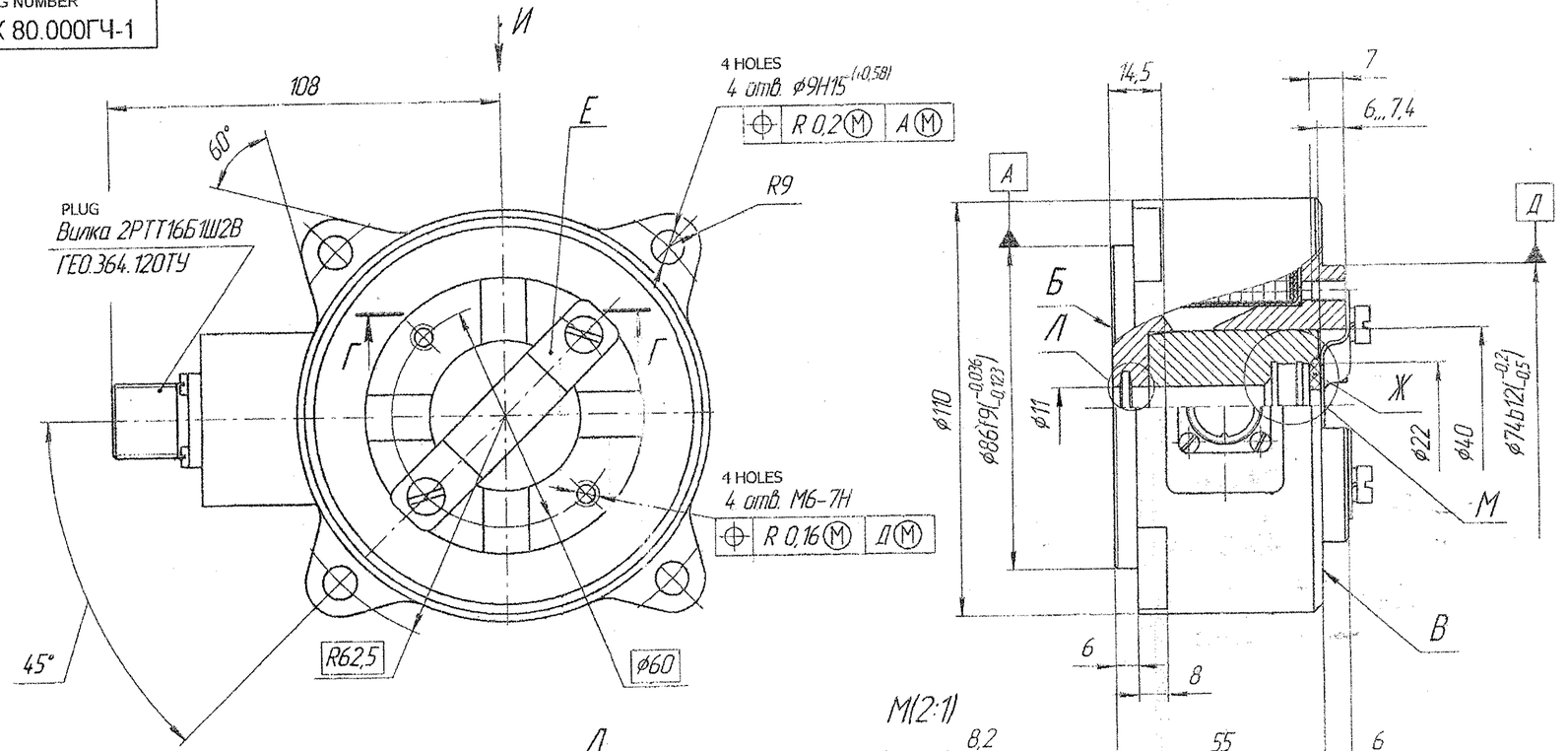
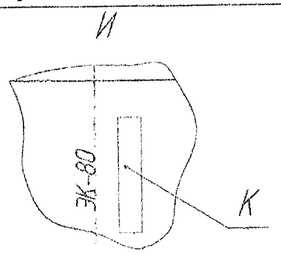
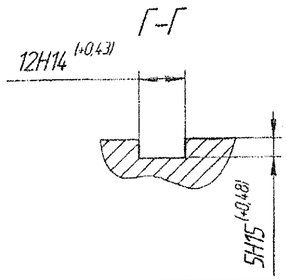
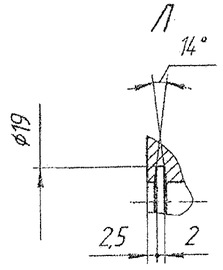
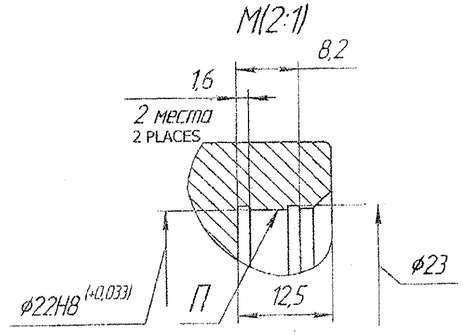
DRAWING NUMBER
ЭК 80.000ГЧ-1











1. Armature travel $6.5^{+0.2}$ mm is to be ensured by the user while mounting the electromagnet onto the tank.
2. Mounting of electromagnet onto the tank should exclude the jamming of armature.
3. Dust-proofing of electromagnet from the side of surfaces Б and В should be ensured by the user while mounting on the tank.
4. Remove the parts Е and Ж while mounting the electromagnet on the tank.
5. Preservation of surface П with oil k-17 GOST 10877-76.

VETTED
6 APR 2009
JWM/STD-CELL

Weight (kgs)
3.6

ISSUE	ZONE	BRIEF RECORD	APPD

DGN / R & D AUTHY
TOL. TO JSS 50003
MATL :
FINISH :

CONTRACTORS NAME :
DRN : CHD
TCD : COMP :
APPD :
PASSED :
SEALED :
CAT. NO. :

SCALE : 1 : 1

TITLE : ELECTRO MAGNET
ЭК 80
OVERALL DRAWING

DRG. NO. ЭК 80.000ГЧ-1
SHEET 1 OF 1
ISSUE
AHSP COA(AVL). AVADI

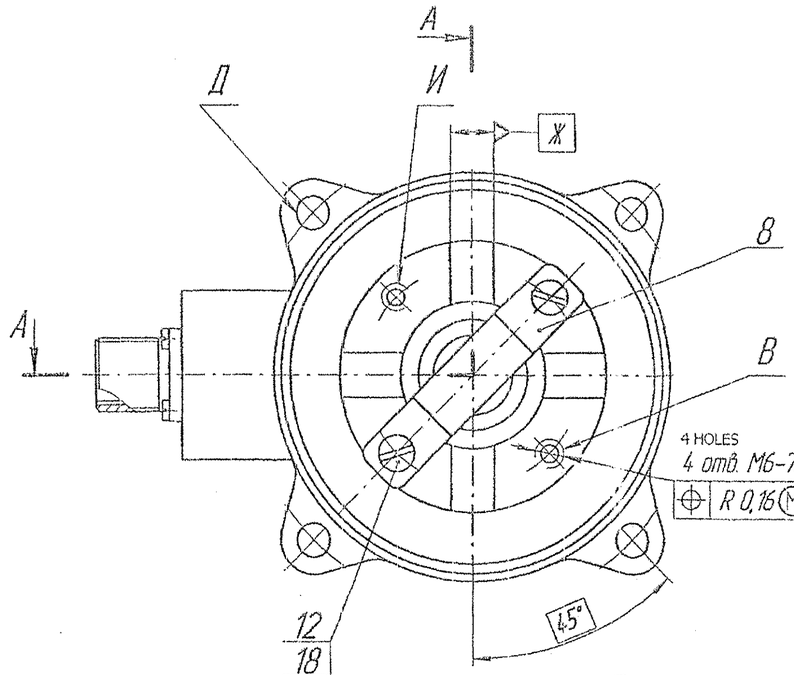
DRG. INDIANISED BASED ON RUSSIAN ORIGINAL ISSUE -

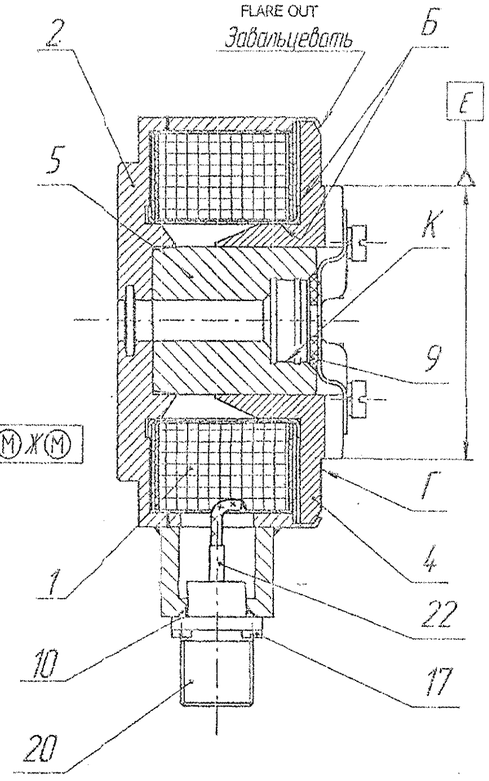
SUPPLY CODE

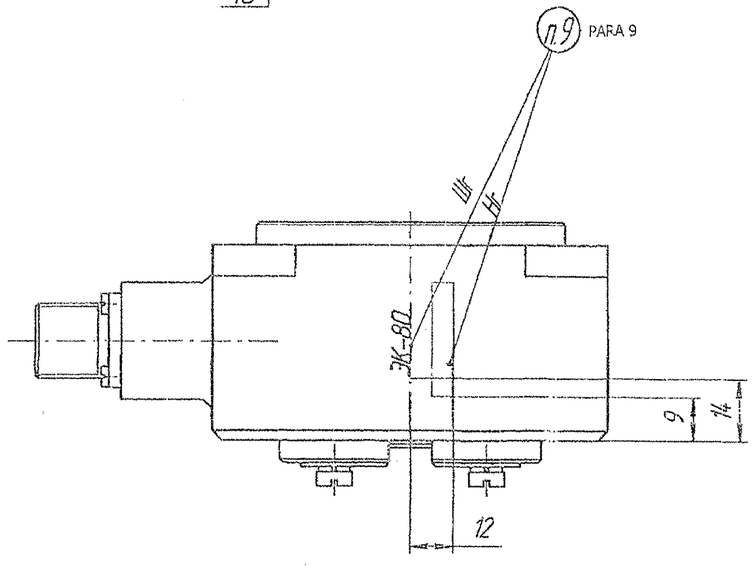
SIZE A3

DRAWING NUMBER
ЭК80.000СБ

A-A







1. Apply sealant УТ-32НТ ТУ38-605462-91 on surface Б.
2. Before flare out, Calk in Body item 2 into slots of cover item 4.
3. Shift of axes of holes Д and И not more than 1° relative to each other (To be ensured by tool).
4. After flare out, Projection of metal beyond plane Г is not allowed. Coat any colour of varnish НЦ-62 on the area of flare out.
5. Terminal of coil item 1 should match with hole for plug item 20. Solder terminal to pin of plug item 20 with solder ПОССу 40-2 GOST 21930-76 with flux ФКСп OST 4ГО.033.200. Slip sleeve item 22 on the place of soldering.
6. Technical Requirements to Electrical Wiring should be as per GOST 23591-79.
7. Empty space between body item 2 and coil item 1 should be filled with Epoxy resin improved grade К-153А ТУ6-05-1584-86 at holes for plug item 20, in this case the plug should be secured with screws item 17. Presence of compound in the holes В is not allowed. Lubricate holes В with lubricant ТSIATIM-221 GOST 9433-80.
8. Apply Gray colour Enamel ГФ-92ХС GOST 9151-75 on the screws item 17. Apply also the said Enamel on the screw heads.
9. Classification number of the article is to be marked with letter 5-Пр3, serial number to be marked with letter – 3Пр3 GOST 26.008-85. The place of markings is to be coated with Enamel МС-17 ТУ5-10-1012-78.
10. Surface К to be preserve with oil К17-GOST 10877-76 .
11. Component item 14 is not shown.
12. Electromagnet should correspond to specification ЭК80.000ТУ.

DRG INDIANISED BASED ON RUSSIAN ORIGINAL

F- 95
02

SIZE A2

Weight (Kgs)
3.6

				DGN / R & D AUTHY	CONTRACTORS NAME :
				TOL TO JSS 50003	DRN : CHD :
				MATL :	TCD : COMP :
					APPD :
				FINISH :	PASSED :
					SEALED :
ISSUE	ZONE	BRIEF RECORD	APPD		CAT. NO. :

SCALE : 1:1	TITLE : ELECTROMAGNET ЭК-80 ASSEMBLY DRAWING	DRG. NO. ЭК80.000СБ ISSUE SHEET 1 OF 1 AHSP CQA(AVL), AVADI

USED ON

REF No.

SIZE	ZONE	ITEM No	DESCRIPTION	NOMENCLATURE	QTY	REMARKS
				DOCUMENTATION		
A2			ЭК80.000 СБ	Assembly Drawing		
*1			ЭК80.000 ГЧ-1	Overall Drawing		*1A4x3
A3			ЭК80.000 ВС	Item List		
A4			ЭК80.000 ТУ	Specification		
A4			ЭК80.000 ОП	List		
A4			ЭК80.000 ПС	Certificate		
				ASSEMBLY DRAWING		
A4		1	ЭК80.010	Coil	1	
A4		2	ЭК80.020	Body	1	

ISSUE	SHEET	REFERENCE

ЭК80.000

APPROVED		
CHECKED		
DRAWN		

ELECTROMAGNET ЭК-80

PAGE	TOTAL PAGE
1	4
U-07-1-4	
F/SL.No.	95/01

SIZE	ZONE	ITEM No.	DESCRIPTION	NOMENCLATURE	QTY	REMARKS
				COMPONENTS		
*1		4	ЭК80.002	Cover	1	*1А4х3
А3		5	ЭК80.003	Armature	1	
А3		8	ЭК80.014	Clamp	1	
А4		9	ВД7.854.011	Washer	1	
А4		10	МВ63-124	Ring	1	
А4		12	Х1-9969Ц	Screw	2	
А3		14	Х9-10949	Transportation Cap	1	
				STANDARDISED ITEM		
		17		Screw М3-6gх8.36.016	4	
				GOST 1491-80		
		18		Washer 6 65Г 06	2	
				GOST 6402-70		

ISSUE	SHEET	REFERENCE	ЭК80.000	PAGE
				2

SIZE	ZONE	ITEM No.	DESCRIPTION	NOMENCLATURE	QTY	REMARKS
				MISCELLANEOUS ITEMS		
		20		Plug	1	
				2РТТ16Б1Ш2В		
				ГЕО.364.120ТУ		
				MATERIALS		
		22		Sleeve 110, Т/В-6	0,01	М
				ТУ 16-89 И16.003.001ТУ		

