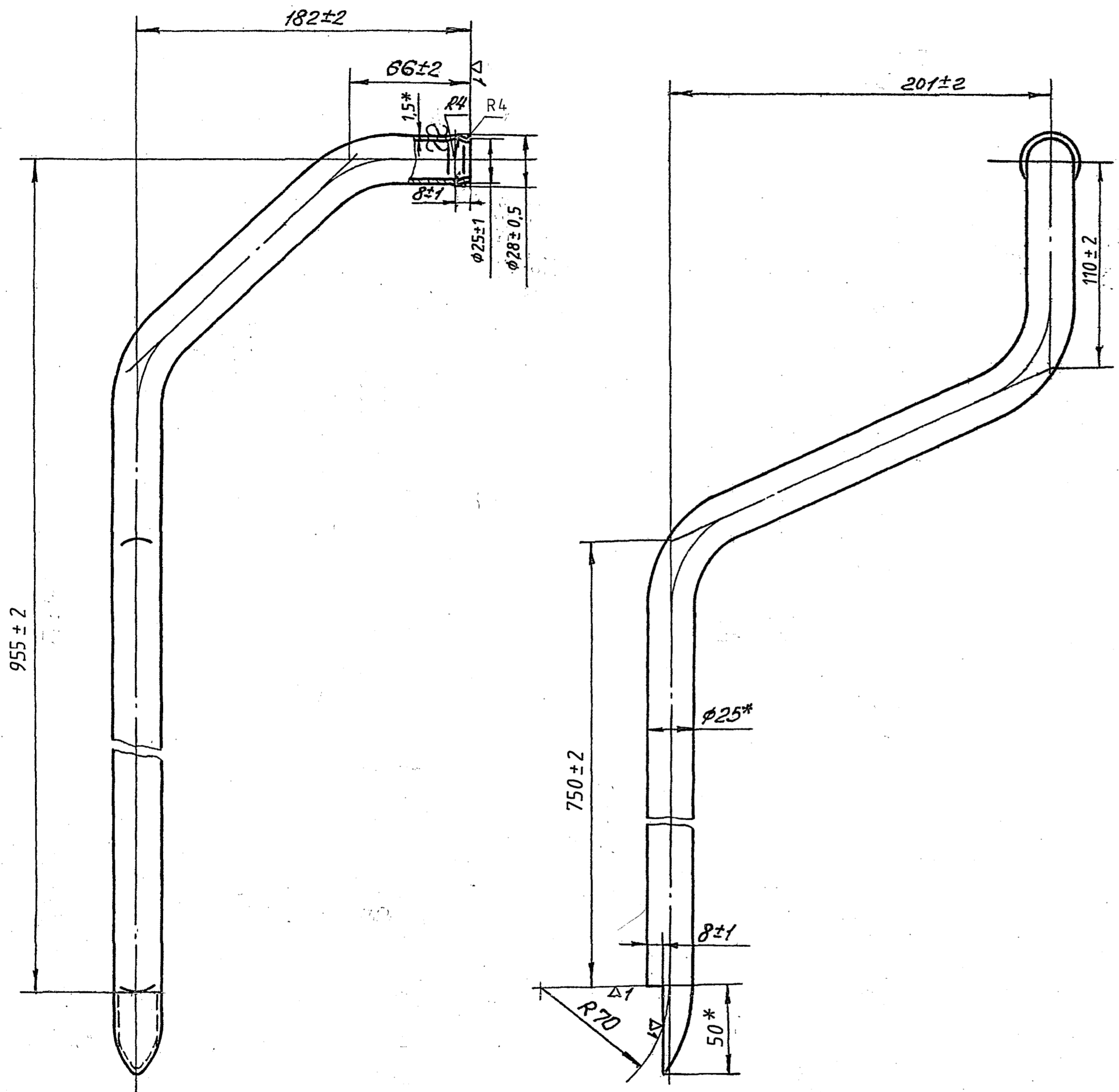


DRAWING NUMBER
172.33.534

SHEET No. 1 OF 1



1. AT A LENGTH OF 30 mm FROM THE EXPANDED END OVALITY SHOULD NOT EXCEED 2 mm.
2. OTHER REQUIREMENTS AS PER SPECIFICATIONS 520 TY 1.
3. RADII OF BENDING TO BE 70 mm TO THE AXIS IN THE PLANE OF BENDING.
4. PIPE MAY BE MADE OF 2 SECTIONS WHICH ARE BUTT WELDED ON HORIZONTAL SECTION OF PIPE. THE WELD IS TO BE SUBJECTED TO A PRESSURE TEST AT A PRESSURE OF 0.75 ATM FOR 5 MIN. MINIMUM LEAKAGE IS NOT PERMISSIBLE.
5. IT IS PERMITTED TO MANUFACTURE FROM TWO PARTS BY BUTT WELDING ON THE HORIZONTAL SECTION OF PIPE. SUBJECT THE WELD JOINT TO PRESSURE TEST WITH AIR AT A PRESSURE $0.735 \cdot 10^5 + 0.098 \cdot 10^5$ Pa ($0.75 + 0.1$ kgf/cm²) LEAKAGE OF AIR IS NOT ALLOWED.
6. LENGTH OF STRAIGHTENED PIPE NOMINAL DIMENSIONS IS APPROXIMATELY 1335 mm.
7. * DIMENSION FOR REFERENCE.
8. ALTERNATE MATERIAL : PIPE AMГ5M KP 25 X 1.5 OST 1.92096-83.

EXPLANATORY NOTE :-

MATERIAL QUOTED: PIPE 25X1,5 AMГ6 M GOST 18475-73

ALUMINIUM ALLOY

25 = NOMINAL DIAMETER
1,5 = WALL THICKNESS
AMГ6 = GRADE
M = ANNEALED

CHEMICAL COMPOSITION AS PER GOST 4784-74

ALUMINIUM = BASE CONSTITUENT
MAGNESIUM = 5,8-6,8
MANGANESE = 0,5-0,8
TITANIUM = 0,02-0,10
BERYLLIUM = 0,0002-0,005

OTHER IMPURITIES (max)

IRON = 0,4
SILICON = 0,4
COPPER = 0,1
ZINC = 0,2

OTHER IMPURITIES (a) individually = 0,05
(b) totally = 0,1

MECHANICAL PROPERTIES AS PER GOST 18475-73

ULTIMATE TENSILE STRENGTH = 32 Kgf/mm² (min)
YIELD POINT = 15 Kgf/mm² (min)
PERCENTAGE OF ELONGATION = 15 (min)

9. MATERIAL : PIPE AMГ6M - KP-25 X 1.5 OST 1-92096-83.

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

EST. WT. (Kg) 0.45	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.		
8	4.4.90	172M 150 A-88(A.L. 10/2)
6,7	5.10.88	AMDT LIST No.6/II BOOK-6
ISSUE	DATE	NATURE OF AMENDMENTS

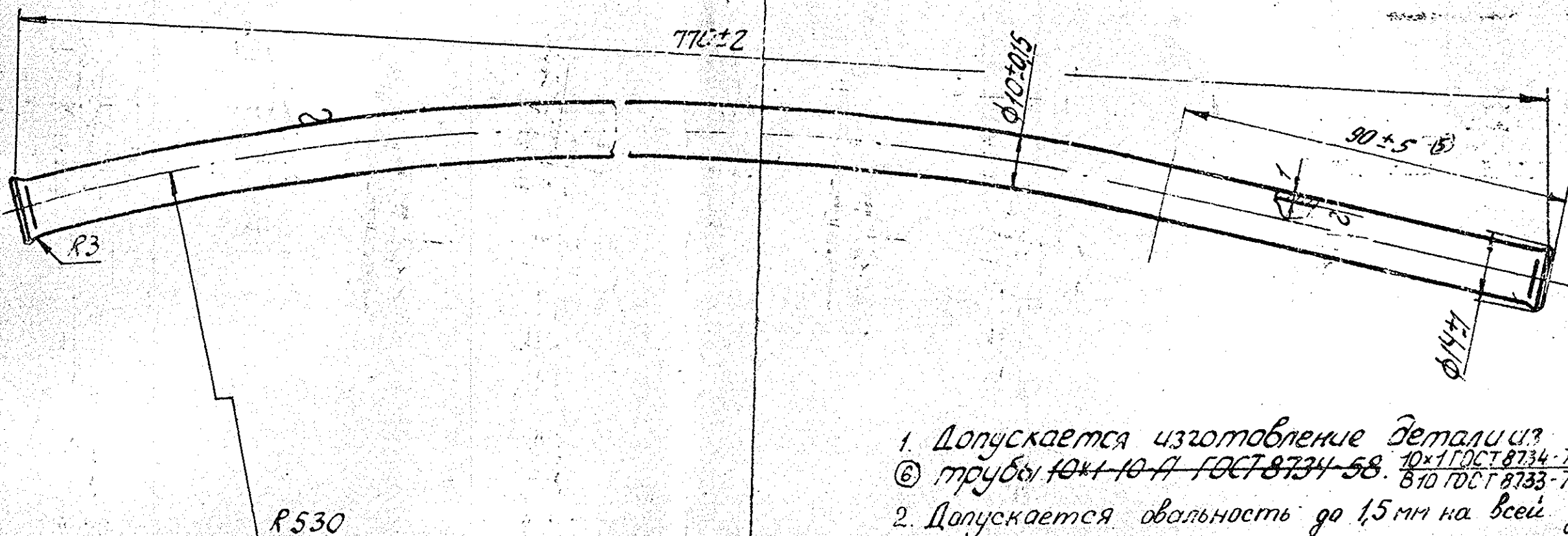
DRN	Sd/=	MATERIAL :- SEE ABOVE	USED ON :-
CHD	Sd/=	PIPE 25X1.5	175.33.011 Cb-2
APPD	Sd/=	AMГ6M GOST 18475-73	
DATE	2-9-86	CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES)	
SCALE:-	1:2	AVADI	
DIMENSIONS IN mm		TITLE:-	
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS : 2102-69		PIPE FUEL SUPPLY	
ALL THREADS TO CONFORM TO		D S CAT NUMBER	DRAWING NUMBER
			172.33.534

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

R. RAMANUJAM
2-6-07,05

F-61
SIZE A2

FIRST ANGLE PROJECTION.



1. Допускается изготовление детали из
 (a) трубы 10x10-A ГОСТ 8734-58. 10x1 ГОСТ 8734-75
 B10 ГОСТ 8733-74
2. Допускается овальность до 1,5 мм на всей длине.

1. Component may be manufactured from
 Pipe 10X1 Gost 8734-75
 810 Gost 8733-74
2. Ovality upto 1.5 mm along the entire length is allowed.

