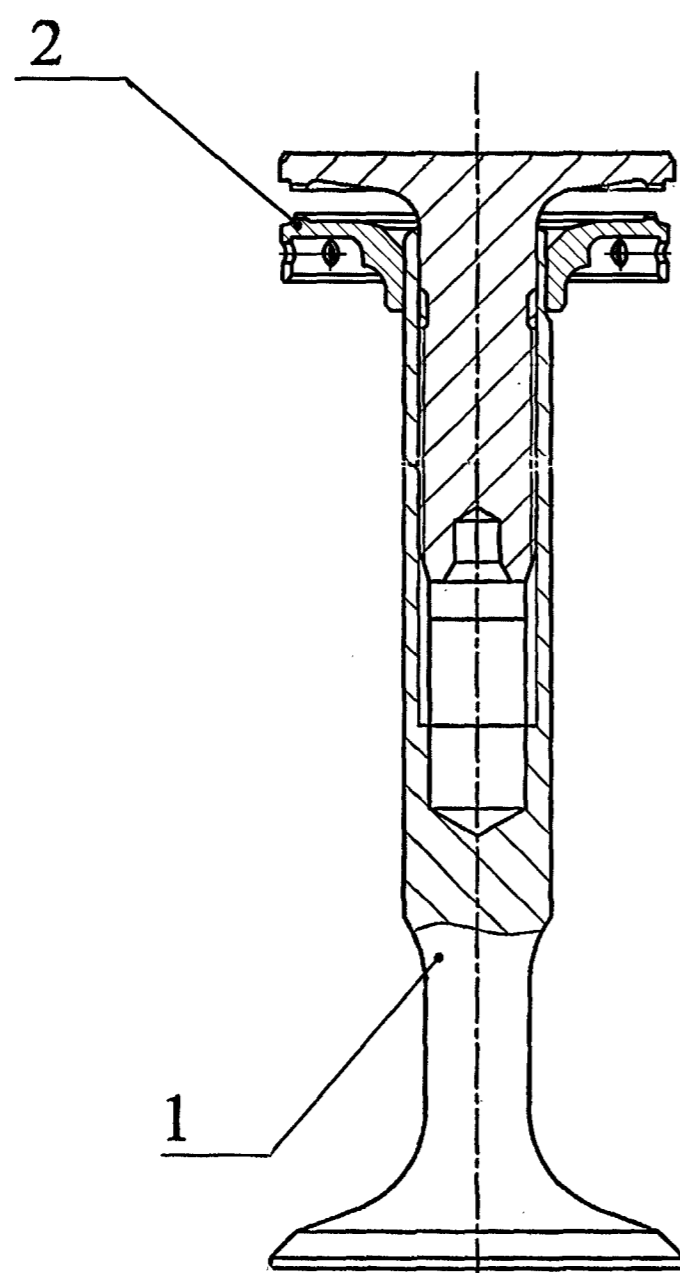


USED ON	V92S2 ENGINE	I/L CREATED BASED ON 11 TH ALT. COMM NEW POINT No.7	ZONE	ITEM NO	DRAWING NUMBER	D S CAT NUMBER	DESCRIPTION	QTY	REMARKS	
					CQA(HV) 506 613E		ASSY. INLET VALVE			
					& ITEM LIST		WITH DISC LOCK			
				1	Cb 306-06-12 & I/L		INLET VALVE ASSY.		1	
				2	306-48-7		VALVE DISC LOCK		1	
F-	ISSUE	DATE	NATURE OF AMENDMENTS			ISSUE	DATE	NATURE OF AMENDMENTS		
	DRN	<i>[Signature]</i>	CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI.							
	CHD	<i>[Signature]</i>	TITLE : ASSY. INLET VALVE WITH DISC LOCK							
	APPD	<i>[Signature]</i>								
	DATE	09 JAN 2016	SHT. NO. 1 OF 1	D S CAT NUMBER	ITEM LIST FOR CQA(HV) 506 613E					

DRAWING NUMBER
CQA(HV) 506 613E

SHEET No. 1 OF 1



TECHNICAL REQUIREMENTS

1. CIRCUMFERENTIAL PLAY OF THE VALVE DISC LOCK 306-48-7 (ITEM No.2) ON FLATS OF THE INLET VALVE STEM Cb 306-45-01 * SHOULD NOT EXCEED 0.3 ON 50 DIA.
2. VALVE DISC LOCK 306-48-7 SHOULD MATCH CLOSELY WITH VALVE DISC 306-47-2 * BY ALL THEIR SPLINES, 100% CHECKING IS TO BE ENSURED.
3. ASSY. INLET VALVE WITH DISC LOCK IS TO BE PROCURED / REPLACED AS A SET.
4. THE PARTS SHOULD BE CLEAN, FREE FROM DUST, DIRT AND OILED TO PREVENT RUST.

* PART OF ITEM No.1

DRG. CREATED BASED ON 11TH ALT. COMM. NEW POINT No.7

PILOT SAMPLE SHOULD BE APPROVED BEFORE BULK PRODUCTION.

EST. WT. (Kg) **0.420 Kg**
 TO BE STAMPED OR MARKED WHERE INDICATED THUS # (LETTERS)

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

	DRN	<i>[Signature]</i>	MATERIAL :-	USED ON :-
	CHD	<i>[Signature]</i>	—	V92S2 ENGINE
	APPD	<i>[Signature]</i>	CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI	
	DATE	09 JAN 2016		
	SCALE:-	1:1	TITLE :- ASSY. INLET VALVE WITH DISC LOCK	
	DIMENSIONS IN mm			
	TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS : 2102 - 69		D S CAT NUMBER	
	ALL THREADS TO CONFORM TO IS:4218.PART-4			
	ISSUE	DATE	DRAWING NUMBER CQA(HV) 506 613E	
		NATURE OF AMENDMENTS		

F-
 SIZE A3

USED ON

ITEM No.

DRAWING NUMBER

D S CAT NUMBER

DESCRIPTION

QTY

REMARKS

Cb.306-06-12

INLET VALVE ASSY

ITEM LIST

1

Cb.306-45-01 & I/L

INLET VALVE ASSY

1

2

306-47-2

VALVE DISC

1

Cb 406-16-15
Cb 406-17-15

I/L CREATED BASED ON RUSSIAN ORIGINAL ISSUE - 2

ISSUE

DATE

NATURE OF AMENDMENTS

ISSUE

DATE

NATURE OF AMENDMENTS

F - 3

64/166

DRN

[Signature]

CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI.

