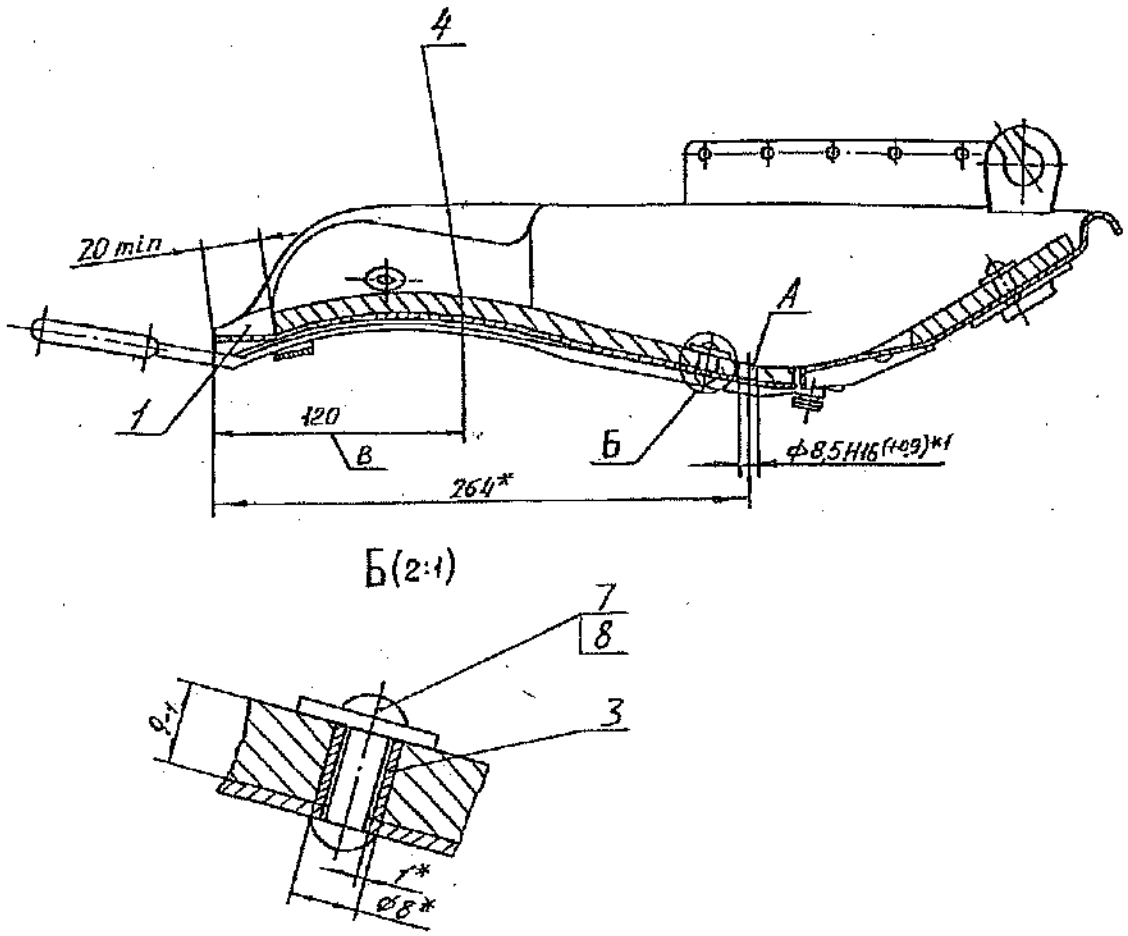


FIGURE: SEAT POT ASSY. (172.65.024cb-3Cb)

(For reference only)

APPENDIX ' A'

RECORD OF AMENDMENTS

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