FOR CONTROLLER OF QUALITY
 (AVA) AVADI CHENNAI 54

ALT. MATL:- STEEL DESIGN CFS 3 OR CFS 4
 Pt-4 TO BS: 6323, Pt 1-82 OR ERW1 OR ERW2 Pt-5
 TO BS: 6323 Pt 1-82, REQUIRED PROPERTIES TO BE
 ACHIEVED.

COATING:- ZINC PLATING Fe Zn 6 TO 15: 1573-1970.
 FOLLOWED BY CHROMATE PASSIVATION TO
 15: 1340-1973.

207

DS CAT No. 4710-001796

1884-W	22-10-03	HINDI NOMEN ADDED	22/11
17902-W	14-2-94	ALT MATL & COATING NOTE ADDED	22/11/85
17088-W	4.7.91	D.S. CAT No ADDED	28/10/15
16478-W	23-10-86	DRG SEALED.	
ISSUE	DATE	REFERENCE	
APPROVED			
CHECKED	A. Babu Rao		
DRAWN	S. S. V.		

172.18.187

40001KD



PIPE पाइप

SHEET	MASS	SCALE
1 of 1	0.252	1:1

MATERIAL:
 PIPE 10X1 GOST 8734-75
 B 20 GOST 8733-74.

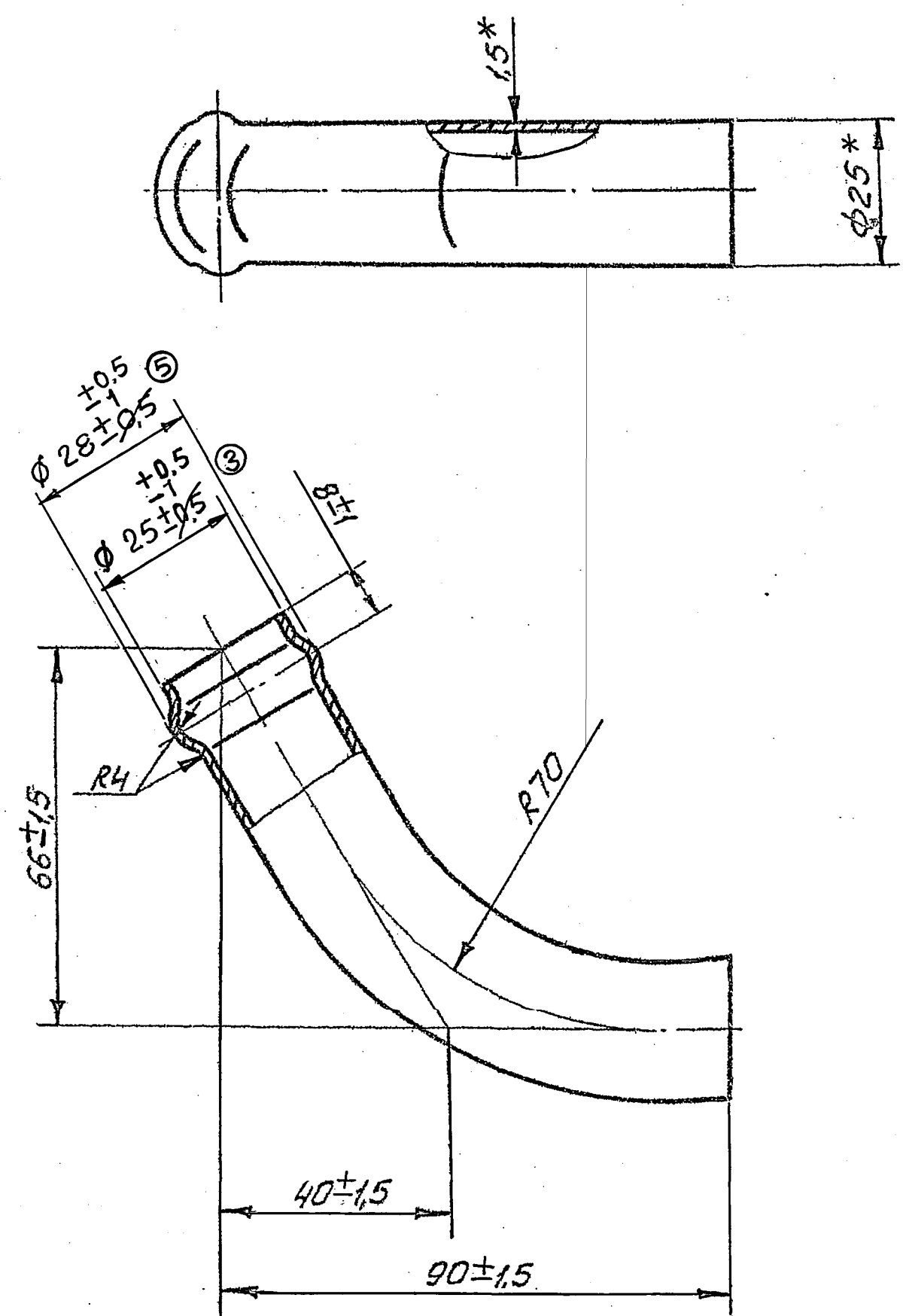
C.Q.A (AVA) AVADI

AVA AVADI, AVADI, CHENNAI, INDIA

DRAWING NUMBER
175.33.094-2A

SHEET No. 1 OF 1

▽1 (▽)



1. AT A LENGTH OF 30 mm. FROM THE EXPANDED END, OVALITY SHOULD NOT EXCEED 1 mm. WHILE ALONG THE REST OF THE LENGTH 2 mm.
2. CREASES UP TO 2 mm. HIGH ARE PERMISSIBLE IN THE PLACE OF BENDING. OVALITY SHOULD NOT EXCEED 3 mm.
3. LENGTH OF STRAIGHTENED PIPE (AS PER THE NOMINAL DIMENSION) IS APPROXIMATELY 102 mm.
4. * DIMENSIONS FOR REFERENCE.
5. OTHER REQUIREMENTS ARE IN ACCORDANCE WITH 432 - 116 - 1.
- ⑦ 6. ALTERNATIVE MATERIAL :- PIPE AMГ 5M-KP-25x1.5 OST 1-92096-83.

EXPLANATORY NOTE :-

7. REFERENCE MATERIAL QUOTED :- PIPE AMГ6-M-KP-25x1.5 OST 1- 92096-83. COLD WROUGHT SEAMLESS PIPE MADE OF ALUMINIUM ALLOYS TO GRADE AMГ6-M-KP-25x1.5 AND ALTERNATIVELY AMГ5 M-KP-25x1.5 ANNEALED CONDITION (M) ROUND PIPE (KP) AS PER OST 1-92096-83. AND MANUFACTURED IN ACCORDANCE WITH GOST 4784-74.

a) CHEMICAL COMPOSITION AS PER GOST 4784-74.

GRADES	CHEMICAL COMPOSITION %										
	ALLOYING CONSTITUENT					IMPURITIES (MAXIMUM)					
	Al.	Mg	Mn	Ti	Be	Fe	Si	Cu	Zn	OTHER IMPURITIES EACH INDIVIDUALLY	TOTAL
AMГ6	BASE CONSTITUENT	5.8 - 6.8	0.5 - 0.8	0.02 - 0.10	0.0002 - 0.005	0.4	0.4	0.1	0.2	0.05	0.1
AMГ5	- do -	4.8 - 5.8	0.3 - 0.4	0.02 - 0.10	0.0002 - 0.005	0.6	0.5	0.1	0.2	0.05	0.1

b) MECHANICAL PROPERTIES AS PER OST 1 -92096-83

GRADE	ULTIMATE STRENGTH Kgf / mm ²	YIELD POINT Kgf / mm ²	ELONGATION - %
AMГ6	33 (MIN)	15 (MIN)	15 (MIN)
AMГ5	-	-	-

"COMMON TO T-90" & BLT DRAWING RE-INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE -5 DRG. REDRAWN AND EXPLANATORY NOTE ADDED ON 05.12.91. I. RAMANUJ, JTO 07-09-05

⑦A ALT. MATL: GRADE 54300 TO IS: 737-86
⑥ PIPE AMГ6-M-KP-25x1.5 OST 1-92096-83

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

EST. WT. (Kg) 0.035	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.	

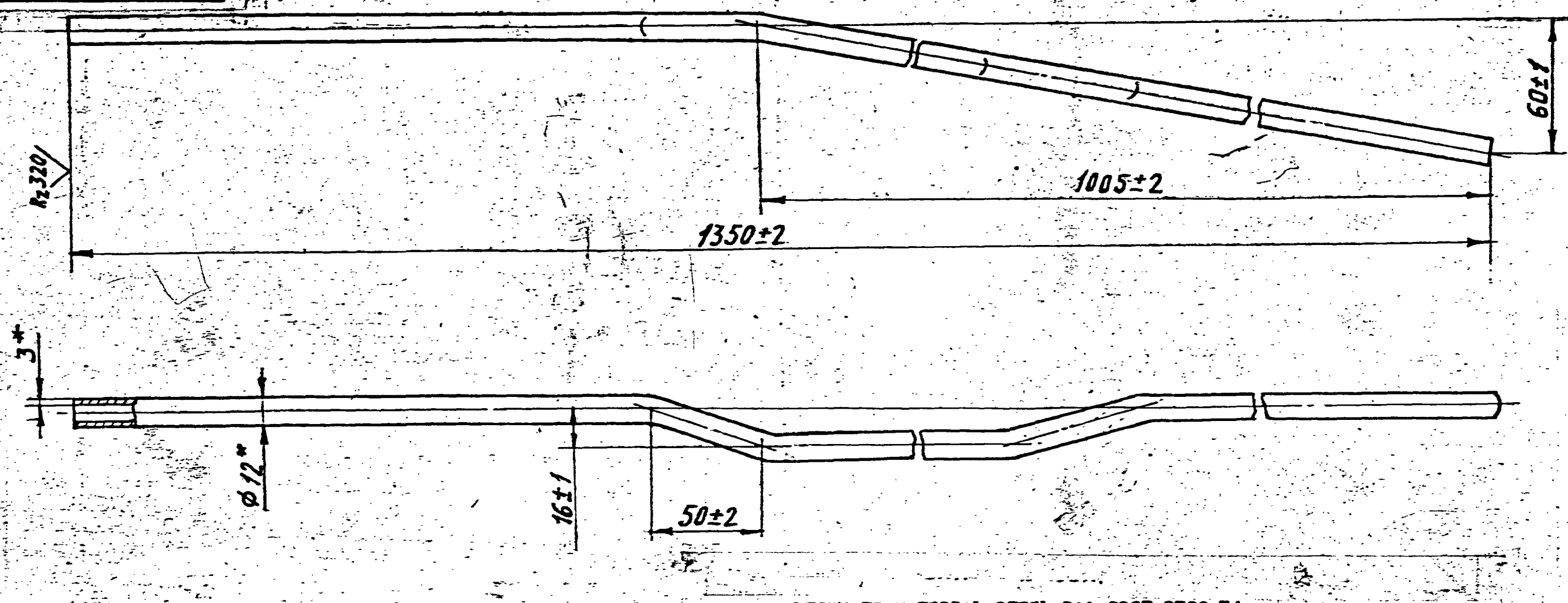
DRN	Sd/=	MATERIAL :- SEE ABOVE	USED ON :- 175.33.007 Cb-2
CHD	Sd/=	PIPE 25x1.5	175.33.008 Cb-2, 175.33.009 Cb-2
APPD	Sd/=	AMI 6M GOST18475-73	175.33.010 Cb-2
DATE	07.08.86	CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI	
SCALE:- 1 : 1		TITLE :-	
DIMENSIONS IN mm		PIPE	
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS : 2102 - 69		D S CAT NUMBER	
7A	23.1.06	AUTHY Lt. No. 80001/CQA/HV/ GEN Dt. 30.11.05	DRAWING NUMBER
7	4.4.90	172 M 150 A - 88 (A.L 10/2)	175.33.094-2A
6	6.10.88	AMDT LIST 6. PT II, BOOK-6.	
ISSUE	DATE	NATURE OF AMENDMENTS	

