

USED ON

ZONE	ITEM NO	DRAWING NUMBER	D S CAT NUMBER	DESCRIPTION	QTY	REMARKS
	18	ETY-500		BEARING 205K	1	Alternate for item 15 or 19
	19	ETY-500		BEARING 205AK	1	Alternate for item 15 or 18

I/L CREATED BASED ON RUSSIAN ORIGINAL ISSUE - NIL

356

SUPPLY CODE

U-01-1-2

D90060

F-81

06

ISSUE	DATE	NATURE OF AMENDMENTS	ISSUE	DATE	NATURE OF AMENDMENTS

DRN	<i>GP Jusupov</i>	CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI.			
CHD	<i>GP Jusupov</i>	TITLE : HYDRAULIC COUPLING WITH SHAFT ASSY.			
APPD	<i>Chanchal</i>				

DATE	22-6-04	SHT. NO. 3 OF 3	D S CAT NUMBER	ITEM LIST FOR
				172.47.015cbCb

COMMON TO T-72.
 I/L CREATED BASED ON RUSSIAN ORIGINAL ISSUE - NIL
 172.47.015cbCb

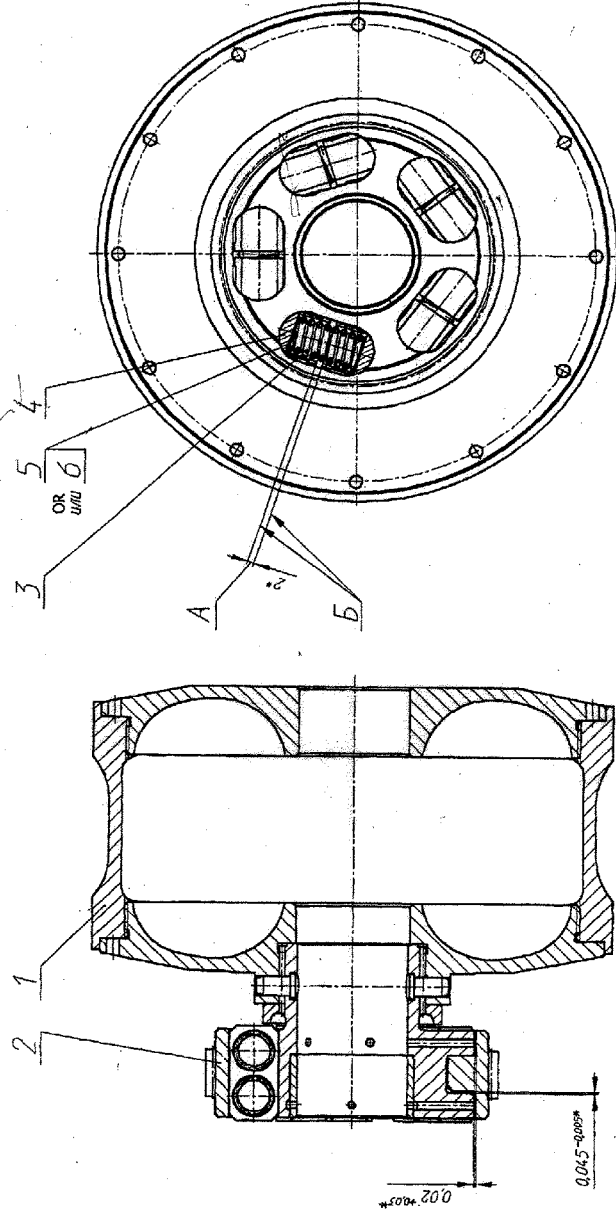
USED ON	ZONE	ITEM NO	DRAWING NUMBER	D S CAT NUMBER	DESCRIPTION	QTY	REMARKS
			172.47.001cbCb		FLEXIBLE COUPLING WITH PUMP WHEEL ASSY.		
	✓	1	172.47.040cbCb ✗		PUMP WHEEL ASSY	1	
	✓	2	172.47.007		GEAR WHEEL	1	
	✓	3	172.47.073		SPRING	10	
	✓	4	172.47.227		SLEEVE	10	
	✓	5	172.47.243 ✗		SHIM	10	SELECTION
	✓	6	172.47.243-01 ✗		SHIM	10	SELECTION

356
 SUPPLY CODE
 U-01-1-2
 D90060
 F-81
 02

ISSUE	DATE	NATURE OF AMENDMENTS	ISSUE	DATE	NATURE OF AMENDMENTS
DRN			CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI.		
CHD			TITLE : FLEXIBLE COUPLING WITH PUMP WHEEL ASSY.		
APPD					
DATE	22-6-04	SHT. NO. 1 OF 1	D S CAT NUMBER	ITEM LIST FOR 172.47.001cbCb	

DRAWING NUMBER
172.47.001 cbCb

SHEET No 1 OF 1



1. Обрабатывание в сборе детали поз. 2 и 172.47.233 по чертежу 172.47.004.сб применять совместно, расконтрактовывать не допускается.
 2. Разность размеров А для всех пар стоек поз. 4, вычисленных для каж-дой пары как среднее арифметическое измерений в крайних точках 0,01 мм, отсчитать поворот стоек и подгонкой их по торцам Б и А 0,01 мм.
 3. Обеспечить предварительную деформацию пружин поз. 3 (0,42 мм подборот регулировочных шайб поз. 5 и 6.
 4. Момент при начале деформации пружин поз. 3 - 32 кг Н м (3,2 · 10 кгс · м), при спрессовывании стоек поз. 4 - 70 кг Н м (7 · кгс · м).
 5. Размеры для справок.
 6. Детальные требования по 520 ТУ1.

1. Parts, item 2 and 172.47.233 machined as assembly unit as per drawing 172.47.004.сб should be used together and not separately.
2. Ensure difference of dimensions A 0,01 mm for all pairs of sleeves, item 4. Calculated for each pair as arithmetic mean of measurement at extreme points by selection of sleeves and grinding them along end face B.
3. Ensure preliminary deformation of spring, item 3 of 1,8 mm by selection of adjusting washers, item 5 and 6.
4. Torque at beginning of deformation of spring, item 3 is 32 Nm (3,2 Kgf/M) and at contact of sleeves, item 4 is 70 Nm (7 Kgf/M).
5. *Dimensions for reference.
6. Other requirements are as per 520.TY1.