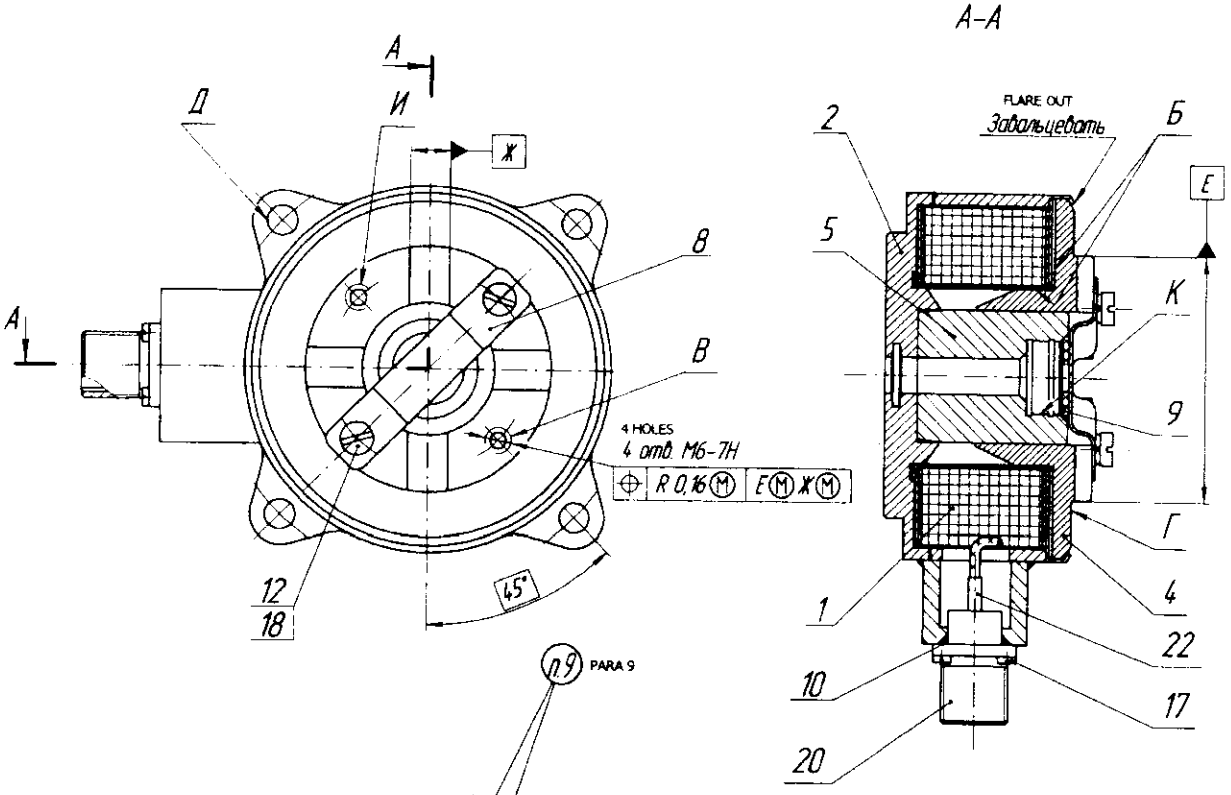
SHEET FOR RECORDING AMENDMENT

ISSUE No.	NO. OF SHEETS / PAGES				TOTAL No. OF SHEETS/PAGES IN THE DOCUMENT	DOCUMENT No.	ENTRY No. OF ACCOMPANYING DOC. & DATE	SIGNATURE	DATE
	AMENDED	REPLACED	NEWLY ADDED	DELETED					

VETTED
23 OCT 2008
JWM/STD-CELL

ISSUE	SHEET	REFERENCE	ЭК80.000

ЭК80.000СБ



1. Apply sealant УТ-32НТ ТУ38-605462-91 on surface Б.
2. Before flare out, Calk in Body item 2 into slots of cover item 4.
3. Shift of axes of holes Д and И not more than 1° relative to each other (To be ensured by tool).
4. After flare out, Projection of metal beyond plane Г is not allowed. Coat any colour of varnish НЦ-62 on the area of flare out.
5. Terminal of coil item 1 should match with hole for plug item 20. Solder terminal to pin of plug item 20 with solder ПОССу 40-2 GOST 21930-76 with flux ФКСп OST 4ГО.033.200. Slip sleeve item 22 on the place of soldering.
6. Technical Requirements to Electrical Wiring should be as per GOST 23591-79.
7. Empty space between body item 2 and coil item 1 should be filled with Epoxy resin improved grade К-153А ТУ6-05-1584-86 at holes for plug item 20, in this case the plug should be secured with screws item 17. Presence of compound in the holes В is not allowed. Lubricate holes В with lubricant TSIATIM-221 GOST 9433-80.
8. Apply Gray colour Enamel ГФ-92ХС GOST 9151-75 on the screws item 17. Apply also the said Enamel on the screw heads.
9. Classification number of the article is to be marked with letter 5-Пр3, serial number to be marked with letter – 3Пр3 GOST 26.008-85. The place of markings is to be coated with Enamel МС-17 ТУ6-10-1012-78.
10. Surface К to be preserve with oil К17-GOST 10877-76 .
11. Component item 14 is not shown.
12. Electromagnet should correspond to specification ЭК80.000ТУ.

			ЭК80.000СБ	Sup. Code	Fold No.	Sl no.
				U-07-1-4	95	02
			ELECTROMAGNET ЭК-80 ASSEMBLY DRAWING	Weight (kgs)	Scale
				3.6	1:1
				Page	Page total
ISSUE SHEET	REFERENCE				1
APPROVED				HEAVY VEHICLES FACTORY AVADI	
CHECKED					
DRAWN					

Перв. примен. ЭК80.000
Справ. №
Подп. и дата
Инв. № дубл.
Взам. инв. №
Подп. и дата
Инв. № подл.

Копировал
Формат А2

Перв. примен. ЭК80.000

Справ. N

Подп. и дата

Инв. N дубл.

Взам. инв. N

Подп. и дата

Инв. N подл.

ITEM No.	DESIGNATION	DESCRIPTION	USED ON DESIGNATION	USED ON QTY	TOTAL QTY	REMARKS
1	ЭК80.000	Electromagnet ЭК-80			1	
2	ЭК80.010	Coil	ЭК80.000	1	1	
3	ЭК80.020	Body	ЭК80.000	1	1	
4	ЭК80.030	Frame	ЭК80.010	1	1	
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
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27						
28						

ISSUE	SHEET	REFERENCE	
APPROVED			
CHECKED			
DRAWN			

ЭК80.000 ВС

ELECTROMAGNET ЭК-80
PARTS LIST

Sup. Code	Fold. No	Sl.no.
U-07-1-4	95	03
Page	Page total	
	1	

HEAVY VEHICLES FACTORY
AVADI

Формат А3

9

USED ON ЭК80.000

REF No.

SIZE	ZONE	ITEM No.	DESCRIPTION	NOMENCLATURE	QTY.	REMARKS
				DOCUMENTATION		
*1			ЭК80.010 СБ	Assembly Drawing		*1A4x3
				ASSEMBLY UNITS		
A4		1	ЭК80.030	Frame	1	
				COMPONENTS		
ND		3	ЭК80.015	Fibre Glass	1	2,5g
				Gasket		
				ЛСК-155/180-0.15		
				ТУ16-90 И37.0003.003ТУ		
				(37...38)мм x (348...352)мм		

ISSUE	SHEET	REFERENCE
APPROVED		
CHECKED		
DRAWN		

ЭК80.010

COIL

PAGE	TOTAL PAGE
1	2

U-07-1-4

F/SL.No. 95/04

SIZE	ZONE	ITEM No.	DESCRIPTION	NOMENCLATURE	QTY	REMARKS
ND		4	ЭК80.016	Fibre Glass	1	0,5 g
				Gasket		
				ЛСК-155/180-0,15		
				ТУ16-90 И37.0003.003ТУ		
				(149...50)мм х (149...50)мм		
				MATERIALS		
		5		Conductor ПЭТВ-2 1,12	1,1	Kg
				ТУ16-705.110-79		
		6		Wire МГШВ 1,0	0,07	м
				ТУ16-505.437-82		
		7		Tape ЛЭС-0,1х15	1,6	м
				GOST 5937-81		
		9		Cord Grip	0,5	м
				АСЭЧ(б)-1,0		
				ТУ17 РСФСР 212-247-10-91		

ЭК80.010СБ

Перв. примен. ЭК80.010

Справ. №

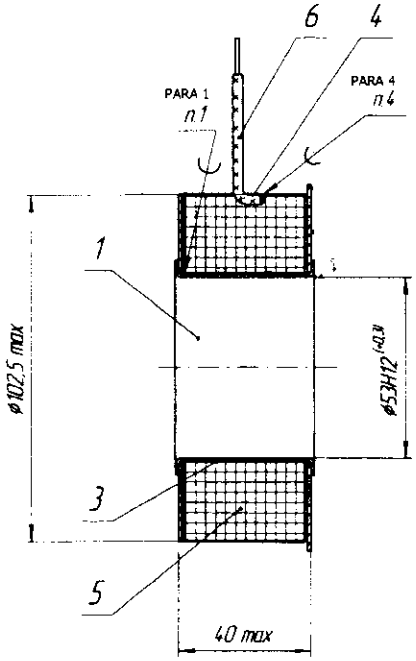
Подп. и дата

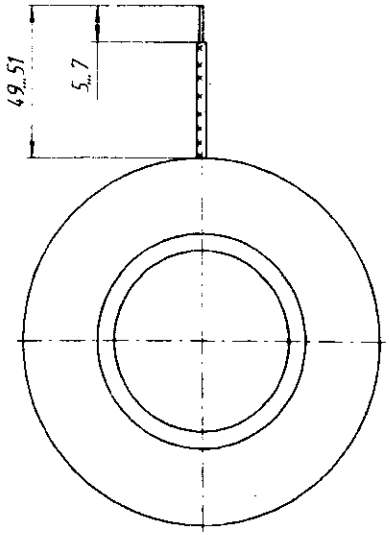
Инв. № дубл.

Взам. инв. №

Подп. и дата

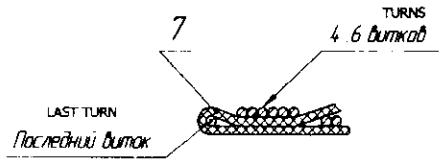
Инв. № подл.





SKETCH OF SECURING LAST TURN

Эскиз крепления последнего витка



1. Start winding, dress and solder to frame item 1 with tin 03 GOST 860-75 with flux ФКСп OST 4Г О.033 200.
2. Frame item 1 is to be insulated with Gasket item 3. Trim the edge of gasket to the depth 2...3mm. Glue Gasket ends with Glue БФ-4 GOST 12172-74.
3. Carry out winding with wire item 5. Number of turns 520 ± 5. Resistance (2.2 ± 0.2) at 20°C.
4. Dress winding end, twist with wire item 6 and solder. Solder with tin 03 GOST 860-75 with flux ФКСп OST 4Г О.033 200. The place of soldering is to be insulated with gasket item 4.
5. Last turn of winding is to be secured on both places with tape item 7.
6. Secure winding end with Cord-grip 9.
7. Insulated externally the winding with tape item 7, overlap ½ width of tape. Glue tape ends with glue БФ-4 GOST 12172-74.

ISSUE	SHEET	REFERENCE
APPROVED		
CHECKED		
DRAWN		

ЭК80.010СБ

COIL
ASSEMBLY DRAWING

Sup. Code	Fold. No.	Sl.no
U-07-1-4	95	05
Weight (kgs)	Scale	
1.28	1:1	
Page	Page total	
	1	

HEAVY VEHICLES FACTORY AVADI

Копировал

Формат А4 х 3

b

USED ON: ЭК80.000

REF No.:

SIZE	ZONE	ITEM No.	DESCRIPTION	NOMENCLATURE	QTY	REMARKS
				DOCUMENTATION		
A1			ЭК80.020 СБ	Assembly Drawing		
				COMPONENTS		
A3		1	ЭК80.001	Support	1	
A4		2	ЭК80.021	Pipe	1	
A3		3	ЭК80.022	Flange	1	

ISSUE	SHEET	REFERENCE
APPROVED		
CHECKED		
DRAWN		

ЭК80.020

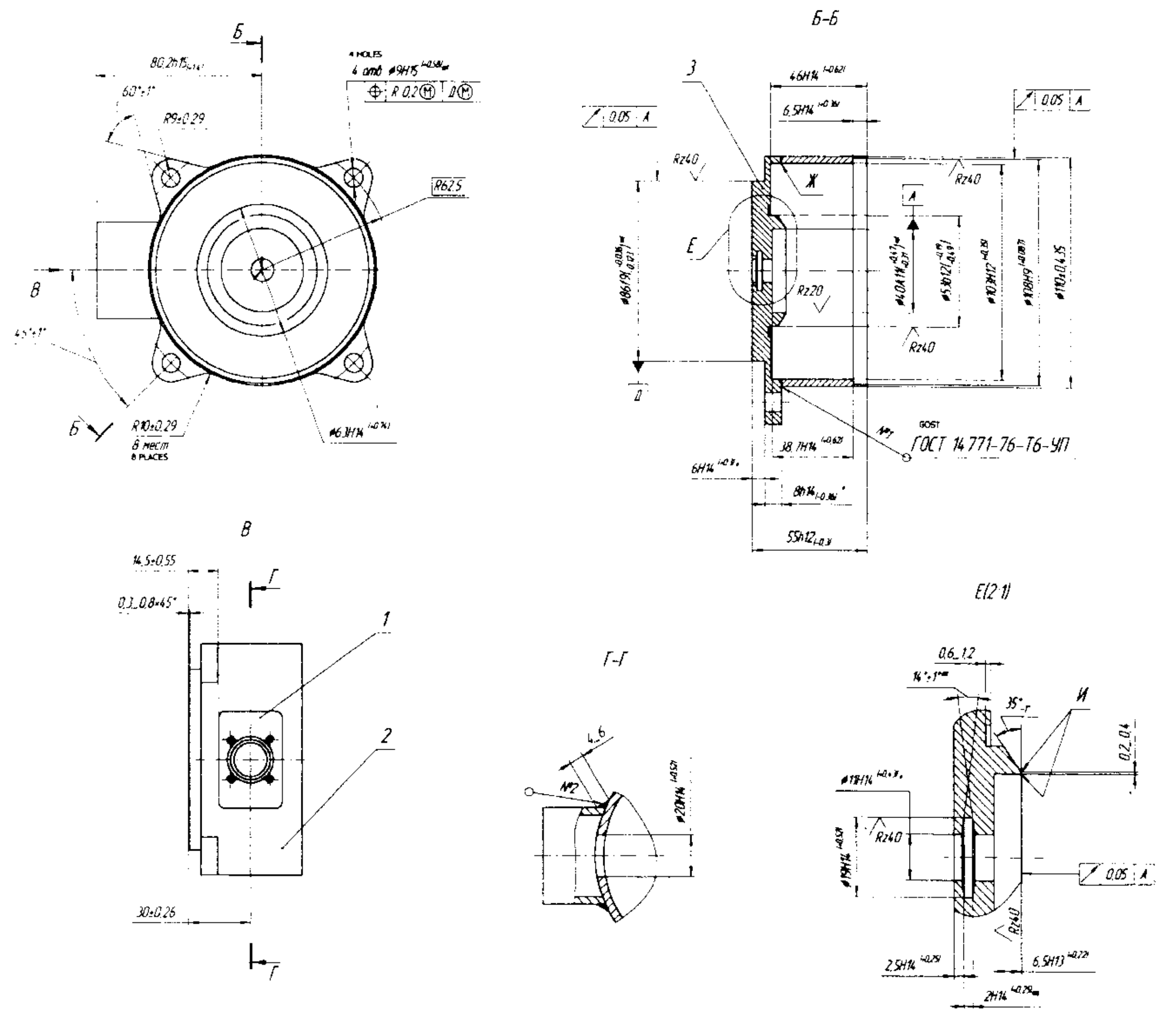
BODY

PAGE	TOTAL PAGE
	1

U-07-1-4

F/SL.No. 95/06

Rz80 √(√)



VETTED
23 OCT 2008
JWM/STD-CELL

1. Re-crystallisation annealing.
2. * Dimensions for reference.
3. *1 Dimensions after Coating.
4. *2 Dimensions to be ensured by tool
5. Edge И not to be blunted.
6. Carry out welding of Joint No.1 and Joint No.2 with wire 1Св-08ГС GOST 2246-70. Welding of Joint No.2 is to be carried out by Gas Shielded Arc Welding.
7. Coating: Zn15, Chromatuzing. The contents of solution for chromatizing should be as per И-252-86.
8. In the welded Joint Zone at surface Ж, absence of coating is allowed.
9. Technical Requirements for Welded Joints as per OST 92-1114-80.
10 Technical Requirements to coating as per GOST 9.301-86.

