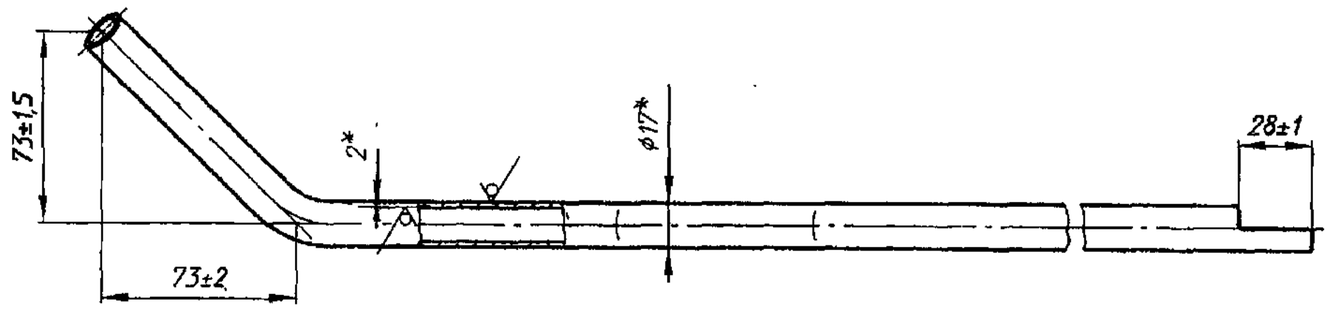
DRG. INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE - NIL

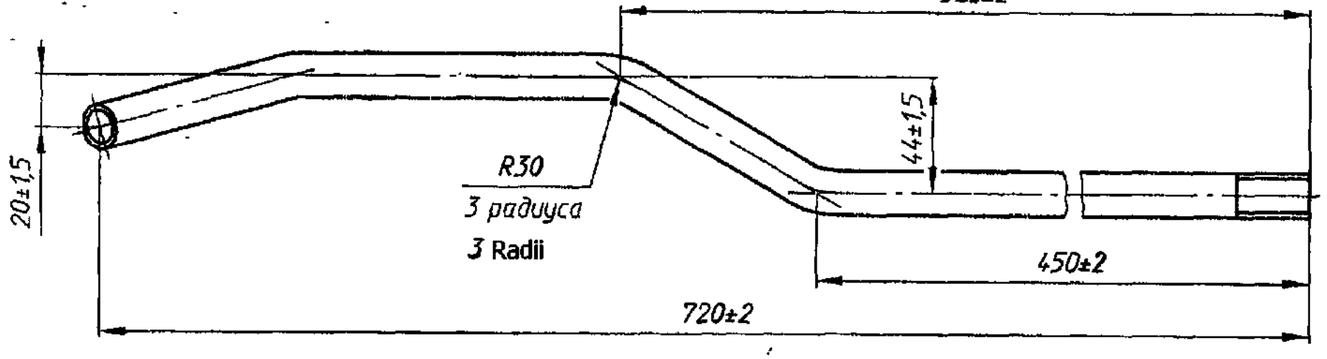
DRAWING NUMBER	SHEET No. 1 OF 1
172.33.763	

Rz160 (√)



1. * Размеры для справок
2 Остальные требования по 520.ТУ1.

1. * Dimensions for reference.
2. Other requirements are as per 520.Ty1.



356

SUPPLY CODE U-01-1-4

D 90209

F-103 / 28

SIZE A3

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

EST. WT. (Kg)	TO BE STAMPED OR MARKED WHERE INDICATED THUS # (LETTERS)
0.65	

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

ISSUE	DATE	NATURE OF AMENDMENTS

DRN	V Ramya
CHD	K. Ganapathy
APPD	Chandak
DATE	10.9.04
SCALE:- 1 : 2	
DIMENSIONS IN mm	
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS : 2102 - 69	
ALL THREADS TO CONFORM TO	

MATERIAL :- PIPE
17x2 GOST 8734 - 75
B10 GOST 8733 - 74

USED ON :-
172.33.224cb-2Cb

CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES)
AVADI

TITLE :-
PIPE

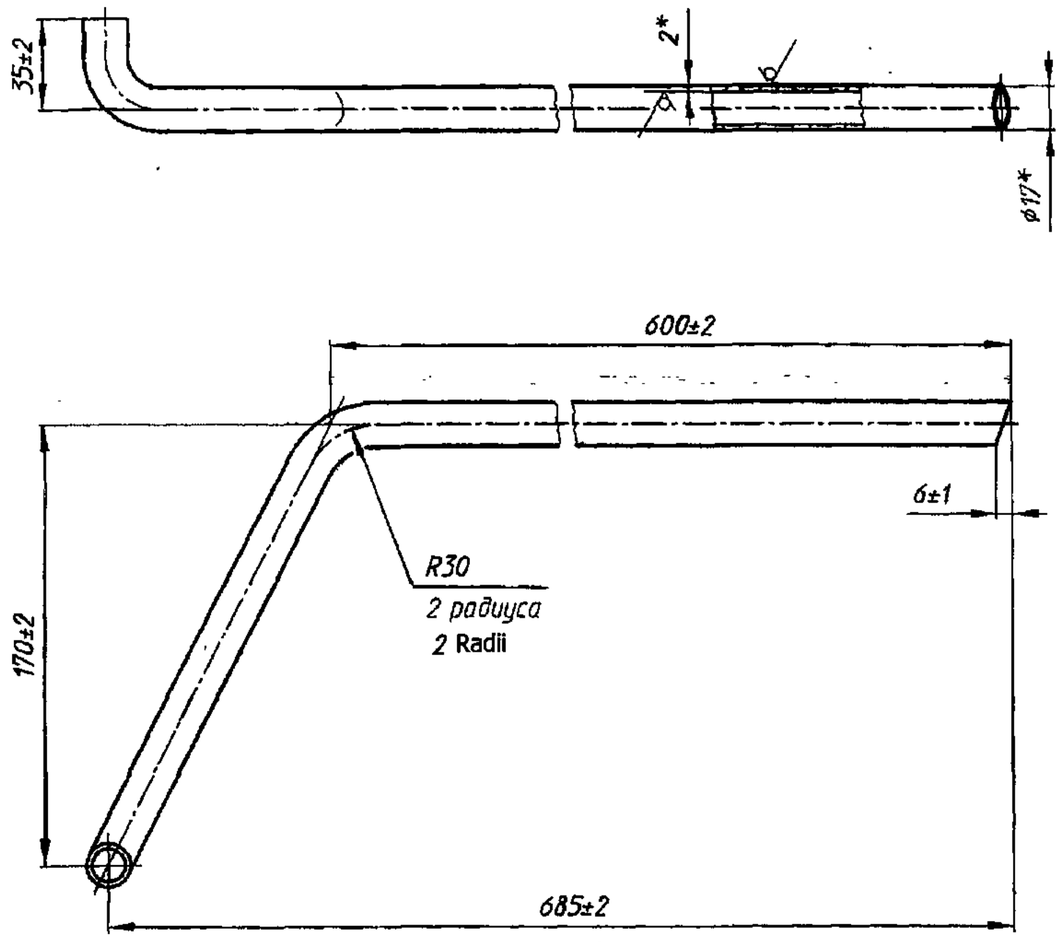
D S CAT NUMBER

DRAWING NUMBER
172.33.763

DRG. INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE - NIL

DRAWING NUMBER	SHEET No. 1 OF 1
172.33.762	

Rz160 (√)



1. * Размеры для справок.
2. Остальные требования по 520.ТУ1.

1. * Dimensions for reference.
2. Other requirements are as per 520.Ty1.

356
SUPPLY CODE
U-01-1-4

D 90209

F-103
27
SIZE A3

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

EST. WT. (Kg)	TO BE STAMPED OR MARKED WHERE INDICATED THUS # (LETTERS)
0.6	

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

ISSUE	DATE	NATURE OF AMENDMENTS

DRN	V Dutt	
CHD	C. Ganguly	
APPD	Chandak	
DATE	10.9.04	
SCALE:- 1 : 2		
DIMENSIONS IN mm		
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS : 2102 - 69		
ALL THREADS TO CONFORM TO		

MATERIAL :- PIPE 17x2 GOST 8734-75 / B10 GOST 8733-74

USED ON :- 172.33.224cb-2Cb

CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI

TITLE :- PIPE

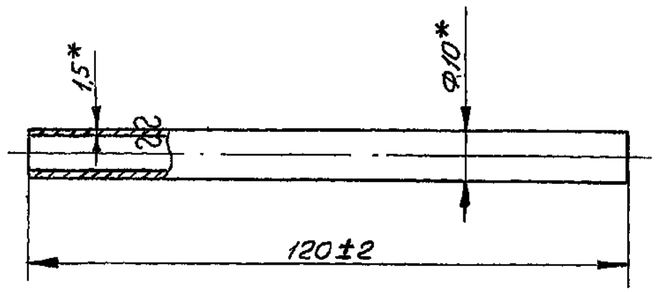
D S CAT NUMBER

DRAWING NUMBER 172.33.762

DRAWING NUMBER
172.2M.33.301

SHEET No. 1 OF 1

UNLESS OTHERWISE SPECIFIED Rz 40 (√)



Заменитель материала В10 ГОСТ 8733-86.74

1. ~~Допускается изготовление из трубы 10×1,5 10А ГОСТ 8734-58.~~
2. * Размеры для справок

1. ALTERNATE MATERIAL - B10, GOST 8733-74.
2. * DIMENSIONS FOR REFERENCE.

EXPLANATORY NOTE:-

THE COMPONENT SHOULD BE MANUFACTURED FROM CARBON AND ALLOY COLD-DEFORMED SEAMLESS STEEL TUBE OF GROUP - 'B' (WITH STANDARDISED MECHANICAL PROPERTIES & CHEMICAL COMPOSITIONS) TO GOST 8733-74.
MATERIAL:-AS PER OPEN HEARTH KILLED STEEL OF GRADE 20 TO GOST 1050-74.
DIMENSIONS & LIMIT DEVIATION OF STEEL TUBE OUTSIDE Ø10mm & THICKNESS 1.5mm SHOULD CONFORM TO GOST 8734-75.
ALTERNATIVELY IT MAY BE PRODUCED FROM STEEL TUBE OF GROUP 'B' TO GOST 8733-74 AND MATERIAL AS PER OPEN HEARTH KILLED STEEL OF GRADE 10 TO GOST 1050-74.

CHEMICAL COMPOSITION:-%AS PER GOST 1050-74.

GRADE OF STEEL	CONTENT OF ELEMENTS %			
	C	Si	Mn	Cr (MAX).
10	0.07-0.14	0.17-0.37	0.35-0.65	0.15
20	0.17-0.24	0.17-0.37	0.35-0.65	0.25

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

MECHANICAL PROPERTIES :- AS PER GOST 8733-74.

GRADE OF STEEL	UTS Kgf/mm²	YIELD POINT, σT Kgf/mm²	RELATIVE ELONGATION, δ5 %
	NOT LESS THAN		
10	35	21	24
20	42	25	21

"COMMON TO T-90"
DRAWING RE - INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE - 4 :-
DRG.REDRAWN AND EXPLANATORY NOTE ADDED ON 04.12.90.
(R.RAMANI).JTO 16-8-05

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

EST. WT. (Kg) 0.038

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.

ISSUE	DATE	NATURE OF AMENDMENTS

DRN	Sd/=
CHD	Sd/=
APPD	Sd/=
DATE	19.7.86
SCALE:- 1 : 1	
DIMENSIONS IN mm	
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS : 2102 - 69	
ALL THREADS TO CONFORM TO	

MATERIAL :- PIPE
10 x 1.5 GOST 8734-75
B 20 GOST 8733-74

USED ON :-
176.33.015cb-1Cb

CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES)
AVADI

TITLE :-
PIPE

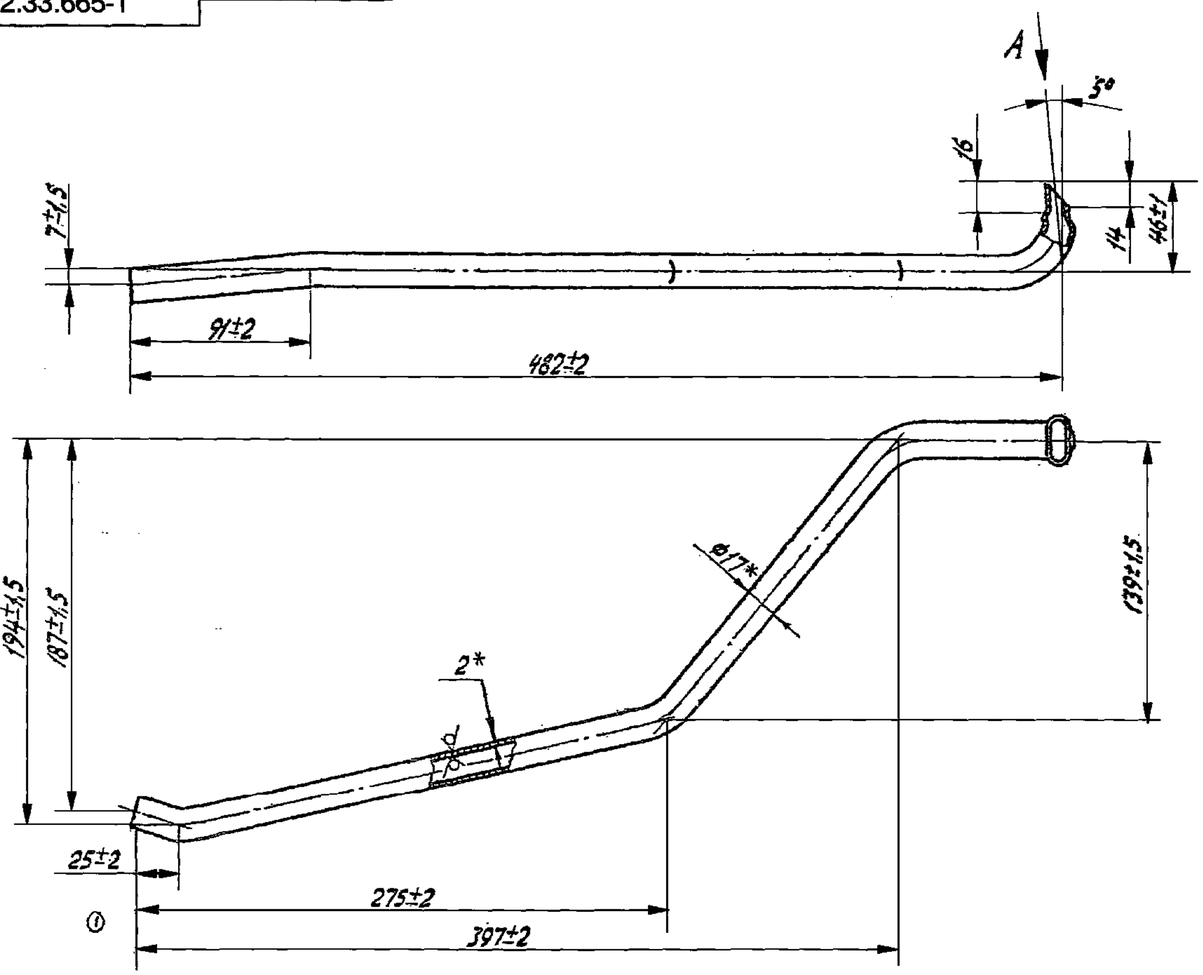
D S CAT NUMBER

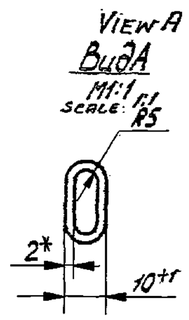
DRAWING NUMBER
172.2M.33.301

A-1
F-64
SIZE A3

DRAWING NUMBER
172.33.665-1

SHEET No. 1 OF 1





UNLESS OTHERWISE SPECIFIED Rz 320 (√)

1. ALTERNATE MATERIAL : PIPE $\frac{17 \times 2 \text{ GOST } 8734\text{-}75}{\text{B } 20 \text{ GOST } 8733\text{-}74}$
2. STRAIGHTENED LENGTH AS PER NOMINAL DIMENSIONS ~ 580 mm
3. RAD II OF BENDING SHOULD BE UPTO THE AXIS OF BENDING IN THE PLANE.
4. IRREGULARITIES OF THE OVAL SECTION OF PIPE ARE PERMITTED.
5. * DIMENSIONS FOR REFERENCE.
6. OTHER REQUIREMENTS ARE ACCORDING TO THE SPECIFICATION 520 TY 1.
7. UNSPECIFIED LIMIT DEVIATIONS OF DIMENSIONS - ± 1.5

EXPLANATORY NOTE :-

THE COMPONENT SHOULD BE MANUFACTURED FROM CARBON & ALLOY COLD DEFORMED SEAMLESS STEEL TUBE WITH STANDARDISED MECHANICAL PROPERTIES AS PER GROUP 'B' TO GOST 8733-74 & STANDARDISED CHEMICAL COMPOSITION AS PER KILLED STEEL OF GRADE '20' TO GOST 1050-74.

TOLERANCE ON Ø17±0.30mm & THICKNESS 2±0.20 mm AS PER GOST 8734-75.

CHEMICAL COMPOSITION % AS PER GOST 1050-74 :-

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

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

MECHANICAL PROPERTIES: AS PER GOST 8733-74.

GRADE OF STEEL	U T S Kgf/mm²	YIELD POINT Kgf/mm²	RELATIVE ELONGATION %
	NOT LESS THAN		
20	42	25	21

DRG. REPLACES 172.33.665 VIDE AMDT LIST 8.
"COMMON TO T-90"
DRAWING RE-INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE-1
DRG. REDRAWN AND EXPLANATORY NOTE ADDED ON 06.12.90 IE-1 (R.RAMANUJ,JTO) 24-07-05

F-13C 1

SIZE A2

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

EST. WT. (Kg)	TO BE STAMPED OR MARKED WHERE INDICATED THUS # (LETTERS)
0.429	

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

ISSUE	DATE	NATURE OF AMENDMENTS
1A	19.4.04	N OF A No. CQA(HV)/T90/33/001

DRN	Sd/=
CHD	Sd/=
APPD	Sd/=
DATE	24-4-89
SCALE:-	1 : 2
DIMENSIONS IN mm	
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS : 2102-69	
ALL THREADS TO CONFORM TO	

MATERIAL :- PIPE
17x2 GOST 8734-75
B 20 GOST 8733-74

USED ON :-
172.33.223Cb-1 (1A)
172.33.256CbCb

CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES)
AVADI

TITLE :-
PIPE

D S CAT NUMBER

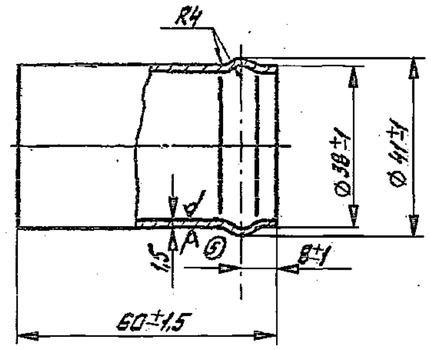
DRAWING NUMBER
172.33.665-1

2015

DRAWING NUMBER
172.33.153

SHEET No. 1 OF 1

UNLESS OTHERWISE SPECIFIED Rz 320 / V V (5) -2



(3) Заменитель материала В20 ГОСТ 8733-74

~~1. Допускается изготовление детали из труб~~ ~~38×1,5-20А ГОСТ 8734-58.~~

2. Вмятины не допускаются, овальность допускается не более 1,5мм.

1. ALTERNATE MATERIAL B 20 GOST 8733-74.
2. DENTS ARE NOT ALLOWED. OVALITY SHOULD NOT EXCEED 1.5 mm.

EXPLANATORY NOTE:-

THE COMPONENT SHOULD BE MANUFACTURED FROM CARBON AND ALLOY COLD DEFORMED SEAMLESS STEEL TUBE OF GROUP 'B' (WITH STANDARDISED MECHANICAL PROPERTIES & CHEMICAL COMPOSITIONS) TO GOST 8733-74.
MATERIAL:-AS PER KILLED STEEL OF GRADE 10 TO GOST 1050-74.
DIMENSIONS & LIMIT DEVIATION OF TUBE OUTSIDE Ø38mm & THICKNESS 1.5mm SHOULD CONFORM TO GOST 8734-75.
ALTERNATIVELY IT MAY BE PRODUCED FROM STEEL TUBE OF GROUP 'B' TO GOST 8733-74 AND MATERIAL AS PER KILLED STEEL OF GRADE 20 TO GOST 1050-74.