DRN	APD	DATE	SCALE	TOLERANCE ON DIMS UNLESS OTHERWISE STATED IS: 210-69	ALL THREADS TO CONFORM TO	ISSUE	DATE	NATURE OF AMENDMENTS
172.47.015cbCb	11-06-04	1:1						

PILOT SAMPLE SHOULD BE APPROVED BY A H S P BEFORE BULK PRODUCTION.
 EST. WT. (KG) 2.25
 TO BE STAMPED OR MARKED WHERE INDICATED THIS # (LETTERS)

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

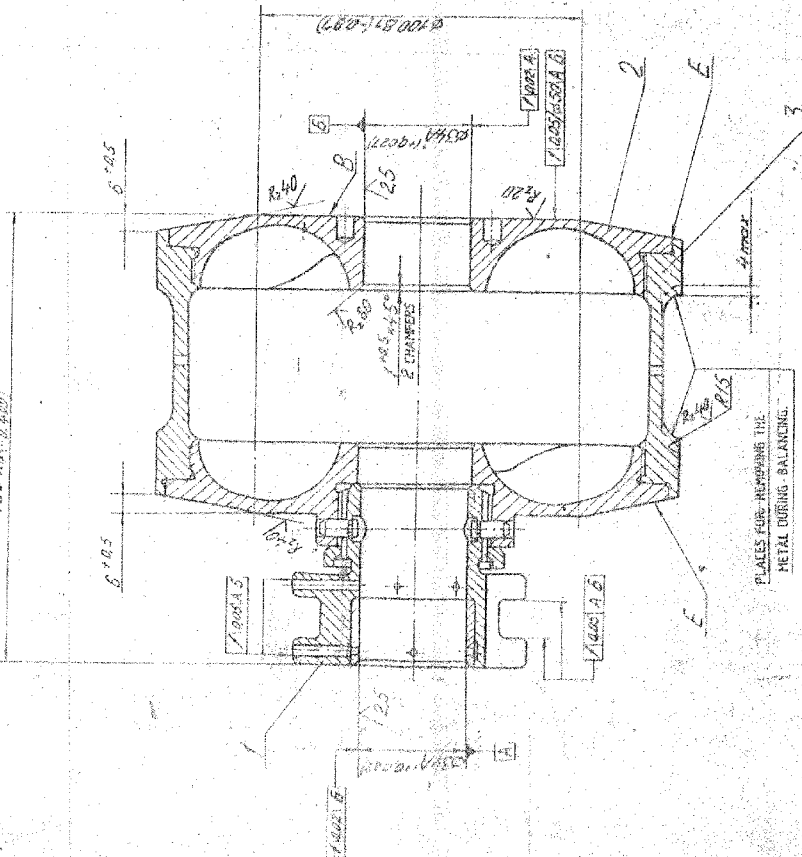
MATERIAL	CONTROLLED BY	USED ON
AYADI	QUALITY ASSURANCE (HEAVY VEHICLES)	172.47.015cbCb

TITLE: FLEXIBLE COUPLING WITH PUMP WHEEL ASSY.
 D S CAT NUMBER 172.47.001cbCb
 DRAWING NUMBER 172.47.001cbCb

ISSUANCE NUMBER

172 47 040 C6C6

136 X₁ (0.250)



1. THREAD OF BOTH IMPELLERS IS TO BE TORQUED TO 4.8 kgm MINIMUM.
- ① 400 - 100 Nm (4.0 - 10 kgm) MINIMUM.
2. AFTER BORING UNIT IS TO BE CLEANED FROM CHIPS AND BLOWN THROUGH WITH COMPRESSED AIR.
3. PAIRING MARK IS TO BE APPLIED ON SURFACES 'E' AFTER MACHINING.
4. THE UNIT IS TO BE SUBJECTED TO DYNAMIC BALANCING WITH ACCURACY TO NOT MORE THAN 0.020 MM (0.0008 IN) STATIC BALANCING IS ALLOWED INSTEAD OF DYNAMIC BALANCING. IN THIS CASE UNBALANCED COUNTERWEIGHT SHOULD NOT BE MORE THAN 15 G AT A RADIUS OF 75 MM.
5. STAMP OF PAIRING WITH COMPONENT 172 47 233 IS TO BE APPLIED ON SURFACE 'E' OF COMPONENT 2.
6. ROUGHNESS R_{a} OF SURFACE 'B' IS TO BE MAINTAINED AT A LENGTH OF $\phi 50$ MIN. ON THE REST OF THE SURFACES ROUGHNESS MAY BE $R_{a} 1.6$.

ASSEMBLY

DRW. NO.	172 47 040 C6
DATE	172 47 040 C6C6
MATERIAL	CONTRIBUTOR OF QUALITY ASSURANCE HEAVY VEHICLES A.V.A.D.I.
SCALE	1:1
TOLERANCE ON DIMS UNLESS OTHERWISE STATED IS 0.025	
COMPLETION TO	172 47 040 C6C6
ISSUE DATE	172 47 040 C6C6
NATURE OF AMENDMENTS	

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

EST. WT. 1.644

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

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

172 47 040 C6C6

USED ON

172 47 042 CB CB

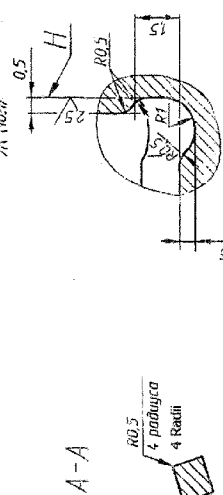
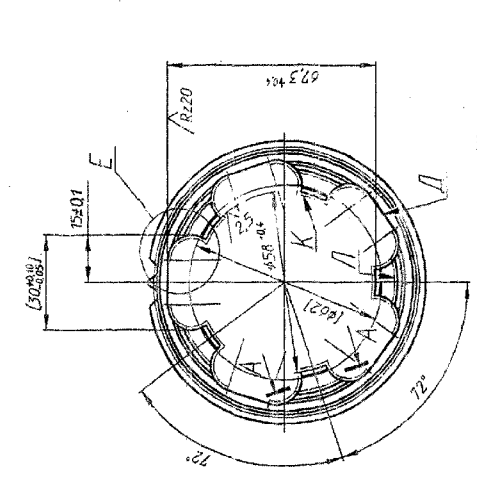
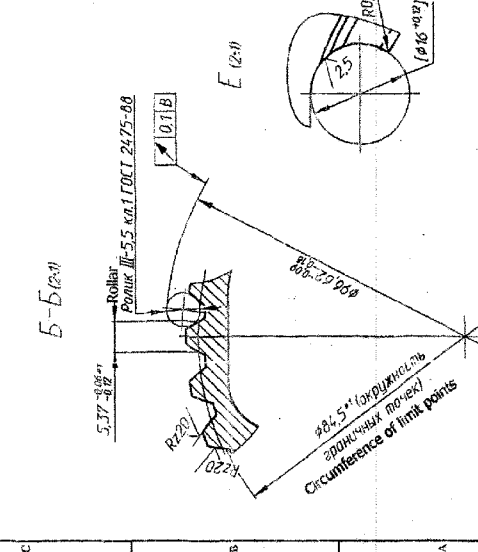
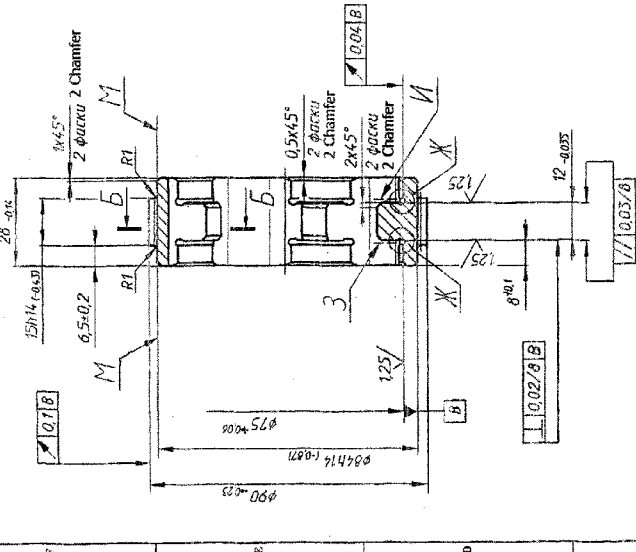
ITEM LIST REDRAWN BASED ON IS - 2 - NIL