CHD

[Signature]

TITLE :

INLET VALVE ASSY

APPD

[Signature]

DATE

14. 5. 07

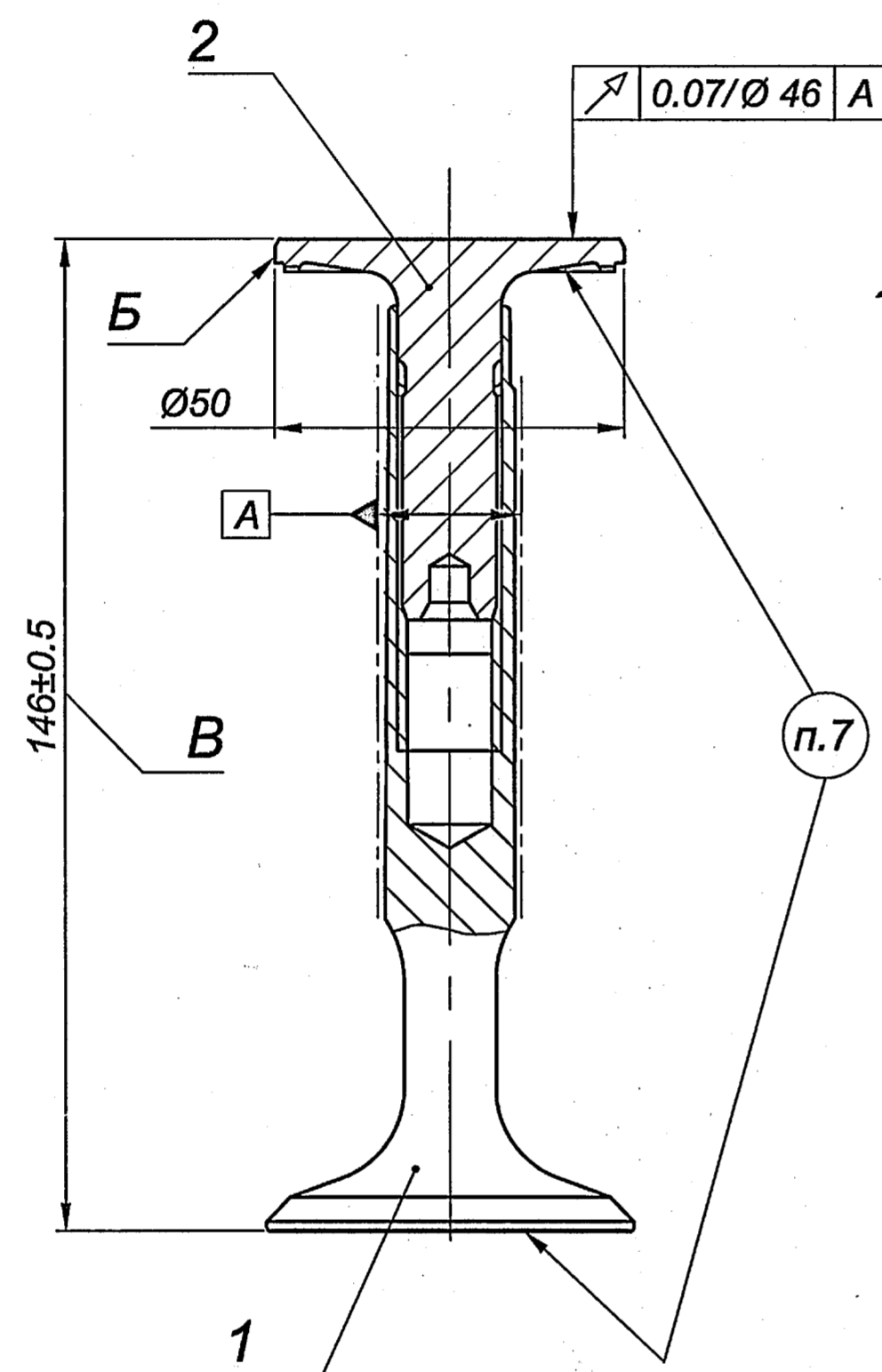
SHT. NO. 1 OF 1

D S CAT NUMBER

ITEM LIST FOR
Cb.306-06-12

DRAWING NUMBER
Cb.306-06-12

SHEET No. 1 OF 1



1. Before Assembly:
 - a). Valve (item 1) and valve disc (item 2) should be thoroughly washed and blow off with dry compressed air.
 - b). Disc thread should be lubricated with mixture of castor oil GOST 6757-73 and graphite ГЛС-2 as per GOST 5420-74 in the ratio of 5:1. It is permitted to use graphite as per GOST 5279-74.
2. The disc (item 2) should be screwed in to the valve stem (item 1) upto the dimension 'B'.
3. While screwing in the torque should be (2.5...12.5)Nm [(25...125)kgf.cm]
4. Shake in disc (item 2) with respect to valve stem (item 1) at the entire dimension 'B' is not allowed. Shake in disc while going in to guiding portion (Ø14.2 mm) of valve stem should not be more than 0.04 mm. Checking of disc shakness to be carried out on surface 'Б' and datum surface 'A'.
5. Tolerance of end play is ensured in any position of disc with respect to valve stem while unscrewing it from the dimension 'B' by one turn.
6. Slight traces of rubbing and external oxidized surface are allowed on guiding portion of disc (item 2)
7. Pairing number to be marked by etching from 1 to 99. For every one hundred numbers marked with alphabetical letter.

DRG. INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE - 2

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)
0.365	

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

DRN	APD	MATERIAL:-	USED ON:-
CHD	DATE		C6 406-16-15
APPD	16/2/02		C6 406-17-15
SCALE:- 1:1	CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI		
DIMENSIONS IN mm	TITLE:-		
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS: 2102-69	INLET VALVE ASSY		
ALL THREADS TO CONFORM TO	D S CAT NUMBER	DRAWING NUMBER	
ISSUE	DATE	Cb.306-06-12	
NATURE OF AMENDMENTS			

F-3
65
166
SIZE A2

USED ON

ITEM No.

DRAWING NUMBER

D S CAT NUMBER

DESCRIPTION

QTY

REMARKS

Cb.306-45-01

& ITEM LIST

INTAKE VALVE ASSY

1

306-46-10

INLET VALVE

ND

STEEL 40X10C2M

TY 14-1-3092-81

1

2

306-49

ADDITIONAL RING

1

Cb 306-06-12

I/L CREATED BASED ON RUSSIAN ORIGINAL ISSUE - 3

ISSUE

DATE

NATURE OF AMENDMENTS

ISSUE

DATE

NATURE OF AMENDMENTS

DRN

CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI.

CHD

TITLE :

INTAKE VALVE ASSY

APPD

DATE

24.8.07

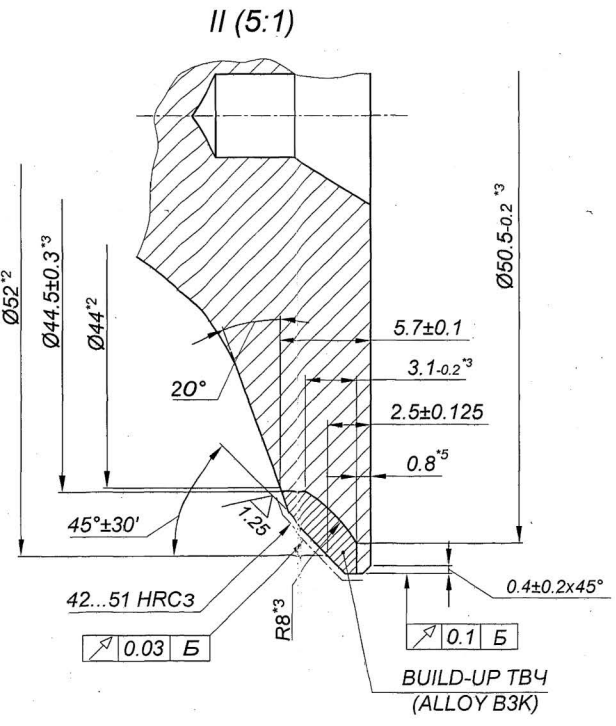
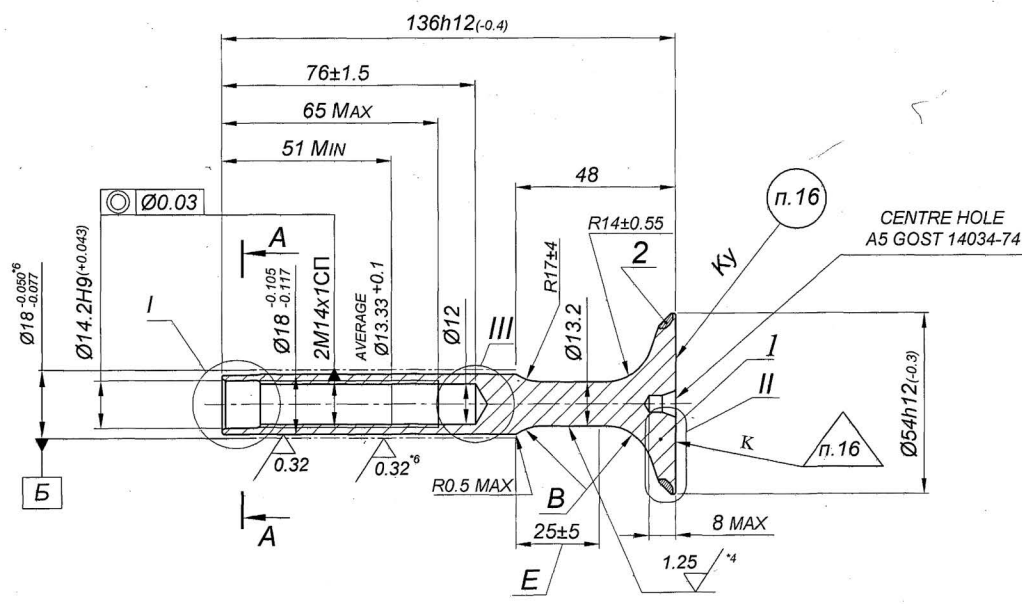
SHT. NO. 1 OF 1

