MACHINED COMPONENTS (GROUP -III)

Sl No	LF No	Drawing No	Nomenclature
1	6106210094	172.27.106	CUP
2	6106210115	172.27.127-1	FLANGE
3	6106211055	172.28.001-2	CASE
4	6106211059	172.28.004-1	FLANGE
5	6106890331	172.28.004-3	FLANGE
6	6106211134	172.28.108-2	HOUSING
7	6106401039	172.40.045	TRAP OIL
8	6106401043	172.40.142	HOUSING RING REAR
9	6106401067	172.40.228	TRUST DISC
10	6101040058	172.40.325	THRUST DISK
11	6101040083	172.40.339-1	RING
12	6101040085	172.40.341	FRONT BODY OF RINGS
13	6101040086	172.40.342	OIL TRAP
14	6106402076	172.41.011	FILLER CAP
15	6106404019	175.43.003-1	CAP
16	6101043014	172.43.024	PACKING COVER
17	6106406033	172.45.015-A	CLAMP
18	6106407099	172.46.043-2	SUCTION PUMP COVER
19	6106407033	172.46.051-1	DELIVERY PUMP COVER
20	6106407056	172.46.087	COVER SUCTION PUMP
21	6106401108	175.40.009-2	FLANGE
22	6106401151	175.40.121	DISC THRUST
23	6106402016	175.41.036	OIL SEAL BODY
24	6106402017	175.41.037	BEARING HOUSING
25	6106402033	175.41.043	COVER
26	6106402037	175.41.053	BEARING HOUSING
27	6106402038	175.41.054	BODY SEAL OIL,ISSUE-6A,
28	6106402056	175.41.080	BEARING HOUSING
29	6106406179	175.45.016-1	BODY
30	6101041011	188.41.004	RING
31	6106401197	432.40.128	THRUST DISK
32	6106401201	432.40.144-2	BODY, RING FRONT
33	6106401029	432.40.011CB-2	RING HOUSING FRONT
34	6106404033	432.43.046	BUSHING
35	6106113054	434.23.041-1	COVER
36	6106402097	54.08.125-5	FAN DRIVE NECK SEAT

MACHINED COMPONENTS (GROUP -III)

Sl no.	Nomenclature & drawing No.	Manufacturing technology & Testing / Inspection Facilities required to produce the item		Must be possessed by the vendor in his premises (P&M list and testing / inspection equipment list to be submitted)	May be possesed by the vendor in his premises or out sourced (Self declaration to be submitted)	FIRM Comp-liance (Y/N)	Remarks
1	Components as per enclosed list of Machined Components (Group III) Total Items = 36 Nos	**TECHNOLOGY-I**	Turning	CNC Turning machine suitable to accommodate component upto 200 mm diameter with 0.010mm accuracy			
			Milling & Drilling	HMC/VMC machine as per component requirement with 0.010mm accuracy			
			Grinding	Internal/ External /Surface grinding machine as per component requirement with 0.010mm accuracy			
		TECHNOLOGY-2	Heat Treatment		Carburising, Hardening, Induction Hardening & Tempering furnace with Oil quenching facility suitable to the components		
			Protection coating		Oxidising , Phosphating, Zinc chromatising, Hard Chromium Plant suitable to the components		
		TECHNOLOGY-3	Raw material		Firm should be capable to arrange the raw material like forging, casting, bar material etc as per drawing specification and standard.		