CHEMICAL COMPOSITION %AS PER GOST 1050-74.

GRADE OF STEEL	CONTENT OF ELEMENTS %			
	C	Si	Mn	Cr (MAX)
10	0.07-0.14	0.17-0.37	0.35-0.65	0.15
20	0.17-0.24	0.17-0.37	0.35-0.65	0.25

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

MECHANICAL PROPERTIES :- AS PER GOST 8733-74.

GRADE OF STEEL	UTS Kgf/mm²	YIELD POINT σT Kgf/mm²	RELATIVE ELONGATION δ5 %
	NOT LESS THAN		
10	35	21	24
20	42	25	21

(5B) ALT. MATL: CDS GRADE-3 TO IS: 3074-79

"COMMON TO T-90" & BLT
DRAWING RE- INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE-5
DRG. REDRAWN AND EXPLANATORY NOTE ADDED ON 03.12.90

(R.RAMANI) JTO
20-07-05

F-60

SIZE A2

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

EST. WT. (Kg)	TO BE STAMPED OR MARKED WHERE INDICATED THUS # (LETTERS)
0.081	

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

ISSUE	DATE	NATURE OF AMENDMENTS
5B	23.1.06	AUTHY LT.No.80001/CQA(HV)/GEN Dt.30.11.05
5A	19.4.04	N OF A No. CQA(HV)/T90/33/001

DRN	Sd/=
CHD	Sd/=
APPD	Sd/=
DATE	29-7-86
SCALE:-	1 : 1
DIMENSIONS IN mm	
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS : 2102-69	
ALL THREADS TO CONFORM TO	

MATERIAL:- PIPE
38x1.5 GOST 8734-75
B10 GOST 8733-74

USED ON:-
176.33.004Cb
172.33.225Cb-2Cb. (5A)

CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES)
AVADI

TITLE:-
PIPE BRANCH

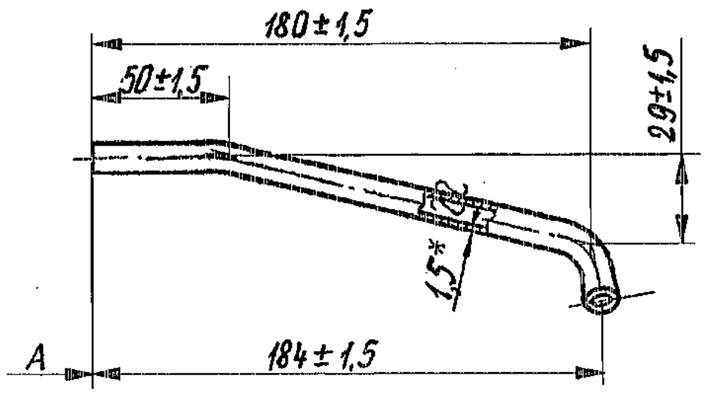
D S CAT NUMBER

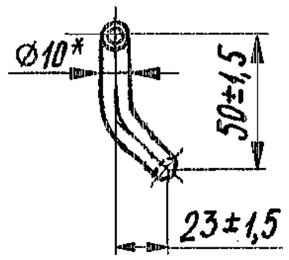
DRAWING NUMBER
172.33.153

DRAWING NUMBER
172.33.516

SHEET No. 1 OF 1

▽1(▽)





EXPLANATORY NOTE :-

MATERIAL QUOTED : PIPE 10X1,5 GOST 8734-75
B20 GOST 8733-74

ALTERNATE MATERIAL QUOTED : B10 GOST 8733-74

10 = EXTERNAL DIAMETER

1,5 = WALL THICKNESS

CHEMICAL COMPOSITION % AS PER GOST 1050-74

GRADE OF STEEL	CONTENT OF ELEMENTS							
	C	Si	Mn	Cr	P	S	Cu	Ni
				MAXIMUM				
20	0,17-0,24	0,17-0,37	0,35-0,65	0,25	0,035	0,040	0,25	0,25
10	0,07-0,14	0,17-0,37	0,35-0,65	0,25	0,035	0,040	0,25	0,25

MECHANICAL PROPERTIES :

	GRADE 20	GRADE 10
ULTIMATE TENSILE STRENGTH Kgf/mm² (min)	42	35
YIELD POINT Kgf/mm² (min)	25	21
PERCENTAGE OF ELONGATION (min)	21	24

1. ALTERNATE MATERIAL B10 GOST 8733-74.
2. DENTS AT A LENGTH OF 30 mm FROM FACE A AND AT A LENGTH OF 10 mm FROM THE OTHER FACE ARE NOT ALLOWED. OVALITY, NOT MORE THAN 1 mm IS PERMISSIBLE.
3. RADII OF BENDING UP TO THE AXIS IN THE BENDING PLANE SHOULD BE 20 mm.
4. LENGTH OF STRAIGHTENED COMPONENT AS PER THE TRUE DIMENSIONS IS APPROXIMATELY 210 mm.
5. * DIMENSIONS FOR REFERENCE.
6. OTHER REQUIREMENTS ARE TO BE IN ACCORDANCE WITH SPECIFICATIONS 520 TY 1.

" COMMON TO T-90 " & BLT
DRAWING RE-INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE-4 (R.RAMANI) JTO 19-10.05

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

EST. WT. (Kg) 0.066

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.

ISSUE	DATE	NATURE OF AMENDMENTS

DRN	Sd/=
CHD	Sd/=
APPD	Sd/=
DATE	29.7.86
SCALE:- 1 : 2	
DIMENSIONS IN mm	
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS : 2102-69	
ALL THREADS TO CONFORM TO	

MATERIAL :- PIPE
10 x 1.5 GOST 8734-75
B 20 GOST 8733-74

USED ON :-
172.33.160cbCb

CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES)
AVADI

TITLE :-
PIPE BRANCH

D S CAT NUMBER

DRAWING NUMBER
172.33.516

F-60
84

SIZE A3


09

" COMMON TO T - 90 & BLT

DRG. RE - INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE -3 [R.RAMANI,JTO 10-03-06

F - 79

4 | 3 | 2 | 1

DRAWING NUMBER
175.41.065

SHEET No. 1 OF 1

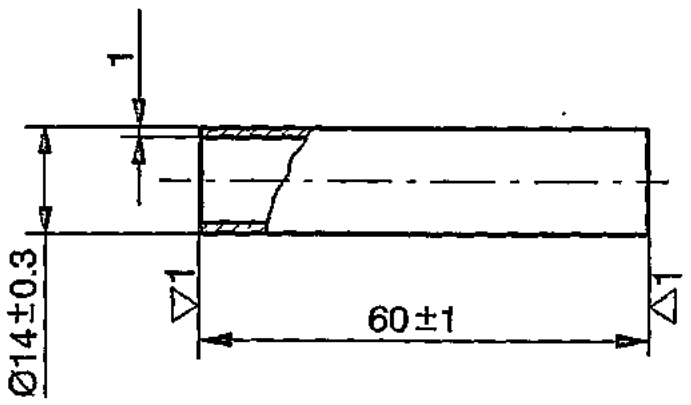
2(▽)

F

E

D

C



1. COMPONENT MAY BE MANUFACTURED FROM TUBE $\frac{\text{14X1 GOST 8734 - 75}}{\text{B10 GOST 8733 - 74}}$

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

ISSUE	DATE	NATURE OF AMENDMENTS

EST. WT. (Kg) 0.018

TO BE STAMPED OR MARKED WHERE INDICATED THUS # (LETTERS)

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

MATERIAL :- TUBE
14X1 GOST 8734 - 75
B20 GOST 8733 - 74

USED ON :-
175.41.011cbCb

DRN Sd/=
CHD Sd/=
APPD Sd/=
DATE 18 - 09 - 86

SCALE :- 1 : 1

DIMENSIONS IN mm

TOLERANCE ON DIMENSIONS UNLESS OTHERWISE STATED IS : 2102 - 69

ALL THREADS TO CONFORM TO

CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES)
AVADI

TITLE :-
TUBE

D S CAT NUMBER

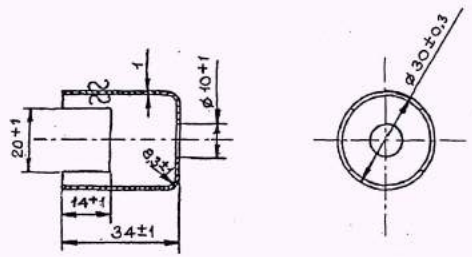
DRAWING NUMBER
175.41.065

SIZE A4

DRAWING NUMBER
54.05.273-A

SHEET No. 1 OF 1

UNLESS OTHERWISE SPECIFIED R_{z80} (√)



1. Допускается изготовление из стали марки 20 ГОСТ 1050-60 мартеновская и стали 08 КП любой группы отделки поверхности и штампуемости, кроме IV Н.
2. Смещение оси отверстия ф 10 и прорезов относительно оси детали не более 1мм.

1. May be manufactured from steel grade 20, Gost 1050-60 open-hearth and steel 08 КП (rimming) of any of finishing and stamping group (except IV H)
2. Misalignment of axis of hole Ø 10 and opening, relative to the axis of the component should not exceed 1 mm.

EXPLANATORY NOTE:-

THE COMPONENT SHOULD BE MANUFACTURED FROM CARBON & ALLOY COLD DEFORMED SEAMLESS STEEL TUBE WITH STANDARDISED MECHANICAL PROPERTIES & STANDARDISED CHEMICAL COMPOSITIONS AS PER GROUP 'B' TO GOST 8733-74. MATERIAL AS PER KILLED STEEL OF GRADE 10 TO GOST 1050-74. TOLERANCE ON EXTERNAL $\phi 30^{\pm 0.30}$mm & WALL THICKNESS $1.0^{\pm 0.12}$mm TO GOST 8734-75. ALTERNATIVELY THE SUBJECT ITEM MAY BE PRODUCED FROM CARBON STRUCTURAL HOT ROLLED KILLED STEEL (OPEN HEARTH) OF GRADE 20 OR RIMMED STEEL OF GRADE 08КП, (EXCEPT CATEGORY IV-WORK HARDENED-H) TO GOST 1050-74

CHEMICAL COMPOSITION%:- AS PER GOST 1050-74.

GRADE OF STEEL	C	Si	Mn	Cr (MAX)
10	0.07-0.14	0.17-0.37	0.35-0.65	0.15
20	0.17-0.24	0.17-0.37	0.35-0.65	0.25
08КП	0.05-0.11	0.03 (MAX)	0.25-0.50	0.10

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

MECHANICAL PROPERTIES:- AS PER GOST 8733-74.

GRADE OF STEEL	U T S Kgf/mm²	YIELD POINT Kgf/mm²	RELATIVE ELONGATION%
	MINIMUM		
10	35	21	24

MECHANICAL PROPERTIES:- AS PER GOST 1050-74.

GRADE OF STEEL	HEAT TREATMENTS OF BLANKS	YIELD POINT Kgf/mm²	U T S Kgf/mm²	ELONGATION %	REDUCTION OF AREA%	IMPACT STRENGTH Kgm/cm²
		MINIMUM				
20	NORMALISING	25	42	25	55	
08КП	NORMALISING	20	33	33	60	

Ⓐ EQUIVALENT MATERIAL: Steel Grade 40C8 to IS: 1570-2004 Pt-2

NOTE: Mechanical Properties of Equivalent Material shall be as per Drawing/OEM Material Specification.

"COMMON TO T-90"
DRAWING RE-INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE-NIL
18.6.05

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

EST. WT. (Kg)	TO BE STAMPED OR MARKED WHERE INDICATED THUS # (LETTERS)
0.019	

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

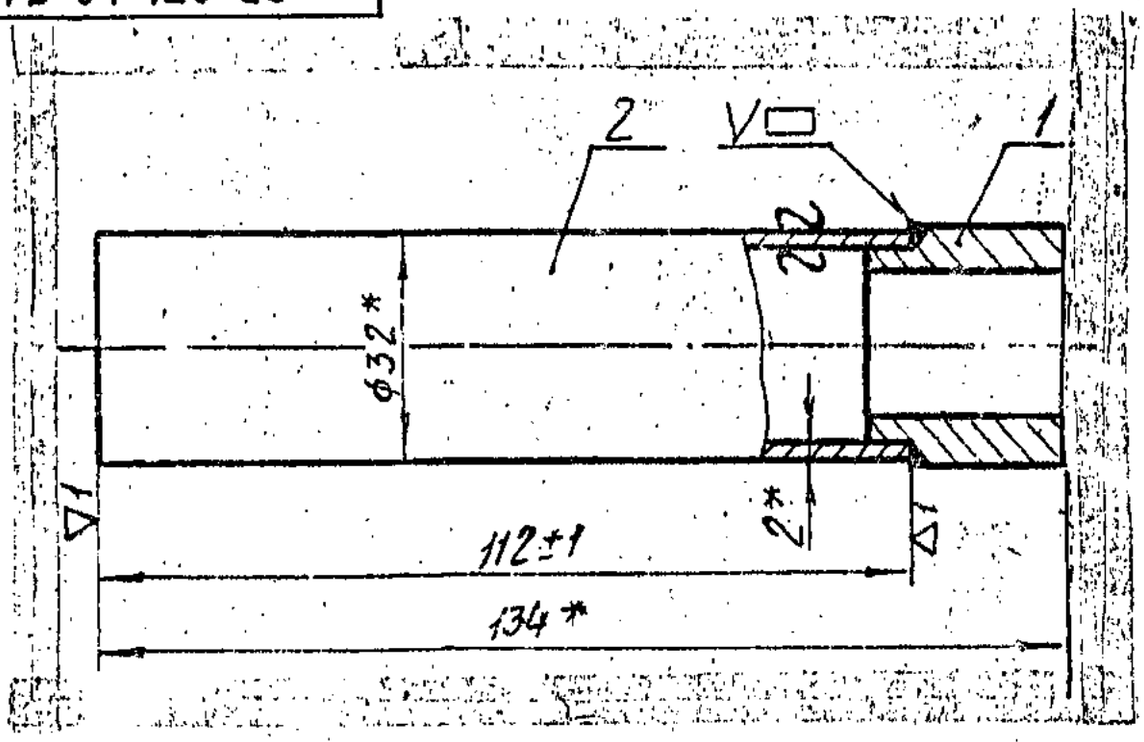
ISSUE	DATE	NATURE OF AMENDMENTS
A	13.06.23	DC(I)No:CQA(HV)/T-72/C-0022/2023 dated 24-01-2023

DRN	Sd/=	MATERIAL:- TUBE 30 x 1 GOST 8734-75 B 10 GOST 8733-74
CHD	Sd/=	USED ON:- 54.05..86 Cb-1Cb
APPD	Sd/=	CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI
DATE	17.8.1988	
SCALE:- 1 : 1		TITLE:- GUIDE- BUSH
DIMENSIONS IN mm		
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS: 2102 - 69		
ALL THREADS TO CONFORM TO		D S CAT NUMBER
		DRAWING NUMBER 54.05.273-A

F-27
73
SIZE A2

[redacted]

DRAWING NUMBER
175 01 120 C6



1. Component 2 is to be manufactured from pipe 32 x 2 - x 18H10T, GOST 9941-72.
2. Weld should not project beyond external surface of bush. Grinding is permissible.
3. *Dimensions for reference.

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

(3B) COMMON TO T-90
(3B) DRG. REINSTATED VIDE N OF A No. CQA(HV)/36/002 Dt. 01.01.10
~~DRG. CANCELLED VIDE N OF A No. CQA (HV)/36/001~~
DRG. INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE-3
(3A) F-2 / 33

ISSUE	DATE	NATURE OF AMENDMENTS
3B	18.01.10	N OF A No. CQA(HV)/T-90/36/002
3A	01-1-10	N OF A No. CQA(HV)/36/002

EST. WT. 0.33Kg

TO BE STAMPED OR MARKED WHERE INDICATED THUS =||= . (LETTERS)

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

MATERIAL :- —

USED ON
175 01 045 C6-2A

DRN [redacted]
CHD [redacted]
T[redacted]
APPD [redacted]
DATE 31/12/87

SCALE :- 1 : 1
DIMENSIONS IN mm

TOLERANCE ON DIMENSIONS UNLESS OTHERWISE STATED IS 2102 -69

ALL THREADS CONFORM TO

CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI.

TITLE
PIPE ASSY.

D S CAT NUMBER

DRAWING NUMBER
175 01 120 C6

SIZE A4

ITEM	DRAWING NUMBER	D S CAT NUMBER	DESCRIPTION	No. OFF	[redacted]
	175 01 120 C6 ✓		PIPE ASSY.		
	& ITEM LIST				
1	175 01 234 ✓		BUSH	1	
2	175 01 236 ✓		PIPE	1	NO SEPERATE DRAWING.

ISSUE	DATE	NATURE OF AMENDMENTS	ISSUE	DATE	NATURE OF AMENDMENTS
3B	18-01-10	N OF A No. CQA(HV)/T-90/36/002			
3A	01-1-10	N OF A No. CQA(HV)/36/002			

DRN	Bapu
CHD	Rao
TCD	M. Sarma
APPD	T.V.
DATE	31/12/89

CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI.

TITLE: **PIPE ASSY.**

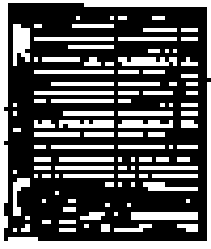
SHT. No. 1 OF 1. | D S CAT NUMBER | ITEM LIST FOR **175 01 120 C6** ✓

-2A

(34) I/L REINSTATED VIDE N OF A No. CQA(HV)/36/002 Dt. 01-01-10
~~I/L CANCELLED VIDE N OF A No. CQA (HV)/36/001~~
I/L SEPARATELY CREATED BASED ON RUSSIAN ORIGINAL ISSUE-3

(38) COMMON TO T-90

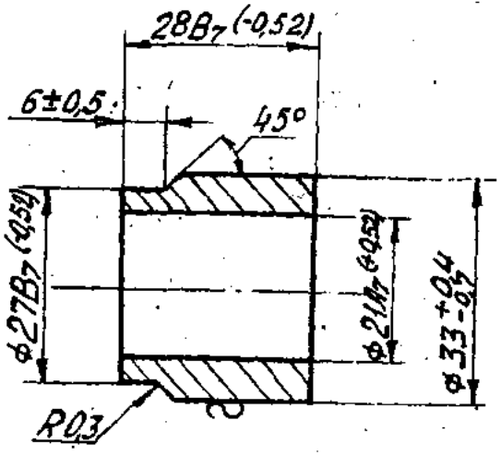
F-2 / 33



175.01.234

REPRODUCED FROM ORIGINAL

▽3(▽)



1. COMPONENT MAY BE MANUFACTURED FROM PIPE 35x8-10-A OR 35x8-20-A, GOST 8734-75 OR FROM OPEN-HEARTH STEEL 20 GOST 1050-74.

2. RUN OUT OF ø33 AND ø27 SURFACES RELATIVE TO ø21 SURFACE NOT TO BE MORE THAN 0.5mm.

DRG. CACELLED VIDE N OF A No. CQA(HV)/36/foot

Bacc
Верн.

DRG. INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE-4.

(4A) DRG. REINSTATED VIDE N OF A No. CQA(HV)/36/002 Dt. 01.01.10
(4B) COMMON TO T-90

ISSUE	DATE	NATURE OF AMENDMENTS
4B	18.1.10	N OF A No. CQA(HV)/T.90/36/002
4A	1.1.10	N OF A No. CQA(HV)/36/002

DRN
CHD
TCD
APPD
DATE 6.9.

SCALE - 1 : 1
DIMENSIONS IN mm.
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED.
ALL THREADS CONFORM TO

EST. MASS 0.108kg

TO BE STAMPED OR MARKED WHERE INDICATED THUS # (LETTERS)

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

MATERIAL:- OPEN HEARTH STEEL IS GOST 1050-74

USED ON:- 175·01·120 ⊂5

CONTROLLERATE OF INSPECTION (HEAVY VEHICLES) AVADI.