ITEM	DRAWING NUMBER	D/S CAT NUMBER	DESCRIPTION	NO. OF	REMARKS		
	172 47 042 CB CB		IMPELLER ASSY (MECHANICAL UNIT)	1			
	8 ITEM LIST		TO BE SUPPLIED AS A SET (A)				
1	172 47 267		TURBINE WHEEL	1			
2	172 47 262		SPLINED BUSH	1			
MASTER COPY							
A	27.3.99	D.O. CORRECTION					
ISSUE	DATE	NATURE OF AMENDMENTS		ISSUE	DATE	NATURE OF AMENDMENTS	
DWN.		CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI					
CHKD.		TITLE: (A) IMPELLER ASSY (MECHANICAL UNIT)					
YCD.		TO BE SUPPLIED AS A SET					
APPO.	V. RAO	D/S CAT NUMBER		ITEM LIST FOR			
DATE	11-02-96	SHT. No. 1 OF 1		172 47 042 CB CB			

F1-88
14

DRAWING NUMBER
172.47.007

SHEET No. 1 OF 1



Module	<i>m</i>	2.5
No. of teeth	<i>Z</i>	34
Profile angle	α	30°
Shift of basic contour	<i>xm</i>	1.25
Reference diameter	<i>d</i>	85

1. Поверхности 3, И, К, Л чертятся по диаметру $\Phi 90,423$ мм. ≥ 56 НРС. Твердость ядра 55...57 НРС. Твердость ядра допускается не контролировать.
 2. Поверхности 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13 чертятся по диаметру $\Phi 10,5$ мм. ≥ 56 НРС. Твердость ядра 55...57 НРС. Твердость ядра допускается не контролировать.
 3. Размеры для справок.
 4. Размеры для справок.
 5. Обработка по размерам в скобках производится совместно с д.п. 172.47.233.
 6. Детали при изготовлении подлежат закалке и последующей обработке на абразивно-шлифовальном станке.
 7. На чертёжных изображениях не указывается лекальная обработка, допускается чертёжная пометка $Rz=20$ мкм.
 8. После термической обработки допускается шероховатость $Rz=20$ мкм по поверхности И и Л.
 9. На поверхности М допускается следы от выхода фрезы.
 10. В окончательной готовности детали поверхности 3, И, К, Л подвергать механической обработке на шлифовальном станке.
 11. В окончательной готовности детали поверхности 3, И, К, Л подвергать механической обработке на шлифовальном станке.
 12. Деталь должна быть изготовлена из стали 18Х2Н4МА-Ш.
 13. Альтернативные требования по 520 ТУ 1.
1. Carburet the surfaces 3, И, К, Л with $H0.5$ to 1.1 mm ≥ 56 HRC. Core hardness 55 to 49 HRC. Core hardness need not be checked.
 2. Alternate material is steel 18X2H4MA, 18X2H4MA-Ш, 18X2H4MA-Ш ГОСТ 4543-71.
 3. *Ensure dimensions with tool.
 4. **Dimensions for reference.
 5. Carryout machining along dimensions given in brackets along with part 172.47.233.
 6. Use the parts together.
 7. On carburizing sections not subjected to machining, height can be 0.8 to 1.3 mm check the depth of carburizing on test piece.
 8. Carburet (case harden) the surfaces 3, И, К, Л.
 9. On surface M traces of milling cutter are allowed.
 10. After heat treatment surface finish of surfaces И and Л can be $Rz=20$ microns.
 11. In the finally prepared part check the surfaces 3, И, К, Л for absence of cracks, peeling off hair cracks and non-metallic inclusions.
 12. The part should be non-magnetic.
 13. Other requirements are as per 520 ТУ 1.

DATE	11-6-04
SCALE	1:1
DRAWN BY	AVADI
CHECKED BY	
APPROVED BY	
MATERIAL	STEEL 18X2H4MA ГОСТ 4543-71
USED ON	172.47.007-CD 172.47.007-0000
CONTROLLER OF QUALITY ASSURANCE (HEAVY VEHICLES)	
AVADI	
TITLE: GEAR WHEEL	
D.S. CAT NUMBER 172.47.007	

ISSUE	DATE	NATURE OF AMENDMENTS

PHOT SAMPLE SHOULD BE APPROVED BY A B S P BEFORE BULK PRODUCTION.

EST. WT. (KG) 0.375

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

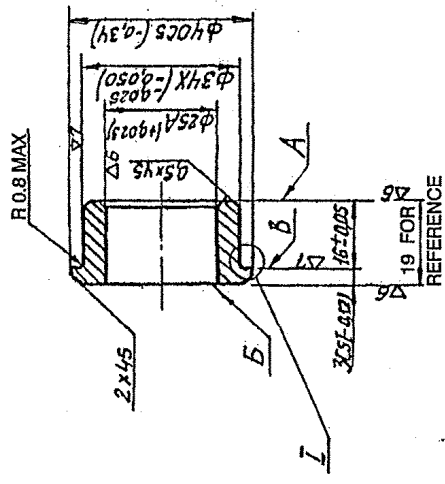
356
SUPPLY CODE
U-01-1-2
D90060

F-81
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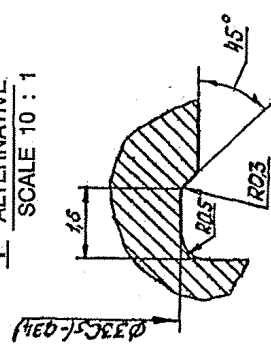
SIZE A3

DRAWING NUMBER
172.47.016

SHEET No. 1 OF 1



I ALTERNATIVE
SCALE 10 : 1



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

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

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

1. RELATIVE TO CYLINDRICAL SURFACE $\phi 25A$ AND FACE 5 MACHINED AT ONE SETTING THE FOLLOWING IS ALLOWED.

- a) END PLAY OF FACES "A" AND "B" NOT EXCEEDING 0.02 mm.
 - b) RUN-OUT OF CYLINDRICAL SURFACE $\phi 34X$ NOT EXCEEDING 0.02 mm.
2. SHARP EDGES SHOULD BE BLUNTED.
3. TO BE HEATED IN BLANK. HARDNESS BHN 302-255 (DIA. OF INDENTATION 3.5 ... 3.8).

EXPLANATORY NOTE :-

- 4. REFERENCE MATERIAL QUOTED : STEEL 38XC GOST 4543-71.
- STRUCTURAL CHROMIUM SILICON ALLOY QUALITY STEEL GRADE 38XC GOST 4543-71.
- a) CHEMICAL COMPOSITION : AS PER STEEL GRADE 38XC GOST 4543-71.