F-63
SIZE A2

DRAWING NUMBER
172 61 066-1

1A

(V)



VIEW-A TURNED

1. ALTERNATE MATERIAL: STEEL B10-GOST 8733-74.
2. BENDING RADII OF 40mm ARE TO THE AXIS IN THE PLANE OF BENDING.
3. LENGTH OF STRAIGHTENED COMPONENT ≈ 1355 mm.
4. REQUIREMENTS ARE IN ACCORDANCE WITH 520 TY 1.
- 5.* DIMENSIONS FOR REFERENCE.

COMMON TO BLT

DRG INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE : 1

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

EST. WT. 0.906 Kg TO BE STAMPED OR MARKED WHERE INDICATED THIS $\frac{1}{2}$ (LETTERS)

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

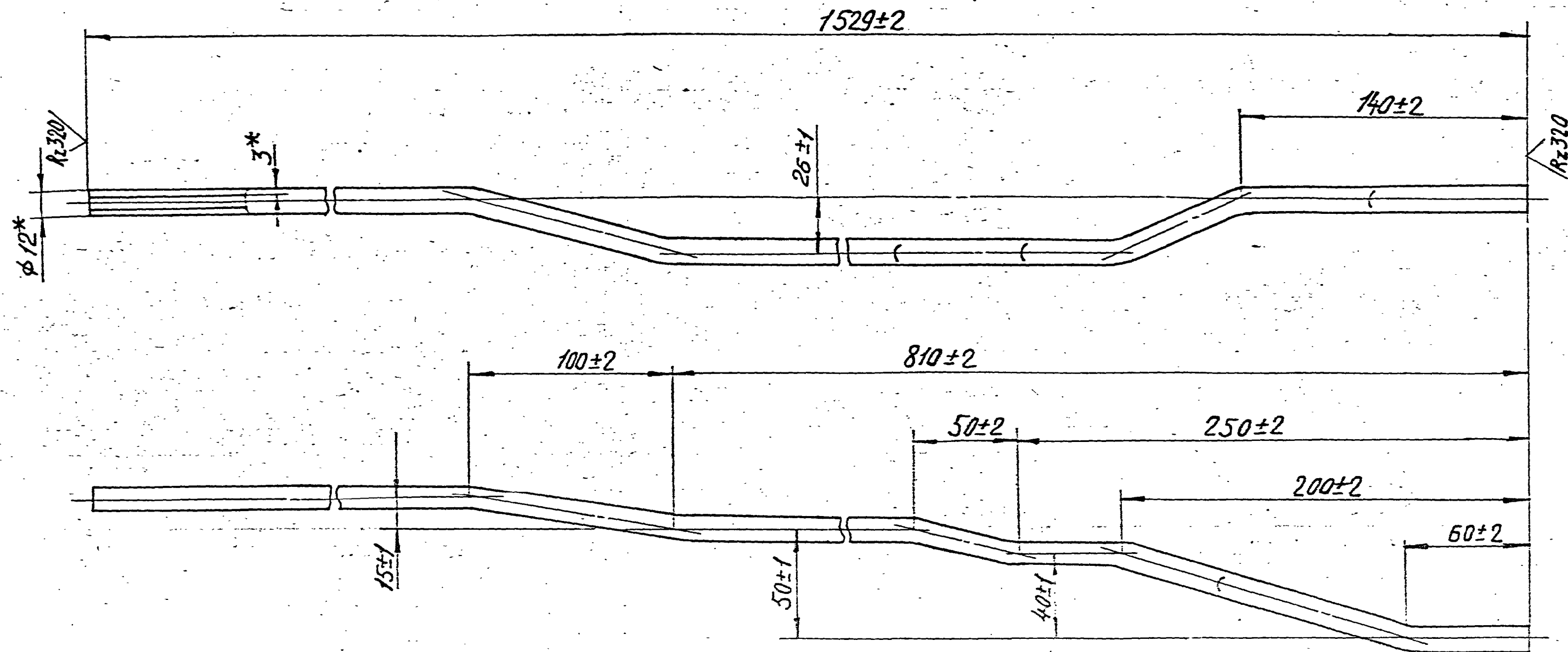
DRN			
CHKD			
TCD			
APPD			
DATE	10-06-88		
SCALE	1 : 2		
DIMENSIONS IN mm			
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS: 2102-69			
ALL THREADS TO CONFORM TO			
ISSUE DATE	1A 17.6.04	NOFA. No. CQA(HV)/T90/61/001	
NATURE OF AMENDMENTS			

DRN		MATERIAL :- PIPE 12x3 GOST 8734-75 B 20 GOST 8733-74	USED ON: 188-61-009 c8-2 c8 172 61 029 Cb-1 (1A)
CHKD		CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI	
TCD		TITLE LINK	
APPD		D S CAT NUMBER	DRAWING NUMBER 172 61 066-1
DATE	10-06-88		

F-97
76
SIZE A3

DRAWING NUMBER
172 61 065-1

✓ (✓)



1. Заменитель материала - Сталь В10 ГОСТ 8733-74.
2. Радиусы изгиба 40 мм до оси в плоскости изгиба.
3. Выпрямленная длина ≈ 1550 мм.
4. Остальные требования согласно 520 ТУ 1.
- 5.* Размеры для справок.

1. ALTERNATE MATERIAL: STEEL В 10 GOST 8733-74.
2. BENDING RADII 40mm. ARE TO AXIS IN THE PLANE OF BENDING.
3. LENGTH OF STRAIGHTENED COMPONENT ≈ 1550mm.
4. OTHER REQUIREMENTS ARE AS PER 520 TY 1.
- 5.* DIMENSIONS FOR REFERENCE.

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

EST. WT. 1.03Kg ✓ TO BE STAMPED OR MARKED WHERE INDICATED THIS # (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	2.1.12	MATERIAL :- PIPE	USED ON :-
END	2.1.12	12X3 GOST 8734-75	172 61 028C6-1
TD	2.1.12	B20 GOST 8733-7C	
APPD		CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES)	
DATE	13-12-1988	A V A D I	
SCALE	1 : 2		
DIMENSIONS IN mm.			
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS 2102-69		TITLE LINK	
ALL THREADS TO CONFORM TO		D S CAT NUMBER	
ISSUE	DATE	DRAWING NUMBER	
		172 61 065-1	
NATURE OF AMENDMENTS.			

COMMON TO BLT

F-97
75
SIZE A2

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	Pipe Fuel Supply Drg.No.172.33.534 LF No. 6206305474	Technology 1	Pipe Fabrication	
		Technology 2	Bending	
		Technology 3	Forming	
		Test/Inspection	Fixture /Gauges/Mandrel /templates	
			Cut off wheel or Pipe Cutting machine	
			Pipe Bending Machine	
			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.

M

DGM/CA & SMS
(M.GNANASEKARAN)

J
JWM/QA(OH)
(S.SAKTHIVEL)

M
19/10/2023
JWM/SMS
(M.NAGARAJAN)

Com/OP Engin...


JWM/QA(OH)

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 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	Pipe Drg.No. 172.18.187 LF No.6206203112	Technology 1 Pipe Fabrication Technology 2 Bending Technology 3 Forming Test/Inspection Fixture /Gauges/Mandrel /templates	Cut off wheel or Pipe Cutting machine Pipe Bending Machine Press for both 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/SMS/VQC/2023-24, dated.26/11/2023

Sl.No	Nomenclature and D:rg.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	PIPE Drg.No. 175.33.094-2A LF No. 6206305244	Technology 1	Cutting Facility required like,. Cut off wheel/power hacksaw.	CNC/Conventional Pipe Bending machine facility for Bending operation.
		Technology 2		
		Technology 3		
		Forming		
		Test/Inspection		

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/OA(OH)
(S.SAKTHIVEL)



JWM/SMS
(M.NAGARAJAN)


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

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	Link Drg.No. 172.61.066-1 LF No.6206417059	Technology 1 Pipe Fabrication Technology 2 Bending Fixture /Gauges/Mandrel /templates	Cut off wheel or Pipe Cutting machine Pipe Bending 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)

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 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	Link Drg.No. 172.61.065-1 LF No.6206417058	Technology 1 Pipe Fabrication Technology 2 Bending Test/Inspection Fixture /Gauges/Mandrel /templates	Cut off wheel or Pipe Cutting machine Pipe Bending 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

(PIPE FUEL SUPPLY)

DRG.NO. 172.33.534

(LF NO: 6206305474)

No HVF/T-72C/QAP/33/PIPE FUEL SUPPLY/240511- 00

ISSUE No:00

DATE:JAN-2022

QUALITY ASSURANCE (RIG-SUB ASSEMBLY)

HEAVY VEHICLES FACTORY

AVADI CHENNAI – 600 054

QUALITY ASSURANCE PLAN (QAP)

FOR

PIPE FUEL SUPPLY

DRG. NO. 172.33.534

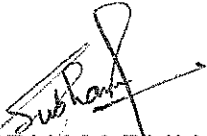
PREPARED BY


(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.
1.	IMPORTANT NOTES	4
2.	INTRODUCTION	4
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
10.	SAMPLING PLAN	7
11.	VISUAL INSPECTION	7
12.	DIMENSIONAL CHECKS	8
13.	MATERIAL CHECKS	9
14.	ACCEPTANCE / PERFORMANCE TESTS	10
15.	FITMENT AND PERFORMANCE TEST	10
16.	INTERCHANGEABILITY	10
17.	CALIBRATION CHECKS	10
18.	MARKING/IDENTIFICATION	11
19.	PRESERVATION CHECK	11
20.	PACKING CHECK	11
21.	DOCUMENTATION	11
22.	REFERENCE	12
23.	ANNEXURE-A	13
24.	FIGURE	14
25.	APPENDIX-A	15

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 **PIPE FUEL SUPPLY TO DRG.NO 172.33.534** 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 **PIPE FUEL SUPPLY TO DRG.NO:172.33.534**.

