

COMMON TO T-72.
DRG. INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE - 3

SUPPLY CODE
U-01-1-2

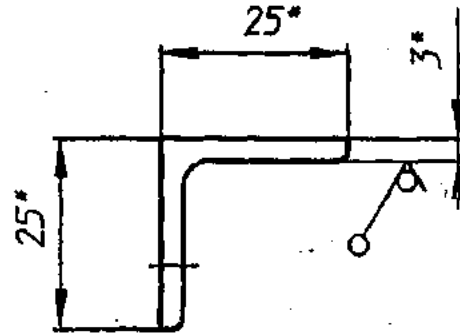
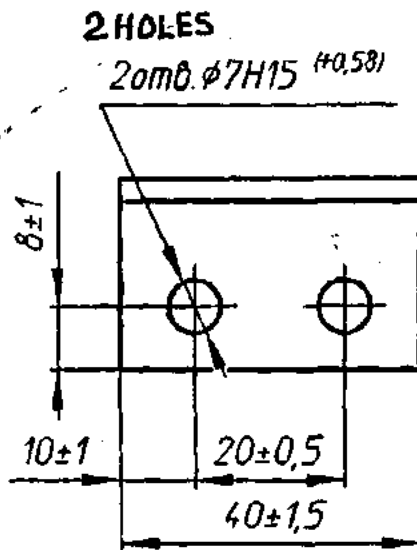
D90053
356

F-74
73

DRAWING NUMBER
172.33.542

SHEET No. 1 OF 1

Rz500/ (✓)



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

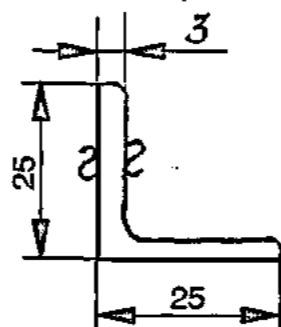
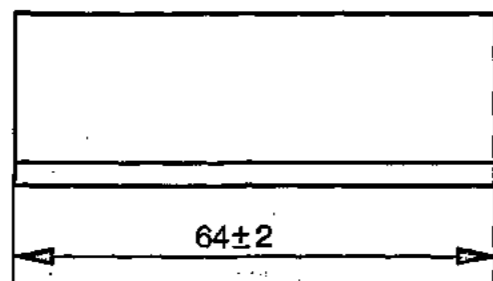
PILOT SAMPLE SHOULD BE APPROVED BY A H S P BEFORE BULK PRODUCTION.

		EST. WT. (Kg) 0.042	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 :- ANGLE PIECE 25x25x3-B GOST 8509-93 Cm.3cn2-1-c6 GOST 535-88	USED ON :- 176.01.010Cb 188.01.011cb-1Cb
ISSUE	DATE	NATURE OF AMENDMENTS	
DRN <i>J. S. S. S.</i>		SCALE :- 1 : 1	CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI
CHD <i>J. S. S. S.</i>		DIMENSIONS IN mm	
APPD <i>Chandhal</i>		TOLERANCE ON DIMENSIONS UNLESS OTHERWISE STATED IS : 2102 - 69	TITLE :- BRACKET
DATE 15-06-04		ALL THREADS TO CONFORM TO	D S CAT NUMBER
			DRAWING NUMBER 172.33.542

SIZE A4

DRAWING NUMBER
175.33.316

SHEET No. 1 OF 1



EXPLANATORY NOTE:

MATERIAL QUOTED: ANGLE BAR: $\overline{B} 25 \times 25 \times 3$ GOST 8509-72
BCT 3Cn 2 I GOST 535-79

ROLLED STEEL EQUAL ANGLES AS PER GOST 8509-72

B = NORMAL ROLLING ACCURACY (B)

BCT 3Cn = GRADE OF STEEL;

2 = CATEGORY ; I = SUB GROUP

CHEMICAL COMPOSITION % (AS PER GOST 380-71)

C = 0.14 - 0.22 ; Mn. = 0.40 - 0.65 ; Si = 0.05 - 0.17.

P = 0.04 ; S = 0.05 ;

Cr. = 0.30 ; Ni = 0.30 ;

ARSENIC-0.08 ; Cu = 0.30.

MAXIMUM

MECHANICAL PROPERTIES (AS PER GOST 380-71)

ULTIMATE TENSILE STRENGTH Kgf/mm^2 (MIN) 38-49

STRESS AT YIELD POINT Kgf/mm^2 (MIN) = 25

% RELATIVE ELONGATION (MIN) = 26.

1. The component may be made from open hearth steel 15 or 20 GOST 1050-74.
2. Non fitness of flanges to the plate should not exceed 1mm.
3. Bevel cut within the tolerance for dimension 64 ± 2 is allowed.

Ⓒ ALT. MATL: Fe 410 WA TO IS: 2062-99.

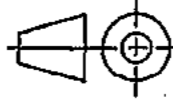
** 172.33.243 Cb Cb ⒹA

"COMMON TO T-90" & BLT
DRAWING RE-INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE -4
EXPLANATORY NOTE ADDED ON 10.01.91
(R.RAMANI), JTO
16-8-05

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

EST. WT. (Kg) 0.07 TO BE STAMPED OR MARKED WHERE INDICATED THUS # (LETTERS)

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

			DRN	Sd/=	MATERIAL:- ANGLE BAR	USED ON:-
			CHD	Sd/=	$\overline{B} 25 \times 25 \times 3$ GOST 8509-72	176.33.004 Cb
			APPD	Sd/=	BCT3 Cn 2 I GOST 535-79	172.2M.33.005 Cb **
			DATE	29.07.86	CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES)	
			SCALE:-	1 : 1	AVADI	
			DIMENSIONS IN mm		TITLE:- 	BRACKET
			TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS : 2102 - 69			
			ALL THREADS TO CONFORM TO		D S CAT NUMBER	DRAWING NUMBER
			4B	23.1.06	175.33.316	
			4A	19.4.04		
			ISSUE	DATE	NATURE OF AMENDMENTS	

F-63
SIZE A3

DRAWING NUMBER
175.33.218

SHEET No. 1 OF 1

▽ (▽)

EXPLANATORY NOTE:

MATERIAL QUOTED: ANGLE BAR: $B 40 \times 40 \times 4$ GOST 8509-72
09Г2-2 GOST 19281-73

ALT. MTL. QUOTED: OPEN HEARTH STEEL 15 & 20 GOST 1050-74.

09Г2 = GRADE OF MANGANESE STEEL.

2 = CATEGORY OF STEEL

B- 40 x 40 x 4 = ANGLE BAR AS PER GOST 8509-72.

CHEMICAL COMPOSITION GRADE 09Г2 %
(AS PER GOST 19282-73)

SILICON = 0.17-0.37 ; MANGANESE = 1.4-1.8

CORBON = 0.12 ; CHROMIUM = 0.30 }
NICKEL = 0.30 ; COPPER = 0.30 } MAXIMUM

MECHANICAL PROPERTIES (AS PER GOST 19281-73)

TENSILE STRENGTH Kgf/mm^2 (MIN) = 45

YIELD POINT Kgf/mm^2 (MIN) = 31

% RELATIVE ELONGATION (MIN) = 21

CHEMICAL COMPOSITION (AS PER GOST 1050-74)

GRADE OF STEEL	CONTENTS OF ELEMENTS %							
	C	Si	Mn	Cr	P	S	Ni	Cu
15	0.12 - 0.19	0.17 - 0.37	0.35 - 0.65	0.25	0.035	0.040	0.25	0.25
	MAXIMUM							
20	0.17 - 0.24	0.17 - 0.37	0.35 - 0.65	0.25	0.035	0.040	0.25	0.25
	MAXIMUM							

MECHANICAL PROPERTIES (AS PER GOST 1050-74)

	GRADE 15	GRADE 20
ULTIMATE TENSILE STRENGTH Kgf/mm^2 (MIN)	38	42
YIELD POINT Kgf/mm^2 (MIN)	23	25
% ELONGATION (MIN)	27	25
% REDUCTION IN AREA (MIN)	55	55

1. THE COMPONENT MAY BE MADE FROM OPEN-HEARTH STEEL 15 AND 20 GOST 1050-74.
2. BEVEL CUT OF FACES SHOULD BE WITH IN THE TOLERANCE ON DIMENSION 45.

(5B) ALT. MATL: Fe 410 WA TO IS: 2062-99.

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

EST. WT. (Kg) 0.109 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:- ANGLE BAR	USED ON:-
CHD	Sd/=	B 40x40 GOST 8509-72	172.2M.33.005Cb (5A)
APPD	Sd/=	09Г 2-2 GOST 19281-73	172.33.243CbCb
DATE	29-7-86	CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI	
SCALE:- 1 : 1		TITLE:-	
DIMENSIONS IN mm		BRACKET	
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS : 2102 - 69		D S CAT NUMBER	
ALL THREADS TO CONFORM TO		DRAWING NUMBER	
ISSUE		175.33.218	
5B	23.1.06	AUTHY Lt.No.80001/CQA(HV)/GEN Dt.30.11.05	
5A	19.4.04	N OF A No. CQA(HV)/T90/33/001	
8	7	6	

"COMMON TO T-90" & BLT DRAWING RE-INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE -5 EXPLANATORY NOTE ADDED ON 25.12.90

63
SIZE A3

Fe 410 WA

DRAWING NUMBER
175.33.192

SHEET No. 1 OF 1

Rz 320 (▽)

EXPLANATORY NOTE:

MATERIAL QUOTED: ANGLE BAR: $5 \times 45 \times 28 \times 4$ GOST 8510-72
09Г2-2 GOST 19281-73

ALT. MTL. QUOTED: OPEN HEARTH STEEL 15 & 20 GOST 1050-74.

09Г2 = GRADE OF MANGANESE STEEL.

2 = CATEGORY OF STEEL

5-45x28x4 = ANGLE BAR AS PER GOST 8510-72.