(D.SATHISH KUMAR)
WM/QA(NF& QMSC)

(LUXMAN SINGH)
WM/TRG-II,HT & EP

(K.DURAIRAJ)
JWM/Trans -II

Sl no.	Nomenclature & drawing No.	Manufacturing technology & Testing / Inspection Facilities required to produce the item		Must be possessed by the vendor in his premises (P&M list and testing / inspection equipment list to be submitted)	May be possesed by the vendor in his premises or out sourced (Self declaration to be submitted)	FIRM Comp-liance (Y/N)	Remarks
1	Components as per enclosed list of Machined Components (Group III)	**TEST / INSPECTION-1**	3D CMM	3D CMM 300 x 300 mm			
			Surface Roughness Tester		Surface Roughness Tester for Ra &Rz values		
			Gauges	Standard Gauges for checking Holes and threads suitable to the requirement of the components.Firm should submit the undertaking in this regard that they will create the facilities within 6 months from the date of receipt of order.			
			Measuring Instruments	Vernier Caliper, Groove Vernier, Radius gauge, Feeler Gauge etc. suitable to the requirement of the components			
		TEST / INSPECTION-2	Hardness measurement		Brinell / Rockwell Hardness Tester		

Note : Justification for alternate facilities may be shared to prove that alternate facilities can be utilised to manufacture the item wherever the facilities are mentioned above are not available, but vendor has alternate facilities.

(D.SATHISH KUMAR)
WM/QA(NF& QMSC)

(LUXMAN SINGH)
WM/TRG-II,HT & EP

(K.DURAIRAJ)
JWM/Trans -II

(J.P.SINGH)
GM-OPERATONS I

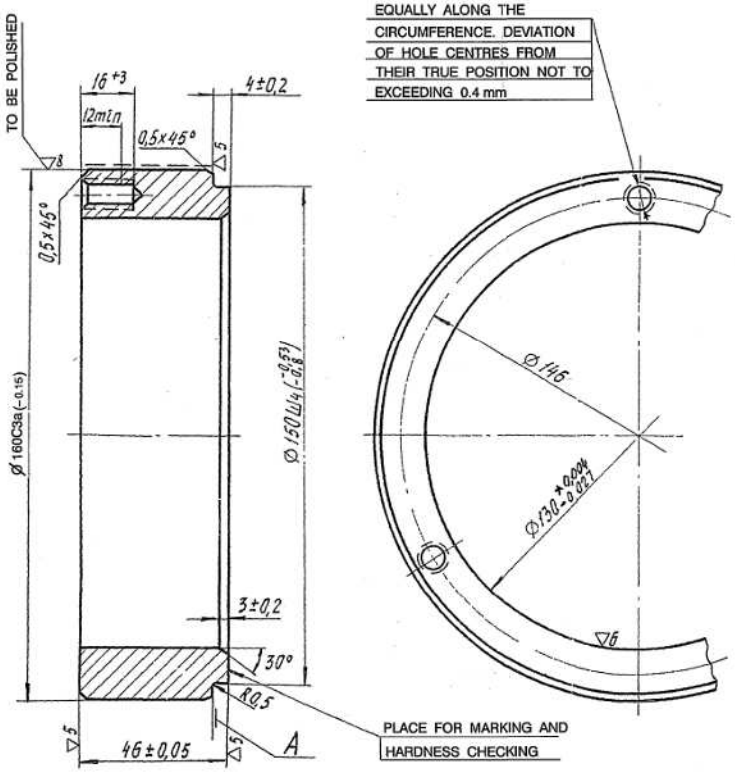
A/H to **(NEERAJ KUMAR)**
QA-RIG(OE)

(ANIMESH PAIK)
DGM/CA,TRG & RG

DRAWING NUMBER 432.43.046

SHEET No. 1 OF 1

UNLESS OTHERWISE SPECIFIED ▽3



(14) 1. RELATIVE TO SURFACE ϕ 130 AND FACE Б ALLOWED IS THE FOLLOWING:

a) RUN OUT OF SURFACE Ø 160 3a SHOULD NOT EXCEED 0.03 mm.

(14) ~~b) END PLAY OF FACES NOT EXCEEDING 0.05 mm.~~

c) RUN OUT OF SURFACE ϕ 150 w4 AND END PLAY OF FACE `A' SHOULD NOT EXCEED 0.1 mm.

(14) b) NON - PARALLELISM OF FACES NOT EXCEEDING 0.05 mm.