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 **PIPE FUEL SUPPLY TO DRG. NO. 172.33.534** 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:

- 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. 175.33.011 CB-2 -

7. LIST OF DRAWINGS:

SI. NO.	DRG. NO	NOMENCLATURE	REMARKS
1	172.33.534	PIPE FUEL SUPPLY	-

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

SI. NO	DRG. NO	NOMENCLATURE	MATERIAL SPECIFICATIONS	Qty
1	172.33.534	PIPE FUEL SUPPLY	PIPE AMΓ6M – KP-25X1.5 OST 1-92096-83	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 andDirt/entry of sunlight / moisture.
- (d) The packaging slip shall contains
 - (i) Certificate of testing- NABL Certificate.
 - (ii) Guarantee/ Warranty Certificate
 - (iii) Service and maintenance instructions
 - (iv) Delivery Slip with Inspector's Acceptance Mark
 - (v) Undertaking letter / certificate of conformance (As applicable).
- (e) The stores are not permitted to be stored together with oils. Petrol, acids, alkaline and other substances to avoid damage to the metal / rubber components.

10. SAMPLING PLAN:

Sl. No.	Sampling Plan	Pilot	Bulk
(i)	Visual Inspection	100%	100%
(ii)	Dimensional Inspection	100%	General Inspection level III, single sampling, Normal Inspection, AQL 2.5 of IS 2500 (Part-I)-2000
(iii)	Material Inspection	1 No	1 No. for each batch of raw material or heat treatment lot as required by specifications.
(iv)	Acceptance test	100 %	100 %
(v)	Pressure testing	100 %	100 %
(vi)	Machining/Fitment/ Performance trial on higher assembly / Tank	01 No.	01 No. per batch/As required.
(vii)	Interchangeability Test	02 Nos.	02 Nos. per batch on randomly basis, except selective assembly.
(viii)	Test stand/Jigs/ Fixtures/Gauges/Man drels/etc.	100 %	100 %
(ix)	Marking/Identification	100%	100%
(x)	Packing/ Preservation	100%	100%

Note:-

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

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

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

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

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

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

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

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

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

12.1 PIPE FUEL SUPPLY TO DRG.NO172.33.534

All dimensions should be confirmed as per drawing.

Sl. No.	Drawing Dimensions
1.	50* mm
2.	8±1 mm
3.	Φ25* mm
4.	750±2 mm
5.	110±2 mm
6.	201±2 mm
7.	955±2 mm
8.	182±2 mm
9.	66±2 mm
10.	1.5* mm
11.	R4
12.	R4
13.	8±1 mm
14.	Φ25±1 mm
15.	Φ28±0.5 mm
16.	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 PIPE FUEL SUPPLY TDRG.NO.172.33.534

a) The component should be manufactured from PIPE AMГ6M – KP-25×1.5 OST 1-92096-83

b **chemical properties** : As per PIPE AMГ6M – KP-25× 1.5 OST 1-92096-83 & GOST 4784-74.

CHEMICAL COMPOSITION AS PER GOST 4784-74

ALUMINIUM	=	BASE CONSTITUENT
MAGNESIUM	=	5,8-6,8
MANGANESE	=	0,5-0,8
TITANIUM	=	0,02-0,10
BERYLLIUM	=	0,0002-0,005

OTHER IMPURITIES (max)

IRON	=	0,4
SILICON	=	0,4
COPPER	=	0,1
ZINC	=	0,2

<u>OTHER IMPURITIES</u>	(a) individually	=	0,05
	(b) totally	=	0,1

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

c) **Mechanical properties:** As per PIPE AMГ6M – KP-25× 1.5 OST 1-92096-83 & GOST 18475-73.

MECHANICAL PROPERTIES AS PER GOST 18475-73

ULTIMATE TENSILE STRENGTH	=	32 Kgf/mm ² (min)
YIELD POINT	=	15 Kgf/mm ² (min)
PERCENTAGE OF ELONGATION	=	15 (min)

14) PERFORMANCES/ACCEPTANCE TEST:PIPE FUEL
SUPPLYTODRG.NO:172.33.534

1. AT A LENGTH OF 30 mm FROM THE EXPANDED END OVALITY SHOULD NOT EXCEED 2 mm.
2. OTHER REQUIREMENTS AS PER SPECIFICATIONS 520 TY 1.
3. RADII OF BENDING TO BE 70 mm TO THE AXIS IN THE PLANE OF BENDING.
- ⑥ 4. IT IS PERMITTED TO MANUFACTURE FROM TWO PARTS BY BUTT WELDING ON THE HORIZONTAL SECTION OF PIPE. SUBJECT THE WELD JOINT TO PRESSURE TEST WITH AIR AT A PRESSURE $0.735.10^{5+0.098.10^5}$ Pa ($0.75^{+0.1}$ kgf/cm²)
LEAKAGE OF AIR IS NOT ALLOWED.
5. LENGTH OF STRAIGHTENED PIPE NOMINAL DIMENSIONS IS APPROXIMATELY 1335 mm.
6. * DIMENSION FOR REFERENCE.
- ⑦ 7. ALTERNATE MATERIAL : PIPE AMГ5M KP 25 X 1.5 OST 1.92096-83.

EXPLANATORY NOTE:

MATERIAL QUOTED: PIPE 25X1,5 AMГ6 M GOST 18475-73

ALUMINIUM ALLOY

25 = **NOMINAL DIAMETER**
1,5 = **WALL THICKNESS**
AMГ6 = **GRADE**
M = **ANNEALED**

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. 5. Calibration reports of instruments and 6. 100 % Dimensional inspection reports.

22) REFERENCE:

1. Drawing No:172.33.534
2. Material specification as per drawing: PIPE AMГ6M – KP-25× 1.5 OST 1-92096-83
3. ALTERNATE MATERIAL : PIPE AMГ5M KP 25× 1.5 OST 1-92096-83
4. SPECIFICATION : 520 TY 1 & OST 1-92096-83.
5. GOST 4784-74 & GOST 18475-73

ANNEXURE-A

SL. NO.	CATEGORY	ASSEMBLY/SU B ASSEMBLY	TESTS/INSPECTION PARAMETERS	STANDARDS TO BE REFERRED	ACCEPTANCE CRITERIA	INSPECTION RESPONSIBILITY			REMARKS
						Firm	HVF	DGQA	
1	PIPE FUEL SUPPLY TO DRG. NO 172.33.534	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- OST-1-92096-83 , GOST 4784-74 & GOST 18475-73	All the values to confirm with QAP(Para no:13.1 (a), (b) & (c))	P	W/V	R	SP followed by HVF.
4		Pressure Testing .	Pressure test	Refer QAP Para no: 14(4)	Confirm to QAP Para no: 14(4)	P	W/V	R	100% by firm/ vendor SP followed by HVF.
5		Dimensional checks	Dimensions as per the drawing	Refer drawing /QAP Para no: 12.1	Confirm to drawing and QAP	P	W/P	R	100% by firm/ vendor SP followed by HVF.
6		Marking / traceability	Firm has to make marking / traceability records.	Refer QAP Para no: 18	Confirm to QAP Para no: 18	P	V	R	100% by firm/ vendor.
7		Preservation & packing	Firm has to make Preservation & packing records	Refer QAP Para no: 19 & 20	Confirm to QAP Para no: 19 & 20	P	V	R	100% by firm/ vendor.

Note:

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

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

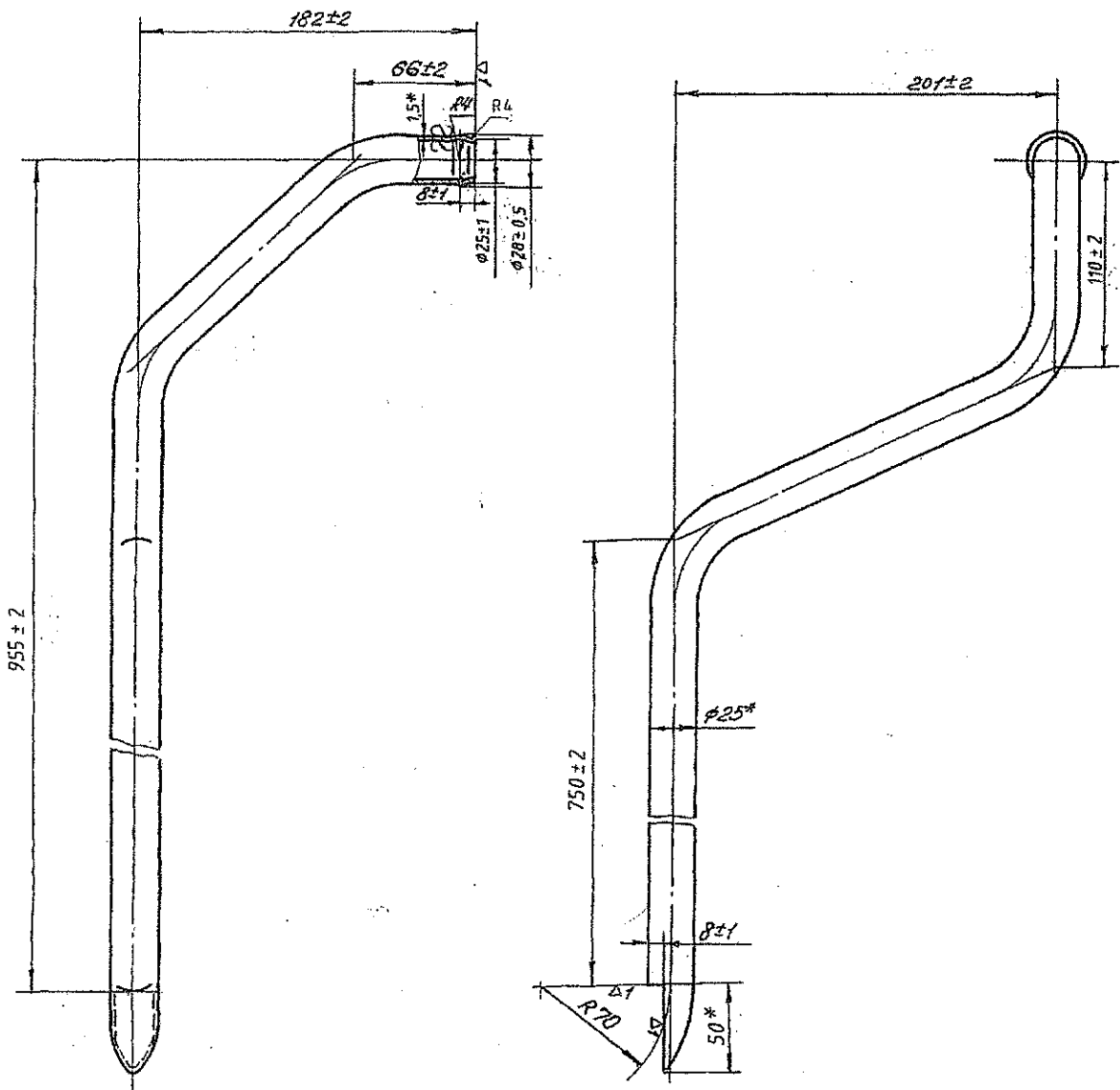


FIG: PIPE FUEL SUPPLY TO DRG. NO 172.33.534

APPENDIX 'A'