CHEMICAL COMPOSITION GRADE 09Г2 1/2
(AS PER GOST 19281-73)

SILICON = 0.17-0.37 ; MANGANESE = 1.4-1.8

CARBON = 0.12 ; CHROMIUM = 0.30 } MAXIMUM
NICKEL = 0.30 ; COPPER = 0.30 }

MECHANICAL PROPERTIES (AS PER GOST 19281-73)

TENSILE STRENGTH Kgf/mm^2 (MIN) = 45

YIELD POINT Kgf/mm^2 (MIN) = 31

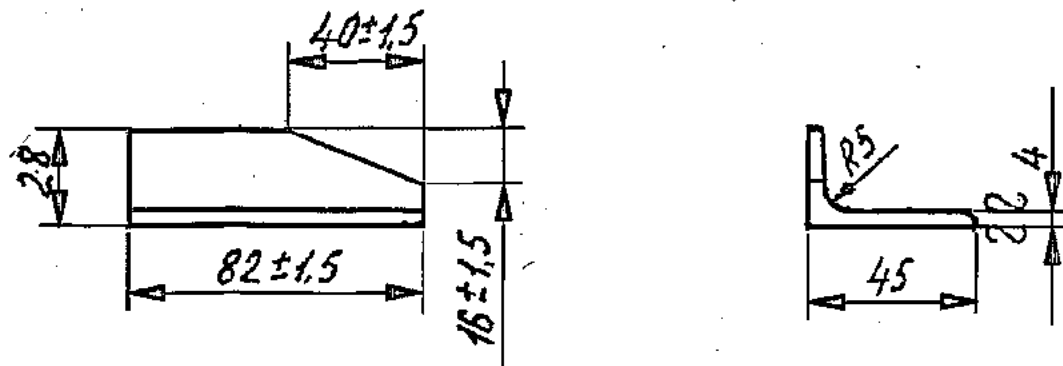
% RELATIVE ELONGATION (MIN) = 21

CHEMICAL COMPOSITION (AS PER GOST 1050-74)

GRADE OF STEEL	CONTENTS OF ELEMENTS 1/2							
	C	SI	MN.	Cr	P	S	Ni	Cu
15	0.12 - 0.19	0.17 - 0.37	0.35 - 0.65	0.25	0.035	0.040	0.25	0.25
	MAXIMUM							
20	0.17 - 0.24	0.17 - 0.37	0.35 - 0.65	0.25	0.035	0.040	0.25	0.25

MECHANICAL PROPERTIES (AS PER GOST 1050-74)

	GRADE 15	GRADE 20
ULTIMATE TENSILE STRENGTH Kgf/mm^2 (MIN)	38	42
YIELD POINT Kgf/mm^2 (MIN)	23	25
% ELONGATION (MIN)	27	25
% REDUCTION IN AREA (MIN)	55	55



1. THE COMPONENT MAY BE MADE FROM OPEN HEARTH STEEL 15 AND 20 GOST 1050-74.
2. BEVEL CUT OF FACES MAY BE WITH IN THE TOLERANCE FOR DIMENSION

Ⓢ ALT. MATL: Fe 410 WA TO IS: 2062-99.

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

EST. WT. (Kg) 0.160 TO BE STAMPED OR MARKED WHERE INDICATED THUS # (LETTERS)

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

DRN	Sd/=	MATERIAL:- ANGLE BAR	USED ON:-
CHD	Sd/=	5 45x28x4 GOST 8510-72	172.2M.33.005Cb ⓈA
APPD	Sd/=	09Г2-2 GOST 19281-73	172.33.243CbCb
DATE	29-7-86	CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES)	
SCALE:-	1:2	AVADI	
DIMENSIONS IN mm		TITLE:-	
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS: 2102-69		BRACKET	
6B 23.1.06 AUTHY Lt.No.80001/CQA(HV)/GEN Dt.30.11.05	ALL THREADS TO CONFORM TO	D S CAT NUMBER	DRAWING NUMBER
6A 19.4.04 N OF A No. CQA(HV)/T90/33/001			175.33.192
ISSUE	DATE	NATURE OF AMENDMENTS	

COMMON TO T-90" & BLT DRAWING RE-INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE -6 EXPLANATORY NOTE ADDED ON 25.12.90 IR. RAMANI, JTO 17-08-05

F-63

SIZE A3

var

DRAWING NUMBER
172.33.736

SHEET No. 1 OF 1

UNLESS OTHERWISE SPECIFIED Rz 320 ✓(✓)

EXPLANATORY NOTE:-

THE COMPONENT SHOULD BE MANUFACTURED FROM EQUAL LEG ANGLE (PRESSED SECTION) EXTRUDED OUT OF ALUMINIUM ALLOY OF NORMAL STRENGTH, WITH OUT HEAT TREATMENT OF GRADE AMΓ 6 TO GOST 8617-81. ANGLE DIMENSIONS 60x60x8 SHOULD CONFORM AS PER TABLE 1 TO GOST 13737-80. CHEMICAL COMPOSITIONS % AS PER GOST 4784-74 AND MECHANICAL PROPERTIES AS PER GOST 8617-81 ARE AS UNDER:-

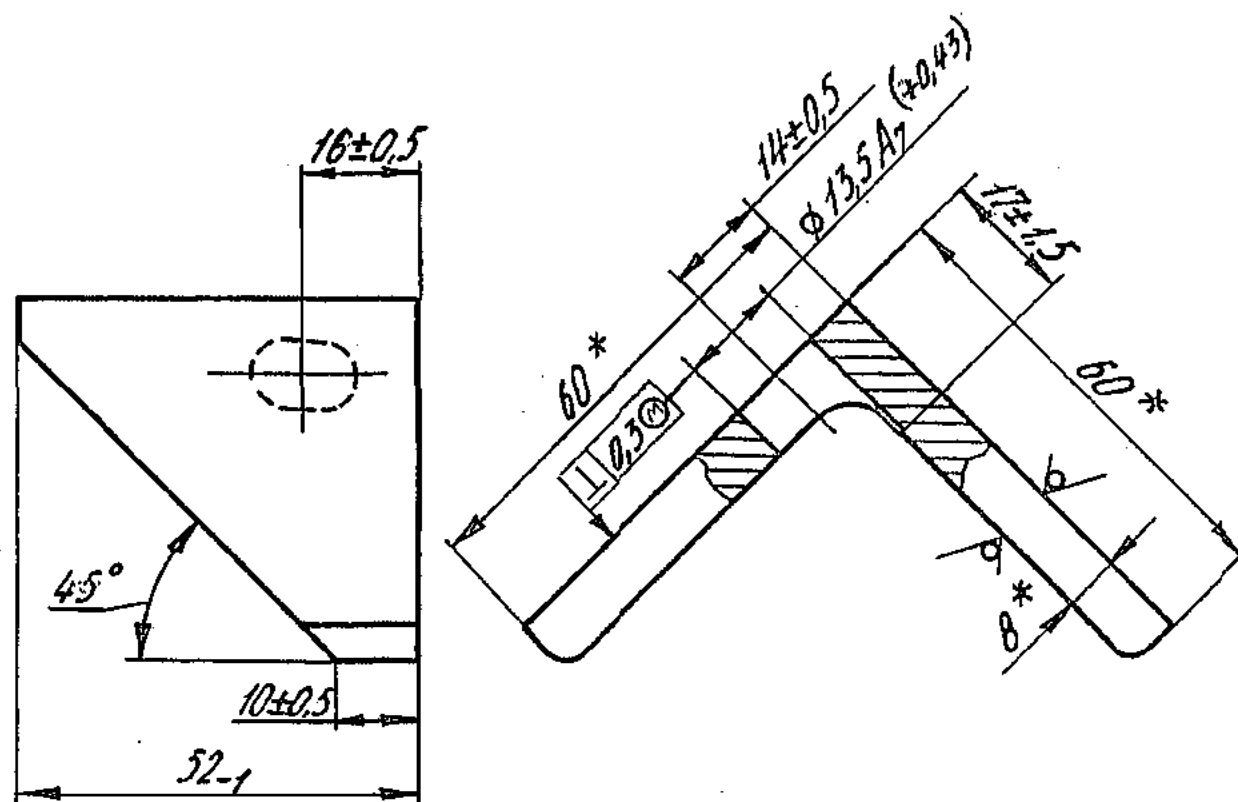
CHEMICAL COMPOSITIONS % :-

GRADE	ALLOYING CONSITUENT											
	Al	Cu	Mg	Mn	Ni	Fe	Si	Zn	Ti	Cr	Be	Zr
AMΓ 6	BASE CONSTITUENT	--	5.8 - 6.8	0.5 - 0.8	--	--	--	--	0.02-0.10	--	0.0002 - 0.005	--

GRADE	IMPURITIES (MAX)										OTHER IMPURITIES	
	Fe	Si	Cu	Mn	Ni	Zn	Ti	Mg	Cr	EACH INDIVIDUALLY	TOTAL	
	AMΓ 6	0.4	0.4	0.1	--	--	0.2	--	--			--

MECHANICAL PROPERTIES :-

BRAND OF ALLOY	CONDITION OF THE MATERIAL	U.T.S Mpa (Kgf/mm ²)	YIELD POINT σ _{0.2} , mpa (Kgf/mm ²)	ELONGATION %
AMΓ 6	WITHOUT HEAT TREATMENT	MINIMUM		
		314(32.0)	157 (16.0)	15.0



- MATERIAL : ANGLE PIECE AMΓ 6 60x60x8 GOST 13737-80 GOST 8617-81
- * DIMENSIONS FOR REFERENCE.
- OTHER REQUIREMENTS AS PER 520. TY 1.

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

EST. WT. (Kg) 0.075 TO BE STAMPED OR MARKED WHERE INDICATED THUS # (LETTERS)

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

DRN	Sd/=	MATERIAL :-	USED ON :-
CHD	Sd/=	SEE PARA 1 OF T.R.	175.33.011cb-2Cb
APPD	Sd/=	CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES)	
DATE	26.10.88	AVADI	
SCALE:-	1 : 1	TITLE :-	
DIMENSIONS IN mm		ANGLE PIECE	
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS : 2102-69		D S CAT NUMBER	
ALL THREADS TO CONFORM TO		DRAWING NUMBER	
		172.33.736	

ISSUE DATE NATURE OF AMENDMENTS

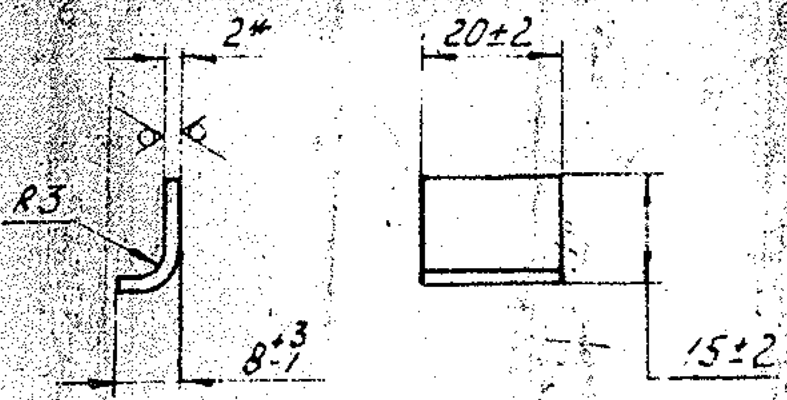
"COMMON TO T-90" & BLT DRAWING RE-INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE -1 (R.RAMANI), TO DRG. REDRAWN AND EXPLANATORY NOTE ADDED ON 24.01.91 INTRODUCED VIDE AMDT. LIST No.6, PART - II BOOK-6 24-09-05

F-8B
30
SIZE A3

Handwritten signature

622-81-011

FIRST ANGLE PROJECTION.



1. Заменитель материала - лист 2 ГОСТ 19904-74 4-II-15 ГОСТ 16523-70

2. Остальные требования согласно

520-791.

3. * Размер для справки

2 GOST 19904-74.

1. ALTERNATE MATERIAL SHEET

4-II 15 GOST 16523-70.

