

DRAWING NUMBER  
155.05.715

SHEET No. 1 OF 1

✓(✓)

**EXPLANATORY NOTE :-**

MATERIAL QUOTED : STEEL 15-4-II GOST 16523-70 OPEN HEARTH

ALTERNATE MATERIAL QUOTED : OPEN HEARTH STEEL 20-4 -II, 10KП-5-II-Г GOST 16523-70

OPEN HEARTH STEEL GRADES 15, 20, AND 10KП TO GOST 1050-74

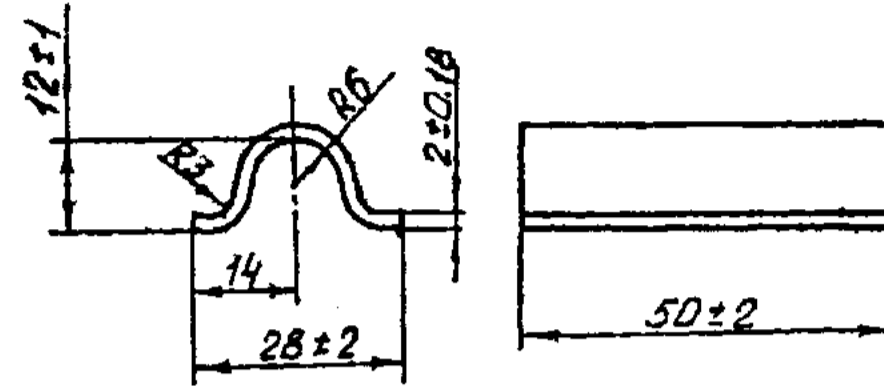
- 4 = CATAGORY No STANDARD CHARACTERISTICS
- 5 = CATAGORY No
- II = SUREACE FINISH ( HIGH FINISH )
- Г = DEEP DRAWN
- KП = RIMMED

(a) **CHEMICAL COMPOSITION:** AS PER GOST 1050-74

GRADE OF STEEL	C O N T E N T O F E L E M E N T S %							
	C	Si	Mn	Cr	P	S	Cu	NI
	M A X I M U M							
10KП	0,07-0,14	0,07 (max)	0,25-0,50	0,15	0,035	0,040	0,25	0,25
15	0,12-0,19	0,17-0,37	0,35-0,65	0,25	0,035	0,040	0,25	0,25
20	0,17-0,24	0,17-0,37	0,35-0,65	0,25	0,035	0,040	0,25	0,25

**MECHANICAL PROPERTIES:** AS PER GOST 16523-70

GRADE OF STEEL	TENSILE STRENGTH Kgf/mm <sup>2</sup>	RELATIVE ELONGATION % (min)
10KП	28 - 40	25
15	34 - 47	24
20	36 - 51	23



1. MAY BE MANUFACTURED FROM STEEL 20-4-II, 10KП-5-II-Г GOST 16523-70 OPEN - HEARTH.
2. DIMENSIONS WITH UNSPECIFIED TOLERANCES ARE NOT TO BE CHECKED.
3. DIFFERENCE IN SIZE OF FLANGES SHOULD BE UPTO 3MM  
LENGTH OF STRAIGHTENED COMPONENT ≈ 42 MM.
4. OTHER REQUIREMENTS AS PER 520 TY 1.

COMMON TO T-90 & BLT  
DRG. RE INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE - 6  
(R. RAMANI), JTO  
04-10.05

F-27  
28

SIZE A2

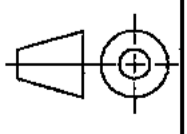
PILOT SAMPLE SHOULD BE APPROVED BY A H S P BEFORE BULK PRODUCTION.

EST. WT. (Kg)	TO BE STAMPED OR MARKED WHERE INDICATED THUS # ( LETTERS)	6E	2.6.15	Authy Lt.No.81233/33/DBII/AMDT Dt.27.5.15
0.03		6D	26.11.12	55150/CQA(HV)/DB/BLT T-72 Dt.19.07.11
		6C	23.1.06	AUTHY Lt.No.80001/CQA(HV)/GEN Dt.30.11.05
		6B	19.4.04	N OF A No.CQA(HV)/T90/33/001
		6A	12.3.04	N OF A No.CQA(HV)/T-90/32/001
		ISSUE	DATE	NATURE OF AMENDMENTS

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

6C ALT. MATL: STEEL 070M20 (En3A) TO BS 970 Part-1: 1983.

- 6E CQA(HV)S 33 010 \*\*
- 6D PV572.0705.0010 6A 175.32.104cb-2  
172.2M.33-005cb
- 6A 172.33.225cb-2Cb 175.33.002cb-1  
172.33.231cb-2Cb 175.33.003cb-2  
172.33.243cbCb 176.33.004cb  
188.32.004cbCb 172.33.226cb

DRN	-5d-	MATERIAL :- OPEN HEARTH	USED ON :-
CHD	-5d-	STEEL 15 - 4 - II	** SEE ABOVE
APPD	-5d-	GOST 16523 - 70	
DATE	9-8-86	CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI	
SCALE:-	1 : 1	TITLE :-	
DIMENSIONS IN mm			
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS : 2102 - 69		<b>CLAMP TANK</b>	
D S CAT NUMBER		DRAWING NUMBER	
		<b>155.05.715</b>	



DRAWING NUMBER  
175.33.378

SHEET No. 1 OF 1

Rz 320 ✓ (✓) ~~(✓)~~ ⑤

EXPLANATORY NOTE:

MATERIAL QUOTED:

OPEN HEARTH STEEL 15-4-II GOST 16523-70

15 = GRADE OF STEEL AS PER GOST 1050-74

4 = CATEGORY. Std. CHARACTERISTICS.

II = HIGH FINISH

CHEMICAL COMPOSITION (AS PER GOST 1050-74)

CARBON = 0.12-0.19 ; SILICON = 0.17-0.37 ;

MANGANESE = 0.35-0.65 ;

CHROMIUM = 0.25 ; PHOSPHORUS = 0.035 ;

SULPHUR = 0.040 ; NICKEL = 0.25 ;

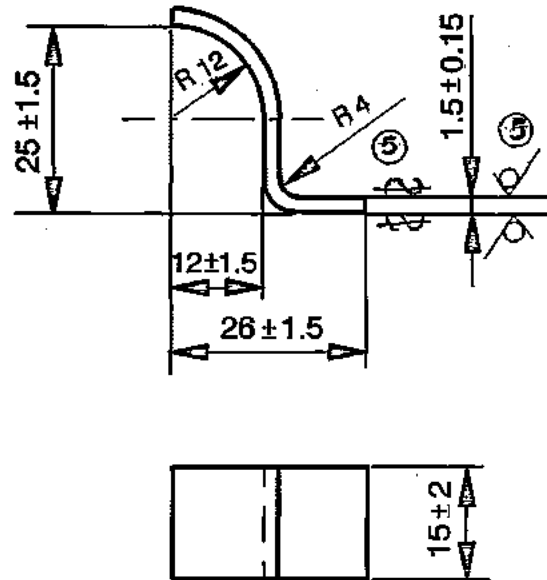
COPPER = 0.25

MAXIMUM

MECHANICAL PROPERTIES (AS PER GOST 16523-70)

ULTIMATE TENSILE STRENGTH  $Kgf/mm^2 = 34-47$

% ELONGATION (MIN) = 24



1. THE COMPONENT MAY BE MANUFACTURED FROM OPEN HEARTH STEEL 10 Kn-5-II-Г, 20-4-II ⑤ GOST 16523-70
2. CORNERS MAY BE ROUNDED OFF TO R 3 mm.

⑤A \*\* 172.33.232Cb-2Cb  
172.33.243CbCb.  
172.33.224cb-2Cb

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

EST. WT. (Kg) 0.007 TO BE STAMPED OR MARKED WHERE INDICATED THUS # ( LETTERS)

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

			DRN	Sd/=	MATERIAL:- O.H.STEEL	USED ON:-	
			CHD	Sd/=	15-4-II GOST 16523-70	172.2M.33.005Cb **	
			APPD	Sd/=	CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES)		
			DATE	29.7.86	AVADI		
			SCALE:- 1 : 1				
			DIMENSIONS IN mm				
			TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS : 2102 - 69				
			TITLE:-				
			CLAMP				
			ALL THREADS TO CONFORM TO			D S CAT NUMBER	DRAWING NUMBER
							175.33.378
8	7	6	ISSUE	DATE	NATURE OF AMENDMENTS		
			5A	19.4.04	N OF A No. CQA(HV)/T90/33/001		
			5	7.10.88	AMDT. LIST No.6 PART II BOK-6		

"COMMON TO T-90" & BLT DRAWING RE-INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE -4 EXPLANATORY NOTE ADDED ON 3.12.90 (R.RAMANI),JTO 7-11-05

F- 64 SIZE A3



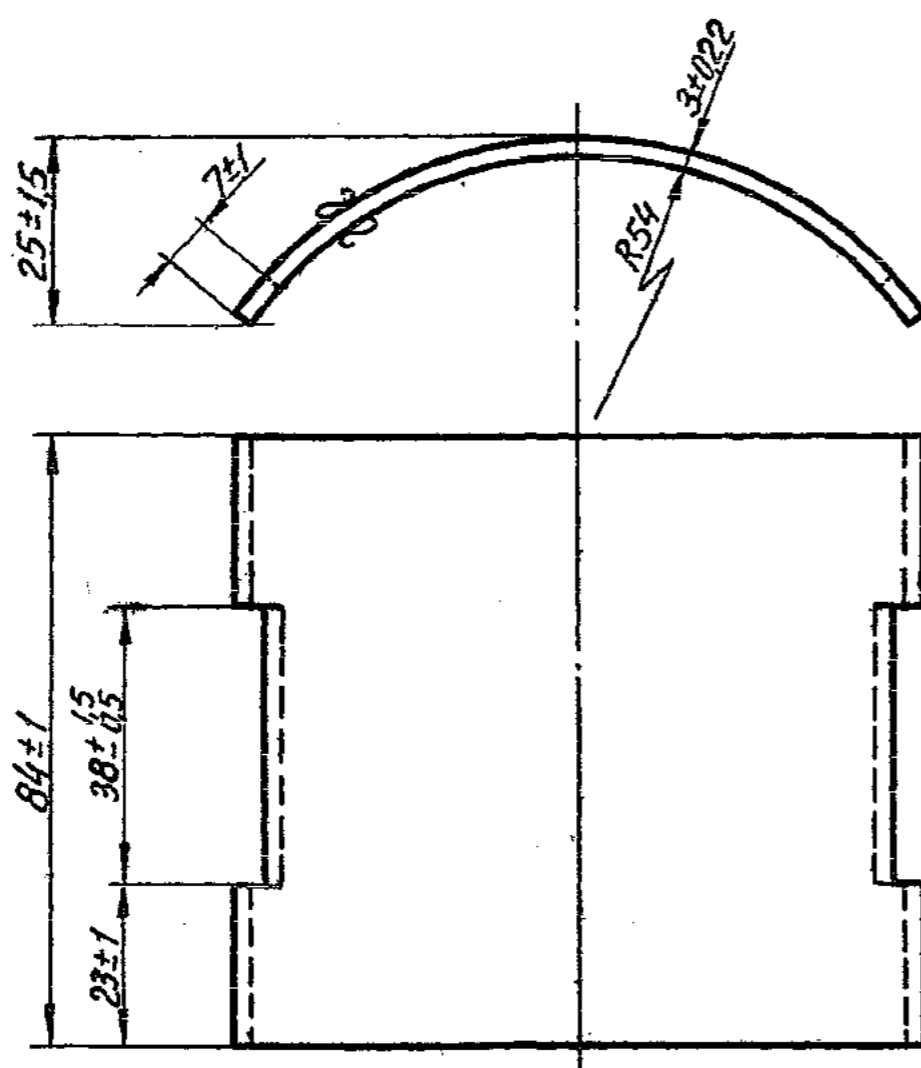
1111



DRAWING NUMBER  
172.33.320

SHEET No. 1 OF 1

UNLESS OTHERWISE SPECIFIED Rz 320 ✓



**EXPLANATORY NOTE:-**

THE COMPONENT SHOULD BE PRODUCED FROM OPEN-HEARTH HOT ROLLED QUALITY CARBON STEEL SHEET 3mm THICKNESS OF HIGH SURFACE FINISH 'II' WITH STANDARD CHARACTERISTICS CATEGORY '4' OF GRADE 15 (KILLED) TO GOST 16523-70.  
ALTERNATIVELY IT MAY BE PRODUCED FROM STEEL SHEET OF HIGH SURFACE FINISH 'II' WITH STANDARD CHARACTERISTICS CATEGORY '4' OF GRADE 20 (KILLED) TO GOST 16523-70.

CHEMICAL COMPOSITION % AS PER GOST 1050-74.

GRADE OF STEEL	C	Si	Mn	Cr (MAX)
15	0.12 - 0.19	0.17 - 0.37	0.35 - 0.65	0.25
20	0.17 - 0.24	0.17 - 0.37	0.35 - 0.65	0.25

NOTE:-

- a) CONTENTS OF SULPHUR 0.040%(MAX) & PHOSPHORUS 0.035%(MAX).
- b) RESIDUAL CONTENT OF COPPER & NICKEL SHOULD NOT EXCEED 0.25% EACH.

MECHANICAL PROPERTIES AS PER GOST 16523-70.

GRADE OF STEEL	TENSILE STRENGTH Kgf/mm <sup>2</sup>	RELATIVE ELONGATION % NOT LESS THAN
15	34 - 47	24
20	36 - 51	23

1. Допускается изготовление из стали марок: @ МС-2ер, ВМС-3ка ГОСТ 380-69 20-4-II ГОСТ 16523-70 маргеновская
2. Неприлегание шаблона к поверхности по R54 не более 1мм.

1. IT IS ALLOWED TO MAKE OPEN HEARTH STEEL 20-4-II GOST 16523-70.
2. NON FITTING OF TEMPLATE TO THE SURFACE ALONG R 54 SHOULD NOT EXCEED 1 mm>

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

EST. WT. (Kg) 0.180	TO BE STAMPED OR MARKED WHERE INDICATED THUS # ( LETTERS)
ALL SHARP EDGES AND CORNERS TO BE REMOVED UNLESS OTHERWISE STATED MACHINED CORNERS TO HAVE R OUTSIDE R INSIDE EQUIVALENT CHAMFERS ARE PERMISSIBLE.	

DRN	Sd/=	MATERIAL:- OPEN HEARTH STEEL 15-4-II GOST 16523-70	USED ON:- 172.33.103Cb **
CHD	Sd/=		
APPD	Sd/=		
DATE	29.7.86	CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI	
SCALE:-	1:1	TITLE:-	
DIMENSIONS IN mm		BOTTOM PLATE	
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS: 2102-69		D S CAT NUMBER	
3B	23.1.06	AUTHY Lt. No. 80001/CQA(HV)/GEN Dt. 30.11.05	DRAWING NUMBER
3A	19.4.04	N OF A No. CQA(HV)/T90/33/001	172.33.320
ISSUE	DATE	NATURE OF AMENDMENTS	

3B) ALT. MATL: STEEL 070M20 (En3A) TO BS 970 Part-1:1983.

\*\* 172.33.255CbCb 172.33.257CbCb 3A)

COMMON TO T-90" & BLT DRAWING RE-INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE-3 DRG. REDRAWN AND EXPLANATORY NOTE ADDED ON 31.10.90.

(R. RAMANI) JTO 20-07-05

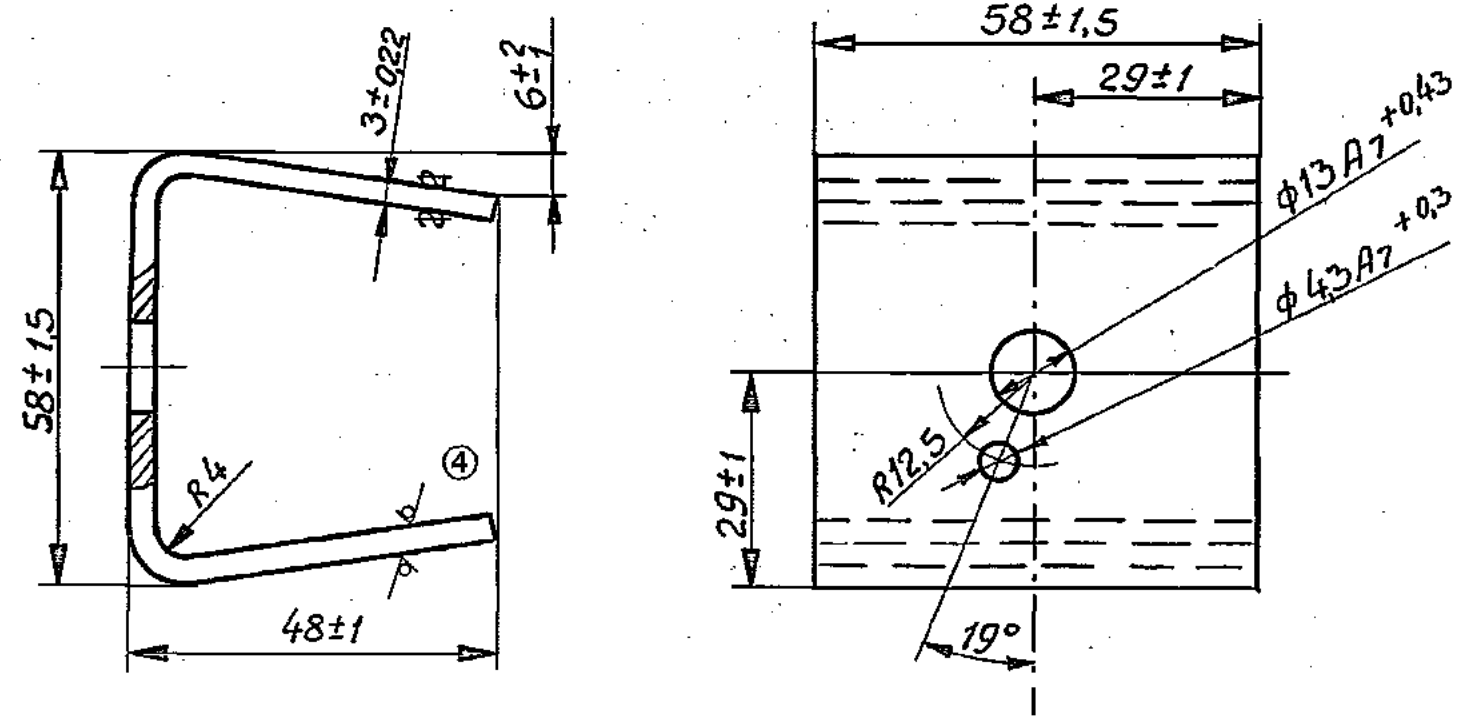
F-60 SIZE A2



DRAWING NUMBER  
172.33.145-2

SHEET No. 1 OF 1

UNLESS OTHERWISE SPECIFIED Rz 320  $\sqrt{(\sqrt{1})/6}$   
-71-



**EXPLANATORY NOTE:-**

THE COMPONENT SHOULD BE PRODUCED FROM OPEN-HEARTH HOT ROLLED QUALITY CARBON STEEL SHEET 3mm THICKNESS OF HIGH SURFACE FINISH 'II', WITH STANDARD CHARACTERISTICS CATEGORY '4' OF GRADE 15 (KILLED) TO GOST 16523-70. ALTERNATIVELY IT MAY BE PRODUCED FROM STEEL SHEET OF SUPERIOR SURFACE FINISH 'III', WITH STANDARD CHARACTERISTICS CATEGORY '4' OF GRADE 10KΠ (RIMMED) TO GOST 16523-70 OR STEEL SHEET OF HIGH SURFACE FINISH 'II' WITH STANDARD CHARACTERISTICS CATEGORY '4' OF GRADE 20 (KILLED) TO GOST 16523-70.

CHEMICAL COMPOSITIONS %AS PER GOST 1050-74

GRADE OF STEEL	C	Si	Mn	Cr (MAX)
15	0.12-0.19	0.17-0.37	0.35-0.65	0.25
10KΠ	0.07-0.14	0.07(MAX)	0.25-0.50	0.15
20	0.17-0.24	0.17-0.37	0.35-0.65	0.25

NOTE -

- a) CONTENTS OF SULPHUR 0.040%(MAX) & PHOSPHORUS 0.035%(MAX)
- b) RESIDUAL CONTENT OF COPPER AND NICKEL SHOULD NOT EXCEED 0.25 % EACH.

MECHANICAL PROPERTIES AS PER GOST 16523-70.

GRADE OF STEEL	TENSILE STRENGTH Kgf/mm <sup>2</sup>	RELATIVE ELONGATION % NOT LESS THAN
15	34 - 47	24
10KΠ	28 - 40	26
20	36 - 51	23

- ④ 1. MAY BE MADE OPEN-HEARTH STEEL 10Kn-4-III, 20-4-II GOST 16523-70.
- 2. DIFFERENCE IN HEIGHT OF THE LEGS AS PER 48 SHOULD NOT EXCEED 0.5mm.
- 3. SHIFT OF AXES OF HOLES φ13 AND φ4.3 FROM THE TRUE POSITION SHOULD NOT EXCEED 0.5 mm.
- 4. PRESSING MARKS ON THE SURFACE OF THE COMPONENT ARE ALLOWED.

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

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

EST. WT. (Kg) 0.195	TO BE STAMPED OR MARKED WHERE INDICATED THUS # ( LETTERS)
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ALL SHARP EDGES AND CORNERS TO BE REMOVED UNLESS OTHERWISE STATED MACHINED CORNERS TO HAVE R OUT-SIDE R INSIDE EQUIVALENT CHAMFERS ARE PERMISSIBLE.

DRN	Sd/-	MATERIAL:-	USED ON:-
CHD	Sd/-	STEEL 15-4-II	172.33.028 Cb-3
APPD	Sd/-	GOST 16523-70. O.H	
DATE	29-7-86	CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI	
SCALE:- 1:1		TITLE:-	
DIMENSIONS IN mm		BRACKET	
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS: 2102-69		D S CAT NUMBER	
ALL THREADS TO CONFORM TO		DRAWING NUMBER	
4A	23.1.06	172.33.145-2	
4	4.10.88		
ISSUE	DATE	NATURE OF AMENDMENTS	

COMMON TO T-90 & BLT  
DRG. INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE -3  
DRG. REDRAWN AND EXPLANATORY NOTE ADDED ON 31.10.90  
IRRAMANI, JTO  
24-09-05  
CCG  
2-2-15

F-60  
SIZE A2

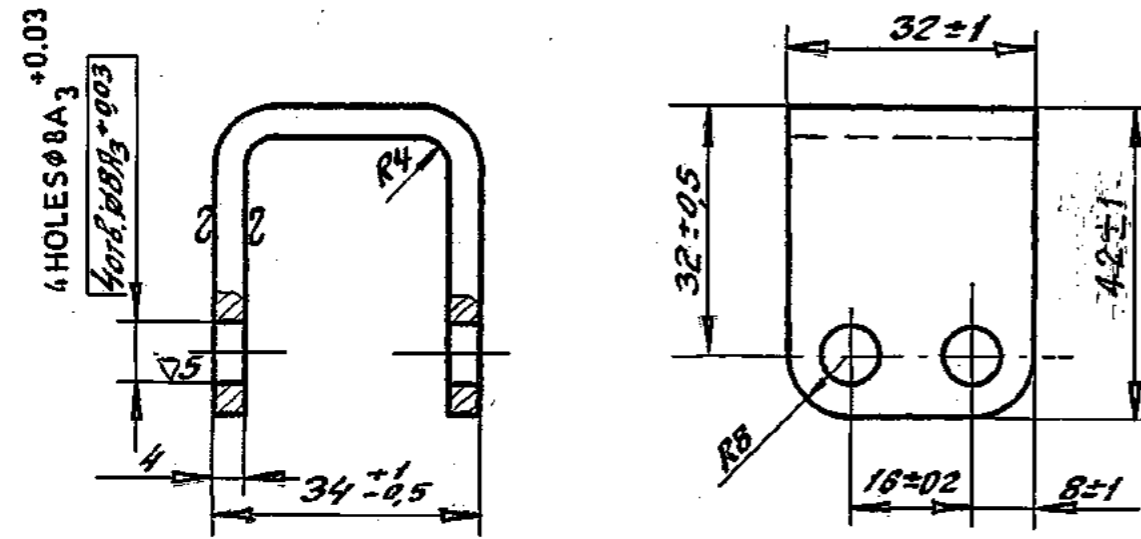




DRAWING NUMBER  
172.33.382

SHEET No. 1 OF 1

UNLESS OTHERWISE SPECIFIED Rz 630 ✓



**EXPLANATORY NOTE:-**

THE COMPONENT SHOULD BE PRODUCED FROM ROLLED SHEET OUT OF STRUCTURAL QUALITY STEEL OF GRADE '15' AND ALTERNATIVELY IT MAY BE PRODUCED FROM STEEL OF GRADE 10, 20 & 25 TO GOST 1577-70.

CHEMICAL COMPOSITION % AS PER GOST 1050-74.

GRADE OF STEEL	C	Si	Mn	Cr (MAX)
15	0.12 - 0.19	0.17 - 0.37	0.50 - 0.80	0.25
10	0.07 - 0.14	0.17 - 0.37	0.35 - 0.65	0.15
20	0.17 - 0.24	0.17 - 0.37	0.35 - 0.65	0.25
25	0.22 - 0.30	0.17 - 0.37	0.50 - 0.80	0.25

NOTE:-

- a) CONTENTS OF SULPHUR 0.040 % (MAX) & PHOSPHORUS 0.035% (MAX)
- b) RESIDUAL CONTENTS OF COPPER & NICKEL SHOULD NOT EXCEED 0.25% EACH.

MECHANICAL PROPERTIES AS PER GOST-1577-70.

GRADE OF STEEL	ULTIMATE TENSILE STRENGTH Mpa (Kgf/mm <sup>2</sup> )	ELONGATION %	IMPACT STRENGTH KCU-20 J/cm <sup>2</sup> (Kpcm/cm <sup>2</sup> )
15	372(38)	30	29 (3)
10	333(34)	32	29 (3)
20	412(42)	28	29 (3)
25	441(45)	25	---

1. MAY BE MADE FROM OPEN HEARTH STEEL GRADES 10 TO 25, GOST 1577-70.
2. ALIGNMENT OF HOLES IS TO BE CHECKED BY PASSING THROUGH CONCENTRICITY GAUGE  $\varnothing 8 \times 3$ .
3. DRAFTS AND SHRINKAGE OF EDGES ARE PERMISSIBLE.
4. PRESSING MARKS ARE ALLOWED ON THE SURFACE OF THE COMPONENT.
5. DIMENSION GIVEN IN   MAY BE MACHINED IN ASSEMBLY WITH COMPONENT 172.33.116 Cb.
6. TOLERANCE ON THE THICKNESS IS TO BE IN ACCORDANCE WITH SPECIFICATIONS  $\varnothing 520$  TTT: GOST 19903-74.

