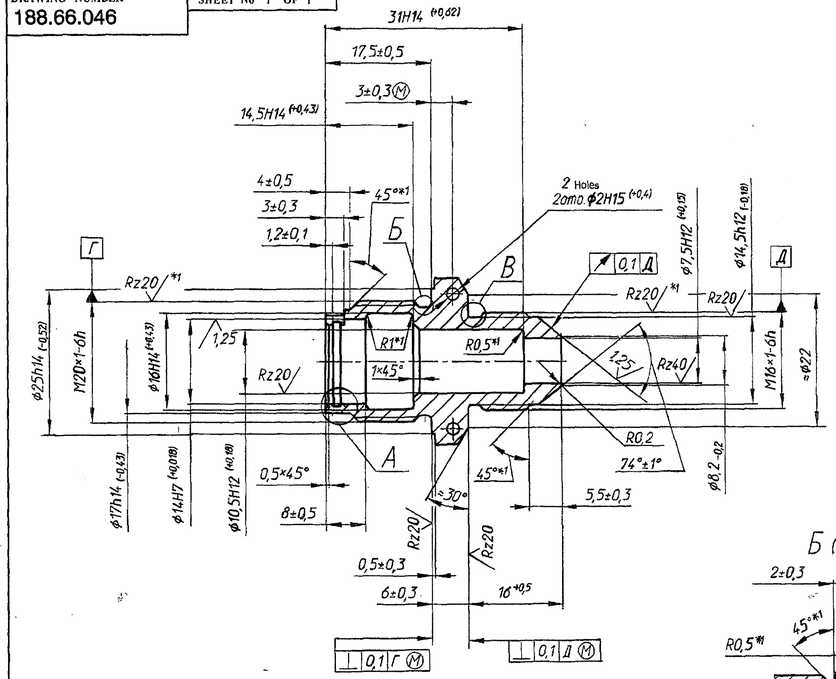
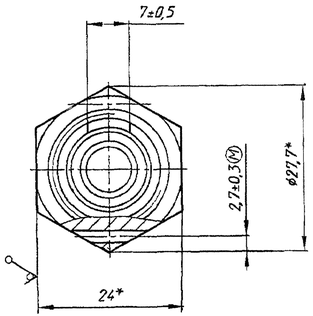
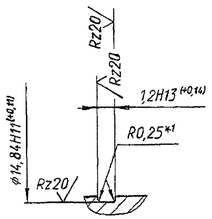
DRAWING NUMBER
188.66.046

SHEET No 1 OF 1

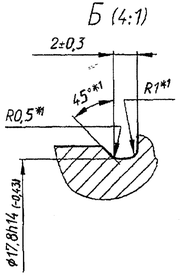




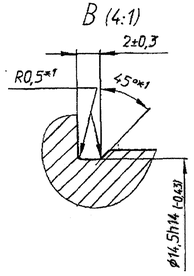
А (5:1)



Б (4:1)



В (4:1)



Rz80 (√)

1. 255...302 НВ.
2. *Размер для справок
3. *1Размеры и шероховатость обеспечить инструментом
4. Покрытие Цб.хр. Качество и толщину покрытия в отверстиях не контролировать.
5. Остальные требования по 520.ТУ1.

1. 255...302 BHN.
2. * Dimensions for reference.
3. *1 Dimensions and surface finishing to be ensured by tool.
4. Coating zinc plated 6mic. chormatised.Quality and thickness of coating in holes need not be checked.
5. Other requirments as per 520.TY1.

ALT. MATERIAL:- EN:24; BS:970
AUTHORITY:- CGA(HV) Letter No:-091/IFD/IND-V/MTPF/OE dt. 17-03-2005

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)
0.05	

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	VS
CHD	[illegible]
APPD	[illegible]
DATE	21.7.04
SCALE:-	2:1
DIMENSIONS IN mm	
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS: 2102-69	
ALL THREADS TO CONFORM TO	

MATERIAL:- Hexagonal bar 24-h11 Gost 8560-78 38ХС-Б-М-То Gost 4543-71

USED ON:- 188.66.020cbCb

CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI

TITLE:- VALVE PIPE UNION

D S CAT NUMBER

DRAWING NUMBER 188.66.046

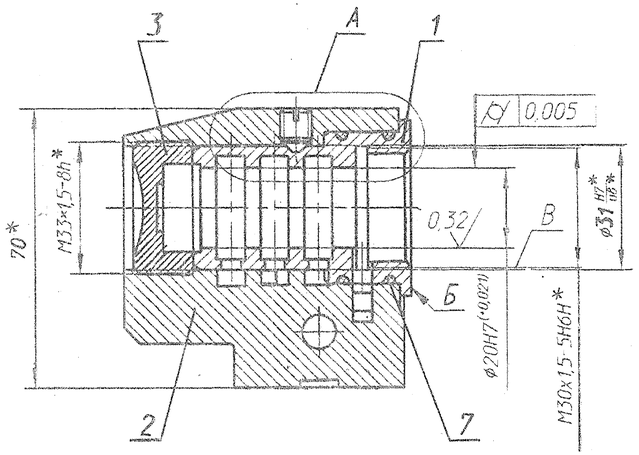
DRG. INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE - NIL

356
SUPPLY CODE
U-01-1-4
D90214

F-108
34
SIZE A4 x 4

DRAWING NUMBER
188.66.016cb-1Cb

SHEET No. 1 OF 1



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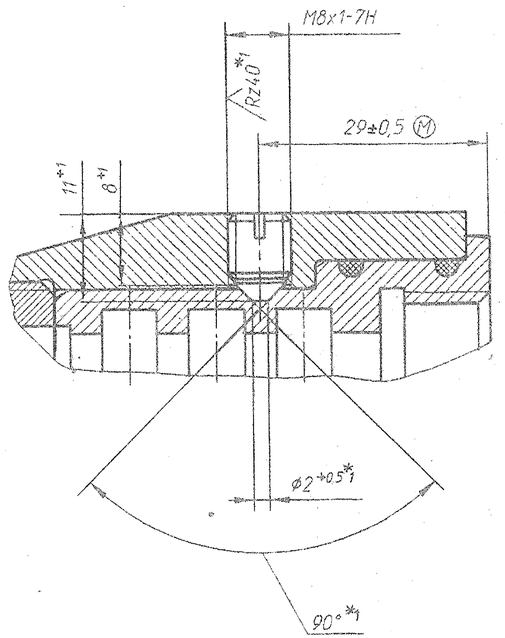
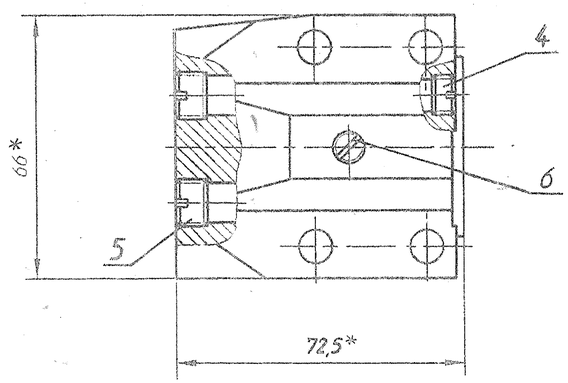




1. Before press-fitting the sleeve, Body item 2, should be heated up to Temperature 110^{+10}°C.
2. Plug items 4 and 5, stopper item3, screw item6, should be set on sealent Anaterm-6 or Anaterm-6BTY6-01-1215-79.
3. Sealing ring items 7 should be applied with lubricant Tsiatim -201 Gost 6267-74 or lithol-24 Gost 21150-87.
4. Non-coincidence of marks on sleeve and body - 0^{+1} mm.
5. * Dimensions for refrence.
6. *1 Surface finishing and dimensions to be ensured by tool.
7. Surfaces Б and B should be protected from damages and dirt.
8. Internal cavities and channels should be tested for leak-proofness with oil, used in transmission, pressure (2.5±0.2)MPa(25±2)Kgf/cm^2) leakage is not permitted.
9. All channels must be clean. In channels, foreign particles, dirt particles, chips are not permitted.
10. Other requirments as per 520.Ty1.

MASTER COPY

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)
0.75	

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	
CHD	R. Govindachari
APPD	Chanchal
DATE	21.7.04
SCALE:- 1 : 1	
DIMENSIONS IN mm	
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS : 2102 - 69	
ALL THREADS TO CONFORM TO	

MATERIAL :- ——

USED ON :- 188.66.015cb-1Cb

CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI

TITLE :- BODY ASSY.

D S CAT NUMBER

DRAWING NUMBER 188.66.016cb-1Cb

DRG. INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE -NIL

356
SUPPLY CODE
U-01-1-4

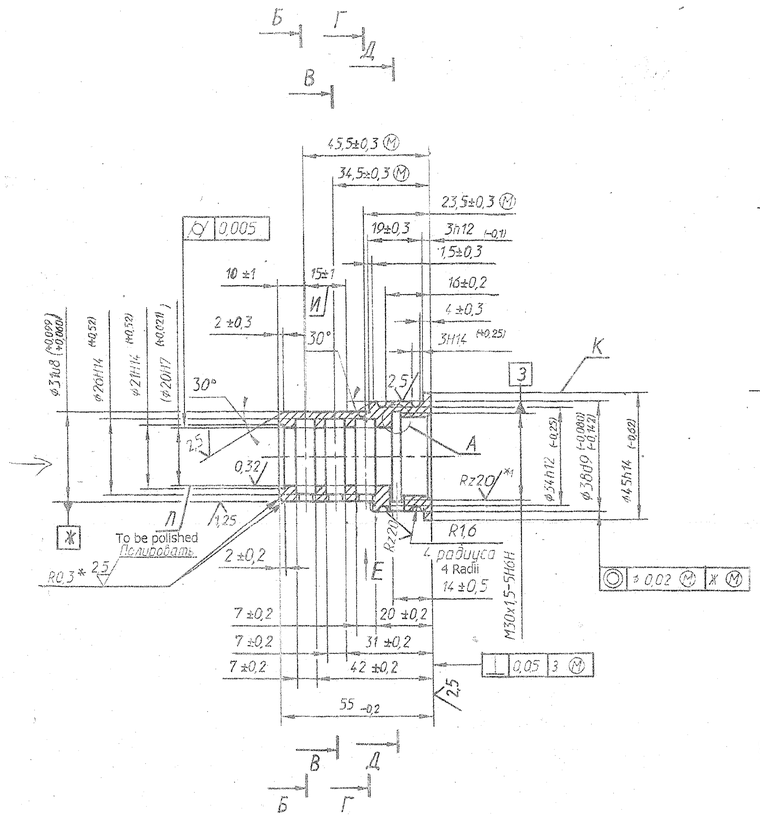
D90214

F-108
9

SIZE A4 x 3

DRAWING NUMBER
188.66.024

SHEET No. 1 OF 1



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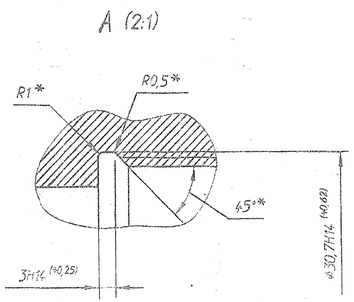
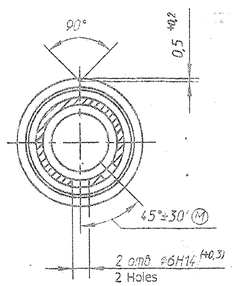
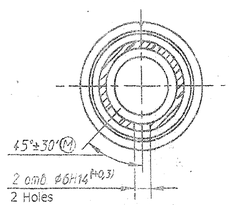


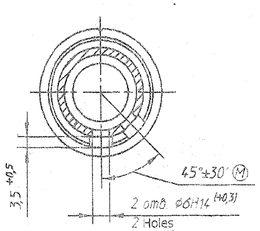
Б-Б



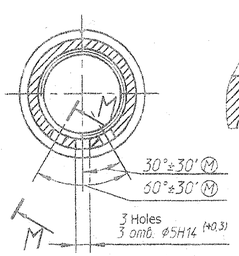
В-В



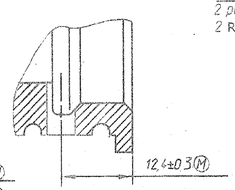
Г-Г



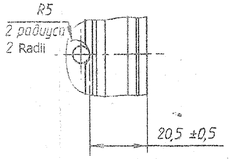
Д-Д



М-М (2:1)



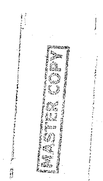
Е



Rz40 / (M)

1. 331...444 HB.
2. На поверхности Л в местах пересечения с торцовыми поверхностями обеспечить острую кромку.
3. *Размеры обеспечить инструментом.
4. *1Шероховатость обеспечить инструментом.
5. Размер в скобках - после сборки.
6. Допускается вместо контроля допуска цилиндричности контролировать допуск овальности и конусообразности поверхности Л 0,0025 мм (полуразность диаметров).
7. Нанести риску длиной И травлением, ориентированную по риске на поверхности К. Допускается выполнение риски механическим способом.
8. Покрытие Хим.Окс.прм. Допускается отсутствие покрытия в районе риски на поверхности.
9. Маркировать обозначение на бирке.
10. Остальные требования по 520 ТУ1.

1. 331...444 BHN.
2. On surface Л in areas of Inter-section with end faces provide sharp edges.
3. *Dimensions to be ensured by tool.
4. *1 Surface-finishing to be ensured by tool.
5. Dimensions in brackets - after assembly.
6. Instead of checking Tolerance for cylindricity it is permitted to check the tolerance for ovality and taper of surface Л 0.0025mm(half difference of diameter).
7. Make the mark with a length И by etching which is oriented along the marks on surface K. making of marks by mechnical method is permitted.
8. Coating chemical oxidised oiled . Absence of coating in areas of marks on surface Ж is permitted.
9. Mark the organisation on tag.
10. Other requirments as per 520TY1.



ALT.MATERIAL:- STEEL BI7M40 (EN-24) TO BS:970-83
AUTHORITY:- CQA(HV) letter No.: 091/IFD/IND-V/MTPF/OE dt. 17-03-05

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)
0.25	

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	[illegible]
CHD	K. Gopalan
APPD	Chandak
DATE	21.7.04
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:- 188.66.016cb-1Cb

CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI

TITLE:- SLEEVE

D S CAT NUMBER

DRAWING NUMBER 188.66.024

DRAWING NUMBER 188.66.026-1 | SHEET No. 1 OF 1

1. HB≥90 10/1000.
2. Материал-заменитель алюминиевый сплав марок АК8, Д16 ГОСТ 4784-97.
3. Допускается вместо допуска цилиндричности контролировать допуск овальности и конусообразности 0,008 мм (полуразность диаметров).
4.* Размеры и шероховатость обеспечить инструментом.
5. Остальные требования по 520.ТУ1
6. Маркировать порядковый номер детали шрифтом ПО-5 ГОСТ 2930-62.

1. BHN ≥ 90 10/1000.
2. Alternate material -Aluminium alloy grade AK8 , Д16 GOST 4784-97.
3. Instead of checking ,tolerance for cylindricity,checking of tolerance for ovality and taper -0.008 mm is permitted (half difference of diameters).
4. *Dimensions and surface finishing to be ensured by tool.
5. Other requirements are as per 520.TY1.
6. Serial number of parts should be marked with letter type ПО-5 GOST 2930-62.

1) ALT. MATERIAL:- ALUMINIUM ALLOY GR. LM-25 TO BS:1490-70
AUTHORITY:- CQA (HV) letter NO:- 091/IFD/IND-V/MTPF/OE dt 17/3/05

2) ALT. MATERIAL:- ALUMINIUM ALLOY GR. 22588 TO IS: 734-75
AUTHORITY:- CQA (HV) Letter NO:- 83066/HYD.CONTROL/IND DT. 01/03/06

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

EST. WT. (Kg) 0.43	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

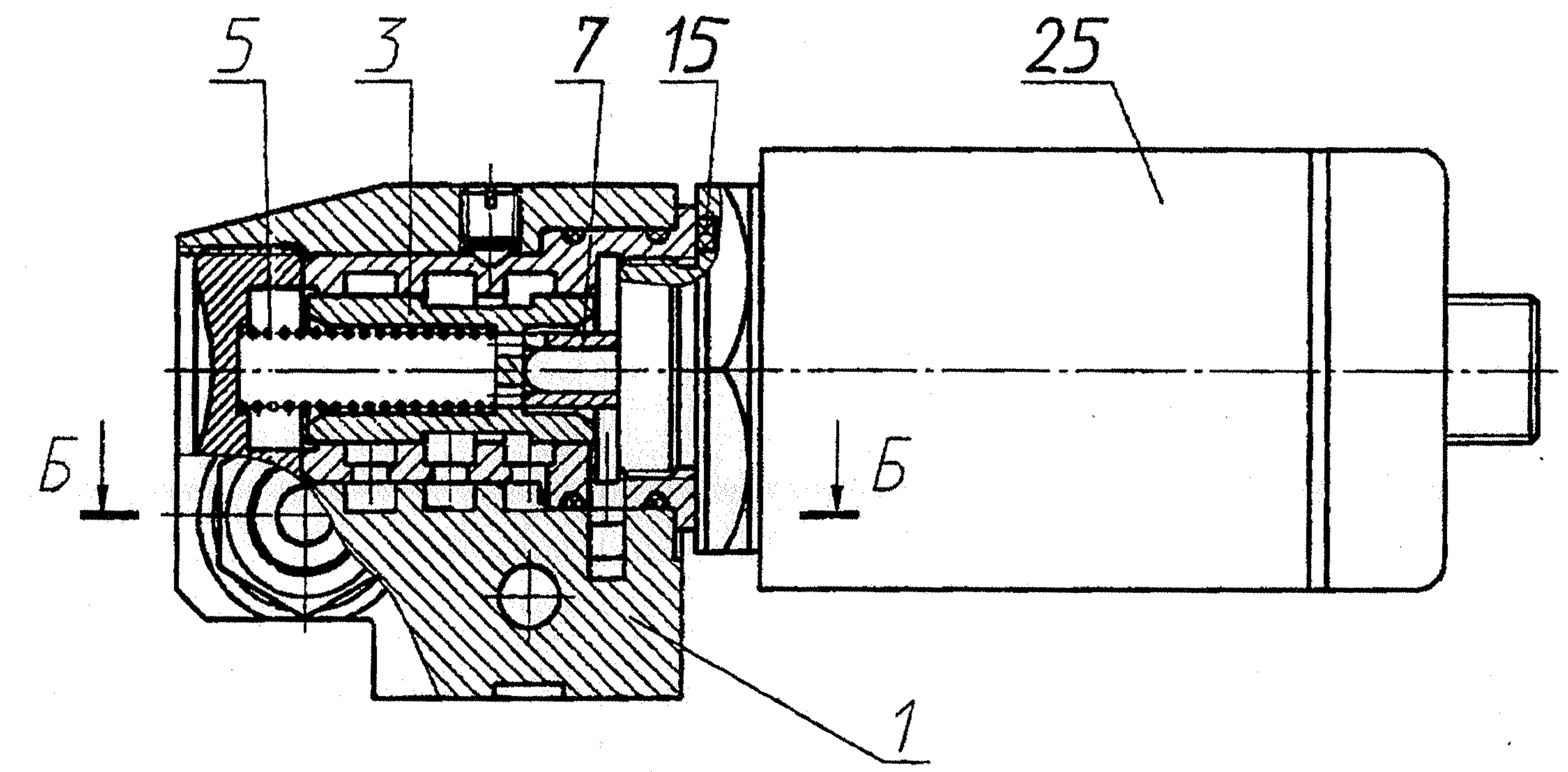
DRN / CHD / APPD	MATERIAL:- ALLUMINIUM ALLOY AK6 GOST 4784-97	USED ON:- 172.33.271cbCb 188.66.016cb-1cb.
DATE 22-7-04	CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI	
SCALE:- 2:1		
DIMENSIONS IN mm; TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS: 2102-69	TITLE:- BODY	
ALL THREADS TO CONFORM TO	D S CAT NUMBER	DRAWING NUMBER 188.66.026-1