		3К80.020СБ	Sup. Code: U-07-1-4	Fold No.: 95	Size: 07
		BODY ASSEMBLY DRAWING	Weight (kgs): 1.12	Scale: 1:1	
ISSUE / SHEET	REFERENCE		Page:	Page total: 1	
APPROVED			HEAVY VEHICLES FACTORY AVADI		
CHECKED					
DRAWN					

Копировал   Формат A1

USED ON: ЭК80.010

REF No.:

SIZE	ZONE	ITEM No.	DESCRIPTION	NOMENCLATURE	QTY	REMARKS
				DOCUMENTATION		
A4			ЭК80.030 СБ	Assembly Drawing		
				COMPONENTS		
A4		1	ЭК80.004	Bushing	1	
A4		2	ЭК80.005	Washer	1	
A4		3	ЭК80.006	Washer	2	
A4		4	ЭК80.007	Washer	1	
A4		6	ЭК80.011	Strip	1	

VETTED
23 OCT 2008
JWM/STD-CELL

ISSUE	SHEET	REFERENCE	ЭК80.030		
APPROVED			FRAME	PAGE	TOTAL PAGE
					1
CHECKED				U-07-1-4	
DRAWN				F/SL.No.	95/08

Перв.примен ЭК80.030

Справ. №

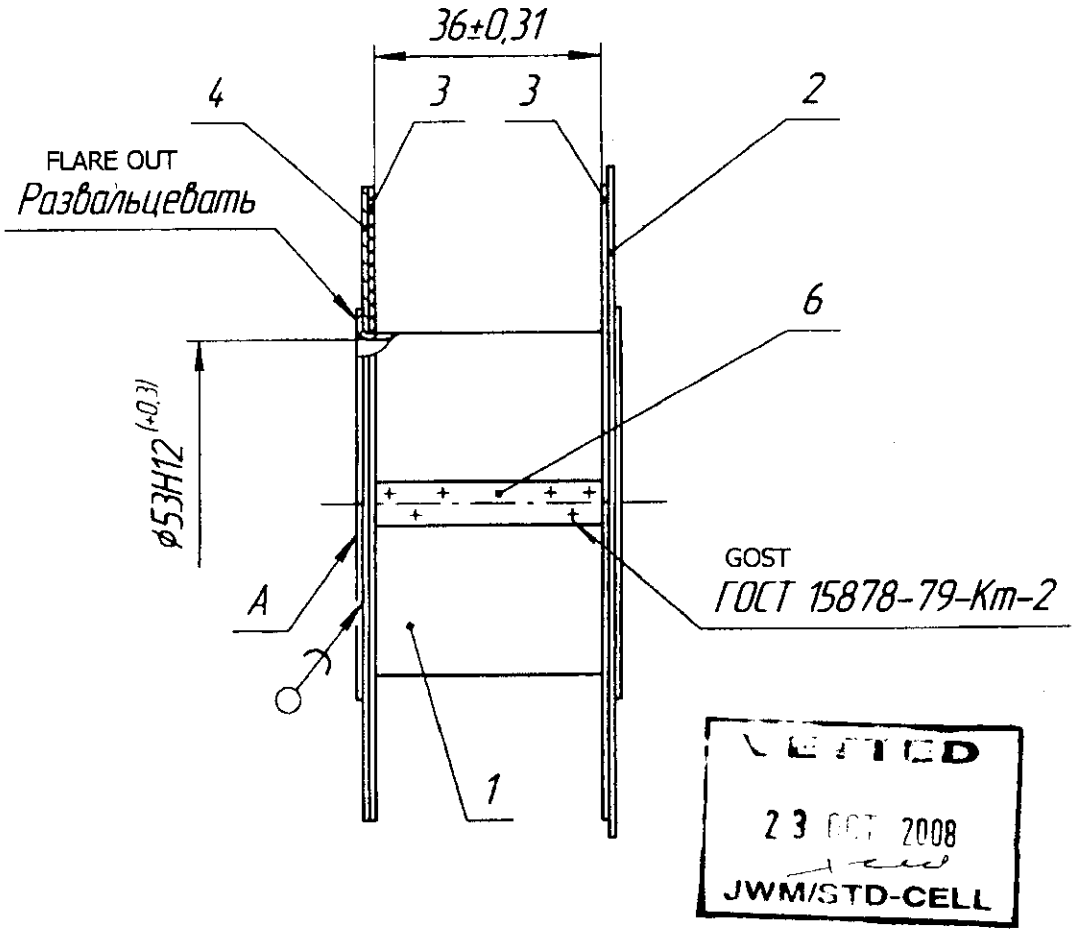
Подп. и дата

Инв. № дубл.

Взам. инв. №

Подп. и дата

Инв. № подл.



Solder ПОССу40-2 GOST 21930-76. Projection of soldering beyond surface A is not allowed.

			ЭК80.030СБ	Sup. Code	Fold. No. / Sl.no.
				U-07-1-4	95 / 09
			FRAME ASSEMBLY DRAWING	Weight (kgs)	Scale
				0.2	1:1
				Page	Page total
ISSUE	SHEET	REFERENCE			1
APPROVED				HEAVY VEHICLES FACTORY AVADI	
CHECKED					
DRAWN					

Копировал Формат А4

ЭК80.001

Перв. примен. ЭК80.020

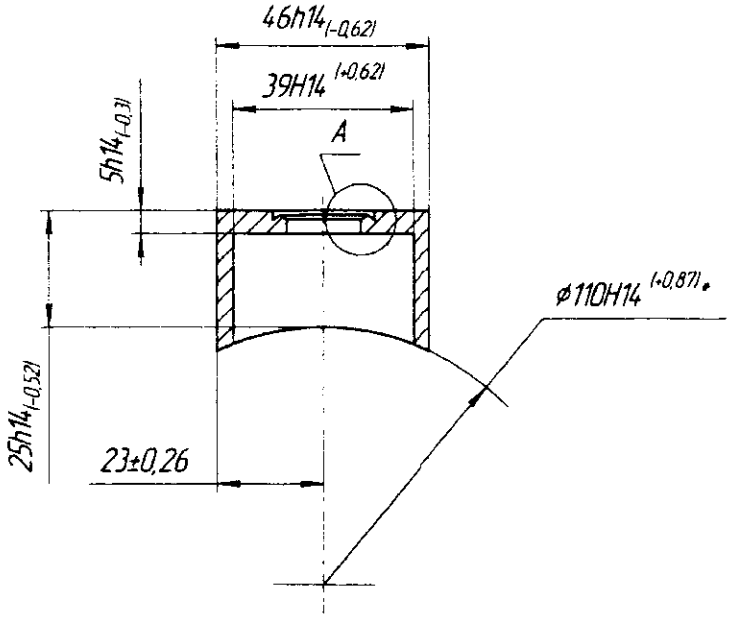
Справ. №

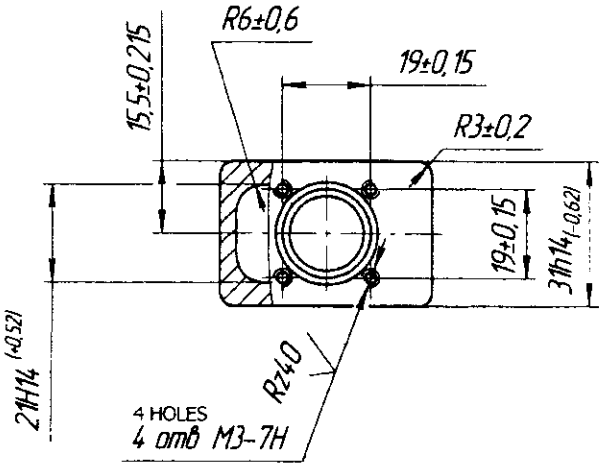
Подп. и дата

Инв. № дубл. Взам. инв. № Инв. № дубл.

Подп. и дата

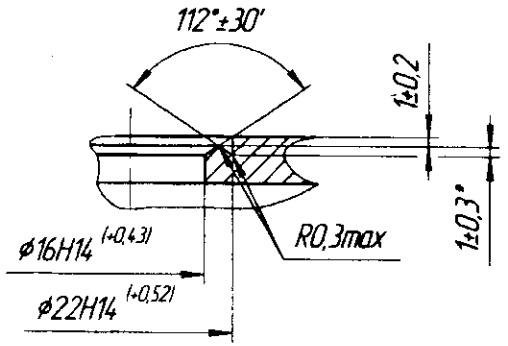
Инв. № подл.





Rz80

A(2:1)

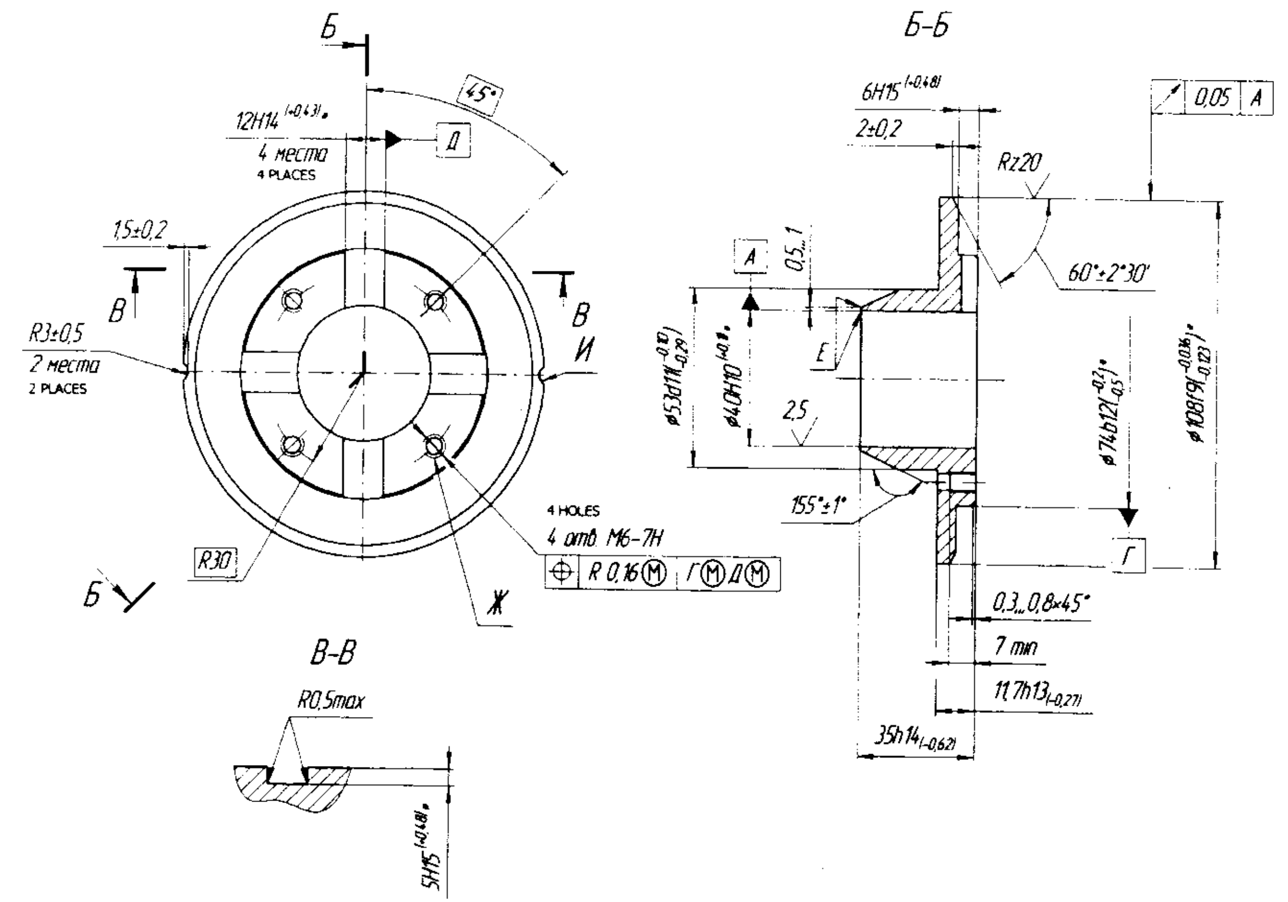


1. * Dimension to be ensured by tool.
2. Sharp edges to be blunted цшер chamfer 0.5x45°mm or with radius 0.3mm maximum.

			ЭК80.001	Sup. Code	Fold No.	Sl.no.
				U-07-1-4	95	10
			SUPPORT	Weight (kgs)	Scale
				0.13	1:1
				Page	Page total
					1
ISSUE	SHEET	REFERENCE	STEEL 10 GOST 1050-88	HEAVY VEHICLES FACTORY AVADI	
APPROVED					
CHECKED					
DRAWN					

Копировал

Формат А3



Rz40 √ (√)

VETTED
23 OCT 2008
JWM/STD-CELL

1. * Dimension after coating.
2. Unspecified radii should be 0.5mm maximum.
3. Sharp edges should be blunted with radius 0.3mm maximum or chamfer 0.5x45°mm. Edge E not to be blunted.
4. Tolerance of angle between axes of any two slots Д - ±30'.
5. Location of slots И relative to slots Д arbitrary.
6. Coating: Cd18, chromatizing. Threaded hole Ж may be without coating.
7. Technical requirements to coating as per GOST 9.301-86.

ЭК80.002	Sub Code	Fold No	Sl no.
	U-07-1-4	95	11
COVER	Weight (kgs)	Scale	
	0.412	1:1	
	Page	Page total	
		1	
ROUND B-I-НД-115 GOST 2590-88 / 10-2ГП-МI-ТВI-TO GOST 1050-88	HEAVY VEHICLES FACTORY AVADI		

ISSUE	SHEET	REFERENCE
APPROVED		
CHECKED		
DRAWN		

ЭК80.002

Перв. примен. ЭК80.000 | Справ. № | Подп. и дата | Инв. № дубл. | Взам. инв. № | Подп. и дата | Инв. № подл.