TITLE:- BUSH

D S CAT NUMBER

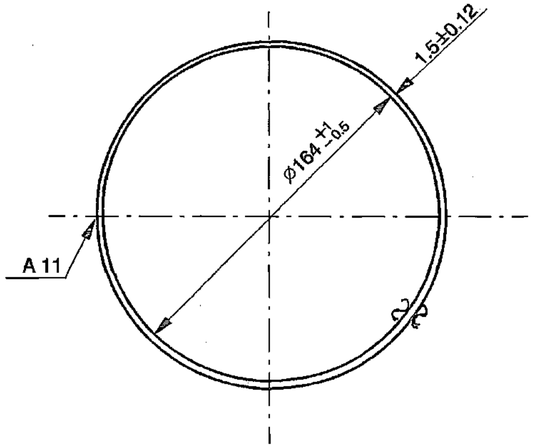
DRAWING NUMBER 175·01·234

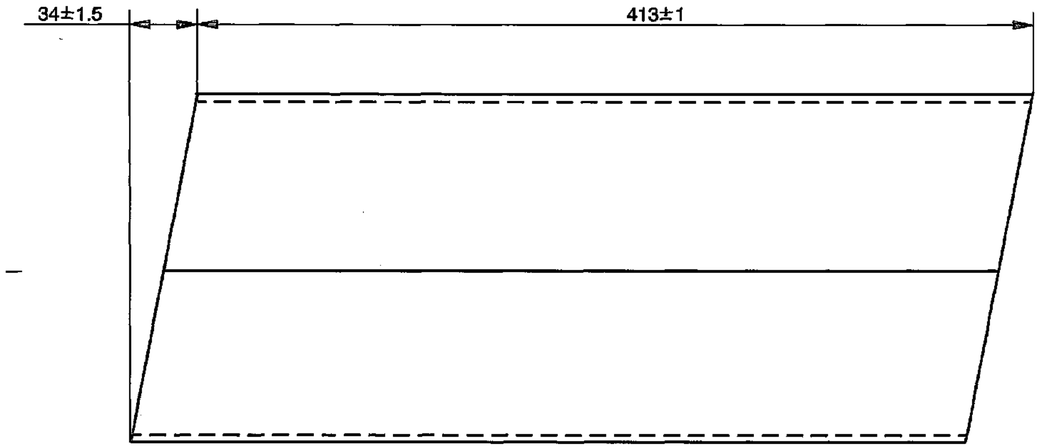
F-8

DRAWING NUMBER
172.33.495

SHEET No. 1 OF 1

UNLESS OTHERWISE SPECIFIED Rz 320 (√)





1. THE COMPONENT IS TO BE MADE FROM OPEN HEARTH STEEL 10 Kn (RIMMING) - 5 - III Г. GOST 16523-70.
2. ON INTERNAL SURFACE, ROLLS FROM WELDING AND SHARP EDGES ARE NOT ALLOWED. SURFACE IRREGULARITIES MAY BE GROUND PLUSH WITH GENEARTRIX ø164.
~~4. PIPE IS TO BE SUBJECTED TO A PRESSURE TEST AT A PRESSURE OF 2 atm. LEAKAGE IS NOT ALLOWED.~~
4. SUBJECT THE UNIT TO PRESSURE TEST WITH AIR AT A PRESSURE $1.96.10^5 + 0.49.10^5$ Pa ($2^{+0.5}$ kgf/cm^2) LEAKAGE OF AIR IS NOT ALLOWED. (5)

EXPLANATORY NOTE:-

THE COMPONENT SHOULD BE PRODUCED FROM OPEN-HEARTH COLD ROLLED QUALITY CARBON STEEL SHEET 1.5mm THICKNESS OF HIGH SURFACE FINISH 'II' WITH STANDARD CHARACTERISTICS CATEGORY '5', DEEP-DRAWN 'Г' OF GRADE 10КП (RIMMED) TO GOST 16523-70.
ALTERNATIVELY IT MAY BE PRODUCED FROM STEEL SHEET OF SUPERIOR FINISH 'III' WITH STANDARD CHARACTERISTICS CATEGORY '5', DEEP-DRAWN 'Г' OF GRADE 10КП (RIMMED) TO GOST 16523-70.

CHEMICAL COMPOSITION% AS PER GOST 1050-74.

GRADE OF STEEL	C	Si (MAX)	Mn	Cr (MAX)
10КП	0.07-0.14	0.07	0.25-0.50	0.15

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

MECHANICAL PROPERTIES - AS PER GOST 16523-70.

GRADE OF STEEL	TENSILE STRENGTH Kgf/mm²	RELATIVE ELONGATION % NOT LESS THAN
10КП	28 - 40	25

COMMON TO T-90 & BLT
DRG. INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE-4
DRG. REDRAWN AND EXPLANATORY NOTE ADDED ON 31.10.90 (R.RAMANI), JTO 24-09-05

F-60

SIZE A2

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

EST. WT. (Kg)	TO BE STAMPED OR MARKED WHERE INDICATED THUS # (LETTERS)
2.530	

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

ISSUE	DATE	NATURE OF AMENDMENTS
5A	19.4.04	N OF A No. CQA(HV)/T90/33/001
5	5.10.88	AMDT. LIST 6, PART II, BOOK-6.

DRN	Sd/-
CHD	Sd/-
APPD	Sd/-
DATE	15-7-86
SCALE:-	1:2
DIMENSIONS IN mm	
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS: 2102-69	
ALL THREADS TO CONFORM TO	

MATERIAL:- OPEN HEARTH STEEL 10 Kn RIMMING - 5 - II - Г. GOST 16523-70

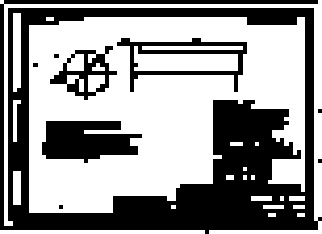
USED ON:- 176.33.004Cb (5A) 172.33.225Cb-2Cb

CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI

TITLE:- PIPE

D S CAT NUMBER

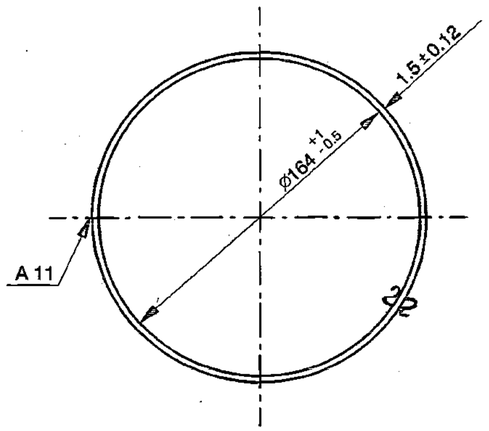
DRAWING NUMBER 172.33.495

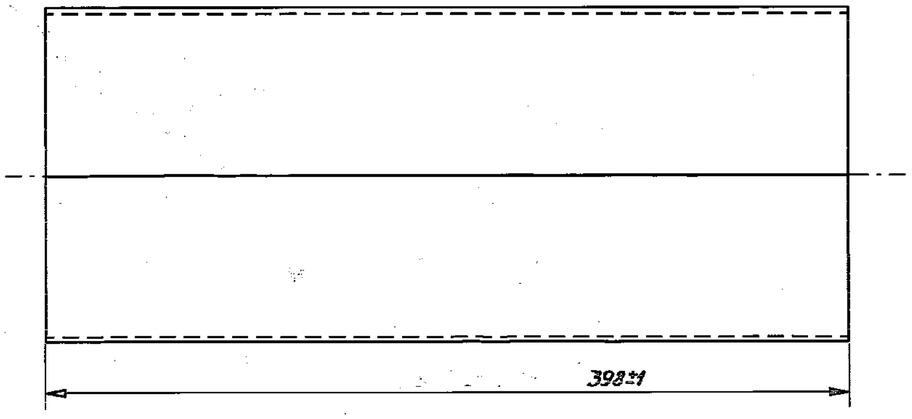


DRAWING NUMBER
172.33.494

SHEET No. 1 OF 1

UNLESS OTHERWISE SPECIFIED Rz 320/ (√)





EXPLANATORY NOTE:-

THE COMPONENT SHOULD BE PRODUCED FROM OPEN-HEARTH COLD ROLLED QUALITY CARBON STEEL SHEET 1.5mm THICKNESS-OF HIGH SURFACE FINISH 'II' WITH STANDARD CHARACTERISTICS CATEGORY '5', DEEP-DRAWN 'Г' OF GRADE 10КП (RIMMED) TO GOST 16523-70.
ALTERNATIVELY IT MAY BE PRODUCED FROM STEEL SHEET OF SUPERIOR FINISH 'III' WITH STANDARD CHARACTERISTICS CATEGORY '5', DEEP-DRAWN 'Г' OF GRADE 10КП (RIMMED) TO GOST 16523-70.

CHEMICAL COMPOSITION% AS PER GOST 1050-74.

GRADE OF STEEL	C	Si (MAX)	Mn	Cr (MAX)
10КП	0.07-0.14	0.07	0.25-0.50	0.15

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

MECHANICAL PROPERTIES - AS PER GOST 16523-70.

GRADE OF STEEL	TENSILE STRENGTH Kgf/mm²	RELATIVE ELONGATION % NOT LESS THAN
10КП	28 - 40	25

1. IT IS ALLOWED TO MAKE THE COMPONENT FROM OPEN HEARTH STEEL 10 Kn (RIMMING) - 5 - III Г. GOST 16523-70.
2. ON INTERNAL SURFACE, ROLLS FROM WELDING AND SHARP EDGES ARE NOT ALLOWED. SURFACE IRREGULARITIES MAY BE GROUND FLUSH WITH GENERATRIX Ø164.

⑥ ~~4. PIPE IS TO BE SUBJECTED TO A PRESSURE TEST AT A PRESSURE OF 2 atm. LEAKAGE IS NOT ALLOWED.~~

4. SUBJECT THE UNIT TO PRESSURE TEST WITH AIR AT A PRESSURE $1.96.10^5 + 0.49.10^5$ Pa

⑥ ($2^{+0.5}$ kgf/cm²) LEAKAGE OF AIR IS NOT ALLOWED.

⑥B ALT. MATL: GRADE 'DD' TO IS: 513-94.

" COMMON TO T-90 " & BLT
DRAWING RE- INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE-5
DRG. REDRAWN AND EXPLANATORY NOTE ADDED ON 31.10.90

IR.RAMANUJ,JTO
26.07.05

F-60

SIZE A2

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

EST. WT. (Kg)	TO BE STAMPED OR MARKED WHERE INDICATED THUS # (LETTERS)
2.43	

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

ISSUE	DATE	NATURE OF AMENDMENTS
6B	23.1.06	AUTHY LT. No. 80001/CQA(HV)/GEN Dt. 30.11.05
6A	19.4.04	N OF A No. CQA(HV)/T90/33/001
6	5.10.88	AMDT. LIST 6. PT-II, BOOK-6

DRN	Sd/=
CHD	Sd/=
APPD	Sd/=
DATE	21-7-86
SCALE:-	1 : 2
DIMENSIONS IN mm	
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS : 2102 - 69	
ALL THREADS TO CONFORM TO	

MATERIAL:- OPEN HEARTH STEEL 10Kn - 5 - II - Г RIMMING GOST 16523-70

USED ON:- 176.33.004Cb, 172.33.225Cb-2Cb ⑥A

CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI

TITLE:- PIPE

D S CAT NUMBER

DRAWING NUMBER 172.33.494

RESTRICTED
(DRAFT/PROVISIONAL)
QUALITY ASSURANCE PLAN

FOR

(PIPE)

DRG.NO.172.33.763

(LF NO: 6206305976)

No: HVF/T-72C/QAP/33/PIPE/243339- 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. 172.33.763

PREPARED BY

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

REVIEWED BY

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

APPROVED BY

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

ISSUED BY

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

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 172.33.763** 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: 172.33.763**

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. 172.33.763** including the technical requirements of the drawings. The recommended Quality Plan stipulated herein is mandatory and should be strictly adhered to.

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

Note:

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

5. DOCUMENTS:

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

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

6. ITEM USED ON:

1. 172.33.224CB-2CB -

7. LIST OF DRAWINGS:

Sl. NO.	DRG. NO	NOMENCLATURE	REMARKS
1	172.33.763	PIPE	-

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

Sl. NO	DRG. NO	NOMENCLATURE	MATERIAL SPECIFICATIONS	Qty
1	172.33.763	PIPE	PIPE 17X2 GOST 8734-75 B 10 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	1 No	1 No per batch / As required.
vii)	Interchangeability Test	02 Nos.	02 Nos. per batch on randomly basis, except selective assembly.
viii)	Test stand/Jigs/ Fixtures/Gauges/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 172.33.763

All dimensions should be confirmed as per drawing.

Sl. No.	Drawing Dimensions
1.	720±2 mm
2.	450±2 mm
3.	20±1.5 mm
4.	44±1.5 mm
5.	525±2 mm
6.	R30 (3 Radii)
7.	73±1.5 mm
8.	73±2 mm
9.	Φ17* mm
10.	2* mm
11.	28±1 mm
12.	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 TO DRG.NO 172.33.763

a) The component should be manufactured from

PIPE 17X2 GOST 8734-75
B10 GOST 8733-74

b) Chemical properties: As per STEEL GRADE B10 GOST 8733-74 & GOST 1050-74.

Grade of Steel	CONTENT OF ELEMENTS%							
	C	Si	Mn	Cr	Ni	P	S	Cu
				MAX				
10	0.17 to 0.24	0.17 to 0.37	0.35 to 0.65	0.15	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 B10 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				
10	21	35	24	-----	------

Note: For other properties refer GOST 8733-74.

14) PERFORMANCES/ACCEPTANCE TEST: PIPE TO DRG.NO.172.33.763

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

15) FITMENT AND PERFORMANCE TEST:

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

16) **INTERCHANGEABILITY:**

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

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

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

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

18) **MARKING / IDENTIFICATION.**

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

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

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

19) **PRESERVATION CHECK**

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

20) **PACKING CHECK**

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

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

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

21) DOCUMENTATION

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

ii. Vendor has to submit Bill of materials, Material test reports, Class 'C' /Endurance test reports (wherever specified in drawing/TY specification/QAP) and Complete PIR (pre-inspection report)at the time of offering the item for inspection. HVF will commence inspection only after scrutiny of these documents.

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

iv. Pre inspection reports (PIR) of firm like, 1. Chemical analysis (NABL Certificate), 2.Mechanical properties (NABL Certificate), 3. Pre-forming process, 4. Coating certification, 5. Calibration reports of instruments and 6. Dimensional inspection reports.

22) REFERENCE:

a) Drawing 172.33.763

b) Material specification as per drawing

Sl. NO	DRG. NO	NOMENCLATURE	MATERIAL SPECIFICATIONS
1	172.33.763	PIPE	PIPE 17X2 GOST 8734-75 B 10 GOST 8733-74

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

d) Specification 520 TY1.

ANNEXURE-A

SL. NO.	CATEGORY	ASSEMBLY/ SUB ASSEMBLY	TESTS/ INSPECTION PARAMETERS	STANDARDS TO BE REFERRED	ACCEPTANCE CRITERIA	INSPECTION RESPONSIBILITY			REMARKS
						Firm	HVF	DGQA	
1	PIPE TO DRG. NO 172.33.763.	**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**

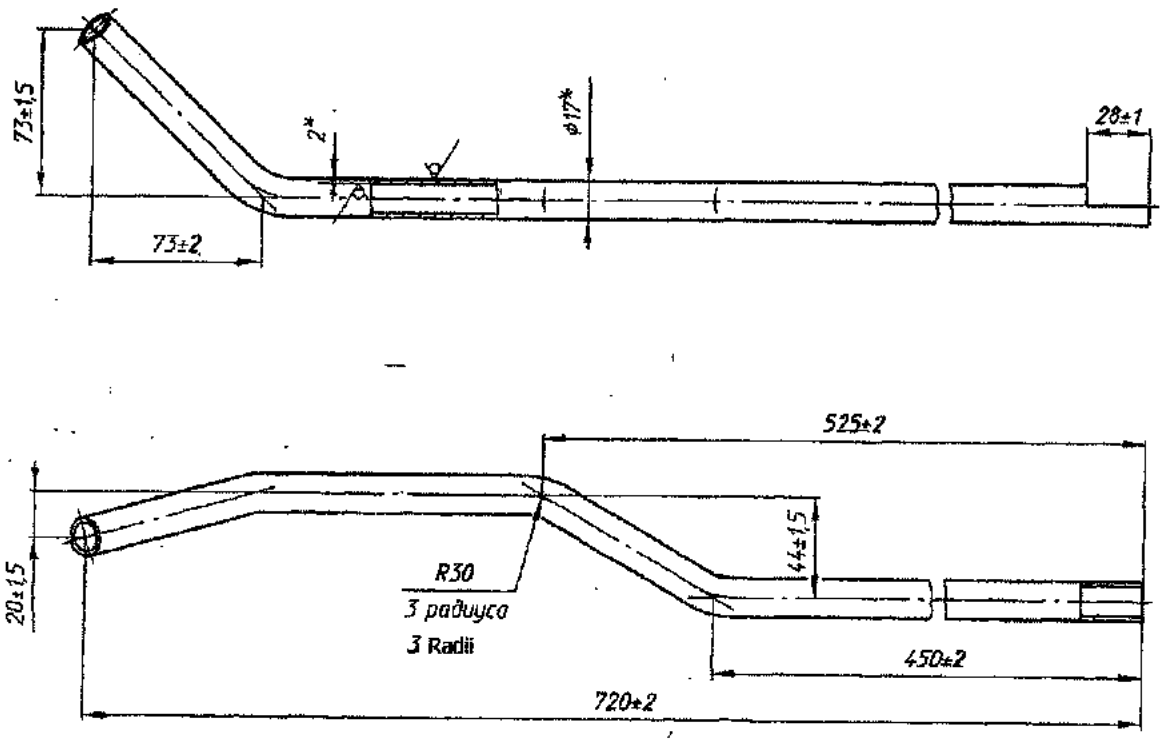


FIG: PIPE TO DRG. NO 172.33.763

APPENDIX ' A'

RECORD OF AMENDMENTS

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

RESTRICTED
(DRAFT/PROVISIONAL)
QUALITY ASSURANCE PLAN

FOR

(PIPE)

DRG.NO.172.33.762

(LF NO: 6206305975)

No: HVF/T-72C/QAP/33/PIPE/243340- 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. 172.33.762

PREPARED BY

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

REVIEWED BY

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

APPROVED BY

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

ISSUED BY

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

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 172.33.762** 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: 172.33.762**

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. 172.33.762** including the technical requirements of the drawings. The recommended Quality Plan stipulated herein is mandatory and should be strictly adhered to.

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

Note:

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

5. DOCUMENTS:

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

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

6. ITEM USED ON:

1. 172.33.224CB-2CB -

7. LIST OF DRAWINGS:

Sl. NO.	DRG. NO	NOMENCLATURE	REMARKS
1	172.33.762	PIPE	-

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

Sl. NO	DRG. NO	NOMENCLATURE	MATERIAL SPECIFICATIONS	Qty
1	172.33.762	PIPE	PIPE 17X2 GOST 8734-75 B 10 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	1 No	1 No per batch / As required.
vii)	Interchangeability Test	02 Nos.	02 Nos. per batch on randomly basis, except selective assembly.
viii)	Test stand/Jigs/ Fixtures/Gauges/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 172.33.762

All dimensions should be confirmed as per drawing.

Sl. No.	Drawing Dimensions
1.	35±2 mm
2.	2* mm
3.	Φ17* mm
4.	600±2 mm
5.	6±1 mm
6.	685±2 mm
7.	R30 (2 Radii)
8.	170±2 mm
9.	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 TO DRG.NO 172.33.762

a) The component should be manufactured from

PIPE 17X2 GOST 8734-75

B10 GOST 8733-74

b) **Chemical properties:** As per STEEL GRADE B10 GOST 8733-74 & GOST 1050-74.