2. REMAINING REQUIREMENTS SHOULD BE AS PER 520 TY 1.

3. * DIMENSION FOR REFERENCE.

ALT MATL :- STEEL GRADE 'D' 15: 513-1986 OR 4CS, SEC 2, TO B5: 1449-PE 1-83.

622-81-011

18814-W	22-10-93	HINDI NOMEN ADDED	DRG
17902-W	14-2-94	ALT MATL ADDED.	REVISED
17088-W	4-7-91	DS CAT NO ADDED	CLD
16278-W	23-10-86	DRG SEALED.	
ISSUE	DATE	REFERENCE	
APPROVED		Alu	
CHECKED		4/12/85	
DRAWN		shil185	

172.18.339.

ANGLE PIECE

एंगल पीस

MATERIAL: 2 GOST 19904-74
Sheet 5-II-Г 10КП Gost 16523-74

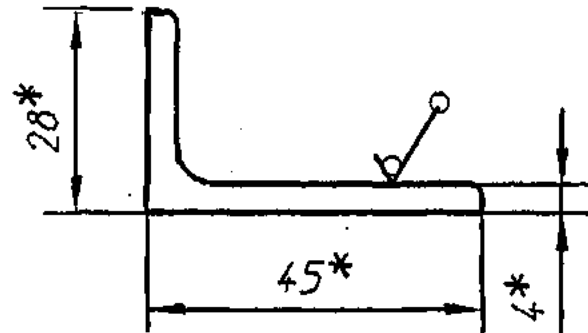
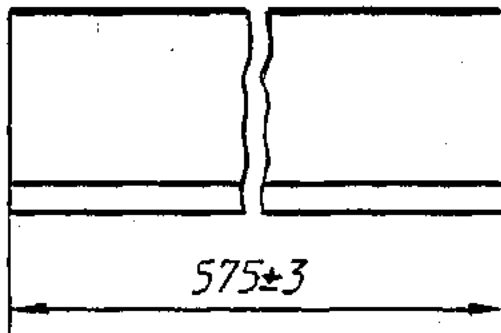
DS CAT No 5220-000994		
Group No	F 117	
40001 K.D.	7'	
SHEET	MASS	SCALE
1 of 1	0.006	1:1
AA		
C. QA(AVA)AVAD		

COMMON TO T-72. & BLT
DRG. INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE -9

DRAWING NUMBER
175.33.050

SHEET No. 1 OF 1

R2320/ (✓)



1. *Материал - заменитель*
Уголок 45x28x4 ОСТ 8510-86
295-09 2 -с -2 ГОСТ 19281-89.
2. * *Размеры для справок.*
3. *Остальные требования по 520.ТУ1.*

356

SUPPLY CODE
U-01-1-4

D 90209

F-103
53

1. Alternate - material - angular bar 45 x 28 x 4 GOST 8510 - 86
295-09 Г2Д - СВ-2 GOST 19281 - 89.
2. * Dimensions for references.
3. Other requirements as per 520.TY.1

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

		EST. WT. (Kg) 1.26	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 OUT-SIDE R INSIDE EQUIVALENT CHAMFERS ARE PERMISSIBLE.	
		MATERIAL :- Angular bar 45x28x4 GOST 8510 - 86 295-09 Г2-2 GOST 19281 - 89	USED ON :- 176.33.004Cb 172.33.225cb-2Cb 172.33.231cb-2Cb
ISSUE	DATE	NATURE OF AMENDMENTS	
DRN	<i>[Signature]</i>	SCALE :- 1 : 1	
CHD	<i>[Signature]</i>	DIMENSIONS IN mm	
APPD	<i>[Signature]</i>	TOLERANCE ON DIMENSIONS UNLESS OTHERWISE STATED IS : 2102 - 69	
DATE	10.9.04	ALL THREADS TO CONFORM TO	
		D S CAT NUMBER	DRAWING NUMBER 175.33.050



TITLE :-

ANGLE PIECE

SIZE A4

Ref : Lr No. 6005/HVF/TA/CBOI/VQC/2022-23 dated.16/11/2022&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	Bracket Drg.No. 175.33.316 LF No. 6206305327	Technology 1 Test/Inspection Fixture /Gauges/Mandrel /templates	Power Hacksaw for cutting of angle material Firm has to develop as per Specification/Drawings.	

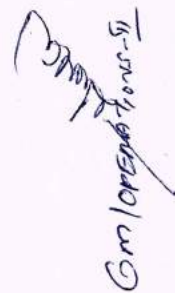
Note: If the firm is not having the above facility and able to make components with alternate methods, the details of methods to be submitted during [participation in Tender for validation and acceptance, if found suitable.


DGM/CA & SMS
(M.GNANASEKARAN)


JWM/QA(OH)
(S.SAKTHIVEL)


JWM/SMS
(M.NAGARAJAN)


JTG/CAO (15-08)


Gm/operation

Ref : Lr No. 6005/HVF/TA/CBOI/VQC/2022-23 dated.16/11/2022&16/02/2023&10/07/2023

SI.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)
		Technology 1	Technology 2	Test/Inspection		
1	Bracket Drg.No. 172.33.542 LF No. 6206305483	Metal fabrication	Metal fabrication	Fixture /Gauges/Mandrel /templates	Power Hacksaw for angle cutting operation Drilling machine for Drill the holes Firm has to develop as per Specification/Drawings.	

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


DGM/CA & SMS
(M.GNANASEKARAN)


JWM/QA(OH)
(S.SAKTHIVEL)


JWM/SMS
(M.NAGARAJAN)


Gen 100 Engine No. 51-5


JWM / CA SMS 2 VP

Ref : Lr No. 6005/HVF/TA/CBOI/VQC/2022-23 dated.16/11/2022&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)
			Technology 1	Metal fabrication	
1	Bracket Drg.No. 175.33.218 LF No. 6206305271	Test/Inspection	Power Hacksaw for cutting of angle materials	Firm has to develop as per Specification/Drawings.	

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


DGM/CA & SMS
(M.GNANASEKARAN)


JWM/QA(OH)
(S.SAKTHIVEL)


JWM/SMS
(M.NAGARAJAN)


JTGm/CA



JTGm/CA

Ref : Lr No. 6005/HVF/TA/CBOI/VQC/2022-23 dated.16/11/2022&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)
		Technology 1	Technology 2	Test/Inspection		
1	Bracket Drg.No. 175.33.192 LF No. 6206305267	Metal fabrication	Metal fabrication	Fixture /Gauges/Mandrel /templates	Power Hacksaw for angle cutting operation Milling machine for the chamfer operation Firm has to develop as per Specification/Drawings.	

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


DGM/CA & SMS
(M.GNANASEKARAN)


JWM/QA(OH)
(S.SAKTHIVEL)


JWM/SMS
(M.NAGARAJAN)


Gm/Operations

JWM/CA & SMS

Ref : Lr No. 6005/HVF/TA/CBOI/VQC/2022-23 dated.16/11/2022&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	Angle piece Drg.No. 172.33.736 LF No. 6206305901	Technology 1 Technology 2 Test/Inspection	Metal fabrication Machining Fixture /Gauges/Mandrel /templates	Power Hacksaw for angle cutting operation Milling machine for chamfering and slot cutting operations. 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.

44
DGM/CA & SMS
(M.GNANASEKARAN)

JWM/QA(OH)
(S.SAKTHIVEL)

17/10/23
JWM/SMS
(M.NAGARAJAN)

Com 100 Equations-11
JWM/QA(OH)
S.SAKTHIVEL


Ref : Lr No. 6005/HVF/TA/CBOII/VQC/2023-24 dated.17/10/2023

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	Angle Piece Drg.No. 172.18.339 LF No. 6206203140	Technology 1	Sheet Metal Fabrication	
		Technology 2	Forming	
		Test/Inspection	Fixture /Gauges/Mandrel /templates	
			1.Shearing machine min capacity 2.0mm Thickness . Press for end forming	
			Firm has to develop as per Specification/Drawings.	

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


 DGM/CA & SMS
 (M.GNANASEKARAN)


 JWM/QA(OH)
 (S.SAKTHIVEL)


 JWM/SMS
 (M.NAGARAJAN)


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

SI.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	ANGLE PIECE Drg.No. 175.33.050 LF No. 6206305208	Technology 1 Test/Inspection	Angle Cutting Fixture /Gauges/Mandrel /templates	Cutting facility for parting of angle Min. 4 mm thick steel angle like power hacksaw machine. Firm has to develop as per Specification/Drawings.

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


DGM/CA & SMS
(M.GNANASEKARAN)


JWM/QA(OH)
(S.SAKTHIVEL)


JWM/SMS
(M.NAGARAJAN)

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

FOR

(BRACKET)

DRG.NO.172.33.542

(LF NO: 6206305483)

No.HVF/T-72C/QAP/33/BRACKET/241055-00

ISSUE No: 00

DATE: JAN-2022

QUALITY ASSURANCE (RIG-SUB ASSEMBLY)

HEAVY VEHICLES FACTORY

AVADI CHENNAI – 600 054

QUALITY ASSURANCE PLAN (QAP)

FOR

BRACKET

DRG. NO. 172.33.542

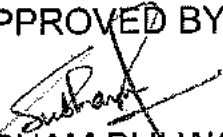
PREPARED BY


(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 **BRACKET TO DRG.NO 172.33.542** 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 indigenously items.
2. This QAP is the property of Government of India and is liable for amendments as and when required. The Sr. General Manager, Heavy Vehicles Factory, Avadi, Chennai – 600 054, is the inspecting Authority for this assembly. Any query / clarification on the content of this QAP shall be referred to this Factory. Any departure from these instructions is allowed only after written approval from the above authority. Notwithstanding the tests indicated in this QAP, the inspecting Officer has the right to carry out any test to check conformance to the paper particulars quoted in the Supply Order, which he may consider necessary to satisfy himself about the stores which he has to accept.

3. AIM

The QAP is aimed at standardizing the Inspection procedure and acceptance norm for **BRACKET TO DRG.NO:172.33.542**.

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

4. SCOPE:

This QAP outlines in general terms, the checks and methods to be used during inspection of **BRACKET TO DRG. NO. 172.33.542** including the technical requirements of the drawings. The recommended Quality Plan stipulated herein is mandatory and should be strictly adhered to.

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

Note:

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

5. DOCUMENTS:

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

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

6. ITEM USED ON:

- 1. 176.01.010CB -
- 2. 188.01.011CB-1CB -
- 3. PV572. 0718.0058 -

7. LIST OF DRAWINGS:

SI. NO.	DRG. NO	NOMENCLATURE	REMARKS
1	172.33.542	BRACKET	-

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

SI. NO	DRG. NO	NOMENCLATURE	MATERIAL SPECIFICATIONS	Qty
1	172.33.542	BRACKET	ANGLE PIECE 25X25X3 --B GOST 8509-93. Cm3cn 2-1-CB GOST 535-88	1

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

9. CONDITIONS OF USE/STORAGE INSTRUCTIONS

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

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

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

10. SAMPLING PLAN:

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

Note:-

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

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

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

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

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

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

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

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

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

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

12.1 BRACKET TO DRG.NO 172.33.542

All dimensions should be confirmed as per drawing.