Копировал Формат А4 х 3

ЭК80.003

Перв. примен. ЭК80.000

Справ. №

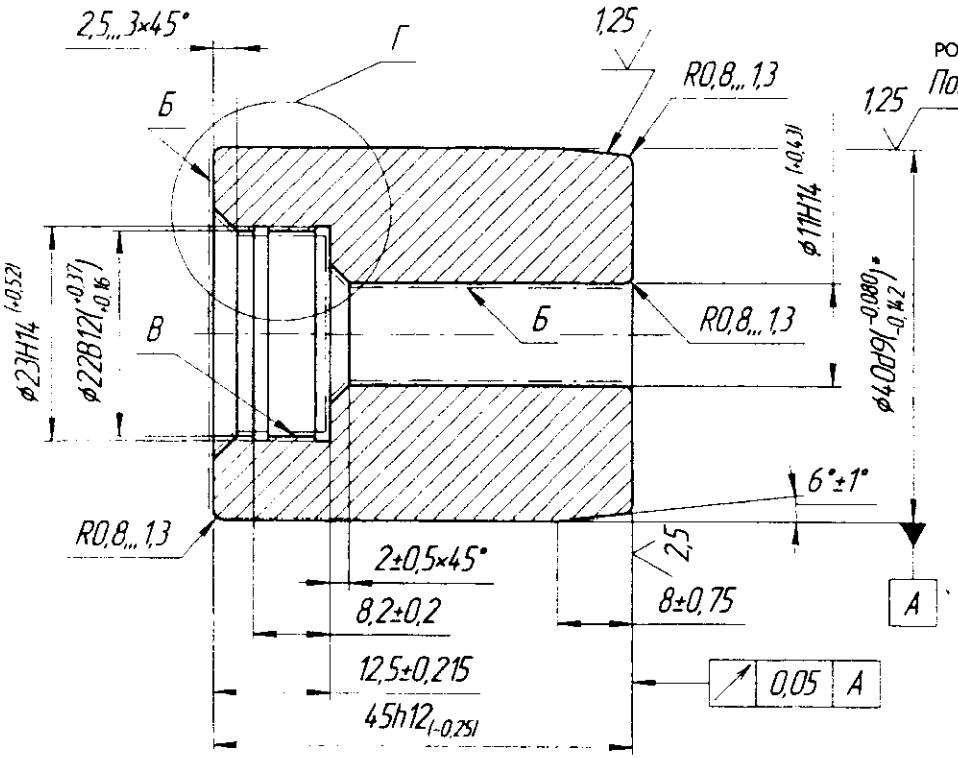
Подп. и дата

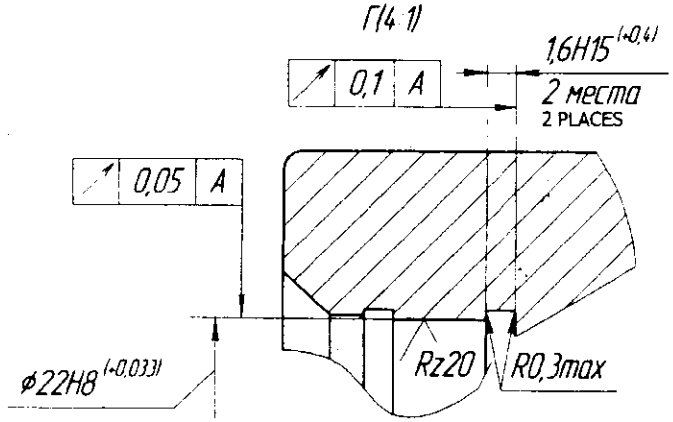
Инв. № дубл.

Взам. инв. №

Подп. и дата

Инв. № подл.





Rz40

VETTED
23 OCT 2008
JWM/STD-CELL

1. * Dimension and polishing after coating.
2. Coating: Hard chrome 15microns, chemical Phosphating oil finish. Surface Б should be without coating of hard chrome 15. On surface B absence of coating is permitted.
3. Technical Requirements to coating as per GOST 9.301-86.

ISSUE	SHEET	REFERENCE
APPROVED		
CHECKED		
DRAWN		

ЭК80.003	Sup. Code	Fold. No.	Sl no.
	U-07-1-4	95	12
ARMATURE	Weight (kgs)	Scale	
	0.367	2:1	
	Page	Page total	
		1	
STEEL 10 GOST 1050-88	HEAVY VEHICLES FACTORY AVADI		

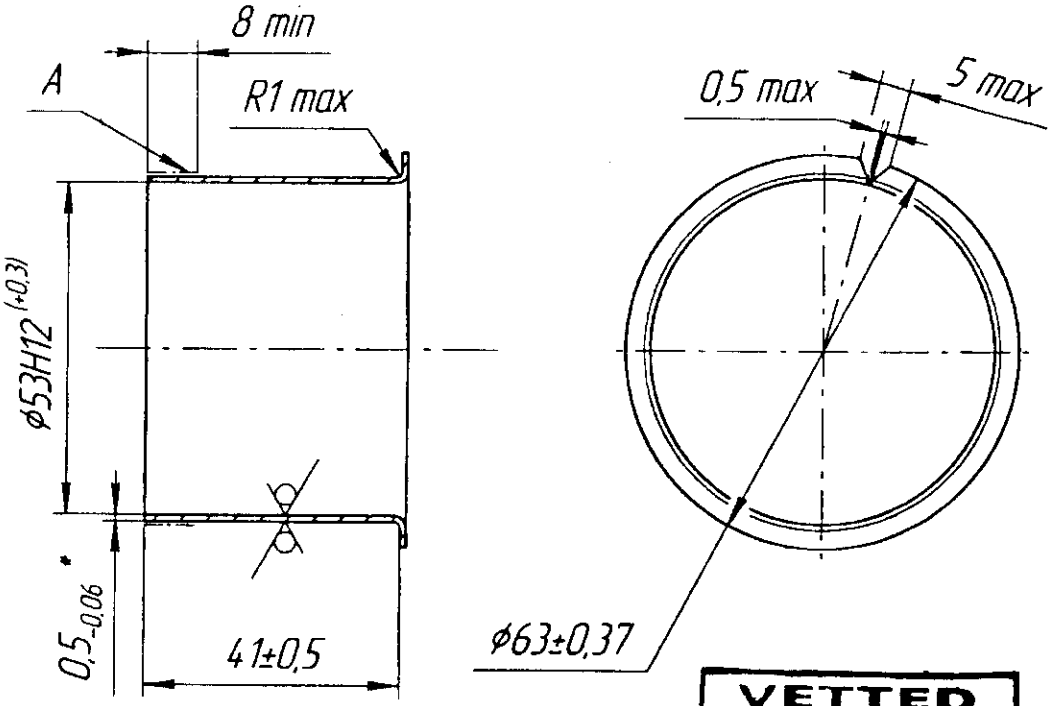
Копировал

Формат А3

9/

ЭК80.004

Rz80 (V)



1. *Dimension for reference.
2. Coating: Chemical phosphating.
   On surface A coat hot tin plate 0.3microns.
3. Check dimensions in ring.
4. Technical requirements to coating as per GOST 9.301-86.
5. Rest of the technical requirements as per OST 3-4343-87.

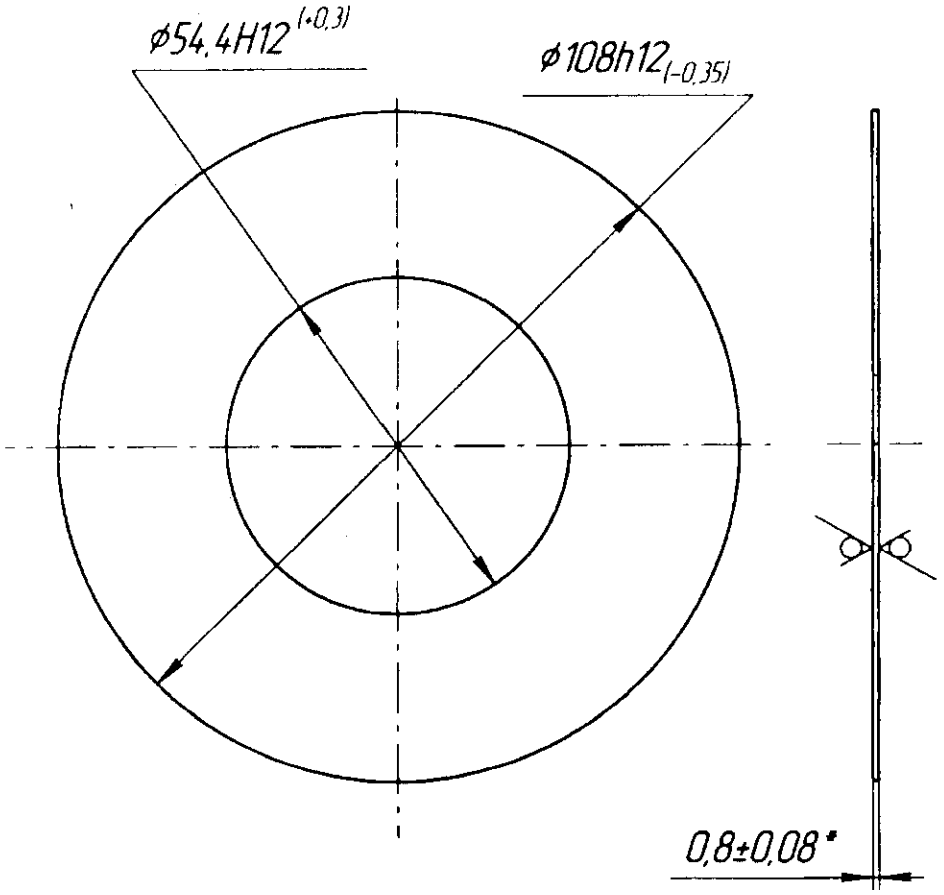
			ЭК80.004	Sup. Code	Fold. No. / Sl.no.
				U-07-1-4	95 / 13
			BUSHING	Weight (kgs)	Scale
				0.03	1:1
				Page	Page total
ISSUE	SHEET	REFERENCE			1
APPROVED			SHEET ДПРМ 0.5 Л63 GOST 931-90	HEAVY VEHICLES FACTORY AVADI	
CHECKED					
DRAWN					

Перв. примен. ЭК80.030
Справ. №
Подп. и дата
Инв. № дубл.
Взам. инв. №
Подп. и дата
Инв. № подл.

Копировал Формат А4

ЭК80.005

Rz80



1. *Dimension for reference.
2. Coating: Zn6.
3. Technical requirements to coating as per GOST 9.301-86.
4. Rest of the technical requirements as per OST3-4343-87.

Перв.примен. ЭК80.030

Справ. №

Подп. и дата

Инв. № дубл.

Взам. инв. №

Подп. и дата

Инв. № подл.

23 OCT 2008
JWM/STD-CELL

ISSUE	SHEET	REFERENCE
APPROVED		
CHECKED		
DRAWN		

ЭК80.005	Sup. Code	Fold. No.	Sl.no.
	U-07-1-4	95	14
WASHER	Weight (kgs)	Scale	
	0.035	1:1	
	Page	Page total	
		1	
SHEET 6T-0.8 GOST 19904-90 / K270B-4-II-10 GOST 16523-97	HEAVY VEHICLES FACTORY AVADI		

Копировал Формат А4

ЭК80.006

Перв.примен ЭК80.030

Справ №

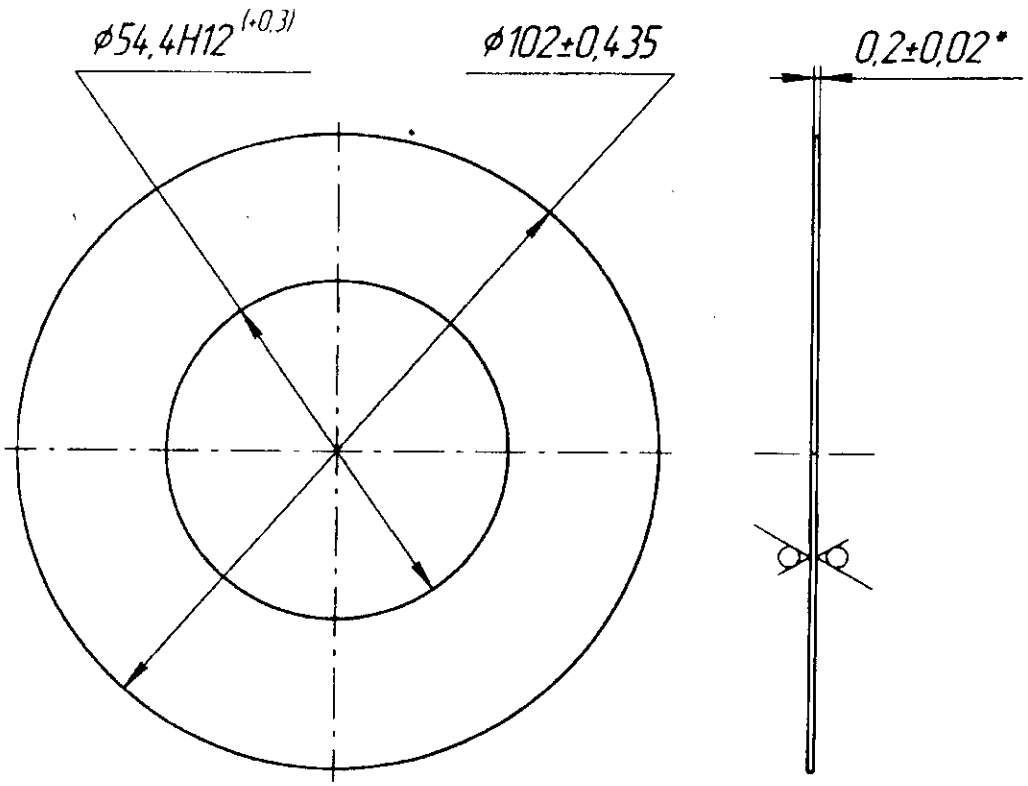
Подп. и дата

Инв № дубл

Взам инв №

Подп. и дата

Инв № подл



1. It is allowed to wrap the component by roll.
2. *Dimension for reference.
3. Rest of the technical requirements as per OST3-4343-87.