"COMMON TO T-90" & BLT  
DRAWING RE-INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE-6  
DRG. REDRAWN AND EXPLANATORY NOTE ADDED ON 23.11.90

IR. RAMANI, JTO  
20-07-05

F-60

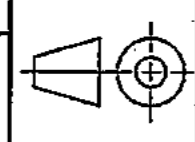
SIZE A2

7A ALT. MATL: STEEL 070M20 (En3A) TO BS 970 Part-1:1983.

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

EST. WT. (Kg) 0.11 TO BE STAMPED OR MARKED WHERE INDICATED THUS # ( LETTERS)

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

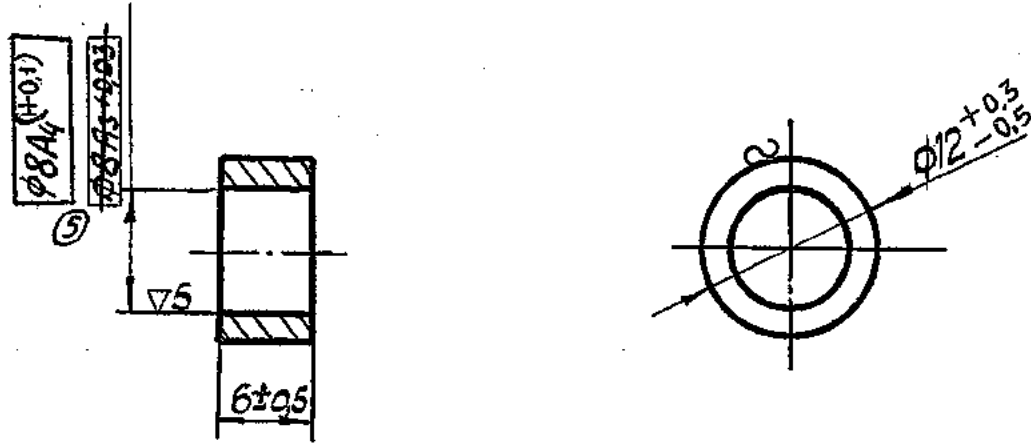
DRN	Sd/=	MATERIAL:-	USED ON:-
CHD	Sd/=	OPEN HEARTH STEEL 15	172.33.116 Cb
APPD	Sd/=	GOST 1577-70.	
DATE	29-7-86	CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI	
SCALE:-	1:1		
DIMENSIONS IN	mm		
TOLERANCE ON DIMNS	UNLESS OTHERWISE STATED IS: 2102-69	TITLE:-  BRACKET	
7A	23.1.06	AUTHY L1.No.80001/CQA/HVI/GEN Dt.30.11.05	ALL THREADS TO CONFORM TO
7	5.10.88	AMDT. LIST No.6/II BOOK-6.	D S CAT NUMBER
ISSUE	DATE	NATURE OF AMENDMENTS	DRAWING NUMBER 172.33.382



DRAWING NUMBER  
172.33.384

SHEET No. 1 OF 1

▽300mm/10HDE



**EXPLANATORY NOTE :-**

THE COMPONENT SHOULD BE PRODUCED FROM OPEN HEARTH COLD ROLLED KILLED STEEL OF GRADE 15 AND ALTERNATIVELY GRADE 20 TO SPECN. GOST 1050-74.

CHEMICAL COMPOSITION % AS PER GOST 1050-74:-

GRADE OF STEEL	C	Si	Mn	Cr (MAX)
15	0.12 - 0.19	0.17 - 0.37	0.35 - 0.65	0.25
20	0.17 - 0.24	0.17 - 0.37	0.35 - 0.65	0.25

NOTE:-

- a) CONTENTS OF SULPHUR 0.040% (MAX) & PHOSPHORUS 0.035% (MAX).
- b) RESIDUAL CONTENT OF COPPER & NICKEL SHOULD NOT EXCEED 0.25%.

MECHANICAL PROPERTIES AS PER GOST 1050-74:-

GRADE OF STEEL	YIELD POINT Kg/mm <sup>2</sup>	U T S Kg/mm <sup>2</sup>	ELONGATION %	REDUCTION OF AREA %
15	23	38	27	55
20	25	42	25	55

Ⓜ5A ALT. MATL: STEEL 070M20 (En3A) TO BS 970 Part-1:1983.

1. MAY BE MADE FROM OPEN HEARTH STEEL 20 GOST 1050-60.
2. DIMENSION IN  MAY BE MACHINED AFTER WELDING THE COMPONENT IN ASSEMBLIES 172.3.116 Cb AND 172.33.117 Cb-1.

"COMMON TO T-90" & BLT  
DRAWING RE-INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE - 5  
DRG. REDRAWN AND EXPLANATORY NOTE ADDED ON 08.12.90

IR. RAMANI, JTO  
20-07-05

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)  
0.003

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

DRN	Sd/=	MATERIAL:-	USED ON:-
CHD	Sd/=	OPEN HEARTH STEEL 15,	176.33.017 Cb
APPD	Sd/=	GOST 1050-74.	172.33.116 Cb
DATE	29-7-86	172.33.117 Cb-1	
SCALE:-	2:1	CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES)	
DIMENSIONS IN mm		AVADI	
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS: 2102-69		TITLE:-	BUSH
ALL THREADS TO CONFORM TO		D S CAT NUMBER	DRAWING NUMBER
5A	23.1.06		172.33.384
ISSUE	DATE	NATURE OF AMENDMENTS	

F-60  
SIZE A3





COMMON TO T-72 & BLT  
DRG. INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE -4

356

SUPPLY CODE

U-01-1-4

D 90209

F-103  
77

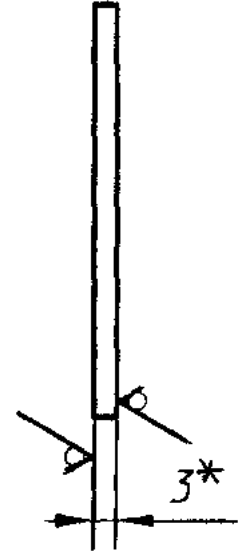
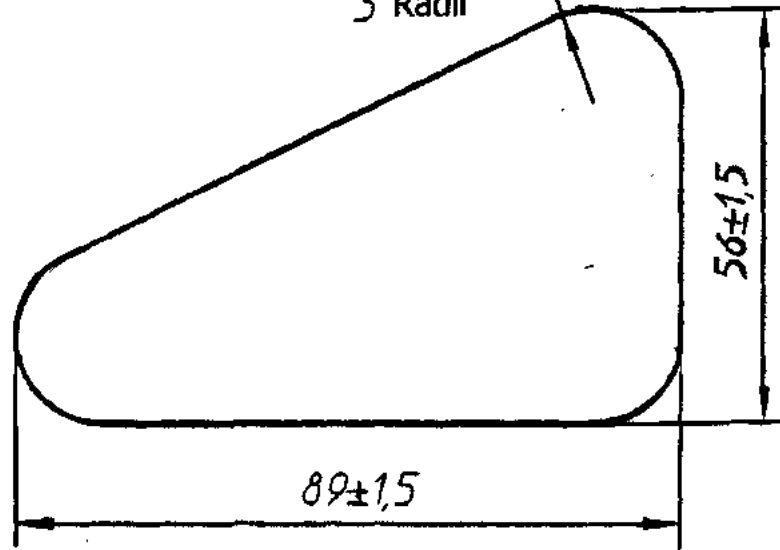
DRAWING NUMBER  
**172-2M.33.361**

SHEET No. 1 OF 1

Rz320 ✓ (✓)

R12

3 радиуса  
3 Radii



1. Материал - заменитель  
3 ГОСТ 19903-74  
лист OK360B 5-IV-Cm3cn-cb ГОСТ 16523-97

2. \* Размер для справок.

3. Остальные требования по 520 ТУ1.

1. Alternate - Material Sheet 3 GOST 19903-74

OK360B 5-IV-Cm3cn-cb GOST 16523-97

2. \* Dimension for references.

3. Other requirements as per 520.TY1.

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

		EST. WT. (Kg) 0.081	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 :- Sheet 3 GOST 19903-74 K330B 5-III-15 GOST 16523-97	USED ON :- 172.2M.33.096cbCb
ISSUE	DATE	NATURE OF AMENDMENTS	
DRN	10/09/04	SCALE :- 1 : 1	CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI
CHD	C. Ganjode	DIMENSIONS IN mm	
APPD	Chanchal	TOLERANCE ON DIMENSIONS UNLESS OTHERWISE STATED IS : 2102 - 69	TITLE :- <b>COVER PLATE</b>
DATE	10.9.04	ALL THREADS TO CONFORM TO	D S CAT NUMBER
SIZE A4			DRAWING NUMBER <b>172-2M.33.361</b>

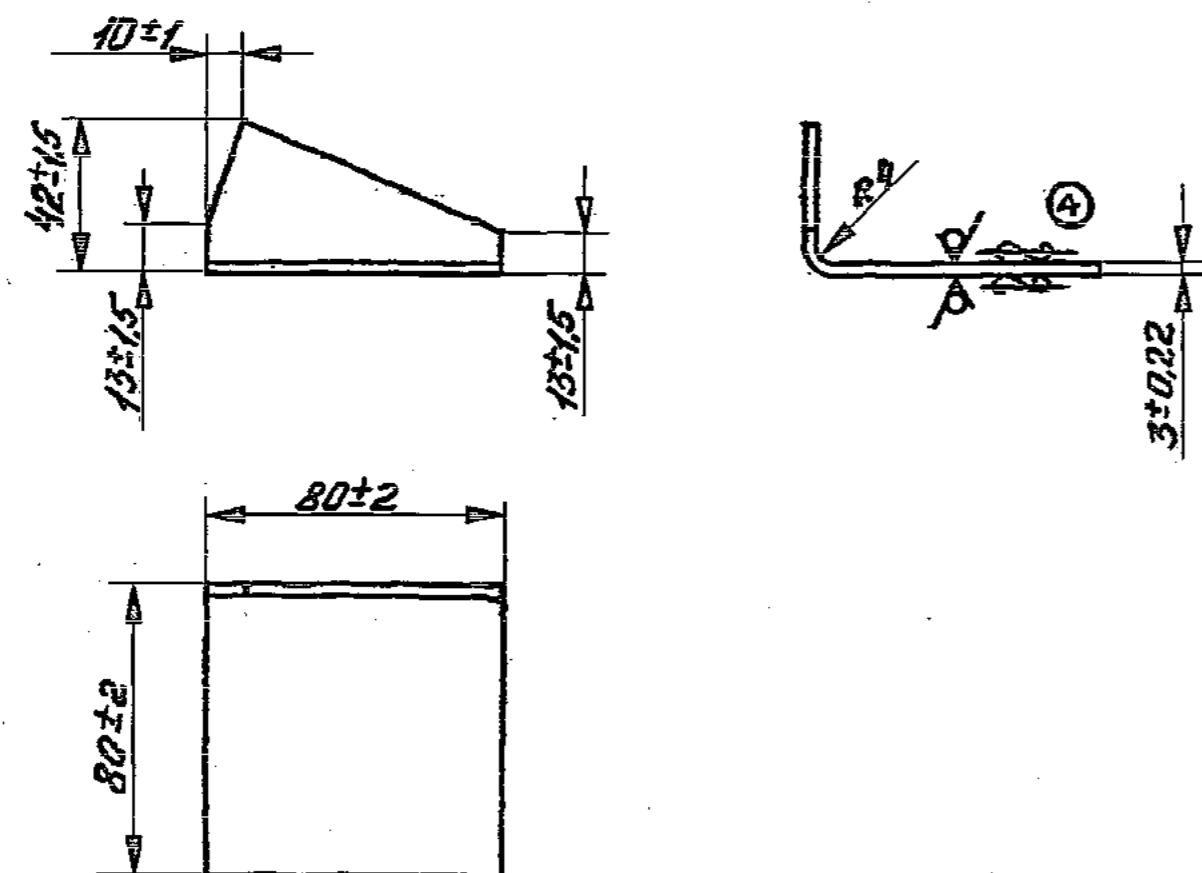


DRAWING NUMBER  
172.33.048-1

SHEET No. 1 OF 1

UNLESS OTHERWISE SPECIFIED R<sub>z</sub>320

(4) (V)



**EXPLANATORY NOTE:-**

THE COMPONENT SHOULD BE PRODUCED FROM OPEN-HEARTH COLD ROLLED QUALITY CARBON STEEL SHEET 3mm THICKNESS OF HIGH SURFACE FINISH 'II', WITH STANDARD CHARACTERISTICS CATEGORY '4' OF GRADE 15 (KILLED) TO GOST 16523-70. ALTERNATIVELY IT MAY BE PRODUCED FROM STEEL SHEET OF SUPERIOR FINISH 'II', WITH STANDARD CHARACTERISTICS CATEGORY '4', OF GRADE 10KII (RIMMED) TO GOST 16523-70. & STEEL SHEET OF HIGH SURFACE FINISH 'II' WITH STANDARD CHARACTERISTICS CATEGORY '4' OF GRADE 20 (KILLED) TO GOST 16523-70.

CHEMICAL COMPOSITIONS %AS PER GOST 1050-74.

GRADE OF STEEL	C	Si	Mn	Cr (MAX)
15	0.12-0.19	0.17-0.37	0.35-0.65	0.25
10KII	0.07-0.14	0.07(MAX)	0.25-0.50	0.15
20	0.17-0.24	0.17-0.37	0.35-0.65	0.25

NOTE:-

- a) CONTENTS OF SULPHUR 0.040%(MAX) & PHOSPHORUS 0.035%(MAX).
- b) RESIDUAL CONTENT OF COPPER AND NICKEL SHOULD NOT EXCEED 0.25% EACH.

MECHANICAL PROPERTIES AS PER GOST 16523-70.

GRADE OF STEEL	TENSILE STRENGTH Kgf/mm <sup>2</sup>	RELATIVE ELONGATION % NOT LESS THAN
15	34 - 47	25
10KII	20 - 40	28
20	36 - 51	24

- ④
1. MAY BE MADE FROM OPEN HEARTH STEEL 10Kn-4-II, 20-4-II, GOST 16523-70.
  2. ROUNDING OFF OF COMPONENT FACES TO R3 IS ALLOWED.
  3. PRESSING MARKS ARE ALLOWED.

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

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)
0.118	
ALL SHARP EDGES AND CORNERS TO BE REMOVED UNLESS OTHERWISE STATED MACHINED CORNERS TO HAVE R OUTSIDE R INSIDE EQUIVALENT CHAMFERS ARE PERMISSIBLE.	

DRN	Sd/=	MATERIAL :- OPEN HEARTH	USED ON :-
		STEEL 15-4-II	172.2M.33.005Cb
		GOST 16523-70	172.33.243CbCb ④A
APPD	Sd/=	CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES)	
DATE	15-7-86	AVADI	
SCALE:-	1:2	TITLE :-	
DIMENSIONS IN mm		PLATE COVER	
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS: 2102-69		D S CAT NUMBER	
4B	23.1.06	DRAWING NUMBER	
4A	19.4.04	172.33.048-1	
4	3.10.88		
ISSUE	DATE	NATURE OF AMENDMENTS	

\* COMMON TO T-90 & BLT  
 DRAWING RE-INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE - 3  
 DRG. REDRAWN AND EXPLANATORY NOTE ADDED ON 11.02.1991

(R. RAMANI), JTO  
 20-07-05

F-60  
SIZE A2

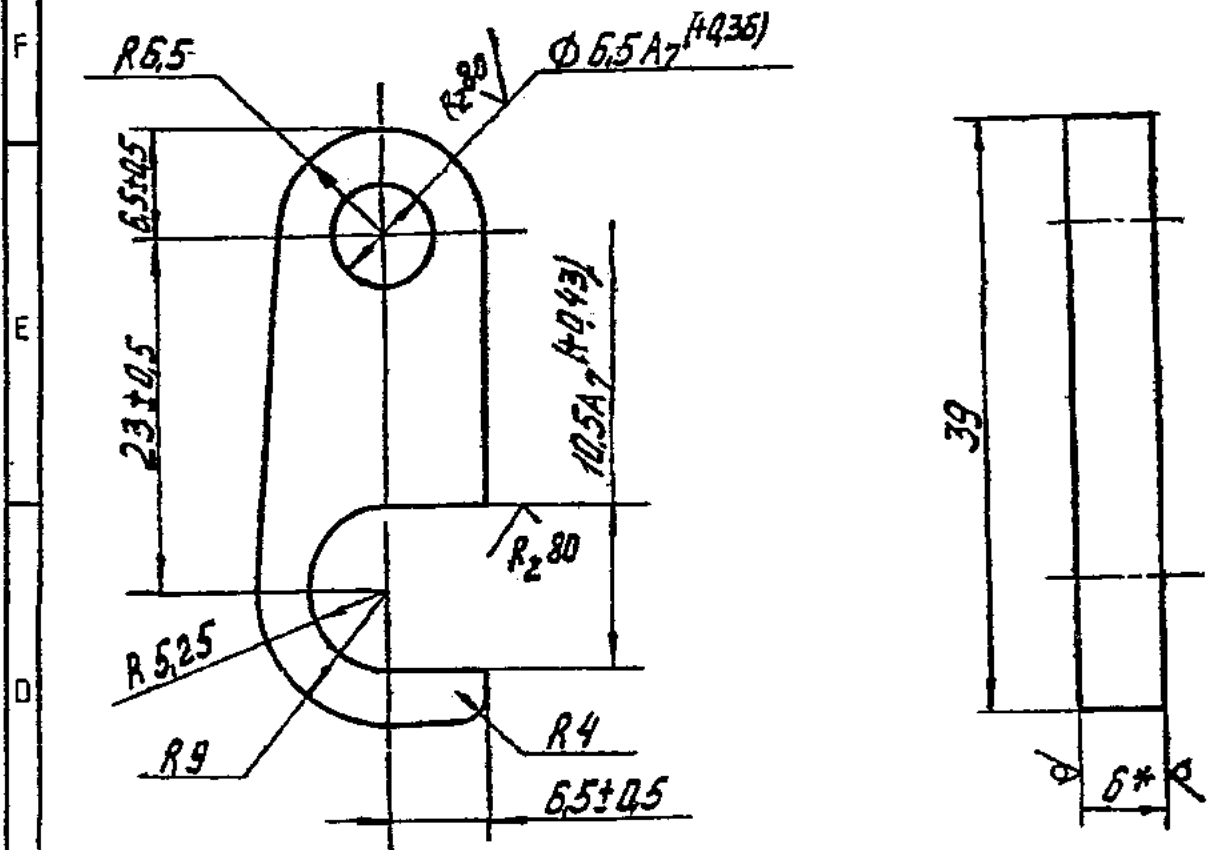






DRAWING NUMBER  
172 64 060

Rz630 (✓) (✓)



COMMON TO BLT

1. ALTERNATE MATERIAL SHEET 6 GOST 19903-74  
20 GOST 1577-70
2. DEVIATION OF THE COMPONENT FROM THE OUTLINE TEMPLET MADE TO NOMINAL DIMENSIONS SHOULD NOT EXCEED 15mm
3. REMAINING REQUIREMENTS AS PER 520 TY 1
4. \* DIMENSION FOR REFERENCE.

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

F-105  
81


		EST. WT 0,021 Kg	TO BE STAMPED OR MARKED WHERE INDICATED THUS ≡ ( LETTERS)
		ALL SHARP EDGES AND CORNERS TO BE REMOVED UNLESS OTHERWISE STATED MACHINED CORNERS TO HAVE R OUTSIDE R INSIDE EQUIVALENT CHAMFERS ARE PERMISSIBLE	
		MATERIAL - SHEET <u>6 GOST 19903-74</u> 15 GOST 1577-70	USED ON 172 64 026 Cb
ISSUE	DATE	NATURE OF AMENDMENTS	
DRN	11.08.88	SCALE - 2 1 DIMENSIONS IN mm	
CHD	11.08.88	TOLERANCE ON DIMENSIONS UNLESS OTHERWISE STATED IS 2102 -69	
TCD	11.08.88	ALL THREADS CONFORM TO	
APPO	11.08.88	DATE 05-09-88	
DATE		05-09-88	
SIZE A4		SIZE A4	
		D S CAT NUMBER	DRAWING NUMBER 172 64 060







Sl.No	Nomenclature and Drg.No.	Manufacturing Technology & Testing/ Inspection facilities required to produce the item		Must be possessed by the Vendor in his own premises (List of Plant and Machinery and Testing /Inspection facility to be submitted)	May be possessed by the Vendor in his own premises or may be Outsourced (Name and Address of sub-contractor ,list of plant and Machinery and Testing /Inspection facility to be submitted)
1	CLAMP TANK Drg.No. 155.05.715 LF No. 6206304534	Technology 1	Sheet Metal Fabrication	Shearing machine min capacity 2.0mm Thickness .	
		Technology 2	Forming	100 Ton Press for forming operation	
		Test/Inspection	Fixture /Gauges/Mandrel /templates	Firm has to develop as per Specification/Drawings.	

**Note:** If the firm is not having the above facility and able to make components with alternate methods, the details of methods to be submitted during [participation in Tender for validation and acceptance, if found suitable.

  
DGM/CA & SMS  
( M.GNANASEKARAN)

  
JWM/QA(OH)  
(S.SAKTHIVEL)

  
24/11/2023  
JWM/SMS  
(M.NAGARAJAN)

Ref : No. 6005/HVF/TA/VQC/2023-24, dated.18/11/2023

Sl.No	Nomenclature and Drg.No.	Manufacturing Technology & Testing/ Inspection facilities required to produce the item		Must be possessed by the Vendor in his own premises (List of Plant and Machinery and Testing /Inspection facility to be submitted)	May be possessed by the Vendor in his own premises or may be Outsourced (Name and Address of sub-contractor ,list of plant and Machinery and Testing /Inspection facility to be submitted)
1	CLAMP Drg.No. 175.33.378 LF No. 6206305352	Technology 1	Sheet Metal Fabrication	Shearing machine min capacity 1.5 mm Thickness .	
		Technology 2	Forming	100 Ton Press for forming operation	
		Test/Inspection	Fixture /Gauges/Mandrel /templates	Firm has to develop as per Specification/Drawings.	

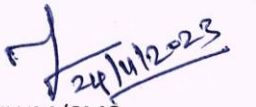
**Note:** If the firm is not having the above facility and able to make components with alternate methods, the details of methods to be submitted during [participation in Tender for validation and acceptance, if found suitable.



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Ref : No. 6005/HVF/TA/VQC/2023-24, dated.18/11/2023

Sl.No	Nomenclature and Drg.No.	Manufacturing Technology & Testing/ Inspection facilities required to produce the item		Must be possessed by the Vendor in his own premises (List of Plant and Machinery and Testing /Inspection facility to be submitted)	May be possessed by the Vendor in his own premises may be Outsourced (Name and Address of sub-contractor ,list of plant and Machinery and Testing /Inspection facility to be submitted)
1	<b>BOTTOM PLATE</b> Drg.No. 172.33.320 LF No. 6200303430	Technology 1	Sheet Metal Fabrication	Metal cutting facility for profile cutting like Laser or water jet cutting facility min. 3.0 mm thick steel plates.	
		Technology 2	Forming	100 Ton Press for forming operation	
		Test/Inspection	Fixture /Gauges/Mandrel /templates	Firm has to develop as per Specification/Drawings.	

**Note:** If the firm is not having the above facility and able to make components with alternate methods; the details of methods to be submitted during [participate in] Tender for validation and acceptance, if found suitable.

  
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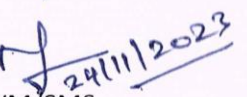


Sl.No	Nomenclature and Drg.No.	Manufacturing Technology & Testing/ Inspection facilities required to produce the item		Must be possessed by the Vendor in his own premises (List of Plant and Machinery and Testing /Inspection facility to be submitted)	May be possessed by the Vendor in his own premises or may be Outsourced (Name and Address of sub-contractor ,list of plant and Machinery and Testing /Inspection facility to be submitted)
1	BRACKET Drg.No. 172.33.145-2 LF No. 6206305424	Technology 1	Sheet Metal Fabrication	Metal cutting facility for profile cutting like Laser or water jet cutting facility min. 3.0 mm thick steel plates.	
		Technology 2	Forming	100 Ton Press for forming operation	
		Test/Inspection	Fixture /Gauges/Mandrel /templates	Firm has to develop as per Specification/Drawings.	

**Note:** If the firm is not having the above facility and able to make components with alternate methods, the details of methods to be submitted during [participation in Tender for validation and acceptance, if found suitable.


  
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1	BRACKET Drg.No. 172.33.382 LF No. 6206305443	Technology 1	Sheet Metal Fabrication	Metal cutting facility for profile cutting like Laser or water jet cutting facility min. 4.0 mm thick steel plates.	
		Technology 2	Forming	100 Ton Press for forming operation	
		Test/Inspection	Fixture /Gauges/Mandrel /templates	Firm has to develop as per Specification/Drawings.	

**Note:** If the firm is not having the above facility and able to make components with alternate methods, the details of methods to be submitted during [participation in Tender for validation and acceptance, if found suitable.

  
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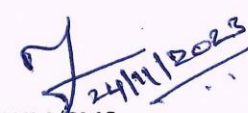
  
JWM/SMS  
(M.NAGARAJAN)

Sl.No	Nomenclature and Drg.No.	Manufacturing Technology & Testing/ Inspection facilities required to produce the item		Must be possessed by the Vendor in his own premises (List of Plant and Machinery and Testing /Inspection facility to be submitted)	May be possessed by the Vendor in his own premises or may be Outsourced (Name and Address of sub-contractor ,list of plant and Machinery and Testing /Inspection facility to be submitted)
1	BUSH Drg.No. 172.33.384 LF No. 6206305445	Technology 1	Pipe Cutting	Cutting facility for parting of pipe Min. Dia 12x2 mm thick steel pipe like power hacksaw machine.	
		Test/Inspection	Fixture /Gauges/Mandrel /templates	Firm has to develop as per Specification/Drawings.	

**Note:** If the firm is not having the above facility and able to make components with alternate methods, the details of methods to be submitted during [participation in Tender for validation and acceptance, if found suitable.