Grade of Steel	CONTENT OF ELEMENTS%							
	C	Si	Mn	Cr	Ni	P	S	Cu
				MAX				
10	0.17 to 0.24	0.17 to 0.37	0.35 to 0.65	0.15	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 B10 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				
10	21	35	24	-----	------

Note: For other properties refer GOST 8733-74.

14) PERFORMANCES/ACCEPTANCE TEST: PIPE TO DRG.NO.172.33.762

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

15) FITMENT AND PERFORMANCE TEST:

a. Pilot samples should be checked for fitment and Performance test to ascertain the efficacy of the system under different operating conditions by fitting in higher assembly and repeating it for functional checks, wherever required.

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

16) INTERCHANGEABILITY:

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

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

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

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

18) MARKING / IDENTIFICATION.

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

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

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

19) PRESERVATION CHECK

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

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

20) PACKING CHECK

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

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

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

21) DOCUMENTATION

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

ii. Vendor has to submit Bill of materials, Material test reports, Class 'C' /Endurance test reports (wherever specified in drawing/TY specification/QAP) and Complete PIR (pre-inspection report)at the time of offering the item for inspection. HVF will commence inspection only after scrutiny of these documents.

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

iv. Pre inspection reports (PIR) of firm like, 1. Chemical analysis (NABL Certificate), 2.Mechanical properties (NABL Certificate), 3. Pre-forming process, 4. Coating certification, 5. Calibration reports of instruments and 6. Dimensional inspection reports.

22) REFERENCE:

a) Drawing 172.33.762

b) Material specification as per drawing

Sl. NO	DRG. NO	NOMENCLATURE	MATERIAL SPECIFICATIONS
1	172.33.762	PIPE	PIPE 17X2 GOST 8734-75 B 10 GOST 8733-74

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

d) Specification 520 TY1.

ANNEXURE-A

SL. NO.	CATEGORY	ASSEMBLY/ SUB ASSEMBLY	TESTS/ INSPECTION PARAMETERS	STANDARDS TO BE REFERRED	ACCEPTANCE CRITERIA	INSPECTION RESPONSIBILITY			REMARKS
						Firm	HVF	DGQA	
1	PIPE TO DRG. NO 172.33.762.	**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**

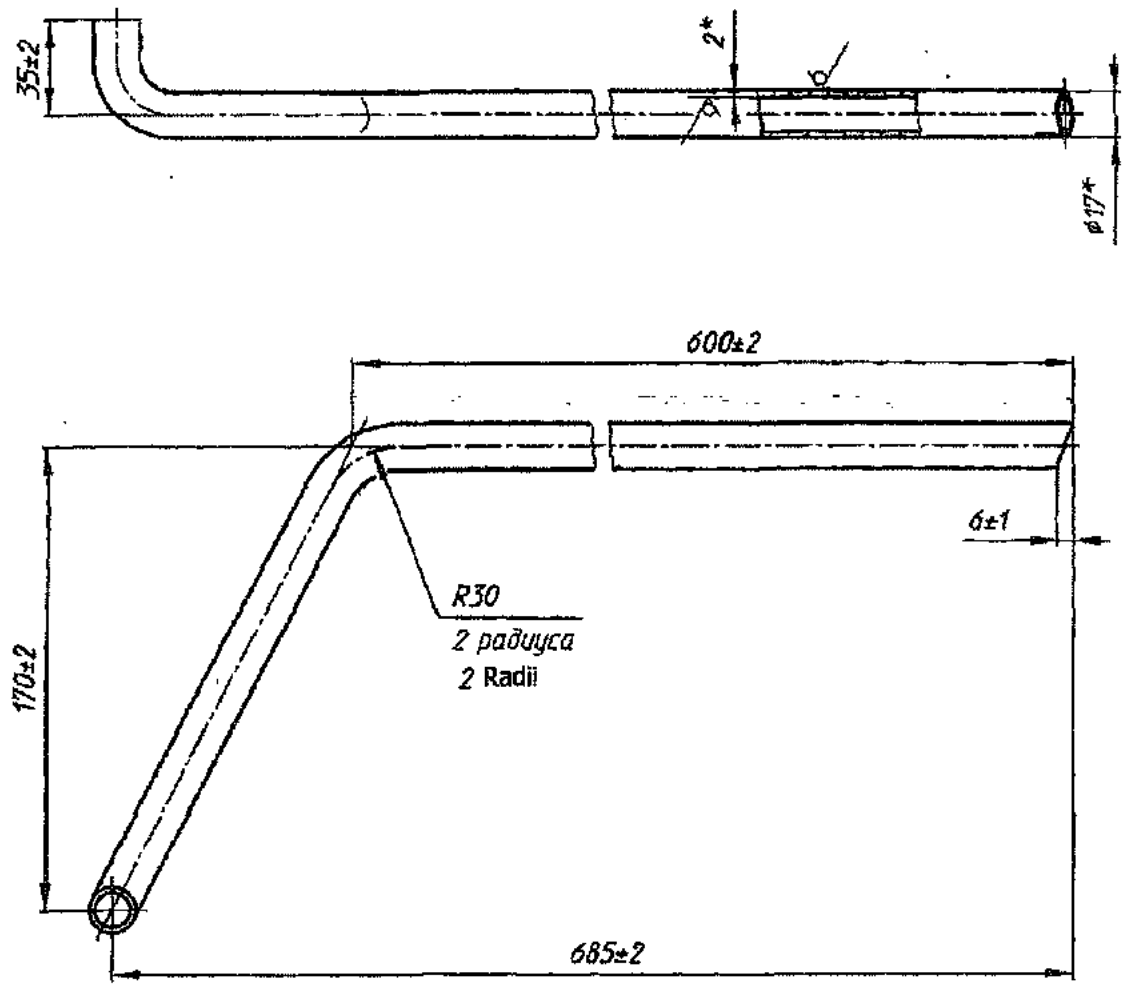


FIG: PIPE TO DRG. NO 172.33.762

APPENDIX ' A'

RECORD OF AMENDMENTS

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

RESTRICTED
(DRAFT/PROVISIONAL)
QUALITY ASSURANCE PLAN

FOR

(PIPE, PIPE 10X1.5-B20 / PIPE)

DRG.NO.172-2M.33.301

(LF NO: 6206305172)

No: HVF/T-72C/QAP/PIPE, PIPE 10X1.5-B20 / PIPE/244283- 00

ISSUE No: 00 **DATE: JULY – 2022**

QUALITY ASSURANCE (RIG–OE)

HEAVY VEHICLES FACTORY

AVADI CHENNAI – 600 054

QUALITY ASSURANCE PLAN (QAP)

FOR

PIPE, PIPE 10X1.5-B20 / PIPE

DRG. NO. 172-2M.33.301

PREPARED BY

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

REVIEWED BY

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

APPROVED BY

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

ISSUED BY

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

1.IMPORTANT NOTES

Note-1

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

Note –2

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

Note-3

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

Note-4

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

Note-5

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

2.INTRODUCTION

1. This quality plan lays down the inspection and testing procedure to be carried out on the component **PIPE, PIPE 10X1.5-B20 / PIPE TO DRG.NO 172-2M.33.301** being procured indigenously. This is prepared, based on the acceptance standards and inspection parameters laid down in collaborators documents and on the inspection test standards followed in respect of similar indigenous items.
2. This QAP is the property of Government of India and is liable for amendments as and when required. The Chief General Manager, Heavy Vehicles Factory, Avadi, Chennai – 600 054, is the inspecting Authority for this assembly. Any query / clarification on the content of this QAP shall be referred to this Factory. Any departure from these instructions is allowed only after written approval from the above authority. Notwithstanding the tests indicated in this QAP, the inspecting Officer has the right to carry out any test to check conformance to the paper particulars quoted in the Supply Order, which he may consider necessary to satisfy himself about the stores which he has to accept.

3.AIM

The QAP is aimed at standardizing the Inspection procedure and acceptance norm for **PIPE, PIPE 10X1.5-B20 / PIPE TO DRG.NO: 172-2M.33.301**

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, PIPE 10X1.5-B20 / PIPE TO DRG. NO. 172-2M.33.301** including the technical requirements of the drawings. The recommended Quality Plan stipulated herein is mandatory and should be strictly adhered to.

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

Note:

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

5. DOCUMENTS:

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

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

6. ITEM USED ON:

1. 176.33.015CB-1CB -

7. LIST OF DRAWINGS:

Sl. NO.	DRG. NO	NOMENCLATURE	REMARKS
1	172-2M.33.301	PIPE, PIPE 10X1.5-B20 / PIPE	-

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

Sl. NO	DRG. NO	NOMENCLATURE	MATERIAL SPECIFICATIONS	Qty
1	172-2M.33.301	PIPE, PIPE 10X1.5-B20 / PIPE	PIPE 10X1.5 GOST 8734-75 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
	Acceptance test (As below)		
(i)	Visual Inspection	100%	100%
(ii)	Dimensional Inspection	100%	General Inspection level III, single sampling, Normal Inspection, AQL 2.5 of IS 2500 (Part-I)-2000
(iii)	Material Inspection (Including Mechanical, Chemical and Physical properties)	1 No	1 No. or qty as specified in specification, GOST for each batch of raw material or heat treatment lot / As required for confirmation of material.
(iv)	Pressure testing	-----	-------
(v)	Machining / Fitment / Performance trial on higher assembly / Tank	------	------
(vi)	Interchangeability Test	------	------
vii)	Calibration reports / certificate of Test stand/Jigs/Equipment/ Fixtures/Gauges/Mandrels/etc.	100 %	100 %
viii)	Marking/Identification	100%	100%
ix)	Packing/ Preservation	100%	100%

Note:-

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

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

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

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

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

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

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

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

The dimensions 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, PIPE 10X1.5-B20 / PIPE TO DRG.NO 172-2M.33.301

1. All dimensions shall be confirmed as per drawing/specification

2. Surface finish/Roughness should be confirmed as per drawing and specification.

3. For admissible alternate method for manufacture in dimensions/material if any, refer drawing/specification.

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

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

13.1 PIPE, PIPE 10X1.5-B20 / PIPE TO DRG.NO 172-2M.33.301

a) The component should be manufactured from

PIPE 10X1.5 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 (MAX)
10	0.07-0.14	0.17-0.37	0.35-0.65	0.15
20	0.17-0.24	0.17-0.37	0.35-0.65	0.25

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

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

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

GRADE OF STEEL	UTS Kgf/mm²	YIELD POINT δ_T Kgf/mm²	RELATIVE ELONGATION δ_5 %
	NOT LESS THAN		
10	35	21	24
20	42	25	21

Note: For other properties refer GOST 8733-74.

14) <u>PERFORMANCES/ACCEPTANCE TEST: PIPE, PIPE 10X1.5-B20 / PIPE TO DRG.NO.172-2M.33.301</u>

1. Alternate material B10 GOST 8733-74.
2. *Dimensions for reference.

<u>EXPLANATORY NOTE:</u>

THE COMPONENT SHOULD BE MANUFACTURED FROM CARBON AND ALLOY COLD-DEFORMED SEAMLESS STEEL TUBE OF GROUP – 'B' (WITH STANDARDISED MECHANICAL PROPERTIES & CHEMICAL COMPOSITIONS) TO GOST 8733-74.
MATERIAL:-AS PER OPEN HEARTH KILLED STEEL OF GRADE 20 TO GOST 1050-74.
DIMENSIONS & LIMIT DEVIATION OF STEEL TUBE OUTSIDE Φ10mm & THICKNESS 1.5mm SHOULD CONFORM TO GOST 8734-75.
ALTERNATIVELY IT MAY BE PRODUCED FROM STEEL TUBE OF GROUP 'B' TO GOST 8733-74 AND MATERIAL AS PER OPEN HEARTH KILLED STEEL OF GRADE 10 TO GOST 1050-74.

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

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

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

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

18) MARKING / IDENTIFICATION.

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

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

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

19) PRESERVATION CHECK

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

20) PACKING CHECK

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

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

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

21) DOCUMENTATION

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

ii. Vendor has to submit Bill of materials, Material test reports, Class 'C' /Endurance test reports (wherever specified in drawing/TY specification/QAP) and Complete PIR (pre-inspection report) at the time of offering the item for inspection. HVF will commence inspection only after scrutiny of these documents.

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

iv. Pre inspection reports (PIR) of firm like, 1. Chemical analysis (NABL Certificate), 2.Mechanical properties (NABL Certificate), 3. Pre-forming process, 4. Coating certification (Wherever applicable), 5. Calibration reports of instruments and 6. 100 % Dimensional inspection reports and other relevant reports for acceptance of the item as specified in GOST/ Specification / drawings etc.

22) REFERENCE:

a) Drawing 172-2M.33.301

b) Material specification as per drawing

Sl. NO	DRG. NO	NOMENCLATURE	MATERIAL SPECIFICATIONS
1	172-2M.33.301	PIPE, PIPE 10X1.5-B20 / PIPE	PIPE 10X1.5 GOST 8734-75 B 20 GOST 8733-74

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

d) Alternate /Equivalent material:

1. B10 GOST 8733-74.

ANNEXURE-A

SL. NO.	CATEGORY	ASSEMBLY/ SUB ASSEMBLY	TESTS/ INSPECTION PARAMETERS	STANDARDS TO BE REFERRED	ACCEPTANCE CRITERIA	INSPECTION RESPONSIBILITY			REMARKS
						Firm	HVF	DGQA	
1	PIPE, PIPE 10X1.5-B20 / PIPE TO DRG. NO 172-2M.33.301.	**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		**Dimensional checks**	Dimensions as per the drawing	Refer drawing / QAP Para no: 12.1	Conform to drawing and QAP	P	W/P	R	100% by firm/ vendor SP followed by HVF.
4		**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% by firm/ vendor SP followed by HVF.
5		**Marking / traceability**	Firm has to make marking / traceability records.	Refer QAP Para no: 18	Confirm to QAP Para no: 18	P	V	R	100% by firm/ vendor.
6		**Preservation & packing**	Firm has to make Preservation & packing records	Refer QAP Para no: 19 & 20	Confirm to QAP Para no: 19 & 20	P	V	R	100% by firm/ vendor.

Note:

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

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.

3. All other relevant tests as specified in GOST/ Specification/ Drawing is to be carried out by firm and to be confirmed.

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

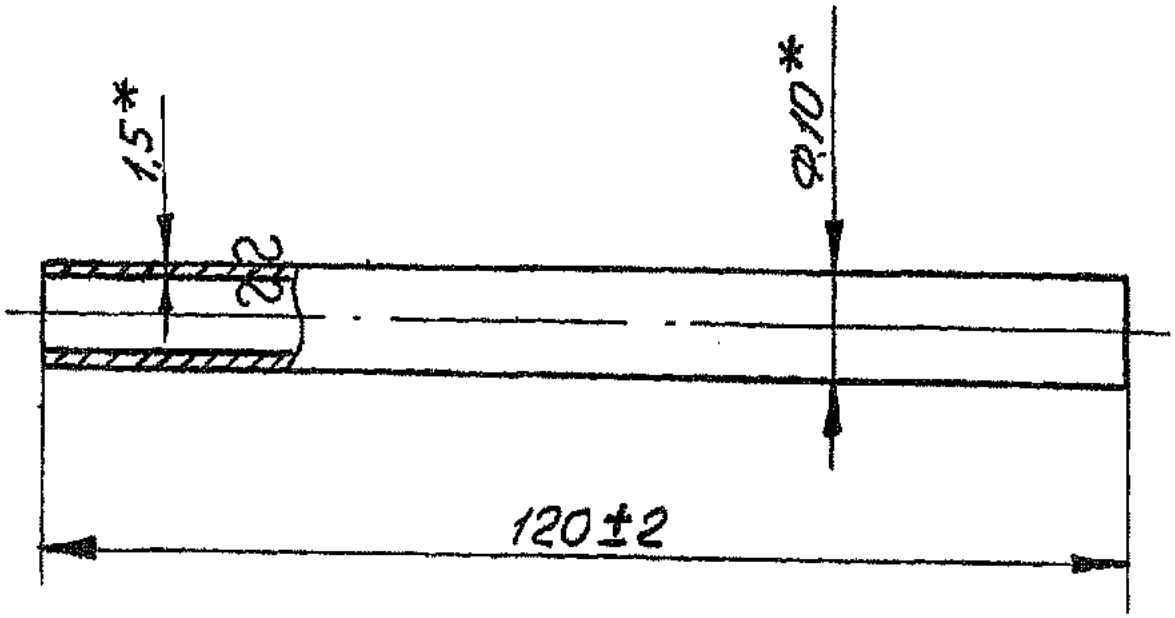


FIG: PIPE, PIPE 10X1.5-B20 / PIPE TO DRG. NO 172-2M.33.301
(For reference only)

APPENDIX ' A'

RECORD OF AMENDMENTS

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

RESTRICTED
(DRAFT/PROVISIONAL)
QUALITY ASSURANCE PLAN

FOR

(PIPE)

DRG.NO. 172.33.665-1

(LF NO: 6206305945)

No: HVF/T-90/QAP/33/PIPE/243088 - 00

ISSUE No: 00 **DATE: DEC – 2021**

QUALITY ASSURANCE (RIG–SUB ASSEMBLY)

HEAVY VEHICLES FACTORY

AVADI CHENNAI – 600 054

QUALITY ASSURANCE PLAN (QAP)

FOR

PIPE

DRG. NO. 172.33.665-1

PREPARED BY

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

REVIEWED BY

(ARUL DASS C)
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

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 172.33.665-1** 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 **PIPE TO DRG.NO: 172.33.665-1**

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 **PIPE TO DRG.NO.172.33.665-1** 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:

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

5. DOCUMENTS:

a) On placement of firm supply order, One set of relevant specification and technical instructions on the subject item can be obtained by the contractor from AHSP through DDO/HVF

b) Any clarification required on these documents should be obtained from the Inspecting Authority i.e. The Sr. General Manager, Heavy Vehicles Factory, Avadi, Chennai – 600 054. Equivalents to the collaborators specifications and standards will be decided only by the Inspecting Authority and should not be unilaterally decided. For any change in the specifications, standards or written approval, any alterations in specification can be affected and not otherwise.

c) The process instruction sheets supplied by the collaborators are available with the Authority Holding Sealed Particulars, i.e. The Controllerate of Quality Assurance (Heavy Vehicles), Avadi, Chennai for the reference. The relevant process sheets may be studied at the premises of the AHSP after obtaining necessary permission.

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

6. ITEM USED ON:

1. 172.33.223Cb-1
2. 172.33.256CbCb

7. LIST OF DRAWINGS:

Sl. NO.	DRG. NO	NOMENCLATURE	REMARKS
1	172.33.665-1	PIPE	-

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

Sl. NO	DRG. NO	NOMENCLATURE	MATERIAL SPECIFICATIONS	Qty
1	172.33.665-1	PIPE	PIPE 17X2 GOST 8734-75 B20 GOST 8733-74	1

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

9. CONDITIONS OF USE/STORAGE INSTRUCTIONS

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

(a) The threaded parts if any should be covered with suitable plastic caps to prevent damages.

(b) If the item consists of assemblies, each assembly should be packed separately.

(c) The stores are to be suitably covered for preventing ingress of dust and Dirt/entry of sunlight / moisture.

(d) The packaging slip shall contains

(i) Certificate of testing- NABL Certificate.

(ii) Guarantee/ Warranty Certificate.

(iii) Service and maintenance instructions.

(iv) Delivery Slip with Inspector's Acceptance Mark.

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

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

10. SAMPLING PLAN :

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

Note:-

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

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

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

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

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

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

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

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

12.1 PIPE TO DRG.NO 172.33.665-1:

1. All dimensions should be confirmed as per drawing.

2. Surface finish / Roughness should be confirmed as per drawing and specification.

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

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

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

13.1 PIPE TO DRG.NO 172.33.665-1

a) The component should be manufactured from

PIPE 17X2 GOST 8734-75
B20 GOST 8733-74

b) Chemical properties:

THE COMPONENT SHOULD BE MANUFACTURED FROM CARBON & ALLOY COLD DEFORMED SEAMLESS STEEL TUBE WITH STANDARDISED MECHANICAL PROPERTIES AS PER GROUP 'B' TO GOST 8733-74 & STANDARDISED CHEMICAL COMPOSITION AS PER KILLED STEEL OF GRADE '20' TO GOST 1050-74.