356 SUPPLY CODE U-01-1-4 DS0214

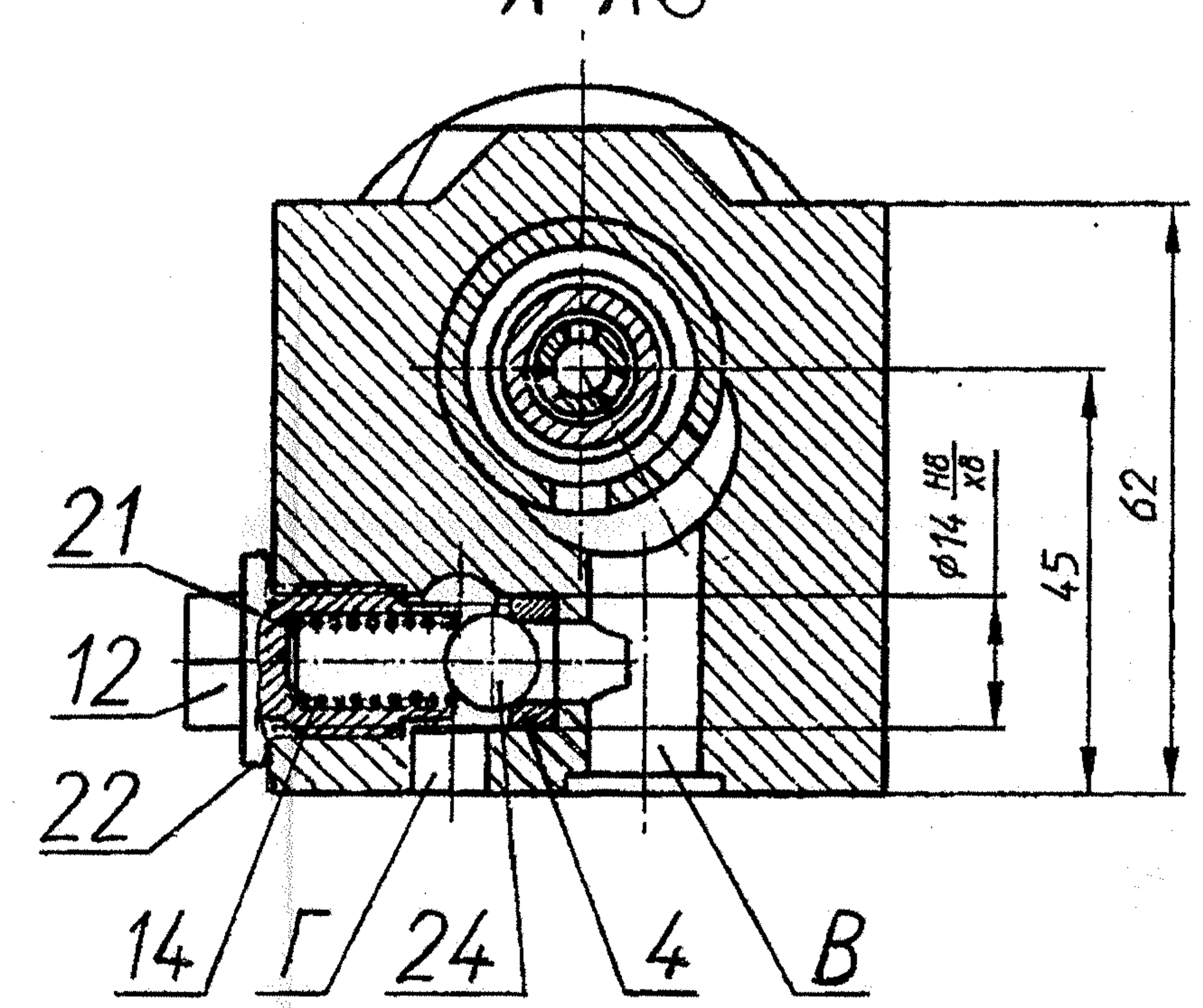
DRG. INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE: NIL

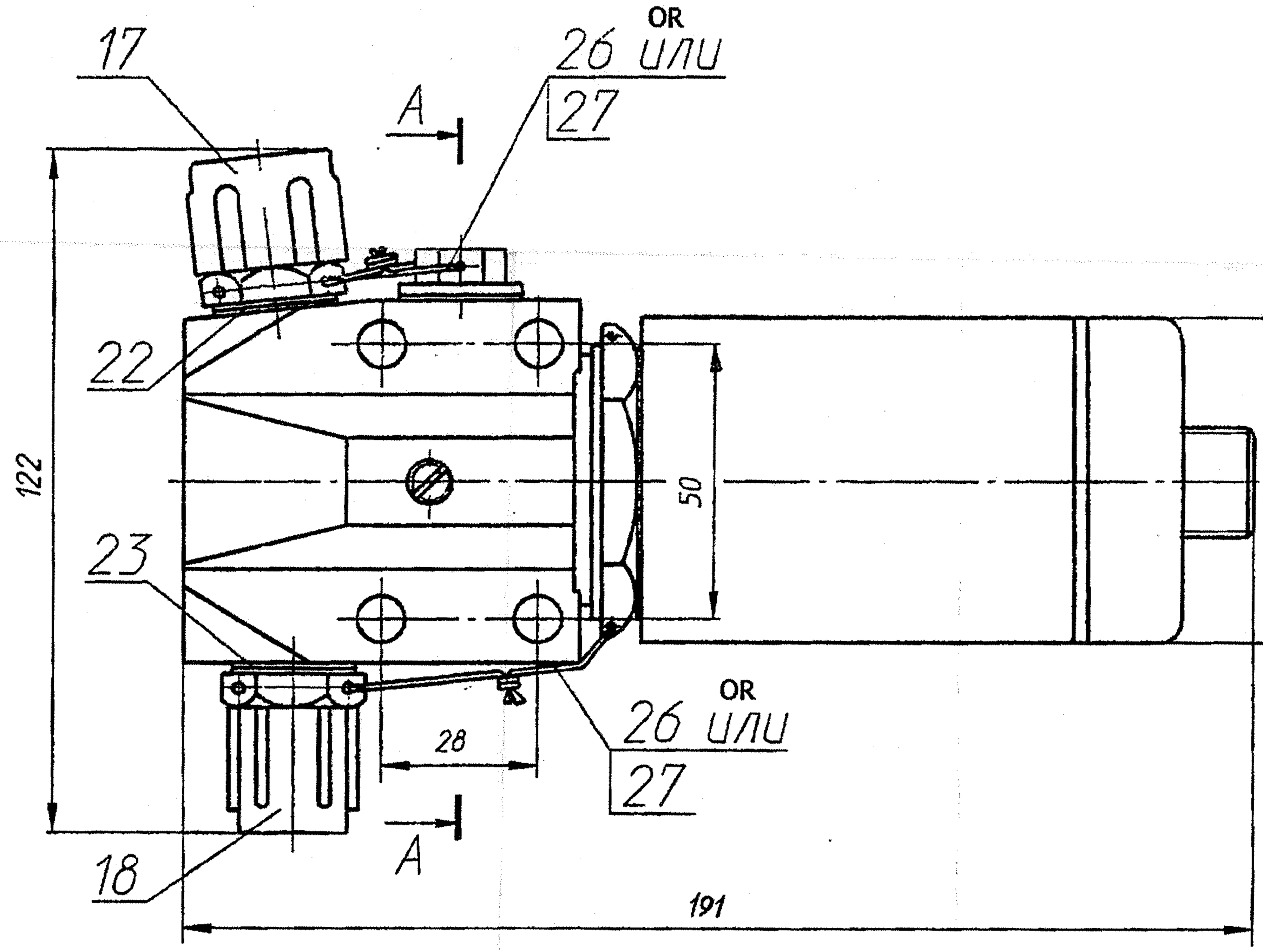
SIZE A2x4

DRAWING NUMBER	SHEET No. 1 OF 1
188.66.015cb-1Cb	



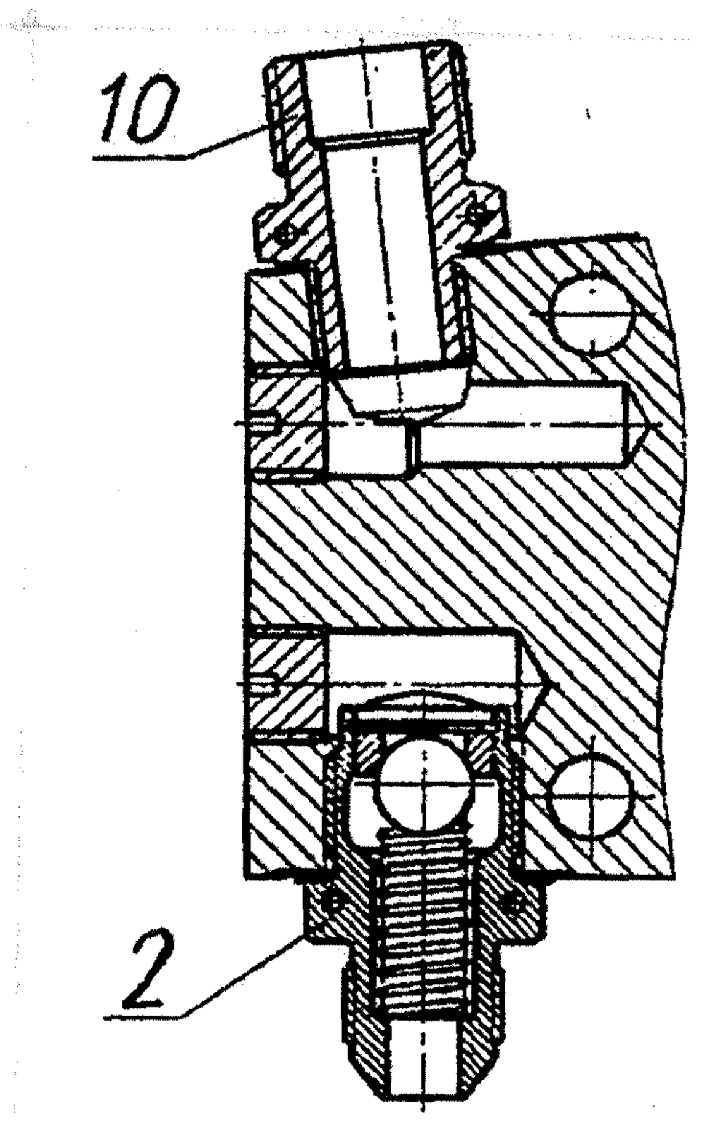
А-Ао





Б-Б

Stoppers item 17 and 18 are not shown
Заглушки поз.17 и 18 не показаны



1. The parts, sent for assembly should be clean. In the duct there should not be any composite objects, dirt particles and chips.
2. Before mounting, wash the parts in benzene Б-70 TY 38.101913-82 or Nefrace C2-80/120 TY 38.401-67 -108-92 and dry them.
3. Lubricate the packing ring item 15 and slide valve, item 3 with lubricant ЦИАТИМ-201 GOST 6267-74 or Lithol-24 GOST 21150-87.
4. The slide valve should be shifted to the body without any wedging and jamming.
5. Before pressure-test, cool the valve seat, item 4 in liquid nitrogen.
6. Check the function and air tightness on a stand as follows:
   - supply oil, used in lubricating system and hydraulic control of transmission of tank, having temperature 25^{+15}_{-10} °C, to screw stopper, item 10 with a pressure of $0.2^{+0.1}$ MPa (2^{+1} Kgf/cm²). When the valve B is closed, oil flow from duct item Г through ball, item 24 of by-pass valve should not be more than 0.3 lit /min. Measuring error can be ±0.01 lit /min.
   - at oil pressure $0.6^{+0.05}$ MPa ($6^{+0.5}$ Kgf/cm²) the by-pass valve should open. Maximum two washers, item 21 can be used.
   - when the oil is supplied to valve, item 2 with pressure (1.8±0.05) MPa [(18±0.5) Kgf/cm²] oil flow through duct B and Г can be maximum 0.2 lit /min. Measuring error can be ±0.01 lit /min.
   Energize the electro magnet, supplying voltage of (22±1) V to the terminal.
   Carryout energizing of electromagnet alternately three times by keeping it in energized condition for 40^{+20} seconds with intervals between the actuation of 5^{+2} minutes. When the electromagnet is energized, oil is supplied to the screw stopper, item 10. Pressure at the outlet from the distributing cock through valve item 2 should be $0.5^{+0.1}$ MPa (5^{+1} Kgf/cm²). In this case oil flow through valve B and Г can be maximum 0.3 lit /min. Measuring error can be ±0.01 lit /min.
   External leakages are not allowed.
7. Dimensions for reference.
8. Fix a cap, supplied along with electromagnet to the plug connector of electromagnet.
9. Other requirements are as per 520.TY1.

MASTER COPY

DRG. INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE - NIL

356
SUPPLY CODE U-01-1-2
D90060
F-81 52
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)
2.63	

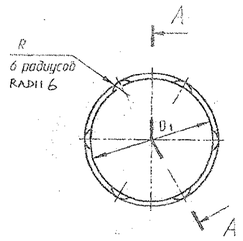
ALL SHARP EDGES AND CORNERS TO BE REMOVED UNLESS OTHERWISE STATED MACHINED CORNERS TO HAVE R OUT-SIDE R INSIDE EQUIVALENT CHAMFERS ARE PERMISSIBLE.

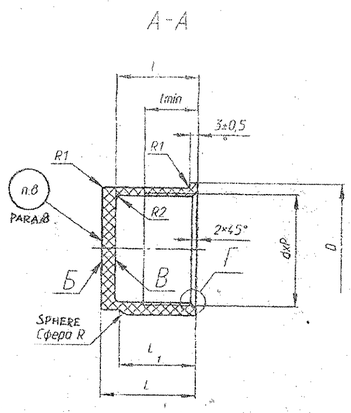
ISSUE	DATE	NATURE OF AMENDMENTS

DRN	[signature]	MATERIAL :- —	USED ON :- 188.66.001SP 188.45.001cb-3Cb
CHD	[signature]		
APPD	[signature]	CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI	
DATE	11-6-04		
SCALE:- 1 : 1			
DIMENSIONS IN mm		TITLE :-	DISTRIBUTING COCK ASSY.
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS : 2102-69			
ALL THREADS TO CONFORM TO		D S CAT NUMBER	DRAWING NUMBER 188.66.015cb-1Cb

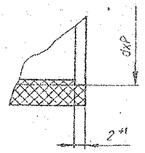
DRAWING NUMBER
520.05.004

SHEET No. 1 OF 1





Г вариант (2:1)
ALTERNATIVE



1. Alternate material – polyethylene 209 or 210 GOST 16338-85.
2. Thread should be checked by free screwing-in of threaded component made with accuracy class 8g GOST 18093-81.
3. Dimensions are to be ensured by tool.
4. It is allowed to make 8 projections with radius R instead of six.
5. Spherical recess (shrinkage cavity) with depth $0^{+2,5}$ mm is allowed on surface E.
6. On surface B, projection is allowed in this case wall thickness should be not less than 2 mm.
7. To be marked (see table), type ПО-3 GOST 2930-62.
8. Other requirements should be as per specifications 520.TY1.

THREAD / TO BE MARKED

Обозначение DESIGNATION	Резьба d	P	L мм LIMIT nominal	L мм LIMIT deviation пред отк	L_1 мм LIMIT nominal	L_1 мм LIMIT deviation пред отк	l мм nominal	l мм пред отк	l min мм	D мм nominal	D мм пред отк	D_1 мм	R мм	WEIGHT Масса, кг	Маркировать
520.05.004	36	2	29	-0,52	24	±1	24	±0,5	17	44	+2 -1	40	4,5	0,015	M36x2
-01	27	1,5	26	-0,52	21		22		16	35		31	4,5	0,009	M27x1,5
✓-02	20	1,5	21	-0,52	17		17		12	28		24	2	0,006	M20x1,5
✓-03	16	1	22	-0,52	17		18		12	24		20	1	0,004	M16x1
-04	14	1	15	-0,43	11		11		7	22		18	2	0,003	M14x1
-05	12	1,25	15	-0,43	11		11		7	20		16	2	0,002	M12x1,25
-06	22	1,5	20	-0,52	16		16		11	30		26	2	0,007	M22x1,5
-07	18	1,5	20	-0,52	15		15		10	26		22	2	0,005	M18x1,5
-08	42	2	30	-0,52	25		25		20	50		46	4,5	0,018	M42x2
-09	16	1,5	22	-0,52	17		18		12	24		20	2	0,004	M16x1,5

PILOT SAMPLE SHOULD BE APPROVED BY VNIISP BEFORE BULK PRODUCTION.

EST. WT. (kg) SEE TABLE

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	[illegible]
CHD	[illegible]
APPD	Chandler
DATE	17-02-04
SCALE:-	
DIMENSIONS IN mm	
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS:2102-69	
ALL THREADS TO CONFORM TO	

MATERIAL:- POLYETHYLENE 181 1ST QUALITY GOST-16337-77

USED ON:-

CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI

TITLE:- PLUG

D S CAT NUMBER

DRAWING NUMBER 520.05.004

DRG. INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE - 5

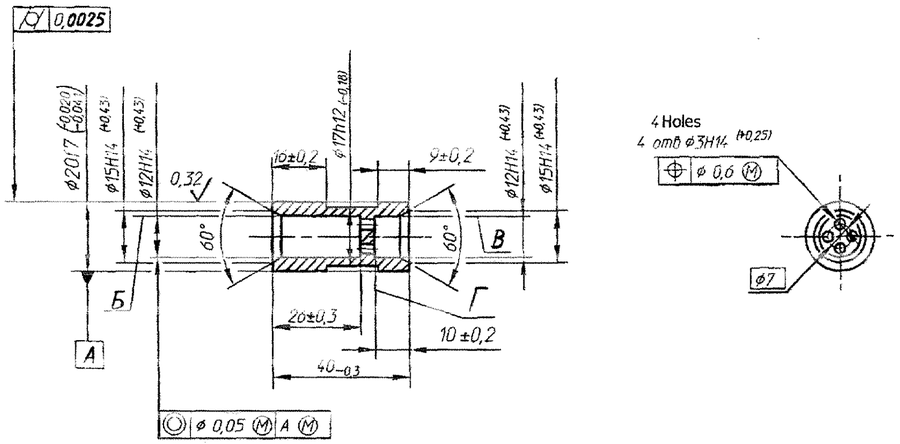
356

0-01-1-5
0980033

DRAWING NUMBER
188.66.022

SHEET No. 1 OF 1

Rz40 √(√)



1 Материал-заменитель сталь 20Х2Н4А ГОСТ 4543-71

2 Поверхность А цианировать h 0,2 0,5 мм после шлифовки, поверхности В и цианировать h 0,2 0,7 мм; HRA 76.