RECORD OF AMENDMENTS

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

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

FOR

(PIPE)

DRG.NO.172.18.187

(LF NO: 6206203112)

No: HVF/T-72C/QAP/18/PIPE/240518- 00

ISSUE No:00

DATE: JAN-2022

QUALITY ASSURANCE (RIG-SUB ASSEMBLY)

HEAVY VEHICLES FACTORY

AVADI CHENNAI – 600 054

QUALITY ASSURANCE PLAN (QAP)

FOR

PIPE

DRG. NO. 172.18.187

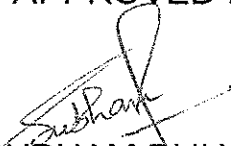
PREPARED BY

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

Sl. no	CONTENTS	PAGE .No.
1.	IMPORTANT NOTES	4
2.	INTRODUCTION	4
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
10.	SAMPLING PLAN	7
11.	VISUAL INSPECTION	7
12.	DIMENSIONAL CHECKS	8
13.	MATERIAL CHECKS	8
14.	ACCEPTANCE / PERFORMANCE TESTS	9
15.	FITMENT AND PERFORMANCE TEST	9
16.	INTERCHANGEABILITY	9
17.	CALIBRATION CHECKS	10
18.	MARKING/IDENTIFICATION	10
19.	PRESERVATION CHECK	10
20.	PACKING CHECK	10
21.	DOCUMENTATION	10
22.	REFERENCE	11
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 **PIPE TO DRG.NO 172.18.187** 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 **PIPE TO DRG.NO:172.18.187**

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 **PIPE TO DRG. NO. 172.18.187** 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	172.18.187	PIPE	-

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

SI. NO	DRG. NO	NOMENCLATURE	MATERIAL SPECIFICATIONS	Qty
1	172.18.187	PIPE	PIPE10X1 GOST 8734-75 B20 GOST 8733-74	1

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

9. CONDITIONS OF USE/STORAGE INSTRUCTIONS

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

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

10. SAMPLING PLAN:

Sl. No.	Sampling Plan	Pilot	Bulk
(i)	Visual Inspection	100%	100%
(ii)	Dimensional Inspection	100%	General Inspection level III, single sampling, Normal Inspection, AQL 2.5 of IS 2500 (Part-I)-2000
(iii)	Material Inspection	1 No	1 No. for each batch of raw material or heat treatment lot as required by specifications.
(iv)	Acceptance test	100%	100%
(v)	Pressure testing	-----	-----
(vi)	Machining / Fitment/ Performance trial on higher assembly / Tank	01 No.	01 No. per batch / As required.
vii)	Interchangeability Test	02 Nos.	02 Nos. Per batch on randomly basis, except selective assembly.
viii)	Test stand/Jigs/ Fixtures/Gauges/Mandrels/etc.	100 %	100 %
ix)	Marking/Identification	100%	100%
x)	Packing/ Preservation	100%	100%

Note:-

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

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

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

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

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

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

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

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

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

12.1 PIPE TO DRG.NO 172.18.187

All dimensions should be confirmed as per drawing.

Sl. No.	Drawing Dimensions
1.	$\Phi 14 \pm 1$ mm
2.	$\Phi 10 \pm 0.15$ mm
3.	770 ± 2 mm
4.	R3 mm
5.	R530 mm
6.	90 ± 5 mm

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 PIPE TO DRG.NO 172.18.187

- a) The component should be manufactured from

PIPE 10X1GOST 8734-75

B20 GOST 8733-74

b) Chemical properties: As per STEEL GRADE B20GOST 8733-74 & GOST 1050-74.

Grade of Steel	CONTENT OF ELEMENTS%							
	C	Si	Mn	Cr	Ni	P	S	Cu
	MAX							
20	0.17 to 0.24	0.17 to 0.37	0.35 to 0.65	0.25	0.25	0.035	0.040	0.25

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

c) Mechanical properties: As per STEEL GRADE B20 GOST 8733-74.

Grade of Steel	Yield point, (kgf/mm ²)	Tensile strength, (Kgf/mm ²)	Elongation %	Relative reduction of area %	Impact strength KCU / (Kgm/cm ²)
	Minimum				
20	25	42	21	----	-----

Note: For other properties refer GOST 8733-74.

14) PERFORMANCES/ACCEPTANCE TEST:PIPE TO DRG.NO.172.18.187

1. Component may be manufacturead from :

Pipe 10x 1 GOST 8734-75

B10 GOST 8733-74

2. Ovality up to 1.5mm along the entire length is allowed.

15) FITMENT AND PERFORMANCE TEST:

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

16) INTERCHANGEABILITY:

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

17) CALIBRATION CHECKS

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

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

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

18) MARKING/IDENTIFICATION.

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

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

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

19) PRESERVATION CHECK

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

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

20) PACKING CHECK

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

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

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

21) DOCUMENTATION

- i. Firm has to maintain all the documents as per QAP with respect to the SI.No.to have traceability.

- ii. Vendor has to submit Bill of materials, Material test reports, Class 'C' /Endurance test reports (wherever specified in drawing/TY specification/QAP) and Complete PIR (pre-inspection report)at the time of offering the item for inspection. HVF will commence inspection only after scrutiny of these documents.
- iii. The testing/inspection responsibility to test all the parameters as per QAP and drawing specifications as mentioned in Annexure -A (enclosed).
- iv. Pre inspection reports (PIR) of firm like, 1. Chemical analysis(NABL Certificate), 2.Mechanical properties(NABL Certificate), 3. Pre-forming process, 4. Coating certification, 5. Calibration reports of instruments and 6. Dimensional inspection reports.

22) REFERENCE:

- a) Drawing. No:172.18.187.
- b) Material specification as per drawing

SI. NO	DRG. NO	NOMENCLATURE	MATERIAL SPECIFICATIONS
1	172.18.187	PIPE	PIPE <u>10X1 GOST 8734-75</u> B 20 GOST 8733-74

- c) GOST 1050-74, GOST 8734-75 & GOST 8733-74.
- d) ALT MATL :-
 - a. STEEL DESIGN CF53 OR CF54 Pt. 4 To B5 : 6323,Pt 1-82 OR ERW 1 OR ERW2 Pt-5 To B5 : 6323 Pt 1-82 , REQUIRED PROPERTIES TO BE ACHIEVED.
(COATING:- ZINC PLATING Fe Zn 6 To 15 : 1573 -1970, FOLLOWED BY CHROMATE PASSIVATION TO IS : 1340-1973).
 - b. Pipe 10x 1 GOST 8734-75
B10 GOST 8733-74

ANNEXURE-A

SL. NO.	CATEGORY	ASSEMBLY/ SUB ASSEMBLY	TESTS/ INSPECTION PARAM ETERS	STANDARDS TO BE REFERRED	ACCEPTANCE CRITERIA	INSPECTION RESPONSIBILITY			REMARKS
						Firm	HVF	DGOA	
1	PIPE TO DRG. NO 172.18.187.	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 8733-74, GOST 8734-75 & GOST 1050-74.	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).

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

P-Perform W-Witness V-Verify R-Review

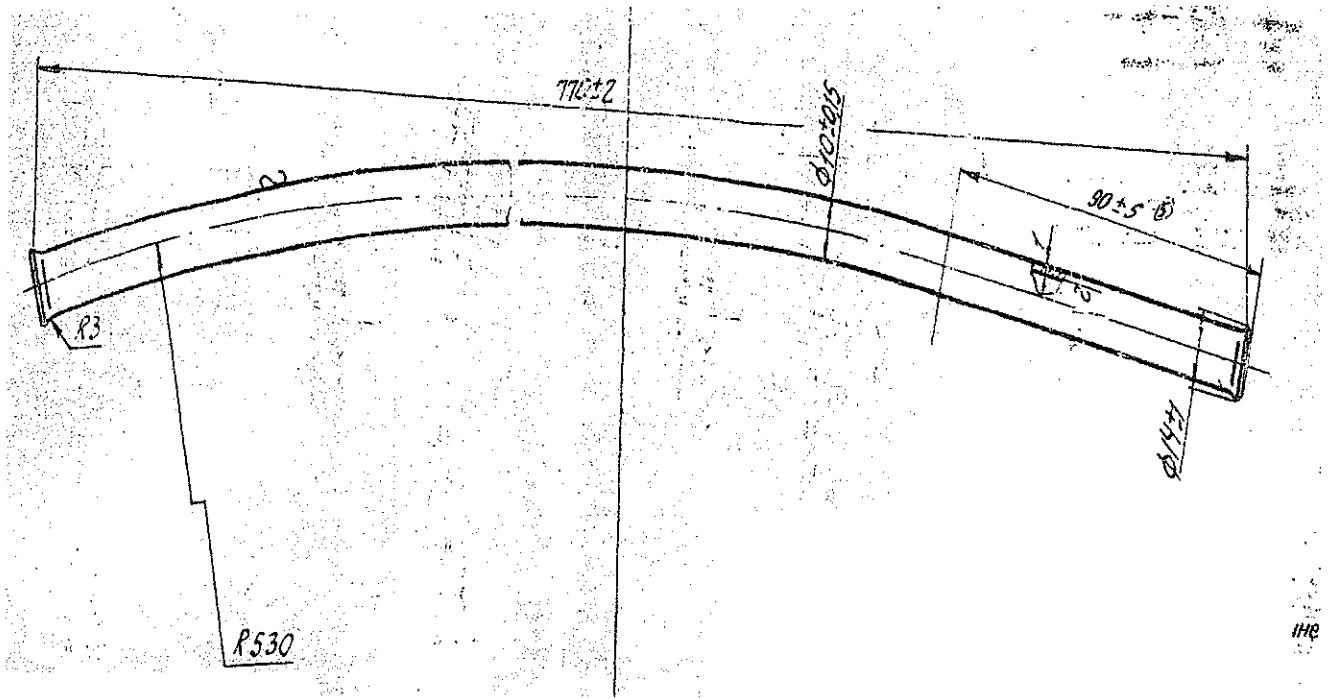


FIG: PIPE TO DRG. NO 172.18.187
(For reference only)