  
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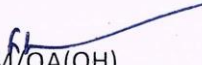



Ref : No. 6005/HVF/TA/VQC/2023-24, dated.18/11/2023

Sl.No	Nomenclature and Drg.No.	Manufacturing Technology & Testing/ Inspection facilities required to produce the item		Must be possessed by the Vendor in his own premises (List of Plant and Machinery and Testing /Inspection facility to be submitted)	May be possessed by the Vendor in his own premises or may be Outsourced (Name and Address of sub-contractor ,list of plant and Machinery and Testing /Inspection facility to be submitted)
1	<b>Support Drg.No. 172.18.026-A LF No. 6206203043</b>	Technology 1	Sheet Metal Fabrication	Metal cutting facility for profile cutting like Laser or water jet cutting facility min. 5.0 mm thick steel plates.	
		Technology 2	Forming	100 Ton Press for forming operation	
		Test/Inspection	Fixture /Gauges/Mandrel /templates	Firm has to develop as per Specification/Drawings.	

**Note:** If the firm is not having the above facility and able to make components with alternate methods, the details of methods to be submitted during [participation in Tender for validation and acceptance, if found suitable.

  
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Ref : No. 6005/HVF/TA/VQC/2023-24, dated.18/11/2023

Sl.No	Nomenclature and Drg.No.	Manufacturing Technology & Testing/ Inspection facilities required to produce the item		Must be possessed by the Vendor in his own premises (List of Plant and Machinery and Testing /Inspection facility to be submitted)	May be possessed by the Vendor in his own premises or may be Outsourced (Name and Address of sub-contractor ,list of plant and Machinery and Testing /Inspection facility to be submitted)
1	COVER PLATE Drg.No. 172.2M.33.361 LF No. 6206305175	Technology 1	Sheet Metal Fabrication	Metal cutting facility for profile cutting like Laser or water jet cutting facility min. 3.0 mm thick steel plates.	
		Test/Inspection	Fixture /Gauges/Mandrel /templates	Firm has to develop as per Specification/Drawings.	

**Note:** If the firm is not having the above facility and able to make components with alternate methods, the details of methods to be submitted during [participation in Tender for validation and acceptance, if found suitable.

  
DGM/CA & SMS  
( M.GNANASEKARAN)

  
JWM/QA(OH)  
(S.SAKTHIVEL)


  
JWM/SMS 24/11/2023  
(M.NAGARAJAN)


Ref : No. 6005/HVF/TA/VQC/2023-24, dated.18/11/2023

Sl.No	Nomenclature and Drg.No.	Manufacturing Technology & Testing/ Inspection facilities required to produce the item		Must be possessed by the Vendor in his own premises (List of Plant and Machinery and Testing /Inspection facility to be submitted)	May be possessed by the Vendor in his own premises or may be Outsourced (Name and Address of sub-contractor ,list of plant and Machinery and Testing /Inspection facility to be submitted)
1	PLATE COVER Drg.No. 172.33.048-1 LF No. 6206305420	Technology 1	Sheet Metal Fabrication	Metal cutting facility for profile cutting like Laser or water jet cutting facility min. 3.0 mm thick steel plates.	
		Technology 2	Bending	100 Ton Press for bending operation	
		Test/Inspection	Fixture /Gauges/Mandrel /templates	Firm has to develop as per Specification/Drawings.	

**Note:** If the firm is not having the above facility and able to make components with alternate methods, the details of methods to be submitted during [participation in Tender for validation and acceptance, if found suitable.

  
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JWM/SMS  
(M.NAGARAJAN)



Ref : Lr No. 6005/HVF/TA/SMS/VQC/2023-24 dtd.28/11/2023

Sl.No	Nomenclature and Drg.No.	Manufacturing Technology & Testing/ Inspection facilities required to produce the item		Must be possessed by the Vendor in his own premises (List of Plant and Machinery and Testing /Inspection facility to be submitted)	May be possessed by the Vendor in his own premises or may be Outsourced (Name and Address of sub-contractor ,list of plant and Machinery and Testing /Inspection facility to be submitted)
1	CLAMP Drg.No. 172.02.681 LF No. 6206102181	Technology 1	Sheet Metal Fabrication		Metal cutting facility for profile cutting like Laser or water jet cutting facility min. 4.0 mm thick steel plates.
		Technology 2	Forming	100 Ton Press for forming operation	
		Test/Inspection	Fixture /Gauges/Mandrel /templates	Firm has to develop as per Specification/Drawings.	

**Note:** If the firm is not having the above facility and able to make components with alternate methods, the details of methods to be submitted during [participation in Tender for validation and acceptance, if found suitable.

  
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Ref : Lr No. 6005/HVF/TA/SMS/VQC/2023-24 dtd.28/11/2023

Sl.No	Nomenclature and Drg.No.	Manufacturing Technology & Testing/ Inspection facilities required to produce the item		Must be possessed by the Vendor in his own premises (List of Plant and Machinery and Testing /Inspection facility to be submitted)	May be possessed by the Vendor in his own premises or may be Outsourced (Name and Address of sub-contractor ,list of plant and Machinery and Testing /Inspection facility to be submitted)
1	PLATE Drg.No. 172.64.060 LF No. 6206420089	Technology 1	Sheet Metal Fabrication	Metal cutting facility for profile cutting like Laser or water jet cutting facility min. 6.0 mm thick steel plates.	
		Technology 2	Drilling	Drilling Facility min. Dia 6.5 mm steel plates.	
		Test/Inspection	Fixture /Gauges/Mandrel /templates	Firm has to develop as per Specification/Drawings.	

**Note:** If the firm is not having the above facility and able to make components with alternate methods, the details of methods to be submitted during [participation in Tender for validation and acceptance, if found suitable.

  
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(S.SAKTHIVEL)

  
JWM/SMS  
(M.NAGARAJAN)  
02/12/2023



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

**FOR**

**(CLAMP TANK)**

**DRG.NO.155-05-715**

**(LF NO: 6206304534)**

**No.HVF/T-72C/QAP/05/CLAMP TANK/244286-00**

**ISSUE No: 00**

**DATE: JULY -2022**

**QUALITY ASSURANCE (RIG-OE)**

**HEAVY VEHICLES FACTORY**

**AVADI CHENNAI - 600 054**

**QUALITY ASSURANCE PLAN (QAP)**

**FOR**

**CLAMP TANK**

**DRG. NO. 155-05-715**

PREPARED BY

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

REVIEWED BY

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

APPROVED BY

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

ISSUED BY

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

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## **1.IMPORTANT NOTES**

### **Note-1**

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

### **Note –2**

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

### **Note-3**

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

### **Note-4**

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

### **Note-5**

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

## **2.INTRODUCTION**

1. This quality plan lays down the inspection and testing procedure to be carried out on the component **CLAMP TANK TO DRG.NO 155-05-715** being procured indigenously. This is prepared, based on the acceptance standards and inspection parameters laid down in collaborators documents and on the inspection test standards followed in respect of similar indigenous items.
2. This QAP is the property of Government of India and is liable for amendments as and when required. The Chief General Manager, Heavy Vehicles Factory, Avadi, Chennai – 600 054, is the inspecting Authority for this assembly. Any query / clarification on the content of this QAP shall be referred to this Factory. Any departure from these instructions is allowed only after written approval from the above authority. Notwithstanding the tests indicated in this QAP, the inspecting Officer has the right to carry out any test to check conformance to the paper particulars quoted in the Supply Order, which he may consider necessary to satisfy himself about the stores which he has to accept.

## **3. AIM**

The QAP is aimed at standardizing the Inspection procedure and acceptance norm for **CLAMP TANK TO DRG.NO:155-05-715**.

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 **CLAMP TANK TO DRG. NO. 155-05-715** including the technical requirements of the drawings. The recommended Quality Plan stipulated herein is mandatory and should be strictly adhered to.

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

#### **Note:**

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

#### **5. DOCUMENTS:**

- a) On placement of firm supply order, One set of relevant specification and technical instructions on the subject item to be obtained by the contractor from AHSP through DDO/HVF
- b) Any clarification required on these documents to be obtained from the Inspecting Authority i.e. The Chief General Manager, Heavy Vehicles Factory, Avadi, Chennai – 600 054. Equivalentents to the collaborators specifications and standards will be decided only by the Inspecting Authority and should not be unilaterally decided. For any change in the specifications, standards or written approval, any alterations in specification can be affected and not otherwise.
- c) The process instruction sheets supplied by the collaborators are available with the Authority Holding Sealed Particulars, i.e. The Controllerate of Quality Assurance (Heavy Vehicles), Avadi, Chennai for the reference. The relevant process sheets may be studied at the premises of the AHSP after obtaining necessary permission.
- d) The supplier after scrutiny of the concerned process sheets and connected paper particulars should establish the necessary production and inspection facilities.

Particularly the inspection test rigs, stands, fixtures, template, gauges etc should be provided as recommended in these process sheets. If process sheet / Process Book is not available the details particulars/parameters available in the drawings to be strictly adhered.

**6. ITEM USED ON:**

1. 172.33.225CB-2CB -
2. 172.33.231CB-2CB & Etc.,

**7. LIST OF DRAWINGS:**

SI. NO.	DRG. NO	NOMENCLATURE	REMARKS
1	155-05-715	CLAMP TANK	-

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

SI. NO	DRG. NO	NOMENCLATURE	MATERIAL SPECIFICATIONS	Qty
1	155-05-715	CLAMP TANK	OPEN HEARTH STEEL 15-4-II GOST 16523-70.	1

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

**9. CONDITIONS OF USE/STORAGE INSTRUCTIONS**

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

- (a) The threaded parts if any should be covered with suitable plastic caps to prevent damages.
- (b) If the item consists of assemblies, each assembly should be packed separately.
- (c) The stores are to be suitably covered for preventing ingress of dust and Dirt/entry of sunlight / moisture.
- (d) The packaging slip shall contains
  - (i) Certificate of testing- NABL Certificate.
  - (ii) Guarantee/ Warranty Certificate.
  - (iii) Service and maintenance instructions.
  - (iv) Delivery Slip with Inspector's Acceptance Mark.
  - (v) Undertaking and certificate of conformance. (As applicable)

(e) The stores are not permitted to be stored together with oils. Petrol, acids, alkaline and other substances to avoid damage to the metal / rubber components.

**10. SAMPLING PLAN:**

Sl. No.	Sampling Plan	Pilot *	Bulk
<b>Acceptance Test (As below)</b>			
(i)	Visual Inspection	100%	100%
(ii)	Dimensional Inspection	100%	General Inspection level III, single sampling, Normal Inspection, AQL 2.5 of IS 2500 (Part-I)-2000
(iii)	Material Inspection (Including Mechanical, Chemical and Physical properties)	1 No	1 No. or qty as specified in specification, GOST for each batch of raw material or heat treatment lot / As required for confirmation of material.
(iv)	Pressure testing	-----	-----
(v)	Machining / Fitment/ Performance trial on higher assembly / Tank	-----	-----
(vi)	Interchangeability Test	-----	-----
vii)	Calibration reports / certificate of Test stand/Jigs/Equipment/ Fixtures/Gauges/Man drels/etc.	100 %	100 %
viii)	Marking/Identification	100%	100%
ix)	Packing/ Preservation	100%	100%

**Note:-**

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

A New (First time supplier of this item) supplier should obtain clearance from HVF for bulk production which will be issued only after inspection/evaluation of pilot samples by HVF.

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

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

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

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

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

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

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

### **12.1 CLAMP TANK TO DRG.NO 155.05.715**

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

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

Material specimen /test bars of the components shall be in conformity as per the material mentioned in the relevant documents/drawing. NABL test reports for all the parameters as per relevant specifications to be submitted. Test samples to be submitted by the vendor to HVF, if required. The material check will be carried out as per sampling plan. \* However, if the manufacturer proposes any alternative material at the stage of tender enquiry, the same has to be approved and a written concurrence should be obtained from AHSP through DDO/HVF, before usage of such materials.

### **13.1 CLAMP TANK TO DRG.NO 155-05-715**

- a) The component should be manufactured from  
OPEN HEARTH STEEL 15-4-II GOST 16523-70.
- b) **Chemical properties:** As per Steel Grade 15 to GOST 16523-70 & GOST 1050-74.



GRADE OF STEEL	C O N T E N T O F E L E M E N T S %							
	C	Si	Mn	Cr	P	S	Cu	Ni
10KП	0,07-0,14	0,07 (max)	0,25-0,50	M A X I M U M				
				0,15	0,035	0,040	0,25	0,25
15	0,12-0,19	0,17-0,37	0,35-0,65	0,25	0,035	0,040	0,25	0,25
20	0,17-0,24	0,17-0,37	0,35-0,65	0,25	0,035	0,040	0,25	0,25

Note: For mass fraction of other elements refer GOST 1050-74.

c) **Mechanical properties:** As per Steel Grade 15 to GOST 16523-70.

GRADE OF STEEL	TENSILE STRENGTH Kgf/mm <sup>2</sup>	RELATIVE ELONGATION % (min)
10KП	28 - 40	25
15	34 - 47	24
20	36 - 51	23

Note: For other parameters refer GOST 16523-70.

**14) PERFORMANCES/ACCEPTANCE TEST: CLAMP TANK TO DRG.NO: 155-05-715.**

- MAY BE MANUFACTURED FROM STEEL 20-4-II, 10KП-5-IIГ GOST 16523-70 OPEN-HEARTH.
- DIMENSIONS WITH UNSPECIFIED TOLERANCES ARE NOT TO BE CHECKED.
- DIFFERENCE IN SIZE OF FLANGES SHOULD BE UPTO 3MM  
LENGTH OF STRAIGHTENED COMPONENT ≈ 42 MM.
- OTHER REQUIREMENTS AS PER 520 TY1.

**EXPLANATORY NOTE:**

MATERIAL QUOTED : STEEL 15-4-II GOST 16523-70 OPEN HEARTH

ALTERNATE MATERIAL QUOTED : OPEN HEARTH STEEL 20-4-II, 10KП-5-IIГ GOST 16523-70

OPEN HEARTH STEEL GRADES 15, 20, AND 10KП TO GOST 1050-74

4 = CATAGORY No STANDARD CHARACTERISTICS

5 = CATAGORY No

II = SUREACE FINISH ( HIGH FINISH )

Г = DEEP DRAWN

KП = RIMMED

**15) FITMENT AND PERFORMANCE TEST**

- Pilot samples should be checked for fitment and Performance test to ascertain the efficacy of the system under different operating conditions by

fitting in higher assembly and repeating it for functional checks, wherever required.

- b. Items of Bulk supplies may be subjected to performance trial in tank in case of repeated failure/defects during exploitation.

#### **16) INTERCHANGEABILITY:**

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

#### **17) CALIBRATION CHECKS**

##### **(TEST STANDS/JIGS/FIXTUERS/GAUGES/INSTRUMENTS):**

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

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

#### **18) MARKING/IDENTIFICATION.**

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

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

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

#### **19) PRESERVATION CHECK**

a) Preservative coatings are to be strictly adhered to as called for in the drawing. However, equivalent BIS Standards can also be followed, subject to the thickness of the coating/preservative is maintained as per the drawing/specification.

b) Other preservations as necessary to prevent damages due to moisture and dust during process, storage and transit are to be carried out. Conventional Methods can also be resorted to.

#### **20) PACKING CHECK**

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

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

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

## **21) DOCUMENTATION**

- i. Firm has to maintain all the documents as per QAP with respect to the Sl.No.to have traceability.
- ii. Vendor has to submit Bill of materials, Material test reports, Class 'C' /Endurance test reports (wherever specified in drawing/TY specification/QAP) and Complete PIR (pre-inspection report) at the time of offering the item for inspection. HVF will commence inspection only after scrutiny of these documents.
- iii. The testing/inspection responsibility to test all the parameters as per QAP and drawing specifications as mentioned in Annexure -A (enclosed).
- iv. Pre inspection reports (PIR) of firm like, 1. Chemical analysis (NABL Certificate), 2.Mechanical properties (NABL Certificate), 3. Pre-forming process, 4. Coating certification (Wherever applicable), 5. Calibration reports of instruments and 6. 100 % Dimensional inspection reports and other relevant reports for acceptance of the item as specified in GOST/ Specification / drawings etc.

## **22) REFERENCE:**

- a) Drawing No: 155-05-715.
- b) Material specification as per drawing:  
OPEN HEARTH STEEL 15-4-II GOST 16523-70.
- c) GOST 1050-74 & GOST 16523-70.
- d) Specification: 520.TY1.
- e) Alternate / Equivalent Material:
  1. OPEN HEARTH STEEL 10КП-5-II Г, 20-4-II GOST 16523-70.
  2. STEEL 070M20 (En 3A) TO BS 970 PART-1: 1983.

**ANNEXURE-A**

SL. NO.	CATEGORY	ASSEMBLY/ SUB ASSEMBLY	TESTS/ INSPECTION PARAMETERS	STANDARDS TO BE REFERRED	ACCEPTANCE CRITERIA	INSPECTION RESPONSIBILITY			REMARKS
						Firm	HVF	DGOA	
1	CLAMP TANK TO DRG. NO 155-05-715	Pre inspection reports (PIR) of firm	Firm has to produce all the document as per QAP	As per the relevant drawing and QAP.	Confirm to drawing and QAP as per bill of material	P	V	R	100% by firm/ vendor.
2		Bill of material (BOM)	Firm has to prepare the BOM as per QAP	Refer QAP Para no: 8 or item list	Confirm to QAP	P	V	R	100% by firm/ vendor.
3		Dimensional checks	Dimensions as per the drawing	Refer drawing / QAP Para no: 12.1	Confirm to drawing and QAP	P	W/P	R	100% by firm/ vendor SP followed by HVF.
4		Material tests	Chemical composition & Mechanical / Physical Properties	As per- GOST 1050-74 & GOST 16523-70.	All the values to confirm with QAP (Para no: 13.1 (a), (b) & (c))	P	W/V	R	100% by firm/ vendor SP followed by HVF.
5		Marking / traceability	Marking / traceability	Refer QAP Para no:18	Confirm to QAP Para no: 18	P	V	R	100% by firm/ vendor.
6		Preservation & packing	Preservation & packing	Refer QAP Para no 19 & 20	Confirm to QAP Para no 19 & 20	P	V	R	100% by firm/ vendor.

Note:

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

- One sample per heat / batch shall be tested under NABL Lab/Govt. Approved lab by firm. In case of non-compliance to standards entire lot shall be rejected or not to use in production further.
- For cross conformation of material, manufacturer has to submit test sample pieces for the items used / test slab and button for rubber items / HVF will draw samples from supplied lot for Witnessing (W) at HVF premises. In case of non-compliance to standards entire lot will be rejected.
- All other relevant tests as specified in GOST/ Specification/ Drawing is to be carried out by firm and to be confirmed.

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

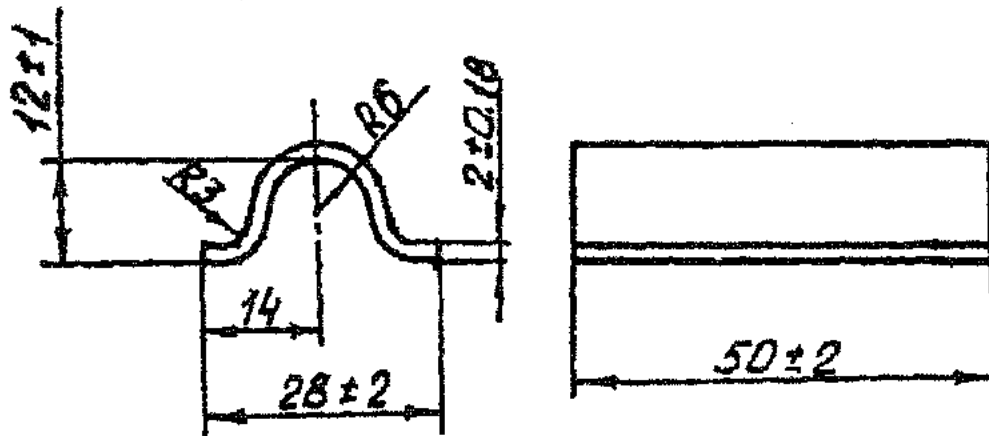


FIG: CLAMP TANK TO DRG.NO.155-05-715.  
(For reference only)



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

**FOR**

**(CLAMP)**

**DRG.NO.175-33-378**

**(LF NO: 6206305352)**

**No.HVF/T-72C/QAP/33/CLAMP/244285-00**

**ISSUE No: 00**

**DATE: JULY-2022**

**QUALITY ASSURANCE (RIG-OE)**

**HEAVY VEHICLES FACTORY**

**AVADI CHENNAI – 600 054**

**QUALITY ASSURANCE PLAN (QAP)**

**FOR**


**CLAMP**

**DRG. NO. 175-33-378**

PREPARED BY

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

REVIEWED BY

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

APPROVED BY

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

ISSUED BY

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



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## **1.IMPORTANT NOTES**

### **Note-1**

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

### **Note –2**

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

### **Note-3**

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

### **Note-4**

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

### **Note-5**

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

## **2.INTRODUCTION**

1. This quality plan lays down the inspection and testing procedure to be carried out on the component **CLAMP TO DRG.NO 175-33-378** 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 indigenious items.
2. This QAP is the property of Government of India and is liable for amendments as and when required. The Chief General Manager, Heavy Vehicles Factory, Avadi, Chennai – 600 054, is the inspecting Authority for this assembly. Any query / clarification on the content of this QAP shall be referred to this Factory. Any departure from these instructions is allowed only after written approval from the above authority. Notwithstanding the tests indicated in this QAP, the inspecting Officer has the right to carry out any test to check conformance to the paper particulars quoted in the Supply Order, which he may consider necessary to satisfy himself about the stores which he has to accept.

## **3. AIM**

The QAP is aimed at standardizing the Inspection procedure and acceptance norm for **CLAMP TO DRG.NO:175-33-378**.

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 **CLAMP TO DRG. NO. 175-33-378** including the technical requirements of the drawings. The recommended Quality Plan stipulated herein is mandatory and should be strictly adhered to.

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

#### **Note:**

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

#### **5. DOCUMENTS:**

- a) On placement of firm supply order, One set of relevant specification and technical instructions on the subject item to be obtained by the contractor from AHSP through DDO/HVF
- b) Any clarification required on these documents to be obtained from the Inspecting Authority i.e. The Chief General Manager, Heavy Vehicles Factory, Avadi, Chennai – 600 054. Equivalentents to the collaborators specifications and standards will be decided only by the Inspecting Authority and should not be unilaterally decided. For any change in the specifications, standards or written approval, any alterations in specification can be affected and not otherwise.
- c) The process instruction sheets supplied by the collaborators are available with the Authority Holding Sealed Particulars, i.e. The Controllerate of Quality Assurance (Heavy Vehicles), Avadi, Chennai for the reference. The relevant process sheets may be studied at the premises of the AHSP after obtaining necessary permission.
- d) The supplier after scrutiny of the concerned process sheets and connected paper particulars should establish the necessary production and inspection facilities.

Particularly the inspection test rigs, stands, fixtures, template, gauges etc should be provided as recommended in these process sheets. If process sheet / Process Book is not available the details particulars/parameters available in the drawings to be strictly adhered.

**6. ITEM USED ON:**

- 1. 172.33.243CBCB -
- 2. 172.33.232CB-2CB -
- 3. 172.33.224CB-2CB -
- 4. 172.2M.33.005CB -

**7. LIST OF DRAWINGS:**

SI. NO.	DRG. NO	NOMENCLATURE	REMARKS
1	175-33-378	CLAMP	-

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

SI. NO	DRG. NO	NOMENCLATURE	MATERIAL SPECIFICATIONS	Qty
1	175-33-378	CLAMP	O.H STEEL 15-4-II GOST 16523-70.	1

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

**9. CONDITIONS OF USE/STORAGE INSTRUCTIONS**

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

- (a) The threaded parts if any should be covered with suitable plastic caps to prevent damages.
- (b) If the item consists of assemblies, each assembly should be packed separately.
- (c) The stores are to be suitably covered for preventing ingress of dust and Dirt/entry of sunlight / moisture.
- (d) The packaging slip shall contains
  - (i) Certificate of testing- NABL Certificate.
  - (ii) Guarantee/ Warranty Certificate.
  - (iii) Service and maintenance instructions.
  - (iv) Delivery Slip with Inspector's Acceptance Mark.
  - (v) Undertaking and certificate of conformance. (As applicable)

- (e) The stores are not permitted to be stored together with oils. Petrol, acids, alkaline and other substances to avoid damage to the metal / rubber components.

**10. SAMPLING PLAN:**

Sl. No.	Sampling Plan	Pilot *	Bulk
<b>Acceptance Test (As below)</b>			
(i)	Visual Inspection	100%	100%
(ii)	Dimensional Inspection	100%	General Inspection level III, single sampling, Normal Inspection, AQL 2.5 of IS 2500 (Part-I)-2000
(iii)	Material Inspection (Including Mechanical, Chemical and Physical properties)	1 No	1 No. or qty as specified in specification, GOST for each batch of raw material or heat treatment lot / As required for confirmation of material.
(iv)	Pressure testing	-----	-----
(v)	Machining / Fitment/ Performance trial on higher assembly / Tank	-----	-----
(vi)	Interchangeability Test	-----	-----
vii)	Calibration reports / certificate of Test stand/Jigs/Equipment/ Fixtures/Gauges/Man drels/etc.	100 %	100 %
viii)	Marking/Identification	100%	100%
ix)	Packing/ Preservation	100%	100%

**Note:-**

- \* This clause is applicable if mentioned in supply order or project sanction order.  
 A New (First time supplier of this item) supplier should obtain clearance from HVF for bulk production which will be issued only after inspection/evaluation of pilot samples by HVF.

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

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

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

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

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

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

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

### **12.1 CLAMP TO DRG.NO 175-33-378**

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

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

Material specimen /test bars of the components shall be in conformity as per the material mentioned in the relevant documents/drawing. NABL test reports for all the parameters as per relevant specifications to be submitted. Test samples to be submitted by the vendor to HVF, if required. The material check will be carried out as per sampling plan. \* However, if the manufacturer proposes any alternative material at the stage of tender enquiry, the same has to be approved and a written concurrence should be obtained from AHSP through DDO/HVF, before usage of such materials.

### **13.1 CLAMP TO DRG.NO 175-33-378**

- a) The component should be manufactured from  
O.H STEEL 15-4-II GOST 16523-70.
- b) **Chemical properties:** As per Steel Grade 15 to GOST 16523-70 & GOST 1050-74.