Допускается цементация.

Допускается цианирование или цементация всех поверхностей, кроме поверхности на поверхностях, кроме поверхностей А, В и Г h 0...0,7 мм.

Глубину цианирования или цементации и твердость проверять на одной детали из партии.

3 На поверхности А в местах пересечения с торцовыми поверхностями обеспечить острую кромку

4 Остальные требования по 520.ТУ1

1. Alternate material-steel 20X2H4A Gost 4543-71.
2. Carryout cyanidation of surface A h 0.2..0.5mm after grinding, subject surfaces B and Г to cyanide treatment h0.2...0.7mm; HRA≥76.case-hardening is permitted. Cyanidation or case-hardening of all surfaces, except surface Б,on surfaces, except surfaces A,B and Г h 0..0.7mm is permitted. Depth of cyanidation on case-hardening and hardness should be checked on one component from batch.
3. On surface A in the areas of inter-section with end-faces, provide sharp edges.
4. Other requirment as per 520.TY1.

ALT. MATL:- STEEL 835M15 (EN-39B) To BS:970-83

AUTHORITY - CQA(HV) letter NO: 091/IFD/IND-V/MTPF/OE, dt. 24-3-05

DRG. INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE -NIL

356
SUPPLY CODE
U-01-1-4

D 90214

F-108
21

SIZE A4 x 3

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

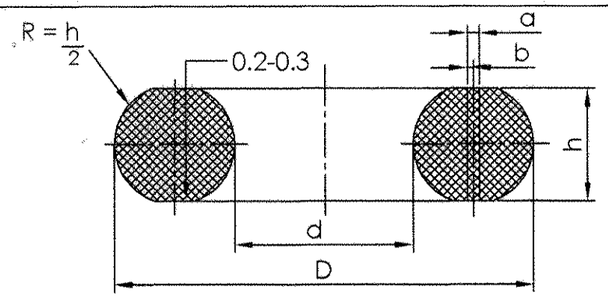
EST. WT. (kg)	TO BE STAMPED OR MARKED WHERE INDICATED THUS # (LETTERS)
0.055	

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		
CHD		
APPD		
DATE	21.7.04	
SCALE:- 1 : 1		
DIMENSIONS IN mm		
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS : 2102 - 69		
ALL THREADS TO CONFORM TO		

MATERIAL:- Steel 20XGost 4543-71	USED ON:- 188.66.015cb-1Cb
CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI	
TITLE:- SLIDE VALVE	
D S CAT NUMBER	DRAWING NUMBER 188.66.022



DESIGNATION	d	D	h	QTY.	USED ON.	WEIGHT OF 100 PCS IN Kg.
	PERMISSIBLE DEVIATION AS PER					
	A7	B7	B9			
12 x 18	12.2	18	2	2	188-45-001CD-3	0.10
16 x 20	16.2	20	2.5	4 2	188-45-001CD-3 188-66-015CD-1	0.08
20 x 26	20.2	26	2.5	5 1	188-45-001CD-3 188-66-015CD-1	0.15
30 x 36	30.3	36	3	1	188-45-001CD-3	0.25
@ 10 x 16	10.2	16	2.5	1	172-66-101CD-1	—

1. RINGS ARE MADE OF COPPER SHEATHE AND ASBESTOS CORE (PACKING). MEANT FOR PACKING THREADED JOINTS AND USED AT TEMPERATURES UP TO 600° C.
2. SHEATHE OF RINGS SHOULD BE MADE OF SOFT COPPER BAND. THE RING CORE SHOULD BE PACKED WITH BRAIDED ASBESTOS CORD, MADE OF CRYSOTILE ASBESTOS. ASBESTOS BOARD WASHERS CAN ALSO BE USED AS CORE MATERIAL. PACKING OF RINGS SHOULD BE COMPACT.
3. SHEATHE SHOULD BE EXPANDED INTO BUTT JOINT. CLEARENCE "a" SHOULD NOT EXCEED 0.5 mm
4. DISPLACEMENT "b" OF SEATHE EDGE FROM MEAN DIAMETER OF RING SHOULD NOT EXCEED 0.35mm
5. ELEVATION OF A SHEATHE EDGE WITH RESPECT TO THE OTHER ONE SHOULD NOT EXCEED 0.3mm
6. THE ASBESTOS FIBRE SHOULD NOT PROJECT BEYOND THE SHEATHE JOINT, ONLY SLIGHT FLUFFINESS IS ALLOWED.
7. **PILOT SAMPLE SHOULD BE APPROVED BEFORE BULK SUPPLY.**

MARKING

A TAG WITH THE FOLLOWING INFORMATION MAY BE ATTACHED WITH EACH SIZE AND BATCH

a) SIZE DESIGNATION WITH SPECIFICATION (Ex. 10 x 16 - MH - 4152 - 62)
b) MANUFACTURER"S NAME/TRADE MARK.
c) BATCH NO, MONTH AND YEAR OF MANUFACTURE.
d) QUANTITY.

This drg. has been prepared based on ~~ATTSP~~ GOST spec.

CHEMICAL COMPOSITION (%)	
ELEMENT	SOFT COPPER BAND Gr. M3 GOST 859-78
Cu + Ag	99.5 Min.
Bismuth	0.003 Max.
Antimony	0.05 Max.
Arsenic	0.01 MAX.
Iron	0.05 MAX.
Nickel	0.20 MAX.
Lead	0.05 Max.
Tin	0.05 Max.
SULPHUR	0.01 MAX.
Oxygen	0.08 MAX.

MECHANICAL PROPERTIES	
DESCRIPTION	SOFT COPPER BAND Gr. M3 GOST 859-78
SPECIFIC ELETRICAL RESISTANCE (MAXIMUM)	0.01706 ohm. mm^2 / m
ELETRICAL CONDUCTIVITY (MINIMUM)	58.6 m / ohm. mm^2

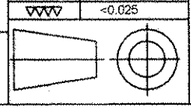
THIS SKETCH ALONG WITH ALL DETAILS IS AN ABSTRACT BASED ON MH 4152-62

VETTED
2 JUN 2006
JWM/STD-CELL

* MATERIAL:- SOFT COPPER BAND GRADE M3 TO GOST 859 - 78
ALTERNATE MATERIAL.:- COPPER ASBESTOS SEALING RING OF COMMERCIAL QUALITY
AUTHORITY:- CQA(HV), AVADI LETTER NO. 98704 / 04 / ID / CO-ORD / ALT COM DATED: 03/05/2005

मूलमाप व अन्वायोजन NOMINAL SIZE & FIT	विचलन DEVIATION

सामान्य सहिष्णुता GENERAL TOLERANCE	
रैखिक परिमाप LINEAR DIMENSION	
0-6	±0.1
6-30	±0.2
30-120	±0.3
120-315	±0.5
315-1000	±0.8
1000-2000	±1.2
कोणिक परिमाप ANGULAR DIMENSION	
1-10	±1°
10-50	±30'
50-100	±20'
>100	±10'
मापांक 'म्यू एम' में VALUE IN "um"	
~	>25
▽	8-25
▽▽	1.6-8
▽▽▽	0.025-1.6
▽▽▽▽	<0.025



	COPPER ASBESTOS SEALING RING		*			
संख्या NO.OFF	विवरण DESCRIPTION	पुर्जा क. PART NO.	पदार्थ MATERIAL	मानक STANDARD	परिमाप DIMENSIONS	अभ्यक्ति REMARKS
			@	RING 10X16 Added. on 16/03/07		

संख्या NO.OFF	संबंधित पुर्जोका आरेखण क्र. DRG. NO. OF ASSOCIATED PART	सूचक INDEX	संशोधन ALTERATION	2006 दिनांक DATE	नाम NAME
	RING. COPPER ASBESTOS SEALING TRANSMISSION GEAR UNIT CODE-45 / T-90 & T-72				

मापमान SCALE	आरेखित DRAWN	27/05	K.S.S.R
NTS	जाँचा CHECKED	27/05	
	अनुमोदित APPROVED	05/06/06	
द्वारा बदला REPLACED BY			
हेतु बदला REPLACED FOR			
आरेखण क. DRAWING NO. MPF/IGB/MH 4152			

मशीनी औजार आदिरूप फैक्टरी, अम्बरनाथ
MACHINE TOOL PROTOTYPE FACTORY, AMBERNATH

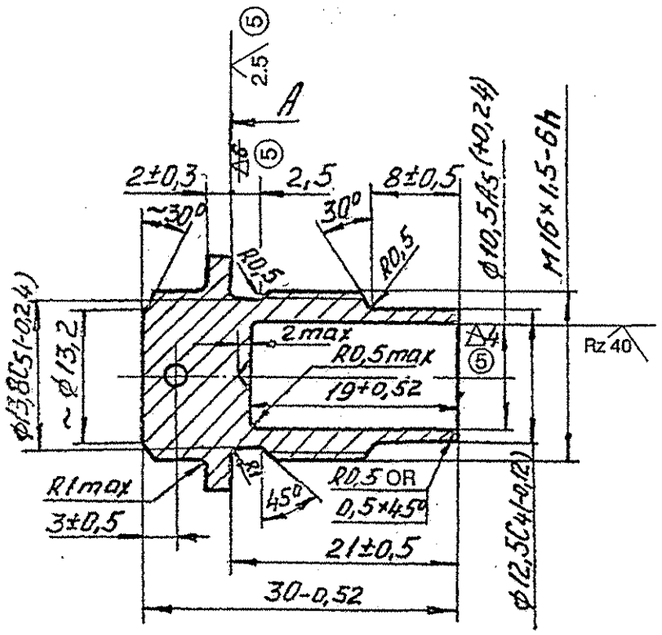
कार्यालय OFFICE: DO

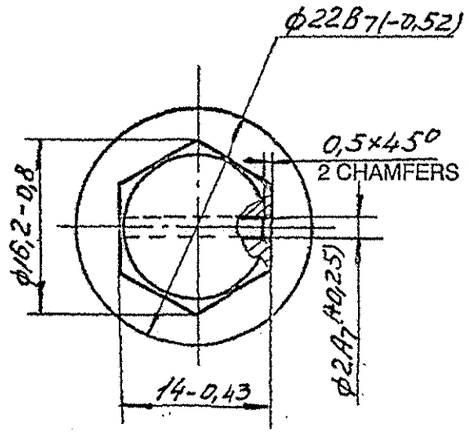
LF. 7044318025

DRAWING NUMBER
172.66.237

SHEET No. 1 OF 1

Rz 80 ⑤





1. BHN 302 - 255 (DIA OF INDENTATION 3.5 - 3.8) MAY BE CHECKED IN BLANK.
2. IN RELATION TO THREAD M16 x 1.5 THE FOLLOWING IS ALLOWED
   a) PLAY OF FACE "A" NOT MORE THAN 0.1 mm,
   b) SHIFT OF HOLE Ø 10.5 NOT MORE THAN 0.2 mm,
   c) SHIFT OF HEXAHEDRON NOT MORE THAN 0.5 mm,
3. SHIFT OF HOLE Ø 2 IN RELATION TO THE AXIS OF HEXAHEDRON IS NOT TO EXCEED 1 mm.
4. WHEN MILLING THE HEXAHEDRON ACCORDING TO DIMENSIONS 14, SHOULDER UPTO 0.3 mm IS ALLOWED.
5. TO BE PLATED WITH ZINC 6 TO 12 MICRONS, TO BE CHROMATIZED. ZINC COATING IN THE HOLES IS NOT TO BE CHECKED.
6. HEAD MAY BE MANUFACTURED BY FORGING. IN SO ,DOING ENSURE THE FOLLOWING;

(4A) a) SURFACE FINISH OF BOLT HEAD ⑤

   b) INTERNAL DRAFT OF HEAD EDGES UPTO 2° WIDTH ACROSS FLATS IS TO BE MEASURED AT THE BASE SURFACE OF HEAD.

7. OTHER REQUIREMENTS ARE ACCORDING TO 520 TY 1.

⑤ 8. COMPONENT MAY BE MANUFACTURED FROM ROUND BAR 22 - 4 GOST 7417 - 75 / 38XC - B - T GOST 4543 - 71 WITH SURFACE FINISH ALONG Ø 22.

(5B) ALT. MATL. :- STEEL 817M40 (En 24) TO BS : 970 Part 1 : 1983

"COMMON TO T - 90"
DRG RE - INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE - 4

IB.JAYAVELU, JT(ID)
24-08-06

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)
0.03	

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
5B	03.08.06	AUTHY.Lt.No.80001/CQA(HV)/GEN/Dt.20.12.05
5A	12.7.04	N OF A No.CQA(HV)/T90/66/001
5	2.9.89	NOTN.No.172M - 587'A' - AL9/5
4A	3.8.89	D.O. CORRECTION

DRN	Sd/=
CHD	Sd/=
APPD	Sd/=
DATE	30 - 06 - 86
SCALE:-	2 : 1
DIMENSIONS IN mm	
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS : 2102 - 69	
ALL THREADS TO CONFORM TO IS : 4218,PART-4.	

MATERIAL :-
STEEL 38XC
GOST 4543 - 71

USED ON :-
188.66.015cb-1Cb
172.66.101cb-1Cb (5A)

CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES)
AVADI

TITLE :-
PLUG

D S CAT NUMBER

DRAWING NUMBER
172.66.237

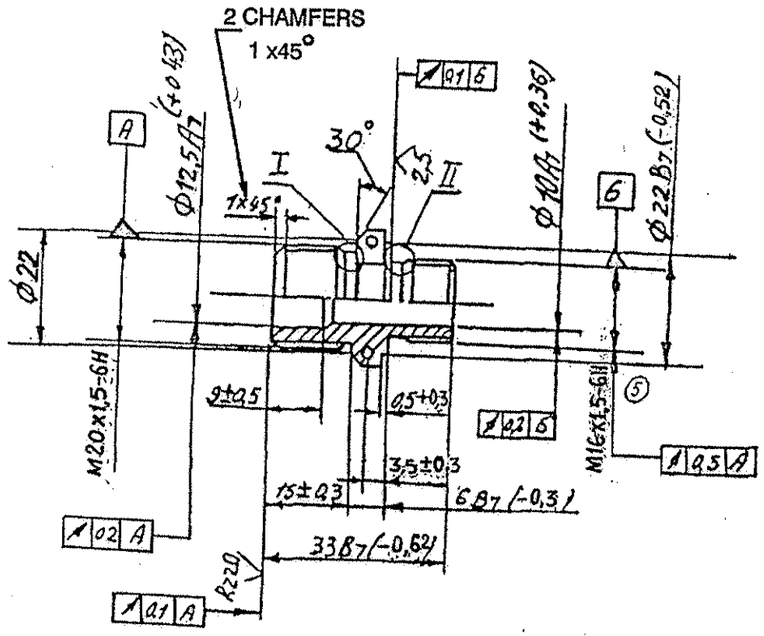
F-

SIZE A3

DRAWING NUMBER
175.66.117

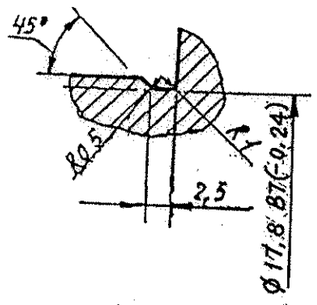
SHEET No. 1 OF 1

Rz80 ✓ (√)



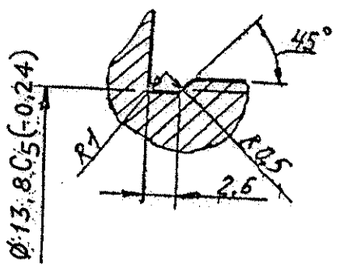
I

SCALE 2 : 1



II

SCALE 2 : 1



1. BHN 302 - 255 (DIA. OF INDENTATION 3.5 - 3.8) TO BE CHECKED IN BLANK.
2. COATING : CHEMICAL OXIDIZING , OIL FINISHING.

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

DRG. REINDIANISED BASED ON RUSSIAN ORIGINAL ISSUE - 7
COMMON TO T-90

(B.JAYAVELU) 24-08-06

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)
0.032 ✓	

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
7B	03.08.06	AUTHY.Lt.No.80001/CQA(HV)/GEN.Dt.20.12.05.
7A	12.07.04	N OF A No.CQA(HV)/T-90/66/001. ✓

DRN	Sd/=
CHD	Sd/=
APPD	Sd/=
DATE	30.06.88 ✓
SCALE:-	1 : 1 ✓
DIMENSIONS IN mm	
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS : 2102 - 69	
ALL THREADS TO CONFORM TO IS : 4218,PART-4.	

MATERIAL :-
STEEL 38XC
GOST 4543-71 ✓

USED ON :-
172.66.101Cb-1
188.66.015cb-1Cb ✓ (7A)

CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES)
AVADI

TITLE :-
SCREW STOPPER

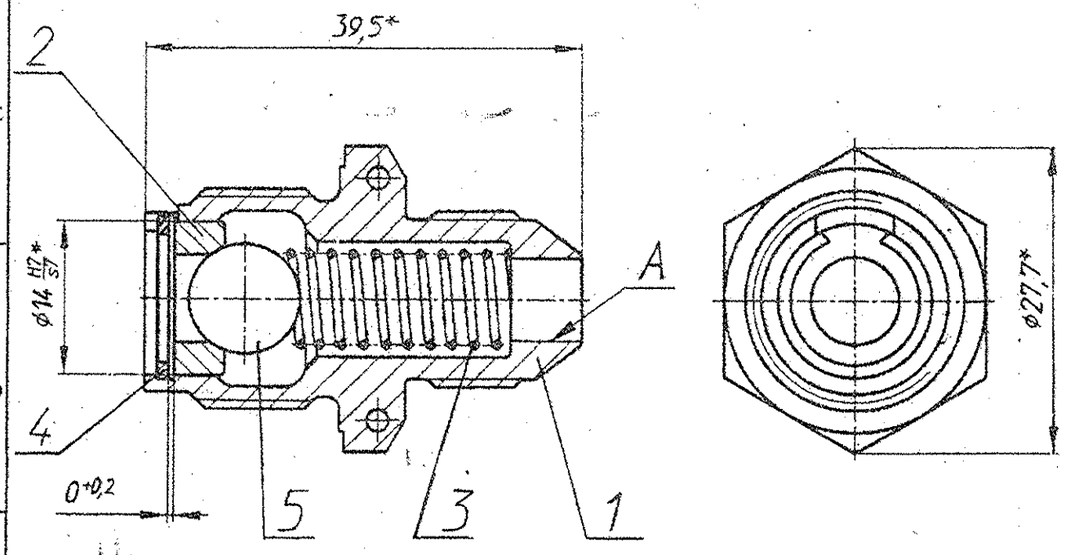
D S CAT NUMBER

DRAWING NUMBER
175.66.117

F-
SIZE A3

DRAWING NUMBER
188.66.020cbCb

SHEET No. 1 OF 1



1. Внутреннюю полость штуцера поз.1 и рабочие поверхности деталей перед сборкой промыть в бензине -70 ТУ 38-101913-82 или нефрасе С2-80/120 ТУ 38.401-67-108-92 и смазать тонким слоем масла, применяемого в трансмиссии
2. *Размеры для справок.
3. Испытать клапан на герметичность маслом ТС3п-8 ТУ38.1011280-89 при температуре 25 давлением (1,8 0,05) МПа [(18 0,5) кгс/см]. Масло подать через отверстие А. Допускаются утечки не более 0,2 л/мин, погрешность измерения 0,01 л/мин.
4. Допускается испытание на герметичность производить в составе сборочной единицы 188.66.15сб-1 при включенном электромагните
5. Остальные требования по 520.ТУ1.