Sl. No.	Drawing Dimension
1.	40±1.5 mm
2.	20±0.5 mm
3.	10±1 mm
4.	8±1 mm
5.	Φ7H15 ^(+0.58) mm (2 Holes).
6.	25* mm
7.	25* mm
8.	3* mm
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 BRACKET TO DRG.NO 172.33.542

- a) The component should be manufactured from
ANGLE PIECE

25X25X3 –B GOST 8509-93

Cm3cn 2-1-CB GOST 535-88

- b) **Chemical properties:** As per Cm3cn 2-1-CB GOST 535-88.

For details refer

ANGLE PIECE

25X25X3 –B GOST 8509-93

Cm3cn 2-1-CB GOST 535-88

- c) **Mechanical properties:** As per Cm3cn 2-1-CB GOST 535-88.

For details refer

ANGLE PIECE

25X25X3 –B GOST 8509-93

Cm3cn 2-1-CB GOST 535-88

14) PERFORMANCES/ACCEPTANCE TEST: BRACKET TO DRG.NO:172.33.542.

1. *Dimensions for reference.
2. Other requirements should be as per specification 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: 172.33.542.
- b) Material specification as per drawing:
ANGLE PIECE
25X25X3 –B GOST 8509-93
Cm3cn 2-1-CB GOST 535-88
- d) GOST 8509-93 & GOST 535-88.
- e) 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	BRACKET TO DRG. NO 172.33.542	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 8509-93 & GOST 535-88	All the values to confirm with QAP (Para no: 13.1 (a), (b) & (c))	P	W/V	R	SP followed by HVF.
4		Dimensional checks	Dimensions as per the drawing	Refer drawing / QAP Para no: 12.1	Confirm to drawing and QAP	P	W/P	R	100% by firm/ vendor SP followed by HVF.
5		Marking / traceability	Marking / traceability	Refer QAP Para no:18	Confirm to QAP Para no: 18	P	V	R	100% by firm/ vendor.
6		Preservation & packing	Preservation & packing	Refer QAP Para no 19 & 20	Confirm to QAP Para no 19 & 20	P	V	R	100% by firm/ vendor.

Note:

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

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

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

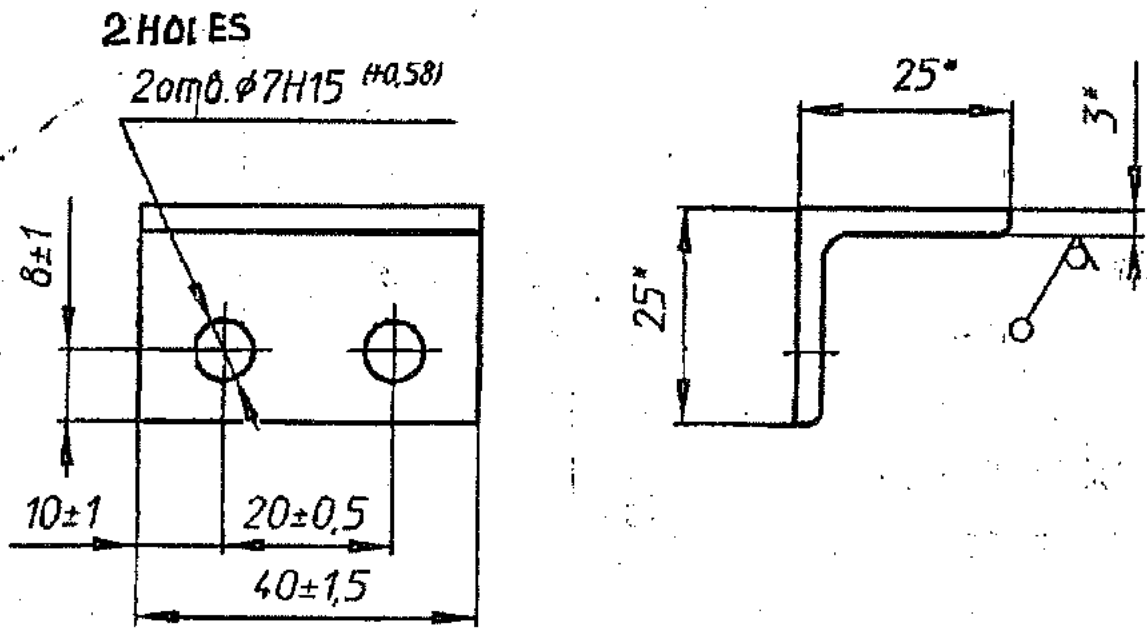


FIG: BRACKET TO DRG.NO.172.33.542.

APPENDIX 'A'

RECORD OF AMENDMENTS

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

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

FOR

(BRACKET)

DRG.NO.175.33.316

(LF NO: 6206305327)

No.HVF/T-72C/QAP/33/BRACKET/243357-00

ISSUE No: 00

DATE: JAN-2022

QUALITY ASSURANCE (RIG-SUB ASSEMBLY)

HEAVY VEHICLES FACTORY

AVADI CHENNAI – 600 054

QUALITY ASSURANCE PLAN (QAP)

FOR

BRACKET

DRG. NO. 175.33.316


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 **BRACKET TO DRG.NO 175.33.316** being procured indigenously. This is prepared, based on the acceptance standards and inspection parameters laid down in collaborators documents and on the inspection test standards followed in respect of similar indigenous items.
2. This QAP is the property of Government of India and is liable for amendments as and when required. The Sr. General Manager, Heavy Vehicles Factory, Avadi, Chennai – 600 054, is the inspecting Authority for this assembly. Any query / clarification on the content of this QAP shall be referred to this Factory. Any departure from these instructions is allowed only after written approval from the above authority. Notwithstanding the tests indicated in this QAP, the inspecting Officer has the right to carry out any test to check conformance to the paper particulars quoted in the Supply Order, which he may consider necessary to satisfy himself about the stores which he has to accept.

3. AIM

The QAP is aimed at standardizing the Inspection procedure and acceptance norm for **BRACKET TO DRG.NO:175.33.316**.

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

4. SCOPE:

This QAP outlines in general terms, the checks and methods to be used during inspection of **BRACKET TO DRG. NO. 175.33.316** 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. Equivalents to the collaborators specifications and standards will be decided only by the Inspecting Authority and should not be unilaterally decided. For any change in the specifications, standards or written approval, any alterations in specification can be affected and not otherwise.
- c) The process instruction sheets supplied by the collaborators are available with the Authority Holding Sealed Particulars, i.e. The Controllerate of Quality Assurance (Heavy Vehicles), Avadi, Chennai for the reference. The relevant process sheets may be studied at the premises of the AHSP after obtaining necessary permission.
- d) The supplier after scrutiny of the concerned process sheets and connected paper particulars should establish the necessary production and inspection facilities.

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

6. ITEM USED ON:

- 1. 172.33.243CBCB -
- 2. 176.33.004CB -
- 3. 172.2M.33.005CB -

7. LIST OF DRAWINGS:

SI. NO.	DRG. NO	NOMENCLATURE	REMARKS
1	175.33.316	BRACKET	-

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

SI. NO	DRG. NO	NOMENCLATURE	MATERIAL SPECIFICATIONS	Qty
1	175.33.316	BRACKET	ANGLE BAR BX25X25X3 GOST 8509-72 BCT3 CП 2 I GOST 535-79	1

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

9. CONDITIONS OF USE/STORAGE INSTRUCTIONS

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

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

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

10. SAMPLING PLAN:

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

Note:-

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

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

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

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

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

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

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

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

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

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

12.1 **BRACKET TO DRG.NO 175.33.316**

All dimensions should be confirmed as per drawing.

Sl. No.	Drawing Dimension
1.	64±2 mm
2.	25 mm
3.	25 mm
4.	3 mm
5.	Surface finish / Roughness of items should be ensured as per drawing and specification.

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

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

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

13.1 **BRACKET TO DRG.NO 175.33.316**

a) The component should be manufactured from
ANGLE BAR

БХ25Х25Х3 GOST 8509-72

ВСТ3 СП 2 | GOST 535-79

b) **Chemical properties:** As per BCT3 СП 2 | GOST 535-79 & GOST 380-71

C = 0.14 - 0.22 ; Mn. = 0.40-0.65 ; Si = 0.05-0.17.

P = 0.04 ; S = 0.05 ;

Cr. = 0.30 ; Ni = 0.30 ;

ARSENIC=0.08;Cu = 0.30.

} MAXIMUM

Note: For mass fraction of other elements refer GOST 380-71.

c) Mechanical properties: As per BCT3 CП 2 | GOST 535-79 & GOST 380-71

ULTIMATE TENSILE STRENGTH Kgf/mm^2 (MIN) = 38-49

STRESS AT YIELD POINT Kgf/mm^2 (MIN) = 25

% RELATIVE ELONGATION (MIN) = 26.

Note: For other parameters refer GOST 380-71.

14) PERFORMANCES/ACCEPTANCE TEST: BRACKET TO DRG.NO:175.33.316.

1. The component may be made from open hearth steel 15 or 20 GOST 1050-74.
2. Non fitness of flanges to the plate should not exceed 1mm.
3. Bevel cut within the tolerance for dimension 64 ± 2 is allowed.

EXPLANATORY NOTE:

MATERIAL QUOTED: ANGLE BAR: $\frac{B 25 \times 25 \times 3 \text{ GOST } 8509-72}{\text{BCT } 3\text{Cn } 2 \text{ I GOST } 535-79}$

ROLLED STEEL EQUAL ANGLES AS PER GOST 8509-72

B = NORMAL ROLLING ACCURACY (B)

BCT 3Cn = GRADE OF STEEL;

2 = CATEGORY ; I = SUB GROUP

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: 175.33.316.
- b) Material specification as per drawing:
ANGLE BAR
БХ25Х25Х3 GOST 8509-72
BCT3 СП 2 | GOST 535-79
- d) GOST 8509-72, GOST 380-71 & GOST 535-79.
- e) Alternate Material:
 1. OPEN HEARTH STEEL 15 or 20 GOST 1050-74.
 2. Fe 410 WA to IS:2062-99.

ANNEXURE-A

SL. NO.	CATEGORY	ASSEMBLY/ SUB ASSEMBLY	TESTS/ INSPECTION PARAMETERS	STANDARDS TO BE REFERRED	ACCEPTANCE CRITERIA	INSPECTION RESPONSIBILITY			REMARKS
						Firm	HVF	DGQA	
1	BRACKET TO DRG. NO 175.33.316	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 8509-72 , GOST 380-71 & GOST 535-79	All the values to confirm with QAP (Para no: 13.1 (a), (b) & (c))	P	W/V	R	SP followed by HVF.
4		Dimensional checks	Dimensions as per the drawing	Refer drawing / QAP Para no: 12.1	Confirm to drawing and QAP	P	W/P	R	100% by firm/ vendor SP followed by HVF.
5		Marking / traceability	Marking / traceability	Refer QAP Para no:18	Confirm to QAP Para no: 18	P	V	R	100% by firm/ vendor.
6		Preservation & packing	Preservation & packing	Refer QAP Para no 19 & 20	Confirm to QAP Para no 19 & 20	P	V	R	100% by firm/ vendor.