CARBON = 0.12-0.19 ; SILICON = 0.17-0.37 ;

MANGANESE = 0.35-0.65 ;

CHROMIUM = 0.25 ; PHOSPHORUS = 0.035 ;

SULPHUR = 0.040 ; NICKEL = 0.25 ;

COPPER = 0.25

MAXIMUM

Note: For mass fraction of other elements refer GOST 1050-74.

c) **Mechanical properties:** As per Steel Grade 15 to GOST 16523-70.

ULTIMATE TENSILE STRENGTH  $\text{Kgf/mm}^2 = 34-47$

% ELONGATION (MIN) = 24

Note: For other parameters refer GOST 16523-70.

**14) PERFORMANCES/ACCEPTANCE TEST: CLAMP TO DRG.NO:175-33-378.**

1. THE COMPONENT MAY BE MANUFACTURED FROM OPEN HEARTH STEEL 10 K $\eta$ -5-II-Г, 20-4-II GOST 16523-70
2. CORNERS MAY BE ROUNDED OFF TO R 3 mm.

**EXPLANATORY NOTE:**

**MATERIAL QUOTED:**

OPEN HEARTH STEEL 15-4-II GOST 16523-70

15 = GRADE OF STEEL AS PER GOST 1050-74

4 = CATEGORY. STD. CHARACTERISTICS.

II = HIGH FINISH

**15) FITMENT AND PERFORMANCE TEST**

- a. Pilot samples should be checked for fitment and Performance test to ascertain the efficacy of the system under different operating conditions by fitting in higher assembly and repeating it for functional checks, wherever required.
- b. Items of Bulk supplies may be subjected to performance trial in tank in case of repeated failure/defects during exploitation.

**16) INTERCHANGEABILITY:**

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

## **17) CALIBRATION CHECKS**

### **(TEST STANDS/JIGS/FIXTURES/GAUGES/INSTRUMENTS):**

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

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

## **18) MARKING/IDENTIFICATION.**

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

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

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

## **19) PRESERVATION CHECK**

a) Preservative coatings are to be strictly adhered to as called for in the drawing. However, equivalent BIS Standards can also be followed, subject to the thickness of the coating/preservative is maintained as per the drawing/specification.

b) Other preservations as necessary to prevent damages due to moisture and dust during process, storage and transit are to be carried out. Conventional Methods can also be resorted to.

## **20) PACKING CHECK**

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

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

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

## **21) DOCUMENTATION**

- i. Firm has to maintain all the documents as per QAP with respect to the SI.No.to have traceability.
- ii. Vendor has to submit Bill of materials, Material test reports, Class 'C' /Endurance test reports (wherever specified in drawing/TY



specification/QAP) and Complete PIR (pre-inspection report) at the time of offering the item for inspection. HVF will commence inspection only after scrutiny of these documents.

- iii. The testing/inspection responsibility to test all the parameters as per QAP and drawing specifications as mentioned in Annexure -A (enclosed).
- iv. Pre inspection reports (PIR) of firm like, 1. Chemical analysis (NABL Certificate), 2. Mechanical properties (NABL Certificate), 3. Pre-forming process, 4. Coating certification (Wherever applicable), 5. Calibration reports of instruments and 6. 100 % Dimensional inspection reports and other relevant reports for acceptance of the item as specified in GOST/ Specification / drawings etc.

**22) REFERENCE:**

- a) Drawing No: 175-33-378.
- b) Material specification as per drawing:  
O.H STEEL 15-4-II GOST 16523-70.
- c) GOST 1050-74 & GOST 16523-70.
- d) Alternate / Equivalent Material:
  - 1. OPEN HEARTH STEEL 10Kn-5-II Г, 20-4-II GOST 16523-70.

SL. NO.	CATEGORY	ASSEMBLY/ SUB ASSEMBLY	TESTS/ INSPECTION PARAMETERS	STANDARDS TO BE REFERRED	ACCEPTANCE CRITERIA	INSPECTION RESPONSIBILITY			REMARKS
						Firm	HVF	DGQA	
1	CLAMP TO DRG. NO 175-33-378	Pre inspection reports (PIR) of firm	Firm has to produce all the document as per QAP	As per the relevant drawing and QAP.	Confirm to drawing and QAP as per bill of material	P	V	R	100% by firm/ vendor.
2		Bill of material (BOM)	Firm has to prepare the BOM as per QAP	Refer QAP Para no: 8 or item list.	Confirm to QAP	P	V	R	100% by firm/ vendor.
3		Dimensional checks	Dimensions as per the drawing	Refer drawing / QAP Para no: 12.1	Confirm to drawing and QAP	P	W/P	R	100% by firm/ vendor SP followed by HVF.
4		Material tests	Chemical composition & Mechanical / Physical Properties	As per- GOST 1050-74 & GOST 16523-70.	All the values to confirm with QAP (Para no: 13.1 (a), (b) & (c))	P	W/V	R	100% by firm/ vendor SP followed by HVF.
5		Marking / traceability	Marking / traceability	Refer QAP Para no:18	Confirm to QAP Para no: 18	P	V	R	100% by firm/ vendor.
6		Preservation & packing	Preservation & packing	Refer QAP Para no 19 & 20	Confirm to QAP Para no 19 & 20	P	V	R	100% by firm/ vendor.

Note:

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

- One sample per heat / batch shall be tested under NABL Lab/Govt. Approved lab by firm. In case of non-compliance to standards entire lot shall be rejected or not to use in production further.
- For cross conformation of material, manufacturer has to submit test sample pieces for the items used / test slab and button for rubber items / HVF will draw samples from supplied lot for Witnessing (W) at HVF premises. In case of non-compliance to standards entire lot will be rejected.
- All other relevant tests as specified in GOST/ Specification/ Drawing is to be carried out by firm and to be confirmed.

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

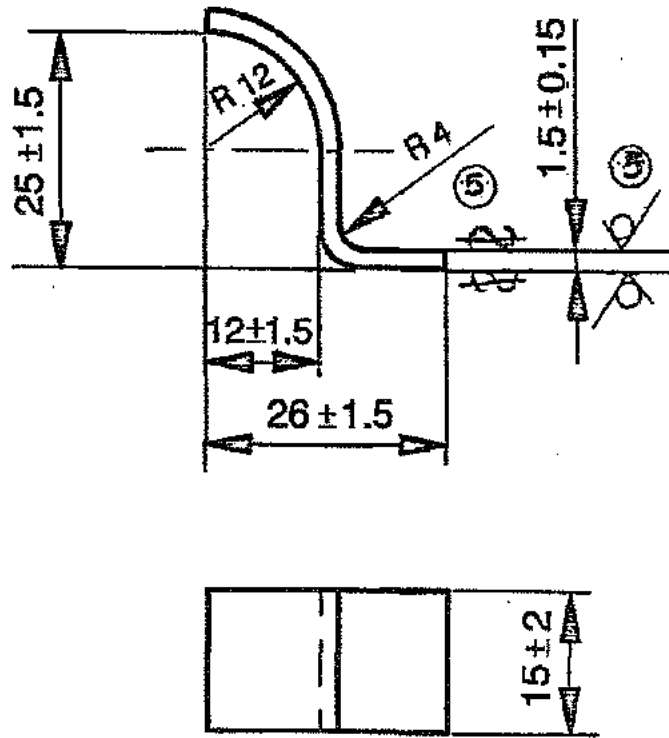


FIG: CLAMP TO DRG.NO.175-33-378.  
(For reference only)



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

**FOR**

**(BOTTOM PLATE)**

**DRG.NO.172.33.320**

**(LF NO: 6206305436)**

**No.HVF/T-72C/QAP/33/BOTTOM PLATE/243243-00**

**ISSUE No: 00**

**DATE: DEC-2021**

**QUALITY ASSURANCE (RIG-SUB ASSEMBLY)**

**HEAVY VEHICLES FACTORY**

**AVADI CHENNAI – 600 054**

**QUALITY ASSURANCE PLAN (QAP)**

**FOR**

**BOTTOM PLATE**

**DRG. NO. 172.33.320**

PREPARED BY

REVIEWED BY

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AVADI CHENNAI – 600 054

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## **1.IMPORTANT NOTE**

### **Note-1**

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

### **Note –2**

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

### **Note-3**

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

### **Note-4**

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

### **Note-5**

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

## **2.INTRODUCTION**

1. This quality plan lays down the inspection and testing procedure to be carried out on the component **BOTTOM PLATE TO DRG.NO 172.33.320** being procured indigenously. This is prepared, based on the acceptance standards and inspection parameters laid down in collaborators documents and on the inspection test standards followed in respect of similar indigenous items.
2. This QAP is the property of Government of India and is liable for amendments as and when required. The Sr. General Manager, Heavy Vehicles Factory, Avadi, Chennai – 600 054, is the inspecting Authority for this assembly. Any query / clarification on the content of this QAP shall be referred to this Factory. Any departure from these instructions is allowed only after written approval from the above authority. Notwithstanding the tests indicated in this QAP, the inspecting Officer has the right to carry out any test to check conformance to the paper particulars quoted in the Supply Order, which he may consider necessary to satisfy himself about the stores which he has to accept.

### **3. AIM**

The QAP is aimed at standardizing the Inspection procedure and acceptance norm for **BOTTOM PLATE TO DRG.NO:172.33.320**.



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 **BOTTOM PLATE TO DRG. NO. 172.33.320** including the technical requirements of the drawings. The recommended Quality Plan stipulated herein is mandatory and should be strictly adhered to.

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

#### **Note:**

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

#### **5. DOCUMENTS:**

- a) On placement of firm supply order, One set of relevant specification and technical instructions on the subject item can be obtained by the contractor from AHSP through DDO/HVF
- b) Any clarification required on these documents should be obtained from the Inspecting Authority i.e. The Sr. General Manager, Heavy Vehicles Factory, Avadi, Chennai – 600 054. Equivalentents to the collaborators specifications and standards will be decided only by the Inspecting Authority and should not be unilaterally decided. For any change in the specifications, standards or written approval, any alterations in specification can be affected and not otherwise.
- c) The process instruction sheets supplied by the collaborators are available with the Authority Holding Sealed Particulars, i.e. The Controllerate of Quality Assurance (Heavy Vehicles), Avadi, Chennai for the reference. The relevant process sheets may be studied at the premises of the AHSP after obtaining necessary permission.
- d) The supplier after scrutiny of the concerned process sheets and connected paper particulars should establish the necessary production and inspection facilities. Particularly the inspection test rigs, stands, fixtures, template, gauges etc should

be provided as recommended in these process sheets. If process sheet / Process Book is not available the details particulars/parameters available in the drawings to be strictly adhered.

**6. ITEM USED ON:**

- 1. 172.33.255CBCB -
- 2. 172.33.257CBCB -
- 3. 172.33.103CB -

**7. LIST OF DRAWINGS:**

SI. NO.	DRG. NO	NOMENCLATURE	REMARKS
1	172.33.320	BOTTOM PLATE	-

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

SI. NO	DRG. NO	NOMENCLATURE	MATERIAL SPECIFICATIONS	Qty
1	172.33.320	BOTTOM PLATE	OPEN HEARTH STEEL 15-4-II GOST 16523-70.	1

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

**9. CONDITIONS OF USE/STORAGE INSTRUCTIONS**

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

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

## 10. SAMPLING PLAN:

Sl. No.	Sampling Plan	Pilot *	Bulk
(i)	Visual Inspection	100%	100%
(ii)	Dimensional Inspection	100%	General Inspection level III, single sampling, Normal Inspection, AQL 2.5 of IS 2500 (Part-I)-2000
(iii)	Material Inspection	1 No	1 No. for each batch of raw material or heat treatment lot as required by specifications.
(iv)	Acceptance test	-----	-----
(v)	Pressure testing	-----	-----
(vi)	Machining / Fitment/ Performance trial on higher assembly / Tank	-----	-----
(vii)	Interchangeability Test	02 Nos.	02 Nos. per batch on randomly basis, except selective assembly.
(viii)	Test stand/Jigs/ Fixtures/Gauges/Man drels/etc.	100 %	100 %
(ix)	Marking/Identification	100%	100%
(x)	Packing/ Preservation	100%	100%

### Note:-

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

A New (First time supplier of this item) supplier should obtain clearance from HVF for bulk production which will be issued only after inspection/evaluation of pilot samples by HVF.

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

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

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

- Defects in construction
- Cracks/Dents/Scratches

- Fitment of all components
- Presence of foreign particles
- Moisture and dust
- Corrosion of metal parts
- Mechanical imperfections & distortion
- Any form of deterioration of material and finishing.

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

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

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

### 12.1 BOTTOM PLATE TO DRG.NO 172.33.320

All dimensions should be confirmed as per drawing.

SI. No.	Drawing Dimension
1.	23±1 mm
2.	84±1 mm
3.	38 (+1.5 / -0.5) mm
4.	3±0.22 mm
5.	R54
6.	25±1.5 mm
7.	7±1 mm
8.	Surface finish / Roughness of items should be ensured as per drawing and specification.

Refer drawing/specification for admissible alternate manufacture in dimensions/material if any specified for the component.

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

Material specimen /test bars of the components shall be in conformity as per the material mentioned in the relevant documents/drawing. NABL test reports for all the parameters as per relevant specifications to be submitted. Test samples to be submitted by the vendor to HVF, if required. The material check will be carried out as per sampling plan. \* However, if the manufacturer proposes any alternative material at the stage of tender enquiry, the same has to be approved and a written concurrence should be obtained from AHSP through DDO/HVF, before usage of such materials.

**13.1 BOTTOM PLATE TO DRG.NO 172.33.320**

- a) The component should be manufactured from  
OPEN HEARTH STEEL 15-4-II GOST 16523-70.
- b) Chemical properties: As per Steel Grade 15 to GOST 16523-70 &  
GOST 1050-74.

GRADE OF STEEL	C	Si	Mn	Cr (MAXI)
15	0.12 - 0.19	0.17 - 0.37	0.35 - 0.65	0.25
20	0.17 - 0.24	0.17 - 0.37	0.35 - 0.65	0.25

NOTE:-

- a) CONTENTS OF SULPHUR 0.040%(MAXI) & PHOSPHORUS 0.035%(MAXI).  
b) RESIDUAL CONTENT OF COPPER & NICKEL SHOULD NOT EXCEED 0.25% EACH.

Note-I: For mass fraction of other elements refer GOST 1050-74.

- c) Mechanical properties: As per Steel Grade 15 to GOST 16523-70.

GRADE OF STEEL	TENSILE STRENGTH Kgf/mm <sup>2</sup>	RELATIVE ELONGATION % NOT LESS THAN
15	34 - 47	24
20	36 - 51	23

Note: For other parameters refer GOST 16523-70.

**14) PERFORMANCES/ACCEPTANCE TEST: BOTTOM PLATE TO DRG.NO:172.33.320.**

1. IT IS ALLOWED TO MAKE OPEN HEARTH STEEL 20-4-II GOST 16523-70.
2. NON FITTING OF TEMPLATE TO THE SURFACE ALONG R 54 SHOULD NOT EXCEED 1 mm>

**EXPLANATORY NOTE :-**

THE COMPONENT SHOULD BE PRODUCED FROM OPEN-HEARTH HOT ROLLED QUALITY CARBON STEEL SHEET 3mm THICKNESS OF HIGH SURFACE FINISH ' II ' WITH STANDARD CHARACTERISTICS CATEGORY ' 4 ' OF GRADE 15 (KILLED) TO GOST 16523-70.

ALTERNATIVELY IT MAY BE PRODUCED FROM STEEL SHEET OF HIGH SURFACE FINISH ' II ' WITH STANDARD CHARACTERISTICS CATEGORY ' 4 ' OF GRADE 20 (KILLED) TO GOST 16523-70.

**15) FITMENT AND PERFORMANCE TEST**

- a. Pilot samples should be checked for fitment and Performance test to ascertain the efficacy of the system under different operating conditions by fitting in higher assembly and repeating it for functional checks, wherever required.
- b. Items of Bulk supplies may be subjected to performance trial in tank in case of repeated failure/defects during exploitation.

**16) INTERCHANGEABILITY:**

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

**17) CALIBRATION CHECKS**

**(TEST STANDS/JIGS/FIXTUERS/GAUGES/INSTRUMENTS):**

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

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

**18) MARKING/IDENTIFICATION.**

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

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

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

**19) PRESERVATION CHECK**

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

## **20) PACKING CHECK**

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

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

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

## **21) DOCUMENTATION**

- i. Firm has to maintain all the documents as per QAP with respect to the Sl.No.to have traceability.
- ii. Vendor has to submit Bill of materials, Material test reports, Class 'C' /Endurance test reports (wherever specified in drawing/TY specification/QAP) and Complete PIR (pre-inspection report)at the time of offering the item for inspection. HVF will commence inspection only after scrutiny of these documents.
- iii. The testing/inspection responsibility to test all the parameters as per QAP and drawing specifications as mentioned in Annexure -A (enclosed).
- iv. Pre inspection reports (PIR) of firm like, 1. Chemical analysis (NABL Certificate), 2.Mechanical properties (NABL Certificate), 3. Pre-forming process, 4. Coating certification (Wherever applicable), 5. Calibration reports of instruments and 6. 100 % Dimensional inspection reports.

## **22) REFERENCE:**

- a) Drawing No: 172.33.320.
- b) Material specification as per drawing:  
OPEN HEARTH STEEL 15-4-II GOST 16523-70.
- c) GOST 1050-74 & GOST 16523-70.
- d) Alternate Material:
  1. OPEN HEARTH STEEL 20-4-II GOST 16523-70.
  2. STEEL 070M20 (En 3A) TO BS 970 PART-1: 1983.

Sl. NO.	CATEGORY	ASSEMBLY/ SUB ASSEMBLY	TESTS/ INSPECTION PARAMETERS	STANDARDS TO BE REFERRED	ACCEPTANCE CRITERIA	INSPECTION RESPONSIBILITY			REMARKS
						Firm	HVF	DGQA	
1	BOTTOM PLATE TO DRG. NO 172.33.320	Pre inspection reports (PIR) of firm	Firm has to produce all the document as per QAP	As per the relevant drawing and QAP.	Confirm to drawing and QAP as per bill of material	P	V	R	100% by firm/ vendor.
2		Bill of material (BOM)	Firm has to prepare the BOM as per QAP	Refer QAP Para no: 8 or item list.	Confirm to QAP	P	V	R	100% by firm/ vendor.
3		Material tests	Chemical composition & Mechanical / Physical Properties	As per- GOST 1050-74 & GOST 16523-70.	All the values to confirm with QAP (Para no: 13.1 (a), (b) & (c))	P	W/V	R	SP followed by HVF.
4		Dimensional checks	Dimensions as per the drawing	Refer drawing / QAP Para no: 12.1	Confirm to drawing and QAP	P	W/P	R	100% by firm/ vendor. SP followed by HVF.
5		Marking / traceability	Marking / traceability	Refer QAP Para no: 18	Confirm to QAP Para no: 18	P	V	R	100% by firm/ vendor.
6		Preservation & packing	Preservation & packing	Refer QAP Para no 19 & 20	Confirm to QAP Para no 19 & 20	P	V	R	100% by firm/ vendor.

**Note:**

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

- One sample per heat / batch shall be tested under NABL Lab/Govt. Approved lab by firm. In case of non-compliance to standards entire lot shall be rejected or not to use in production further.
- For cross conformation of material, manufacturer has to submit test sample pieces for the items used / test slab and button for rubber items / HVF will draw samples from supplied lot for Witnessing (W) at HVF premises. In case of non-compliance to standards entire lot will be rejected.

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



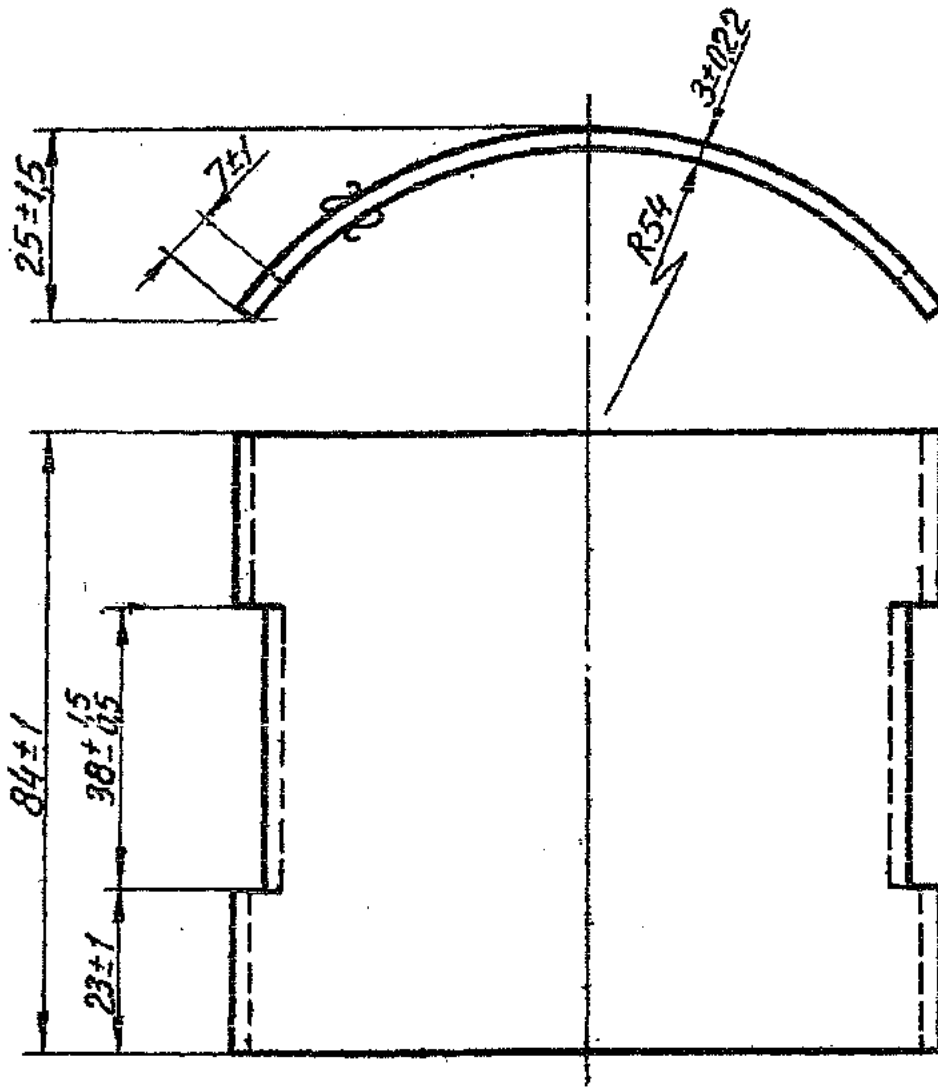


FIG: BOTTOM PLATE TO DRG.NO.172.33.320.



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

**FOR**

**(BRACKET)**

**DRG.NO.172.33.145-2**

**(LF NO: 6206305424)**

**No.HVF/T-72C/QAP/33/BRACKET/243232-00**

**ISSUE No: 00**

**DATE: DEC-2021**

**QUALITY ASSURANCE (RIG-SUB ASSEMBLY)**

**HEAVY VEHICLES FACTORY**

**AVADI CHENNAI – 600 054**


**QUALITY ASSURANCE PLAN (QAP)**

**FOR**

**BRACKET**

**DRG. NO. 172.33.145-2**

PREPARED BY

  
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JWM/QA (RIG-SA)

REVIEWED BY

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



APPROVED BY

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

ISSUED BY

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

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## **1.IMPORTANT NOTE**

### **Note-1**

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

### **Note –2**

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

### **Note-3**

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

### **Note-4**

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

### **Note-5**

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

## **2.INTRODUCTION**

1. This quality plan lays down the inspection and testing procedure to be carried out on the component **BRACKET TO DRG.NO 172.33.145-2** being procured indigenously. This is prepared, based on the acceptance standards and inspection parameters laid down in collaborators documents and on the inspection test standards followed in respect of similar indigenous items.
2. This QAP is the property of Government of India and is liable for amendments as and when required. The Sr. General Manager, Heavy Vehicles Factory, Avadi, Chennai – 600 054, is the inspecting Authority for this assembly. Any query / clarification on the content of this QAP shall be referred to this Factory. Any departure from these instructions is allowed only after written approval from the above authority. Notwithstanding the tests indicated in this QAP, the inspecting Officer has the right to carry out any test to check conformance to the paper particulars quoted in the Supply Order, which he may consider necessary to satisfy himself about the stores which he has to accept.

## **3. AIM**

The QAP is aimed at standardizing the Inspection procedure and acceptance norm for **BRACKET TO DRG.NO:172.33.145-2**.

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 **BRACKET TO DRG. NO. 172.33.145-2** including the technical requirements of the drawings. The recommended Quality Plan stipulated herein is mandatory and should be strictly adhered to.

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

#### **Note:**

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

#### **5. DOCUMENTS:**

- a) On placement of firm supply order, One set of relevant specification and technical instructions on the subject item can be obtained by the contractor from AHSP through DDO/HVF
- b) Any clarification required on these documents should be obtained from the Inspecting Authority i.e. The Sr. General Manager, Heavy Vehicles Factory, Avadi, Chennai – 600 054. Equivalentents to the collaborators specifications and standards will be decided only by the Inspecting Authority and should not be unilaterally decided. For any change in the specifications, standards or written approval, any alterations in specification can be affected and not otherwise.
- c) The process instruction sheets supplied by the collaborators are available with the Authority Holding Sealed Particulars, i.e. The Controllorate of Quality Assurance (Heavy Vehicles), Avadi, Chennai for the reference. The relevant process sheets may be studied at the premises of the AHSP after obtaining necessary permission.
- d) The supplier after scrutiny of the concerned process sheets and connected paper particulars should establish the necessary production and inspection facilities.

Particularly the inspection test rigs, stands, fixtures, template, gauges etc should be provided as recommended in these process sheets. If process sheet / Process Book is not available the details particulars/parameters available in the drawings to be strictly adhered.

