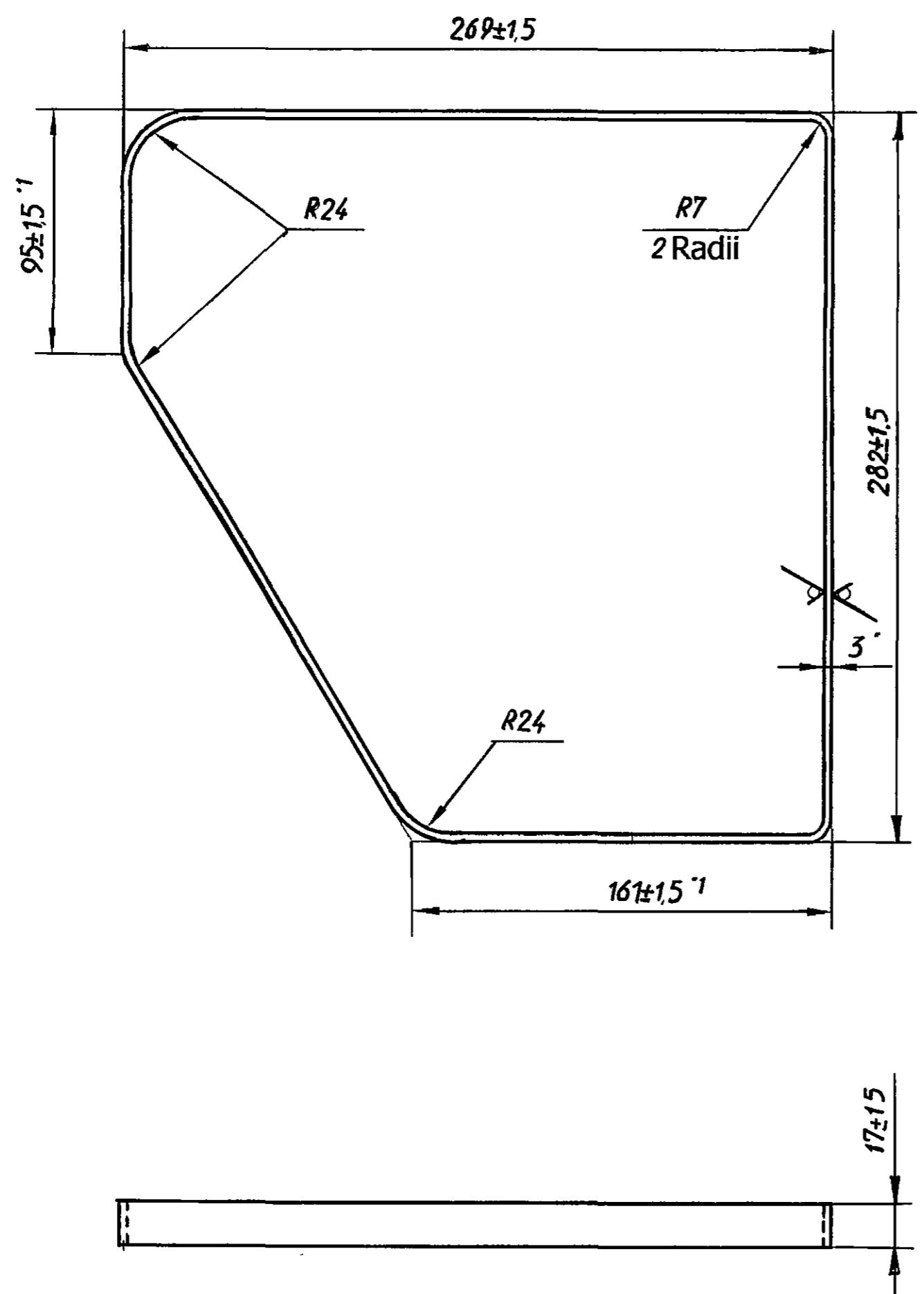


DRAWING NUMBER
188.91.023

SHEET No. 1 OF 1

Rz320/√



1. Материал-заменитель лист АМг5.М3 ГОСТ 21631-76.
2. Допускается изготовление из двух частей по ГОСТ 14806-80-С2.0^{Rz160}√
- 4.* Размер для справок.
- 6.*1 Размеры обеспеч. инстр.
5. Остальные требования по 520 ТУ1.

1. Alternate material sheet AM-5 M3 GOST 21631-76.
2. The component may be manufactured from two parts as per GOST 14806-80-С2.0^{Rz160}√
- 4.*Dimensions for reference.
- 6.*1Dimensions are to be ensured by tool.
5. Other requirements are as per 520.TY1.

DRG. INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE -NIL

356
SUPPLY CODE
U-01-1-4
D 90222
F-116
44
SIZE A2

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

EST. WT. (Kg) 0.103	TO BE STAMPED OR MARKED WHERE INDICATED THUS # (LETTER)
ALL SHARP EDGES AND CORNERS TO BE REMOVED UNLESS OTHERWISE STATED MACHINED CORNERS TO HAVE R OUTSIDE R INSIDE EQUIVALENT CHAMFERS ARE PERMISSIBLE.	

DRN	CHD	APPD	DATE	SCALE:- 1 : 2	DIMENSIONS IN mm	TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS : 2102 - 69	ALL THREADS TO CONFORM TO	ISSUE	DATE	NATURE OF AMENDMENTS	
			12.11.04								
MATERIAL :- SHEET AM- 6.5M3 GOST 21631-76				USED ON :- 188.91.014cbCb 188.91.015cbCb				CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI			
				TITLE :- SHELL				D S CAT NUMBER			
								DRAWING NUMBER 188.91.023			

"COMMON TO T-90" & BLT
DRG RE-INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE - 8
B. JAYAVELU, JTOIDJ
22-08-06

DRAWING NUMBER: 175.91.060
SHEET No 1 OF 1

▽1 (▽)

EXPLANATORY NOTE :-

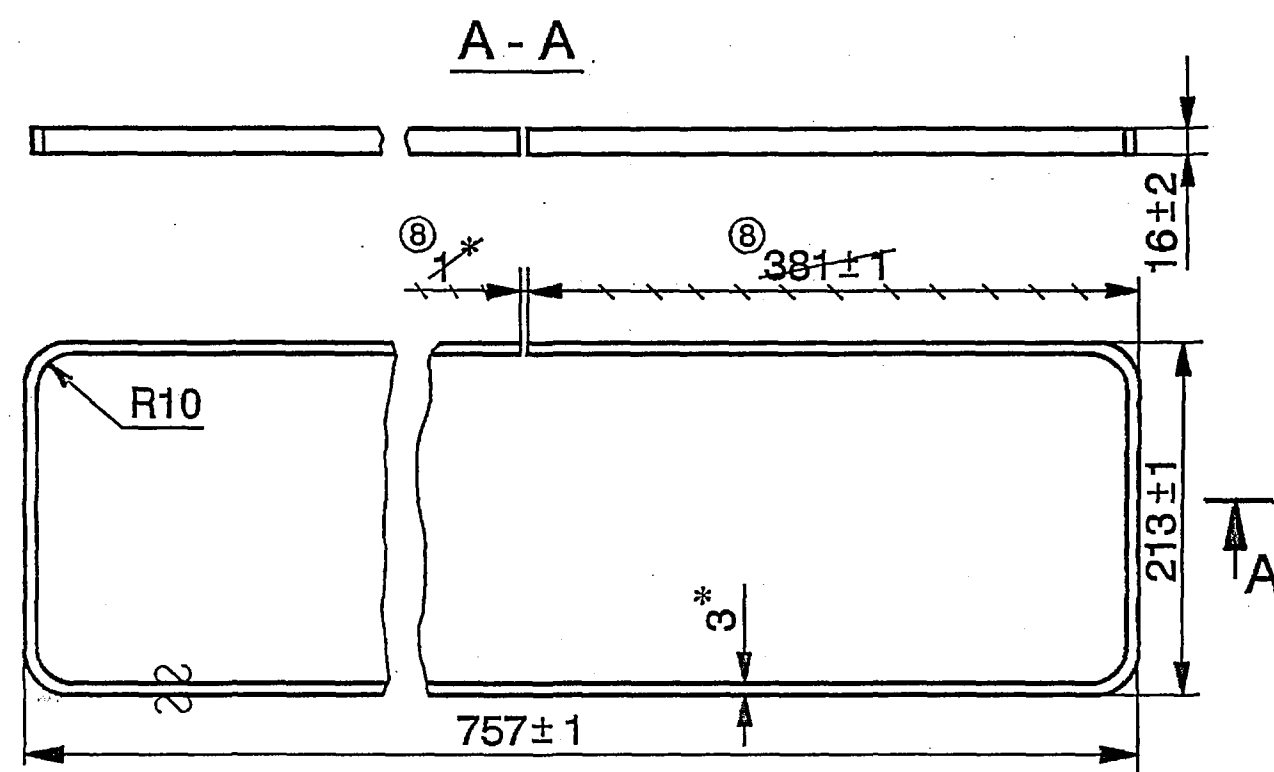
4. REFERENCE MATERIAL QUOTED :- ALUMINIUM ALLOY SHEET 3mm THICK ANNEALED (M) WITH TECHNOLOGICAL CLADDING (5) WITH NORMAL SURFACE FINISH TO GOST 21631 - 76 MANUFACTURED FROM GRADE AMΓ 6 TO GOST 4784 - 74.

(a) CHEMICAL COMPOSITION :-

ALLOY GRADE	ALLOYING CONSTITUENTS					IMPURITIES (MAX)				OTHER IMPURITIES	
	Al	Mg	Mn	Ti	Be	Fe	Si	Cu	Zn	EACH INDIVIDUALLY	TOTAL
AMΓ 6	BASE - CONSTITUENT	5.8 - 6.8	0.5 - 0.8	0.02 - 0.10	0.0002 - 0.0005	0.4	0.4	0.1	0.2	0.05	0.1

(b) MECHANICAL PROPERTIES AS PER GOST 21631 - 76.

ALLOY GRADE	MATERIAL CONDITION OF SHEET	TENSILE STRENGTH Kgf / mm ²	YIELD POINT Kgf / mm ²	ELONGATION %
AMΓ 6	ANNEALED	31.0	15.0	15.0



1. MANUFACTURE FROM SHEET AMΓ 6M (UNCOATED) AND AMΓ 6YM GOST 21631 - 76.
2. MANUFACTURING FROM FOUR PARTS IS ALLOWED.
3. * DIMENSIONS FOR REFERENCE.

⊗ ALT. MATL. :- GRADE 54300 TO IS : 737 - 86

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

EST. WT. (Kg) 0.242 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.

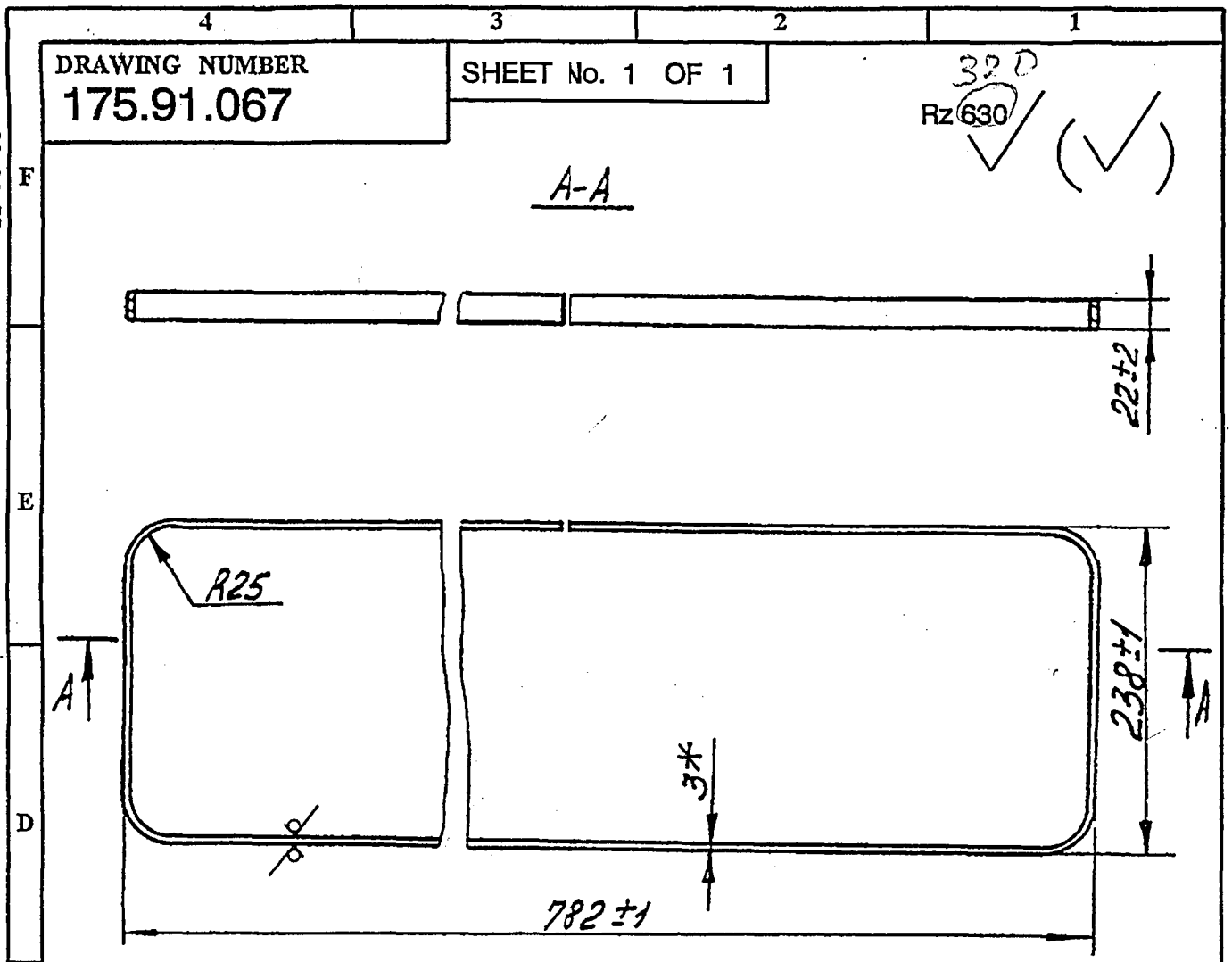
DRN	Sd/=	MATERIAL :- SHEET AMΓ 65M - 3 GOST 21631 - 76	USED ON :- 188.91.016cbCb 175.91.033cb-2Cb ⊗
CHD	Sd/=		
APPD	Sd/=	CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI	
DATE	03 - 04 - 86		
SCALE:- 1 : 1		TITLE :- SHELL	D S CAT NUMBER
DIMENSIONS IN mm			
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS : 2102 - 69		DRAWING NUMBER 175.91.060	
8B	16.5.06 AUTHY.Lt.No.80001/CQA(HV)/GEN/A.Dt.13.1.06		
8A	2.8.04 N OF A No.CQA(HV)/T90/91/001	ALL THREADS TO CONFORM TO IS : 4218 Pt. IV	
ISSUE	DATE	NATURE OF AMENDMENTS	

F-
SIZE A3



COMMON TO T-90 " & BLT
 DRG. RE - INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE - 5
 (B. JAYAVELU, JT01D)
 22-08-06

F-172
 8



DRAWING NUMBER
175.91.067

SHEET No. 1 OF 1

320
 Rz 630
 (✓) (✓)

1. MANUFACTURE FROM SHEET AMГ 6M (UN COATED) AND AMГ 6YM GOST 21631 -76 IS ALLOWED.
2. MANUFACTURE FROM FOUR PARTS IS ALLOWED.
3. * DIMENSIONS FOR REFERENCE.