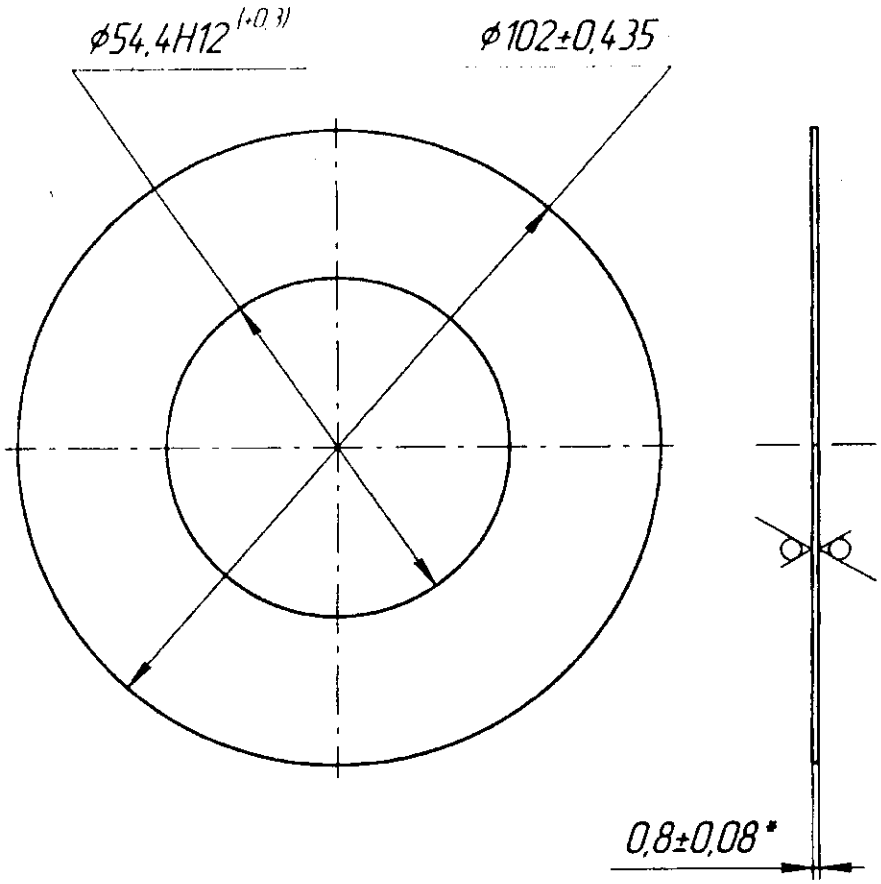
VETTED
23 OCT 2008
JWM/STD-CELL

			ЭК80.006	Sup. Code	Fold. No. / Sl.no.
				U-07-1-4	95 / 15
			WASHER	Weight (kgs)	Scale
				0.002	1:1
				Page	Page total
					1
ISSUE	SHEET	REFERENCE	ELECTRICAL INSULATING BOARD ЭВ-0.2 GOST 2824-86	HEAVY VEHICLES FACTORY AVADI	
APPROVED					
CHECKED					
DRAWN					

Копировал Формат А4

ЭК80.007

Rz80



1. *Dimension for reference.
2. Coating: Cd6.
3. Technical requirements to coating as per GOST 9.301-86.
4. Rest of the technical requirements as per OST3-4343-87.

Перв.примен. ЭК80.030

Справ. №

Подп. и дата

Инв. № дубл.

Взам. инв. №

Подп. и дата

Инв. № подл.

23 OCT 2008
JWM/STD-CELL

ISSUE	SHEET	REFERENCE
APPROVED		
CHECKED		
DRAWN		

ЭК80.007

WASHER

SHEET БТ-0.8 GOST 19904-90 / К270В-4-II-10 GOST 16523-97

Sup. Code	Fold. No.	Sl.no.
U-07-1-4	95	16
Weight (kgs)	Scale	
0.035	1:1	
Page	Page total	
	1	

HEAVY VEHICLES FACTORY
AVADI

Копировал Формат А4

ЭК80.011

Перв.примен ЭК80.030

Справ №

Подп. и дата

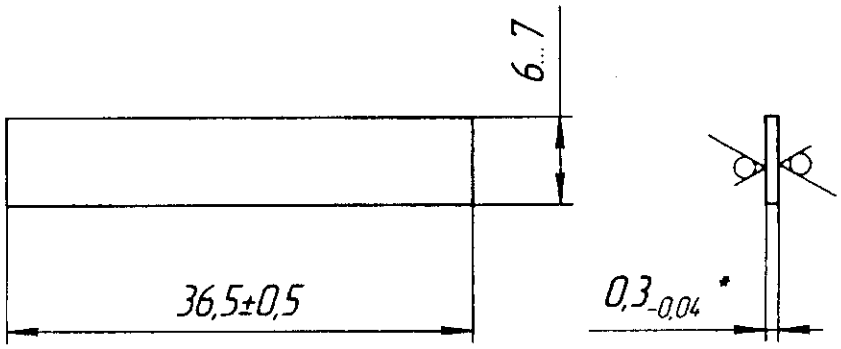
Инв. № дубл

Взам. инв. №

Подп. и дата

Инв. № подл

Rz80



*Dimension for reference.

ISSUE	SHEET	REFERENCE		
APPROVED				
CHECKED				
DRAWN				

ЭК80.011

STRIP

STRIP ДПРНМ 0.3
Л63 GOST 2208-91

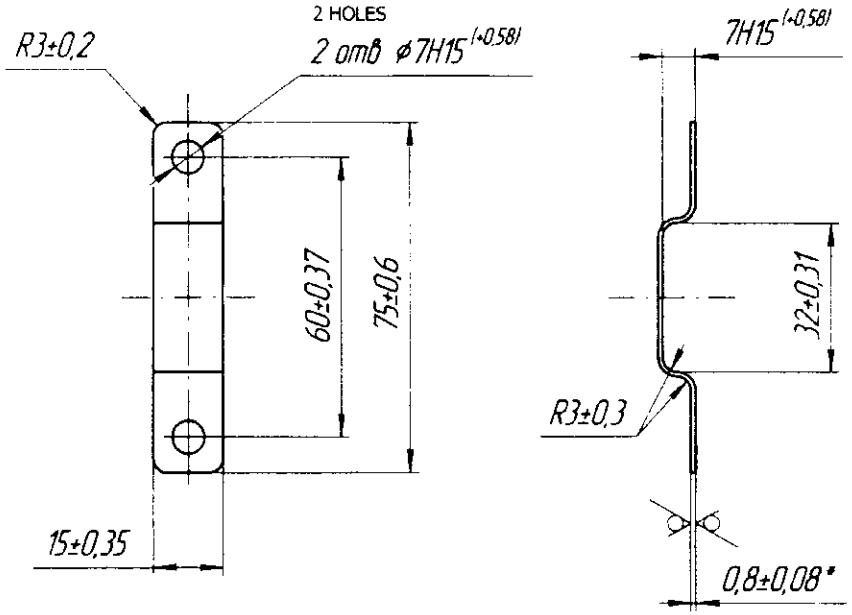
Sup. Code	Fold. No.	Sl.no.
U-07-1-4	95	17
Weight (kgs)	Scale	
0.0005	2:1	
Page	Page total	
	1	

HEAVY VEHICLES FACTORY
AVADI

Копировал Формат А4

ЭК80.014

Rz80



1. *Dimension for reference.
2. Coating: Zn9 chromatizing. Contents of solution for chromatizing as per И-252-86.
3. Technical requirements to coating as per GOST 9.301-86.
4. Rest of the technical requirements as per OST3-4343-87.

			ЭК80.014	Sup. Code	Fold. No. / Sl.no.
				U-07-1-4	95 / 18
			CLAMP	Weight (kgs)	Scale
				0.008	1:1
				Page	Page total
					1
ISSUE	SHEET	REFERENCE	SHEET 5-0.8 GOST 19904-90 II-ВГ-08кп GOST 9045-93	HEAVY VEHICLES FACTORY AVADI	
APPROVED					
CHECKED					
DRAWN					

Копировал

Формат А3

Перв. примен. ЭК80.000 | Справ. № | Подп. и дата | Инв. № дубл. | Взам. инв. № | Подп. и дата | Инв. № подл.

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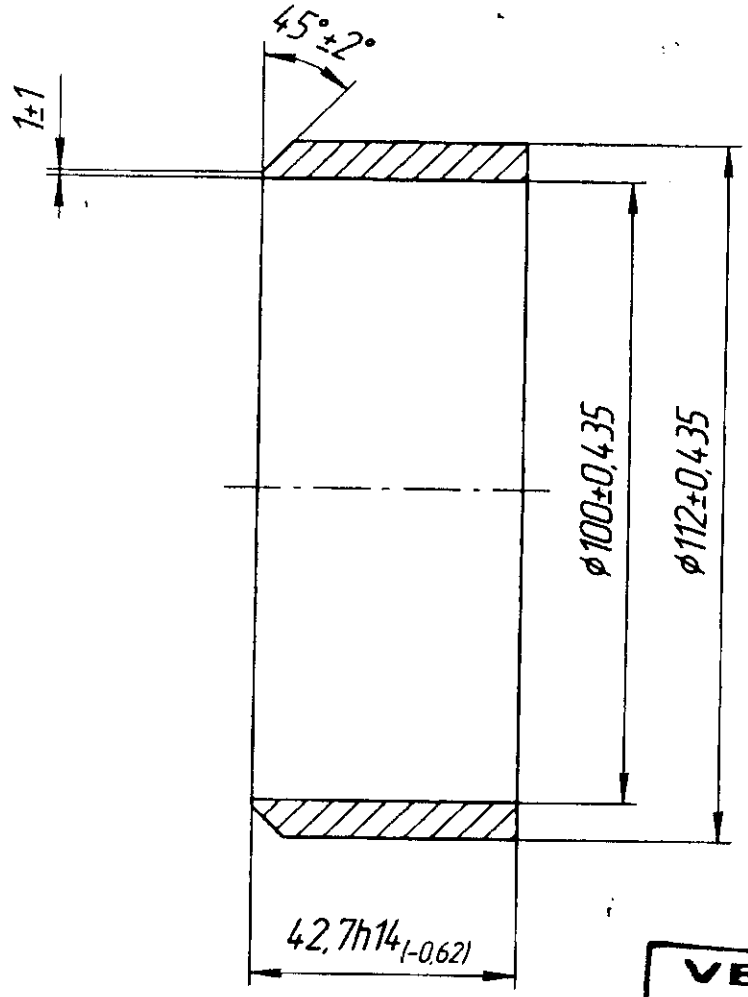
ЭК80.021

Rz80



Перв.примен ЭК80.020

Справ №

Подп. и дата

Инв № дубл

Взам. инв №

Подп. и дата

Инв № подл

ISSUE	SHEET	REFERENCE	ЭК80.021	Sup. Code	Fold. No. / Sl.no.
				U-07-1-4	95 / 19
			PIPE	Weight (kgs)	Scale
				0.45	1:1
				Page	Page total
					1
APPROVED			STEEL 10 GOST 1050-88	HEAVY VEHICLES FACTORY AVADI	
CHECKED					
DRAWN					

Копировал

Формат А4

ЭК80.022

Перв.примен. ЭК80.020

Справ. №

Подп. и дата

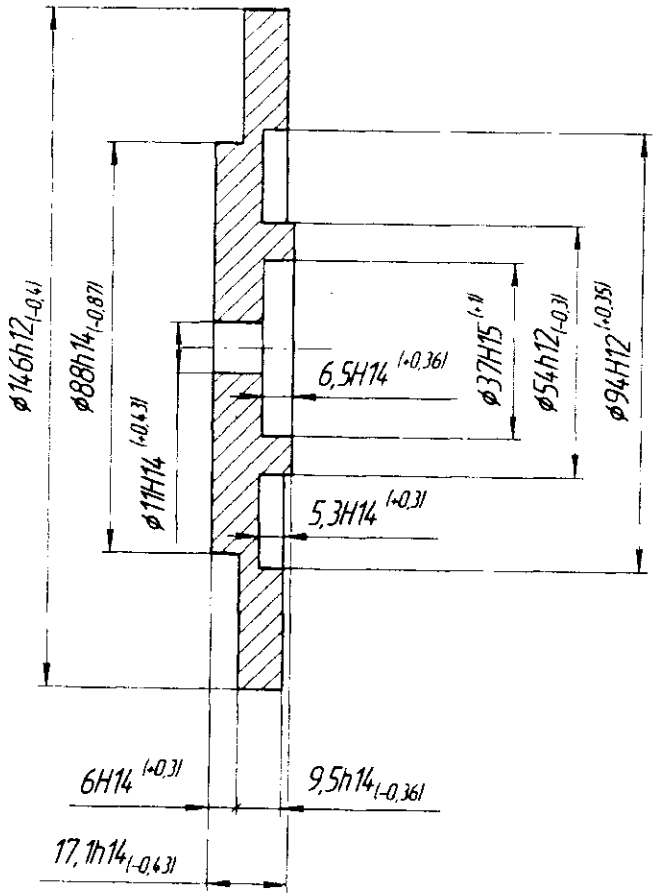
Инв. № дубл.

Взам. инв. №

Подп. и дата

Инв. № подл.

Rz80



			ЭК80.022	Sup. Code	Fold. No. / Sl.no.
				U-07-1-4	95 / 20
			FLANGE	Weight (kgs)	Scale
				0.5	1:1
				Page	Page total
ISSUE	SHEET	REFERENCE			1
APPROVED			STEEL 10 GOST 1050-88	HEAVY VEHICLES FACTORY AVADI	
CHECKED					
DRAWN					

Копировал

Формат А3

47

FOLDER No. 98

Electric magnet ЭК –80

Certificate

ЭК80.000 ПС

Translated by:
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U – 07 – 1 – 4

List of content of folder No. 98

Sl. No.	Part No., assembly unit of part	Name of technical documents	Code of documents	Number of sketch	Number of sheets in one sketch	Remarks
1	2	3	4	5	6	7
		Electromagnet				
		ЭК – 80				
		Certificate	ЭК80.000 PS	1	6	
		Total sheets			6	

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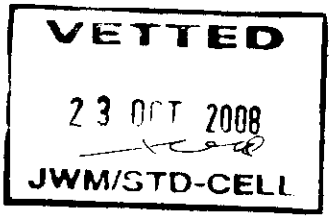
Electric magnet ЭК –80

Certificate

ЭК80.000 ПС



27

1. Basic technical data and characteristics

1.1 Voltage supply – (22 – 29) V of direct current.

1.2 Course of armature – ($6.5^{+0.2}$) mm.

1.3 Electromagnetic force under normal climatic conditions and practically in cold conditions with voltage supply 16 V and gap between armature and stop is 6.5 mm – not less than 245H (25 kgf).

1.4 Winding impedance at 20°C – (2.2 ± 0.1) Ohm.

1.5 Make - opened, splash proof and dust proof is ensured by customer during installation on unit.

1.6 Prolonged operating mode, in this case not later than 2 sec after switching on voltage on magnet winding is reduced two times.

Starting frequency – not more than three times per minute.

1.7 Connection diagram - single-wire.

1.8 Operating position – any.

1.9 Weight – not more than 3.6 kg.

2. Complete set of delivery

2.1 Electric magnet ЭК–80 – 1 piece.

2.2 Certificate – 1 piece.

Original inventory no.	Sign and date	Replaced inventory no.	Inventory no.dupl.	Sign and date

Mod.	Sheet	Doc. no	Signature	Date	ЭК80.000 ПС	Sheet
						3

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3. Manufacturer's Guarantee

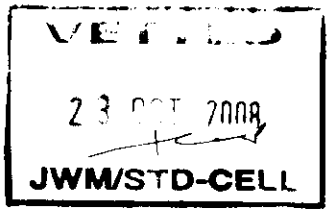
3.1 Manufacturer sets guarantee period.

4. Certificate about acceptance

4.1 Electric magnet ЭК–80 No. _____

acknowledged suitable for operation

Responsible for acceptance _____



Original inventory no.	Sign and date	Replaced inventory no.	Inventory no. dupl.	Sign and date

Mod.	Sheet	Doc. no	Signature	Date	ЭК80.000 ПС	Sheet
						5

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AMENDMENT RECORD SHEETS

Sr. No.	Number of sheets (Pages)				Total sheets (pages) in document	Document No.	Received No. of accompanying documents and Date	Signature	Date
	Amended	Replaced	New	Withdrawn					

					ЭК80.000 ПС	Sheet
						6
Mod.	Sheet	Doc. no	Signature	Date		

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Book No. 3

Lot -6/4
Folder - 236

RIG FOR OPERATING TIME Logbook

СТН. ЭК80. 000 ФО

Translated by:
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Original inventory no.	Sign and date	Replaced inventory no.	Inventory no dupl.	Sign and date

RIG FOR OPERATING TIME

Logbook

СТН. ЭК80. 000 ФО

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CONTENTS

Sign and date | Inventory no.dupl. | Replaced inventory no. | Sign and date | Original inventory no

Amend.	Sheet	Document no.	Sign	date	СТН. ЭК. 000 ФО		
Develop by					Rig for operating time Logbook	Letter	Sheet 2 / Sheets 14
Check by						И	
Chief designer							
Chief inspector							
Approved by							

1. GENERAL SPECIFICATIONS

1.1 Before operation, it is necessary to attentively become familiar with technical description and operating instructions of rigs.