**6. ITEM USED ON:**

1. 172.33.028CB-3 -

**7. LIST OF DRAWINGS:**

SI. NO.	DRG. NO	NOMENCLATURE	REMARKS
1	172.33.145-2	BRACKET	-

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

SI. NO	DRG. NO	NOMENCLATURE	MATERIAL SPECIFICATIONS	Qty
1	172.33.145-2	BRACKET	STEEL 15-4-II GOST 16523-70 OPEN HEARTH.	1

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

**9. CONDITIONS OF USE/STORAGE INSTRUCTIONS**

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

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



## 10. SAMPLING PLAN:

Sl. No.	Sampling Plan	Pilot *	Bulk
(i)	Visual Inspection	100%	100%
(ii)	Dimensional Inspection	100%	General Inspection level III, single sampling, Normal Inspection, AQL 2.5 of IS 2500 (Part-I)-2000
(iii)	Material Inspection	1 No	1 No. for each batch of raw material or heat treatment lot as required by specifications.
(iv)	Acceptance test	-----	-----
(v)	Pressure testing	-----	-----
(vi)	Machining / Fitment/ Performance trial on higher assembly / Tank	-----	-----
vii)	Interchangeability Test	02 Nos.	02 Nos. per batch on randomly basis, except selective assembly.
viii)	Test stand/Jigs/ Fixtures/Gauges/Man drels/etc.	100 %	100 %
ix)	Marking/Identification	100%	100%
x)	Packing/ Preservation	100%	100%

### **Note:-**

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

A New (First time supplier of this item) supplier should obtain clearance from HVF for bulk production which will be issued only after inspection/evaluation of pilot samples by HVF.

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

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

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

- Defects in construction
- Cracks/Dents/Scratches
- Fitment of all components

- Presence of foreign particles
- Moisture and dust
- Corrosion of metal parts
- Mechanical imperfections & distortion
- Any form of deterioration of material and finishing.

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

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

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

### 12.1 BRACKET TO DRG.NO 172.33.145-2

All dimensions should be confirmed as per drawing.

Sl. No.	Drawing Dimension
1.	$\phi 4.3A_7^{+0.3}$ mm
2.	$\phi 13A_7^{+0.43}$ mm
3.	29 $\pm$ 1 mm
4.	58 $\pm$ 1.5 mm
5.	R12.5
6.	29 $\pm$ 1 mm
7.	19°
8.	48 $\pm$ 1 mm
9.	R4
10.	58 $\pm$ 1.5 mm
11.	3 $\pm$ 0.22 mm
12.	6 (+2 / -1) mm
13.	Surface finish / Roughness of items should be ensured as per drawing and specification.

Refer drawing/specification for admissible alternate manufacture in dimensions/material if any specified for the component.

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

Material specimen /test bars of the components shall be in conformity as per the material mentioned in the relevant documents/drawing. NABL test reports for all the parameters as per relevant specifications to be submitted. Test

samples to be submitted by the vendor to HVF, if required. The material check will be carried out as per sampling plan. \* However, if the manufacturer proposes any alternative material at the stage of tender enquiry, the same has to be approved and a written concurrence should be obtained from AHSP through DDO/HVF, before usage of such materials.

**13.1 BRACKET TO DRG.NO 172.33.145-2**

a) The component should be manufactured from  
STEEL 15-4-II GOST 16523-70 OPEN HEARTH.

b) Chemical properties: As per Steel Grade 15 to GOST 16523-70 & GOST 1050-74.

GRADE OF STEEL	C	Si	Mn	Cr (MAX)
15	0.12-0.19	0.17-0.37	0.35-0.65	0.25
10KП	0.07-0.14	0.07(MAX)	0.25-0.50	0.15
20	0.17-0.24	0.17-0.37	0.35-0.65	0.25

NOTE -

- a) CONTENTS OF SULPHUR 0.040%(MAX) & PHOSPHORUS 0.035%(MAX)
- b) RESIDUAL CONTENT OF COPPER AND NICKEL SHOULD NOT EXCEED 0.25 % EACH.

Note-I: For mass fraction of other elements refer GOST 1050-74.

c) Mechanical properties: As per Steel Grade 15 to GOST 16523-70.

GRADE OF STEEL	TENSILE STRENGTH Kgf/mm <sup>2</sup>	RELATIVE ELONGATION % NOT LESS THAN
15	34 - 47	24
10KП	28 - 40	26
20	36 - 51	23

Note: For other parameters refer GOST 16523-70.

**14) PERFORMANCES/ACCEPTANCE TEST: BRACKET TO DRG.NO:172.33.145-2.**

1. MAY BE MADE OPEN - HEARTH STEEL 10Kп - 4 - III, 20 - 4 - II GOST 16523-70.
2. DIFFERENCE IN HEIGHT OF THE LEGS AS PER 48 SHOULD NOT EXCEED 0.5mm.
3. SHIFT OF AXES OF HOLES  $\phi$ 13 AND  $\phi$ 4.3 FROM THE TRUE POSITION SHOULD NOT EXCEED 0.5 mm.
4. PRESSING MARKS ON THE SURFACE OF THE COMPONENT ARE ALLOWED.

### **EXPLANATORY NOTE:**

THE COMPONENT SHOULD BE PRODUCED FROM OPEN-HEARTH HOT ROLLED QUALITY CARBON STEEL SHEET 3mm THICKNESS OF HIGH SURFACE FINISH ' II ' , WITH STANDARD CHARACTERISTICS CATEGORY '4 ' OF GRADE 15 (KILLED) TO GOST 16523-70.

ALTERNATIVELY IT MAY BE PRODUCED FROM STEEL SHEET OF SUPERIOR SURFACE FINISH ' III ' , WITH STANDARD CHARACTERISTICS CATEGORY '4 ' OF GRADE 10K11 (RIMMED) TO GOST 16523-70 OR STEEL SHEET OF HIGH SURFACE FINISH ' II ' WITH STANDARD CHARACTERISTICS CATEGORY '4 ' OF GRADE 20 (KILLED) TO GOST 16523-70.

### **15) FITMENT AND PERFORMANCE TEST**

- a. Pilot samples should be checked for fitment and Performance test to ascertain the efficacy of the system under different operating conditions by fitting in higher assembly and repeating it for functional checks, wherever required.
- b. Items of Bulk supplies may be subjected to performance trial in tank in case of repeated failure/defects during exploitation.

### **16) INTERCHANGEABILITY:**

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

### **17) CALIBRATION CHECKS**

#### **(TEST STANDS/JIGS/FIXTURES/GAUGES/INSTRUMENTS):**

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

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

### **18) MARKING/IDENTIFICATION.**

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

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

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

## **19) PRESERVATION CHECK**

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

## **20) PACKING CHECK**

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

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

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

## **21) DOCUMENTATION**

- i. Firm has to maintain all the documents as per QAP with respect to the SI.No.to have traceability.
- ii. Vendor has to submit Bill of materials, Material test reports, Class 'C' /Endurance test reports (wherever specified in drawing/TY specification/QAP) and Complete PIR (pre-inspection report)at the time of offering the item for inspection. HVF will commence inspection only after scrutiny of these documents.
- iii. The testing/inspection responsibility to test all the parameters as per QAP and drawing specifications as mentioned in Annexure -A (enclosed).
- iv. Pre inspection reports (PIR) of firm like, 1. Chemical analysis (NABL Certificate), 2.Mechanical properties (NABL Certificate), 3. Pre-forming process, 4. Coating certification (Wherever applicable), 5. Calibration reports of instruments and 6. 100 % Dimensional inspection reports.

## **22) REFERENCE:**

- a) Drawing No: 172.33.145-2.
- b) Material specification as per drawing:  
STEEL 15-4-II GOST 16523-70 OPEN HEARTH.
- c) GOST 1050-74 & GOST 16523-70.
- d) Alternate Material:
  1. OPEN HEARTH STEEL GRADES 10KП-4 III, 20-4-II GOST 16523-70.
  2. STEEL 070M20 (En 3A) TO BS 970 PART-1: 1983.

SL. NO.	CATEGORY	ASSEMBLY/ SUB ASSEMBLY	TESTS/ INSPECTION PARAMETERS	STANDARDS TO BE REFERRED	ACCEPTANCE CRITERIA	INSPECTION RESPONSIBILITY			REMARKS
						Firm	HVF	DGGA	
1	BRACKET TO DRG. NO 172.33.145-2	Pre inspection reports (PIR) of firm	Firm has to produce all the document as per QAP	As per the relevant drawing and QAP.	Confirm to drawing and QAP as per bill of material	P	V	R	100% by firm/ vendor.
2		Bill of material (BOM)	Firm has to prepare the BOM as per QAP	Refer QAP Para no: 8 or item list.	Confirm to QAP	P	V	R	100% by firm/ vendor.
3		Material tests	Chemical composition & Mechanical / Physical Properties	As per- GOST 1050-74 & GOST 16523-70.	All the values to confirm with QAP (Para no: 13.1 (a), (b) & (c))	P	WV	R	SP followed by HVF.
4		Dimensional checks	Dimensions as per the drawing	Refer drawing / QAP Para no: 12.1	Confirm to drawing and QAP	P	W/P	R	100% by firm/ vendor SP followed by HVF.
5		Marking / traceability	Marking / traceability	Refer QAP Para no: 18	Confirm to QAP Para no: 18	P	V	R	100% by firm/ vendor.
6		Preservation & packing	Preservation & packing	Refer QAP Para no 19 & 20	Confirm to QAP Para no 19 & 20	P	V	R	100% by firm/ vendor.

**Note:**

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

- One sample per heat / batch shall be tested under NABL Lab/Govt. Approved lab by firm. In case of non-compliance to standards entire lot shall be rejected or not to use in production further.
- For cross conformation of material, manufacturer has to submit test sample pieces for the items used / test slab and button for rubber items / HVF will draw samples from supplied lot for Witnessing (WV) 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**

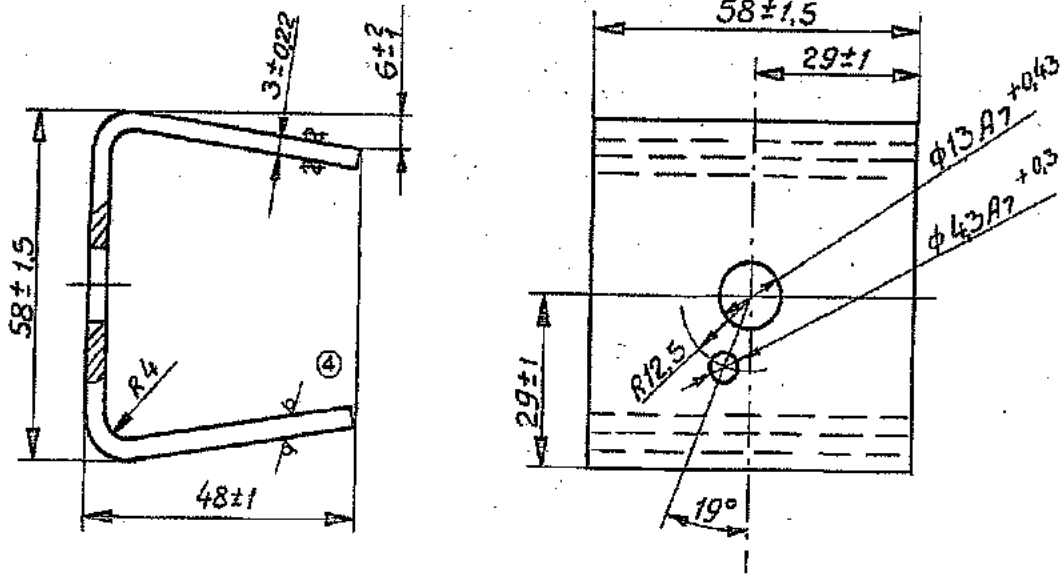


FIG: BRACKET TO DRG.NO.172.33.145-2.





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

**FOR**

**(BRACKET)**

**DRG.NO.172.33.382**

**(LF NO: 6206305443)**

**No.HVF/T-72C/QAP/33/BRACKET/243143-00**

**ISSUE No: 00**

**DATE: DEC-2021**

**QUALITY ASSURANCE (RIG-SUB ASSEMBLY)**

**HEAVY VEHICLES FACTORY**

**AVADI CHENNAI – 600 054**

**QUALITY ASSURANCE PLAN (QAP)**

**FOR**

**BRACKET**

**DRG. NO. 172.33.382**

PREPARED BY

REVIEWED BY

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ISSUED BY

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AVADI CHENNAI – 600 054

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## **1.IMPORTANT NOTE**

### **Note-1**

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

### **Note –2**

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

### **Note-3**

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

### **Note-4**

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

### **Note-5**

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

## **2.INTRODUCTION**

1. This quality plan lays down the inspection and testing procedure to be carried out on the component **BRACKET TO DRG.NO 172.33.382** being procured indigenously. This is prepared, based on the acceptance standards and inspection parameters laid down in collaborators documents and on the inspection test standards followed in respect of similar indigenous items.
2. This QAP is the property of Government of India and is liable for amendments as and when required. The Sr. General Manager, Heavy Vehicles Factory, Avadi, Chennai – 600 054, is the inspecting Authority for this assembly. Any query / clarification on the content of this QAP shall be referred to this Factory. Any departure from these instructions is allowed only after written approval from the above authority. Notwithstanding the tests indicated in this QAP, the inspecting Officer has the right to carry out any test to check conformance to the paper particulars quoted in the Supply Order, which he may consider necessary to satisfy himself about the stores which he has to accept.

## **3.AIM**

The QAP is aimed at standardizing the Inspection procedure and acceptance norm for **BRACKET TO DRG.NO:172.33.382**.

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 **BRACKET TO DRG. NO. 172.33.382** including the technical requirements of the drawings. The recommended Quality Plan stipulated herein is mandatory and should be strictly adhered to.

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

#### **Note:**

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

#### **5. DOCUMENTS:**

- a) On placement of firm supply order, One set of relevant specification and technical instructions on the subject item can be obtained by the contractor from AHSP through DDO/HVF
- b) Any clarification required on these documents should be obtained from the Inspecting Authority i.e. The Sr. General Manager, Heavy Vehicles Factory, Avadi, Chennai – 600 054. Equivalent to the collaborators specifications and standards will be decided only by the Inspecting Authority and should not be unilaterally decided. For any change in the specifications, standards or written approval, any alterations in specification can be affected and not otherwise.
- c) The process instruction sheets supplied by the collaborators are available with the Authority Holding Sealed Particulars, i.e. The Controllerate of Quality Assurance (Heavy Vehicles), Avadi, Chennai for the reference. The relevant process sheets may be studied at the premises of the AHSP after obtaining necessary permission.
- d) The supplier after scrutiny of the concerned process sheets and connected paper particulars should establish the necessary production and inspection facilities. Particularly the inspection test rigs, stands, fixtures, template, gauges etc should

be provided as recommended in these process sheets. If process sheet / Process Book is not available the details particulars/parameters available in the drawings to be strictly adhered.

**6. ITEM USED ON:**

1. 172.33.116CB -

**7. LIST OF DRAWINGS:**

SI. NO.	DRG. NO	NOMENCLATURE	REMARKS
1	172.33.382	BRACKET	-

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

SI. NO	DRG. NO	NOMENCLATURE	MATERIAL SPECIFICATIONS	Qty
1	172.33.382	BRACKET	OPEN HEARTH STEEL 15 GOST 1577-70.	1

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

**9. CONDITIONS OF USE/STORAGE INSTRUCTIONS**

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

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

**10. SAMPLING PLAN:**

Sl. No.	Sampling Plan	Pilot *	Bulk
(i)	Visual Inspection	100%	100%
(ii)	Dimensional Inspection	100%	General Inspection level III, single sampling, Normal Inspection, AQL 2.5 of IS 2500 (Part-I)-2000
(iii)	Material Inspection	1 No	1 No. for each batch of raw material or heat treatment lot as required by specifications.
(iv)	Acceptance test	-----	-----
(v)	Pressure testing	-----	-----
(vi)	Machining / Fitment/ Performance trial on higher assembly / Tank	-----	1 no.per batch/ as required
vii)	Interchangeability Test	02 Nos.	02 Nos. per batch on randomly basis, except selective assembly.
viii)	Test stand/Jigs/ Fixtures/Gauges/Man dreis/etc.	100 %	100 %
ix)	Marking/Identification	100%	100%
x)	Packing/ Preservation	100%	100%

**Note:-**

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

A New (First time supplier of this item) supplier should obtain clearance from HVF for bulk production which will be issued only after inspection/evaluation of pilot samples by HVF.

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

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

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

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

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

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

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

**12.1 BRACKET TO DRG.NO 172.33.382**

All dimensions should be confirmed as per drawing.

Sl. No.	Drawing Dimension
1.	8±1 mm
2.	16±0.2 mm
3.	R8
4.	32±0.5 mm
5.	32±1 mm
6.	42±1 mm
7.	34 (+1 / -0.5) mm
8.	4 mm
9.	R4
10.	φ8A <sub>3</sub> (+0.03) mm (4 holes)
11.	Surface finish / Roughness of items should be ensured as per drawing and specification.

Refer drawing/specification for admissible alternate manufacture in dimensions/material if any specified for the component.

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

Material specimen /test bars of the components shall be in conformity as per the material mentioned in the relevant documents/drawing. NABL test reports for all the parameters as per relevant specifications to be submitted. Test samples to be submitted by the vendor to HVF, if required. The material check will be carried out as per sampling plan. \* However, if the manufacturer proposes any alternative material at the stage of tender enquiry, the same has to be approved and a written concurrence should be obtained from AHSP through DDO/HVF, before usage of such materials.

**13.1 BRACKET TO DRG.NO 172.33.382**

a) The component should be manufactured from OPEN HEARTH STEEL 15 GOST 1577-70.

b) **Chemical properties:** As per STEEL 15 GOST 1577-70 and GOST 1050-74.



GRADE OF STEEL	C	Si	Mn	Cr (MAX)
15	0.12 - 0.19	0.17 - 0.37	0.50 - 0.80	0.25
10	0.07 - 0.14	0.17 - 0.37	0.35 - 0.65	0.15
20	0.17 - 0.24	0.17 - 0.37	0.35 - 0.65	0.25
25	0.22 - 0.30	0.17 - 0.37	0.50 - 0.80	0.25

NOTE:-

a) CONTENTS OF SULPHUR 0.040 % (MAX) & PHOSPHORUS 0.035%(MAX)

b) RESIDUAL CONTENTS OF COPPER & NICKEL SHOULD NOT EXCEED 0.25%.EACH.


Note-I: For mass fraction of other elements refer GOST 1050-74

c) Mechanical properties: As per STEEL 15 GOST 1577-70.

GRADE OF STEEL	ULTIMATE TENSILE STRENGTH Mpa (Kgf/mm <sup>2</sup> )	ELONGATION %	IMPACT STRENGTH KCU-20 J/cm <sup>2</sup> (Kgcm/cm <sup>2</sup> )
	M I N I M U M		
15	372(38)	30	29 (3)
10	333(34)	32	29 (3)
20	412(42)	28	29(3)
25	441(45)	25	---

Note: For other parameters refer GOST 1577-70.

#### 14) PERFORMANCES / ACCEPTANCE TEST: BRACKET TO DRG.NO:172.33.382

- MAY BE MADE FROM OPEN HEARTH STEEL GRADES 10 TO 25, GOST 1577-70.
- ALIGNMENT OF HOLES IS TO BE CHECKED BY PASSING THROUGH CONCENTRICITY GAUGE  $\varnothing 8 \times 3$ .
- DRAFTS AND SHRINKAGE OF EDGES ARE PERMISSIBLE.
- PRESSING MARKS ARE ALLOWED ON THE SURFACE OF THE COMPONENT.
- DIMENSION GIVEN IN  MAY BE MACHINED IN ASSEMBLY WITH COMPONENT 172.33.116 Cb.
- TOLERANCE ON THE THICKNESS IS TO BE IN ACCORDANCE WITH SPECIFICATIONS GOST 19903-74.

**15) FITMENT AND PERFORMANCE TEST:**

- a. Pilot samples should be checked for fitment and Performance test to ascertain the efficacy of the system under different operating conditions by fitting in higher assembly and repeating it for functional checks, wherever required.
- b. Items of Bulk supplies may be subjected to performance trial in tank in case of repeated failure/defects during exploitation.

**16) INTERCHANGEABILITY:**

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

**17) CALIBRATION CHECKS**

**(TEST STANDS/JIGS/FIXTUERS/GAUGES/INSTRUMENTS):**

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

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

**18) MARKING/IDENTIFICATION.**

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

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

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

**19) PRESERVATION CHECK**

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

## **20) PACKING CHECK**

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

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

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

## **21) DOCUMENTATION**

- i. Firm has to maintain all the documents as per QAP with respect to the Sl.No.to have traceability.
- ii. Vendor has to submit Bill of materials, Material test reports, Class 'C' /Endurance test reports (wherever specified in drawing/TY specification/QAP) and Complete PIR (pre-inspection report)at the time of offering the item for inspection. HVF will commence inspection only after scrutiny of these documents.
- iii. The testing/inspection responsibility to test all the parameters as per QAP and drawing specifications as mentioned in Annexure -A (enclosed).
- iv. Pre inspection reports (PIR) of firm like, 1. Chemical analysis (NABL Certificate), 2.Mechanical properties (NABL Certificate), 3. Pre-forming process, 4. Coating certification (Wherever applicable), 5. Calibration reports of instruments and 6. 100 % Dimensional inspection reports.

## **22) REFERENCE:**

- a) Drawing No: 172.33.382 & 172.33.116CB.
- b) Material specification as per drawing:  
OPEN HEARTH STEEL 15 GOST 1577- 70.
- c) GOST 1577-70, GOST 19903-74 & GOST 1050-74.
- d) Alternate material:
  - a. OPEN- HEARTH STEEL GRADES FROM 10 TO 25 GOST 1577-70.

SL. NO.	CATEGORY	ASSEMBLY/ SUB ASSEMBLY	TESTS/ INSPECTION PARAMETERS	STANDARDS TO BE REFERRED	ACCEPTANCE CRITERIA	INSPECTION RESPONSIBILITY			REMARKS
						Firm	HVF	DGQA	
1	BRACKET TO DRG. NO 172.33.382	Pre inspection reports (PIR) of firm	Firm has to produce all the document as per QAP	As per the relevant drawing and QAP.	Confirm to drawing and QAP as per bill of material	P	V	R	100% by firm/ vendor.
2		Bill of material (BOM)	Firm has to prepare the BOM as per QAP	Refer QAP Para no: 8 or item list.	Confirm to QAP	P	V	R	100% by firm/ vendor.
3		Material tests	Chemical composition & Mechanical / Physical Properties	As per- GOST 1577-70 & 1050-74.	All the values to confirm with QAP (Para no: 13.1 (a), (b) & (c).	P	W/V	R	SP followed by HVF.
4		Dimensional checks	Dimensions as per the drawing	Refer drawing / QAP Para no: 12.1	Confirm to drawing and QAP	P	W/P	R	100% by firm/ vendor SP followed by HVF.
5		Marking / traceability	Marking / traceability	Refer QAP Para no:18	Confirm to QAP Para no: 18	P	V	R	100% by firm/ vendor.
6		Preservation & packing	Preservation & packing	Refer QAP Para no 19 & 20	Confirm to QAP Para no 19 & 20	P	V	R	100% by firm/ vendor.

**Note:**

- For conformity of the items (Chemical/Physical/Mechanical properties).
- One sample per heat / batch shall be tested under NABL Lab/Govt. Approved lab by firm. In case of non-compliance to standards entire lot shall be rejected or not to use in production further.
  - For cross conformation of material, manufacturer has to submit test sample pieces for the items used / test slab and button for rubber items / HVF will draw samples from supplied lot for Witnessing (W) at HVF premises. In case of non-compliance to standards entire lot will be rejected.

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

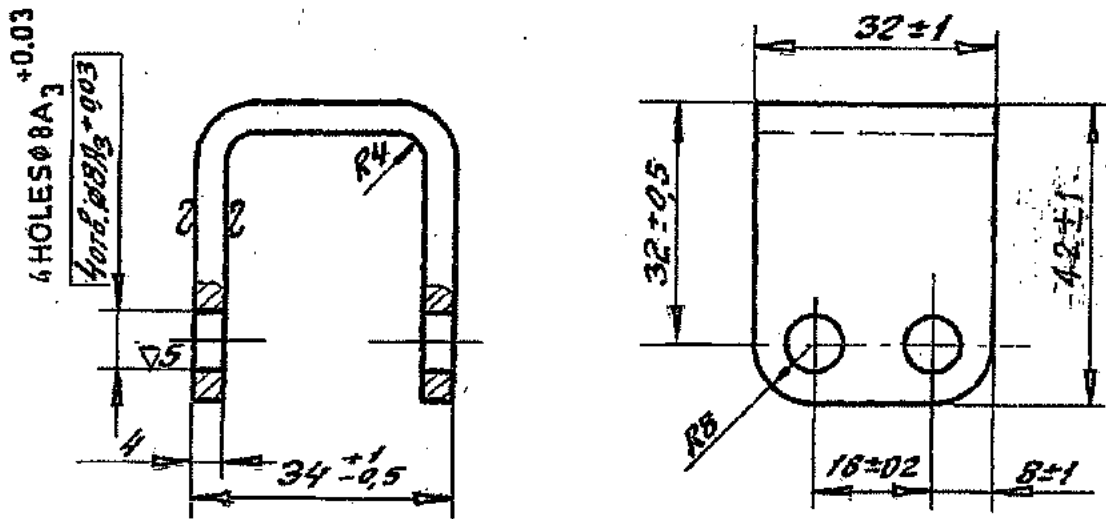


FIG: BRACKET TO DRG.NO.172.33.382.



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

**FOR**

**(BUSH)**

**DRG.NO.172.33.384**

**(LF NO: 6206305445)**

**No: HVF/T-72C/QAP/33/BUSH/243227- 00**

**ISSUE No: 00**

**DATE: DEC – 2021**

**QUALITY ASSURANCE (RIG-SUB ASSEMBLY)**

**HEAVY VEHICLES FACTORY**

**AVADI CHENNAI – 600 054**

**QUALITY ASSURANCE PLAN (QAP)**

**FOR**

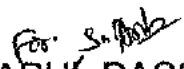
**BUSH**

**DRG. NO. 172.33.384**

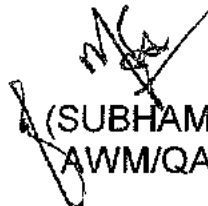
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AVADI CHENNAI – 600 054



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## **1.IMPORTANT NOTE**

### **Note-1**

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

### **Note –2**

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

### **Note-3**

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

### **Note-4**

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

### **Note-5**

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

## **2.INTRODUCTION**

1. This quality plan lays down the inspection and testing procedure to be carried out on the component **BUSH TO DRG.NO 172.33.384** being procured indigenously. This is prepared, based on the acceptance standards and inspection parameters laid down in collaborators documents and on the inspection test standards followed in respect of similar indigenous items.
2. This QAP is the property of Government of India and is liable for amendments as and when required. The Sr. General Manager, Heavy Vehicles Factory, Avadi, Chennai – 600 054, is the inspecting Authority for this assembly. Any query / clarification on the content of this QAP shall be referred to this Factory. Any departure from these instructions is allowed only after written approval from the above authority. Notwithstanding the tests indicated in this QAP, the inspecting Officer has the right to carry out any test to check conformance to the paper particulars quoted in the Supply Order, which he may consider necessary to satisfy himself about the stores which he has to accept.