(5B) ALT. MATL. :- GRADE 54300 TO IS : 737 - 86

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

		EST. WI. (Kg) 0.35	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.	
5B	16.5.06	AUTHY.Lt.No.80001/CQA(HV)/GEN/A.Dt.13.1.06	MATERIAL :- SHEET AMГ 6 5M - 3 GOST 21631 - 76
5A	2.8.04	N OF A.No.CQA(HV) / T90 / 91 / 001	USED ON :- 172.91.252cbCb 188.91.008cbCb 188.91.008cb-1Cb (5A)
ISSUE	DATE	NATURE OF AMENDMENTS	
DRN	Sd/=	SCALE :- 1 : 2 DIMENSIONS IN mm	CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI
CHD	Sd/=	TOLERANCE ON DIMENSIONS UNLESS OTHERWISE STATED IS : 2102 - 69	TITLE :- SHELL
APPD	Sd/=	ALL THREADS TO CONFORM TO	D S CAT NUMBER
DATE	03 - 02 - 2K		DRAWING NUMBER 175.91.067

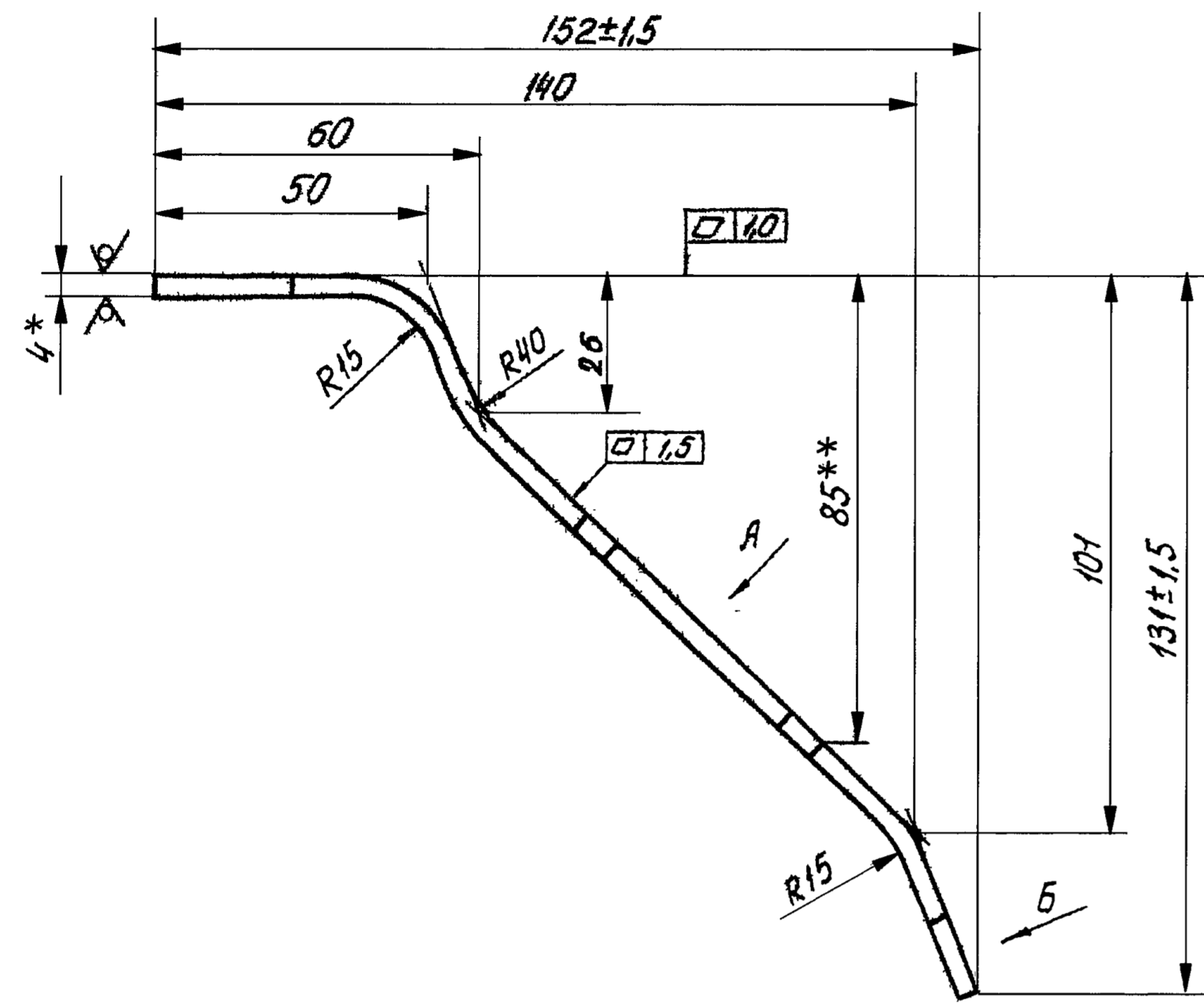
SIZE A4



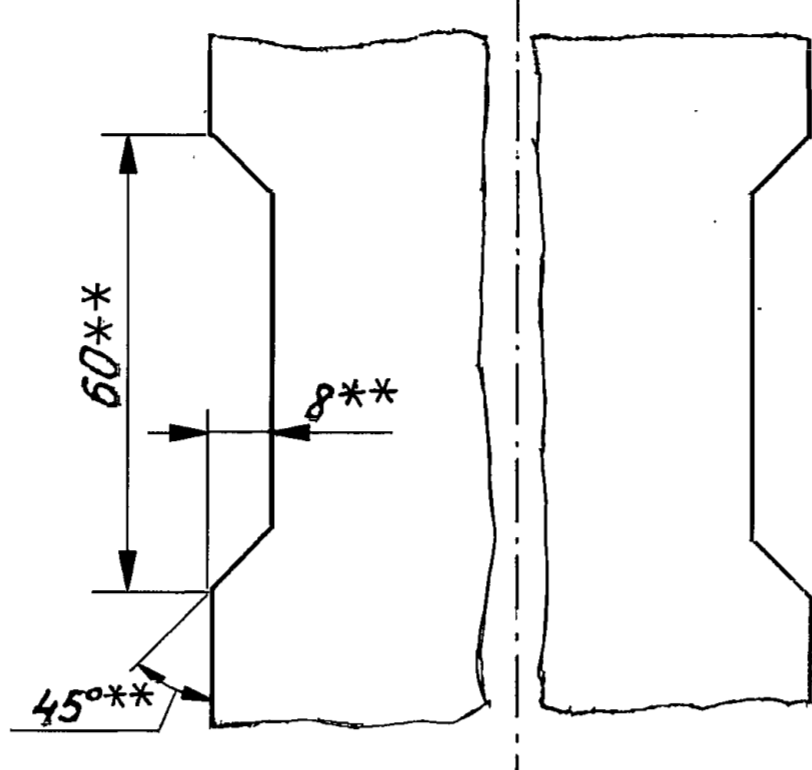
DRAWING NUMBER
172.33.562

SHEET No. 1 OF 1

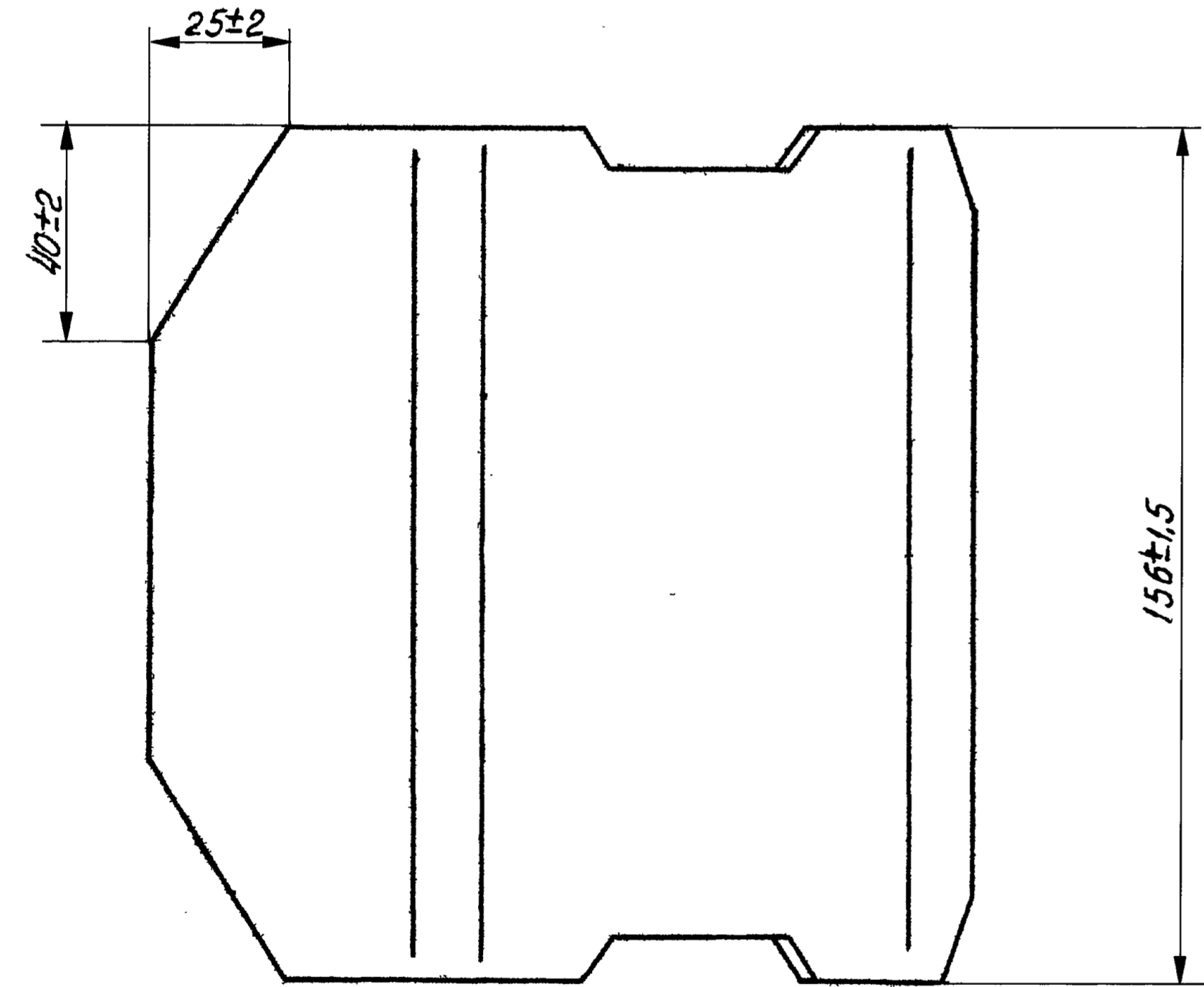
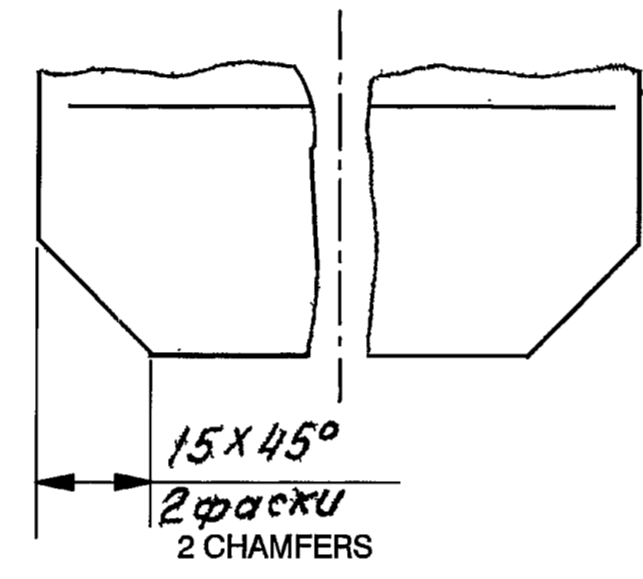
Rz 630 (✓)



VIEW 'A' REVOLVED
Вид А повернуто



VIEW 'B' REVOLVED
Вид Б повернуто



1. ALTERNATE MATERIAL : SHEET AMG 6M (NON COATED) OR AMG 6UM GOST 21631-76.
2. DRAFTS AND SHRINKAGE OF EDGES ARE PERMISSIBLE.
3. NATURAL THINNING OF METAL IN THE PLACES OF BENDING IS ALLOWED.
4. SLOTS AS PER DIMENSIONS 60, 85, 45°, 8 SHOULD NOT BE MADE.
5. THE COMPONENT PROFILE IS TO BE CHECKED BY A TEMPLATE MADE ACCORDING TO THE NOMINAL DIMENSIONS. NON FITTING SHOULD NOT EXCEED 1.5 mm.
6. OTHER REQUIREMENTS ARE TO BE IN ACCORDANCE WITH INSTRUCTIONS 432-U6-1 ALUMINIUM ALLOYS.
7. * DIMENSIONS FOR REFERENCE.
8. ** DIMENSIONS TO BE ENSURED BY THE TOOL.

EXPLANATORY NOTE :-

MATERIAL QUOTED :- SHEET AMG 6, BM 25 GOST 21631-76.
CLADDED ALUMINIUM SHEET TO GRADE AMG 6 (M)
B = CLADDING U = THICK CLADDING All Math
M = ANNEALED AMG 6M OR AMG 6UM
(Ref Note No : 1)
THICKNESS 2.5 mm NORMAL FINISH AND MANUFACTURING ACCURACY TO GOST 21631 - 76.

a) CHEMICAL COMPOSITION % : AS PER GOST 4784 - 74.

BASE CONSTITUENT	= ALUMINIUM
MAGNESIUM	= 5.8 - 6.8
MANGANESE	= 0.5 - 0.8
TITANIUM	= 0.02 - 0.10
BARYLLIUM	= 0.0002 - 005

OTHER IMPURITIES :- (MAXIMUM)

IRON	= 0.4
SILICON	= 0.4
COPPER	= 0.1
ZINC	= 0.2
OTHER IMPURITIES (a) INDIVIDUALLY	= 0.05
(b) TOTALLY	= 0.1

MECHANICAL PROPERTIES :-

TENSILE STRENGTH kgf/mm ²	= 32 (min)
YIELD POINT kgf/mm ²	= 16 (min)
% ELONGATION	= 15 (min)

COMMON TO T-80* DRAWING RE-INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE-NIL

F-61

SIZE A1

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

EST. WT. (g) 0.3	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.	

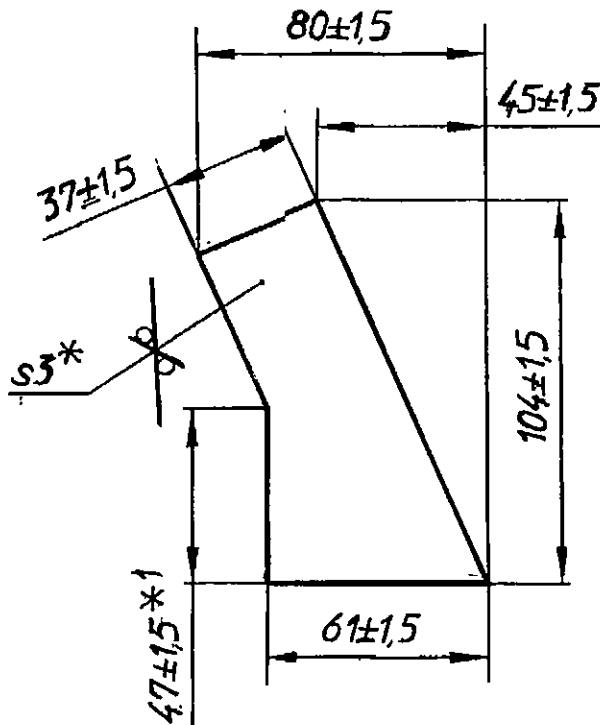
DRN	Sd/=	MATERIAL :-	USED ON :-
CHD	Sd/=	SHEET AMG 6 BM-4	175.33.011Cb-2
APPD	Sd/=	GOST 21631-76	
DATE	26-8-86	CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES)	
SCALE:-	1 : 1	AVADI	
DIMENSIONS IN mm		TITLE :-	
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS: 2102-69		PLATE COVER	
ALL THREADS TO CONFORM TO		D S CAT NUMBER	DRAWING NUMBER
ISSUE	DATE	NATURE OF AMENDMENTS	172.33.562

DRG. INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE - NIL

DRAWING NUMBER
188.91.051

SHEET No 1 OF 1

Rz320/
✓ (✓)



- 1 *Размер для справок
- 2 *1Размер обеспеч инстр
- 3 Остальные требования ю 520.ТУ1

- 1.*Dimensions for refeience.
- 2.*1Dimension is to be ensured by tool.
- 3.Other requirements are as per 520.TY1.

356

SUPPLY CODE
U-01-1-4
D 90222

F-116
63

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

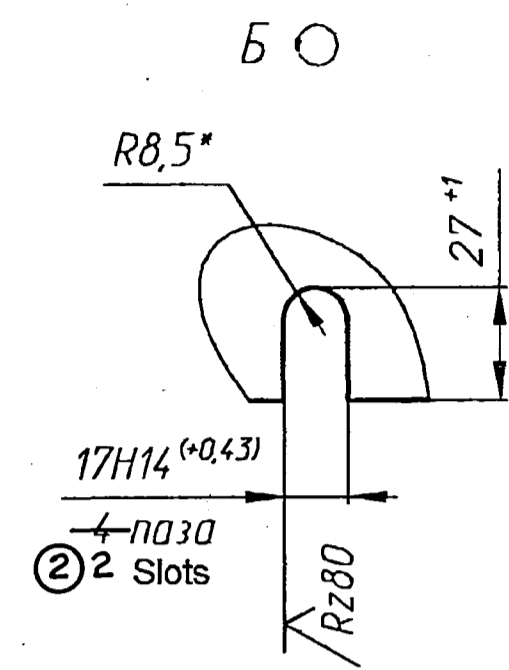
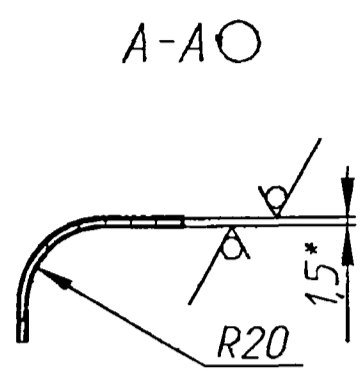
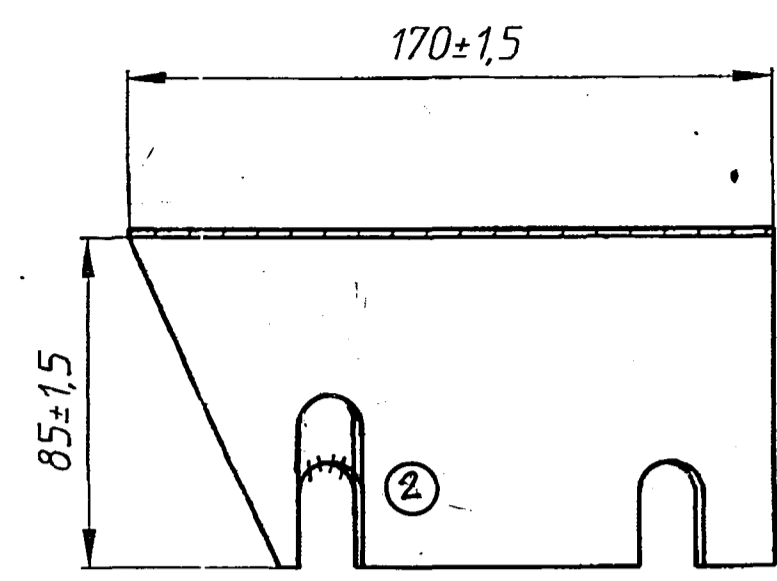
		EST. WT. (kg) 0.04	TO BE STAMPED OR MARKED WHERE INDICATED THUS # (LETTERS)
		ALL SHARPEGES AND CORNERS TO BE REMOVED UNLESS OTHERWISE STATED MACHINED CORNERS TO HAVE R OUT-SIDE R INSIDE EQUIVALENT CHAMFERS ARE PERMISSIBLE.	
		MATERIAL - SHEET АМГ 6.БМ3 GOST 21631-76	USED ON :- 188.91.008cbCb 188.91.008cb-1Cb
ISSUE DATE	NATURE OF AMENDMENTS	CONTROLLEATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI	
DRN <i>[Signature]</i>	SCALE :- 1 : 2	TITLE :- COVER PLATE	
CHD <i>[Signature]</i>	DIMENSIONS IN mm		
APPD <i>[Signature]</i>	TOLERANCE ON DIMENSIONS UNLESS OTHERWISE STATED IS : 2102 - 69	D S CAT NUMBER	
DATE 12.17.04	ALL THREADS TO CONFORM TO		
		DRAWING NUMBER 188.91.051	