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

RESIDUAL CONTENT OF COPPER AND NICKEL SHOULD NOT EXCEED 0.30% EACH

- b) MECHANICAL PROPERTIES : AS PER STEEL GRADE 38XC GOST 4543-71.

TENSILE STRENGTH Kg/mm ²	YIELD POINT Kg/mm ²	ELONGATION %	REDUCTION IN AREA %	IMPACT STRENGTH Kg/cm ²
95	75	12	50	7
MINIMUM				

(7A) ALT. MATL. :- STEEL 817M40 (En 24) TO BS : 970 Part 1 : 1983

DRN	Sd/=	MATERIAL :-	USED ON :-
CHD	Sd/=	STEEL 38XC	172.47.015Cb
APPD	Sd/=	GOST 4543-71	
DATE	12.02.94	CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES)	
SCALE:-	1 : 1	AVADI	
DIMENSIONS IN mm			
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS : 2102-69			
ALL THREADS TO CONFORM TO IS : 4218.PART-4.			
7A	07.07.06	AUTHY/LIN.No.80001/COA(RV)/GEN.DI-15-10.05.	D S CAT NUMBER
ISSUE	DATE	NATURE OF AMENDMENTS	DRAWING NUMBER
			172.47.016



TITLE :-
BUSHING

F-88
35

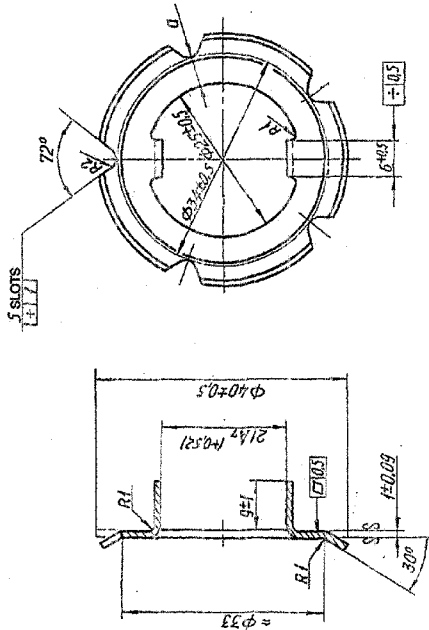
SIZE A3

(B JAYAYVELU, JTDI)
27-07-06

DRAWING NUMBER
172.47.066

SHEET No. 1 OF 1

▽2 (▽)



EXPLANATORY NOTE :-

- a) REFERENCE MATERIAL QUOTED OPEN HEARTH STEEL 10KT-5-II GOST 16623-70. COLD ROLLED STEEL SHEET WITH NORMAL ROLLING ACCURACY OF STEEL GRADE 10 KT CATEGORY 5 GROUP II HIGH FINISH DEEP DRAWN (Γ) ON SURFACE QUALITY GOST 16623-70 AND MANUFACTURED IN ACCORDANCE WITH GOST 1060-74.
- b) REFERENCE NOTE 1 ON ALTERNATIVE MATERIAL: STEEL 15 KT-5-II-Γ GOST 16623-70 COLD ROLLED STEEL SHEET WITH NORMAL ROLLING ACCURACY OF STEEL GRADE 15 KT CATEGORY 5 GROUP II HIGH FINISH DEEP DRAWN (Γ) ON SURFACE QUALITY GOST 16623-70 AND MANUFACTURED IN ACCORDANCE WITH GOST 1060-74.
- 5 a) CHEMICAL COMPOSITION AS PER STEEL GRADES 10 KT AND 15 KT TO GOST 1060-74.

GRADE OF STEEL	CONTENT OF ELEMENTS %				
	Cr	Si	Mn	S	P
10 KT	0.07 - 0.14	0.07 (MAX)	0.25 - 0.80	0.15	0.040
15 KT	0.12 - 0.19	0.07 (MAX)	0.25 - 0.50	0.25	0.040
					0.035

b) MECHANICAL PROPERTIES AS PER STEEL GRADES 10 KT AND 15 KT TO GOST 16623-70

GRADE OF STEEL	ULTIMATE TENSILE STRENGTH Kgf/mm ²	RELATIVE ELONGATION %	CUPPING TEST DEPTH SPHERICAL HOLE	BEND TEST 180° IN COLD STAGE
10 KT	28 - 40	25	0.1	CLOSE
15 KT	32 - 45	24	9.2	CLOSE

1. MAY BE MANUFACTURED FROM STEEL 15 Kt-5-II GOST 16623-70 OPEN HEARTH.
2. DIFFERENCE IN MEASUREMENT OF DIMENSION "a" SHOULD NOT 1 MM.
3. COATING: Zn 9, CHROMATIZING.

ALT. MATL. - GRADE 'D' TO IS: 513-94

DCN	SAJ =	MATERIAL - OPEN HEARTH	USED ON:
CHD	SAJ =	STEEL 10 KT-5 II	172.47.066CB
ATD	SAJ =	GOST 16623-70	
DATE	19-02-94	CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES)	
SCALE	2:1	AVADI	
DIMENSIONS IN mm			
TOLERANCE ON DRIMS			
HOLE SIZE CHAMFER			
SEATED IS: 202-69			
ALL THREADS TO CONFORM TO			
IS: 4218 Pt IV			
2A	07.07.94	DRAWING NUMBER	
ISSUE DATE	NATURE OF AMENDMENTS	172.47.066	

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

EST. WT. (G) TO BE STAMPED OR MARKED WHERE INDICATED TRIS # (LETTERS)

ALL BEANS BLOCKS AND CORNERS TO BE REMOVED (UNLESS OTHERWISE STATED). ALL CORNERS TO HAVE R. CUT. SIDE R. INSIDE EQUIVALENT CHAMFERS ARE PERMISSIBLE.

TITLE: LOCK WASHER

D S CAT NUMBER

D S CAT NUMBER

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F-88 41 SIZE A3

DRAWING NUMBER
172.47.071

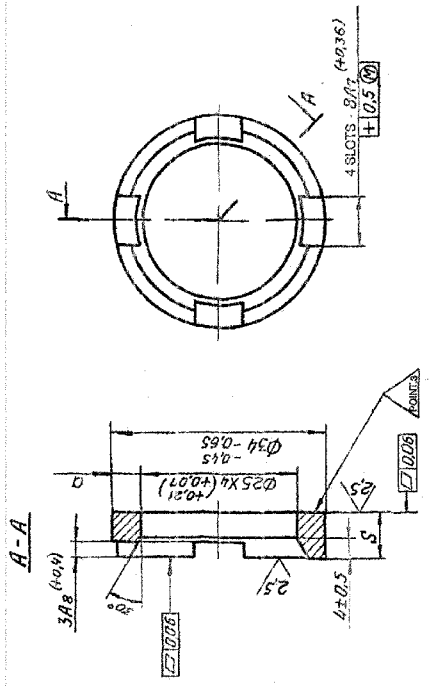
SHEET No. 1 OF 1

RF-40 ✓ (✓)

1. BHN 302-255 (DIA. OF INDENTATION 3.5 . . . 3.8) TO BE CHECKED IN BLANK.
2. DIFFERENCE IN MEASUREMENTS OF DIMENSION 'a' SHOULD NOT EXCEED 0.2 MM.
3. TO BE MARKED OTHERWISE THAN BY PUNCHING.
4. ALTERNATE MATERIAL : STEEL 30X1CA COST 4543-71.