D S CAT NUMBER

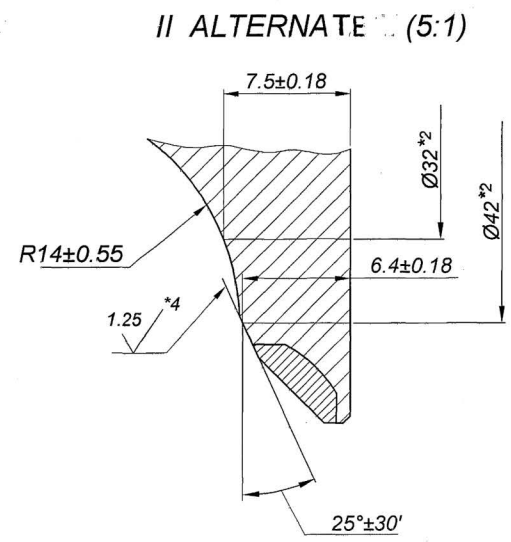
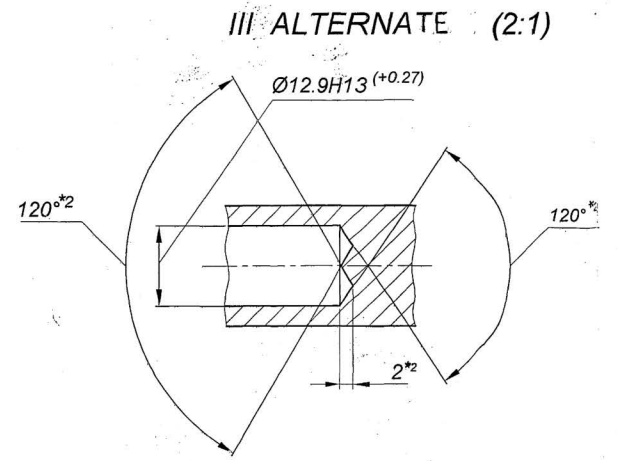
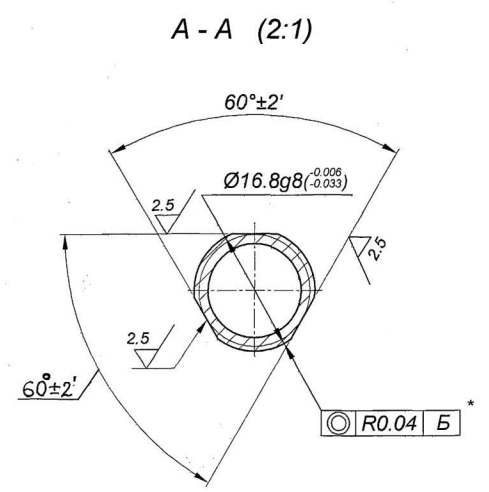
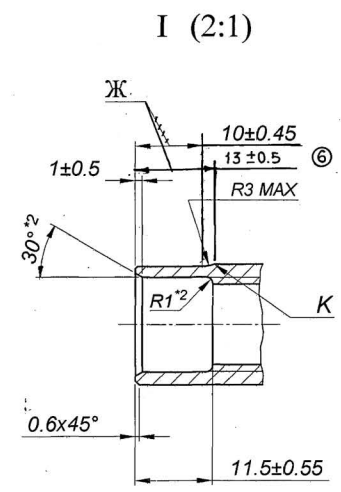
ITEM LIST FOR

Cb.306-45-01

F-3
88/166



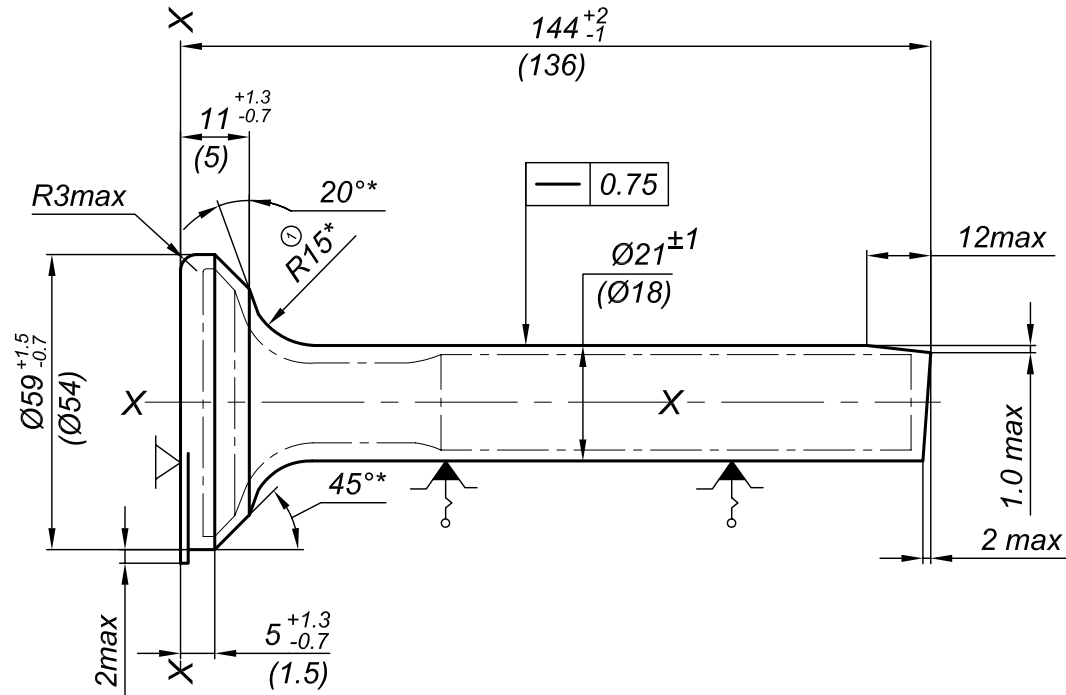
1. Inspection group II as per TT-11.
2. 255-302 HB except the places specified separately
3. Direction of grains in longitudinal section should correspond with external contour of forging with out loop and breaks as per set standard. Breaks of grains is permitted in the zone metal building.
4. Metal building is carried out as per instruction И-УГТМ3 -126-91.
5. Chromium plating of surface Б X Hardness: 21 as per ИЛ-154-75. After plating tempering is carried out.
6. Unspecified limit deviation of dimensions in machining: H14, h14, ± IT¹⁴/₂.
7. Technical requirement for thread are taken as per standard 82021-00.
8. On the surface of chamfer- pores, cavity, cracks and Non-metalic inclusions are not allowed.
- 9.* Check the following dimensions with set gauges:
Diameter of flattened spots - 16.853 mm.
Diameter of hole - 17.962 mm.
Angle between flats - 60°±2.
10. Polish the surface 'B'. On edges burrs and chromium splashes are not allowed.
11. Edge 'K' to be dressed, polished as per standards.
12. Acceptance of part after final Heat-treatment to be carried out as per TTM 56-78.
13. Chromium -plating is permitted on the length 'E'. Remaining surface of valve head, section K and internal surface are to be protected.