TOLERANCE ON φ17±0.30mm & THICKNESS 2±0.20 mm AS PER GOST 8734-75.

CHEMICAL COMPOSITION % AS PER GOST 1050-74:-

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

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

MECHANICAL PROPERTIES: AS PER GOST 8733-74.

GRADE OF STEEL	U T S Kgf/mm^2	YIELD POINT Kgf/mm^2	RELATIVE ELONGATION %
20	NOT LESS THAN		
	42	25	21

14) PERFORMANCES / ACCEPTANCE TEST: PIPE TO DRG.NO: 172.33.665-1

1. ALTERNATE MATERIAL : PIPE $\frac{17 \times 2 \text{ GOST } 8734\text{-}75}{\text{B } 20 \text{ GOST } 8733\text{-}74}$

2. STRAIGHTENED LENGTH AS PER NOMINAL DIMENSIONS ~ 580 mm

3. RAD II OF BENDING SHOULD BE UPTO THE AXIS OF BENDING IN THE PLANE.

4. IRREGULARITIES OF THE OVAL SECTION OF PIPE ARE PERMITTED.

5. * DIMENSIONS FOR REFERENCE.

6. OTHER REQUIREMENTS ARE ACCORDING TO THE SPECIFICATION 520 TY 1.

7. UNSPECIFIED LIMIT DEVIATIONS OF DIMENSIONS - ± 1.5

15) FITMENT AND PERFORMANCE TEST:

a. Pilot samples should be checked for fitment and Performance test to ascertain the efficacy of the system under different operating conditions by fitting in higher assembly and repeating it for functional checks, wherever required.

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

16) INTERCHANGEABILITY:

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

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

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

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

18) MARKING / IDENTIFICATION.

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

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

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

19) PRESERVATION CHECK

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

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

20) PACKING CHECK

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

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

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

21) DOCUMENTATION

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

ii. Vendor has to submit Bill of materials, Material test reports, Class 'C' /Endurance test reports (wherever specified in drawing/TY specification/QAP) and Complete PIR (pre-inspection report)at the time of offering the item for inspection. HVF will commence inspection only after scrutiny of these documents.

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

iv. Pre inspection reports (PIR) of firm like, 1. Chemical analysis (NABL Certificate), 2.Mechanical properties (NABL Certificate), 3. Pre-forming process, 4. Coating certification, 5. Calibration reports of instruments and 6. Dimensional inspection reports.

22) REFERENCE:

a) Drawing No: 172.33.665-1

b) Material specification as per drawing:

PIPE 17X2 GOST 8734-75
B20 GOST 8733-74

d) GOST 8734-75

e) GOST 8733-74

f) 520 TY1

g) Alternate Material : PIPE 17X2 GOST 8734-75
B20 GOST 8733-74

SL. NO	ITEM/ SUB ASSY/ ASSEMBLY	CATEGORY	TESTS/INSPECTION PARAMETERS	STANDARDS TO BE REFERRED	ACCEPTANCE CRITERIA	INSPECTION RESPONSIBILITY			REMARKS
						Firm	HVF	DGQA	
1	PIPE to DRG.NO: 172.33.665-1	**Pre inspection reports (PIR) of firm**	Firm has to produced all the document as per QAP	As per the relevant drawing and QAP.	Confirm to drawing and QAP as per bill of material	P	W/V	R	100% should be ensured.
2		**Bill of material (BOM)**	Firm has to prepare the BOM as per QAP	Refer QAP Para no: 8	Confirm to QAP.	P	W/V	R	100% should be ensured.
3		**Material Checks**	Chemical composition & Physical, Mechanical Properties	As per the 8734-75, GOST 8733-74, 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	Confirm to drawing and QAP.	P	W/V	R	100% should be ensured.
5		**Marking / traceability**	Firm has to make marking / traceability records.	Refer QAP Para no: 18	Confirm to QAP Para no: 18	P	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**

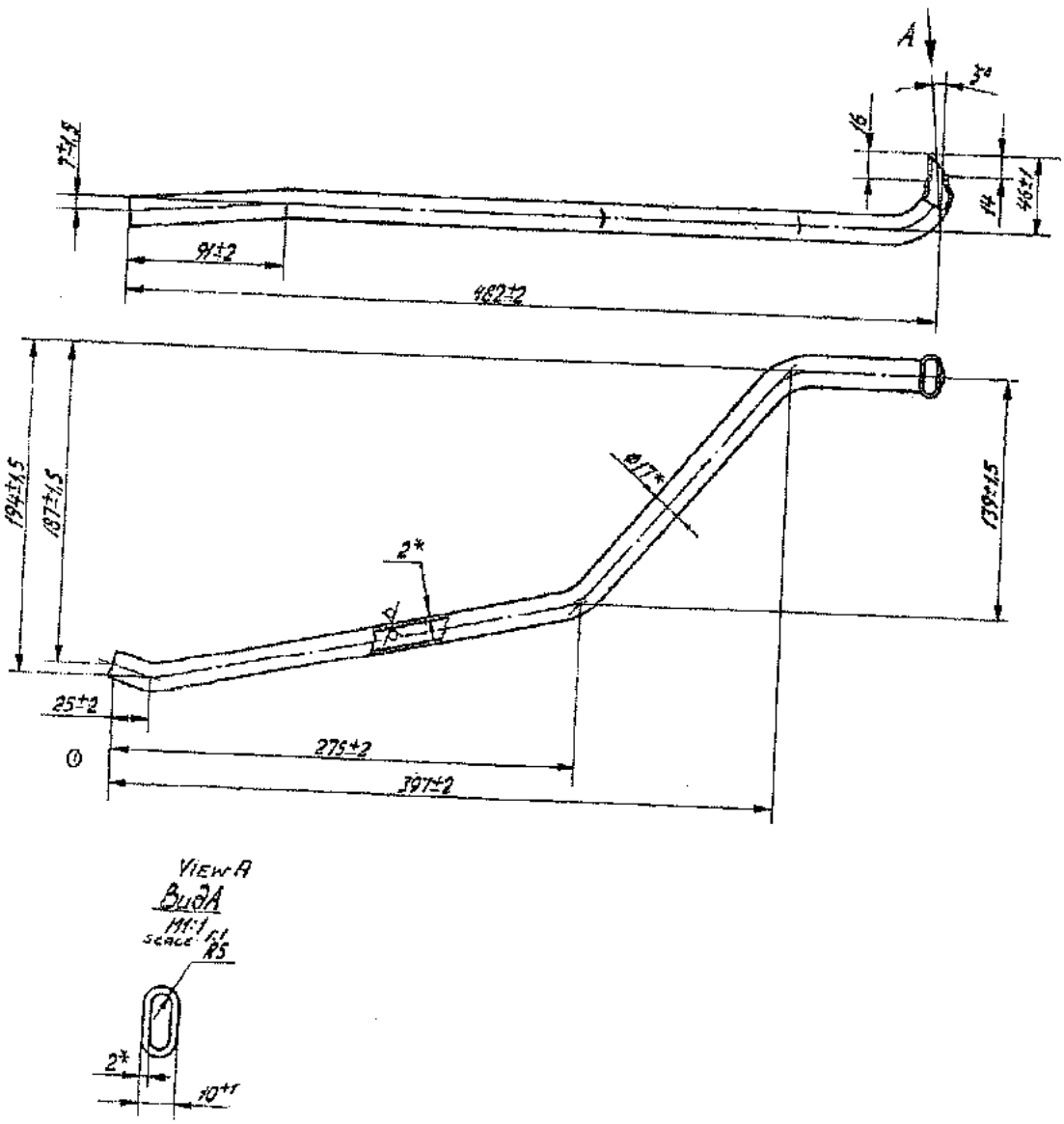


FIG: PIPE TO DRG. NO 172.33.665-1

APPENDIX ' A'

RECORD OF AMENDMENTS

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

RESTRICTED
(DRAFT/PROVISIONAL)
QUALITY ASSURANCE PLAN

FOR

(PIPE BRANCH)

DRG.NO.172.33.153

(LF NO: 6206305426)

No: HVF/T-72C/QAP/33/PIPE BRANCH/243231- 00

ISSUE No: 00 **DATE: DEC – 2021**

QUALITY ASSURANCE (RIG–SUB ASSEMBLY)

HEAVY VEHICLES FACTORY

AVADI CHENNAI – 600 054

QUALITY ASSURANCE PLAN (QAP)

FOR

PIPE BRANCH

DRG. NO. 172.33.153

PREPARED BY

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

REVIEWED BY

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

APPROVED BY

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

ISSUED BY

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

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 BRANCH TO DRG.NO 172.33.153** 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 BRANCH TO DRG.NO: 172.33.153**

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 BRANCH TO DRG. NO. 172.33.153** including the technical requirements of the drawings. The recommended Quality Plan stipulated herein is mandatory and should be strictly adhered to.

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

Note:

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

5. DOCUMENTS:

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

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

6. ITEM USED ON:

1. 176.33.004CB -
2. 172.33.225CB-2CB -

7. LIST OF DRAWINGS:

SI. NO.	DRG. NO	NOMENCLATURE	REMARKS
1	172.33.153	PIPE BRANCH	-

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

SI. NO	DRG. NO	NOMENCLATURE	MATERIAL SPECIFICATIONS	Qty
1	172.33.153	PIPE BRANCH	PIPE 38X1.5 GOST 8734-75 B 10 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	------	------
(v)	Pressure testing	------	------
(vi)	Machining / Fitment / Performance trial on higher assembly / Tank	------	------
vii)	Interchangeability Test	02 Nos.	02 Nos. per batch on randomly basis, except selective assembly.
viii)	Test stand/Jigs/ Fixtures/Gauges/Mandrels/etc.	100 %	100 %
ix)	Marking/Identification	100%	100%
x)	Packing/ Preservation	100%	100%

Note:-

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

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

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

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

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

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

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

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

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

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

12.1 PIPE BRANCH TO DRG.NO 172.33.153

All dimensions should be confirmed as per drawing.

Sl. No.	Drawing Dimensions
1.	60±1.5 mm
2.	1.5 mm
3.	8±1 mm
4.	ϕ 41±1 mm
5.	ϕ 38±1 mm
6.	R4
7.	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 BRANCH TO DRG.NO 172.33.153**

a) The component should be manufactured from

PIPE 38X1.5 GOST 8734-75

B10 GOST 8733-74

b) **Chemical properties:** As per STEEL GRADE B10 GOST 8733-74 & GOST 1050-74.

GRADE OF STEEL	CONTENT OF ELEMENTS, %			
	C	Si	Mn	Cr (MAX)
10	0.07-0.14	0.17-0.37	0.35-0.65	0.15
20	0.17-0.24	0.17-0.37	0.35-0.65	0.25

NOTE:-

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

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

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

c) **Mechanical properties:** As per STEEL GRADE B10 GOST 8733-74.

GRADE OF STEEL	UTS Kgf/mm²	YIELD POINT δT Kgf/mm²	RELATIVE ELONGATION $\delta 5$ %
	NOT LESS THAN		
10	35	21	24
20	42	25	21

Note: For other properties refer GOST 8733-74.

14) **PERFORMANCES/ACCEPTANCE TEST: PIPE BRANCH TO DRG.NO.172.33.153**

1. Alternate material B20 GOST 8733-74.
2. Dents are not allowed. Ovality should not exceed 1.5mm.

EXPLANATORY NOTE:

THE COMPONENT SHOULD BE MANUFACTURED FROM CARBON AND ALLOY COLD DEFORMED SEAMLESS STEEL TUBE OF GROUP 'B' (WITH STANDARDISED MECHANICAL PROPERTIES & CHEMICAL COMPOSITIONS) TO GOST 8733-74.
MATERIAL:-AS PER KILLED STEEL OF GRADE 10 TO GOST 1050-74.
DIMENSIONS & LIMIT DEVIATION OF TUBE OUTSIDE ϕ38mm & THICKNESS 1.5mm SHOULD CONFORM TO GOST 8734-75.

ALTERNATIVELY IT MAY BE PRODUCED FROM STEEL TUBE OF GROUP 'B' TO GOST 8733-74 AND MATERIAL AS PER KILLED STEEL OF GRADE 20 TO GOST 1050-74.

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

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

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

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

18) **MARKING / IDENTIFICATION.**

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

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

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

19) **PRESERVATION CHECK**

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

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

20) PACKING CHECK

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

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

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

21) DOCUMENTATION

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

ii. Vendor has to submit Bill of materials, Material test reports, Class 'C' /Endurance test reports (wherever specified in drawing/TY specification/QAP) and Complete PIR (pre-inspection report)at the time of offering the item for inspection. HVF will commence inspection only after scrutiny of these documents.

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

iv. Pre inspection reports (PIR) of firm like, 1. Chemical analysis (NABL Certificate), 2.Mechanical properties (NABL Certificate), 3. Pre-forming process, 4. Coating certification, 5. Calibration reports of instruments and 6. Dimensional inspection reports.

22) REFERENCE:

a) Drawing 172.33.153

b) Material specification as per drawing

Sl. NO	DRG. NO	NOMENCLATURE	MATERIAL SPECIFICATIONS
1	172.33.153	PIPE BRANCH	PIPE 38X1.5 GOST 8734-75 B 10 GOST 8733-74

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

d) Alternate material:

1. B20 GOST 8733-74.
2. CDS GRADE-3 TO IS: 3074-79.

ANNEXURE-A

SL. NO.	CATEGORY	ASSEMBLY/ SUB ASSEMBLY	TESTS/ INSPECTION PARAMETERS	STANDARDS TO BE REFERRED	ACCEPTANCE CRITERIA	INSPECTION RESPONSIBILITY			REMARKS
						Firm	HVF	DGQA	
1	PIPE BRANCH TO DRG. NO 172.33.153.	**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** **SP-Sampling Plan**

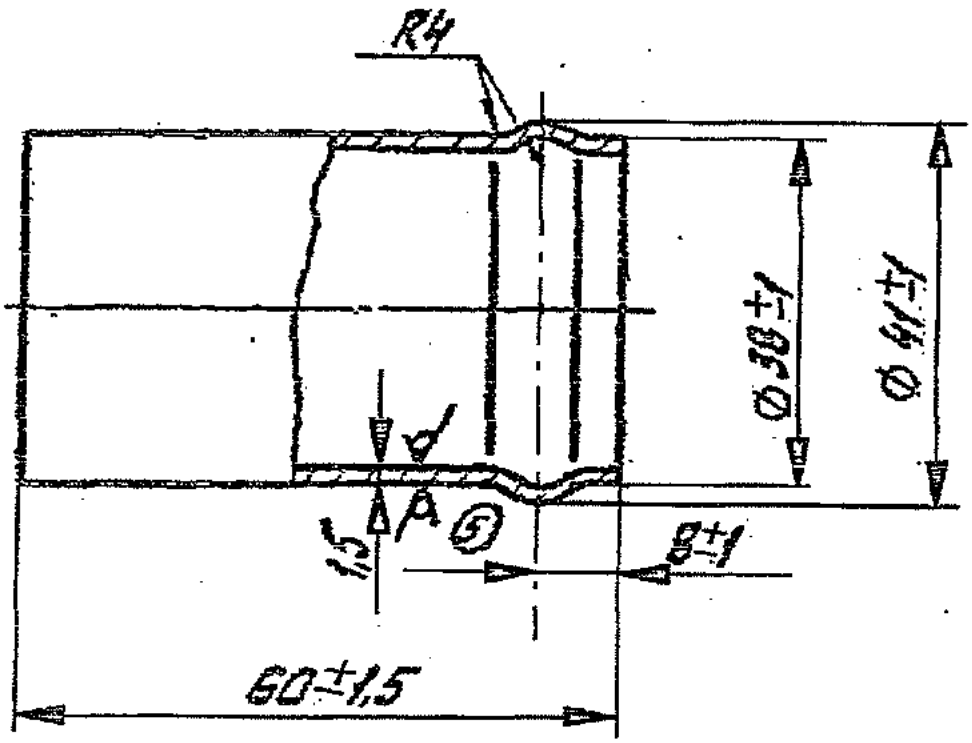


FIG: PIPE BRANCH TO DRG. NO 172.33.153

APPENDIX ' A'

RECORD OF AMENDMENTS

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

RESTRICTED

(DRAFT/PROVISIONAL) QUALITY ASSURANCE PLAN

FOR

(PIPE BRANCH)

DRG.NO.172.33.516

(LF NO: 6206305467)

No: HVF/T-72C/QAP/33/PIPE BRANCH/243355- 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 BRANCH

DRG. NO. 172.33.516

PREPARED BY

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

REVIEWED BY

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

APPROVED BY

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

ISSUED BY

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

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 BRANCH TO DRG.NO 172.33.516** 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 BRANCH TO DRG.NO: 172.33.516**

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 BRANCH TO DRG. NO. 172.33.516** including the technical requirements of the drawings. The recommended Quality Plan stipulated herein is mandatory and should be strictly adhered to.

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

Note:

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

5. DOCUMENTS:

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

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

6. ITEM USED ON:

1. 172.33.160CBCB -

7. LIST OF DRAWINGS:

SI. NO.	DRG. NO	NOMENCLATURE	REMARKS
1	172.33.516	PIPE BRANCH	-

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

SI. NO	DRG. NO	NOMENCLATURE	MATERIAL SPECIFICATIONS	Qty
1	172.33.516	PIPE BRANCH	PIPE 10X1.5 GOST 8734-75 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	------	---------
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 BRANCH TO DRG.NO 172.33.516

All dimensions should be confirmed as per drawing.

Sl. No.	Drawing Dimensions
1.	184±1.5 mm
2.	1.5* mm
3.	50±1.5 mm
4.	180±1.5 mm
5.	29±1.5 mm
6.	23±1.5 mm
7.	50±1.5 mm
8.	Φ10* mm
9.	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 BRANCH TO DRG.NO 172.33.516**

a) The component should be manufactured from

PIPE 10X1.5 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	P	S	Cu	Ni
				MAXIMUM				
20	0,17–0,24	0,17–0,37	0,35–0,65	0,25	0,035	0,040	0,25	0,25
10	0,07–0,14	0,17–0,37	0,35–0,65	0,25	0,035	0,040	0,25	0,25

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

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

GRADE OF STEEL	UTS Kgf/mm²	YIELD POINT δ_T Kgf/mm²	RELATIVE ELONGATION δ_5 %
	NOT LESS THAN		
10	35	21	24
20	42	25	21

Note: For other properties refer GOST 8733-74.

14) **PERFORMANCES/ACCEPTANCE TEST: PIPE BRANCH TO DRG.NO.172.33.516**

1. ALTERNATE MATERIAL B10 GOST 8733-74.
2. DENTS AT A LENGTH OF 30 mm FROM FACE A AND AT A LENGTH OF 10 mm FROM THE OTHER FACE ARE NOT ALLOWED. OVALITY, NOT MORE THAN 1 mm IS PERMISSIBLE.
3. RADII OF BENDING UP TO THE AXIS IN THE BENDING PLANE SHOULD BE 20 mm.
4. LENGTH OF STRAIGHTENED COMPONENT AS PER THE TRUE DIMENSIONS IS APPROXIMATELY 210 mm.
5. * DIMENSIONS FOR REFERENCE.
6. OTHER REQUIREMENTS ARE TO BE IN ACCORDANCE WITH SPECIFICATIONS 520 TY 1.

EXPLANATORY NOTE :-

MATERIAL QUOTED : PIPE 10X1,5 GOST 8734-75
B20 GOST 8733-74

ALTERNATE MATERIAL QUOTED : B10 GOST 8733-74

10 = EXTERNAL DIAMETER

1,5 = WALL THICKNESS

15) FITMENT AND PERFORMANCE TEST:

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

16) INTERCHANGEABILITY:

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

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

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

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

18) MARKING / IDENTIFICATION.

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

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

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

19) PRESERVATION CHECK

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

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

20) PACKING CHECK

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

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

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

21) DOCUMENTATION

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

ii. Vendor has to submit Bill of materials, Material test reports, Class 'C' /Endurance test reports (wherever specified in drawing/TY specification/QAP) and Complete PIR (pre-inspection report)at the time of offering the item for inspection. HVF will commence inspection only after scrutiny of these documents.