1. Internal cavity of pipe union item 1, and working surfaces of parts before assembly should be cleaned with benzene Б-70 ТУ 38-101913-82 or nephrace C2-80/120 ТУ 38.401-67-108-92 and should be applied with thin layer of lubricant used in transmission.
2. *Dimensions for reference.
3. Test the valve for leak-proofness with oil TC3n-8 TУ38.1011280-89 at temperature 25^{+15}_{-10}°C with pressure (1.8±0.05)MPa [(18 ±0.5)Kgf/cm^2]. Oil should be fed through hole A. leakage not exceeding 0.2 litre/min is permitted, error of measurement-±0.01 litre/min. Lout
4. Test for leak-proofness may be carried in set of assembly units 188.66. 015cb-1Cb when electro magnet is energized.
5. Other requirments as per 520.Ty1.

MASTER COPY

DRG. INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE - NIL

356
SUPPLY CODE
U-01-1-4
D 90214

F-108
11
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)
0.06	

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@m
CHD	R. Gangadhar
APPD	Chanchal
DATE	21.7.04
SCALE:- 2 : 1	
DIMENSIONS IN mm	
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS : 2102 - 69	
ALL THREADS TO CONFORM TO	

MATERIAL :- —

USED ON :- 188.66.015cb-1Cb

CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI

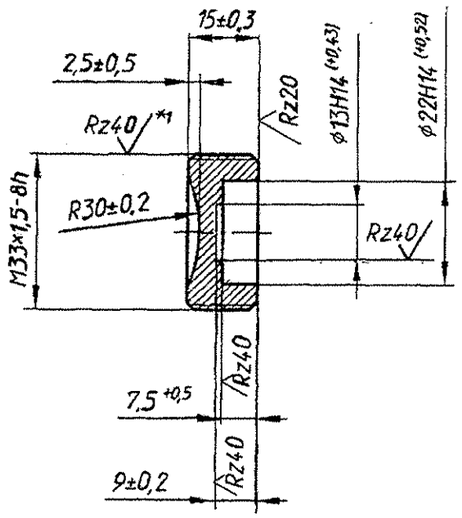
TITLE :- VALVE ASSY.

D S CAT NUMBER

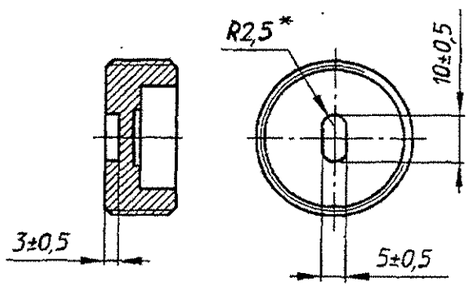
DRAWING NUMBER 188.66.020cbCb

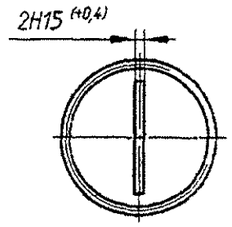
DRAWING NUMBER
188.66.030

SHEET No. 1 OF 1



Alternate
Вариант





Rz80 (√)

1 255..302 НВ. Проверять в заготовке.

2 *Размер для справок

3 *1Шероховатость обеспечить инструментом.

4. Покрытие Хим. Фос. окс. прм. или Хим. Окс. прм.

5 Остальные требования по 520.ТУ1

1. BHN 255...302. Hardness should be checked in blank.
2. *Dimensions for reference.
3. *1 Surface finish should be ensured by tool.
4. Coating: Chemical phosphating,oxidising,oil finishing or chemical oxidising,oil finishing.
5. Other requirments are as per 520 TY1.

ALT. MATL :- STEEL 817 M40 (EN-24) BS:970-83

AUTHORITY:- CQA(HV), letter NO. 091/IFD/IND-V/MTPF/OE dt. 17-03-05

DRG. INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE - NIL

356

SUPPLY CODE
U-01-1-4
D 90214

F-108
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)
0.048	

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

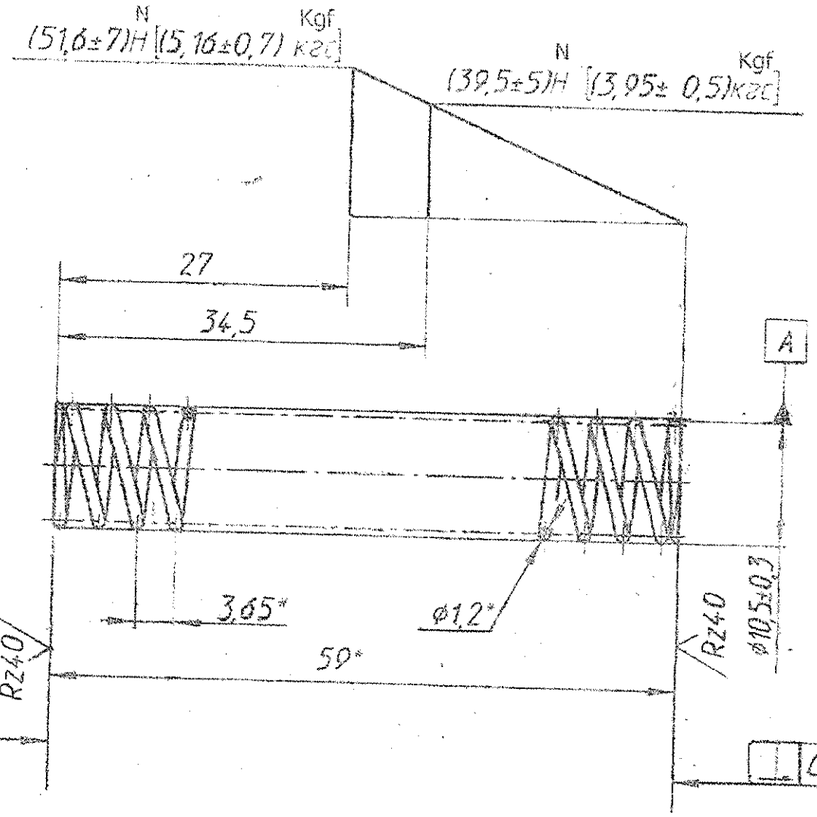
ISSUE	DATE	NATURE OF AMENDMENTS

DRN	V.D.	MATERIAL :- Steel 38XC Gost 4543-71
CHD	K. Gangadhar	USED ON :- 188.66.016cb-1Cb
APPD	Chandel	CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI
DATE	21.7.04	
SCALE:- 1 : 1		
DIMENSIONS IN mm		TITLE :- STOPPER
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS : 2102 - 69		
ALL THREADS TO CONFORM TO		D S CAT NUMBER / DRAWING NUMBER 188.66.030

DRG. INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE - NIL

DRAWING NUMBER
188.66.034

SHEET No. 1 OF 1



1. Alternate material-steel Б-2А-1.2 Gost9389-75.
2. * Dimensions for reference.
3. Winding direction of spring-orbit rary.
4. n=16.
5. n_t= 17.5
6. After fivefold of pressing of spring up to height (21±0.5) mm residual deformation is not permitted.
7. Instead of checking of tolerance for perpendicularity of end-faces relative to external diameter, checking of tolerance for perpendicularity of external diameter relative to end faces of spring - 1.2 mm is permitted.
8. Coating chemical, oxidised, oiled.
9. Mark the designation of spring and stamp on label.
10. Other requirments as per 520. TY1.

ALT. MATL:- STEEL WIRE GRADE '3' TO IS:4454 Pt I - 1981

AUTH:- CQA (HV) letter NO:. 091/IFD/IND-V/MPF/OE dt. 17.3.05

356

SUPPLY CODE
U-01-1-4
D90214

F-108
29

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)
0.004	

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@m
CHD	C. Gangadhar
APPD	Chandhar
DATE	21-7-04
SCALE:- 2 : 1	
DIMENSIONS IN mm	
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS : 2102 - 69	
ALL THREADS TO CONFORM TO	

MATERIAL :-
Wire B-2-1.2
Gost 9389-75

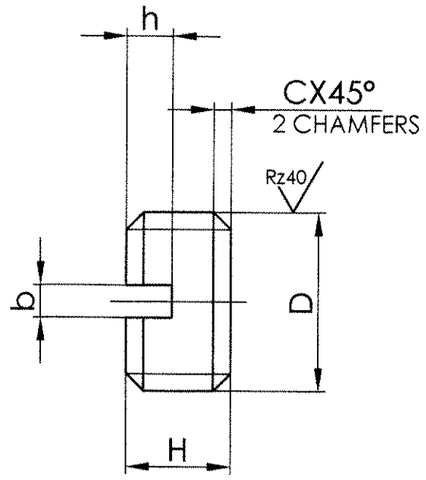
USED ON :-
188.66.015cb-1Cb

CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES)
AVADI

TITLE :-
SPRING

D S CAT NUMBER

DRAWING NUMBER
188.66.034



DRG. NO.	188-66-039-03	188-66-039-04
PART NO.	4	5
NO. OFF.	1	2
D	M10X1 - 8h	M12X1 - 8h
H	6 ±0.5	8 ±0.5
b	1.6 ±0.25	2.0 ±0.25
h	2.3 ±0.3	3.0 ±0.3
C	1.0	1.0
WEIGHT Kg.	0.0033	0.0065

MECHANICAL PROPERTIES		
DESCRIPTION	STEEL 38XC GOST 4543-71	STEEL 817M40 (EN-24) BS: 970-83
ULTIMATE STRENGTH STRENGTH	--------	150 mm
ULTIMATE STRENGTH STRENGTH	--------	T
ULTIMATE STRENGTH	95 Kgf/mm² MIN.	850 - 1000 MPa
YIELD STRENGTH	75 Kgf/mm² MIN.	680 MPa MIN.
REDUCTION OF AREA	50 % MIN.	--------
ELONGATION (%)	12 MIN.	13 MIN.
HARDNESS BHN	302 - 255	302 - 255
IMPACT STRENGTH	7 Kgf.m/cm² MIN.	--------
IZOD	--------	40 ft.lb MIN.
KVC (CHARPY)	--------	50 J MIN.
0.2% PROOF STRESS	--------	665 MPa MIN.

CHEMICAL COMPOSITION (%)		
ELEMENT	STEEL 38XC GOST 4543-71	STEEL 817M40 (EN-24) BS: 970-83
C	0.34 - 0.42	0.36 - 0.44
Si	1.00 - 1.40	--------
Mn	0.30 - 0.60	0.45 - 0.70
Cr	1.30 1.60	1.00 - 1.40
S	0.035 MAX.	0.025 - 0.050
P	0.035 MAX.	0.035 MAX.
Cu	0.30 MAX.	--------
Ni	0.30 MAX	1.30 - 1.70
Mo	-------	0.20 - 0.35

THREAD DETAILS		
SIZE	M10x1 - 8h	M12x1 - 8h
MAJOR Ø	10.000 -0.180	12.000 -0.280
PITCH Ø	9.35 -0.112	11.35 -0.190
MIN. Ø	8.773 -0.184	10.773 -0.262

ALTERNATE MATERIAL :- STEEL 817M40 (EN-24) BS : 970-83

AUTHORITY :- CQA (HV). LETTER NO. 091/IFD/IND-V/MTPF/OE DATED : 17-03-2005

VETTED 19 OCT 2006 JWM/STD-CELL

Rz80

USED ON : 188-66-016cb-1Cb

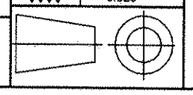
TECHNICAL REQUIREMENTS

1. BHN 255.....302.
2. *SURFACE FINISH SHOULD BE ENSURED BY TOOL.
3. COATING: ZINC COATING OF 6 MICRONS THICK FOLLOWED BY CHROMIUM TREATMENT. THE QUALITY AND THICKNESS OF COATING ON THE INTETRNAL SURFACES NEED NOT BE CHECKED.
4. OTHER REQUIREMENTS ARE AS PER 520 TY1.
5. PILOT SAMPLE SHOULD BE APPROVED BY A H S P BEFORE BULK PRODUCTION.

This drg. has been prepared based on AHSP drg. no 188-66-039-03-04

मूलमाप व अन्वायोजन NOMINAL SIZE & FIT	विचलन DEVIATION

सामान्य सहिष्णुता GENERAL TOLERANCE	
रैखिक परिमाप LINEAR DIMENSION	
0-6	±0.1
6-30	±0.2
30-120	±0.3
120-315	±0.5
315-1000	±0.8
1000-2000	±1.2
कोणिक परिमाप ANGULAR DIMENSION	
1-10	±1°
10-50	±30'
50-100	±20'
>100	±10'
मापांक 'म्यू एम' में VALUE IN "um"	
~	>25
▽	8-25
▽▽	1.6-8
▽▽▽	0.025-1.6
▽▽▽▽	<0.025



SEE TABLE	PLUG	SEE TABLE	STEEL 38XC	GOST 4543-71		WEIGHT SEE TABLE
संख्या NO.OFF	विवरण DESCRIPTION	पुर्जा क्र. PART NO.	पदार्थ MATERIAL	मानक STANDARD	परिमाप DIMENSIONS	अभ्यक्ति REMARKS

संख्या NO.OFF	संबंधित पुर्जोका आरेखण क्र. DRG. NO. OF ASSOCIATED PART	सूचक INDEX	संशोधन ALTERATION	दिनांक DATE	नाम NAME

PLUG
TRANSMISSION GEAR UNIT
CODE - 45 / T - 90

मापमान SCALE	NTS	आरेखित DRAWN	28-09
		जाँचा CHECKED	19.10.06 krb
		अनुमोदित APPROVED	19/10/06
द्वारा बदला REPLACED BY			
हेतु बदला REPLACED FOR			

मशीनी औजार आदिरूप फैक्टरी, अम्बरनाथ
MACHINE TOOL PROTOTYPE FACTORY, AMBERNATH

कार्यालय OFFICE: D. O.

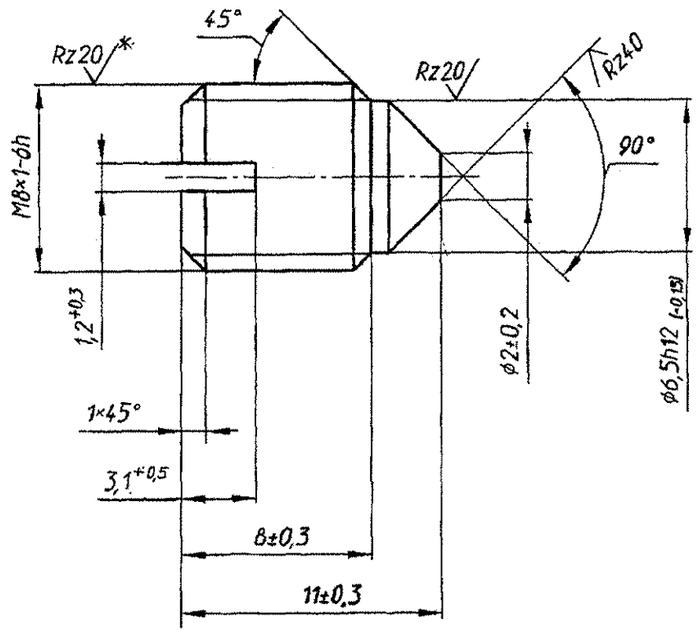
आरेखण क्र. DRAWING NO.
188 - 66 - 039 - 03
188 - 66 - 039 - 04

FILE PATH D:\sudam\CODE-45\188-66-039 dwg.

DRAWING DEVELOPED FROM CQA (HV).. AVADI. ORIGINAL PRINT DATED : 07-05-2005

DRG. INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE - NIL

DRAWING NUMBER	SHEET No. 1 OF 1
188.66.041	



Rz80 (√)

1. 255...302 HB
2. *Шероховатость обеспечить инструментом
3. Покрытие Ц6.хр. Качество и толщину покрытия на внутренних поверхностях не контролировать.
4. Остальные требования по 520.ТУ1

1. BHN 255...302
2. *Surface finish should be ensured by tool.
3. Coating: Zinc coating of 6 microns thickness, followed by chromium treatment, the quality and thickness of coating at the internal surfaces need not be checked.
4. Other requirments are as per 520.TY1.

ALT. MATL:- STEEL 817M40 (EN-24) BS:970-83
AUTHORITY:- CQA(HV) letter NO:- 091/IFD/IND-V/MTPF/OE dt.: 17-03-05

356
SUPPLY CODE
U-01-1-4
D90214

F-108
31
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)
0.004	

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

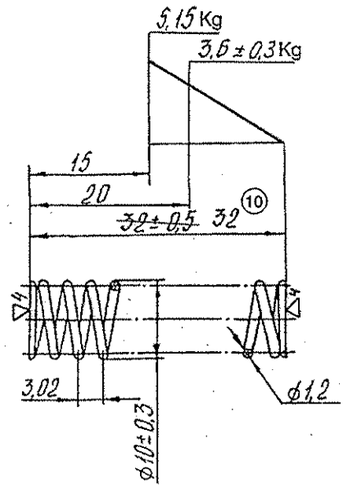
ISSUE	DATE	NATURE OF AMENDMENTS

DRN	
CHD	
APPD	Chanchal
DATE	21.7.04
SCALE:- 5 : 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 :- 188.66.016cb-1Cb
CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI	
TITLE :- SCREW	
D S CAT NUMBER	DRAWING NUMBER 188.66.041

DRAWING NUMBER
432.40.235-1

SHEET No. 1 OF 1



NUMBER OF WORKING COILS	10
TOTAL NUMBER OF COILS	12 – 1
DIRECTION OF SPRING COILING	EITHER
DEVELOPED LENGTH OF SPRING	APPX ≈ 330

EXPLANATORY NOTE :-

1. EXTREME COILS SHOULD BE COMPRESSED BY ONE COIL AND AT LEAST 3/4 OF TURN SHOULD BE GROUND.
2. NON-SQUARENESS OF SPRING AXIS RELATIVE TO FACES SHOULD NOT EXCEED 1 MM, WITHIN SPRING LENGTH.
3. AFTER SPRING IS COMPRESSED TO SIZE 14 MM TEN TIMES RESIDUAL DEFORMATION IS NOT ALLOWED.
11. 4. TO BE HEAT TREATED. HARDNESS ~~HRC (ROCKWELL) 40 TO 48,~~ 41.5 .....49.5 HRC IT IS ALLOWED TO CHECK HARDNESS WITH THE HELP OF A TEST PIECE.
5. COATING - CHEM., OXID., OIL AS PER TY 16.
9 10. 6. MAY BE MADE FROM WIRE ~~50XΦA-W-5-1.2-TY 14-4-897-78.~~ 51XΦA-W-5-1.2 TY 14-4-1130-81
7. OTHER REQUIREMENTS ARE AS PER 60.018 TY.