SIZE A4

DRAWING NUMBER
188.04.040

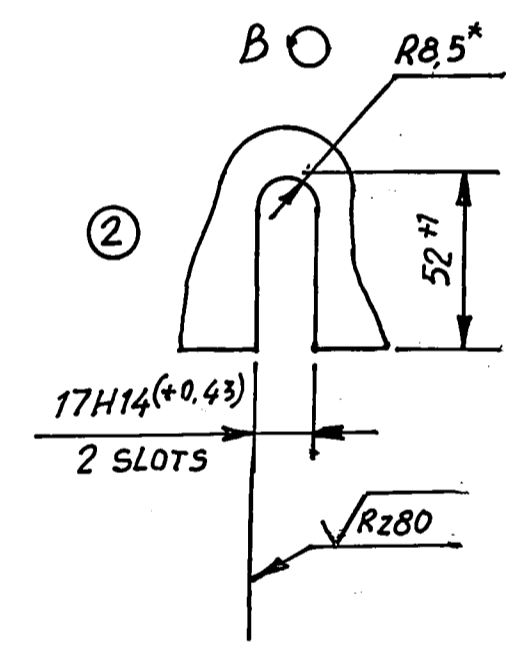
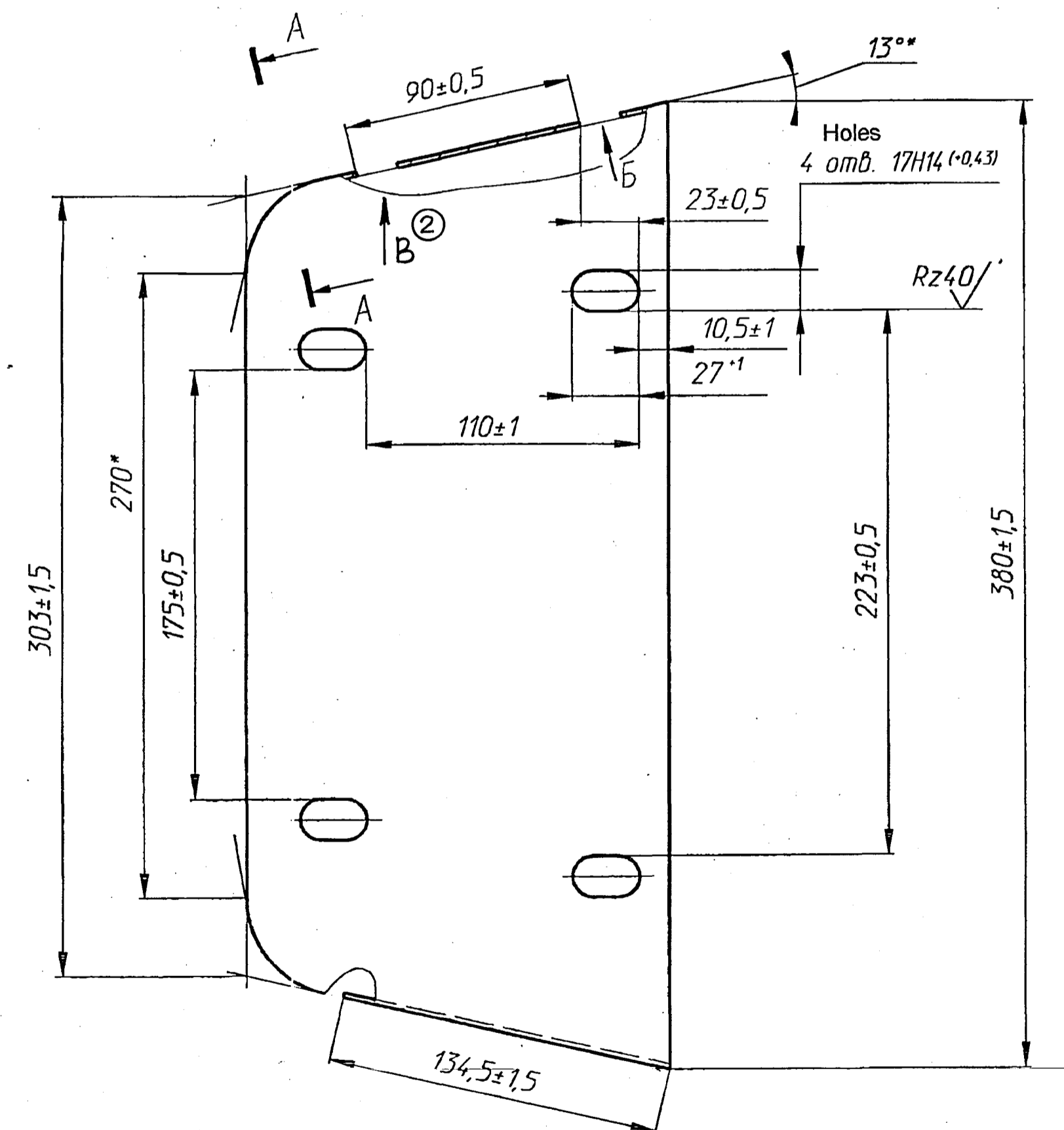
SHEET No. 1 OF 1

Rz160/✓(✓)



1. Неуказанные радиусы 3⁺³ мм.
2. *Размеры для справок.
3. Покрытие:
Грунтовка ВЛ-02
Грунтовка АК-070
Эмаль ХВ-518 защитная.
Требования по 520.TY5.
4. Остальные требования по 520.TY1.

1. Unspecified radii 3⁺³ mm.
2. *Dimensions are for reference.
3. Coating:
Primer ВЛ-02
Primer АК-070
Enamel ХВ-518 Khaki
Requirements are as per 520.TY5
4. Remaining requirements are as per 520.TY1.



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

EST. WT. (Kg) 0.23	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	Mr. Dargha	MATERIAL:- SHEET	USED ON:-
CHD	Shah	AMr6.5M 1.5 GOST 21631-76	188.04.058cbCb
APPD	Shah	CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI	
DATE	16.6.04	TITLE:-	
SCALE:- 1:2		SHIELD	
DIMENSIONS IN mm		D S CAT NUMBER	
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS: 2102-69		DRAWING NUMBER	
ALL THREADS TO CONFORM TO		188.04.040	
ISSUE	DATE	NATURE OF AMENDMENTS	
2	30.12.10	Nofn. No. 188A-50-08	

DRG. INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE - 1

356
SUPPLY CODE
U-01-1-2
D90042

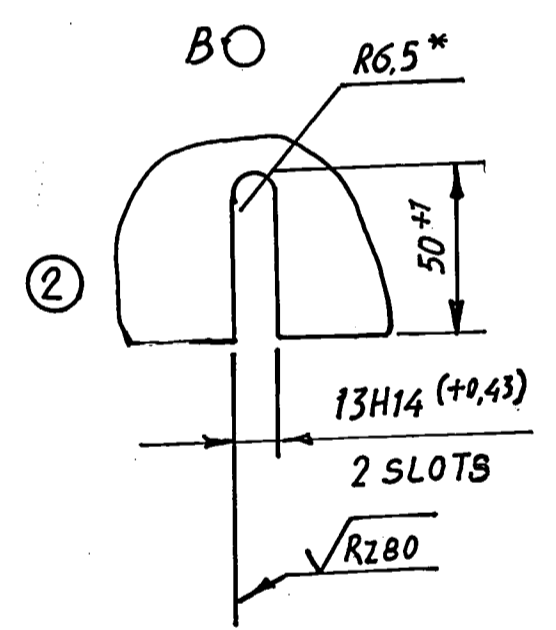
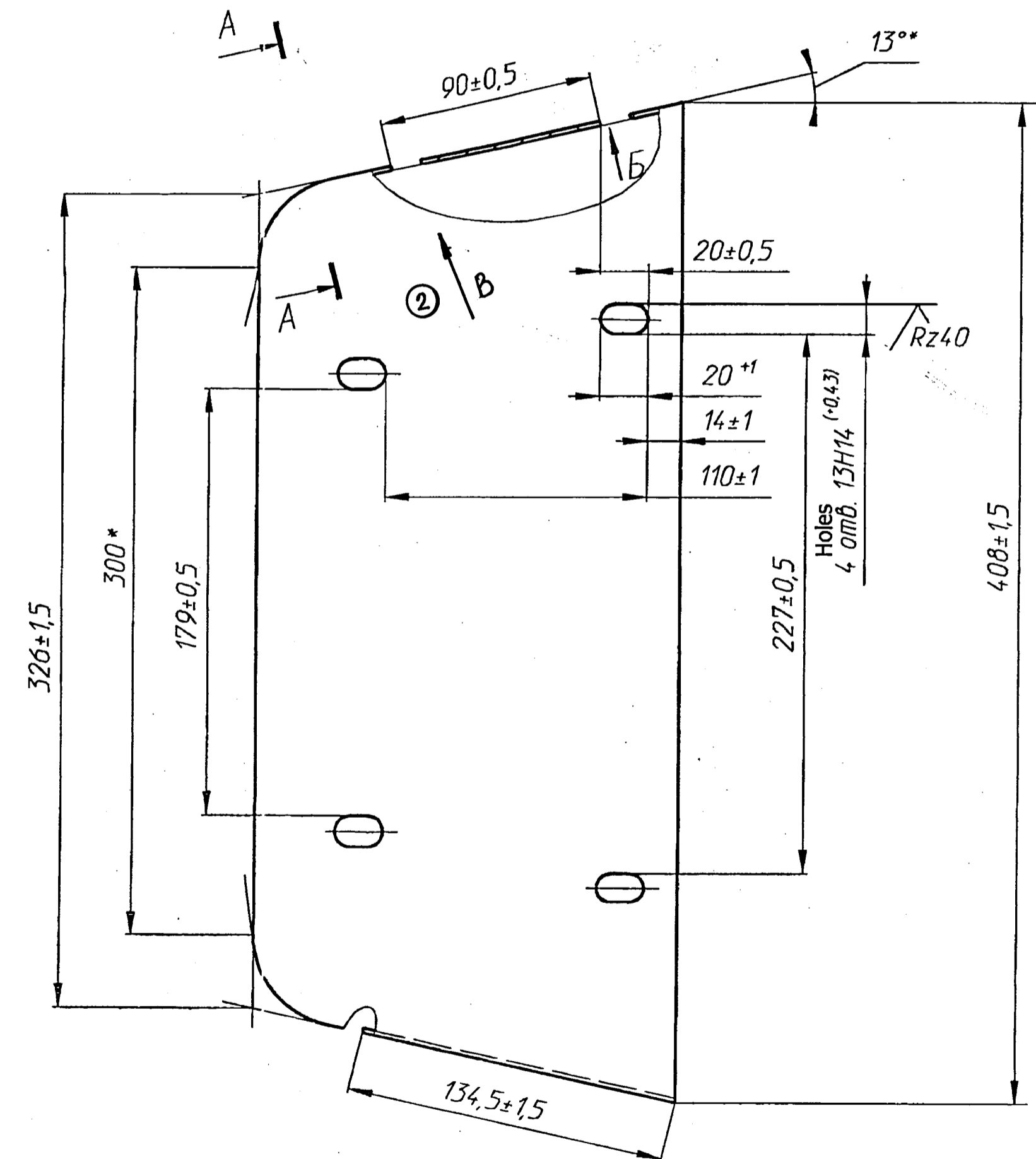
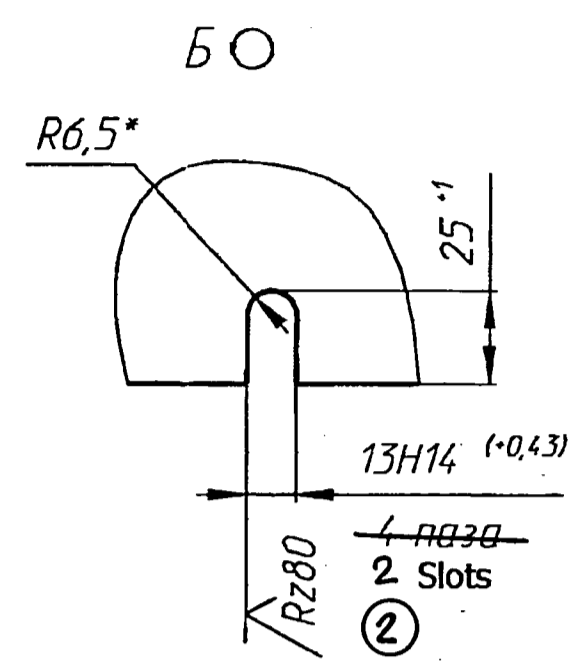
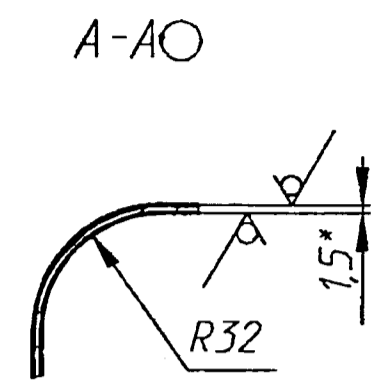
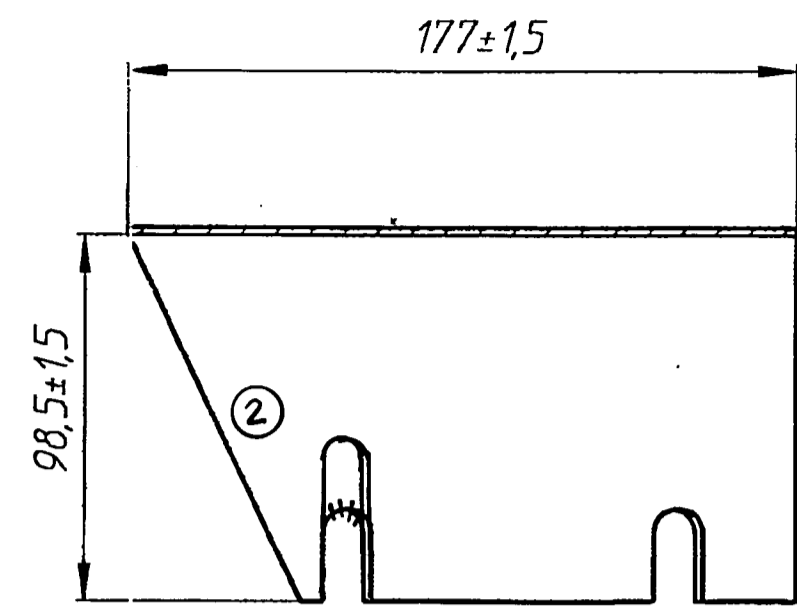
F-63
80
SIZE A2



DRAWING NUMBER
188.04.041

SHEET No. 1 OF 1

Rz160 ✓ (✓)



1. Неуказанные радиусы 3⁺³ мм.
2. *Размеры для справок.
3. Покрытие:
Грунтовка ВЛ-02
Грунтовка АК-070
Эмаль ХВ-518 защитная.
Требования по 520.ТУ5.
4. Остальные требования по 520.ТУ1.

1. Unspecified radii 3⁺³ mm.
2. *Dimensions are for reference.
3. Coating:
Primer ВЛ-02
Primer АК-070
Enamel ХВ-518 Khaki
Requirements are as per 520.TY5
4. Remaining requirements are as per 520.TY1.