EXPLANATORY NOTE :-

- a) REFERENCE MATERIAL QUOTED :- STEEL 38XC GOST 4543-74.
STRUCTURAL CHROMIUM SILICON ALLOY QUALITY STEEL
GRADE 38XC GOST 4543-74.
- b) REFERENCE NOTE 4 ON ALTERNATIVE MATERIAL :- STEEL 30X1CA COST 4543-74
STRUCTURAL ALLOY STEEL HIGH QUALITY GRADE 30X1CA (CHROMIUM SILICON
MANGANESE STEEL & CHROMIUM SILICON MANGANESE NICKEL STEEL
AND MANUFACTURED IN ACCORDANCE WITH GOST 4543-71.
2. a) CHEMICAL COMPOSITION AS PER STEEL GRADES 38XC & 30X1CA GOST 4543-74.



PART NO.	S	MAXIMUM TOLERANCE	MASS
172.47.071	7.4	0.018	0.0176
	-01	7.2	0.0172
	-02	7	0.0168
	-03	6.8	0.0164
	-04	6.6	0.0160

GRADE OF STEEL	CONTENT OF ELEMENTS %										RESIDUAL CONTENTS %		
	C	Si	Mn	Cr	S	P	Cu	Ni	Cr	MAXIMUM			
38XC	0.34-0.42	1.0-1.4	0.30-0.60	1.30-1.60	0.035	0.035	0.30	0.30	0.30	0.30	0.30	0.30	
30X1CA	0.28-0.34	0.30-1.4	0.60-1.10	0.60-1.10	0.025	0.025	0.30	0.30	0.30	0.30	0.30	0.30	

b) MECHANICAL PROPERTIES AS PER STEEL GRADES 38XC & 30X1CA GOST 4543-74.

GRADE OF STEEL	TENSILE STRENGTH Kgf/mm ²	YIELD POINT Kgf/mm ²	ELONGATION %	REDUCTION IN AREA %	IMPACT STRENGTH Kgm/cm ²
38XC	95	75	12	50	7
30X1CA	110	85	10	45	5

2A) ALT. MATL. : STEEL 317M40 (EN 24) TO BS: 970 Part 1 : 1983

DRN	SSJ / =	MATERIAL:	USED ON :-
CHD	SSJ / =	STEEL 38XC	172.47.0156bCb
REV	SSJ / =	GOST 4543-71	
DATE	12-02-94	CONTROLLER OF QUALITY ASSURANCE (HEAVY VEHICLES)	
SCALE	2:1	AVADI	
DIMENSIONS IN mm		TITLE :-	RING ADJUSTING
TOLERANCE ON DIMENSIONS UNLESS OTHERWISE STATED IS 2102-69		D S CAT NUMBER	DRAWING NUMBER
ALL SHARP EDGES AND CORNERS TO BE REMOVED UNLESS OTHERWISE STATED MACHINED CORNERS TO HAVE R OUT-SIDE R INSIDE EQUIVALENT CHAMFERS ARE PERMISSIBLE.		IS 4218 Pt. IV	172.47.071
ISSUE DATE	2A 07.07.06	AUTHORITY	
NATURE OF AMENDMENTS			

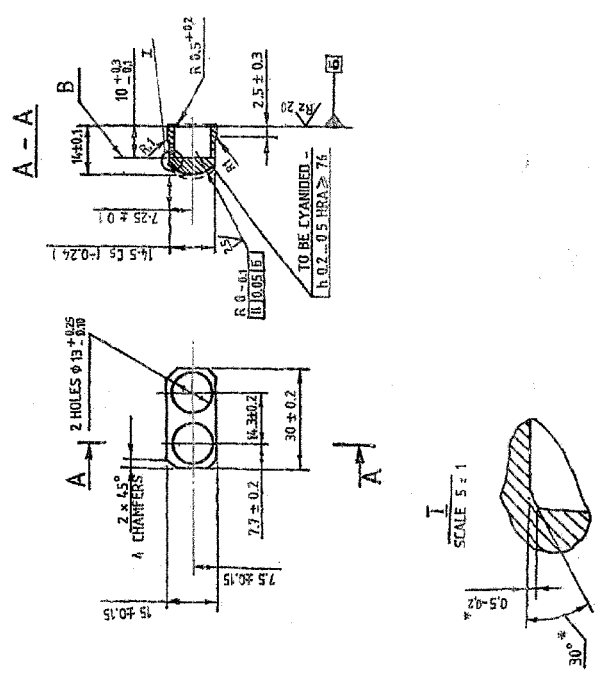
PILOT SAMPLE SHOULD BE APPROVED BY A H S P BEFORE BULK PRODUCTION.
EST. WT. (KG) TO BE STAMPED ON MARKED WHERE INDICATED THIS # (LETTERS)
SEE TABLE

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

DRAWING NUMBER
172.47.227

SHEET No. 1 OF 1

Fig. 40 (V)



EXPLANATORY NOTE :-

9. REFERENCE MATERIAL QUOTED : STEEL 12X1H8A GOST 4543-71
STRUCTURAL ALLOY STEEL HIGH QUALITY OF GRADE 20X2H8A AND ALTERNATIVELY 20X2H4A
(CHROMIUM-NICKEL AND CHROMIUM NICKEL STEEL WITH BORON) AND MANUFACTURED
IN ACCORDANCE WITH GOST 4543-71.
- a) CHEMICAL COMPOSITION AS PER GOST 4543-71

GRADE OF STEEL	CONTENT OF ELEMENTS %								RESIDUAL CONTENT % (MAX)				
	C	Si	Mn	Cr	Ni	S	Cu	NI	P	Cr			
12X1H8A	0.09-0.16	0.17-0.37	0.3-0.6	0.60-0.90	2.75-3.75	0.025	0.30	0.30	0.025	0.30			
20X2H4A	0.18-0.22	0.17-0.37	0.3-0.6	1.25-1.65	3.25-3.65	0.025	0.30	0.30	0.025	0.30			

- b) MECHANICAL PROPERTIES AS PER GOST 4543-71.