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

**FOR
(PIPE)**

DRG.NO.175.33.094-2A

(LF NO: 6206305244)

No: HVF/T-72C/QAP/33/PIPE/243361- 00

ISSUE No: 00

DATE: JAN-2022

QUALITY ASSURANCE (RIG-SUB ASSEMBLY)

HEAVY VEHICLES FACTORY

AVADI CHENNAI – 600 054

QUALITY ASSURANCE PLAN (QAP)

FOR

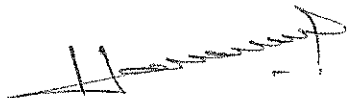
PIPE

DRG. NO. 175.33.094-2A


PREPARED BY

REVIEWED BY


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


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

APPROVED BY


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

ISSUED BY

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

Sl. no	CONTENTS	PAGE .No.
1.	IMPORTANT NOTES	4
2.	INTRODUCTION	4
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
10.	SAMPLING PLAN	7
11.	VISUAL INSPECTION	7
12.	DIMENSIONAL CHECKS	8
13.	MATERIAL CHECKS	9
14.	ACCEPTANCE / PERFORMANCE TESTS	10
15.	FITMENT AND PERFORMANCE TEST	10
16.	INTERCHANGEABILITY	10
17.	CALIBRATION CHECKS	10
18.	MARKING/IDENTIFICATION	11
19.	PRESERVATION CHECK	11
20.	PACKING CHECK	11
21.	DOCUMENTATION	11
22.	REFERENCE	12
23.	ANNEXURE-A	13
24.	FIGURE	14
25.	APPENDIX-A	15

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 **PIPE TO DRG.NO 175.33.094-2A** 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 **PIPE TO DRG.NO:175.33.094-2A**

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 **PIPE TO DRG. NO.175.33.094-2A** 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. 175.33.007CB-2 -
2. 175.33.008CB-2 -
3. 175.33.009CB-2 -
4. 175.33.010CB-2 -

7. LIST OF DRAWINGS:

SI. NO.	DRG. NO	NOMENCLATURE	REMARKS
1	175.33.094-2A	PIPE	-

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

SI. NO	DRG. NO	NOMENCLATURE	MATERIAL SPECIFICATIONS	Qty
1	175.33.094-2A	PIPE	PIPE AMГ6-M-KP-25X1.5 OST 1-92096-83.	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/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 PIPE TO DRG. 175.33.094-2A

All dimensions should be confirmed as per drawing.

Sl. No.	Drawing Dimensions
1.	90±1.5 mm
2.	40±1.5 mm
3.	R70
4.	R4
5.	66±1.5 mm
6.	8±1 mm
7.	φ25 (+0.5 / -1) mm
8.	φ28 (+0.5 / -1) mm
9.	1.5* mm
10.	φ25* mm
11.	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 PIPE TO DRG.NO 175.33.094-2A

- a) The component should be manufactured from PIPE AMΓ6-M-KP-25X1.5 OST 1-92096-83.
- b) **Chemical properties:** As per PIPE AMΓ6-M-KP-25X1.5 OST 1-92096-83 & GOST 4784-74.

GRADES	CHEMICAL COMPOSITION %										
	ALLOYING CONSTITUENT					IMPURITIES (MAXIMUM)					
	Al.	Mg	Mn	Ti	Be	Fe	Si	Cu	Zn	OTHER IMPURITIES EACH INDIVIDUALLY	TOTAL
AMΓ6	BASE- CONSTITUENT	5.8 - 6.8	0.5 - 0.8	0.02- 0.10	0.0002- 0.005	0.4	0.4	0.1	0.2	0.05	0.1
AMΓ5	- do -	4.8 - 5.8	0.3 - 0.4	0.02- 0.10	0.0002- 0.005	0.6	0.5	0.1	0.2	0.05	0.1

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

- c) **Mechanical properties:** As per PIPE AMΓ6-M-KP-25X1.5 OST 1-92096-83.

GRADE	ULTIMATE STRENGTH Kgf / mm ²	YIELD POINT Kgf / mm ²	ELONGATION - %
AMΓ6	33 (MIN)	15 (MIN)	15 (MIN)
AMΓ5	-	-	-

Note: For other properties refer OST 1- 92096-83.

14) PERFORMANCES/ACCEPTANCE TEST: PIPE TO DRG.NO.175.33.094-2A

1. AT A LENGTH OF 30 mm. FROM THE EXPANDED END, OVALITY SHOULD NOT EXCEED 1 mm. WHILE ALONG THE REST OF THE LENGTH 2 mm.
2. CREASES UP TO 2 mm. HIGH ARE PERMISSIBLE IN THE PLACE OF BENDING. OVALITY SHOULD NOT EXCEED 3 mm.
3. LENGTH OF STRAIGHTENED PIPE (AS PER THE NOMINAL DIMENSION) IS APPROXIMATELY 102 mm.
4. * DIMENSIONS FOR REFERENCE.
5. OTHER REQUIREMENTS ARE IN ACCORDANCE WITH 432 - U6 - 1.
6. ALTERNATIVE MATERIAL :- PIPE AMГ 5M-KP-25x15 OST 1-92096-83.

EXPLANATORY NOTE:

7. REFERENCE MATERIAL QUOTED :- PIPE AMГ 6-M-KP-25x15 OST 1- 92096-83. COLD WROUGHT SEAMLESS PIPE MADE OF ALUMINIUM ALLOYS TO GRADE AMГ 6-M-KP-25x15 AND ALTERNATIVELY AMГ 5 M-KP-25x15 ANNEALED CONDITION (M) ROUND PIPE (KP) AS PER OST 1-92096-83. AND MANUFACTURED IN ACCORDANCE WITH GOST 4784-74.

15) FITMENT AND PERFORMANCE TEST:

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

16) INTERCHANGEABILITY:

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

17) CALIBRATION CHECKS

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

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

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

18) MARKING/IDENTIFICATION.

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

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

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

19) PRESERVATION CHECK

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

20) PACKING CHECK

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

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

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

21) DOCUMENTATION

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

process, 4. Coating certification (wherever applicable), 5. Calibration reports of instruments and 6. 100 % Dimensional inspection reports.

22) REFERENCE:

- a) Drawing No: 175.33.094-2A
- b) Material specification as per drawing:
PIPE AMГ6-M-KP-25X1.5 OST 1-92096-83.
- c) GOST 4784-74 & OST 1-92096-83.
- d) Specification: 432-Ц6-1.
- e) Alternate material:
 - 1. PIPE AMГ 5M-KP-25X1.5 OST 1-92096-83.
 - 2. GRADE 54300 TO IS: 737-86.

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	PIPE TO DRG. NO 175.33.094-2A	Material tests	Chemical composition & Mechanical / Physical Properties	As per – OST 1- 92096-83 & 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**

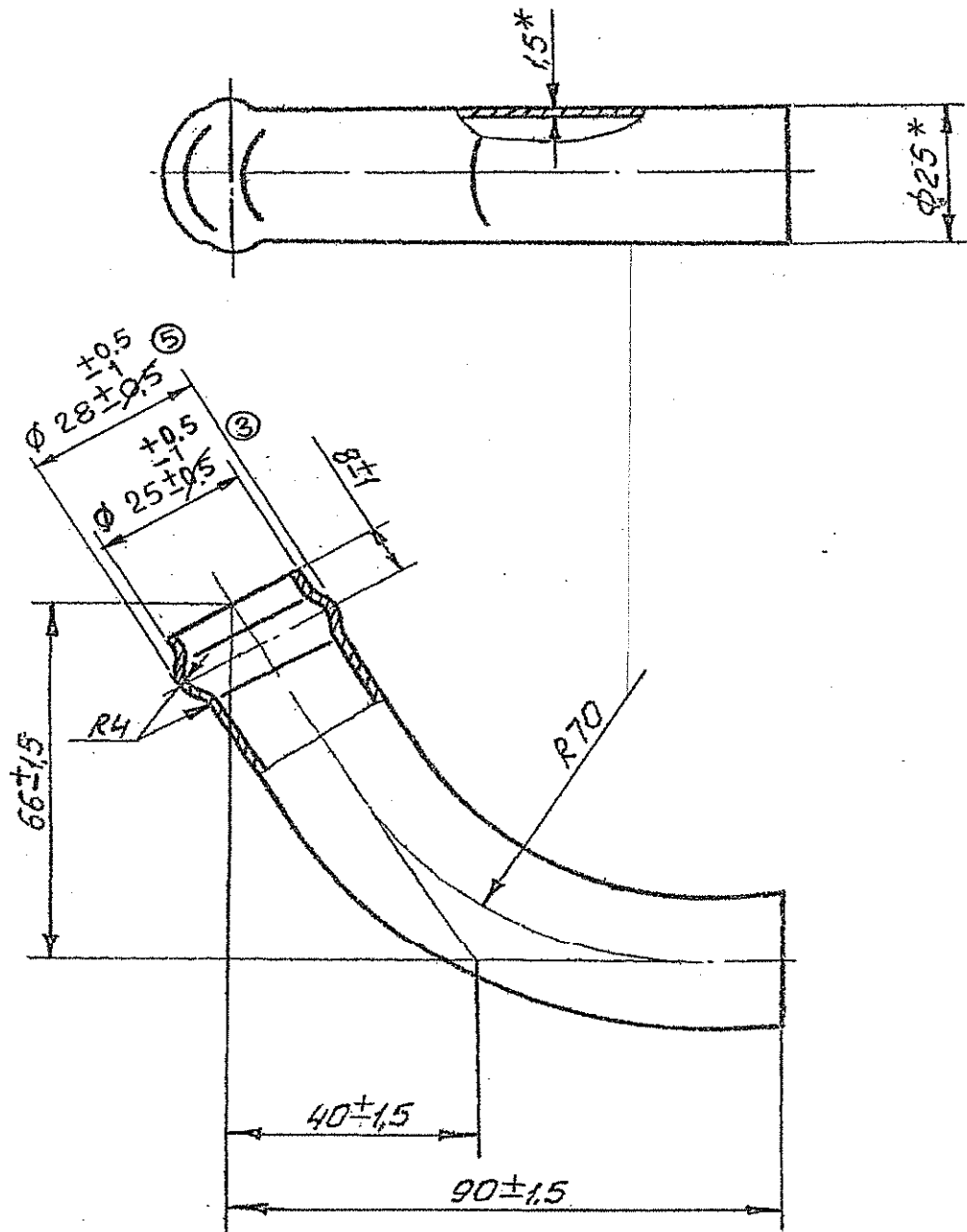


FIG: PIPE TO DRG. NO 175.33.094-2A

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

FOR

(LINK)