14. Check the part on magnetic defectoscope. Technical requirement and acceptance rules are as per TT ИВ-17
15. Roller burnish the surface 'B' before Chromium-plating by roller Ø 30...35mm, radius at the top of the roller is R=4⁺¹mm, load on the roller should be 80...130kg. Feed 100mm per minute. Polishing is permitted.
16. Stamp by Electro-chemical method as per instruction PM-32 or Electro-sparking method, and mark 'X'.
17. ⁺² Dimension to be ensured by tool.
18. ⁺³ Dimension to be ensured before building up.
19. ⁺⁴ Accept as per inspection specimen.
20. ⁺⁵ Dimension is given for reference.
21. ⁺⁶ Dimension and roughness after plating.

PILOT SAMPLE SHOULD BE APPROVED BY A H S P BEFORE BULK PRODUCTION.		DRN	CHD	APPD	DATE	MATERIAL	USED ON
EST. WT. (kg)	TO BE STAMPED OR MARKED WHERE INDICATED THIS # (LETTERS)	6	20.11.08	SA	09.07.08	CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI	Cb 306-06-12
ALL SHARP EDGES AND CORNERS TO BE REMOVED UNLESS OTHERWISE STATED MACHINED CORNERS TO HAVE R OUT-SIDE R INSIDE EQUIVALENT CHAMFERS ARE PERMISSIBLE.		NOTN. NO: 2002-379 (F-158)	DO CORRECTION			TITLE: INTAKE VALVE ASSY	D S CAT NUMBER
		ISSUE	DATE	NATURE OF AMENDMENTS			DRAWING NUMBER Cb.306-45-01

DRG. INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE - 5



1. Forging is machined as per GOST 7505-89.
- 1.1 Class of accuracy M3.
- 1.2 Steel grade C3.
- 1.3 Degree of Complexity T4.
- 1.4 Die parting surface is flat.
- 1.5 Initial Index - 12.

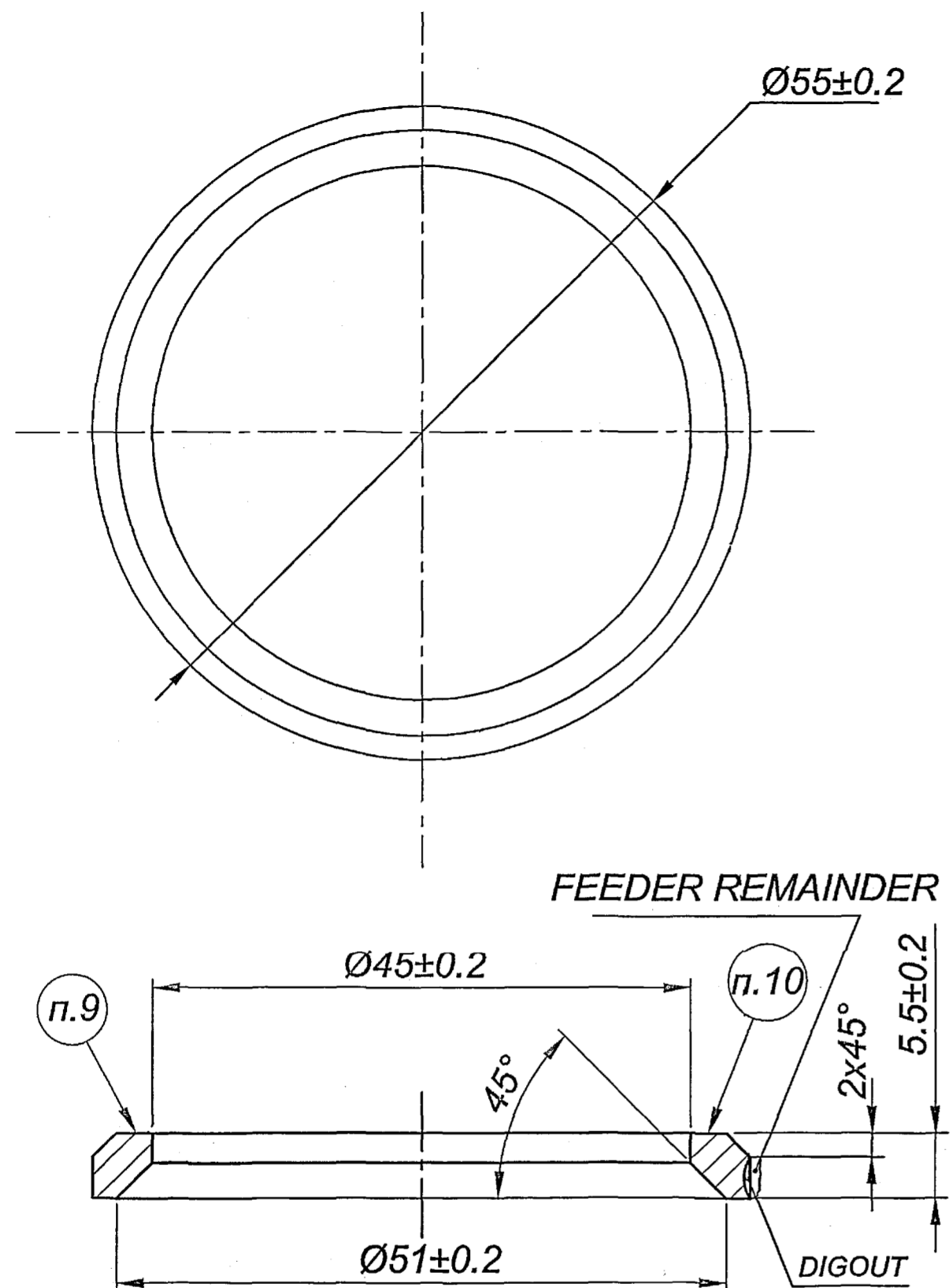
2. Shift of die parting surface should not be more than 0.5mm.
3. Burrs about die parting surface should not be bigger than 1.4mm by height .
4. Local surface defects upto a depth of not more than 0.5 of the actual allowance is permitted.
5. 255...302HB ($\Phi_{imprint}$ 3.8...3.5 mm) Гр II GOST 8479-70.
6. * - Dimensions are ensured by tool.