Note:

For conformity of the items (Chemical/Physical/Mechanical properties).
 1. One sample per heat / batch shall be tested under NABL Lab/Govt. Approved lab by firm. In case of non-compliance to standards entire lot shall be rejected or not to use in production further.

2. For cross conformation of material, manufacturer has to submit test sample pieces for the items used / test slab and button for rubber items / HVF will draw samples from supplied lot for Witnessing (WV) at HVF premises. In case of non-compliance to standards entire lot will be rejected.

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

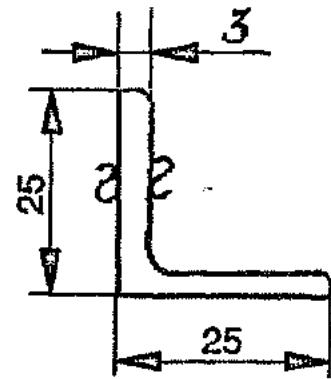
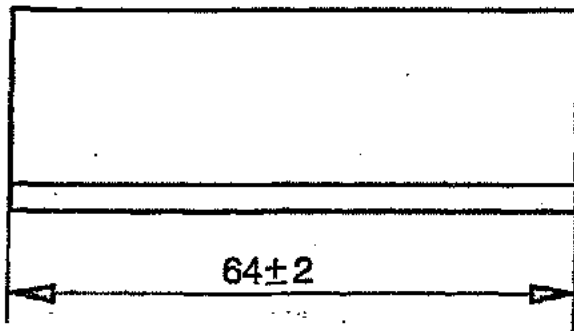


FIG: BRACKET TO DRG.NO.175.33.316.

APPENDIX 'A'

RECORD OF AMENDMENTS

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

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

FOR

(BRACKET)

DRG.NO.175.33.218

(LF NO: 6206305271)

No.HVF/T-72C/QAP/33/BRACKET/243365-00

ISSUE No: 00

DATE: JAN-2022

QUALITY ASSURANCE (RIG-SUB ASSEMBLY)

HEAVY VEHICLES FACTORY

AVADI CHENNAI – 600 054

QUALITY ASSURANCE PLAN (QAP)

FOR

BRACKET

DRG. NO. 175.33.218

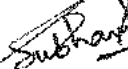
PREPARED BY


(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

Sl. no	CONTENTS	PAGE .No.
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2.	INTRODUCTION	4
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4.	SCOPE	5
5.	DOCUMENTS	5
6.	ITEM USED ON	6
7.	LIST OF DRAWINGS	6
8.	BILL OF MATERIAL	6
9.	CONDITIONS OF USE/ STORAGE INSTRUCTIONS	6
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12.	DIMENSIONAL CHECKS	8
13.	MATERIAL CHECKS	8
14.	ACCEPTANCE / PERFORMANCE TESTS	9
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1.IMPORTANT NOTE

Note-1

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

Note –2

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

Note-3

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

Note-4

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

Note-5

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

2.INTRODUCTION

1. This quality plan lays down the inspection and testing procedure to be carried out on the component **BRACKET TO DRG.NO 175.33.218** being procured indigenously. This is prepared, based on the acceptance standards and inspection parameters laid down in collaborators documents and on the inspection test standards followed in respect of similar indigenous items.
2. This QAP is the property of Government of India and is liable for amendments as and when required. The Sr. General Manager, Heavy Vehicles Factory, Avadi, Chennai – 600 054, is the inspecting Authority for this assembly. Any query / clarification on the content of this QAP shall be referred to this Factory. Any departure from these instructions is allowed only after written approval from the above authority. Notwithstanding the tests indicated in this QAP, the inspecting Officer has the right to carry out any test to check conformance to the paper particulars quoted in the Supply Order, which he may consider necessary to satisfy himself about the stores which he has to accept.

3. AIM

The QAP is aimed at standardizing the Inspection procedure and acceptance norm for **BRACKET TO DRG.NO:175.33.218**.

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

4. SCOPE:

This QAP outlines in general terms, the checks and methods to be used during inspection of **BRACKET TO DRG. NO. 175.33.218** including the technical requirements of the drawings. The recommended Quality Plan stipulated herein is mandatory and should be strictly adhered to.

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

Note:

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

5. DOCUMENTS:

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

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

6. ITEM USED ON:

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

7. LIST OF DRAWINGS:

SI. NO.	DRG. NO	NOMENCLATURE	REMARKS
1	175.33.218	BRACKET	-

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

SI. NO	DRG. NO	NOMENCLATURE	MATERIAL SPECIFICATIONS	Qty
1	175.33.218	BRACKET	ANGLE BAR B 40X40 GOST 8509-72 09Г2-2 GOST 19281-73	1

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

9. CONDITIONS OF USE/STORAGE INSTRUCTIONS

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

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

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

10. SAMPLING PLAN:

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

Note:-

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

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

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

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

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

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

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

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

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

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

12.1 BRACKET TO DRG.NO 175.33.218

All dimensions should be confirmed as per drawing.

Sl. No.	Drawing Dimension
1.	45±2 mm
2.	40 mm
3.	40 mm
4.	4 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 BRACKET TO DRG.NO 175.33.218

a) The component should be manufactured from
ANGLE BAR

Б 40X40 GOST 8509-72

09Г2-2 GOST 19281-73

b) **Chemical properties:** As per 09Г2 GOST 19281-73 & GOST 19282-73

SILICON = 0.17-0.37 ; MANGANESE = 1.4-1.8
 CARBON = 0.12 ; CHROMIUM = 0.30 }
 NICKEL = 0.30 ; COPPER = 0.30 } MAXIMUM

Note: For mass fraction of other elements refer GOST 19281-73 & GOST 19282-73.

c) Mechanical properties: As per 09Г2 GOST 19281-73.

TENSILE STRENGTH Kgf/mm^2 (MIN) = 45
 YIELD POINT Kgf/mm^2 (MIN) = 31
 % RELATIVE ELONGATION (MIN) = 21

Note: For other parameters refer GOST 19281-73.

13.2 BRACKET TO DRG.NO 175.33.218

a) The component may be manufactured from OPEN HEARTH STEEL 15 & 20 GOST 1050-74

b) Chemical properties: As per STEEL 15 & 20 GOST 1050-74.

GRADE OF STEEL	CONTENTS OF ELEMENTS %								
	C	Si	Mn.	Cr	P	S	Ni	Cu	
15	0.12-	0.17-	0.35-	MAXIMUM					
	0.19	0.37	0.65	0.25	0.035	0.040	0.25	0.25	
20	0.17-	0.17-	0.35-						
	0.24	0.37	0.65	0.25	0.035	0.040	0.25	0.25	

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

d) Mechanical properties: As per STEEL 15 & 20 GOST 1050-74.

	GRADE 15	GRADE 20
ULTIMATE TENSILE STRENGTH Kgf/mm^2 (MIN)	= 38	42
YIELD POINT Kgf/mm^2 (MIN)	= 23	25
% ELONGATION (MIN)	= 27	25
% REDUCTION IN AREA (MIN)	= 55	55

Note: For other parameters refer GOST 1050-74.

14) PERFORMANCES/ACCEPTANCE TEST: BRACKET TO DRG.NO:175.33.218.

1. THE COMPONENT MAY BE MADE FROM OPEN - HEARTH STEEL 15 AND 20 GOST 1050-74.
2. BEVEL CUT OF FACES SHOULD BE WITH IN THE TOLERANCE ON DIMENSION 45.

EXPLANATORY NOTE:

MATERIAL QUOTED: ANGLE BAR: $\overline{B-40 \times 40 \times 4}$ GOST 8509-72
O9T2-2 GOST 19281-73

ALT. MTL. QUOTED: OPEN HEARTH STEEL 15& 20 GOST1050-74.

O9T2 = GRADE OF MANGANESE STEEL.

2 = CATEGORY OF STEEL

B- 40 x 40 x 4 = ANGLE BAR AS PER GOST 8509-72.

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: 175.33.218.
- b) Material specification as per drawing:
ANGLE BAR
B 40X40 GOST 8509-72
09Г2-2 GOST 19281-73
- d) GOST 8509-72, GOST 19281-73
- e) Alternate Material:
 1. OPEN HEARTH STEEL 15 AND 20 GOST 1050-74.
 2. Fe 410 WA to IS: 2062-99.

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	BRACKET TO DRG. NO 175.33.218	Material tests	Chemical composition & Mechanical / Physical Properties	As per- GOST 8509-72 & GOST 19281-73.	All the values to confirm with QAP (Para no: 13.1 (a), (b) & (c) OR 13.2 (a), (b) & (c))	P	W/V	R	SP followed by HVF.
4		Dimensional checks	Dimensions as per the drawing	Refer drawing / QAP Para no: 12.1	Confirm to drawing and QAP	P	W/P	R	100% by firm/ vendor SP followed by HVF.
5		Marking / traceability	Marking / traceability	Refer QAP Para no:18	Confirm to QAP Para no: 18	P	V	R	100% by firm/ vendor.
6		Preservation & packing	Preservation & packing	Refer QAP Para no 19 & 20	Confirm to QAP Para no 19 & 20	P	V	R	100% by firm/ vendor.

Note:

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

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

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

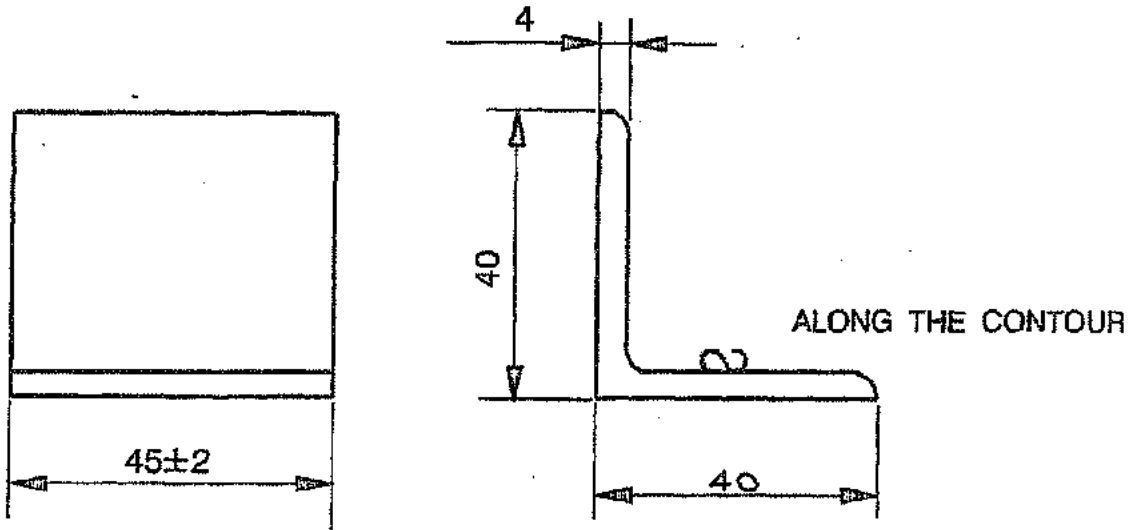


FIG: BRACKET TO DRG.NO.175.33.218.