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

iv. Pre inspection reports (PIR) of firm like, 1. Chemical analysis (NABL Certificate), 2.Mechanical properties (NABL Certificate), 3. Pre-forming process, 4. Coating certification, 5. Calibration reports of instruments and 6. Dimensional inspection reports.

22) REFERENCE:

a) Drawing 172.33.516

b) Material specification as per drawing

Sl. NO	DRG. NO	NOMENCLATURE	MATERIAL SPECIFICATIONS
1	172.33.516	PIPE BRANCH	PIPE 10X1.5 GOST 8734-75 B 20 GOST 8733-74

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

d) Specification 520 TY1.

e) Alternate material:

1. B10 GOST 8733-74.

ANNEXURE-A

SL. NO.	CATEGORY	ASSEMBLY/ SUB ASSEMBLY	TESTS/ INSPECTION PARAMETERS	STANDARDS TO BE REFERRED	ACCEPTANCE CRITERIA	INSPECTION RESPONSIBILITY			REMARKS
						Firm	HVF	DGQA	
1	PIPE BRANCH TO DRG. NO 172.33.516.	**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** **SP-Sampling Plan**

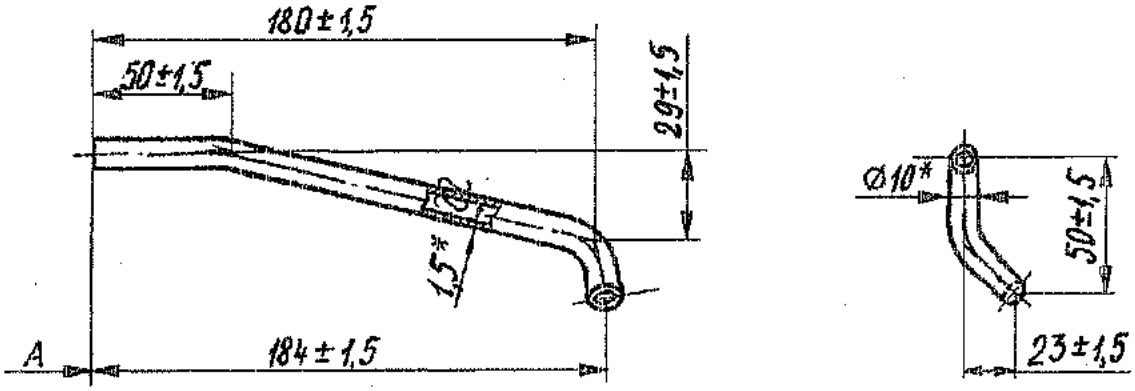


FIG: PIPE BRANCH TO DRG. NO 172.33.516

APPENDIX ' A'

RECORD OF AMENDMENTS

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

RESTRICTED
(DRAFT/PROVISIONAL)
QUALITY ASSURANCE PLAN

FOR

(TUBE)

DRG.NO.175.41.065

(LF NO: 6206402048)

No: HVF/T-72C/QAP/41/TUBE/242887- 00

ISSUE No: 00 **DATE: NOV – 2021**

QUALITY ASSURANCE (RIG–SUB ASSEMBLY)

HEAVY VEHICLES FACTORY

AVADI CHENNAI – 600 054

QUALITY ASSURANCE PLAN (QAP)

FOR

TUBE

DRG. NO. 175.41.065

PREPARED BY

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

REVIEWED BY

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

APPROVED BY

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

ISSUED BY

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

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 **TUBE TO DRG.NO 175.41.065** 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 **TUBE TO DRG.NO: 175.41.065**

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 **TUBE TO DRG. NO. 175.41.065** including the technical requirements of the drawings. The recommended Quality Plan stipulated herein is mandatory and should be strictly adhered to.

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

Note:

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

5. DOCUMENTS:

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

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

6. ITEM USED ON:

1. 175.41.011CBCB - COVER.

7. LIST OF DRAWINGS:

SI. NO.	DRG. NO	NOMENCLATURE	REMARKS
1	175.41.065	TUBE	-

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

SI. NO	DRG. NO	NOMENCLATURE	MATERIAL SPECIFICATIONS	Qty
1	175.41.065	TUBE	TUBE 14X1 GOST 8734-75 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	------	------
(v)	Pressure testing	------	-------
(vi)	Machining / Fitment / Performance trial on higher assembly / Tank	------	------
vii)	Interchangeability Test	02 Nos.	02 Nos. per batch on randomly basis, except selective assembly.
viii)	Test stand/Jigs/ Fixtures/Gauges/Mandrels/etc.	100 %	100 %
ix)	Marking/Identification	100%	100%
x)	Packing/ Preservation	100%	100%

Note:-

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

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

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

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

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

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

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

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

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

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

12.1 TUBE TO DRG.NO 175.41.065

All dimensions should be confirmed as per drawing.

Sl. No.	Drawing Dimensions
1.	60±1 mm
2.	1 mm
3.	ϕ14±0.3 mm
4.	Surface finish / Roughness should be ensured as per drawing and specification.

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

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

Material specimen / test bars of the components shall be in conformity as per the material mentioned in the relevant documents/drawing. 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 TUBE TO DRG.NO 175.41.065

a) The component should be manufactured from

TUBE 14X1 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: TUBE TO DRG.NO 175.41.065

1) Component may be manufactured from TUBE 14X1 GOST 8734-75.
B10 GOST 8733-74

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

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

The supplier / Contractor should have suitable Instruments, Test Stand, jigs, fixture, mandrels and gauges to carry out quality checks, to ensure

conformance of components/assembly as per drawing and Specification /T.R points.

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

18) MARKING / IDENTIFICATION.

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

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

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

19) PRESERVATION CHECK

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

20) PACKING CHECK

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

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

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

21) DOCUMENTATION

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

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

iv. Pre inspection reports (PIR) of firm like, 1. Chemical analysis (NABL Certificate), 2.Mechanical properties (NABL Certificate), 3. Pre-forming process, 4. Coating certification, 5. Calibration reports of instruments and 6. Dimensional inspection reports.

22) REFERENCE:

a) Drawing 175.41.065.
b) Material specification as per drawing
TUBE 14X1 GOST 8734-75
B20 GOST 8733-74.
c) GOST 1050-74, GOST 8734-75 & GOST 8733-74.
d) Alternate material:
1. TUBE 14X1 GOST 8734-575
B10 GOST 8733-6674.

ANNEXURE-A

SL. NO.	CATEGORY	ASSEMBLY/ SUB ASSEMBLY	TESTS/ INSPECTION PARAMETERS	STANDARDS TO BE REFERRED	ACCEPTANCE CRITERIA	INSPECTION RESPONSIBILITY			REMARKS
						Firm	HVF	DGQA	
1	TUBE TO DRG. NO 175.41.065.	**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	W/V	R	100% should be ensured.
2		**Bill of material (BOM)**	Firm has to prepare the BOM as per QAP	Refer QAP Para no: 8 or item list.	Confirm to QAP.	P	W/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/V	R	100% should be ensured.
5		**Marking / traceability**	Firm has to make marking / traceability records.	Refer QAP Para no: 18	Confirm to QAP Para no: 18	P	W/V	R	100% to be done
6		**Preservation & packing**	Firm has to make Preservation & packing records	Refer QAP Para no: 19 & 20	Confirm to QAP Para no: 19 & 20	P	W/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**

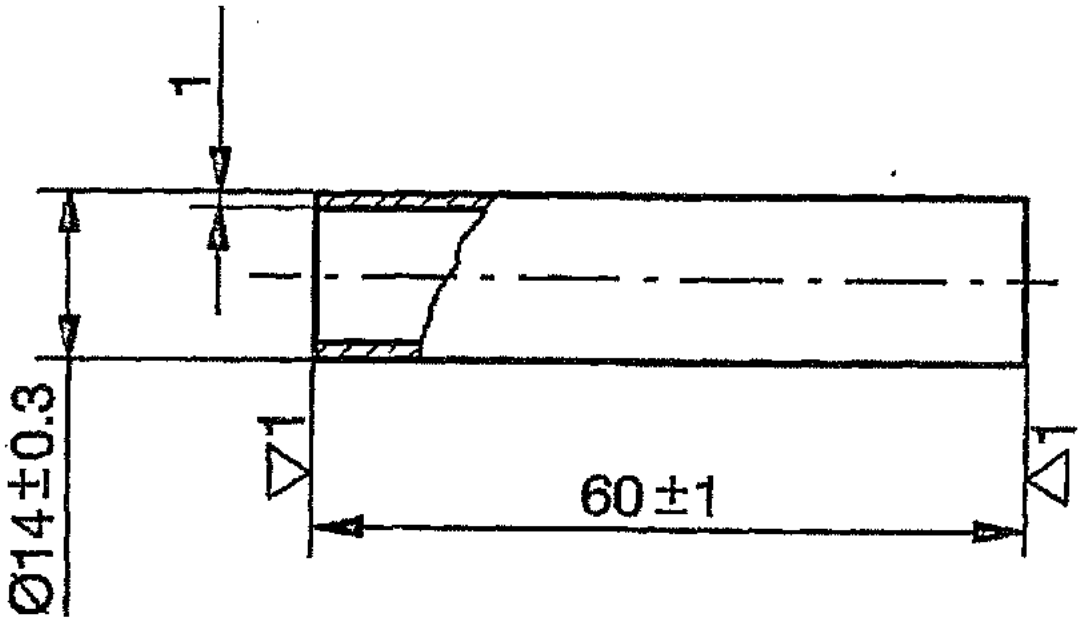


FIG: TUBE TO DRG. NO 175.41.065

APPENDIX ' A'

RECORD OF AMENDMENTS

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

RESTRICTED
(DRAFT/PROVISIONAL)
QUALITY ASSURANCE PLAN

FOR

(GUIDE BUSH)

DRG.NO.54.05.273-A

(LF NO: 6206305625)

No: HVF/T-72C/QAP/05/GUIDE BUSH/243216- 00

ISSUE No: 00 **DATE: DEC – 2021**

QUALITY ASSURANCE (RIG–SUB ASSEMBLY)

HEAVY VEHICLES FACTORY

AVADI CHENNAI – 600 054

QUALITY ASSURANCE PLAN (QAP)

FOR

GUIDE BUSH

DRG. NO. 54.05.273-A

PREPARED BY

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

REVIEWED BY

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

APPROVED BY

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

ISSUED BY

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

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 **GUIDE BUSH TO DRG.NO 54.05.273-A** being procured indigenously. This is prepared, based on the acceptance standards and inspection parameters laid down in collaborators documents and on the inspection test standards followed in respect of similar indigenous items.

2. This QAP is the property of Government of India and is liable for amendments as and when required. The Sr. General Manager, Heavy Vehicles Factory, Avadi, Chennai – 600 054, is the inspecting Authority for this assembly. Any query / clarification on the content of this QAP shall be referred to this Factory. Any departure from these instructions is allowed only after written approval from the above authority. Notwithstanding the tests indicated in this QAP, the inspecting Officer has the right to carry out any test to check conformance to the paper particulars quoted in the Supply Order, which he may consider necessary to satisfy himself about the stores which he has to accept.

3.AIM

The QAP is aimed at standardizing the Inspection procedure and acceptance norm for **GUIDE BUSH TO DRG.NO: 54.05.273-A**

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

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

4. SCOPE:

This QAP outlines in general terms, the checks and methods to be used during inspection of **GUIDE BUSH TO DRG. NO. 54.05.273-A** including the technical requirements of the drawings. The recommended Quality Plan stipulated herein is mandatory and should be strictly adhered to.

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

Note:

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

5. DOCUMENTS:

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

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

6. ITEM USED ON:

1. 54.05.86CB-1CB -

7. LIST OF DRAWINGS:

Sl. NO.	DRG. NO	NOMENCLATURE	REMARKS
1	54.05.273-A	GUIDE BUSH	-

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

Sl. NO	DRG. NO	NOMENCLATURE	MATERIAL SPECIFICATIONS	Qty
1	54.05.273-A	GUIDE BUSH	TUBE 30X1 GOST 8734-75 B 10 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	------	------
(v)	Pressure testing	------	------
(vi)	Machining / Fitment / Performance trial on higher assembly / Tank	------	------
vii)	Interchangeability Test	02 Nos.	02 Nos. per batch on randomly basis, except selective assembly.
viii)	Test stand/Jigs/ Fixtures/Gauges/Mandrels/etc.	100 %	100 %
ix)	Marking/Identification	100%	100%
x)	Packing/ Preservation	100%	100%

Note:-

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

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

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

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

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

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

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

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

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

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

12.1 GUIDE BUSH TO DRG.NO 54.05.273-A

All dimensions should be confirmed as per drawing.

Sl. No.	Drawing Dimensions
1.	34±1 mm
2.	14^{+1} mm
3.	20^{+1} mm
4.	1 mm
5.	8.3±1 mm
6.	$\phi 10^{+1}$ mm
7.	ϕ30±0.3 mm
8.	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 GUIDE BUSH TO DRG.NO 54.05.273-A

a) The component should be manufactured from

TUBE 30X1 GOST 8734-75
B10 GOST 8733-74

b) **Chemical properties:** As per STEEL GRADE B10 GOST 8733-74 & GOST 1050-74.

GRADE OF STEEL	C	Si	Mn	Cr (MAX)
10	0.07-0.14	0.17-0.37	0.35-0.65	0.15
20	0.17-0.24	0.17-0.37	0.35-0.65	0.25
08КП	0.05-0.11	0.03 (MAX)	0.25-0.50	0.10

NOTE:-

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

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

Note-1: For mass fraction of other elements refer GOST 1050-74.

c) **Mechanical properties:** As per STEEL GRADE B10 GOST 8733-74.

GRADE OF STEEL	U T S Kgf/mm²	YIELD POINT Kgf/mm²	RELATIVE ELONGATION%
	MINIMUM		
10	35	21	24

Note: For other properties refer GOST 8733-74.

14) PERFORMANCES/ACCEPTANCE TEST: GUIDE BUSH TO DRG.NO.54.05.273-A

1. May be manufactured from steel grade 20, Gost 1050-60 open-hearth and steel 08 КП (rimming) of any of finishing and stamping group (except IV Н)
2. Misalignment of axis of hole Ø 10 and opening, relative to the axis of the component should not exceed 1 mm.

EXPLANATORY NOTE:-

THE COMPONENT SHOULD BE MANUFACTURED FROM CARBON & ALLOY COLD DEFORMED SEAMLESS STEEL TUBE WITH STANDARDISED MECHANICAL PROPERTIES & STANDARDISED CHEMICAL COMPOSITIONS AS PER GROUP 'B' TO GOST 8733-74. MATERIAL AS PER KILLED STEEL OF GRADE 10 TO GOST 1050-74. TOLERANCE ON EXTERNAL $\phi 30^{+0.30}$mm & WALL THICKNESS $1.0^{+0.12}$mm TO GOST 8734-75 ALTERNATIVELY THE SUBJECT ITEM MAY BE PRODUCED FROM CARBON STRUCTURAL HOT ROLLED KILLED STEEL (OPEN HEARTH) OF GRADE 20 OR RIMMED STEEL OF GRADE 08КП, (EXCEPT CATEGORY IV-WORK HARDENED-'H') TO GOST 1050-74

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

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

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

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

18) MARKING / IDENTIFICATION.

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

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

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

19) PRESERVATION CHECK

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

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

20) PACKING CHECK

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

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

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

21) DOCUMENTATION

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

ii. Vendor has to submit Bill of materials, Material test reports, Class 'C' /Endurance test reports (wherever specified in drawing/TY specification/QAP) and Complete PIR (pre-inspection report)at the time of offering the item for inspection. HVF will commence inspection only after scrutiny of these documents.

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

iv. Pre inspection reports (PIR) of firm like, 1. Chemical analysis (NABL Certificate), 2.Mechanical properties (NABL Certificate), 3. Pre-forming process, 4. Coating certification, 5. Calibration reports of instruments and 6. Dimensional inspection reports.

22) REFERENCE:

a) Drawing 54.05.273-A

b) Material specification as per drawing

Sl. NO	DRG. NO	NOMENCLATURE	MATERIAL SPECIFICATIONS
1	54.05.273-A	GUIDE BUSH	TUBE 30X1 GOST 8734-75. B 10 GOST 8733-74.

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

d) Alternate Material:

a. Refer QAP Para NO: 14(1)

ANNEXURE-A

SL. NO.	CATEGORY	ASSEMBLY/ SUB ASSEMBLY	TESTS/ INSPECTION PARAMETERS	STANDARDS TO BE REFERRED	ACCEPTANCE CRITERIA	INSPECTION RESPONSIBILITY			REMARKS
						Firm	HVF	DGQA	
1	GUIDE BUSH TO DRG. NO 54.05.273-A.	**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**

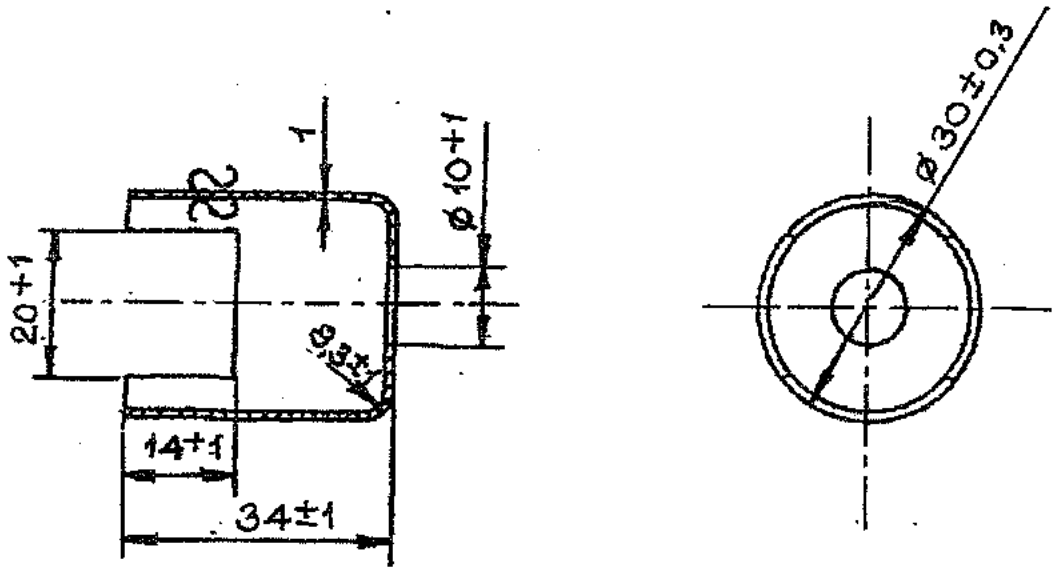


FIG: GUIDE BUSH TO DRG. NO 54.05.273-A

APPENDIX ' A'

RECORD OF AMENDMENTS

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

RESTRICTED
(DRAFT/PROVISIONAL)
QUALITY ASSURANCE PLAN

FOR

(PIPE ASSY)

DRG.NO.175.01.120CB

(LF NO: 6206801081)

No.HVF/T-72C/QAP/01/PIPE ASSY/243535-00

ISSUE No: 00 **DATE: APRIL-2022**

QUALITY ASSURANCE (RIG–SUB ASSEMBLY)

HEAVY VEHICLES FACTORY

AVADI CHENNAI – 600 054

QUALITY ASSURANCE PLAN (QAP)

FOR

PIPE ASSY

DRG. NO. 175.01.120CB

PREPARED BY

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

REVIEWED BY

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

APPROVED BY

(A.ANNACHAMY)
AWM/QA-RIG-ASSY

ISSUED BY

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

1. IMPORTANT NOTES

Note-1

This is only a provisional and will be amended from time to time according to the requirement. No addition, deletion and reproduction will be done without 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/specification/GOST issued along with the contract, the latter only will prevail.