1.2. Logbook should be constantly located with rig.

1.3. All notes in logbook are carried out only by India ink or inks, distinct and accurate. Erasures, blots and uncertified adjustments are not permitted.

1.4. Section of logbook <<GROUP SET>> is filled up by designer. Sections of logbook << REFERENCE ABOUT MOVEMENT AND FASTENING (INSTALLATION) OF RIG DURING OPERATION>>, << RECORD OF FAILURE DURING OPERATION >>, << RECORD OF TECHNICAL MAINTENANCE>> and <<REFERENCE ABOUT OVERHAULING OF RIG>> are filled up during operation of rig. Members of commission fills-up the section of logbook <<CERTIFICATE ABOUT ACCEPTANCE>>.

2. GENERAL REFERENCE ABOUT RIG

2.1 Name of rig – Rig for checking parameters

2.2 Code of rig СТН. ЭК80. 000.

2.3 Date of issue.

Sign and date | Inventory no dupl. | Replaced inventory no. | Sign and date | Original inventory no.

3. BASIC TECHNICAL SPECIFICATIONS AND CHARACTERISTICS

3.1 Voltage (220 ± 22) V, 50 Hz and (27 ± 0.2) V

3.2 Consumption current – max. 35A

3.3 Mode of operations - automatic.

3.4 Quantity of simultaneously checked units -four.

3.5 Rig according to over-all, adjusting, connecting dimensions and exterior view should correspond to assembly drawing СТН. ЭК80.000 СБ.

3.6 Wiring of rig should correspond to key diagram СТН. ЭК80.000 СБ.

4. GROUP SET

Code	Name	Quantity	Over-all dimensions, mm	Weight, Kg
СТН. ЭК800. 100	Control panel	1		
СТН. ЭК80. 200	Fixture	1		
СТН. ЭК80. 00 ТО	Technical description and instructions for operation	1		
СТН. ЭК80. 000ФО	Log book	1		

Note- Form is filled-up by designer of rig.

Mod.	Sheet	Doc. no	Signature	Date	СТН. ЭК. 000 ФО	Sheet 5

Original inventory no. | Sign and date | Replaced inventory no. | Inventory no dupl. | Sign and date

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5. ACCEPTANCE CERTIFICATE No._____

On rig_____

name and code of rig

factory number _____ manufactured _____

_____

name of manufacturing plant

pertains to _____

name of sub-unit-operation

On the basis of results of primary (periodic, extraordinary) inspection of technical condition, carried out by commission in the connection from

_____

cause of conducting of checking of technical condition

<<_____>> _____200_., is established that rig corresponds to the requirements of standard-technical documentation and is permitted to use.

Validity period of acceptance certificate upto<<____>>_____ 200_.

Chairman of commission:

_____(_____)

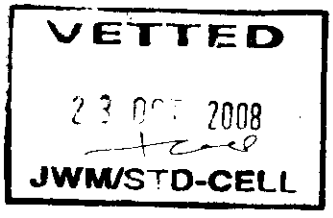
Members of the commission:

_____(_____)

_____(_____)

_____(_____)

_____(_____)



Original inventory no.	Sign and date	Inventory no dupl.	Replaced inventory no.	Sign and date

Mod.	Sheet	Doc. no	Signature	Date	СТН. ЭК. 000 ФО	Sheet
						6

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6. REFERENCE ABOUT MOVEMENT AND FASTENING (INSTALLATION) OF RIG DURING OPERATION

Designation	Surname of person, certified for operation	Name and date of order (order)		Signature of certified person
		About transfer	About deduction	

NOTE - Form is filled-up by shop (section) of operation.

Sign and date | Inventory no dupl. | Replaced inventory no. | Sign and date | Original inventory no.

7. RECORD OF FAILURE DURING OPERATION

Date of failure of rig or its component part. Modes of operation, type of load	Degree (external appearance) of imperfection	Cause of trouble (failure)	Measures taken for repairable failure	Designation, surname and signature of person certified for repairable failure	Remarks

NOTE - Form is filled-up by shop (section) of operation.

Original inventory no.	Sign and date	Replaced inventory no.	Inventory no dupl.	Sign and date

8. RECORD OF TECHNICAL MAINTENANCE

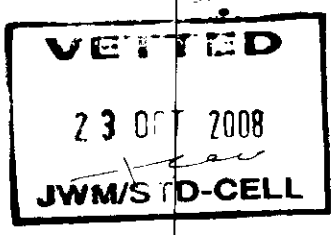
Date	Type of operation, carried out during technical maintenance of rig	Note about technical condition	Designation, signature and surname of certified person

NOTE - Form is filled-up by shop (section) of operation.

Original inventory no	Sign and date	Replaced inventory no	Inventory no dupl.	Sign and date

9. REFERENCE ABOUT AMENDMENTS OF DESIGN OF RIG AND ITS COMPONENT PARTS, CARRIED OUT IN PROCESS OF MANUFACTURING, OPERATION AND OVERHAULING

Base (name of documents)	Date of conduction of amendment	Contents of carried out operation	Characteristics of operation of rig after carried out amendment	Designation, surname and signature of person certified after carried out amendment	Remarks



NOTE - Fill-up the form during manufacturing, operation and overhauling of rig.

Original inventory no. | Sign and date | Replaced inventory no. | Inventory no dupl. | Sign and date

Mod.	Sheet	Doc. no	Signature	Date	СТН. ЭК. 000 ФО	Sheet 10

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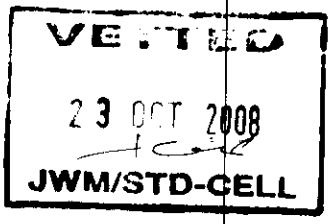
10. REFERENCE ABOUT AMENDMENTS OF MEASURING MEANS AND GROUP SET UNIT OF RIG, CARRIED OUT IN PROCESS OF MANUFACTURING, OPERATION AND OVERHAULING

Base (name of documents)	Date of conduction of amendment	Contents of carried out operation	Characteristics of operation of rig after carried out amendment	Designation, surname and signature of person certified after carried out amendment	Remarks



NOTE - Fill-up the form during manufacturing, operation and overhauling of rig.

Sign and date | Inventory no dupl. | Replaced inventory no | Sign and date | Original inventory no

Mod.	Sheet	Doc. no	Signature	Date	СТН. ЭК. 000 ФО	Sheet 11

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11. REFERENCE ABOUT OVER-HAULING OF RIG

Name and code of basic part of rig	Base for delivery in overhauling	Date		Name of over-hauling sub-division	Number of hours of (shift) operation upto overhauling	Type of overhauling	Name of overhauled operation	Designation Surname and signature of certified person	
		Entering for overhauling	Withdrawal from overhauling					Carrying out overhaul	Accepted after overhaul

NOTE - Form is filled - up by shop (section) of operation and sub-division, carrying out overhaul

Original inventory no.	Sign and date	Replaced inventory no.	Inventory no.dupl.	Sign and date

12. SPECIAL MARKS

Original inventory no.	Sign and date	Replaced inventory no.	Inventory no dupl.	Sign and date

AMENDMENT RECORD SHEETS

Sr. No.	Number of sheets (Pages)				Total sheets (pages) in document	Document No.	Received No. of accompanying documents and Date	Signature	Date
	Amended	Replaced	New	Withdrawn					

FOLDER No. 98

Electric magnet ЭК –80

Certificate

ЭК80.000 ПС

Translated by:
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PB / 835606213601

U – 07 – 1 – 4

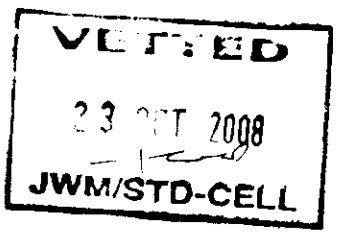
List of content of folder No. 98

Sl. No.	Part No., assembly unit of part	Name of technical documents	Code of documents	Number of copies	Number of sheets in one copy	Remarks
1	2	3	4	5	6	7
		Electromagnet				
		ЭК – 80				
		Certificate	ЭК80.000 ПС	1	6	
		Total sheets			6	

Electric magnet ЭК –80

Certificate

ЭК80.000 ПС



5t

1. Basic technical data and characteristics

1.1 DC supply Voltage – (22 – 29)V.

1.2 Stroke of armature – $(6.5^{+0.2})$ mm.

1.3 Electromagnetic force under normal climatic conditions and practically in cold conditions with supply voltage 16V and gap between armature and stop is 6.5mm – not less than 245N (25 kgf).

1.4 Winding impedance at 20°C – (2.2 ± 0.1) Ohm.

1.5 Make - open, splash proof and dust proof is ensured by customer during installation on article.

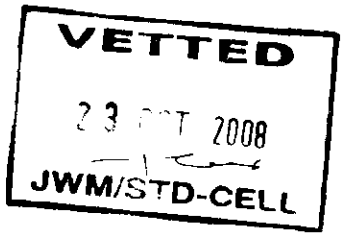
1.6 Prolonged operating mode, in this case not later than 2 sec after switching on voltage on magnet winding is reduced two times.

Starting frequency – not more than three times per minute.

1.7 Connection diagram - single-wire.

1.8 Operating position – any.

1.9 Weight – not more than 3.6 kg.



2. Complete set of delivery

2.1 Electric magnet ЭК–80 – 1 piece.

2.2 Certificate – 1 piece.

Original inventory no.	Sign and date	Replaced inventory no.	Inventory no.dupl.	Sign and date

Mod.	Sheet	Doc. no	Signature	Date	ЭК80.000 ПС	Sheet
						3

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3. Manufacturer's Guarantee

3.1 Manufacturer sets guarantee period.

4. Certificate about acceptance

4.1 Electric magnet ЭК–80 No. _____

certified suitable for operation

Responsible for acceptance _____

Original inventory no.	Sign and date	Replaced inventory no.	Inventory no.dupl.	Sign and date

Mod.	Sheet	Doc. no	Signature	Date	ЭК80.000 ПС	Sheet
						5

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AMENDMENT RECORD SHEETS

Sr. No.	Number of sheets (Pages)				Total sheets (pages) in document	Document No.	Received No. of accompanying documents and Date	Signature	Date
	Amended	Replaced	New	Withdrawn					

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Mod.	Sheet	Doc. no	Signature	Date	ЭК80.000 ПС	Sheet 6

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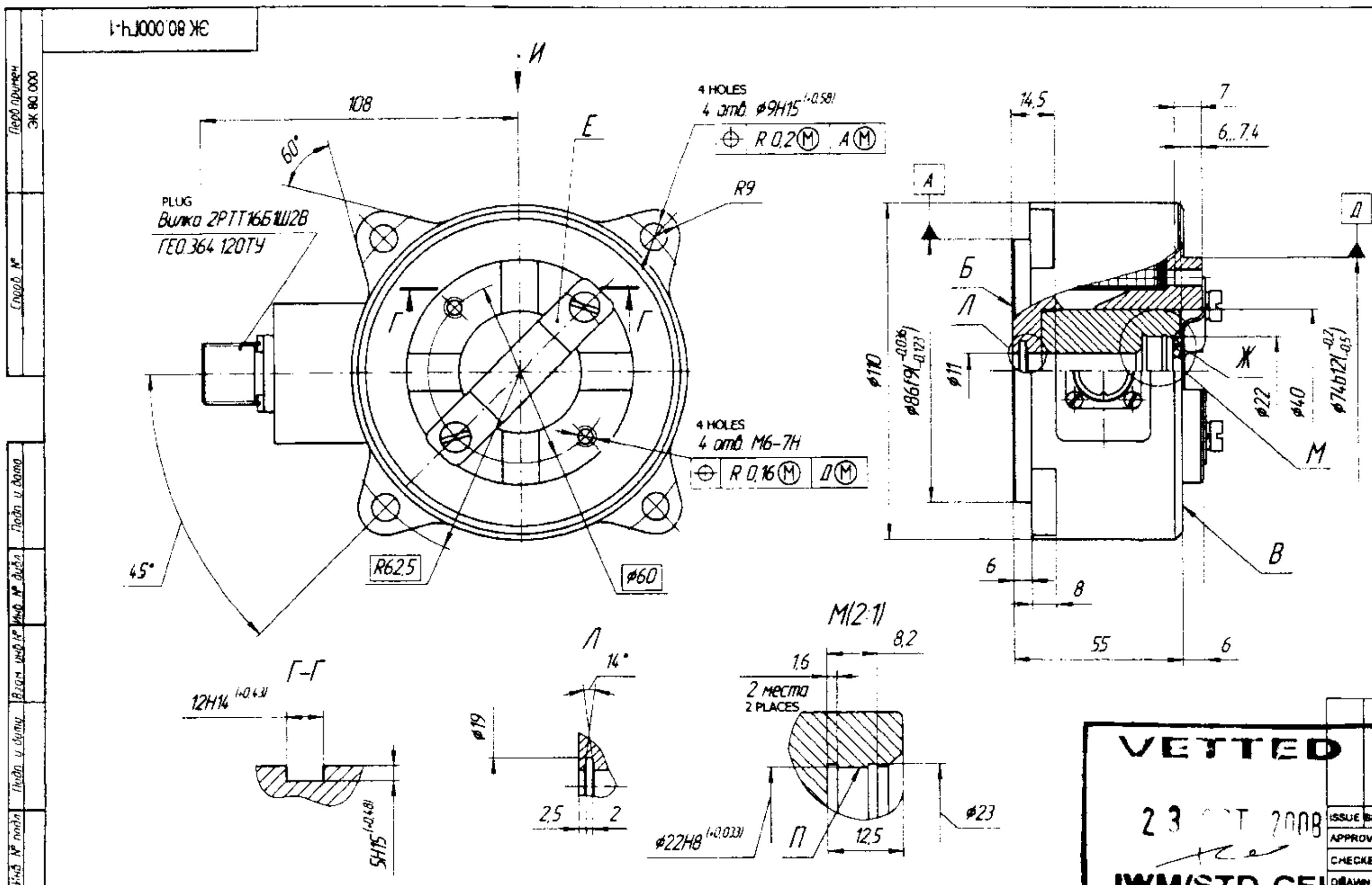

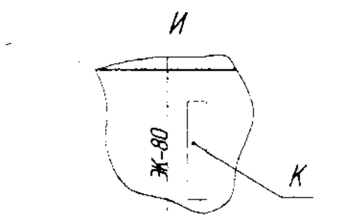

1. Armature travel $6.5^{+0.2}$ mm is to be ensured by the user while mounting the electromagnet onto the tank.
2. Mounting of electromagnet onto the tank should exclude the jamming of armature.
3. Dust-proofing of electromagnet from the side of surfaces Б and B should be ensured by the user while mounting on the tank.
4. Remove the parts E and Ж while mounting the electromagnet on the tank.
5. Preservation of surface П with oil k-17 GOST 10677-76.