DRG. INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE - 1

356
SUPPLY CODE
U-01-1-2
D90042

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

EST. WT. (Kg) 0.26	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	Dr. Dargham	MATERIAL:- SHEET	USED ON:-
CHD	J. D. ...	AMr6. 5M 1.5 GOST 21631-76	188.04.058cbCb
APPD	Chanchel	CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI	
DATE	16.6.04	TITLE:-	
SCALE:- 1:2			
DIMENSIONS IN mm			
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS: 2102-69		SHIELD	
ALL THREADS TO CONFORM TO		D S CAT NUMBER	DRAWING NUMBER
2	30.12.10	Notn.No.188A-50-08	188.04.041
ISSUE	DATE	NATURE OF AMENDMENTS	

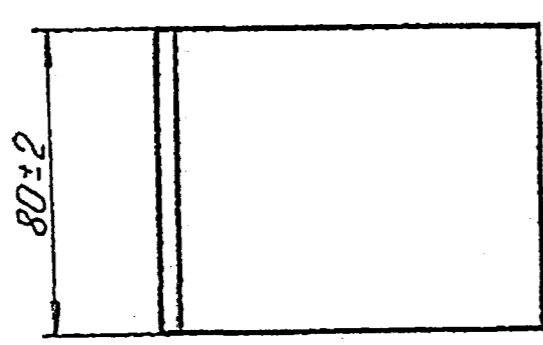
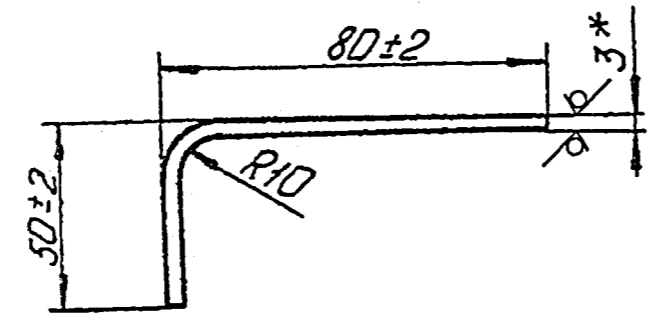
F-63
81
SIZE A2



IB. JAYAVELUJ, JTQIDJ
09-09-06

COMMON TO T-90 & BLT
DRG RE - INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE - 6

F-172
37
SIZE A3

DRAWING NUMBER 175.91.120		SHEET No 1 OF 1		Rz 320 ✓ (✓)															
		<ol style="list-style-type: none"> MANUFACTURE FROM SHEET AMГ 6M (UN COATED) AND AMГ 65YM GOST 21631 - 76 IS ALLOWED. NATURAL THINNING OF METAL AND TOOL MARKS ARE ALLOWED. OTHER REQUIREMENTS AS PER 432. U6 - 1. * DIMENSIONS FOR REFERENCE. MANUFACTURE OF COMPONENT 4, 5 OR 6 MM THICK DEPENDING ON BOX HOUSING 175.91.032cb-2 WRAPAGE IS ALLOWED. 																	
		<p>Ⓟ ALT. MATL. :- GRADE 54300 TO IS : 737 - 86</p>																	
<p>PILOT SAMPLE SHOULD BE APPROVED BY A H S P BEFORE BULK PRODUCTION.</p>		<table border="1"> <tr><td>DRN</td><td>Sd/=</td></tr> <tr><td>CHD</td><td>Sd/=</td></tr> <tr><td>APPD</td><td>Sd/=</td></tr> <tr><td>DATE</td><td></td></tr> <tr><td>SCALE:-</td><td>1 : 2</td></tr> <tr><td>DIMENSIONS IN mm</td><td></td></tr> <tr><td>TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS :</td><td>2102 - 69</td></tr> </table>		DRN	Sd/=	CHD	Sd/=	APPD	Sd/=	DATE		SCALE:-	1 : 2	DIMENSIONS IN mm		TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS :	2102 - 69	<p>MATERIAL :- SHEET AMГ 65M - 3 GOST 21631 - 76</p> <p>USED ON :- 172.91.252cbCb 188.91.008cbCb Ⓟ 188.91.008cb-1Cb Ⓟ</p>	
DRN	Sd/=																		
CHD	Sd/=																		
APPD	Sd/=																		
DATE																			
SCALE:-	1 : 2																		
DIMENSIONS IN mm																			
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS :	2102 - 69																		
<p>EST. WT. (Kg) 0.080</p> <p>TO BE STAMPED OR MARKED WHERE INDICATED THUS # (LETTERS)</p>		<table border="1"> <tr><td>6B</td><td>16.5.06</td><td>AUTHY.Lt.No.80001/CQA(HV)/GEN/A.Dt.13.1.03</td></tr> <tr><td>6A</td><td>2.8.04</td><td>N OF A No.CQA(HV) / T90 / 91 / 001</td></tr> <tr><td>ISSUE</td><td>DATE</td><td>NATURE OF AMENDMENTS</td></tr> </table>		6B	16.5.06	AUTHY.Lt.No.80001/CQA(HV)/GEN/A.Dt.13.1.03	6A	2.8.04	N OF A No.CQA(HV) / T90 / 91 / 001	ISSUE	DATE	NATURE OF AMENDMENTS	<p>CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI</p> <p>TITLE :- STRAP</p>						
6B	16.5.06	AUTHY.Lt.No.80001/CQA(HV)/GEN/A.Dt.13.1.03																	
6A	2.8.04	N OF A No.CQA(HV) / T90 / 91 / 001																	
ISSUE	DATE	NATURE OF AMENDMENTS																	
<p>ALL SHARP EDGES AND CORNERS TO BE REMOVED UNLESS OTHERWISE STATED MACHINED CORNERS TO HAVE R OUT-SIDE R INSIDE EQUIVALENT CHAMFERS ARE PERMISSIBLE.</p>		<p>ALL THREADS TO CONFORM TO</p>		<p>D S CAT NUMBER</p> <p>DRAWING NUMBER 175.91.120</p>															

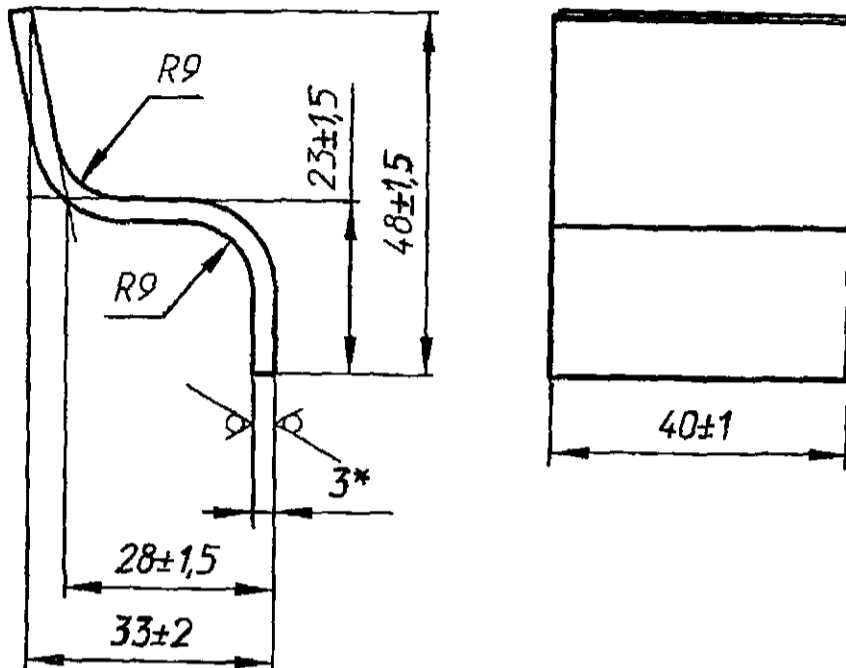


DRG. INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE - NIL

DRAWING NUMBER
172.91.810

SHEET No. 1 OF 1

Rz320/
✓(✓)



2 *¹Размер для справок
3 Остальные требования по 520.ТУ1

356

SUPPLY CODE
U-01-1-4
D 90223

F-117
36

2.*¹Dimension for reference.
3.Other requirements are as per 520.TY1.

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

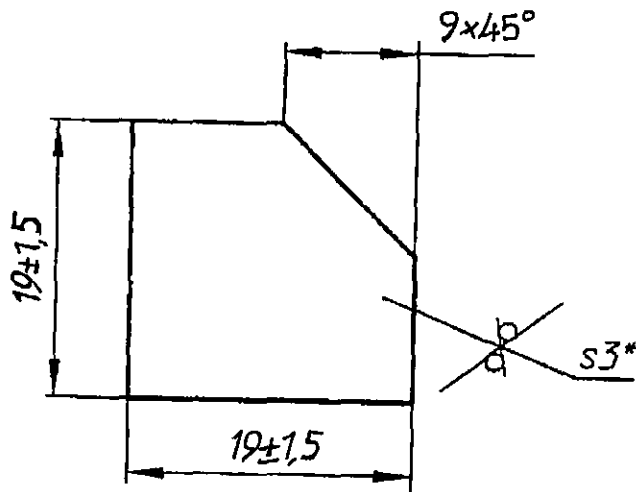
		EST. WT. (Kg) 0.026	TO BE STAMPED OR MARKED WHERE INDICATED THUS # (LETTERS)
		ALL SHARP EDGES AND CORNERS TO BE REMOVED UNLESS OTHERWISE STATED MACHINED CORNERS TO HAVE R OUT-SIDE R INSIDE EQUIVALENT CHAMFERS ARE PERMISSIBLE.	
		MATERIAL :- SHEET AMГ6.БМ3 GOST 21631-76	USED ON :- 188.91.008cbCb 188.91.008cb-1Cb
ISSUE	DATE	NATURE OF AMENDMENTS	
DRN <i>TRam</i>		SCALE :- 1 : 1	CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI
CHD <i>B.Ton</i>		DIMENSIONS IN mm	
APPD <i>Chanchal</i>		TOLERANCE ON DIMENSIONS UNLESS OTHERWISE STATED IS : 2102 - 69	TITLE :- STRAP
DATE <i>23-7-04</i>		ALL THREADS TO CONFORM TO	D S CAT NUMBER
SIZE A4			DRAWING NUMBER 172.91.810

DRG. INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE - NIL

DRAWING NUMBER
172.91.811

SHEET No. 1 OF 1

Rz320/
✓ (✓)



- 2. *Размер для справок
- 3. Остальные требования по 520.TY1.

- 1.*Dimension for reference.
- 2.Other requirements are as per 520.TY1.

356
SUPPLY CODE
U-01-1-4
D 90223

F-117
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PILOT SAMPLE SHOULD BE APPROVED BY A H S P BEFORE BULK PRODUCTION.

		EST. WT. (Kg) 0.003	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 AMr 6.5 M 3 GOST 21631-76	USED ON :- 188.91.008cbCb 188.91.008cb-1Cb
ISSUE DATE	NATURE OF AMENDMENTS		
DRN <i>Pran</i>	SCALE :- 2 : 1	CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI	
CHD <i>B. J. D. S.</i>	DIMENSIONS IN mm		
APPD <i>Chanchal</i>	TOLERANCE ON DIMENSIONS UNLESS OTHERWISE STATED IS : 2102 - 69	TITLE :- RIB	
DATE <i>23.7.04</i>	ALL THREADS TO CONFORM TO	D S CAT NUMBER	DRAWING NUMBER 172.91.811

SIZE A4


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	Shell Drg.No. 188.91.023 LF No. 6201291128	Technology 1	Sheet Metal Fabrication	1.Shearing machine min capacity 3.0mm Thickness.	
		Technology 2	Shape cutting and Forming	Press min 100 T required for Forming and Trimming operation.	
		Technology 3	Machining or Grinding	Conventional Horizontal or Vertical Milling Machine 400x500mm, Surface grinding 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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(S.SAKTHIVEL)


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(M.NAGARAJAN)


DGM/CA & SMS - 11


JWM/QA(OH) - OP

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	Shell Drg.No. 175.91.060 LF No. 6206008232	Technology 1	Sheet Metal Fabrication	1.Shearing machine min capacity 3.0mm Thickness .	
		Technology 2	Shape Bending	Press Brake min 100 Ton required 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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GM OPERATIONS - 91


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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	Shell Drg.No. 175.91.067 LF No. 6206008237	Technology 1	Sheet Metal Fabrication	1.Shearing machine min capacity 3.0mm Thickness . Press Brake min 100 Ton required for Bending operation.	
		Technology 2	Shape Bending		
		Test/Inspection	Fixture /Gauges/Mandrel /templates	Firm has to develop as per Specification/Drawings.	

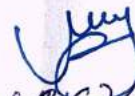
Note: If the firm is not having the above facility and able to make components with alternate methods, the details of methods to be submitted during [participation in Tender for validation and acceptance, if found suitable.


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GM/OPERATIONS - II

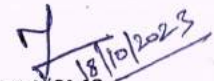

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Sl.No	Nomenclature and Drg.No.	Manufacturing Technology & Testing/ Inspection facilities required to produce the item		Must be possessed by the Vendor in his own premises (List of Plant and Machinery and Testing /Inspection facility to be submitted)	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	Cover Plate Drg.No. 172.33.562 LF No. 6206305494	Technology 1	Sheet Metal Fabrication		Metal cutting facility for profile cutting like Laser or water jet cutting facility min. 4 mm thick Aluminum plates.
		Technology 2	Shape Forming	Press min 100 Ton required for Shape 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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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. 188.91.051	Technology 1	Sheet Metal Fabrication	1.Shearing machine min capacity 5.0mm Thickness .	
		Technology 2	Shape cutting	Press min 100 Ton required for profile cutting operation.	
	LF No. 6201291149	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/CBOI/VQC/2022-23 dtd.09/09/2022,21/09/2022&16/02/2023&10/07/2023

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	Shield Drg.No. 188.04.040 LF No. 6201004049	Technology 1	Sheet Metal Fabrication		Metal cutting facility for profile cutting like Laser or water jet cutting facility min.1.5mm thick Aluminum plates.
		Technology 2	Shape Forming	Press min 100 Ton required for Shape 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/CBOI/VQC/2022-23 dtd.09/09/2022,21/09/2022&16/02/2023&10/07/2023

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	Shield Drg.No. 188.04.040 LF No. 6201004049	Technology 1	Sheet Metal Fabrication		Metal cutting facility for profile cutting like Laser or water jet cutting facility min.1.5mm thick Aluminum plates.
		Technology 2	Shape Forming	Press min 100 Ton required for Shape 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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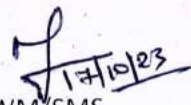
Ref : Lr No. 6005/HVF/TA/CBOI/VQC/2022-23 dtd.09/09/2022,21/09/2022&16/02/2023&10/07/2023


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	Shield Drg.No. 188.04.041 LF No. 6201004050	Technology 1	Sheet Metal Fabrication		Metal cutting facility for profile cutting like Laser or water jet cutting facility min.1.5mm thick Aluminum plates.
		Technology 2	Shape Forming	Press min 100 Ton required for Shape 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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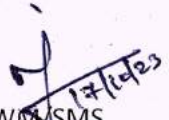

JSM/CA (R19) - OP


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	Strap Drg.No. 175.91.120 LF No. 6206008260	Technology 1	Sheet Metal Fabrication	1.Shearing machine min capacity 3.0mm Thickness .	
		Technology 2	Shape Forming	Press min 100 Ton required for Shape 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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JTCM/CA (17/1/23)-00


Ref : Lr No. 6005/HVF/TA/CBOI/VQC/2022-23 dtd.09/09/2022,21/09/2022&16/02/2023&10/07/2023


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	Rib Drg.No. 172.91.811 LF No. 6201291184	Technology 1	Sheet Metal Fabrication	1.Shearing machine min capacity 5.0mm Thickness .	
		Technology 2	Shape cutting	Press min 100 Ton required for profile cutting 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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JWSM/CA(OH)-OP

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	Strap Drg.No. 172.91.810	Technology 1	Sheet Metal Fabrication	1.Shearing machine min capacity 3.0mm Thickness	
		Technology 2	Shape Forming	Press min 100 Ton required for Shape forming operation.	
	LF No. 6201291183	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/CA (CA) - DP

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

FOR

(SHELL)

DRG.NO.188.91.023

(LF NO: 6201291128)

No.HVF/T-90/QAP/91/SHELL/240519-00

ISSUE No: 00

DATE: JAN-2022

QUALITY ASSURANCE (RIG-SUB ASSEMBLY)

HEAVY VEHICLES FACTORY

AVADI CHENNAI – 600 054

QUALITY ASSURANCE PLAN (QAP)

FOR

SHELL

DRG. NO. 188.91.023

PREPARED BY

REVIEWED BY


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


(ARUL DASS)
JWM/QA (RIG-SA /TP)

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 **SHELL TO DRG.NO 188.91.023** 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 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 **SHELL TO DRG.NO:188.91.023**.

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 **SHELL TO DRG. NO. 188.91.023** 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. 188.91.014CBCB -
- 2. 188.91.015CBCB -

7. LIST OF DRAWINGS:

SI. NO.	DRG. NO	NOMENCLATURE	REMARKS
1	188.91.023	SHELL	-

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

SI. NO	DRG. NO	NOMENCLATURE	MATERIAL SPECIFICATIONS	Qty
1	188.91.023	SHELL	SHEET AMГ 6 БМ- 3 GOST 21631-76.	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 SHELL TO DRG.NO 188.91.023

All dimensions should be confirmed as per drawing.

Sl. No.	Drawing Dimension
1.	17± 1.5 mm (Refer Drawing)
2.	161±1.5 ^{**} mm
3.	R24
4.	282±1.5 mm
5.	3* mm
6.	R7 (2 Radii)
7.	R24
8.	269±1.5 mm
9.	95±1.5 ^{**} mm
10.	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 SHELL TO DRG.NO 188.91.023

- a) The component should be manufactured from SHEET AMF 6 EM- 3 GOST 21631-76.
- b) **Chemical properties:** As per SHEET AMF 6 EM- 3 GOST 21631-76 and GOST 4784-74.

Grade	Content of elements %										
	Alloying constituent					Impurities, maximum					
	Al	Mg	Mn	Ti	Be	Fe	Si	Cu	Zn	Other impurities	
										Each individually	Total
AMГ6	Base constituent	5.8 - 6.9	0.5 - 0.8	0.02 - 0.10	0.0002 - 0.005	0.4	0.4	0.1	0.2	0.05	1.0

Note: For mass fraction of other elements refer GOST 4784-74.

c) **Mechanical properties:** As per SHEET AMГ 6 БМ- 3 GOST 21631-76.

grade of alloy	Ultimate Stress (Kgf/mm ²)	Yield point (Kgf/mm ²)	Elongation % l= 11.3 √F
	Minimum		
AMГ 6	32.0	16	15

Note: For other parameters refer GOST 21631-76.

14) PERFORMANCES / ACCEPTANCE TEST: SHELL TO DRG.NO:188.91.023

1. Alternate material sheet AM_r5 M3 GOST 21631-76.
2. The component may be manufactured from two parts as per GOST 14806-80-C2.0 ^{Rz160} ✓
4. *Dimensions for reference.
6. *Dimensions are to be ensured by tool.
5. Other requirements are 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: 188.91.023
- b) Material specification as per drawing:
SHEET AMГ 6 БМ- 3 GOST 21631-76.
- c) GOST 21631-76 & GOST 4784-74.
- d) Specification 520 TY1.
- e) Alternate Material:
 - a. Refer QAP Para No:14(1) & 14(2).

ANNEXURE-A

SL. NO.	CATEGORY	ASSEMBLY/ SUB ASSEMBLY	TESTS/ INSPECTION PARAMETERS	STANDARDS TO BE REFERRED	ACCEPTANCE CRITERIA	INSPECTION RESPONSIBILITY			REMARKS
						Firm	HVF	DGOA	
1	SHELL TO DRG. NO 188.91.023	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 21631-76, & GOST 4784-74.	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).