					306-46-10						
					FORGING (INLET VALVE)			CAST	WEIGHT	SCALE	
MOD. SHEET	DOC. NO.	SIGN.	DATE								1:1
DRAWN By.											
CHECKED By											
T. INSPECTION									SHEET	SHEETS	1
N. INSPECTION									Steel 40X10C2M TY14-1-3092-81.		
APPROVED By									ENGINE FACTORY AVADI		
					F-11						

DRAWING NUMBER

306-49

SHEET No. 1 OF 1



1. Casting as per pattern.
2. 43...51 HRC₃.
3. Unspecified casting radii upto 0.5 mm.
4. Unspecified casting draft upto 1°.
5. Casting accuracy 5T-5-8-5 GOST 26645-85.
6. The following are permitted:
 - a). Cutting -out of the body of casting in the place of runner with depth not exceeding 0.3 mm is allowed, remaining undressed runner should not be bigger than 0.5 mm.
 - 6). Short-run of edges on Ø55 should not exceed 0.5 mm.
 - b). Clean sandy cavities occupying not more than 10% of a total surface of casting.
 - c). Separate clean cavities in quantity of 5 pieces not bigger than Ø1 mm and up to a depth of 0.5 mm maximum, distributed over a distance of 10 mm minimum from each other.
7. The following are not allowed:
 - a). Metal overflow and Burrs on the diameter 45 mm.
 - 6). Deep cracks, non-homogenous body.
8. Surface of casting should be cleaned from the reminders of ceramics by sand blasting.
9. Stamp letter K on the tag with Letter type 3-Пp GOST 26.008-85.
10. Mark the seat number with Letter type 3-Пp GOST 26.008-85.
11. Remaining requirment are as per TY-4591-008-08629387-2000.

DRG. INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE - 6

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

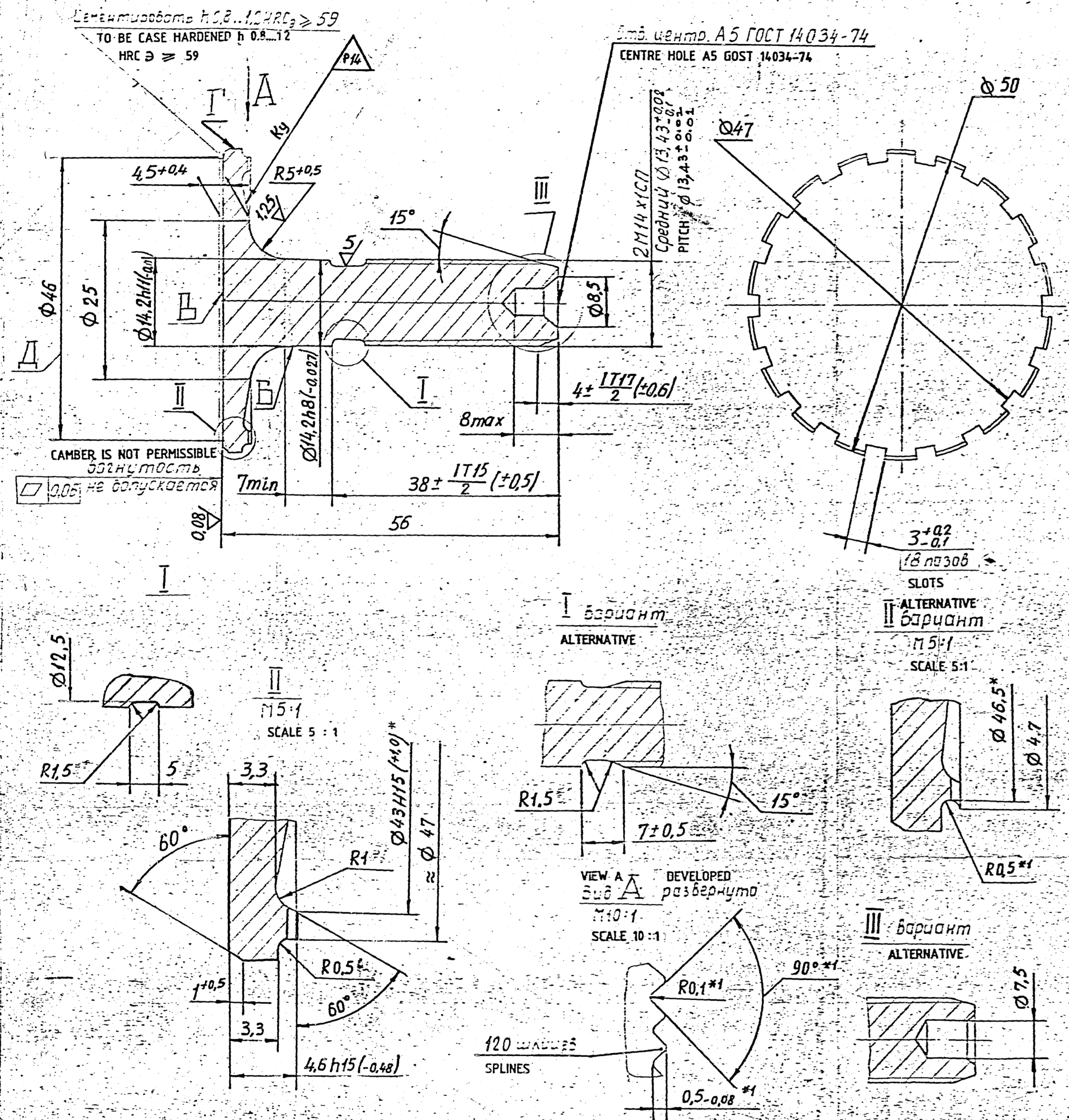
EST. WT. (Kg) 0.025	TO BE STAMPED OR MARKED WHERE INDICATED THUS # (LETTERS)
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ALL SHARP EDGES AND CORNERS TO BE REMOVED UNLESS OTHERWISE STATED MACHINED CORNERS TO HAVE R OUT-SIDE R INSIDE EQUIVALENT CHAMFERS ARE PERMISSIBLE.

DRN		MATERIAL :- ALLOY B3K TY 4591-008-08629387-2000	USED ON :- Cb 306-45-01
CHD			
APPD			
DATE	11-9-2007	CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI	
SCALE:-	2 : 1		
DIMENSIONS IN mm		TITLE :- ADDITIONAL RING	
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS : 2102 - 69			
ALL THREADS TO CONFORM TO		D S CAT NUMBER	DRAWING NUMBER 306-49
ISSUE	DATE	NATURE OF AMENDMENTS	

F-3
97
166

SIZE A2



1. Группа контроля III по ТТ-11.
2. HRC, 26...42, кроме места, обозначенного осью.
3. Неуказанные предельные отклонения, размеров: отверстий по H14; валов по h14; остальных $\pm \frac{IT14}{2}$.
4. Технические требования на резьбу по нормам 82021-00.
5. Торцовые шлицы и расположение их относительно оси поверхности Б проверять специальным калибром в 3х положениях через 120°. Прилегание должно быть плотным без ощутимой качки. Принимать по контрольному образцу.
6. Допуск торцового биения поверхности В относительно оси среднего диаметра резьбы не более 0.04 мм на диаметре Д.
7. Допуск радиального биения поверхности Б относительно оси среднего диаметра 0.03 мм, не более.
8. Допускается подкачка остальной поверхности.
9. Допускается при накатке резьбы закругление гребешков R=0.17 мм, не более.
10. Допускается цементация поверхности Г h=4,2 мм, не более.
11. Допускается отсутствие центрального отверстия.
12. На дне канавки выхода резьбы риски не допускаются.
13. Деталь проверить на магнитном дефектоскопе. Технические требования и правила приемки согласно ТТ ЧЗ-17.
14. Диаметр клейма 5 мм, не более.
- 15.* Размеры контролировать до накатки торцовых шлицев.
- 15.* Размеры обеспечить инструментом.
17. Покрытие хим. окс. прм.