2. THREADED HOLES ARE TO BE COUNTERSUNK AT AN ANGLE OF 90° - 120° UPTO THREAD OUTER DIAMETER.
3. BURRS AND SHARP EDGES ARE NOT ALLOWED.
4. TO BE HEAT TREATED HARDNESS 444 TO 341 (DIA OF INDENTATION 2.9 TO 3.3)
5. — — — SURFACE ϕ 160 TO BE COATED WITH HARD CHROMIUM 21 IN COMPLIANCE WITH SPECIFICATION 432 TY - 3.
6. CHROMIUM CHIPPINGS AT A LENGTH OF 0.5 mm MAX. FROM END FACES ARE ALLOWED ON BOTH SIDES OF SURFACE ϕ 160 .
7. THREADED HOLES M10 - 7H MAY BE LOOSENED BY 0.1 mm. RELATIVE TO SMOOTH SCREW PLUG.
8. HARDNESS MAY BE CHECKED ON THE END FACE WITH THREADED HOLES.

COMMON TO T-90
DRG. REINDIANISED BASED ON RUSSIAN ORIGINAL ISSUE - 13

(B. JAYAVELU) JTO(D) 08-02-08

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)
2.15	

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
14	09.11.88	AMDT.LIST No.7

DRN	Sd/=
CHD	Sd/=
APPD	Sd/=
DATE	01.01.88
SCALE:-	1 : 1
DIMENSIONS IN mm	
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS : 2102 - 69	
ALL THREADS TO CONFORM TO	

MATERIAL :- STEEL 38XC GOST 4543-71

USED ON :- 172.43cb-1Cb 175.43Cb-1 L.H., 172.43cb-2Cb 175.43Cb-1 R.H.

CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI

TITLE :- BUSHING

D S CAT NUMBER DCAN: 5365180899

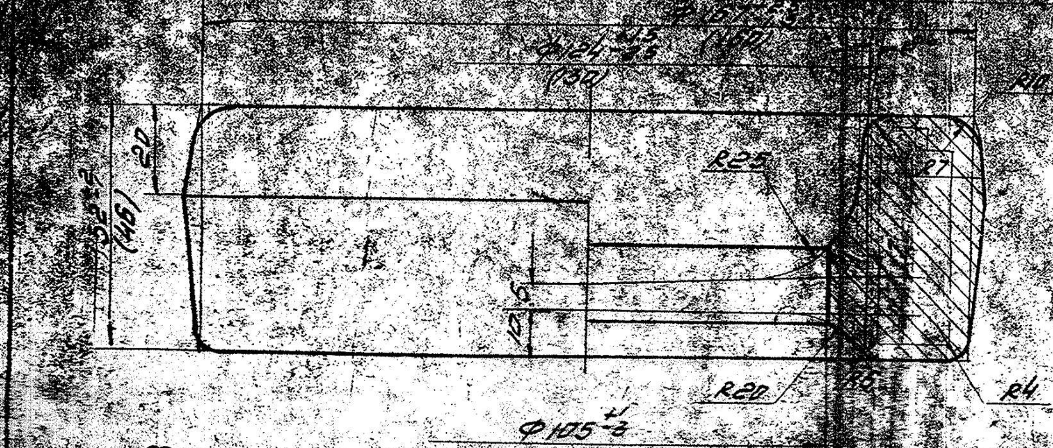
DRAWING NUMBER 432.43.046

F - 82
37
SIZE A2

432-43-046

Карта технологического процесса изготовления поковки из проката

Втулка 432-43-046



Технические требования.

1. Термообработать на твердость dотп ≥ 3,8
2. Очистить от окалины (травить)

Допускается:

3. Поверхностные дефекты глубиной до 0,5 фактического припуска
4. Перекос (сдвиг осей штампов) до 1,2мм
5. Следы заусенца по разъему до 1,0мм. Затянутый заусенец в отверстии
6. Эксцентричность прошиваемого отверстия до 2мм
7. Коробление до 0,5мм

Примечание

1. Неоговоренные штамповочные уклоны [illegible]
2. Размеры в скобках для мех. обработки
3. Размеры [illegible] не контролировать
4. При транспортировке заготовок и [illegible] пользоваться нормализованной тарой [illegible] [redacted] для заусенца [redacted] 76-65г)

[redacted]

TOOL NO.	TOOL DESCRIPTION	MACHINE	REMARKS
20321	PIERCING TOOL	300T	
20320	TRIMMING TOOL	300T	
20319	STAMPING DIES	DG-6	

TECHNICAL REQUIREMENTS.