VETTED
23 OCT 2008
JWM/STD-CELL

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Page 56 to 90

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USED ON ЭК80.000

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№ строки	Формат	Обозначение	Наименование	Кол. листов	№ экз.	Приме-чание
1			Technical Specifications			
2	*)	ЭК80.000 ТУ	Технические условия	33		*) А4
3			Outline Drawing			
4	*)	ЭК80.000 ГЧ-1	Габаритный чертеж	1		*)А4х3
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ЭК 80.000 **ОП**

ELECTROMAGNET
ЭК **-80**
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ELECTROMAGNET ЭК -80
TECHNICAL SPECIFICATIONS
ЭК80.000 ТУ

Present technical specifications (TY) pertain to the electro magnet ЭК – 80 (hereafter referred to as electromagnet), of retractable type, DC, mounted in the habitable section of tank. meant for working in the automation system in the conditions of modulate and cold climates.

Designation of electromagnet while ordering:

Electromagnet ЭК– 80, ЭК 80.000 TY

List of documents, which are referred to in the present TY, has been specified in annexure1.

1. TECHNICAL REQUIREMENTS.

Electromagnet should correspond to the requirements of present TY.

1.1 Basic parameters and dimensions.

1.1.1 Working supply voltage – (22 – 29). V DC.

1.1.2 Armature travel – ($6.5^{+0.2}$) mm.

1.1.3 Force of electromagnet in normal climatic conditions, actually in cold conditions at voltage supply 16 V. and in gap between armature and stop 6.5 mm should not be less than 245 N (25 kg).

1.1.4 Resistance of winding at temperature plus 20°C – (2.2 ± 0.2) Ohm.

1.1.5 Working mode – continuous, during this 2s after the switching-on the voltage on the winding of electromagnet should be reduced by twice.

Frequency of switching – not more than 3 switchings per minute.

1.1.6 Connection diagram – single wired.

1.1.7 Working position – arbitrary

1.1.8 Overall, connection and mounting dimensions of electromagnet should conform to the drawing ЭК– 80.000 ГЧ – 1.

1.2 Technical – design requirements.

1.2.1 Make of the electromagnet – open, splash protection and dust proofness are to be ensured by the user while mounting on the tank.

1.2.2 Weight of the electromagnet should not exceed 3.6 kg.

1.2.3 Electromagnet should not posses any design elements and assembly units with resonance frequencies 5 to 40 Hz.

1.2.4 Parts and assembly units of electromagnet should be interchangeable.

1.2.5 All the constituent articles and materials, used during manufacturing of electromagnet, should correspond to applicable standards and their TY.

1.2.6 Excessive temperature of windings of electromagnet at a voltage 13.5 V should not be more than 100 ° C.

1.2.7 Coating of electromagnet should be stable against the effect of climatic and mechanical factors and it should ensure the corrosive resistivity as per GOST 9.301.86.

1.2.8 Electromagnet should be serviceable while operated at voltage 22 to 29 V and should retain its parameters in below mentioned conditions:

- during the effect of sinusoidal vibration loads in the frequency range 5 – 500 Hz for acceleration 29 ms^{-2} (3g), maximum
- after the effect of sinusoidal vibration loads in the frequency range 5 – 500 Hz at acceleration 29 ms^{-2} (3g), maximum
- during the effect of mechanical impacts of multiple action with peak impact acceleration 200 ms^{-2} (20g), maximum and duration of impact impulse 5 – 15ms, maximum
- after the effect of mechanical impacts of multiple action with peak impact acceleration 200 ms^{-2} (20g), maximum and duration of impact impulse 5 –15 ms, maximum

- during the effect of mechanical impacts of single action with peak impact acceleration 4900 ms^{-2} (500g), maximum , and duration of impact impulse 0.2 – 2.0 ms, maximum
- after the effect of changes in ambient temperature from minus 60 to plus 70°C;
- during increased relative humidity 98%, maximum , and temperature plus 25°C, maximum
- during decreased ambient temperature minus 50 °C, maximum
- during the effect of atmospheric precipitations (dew and frost);
- during increased ambient temperature plus 50 °C ,
- during decreased atmospheric pressure up to 60KPa (450 mm of Hg), maximum
- after the effect of decreased atmospheric pressure upto 12 kPa (99 mm of Hg), maximum
- during the effect of saline (sea) fog.

1.2.9 To ensure the guarantee operation time the electromagnet should with stand 10000 switchings of stand tests.

1.2.10 service life of electromagnet should consist of 20000 switchings.

1.3 Consignment Set.

1.3.1 The consignment set consists of :

- electromagnet ЭК– 80 – 1 no.
- certificate – 1no.

1.4 Stamping.

1.4.1 Stamping of electromagnet should be carried out in conformity with the set of documentation as per specification ЭК 80.000.

1.5 Packing and Preservation.

1.5.1 Packing of electromagnet should be carried out in conformity with the applicable drawing for packing.

1.5.2 When the electromagnets are shipped to the customer as a component article, it should be preserved in oil K – 17 GOST 10877 – 76 as per drawing for packing. Shelf life for transportation between the factories – 0.5 yr.

2. ACCEPTANCE RULES

2.1 Present TY and set of documents as per specifications ЭК80.000 are the main documents for manufacturing, testing and acceptance of electromagnets.

2.2 All the procured articles and materials, used during manufacturing of electromagnet, should be checked by QCD of material procurement section.

2.3 Before the tests the electro magnet should under go the technological guaranteed operation time at the manufacture's plant with in the scope of 30 switchings.

2.4 Tests of electromagnet are subdivided into acceptance, periodic and the type tests.

2.5 100% of presentation tests by QCD (annexure 2) should precede the acceptance test with in the scope of acceptance tests as per table 1 of present TY.

2.6 Acceptance Tests.

2.6.1 Each electromagnet should be subjected to acceptance tests in volume and sequence in conformity with table 1 of present TY.

It is permissible to carry out the random method of checking of batch in a volume of 10% of electromagnets from the presented batch, but not less than two electromagnets, in volume and sequence as per table 1 of present TY. During this process, check the condition of coatings, absence of external mechanical damages on all the electromagnets from the presented batch.

In case of positive results of tests the customer's representative puts a corresponding stamp onto the electromagnet and puts conclusive remarks in the certificate, verifying the acceptance and validity.

2.6.2 Batch not withstanding the tests, is returned by the customer's representative to QCD with a statement about the causes of return and rejection for identification of causes of non-compliance to the requirements of present TY, for taking the necessary measures for their elimination and for determining the possibility of rectification of defect and repetitive presentation.

Electromagnets, returned by customer's representative, after elimination of defects, repetitive inspection, repetitive presentation tests and QCD approval, in case of positive results are again presented to customer's representative. Repetitive tests are conducted in full scope of acceptance tests.

2.6.3 During repetitive presentation of batch for random inspection, double the quantity of electromagnets should be subjected to tests. The whole batch is rejected if even a single electromagnet does not comply to the requirements of present TY.

Tests and acceptance, of electromagnets, manufactured as per the same technological and normative technical documentation, as the electromagnet, which did not withstand the repetitive tests and rejected during two sequential initial presentations because of same cause, should be suspended.

Decision about resumption of tests and acceptance of electromagnets should be taken by the customer after the conduction of necessary measures for elimination of reasons, causing the suspension of tests and acceptance and after preparing the corresponding document, agreed with the customer's representative.

In this case the customer is informed in the established manner about the reasons for suspension of tests and acceptance and about the measures taken for elimination of defect .

The electromagnet, which withstands the test, should be considered approved. It should also have the stamps of QCD and customer's representative and certificate with conclusion, about acceptance and validity drawn up for the same

2.7 Periodic Tests.

2.7.1 Periodic tests of electromagnets are carried out, in volume and sequence as per table of present TY, once in half year on two specimens, from the ones that have undergone the acceptance tests.

2.7.2 In case of rejection the repetitive periodic tests are conducted on double the quantity of electromagnets, chosen from the batch, whose volume is established in agreement with the customer's representative.

2.7.3 After the completions of periodic test by commission, which comprises of representatives of customer, QCD and production shop, the electromagnet is disassembled with the purpose of checking the sub assemblies and parts; depending upon the results of inspections and if necessary the essential measures are developed to improve the quality.

2.7.4 Results of periodic tests are entered in a record, which indicates dates or quantity of electromagnets, to which the results of periodic tests are

2.7.5 Decision about further usage of electromagnets, which have undergone the tests, is taken by customer's representative.

2.8 Type Tests.

2.8.1 Type tests are conducted in case of major changes in the design and manufacturing technology of electromagnet, which may effect on the technical characteristics, operation characteristics : they are also conducted incase of necessity for checking the service life of electromagnet and measures taken for elimination of defects of electromagnet and similarly on the specified batch of mass production.

2.8.2 Type tests of electromagnets are conducted as per the schedule of tests, prepared by the designer and agreed with customer's representative.

Customer's representative determines volume of type tests as per table 1 of present TY. Volume of type tests, included in the schedule, should be sufficient enough for grading of effect of incorporated changes on the technical characteristics.

2.8.3 Customer's representative together with designing firm stipulates the quantity of electromagnets, which is necessary for carrying out type tests.

Decision about further usage of electromagnets, which have passed the tests, is taken by customer's representative.

Table 1

Type of inspection and Test	Clause no. of		Category of tests	
	Requirements	Methodology	Acceptance	Periodic
1. Checking of completeness and conformity to drawings.	1.3.1 1.1.8	3.2	+	+
2. Checking of developed force.	1.1.3	3.3	+	+
3. Checking of resistance of winding.	1.1.4	3.4	+	+
4. Inspection of weight	1.2.2	3.5	-	-
5. Test for detection of resonance.	1.2.3	3.6	-	-
6. Checking for interchangeability	1.2.4	3.7	+	+
7. Checking for increase in temperature of winding.	1.2.6	3.8	-	-
8. Grading of Quality of coating.	1.2.7	3.9	-	+
9. Test for effect of increased humidity.	1.2.8	3.9 3.10	-	+
10. Test for effect of decreased ambient temperature.	1.2.8	3.9 3.11	-	+
11. Test for effect of increased ambient temperature.	1.2.8	3.9 3.12	-	+
12. Test for effect of atmospheric precipitations (frost & dew)	1.2.8	3.13	-	-
13. Test for effect of saline (sea) fog.	1.2.8	3.9 3.14	-	-
14. Test for effect of changes in ambient temperature.	1.2.8	3.9 3.15	-	+
15. Test for strength during the effect of sinusoidal vibration.	1.2.8	3.9 3.16	-	+
16. Test for strength during the effect of mechanical impacts of multiple action.	1.2.8	3.9 3.17	-	+
17. Test for stability during the effect of sinusoidal vibrations.	1.2.8	3.18	-	-

Table 1 contd.

Type of inspection and Test	Clause no. of		Category of tests	
	Requirements	Methodology	Acceptance	Periodic
18. Test for stability during the effect of mechanical impacts of multiple action.	1.2.8	3.18	-	+
19. Test for guaranteed operation time.	1.2.9	3.19	-	+
20. Test for service life	1.2.10	3.20	-	-
21. Test for effect of low atmospheric pressure.	1.2.8	3.21	-	-
22. Test for strength and stability during the effect of mechanical impact of single action.	1.2.8	3.22	-	-

Note

1. Following conventional signs have been used in the table.

+ tests are conducted;

- test are not conducted;

2. Sequence for carrying out the tests may be altered as per agreement with customer's representative.

3. Sequence for conduction of tests for vibrational strength and shock strength is determined by the methodology of present TY.

4. It is permissible to mix-up the test for effect of dew and droft with the test for effect of decreased ambient temperature.

1. Inspection Methods

1.1 General Conditions

1.1.1 Tests are carried out in normal climatic conditions except for the ones, where climatic conditions are particularly mentioned.

Characteristics of normal climatic conditions

1) ambient temperature + $(25\pm10)^0$ C;

2) relative humidity of air (65^{+15}_{-20})%;

3) atmospheric pressure 84-107 kpa (630-800 mm of Hg).

Note. For temperature above 30^0C, the relative humidity of air should not exceed 70%.

Electromagnet is considered in practically cold condition, if it remains in switched-off state for 2 hour.

Testing modes of mechanical factors should be maintained as per the readings of measuring tools with deviations, not exceeding the values as specified in table 2.

Deviations of characteristics of climatic factors during tests should not exceed the values, as specified in table 2.

Effecting factor	Permissible deviation.
Temperature	±3^{0}C
Relative humidity	±3%
Pressure	±5%
Time	±10%
Displacement amplitude	±15%
Vibration frequency: upto 50 Hz above 50 Hz.	±2 Hz ±2%
Amplitude of vibration and peak shock acceleration.	±20%
Number of cycles quantity of impacts	±5%
Supply Voltage	±0,2V
Armature travel, clearance between armature and stop.	±0,1 mm
Force	±1%

Holding time in testing mode is calculated from the moment of setting of given mode.

Results of calculations as per formulas, specified in present TY is rounded-off upto three decimal places.

Technological operation trial of electromagnet is carried out as per methodology of clause 3.19 of present TY at supply voltage 27V.

1.2 Checking for completeness and conformity to the drawings.

Conformity of electromagnet to design documents is checked with tools of measurement and inspection as specified in technological documentation. Completeness, quality of soldering, assembly, absence of fastening are checked visually with naked eye.

1.3 Checking of developed force

Checking of force, developed by electromagnet, is carried out on the stand, which ensures the counterforce 245 N (25 kgf) for a gap between armature and stop 6.5 mm.

Electromagnet is switched-on thrice by a voltage 16 volt. Duaration of each switching should not be more than 2s.

Electromagnet is considered test sustaining if it functions properly, while overcoming the counterforce 245N (25kgf).

1.4 Checking for resistance of winding.

Inspection of resistance of winding of electromagnet is carried out while checking the force of electromagnet by measuring the consumption current in last switching whose duration may be increased upto 5s.

Resistance of winding corresponds to the requirement of clause 1.1.4 of present TY if consumption current is 6.4 – 8.0 A.

1.5 Inspection of Weight

The weight of electromagnet is checked on weighing scale.

Electromagnet is considered to have withstood the check, if weight corresponds to the requirement of clause 1.2.2 of present TY.

1.6 Test for detection of resonance.

Test for the absence of resonance of design elements and assembly units with resonance frequency 5 to 40 Hz is not carried out. Conformity to the given requirements is ensured by design.

1.7 Checking for interchangeability.

So as to check for conformity to drawings and interchangeability as per the requirements of customer's representative, one of the specimens from used batch should be disassembled . During the process, check for the conformity of parts and assembly units to the requirements of design documentation is to be carried out.

Inter changeability is checked by replacing the parts and assembly units in electromagnet by the ones on the assembly line, with subsequent applicable adjustment. In case the parts and assembly units are not available on the assembly line, two electromagnets may be dismantled.

Electromagnet is considered to have withstood the check, if parts and assembly units comply with the drawings and after their replacement the electromagnet complies with the clauses of acceptance tests of presentsTY.

1.8 Checking for excessive temperature of winding.

Checking for excessive temperature of winding is carried out by the method of resistance. Electromagnet in cold state is switched to the voltage 13.5 V. Immediately after 3 hours, measure the current of electromagnet. Increase in temperature of winding is determined by formula:

$$\Theta = \frac{I_X - I_H}{I_H} (235 + \Theta x) + \Theta_X - \Theta_H$$

Where Θ – increase in temp, °C;

I_X - current of winding in cold state, A;

I_H – current of winding in heated state, A;

Θx – ambient temperature at the time of measurement of Ix, °C;

While checking, the electromagnet is mounted on to the metallic base with thickness 15 to 20 mm and total area not less than 0.1 m^2 .