8. REFERENCE MATERIAL QUOTED :- WIRE POLISHED 51XΦA-5-П-XH-1.2 GOST 14963-78.
ALLOY STEEL SPRING WIRE GRADE 51XΦA QUALITY OF SURFACE FINISH GROUP "5" GROUND ON POLISHED 0.63 COLD ROLLING "XH" HIGH ACCURACY "П" ON DIAMETER 1.2 ± 0.02 AS PER GOST 14963-78 AND MANUFACTURED IN ACCORDANCE WITH GOST 14959-79.

9. a) CHEMICAL COMPOSITION AS PER SPRING STEEL WIRE GRADE 51XΦA GOST 14959-79.

CONTENT OF ELEMENTS %								
C	Si	Mn	Cr	V	S	P	Cu	Ni
					MAXIMUM			
0.47 0.55	0.15 0.30	0.30 0.60	0.75 1.10	0.15 0.25	0.035	0.035	0.20	0.25

b) MECHANICAL PROPERTIES AS PER GRADE 51XΦA GOST 14959-79.

HEAT TREATMENT			MECHANICAL PROPERTIES			
HARDENING TEMPERATURE 0° C	HARDENING MEDIUM	TEMPERING TEMPERATURE 0° C	ULTIMATE TENSILE STRENGTH Kgf/mm²	YIELD POINT Kgf/mm²	ELONGATION %	REDUCTION IN AREA %
			MINIMUM			
850	OIL	470	130	110	8	35

11B 172.40.050cbCb
172.40.051cbCb
188.66.015cb-1Cb 11A

11C ALT. MATL : WIRE Gde. 3 TO IS: 4454 - 81

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)
0.0025	

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
11C	01-02-06	Lt. No. 80001/CQA(HV)/GEN Dt. 15.10.05
11B	17.9.04	N OF A. No. CQA(HV)/T90/40/001
11A	12.7.04	N OF A. No. CQA(HV)/T90/66/001
11	21.2.90	172M 31-'A'-88 (AL 10/1)
9,10	17.11.88	AMDT. LIST 6/II, BOOK-7

DRN	Sd/=
CHD	Sd/=
APPD	Sd/=
DATE	06-07-89
SCALE:-	2 : 1
DIMENSIONS IN mm	
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS : 2102-69	
ALL THREADS TO CONFORM TO	

MATERIAL :- WIRE POLISHED 51XΦA-5-П-XH-1.2 GOST 14963-78

USED ON :- 172.40.022cb, 172.66.001cb, 172.40.020cb

CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI

TITLE :- SPRING

D S CAT NUMBER

DRAWING NUMBER 432.40.235-1

" COMMON TO T-90 "
DRG. RE INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE - 8
(R.RAMANI).JTO 09-02-06
DRG REPLACED BY 54.36.393 VIDE NOTIFICATION No.188 Dt. 46-03 Dt. AUG 02

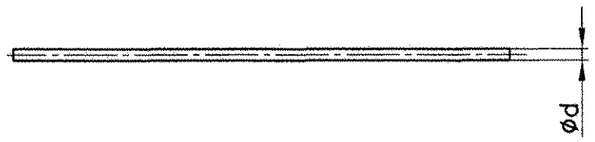
F-78
63
SIZE A2

DESIGNATION	DIA. OF WIRE mm (ød)	TEST PROCEDURE			USED ON
		NUMBER OF BENDS TO 180°	NUMBER OF TWISTS TO 360°	DIA. OF ROLLERS IN mm	
KO 1.2	$1.2^{+0.08}_{-0.06}$	6	25	5	CODE-45 CODE-94
KO 1.0	$1.0^{+0.06}_{-0.03}$	7	25	5	CODE-94
KO 1.2 x 100 Lg	1.2	6	25	5	CODE-45 (T-72)
KO 1.4 x 100 Lg	1.4	14	20	10	
KO 1.6 x 100 Lg	1.6	13	20	10	172-66-101CD-1

TECHNICAL REQUIREMENTS

1. WIRE IS MADE FROM LOW CARBON STEEL WIRE AS PER GOST 1050-60.
2. IN THE DESIGNATION KO INDICATES GALVANIZED (ZINC COATED) WIRE OF TENSILE STRENGTH 37kg/mm².
3. THE FOLLOWING ARE NOT ALLOWED ON GALVANIZED SURFACE OR WIRE.
   a). LOCAL EXCESSIVE ZINC, INCREASING THE ACTUAL DIAMETER OF WIRE TO A VALUE MORETHAN HALF THE DIAMETRICAL TOLERANCE.
   b) WHITE DEPOSIT, IF AFTER ITS ELIMINATION WIRE DOES NOT WITHSTAND THE TESTING ON THE QUALITY OR ZINC COATING.
4. ZINC COATING OF THE SURFACE OF WIRE SHOULD BE DURABLE, WHILE WINDING THE WIRE ON A CYLINDER HAVING A DIAMETER EQUAL TO FIVE TIMES THE DIAMETER OF WIRE, POELING, CRACKING OF ZINC COATING SHOULD NOT BE THERE.
5. ZINC COATING SHOULD WITH STAND'S THE NUMBER OF IMMERSIONS IN COPPER SULPHATE AS SHOWN BELOW.

DIA. OF WIRE IN mm	No. OF IMMERSIONS	DURATION OF HOLDING IN SOLUTION IN SECONDS.
FROM 1.0 TO 2.6	2	60



ALT. MATERIAL: COMMERCIAL QUALITY OF WIRE CAN BE USED WHICH IS SUITABLE FOR END USE. (M.S WIRE GALVANIZED 1/4 HARD TO IS:280-78)

AUTHORITY: CQA(HV) LETTER No. 98704/04/ID.CO-ORD/ALT. COM DTD. 03-05-2005.

CHEMICAL COMPOSITION (IN %)

MATERIAL	C	Si	Mn	Cr MAX.	S MAX.	P MAX.
LOW CARBON STEEL (STEEL GRADE 15 GOST-1050-88)	0.12-0.19	0.17-0.37	0.35-0.65	0.25	0.04	0.035
M.S WIRE GALVANIZED 1/4 HARD TO IS:280-78 REF. IS:7887-75	0.23 MAX.	---	---	---	0.055	0.055

MECHANICAL PROPERTIES:

@ ALL DETAILS IS AN ABSTRACT BASED ON GOST-792-67

MATERIAL	ULTIMATE STRENGTH kgf/mm²
LOW CARBON STEEL (STEEL GRADE -15 GOST-1050-88. 'NORMALISING')	37 MIN.
M.S WIRE GALVANIZED 1/4 HARD TO IS:280-78 REF. IS:7887-75	55 MAX.

VETTED 8 JUN 2006 JWM/STD-CELL

मूलमाप व अन्वायोजन NOMINAL SIZE & FIT	विचलन DEVIATION

COMBINED DRAWING FOR CODE-45 & CODE-94 / T-90

संख्या NO.OFF	विवरण DESCRIPTION	पुर्जा क्र. PART NO.	पदार्थ MATERIAL	मानक STANDARD	परिमाप DIMENSIONS	अभ्यक्ति REMARKS
	LOW CARBON QUALITY WIRE		LOW CARBON STEEL GRADE-15	GOST 1050-60		

@	DRG NO CHANGED. NOTE ADDED	23.12.11			

सामान्य सहिष्णुता GENERAL TOLERANCE

रेखिक परिमाप LINEAR DIMENSION

0-6	±0.1
6-30	±0.2
30-120	±0.3
120-315	±0.5
315-1000	±0.8
1000-2000	±1.2

कोणिक परिमाप ANGULAR DIMENSION

1-10	±1°
10-50	±30′
50-100	±20′
>100	±10′

मापांक 'म्यू एम' में VALUE IN "um"

~	>25
▽	8-25
▽▽	1.6-8
▽▽▽	0.025-1.6
▽▽▽▽	<0.025

संख्या NO.OFF	संबंधित पुर्जोका आरेखण क्र. DRG. NO. OF ASSOCIATED PART	सूचक INDEX	संशोधन ALTERATION	2006	दिनांक DATE	नाम NAME

WIRE.
LOW CARBON QUALITY
CODE-45, CODE-94 / T-90

मापमान SCALE	NTS	आरेखित DRAWN	08.06 KRB
		जाँचा CHECKED	7/6/06
		अनुमोदित APPROVED	8/6/06
द्वारा बदला REPLACED BY			
हेतु बदला REPLACED FOR			
आरेखण क्र. DRAWING NO.	MPF/1GB/792		

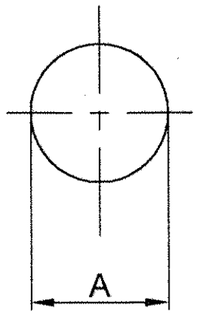
मशीनी औजार आदिरूप फैक्टरी, अम्बरनाथ
MACHINE TOOL PROTOTYPE FACTORY, AMBERNATH

कार्यालय OFFICE: DO

DRG PREPAIRED BASED ON AHSP DRG MPF/1GB/792

BALL SPECIFICATION	NOMINAL DIA. OF BALL 'A'	DEGREE OF ACCURACY	DEVIATION OF MEAN DIAMETER OF BALLS USED AS SEPERATE PARTS, μ (MICRONS)	DIMENSIONAL DIFFERENCE OF BALLS AS PER DIAMETER IN A BATCH. MAX	VARIATIONS IN A SINGLE DIAMETER	DEVIATION FROM SPHERICAL SHAPE	SURFACE ROUGHNESS		BREAKING LOAD Kgf, (MIN.)
							Ra	Rz	
9.525-60	9.525	60	±30	3.00	1.50	1.50	1.00	0.500	4800
Б 10.319-100	10.319	100	±40	5.00	2.50	2.50	0.125	0.600	5600
Б 7.938-100	7.938	100	±40	5.00	2.50	2.50	0.125	0.600	3350
Б 7.938-200	7.938	200	±60	10.00	5.00	5.00	0.200	0.800	3350
Б 10-100	10	100	±40	5.00	2.50	2.50	0.125	0.600	5300
V 4 MM 60	4	5	±5	0.25	0.13	0.13	0.020	0.100	860
Б 6-200	6	200	±60	10.00	5.00	5.00	0.200	0.800	1850
Б 5 - 11 MM H	11	5	±5	0.25	0.13	0.13	0.020	0.100	6500
4-60	4	60	± 30	3·00	1·5	1·5	1·0	0·500	860

CHEMICAL COMPOOSITION IN %		
ELEMENT	ШХ15 GOST:801-78	103 Cr2 IS:4398-72
C	0.95 - 1.05	0.95 - 1.10
Mn	0.20 - 0.40	0.25 - 0.45
Si	0.17 - 0.37	0.15 - 0.35
Cr	1.30 - 1.65	1.40 - 1.60
S	0.02 MAX	0.025 MAX
P	0.027 MAX	0.025 MAX
Ni	0.30 MAX	—
Cu	0.25 MAX	—



VETTED
21 DEC 2006
JWM/STD-CELL

ALT. MATL. :- 103 Cr 2 TO IS 4398-72 OR EN-31
AUTHO. :- CQA(HV),LETTER No.98704/04/ID-CO-ORD/ALT COM
DT. : 03-05-2005

HARDNESS : 62 - 66 HRC

This sketch alongwith all details is an abstract based on GOST 3722 ⑤

	BALL		ШХ15	GOST:801-78		
संख्या NO.OFF	विवरण DESCRIPTION	पुर्जा क्र. PART NO.	पदार्थ MATERIAL	मानक STANDARD	परिमाप DIMENSIONS	अभ्यक्ति REMARKS

②	4-60 added			27/(illegible)	
①	dtg. updated			29/08/11	

सामान्य सहिष्णुता GENERAL TOLERANCE

रेखिक परिमाप LINEAR DIMENSION

0-6	±0.1
6-30	±0.2
30-120	±0.3
120-315	±0.5
315-1000	±0.8
1000-2000	±1.2

कोणिक परिमाप ANGULAR DIMENSION

1-10	±1°
10-50	±30'
50-100	±20'
>100	±10'

मापांक 'म्यू एम' में VALUE IN "um"

~	>25
▽	8-25
▽▽	1.6-8
▽▽▽	0.025-1.6
▽▽▽▽	<0.025

संख्या NO.OFF	संबंधित पुर्जोका आरेखण क्र. DRG. NO. OF ASSOCIATED PART	सूचक INDEX	संशोधन ALTERATION	2006	दिनांक DATE	नाम NAME
	BALL			मापमान SCALE	आरेखित DRAWN	21-12 VML
	CODE-45 / T-72 & T-90			NTS	जाँचा CHECKED	22/12
					अनुमोदित APPROVED	
				द्वारा बदला	REPLACED BY	
				हेतु बदला	REPLACED FOR	

मूलमाप व अन्वायोजन NOMINAL SIZE & FIT	विचलन DEVIATION

मशीनी औजार आदिरूप फैक्टरी, अम्बरनाथ
MACHINE TOOL PROTOTYPE FACTORY, AMBERNATH

कार्यालय OFFICE: D.O.

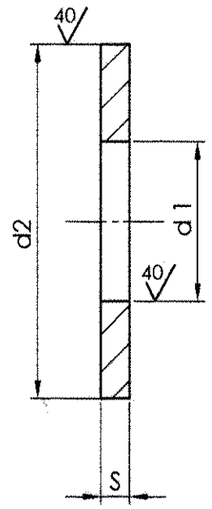
आरेखण क्र. DRAWING NO. ⑤ MPF/IGB/3722

REF. STDS:- GOST - 3722, IS : 4398

FILE PATH:-D:\VML\OLD-PC\CODE-45\T-90\COMPONENTS\GOST-3722.DWG.

Code 38, 84, 74, deleted

VARIANT 1



WASHER AS PER IS:2016-67, ACCEPTABLE

* MATERIAL: STEEL 10KΠ GOST 1050-74

ALTERNATE MATERIAL: STEEL Gde. 'D' TO IS:513 - 94

(AUTHORITY - CQA(HV), AVADI, LETTER NO. 98704/04/ID-CO-ORD/ALT COM, DATED 03/05/2005.)

CHEMICAL COMPOSITION:

MATERIAL DESIGNATION	% C	% Si	% Mn	% Cr	% S	% P	% Cu	% Ni
STEEL 10KΠ GOST 1050 - 74	0.07 0.14	0.07 max	0.25 0.50	0.15 max	0.040 max	0.035 max	0.25 max	0.25 max
STEEL Gde.'D' IS:513 - 92	0.12 max	---	0.50 max	---	0.040 max	0.040 max	---	---

MECHANICAL PROPERTIES:

MATERIAL DESIGNATION	YIELD POINT kg/mm² (min)	ULTIMATE TENSILE STRENGTH , kg/mm²	ELONGATION, % (min)	REDUCTION OF AREA % (min)	HARDNESS
STEEL 10KΠ GOST 1050 - 74	21	34	31	55	143 HB max

	TENSILE STRENGTH MPa	YIELD STRESS MPa (max)	ELONGATION, % (min)	IMPACT STRENGTH ft.lb (min)	HARDNESS (max)
STEEL Gde.'D' IS:513 - 94	270 - 410	280	23	---	65 HRB

@ This sketch alongwith all details is an abstract of GOST 11371-78 & 68

DESIGNATION	NOMINAL DIA.	INTERNAL DIA. (d1)	EXTERNAL DIA. (d2)	THICKNESS S
4.01.016	4	4.3	9.0	0.8
05.01.016	5	5.3	10.0	1.0
C5.01.016	5	5.3	10.0	1.0
C6.01.016	6	6.4	12.5	1.6
C8.01.016	8	8.4	17.0	1.6

DESIGNATION EXAMPLE :-
C5.01.01.6

C ------ TOLERANCE CLASS
5 ------ NOMINAL DIA. OF THREAD
01------ VARIANT 1
01 ------ TYPE OF PLATING
6 ------- THICKNESS OF PLATING IN MICRONS

NATIONAL DESIGNATION OF PLATING		TYPE OF PLATING
NUMERICAL	ACCORDING TO GOST 9073-77	
01	Zn, Cr	ZINC CHROMATING
02	Cd, Cr	CADMIUM CHROMATING
03	Cu, Ni	MULTILAYER COPPER NICKEL
04	Cu Ni Cr	MULTILAYER COPPER NICKEL CHROMIUM
05	Chem. Oxid.	OXIDING
06	Chem. Phos. Oil Imp.	PHOSPHATING WITH OIL IMPREGNATION
07	Cu	COPPER
08	Zn	ZINC
09	Hot Zn (Galv.)	HOT ZINC (GALVANISING)
10	Anod. Oxid. Cr	OXIDING WITH POTASSIUM BICHROMATE SOLUTION
11	Chem. Pass.	OXIDING WITH ACID SOLUTION
13	Ni	NICKEL
14	Cd	CADMIUM

VETTED
07 DEC 2007
JWM/STD-CELL

VETTED
02 DEC 2005
JWM/QC

संख्या NO.OFF	विवरण DESCRIPTION	पुर्जा क्र. PART NO	पदार्थ MATERIAL	मानक STANDARD	परिमाप DIMENSIONS	अभ्यक्ति REMARKS
	WASHER		*			
			@	Note added and drg. no amended		

सामान्य सहिष्णुता GENERAL TOLERANCE

रैखिक परिमाप LINEAR DIMENSION

0-6	±0.1
6-30	±0.2
30-120	±0.3
120-315	±0.5
315-1000	±0.8
1000-2000	±1.2

कोणिक परिमाप ANGULAR DIMENSION

1-10	±1°
10-50	±30'
50-100	±20'
> 100	±10'

मापांक 'म्यू एम' में VALUE IN "um"

~	>25
▽	8-25
▽▽	1.6-8
▽▽▽	0.025-1.6
▽▽▽▽	<0.025

संख्या NO.OFF	संबंधित पुर्जोका आरेखण क्र. DRG. NO. OF ASSOCIATED PART	सूचक INDEX	संशोधन ALTERATION	2005	दिनांक DATE	नाम NAME
				मापमान SCALE	आरेखित DRAWN	06/09/05 RRK
				NTS	जाँचा CHECKED	2.12.05
					अनुमोदित APPROVED	05.12

WASHER
TRANSMISSION GEAR UNIT
CODE - 45 / T-72 & T-90
GOST 11371-78 & 68

मशीनी औजार आदिरूप फैक्टरी, अम्बरनाथ
MACHINE TOOL PROTOTYPE FACTORY, AMBERNATH

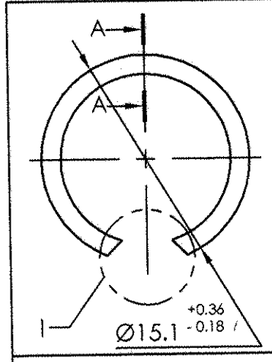
कार्यालय OFFICE: D.O.