## **3.AIM**

The QAP is aimed at standardizing the Inspection procedure and acceptance norm for **BUSH TO DRG.NO: 172.33.384**

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 **BUSH TO DRG. NO. 172.33.384** including the technical requirements of the drawings. The recommended Quality Plan stipulated herein is mandatory and should be strictly adhered to.

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

#### **Note:**

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

#### **5. DOCUMENTS:**

- a) On placement of firm supply order, One set of relevant specification and technical instructions on the subject item can be obtained by the contractor from AHSP through DDO/HVF.
- b) Any clarification required on these documents should be obtained from the Inspecting Authority i.e. The Sr. General Manager, Heavy Vehicles Factory, Avadi, Chennai – 600 054. Equivalent to the collaborators specifications and standards will be decided only by the Inspecting Authority and should not be unilaterally decided. For any change in the specifications, standards or written approval, any alterations in specification can be affected and not otherwise.
- c) The process instruction sheets supplied by the collaborators are available with the Authority Holding Sealed Particulars, i.e. The Controllerate of Quality Assurance (Heavy Vehicles), Avadi, Chennai for the reference. The relevant process sheets may be studied at the premises of the AHSP after obtaining necessary permission.
- d) The supplier after scrutiny of the concerned process sheets and connected paper particulars should establish the necessary production and inspection facilities. Particularly the inspection test rigs, stands, fixtures, template, gauges

etc should be provided as recommended in these process sheets. If process sheet / Process Book is not available the details particulars/parameters available in the drawings to be strictly adhered.

**6. ITEM USED ON:**

- 1. 176.33.017CB -
- 2. 172.33.116CB -
- 3. 172.33.117CB-1 -

**7. LIST OF DRAWINGS:**

SI. NO.	DRG. NO	NOMENCLATURE	REMARKS
1	172.33.384	BUSH	-

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

SI. NO	DRG. NO	NOMENCLATURE	MATERIAL SPECIFICATIONS	Qty
1	172.33.384	BUSH	OPEN HEARTH STEEL 15 GOST 1050-74.	1

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

**9. CONDITIONS OF USE/STORAGE INSTRUCTIONS**

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

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

## 10. SAMPLING PLAN :

Sl. No.	Sampling Plan	Pilot *	Bulk
(i)	Visual Inspection	100%	100%
(ii)	Dimensional Inspection	100%	General Inspection level III, single sampling, Normal Inspection, AQL 2.5 of IS 2500 (Part-I)-2000
(iii)	Material Inspection	1 No	1 No. for each batch of raw material or heat treatment lot as required by specifications.
(iv)	Acceptance test	-----	-----
(v)	Pressure testing	-----	-----
(vi)	Machining / Fitment / Performance trial on higher assembly / Tank	-----	-----
vii)	Interchangeability Test	02 Nos.	02 Nos. per batch on randomly basis, except selective assembly.
viii)	Test stand/Jigs/ Fixtures/Gauges/Man drels/etc.	100 %	100 %
ix)	Marking/Identification	100%	100%
x)	Packing/ Preservation	100%	100%

### Note:-

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

A New (First time supplier of this item) supplier should obtain clearance from HVF for bulk production which will be issued only after inspection/evaluation of pilot samples by HVF.

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

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

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

- Defects in construction
- Cracks/Dents/Scratches
- Fitment of all components
- Presence of foreign particles

- Moisture and dust
- Corrosion of metal parts
- Mechanical imperfections & distortion
- Any form of deterioration of material and finishing.

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

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

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

### 12.1 BUSH TO DRG.NO 172.33.384

All dimensions should be confirmed as per drawing.

Sl. No.	Drawing Dimensions
1.	6±0.5 mm
2.	Φ12 (+0.3 / -0.5) mm
3.	Φ8A <sub>4</sub> <sup>(+0.1)</sup>
4.	Surface finish / Roughness should be ensured as per drawing and specification.

Refer drawing / specification for admissible alternate manufacture in dimensions/material if any specified for the component.

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

Material specimen / test bars of the components shall be in conformity as per the material mentioned in the relevant documents/drawing. NABL test reports for all the parameters as per relevant specifications to be submitted. Test samples to be submitted by the vendor to HVF, if required. The material check will be carried out as per sampling plan. \*However, if the manufacturer proposes any alternative material at the stage of tender enquiry, the same has to be approved and a written concurrence should be obtained from AHSP through DDO/HVF, before usage of such materials.

### 13.1 BUSH TO DRG.NO 172.33.384

a) The component should be manufactured from OPEN HEARTH STEEL 15 GOST 1050-74.

b) **Chemical properties:** As per Steel 15 to GOST 1050-74.

GRADE OF STEEL	C	Si	Mn	Cr (MAX)
15	0.12 - 0.19	0.17 - 0.37	0.35 - 0.65	0.25
20	0.17 - 0.24	0.17 - 0.37	0.35 - 0.65	0.25

NOTE:-

- a) CONTENTS OF SULPHUR 0.040% (MAX) & PHOSPHORUS 0.035% (MAX).  
b) RESIDUAL CONTENT OF COPPER & NICKEL SHOULD NOT EXCEED 0.25%.

Note: For mass fraction of other elements refer GOST 1050-74.

c) Mechanical properties: As per Steel 15 to GOST 1050-74.

GRADE OF STEEL	YIELD POINT Kg/mm <sup>2</sup>	U T S Kg/mm <sup>2</sup>	ELONGATION %	REDUCTION OF AREA %
	MINIMUM			
15	23	38	27	55
20	25	42	25	55

Note: For other parameters refer GOST 1050-74.

d) Hardness: As per Steel 15 to GOST 1050-74.

For details refer

OPEN HEARTH STEEL 15 GOST 1050-74.

#### 14) PERFORMANCES/ACCEPTANCE TEST: BUSH TO DRG.NO 172.33.384

- MAY BE MADE FROM OPEN HEARTH STEEL 20 GOST 1050-60.
- DIMENSION IN  MAY BE MACHINED AFTER WELDING THE COMPONENT IN ASSEMBLIES 172.3.116 Cb AND 172.33.117 Cb-1.

#### EXPLANATORY NOTE :-

THE COMPONENT SHOULD BE PRODUCED FROM OPEN HEARTH COLD ROLLED KILLED STEEL OF GRADE 15 AND ALTERNATIVELY GRADE 20 TO SPECN. GOST 1050-74.

#### 15) FITMENT AND PERFORMANCE TEST:

- Pilot samples should be checked for fitment and Performance test to ascertain the efficacy of the system under different operating conditions by

fitting in higher assembly and repeating it for functional checks, wherever required.

- b. Items of Bulk supplies may be subjected to performance trial in tank in case of repeated failure/defects during exploitation.

#### **16) 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 as per sampling plan.

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

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

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

#### **18) MARKING / IDENTIFICATION.**

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

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

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

#### **19) PRESERVATION CHECK**

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



## **20) PACKING CHECK**

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

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

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

## **21) DOCUMENTATION**

- i. Firm has to maintain all the documents as per QAP with respect to the SI.No.to have traceability.
- ii. Vendor has to submit Bill of materials, Material test reports, Class 'C' /Endurance test reports (wherever specified in drawing/TY specification/QAP) and Complete PIR (pre-inspection report)at the time of offering the item for inspection. HVF will commence inspection only after scrutiny of these documents.
- iii. The testing/inspection responsibility to test all the parameters as per QAP and drawing specifications as mentioned in Annexure -A (enclosed).
- iv. Pre inspection reports (PIR) of firm like, 1. Chemical analysis (NABL Certificate), 2.Mechanical properties (NABL Certificate), 3. Pre-forming process, 4. Coating certification, 5. Calibration reports of instruments and 6. Dimensional inspection reports.

## **22) REFERENCE:**

- a) Drawing 172.33.384, 172.33.116CB & 172.33.117CB-1.
- b) Material specification as per drawing  
OPEN HEARTH STEEL 15 GOST 1050-74.
- c) GOST 1050-74.
- d) Alternate material:
  1. OPEN HEARTH STEEL GRADE 20 GOST 1050-60.
  2. STEEL 070M20 (En 3A) TO BS 970 PART-1: 1983.

Sl. NO.	CATEGORY	ASSEMBLY/ SUB ASSEMBLY	TESTS/ INSPECTION PARAMETERS	STANDARDS TO BE REFERRED	ACCEPTANCE CRITERIA	INSPECTION RESPONSIBILITY			REMARKS
						Firm	HVF	DGQA	
1	BUSH TO DRG. NO 172.33.384.	Pre inspection reports (PIR) of firm	Firm has to produce all the document as per Para 21 (iv)	As per the relevant drawing and QAP.	Confirm to drawing and QAP as per bill of material	P	V	R	100% by firm/ vendor.
2		Bill of material (BOM)	Firm has to prepare the BOM as per QAP	Refer QAP Para no: 8 or item list.	Confirm to QAP.	P	V	R	100% by firm/ vendor.
3		Material tests	Chemical composition & Mechanical / Physical Properties	As per-GOST 1050-74.	All the values to confirm with QAP ( Para no:13.1 (a),(b),(c) & (d))	P	WV	R	Sampling plan followed by HVF
4		Hardness check	Hardness	Refer drawing / QAP Para no: 13.1 (d)	Confirm to QAP Para no: 13.1 (d)	P	WV	R	Sampling plan followed by HVF
5		Dimensional checks	Dimensions as per the drawing	Refer drawing / QAP Para no: 12.1	Conform to drawing and QAP	P	W/P	R	100% by firm/ vendor. Sampling plan followed by HVF
6		Marking / traceability	Firm has to make marking / traceability records.	Refer QAP Para no: 18	Confirm to QAP Para no: 18	P	V	R	100% by firm/ vendor.
7		Preservation & packing	Firm has to make Preservation & packing records	Refer QAP Para no: 19 & 20	Confirm to QAP Para no: 19 & 20	P	V	R	100% by firm/ vendor.

**Note:**

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

- One sample per heat / batch shall be tested under NABL Lab/Govt. Approved lab by firm. In case of non-compliance to standards entire lot shall be rejected or not to use in production further.
- For cross conformation of material, manufacturer has to submit test sample pieces for the items used / test slab and button for rubber items / HVF will draw samples from supplied lot for Witnessing (WV) 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

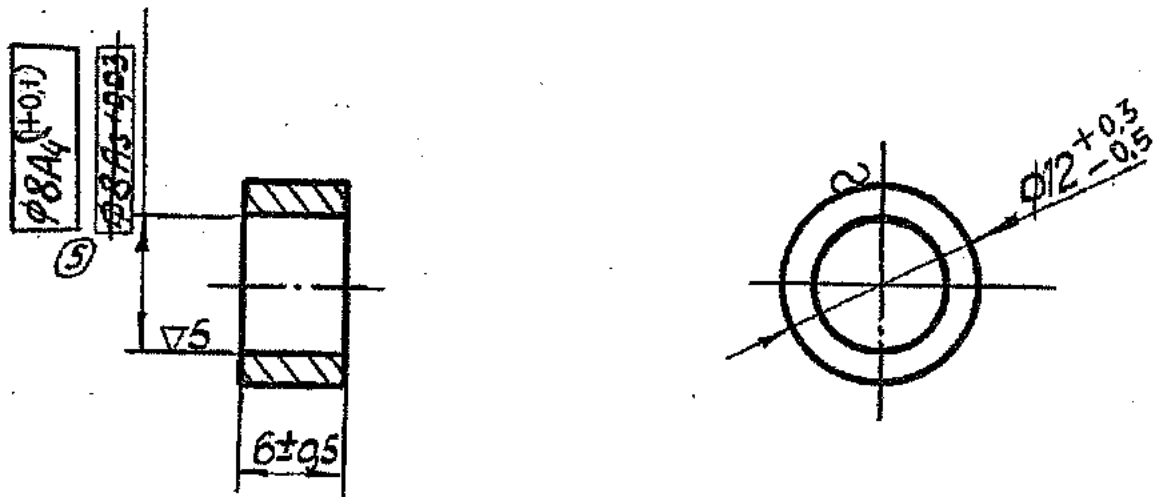


FIG: BUSH TO DRG. NO 172.33.384



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

**FOR**

**(SUPPORT)**

**DRG.NO.172.18.026-A**

**(LF NO: 6206203043)**

**No.HVF/T-72/QAP/18/SUPPORT/243022-00**

**ISSUE No: 00**

**DATE: DEC-2021**

**QUALITY ASSURANCE (RIG-SUB ASSEMBLY)**

**HEAVY VEHICLES FACTORY**

**AVADI CHENNAI – 600 054**

**QUALITY ASSURANCE PLAN (QAP)**

**FOR**

**SUPPORT**

**DRG. NO. 172.18.026-A**

PREPARED BY

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

REVIEWED BY

  
(SITA RAMAYYA MVSS)  
JWM/QA (RIG-SA /SASO)

APPROVED BY

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

ISSUED BY

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

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## **1.IMPORTANT NOTE**

### **Note-1**

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

### **Note –2**

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

### **Note-3**

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

### **Note-4**

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

### **Note-5**

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

## **2.INTRODUCTION**

1. This quality plan lays down the inspection and testing procedure to be carried out on the component **SUPPORT TO DRG.NO 172.18.026-A** being procured indigenously. This is prepared, based on the acceptance standards and inspection parameters laid down in collaborators documents and on the inspection test standards followed in respect of similar indigenous items.
2. This QAP is the property of Government of India and is liable for amendments as and when required. The Sr. General Manager, Heavy Vehicles Factory, Avadi, Chennai – 600 054, is the inspecting Authority for this assembly. Any query / clarification on the content of this QAP shall be referred to this Factory. Any departure from these instructions is allowed only after written approval from the above authority. Notwithstanding the tests indicated in this QAP, the inspecting Officer has the right to carry out any test to check conformance to the paper particulars quoted in the Supply Order, which he may consider necessary to satisfy himself about the stores which he has to accept.

## **3.AIM**

The QAP is aimed at standardizing the Inspection procedure and acceptance norm for **SUPPORT TO DRG.NO:172.18.026-A**.



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 **SUPPORT TO DRG. NO. 172.18.026-A** including the technical requirements of the drawings. The recommended Quality Plan stipulated herein is mandatory and should be strictly adhered to.

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

#### **Note:**

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

#### **5. DOCUMENTS:**

- a) On placement of firm supply order, One set of relevant specification and technical instructions on the subject item can be obtained by the contractor from AHSP through DDO/HVF
- b) Any clarification required on these documents should be obtained from the Inspecting Authority i.e. The Sr. General Manager, Heavy Vehicles Factory, Avadi, Chennai – 600 054. Equivalentents to the collaborators specifications and standards will be decided only by the Inspecting Authority and should not be unilaterally decided. For any change in the specifications, standards or written approval, any alterations in specification can be affected and not otherwise.
- c) The process instruction sheets supplied by the collaborators are available with the Authority Holding Sealed Particulars, i.e. The Controllerate of Quality Assurance (Heavy Vehicles), Avadi, Chennai for the reference. The relevant process sheets may be studied at the premises of the AHSP after obtaining necessary permission.
- d) The supplier after scrutiny of the concerned process sheets and connected paper particulars should establish the necessary production and inspection facilities. Particularly the inspection test rigs, stands, fixtures, template, gauges etc should

be provided as recommended in these process sheets. If process sheet / Process Book is not available the details particulars/parameters available in the drawings to be strictly adhered.

**6. ITEM USED ON:**

-----

**7. LIST OF DRAWINGS:**

SI. NO.	DRG. NO	NOMENCLATURE	REMARKS
1	172.18.026-A	SUPPORT	-

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

SI. NO	DRG. NO	NOMENCLATURE	MATERIAL SPECIFICATIONS	Qty
1	172.18.026-A	SUPPORT	OPEN HEARTH STEEL 15 GOST 1577-70.	1

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

**9. CONDITIONS OF USE/STORAGE INSTRUCTIONS**

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

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

**10. SAMPLING PLAN:**

Sl. No.	Sampling Plan	Pilot *	Bulk
(i)	Visual Inspection	100%	100%
(ii)	Dimensional Inspection	100%	General Inspection level III, single sampling, Normal Inspection, AQL 2.5 of IS 2500 (Part-I)-2000
(iii)	Material Inspection	1 No	1 No. for each batch of raw material or heat treatment lot as required by specifications.
(iv)	Acceptance test	-----	-----
(v)	Pressure testing	-----	-----
(vi)	Machining / Fitment/ Performance trial on higher assembly / Tank	-----	-----
vii)	Interchangeability Test	02 Nos.	02 Nos. per batch on randomly basis, except selective assembly.
viii)	Test stand/Jigs/ Fixtures/Gauges/Man drels/etc.	100 %	100 %
ix)	Marking/Identification	100%	100%
x)	Packing/ Preservation	100%	100%

**Note:-**

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

A New (First time supplier of this item) supplier should obtain clearance from HVF for bulk production which will be issued only after inspection/evaluation of pilot samples by HVF.

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

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

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

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

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

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

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

**12.1 SUPPORT TO DRG.NO 172.18.026-A**

All dimensions should be confirmed as per drawing.

Sl. No.	Drawing Dimension
1.	266 mm
2.	240 mm
3.	180±2 mm
4.	155 mm
5.	72 mm
6.	78 (+2 / -1) mm
7.	30°
8.	Φ40A <sub>8</sub> <sup>(+1)</sup> mm
9.	45 <sup>+2</sup> mm
10.	80 <sup>+2</sup> mm
11.	40 ± 1.5
12.	17.5 mm
13.	34±1.5 mm
14.	R22.5 mm
15.	R11.5
16.	10.5 <sup>+0.5</sup> mm
17.	56.5 mm
18.	23 (+1 / -0.5)
19.	113 (+2 / -1) mm
20.	163° 40'
21.	R10 max
22.	5
23.	Surface finish / Roughness of items should be ensured as per drawing and specification.

Refer drawing/specification for admissible alternate manufacture in dimensions/material if any specified for the component.

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

Material specimen /test bars of the components shall be in conformity as per the material mentioned in the relevant documents/drawing. NABL test reports for all the parameters as per relevant specifications to be submitted. Test samples to be submitted by the vendor to HVF, if required. The material check will be carried out as per sampling plan. \* However, if the manufacturer proposes any alternative material at the stage of tender enquiry, the same has to be approved and a written concurrence should be obtained from AHSP through DDO/HVF, before usage of such materials.

**13.1 SUPPORT TO DRG.NO 172.18.026-A**

a) The component should be manufactured from OPEN HEARTH STEEL 15 GOST 1577-70.

b) **Chemical properties:** As per STEEL 15 GOST 1577-70 and GOST 1050-74.

CONTENT OF ELEMENTS%							
C	Si	Mn	Cr	Ni	S	P	Cu
MAX							
0.12 to 0.19	0.17 to 0.37	0.35 to 0.65	0.25	0.25	0.040	0.035	0.25

Note: For mass Fraction of other elements refer GOST 1050-74.

c) **Mechanical properties:** As per STEEL 15 GOST 1577-70.

For details refer

OPEN HEARTH STEEL 15 GOST 1577-70.

**14) PERFORMANCES / ACCEPTANCE TEST: SUPPORT TO DRG.NO:172.18.026-A**

1. It may be manufactured from open-hearth steel: 10, 20 and 25 Gost 1577-70 and 09C-2A-12 Gost 19281-73.
2. Drafts and shrinkage of edges are permissible.
3. Deviation from template, constructed as per nominal size, should not exceed 1.5 mm
4. Dimensions of 30° chamfer of holes Ø40 and 80X 45 and location of edges are not to be checked after bending.
5. Natural thinning of metal, after banding, is allowed.
6. Tolerance on thickness as per Gost 19903-74.

**15) FITMENT AND PERFORMANCE TEST:**

- a. Pilot samples should be checked for fitment and Performance test to ascertain the efficacy of the system under different operating conditions by fitting in higher assembly and repeating it for functional checks, wherever required.
- b. Items of Bulk supplies may be subjected to performance trial in tank in case of repeated failure/defects during exploitation.

**16) INTERCHANGEABILITY:**

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

**17) CALIBRATION CHECKS**

**(TEST STANDS/JIGS/FIXTUERS/GAUGES/INSTRUMENTS):**

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

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

**18) MARKING/IDENTIFICATION.**

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

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

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

**19) PRESERVATION CHECK**

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

## **20) PACKING CHECK**

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

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

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

## **21) DOCUMENTATION**

- i. Firm has to maintain all the documents as per QAP with respect to the SI.No.to have traceability.
- ii. Vendor has to submit Bill of materials, Material test reports, Class 'C' /Endurance test reports (wherever specified in drawing/TY specification/QAP) and Complete PIR (pre-inspection report)at the time of offering the item for inspection. HVF will commence inspection only after scrutiny of these documents.
- iii. The testing/inspection responsibility to test all the parameters as per QAP and drawing specifications as mentioned in Annexure -A (enclosed).
- iv. Pre inspection reports (PIR) of firm like, 1. Chemical analysis (NABL Certificate), 2.Mechanical properties (NABL Certificate), 3. Pre-forming process, 4. Coating certification (Wherever applicable), 5. Calibration reports of instruments and 6. 100 % Dimensional inspection reports.

## **22) REFERENCE:**

- a) Drawing No: 172.18.026-A.
- b) Material specification as per drawing:  
OPEN HEARTH STEEL 15 GOST 1577- 70.
- c) GOST 1577-70, GOST 19903-74 & GOST 1050-74.
- d) Alternate material:
  1. OPEN HEARTH STEEL 10,20 and 25 GOST 1577-70 and 09Г2Д-12 GOST 19281-73.
  2. STEEL HR 15 to BS 1449:1983.

**ANNEXURE-A**

SL. NO.	CATEGORY	ASSEMBLY/ SUB ASSEMBLY	TESTS/ INSPECTION PARAMETERS	STANDARDS TO BE REFERRED	ACCEPTANCE CRITERIA	INSPECTION RESPONSIBILITY			REMARKS
						Firm	HVF	DGOA	
1	SUPPORT TO DRG. NO 172.18.026-A	Pre inspection reports (PIR) of firm	Firm has to produce all the document as per QAP	As per the relevant drawing and QAP.	Confirm to drawing and QAP as per bill of material	P	V	R	100% by firm/ vendor.
2		Bill of material (BOM)	Firm has to prepare the BOM as per QAP	Refer QAP Para no: 8 or Item list.	Confirm to QAP	P	V	R	100% by firm/ vendor.
3		Material tests	Chemical composition & Mechanical / Physical Properties	As per- GOST 1577-70 & 1050-74.	All the values to confirm with QAP (Para no: 13.1 (a), (b) & (c).	P	W/V	R	SP followed by HVF.
4		Dimensional checks	Dimensions as per the drawing	Refer drawing / QAP Para no: 12.1	Confirm to drawing and QAP	P	W/P	R	100% by firm/ vendor SP followed by HVF.
5		Marking / traceability	Marking / traceability	Refer QAP Para no:18	Confirm to QAP Para no: 18	P	V	R	100% by firm/ vendor.
6		Preservation & packing	Preservation & packing	Refer QAP Para no 19 & 20	Confirm to QAP Para no 19 & 20	P	V	R	100% by firm/ vendor.

**Note:**

- For conformity of the items (Chemical/Physical/Mechanical properties).
- One sample per heat / batch shall be tested under NABL Lab/Govt. Approved lab by firm. In case of non-compliance to standards entire lot shall be rejected or not to use in production further.
  - For cross conformation of material, manufacturer has to submit test sample pieces for the items used / test slab and button for rubber items / HVF will draw samples from supplied lot for Witnessing (W) at HVF premises. In case of non-compliance to standards entire lot will be rejected.

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



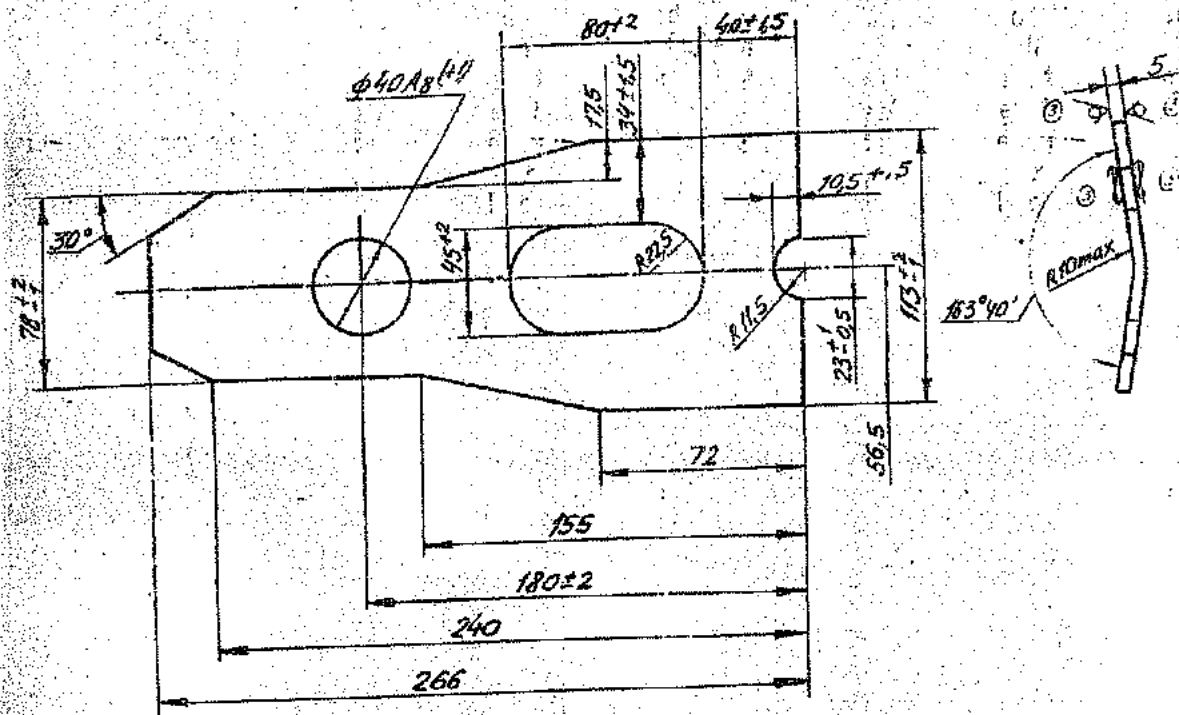


FIG: SUPPORT TO DRG.NO.172.18.026-A.