DRG.NO.172.61.065-1

(LF NO: 6206417058)

No: HVF/T-72C/QAP/61/LINK/241152- 00

ISSUE No: 00

DATE: JAN – 2022

QUALITY ASSURANCE (RIG-SUB ASSEMBLY)

HEAVY VEHICLES FACTORY

AVADI CHENNAI – 600 054

QUALITY ASSURANCE PLAN (QAP)

FOR

LINK

DRG. NO. 172.61.065-1

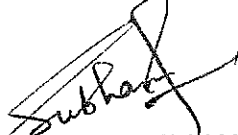
PREPARED BY


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

REVIEWED BY


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

APPROVED BY


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

ISSUED BY

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HEAVY VEHICLES FACTORY
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Sl. no	CONTENTS	PAGE .No.
1.	IMPORTANT NOTES	4
2.	INTRODUCTION	4
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
10.	SAMPLING PLAN	7
11.	VISUAL INSPECTION	7
12.	DIMENSIONAL CHECKS	8
13.	MATERIAL CHECKS	9
14.	ACCEPTANCE / PERFORMANCE TESTS	9
15.	FITMENT AND PERFORMANCE TEST	10
16.	INTERCHANGEABILITY	10
17.	CALIBRATION CHECKS	10
18.	MARKING/IDENTIFICATION	10
19.	PRESERVATION CHECK	10
20.	PACKING CHECK	11
21.	DOCUMENTATION	11
22.	REFERENCE	11
23.	ANNEXURE-A	12
24.	FIGURE	13
25.	APPENDIX-A	14

1.IMPORTANT NOTE

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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 **LINK TO DRG.NO 172.61.065-1** being procured indigenously. This is prepared, based on the acceptance standards and inspection parameters laid down in collaborators documents and on the inspection test standards followed in respect of similar indigenous items.
2. This QAP is the property of Government of India and is liable for amendments as and when required. The Sr. General Manager, Heavy Vehicles Factory, Avadi, Chennai – 600 054, is the inspecting Authority for this assembly. Any query / clarification on the content of this QAP shall be referred to this Factory. Any departure from these instructions is allowed only after written approval from the above authority. Notwithstanding the tests indicated in this QAP, the inspecting Officer has the right to carry out any test to check conformance to the paper particulars quoted in the Supply Order, which he may consider necessary to satisfy himself about the stores which he has to accept.

3.AIM

The QAP is aimed at standardizing the Inspection procedure and acceptance norm for **LINK TO DRG.NO: 172.61.065-1**

It also aims at giving adequate information to the manufacturer on the quality requirements so that the required quality control methods are

established. This is also meant to guide authorized Inspection Officer in his routine inspection and to set out main points to which his attention must be drawn to ensure that the accepted stores meet the stipulated standards.

4. SCOPE:

This QAP outlines in general terms, the checks and methods to be used during inspection of **LINK TO DRG. NO. 172.61.065-1** including the technical requirements of the drawings. The recommended Quality Plan stipulated herein is mandatory and should be strictly adhered to.

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

Note:

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

5. DOCUMENTS:

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

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

6. ITEM USED ON:

1. 172.61.028CB-1

7. LIST OF DRAWINGS:

SI. NO.	DRG. NO	NOMENCLATURE	REMARKS
1	172.61.065-1	LINK	-

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

SI. NO	DRG. NO	NOMENCLATURE	MATERIAL SPECIFICATIONS	Qty
1	172.61.065-1	LINK	PIPE <u>12X3 GOST 8734-75</u> B 20 GOST 8733-74	1

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

9. CONDITIONS OF USE/STORAGE INSTRUCTIONS

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

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

10. SAMPLING PLAN :

Sl. No.	Sampling Plan	Pilot	Bulk
(i)	Visual Inspection	100%	100%
(ii)	Dimensional Inspection	100%	General Inspection level III, single sampling, Normal Inspection, AQL 2.5 of IS 2500 (Part-I)-2000
(iii)	Material Inspection	1 No	1 No. for each batch of raw material or heat treatment lot as required by specifications.
(iv)	Acceptance test	100%	100%
(v)	Pressure testing	-----	-----
(vi)	Machining / Fitment / Performance trial on higher assembly / Tank	01 No.	01 No. per batch / As required.
vii)	Interchangeability Test	02 Nos.	02 Nos. per batch on randomly basis, except selective assembly.
viii)	Test stand/Jigs/ Fixtures/Gauges/Mandrels/etc.	100 %	100 %
ix)	Marking/Identification	100%	100%
x)	Packing/ Preservation	100%	100%

Note:-

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

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

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

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

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

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

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

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

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

12.1 LINK TO DRG.NO 172.61.065-1

All dimensions should be confirmed as per drawing.

Sl. No.	Drawing Dimensions
1.	1529±2 mm
2.	Φ12* mm
3.	3* mm
4.	26±1 mm
5.	140±2 mm
6.	100±2 mm
7.	810±2 mm
8.	50±2 mm
9.	250±2 mm
10.	200±2 mm
11.	60±2 mm
12.	40±1 mm
13.	50±1 mm
14.	15±1 mm
15.	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 LINK TO DRG.NO 172.61.065-1

a) The component should be manufactured from

PIPE 12X3 GOST 8734-75
B20 GOST 8733-74

b) **Chemical properties:** As per STEEL GRADE B20 GOST 8733-74 & GOST 1050-74.

Grade of Steel	CONTENT OF ELEMENTS%							
	C	Si	Mn	Cr	Ni	P	S	Cu
	MAX							
20	0.17 to 0.24	0.17 to 0.37	0.35 to 0.65	0.25	0.25	0.035	0.040	0.25

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

c) **Mechanical properties:** As per STEEL GRADE B20 GOST 8733-74.

Grade of Steel	Yield point, (kgf/mm ²)	Tensile strength, (Kgf/mm ²)	Elongation %	Relative reduction of area %	Impact strength KCU / (Kgm/cm ²)
Minimum					
20	25	42	21	----	-----

Note: For other properties refer GOST 8733-74.

14) PERFORMANCES/ACCEPTANCE TEST: LINK TO DRG.NO.172.61.065-1

1. ALTERNATE MATERIAL: STEEL B 10 GOST 8733-74.
2. BENDING RADII 40mm. ARE TO AXIS IN THE PLANE OF BENDING.
3. LENGTH OF STRAIGHTENED COMPONENT ≈ 1550mm.
4. OTHER REQUIREMENTS ARE AS PER 520 TY 1.
5. * DIMENSIONS FOR REFERENCE.

15) FITMENT AND PERFORMANCE TEST:

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

16) INTERCHANGEABILITY:

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

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

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

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

18) MARKING / IDENTIFICATION.

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

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

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

19) PRESERVATION CHECK

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

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

20) PACKING CHECK

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

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

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

21) DOCUMENTATION

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

22) REFERENCE:

- a) Drawing. No: 172.61.065-1.
- b) Material specification as per drawing

SI. NO	DRG. NO	NOMENCLATURE	MATERIAL SPECIFICATIONS
1	172.61.065-1	LINK	PIPE <u>12X3 GOST 8734-75</u> B 20 GOST 8733-74

- c) GOST 1050-74, GOST 8734-75 & GOST 8733-74.
- d) Specification: 520 TY1.
- d) Alternate material:
 1. Refer QAP Para No:14(1).

SL. NO.	CATEGORY	ASSEMBLY/ SUB ASSEMBLY	TESTS/ INSPECTION PARAMETERS	STANDARDS TO BE REFERRED	ACCEPTANCE CRITERIA	INSPECTION RESPONSIBILITY			REMARKS
						Firm	HVF	DGOA	
1	LINK TO DRG. NO 172.61.065-1.	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 8733-74, GOST 8734-75 & GOST 1050-74.	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

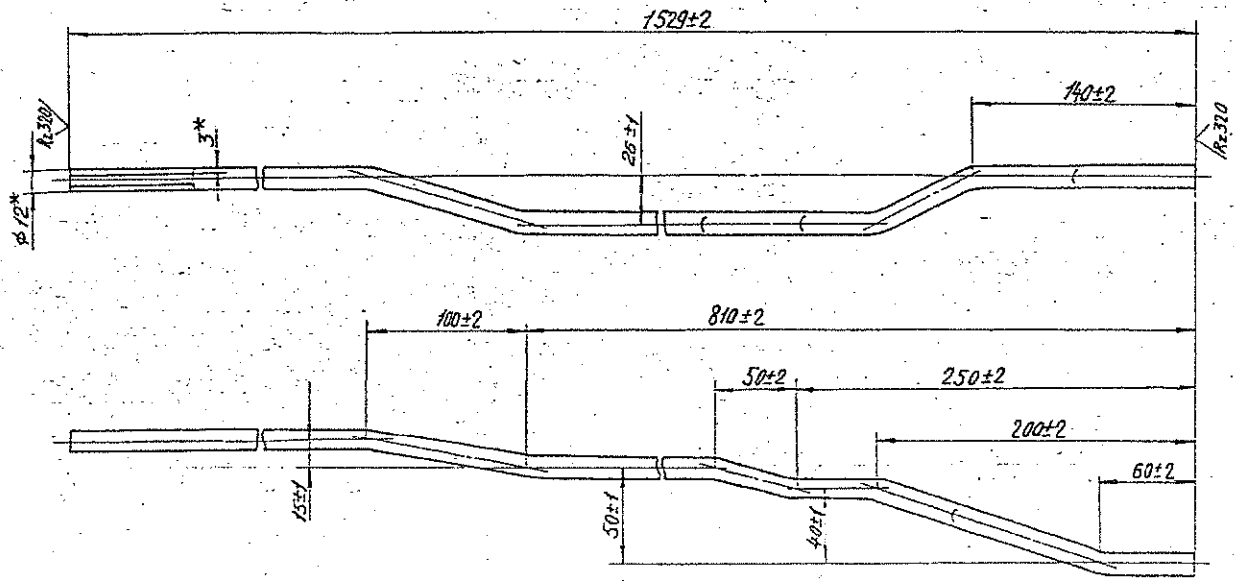


FIG: LINK TO DRG. NO 172.61.065-1
 (For reference only)

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

FOR

(ROD / LINK)

DRG.NO.172.61.066-1

(LF NO: 6206417059)