द्वारा बदला REPLACED BY

हेतु बदला REPLACED FOR

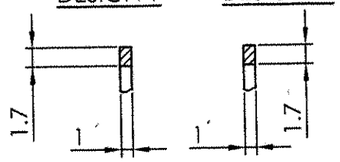
आरेखण क्र. DRAWING NO. MPF/IGB/11371

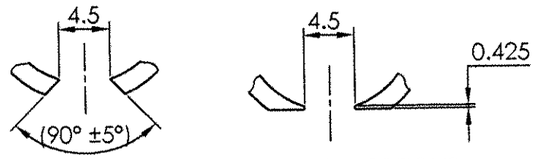
मूलमाप व अन्वायोजन NOMINAL SIZE & FIT	विचलन DEVIATION



MAX. PERMISSIBLE AXIAL LOAD
= 4.32 KN

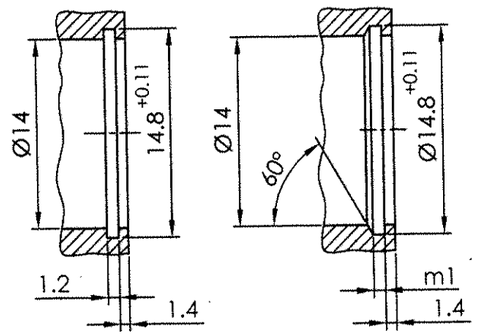
SECTION A-A





DETAIL - I DESIGN OPTIONS

DESIGN OPTIONS OF GROOVES FOR SINGLE DIRECTION AXIAL LOADING



m1 ≥ 1.2

CHEMICAL COMPOSITION (%)		MECHANICAL PROPERTIES
ELEMENT	STEEL 70 C6 IS:2507-75	STEEL 70 C6 IS:2507-75
C	0.65 - 0.75	YIELD STRESS N /mm² 1030 MIN.
Si	0.10 - 0.35	TENSILE STRENGTH N /mm² 1180 - 1420
Mn	0.50 - 0.80	ELONGATION (%) 6 MIN.
S	0.050 MAX.	HARDNESS (VICKERS) 350 - 425
P	0.050 MAX.	

TECHNICAL REQUIRMENTS:-

1. SPRING PROPERTIES OF RING SHOULD ENSURE THE CHANCE OF FREQUENT SETTING OF RINGS IN THE GROOVE. AFTER THREE FOLD OPENING OR COMPRESSION OF RINGS FOR SETTING INTO THE GROOVE, THEIR WORKING DIAMETER SHOULD BE WITHIN THE TOLERANCE LIMITS.
2. TOLERANCE ON PARALLELISM OF SUPPORTING PROFILE PLANES IS EQUAL TO HALF TO THE TOLERANCE OF THE RING THICKNESS.
3. TOLERANCE ZONE ON THICKNESS A = h11 , B = h12 , C = h13
   TOLERANCE ON FLATNESS A = 11 , B = 12 , C = 13. AS PER GOST 13944 - 86.
4. RADIAL CLEARANCE BETWEEN THE RING AND THE GROOVE MAY NOT BE MORE THAN AT TWO PLACES ALONG THE CIRCUMFERENCE AND SHOULD NOT EXCEED HALF OF THE TOLERANCE FOR GROOVE DIAMETER.
5. CRACKS , BURRS , DEATS , NICKS AND SCALE ARE NOT PERMITTED ON THE SURFACE OF THE RING.
6. WORKING EDGES OF RINGS (EDGES, ENTERING INTO THE GROOVE SHOULD BE SHARP. OTHER EDGES SHOULD BE BLUNTED.
   WORKING EDGES MAY BE BLUNTED BY ROUNDING OFF OR CHAMFERING IN mm, NOT EXCEEDING FOR THE RINGS WITH NOMINAL DIAMETER d mm.
   FROM 12 TO 40 ..... 0.1
   ABOVE 40 TO 100 ..... 0.2
   ABOVE 100 ..... 0.4
7. WHILE CHECKING THE EXTERNAL APPEARANCE OF RINGS, CRACKS ARE CLASSIFIED WITH CRITICAL DEFECTS, BURRS AND DENTS ON THE WORKING EDGES ARE MAJOR DEFECTS, REMAINING DEFECTS ARE CONSIDERED AS MINOR DEFECTS.
8. WHILE CHECKING THE DIMENSIONS, WORKING DIAMETER, THICKNESS AND FLATNESS OF RINGS ARE GROUPPED WITH MAIN PARAMETERS, REMAINING - SECONDARY PARAMETERS.
9. PILOT SAMPLE ARE TO BE APPROVED BEFORE BULK SUPPLY.

VETTED
9 JAN 2007
JWM/STD-CELL

ALTERNATE MATERIAL AUTHORITY :- COMMERCIAL QUALITY CAN BE USED WHICH IS SUITABLE FOR END USE
:- CQA(HV) LETTER No. 98704/04/ID-CO-ORD/ALT.COM DATED 03-05-2005

ALTERNATE MATERIAL AUTHORITY :- 70 C6 IS:2507-75
:- CQA(HV) LETTER No. 98704/04/ID-CO-ORD/ALT.COM DATED 16-05-2006

WEIGHT IN Kg. OF 1000 NOS. RINGS = 0.48 Kg.

संख्या NO.OFF	विवरण DESCRIPTION	पुर्जा क. PART NO.	पदार्थ MATERIAL	मानक STANDARD	परिमाप DIMENSIONS	अभ्यक्ति REMARKS
			STEEL 60C2A	GOST 14959-79		

सामान्य सहिष्णुता GENERAL TOLERANCE	
रेखिक परिमाप LINEAR DIMENSION	
0-6	±0.1
6-30	±0.2
30-120	±0.3
120-315	±0.5
315-1000	±0.8
1000-2000	±1.2
कोणिक परिमाप ANGULAR DIMENSION	
1-10	±1°
10-50	±30'
50-100	±20'
>100	±10'

मापांक 'म्यू एम' में VALUE IN "um"	
~	>25
▽	8-25
▽▽	1.6-8
▽▽▽	0.025-1.6
▽▽▽▽	<0.025

संख्या NO.OFF	संबंधित पुर्जोका आरेखण क्र. DRG. NO. OF ASSOCIATED PART	सूचक INDEX	संशोधन ALTERATION	2007 दिनांक DATE	नाम NAME

RING B14 (RETAINING RING)
TRANSMISSION GEAR UNIT
CODE-45 / T-90 GOST 13941-86

मापमान SCALE	आरेखित DRAWN	05/01	सुदाम
NTS	जाँचा CHECKED	08/01	[illegible]
	अनुमोदित APPROVED	10/1	DPS

द्वारा बदला REPLACED BY
हेतु बदला REPLACED FOR

मशीनी औजार आदिरूप फैक्टरी, अम्बरनाथ
MACHINE TOOL PROTOTYPE FACTORY, AMBERNATH

कार्यालय OFFICE D. O.

आरेखण क्र. DRAWING NO. MPF/IGB/13941

मूलमाप व अन्वायोजन NOMINAL SIZE & FIT	विचलन DEVIATION

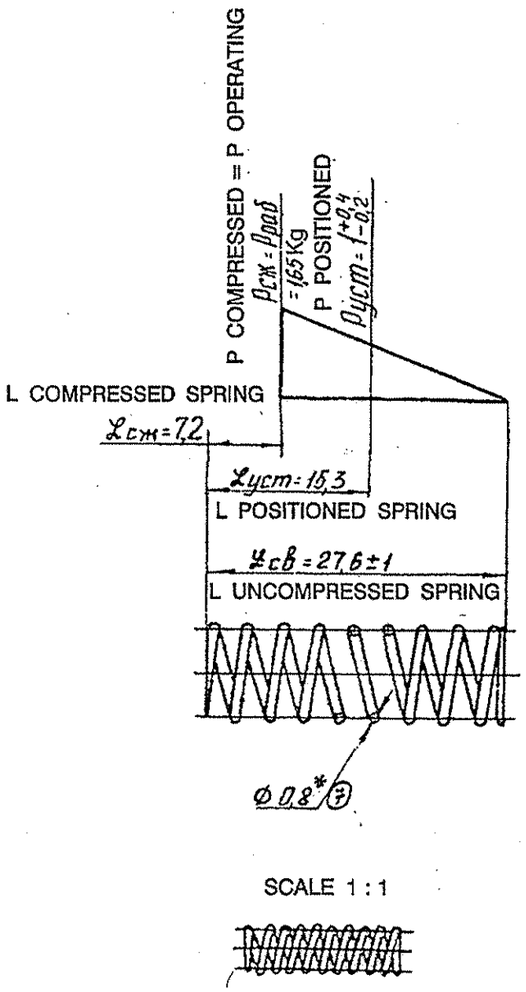
This drg. has been prepared based on GOST Specn.

FILE PATH \ D\sudam\CODE-45\COCK DISTRIBUTION ASSY\GOST-13941.dwg

DRAWING NUMBER
54.58.058

SHEET No. 1 OF 1

NUMBER OF OPERATING COILS	8.5
TOTAL NUMBER OF COILS	10±0.25
LENGTH OF DEVELOPED WIRE	224
LEFT WARD WINDING	левая



SCALE 1 : 1

1. AFTER THREE FOLD COMPRESSION UPTO CONTACT OF COILS, THERE SHOULD NOT BE RESIDUAL DEFORMATIONS.
2. THE SPRING MAY BE MANUFACTURED FROM WIRE I - 0.8 GOST 9389 - 75.
3. TO BE SUBJECTED TO NICKEL PLATING. THICKNESS OF NICKEL LAYER SHOULD NOT BE LESS THAN 20 MICRON.
4. * DIMENSION FOR REFERENCE.

(7B) ALT. MATL. :- GRADE SM TO IS : 4454 (Part - 1) - 2001

"COMMON TO T - 90"
DRG RE - INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE - 7
(B.JAYAVELU, JTOID) 24-08-96

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)
0.001	

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
7B	03.08.06	AUTHY.Lt.No.80001/CQA(HV)/GEN/Dt.20.12.05
7A	12.7.04	N OF A No.CQA(HV)/T90/66/001

DRN	Sd/=
CHD	Sd/=
APPD	Sd/=
DATE	30 - 06 - 86
SCALE:-	2 : 1
DIMENSIONS IN mm	
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS : 2102 - 69	
ALL THREADS TO CONFORM TO IS : 4218, PART-4.	

MATERIAL :- WIRE II - 0.8 GOST 9389 - 75

USED ON :- 172.66.101cbCb, 188.66.020cbCb (7A)

CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI

TITLE :- SPRING

D S CAT NUMBER

DRAWING NUMBER 54.58.058

F-187

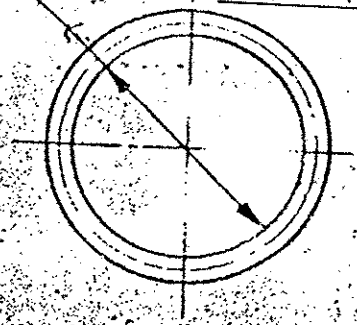
SIZE A3

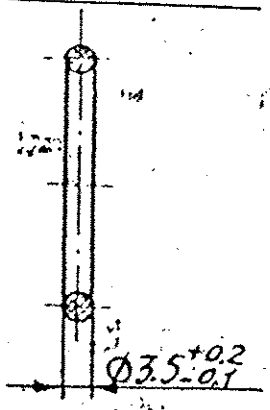
DRG. REINDENTED BASED ON RUSSIAN ORIGINAL ISSUE-4

DRAWING NUMBER
432 66 142

ALT. MATERIAL :-
CQA(HV)/NBR TO GRADE N3

AUTHORITY:- CQA(HV) letter NO.
98704/04/ID/CO-ORD/ALT. COM
dt - 21-11-05





1. DEVIATION OF THE RING SECTION (OVALITY DISPLACEMENT OF RING AMONG PARTING LINE AND ETC) SHOULD BE AS PER TOLERANCE OF THE RING DIAMETER.

2. COATS ON THE SURFACE OF THE MOULD PARTING SHOULD BE STRICTLY DRESSED.

3. ALL OTHER REQUIREMENTS ARE ACCORDING TO TY 005216-75 CODE 253 111.

(5) 4. TO BE MARKED ON TAG.

F-109
105

MASTER COPY

FOR REFERENCE ONLY

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

EST. WT. 0.003 Kg

TO BE STAMPED OR MARKED WHERE INDICATED THUS # 1 LETTERS)

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

MATERIAL :-
RUBBER UPM -1078
TY 005-216-75.

USED ON IND. ET
172.03.023 C5
172.2M.66.001 C5

CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VE... AVADI.

TOLERANCE ON DIMENSIONS UNLESS OTHERWISE ... IS 2102-69

ALL THREADS CONFORM TO

TITLE
PACKING RING

D S CAT NUMBER

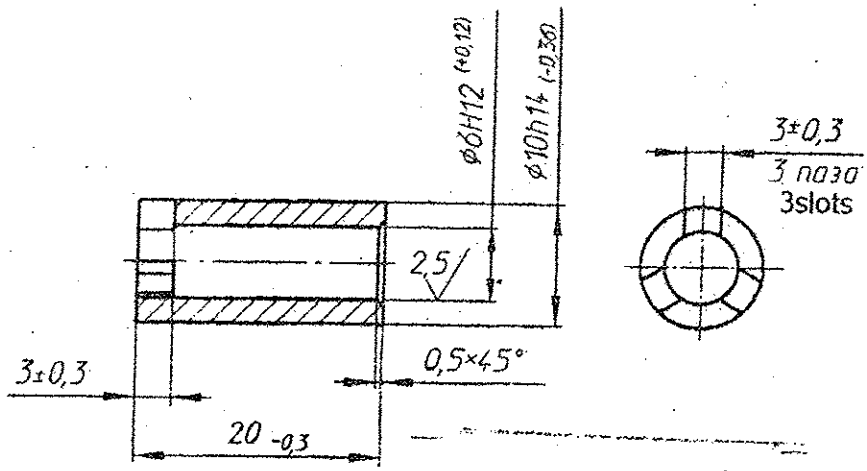
DRAWING NUMBER
432 66 142

SUE	DATE	NATURE OF AMENDMENTS
5	2.1.89	AMDT. LIST NO.6/II BOOK-9

SCALE :- 1:1
DIMENSIONS IN mm

DRAWING NUMBER	SHEET No. 1 OF 1
188.66.044	

Rz40 (√)



MASTER COPY

1. 255...302 HB.
2. Остальные требования по 520 ТУ1

1. BHN 255...302
2. Other requirments are as per 520TY1.

* ALT. MATL:-

STEEL GRADE 817 M40 (EN-24) TO BS:970-83

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

DRG. INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE - NIL

* CQA (HV) letter No:- 091/IFD/IND-V/MTPF/OE dt:- 17-03-05

356
SUPPLY CODE
U-01-1-4
D90214

F-108
32

ISSUE	DATE	NATURE OF AMENDMENTS

DRN	VGM
CHD	C Gangadharan
APPD	Chauchal
DATE	21.7.04
SIZE A4	

SCALE :- 2 : 1	
DIMENSIONS IN mm	
TOLERANCE ON DIMENSIONS UNLESS OTHERWISE STATED IS : 2102 - 69	
ALL THREADS TO CONFORM TO	

EST. WT. (Kg) 0.008	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 :- Steel 38XC Gost 4543-71	USED ON :- 188.66.015cb-1Cb
CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI	
TITLE :- BUSHING	
D S CAT NUMBER	DRAWING NUMBER 188.66.044

* AUTHORITY :- CQA(HV) letter No:- 091/IFD/IND-V/MTPF/OE dt: 17-03-05

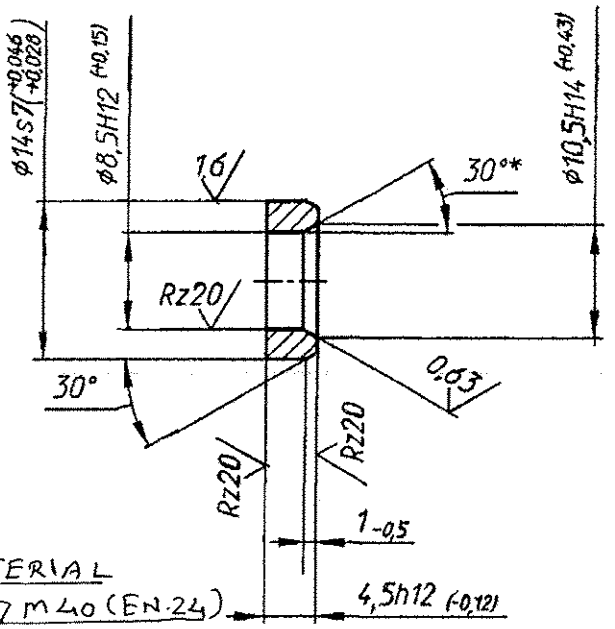
DRG. INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE - NIL

4	3	2	1

DRAWING NUMBER
188.66.047

SHEET No. 1 OF 1

Rz40 (√)



* ALT. MATERIAL
STEEL 817M40 (EN.24)
TO BS:970-83

356
SUPPLY CODE
U-01-1-4
D90214

F-108
35

1. BHN 255...302
2. *Dimensions should be enusred by tool.
3. Coating chemical oxidising oil finishing or chemical phosphating oxidising oil finishing.
4. Other requirments are as per 520 TY1.

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

ISSUE	DATE	NATURE OF AMENDMENTS

EST. WT. (Kg) 0.0035

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 :- Steel 38XC Gost 4543-71

USED ON :- 188.66.020cbCb

DRN V

CHD

APPD Chanchal

DATE 21.7.04

SCALE :- 2 : 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 :- BUSHING

D S CAT NUMBER

DRAWING NUMBER 188.66.047

SIZE A4

4	3	2	1

DRAWING NUMBER
432. 42. 022

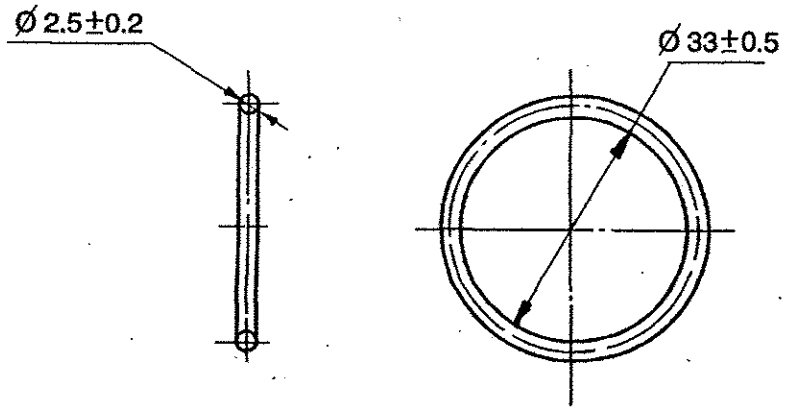
SHEET No. 1 OF 1

F

E

D

C



REQUIREMENTS FOR COMPONENT ARE IN ACCORDANCE WITH

TY 005216 75, CODE 253111 .