1. HEAT TREAT. DIA. OF IND. ≥3.8 MM
2. DESCALE.
3. SURFACE DEFECTS AND SCALE PITS UPTO 0.5 OF ACTUAL ALLOWANCE ARE ALLOWED.
4. MISMATCH SHOULD NOT EXCEED 1.2MM
5. RESIDUAL FIN SHOULD NOT EXCEED 1.0MM.
6. BUCKLING SHOULD NOT EXCEED 0.5MM
7. UNSPECIFIED DRAFTS : 6°
8. ~~UNSPECIFIED RADII~~ : ___
9. MARK PART NO.
10. FOLDING OF FIN ALLOWED IN PIERCED HOLE.
11. MACHINING DIMENSIONS ARE SHOWN IN BRACKETS.
12. UNTOLERANCED DIMENSIONS ARE FOR CONSTRUCTION.
13. ECCENTRICITY OF PIERCED HOLE SHOULD NOT EXCEED 2 MM

MATERIAL: STEEL 38XC GOST 4543-71

FORGING WEIGHT: 5.02 KGS.

(108) DG-6

CHD. Ramu 14/8/80 APPD. [illegible] 14/8/80

DRG. NO. 432.43.046/F

TITLE: BUSHING

HEAVY VEHICLES FACTORY. AVADI.

RESTRICTED
(DRAFT/PROVISIONAL)
QUALITY ASSURANCE PLAN

FOR

(BUSHING)

DRG.NO.432.43.046

(LF NO: 6206404033)

No.HVF/T-72/QAP/43/BUSHING/240063-00

ISSUE No:00 **DATE:FEB - 2021**

QUALITY ASSURANCE (RIG–SUB ASSEMBLY)

HEAVY VEHICLES FACTORY

AVADI CHENNAI – 600 054

QUALITY ASSURANCE PLAN (QAP)

FOR

BUSHING

DRG. NO. 432.43.046

PREPARED BY	REVIEWED BY
( )	( )
JWM/QA (RIG-SA)	JWM/QA (RIG-SA /TA)

APPROVED / REVIEWED BY

( )

DGM/QA-RIG-(SA)

ISSUED BY

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

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1.IMPORTANT NOTE

Note-1

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

Note –2

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

Note-3

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

Note-4

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

2.INTRODUCTION

1. This quality plan lays down the inspection and testing procedure to be carried out on the component **BUSHING TO DRG.NO 432.43.046** 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 **BUSHING TO DRG.NO:432.43.046.**

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 **BUSHING TO DRG.NO 432.43.046** including the technical requirements as per the drawings/ specifications. The recommended Quality Plan stipulated herein is mandatory and should be strictly adhered to.

Note:

Tender enquiry (TE) and supply order (S.O) will be issued with QAP stating that inspection will be done as per QAP.

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.

In case of S.O, it is the vendor responsibility 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. 172.43CB-1CB - RIGHT HAND FINAL DRIVE ASSY
2. 172.43CB-2CB - LEFT-HAND FINAL DRIVE ASSY.
3. 175.43CB-1 L.H
4. 175.43CB-1 R.H

7.LIST OF DRAWINGS:

SI. NO.	DRG. NO	NOMENCLATURE	REMARKS
1	432.43.046	BUSHING	-

8. BILL OF MATERIALS:

SI. NO	DRG. NO	NOMENCLATURE	MATERIAL SPECIFICATIONS	Qty
1	432.43.046	BUSHING	STEEL 38XC to GOST 4543-71	1

Note: Vendor/Contractor may use approved alternate material as per drawing. (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)