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 (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

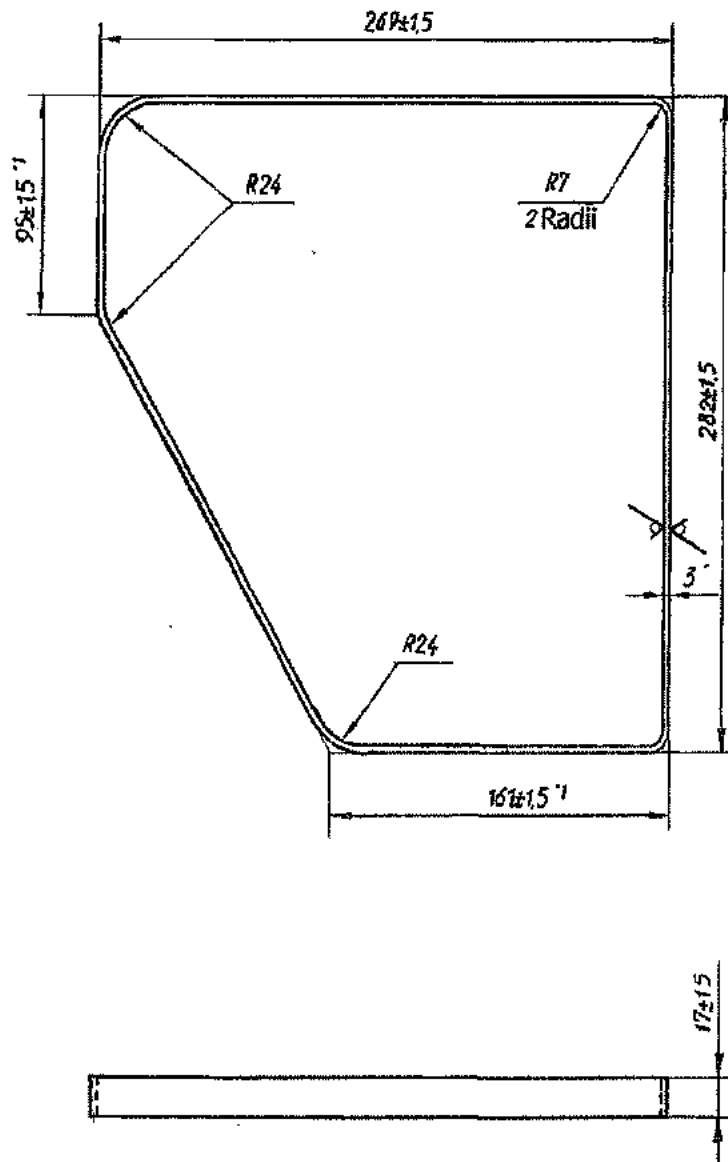


FIG: SHELL TO DRG.NO.188.91.023.

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

FOR

(SHELL)

DRG.NO.175.91.060

(LF NO: 6206008232)

No.HVF/T-72C/QAP/91/SHELL/243320-00

ISSUE No: 00

DATE: JAN-2022

QUALITY ASSURANCE (RIG-SUB ASSEMBLY)

HEAVY VEHICLES FACTORY

AVADI CHENNAI – 600 054

QUALITY ASSURANCE PLAN (QAP)

FOR

SHELL

DRG. NO. 175.91.060


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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 **SHELL TO DRG.NO 175.91.060** 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 **SHELL TO DRG.NO:175.91.060**.

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 **SHELL TO DRG. NO. 175.91.060** 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. 188.91.016CBCB -
- 2. 175.91.033CB-2CB -

7. LIST OF DRAWINGS:

SI. NO.	DRG. NO	NOMENCLATURE	REMARKS
1	175.91.060	SHELL	-

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

SI. NO	DRG. NO	NOMENCLATURE	MATERIAL SPECIFICATIONS	Qty
1	175.91.060	SHELL	SHEET AMГ 6 EM- 3 GOST 21631-76.	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 II, 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 SHELL TO DRG.NO 175.91.060

All dimensions should be confirmed as per drawing.

Sl. No.	Drawing Dimension
1.	757±1 mm
2.	3* mm
3.	R10
4.	16±2 mm
5.	213±1 mm
6.	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 SHELL TO DRG.NO 175.91.060

a) The component should be manufactured from SHEET AMГ 6 БМ- 3 GOST 21631-76.

b) **Chemical properties:** As per SHEET AMГ 6 БМ- 3 GOST 21631-76 and GOST 4784-74.

ALLOY GRADE	ALLOYING CONSTITUENTS					IMPURITIES (MAX)				OTHER IMPURITIES	
	Al	Mg	Mn	Ti	Be	Fe	Si	Cu	Zn	EACH INDIVIDUALLY	TOTAL
AMГ 6	BASE - CONSTITUENT	5.8- 6.8	0.5- 0.8	0.02 0.10	0.0002 0.0005	0.4	0.4	0.1	0.2	0.05	0.1

Note: For mass fraction of other elements refer GOST 4784-74.

c) **Mechanical properties:** As per SHEET AMГ 6 БМ- 3 GOST 21631-74.

ALLOY GRADE	MATERIAL CONDITION OF SHEET	TENSILE STRENGTH Kgf / mm ²	YIELD POINT Kgf / mm ²	ELONGATION %
AMГ 6	ANNEALED	31.0	15.0	15.0

Note: For other parameters refer GOST 21631-74.

14) PERFORMANCES / ACCEPTANCE TEST: SHELL TO DRG.NO:175.91.060

1. MANUFACTURE FROM SHEET AMГ 6M (UNCOATED) AND AMГ 6YM GOST 21631 - 76 .
2. MANUFACTURING FROM FOUR PARTS IS ALLOWED.
3. * DIMENSIONS FOR REFERENCE.

EXPLANATORY NOTE :-

4. REFERENCE MATERIAL QUOTED :- ALUMINIUM ALLOY SHEET 3mm THICK ANNEALED (M) WITH TECHNOLOGICAL CLADDING (Б) WITH NORMAL SURFACE FINISH TO GOST 21631 - 76 MANUFACTURED FROM GRADE AMГ 6 TO GOST 4784 - 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: 175.91.060.
- b) Material specification as per drawing:
SHEET AMГ 6 БМ- 3 GOST 21631-76.
- c) GOST 21631-76 & GOST 4784-74.
- d) Alternate material:
 - a. GRADE 54300 TO IS: 737-86.
 - b. REFER QAP PARA NO: 14(1).

SL. NO.	CATEGORY	ASSEMBLY/ SUB ASSEMBLY	TESTS/ INSPECTION PARAMETERS	STANDARDS TO BE REFERRED	ACCEPTANCE CRITERIA	INSPECTION RESPONSIBILITY			REMARKS
						Firm	HVF	DGQA	
1	SHELL TO DRG. NO 175.91.060	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 21631- 76, & GOST 4784-74.	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).

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 buton 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

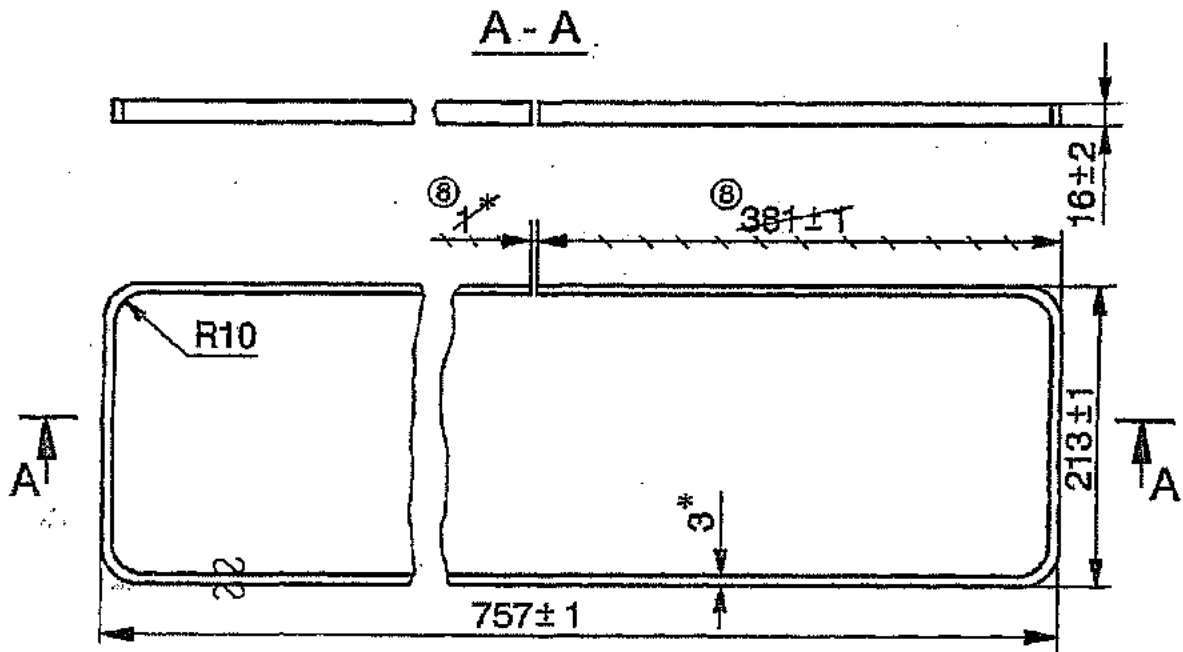


FIG: SHELL TO DRG.NO.175.91.060.

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

FOR

(SHELL)

DRG.NO.175.91.067

(LF NO: 6206008237)

No.HVF/T-72C/QAP/91/SHELL/243327-00

ISSUE No: 00

DATE: JAN-2022

QUALITY ASSURANCE (RIG-SUB ASSEMBLY)

HEAVY VEHICLES FACTORY

AVADI CHENNAI – 600 054

QUALITY ASSURANCE PLAN (QAP)

FOR


SHELL

DRG. NO. 175.91.067

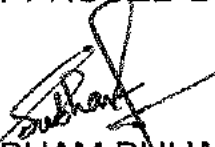
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1.IMPORTANT NOTE

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 **SHELL TO DRG.NO 175.91.067** 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 **SHELL TO DRG.NO:175.91.067**.

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 **SHELL TO DRG. NO. 175.91.067** 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. 188.91.008CBCB -
- 2. 188.91.008CB-1CB -
- 3. 172.91.252CBCB -

7. LIST OF DRAWINGS:

SI. NO.	DRG. NO	NOMENCLATURE	REMARKS
1	175.91.067	SHELL	-

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

SI. NO	DRG. NO	NOMENCLATURE	MATERIAL SPECIFICATIONS	Qty
1	175.91.067	SHELL	SHEET AMΓ 6 EM- 3 GOST 21631-76.	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/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 SHELL TO DRG.NO 175.91.067

All dimensions should be confirmed as per drawing.

Sl. No.	Drawing Dimension
1.	782±1 mm
2.	3* mm
3.	R25
4.	238±1 mm
5.	22±2 mm
6.	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 SHELL TO DRG.NO 175.91.067

a) The component should be manufactured from SHEET AMF 6 БМ- 3 GOST 21631-76.

b) **Chemical properties:** As per SHEET AMF 6 БМ- 3 GOST 21631-76 and GOST 4784-74.

Grade	Content of elements %										
	Alloying constituent					Impurities, maximum					
	Al	Mg	Mn	Ti	Be	Fe	Si	Cu	Zn	Other impurities	
										Each individually	Total
AMГ6	Base constituent	5.8	0.5	0.02	0.0002	0.4	0.4	0.1	0.2	0.05	0.1
		-	-	-	- 0.005						
		6.9	0.8	0.10							

Note: For mass fraction of other elements refer GOST 4784-74.

c) Mechanical properties: As per SHEET AMГ 6 БМ- 3 GOST 21631-76.

grade of alloy	Ultimate Stress	Yield point	Elongation %
	(Kgf/mm ²)	(Kgf/mm ²)	l= 11.3 √F
	Minimum		
AMГ 6	32.0	16	15

Note: For other parameters refer GOST 21631-76.

14) PERFORMANCES / ACCEPTANCE TEST: SHELL TO DRG.NO:175.91.067

1. MANUFACTURE FROM SHEET AMГ 6M (UN COATED) AND AMГ 6YM GOST 21631 -76 IS ALLOWED.
2. MANUFACTURE FROM FOUR PARTS IS ALLOWED.
3. * DIMENSIONS FOR REFERENCE.

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: 175.91.067
- b) Material specification as per drawing:
SHEET AMF 6 EM- 3 GOST 21631-76.
- c) GOST 21631-76 & GOST 4784-74.
- d) Alternate Material:
 - a. GRADE 54300 TO IS: 737-86.
 - b. Refer QAP Para No:14(1).

ANNEXURE-A

SL. NO.	CATEGORY	ASSEMBLY/ SUB ASSEMBLY	TESTS/ INSPECTION PARAMETERS	STANDARDS TO BE REFERRED	ACCEPTANCE CRITERIA	INSPECTION RESPONSIBILITY			REMARKS
						Firm	HVF	DGQA	
1	SHELL TO DRG. NO 175.91.067	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 21631-76, & GOST 4784-74.	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 (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

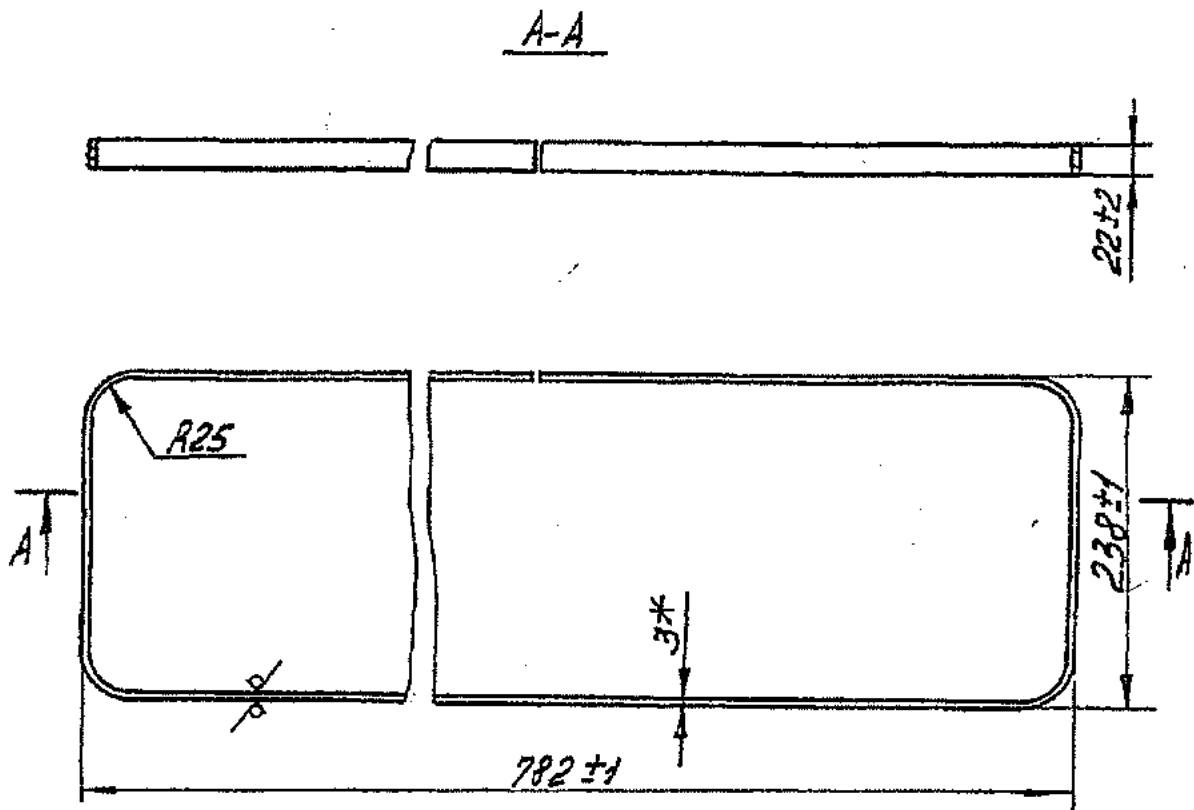


FIG: SHELL TO DRG.NO.175.91.067.

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

FOR

(PLATE COVER) /

DRG.NO.172.33.562 /

(LF NO: 6206305494)

No: HVF/T-72C/QAP/33/PLATECOVER/243274 - 00 /

ISSUE No: 00

DATE: JAN – 2022

QUALITY ASSURANCE (RIG-SUB ASSEMBLY)

HEAVY VEHICLES FACTORY

AVADI CHENNAI – 600 054

QUALITY ASSURANCE PLAN (QAP)

FOR


PLATE COVER

DRG. NO. 172.33.562

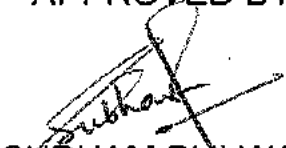
PREPARED BY


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

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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 **PLATE COVER TO DRG.NO 172.33.562** 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: 172.33.562**

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.172.33.562** 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:

1. Tender enquiry (TE) and supply order (S.O) will be issued with QAP stating that inspection will be done as per QAP.
2. 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.
3. 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, PLATE COVER, 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	172.33.562	PLATE COVER	-

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

SI. NO	DRG. NO	NOMENCLATURE	MATERIAL SPECIFICATIONS	Qty
1	172.33.562	PLATE COVER	SHEET AMG6 BM-4 GOST 21631-76	1

Note: Vendor/Contractor may use approved alternate material as per drawing if any as specified in drawing / specification / GOST also refer** Para no: 13.

9. CONDITIONS OF USE/STORAGE INSTRUCTIONS

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

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

(v) Undertaking letter/conformance of certificate(as applicable).