RECORD OF AMENDMENTS

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

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

FOR

(BRACKET)

DRG.NO.175.33.192

(LF NO: 6206305267)

No.HVF/T-72C/QAP/33/BRACKET/243366-00

ISSUE No: 00

DATE: JAN-2022

QUALITY ASSURANCE (RIG-SUB ASSEMBLY)

HEAVY VEHICLES FACTORY

AVADI CHENNAI – 600 054

QUALITY ASSURANCE PLAN (QAP)

FOR

BRACKET

DRG. NO. 175.33.192


PREPARED BY


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

REVIEWED BY


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

APPROVED BY


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

ISSUED BY

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

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1.IMPORTANT NOTE

Note-1

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

Note –2

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

Note-3

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

Note-4

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

Note-5

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

2.INTRODUCTION

1. This quality plan lays down the inspection and testing procedure to be carried out on the component **BRACKET TO DRG.NO 175.33.192** being procured indigenously. This is prepared, based on the acceptance standards and inspection parameters laid down in collaborators documents and on the inspection test standards followed in respect of similar indigenous items.
2. This QAP is the property of Government of India and is liable for amendments as and when required. The Sr. General Manager, Heavy Vehicles Factory, Avadi, Chennai – 600 054, is the inspecting Authority for this assembly. Any query / clarification on the content of this QAP shall be referred to this Factory. Any departure from these instructions is allowed only after written approval from the above authority. Notwithstanding the tests indicated in this QAP, the inspecting Officer has the right to carry out any test to check conformance to the paper particulars quoted in the Supply Order, which he may consider necessary to satisfy himself about the stores which he has to accept.

3. AIM

The QAP is aimed at standardizing the Inspection procedure and acceptance norm for **BRACKET TO DRG.NO:175.33.192**.

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

4. SCOPE:

This QAP outlines in general terms, the checks and methods to be used during inspection of **BRACKET TO DRG. NO. 175.33.192** including the technical requirements of the drawings. The recommended Quality Plan stipulated herein is mandatory and should be strictly adhered to.

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

Note:

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

5. DOCUMENTS:

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

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

6. ITEM USED ON:

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

7. LIST OF DRAWINGS:

SI. NO.	DRG. NO	NOMENCLATURE	REMARKS
1	175.33.192	BRACKET	-

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

SI. NO	DRG. NO	NOMENCLATURE	MATERIAL SPECIFICATIONS	Qty
1	175.33.192	BRACKET	ANGLE BAR B 45X28X4 GOST 8510-72 09Г2-2 GOST 19281-73.	1

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

9. CONDITIONS OF USE/STORAGE INSTRUCTIONS

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

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

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

10. SAMPLING PLAN:

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

Note:-

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

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

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

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

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

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

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

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

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

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

12.1 BRACKET TO DRG.NO 175.33.192

All dimensions should be confirmed as per drawing.

Sl. No.	Drawing Dimension
1.	4 mm
2.	45 mm
3.	R5
4.	16±1.5 mm
5.	28 mm
6.	40±1.5 mm
7.	82±1.5 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 BRACKET TO DRG.NO 175.33.192

- a) The component should be manufactured from

ANGLE BAR

Б 45X28X4 GOST 8510-72

09Г2-2 GOST 19281-73

b) Chemical properties: As per 09Г2 GOST 19281-73.

SILICON = 0.17-0.37 ; MANGANESE = 1.4-1.8
 CARBON = 0.12 ; CHROMIUM = 0.30 }
 NICKEL = 0.30 ; COPPER = 0.30 } MAXIMUM

Note: For mass fraction of other elements refer GOST 19281-73.

c) Mechanical properties: As per 09Г2 GOST 19281-73.

TENSILE STRENGTH Kgf/mm^2 (MIN) = 45
 YIELD POINT Kgf/mm^2 (MIN) = 31
 % RELATIVE ELONGATION (MIN) = 21

Note: For other parameters refer GOST 19281-73.

13.2 BRACKET TO DRG.NO 175.33.192

a) The component may be manufactured from OPEN HEARTH STEEL 15 & 20 GOST 1050-74

b) Chemical properties: As per STEEL 15 & 20 GOST 1050-74.

GRADE OF STEEL	CONTENTS OF ELEMENTS %								
	C	Si	Mn	Cr	P	S	Ni	Cu	
15	0.12-	0.17-	0.35-	MAXIMUM					
	0.19	0.37	0.65	0.25	0.035	0.040	0.25	0.25	
20	0.17-	0.17-	0.35-						
	0.24	0.37	0.65	0.25	0.035	0.040	0.25	0.25	

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

d) Mechanical properties: As per STEEL 15 & 20 GOST 1050-74.

	GRADE 15	GRADE 20
ULTIMATE TENSILE STRENGTH Kgf/mm^2 (MIN)	= 38	42
YIELD POINT Kgf/mm^2 (MIN)	= 23	25
% ELONGATION (MIN)	= 27	25
% REDUCTION IN AREA (MIN)	= 55	55

Note: For other parameters refer GOST 1050-74.

14) PERFORMANCES/ACCEPTANCE TEST: BRACKET TO DRG.NO:175.33.192.

1. THE COMPONENT MAY BE MADE FROM OPEN HEARTH STEEL 15 AND 20 GOST 1050-74.
2. BEVEL CUT OF FACES MAY BE WITH IN THE TOLERANCE FOR DIMENSION

EXPLANATORY NOTE :

MATERIAL QUOTED : ANGLE BAR: B 45 x 28 x 4 GOST 8510-72
O9Г2-2 GOST 19281-73

ALT. MTL. QUOTED : OPEN HEARTH STEEL 15 & 20 GOST 1050-74.

O9Г2 = GRADE OF MANGANESE STEEL.

2 = CATEGORY OF STEEL

B-45 x 28 x 4 = ANGLE BAR AS PER GOST 8510-72.

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: 175.33.192.
- b) Material specification as per drawing:
ANGLE BAR
Б 45X28X4 GOST 8510-72
09Г2-2 GOST 19281-73
- d) GOST 8510-72, GOST 19281-73
- e) Alternate Material:
 1. OPEN HEARTH STEEL 15 AND 20 GOST 1050-74.
 2. Fe 410 WA to IS: 2062-99.

ANNEXURE-A

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	BRACKET TO DRG. NO 175.33.192	Material tests	Chemical composition & Mechanical / Physical Properties	As per- GOST 8510-72 & GOST 19281-73.	All the values to confirm with QAP (Para no: 13.1 (a), (b) & (c) OR 13.2 (a), (b) & (c))	P	W/V	R	SP followed by HVF.
4		Dimensional checks	Dimensions as per the drawing	Refer drawing / QAP Para no: 12.1	Confirm to drawing and QAP	P	W/P	R	100% by firm/ vendor SP followed by HVF.
5		Marking / traceability	Marking / traceability	Refer QAP Para no:18	Confirm to QAP Para no: 18	P	V	R	100% by firm/ vendor.
6		Preservation & packing	Preservation & packing	Refer QAP Para no 19 & 20	Confirm to QAP Para no 19 & 20	P	V	R	100% by firm/ vendor.

Note:

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

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

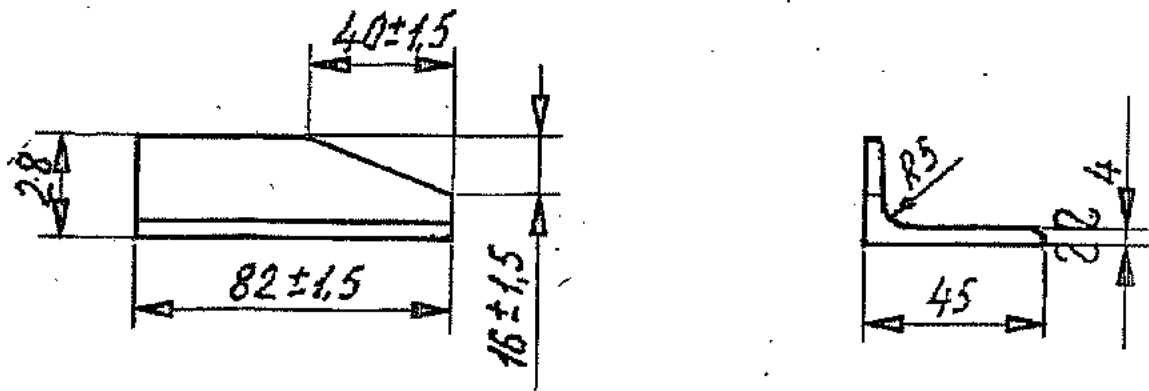


FIG: BRACKET TO DRG.NO.175.33.192.

APPENDIX 'A'

RECORD OF AMENDMENTS

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

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

FOR

(ANGLE PIECE)

DRG.NO.172.33.736

(LF NO: 6206305901)

No: HVF/T-72C/QAP/33/ANGLE PIECE/243363- 00

ISSUE No: 00

DATE: JAN-2022

QUALITY ASSURANCE (RIG-SUB ASSEMBLY)

HEAVY VEHICLES FACTORY

AVADI CHENNAI – 600 054

QUALITY ASSURANCE PLAN (QAP)

FOR

ANGLE PIECE

DRG. NO. 172.33.736


PREPARED BY

REVIEWED BY


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


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

APPROVED BY


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

ISSUED BY

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

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12.	DIMENSIONAL CHECKS	8
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15.	FITMENT AND PERFORMANCE TEST	10
16.	INTERCHANGEABILITY	10
17.	CALIBRATION CHECKS	10
18.	MARKING/IDENTIFICATION	10
19.	PRESERVATION CHECK	11
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21.	DOCUMENTATION	11
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23.	ANNEXURE-A	12
24.	FIGURE	13
25.	APPENDIX-A	14

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 **ANGLE PIECE TO DRG.NO 172.33.736** 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 **ANGLE PIECE TO DRG.NO:172.33.736**

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 **ANGLE PIECE TO DRG. NO.172.33.736** 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. 175.33.011CB-2CB -

7. LIST OF DRAWINGS:

SI. NO.	DRG. NO	NOMENCLATURE	REMARKS
1	172.33.736	ANGLE PIECE	-

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

SI. NO	DRG. NO	NOMENCLATURE	MATERIAL SPECIFICATIONS	Qty
1	172.33.736	ANGLE PIECE	ANGLE PIECE AMГ6 60X60X8 <u>GOST 13737-80</u> GOST 8617-81	1

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

9. CONDITIONS OF USE/STORAGE INSTRUCTIONS

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

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

* 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.