(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)	Fitment/ Performance trial on higher assembly / Tank	2 nos.	-----
vii)	Interchangeability Test	02 Nos.	02 Nos. 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

Sl. No.	Drawing Dimensions
(i)	46 ± 0.05 mm
(ii)	Φ160C3a (-0.15) mm
(iii)	0.5x45°
(iv)	16^{+3} mm
(v)	12 min
(vi)	4 ± 0.2 mm
(vii)	0.5x45°
(viii)	Φ150Ш$_4$ (- 0.53 / - 0.8) mm
(ix)	3±0.2 mm
(x)	30°
(xi)	R0.5
(vii)	Φ146 mm
(xii)	Φ130 (+0.004 /-0.027)
(xiii)	M10 – 7H (Equally along the circumferance deviation of hole centers from their ture position no to exceeding 0.4 mm)
(xiv)	Surface finish/Roughness of items should be ensured as per drawing and specification.
(xv)	Places for marking and Hardness checking refer drawing
(xvi)	For coating/polishing of components refer drawing.

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 BUSHING TO DRG. NO 432.43.046

a) The component should be manufactured from STEEL 38XC GOST 4543-71

b) Chemical properties: as per Steel 38XC GOST 4543-71

CONTENT OF ELEMENTS%					
C	Si	Mn	Cr	S	P
				MAX	
0.34 to 0.42	1.00 to 1.40	0.30 to 0.60	1.30 to 1.60	0.035	0.035

For mass fraction of other elements refer GOST 4543-71

c) Mechanical properties: as per STEEL GRADE 38XC GOST 4543-71

Yield point, N/mm^2 / (kgf/mm^2)	Ultimate strength, N/mm^2 (Kgf/mm^2)	Elongation %	Relative reduction of area %	Impact strength KCU / (Kgm/cm^2)
Not less than				
(735) 75	930 (95)	12	50	(69) 7

14) PERFORMANCES/ACCEPTANCE TEST:BUSHING TO DRG.NO 432.43.046

1) Relative to surface ϕ130 and face Б allowed is the following
   a) Run out of surface ϕ160 3a should not exceed 0.03 mm
   b) Run out of surface ϕ150 w4 and end play of face 'A' should not exceed 0.1mm
   c) Non – Parallelism of faces not exceeding 0.05 mm.
2) Threaded holes are to be countersunk at an angle of 90° -120° up to thread outer diameter.
3) Burrs and sharp edges are not allowed.
4) To be heat treated hardness 341 to 444 (Dia of Indentation 2.9 to 3.3)
5) ---------- surface ϕ160 to be coated with hard chromium 21 in compliance with specification 432 TY-3.
6) Chromium chippings at a length of 0.5mm Max from end faces are allowed on both sides of surfaces ϕ160.
7) Threaded holes M10-7H may be loosened by 0.1 mm. Relative to smooth screw plug.
8) Hardness may be checked on the end face with threaded holes.

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/GAUGESINSTRUMENTS):

The supplier / Contractor should have a 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/specification. However, equivalent BIS Standards can also be followed, subject to the thickness of the coating/preservatives 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, 2.Mechanical properties, 3. Pre-forming process, 4. Coating certification, 5. Calibration reports of instruments and 6. Dimensional inspection reports.

22) REFERENCE:

a) Drawing No: 432.43.046.
b) Material specification as per drawing: STEEL 38XC to GOST 4543-71
c) Specification 432 Ty-3.