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

10. SAMPLING PLAN :

Sl. No.	Sampling Plan	Pilot	Bulk
(i)	Visual Inspection	100%	100%
(ii)	Dimensional Inspection	100%	General Inspection level III, single sampling, Normal Inspection, AQL 2.5 of IS 2500 (Part-I)-2000
(iii)	Material Inspection	1 No	1 No. for each batch of raw material or heat treatment lot as required by specifications.
(iv)	Acceptance test	-----	-----
(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:-

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 172.33.562:

1. All dimensions should be confirmed as per drawing.

Sl. No.	Drawing Dimensions
1.	152±1.5 mm
2.	140 mm
3.	60 mm
4.	50 mm
5.	4* mm
6.	85** mm
7.	131±1.5 mm
8.	101 mm
9.	R15
10.	R40
11.	26 mm
12.	□ 1.5

13.	R15
14.	6 mm
15.	25±2 mm
16.	40±2 mm
17.	156±1.5 mm
18.	60** mm
19.	8** mm
20.	45***
21.	15x45°
22.	Surface finish / Roughness should be confirmed as per drawing and specification.

2. 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. 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 172.33.562

MATERIAL QUOTED :- SHEET AMG 6 , BM 25 GOST 21631-76.

CLADDED ALUMINIUM SHEET TO GRADE AMG 6 (M)

B = CLADDING U = THICK CLADDING *Alt Matl*
 AMG 6M OR AMG 6UM
 M = ANNEALED (Ref Note No : 1)

THICKNESS 2.5 mm NORMAL FINISH AND MANUFACTURING ACCURACY TO GOST 21631 - 76.

a) CHEMICAL COMPOSITION % : AS PER GOST 4784 - 74.

BASE CONSTITUENT	= ALUMINIUM
MAGNESIUM	= 5.8 - 6.8
MANGANESE	= 0.5 - 0.8
TITANIUM	= 0.02 - 0.10
BARYLLIUM	= 0.0002 - 0.005

OTHER IMPURITIES :- (MAXIMUM)

IRON	= 0.4
SILICON	= 0.4
COPPER	= 0.1
ZINC	= 0.2
<u>OTHER IMPURITIES (a) INDIVIDUALLY</u>	= 0.05
(b) TOTALLY	= 0.1

MECHANICAL PROPERTIES :-

TENSILE STRENGTH kgf/mm ²	= 32 (min)
YIELD POINT kgf/mm ²	= 16 (min)
% ELONGATION	= 15 (min)

**14) PERFORMANCES / ACCEPTANCE TEST: PLATE COVER TO DRG.NO:
172.33.562**

1. ALTERNATE MATERIAL : SHEET AMG 6M (NON COATED) OR AMG 6UM GOST 21631-76.
2. DRAFTS AND SHRINKAGE OF EDGES ARE PERMISSIBLE.
3. NATURAL THINNING OF METAL IN THE PLACES OF BENDING IS ALLOWED.
4. SLOTS AS PER DIMENSIONS 60 , 85 , 45°, 8 SHOULD NOT BE MADE.
5. THE COMPONENT PROFILE IS TO BE CHECKED BY A TEMPLATE MADE ACCORDING TO THE NOMINAL DIMENSIONS. NON FITTING SHOULD NOT EXCEED 1.5 mm.
6. OTHER REQUIREMENTS ARE TO BE IN ACCORDANCE WITH INSTRUCTIONS 492 -U6-1 ALUMINIUM ALLOYS.
7. * DIMENSIONS FOR REFERENCE.
8. ** DIMENSIONS TO BE ENSURED BY THE TOOL.

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 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

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.

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 No: 172.33.562
- b) Material specification as per drawing:
SHEET AMG6 BM-4 GOST 21631-76
- c) GOST 21631-76.
- d) Alternate Material: SHEET AMG 6M (non-coated) or AMG 6UM GOST 21631-76.

SL. NO	ITEM/ SUB ASSY/ ASSEMBLY	CATEGORY	TESTS/INSPECTION PARAMETERS	STANDARDS TO BE REFERRED	ACCEPTANCE CRITERIA	INSPECTION RESPONSIBILITY			REMARKS
						Firm	HVF	DGQA	
1	PLATE COVER to DRG.NO: 172.33.562	Pre inspection reports (PIR) of firm	Firm has to produced all the document as per QAP	As per the relevant drawing and QAP.	Confirm to drawing and QAP as per bill of material	P	W/V	R	100% should be ensured.
2		Bill of material (BOM)	Firm has to prepare the BOM as per QAP	Refer QAP Para no: 8	Confirm to QAP.	P	W/V	R	100% should be ensured.
3		Material Checks	Chemical composition & Physical, Mechanical Properties	As per the GOST 21631-76	All the values to confirm with QAP Para no:13.1	P	W/V	R	100% should be ensured.
4		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/V	R	100% should be ensured.
5		Marking / traceability	Firm has to make marking / traceability records.	Refer QAP Para no: 18	Confirm to QAP Para no: 18	P	W/V	R	100% to be done
6		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% to be done

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

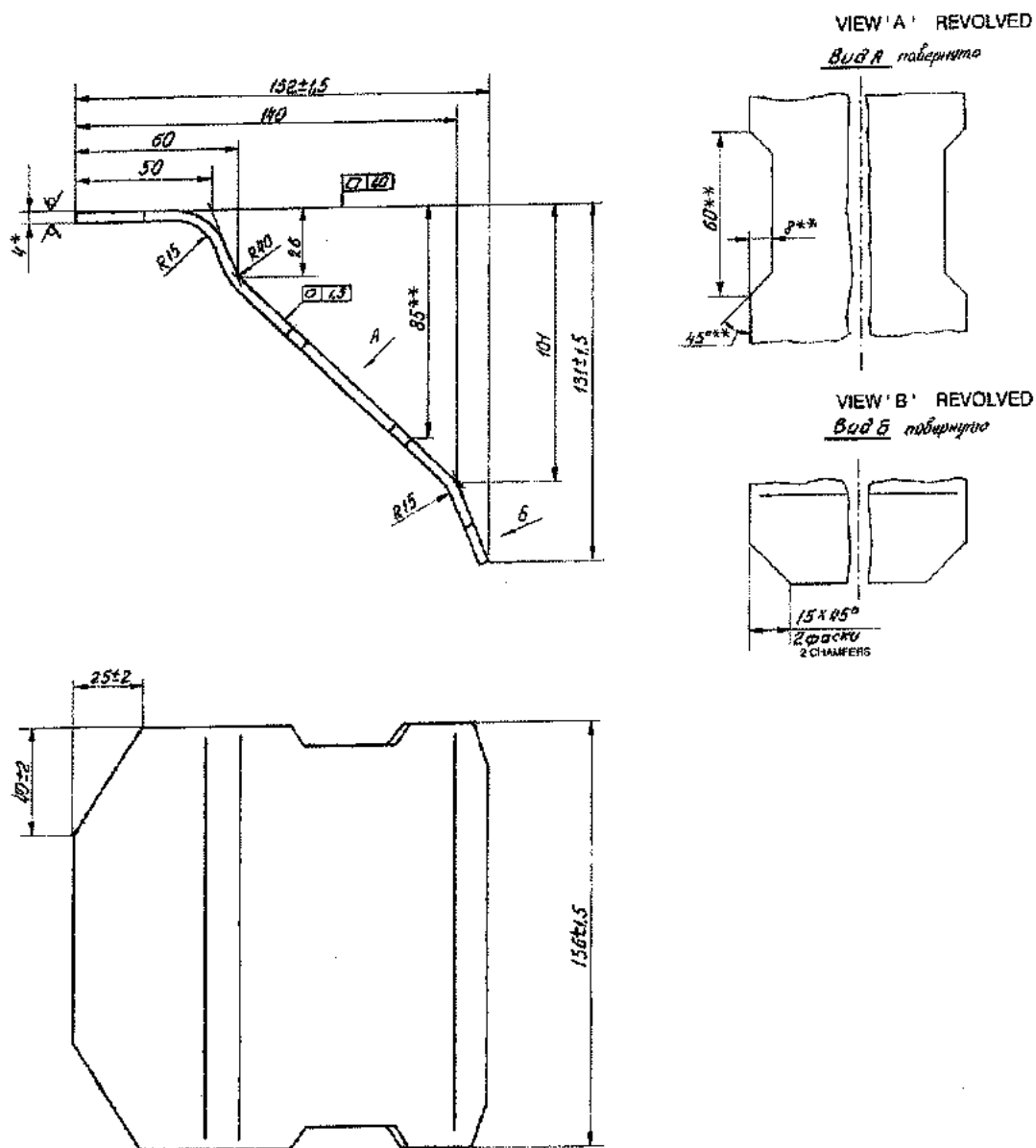


FIG: PLATE COVER TO DRG. NO 172.33.562

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

FOR

(COVER PLATE)

DRG.NO.188.91.051

(LF NO: 6201291149)

No.HVF/T-90/QAP/91/COVER PLATE/243323-00

ISSUE No: 00

DATE: JAN-2022

QUALITY ASSURANCE (RIG-SUB ASSEMBLY)

HEAVY VEHICLES FACTORY

AVADI CHENNAI – 600 054

QUALITY ASSURANCE PLAN (QAP)

FOR

COVER PLATE

DRG. NO. 188.91.051

PREPARED BY


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

REVIEWED BY


(ARUL DASS)
JWM/QA (RIG-SA /TP)

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 **COVER PLATE TO DRG.NO 188.91.051** 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:188.91.051**.

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. 188.91.051** 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. 188.91.008CBCB -
- 2. 188.91.008CB-1CB -

7. LIST OF DRAWINGS:

SI. NO.	DRG. NO	NOMENCLATURE	REMARKS
1	188.91.051	COVER PLATE	-

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

SI. NO	DRG. NO	NOMENCLATURE	MATERIAL SPECIFICATIONS	Qty
1	188.91.051	COVER PLATE	SHEET AMF 6 BM- 3 GOST 21631-76.	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 COVER PLATE TO DRG.NO 188.91.051

All dimensions should be confirmed as per drawing.

Sl. No.	Drawing Dimension
1.	61±1.5 mm
2.	80±1.5 mm
3.	45±1.5 mm
4.	37±1.5 mm
5.	S3* mm
6.	104±1.5 mm
7.	47±1.5* 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 COVER PLATE TO DRG.NO 188.91.051

a) The component should be manufactured from SHEET AMГ 6 EM- 3 GOST 21631-76.

b) **Chemical properties:** As per SHEET AMГ 6 EM- 3 GOST 21631-76 and GOST 4784-74.

Grade	Content of elements %										
	Alloying constituent					Impurities, maximum					
	Al	Mg	Mn	Ti	Be	Fe	Si	Cu	Zn	Other impurities	
										Each individually	Total
AMГ6	Base constituent	5.8	0.5	0.02	0.0002	0.4	0.4	0.1	0.2	0.05	1.0
		-	-	-	-0.005						
		6.9	0.8	0.10							

Note: For mass fraction of other elements refer GOST 4784-74.

c) **Mechanical properties:** As per SHEET AMГ 6 БМ- 3 GOST 21631-76.

grade of alloy	Ultimate Stress (Kgf/mm ²)	Yield point (Kgf/mm ²)	Elongation % l= 11.3 √F
	Minimum		
AMГ 6	32.0	16	15

Note: For other parameters refer GOST 21631-76.

14) PERFORMANCES / ACCEPTANCE TEST: COVER PLATE TO DRG.NO:188.91.051

1. *Dimension for reference.
2. *¹ Dimensions is to be ensured by tool.
3. Other requirements are 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/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: 188.91.051.
- b) Material specification as per drawing:
SHEET AMГ 6 БМ- 3 GOST 21631-76.
- c) GOST 21631-76 & GOST 4784-74.
- d) Specification: 520 TY 1.

SL. NO.	CATEGORY	ASSEMBLY/ SUB ASSEMBLY	TESTS/ INSPECTION PARAMETERS	STANDARDS TO BE REFERRED	ACCEPTANCE CRITERIA	INSPECTION RESPONSIBILITY			REMARKS
						Firm	HVF	DGQA	
1		Pre inspection reports (PIR) of firm	Firm has to produce all the document as per QAP	As per the relevant drawing and QAP.	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	COVER PLATE TO DRG. NO 188.91.051	Material tests	Chemical composition & Mechanical / Physical Properties	As per- GOST 21631-76, & GOST 4784-74.	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

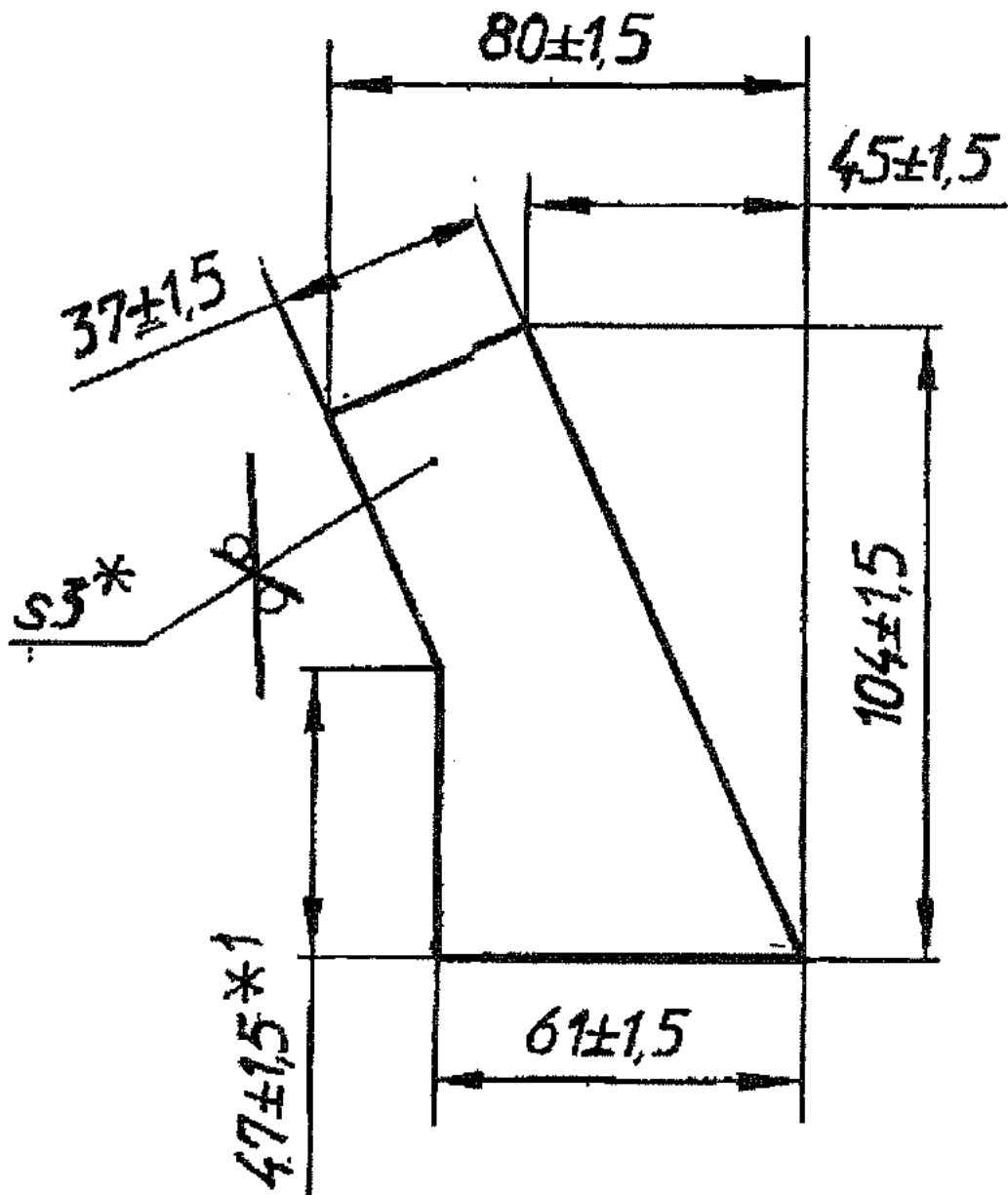


FIG: COVER PLATE TO DRG.NO.188.91.051.

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

FOR

(SHIELD)

DRG.NO.188.04.040

(LF NO: 6201004049)

No.HVF/T-90/QAP/04/SHIELD/242270-00

ISSUE No:00

DATE: FEB-2022

QUALITY ASSURANCE (RIG-SUB ASSEMBLY)

HEAVY VEHICLES FACTORY

AVADI CHENNAI – 600 054

QUALITY ASSURANCE PLAN (QAP)

FOR

SHIELD

DRG. NO. 188.04.040


PREPARED BY


(C. NANDA KUMAR)
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 **SHIELDTO DRG.NO 188.04.040** 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 **SHIELDTO DRG.NO:188.04.040**.

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 **SHIELD TO DRG. NO. 188.04.040** 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. 188.04.058CBCB -

7. LIST OF DRAWINGS:

SI. NO.	DRG. NO	NOMENCLATURE	REMARKS
1	188.04.040	SHIELD	-

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

SI. NO	DRG. NO	NOMENCLATURE	MATERIAL SPECIFICATIONS	Qty
1	188.04.040	SHIELD	SHEET AMI 6 EM-1.5 GOST 21631-76.	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 SHIELD TO DRG.NO 188.04.040

All dimensions should be confirmed as per drawing.