- 1) INSPECTION GROUP III AS PER TT-11.
- 2) HRC 26...42 UNLESS OTHERWISE SPECIFIED.
- 3) UNSPECIFIED LIMIT DEVIATION OF DIMENSIONS OF HOLES AS PER H14, SHAFT PER h14 AND OTHER DIMENSIONS $\pm \frac{IT14}{2}$.
- 4) TECHNICAL REQUIREMENTS FOR THE THREAD ARE AS PER STANDARD 82021-00.
- 5) THE FACE SPLINES AND THEIR POSITION RELATIVE TO THE AXIS OF SURFACE B BE CHECKED WITH A SPECIAL GAUGE. THE CHECK SHOULD BE CARRIED OUT AT 3 POINTS EVERY 120°. THE ENGAGEMENT SHOULD BE FULL WITHOUT PLAY AND ACCEPTED ON TEST SPECIMEN.
- 6) THE RUNOUT OF SURFACE B RELATIVE TO THE AXIS OF THE DIAMETER OF THE THREAD SHOULD NOT EXCEED 0.04mm ON DIAMETER D.
- 7) THE RADIAL RUNOUT OF SURFACE B RELATIVE TO THE PITCH DIAMETER OF THE THREAD SHOULD NOT EXCEED 0.03mm.
- 8) THE REPEATED CARBURIZATION OF THE REMAINING SURFACE IS ALLOWED.
- 9) WHEN ROLLING THE THREAD THE CRESTS MAY BE BLUNTED TO A RADIUS NOT EXCEEDING 0.17mm.
- 10) SURFACE G MAY BE CARBURIZED THE DEPTH OF CARBURIZATION SHOULD NOT EXCEED h=1.2mm.
- 11) CENTRE HOLE MAY BE DRILLED.
- 12) MARKS ARE NOT ALLOWED ON THE BOTTOM OF GROOVE TO WHICH THE THREAD COMES.
- 13) THE COMPONENT SHOULD BE CHECKED FOR DEFECTS ON MAGNETIC FIELD FLAW DETECTOR. TECHNICAL REQUIREMENTS AND ACCEPTANCE RULES ARE IN ACCORDANCE WITH TECHNICAL REQUIREMENTS ИВ-17.
- 14) MARKING DIAMETER SHOULD NOT EXCEED 5mm.
- 15) DIMENSIONS SHOULD BE CHECKED BEFORE FORMING THE FACE SPLINES. MARKING DIAMETER SHOULD NOT EXCEED 5mm.
- 16) DIMENSIONS TO BE ENSURED BY TOOL.
- 17) COATING: CHEMICAL OXIDIZING OIL FINISHING.

Ⓐ ALT. MATERIAL BS: 970. STEEL GRADE En36B.

CHEMICAL COMPOSITION	MECHANICAL PROPERTIES
C = 0.12 TO 0.18	ULTIMATE TENSILE STRENGTH - 102 kg/mm ² (min)
Si = 0.10 TO 0.35	ELONGATION % - 13 (min)
Mn = 0.30 TO 0.60	IZOD IMPACT - 4.8 kgm/cm ² (min)
Cr = 0.60 TO 1.10	
Ni = 3.0 TO 3.75	
P = 0.05 (Max)	
S = 0.05 (Max)	

Ⓑ EQUIVALENT MATERIAL EN 36B TO BS: 970 / 13 Ni13 Cr3 TO IS: 4432-1988

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

EST. MASS 0.115 Kg. TO BE STAMPED OR MARKED WHERE INDICATED THUS # LETTERS!

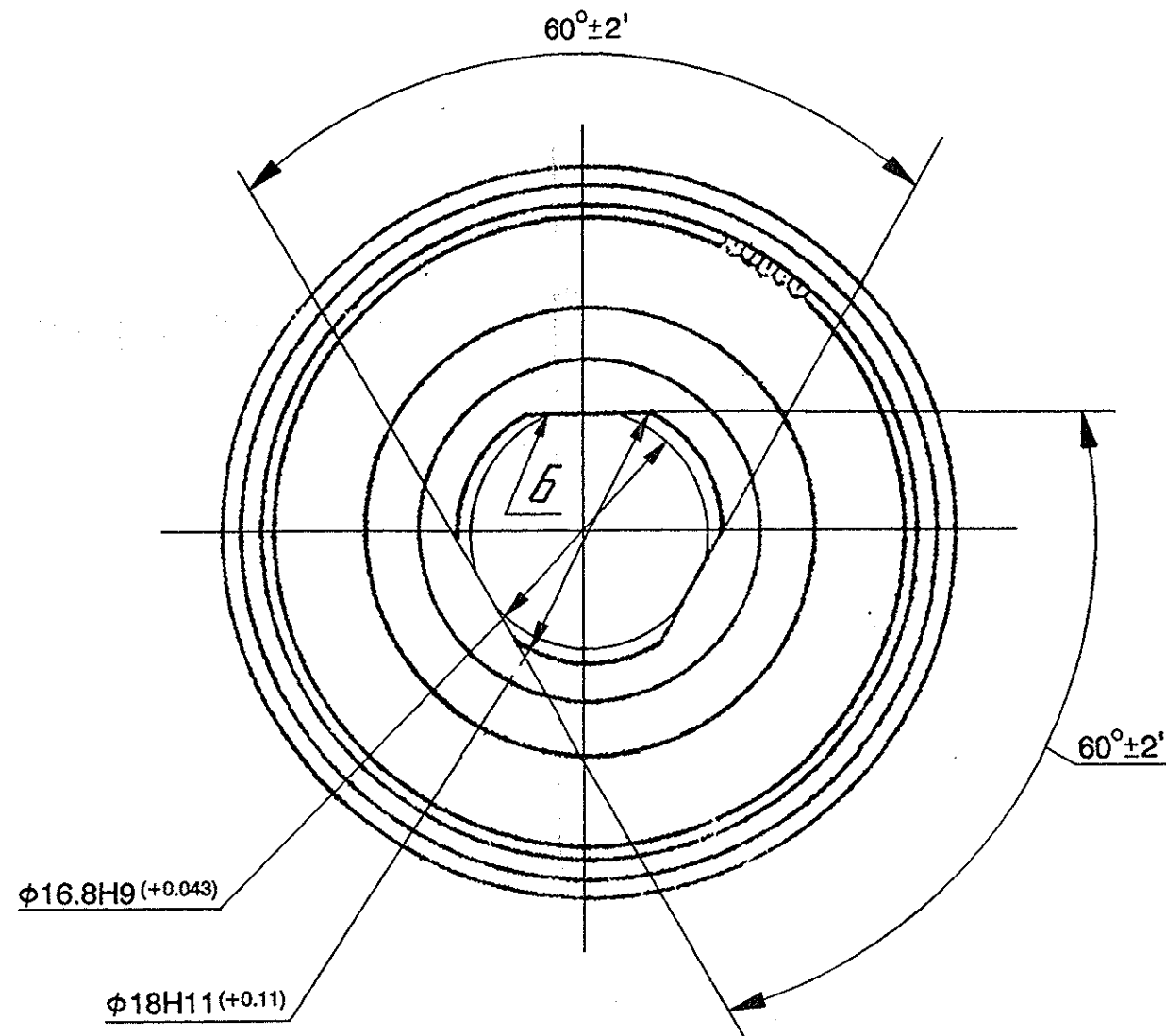
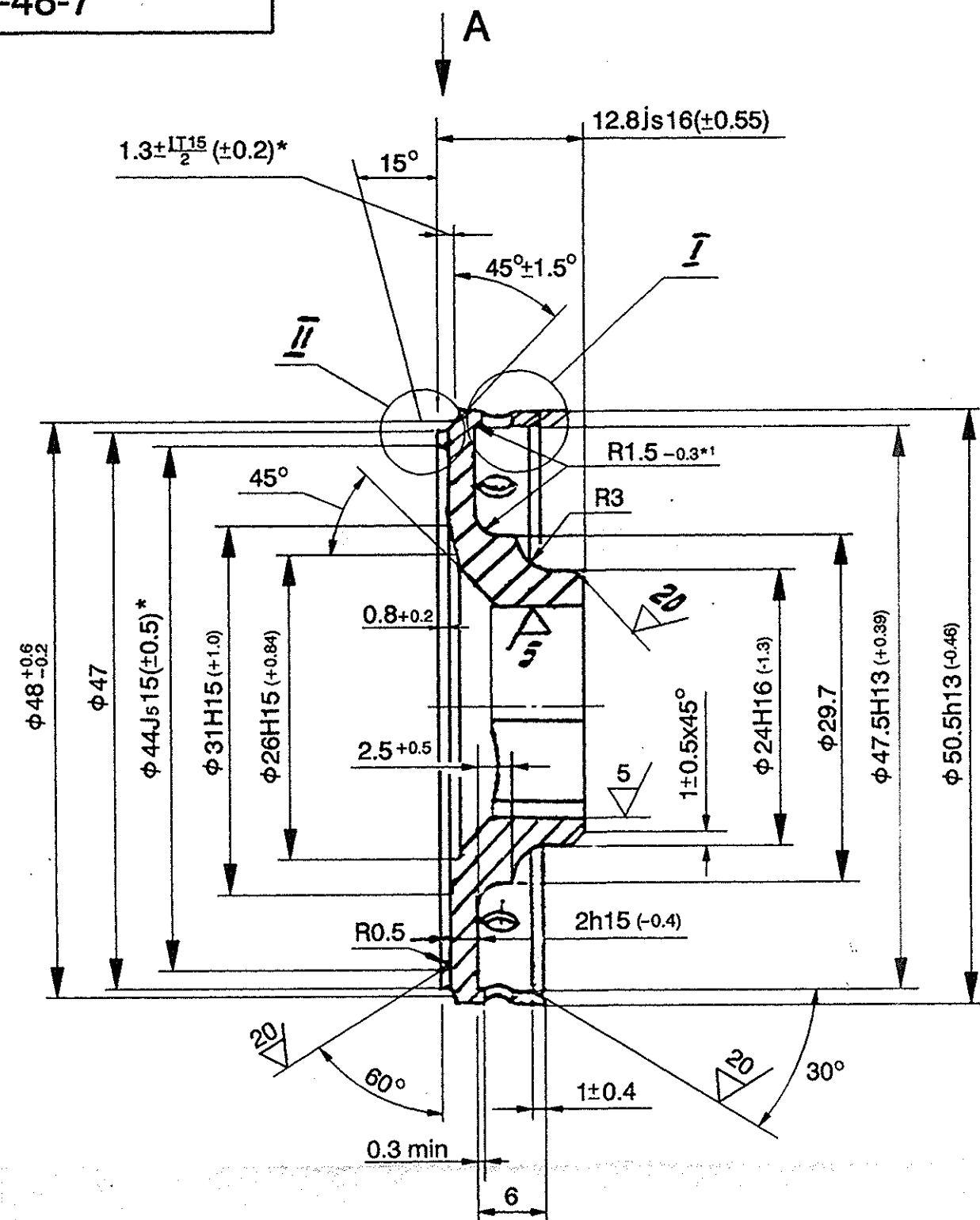
ALL SHARP EDGES AND CORNERS TO BE REMOVED UNLESS OTHERWISE STATED MACHINED CORNERS TO HAVE R OUTSIDE R INSIDE EQUIVALENT CHAMFERS ARE PERMISSIBLE.