ANNEXURE-A

SL. NO.	CATEGORY	ASSEMBLY/ SUB ASSEMBLY	TESTS/INSPECTION PARAMETERS	STANDARDS TO BE REFERRED	ACCEPTANCE CRITERIA	INSPECTION RESPONSIBILITY			REMARKS
						Firm	HVF	DGQA	
1	BUSHING TO DRG. NO 432.43.046	**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 4543-71	All the values to confirm with QAP (Para no:13.1 (a), (b), &(c))	P	W/V	R	100% should be ensured.
		Hardness check	341 -- 444 HB	Refer QAP Para no: 14 (4)	All the values to confirm with QAP	P	W/V	R	100% should be ensured.
		Coating checks	Hard chromium 21.	Refer QAP Para no: 14 (5) & Specification 432 TY - 3	All the values to confirm with QAP	P	W/V	R	100% should be ensured.
4		**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
5		**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**

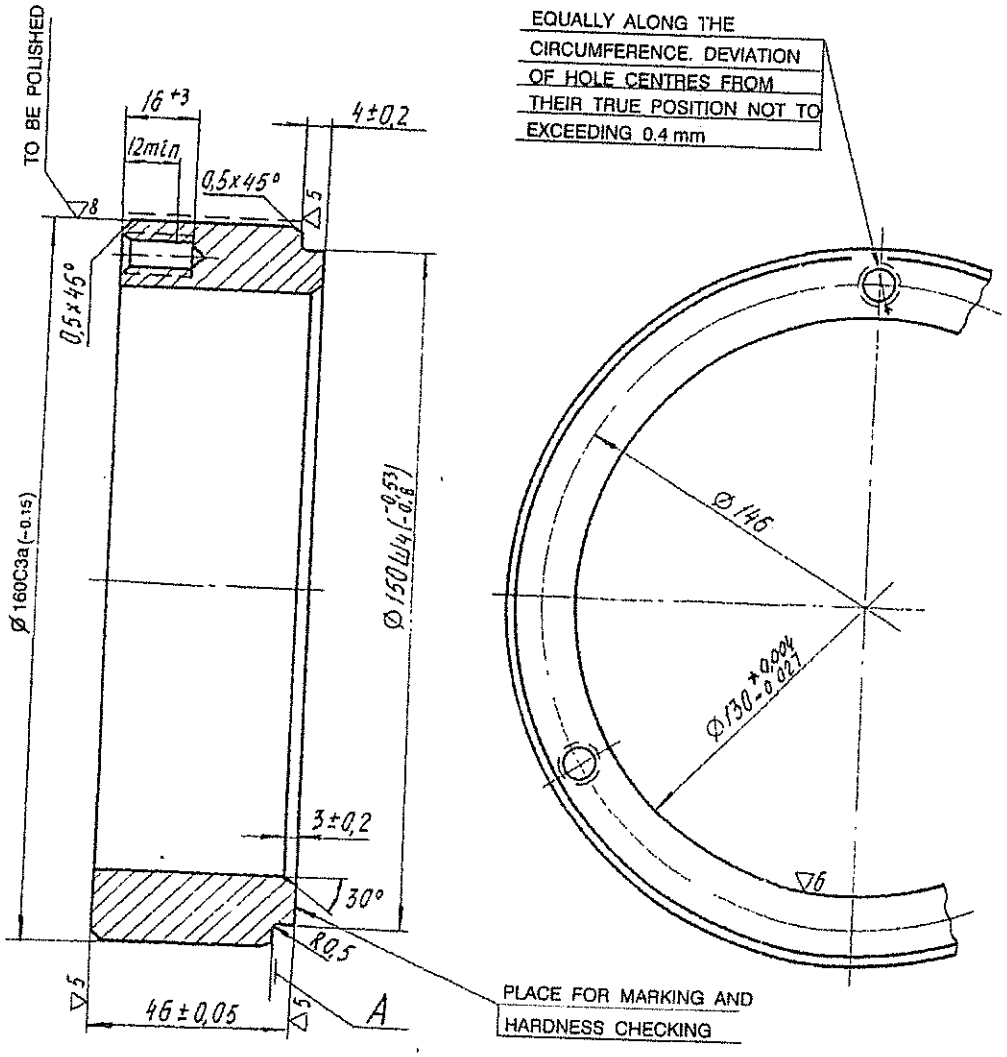

FIG: BUSHING TO DRG. NO 432.43.046

APPENDIX ' A'

RECORD OF AMENDMENTS

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