2. INTRODUCTION

1. This quality plan lays down the inspection and testing procedure to be carried out on the component **PIPE ASSYTO DRG.NO 175.01.120CB**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 ASSYTO DRG.NO.175.01.120CB.**

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 ASSYTO DRG. NO. 175.01.120CB**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 to be obtained by the contractor from AHSP through DDO/HVF
b) Any clarification required on these documents to be obtained from the Inspecting Authority i.e. The Sr. General Manager, Heavy Vehicles Factory, Avadi, Chennai – 600 054. Equivalents to the collaborators specifications and standards will be decided only by the Inspecting Authority and should not be unilaterally decided. For any change in the specifications, standards or written approval, any alterations in specification can be affected and not otherwise.
c) The process instruction sheets supplied by the collaborators are available with the Authority Holding Sealed Particulars, i.e. The Controllerate of Quality Assurance (Heavy Vehicles), Avadi, Chennai for the reference. The relevant process sheets may be studied at the premises of the AHSP after obtaining necessary permission.
d) The supplier after scrutiny of the concerned process sheets and connected paper particulars should establish the necessary production and inspection facilities. Particularly the inspection test rigs, stands, fixtures, template, gauges etc should be provided as recommended in these process sheets. If process sheet /

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

6. ITEM USED ON:

1) 175.01.045CB-2A -

7.LIST OF DRAWINGS:

SI. NO.	DRG. NO	NOMENCLATURE	REMARKS
	175.01.120CB	**PIPE ASSY**	-
1	175.01.234	BUSH	-
2	175.01.236	PIPE	NO SEPARATE DRAWING

8. BILL OF MATERIALS:

SI. NO.	DRG. NO	NOMENCLATURE	MATERIAL SPECIFICATIONS	QTY
	175.01.120CB	**PIPE ASSY**	------	
1	175.01.234	BUSH	OPEN HEARTH STEEL 15 GOST 1050-74	1
2	175.01.236	PIPE	PIPE 32x2-x18H10T GOST 9941-72	1

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

9. CONDITIONS OF USE/STORAGE INSTRUCTIONS

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

(a) The threaded parts if any should be covered with suitable plastic caps to prevent damages.

(b) If the item consists of assemblies, each assembly should be packed separately.

(c) The stores are to be suitably covered for preventing ingress of dust and Dirt/entry of sunlight / moisture.

(d) The packaging slip shall contains

(i) Certificate of testing- NABL Certificate.
(ii) Guarantee/ Warranty Certificate.
(iii) Service and maintenance instructions.
(iv) Delivery Slip with Inspector's Acceptance Mark.
(v) Undertaking and certificate of conformance (As applicable).

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

10.SAMPLING PLAN:

Sl. No.	Sampling Plan	Pilot	Bulk
(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.	02Nos.perbatchon 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.

Sl. NO.	DRG. NO	NOMENCLATURE	REMARKS
	175.01.120CB	**PIPE ASSY**	All dimensions should be confirmed against each item as per relevant drawing/specification.
1	175.01.234	BUSH	
2	175.01.236	PIPE	

NOTE:

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

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

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

13.1 BUSH TO DRG.NO 175.01.234

a) The component should be manufactured from OPEN HEARTH STEEL 15 GOST 1050-74.
b) **Chemical properties:** As per STEEL 15 GOST 1050-74.

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

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

c) **Mechanical properties:** As per STEEL 15 GOST 1050-74.

GRADE OF STEEL	YIELD POINT Kg/mm^2	U T S Kg/mm^2	ELONGATION %	REDUCTION OF AREA %	IMPACT STRENGTH Kgm/cm^2
	MINIMUM				
15	23	38	27	55	—

NOTE: For other parameters refer GOST 1050-74.

13.2 **PIPE TO DRG NO 175.01.236**

a) The component should be manufactured from 32x2-x18H10T GOST 9941-72.

b) **Chemical properties:** As per 32x2-x18H10T GOST 9941-72.
For details refer
32x2-x18H10T GOST 9941-72

c) **Mechanical properties:** As per 32x2-x18H10T GOST 9941-72.
For details refer
32x2-x18H10T GOST 9941-72.

d) **Alternative material:**

1. PIPE 35x8-10-4 GOST 8735-75.
2. PIPE 35x8-20-A GOST 8735-75.
3. OPEN HEARTH STEEL 20 GOST 1050-74.

14) **PERFORMANCES/ACCEPTANCETEST:PIPE ASSY TO DRG NO: 175.01.120CB**

1. Component 2 is to be manufactured from pipe 32 x 2 - x 18H10T, GOST 9941-72.
2. Weld should not project beyond external surface of bush. Grinding is permissible.
3. *Dimensions for reference.

15) **FITMENT AND PERFORMANCE TEST:**

a. Pilot samples should be checked for fitment and Performance test to ascertain the efficacy of the system under different operating conditions by fitting in higher assembly and repeating it for functional checks, wherever required.

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

EXPLANATORY NOTE:

1) Stage wise process and inspection of the component as specified in TD Book/ Process Book/ illustration book/specification is to be confirmed by the supplier during manufacturing the components.
2) Firm shall submit details of manufacturing process, inspection process and also reports for the same to HVF.
3) If required/applicable HVF shall witness/verify stage wise inspection /process details during manufacturing of the components.
4) The component may be subject to endurance test, when fitted in higher assembly as specified in process / illustration /TD book.
5) Apart from above, all other relevant test for acceptance of the item as specified in GOST / Specification / drawing shall be carried out by the firm and the report/ certificates shall be submitted to HVF.

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 arelegible and considering the parameters mentioned in the drawing and specification.

19) PRESERVATION CHECK

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

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

20) PACKING CHECK

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

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

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

21) DOCUMENTATION

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

ii. Vendor has to submit Bill of materials, Material test reports, Class 'C' /Endurance test reports (wherever specified in drawing/TY specification/QAP) and Complete PIR (pre-inspection report)at the time of offering the item for inspection. HVF will commence inspection only after scrutiny of these documents.

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

iv. Pre inspection reports (PIR) of firm like, 1. Chemical analysis (NABL Certificate), 2.Mechanical properties (NABL Certificate), 3. Pre-forming process, 4. Coating certification (Wherever applicable), 5. Calibration reports of instruments and 6. 100 % Dimensional inspection reports and other relevant reports for acceptance of the item as specified in GOST/ Specification / drawings etc.

22) REFERENCE

a) Drawing No. 175.01.120CB.

b) Material Specification as per drawing.

SI. NO.	DRG. NO	NOMENCLATURE	MATERIAL SPECIFICATIONS
	175.01.120CB	**PIPE ASSY**	------
1	175.01.234	BUSH	OPEN HEARTH STEEL 15 GOST 1050-74
2	175.01.236	PIPE	PIPE 32x2-x18H10T GOST 9941-72

c) GOST 1050-74, GOST 9941-72

d) Alternate Material:

SI. NO.	DRG. NO	NOMENCLATURE	ALTERNATE MATERIAL
1	175.01.236	PIPE	1. PIPE 35x8-10-4 GOST 8735-75. 2. PIPE 35x8-20-A GOST 8735-75. 3. OPEN HEARTH STEEL 20 GOST 1050-74.

ANNEXURE-A

SL. NO.	CATEGORY	ASSEMBLY/ SUB ASSEMBLY	TESTS/ INSPECTION PARAMETERS	STANDARDS TO BE REFERRED	ACCEPTANCE CRITERIA	INSPECTION RESPONSIBILITY			REMARKS
						Firm	HVF	DGQA	
1	PIPE ASSYTO DRG. NO 175.01.120CB	Pre inspection reports (PIR) of firm	Firm has to produce all the document as per QAP	As per the relevant drawing and QAP.	Confirm to drawing and QAP as per bill of material	P	V	R	100% by firm/ vendor.
2		Bill of material (BOM)	Firm has to prepare the BOM as per QAP	Refer QAP Para no: 8 or item list.	Confirm to QAP	P	V	R	100% by firm/ vendor.
3		Material tests	Chemical composition & Mechanical / Physical Properties	As per– GOST/SPECIFICATION/ DRAWING	All the values to confirm with QAP Para no:(13.1 to 13.2 (a) (b) (c))	P	W/V	R	SP followed by HVF.
4		Hardness checks	Hardness	Refer QAP Para no:14	Confirm to QAP Para no: 14	P	V	R	100% by firm/ vendor SP followed by HVF.
5		Coating checks	Coating	Refer QAP Para no: 14.	Confirm to QAP Para no: 14	P	V	R	100% by firm/ vendor SP followed by HVF.
6		Dimensional checks	Dimensions as per the drawing	Refer drawing / QAP Para no: 12	Confirm to drawing and QAP	P	W/P	R	100% by firm/ vendor SP followed by HVF.
7		Marking / traceability	Marking / traceability	Refer QAP Para no:18	Confirm to QAP Para no: 18	P	V	R	100% by firm/ vendor.
8		Preservation & packing	Preservation & packing	Refer QAP Para no 19 & 20	Confirm to QAP Para no 19 & 20	P	V	R	100% by firm/ vendor.

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

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

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

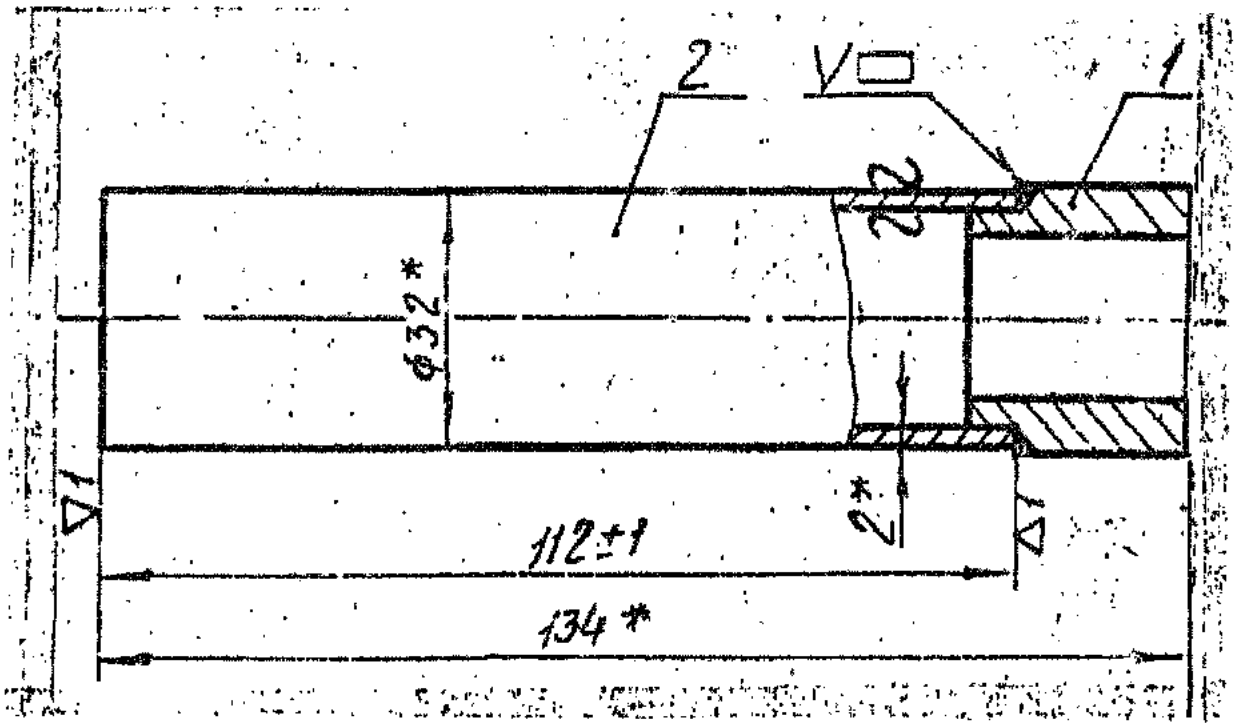


FIG: PIPE ASSYTO DRG.NO.175.01.120CB
(For reference only)

APPENDIX 'A'

RECORD OF AMENDMENTS

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

RESTRICTED
(DRAFT / PROVISIONAL)
QUALITY ASSURANCE PLAN

FOR

(PIPE)

DRG.NO.172.33.495

(LF NO: 6206305456)

No: HVF/T-72C/QAP/33/PIPE/243369- 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. 172.33.495

PREPARED BY

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

REVIEWED BY

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

APPROVED BY

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

ISSUED BY

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

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 172.33.495** 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: 172.33.495.**

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. 172.33.495** including the technical requirements of the drawings. The recommended Quality Plan stipulated herein is mandatory and should be strictly adhered to.

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

Note:

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

5. DOCUMENTS:

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

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

6. ITEM USED ON:

1. 176.33.004CB -
2. 172.33.225CB-2CB -

7. LIST OF DRAWINGS:

Single (individual) item

Sl. NO.	DRG. NO	NOMENCLATURE	REMARKS
1	172.33.495	PIPE	-

8. BILL OF MATERIALS:

Single (individual) items, details as below,

Sl. NO	DRG. NO	NOMENCLATURE	MATERIAL SPECIFICATIONS	Qty
1	172.33.495	PIPE	OPEN HEARTH STEEL 10Kn RIMMING -5-II- Г GOST 16523-70.	1

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

9. CONDITIONS OF USE / STORAGE INSTRUCTIONS

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

(a) The threaded parts if any should be covered with suitable plastic caps to prevent damages.

(b) If the item consists of assemblies, each assembly should be packed separately.

(c) The stores are to be suitably covered for preventing ingress of dust and Dirt/entry of sunlight / moisture.

(d) The packaging slip shall contains

(i) Certificate of testing- NABL Certificate.

(ii) Guarantee/ Warranty Certificate.

(iii) Service and maintenance instructions.

(iv) Delivery Slip with Inspector's Acceptance Mark.

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

10. SAMPLING PLAN :

Sl. No.	Sampling Plan	Pilot	Bulk
(i)	Visual Inspection	100%	100%
(ii)	Dimensional Inspection	100%	General Inspection level III, single sampling, Normal Inspection, AQL 2.5 of IS 2500 (Part-I)-2000
(iii)	Material Inspection	1 No	1 No. for each batch of raw material or heat treatment lot as required by specifications.
(iv)	Acceptance test	100%	100%
(v)	Pressure testing	100%	100%
(vi)	Machining / Fitment / Performance trial on higher assembly / Tank	1 No	1 No per batch / As required.
vii)	Interchangeability Test	02 Nos.	02 Nos. per batch on randomly basis, except selective assembly.
viii)	Test stand/Jigs/ Fixtures/Gauges/Man 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 TO DRG.NO 172.33.495

All dimensions should be confirmed as per drawing.

Sl. No.	Drawing Dimensions
1.	Φ164 (+1 / -0.5) mm
2.	1.5±0.12 mm
3.	34±1.5 mm
4.	413±1 mm
5.	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 172.33.495

a) The component should be manufactured OPEN HEARTH STEEL 10Kn RIMMING -5-II –Г, GOST 16523-70.

b) Chemical properties: As per OPEN HEARTH STEEL 10Kn RIMMING -5-II Г, GOST 16523-70 & GOST 1050-74

Grade of Steel	CONTENT OF ELEMENTS %							
	C	Si	Mn	Cr	Ni	S	P	Cu
				MAX				
10КП	0.07 to 0.14	0.07 Max	0.25 to 0.50	0.15	0.25	0.040	0.035	0.25

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

c) **Mechanical properties:** As per OPEN HEARTH STEEL 10Kn RIMMING - 5-II-Г GOST 16523-70.

GRADE OF STEEL	TENSILE STRENGTH Kgf/mm²	RELATIVE ELONGATION % NOT LESS THAN
10КП	28 – 40	25

Note: For other properties refer GOST 16523-70.

14) PERFORMANCES/ACCEPTANCETEST: PIPE TO DRG.NO.172.33.495

1. THE COMPONENT IS TO BE MADE FROM OPEN HEARTH STEEL 10 Kn (RIMMING) - 5 - III Г. GOST 16523-70.
2. ON INTERNAL SURFACE, ROLLS FROM WELDING AND SHARP EDGES ARE NOT ALLOWED. SURFACE IRREQULARITIES MAY BE GROUND PLUSH WITH GENEARTRIX Ø164. SUBJECT THE UNIT TO PRESSURE TEST WITH AIR AT A PRESSURE $1.96.10^5 + 0.49.10^5$ Pa
3. $(2^{+0.5} kgf/cm^2)$ LEAKAGE OF AIR IS NOT ALLOWED.

EXPLANATORY NOTE:-

THE COMPONENT SHOULD BE PRODUCED FROM OPEN-HEARTH COLD ROLLED QUALITY CARBON STEEL SHEET 1.5mm THICKNESS OF HIGH SURFACE FINISH ' II ' WITH STANDARD CHARACTERISTICS CATEGORY '5', DEEP-DRAWN ' Г ' OF GRADE 10КП (RIMMED) TO GOST 16523-70. ALTERNATIVELY IT MAY BE PRODUCED FROM STEEL SHEET OF SUPERIOR FINISH ' III ' WITH STANDARD CHARACTERISTICS CATEGORY '5', DEEP-DRAWN ' Г ' OF GRADE 10КП (RIMMED) TO GOST 16523-70.

15) FITMENT AND PERFORMANCE TEST:

a. Pilot samples should be checked for fitment and Performance test to ascertain the efficacy of the system under different operating conditions by fitting in higher assembly and repeating it for functional checks, wherever required.

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

16) INTERCHANGEABILITY:

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

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

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

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

18) MARKING / IDENTIFICATION.

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

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

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

19) PRESERVATION CHECK

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

20) PACKING CHECK

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

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

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

21) DOCUMENTATION

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

22) REFERENCE:

(a) Drawing No: 172.33.495.

(b) Material specification as per drawing:

OPEN HEARTH STEEL 10Kn RIMMING -5-II- Г, GOST 16523-70.

(c) GOST 16523-70 & GOST 1050-74.

(d) Alternate material:

1. OPEN HEARTH STEEL 10Kn (RIMMING) -5-III-Г GOST 16523-70,.

ANNEXURE-A

SL. NO.	CATEGORY	ASSEMBLY/ SUB ASSEMBLY	TESTS/ INSPECTION PARAMETERS	STANDARDS TO BE REFERRED	ACCEPTANCE CRITERIA	INSPECTION RESPONSIBILITY			REMARKS
						Firm	HVF	DGQA	
1	PIPE TO DRG. NO 172.33.495	**Pre inspection reports (PIR) of firm**	Firm has to produce all the document as per QAP	As per the relevant drawing and QAP.	Confirm to drawing and QAP as per bill of material	P	V	R	100% by firm/ vendor.
2		**Bill of material (BOM)**	Firm has to prepare the BOM as per QAP	Refer QAP Para no: 8 or item list.	Confirm to QAP	P	V	R	100% by firm/ vendor.
3		**Material tests**	Chemical composition & Mechanical / Physical Properties	As per GOST 16523-70 & GOST 1050-74.	All the values to confirm with QAP Para no: 13.1 (a), (b) & (c).	P	W/V	R	SP followed by HVF.
4		**Pressure Testing**	Pressure test	Refer QAP Para no:14(3)	Confirm to QAP Para no: 14(3)	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**	Marking / traceability	Refer QAP Para no:18	Confirm to QAP Para no: 18	P	V	R	100% by firm/ vendor.
7		**Preservation & packing**	Preservation & packing	Refer QAP Para no 19 & 20	Confirm to QAP Para no 19 & 20	P	V	R	100% by firm/ vendor.

Note:

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

1. One sample per heat / batch shall be tested under NABL Lab/Govt. Approved lab by firm. In case of non-compliance to standards entire lot shall be rejected or not to use in production further.

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

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

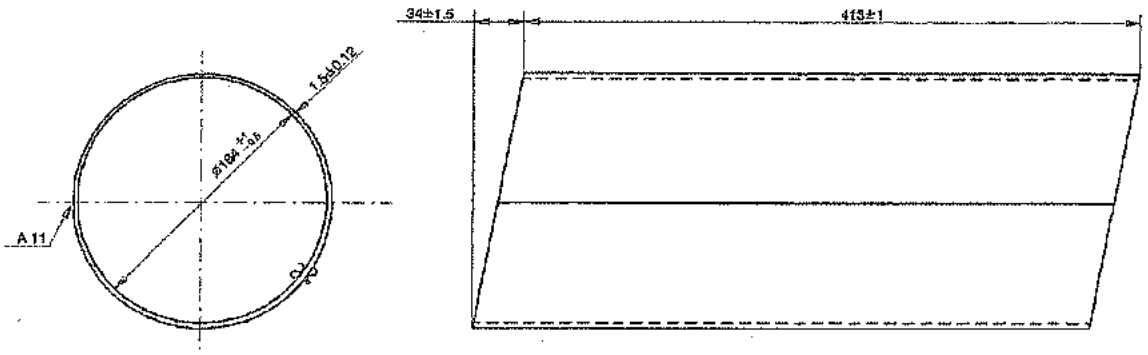


FIG: PIPE TO DRG.NO.172.33.495.