DRN	EDD	ICD	APPD	DATE	SCALE	DIMENSIONS IN mm	TOLERANCE ON DIMS UNLESS OTHERWISE STATED IS 2102-69	MATERIAL - STEEL 12XH3A	USED ON - CB 306-06-36 CB
				23-3-88	2:1			TY 14-1-381-72	CB 306-07-3A
								CONTROLLERATE OF QUALITY ASSURANCE BEAVY VEICULIN	AVAQI
								TITLE	VALVE DISC
								S EAT NUMBER	306-47-2

DRAWING NUMBER
306-48-7

SHEET No. 1 OF 1

10/ (✓)



1. INSPECTION GROUP III AS PER TT-11.
2. HRC₃ 28.....32.
3. UNSPECIFIED LIMIT DEVIATIONS OF DIMENSIONS HOLES AS PER H 14, SHAFTS AS PER h 14, OTHERS $\pm \frac{IT_{14}}{2}$.
4. THE FACE SPLINES SHOULD BE CHECKED WITH A SPECIAL GAUGE IN 3 POSITIONS THROUGH 120° ON A MANDREL WHICH IS MADE TO SUIT MAXIMUM DIMENSION ON THE MATING COMPONENT.
5. ENGAGEMENT OF SPLINES SHOULD BE ACCEPTED AS PER TEST SPECIMEN.
6. RELATIVE POSITION OF SURFACE B IS TO BE CHECKED BY SPECIAL GAUGE. GAUGE MANUFACTURED AS PER MAXIMUM DIMENSIONS OF MATING COMPONENTS.
7. COATING : CHEMICAL OXIDIZING OIL FINISHING.
8. TO BE MARKED ON TAG FOR THE BATCH OF COMPONENTS WITH SEALING.
9. * DIMENSIONS TO BE CHECKED BEFORE ROLLING FACE SPLINES.
10. * 1 DIMENSIONS TO BE ENSURED WITH TOOL.
11. HARDNESS MAY BE CHECKED ON BLANK ON EACH HEAT TREATED BAR BHN 255 285.
12. SLOT MAY BE MADE AS PER ALTERNATIVE 2 INSTEAD OF ONE FROM HOLE B.

EXPLANATORY NOTE :