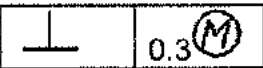
Packing and preservation should be ensured as per drawings/relevant TY specification (To be ensured on receipt at consignee end).

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 ANGLE PIECE TO DRG. 172.33.736

All dimensions should be confirmed as per drawing.

Sl. No.	Drawing Dimensions
1.	52 \pm 0.1 mm
2.	10 \pm 0.5 mm
3.	45°
4.	16 \pm 0.5 mm
5.	60* mm
6.	14 \pm 0.5 mm
7.	17 \pm 1.5 mm
8.	60* mm
9.	8* mm
10.	Φ 13.5 A ₇ ^(+0.43) mm
11.	 0.3 (M)
12.	Surface finish/Roughness should be confirmed 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 ANGLE PIECE TO DRG.NO 172.33.736

a) The component should be manufactured from
ANGLE PIECE

AMГ6 60X60X8 GOST 13737-80
GOST 8617-81

b) Chemical properties: As per AMГ6 GOST 8617-81 & 4784-74.

GRADE	ALLOYING CONSTITUENT											
	Al	Cu	Mg	Mn	Ni	Fe	Si	Zn	Ti	Cr	Be	Zr
AMГ 6	BASE CONSTITUENT	--	5.8 - 6.8	0.5 - 0.8	--	--	--	--	0.02- 0.10	--	0.0002 0.005	--

GRADE	IMPURITIES (MAX)										OTHER IMPURITIES	
	Fe	Si	Cu	Mn	Ni	Zn	Ti	Mg	Cr	EACH INDIVIDUALLY	TOTAL	
	AMГ 6	0.4	0.4	0.1	--	--	0.2	--	--			--

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

c) Mechanical properties: As per AMГ6 GOST 8617-81.

BRAND OF ALLOY	CONDITION OF THE MATERIAL	U.T.S Mpa (Kgf/mm ²)	YIELD POINT δ 0.2, mpa (Kgf/mm ²)	ELONGATION %
AMГ 6	WITHOUT HEAT TREATMENT	MINIMUM		
		314 (32.0)	157 (16.0)	15.0

Note: For other properties refer GOST 8617-81.

14) PERFORMANCES/ACCEPTANCE TEST: ANGLE PIECE TO DRG.NO.172.33.736

1. MATERIAL : ANGLE PIECE AMF 6 60 x 60 x 8 GOST 13737 - 80
GOST 8617 - 81
2. * DIMENSIONS FOR REFERENCE.
3. OTHER REQUIREMENTS AS PER 520. TY 1.

EXPLANATORY NOTE:-

THE COMPONENT SHOULD BE MANUFACTURED FROM EQUAL LEG ANGLE (PRESSED SECTION) EXTRUDED OUT OF ALUMINIUM ALLOY OF NORMAL STRENGTH, WITH OUT HEAT TREATMENT OF GRADE AMF 6 TO GOST 8617-81. ANGLE DIMENSIONS 60x60x8 SHOULD CONFORM AS PER TABLE 1 TO GOST 13737-80.

15) FITMENT AND PERFORMANCE TEST:

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

16) INTERCHANGEABILITY:

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

17) CALIBRATION CHECKS

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

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

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

18) MARKING/IDENTIFICATION.

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

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

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

19) PRESERVATION CHECK

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

20) PACKING CHECK

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

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

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

21) DOCUMENTATION

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

22) REFERENCE:

- a) Drawing No: 172.33.736
- b) Material specification as per drawing:
ANGLE PIECE
AMГ6 60X60X8 GOST 13737-80
GOST 8617-81
- c) GOST 13737-80, GOST 8617-81 & GOST 4784-74.
- d) Specification: 520 TY1.

ANNEXURE-A

SL NO.	CATEGORY	ASSEMBLY/ SUB ASSEMBLY	TESTS/ INSPECTION PARAMETERS	STANDARDS TO BE REFERRED	ACCEPTANCE CRITERIA	INSPECTION RESPONSIBILITY			REMARKS
						Firm	HVF	DGQA	
1	ANGLE PIECE TO DRG. NO 172.33.736	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 13737-80, GOST 8617-81 & 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

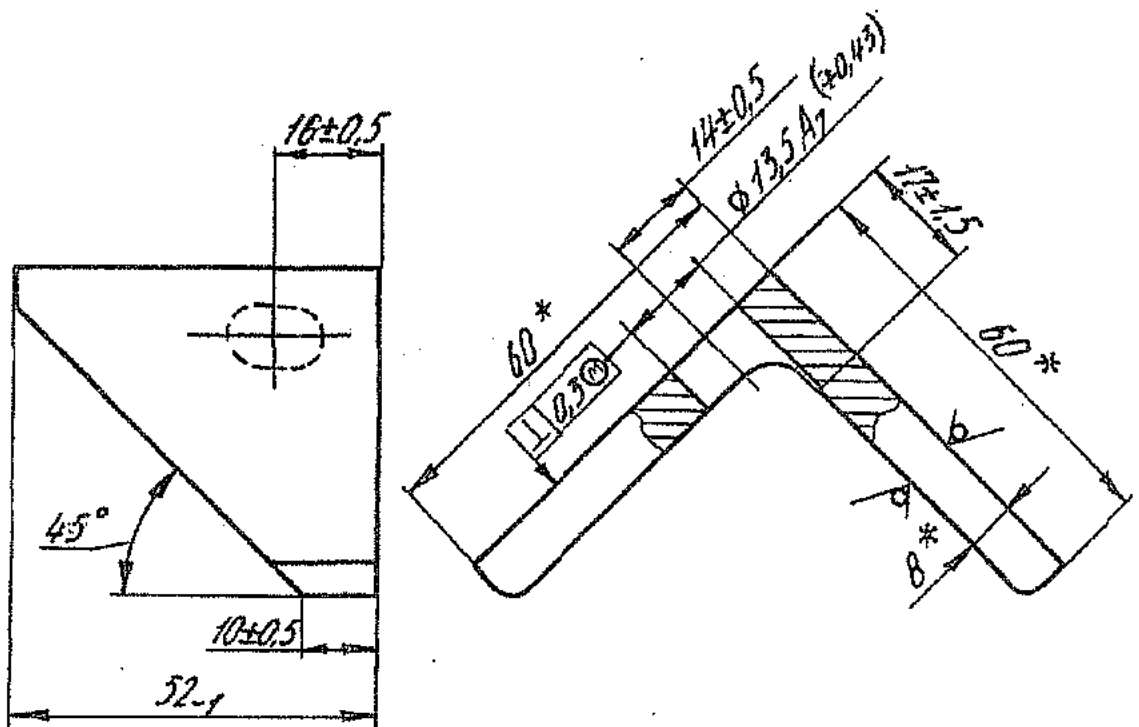


FIG: ANGLE PIECE TO DRG. NO 172.33.736

RECORD OF AMENDMENTS

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

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

FOR

(ANGLE PIECE)

DRG.NO. 172.18.339

(LF NO: 6206203140)

No HVF/T-72C/QAP/18/ANGLE PIECE/243345 - 00

ISSUE No: 00

DATE: JAN- 2022

QUALITY ASSURANCE (RIG-SUB ASSEMBLY)

HEAVY VEHICLES FACTORY

AVADI CHENNAI – 600 054

QUALITY ASSURANCE PLAN (QAP)

FOR

ANGLE PIECE

DRG. NO. 172.18.339

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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3.	AIM	4
4.	SCOPE	5
5.	DOCUMENTS	5
6.	ITEM USED ON	6
7.	LIST OF DRAWINGS	6
8.	BILL OF MATERIAL	6
9.	CONDITIONS OF USE/ STORAGE INSTRUCTIONS	6
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11.	VISUAL INSPECTION	7
12.	DIMENSIONAL CHECKS	8
13.	MATERIAL CHECKS	8
14.	ACCEPTANCE / PERFORMANCE TESTS	9
15.	FITMENT AND PERFORMANCE TEST	9
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17.	CALIBRATION CHECKS	9
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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 **ANGLE PIECE TO DRG.NO 172.18.339** 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 indigenously 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 **ANGLE PIECE TO DRG.NO:172.18.339**.

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 **ANGLE PIECE TO DRG. NO. 172.18.339** including the technical requirements of the drawings. The recommended Quality Plan stipulated herein is mandatory and should be strictly adhered to.

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

Note:

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

5. DOCUMENTS:

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

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

6. ITEM USED ON:

7. LIST OF DRAWINGS:

SI. NO.	DRG. NO	NOMENCLATURE	REMARKS
1	172.18.339	ANGLE PIECE	-

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

SI. NO	DRG. NO	NOMENCLATURE	MATERIAL SPECIFICATIONS	Qty
1	172.18.339	ANGLE PIECE	<u>SHEET 2 GOST 19904-74</u> 5-II-Г-10КП GOST 16523-74.	1

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

9. CONDITIONS OF USE/STORAGE INSTRUCTIONS

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

- (a) The threaded parts if any should be covered with suitable plastic caps to prevent damages.
- (b) If the item consists of assemblies, each assembly should be packed separately.
- (c) The stores are to be suitably covered for preventing ingress of dust and Dirt/entry of sunlight / moisture.
- (d) The packaging slip shall contains
 - (i) Certificate of testing- NABL Certificate.
 - (ii) Guarantee/ Warranty Certificate
 - (iii) Service and maintenance instructions
 - (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 ANGLE PIECE TO DRG.NO 172.18.339

All dimensions should be confirmed as per drawing.

Sl. No.	Drawing Dimension
1.	15±2 mm
2.	20±2 mm
3.	2* mm
4.	R3
5.	8 (+3 / -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 ANGLE PIECE TO DRG.NO 172.18.339

- a) The component should be manufactured from
SHEET 2 GOST 19904-74
 5-II-Г-10КП GOST 16523-74.

b) **Chemical properties:** As per STEEL SHEET 5-II-Г-10КП GOST 16523-74.

For details refer

SHEET 2 GOST 19904-74
5-II-Г-10КП GOST 16523-74.

c) **Mechanical properties:** As per STEEL SHEET 5-II-Г-10КП GOST 16523-74.

For details refer

SHEET 2 GOST 19904-74
5-II-Г-10КП GOST 16523-74.

14) PERFORMANCES / ACCEPTANCE TEST: ANGLE PIECE TO DRG.NO:
172.18.339

2 GOST 19904-74.
1. **ALTERNATE MATERIAL SHEET** -----
4-II 15 GOST 16523-70.
2. **REMAINING REQUIREMENTS SHOULD BE AS PER 520 TY 1.**
3. *** DIMENSION 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/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

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

22) REFERENCE:

a) Drawing No: 172.18.339.

b) Material specification as per drawing:

SI. NO	DRG. NO	NOMENCLATURE	MATERIAL SPECIFICATIONS
1	172.18.339	ANGLE PIECE	<u>SHEET 2 GOST 19904-74</u> 5-II-Г-10КП GOST 16523-74.

c) GOST 16523-74 & GOST 19904-74

d) Specification: 520 TY1.

e) Alternate Material:

a. Refer QAP Para NO: 14(1).

b. STEEL GRADE 'O' to IS:513 : 1986 or 4C5, SEC 2, TO BS-1449 pt-1:1983.