APPENDIX ' A'

RECORD OF AMENDMENTS

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

RESTRICTED
(DRAFT / PROVISIONAL)
QUALITY ASSURANCE PLAN

FOR

(PIPE)

DRG.NO.172.33.494

(LF NO: 6206305455)

No: HVF/T-72C/QAP/33/PIPE/243370- 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. 172.33.494

PREPARED BY

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

REVIEWED BY

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

APPROVED BY

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

ISSUED BY

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

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 172.33.494** 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: 172.33.494.**

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. 172.33.494** including the technical requirements of the drawings. The recommended Quality Plan stipulated herein is mandatory and should be strictly adhered to.

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

Note:

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

5. DOCUMENTS:

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

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

6. ITEM USED ON:

1. 176.33.004CB -
2. 172.33.225CB-2CB -

7. LIST OF DRAWINGS:

Single (individual) item

SI. NO.	DRG. NO	NOMENCLATURE	REMARKS
1	172.33.494	PIPE	-

8. BILL OF MATERIALS:

Single (individual) items, details as below,

SI. NO	DRG. NO	NOMENCLATURE	MATERIAL SPECIFICATIONS	Qty
1	172.33.494	PIPE	OPEN HEARTH STEEL 10Kn -5-II-Г RIMMING GOST 16523-70.	1

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

9. CONDITIONS OF USE / STORAGE INSTRUCTIONS

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

(a) The threaded parts if any should be covered with suitable plastic caps to prevent damages.

(b) If the item consists of assemblies, each assembly should be packed separately.

(c) The stores are to be suitably covered for preventing ingress of dust and Dirt/entry of sunlight / moisture.

(d) The packaging slip shall contains

(i) Certificate of testing- NABL Certificate.

(ii) Guarantee/ Warranty Certificate.

(iii) Service and maintenance instructions.

(iv) Delivery Slip with Inspector's Acceptance Mark.

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

10. SAMPLING PLAN :

Sl. No.	Sampling Plan	Pilot	Bulk
(i)	Visual Inspection	100%	100%
(ii)	Dimensional Inspection	100%	General Inspection level III, single sampling, Normal Inspection, AQL 2.5 of IS 2500 (Part-I)-2000
(iii)	Material Inspection	1 No	1 No. for each batch of raw material or heat treatment lot as required by specifications.
(iv)	Acceptance test	100%	100%
(v)	Pressure testing	100%	100%
(vi)	Machining / Fitment / Performance trial on higher assembly / Tank	1 No	1 No per batch / As required.
vii)	Interchangeability Test	02 Nos.	02 Nos. per batch on randomly basis, except selective assembly.
viii)	Test stand/Jigs/ Fixtures/Gauges/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 172.33.494

All dimensions should be confirmed as per drawing.

Sl. No.	Drawing Dimensions
1.	Φ164 (+1 / -0.5) mm
2.	1.5±0.12 mm
3.	398±1 mm
4.	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 172.33.494

a) The component should be manufactured
OPEN HEARTH STEEL 10Kn -5-II –Г, RIMMING GOST 16523-70.

b) Chemical properties: As per OPEN HEARTH STEEL 10Kn -5-II- Г, RIMMING GOST 16523-70 & GOST 1050-74

Grade of Steel	CONTENT OF ELEMENTS %							
	C	Si	Mn	Cr	Ni	S	P	Cu
				MAX				
10КП	0.07 to 0.14	0.07 Max	0.25 to 0.50	0.15	0.25	0.040	0.035	0.25

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

c) **Mechanical properties:** As per OPEN HEARTH STEEL 10Kn 5-II-Г, RIMMING - GOST 16523-70.

GRADE OF STEEL	TENSILE STRENGTH Kgf/mm²	RELATIVE ELONGATION % NOT LESS THAN
10КП	28 – 40	25

Note: For other properties refer GOST 16523-70.

14) PERFORMANCES/ACCEPTANCETEST: PIPE TO DRG.NO.172.33.494

1. IT IS ALLOWED TO MAKE THE COMPONENT FROM OPEN HEARTH STEEL 10 Kn (RIMMING) - 5 - III Г. GOST 16523-70.
2. ON INTERNAL SURFACE, ROLLS FROM WELDING AND SHARP EDGES ARE NOT ALLOWED. SURFACE IRREGULARITIES MAY BE GROUND FLUSH WITH GENERATRIX Ø164.
3. SUBJECT THE UNIT TO PRESSURE TEST WITH AIR AT A PRESSURE $1.96.10^5 + 0.49.10^5$ Pa ($2^{+0.5}$ kgf/cm²) LEAKAGE OF AIR IS NOT ALLOWED.

EXPLANATORY NOTE:-

THE COMPONENT SHOULD BE PRODUCED FROM OPEN-HEARTH COLD ROLLED QUALITY CARBON STEEL SHEET 1.5mm THICKNESS OF HIGH SURFACE FINISH 'II' WITH STANDARD CHARACTERISTICS CATEGORY '5', DEEP-DRAWN 'Г' OF GRADE 10КП (RIMMED) TO GOST 16523-70.
ALTERNATIVELY IT MAY BE PRODUCED FROM STEEL SHEET OF SUPERIOR FINISH 'III' WITH STANDARD CHARACTERISTICS CATEGORY '5', DEEP-DRAWN 'Г' OF GRADE 10КП (RIMMED) TO GOST 16523-70.

15) FITMENT AND PERFORMANCE TEST:

a. Pilot samples should be checked for fitment and Performance test to ascertain the efficacy of the system under different operating conditions by fitting in higher assembly and repeating it for functional checks, wherever required.

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

16) INTERCHANGEABILITY:

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

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

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

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

18) MARKING / IDENTIFICATION.

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

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

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

19) PRESERVATION CHECK

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

20) PACKING CHECK

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

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

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

21) DOCUMENTATION

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

22) REFERENCE:

(a) Drawing No: 172.33.494.

(b) Material specification as per drawing:

OPEN HEARTH STEEL 10Kn -5-II- Г, RIMMING GOST 16523-70.

(c) GOST 16523-70 & GOST 1050-74.

(d) Alternate material:

1. OPEN HEARTH STEEL 10Kn (RIMMING) -5-III-Г GOST 16523-70,.
2. GRADE 'DD' to IS: 513-94.

ANNEXURE-A

SL. NO.	CATEGORY	ASSEMBLY/ SUB ASSEMBLY	TESTS/ INSPECTION PARAMETERS	STANDARDS TO BE REFERRED	ACCEPTANCE CRITERIA	INSPECTION RESPONSIBILITY			REMARKS
						Firm	HVF	DGQA	
1	PIPE TO DRG. NO 172.33.494	**Pre inspection reports (PIR) of firm**	Firm has to produce all the document as per QAP	As per the relevant drawing and QAP.	Confirm to drawing and QAP as per bill of material	P	V	R	100% by firm/ vendor.
2		**Bill of material (BOM)**	Firm has to prepare the BOM as per QAP	Refer QAP Para no: 8 or item list.	Confirm to QAP	P	V	R	100% by firm/ vendor.
3		**Material tests**	Chemical composition & Mechanical / Physical Properties	As per GOST 16523-70 & GOST 1050-74.	All the values to confirm with QAP Para no: 13.1 (a), (b) & (c).	P	W/V	R	SP followed by HVF.
4		**Pressure Testing**	Pressure test	Refer QAP Para no:14(3)	Confirm to QAP Para no: 14(3)	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**	Marking / traceability	Refer QAP Para no:18	Confirm to QAP Para no: 18	P	V	R	100% by firm/ vendor.
7		**Preservation & packing**	Preservation & packing	Refer QAP Para no 19 & 20	Confirm to QAP Para no 19 & 20	P	V	R	100% by firm/ vendor.

Note:

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

1. One sample per heat / batch shall be tested under NABL Lab/Govt. Approved lab by firm. In case of non-compliance to standards entire lot shall be rejected or not to use in production further.

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

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

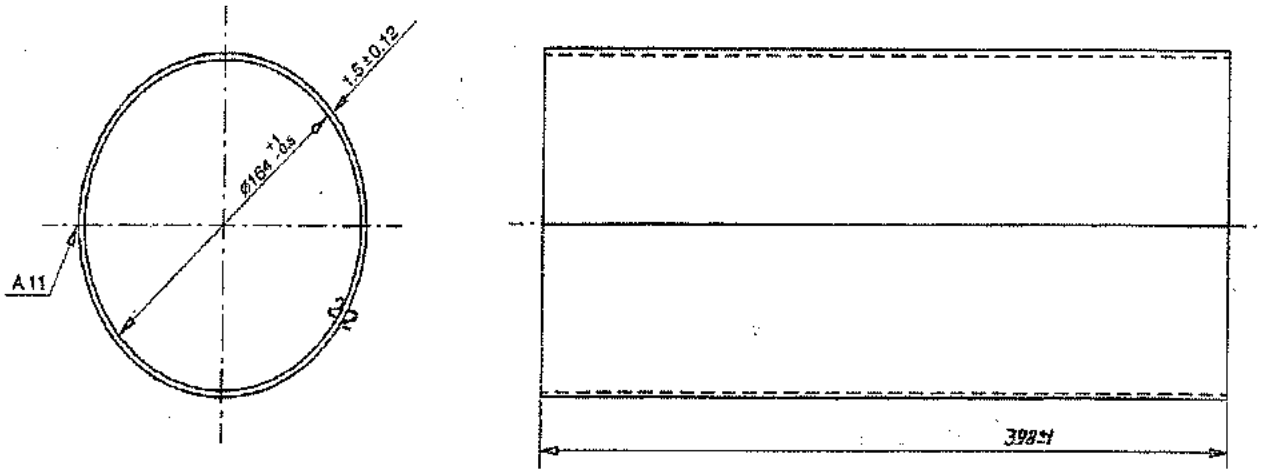


FIG: PIPE TO DRG.NO.172.33.494.

APPENDIX 'A'

RECORD OF AMENDMENTS

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

Ref : No. 6005/HVF/TA/SMS/VQC/2023-24, dated.26/11/2023

Sl.No	Nomenclature and Drg.No	Manufacturing Technology &Testing/ Inspection facilities required to produce the item		Must be possessed by the Vendor in his own premises (List of Plant and Machinery and Testing /Inspection facility to be submitted)	May be possessed by the Vendor in his own premises or may be Outsourced (Name and Address of sub-contractor ,list of plant and Machinery and Testing /Inspection facility to be submitted)
1	**PIPE Drg.No. 172.33.763 LF No. 6206305976**	Technology 1	Pipe Cutting	Cutting Facility required like,. Cut off wheel,power hacksaw etc.	
		Technology 2	Pipe Bending		CNC/Conventional Pipe Bending machine facility for Bending operation.
		Test/Inspection	Fixture /Gauges/Mandrel /templates	Firm has to develop as per Specification/Drawings.	

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

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(S.SAKTHIVEL)

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(M.NAGARAJAN)

Sl.No	Nomenclature and Drg.No.	Manufacturing Technology &Testing/ Inspection facilities required to produce the item		Must be possessed by the Vendor in his own premises (List of Plant and Machinery and Testing /Inspection facility to be submitted)	May be possessed by the Vendor in his own premises or may be Outsourced (Name and Address of sub-contractor ,list of plant and Machinery and Testing /Inspection facility to be submitted)
1	**PIPE Drg.No. 172.33.762 LF No. 6206305975**	Technology 1	Pipe Cutting	Cutting Facility required like,. Cut off wheel,power hacksaw.	
		Technology 2	Pipe Bending		CNC/Conventional Pipe Bending machine facility for Bending operation.
		Test/Inspection	Fixture /Gauges/Mandrel /templates	Firm has to develop as per Specification/Drawings.	

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

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Ref : No. 6005/HVF/TA/SMS/VQC/2023-24, dated.26/11/2023

Sl.No	Nomenclature and Drg.No.	Manufacturing Technology &Testing/ Inspection facilities required to produce the item		Must be possessed by the Vendor in his own premises (List of Plant and Machinery and Testing /Inspection facility to be submitted)	May be possessed by the Vendor in his own premises or may be Outsourced (Name and Address of sub-contractor ,list of plant and Machinery and Testing /Inspection facility to be submitted)
1	**PIPE Drg.No. 172.2M.33.301 LF No. 6206305172**	Technology 1	Pipe Cutting	Cutting Facility required like,. Cut off wheel,power hacksaw etc.	
		Test/Inspection	Fixture /Gauges/Mandrel /templates	Firm has to develop as per Specification/Drawings.	

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

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Ref : Lr No. 6005/HVF/TA/CBOI/VQC/2022-23 dated.19/11/2022 & 16/02/2023 & 10/07/2023

Sl.No	Nomenclature and Drg.No.	Manufacturing Technology &Testing/ Inspection facilities required to produce the item		Must be possessed by the Vendor in his own premises (List of Plant and Machinery and Testing /Inspection facility to be submitted)	May be possessed by the Vendor in his own premises or may be Outsourced (Name and Address of sub-contractor ,list of plant and Machinery and Testing /Inspection facility to be submitted)
1	**Pipe Drg.No. 172.33.665-1**	Technology 1	Pipe Fabrication	Cut off wheel or Pipe Cutting machine	
		Technology 2	Bending	Pipe Bending Machine	
		Technology 3	Forming	Press for end forming	
	LF No.6206305945	Test/Inspection	Fixture /Gauges/Mandrel /templates	Firm has to develop as per Specification/Drawings.	

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

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19/10/2023
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Ref : No.6005/HVF/TA/SMS/VQC/2023-24, dated.26/11/2023

Sl.No	Nomenclature and Drg.No.	Manufacturing Technology &Testing/ Inspection facilities required to produce the item		Must be possessed by the Vendor in his own premises (List of Plant and Machinery and Testing /Inspection facility to be submitted)	May be possessed by the Vendor in his own premises or may be Outsourced (Name and Address of sub-contractor ,list of plant and Machinery and Testing /Inspection facility to be submitted)
1	**PIPE BRANCH Drg.No. 172.33.153 LF No. 6206305426**	Technology 1	Pipe Cutting	Cutting Facility required like,. Cut off wheel/power hacksaw.	
		Technology 2	Forming	Press min 100 Ton required for Pipe end forming/Embossing operation.	
		Test/Inspection	Fixture /Gauges/Mandrel /templates	Firm has to develop as per Specification/Drawings.	

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

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Ref : No.6005/HVF/TA/SMS/VQC/2023-24, dated.26/11/2023

Sl.No	Nomenclature and Drg.No.	Manufacturing Technology &Testing/ Inspection facilities required to produce the item		Must be possessed by the Vendor in his own premises (List of Plant and Machinery and Testing /Inspection facility to be submitted)	May be possessed by the Vendor in his own premises or may be Outsourced (Name and Address of sub-contractor ,list of plant and Machinery and Testing /Inspection facility to be submitted)
1	**PIPE BRANCH Drg.No. 172.33.516 LF No. 6206305467**	Technology 1	Pipe Cutting	Cutting Facility required like,. Cut off wheel/power hacksaw.	
		Technology 2	Pipe Bending		CNC/Conventional Pipe Bending machine facility for Bending operation.
		Test/Inspection	Fixture /Gauges/Mandrel /templates	Firm has to develop as per Specification/Drawings.	

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

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Ref : No. 6005/HVF/TA/SMS/VQC/2023-24, dated.26/11/2023

Sl.No	Nomenclature and Drg.No.	Manufacturing Technology &Testing/ Inspection facilities required to produce the item		Must be possessed by the Vendor in his own premises (List of Plant and Machinery and Testing /Inspection facility to be submitted)	May be possessed by the Vendor in his own premises or may be Outsourced (Name and Address of sub-contractor ,list of plant and Machinery and Testing /Inspection facility to be submitted)
1	**TUBE Drg.No. 175.41.065 LF No. 6206402048**	Technology 1	Pipe Cutting	Cutting Facility required like,. Cut off wheel,power hacksaw etc.	
		Test/Inspection	Fixture /Gauges/Mandrel /templates	Firm has to develop as per Specification/Drawings.	

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

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Ref : No.6005/HVF/TA/SMS/VQC/2023-24, dated.26/11/2023

Sl.No	Nomenclature and Drg.No.	Manufacturing Technology &Testing/ Inspection facilities required to produce the item		Must be possessed by the Vendor in his own premises (List of Plant and Machinery and Testing /Inspection facility to be submitted)	May be possessed by the Vendor in his own premises or may be Outsourced (Name and Address of sub-contractor ,list of plant and Machinery and Testing /Inspection facility to be submitted)
1	**GUIDE BUSH Drg.No. 54.05.273-A LF No. 6206305625**	Technology 1	Sheet Metal Fabrication		Metal cutting facility for profile cutting like Laser or water jet cutting facility min.1.0mm thick Steel plates.
		Technology 2	Pipe Cutting	Cutting Facility required like,. Cut off wheel/power hacksaw.	
		Technology 3	Machining		CNC/Conventional Milling machine for machining operation.
		Technology 4	Brazing	Brazing facility required for brazing operation.	
		Test/Inspection	Fixture /Gauges/Mandrel /templates	Firm has to develop as per Specification/Drawings.	

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

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JWM/SMS
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7/12/2023

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

Sl.No	Nomenclature and Drg.No.	Manufacturing Technology &Testing/ Inspection facilities required to produce the item		Must be possessed by the Vendor in his own premises (List of Plant and Machinery and Testing /Inspection facility to be submitted)	May be possessed by the Vendor in his own premises or may be Outsourced (Name and Address of sub-contractor ,list of plant and Machinery and Testing /Inspection facility to be submitted)
1	**Pipe Assy Drg.No. 175.01.120 CB LF No.6206801081**	Technology 1	Pipe Fabrication	Cut off wheel or Pipe Cutting machine	
		Technology 2	Welding	Arc Welding / CO2 Welding machines for assembly and welding process	
		Test/Inspection	Fixture /Gauges/Mandrel /templates	Firm has to develop as per Specification/Drawings.	

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

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02.12.2023

Ref : Lr No. 6005/HVF/TA/SMS/VQC/2023-24 dtd.26/11/2023

Sl.No	Nomenclature and Drg.No.	Manufacturing Technology &Testing/ Inspection facilities required to produce the item		Must be possessed by the Vendor in his own premises (List of Plant and Machinery and Testing /Inspection facility to be submitted)	May be possessed by the Vendor in his own premises or may be Outsourced (Name and Address of sub-contractor ,list of plant and Machinery and Testing /Inspection facility to be submitted)
1	**PIPE Drg.No. 172.33.495 LF No. 6206305456**	Technology 1	Sheet Metal Fabrication	Shearing machine min capacity 1.5 mm Thick steel plate .	
		Technology 2	Forming	100 Ton Press for Forming operation.	
		Technology 3	Welding	Arc and CO2 Welding machines Facility required	
		Test/Inspection	Fixture /Gauges/Mandrel /templates/ Testing Facility	Firm has to develop as per Specification/Drawings.	

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

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Ref : Lr No. 6005/HVF/TA/SMS/VQC/2023-24 dtd.26/11/2023

Sl.No	Nomenclature and Drg.No.	Manufacturing Technology &Testing/ Inspection facilities required to produce the item		Must be possessed by the Vendor in his own premises (List of Plant and Machinery and Testing /Inspection facility to be submitted)	May be possessed by the Vendor in his own premises or may be Outsourced (Name and Address of sub-contractor ,list of plant and Machinery and Testing /Inspection facility to be submitted)
1	**PIPE Drg.No. 172.33.494 LF No. 6206305455**	Technology 1	Sheet Metal Fabrication	Shearing machine min capacity 1.5 mm Thick steel plate .	
		Technology 2	Forming	100 Ton Press for Forming operation.	
		Technology 3	Welding	Arc and CO2 Welding machines Facility required	
		Test/Inspection	Fixture /Gauges/Mandrel /templates/ Testing Facility	Firm has to develop as per Specification/Drawings.	

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

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