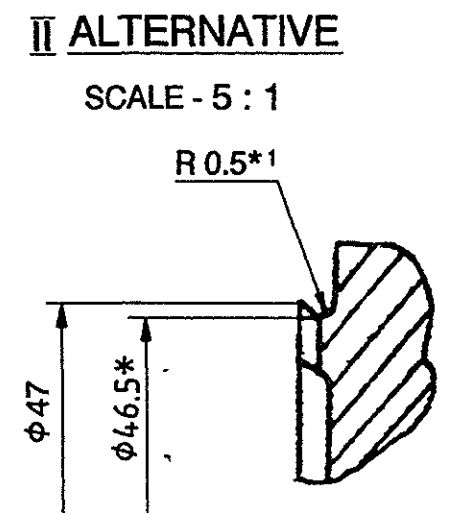
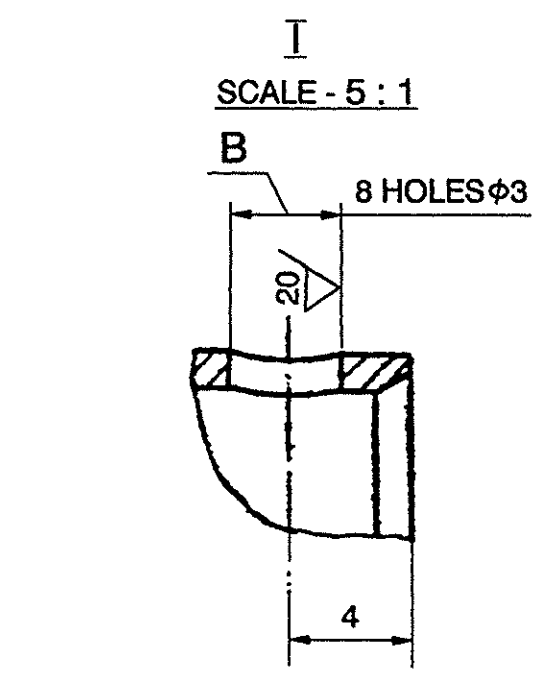
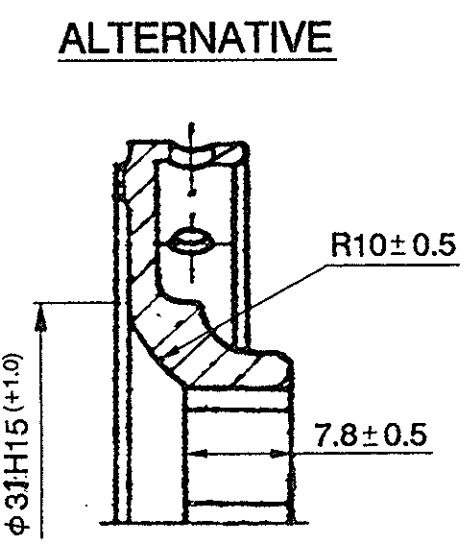
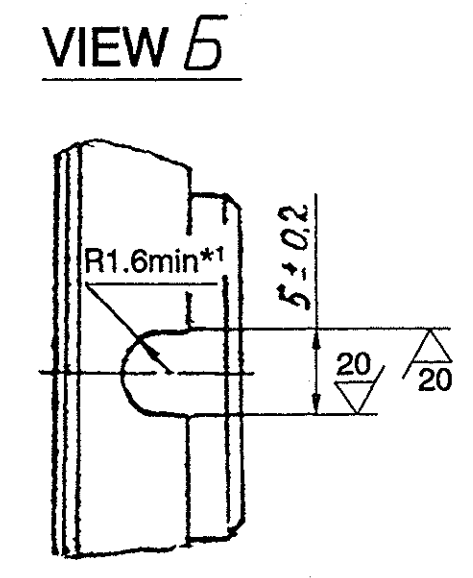
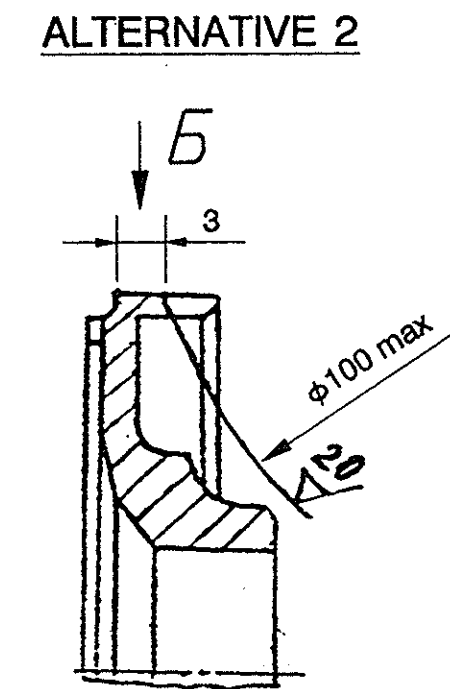
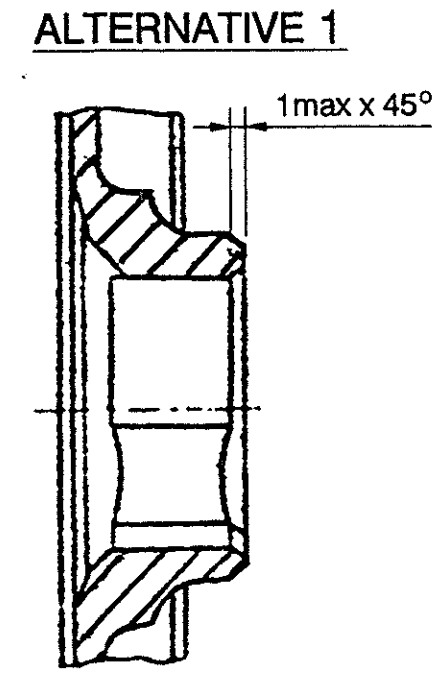
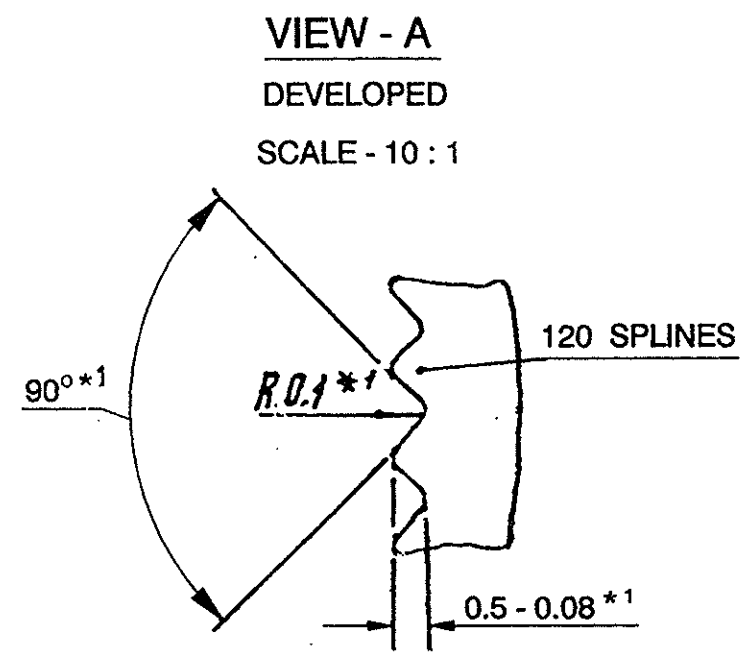
MATERIAL QUOTED : STEEL 38 X C
GOST 4543-71
38XC CHROMIUM SILICON QUALITY STEEL

CHEMICAL COMPOSITION:

GRADE OF STEEL	CONTENT OF ELEMENTS %							
	C	Si	Mn	Cr	P	S	Cu	Ni
38 X C	0.34 -	1.00 -	0.30 -	1.30 -	0.035	0.035	0.30	0.30
	0.42	1.40	0.60	1.60				

MECHANICAL PROPERTIES:

GRADE OF STEEL	YIELD POINT Kgf/mm ²	ULTIMATE TENSILE STRENGTH Kgf/mm ²	RELATIVE ELONGATION %	RELATIVE REDUCTION ALONG CROSS SECTION %	IMPACT STRENGTH Kgf/cm ² Kgf.m/cm ² (C)
38 X C	75	95	12	50	7



(A) ALT.MATERIAL: STEEL 709M40 (EN-19) TO BS-970 P1-1-1983

EST. WT. (Kg) 0.05
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
C	16.08.18	D.O.CORRECTION
B	04.04.16	USED ON NUMBER ADDED.
A	18.05.09	AUTHY : THIRD ALT.COMM.MINUTES POINT No.2 DATED 27-02-2009.

DRN	CHD	APPD	DATE	SCALE	DIMENSIONS IN mm	TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS : 2102 - 69	TITLE :-
-sd-	-sd-	-sd-	19-05-1989	2 : 1			VALVE DISC LOCK
MATERIAL :- STEEL 38XC GOST 4543-71							USED ON :- Cb406-16-2, CQA(HV)506 613E Cb406-17-2, CQA(HV)506 614E
CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI							D S CAT NUMBER
DRAWING NUMBER 306-48-7							

DRG.RE- INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE - 6
V.V. RAMESH
JTO(D)
Dt: 31 Mar 2018.