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

**FOR**

**(COVER PLATE)**

**DRG.NO.172.2M.33.361**

**(LF NO: 6206305175)**

**No.HVF/T-72C/QAP/COVER PLATE/243314-00**

**ISSUE No:00**

**DATE:DEC-2021**

**QUALITY ASSURANCE (RIG-SUB ASSEMBLY)**

**HEAVY VEHICLES FACTORY**

**AVADI CHENNAI – 600 054**

**QUALITY ASSURANCE PLAN (QAP)**

**FOR**

**COVER PLATE**

**DRG. NO. 172.2M.33.361**

PREPARED BY

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JWM/QA (RIG-SA)

*Rohini*

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*H. Hanumantha Rao Golla*  
(HANUMANTHA RAO GOLLA)  
JWM/QA (RIG-SA /TA)

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ISSUED BY

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

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## **1.IMPORTANT NOTE**

### **Note-1**

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

### **Note –2**

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

### **Note-3**

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

### **Note-4**

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

### **Note-5**

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

## **2.INTRODUCTION**

1. This quality plan lays down the inspection and testing procedure to be carried out on the component **COVER PLATE TO DRG.NO 172.2M.33.361** being procured indigenously. This is prepared, based on the acceptance standards and inspection parameters laid down in collaborators documents and on the inspection test standards followed in respect of similar indigenous items.
2. This QAP is the property of Government of India and is liable for amendments as and when required. The Sr. General Manager, Heavy Vehicles Factory, Avadi, Chennai – 600 054, is the inspecting Authority for this assembly. Any query / clarification on the content of this QAP shall be referred to this Factory. Any departure from these instructions is allowed only after written approval from the above authority. Notwithstanding the tests indicated in this QAP, the inspecting Officer has the right to carry out any test to check conformance to the paper particulars quoted in the Supply Order, which he may consider necessary to satisfy himself about the stores which he has to accept.

## **3.AIM**

The QAP is aimed at standardizing the Inspection procedure and acceptance norm for **COVER PLATE TO DRG.NO:172.2M.33.361**.

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 **COVER PLATE TO DRG. NO. 172.2M.33.361** including the technical requirements of the drawings. The recommended Quality Plan stipulated herein is mandatory and should be strictly adhered to.

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

#### **Note:**

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

#### **5. DOCUMENTS:**

- a) On placement of firm supply order, One set of relevant specification and technical instructions on the subject item can be obtained by the contractor from AHSP through DDO/HVF
- b) Any clarification required on these documents should be obtained from the Inspecting Authority i.e. The Sr. General Manager, Heavy Vehicles Factory, Avadi, Chennai – 600 054. Equivalentents to the collaborators specifications and standards will be decided only by the Inspecting Authority and should not be unilaterally decided. For any change in the specifications, standards or written approval, any alterations in specification can be affected and not otherwise.
- c) The process instruction sheets supplied by the collaborators are available with the Authority Holding Sealed Particulars, i.e. The Controllerate of Quality Assurance (Heavy Vehicles), Avadi, Chennai for the reference. The relevant process sheets may be studied at the premises of the AHSP after obtaining necessary permission.

- d) The supplier after scrutiny of the concerned process sheets and connected paper particulars should establish the necessary production and inspection facilities. Particularly the inspection test rigs, stands, fixtures, template, gauges etc should be provided as recommended in these process sheets. If process sheet / Process Book is not available the details particulars/parameters available in the drawings to be strictly adhered.

**6. ITEM USED ON:**

- 1) 172.2M.33.096CBCB -

**7. LIST OF DRAWINGS:**

SI. NO.	DRG. NO	NOMENCLATURE	REMARKS
1	172.2M.33.361	COVER PLATE	-

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

SI. NO	DRG. NO	NOMENCLATURE	MATERIAL SPECIFICATIONS	Qty
1	172.2M.33.361	COVER PLATE	SHEET 3 GOST 19903-74 K330B 5-III-15 GOST 16523-97	1

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

**9. CONDITIONS OF USE/STORAGE INSTRUCTIONS**

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

- (a) The threaded parts if any should be covered with suitable plastic caps to prevent damages.
- (b) If the item consists of assemblies, each assembly should be packed separately.
- (c) The stores are to be suitably covered for preventing ingress of dust and Dirt/entry of sunlight / moisture.
- (d) The packaging slip shall contains
  - (i) Certificate of testing- NABL Certificate.
  - (ii) Guarantee/ Warranty Certificate.
  - (iii) Service and maintenance instructions.
  - (iv) Delivery Slip with Inspector's Acceptance Mark.
  - (v) Undertaking letter / 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.

#### **10. SAMPLING PLAN:**

Sl. No.	Sampling Plan	Pilot*	Bulk
(i)	Visual Inspection	100%	100%
(ii)	Dimensional Inspection	100%	General Inspection level III, single sampling, Normal Inspection, AQL 2.5 of IS 2500 (Part-I)-2000
(iii)	Material Inspection	1 No	1 No. for each batch of raw material or heat treatment lot as required by specifications.
(iv)	Acceptance test	-----	-----
(v)	Pressure testing	-----	-----
(vi)	Machining / Fitment/ Performance trial on higher assembly / Tank	-----	-----
vii)	Interchangeability Test	02 Nos.	02 Nos. per batch on randomly basis, except selective assembly.
viii)	Test stand/Jigs/ Fixtures/Gauges/Mandrels/etc.	100 %	100 %
ix)	Marking/Identification	100%	100%
x)	Packing/ Preservation	100%	100%

#### **Note:-**

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

A New (First time supplier of this item) supplier should obtain clearance from HVF for bulk production which will be issued only after inspection/evaluation of pilot samples by HVF.

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

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

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

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

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

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

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

### **12.1 COVER PLATE TO DRG.NO 172.2M.33.361**

All dimensions should be confirmed as per drawing.

SI. No.	Drawing Dimension
1.	89±1.5 mm
2.	56±1.5 mm
3.	R12 (3 Radii)
4.	3* mm
5.	Surface finish/Roughness of items should be ensured as per drawing and specification.

Refer drawing/specification for admissible alternate manufacture in dimensions/material if any specified for the component.

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

Material specimen /test bars of the components shall be in conformity as per the material mentioned in the relevant documents/drawing. NABL test reports for all the parameters as per relevant specifications to be submitted. Test samples to be submitted by the vendor to HVF, if required. The material check will be carried out as per sampling plan.\* However, if the manufacturer proposes any alternative material at the stage of tender enquiry, the same has to be approved and a written concurrence should be obtained from AHSP through DDO/HVF, before usage of such materials.

### **13.1 COVER PLATE TO DRG.NO 172.2M.33.361**

- a) The component should be manufactured from

SHEET 3 GOST 19903-74  
K330B 5-III-15 GOST 16523-97

b) **Chemical properties:** As per Steel 15 to GOST 16523-97 & GOST 1050-88.

CONTENT OF ELEMENTS %							
C	Si	Mn	Cr	Ni	S	P	Cu
MAX							
0.12 to 0.19	0.17 to 0.37	0.35 to 0.65	0.25	0.30	0.040	0.035	0.30

**Note:** For mass fraction of other elements refer GOST 1050-88.

c) **Mechanical properties:** As per STEEL 15 to GOST 16523-97.

Ultimate strength, N/MM <sup>2</sup> (Kgf/mm <sup>2</sup> )	Yield point, N/MM <sup>2</sup> (kgf/mm <sup>2</sup> )	Relative elongation %	Relative reduction of area %
330-460 (34-47)	Refer GOST 16523-97		

**Note:** For other parameters refer GOST 16523-97.

**14) PERFORMANCES / ACCEPTANCE TEST: COVER PLATE TO DRG.NO:**  
**172.2M.33.361**

1. Alternate - Material Sheet 3 GOST 19903-74  
OK360B 5-IV-Cm3cn-cB GOST 16523-97
2. \* Dimension for references.
3. Other requirements as per 520.TY1.

**15) FITMENT AND PERFORMANCE TEST:**

- a. Pilot samples should be checked for fitment and Performance test to ascertain the efficacy of the system under different operating conditions by fitting in higher assembly and repeating it for functional checks, wherever required.
- b. Items of Bulk supplies may be subjected to performance trial in tank in case of repeated failure/defects during exploitation.

**16) INTERCHANGEABILITY:**

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

## **17) CALIBRATION CHECKS**

### **(TEST STANDS/JIGS/FIXTURES/GAUGES/INSTRUMENTS):**

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

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

## **18) MARKING/IDENTIFICATION.**

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

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

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

## **19) PRESERVATION CHECK**

a) Preservative coatings are to be strictly adhered to as called for in the drawing. However, equivalent BIS Standards can also be followed, subject to the thickness of the coating/preservative is maintained as per the drawing/specification.

b) Other preservations as necessary to prevent damages due to moisture and dust during process, storage and transit are to be carried out. Conventional Methods can also be resorted to.

## **20) PACKING CHECK**

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

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

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

## **21) DOCUMENTATION**

- i. Firm has to maintain all the documents as per QAP with respect to the Sl.No.to have traceability.
- ii. Vendor has to submit Bill of materials, Material test reports, Class 'C' /Endurance test reports (wherever specified in drawing/TY

specification/QAP) and Complete PIR (pre-inspection report) at the time of offering the item for inspection. HVF will commence inspection only after scrutiny of these documents.

- iii. The testing/inspection responsibility to test all the parameters as per QAP and drawing specifications as mentioned in Annexure -A (enclosed).
- iv. Pre inspection reports (PIR) of firm like, 1. Chemical analysis (NABL Certificate), 2. Mechanical properties (NABL Certificate), 3. Pre-forming process, 4. Coating certification (Wherever applicable), 5. Calibration reports of instruments and 6. 100 % Dimensional inspection reports.

**22) REFERENCE:**

- a) Drawing No: 172.2M.33.361
- b) Material specification as per drawing:  
SHEET 3 GOST 19903-74  
K330B5-III-15 GOST 16523-97.
- c) GOST 19903-74, GOST 16523-97 & GOST 1050-88.
- d) Specification 520 TY1.
- e) Alternate Material:

Sheet 3 GOST 19903-74  
OK360B 5-IV-Cm3cn-c5 GOST 16523-97

**ANNEXURE-A**

SL. NO.	CATEGORY	ASSEMBLY/ SUB ASSEMBLY	TESTS/ INSPECTION PARAMETERS	STANDARDS TO BE REFERRED	ACCEPTANCE CRITERIA	INSPECTION RESPONSIBILITY			REMARKS
						Firm	HVF	DGQA	
1	COVER PLATE TO DRG. NO 172.2M.33.361	Pre inspection reports (PIIR) of firm	Firm has to produce all the document as per QAP	As per the relevant drawing and QAP.	Confirm to drawing and QAP as per bill of material	P	V	R	100% by firm/ vendor.
2		Bill of material (BOM)	Firm has to prepare the BOM as per QAP	Refer QAP Para no: 8 or item list.	Confirm to QAP	P	V	R	100% by firm/ vendor.
3		Material tests	Chemical composition & Mechanical / Physical Properties	As per- GOST 19903-74, GOST 16523-97 & GOST 1050-98.	All the values to confirm with QAP ( Para no:13.1 (a), (b) & (c))	P	W/V	R	SP followed by HVF.
4		Dimensional checks	Dimensions as per the drawing	Refer drawing / QAP Para no: 12.1	Confirm to drawing and QAP	P	W/P	R	100% by firm/ vendor SP followed by HVF.
5		Marking / traceability	Marking / traceability	Refer QAP Para no:18	Confirm to QAP Para no: 18	P	V	R	100% by firm/ vendor.
6		Preservation & packing	Preservation & packing	Refer QAP Para no: 19 & 20	Confirm to QAP Para no: 19 & 20	P	V	R	100% by firm/ vendor.

**Note:**

For conformity of the items (Chemical/Physical/Mechanical properties).  
 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 shall be rejected or not to use in production further.

2. For cross conformation of material, manufacturer has to submit test sample pieces for the items used / test slab and button for rubber items / HVF will draw samples from supplied lot for Witnessing (WV) 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**

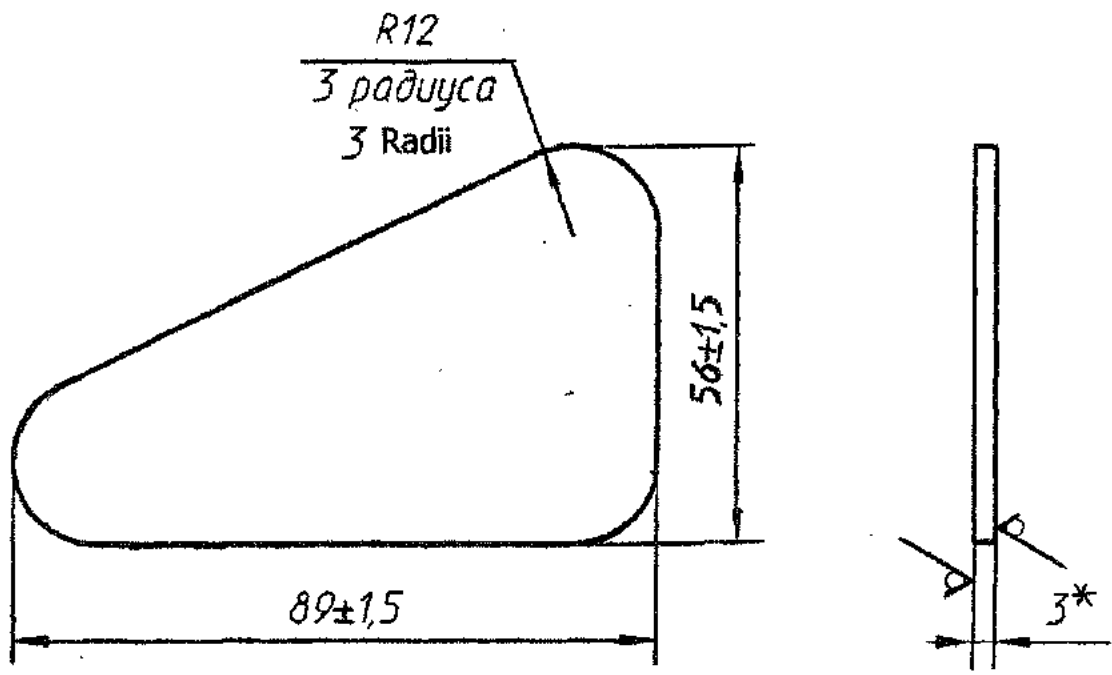


FIG: COVER PLATE TO DRG.NO.172.2M.33.361.





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

**FOR**

**(PLATE COVER)**

**DRG.NO.172.33.048-1**

**(LF NO: 6206305420)**

**No.HVF/T-72C/QAP/33/PLATE COVER/243234-00**

**ISSUE No: 00**

**DATE: DEC-2021**

**QUALITY ASSURANCE (RIG-SUB ASSEMBLY)**

**HEAVY VEHICLES FACTORY**

**AVADI CHENNAI – 600 054**

**QUALITY ASSURANCE PLAN (QAP)**

**FOR**

**PLATE COVER**

**DRG. NO. 172.33.048-1**

PREPARED BY

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## **1.IMPORTANT NOTE**

### **Note-1.**

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

### **Note –2**

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

### **Note-3**

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

### **Note-4**

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

### **Note-5**

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

## **2.INTRODUCTION**

1. This quality plan lays down the inspection and testing procedure to be carried out on the component **PLATE COVER TO DRG.NO 172.33.048-1** being procured indigenously. This is prepared, based on the acceptance standards and inspection parameters laid down in collaborators documents and on the inspection test standards followed in respect of similar indigenous items.
2. This QAP is the property of Government of India and is liable for amendments as and when required. The Sr. General Manager, Heavy Vehicles Factory, Avadi, Chennai – 600 054, is the inspecting Authority for this assembly. Any query / clarification on the content of this QAP shall be referred to this Factory. Any departure from these instructions is allowed only after written approval from the above authority. Notwithstanding the tests indicated in this QAP, the inspecting Officer has the right to carry out any test to check conformance to the paper particulars quoted in the Supply Order, which he may consider necessary to satisfy himself about the stores which he has to accept.

## **3. AIM**

The QAP is aimed at standardizing the Inspection procedure and acceptance norm for **PLATE COVER TO DRG.NO:172.33.048-1**.

It also aims at giving adequate information to the manufacturer on the quality requirements so that the required quality control methods are established. This is also meant to guide authorized Inspection Officer in his routine inspection and to set out main points to which his attention must be drawn to ensure that the accepted stores meet the stipulated standards.

#### **4. SCOPE:**

This QAP outlines in general terms, the checks and methods to be used during inspection of **PLATE COVER TO DRG. NO. 172.33.048-1** including the technical requirements of the drawings. The recommended Quality Plan stipulated herein is mandatory and should be strictly adhered to.

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

#### **Note:**

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

#### **5. DOCUMENTS:**

- a) On placement of firm supply order, One set of relevant specification and technical instructions on the subject item can be obtained by the contractor from AHSP through DDO/HVF
- b) Any clarification required on these documents should be obtained from the Inspecting Authority i.e. The Sr. General Manager, Heavy Vehicles Factory, Avadi, Chennai – 600 054. Equivalent to the collaborators specifications and standards will be decided only by the Inspecting Authority and should not be unilaterally decided. For any change in the specifications, standards or written approval, any alterations in specification can be affected and not otherwise.
- c) The process instruction sheets supplied by the collaborators are available with the Authority Holding Sealed Particulars, i.e. The Controllerate of Quality Assurance (Heavy Vehicles), Avadi, Chennai for the reference. The relevant process sheets may be studied at the premises of the AHSP after obtaining necessary permission.
- d) The supplier after scrutiny of the concerned process sheets and connected paper particulars should establish the necessary production and inspection facilities. Particularly the inspection test rigs, stands, fixtures, template, gauges etc should

be provided as recommended in these process sheets. If process sheet / Process Book is not available the details particulars/parameters available in the drawings to be strictly adhered.

**6. ITEM USED ON:**

- 1. 172.2M.33.005CB -
- 2. 172.33.243CBCB -

**7. LIST OF DRAWINGS:**

SI. NO.	DRG. NO	NOMENCLATURE	REMARKS
1	172.33.048-1	PLATE COVER	-

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

SI. NO	DRG. NO	NOMENCLATURE	MATERIAL SPECIFICATIONS	Qty
1	172.33.048-1	PLATE COVER	OPEN HEARTH STEEL 15-4-II GOST 16523-70.	1

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

**9. CONDITIONS OF USE/STORAGE INSTRUCTIONS**

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

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

## 10. SAMPLING PLAN:

Sl. No.	Sampling Plan	Pilot *	Bulk
(i)	Visual Inspection	100%	100%
(ii)	Dimensional Inspection	100%	General Inspection level III, single sampling, Normal Inspection, AQL 2.5 of IS 2500 (Part-I)-2000
(iii)	Material Inspection	1 No	1 No. for each batch of raw material or heat treatment lot as required by specifications.
(iv)	Acceptance test	-----	-----
(v)	Pressure testing	-----	-----
(vi)	Machining / Fitment/ Performance trial on higher assembly / Tank	-----	-----
vii)	Interchangeability Test	02 Nos.	02 Nos. per batch on randomly basis, except selective assembly.
viii)	Test stand/Jigs/ Fixtures/Gauges/Man drels/etc.	100 %	100 %
ix)	Marking/Identification	100%	100%
x)	Packing/ Preservation	100%	100%

### Note:-

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

A New (First time supplier of this item) supplier should obtain clearance from HVF for bulk production which will be issued only after inspection/evaluation of pilot samples by HVF.

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

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

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

- Defects in construction
- Cracks/Dents/Scratches
- Fitment of all components

- Presence of foreign particles
- Moisture and dust
- Corrosion of metal parts
- Mechanical imperfections & distortion
- Any form of deterioration of material and finishing.

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

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

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

### **12.1 PLATE COVER TO DRG.NO 172.33.048-1**

All dimensions should be confirmed as per drawing.

<b>SI. No.</b>	<b>Drawing Dimension</b>
1.	80±2 mm
2.	80±2 mm
3.	13±1.5 mm
4.	13±1.5 mm
5.	42±1.5 mm
6.	10±1 mm
7.	3±0.22 mm
8.	R4
9.	Surface finish / Roughness of items should be ensured as per drawing and specification.

Refer drawing/specification for admissible alternate manufacture in dimensions/material if any specified for the component.

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

Material specimen /test bars of the components shall be in conformity as per the material mentioned in the relevant documents/drawing. NABL test reports for all the parameters as per relevant specifications to be submitted. Test samples to be submitted by the vendor to HVF, if required. The material check will be carried out as per sampling plan. \* However, if the manufacturer proposes any alternative material at the stage of tender enquiry, the same has to be approved and a written concurrence should be obtained from AHSP through DDO/HVF, before usage of such materials.



**13.1 PLATE COVER TO DRG.NO 172.33.048-1**

- a) The component should be manufactured from  
OPEN HEARTH STEEL 15-4-II GOST 16523-70.
- b) Chemical properties: As per Steel Grade 15 to GOST 16523-70 & GOST 1050-74.

GRADE OF STEEL	C	Si	Mn	Cr (MAX)
Б	0.12-0.19	0.17-0.37	0.35-0.65	0.25
10KII	0.07-0.14	0.07(MAX)	0.25-0.50	0.15
20	0.17-0.24	0.17-0.37	0.35-0.65	0.25

NOTE -

- a) CONTENTS OF SULPHUR 0.040%(MAX) & PHOSPHORUS 0.035%(MAX)  
b) RESIDUAL CONTENT OF COPPER AND NICKEL SHOULD NOT EXCEED 0.25 % EACH.

Note: For mass fraction of other elements refer GOST 1050-74.

- c) Mechanical properties: As per Steel Grade 15 to GOST 16523-70.

GRADE OF STEEL	TENSILE STRENGTH Kgf/mm <sup>2</sup>	RELATIVE ELONGATION % NOT LESS THAN
Б	34 - 67	25
10KB	28 - 60	28
20	36 - 51	24

Note: For other parameters refer GOST 16523-70.

**14) PERFORMANCES/ACCEPTANCE TEST: PLATE COVER TO DRG.NO:172.33.048-1.**

1. MAY BE MADE FROM OPEN HEARTH STEEL 10Kn - 4 - II, 20 - 4 - II , GOST 16523-70.
2. ROUNDING OFF OF COMPONENT FACES TO R3 IS ALLOWED.
3. PRESSING MARKS ARE ALLOWED.

**EXPLANATORY NOTE:**

**THE COMPONENT SHOULD BE PRODUCED FROM OPEN-HEARTH COLD ROLLED QUALITY CARBON STEEL SHEET 3mm THICKNESS OF HIGH SURFACE FINISH ' II ' , WITH STANDARD CHARACTERISTICS CATEGORY ' 4 ' OF GRADE 15 (KILLED) TO GOST 16523-70.**

**ALTERNATIVELY IT MAY BE PRODUCED FROM STEEL SHEET OF SUPERIOR FINISH 'II', WITH STANDARD CHARACTERISTICS CATEGORY '4', OF GRADE 10K2 (RPMED) TO GOST 16523-70. & STEEL SHEET OF HIGH SURFACE FINISH 'II' WITH STANDARD CHARACTERISTICS CATEGORY '4' OF GRADE 20 (KILLED) TO GOST 16523-70.**

**15) FITMENT AND PERFORMANCE TEST**

- a. Pilot samples should be checked for fitment and Performance test to ascertain the efficacy of the system under different operating conditions by fitting in higher assembly and repeating it for functional checks, wherever required.
- b. Items of Bulk supplies may be subjected to performance trial in tank in case of repeated failure/defects during exploitation.

**16) INTERCHANGEABILITY:**

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

**17) CALIBRATION CHECKS**

**(TEST STANDS/JIGS/FIXTUERS/GAUGES/INSTRUMENTS):**

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

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

**18) MARKING/IDENTIFICATION.**

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

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

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

**19) PRESERVATION CHECK**

- a) Preservative coatings are to be strictly adhered to as called for in the drawing. However, equivalent BIS Standards can also be followed, subject to the

thickness of the coating/preservative is maintained as per the drawing/specification.

- b) Other preservations as necessary to prevent damages due to moisture and dust during process, storage and transit are to be carried out. Conventional Methods can also be resorted to.

## **20) PACKING CHECK**

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

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

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

## **21) DOCUMENTATION**

- i. Firm has to maintain all the documents as per QAP with respect to the SI.No.to have traceability.
- ii. Vendor has to submit Bill of materials, Material test reports, Class 'C' /Endurance test reports (wherever specified in drawing/TY specification/QAP) and Complete PIR (pre-inspection report)at the time of offering the item for inspection. HVF will commence inspection only after scrutiny of these documents.
- iii. The testing/inspection responsibility to test all the parameters as per QAP and drawing specifications as mentioned in Annexure -A (enclosed).
- iv. Pre inspection reports (PIR) of firm like, 1. Chemical analysis (NABL Certificate), 2.Mechanical properties (NABL Certificate), 3. Pre-forming process, 4. Coating certification (Wherever applicable), 5. Calibration reports of instruments and 6. 100 % Dimensional inspection reports.

## **22) REFERENCE:**

- a) Drawing No: 172.33.048-1.
- b) Material specification as per drawing:  
OPEN HEARTH STEEL 15-4-II GOST 16523-70.
- c) GOST 1050-74 & GOST 16523-70.
- d) Alternate Material:
  - 1. OPEN HEARTH STEEL 10KП-4 II, 20-4-II GOST 16523-70.
  - 2. STEEL 070M20 (En 3A) TO BS 970 PART-1: 1983.

**ANNEXURE-A**

SL. NO.	CATEGORY	ASSEMBLY/ SUB ASSEMBLY	TESTS/ INSPECTION PARAMETERS	STANDARDS TO BE REFERRED	ACCEPTANCE CRITERIA	INSPECTION RESPONSIBILITY			REMARKS
						Firm	HVF	DGQA	
1	PLATE COVER TO DRG. NO 172.33.048-1	Pre inspection reports (PIR) of firm	Firm has to produce all the document as per QAP	As per the relevant drawing and QAP.	Confirm to drawing and QAP as per bill of material	P	V	R	100% by firm/ vendor.
2		Bill of material (BOM)	Firm has to prepare the BOM as per QAP	Refer QAP Para no: 8 or item list.	Confirm to QAP	P	V	R	100% by firm/ vendor.
3		Material tests	Chemical composition & Mechanical / Physical Properties	As per- GOST 1050-74 & GOST 16523-70.	All the values to confirm with QAP (Para no: 13.1 (a), (b) & (c))	P	W/V	R	SP followed by HVF.
4		Dimensional checks	Dimensions as per the drawing	Refer drawing / QAP Para no: 12.1	Confirm to drawing and QAP	P	W/P	R	100% by firm/ vendor SP followed by HVF.
5		Marking / traceability	Marking / traceability	Refer QAP Para no:18 & 14(3)	Confirm to QAP Para no: 18 & 14(3)	P	V	R	100% by firm/ vendor.
6		Preservation & packing	Preservation & packing	Refer QAP Para no 19 & 20	Confirm to QAP Para no 19 & 20	P	V	R	100% by firm/ vendor.