GRADE OF STEEL	YIELD POINT STRENGTH Kg/mm ²	ULTIMATE STRENGTH Kg/mm ²	ELONGATION %	REDUCTION IN AREA %		IMPACT STRENGTH
				MINIMUM	MINIMUM	
12X1H8A	70	95	11	65	9	
20X2H4A	110	130	9	45	8	

1. IT IS ALLOWED TO MANUFACTURE FROM SHAPED ROLLED STOCK No.2618 AS PER TY 14-1-1271-75.
2. CYANIDING ALL OVER IS ALLOWED.
3. MARK LEFT BY DRILL WITH DIAMETER NOT MORE THAN 5mm TO THE DEPTH NOT MORE THAN 1mm IS ALLOWED ON SURFACE "B".
4. LOCAL TOOL MARKS IN HOLE DIA 43 ARE ALLOWED.
5. ALTERNATE MATERIAL-STEEL 20X2H4A, GOST 4543-71.
6. * DIMENSIONS TO BE ENSURED BY TOOL.
7. TRACE OF CHECKING THE HARDNESS ON SPHERE R 8 WITH DEPTH NOT EXCEEDING 0.06mm IS PERMITTED
8. REMAINING REQUIREMENTS ARE AS PER 520 TY 1.

ALT. MATL. - STEEL 655 M18 (EN 36A) TO BS: 970 Part 1: 1983

DRN	Sd/ =	MATERIAL -	USED ON -
CRD	Sd/ =	STEEL 20X2H8A	172.47.227.02CC
APPD	Sd/ =	GOST 4543-71	
DATE	19-03-94	CONTROL RATE OF QUALITY ASSURANCE (HEAVY VEHICLES)	
SCALE: 1:1			
DIMENSIONS IN mm			
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS: 202-69			
TITLE: SLEEVE			
AUTOMATICALLY GENERATED FILE NO. 172M.510.A.87.A.L.No.95			D S CAT NUMBER
ISSUE DATE: 3.8.89			DRAWING NUMBER
NATURE OF AMENDMENTS			172.47.227

PILOT SAMPLE SHOULD BE APPROVED BY A H S P BEFORE BULK PRODUCTION.
EST. WT. (KG) TO BE STAMPED ON 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.

DRAWING NUMBER
172.47.233

SHEET No. 1 OF 1

Rz4.0

Module	m	1.5
No. of teeth	z	20
Profile angle	α	30°
Shift of base rack	x/m	0.75
Reference diameter	d	42

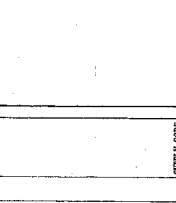
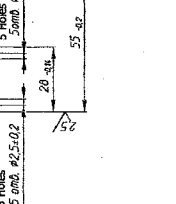
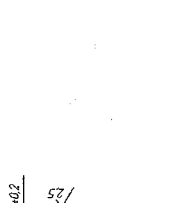
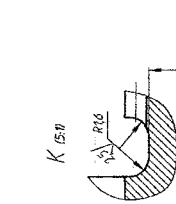
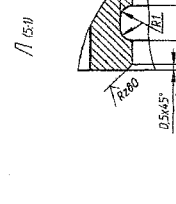
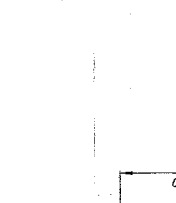
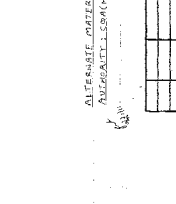
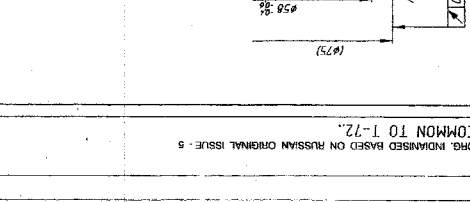
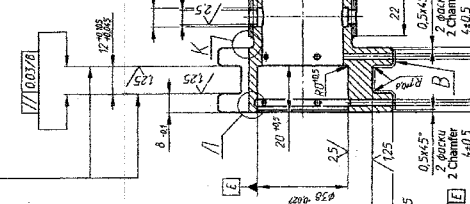
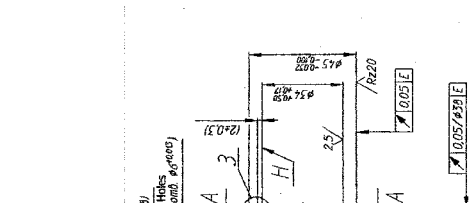
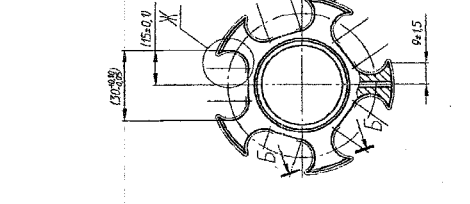
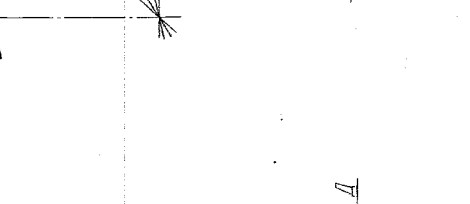
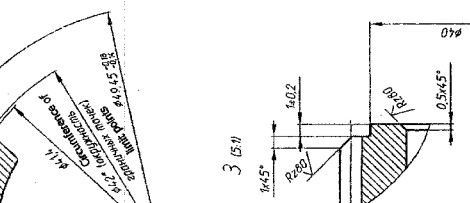
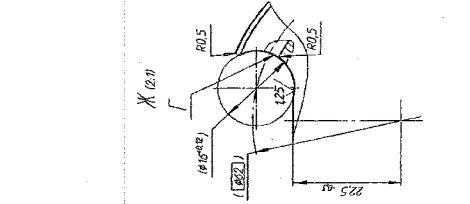
1. Подверности В, Д центрируются, h 0.5 - 1.1 мм, > 50 HRC. Допускается центровка кружком, при этом шероховатость H ГОСТ 4543-71.
2. Профиль для справок.
3. Размеры в скобках - после сборки.
4. На центрирующих участках, кроме подверности Г, допускается h 0.2 - 0.3 мм.
5. Шлифовальные поверхности, кроме поверхности каблука, должны иметь матовую поверхность без фаски.
6. Декоративная обработка.
7. Ветель, ветель быть чашечковой.
8. Ветель, ветель по 520 ТУ1.

1. Case harden the surface В, Д with h 0.5 to 1.1 mm, > HRC 56.
2. Alternate material is steel 18X2H4BA, 18X2H4MA, Ш ГОСТ 4543-71.
3. Dimensions for reference.
4. Dimensions given in brackets are after assembly.
5. On case hardening sections, except surface Г, h 0.6 to 1.3 mm is allowed.
6. Check the spline with complete gauge.
7. Carry out checking by magnetic particle test. Defects are not allowed.
8. Finish requirements are as per 520 T.U.1.

B-B
R0.5
в радиусе
в радиусе

A-A (4.0)
Wire
Проволока П-5.5 по ГОСТ 2475-68
Class 1, GOST
3.222 ± 0.08

Ж (2.0)



PILOT SAMPLE SHOULD BE APPROVED BY A H S P BEFORE BULK PRODUCTION.
EST. WT 60 INDICATED UNLESS OTHERWISE SPECIFIED.
ALL SHARP EDGES AND CORNERS TO BE REMOVED UNLESS OTHERWISE SPECIFIED.
SIDE R INSIDE EQUIVALENT CHANGES ARE PERMISSIBLE.