No: HVF/T-72C/QAP/61/ROD/LINK/241047- 00

ISSUE No: 00

DATE: JAN – 2022

QUALITY ASSURANCE (RIG-SUB ASSEMBLY)

HEAVY VEHICLES FACTORY

AVADI CHENNAI – 600 054

QUALITY ASSURANCE PLAN (QAP)

FOR


ROD / LINK

DRG. NO. 172.61.066-1


PREPARED BY

REVIEWED BY


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


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

APPROVED BY


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

ISSUED BY

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

Sl. no	CONTENTS	PAGE .No.
1.	IMPORTANT NOTES	4
2.	INTRODUCTION	4
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
10.	SAMPLING PLAN	7
11.	VISUAL INSPECTION	7
12.	DIMENSIONAL CHECKS	8
13.	MATERIAL CHECKS	8
14.	ACCEPTANCE / PERFORMANCE TESTS	9
15.	FITMENT AND PERFORMANCE TEST	9
16.	INTERCHANGEABILITY	10
17.	CALIBRATION CHECKS	10
18.	MARKING/IDENTIFICATION	10
19.	PRESERVATION CHECK	10
20.	PACKING CHECK	11
21.	DOCUMENTATION	11
22.	REFERENCE	11
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 **ROD / LINK TO DRG.NO 172.61.066-1** being procured indigenously. This is prepared, based on the acceptance standards and inspection parameters laid down in collaborators documents and on the inspection test standards followed in respect of similar indigenous items.
2. This QAP is the property of Government of India and is liable for amendments as and when required. The Sr. General Manager, Heavy Vehicles Factory, Avadi, Chennai – 600 054, is the inspecting Authority for this assembly. Any query / clarification on the content of this QAP shall be referred to this Factory. Any departure from these instructions is allowed only after written approval from the above authority. Notwithstanding the tests indicated in this QAP, the inspecting Officer has the right to carry out any test to check conformance to the paper particulars quoted in the Supply Order, which he may consider necessary to satisfy himself about the stores which he has to accept.

3.AIM

The QAP is aimed at standardizing the Inspection procedure and acceptance norm for **ROD / LINK TO DRG.NO: 172.61.066-1**

It also aims at giving adequate information to the manufacturer on the quality requirements so that the required quality control methods are

established. This is also meant to guide authorized Inspection Officer in his routine inspection and to set out main points to which his attention must be drawn to ensure that the accepted stores meet the stipulated standards.

4. SCOPE:

This QAP outlines in general terms, the checks and methods to be used during inspection of **ROD / LINK TO DRG. NO. 172.61.066-1** including the technical requirements of the drawings. The recommended Quality Plan stipulated herein is mandatory and should be strictly adhered to.

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

Note:

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

5. DOCUMENTS:

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

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

6. ITEM USED ON:

- 1. 188.61.009CB-2CB -
- 2. 172.61.029CB-1 -

7. LIST OF DRAWINGS:

SI. NO.	DRG. NO	NOMENCLATURE	REMARKS
1	172.61.066-1	ROD / LINK	-

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

SI. NO	DRG. NO	NOMENCLATURE	MATERIAL SPECIFICATIONS	Qty
1	172.61.066-1	ROD / LINK	PIPE <u>12X3 GOST 8734-75</u> B 20 GOST 8733-74	1

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

9. CONDITIONS OF USE/STORAGE INSTRUCTIONS

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

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

10. SAMPLING PLAN :

Sl. No.	Sampling Plan	Pilot	Bulk
(i)	Visual Inspection	100%	100%
(ii)	Dimensional Inspection	100%	General Inspection level III, single sampling, Normal Inspection, AQL 2.5 of IS 2500 (Part-I)-2000
(iii)	Material Inspection	1 No	1 No. for each batch of raw material or heat treatment lot as required by specifications.
(iv)	Acceptance test	100%	100%
(v)	Pressure testing	-----	-----
(vi)	Machining / Fitment / Performance trial on higher assembly / Tank	01 No.	01 No. per batch / As required.
(vii)	Interchangeability Test	02 Nos.	02 Nos. per batch on randomly basis, except selective assembly.
(viii)	Test stand/Jigs/ Fixtures/Gauges/Man drels/etc.	100 %	100 %
(ix)	Marking/Identification	100%	100%
(x)	Packing/ Preservation	100%	100%

Note:-

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

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

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

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

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

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

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

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

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

12.1 ROD / LINK TO DRG.NO 172.61.066-1

All dimensions should be confirmed as per drawing.

SI. No.	Drawing Dimensions
1.	50±2 mm
2.	16±1 mm
3.	Φ12* mm
4.	3* mm
5.	1350±2 mm
6.	1005±2 mm
7.	60±1 mm
8.	150±2 mm
9.	305±2 mm
10.	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 ROD / LINK TO DRG.NO 172.61.066-1

- a) The component should be manufactured from
 PIPE 12X3 GOST 8734-75
 B20 GOST 8733-74
- b) **Chemical properties:** As per STEEL GRADE B20 GOST 8733-74 & GOST 1050-74.

Grade of Steel	CONTENT OF ELEMENTS%							
	C	Si	Mn	Cr	Ni	P	S	Cu
20	0.17 to 0.24	0.17 to 0.37	0.35 to 0.65	0.25	0.25	0.035	0.040	0.25

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

- c) **Mechanical properties:** As per STEEL GRADE B20 GOST 8733-74.

Grade of Steel	Yield point, (kgf/mm ²)	Tensile strength, (Kgf/mm ²)	Elongation %	Relative reduction of area %	Impact strength KCU / (Kgm/cm ²)
		Minimum			
20	25	42	21	----	----

Note: For other properties refer GOST 8733-74.

14) PERFORMANCES/ACCEPTANCE TEST: ROD/LINK TO DRG.NO.172.61.066-1

- 1. ALTERNATE MATERIAL: STEEL B10-GOST 8733-74.
- 2. BENDING RADII OF 40mm ARE TO THE AXIS IN THE PLANE OF BENDING.
- 3. LENGTH OF STRAIGHTENED COMPONENT IS 1355 mm.
- 4. REQUIREMENTS ARE IN ACCORDANCE WITH 520 TY 1.
- 5. * DIMENSIONS FOR REFERENCE.

15) FITMENT AND PERFORMANCE TEST:

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

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

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

16) INTERCHANGEABILITY:

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

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

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

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

18) MARKING / IDENTIFICATION.

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

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

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

19) PRESERVATION CHECK

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

20) PACKING CHECK

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

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

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

21) DOCUMENTATION

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

22) REFERENCE:

a) Drawing. No: 172.61.066-1.

b) Material specification as per drawing

Sl. NO	DRG. NO	NOMENCLATURE	MATERIAL SPECIFICATIONS
1	172.61.066-1	ROD / LINK	PIPE <u>12X3 GOST 8734-75</u> B 20 GOST 8733-74

c) GOST 1050-74, GOST 8734-75 & GOST 8733-74.

d) Specification: 520 TY1.

d) Alternate material:

1. STEEL B10 GOST 8733-74.

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 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	ROD / LINK TO DRG. NO 172.61.066-1.	Material tests	Chemical composition & Mechanical / Physical Properties	As per-GOST 8733-74, GOST 8734-75 & GOST 1050-74.	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

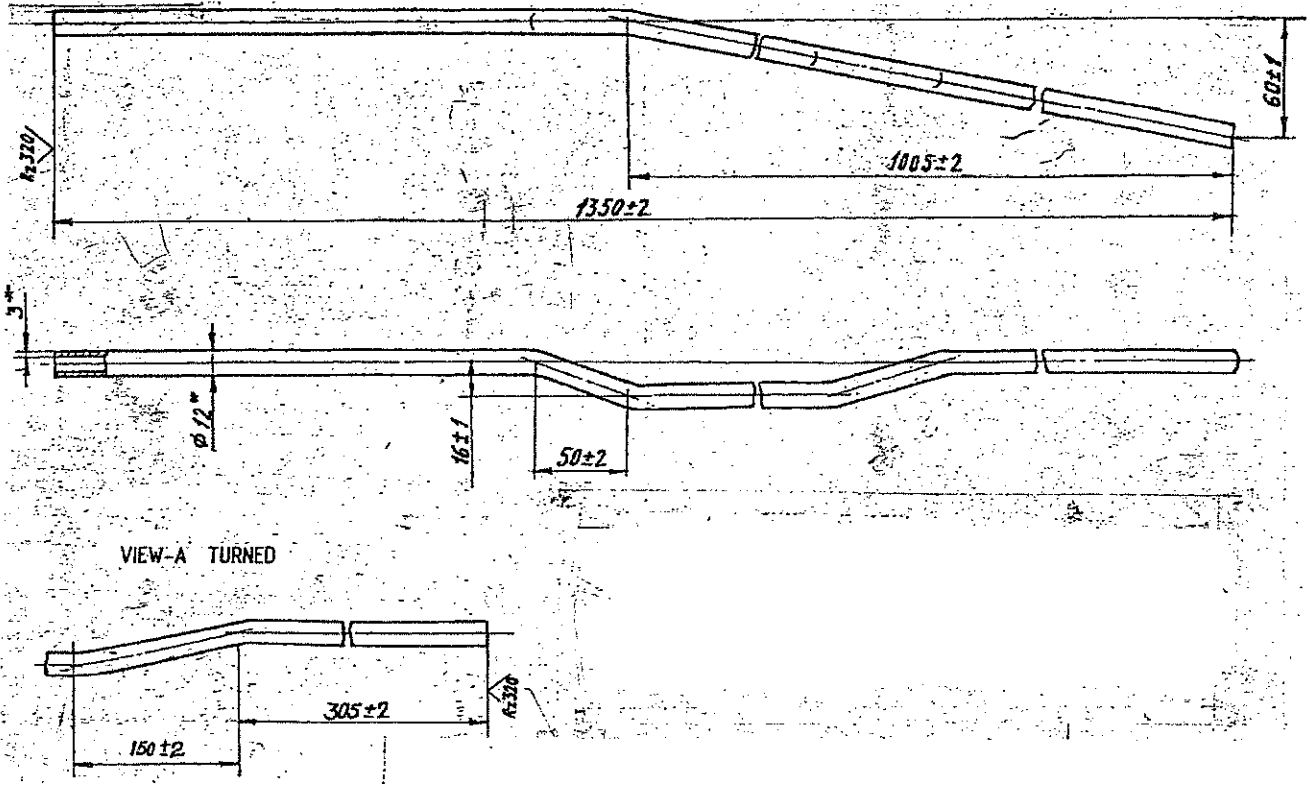


FIG: ROD / LINK TO DRG. NO 172.61.066-1
 (For reference only)