(6B) ALT. MATL: RUBBER GRADE N3 TO SPECN. CQA(HV)/NBR * 188.66.016cb-1Cb. (6A)

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

COMMON TO T-90

DRAWING RE - INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE - 6

(B.JAYAVELU,JTO(D)) 12 OCT 06

F - 81

ISSUE	DATE	NATURE OF AMENDMENTS
6C	22.6.07	AS PER KIT LIST No.CQA(HV)/SET/0023
6B	13.01.07	Lt.No.81312/CQA(HV)/DB-III/Alt.Matl. dt.12.10.06.
6A	12.7.04	N of A No.CQA(HV)/T90/66/001.

EST. WT. (Kg) 0.001

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 :- RUUBBER 9831 TY 005216 - 75

USED ON :- IND. SET
~~175.42.002cb-1~~ *
175.42.001cb-1 (6A)
172.42.010cbCb

DRN	Sd/=
CHD	Sd/=
APPD	Sd/=
DATE	25-11-99

SCALE :-

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 :- RING PACKING (6C)

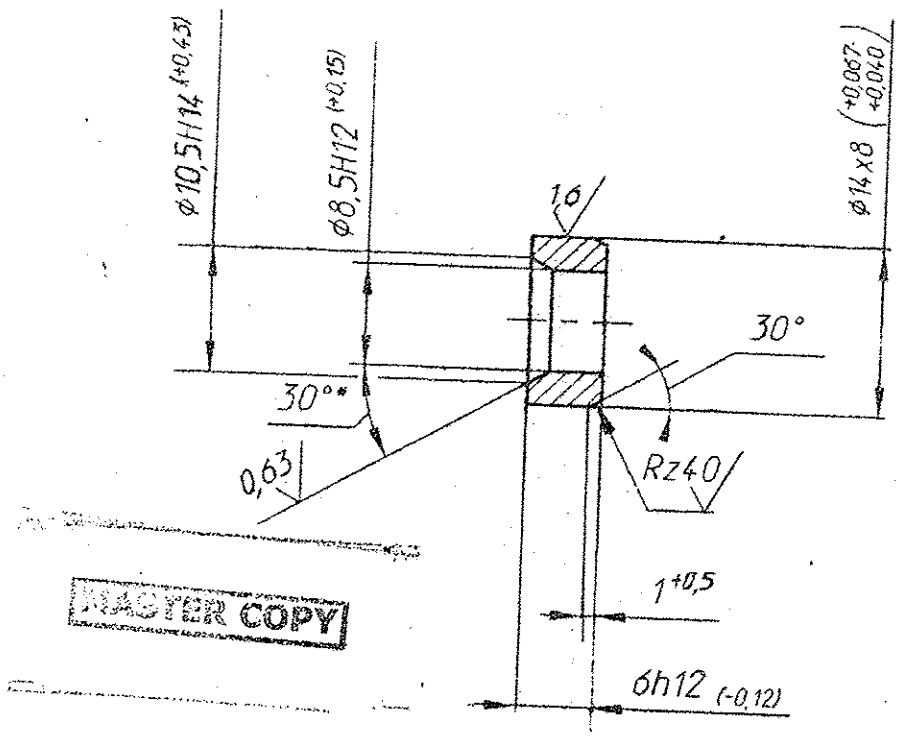
D S CAT NUMBER

DRAWING NUMBER **432. 42. 022**

SIZE A4

DRAWING NUMBER	SHEET No. 1 OF 1
188.66.025	

Rz20 √(V)



1. BHN 255...302 (Dia of indautation 3.8...3.5)
2. *Dimensions should be ensured by tool.
3. Coating chemical phosphating oxidising oil finishing or chemical oxidising oil finishing.
4. Other requirments are as per 520.TY1.

* ALT. MATL:- STEEL GRADE 817M40 (EN-24) TO BS:970-83

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

-DRG. INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE -NIL

356
SUPPLY CODE
U-01-1-4
D90214

F-108
23

* CQA (HV) Letter No:- 091/IFD/IND-V/MTPF/06 dt. 17-03-05

ISSUE	DATE	NATURE OF AMENDMENTS

EST. WT. (Kg) 0.004

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 PERMISSIBL

MATERIAL :-
Steel 38XC
Gost 4543-71

USED ON :-
188.66.015cb-1Cb

DRN V@r1

CHD K.Gangadhar

APPD Chowchal

DATE 21.7.04

SCALE :- 2 : 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 :-
VALVE SEAT

D S CAT NUMBER

DRAWING NUMBER
188.66.025

SIZE A4

TABLE - 3

Acceleration g	Pulse duration , ms	Total number of impacts	Number of impacts per minutes
15	from 1.0 to 1.5	2000	upto 100

Appendix - I

Document title	Document Designation	Page numbers in specifications, where references to the documents have been made
1-/National standard/OST " Electrical equipment of special transport machines. General specifications"	OSTB3-1164-72	2, 5, 18
2- Assembly units and parts of tracked vehicles. Methods and means of preservation	OSTB3-2381-74	5, 18, 19
4-/State standard/(GOST) "Coordination on use of purchased articles."	GOST 2-117-71	19
5-/State standard/(GOST), Sodium chloride.	GOST 4233-66	13

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ELECTROMAGNET Э M-74 M
FOR DISTRIBUTION COCK ASSY. (188-66-015Cd-1)
TRANSMISSION GEAR UNIT ,
CODE - 45 / T-90

मशीनी औजार आदिरूप फैक्टरी, अम्बरनाथ
MACHINE TOOL PROTOTYPE FACTORY, AMBERNATH

कार्यालय OFFICE: D.O.

		2005 दिनांक DATE	नाम NAME
मापमान SCALE: NTS	आरेखित DRAWN	19/10	GMK
	जाँचा CHECKED	17.11	
	अनुमोदित APPROVED		
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हेतु बदला REPLACED FOR			

आरेखण क्र. DRAWING NO. 7/7
Э M-74 M.000 TY
EM-74M.000TY

TECHNICAL REQUIREMENTS :-

Electromagnet must conform to the requirements of these specifications & set of documents as per specifications M 74M.000 , OST B3 - 1164 - 72. All articles and materials used to manufacture the electro magnet must conform to valid standards and specifications.

1.1. Basic parameters and dimensions

1.1.1. Electromagnet has the following main parameters.

a) rated voltage - 27V ;
b) operating condition - 2 activations of 1.5 min. with interval between activations as 5 min.; after that break till complete cooling.
c) circuit diagram two - wire
d) version sealed from the armature chamber side and water-proof from external side ;
e) electromagnet force with 11mm clearance - 6Kgf ;
f) coil resistance at 20° C - not less than 6 ohm ;
g) working position - any position
h) nominal armature stroke - 13 mm
i) mass , not more than - 1.7 Kg

1.1.2 Overall dimensions of electromagnet as per drg.

1.1.3 Plug with nut Cδ is a vital part of electromagnet joint which does not form part of electromagnet supply set.

1.2. SPECIFICATIONS.

1.2.1 Electromagnet must conform to drawings é M 74M.000 Г4 and é M 74M.000 w.r.t. overall and installation dimensions and exterior view.

1.2.2 Electromagnet must develop a force of not less than 6Kgf under normal climatic conditions and practically in cold state at 16v with 11mm clearance between armature and stop. Electromagnet current in this case must not be more than 2.67 A.

1.2.3 Insulation resistance between coil and casing must be :
a) under normal climatic conditions and practically cold state - not less than 20 Mohm ;
b) at high temperatures - not less than 3 Mohm;
c) under high moisture conditions - not less than 1 Mohm.

1.2.4 Insulation between coil and casing must withstand 550 V (effective value) AC test voltage of 50Hz without breakdown or surface flash-over under normal climatic conditions.

1.2.5 Electromagnet must be capable of operation and preserve its parameters under the conditions, specified in the national standard OST B 3 - 1164-72 at high ambient temperature upto 80°C and after action of ambient temperature upto 100°C, and also upto 5 atm. pressure of oil (MT - 8П or M Г E-10A) in internal cavity of electromagnet (armature chamber).

1.2.6 Electromagnet must withstand 4000 activations on test stand in order to ensure guaranteed operating time.

1.2.7 Electromagnet design (coil chamber) must be water proof.

1.2.8 Electromagnet operating life must prolong over 8000 activations.

1.3. Complete Set.

1.3.1 Delivery includes :
a) electromagnet ЭМ - 74М ;
b) certificate

1.4. Marking

1.4.1 Electromagnet must be marked as per the set of documents on specifications ЭМ - 74М.000.

1.5. Packing and preservation.

1.5.1 Electromagnet must be packed according to the requirements бЋ/ national standard / OST B - 3 - 1164 - 72 and valid packing drawing.
Preservation must be carried out taking into account the requirement бЋ OST B3 - 2381 - 74.

2. ACCEPTANCE RULES.

2.1 These specifications, OST B-3-1164-72 and set of documents on specifications ЭМ - 74М.000 are the main documents for manufacture , testing and acceptance of electromagnet.

2.2 All purchased articles and materials used for manufacturing the electromagnet must be inspected by external acceptance group of quality inspection department. Scope and procedure of input-checking is established in agreement with the customer's representative.

2.3 Elexctromagnet tests are divided into acceptance , periodic and type tests.

2.4 Each electromagnet is subjected to acceptance tests in scope and sequence given in table 1. Electromagnet are sent for acceptance in baches of 36 - 54 pieces.

2.5 Periodic tests are conducted twice in a year on two specimens in scope and sequence given in table 1.

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CODE - 45 / T-90

मशीनी औजार आदिरूप फैक्टरी, अम्बरनाथ
MACHINE TOOL PROTOTYPE FACTORY, AMBERNATH

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Э M-74 M.000 TY
EM-74M.000TY

2.6 Type tests are conducted in order to check the conformance of electromagnet to requirements of these specifications; in case of major changes in design or manufacturing technology of electromagnet which may affect operational characteristics; in case of necessity to check service life of electromagnet and measures taken for elimination of electromagnet defects and also on initial batch of series production. Necessity of conducting type tests is determined and agreed by manufacturer and customer's representative in scope sufficient for checking the effectiveness of measures undertaken as per the agreed test programme guided by the type of tests in table 1.

3. TEST PROCEDURE METHODS

3.1 All tests are conducted under normal climatic conditions, except these climatic conditions are specifically given.
Characteristics of normal climatic conditions;
a) ambient air temperature = + 25 ±10°C
b) air relative humidity = 45 - 80 %
c) atmospheric pressure = 630 - 800 mm Hg col.
Note : At a temperature higher than 30° C, relative humidity must be higher than 70 %.
Test instruments must have class of accuracy not less than 1.5.

3.2 During visual inspection, complete set, conformance to the requirements of drawings, quality of assembly, finishing, quality of soldering and absence of loose fixtures are checked. Setting and overall dimensions are checked with the help of test instruments.

3.3 Checking of force developed by electromagnet is conducted on a special stand. Clearance between electromagnet armature and stop is kept as 11mm, 6Kgf load is fixed to the stem and electromagnet is connected to 16 V five times.
Duration of each activation not more than 1S.
Electromagnet current is checked during checking of force in the last activation whose duration may be increased to 5S.
Electromagnet is considered as withstood the test, if it operates overcoming 6 Kgf opposing force and current comsumption is not more than 2.67A.

3.4 Insulation resistance test is conducted using 500 V DC mega ohm meter. Insulation resistance is measured between electromagnet casing and any contact of plug connection.
Electromagnet is considered as withstood the test, if the measured values of insulation resistance correspond to cl.1.2.3 of these specifications (for respective test conditions).

3.5 Insulation electrical strength is checked on a special high-voltage installation of not less than 0.5 kVA capacity by feeding total test voltage for 1 S, test voltage is applied between casing and any contact of plug connection.
electromagnet is considered as withstood the test if during checking no break-down or surface flash-over takes place.
Note : in case of subsequent checkings of electromagnet before installation on machine, after moisture resistance test and in case of necessity to check insulation electrical strength during guaranteed operating time, test voltage is set at 80 % of that envisaged by the requirements of these specifications.

3.6 Electromagnet pressure testing is done with МТ-8 П or М Г Е Ю А oil at a pressure of 5 atm. for 10 minutes. Oil is supplied from the stem side. electromagnet is considered as withstood the test, if there is no oil leakage.

3.7 In case of moisture - resistance test, electromagnet in disconnected state is put into hygrostat with 93 - 97% relative humidity and 20 - 25°C temperature and held in it for 5 days Rise in humidity upto 98% and temperature upto 35°C is permitted.
After withdrawal of electromagnet from hydrostat, check immediately, not later than 3 minutes, the following:
a) insulation resistance according to the procedure in cl.3.4 of these specifications.
b) force, developed and current consumption as per the procedure in cl. 3.3 of these specifications;
c) absence of corrosion except on seating surfaces, whose anti corrosion protection is not envisaged by drawings;
d) state of preservation of varnish and paint.
After holding for 24 hours under normal climatic conditions, insulation resistance and also insulation electrical strength are checked according to the procedure in cl. 3.4 and 3.5 of these specifications.
Electromagnet is considered as withstood the test, if it satisfies the requirements of cl.1.2.2 and 1.2.3C of these specifications; there is no peeling of varnish and paint and no corrosion and after holding under normal climatic conditions electrical strength and insulation resistance conform to the requirements in cl. 1.2.3a and 1.2.4 of these specifications.

3.8 In case of Cold-resistance test electromagnet in disconnected state is put into cooling chamber, in which temperature is reduced to minus 50°C and maintained with an accuracy of ±3°C. On achieving this temperature the electromagnet is kept in chamber for 4 hours. Electromagnet force is checked as per the procedure in cl. 3.3 of these specifications not later than 3 minutes after withdrawal from the chamber. In this case, the current consumption is not monitored. Electromagnet is considered as withstood the test, if its force conforms to the requirements in cl. 1.2.2 of these specifications.

Note : It is permitted to put electromagnet in cooling chamber, in which temperature upto minus 50°C has been already attained. In this case electromagnet is kept in chamber for 4 hours.

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MACHINE TOOL PROTOTYPE FACTORY, AMBERNATH

कार्यालय OFFICE: D.O.

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Э М-74 М.000 ТУ
EM-74M-000 TY

3.9 In case of thermal stability test, temperature in heating chamber is set at plus 100°C and maintained with an accuracy of ±3°C. Electromagnet is retained in heating chamber in disconnected state for 4 hours, then temperature is reduced to + 90°C and electromagnet is kept for 2 hours at this temperature. After that it is taken out of the heating chamber and within 3 minutes, force at 22V and insulation resistance are checked as per the procedure in cl. 3.3 and 3.4 of these specifications.
electromagnet current is not monitored in this case.
Electromagnet is considered as withstood the test, if it operates overcoming 6 Kgf opposing force at 22V and also insulation resistance corresponds to cl. 1.2.4b of these specifications.

3.9a Water tightness test is conducted in the following manner :
a) during acceptance tests electromagnet is put into a special chamber in disconnected state. Electromagnet coil chamber is connected to external medium with the help of a special union and rubber tubing. Dry air at 0.2 - 0.05 atm(g) pressure is supplied to the chamber for 5 minutes. Immediately after air supply, tubing end coming out of the chamber is immersed in a water tank by 2 -3 cm. water tank is located 20 - 30 cm lower than the electromagnet.
b) during periodic and type tests, electromagnet , in disconnected state, is immersed in water bath for 1 hour.
Electromagnet temperature must exceed the water temperature by 10 - 15°C at the time of immersion.
Immersion depth from water surface to upper point of electromagnet must not be less than 50 - 55 cm.
After testing, electromagnet is taken out of the bath, dried and its force and current are checked as per the procedure in col. 3.3 of these specifications.
Electromagnet is considered as withstood the test, if it satisfies the requirements in cl. 1.2.2 of these specifications.
Note : In the water - tightness test, armature stem exit location is sealed by any method.

3.10 In case of test on stability to the action of frost and dew, electromagnet, in disconnected state, is put into cooling chamber and kept in it at a temperature of minus 20 ± 5°C for two hours.
After this electromagnet is taken out of the chamber and kept under normal climatic conditions. During three hours under conditions of frost and dew formation immediately after withdrawal and after every 30 - 60 minutes, electromagnet force is checked as per the procedure in cl. 3.3 of these specifications.
Electromagnet is considered as withstood the test, if during stay time under normal climatic conditions after withdrawal from cooling chamber its force conforms to the requirements in cl. 1.2.2 of these specifications.

3.11 In case of test on the action of sea (salt) fog, electromagnet sealed from the stem exit side is put into a chamber in which temperature of 27 - 30°C is maintained and subjected to the action of salt fog. Before putting into the chamber, visual inspection to ensure absence of damaged coating is conducted. Electromagnet is located in the chamber in such a way that during testing solution splash and also drops from ceiling, walls and suspension system do not fall on it. Fog is formed by spraying with centrifugal aerosol equipment or pulverizer of salt solution, which is prepared by dissolving sodium chloride in distfilled water according to GOST 4233-77 in the quantity of 33 ±3 g/l.
Fog must have particle size of 1 - 10 μ (95% drops) and 2 - 3 g/l water content.
Solution is sprayed for 15 minutes after every 45 minutes. Total duration test is 2 days. Test duration is counted from the start of the first spray of solution.
At the end of the test, electromagnet is washed with distilled water, after this dried for 1 hour at a temp. of 55° ±2°C followed by cooling and visually inspected.
Electromagnet is considered as withstood the test, if no traces of corrosion and damage to coatings will be observed.

3.12 In the test on stability to cyclic changes in temperatures, electromagnet is subjected in disconnected state to three cycles of change in temperature continuously following each other.
Each cycle is conducted in the following order. Electromagnet is put into cooling chamber, in which temperature is already brought to minus 50°C and kept at this temperature for four hours.
From cooling chamber electromagnet is immediately transferred to heating chamber at +65°C and kept in it at this temperature for 4 hours.
Holding time in heating and cooling chamber is counted from the time of achieving the specified air temperature in the chamber after putting the electromagnet.
At the end of the last cycle of test, electromagnet is withdrawn from the heating chamber and kept under normal climatic conditions for 4 hours.
Then it is visually inspected and its force and current are checked as per the procedure in cl. 3.3 of these specifications.
Electromagnet is considered as withstood the test, if it satisfies the requirements in cl. 1.2.2 of these specifications.
Note : it is permitted to conduct test on stability against cyclic changes in temperature in one chamber with rate of change in temperature not less than 0.50°C per minute.