Electromagnet is considered to be test sustaining, if requirement of clause 1.2.6 of present TY is fulfilled .

1.9 Grading of coating quality.

Quality of coating is rated visually with naked eye.

Before starting the tests, check the electromagnet visually.

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Electromagnet is considered to have withstood the inspection, if after testing the traces of corrosion of base metal are absent and stamping is visible. After the tests, white spots are permissible.

Presence of traces of corrosion on sharp edges, thread and fastening parts are not considered to be defects.

1.10 Test for effect of increased humidity.

Test for effect of increased humidity is carried out in climatic chamber in switched – off state of electromagnet by ten cycles each having 24 hour duration, following one after another continuously.

Before mounting it into the chamber it is necessary to preserve the electromagnet with oil K – 17- GOST 10877 – 76 in conformity with the mounting on tank.

Make sure that the drops of condensate do not fall into the internal space and surface of electromagnet from the roof and walls of chamber.

Each cycle should be conducted in following sequence :

1) increase the temp. in chamber upto 40°C at relative humidity (95 + 3) % for 1to 3 hours;

for temperature in the chamber (40 ± 2)°C, maintain the relative humidity (93 ± 3) %; for (12.0 ± 0.5) hour from the start of cycle;

2) decrease the temperature in chamber upto 25°C in 4 to 9 hours. During this period the relative humidity should not be less than 95% and maintain a temperature 25°C and relative humidity not less than 95 % till the end of cycle.

Take out the electromagnet from the chamber and after holding it for 12 hours in normal climatic conditions carry out the checking of developed force, resistance of winding and grading of coating quality as per methodology of clauses 3.3, 3.4 and 3.9 of present TY.

Electromagnet should be considered test-sustaining if it corresponds to the requirements of clauses 1.1.3, 1.1.4 and 1.2.7 of present TY.

1.11 Test for effect of decreased ambient temperature.

Test for the effect of decreased ambient temperature should be carried out in climatic chamber with electromagnet in switched – off state.

Temperature in the chamber is preset upto temperature limit minus 60°C and electromagnet is sustained for 3 hours.

Then increase the temperature in chamber upto working temperature minus 50° C and hold the electromagnet at this temperature for 3 hours.

Take out the electromagnet from chamber and after hot later than 3 minutes, carry out the checking of force as per methodology of clause 3.3 present TY.

Subsequently after holding it for 3 hours in normal climatic conditions, check the grading of coating quality as per methodology of clause 3.9 of present TY.

Electromagnet is considered test sustaining, if it corresponds to the requirements of clauses 1.1.3, 1.2.7 of present TY.

1.12 Test for the effect of increased ambient temperature.

During test for effect of increased ambient temp, preset the temp. in chamber upto 50° C.

Hold the electromagnet in chamber in switched-onstate for 3 hours at a voltage 13.5 V. After that take it out from chamber and not later than 3 minutes after taking it out from chamber check its force at voltage 22 V as per methodology of clause 3.3 of present TY.

After holding it in normal climatic conditions for 3 hours, check the grading of coating quality as per methodology of clause 3.9 of present TY.

Electromagnet is considered test sustaining if it functions properly, while overcoming the counter force 245 N (25 kgf) at a voltage 22 V and the coating corresponds to the requirements of the clause 1.2.7 of present TY.

During the test for effect of increased temperature the electromagnet should be fastened to smooth metallic surface having dimensions as specified in clause 3.8 of present TY.

1.13 Test for the effect of atmospheric precipitations (dew and frost).

During the test for effect of atmospheric precipitations (dew and frost). the electromagnet in switched – off state is placed into climatic chamber and is suatained in it at temperature minus (20 ± 5)°C for 2 hours.,

After that the electromagnet is taken – out from the chamber, is kept in normal climatic conditions for 3 hours in the conditions of formation of dew and frost. Check the force of electromagnet immediately after taking it out from chamber and also after every 30 minutes as per methodology of clause 3.3 of present TY.

Electromagnet is considered test – sustaining, if during arrival in normal climatic conditions, after removal from the chamber, its force corresponds to the requirements of clause 1.1.3 of present TY.

1.14 Test for the effect of saline (sea) fog.

Before the test carry out the external inspection of electromagnet with the purpose of checking the absence of damaged varnish coatings.

Protect the electromagnet from falling of saline (sea) fog inside it.

Place the electromagnet into chamber, the temp. in which is set at 27 – 30° C, and subject it to the effect of saline fog.

Electromagnet should be positioned in chamber in such a manner that during the testing, the splashes of solutions and drops from roof and walls did not fall onto it.

Fog is created by spraying with centrifugal aerosol generator or with pulveriser (sprayer) of saline solution, which is prepared by dissolving (33 ± 3) g of sodium chloride (Nacl , molecular weight 58.44) to 1 litre of distilled water. Fog should posses dispersion 1 – 10 μm (95 % drops) and water content 2 – 3 gm^{-3}

Spraying of solution should be carried out for 15 minutes after every 45 minutes. Total duration of test - 2 days. Test duration is counted from the moment of first spraying of solution.

Upon the completion of test, wipe the electromagnet with wad, soaked in distilled water, after that dry it for 1 hour at a temp. 55°C, cool it up to normal temp. and check the grading of coating quality.

Electromagnet is considered to be test sustaining, if the coating quality corresponds to the requirements of clause 1.2.7 of present TY.

1.15 Test for the effect of change in ambient temp.

Test for the effect of change in ambient temp. is carried out in climatic chamber, where the electromagnet in switched-off state is subjected to the effect of three temp. cycles, following one after another.

Each cycle should be carried out in the following sequence:

Electromagnet is placed in climatic chamber, the temp. in which is preset up to minus 60°C and it is sustained in the chamber for 3 hours at this temperature.

Then shift the electromagnet to climatic chamber, whose temperature is preset up to limited value 70°C and hold it at this temp. for 3 hours.

Every time the holding time in the chamber is calculated from the moment the given temp., of air in the chamber after loading of electromagnet, is achieved.

Upon the completion of last test cycle, take out the electromagnet from chamber, hold it in normal climatic conditions for 3 hours, after that carry out the external inspection, inspection of force, resistance of winding and grading of coating quality as per methodology of clause 3.3, 3.4, 3.9 of present TY.

Electromagnet should be considered test-sustaining, if after the tests it fulfills the requirements of clauses 1.1.3, 1.1.4, 1.2.7 of present TY.

1.16 Test for strength during the effect of sinusoidal vibrations.

Test for strength during the effect of sinusoidal vibrations is carried out in switched-off state of electromagnet for a gap between armature and stop 6.5mm. Before the test, check the electromagnet externally. Mount the electromagnet into fixture, which ensures a gap between armature and stop 6.5mm and counter force at this gap 41.2 N(4.2Kgf). Increase of this force by (5.7±0.6)N[(0.58±0.06)Kgf] takes place for a decrease in gap by each millimeter. Electromagnet with fixture is tightly mounted on the vibration stand sequentially in three relatively perpendicular positions:

- Vertical – axis of armature of electromagnet is perpendicular to the plane of platform having stop or armature upwards or downwards.
- Longitudnal – axis of armature of electromagnet is parallel to the surface of platform, with connector downwards;
- lateral – axis of armature of electromagnet is parallel to the surface of platform , with connector side wards.

Test is carried out by the method of oscillating frequency during gradual change of vibration frequency through out the range in the direction from lower value to the upper one and vice versa with a speed not exceeding one octave per minute as per norms, as specified in table3.

Table 3

Range of frequency	Transmission frequency	Amplitude of frequency build -up	Amplitude of vibration displacement	Duration of tests for directions, hours	Total duration, hours.
1-500	39	30,(3,0)	0,5	Vertical -15 Longitudinal -9 Lateral - 0	30

Notes:

1. By considering the capacity of test equipment, test may be carried out with in the frequency range 5-500 Hz.
2. At the frequencies below the transmission ones, maintain the amplitude of vibration displacement, for frequencies above the transmission frequency maintain the acceleration constant.

Test for vibration strength is carried out simultaneously with the test for guaranteed operation time as per following mode:

half of total time of vibration in vertical position of electromagnet until the test for guaranteed operation time,

half of total time of vibration in longitudinal and lateral position of electromagnet in the middle of test for guaranteed operation time.

After the test carry out the external inspection, checking of force, resistance of winding and grading of coating quality as per methodology of clause 3.3, 3.4, 3.9 of present TY.

Electromagnet should be considered test-sustaining, if during external inspection no mechanical damages are detected and it fulfills the requirements of clauses 1.1.3, 1.1.4, 1.2.7 of present TY.

1.17 Test for strength during the effect of mechanical impacts of multiple action.

Test for strength during the effect of mechanical impacts of multiple action should be carried out on electromagnet (switched-off) in the middle of test for guaranteed operation time for a gap between armature and stop 6.5mm with the fixture, as mentioned in clause 3.16 of present TY. Before the test the electromagnet should be checked externally.

Electromagnet with the fixture is tightly mounted on the stand sequentially in three relatively perpendicular positions, as specified in clause 3.10 of present TY and is subjected to the effect of impacts in each position as per norms, specified in table4.

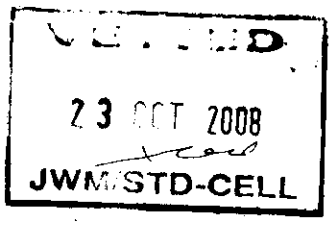


Table 4

Peak shock acceleration, ms^{-2}(g)	Duration of action of impact pulse, m1s	Total number of impacts along three directions
200(20)	from 5 to15	10000

Test should be carried out with a frequency up to 120 impacts per minute, total number of impacts should be divided equally in three specified directions.

After the test, carry out the external inspection, inspection of force, resistance of winding, grading of coating quality as per methodology of clauses 3.3, 3.4, 3.9 of present TY.

Electromagnet should be considered to be test-sustaining, if during external inspection no mechanical damages are found and it satisfies the requirements of clauses 1.1.3, 1.1.4, 1.2.7 of present TY.

1.18 Test for stability during the effect of sinusoidal vibrations and during the effect of mechanical impacts of multiple action.

Test for stability during the effect of sinusoidal vibrations and during the effect of mechanical impacts of multiple action are not to be carried out.

Compliance of electromagnet to the given requirements are to be ensured by the design of electromagnet.

1.19 Test for guaranteed operation time

During the test for guaranteed operation time, the electromagnet is fastened to the smooth metallic surface having dimensions, as specified in clause 3.8 of present TY. Set the gap between armature and stop 6.5 mm in the fixture, as specified in clause 3.16 of present TY.

Electromagnet is switched in the mode:

2s- switched-on, 6s- switched-off.

Number of switchings:

At voltage 22V- 2500;

At Voltage 27V- 5000;

At Voltage 29V- 2500;

Upon the completion of test of electromagnet, carry out 100 additional swtichings at voltage 27V, after that check the force as per methodology of clause 3.3 of present TY in normal climatic conditions and in cold state of electromagnet.

Electromagnet should be considered test-sustaining, if during the test there are no failures and it fulfills the requirements of clause 1.1.3 of present TY.

1.20 Test for service life

Test for service life should be carried out as per methodology of clause 3.19 of present TY.

Number of swtichings, carried out during guaranteed operation, should be taken into consideration during tests for service life .

Electromagnet should be considered to be test-sustaining, if during the test, additional operations are not required and it remains serviceable during the additional test in a volume of 50 swtichings at a voltage 27V.

1.21 Test for the effect of decreased atmospheric pressure

Testing in the conditions of decreased pressure should not be conducted. Compliance to the given requirement is to be ensured by the design of electromagnet.

1.22 Test for strength and stability during effect of mechanical impacts of single action.

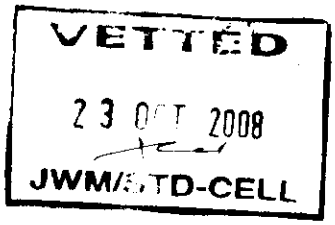
Test for strength and stability during the effect of mechanical impacts of single action is not carried out.

Compliance of electromagnet and its installation to the given requirement is to be ensured by the design of electromagnet.

4. Transportation and storage.

4.1 Electromagnet in the factory packing of manufacturer may be transported by all means of transport with a provision for protection from effect of precipitations and mechanical damages.

Shelf life of articles is equal to the period for timely protection, as specified in clause1.5.2 of present TY.



5. Operation (usage) Instructions

5.1 Electromagnet should be used in the tank in the conditions and modes, corresponding to the requirement of present TY. During the operation of electromagnet, the user should ensure:

- Protection of electromagnet from dust;

- Setting of armature travel;

- Absence of mismatching of armature;

- Absence of displacement of armature for switched-off electromagnet during the effect of vibration impact loads;

- Fastening of electromagnet on to the metallic base with thickness 15-20mm and having total area not less than $0.1m^2$.

5.2 Usage of electromagnet should be agreed upon.

5.3 Maintenance during operation in conformity with the requirement of operation instructions of tank.

6. Manufacture's (Supplier's) Guarantee.

6.1 Electromagnet should be approved by the quality control of manufacturing firm.

Manufacturer should guarantee the conformity of electromagnet to the requirements of present TY and failure- proof working in case the user properly follows the conditions necessary for operation, transportation and storage, established by the present TY.

6.2 Guaranteed operation time of electromagnet 500 machine hours of working of main engine and 6000 km run in conformity with the guarantee for tank.

Annexure 1

List of Documents, referred to in the Present TY

Document Designation	Sheet No. of TY, in which the document is referred
GOST 9.301-86	5
GOST 10877-76	7, 18
ЭК80.000	7, 9
ЭК80.000 ГЧ - 1	4

PRESENTATION TESTS.

1. General Conditions

1.1 Presentation tests should be carried out by QCD with the purpose of checking of electromagnet for conformity to the requirements of present technical specifications and for determining its preparedness for presentation to the customer's representative.

2. Presentation Tests.

2.1 Each manufactured electromagnet, which is to be submitted for presentation test, during the manufacturing, should be subjected to production control for conformity to the requirements of technical documentation by the production shop and QCD of shop.

2.2 Production shop submits the electromagnet for presentation tests by attaching the notification and technological certificate.

2.3 Electromagnet should be considered approved by QCD and fit for submission to customer's representative for tests, if it passes the presentation tests with positive results and the test results have been prepared by a protocol.

2.4 QCD returns the electromagnet, which did not withstand the presentation tests, to the production shop for eliminating the defect causes and for taking the necessary measures for removal of defects and their causes, for repetitive check and subsequent presentation.

2.5 After taking the necessary measures for removal of defects and their causes, and after repetitive inspection by the production shop of electromagnets, they are again presented to the QCD. Production shop should second time present the electromagnets to QCD with a notification with a remark "Secondary".

Technological report about the removal of defects and the measures taken should be attached to the notification.

2.6 Electromagnet, which did not withstand the repetitive tests, should be rejected by QCD and returned to the production shop. Higher authorities of manufacturing plant together with QCD manager decide whether to present this particular article to QCD again or not.

AMENDMENT RECORD SHEET

Amend ment	No. of sheets (pages)				Total sheets (pages in the document	Docu ment No.	Entry No. of accompanyin g document	Sig.	Date
	Amen-ded	Replaced	New	Cancell ed					