Sl. No.	Drawing Dimension
1.	134.5 ±1.5 mm
2.	303 ±1.5 mm
3.	270* mm
4.	175 ± 0.5 mm
5.	90 ± 0.5 mm
6.	110 ± 1 mm
7.	27 ⁺¹ mm
8.	10.5 ±1 mm
9.	23 ± 0.5 mm
10.	13 ^{0*}
11.	17H14 ^(+0.43) mm (4 Holes)
12.	223 ± 0.5 mm
13.	380 ±1.5 mm
14.	85 ±1.5 mm
15.	170 ±1.5 mm
16.	R20
17.	1.5*mm
18.	17H14 ^(+0.43) mm (2 Slots)
19.	R8.5*
20.	27 ⁺¹ mm
21.	52 ⁺¹ mm
22.	R8.5*
23.	17H14 ^(+0.43) mm (2 Slots)
24.	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 SHIELD TO DRG.NO 188.04.040

- a) The component should be manufactured from SHEET AMΓ 6 5M-1.5 GOST 21631-76.
- b) **Chemical properties:** As per SHEET AMΓ 6 5M- 1.5 GOST 21631-76 and GOST 4784-74.

Grade	Content of elements %										
	Alloying constituent					Impurities, maximum					
	Al	Mg	Mn	Ti	Be	Fe	Si	Cu	Zn	Other impurities	
										Each individually	Total
AMΓ6	Base constituent	5.8 - 6.9	0.5 - 0.8	0.02 - 0.10	0.0002 - 0.005	0.4	0.4	0.1	0.2	0.05	1.0

Note: For mass fraction of other elements refer GOST 4784-74.

- c) **Mechanical properties:** As per SHEET AMΓ 6 5M- 1.5 GOST 21631-76.

grade of alloy	Ultimate Stress	Yield point	Elongation %
	(Kgf/mm ²)	(Kgf/mm ²)	l= 11.3 √F
	Minimum		
AMΓ 6	32.0	16	15

Note: For other parameters refer GOST 21631-76.

14)PERFORMANCES / ACCEPTANCETEST:SHIELD TO DRG.NO: 188.04.040

1. **Unspecified radii 3⁺³ mm.**
2. ***Dimensions are for reference.**
3. **Coating:**
 - Primer ВЛ-02**
 - Primer AK-070**
 - Enamel XB-518 Khaki**
 - Requirements are as per 520.TY5**
4. **Remaining requirements are 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.
- c.

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:188.04.040
- b) Material specification as per drawing:
SHEET AMГ 6 БМ-1.5 GOST 21631-76.
- c) GOST 21631-76 &GOST 4784-74.
- d) Specification 520 TY1 & 520 TY 5

ANNEXURE-A

Sl. NO.	CATEGORY	ASSEMBLY/ SUB ASSEMBLY	TESTS/ INSPECTION PARAMETERS	STANDARDS TO BE REFERRED	ACCEPTANCE CRITERIA	INSPECTION RESPONSIBILITY			REMARKS
						Firm	HVF	DGQA	
1	SHIELD TO DRG. NO 188.04.040	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 21631- 76, &GOST 4784-74.	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		Coating	Coating	Refer drawing / QAP Para no: 14 (3)	Confirm to drawing and QAP.	P	V	R	SP followed by HVF.
6		Marking / traceability	Marking / traceability	Refer QAP Para no: 18	Confirm to QAP Para no: 18	P	V	R	100% by firm/ vendor.
7		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

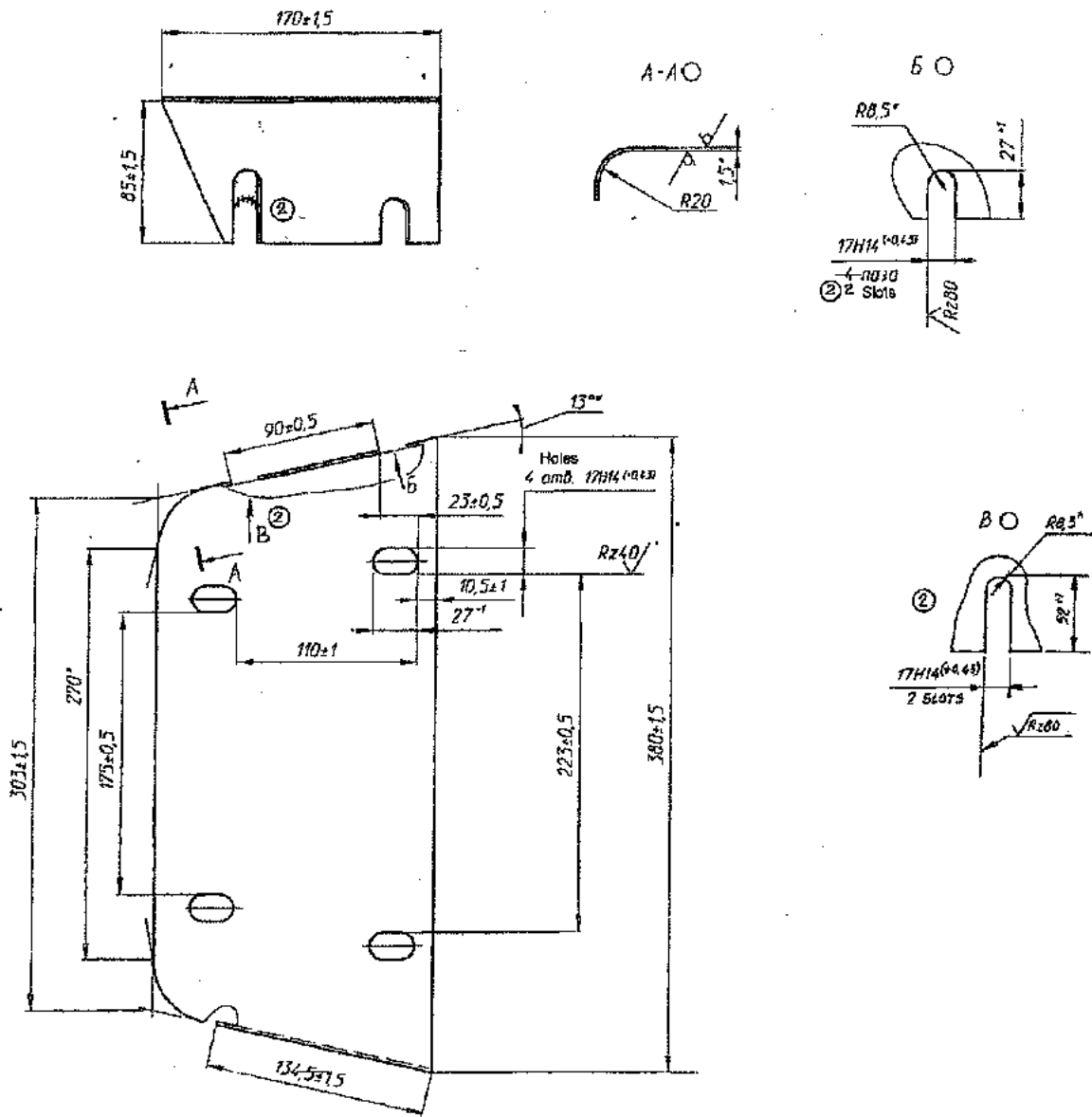


FIG: SHIELD TO DRG. NO. 188.04.040.
(For Reference Only)

RECORD OF AMENDMENTS

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

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

FOR

(SHIELD)

DRG.NO.188.04.041

(LF NO: 6201004050)

No.HVF/T-90/QAP/04/SHIELD/242350-00

ISSUE No:00

DATE: FEB-2022

QUALITY ASSURANCE (RIG-SUB ASSEMBLY)

HEAVY VEHICLES FACTORY

AVADI CHENNAI – 600 054

QUALITY ASSURANCE PLAN (QAP)

FOR

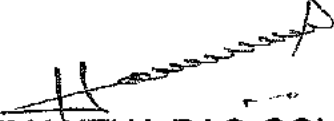
SHIELD

DRG. NO. 188.04.041

PREPARED BY


(C.NANDA KUMAR)
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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5.	DOCUMENTS	5
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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 **SHIELD TO DRG.NO 188.04.041** 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 **SHIELD TO DRG.NO:188.04.041**.

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 **SHIELD TO DRG. NO. 188.04.041** 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.
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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
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- 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. 188.04.058CBCB -

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SI. NO.	DRG. NO	NOMENCLATURE	REMARKS
1	188.04.041	SHIELD	-

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

SI. NO	DRG. NO	NOMENCLATURE	MATERIAL SPECIFICATIONS	Qty
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Note: Vendor/Contractor may use approved alternate material if any specified in drawing/specification. *Also refer Para 13.

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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.
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(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 SHIELD TO DRG.NO 188.04.041

All dimensions should be confirmed as per drawing.

Sl. No.	Drawing Dimension
1.	134.5 ±1.5 mm
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5.	90 ±0.5 mm
6.	13 ^{0*}
7.	20 ±0.5 mm
8.	20 ⁺¹ mm
9.	14 ±1 mm
10.	110 ±1 mm
11.	227 ±0.5 mm
12.	13H14 ^(+0.43) mm (4 Hole)
13.	408 ±1.5 mm
14.	98.5 ±1.5 mm
15.	177 ±1.5 mm
16.	R32
17.	1.5 [*] mm
18.	R6.5 *
19.	25 ⁺¹ mm
20.	13H14 ^(+0.43) mm (2 Slots)
21.	R6.5 *
22.	13H14 ^(+0.43) mm (2 Slots)
23.	50 ⁺¹ mm

24.	Surface finish/Roughness of items should be ensured as per drawing and specification.
-----	---

Refer drawing/specification for admissible alternate manufacture indimensions/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 SHIELD TO DRG.NO 188.04.041

a) The component should be manufactured from SHEET AMF 6 EM- 1.5 GOST 21631-76.

b) **Chemical properties:** As per SHEET AMF 6 EM- 1.5 GOST 21631-76 and GOST 4784-74.

Grade	Content of elements %										
	Alloying constituent					Impurities, maximum					
	Al	Mg	Mn	Ti	Be	Fe	Si	Cu	Zn	Other impurities	
										Each individually	Total
AMF6	Base const ituent	5.8 - 6.9	0.5 - 0.8	0.02 - 0.10	0.0002 - 0.005	0.4	0.4	0.1	0.2	0.05	1.0

Note: For mass fraction of other elements refer GOST 4784-74.

c) **Mechanical properties:** As per SHEET AMF 6 EM- 1.5 GOST 21631-76.

grade of alloy	Ultimate Stress (Kgf/mm ²)	Yield point (Kgf/mm ²)	Elongation % l= 11.3 √F
	Minimum		
AMF 6	32.0	16	15

Note: For other parameters refer GOST 21631-76.

14) PERFORMANCES/ACCEPTANCE TEST: SHIELD TO DRG.NO:188.04.041

1. Unspecified radii 3⁺³ mm.

2. *Dimensions are for reference.

3. Coating:

Primer BЛ-02

Primer AK-070

Enamel XB-518 Khaki

Requirements are as per 520.TY5

4. Remaining requirements are 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 offeringthe 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:188.04.041
- b) Material specification as per drawing:
SHEET AMГ 6 БМ- 1.5 GOST 21631-76.
- c) GOST 21631-76 &GOST 4784-74.
- d) Specification 520 TY 1 & 520 TY 5.

SL. NO.	CATEGORY	ASSEMBLY/ SUB ASSEMBLY	TESTS/ INSPECTION PARAMETERS	STANDARDS TO BE REFERRED	ACCEPTANCE CRITERIA	INSPECTION RESPONSIBILITY			REMARKS
						Firm	HVF	DGQA	
1	SHIELD TO DRG. NO 188.04.041	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 21631- 76, &GOST 4784-74.	All the values to confirm with QAP (Para no: 13.1 (a), (b) & (c).	P	W/V	R	SP followed by HVF.
4		Coating checks	coating	Refer QAP Para no:14(3)	Confirm to QAP Para no: 14(3)	P	V	R	SP followed by HVF.
5		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.
6		Marking / traceability	Marking / traceability	Refer QAP Para no:18	Confirm to QAP Para no: 18	P	V	R	100% by firm/ vendor.
7		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 (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

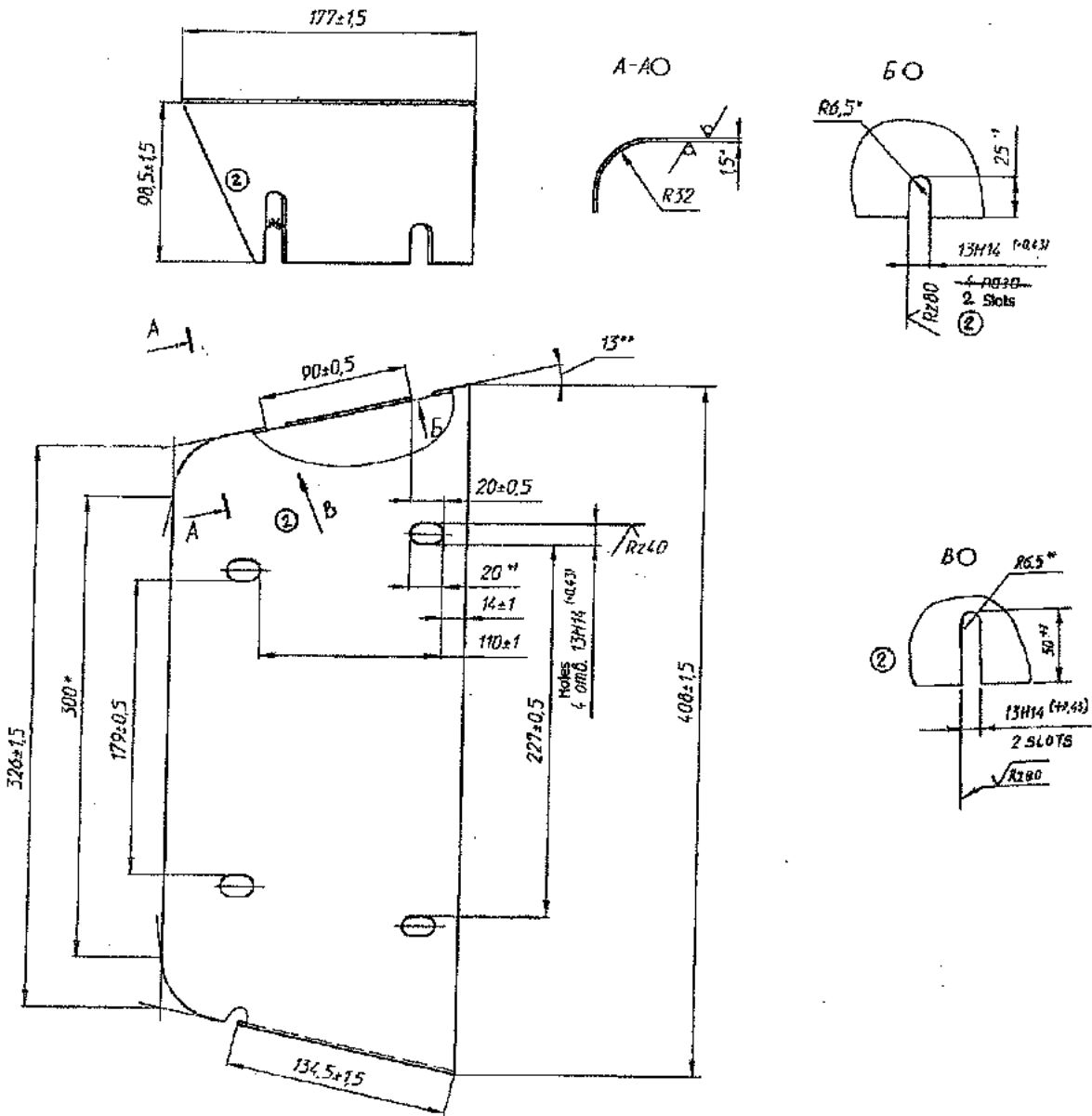


FIG: SHIELD TO DRG.NO.188.04.041.
(For Reference Only)

RECORD OF AMENDMENTS

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

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

FOR

(STRAP)

DRG.NO.175.91.120

(LF NO: 6206008260)

No.HVFI/T-72C/QAP/91/STRAP/243324-00

ISSUE No: 00

DATE: JAN-2022

QUALITY ASSURANCE (RIG-SUB ASSEMBLY)

HEAVY VEHICLES FACTORY

AVADI CHENNAI – 600 054

QUALITY ASSURANCE PLAN (QAP)

FOR


STRAP

DRG. NO. 175.91.120

PREPARED BY

REVIEWED BY


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


(ARUL DASS)
JWM/QA (RIG-SA /TP)

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 **STRAP TO DRG.NO 175.91.120** 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 **STRAP TO DRG.NO:175.91.120**.

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 **STRAP TO DRG. NO. 175.91.120** 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. 188.91.008CBCB -
- 2. 188.91.008CB-1CB -
- 3. 172.91.252CBCB -

7. LIST OF DRAWINGS:

SI. NO.	DRG. NO	NOMENCLATURE	REMARKS
1	175.91.120	STRAP	-

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

SI. NO	DRG. NO	NOMENCLATURE	MATERIAL SPECIFICATIONS	Qty
1	175.91.120	STRAP	SHEET AMГ 6 БМ- 3 GOST 21631-76.	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 STRAP TO DRG.NO 175.91.120

All dimensions should be confirmed as per drawing.

SI. No.	Drawing Dimension
1.	R10
2.	80±2 mm
3.	50±2 mm
4.	3* mm
5.	80±2 mm
6.	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 STRAP TO DRG.NO 175.91.120

a) The component should be manufactured from SHEET AMΓ 6 EM- 3 GOST 21631-76.

b) **Chemical properties:** As per SHEET AMΓ 6 EM- 3 GOST 21631-76 and GOST 4784-74.

Grade	Content of elements %										
	Alloying constituent					Impurities, maximum					
	Al	Mg	Mn	Ti	Be	Fe	Si	Cu	Zn	Other impurities	
										Each individually	Total
AMГ6	Base const ituent	5.8 - 6.9	0.5 - 0.8	0.02 - 0.10	0.0002 - 0.005	0.4	0.4	0.1	0.2	0.05	1.0

Note: For mass fraction of other elements refer GOST 4784-74.

c) **Mechanical properties:** As per SHEET AMГ 6 6M- 3 GOST 21631-76.

grade of alloy	Ultimate Stress	Yield point	Elongation %
	(Kgf/mm ²)	(Kgf/mm ²)	l= 11.3 √F
	Minimum		
AMГ 6	32.0	16	15

Note: For other parameters refer GOST 21631-76.