ANNEXURE-A

Sl. NO.	CATEGORY	ASSEMBLY/SUB ASSEMBLY	TESTS/INSPECTION PARAMETERS	STANDARDS TO BE REFERRED	ACCEPTANCE CRITERIA	INSPECTION RESPONSIBILITY			REMARKS
						Firm	HVF	DGQA	
1	ANGLE PIECE TO DRG. NO 172.18.339.	Pre inspection reports (PIR) of firm	Firm has to produced all the document as per Para 21 (iv)	As per the relevant drawing and QAP.	Confirm to drawing and QAP as per bill of material	P	V	R	100% by firm/ vendor.
2		Bill of material (BOM)	Firm has to prepare the BOM as per QAP	Refer QAP Para no: 8 or item list.	Confirm to QAP.	P	V	R	100% by firm/ vendor.
3		Material tests	Chemical composition & Mechanical / Physical Properties	As per--GOST 16623-74 & GOST 19904-74	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	Firm has to make marking / traceability records.	Refer QAP Para no: 18	Confirm to QAP Para no: 18	P	V	R	100% by firm/ vendor.
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% 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

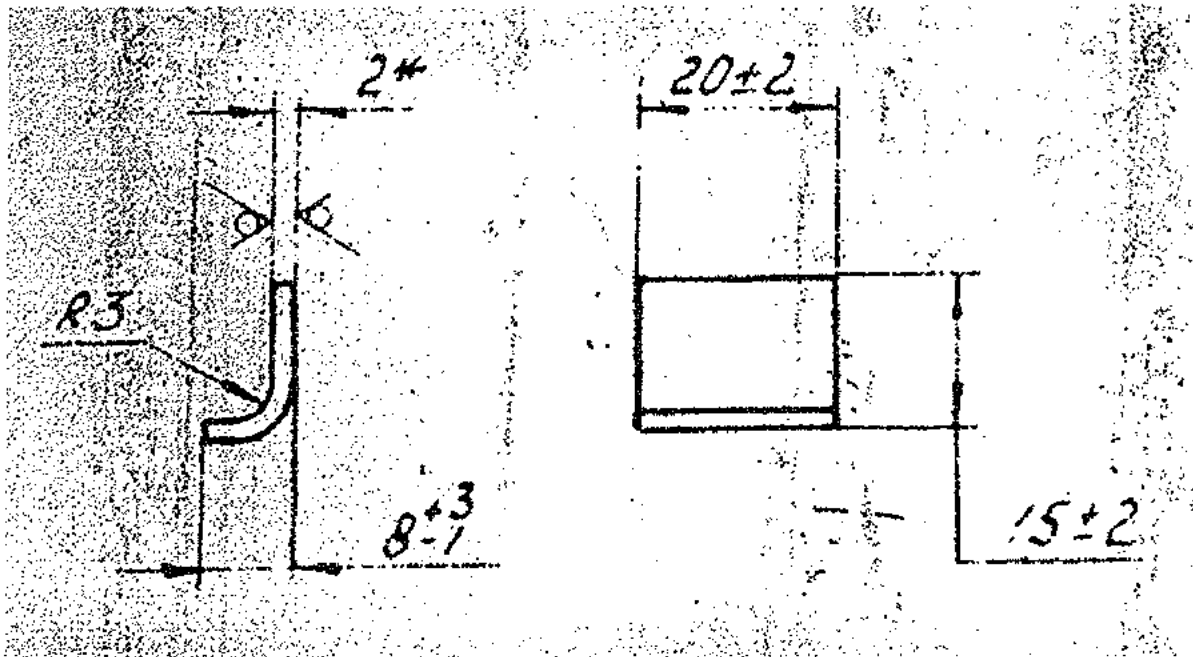


FIG: ANGLE PIECE TO DRG. NO 172.28.130- 4
(For reference only)

RECORD OF AMENDMENTS

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

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

FOR

(ANGLE PIECE)

DRG.NO.175.33.050

(LF NO: 6206305208)

No: HVFT-72C/QAP/33/ANGLE PIECE/243360- 00

ISSUE No: 00

DATE: JAN – 2022

QUALITY ASSURANCE (RIG-SUB ASSEMBLY)

HEAVY VEHICLES FACTORY

AVADI CHENNAI – 600 054

QUALITY ASSURANCE PLAN (QAP)

FOR

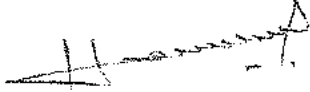
ANGLE PIECE

DRG. NO. 175.33.050

PREPARED BY

REVIEWED BY


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


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

APPROVED BY


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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 **ANGLE PIECE TO DRG.NO 175.33.050** 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 indigenously 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 **ANGLE PIECE TO DRG.NO: 175.33.050**

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 **ANGLE PIECE TO DRG. NO. 175.33.050** including the technical requirements of the drawings. The recommended Quality Plan stipulated herein is mandatory and should be strictly adhered to.

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

Note:

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

5. DOCUMENTS:

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

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

6. ITEM USED ON:

- 1. 176.33.004CB -
- 2. 172.33.225CB-2CB -
- 3. 172.33.231CB-2CB -

7. LIST OF DRAWINGS:

SI. NO.	DRG. NO	NOMENCLATURE	REMARKS
1	175.33.050	ANGLE PIECE	-

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

SI. NO	DRG. NO	NOMENCLATURE	MATERIAL SPECIFICATIONS	Qty
1	175.33.050	ANGLE PIECE	ANGULAR BAR 45X28X4 GOST 8510-86 295-09Г2-2 GOST 19281-89.	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 ANGLE PIECE TO DRG.NO 175.33.050

All dimensions should be confirmed as per drawing.

Sl. No.	Drawing Dimensions
1.	575±3 mm
2.	28* mm
3.	45* mm
4.	4* mm
5.	Surface finish / Roughness should be ensured as per drawing and specification.

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

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

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

13.1 ANGLE PIECE TO DRG.NO 175.33.050

- a) The component should be manufactured from
 ANGULAR BAR 45X28X4 GOST 8510-86
 295-09Г2-2 GOST 19281-89.

b) **Chemical properties:** As per STRIP 295-09Г2 -2 GOST 19281-89.

CONTENT OF ELEMENTS%								
Cu	Si	Mn	C	S	P	Cr	Ni	
			MAX					
0.30 max	0.17 to 0.37	1.4 to 1.8	0.12	0.040	0.035	0.30	0.30	

Note: For mass fraction of other elements refer GOST 19281-89.

c) **Mechanical properties:** As per STRIP 295-09Г2 - 2 GOST 19281-89.

For details refer

ANGULAR BAR 45X28X4 GOST 8510-86

295-09Г2-2 GOST 19281-89.

**14) PERFORMANCES/ACCEPTANCE TEST: ANGLE PIECE TO
DRG.NO.175.33.050**

1. Alternate - material - angular bar 45 x 28 x 4 GOST 8510 - 86
295-09Г2А-СВ-2 GOST 19281 - 89.
2. * Dimensions for references.
3. Other requirements as per 520.TY.1

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

- 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, 5. Calibration reports of instruments and 6. Dimensional inspection reports.

22) REFERENCE:

- a) Drawing. No: 175.33.050.
- b) Material specification as per drawing

SI. NO	DRG. NO	NOMENCLATURE	MATERIAL SPECIFICATIONS
1	175.33.050	ANGLE PIECE	ANGULAR BAR 45X28X4 GOST 8510-86 295-09Г2-2 GOST 19281-89.

- c) GOST 8510-86 & GOST 19281-89.
- d) Specification: 520.TY1.
- e) Alternate material:
 - 1. ANGULAR BAR 45X28X4 GOST 8510-86
295-09Г2Д-CB-2 GOST 19281-89.

ANNEXURE-A

SL. NO.	CATEGORY	ASSEMBLY/ SUB ASSEMBLY	TESTS/ INSPECTION PARAMETERS	STANDARDS TO BE REFERRED	ACCEPTANCE CRITERIA	INSPECTION RESPONSIBILITY			REMARKS
						Firm	HVF	DGOA	
1	ANGLE PIECE TO DRG. NO 175.33.050.	Pre inspection reports (PIR) of firm	Firm has to produced all the document as per Para 21 (iv)	As per the relevant drawing and QAP.	Confirm to drawing and QAP as per bill of material	P	V	R	100% should be ensured.
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% should be ensured.
3		Material tests	Chemical composition & Mechanical / Physical Properties	As per-GOST 8510-86 & GOST 19281-89.	All the values to confirm with QAP (Para no:13.1 (a),(b) & (c))	P	W/V	R	100% should be ensured.
4		Dimensional checks	Dimensions as per the drawing	Refer drawing / QAP Para no: 12.1	Conform to drawing and QAP	P	W/P	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	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

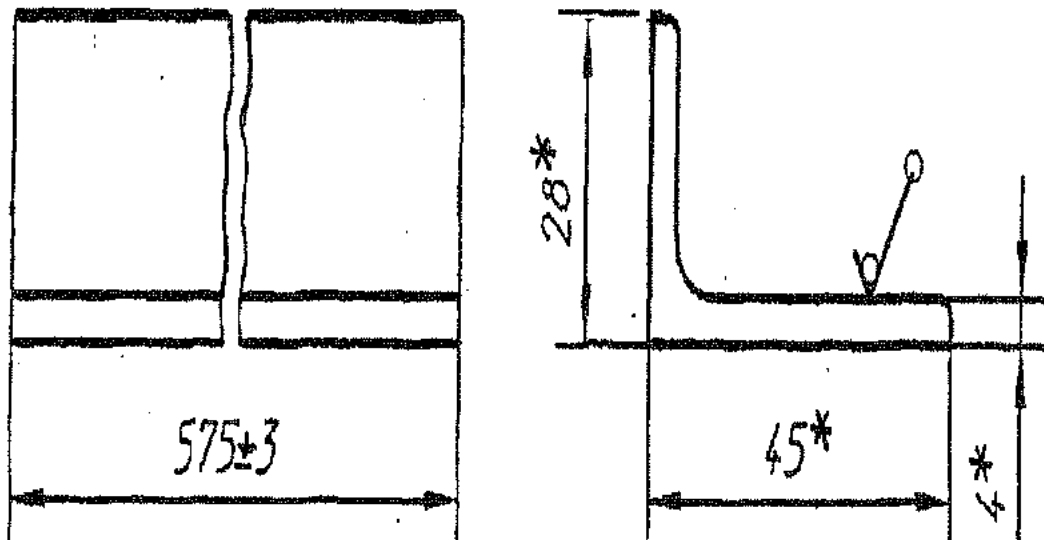


FIG: ANGLE PIECE TO DRG. NO 175.33.050

APPENDIX ' A'

RECORD OF AMENDMENTS

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