ISSUE	DATE	NATURE OF AMENDMENTS

DATE	APPROVED BY	DESIGNED BY

DATE	APPROVED BY	DESIGNED BY

DATE	APPROVED BY	DESIGNED BY

DATE	APPROVED BY	DESIGNED BY

ALTERNATE MATERIALS: STEEL: 18X2H4BA, 18X2H4MA, Ш ГОСТ 4543-71.
ALUMINUM: 6061-T6, 6063-T5, 6061-T6, 6063-T5, 6061-T6, 6063-T5, 6061-T6, 6063-T5.

MATERIAL:	Steel 18X2H4MA GOST 4543-71	USED ON: 172.47.0416 172.47.0416C6
CONTROL:	CONTROLLED BY QUALITY ASSURANCE (HEAVY VEHICLES)	
DATE:	11-05-04	
SCALE:	1:1	
TITLE:	INNER CARRIER	
ISSUED TO:	D S CAT NUMBER	
CONFORM TO:	D S CAT NUMBER	
DRAWING NUMBER:	172.47.233	

DATE:	11-05-04
SCALE:	1:1
TITLE:	INNER CARRIER
ISSUED TO:	D S CAT NUMBER
CONFORM TO:	D S CAT NUMBER
DRAWING NUMBER:	172.47.233

DATE:	11-05-04
SCALE:	1:1
TITLE:	INNER CARRIER
ISSUED TO:	D S CAT NUMBER
CONFORM TO:	D S CAT NUMBER
DRAWING NUMBER:	172.47.233

DATE:	11-05-04
SCALE:	1:1
TITLE:	INNER CARRIER
ISSUED TO:	D S CAT NUMBER
CONFORM TO:	D S CAT NUMBER
DRAWING NUMBER:	172.47.233

DATE:	11-05-04
SCALE:	1:1
TITLE:	INNER CARRIER
ISSUED TO:	D S CAT NUMBER
CONFORM TO:	D S CAT NUMBER
DRAWING NUMBER:	172.47.233

DATE:	11-05-04
SCALE:	1:1
TITLE:	INNER CARRIER
ISSUED TO:	D S CAT NUMBER
CONFORM TO:	D S CAT NUMBER
DRAWING NUMBER:	172.47.233

DATE:	11-05-04
SCALE:	1:1
TITLE:	INNER CARRIER
ISSUED TO:	D S CAT NUMBER
CONFORM TO:	D S CAT NUMBER
DRAWING NUMBER:	172.47.233

DATE:	11-05-04
SCALE:	1:1
TITLE:	INNER CARRIER
ISSUED TO:	D S CAT NUMBER
CONFORM TO:	D S CAT NUMBER
DRAWING NUMBER:	172.47.233

DATE:	11-05-04
SCALE:	1:1
TITLE:	INNER CARRIER
ISSUED TO:	D S CAT NUMBER
CONFORM TO:	D S CAT NUMBER
DRAWING NUMBER:	172.47.233

DATE:	11-05-04
SCALE:	1:1
TITLE:	INNER CARRIER
ISSUED TO:	D S CAT NUMBER
CONFORM TO:	D S CAT NUMBER
DRAWING NUMBER:	172.47.233

DRAWING NUMBER
172 47 234

P1440
V

1. DIMENSION IN BRACKETS IS TO BE ENSURED AFTER ASSEMBLY.
2. OTHER REQUIREMENTS ARE AS PER S20 TY 1.
3. ISOLATED PIN-HOLE CASTING DEFECTS, NOT MORE THAN TWO ON EACH MACHINED SURFACE, ARE ALLOWED.

EXPLANATORY NOTE

4. REFERENCE MATERIAL: TIN FOUNDRY BRONZE EP 05 US CS TO 613-79
- 5P - BRONZE, 0-TIN, 4-ZINC, C-LEAD.
- 6) CHEMICAL COMPOSITION:

GRADE OF BRONZE	CONTENT OF ELEMENTS IN %									
	Sn	Zn	Pb	Cu	Al	Fe	Si	P	Sb	TOTAL
5p05USCS	4.0-6.0	4.0-6.0	RES*	0.05	0.4	0.05	0.1	0.5	1.3	
					MAXIMUM					

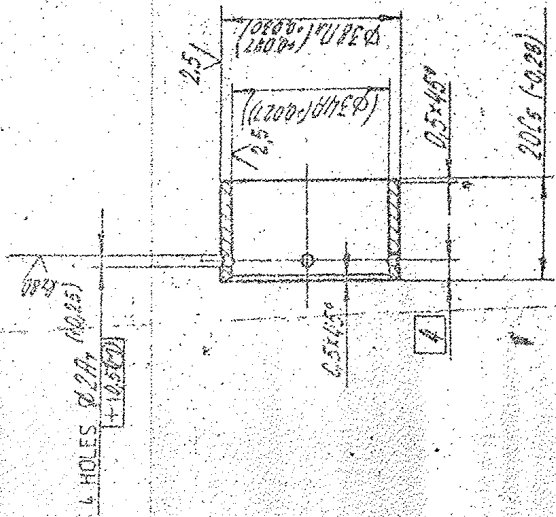
5) MECHANICAL PROPERTIES:-

GRADE OF BRONZE	ULTIMATE TENSILE STRENGTH Kgf/cm ²	ELONGATION %	HARDNESS BHN
5p05USCS	15	5	588
		MINIMUM	

ALTERNATE MATERIAL:-

BS: 1400-73 LG2 (Used Latest std BS:1400-85)
 AUTHORITY:- CQA(HV), Levey NO:
 98704/04/ID.CO.ORD/ALT.com dt:03-06-2005

MASTER COPY



PROF SAMPLE SHOULD BE APPROVED BY A H S P BEFORE
 MILK PRODUCTION

EST. MT. 0.032
 TO BE STAPPED OR MARKED WHERE
 SPECATED THIS # (LETTERS)

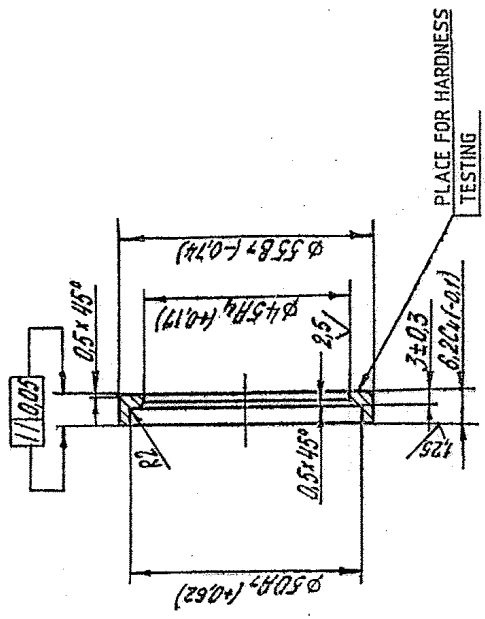
ALL SHARP EDGES AND CORNERS TO BE REMOVED UNLESS
 OTHERWISE STATED MACHINED CORNERS TO HAVE R OUT SIDE
 P. MISSE EQUIVALENT DIMENSIONS ARE PERMISSIBLE.