14) PERFORMANCES / ACCEPTANCE TEST: STRAP TO DRG.NO:175.91.120

1. MANUFACTURE FROM SHEET AMГ 6M (UN COATED) AND AMГ 65YM GOST 21631 - 76 IS ALLOWED.
2. NATURAL THINNING OF METAL AND TOOL MARKS ARE ALLOWED.
3. OTHER REQUIREMENTS AS PER 432. U6 - 1.
4. * DIMENSIONS FOR REFERENCE.
5. MANUFACTURE OF COMPONENT 4 , 5 OR 6 MM THICK DEPENDING ON BOX HOUSING 175.91.032cb-2 WRAPAGE IS ALLOWED.

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: 175.91.120 & 175.91.032cb-2
- b) Material specification as per drawing:
SHEET AMГ 6 БМ- 3 GOST 21631-76.
- c) GOST 21631-76 & GOST 4784-74.
- d) Specification: 432 L6-1.
- e) Alternate Material:
 - a. GRADE 54300 TO IS: 737 - 86.
 - b. Refer QAP Para No: 14(1) & 14(5).

Sl. NO.	CATEGORY	ASSEMBLY/ SUB ASSEMBLY	TESTS/ INSPECTION PARAMETERS	STANDARDS TO BE REFERRED	ACCEPTANCE CRITERIA	INSPECTION RESPONSIBILITY			REMARKS
						Firm	HVF	DGOA	
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	STRAP TO DRG. NO 175.91.120	Material tests	Chemical composition & Mechanical / Physical Properties	As per-- GOST 21631-76, & GOST 4784-74.	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).

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 (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

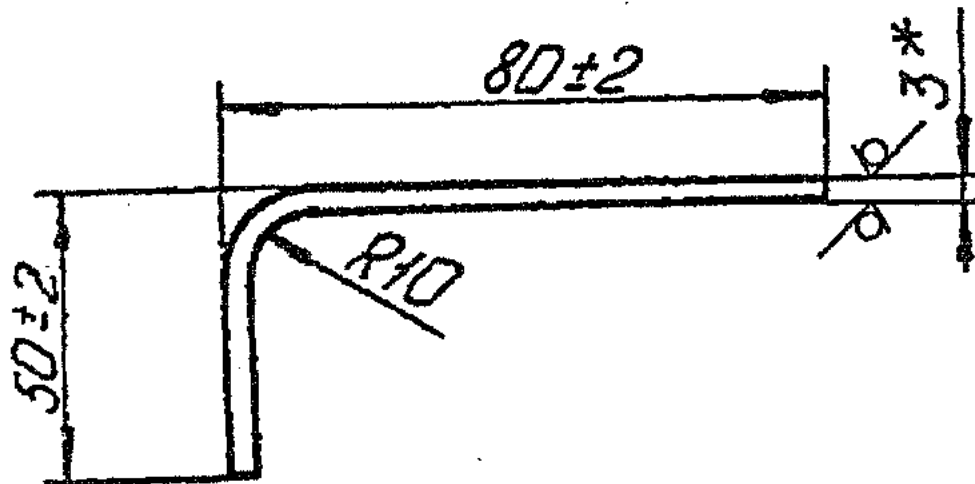
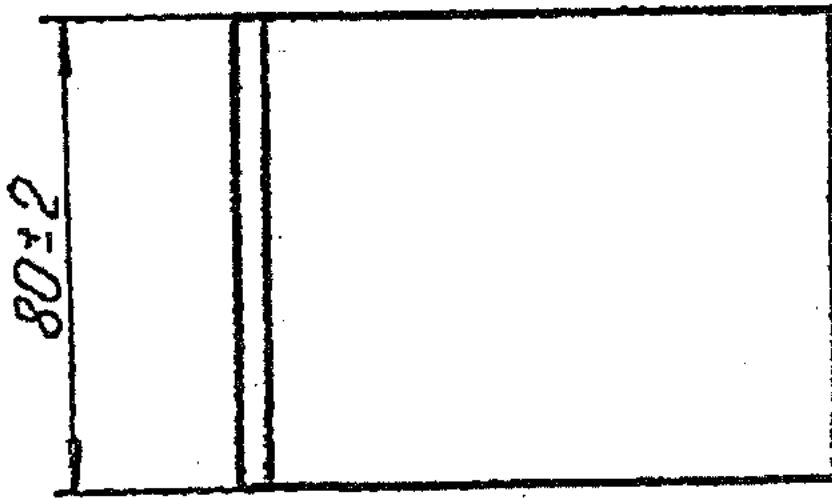


FIG: STRAP TO DRG.NO.175.91.120.

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

FOR

(STRAP)

DRG.NO.172.91.810

(LF NO: 6201291183)

No.HVF/T-90/QAP/91/STRAP/243326-00

ISSUE No: 00

DATE: JAN-2022

QUALITY ASSURANCE (RIG-SUB ASSEMBLY)

HEAVY VEHICLES FACTORY

AVADI CHENNAI – 600 054

QUALITY ASSURANCE PLAN (QAP)

FOR

STRAP

DRG. NO. 172.91.810


PREPARED BY

REVIEWED BY


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


(ARUL DASS)
JWM/QA (RIG-SA /TP)

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

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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.

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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 **STRAP TO DRG.NO 172.91.810** 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 **STRAP TO DRG.NO:172.91.810**.

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 **STRAP TO DRG. NO. 172.91.810** 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. 188.91.008CBCB -
- 2. 188.91.008CB-1CB -

7. LIST OF DRAWINGS:

SI. NO.	DRG. NO	NOMENCLATURE	REMARKS
1	172.91.810	STRAP	-

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

SI. NO	DRG. NO	NOMENCLATURE	MATERIAL SPECIFICATIONS	Qty
1	172.91.810	STRAP	SHEET AMF 6 BM- 3 GOST 21631-76.	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 STRAP TO DRG.NO 172.91.810

All dimensions should be confirmed as per drawing.

Sl. No.	Drawing Dimension
1.	33±2 mm
2.	28±1.5 mm
3.	3* mm
4.	40±1 mm
5.	48±1.5 mm
6.	23±1.5 mm
7.	R9
8.	R9
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 STRAP TO DRG.NO 172.91.810

a) The component should be manufactured from SHEET AMГ 6 БМ- 3 GOST 21631-76.

b) **Chemical properties:** As per SHEET AMГ 6 БМ- 3 GOST 21631-76 and GOST 4784-74.

Grade	Content of elements %										
	Alloying constituent					Impurities, maximum					
	Al	Mg	Mn	Ti	Be	Fe	Si	Cu	Zn	Other impurities	
										Each individually	Total
AMГ6	Base constituent	5.8 - 6.9	0.5 - 0.8	0.02 - 0.10	0.0002 - 0.005	0.4	0.4	0.1	0.2	0.05	0.1

Note: For mass fraction of other elements refer GOST 4784-74.

c) Mechanical properties: As per SHEET AMГ 6 БМ- 3 GOST 21631-76.

grade of alloy	Ultimate Stress (Kgf/mm ²)	Yield point (Kgf/mm ²)	Elongation % l = 11.3 √F
		Minimum	
AMГ 6	32.0	16	15

Note: For other parameters refer GOST 21631-76.

14) PERFORMANCES / ACCEPTANCE TEST: STRAP TO DRG.NO:172.91.810

- *1 Dimension for reference.
- Other requirements are as per 520 TY1.

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.
- 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: 172.91.810
- b) Material specification as per drawing:
SHEET AMГ 6 БМ- 3 GOST 21631-76.
- c) GOST 21631-76 & GOST 4784-74.
- d) Specification: 520 TY1.

SL NO.	CATEGORY	ASSEMBLY/ SUB ASSEMBLY	TESTS/ INSPECTION PARAMETERS	STANDARDS TO BE REFERRED	ACCEPTANCE CRITERIA	INSPECTION RESPONSIBILITY			REMARKS
						Firm	HVF	DGQA	
1		Pre inspection reports (PIR) of firm	Firm has to produce all the document as per QAP	As per the relevant drawing and QAP.	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	STRAP TO DRG. NO 172.91.810	Material tests	Chemical composition & Mechanical / Physical Properties	As per- GOST 21631-76, & GOST 4784-74.	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 (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**

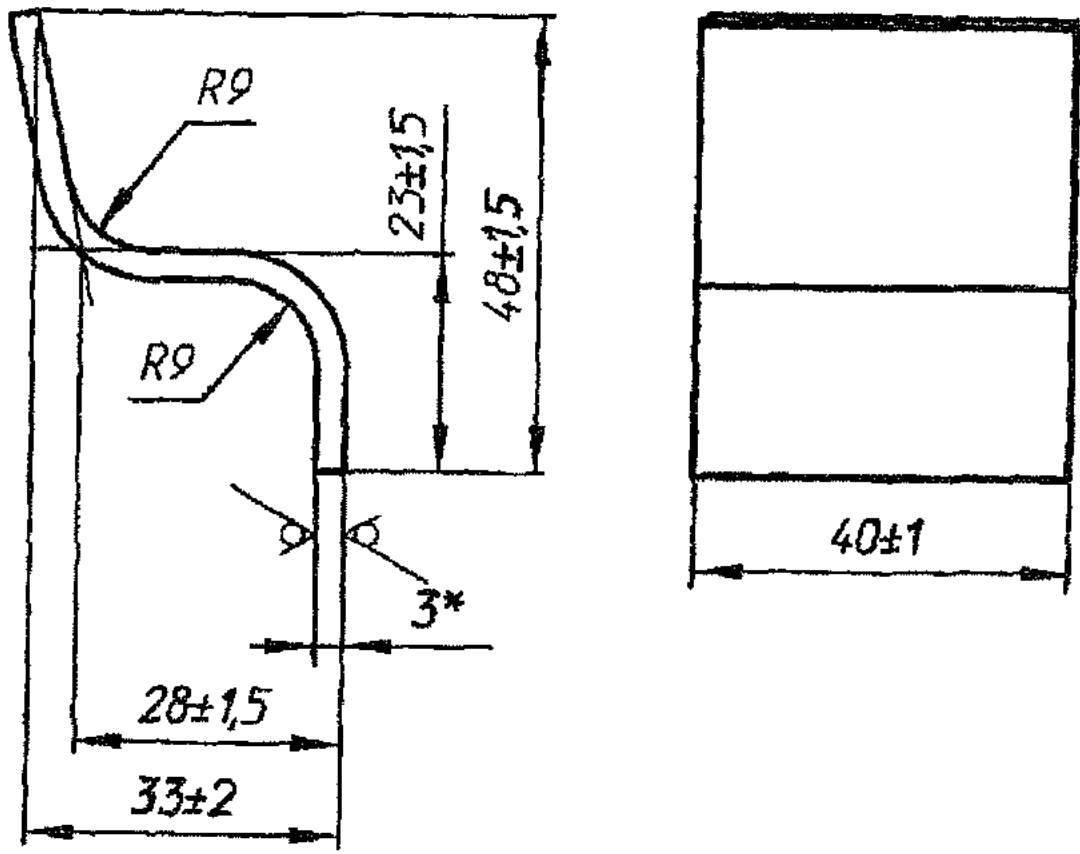


FIG: STRAP TO DRG.NO.172.91.810.

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

FOR

(RIB) ✓

DRG.NO.172.91.811 ✓

(LF NO: 6201291184)

No.HVF/T-90/QAP/91/RIB/243325-00

ISSUE No: 00

DATE: JAN-2022

QUALITY ASSURANCE (RIG-SUB ASSEMBLY)

HEAVY VEHICLES FACTORY

AVADI CHENNAI – 600 054

QUALITY ASSURANCE PLAN (QAP)

FOR

RIB

DRG. NO. 172.91.811

PREPARED BY

REVIEWED BY


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


(ARUL DASS)
JWM/QA (RIG-SA /TP)

APPROVED BY


(SUBHAM BNILWAN)
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 **RIB TO DRG.NO 172.91.811** 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 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 **RIB TO DRG.NO:172.91.811**.

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 **RIB TO DRG. NO. 172.91.811** 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. 188.91.008CBCB -
- 2. 188.91.008CB-1CB -

7. LIST OF DRAWINGS:

SI. NO.	DRG. NO	NOMENCLATURE	REMARKS
1	172.91.811	RIB	-

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

SI. NO	DRG. NO	NOMENCLATURE	MATERIAL SPECIFICATIONS	Qty
1	172.91.811	RIB	SHEET AMF 6 БМ- 3 GOST 21631-76.	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/ 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 RIB TO DRG.NO 172.91.811

All dimensions should be confirmed as per drawing.

Sl. No.	Drawing Dimension
1.	19±1.5 mm
2.	19±1.5 mm
3.	9x45°
4.	S3* 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 RIB TO DRG.NO 172.91.811

a) The component should be manufactured from SHEET AMF 6 5M- 3 GOST 21631-76.

b) **Chemical properties:** As per SHEET AMF 6 5M- 3 GOST 21631-76 and GOST 4784-74.

Grade	Content of elements %										
	Alloying constituent					Impurities, maximum					
	Al	Mg	Mn	Ti	Be	Fe	Si	Cu	Zn	Other impurities	
										Each individually	Total
AMF6	Base constituent	5.8 - 6.9	0.5 - 0.8	0.02 - 0.10	0.0002 - 0.005	0.4	0.4	0.1	0.2	0.05	0.1

Note: For mass fraction of other elements refer GOST 4784-74.

c) **Mechanical properties:** As per SHEET AMГ 6 БМ- 3 GOST 21631-76.

grade of alloy	Ultimate Stress	Yield point	Elongation % $\epsilon = 11.3 \sqrt{F}$
	(Kgf/mm ²)	(Kgf/mm ²)	
	Minimum		
AMГ 6	32.0	16	15

Note: For other parameters refer GOST 21631-76.

14) PERFORMANCES / ACCEPTANCE TEST: RIB TO DRG.NO:172.91.811

1. *Dimension for reference.
2. Other requirements are 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/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: 172.91.811
- b) Material specification as per drawing:
SHEET AMГ 6 БМ- 3 GOST 21631-76.
- c) GOST 21631-76 & GOST 4784-74.
- d) Specification: 520 TY1.

SL. NO.	CATEGORY	ASSEMBLY/ SUB ASSEMBLY	TESTS/ INSPECTION PARAMETERS	STANDARDS TO BE REFERRED	ACCEPTANCE CRITERIA	INSPECTION RESPONSIBILITY			REMARKS
						Firm	HVF	DGQA	
1		Pre inspection reports (PIR) of firm	Firm has to produce all the document as per QAP	As per the relevant drawing and QAP.	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	RIB TO DRG. NO 172.91.811	Material tests	Chemical composition & Mechanical / Physical Properties	As per- GOST 21631-76, & GOST 4784-74.	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).

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 (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

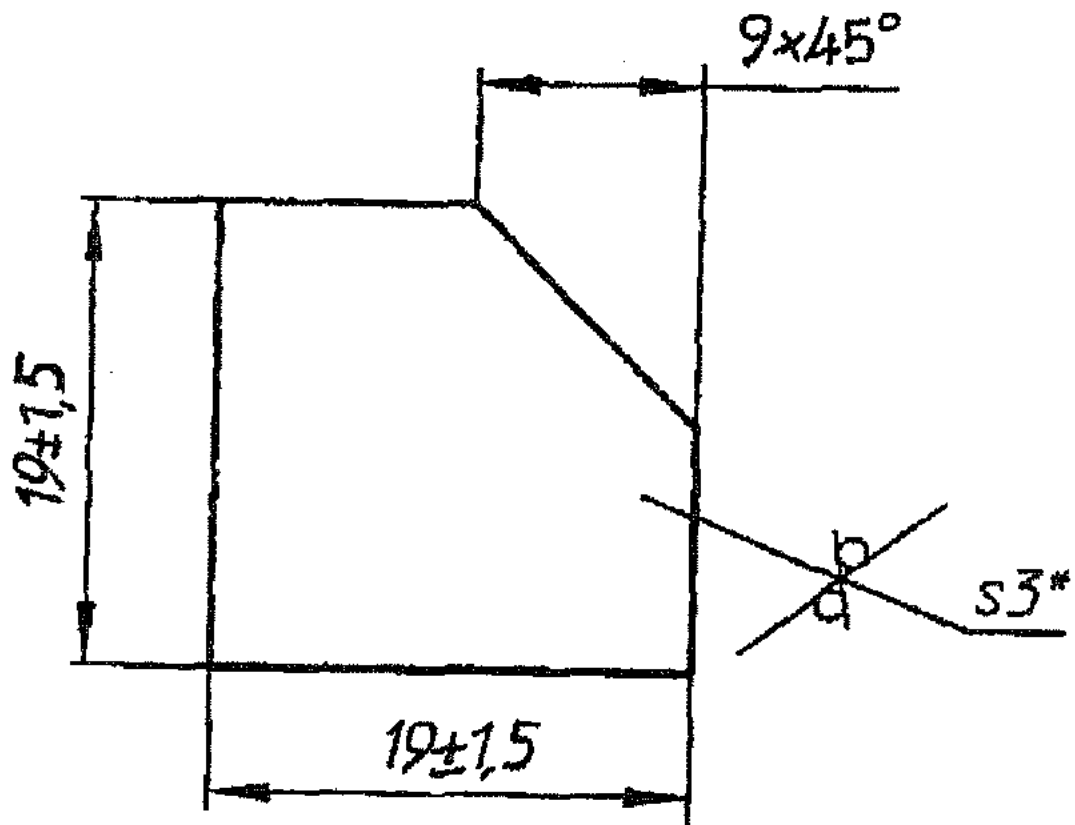


FIG: RIB TO DRG.NO.172.91.811.