**Note:**

- For conformity of the items (Chemical/Physical/Mechanical properties).  
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 shall be rejected or not to use in production further.
- For cross conformation of material, manufacturer has to submit test sample pieces for the items used / test slab and button for rubber items / HVF will draw samples from supplied lot for Witnessing (W) at HVF premises. In case of non-compliance to standards entire lot will be rejected.

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

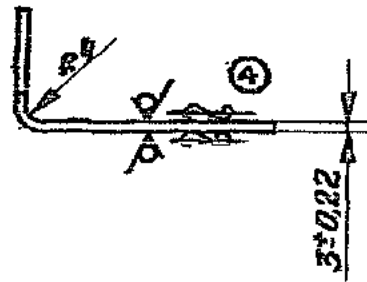
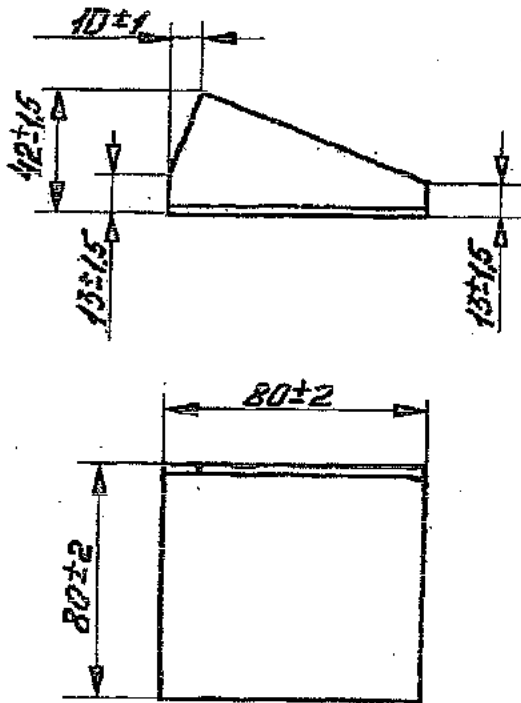


FIG: PLATE COVER TO DRG.NO.172.33.048-1.



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

**FOR**

**(CLAMP)**

**DRG.NO.172.02.681**

**(LF NO: 6206102181)**

**No.HVFT-72C/QAP/02/CLAMP/243891-00**

**ISSUE No: 00**

**DATE: NOV-2023**

**QUALITY ASSURANCE (RIG-OP)**

**HEAVY VEHICLES FACTORY**

**AVADI CHENNAI – 600 054**

**QUALITY ASSURANCE PLAN (QAP)**

**FOR**

**CLAMP**

**DRG. NO. 172.02.681**

PREPARED BY

  
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JWM/QA (RIG-OE&OH)

REVIEWED BY

  
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APPROVED BY

  
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ISSUED BY

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



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## **1. IMPORTANT NOTES**

### **Note-1**

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

### **Note –2**

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

### **Note-3**

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

### **Note-4**

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

### **Note-5**

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

## **2. INTRODUCTION**

1. This quality plan lays down the inspection and testing procedure to be carried out on the component **CLAMP TO DRG.NO 172.02.681** being procured indigenously. This is prepared, based on the acceptance standards and inspection parameters laid down in collaborators documents and on the inspection test standards followed in respect of similar indigenous items.
2. This QAP is the property of Government of India and is liable for amendments as and when required. The Chief General Manager, Heavy Vehicles Factory, Avadi, Chennai – 600 054, is the inspecting Authority for this assembly. Any query / clarification on the content of this QAP shall be referred to this Factory. Any departure from these instructions is allowed only after written approval from the above authority. Notwithstanding the tests indicated in this QAP, the inspecting Officer has the right to carry out any test to check conformance to the paper particulars quoted in the Supply Order, which he may consider necessary to satisfy himself about the stores which he has to accept.

## **3. AIM**

This QAP is aimed at standardizing the Inspection procedure and acceptance norm for **CLAMP TO DRG.NO:172.02.681**.

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 **CLAMP TO DRG.NO.172.02.681** including the technical requirements of the drawings. The recommended Quality Plan stipulated herein is mandatory and should be strictly adhered to.

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

#### **Note:**

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

#### **5. DOCUMENTS:**

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

Process Book is not available the details particulars/parameters available in the drawings to be strictly adhered.

**6. ITEM USED ON:**

1. 172.02.178CB-1CB - BRACKET.

**7. LIST OF DRAWINGS:**

SI. NO.	DRG. NO	NOMENCLATURE	REMARKS
1	172.02.681	CLAMP	-

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

Sl. No	DRG. NO	NOMENCLATURE	MATERIAL SPECIFICATIONS	Qty
1	172.02.681	CLAMP	OPEN HEARTH STEEL 15 GOST 1577-70	1

**Note:** Vendor/Contractor may use approved alternate material, if any specified in drawing/specification.\* Also refer Para no: 13.

**9. CONDITIONS OF USE/STORAGE INSTRUCTIONS**

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

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

## 10. SAMPLING PLAN:

Sl. No.	Sampling Plan	Pilot*	Bulk
<b>Acceptance test ( as below)</b>			
(i)	Visual Inspection	100%	100%
(ii)	Dimensional Inspection	100%	General Inspection level III, single sampling, Normal Inspection, AQL 2.5 of IS 2500 (Part-I)-2000
(iii)	Material Inspection (including Chemical, Mechanical & Physical properties)	1 No	1 No. or qty as specified in specification, GOST for each batch of raw material or heat treatment lot / As required for confirmation of material.
(iv)	Pressure testing	----	-----
(v)	Machining/Fitment/ Performance trial on higher assembly / Tank	----	-----
(vi)	Interchangeability Test	----	-----
(vii)	Calibration Reports/Certificates of Test stand/Jigs/ Equipment's/Fixtures/ Gauges/Mandrels/etc.	100%	100%
(viii)	Marking/Identification	100%	100%
(ix)	Packing/ Preservation	100%	100%

### Note:-

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

A New (First time supplier of this item) supplier should obtain clearance from HVF for bulk production which will be issued only after inspection/evaluation of pilot samples by HVF.

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

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

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

- Defects in construction
- Cracks/Dents/Scratches
- Fitment of all components

- Presence of foreign particles
- Moisture and dust
- Corrosion of metal parts
- Mechanical imperfections & distortion
- Any form of deterioration of material and finishing.

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

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

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

**12.1 CLAMP TO DRG.NO:172.02.681**

1. All dimensions including geometrical parameters shall be confirmed as per drawing/specification.

Sl. No.	Drawing Dimensions
<b>(Contradiction if any between the dimensions mentioned in this QAP and Drawing the later only will prevail)</b>	
1.	64±1.5 mm
2.	24±1 mm
3.	R10 (On plane)
4.	20±1.5 mm
5.	R15 mm
6.	4 mm
7.	42 mm
8.	25 mm
9.	40 mm

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

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

Material specimen /test bars of the components shall be in conformity as per the material mentioned in the relevant documents/drawing. NABL test reports for all the parameters as per relevant specifications to be submitted. Test samples to be submitted by the vendor to HVF, if required. The material check will be carried out as per sampling plan. \* However, if the manufacturer proposes any alternative material at the stage of tender enquiry, the same has to be

approved and a written concurrence should be obtained from AHSP through DDO/HVF, before usage of such materials.

**13.1 CLAMP TO DRG.NO:172.02.681**

a) The component should be manufactured from OPEN HEARTH STEEL 15 GOST 1577-70.

b) **Chemical properties:** As per OPEN HEARTH STEEL 15 GOST 1577-70 & GOST 1050-74.

CONTENT OF ELEMENTS %					
C	Si	Mn	Cr	S	P
			MAXIMUM		
0.12 -0.19	0.17- 0.37	0.35-0.65	0.25	0.040	0.035

**Note:** For mass fraction of other elements refer GOST 1050-74.

c) **Mechanical properties:** As per OPEN HEARTH STEEL 15 GOST 1577-70.

Grade of Steel	Tensile Strength, Kgf/mm <sup>2</sup>	Yield Point, Kgf/mm <sup>2</sup>	Elongation, %	Impact Strength, Kgm/cm <sup>2</sup>
	Minimum			
15	38	-	30	3

**Note:** For details of other parameters & properties refer GOST 1577-70.

**14) PERFORMANCES/ACCEPTANCE TEST/TR POINTS OF CLAMP TO DRG.NO:172.02.681**

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

1. MAY BE MANUFACTURED FROM OPEN - HEARTH STEEL OF GRADES 20,25 GOST 1577 - 70.
2. DEVIATION OF COMPONENT PROFILE FROM TEMPLATE, CONSTRUCTED AS PER NOMINAL DIMENSIONS, SHOULD NOT BE MORE THAN 1.5 mm.
3. CORNERS MAY BE ROUNDED - OFF TO R 5 mm.
4. TOLERANCE ON THICKNESS SHOULD BE ACCORDING TO GOST 19903 - 74.

**15) FITMENT AND PERFORMANCE TEST:**

- a. Pilot samples should be checked for fitment Performance trial at HVF and Performance test to ascertain the efficacy of the system under different operating

conditions by fitting in higher assembly and repeating it for functional checks, wherever required.

- b. Items of Bulk supplies may be subjected to performance trial in tank in case of repeated failure/defects during exploitation.

**16) INTERCHANGEABILITY:**

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

**17) CALIBRATION CHECKS**

**(TEST STANDS/JIGS/FIXTURES/GAUGES/INSTRUMENTS):**

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

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

**18) MARKING/IDENTIFICATION.**

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

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

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

**19) PRESERVATION CHECK**

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

**20) PACKING CHECK**

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



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

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

**21) DOCUMENTATION**

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

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

**22) REFERENCE:**

- a) Drawing No: 172.02.681.
- b) Material specification as per drawing: OPEN HEARTH STEEL 15 GOST 1577-70.
- c) GOST 19903-74, GOST 1577-70 & GOST 1050-74.
- d) Equivalent / Alternate Material:  
OPEN HEARTH STEEL GRADES 20, 25 GOST 1577-70.

**ANNEXURE-A**

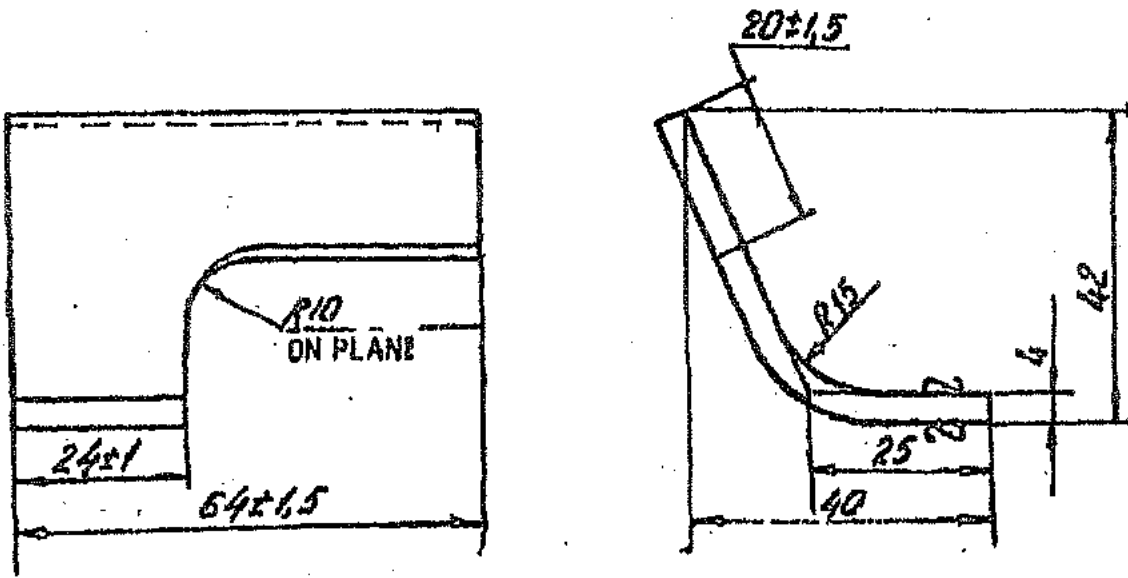
SL NO.	CATEGORY	ASSEMBLY/ SUB ASSEMBLY	TESTS/ INSPECTION PARAMETERS	STANDARDS TO BE REFERRED	ACCEPTANCE CRITERIA	INSPECTION RESPONSIBILITY			REMARKS
						Firm	HVF	DGOA	
1	CLAMP TO DRG. NO 172.02.681	Bill of material (BOM)	Firm has to prepare the BOM as per QAP	Refer QAP Para no: 8 or item list.	Confirm to QAP	P	V	R	100% by firm/ vendor.
2		Pre inspection reports (PIR) of firm	Firm has to produce all the document as per QAP	As per the relevant drawing/specification/TD book/process book and QAP	Confirm to relevant drawing/specification/TD book/process book and QAP as per bill of material	P	V	R	100% by firm/ vendor.
3		Dimensional checks	Dimensions as per the drawing	Refer drawing / QAP Para no: 12.1	Confirm to drawing and QAP Para no: 12.1	P	W/P	R	100% by firm/ vendor & SP followed by HVF.
4		Material tests	Chemical composition & Mechanical / Physical Properties	As per-GOST 1577-70 & GOST 1050-74	All the values to confirm with QAP (Para no:13.1 (a), (b), (c))	P	W/V/P	R	As per SP of HVF by firm and SP followed by HVF
5		Marking / traceability	Marking / traceability	Refer QAP Para no:18	Confirm to QAP Para no: 18.	P	V	R	100% by firm/ vendor.
6		Preservation & packing	Preservation & packing	Refer QAP Para no 19 & 20	Confirm to QAP Para no 19 & 20	P	V	R	100% by firm/ vendor.

**Note:**

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

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 shall be rejected and shall not be used in production further.
2. For cross conformation of material, manufacturer has to submit sufficient quantity (as specified in GOST/Specification/supply order) test sample pieces for the items used / test slab and button for rubber items / HVF will draw samples from supplied lot for Witnessing/Verify/Perform(W/V/P) at HVF premises. In case of non-compliance to standards, entire lot will be rejected as per the Terms and Conditions.
3. All other relevant tests as specified in GOST/specification/drawing is to be carried out by firm and to be confirmed.

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



**FIG: CLAMP TO DRG.NO.172.02.681.**  
(For reference only)



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

**FOR**

**(PLATE)**

**DRG.NO.172.64.060**

**(LF NO: 6206420089)**

**No.HVFIT-72C/QAP/64/PLATE/243817-00**

**ISSUE No: 00**

**DATE: NOV-2023**

**QUALITY ASSURANCE (RIG-OP)**

**HEAVY VEHICLES FACTORY**

**AVADI CHENNAI – 600 054**

**QUALITY ASSURANCE PLAN (QAP)**

**FOR**

**PLATE**

**DRG. NO. 172.64.060**

PREPARED BY

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

REVIEWED BY

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

APPROVED BY

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

ISSUED BY

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

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Process Book is not available the details particulars/parameters available in the drawings to be strictly adhered.

**6. ITEM USED ON:**

1.172.64.026CB - ROD.

**7. LIST OF DRAWINGS:**

SI. NO.	DRG. NO	NOMENCLATURE	REMARKS
1	172.64.060	PLATE	-

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

Sl. No	DRG. NO	NOMENCLATURE	MATERIAL SPECIFICATIONS	Qty
1	172.64.060	PLATE	SHEET 6 GOST 19903-74 15 GOST 1577-70	1

**Note:** Vendor/Contractor may use approved alternate material, if any specified in drawing/specification.\* Also refer Para no: 13.

**9. CONDITIONS OF USE/STORAGE INSTRUCTIONS**

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

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



## 10. SAMPLING PLAN:

Sl. No.	Sampling Plan	Pilot*	Bulk
<b>Acceptance test ( as below)</b>			
(i)	Visual Inspection	100%	100%
(ii)	Dimensional Inspection	100%	General Inspection level III, single sampling, Normal Inspection, AQL 2.5 of IS 2500 (Part-I)-2000
(iii)	Material Inspection (including Chemical, Mechanical & Physical properties)	1 No	1 No. or qty as specified in specification, GOST for each batch of raw material or heat treatment lot / As required for confirmation of material.
(iv)	Pressure testing	----	----
(v)	Machining/Fitment/ Performance trial on higher assembly / Tank	----	----
(vi)	Interchangeability Test	----	----
(vii)	Calibration Reports/Certificates of Test stand/Jigs/ Equipment's/Fixtures/ Gauges/Mandrels/etc.	100%	100%
(viii)	Marking/Identification	100%	100%
(ix)	Packing/ Preservation	100%	100%

### Note:-

\* This clause is applicable if mentioned in supply order or project sanction order. A New (First time supplier of this item) supplier should obtain clearance from HVF for bulk production which will be issued only after inspection/evaluation of pilot samples by HVF.

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

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

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

- Defects in construction
- Cracks/Dents/Scratches
- Fitment of all components

- Presence of foreign particles
- Moisture and dust
- Corrosion of metal parts
- Mechanical imperfections & distortion
- Any form of deterioration of material and finishing.

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

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

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

### 12.1 PLATE TO DRG.NO:172.64.060

1. All dimensions including geometrical parameters shall be confirmed as per drawing/specification.

Sl. No.	Drawing Dimensions
<b>(Contradiction if any between the dimensions mentioned in this QAP and Drawing the later only will prevail)</b>	
1.	6.5±0.5 mm
2.	R4 mm
3.	R9 mm
4.	R5.25 mm
5.	23±0.5 mm
6.	6.5±0.5 mm
7.	R6.5 mm
8.	Φ6.5 A <sub>7</sub> <sup>(+0.36)</sup> mm
9.	10.5A <sub>7</sub> <sup>(+0.43)</sup> mm
10.	39 mm
11.	6* mm

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

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

Material specimen /test bars of the components shall be in conformity as per the material mentioned in the relevant documents/drawing. NABL test reports for all the parameters as per relevant specifications to be submitted. Test samples to be submitted by the vendor to HVF, if required. The material check will be carried out as per sampling plan. \* However, if the manufacturer proposes any alternative material at the stage of tender enquiry, the same has to be approved and a written concurrence should be obtained from AHSP through DDO/HVF, before usage of such materials.

**13.1 PLATE TO DRG.NO:172.64.060**

- a) The component should be manufactured from  
SHEET 6 GOST 19903-74  
15 GOST 1577-70

b) Chemical properties: As per STEEL 15 GOST 1577-70 & GOST 1050-74.

CONTENT OF ELEMENTS %					
C	Si	Mn	Cr	S	P
MAXIMUM					
0.12 –0.19	0.17– 0.37	0.35-0.65	0.25	0.040	0.035

Note: For mass fraction of other elements refer GOST 1050-74.

c) Mechanical properties: As per STEEL 15 GOST 1577-70.

Grade of Steel	Tensile Strength, Kgf/mm <sup>2</sup>	Yield Point, Kgf/mm <sup>2</sup>	Elongation, %	Impact Strength, Kgm/cm <sup>2</sup>
	Minimum			
15	38	-	30	3

Note: For details of other parameters & properties refer GOST 1577-70.

**14) PERFORMANCES/ACCEPTANCE TEST /TR POINTS OF PLATE TO DRG.NO:172.64.060**

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

1. ALTERNATE MATERIAL SHEET 6 GOST 19903-74  
20 GOST 1577-70
2. DEVIATION OF THE COMPONENT FROM THE OUTLINE TEMPLET MADE TO NOMINAL DIMENSIONS SHOULD NOT EXCEED 15 mm
3. REMAINING REQUIREMENTS AS PER 520 TY 1
4. \* DIMENSION FOR REFERENCE

**15) FITMENT AND PERFORMANCE TEST:**

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

**16) INTERCHANGEABILITY:**

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

**17) CALIBRATION CHECKS**

**(TEST STANDS/JIGS/FIXTUERS/GAUGES/INSTRUMENTS):**

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

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

**18) MARKING/IDENTIFICATION.**

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

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

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

**19) PRESERVATION CHECK**

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

## 20) PACKING CHECK

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

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

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

## 21) DOCUMENTATION

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

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

## 22) REFERENCE:

- a) Drawing No: 172.64.060.
- b) Material specification as per drawing: SHEET 6 GOST 19903-74  
15 GOST 1577-70
- c) GOST 19903-74, GOST 1577-70 & GOST 1050-74.
- d) Specification 520 TY 1.
- a) d) Equivalent / Alternate Material: SHEET 6 GOST 19903-74  
20 GOST 1577-70

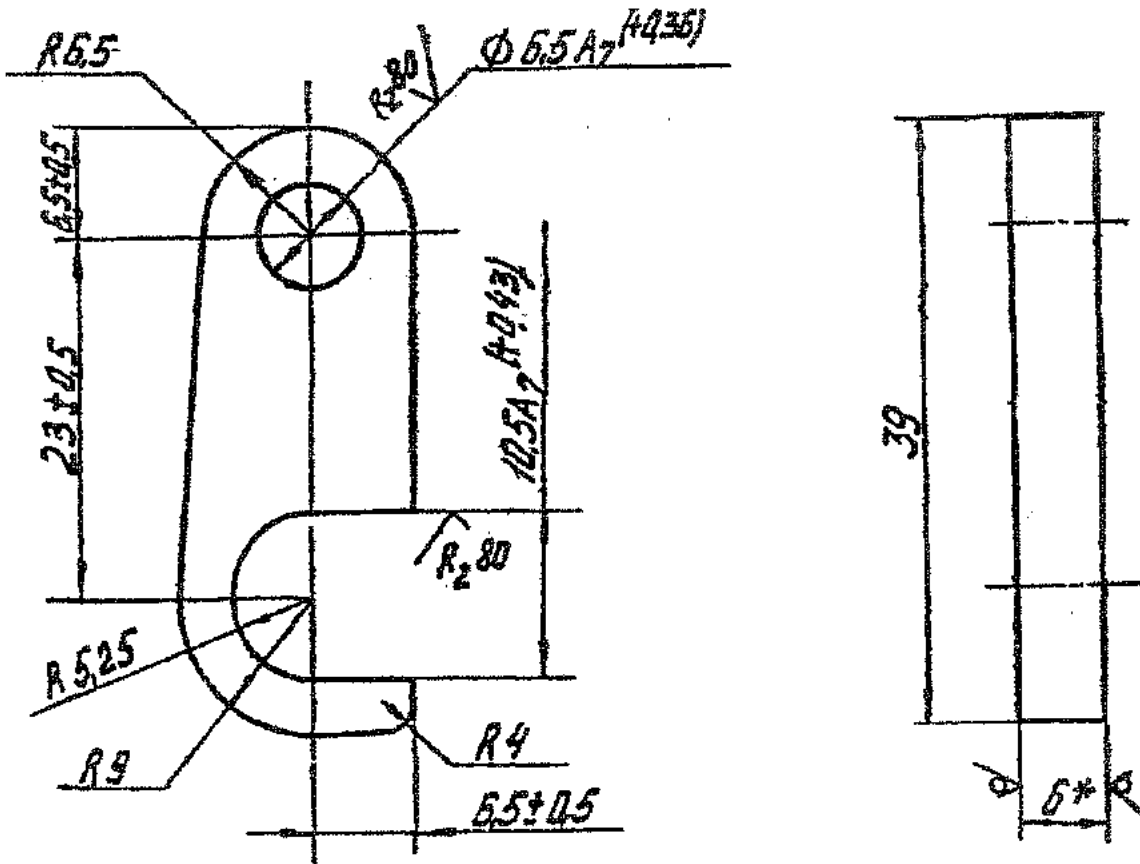
SL. NO.	CATEGORY	ASSEMBLY/ SUB ASSEMBLY	TESTS/ INSPECTION PARAMETERS	STANDARDS TO BE REFERRED	ACCEPTANCE CRITERIA	INSPECTION RESPONSIBILITY			REMARKS
						Firm	HVF	DGQA	
1		Bill of material (BOM)	Firm has to prepare the BOM as per QAP	Refer QAP Para no: 8 or item list.	Confirm to QAP	P	V	R	100% by firm/ vendor.
2		Pre inspection reports (PIR) of firm	Firm has to produce all the document as per QAP	As per the relevant drawing/specification/TD book/process book and QAP	Confirm to relevant drawing/specification/TD book/process book and QAP as per bill of material	P	V	R	100% by firm/ vendor.
3	PLATE TO DRG. NO 172.64.060	Dimensional checks	Dimensions as per the drawing	Refer drawing / QAP Para no: 12.1	Confirm to drawing and QAP Para no: 12.1	P	W/P	R	100% by firm/ vendor & SP followed by HVF.
4		Material tests	Chemical composition & Mechanical / Physical Properties	As per- GOST 19903-74, GOST 1577-70 & GOST 1050-74	All the values to confirm with QAP (Para no:13.1 (a), (b), (c))	P	W/V/P	R	As per SP of HVF by firm and SP followed by HVF
5		Marking / traceability	Marking / traceability	Refer QAP Para no: 18	Confirm to QAP Para no: 18.	P	V	R	100% by firm/ vendor.
6		Preservation & packing	Preservation & packing	Refer QAP Para no 19 & 20	Confirm to QAP Para no 19 & 20	P	V	R	100% by firm/ vendor.

**Note:**

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

- One sample per heat / batch shall be tested under NABL Lab/Govt. Approved lab by firm. In case of non-compliance to standards entire lot shall be rejected and shall not be used in production further.
- For cross conformation of material, manufacturer has to submit sufficient quantity (as specified in GOST/Specification/supply order) test sample pieces for the items used / test slab and button for rubber items / HVF will draw samples from supplied lot for Witnessing/Verify/Perform(WV/P) at HVF premises. In case of non-compliance to standards, entire lot will be rejected as per the Terms and Conditions.
- All other relevant tests as specified in GOST/Specification/drawing is to be carried out by firm and to be confirmed.

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



**FIG: PLATE TO DRG.NO.172.64.060.**  
 (For reference only)

RECORD OF AMENDMENTS

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