DRX	DATE	SCALE	1:1
DR	28-7-94		
TCO			
APPR			
DIMENSIONS IN mm TOLERANCE ON DIMS UNLESS OTHERWISE STATED IS 20H-6P ALL THREADS TO CONFORM TO			
MATERIAL:- BRONZE 01C 5-5-5 6051 613-85			
USED ON 172 47 041 Cb Cb			
CONTRIBUTE OF QUALITY ASSURANCE (HEAVY VERTS) AVADI			
TITLE BUSH			D S CAT NUMBER 172 47 234
DRAWING NUMBER			172 47 234

SIZE A3

DRAWING NUMBER
172.47.235

SHEET No. 1 OF 1



1. TO BE CYANIDED ALL OVER h 0.2 TO 0.6 mm. HRA > 76.
2. OTHER REQUIREMENTS ARE AS PER 520 TY1.
3. ALTERNATIVE MATERIAL : STEEL 20 X 2H4A GOST 4543-71.

EXPLANATORY NOTE :-

4. REFERENCE MATERIAL QUOTED : STEEL 12 X H9A GOST 4543-71. STRUCTURAL CHROMIUM - NICKEL AND CHROMIUM NICKEL STEEL WITH BORON, HIGH QUALITY GRADE OF STEEL 12XH3A, ALTERNATIVELY STEEL GRADE 20X 2H4A AND MANUFACTURED IN ACCORDANCE WITH GOST 4543-71.
- a. CHEMICAL COMPOSITION AS PER GOST 4543-71

GRADE OF STEEL	CONTENT OF ELEMENTS %						IMPURITIES %(MAXIMUM)			
	C	Si	Mn	Cr	Ni	P	S	Cu	Ni	Cr
12XH3A	0.09	0.17	0.30	0.60	2.75	0.025	0.025	0.30	0.30	0.30
20X2H4A	0.16	0.37	0.60	0.90	3.15	0.025	0.025	0.30	0.30	0.30

- b. MECHANICAL PROPERTIES AS PER GOST 4543-71.

GRADE OF STEEL	TENSILE STRENGTH Kgf/mm ²	YIELD POINT Kgf/mm ²	ELONGATION %	REDUCTION IN AREA %	IMPACT STRENGTH Kgf/cm ²
12XH3A	95 MIN	70 MIN	11 MIN	55 MIN	9 MIN
20X2H4A	130 MIN	110 MIN	9 MIN	45 MIN	8 MIN

Ⓐ ALT. MATL: STEEL 65SM3 (En36A) TO BS 970 Part-1: 1983

PILOT SAMPLE SHOULD BE APPROVED BY A H S P BEFORE BULK PRODUCTION.		DRN	Sd/=	MATERIAL:-	USED ON:-
EST. WT. (kg)	TO BE STAMPED OR MARKED WHERE INDICATED THUS # (LETTERS)	CHD	Sd/=	STEEL 12XH3A	172.47.041CbCb -
0.030		APPD	Sd/=	GOST 4543-71 -	
ALL SHARP EDGES AND CORNERS TO BE REMOVED UNLESS OTHERWISE STATED MACHINED CORNERS TO HAVE R OUT-SIDE R INSIDE EQUIVALENT CHAMFERS ARE PERMISSIBLE.		DATE	29-07-94 -	CONTROLLEDATE OF QUALITY ASSURANCE (HEAVY VEHICLES)	
		SCALE:-	1 : 1 -	AVADI	
		DIMENSIONS IN mm		TITLE:-	
		TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS: 2102-69		RING	
		ALL THREADS TO CONFORM TO		D S CAT NUMBER	
ISSUE	DATE	NATURE OF AMENDMENTS		DRAWING NUMBER	
A	07-07-06	AUJHY G.N.No. 80001/GA/IV/ GEN DI. 15.10.05		172.47.235	

Rz 40 (✓)

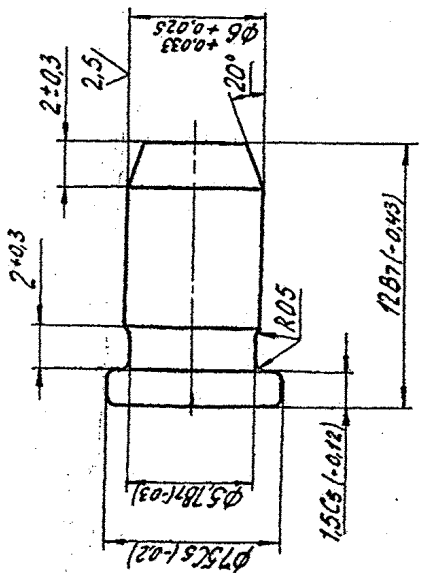
DRG RE - INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE - NIL
 27-07-06
 (BAYAVELUJ, T01D)

F-89
 43
 SIZE A3

"COMMON TO T-90"

DRAWING NUMBER
172.47.236

SHEET No 1 OF 1



EXPLANATORY NOTE :-

REFERENCE MATERIAL QUOTED :- STEEL 38XC GOST 4543 - 71.
 STRUCTURAL CHROMIUM SILICON ALLOY QUALITY STEEL
 GRADE 38XC GOST 4543 - 71.
 CHEMICAL COMPOSITION: AS PER STEEL GRADE 38XC GOST 4543 - 71.

CONTENT OF ELEMENTS %					
C	Si	Mn	Cr	S	P
0.34 - 0.42	1.0 - 1.4	0.30 - 0.60	1.30 - 1.60	0.035	0.035
				MAX	

RESIDUAL CONTENT OF COPPER, NICKEL AND CHROMIUM SHOULD NOT EXCEED 0.30 % EACH.

MECHANICAL PROPERTIES: AS PER STEEL GRADE 38XC GOST 4543 - 71.

TENSILE STRENGTH Kg/mm ²	YIELD POINT Kg/mm ²	ELONGATION %	REDUCTION IN AREA %	IMPACT STRENGTH Kgf/cm ²
95	75	12	50	7
MINIMUM				

- HRC 26 - 33. IT IS ALLOWED TO CHECK BHN 302 - 255 (DIA OF INDENTATION 3.5 - 3.8)
- OTHER REQUIREMENTS ARE AS PER 520 TY 1.

Ⓐ ALT. MATL. :- STEEL 817M40 (En 24) TO BS: 970 Part 1 : 1983

DRN		Sd/=	MATERIAL:-	USED ON:-
CHD		Sd/=	STEEL 38XC	172.47.041cbCb
APPD		Sd/=	GOST 4543 - 71	
DATE		15-07-94	CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI	
SCALE:-		5:1	TITLE:-	
DIMENSIONS IN mm			RETAINER	
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS: 2102-69			D S CAT NUMBER	
ALL THREADS TO CONFORM TO			DRAWING NUMBER	
A 07.07.08 AUTHYLING.80007/CSA(HV)/GEN/01.15.10.05			172.47.236	
ISSUE DATE			NATURE OF AMENDMENTS	
8		7	6	

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)
 0.005

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