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MACHINE TOOL PROTOTYPE FACTORY, AMBERNATH

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Э M-74 M.000 TY
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3.13 Vibration strength test is conducted in disconnected state of electromagnet is rigidly fixed on stand with one - component horizontal or vertical vibration alternatively in two mutually perpendicular positions, in one of which armature axis is perpendicular to the test stand plane (stem down ward), and in another parallel and subjected to test in each position by fixed frequency method as per the standards given in table 2.
Test on vibration strength is conducted alongwith the test on guaranteed operating time as per the following condition: 1/4 of total vibration time in first position of electromagnet before testing on guaranteed operating time, 1/2 of total vibration time in second position of electromagnet in the middle of test on guaranteed operating time and 1/4 of total vibration - time in first position of electromagnet after test on guaranteed operating time.
After testing electromagnet is visually inspected, its force and current are checked and pressure testing with oil is conducted as per the procedure in cl. 3.3 and 3.6 of these specifications.
Electromagnet is considered as withstood the test if during visual inspection no mechanical damages are observed and it satisfies the requirements in cl. 1.2.2 of these specifications and there is no leakage of oil.

3.14 Impact strength test is conducted in disconnected state of electromagnet in the middle of the test on guaranteed operating time. It is visually inspected before the test.
Electromagnet is rigidly fixed on stand alternatively in two mutually perpendicular positions, indicated in cl. 3.13 of these specifications and subjected to the action of impacts in each position as per the standards given in table 3.
Total number of impacts is equally divided for different positions of electromagnet. After test, electromagnet is visually inspected, its force and current are checked and pressure testing with oil is conducted as per the procedure in cl. 3.3 and 3.6 of these specifications.
Electromagnet is considered as withstood the test, if during visual inspection no mechanical damages are observed and electromagnet satisfies the requirement in cl. 1.2.2 of these specifications and there is no leakage of oil.

3.15 Test on electromagnet for guaranteed operating time is conducted on a special device, which imitates its operation under real conditions. Electromagnet is activated on a spring, whose force equals to 3.5 ±0.35 Kgf and rate to 0.23 ±0.02 Kg/mm with 11mm gap between armature and stop.
Electromagnet is activated by series with 60 activations per series under condition 1S connected and 1S disconnected. Interval between series - till complete cooling. Forced blast is permitted.
Number of activation series :
at 22V 22;
at 27V 27;
at 29V 29;
At the end of electromagnet testing, 40 additional activations are made, after that force and current are checked and pressure testing with oil is conducted as per the procedure in cl. 3.3 of these specifications.
Electromagnet is considered as withstood the test, if during testing no failure occur and it satisfies the requirements in cl. 1.2.2 of these specifications and there is no leakage of oil.

3.16 Conformance of electromagnet and its installation to the requirements of stability against destructive action of single shocks with large accelerations is confirmed by full scale tests on the machine.

3.17 Before working out the procedure for stand tests on stability to the anti freezing compound and fuel and lubricant conformance of electromagnet to this requirement is confirmed by full scale tests and its operation on the machine.
Test for the action of γ and η - back ground is not conducted. Conformance to this clause of requirements is ensured by design of the electromagnet.

3.19 Test on electromagnet for service life is conducted after periodic tests as per the procedure in cl. 3.15 along with vibration strength and impact strength tests as per the procedure in cl. 3.13 and 3.14 of these specifications. Electromagnet is considered as withstood the service life test, if it remains functional after additional test amounting to 20 activations.
Note : Number of activations made during guaranteed operating time test, is taken into account in case of service life test.

4. TRANSPORTATION AND STORAGE

4.1 Packed electromagnet can be transferred by any means of transport with protection against the action of precipitations and mechanical damages.
4.2 Electromagnet must be stored according to the requirements in / national / OST 83-1164-72 and OST B3-2381-74.

5. INSTRUCTIONS FOR OPERATOR

5.1 Electromagnet must be operated under operating conditions conforming to the requirements of these specifications.
5.2 Use of electromagnet must be according to the GOST 2.117-71.

6. SUPPLIER GUARANTEES

6.1 Electromagnet must be accepted by quality inspection department of supplier plant. Supplier guaranties the conformance of article to the requirements of these specifications and non-failure operation if operating , transportation and storage conditions given in the specifications are observed by the user.
Guarantee period is specified as 500 motor hours of main engine operation (6000 Km runing of machine).
Self life of electromagnets in user stores, preserved according to / the national standard / OST B3-2381-74 must not exceed 5 years & in case of packing in hermetically sealed covers according to / the national standard / OST B3-2381-74 not more than 8 years.

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Э M-74 M.000 TY
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TABLE - I

	Types of Tests and Checks	Clause Number		Test Category		
		Require -ments	Procedure	Acceptance	Periodic	Type
1	Check on complete set conformance to drawings	1.2.1	3.2	+	+	+
2	Check on force developed and current consumption	1.2.2	3.3	+	+	+
3	Insulation resistance test					
	a) Under normal climatic conditions	1.2.3a	3.4	+	+	+
	b) Under high temperature conditions	1.2.3o	3.4	-	+	+
	c) Under high humidity conditions	1.2.3B	3.4	-	+	+
4	Insulation electric strength test	1.2.4	3.5	+	+	+
5	Pressure testing with oil	1.2.5	3.6	+	+	+
6	Moisture resistance test	1.2.5	3.7	-	+	+
7	Cold resistance test	1.2.5	3.8	-	+	+
8	Thermal - stability test	1.2.5	3.9	-	+	+
9	Test on stability to the ation of frost and dew	1.2.5	3.10	-	-	+
10	Test on the action of sea (salt) fog	1.2.5	3.11	-	-	+
11	Test on the action of cyclic change in ambient temperatures	1.2.5	3.12	-	+	+
12	Vibration strength test	1.2.5	3.13	-	+	+
13	Impact test	1.2.5	3.14	-	+	+
14	Guaranteed operating time test	1.2.6	3.15	-	+	+
14a	Test on the action of water	1.2.7	3.9a	+	+	+
15	Test on the action of single shocks with high accelerations	1.2.5	3.16	-	-	+
16	Test on the action of anti freezing compound fuel & lubricant	1.2.5	3.17	-	-	+
17	Test on the action of and η back ground	1.2.5	3.18	-	-	+
18	Service life test	1.2.8	3.19	-	-	+

19. Signs : "+" test is conducted.
"_" test is not conducted.

20. Notes : 1. Sequence of conducting tests can be changed in agreement with the customer's representative.
2. Sequence of conducting vibration strength and impact strength tests is determined by the test procedures.

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TABLE - 2

Fixed frequency Hr.	Amplitude		Total test duration hours
	Acceleration, g	Displacement mm	
10	1.0	2.0	3.0
20	2.0	1.0	9.0
30	3.0	0.8	6.0
40		0.6	4.5
50		0.4	
60	4.0	0.3	
80		Corresponds to acceleration	1.5
100			
120			

Note : Monitoring is done by one of the methods ;
By acceleration or displacement.

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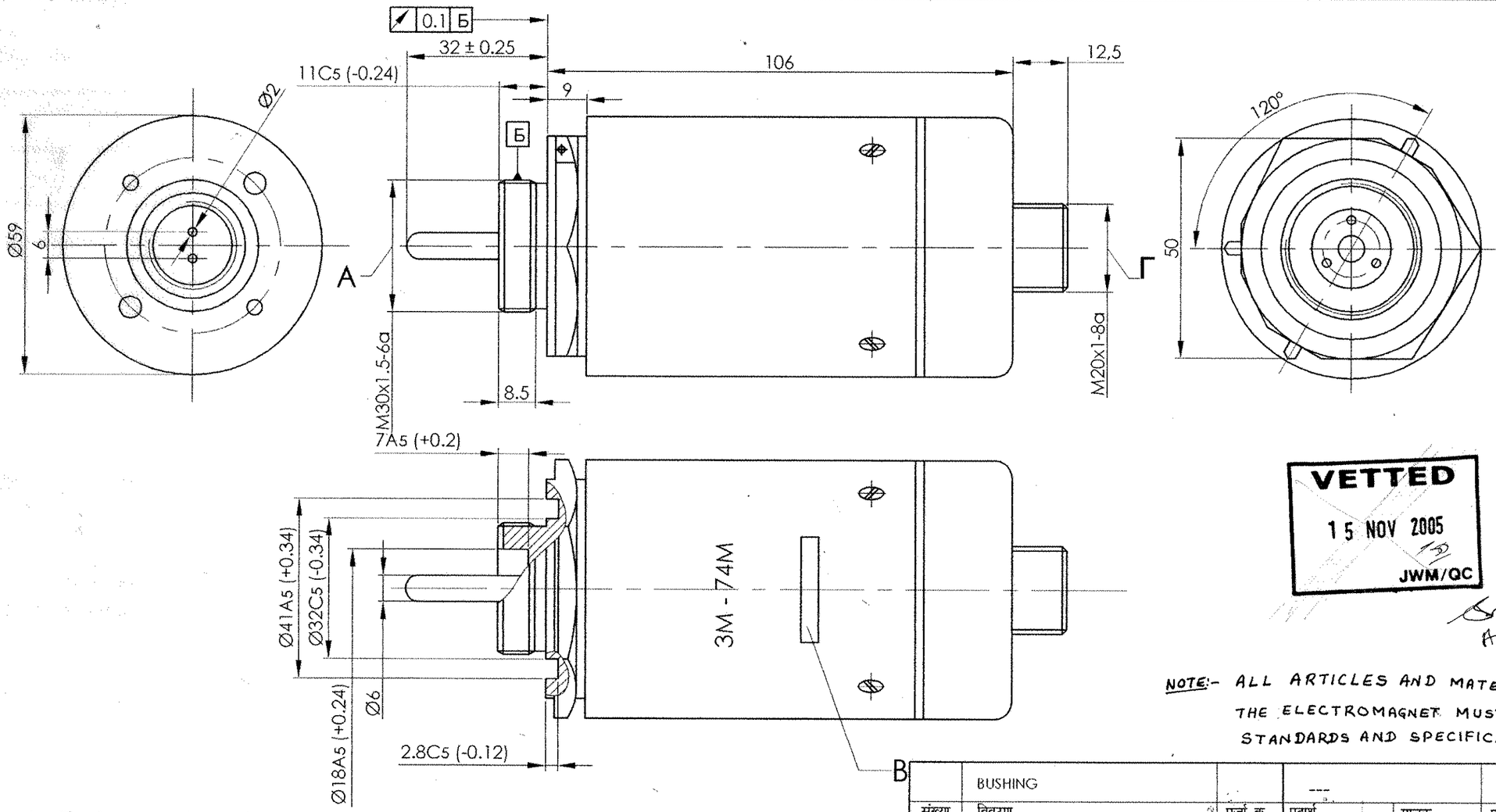
∋ M-74 M.000 TY
EM-74M.000 TY



1. Electromagnet armature must move freely inside the magnet without seizing. Free stroke of electromagnet armature must not be less than 13.5mm.
2. Transportation caps are screwed on threads A and Г. Caps are not shown in the drawing.
3. Electromagnet coils resistance not less than 6 ohm at 20°C.
4. B - serial number location.
5. During installation of electromagnet on object, use vital part of plug connector; Plug with nut C6-8.

मूलमाप व अन्वायोजन NOMINAL SIZE & FIT	विचलन DEVIATION

NOTE:- ALL ARTICLES AND MATERIALS USED TO MANUFACTURE THE ELECTROMAGNET MUST CONFORM TO VALID STANDARDS AND SPECIFICATIONS.

संख्या NO.OFF	विवरण DESCRIPTION	पुर्जा क्र. PART NO.	पदार्थ MATERIAL	मानक STANDARD	परिमाप DIMENSIONS	अभ्यक्ति REMARKS
	BUSHING		---			

सामान्य सहिष्णुता GENERAL TOLERANCE	
रेखिक परिमाप LINEAR DIMENSION	
0-6	±0.1
6-30	±0.2
30-120	±0.3
120-315	±0.5
315-1000	±0.8
1000-2000	±1.2
कोणिक परिमाप ANGULAR DIMENSION	
1-10	±1°
10-50	±30'
50-100	±20'
>100	±10'
मापांक 'म्यू एम' में VALUE IN "um"	
▽	>25
▽	6-25
▽▽	1.6-6
▽▽▽	0.025-1.6
▽▽▽▽	<0.025

संख्या NO.OFF	संबंधित पुर्जोका आरेखण क्र. DRG. NO. OF ASSOCIATED PART	सूचक INDEX	संशोधन ALTERATION	दिनांक DATE	नाम NAME
			2005		

ELECTROMAGNET Э M-74 M
FOR DISTRIBUTION COCK ASSY. (188-66-015Cd-1)
TRANSMISSION GEAR UNIT,
CODE - 45 / T-90

मशीनी औजार आदिरूप फैक्टरी, अम्बरनाथ
MACHINE TOOL PROTOTYPE FACTORY, AMBERNATH

कार्यालय OFFICE: D.O.

मापमान SCALE	आरेखित DRAWN	19/10	GMK
NTS	जाँचा CHECKED	17.11	
	अनुमोदित APPROVED		

द्वारा बदला REPLACED BY
हेतु बदला REPLACED FOR

आरेखण क्र. DRAWING NO. 1/7
Э M-74 M.000 TY
EM-74M.000 TY

USED ON	ZONE	ITEM NO	DRAWING NUMBER	D S CAT NUMBER	DESCRIPTION	QTY	REMARKS
			188.66.020cbCb		**VALVE ASSY.**		
188.66.015cb-1Cb		1	188.66.046		VALVE PIPE UNION	1	
		2	188.66.047		BUSH	1	
		3	54.58.058		SPRING	1	
		4	GOST-13941-86		RING B14 CHEMICAL PHOSPHATED OXI. OIL	1	
		5	ETY-500		BALL Б 10.319-100 E	1	

I/L CREATED BASED ON RUSSIAN ORIGINAL ISSUE - NIL

MASTER COPY

ISSUE	DATE	NATURE OF AMENDMENTS	ISSUE	DATE	NATURE OF AMENDMENTS

356
SUPPLY CODE
U-01-1-4

D90214

F-108
12

DRN	√ Ors	CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI.		
CHD	C. Gangadharan	TITLE : VALVE ASSY.		
APPD	Chanchal			
DATE	21.7.04	SHT. NO. 1 OF 1	D S CAT NUMBER	ITEM LIST FOR 188.66.020cbCb

USED ON	ZONE	ITEM NO	DRAWING NUMBER	D S CAT NUMBER	DESCRIPTION	QTY	REMARKS
		14	432 40 235-1		SPRING	1	
		15	432 66 142		PACKING RING	1	
		17	520 05 004-02		STOPPER	1	TECHNOLOG-ICAL
		18	520 05 004-03		STOPPER	1	TECHNOLOG-ICAL
		21	GOST-11371-78		WASHER C 5 01 016	2	MAX QTY
		22	MH-4152-62		RING 16x20	2	
		23	MH-4152-62		RING 20x26	1	
		24	ETY-500		BALL Б 10 319-100	1	
		25	ЭМ-74М 000ТУ		ELECTROMAGNET ЭМ-74М	1	

I/L CREATED BASED ON RUSSIAN ORIGINAL ISSUE – NIL

356
SUPPLY CODE
U-01-1-2

D90060

F-81
53

ISSUE	DATE	NATURE OF AMENDMENTS	ISSUE	DATE	NATURE OF AMENDMENTS

DRN		CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI.	
CHD		TITLE	**DISTRIBUTING COCK ASSY.**
APPD	Chauchal		
DATE	22-6-04	SHT NO 2 OF 3	D S CAT NUMBER / ITEM LIST FOR **188.66.015cb-1Cb**

USED ON	ZONE	ITEM NO	DRAWING NUMBER	D S CAT NUMBER	DESCRIPTION	QTY	REMARKS
I/L CREATED BASED ON RUSSIAN ORIGINAL ISSUE – NIL	✓	26	GOST-792-67 ✓		WIRE KO 1	0 3 M	Alternate for item 27
	✓	27	GOST-792-67 -		WIRE KO 1 2	0 3 M	Alternate for item 26

ISSUE	DATE	NATURE OF AMENDMENTS	ISSUE	DATE	NATURE OF AMENDMENTS

356
SUPPLY CODE
U-01-1-2

D90060

F-81
53

DRN		CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI		
CHD		TITLE	**DISTRIBUTING COCK ASSY.**	
APPD	Chanchal			
DATE	22-6-04	SHT NO 3 OF 3	D S CAT NUMBER	ITEM LIST FOR **188.66.015cb-1Cb**

USED ON

188.66.015cb-1Cb

I/L CREATED BASED ON RUSSIAN ORIGINAL ISSUE NIL

ZONE	ITEM NO	DRAWING NUMBER	D S CAT NUMBER	DESCRIPTION	QTY	REMARKS
		188.66.016cb-1Cb		**BODY ASSY.**		
	1	188.66.024		SLEEVE	1	
	2	188.66.026-1		BODY	1	
	3	188.66.030		STOPPER	1	
	4	188.66.039-03		PLUG	1	
	5	188.66.039-04		PLUG	2	
	6	188.66.041		SCREW	1	
	7	432.42.022		SEALING RING / (PACKING RING)	2	

ISSUE	DATE	NATURE OF AMENDMENTS	ISSUE	DATE	NATURE OF AMENDMENTS

356
SUPPLY CODE
U-01-1-4

D90214

F-108
10

DRN	V Ours	CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI.		
CHD	K. Gangadhara	TITLE : **BODY ASSY.**		
APPD	Chanchal			
DATE	21.7.04	SHT. NO. 1 OF 1	D S CAT NUMBER	ITEM LIST FOR **188.66.016cb-1Cb**

USED ON	ZONE	ITEM NO	DRAWING NUMBER	D S CAT NUMBER	DESCRIPTION	QTY	REMARKS
188 66 001C1 188 45 001cb-3Cb	✓		**188 66.015cb-1Cb**		**DISTRIBUTING COCK**		
					ASSY		
	✓	1	188 66 016cb-1Cb		BODY ASSY	1	
	✓	2	188 66 020cbCb		VALVE ASSY	1	
	✓	3	188 66 022		SLIDE VALVE	1	
	✓	4	188 66 025		VALVE SEAT	1	
	✓	5	188 66 034		SPRING	1	
	✓	7	188 66 044		BUSHING	1	
	✓	10	175 66 117		SCREW STOPPER	1	
	✓	12	172 66 237		PLUG	1	

I/L CREATED BASED ON RUSSIAN ORIGINAL ISSUE – NIL

356
SUPPLY CODE
U-01-1-2

D90060

F-81
53

ISSUE	DATE	NATURE OF AMENDMENTS	ISSUE	DATE	NATURE OF AMENDMENTS

DRN	GRuslparaj	CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI	
CHD	GRuslparaj	TITLE **DISTRIBUTING COCK ASSY.**	
APPD	Chawchal		
DATE	22-6-04	SHT NO 1 OF 3	D S CAT NUMBER
			ITEM LIST FOR **188.66.015cb-1Cb**