

TECHNICAL SPECIFICATIONS FOR  
ARTICLE PARTS

520.TY1

FOR REFERENCE ONLY

Present technical specifications pertain to manufacture and acceptance of parts and assembly units of articles, as well as for replacement of materials.

### 1. GENERAL REQUIREMENTS

- 1.1 Parts should comply with existing design documentation and present technical specifications (TY).
- 1.2 Present TY is obligatory for parts and assembly units, in drawings, which have reference to 60.018TY and 432.И6-1.
- 1.3 While manufacturing parts and Assembly units with thermal cutting, welding, soldering, factory instructions approved by chief designer and representative of customer may be followed.
- 1.4 Manufacturing and usage of seals, glues, lubrication, zinc white pigment for sealing of joints, as well as chemical materials, specified in design documents, to be carried out as per technical instructions of factory-manufacturer.
- 1.5 Control of profile and contour of parts may be carried out by any method.
- 1.6 All parts and assembly units should be thoroughly cleaned from dirt, dust, sand, scales, cuttings and other foreign particles before assembly.
- 1.7 All threaded joints should be tightened with wrenches, specified in technological process, and locked in compliance with requirements of design documentation.
- 1.8 Placing of wires during locking of threaded joints should prevent their self-unscrewing.
- 1.9 Lugs of locking washers should be bent, so that they prevent self-unscrewing of fixing parts.
- 1.10 It is necessary to lubricate with thin layer of plastic lubricant used on article, thread and clean surface of bolts, nuts, rod, axial, shafts, tie rod, coupling and other, before assembly.

					520.TY1			
Amnd	Page no.	Doc.No	Sign.	Date	TECHNICAL SPECIFICATIONS FOR ARTICLE PARTS	Letter	Page no	No. of pages
Designed by							2	34
Checked by						356		
Head of Deptt.								

Deviation from parallelism

A



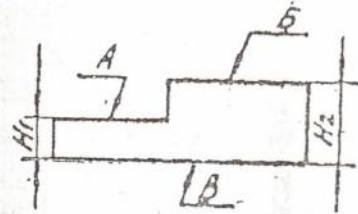
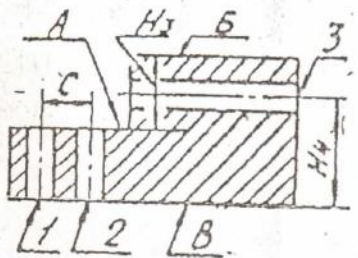
## 2. REQUIREMENTS FOR MACHINING OF PARTS

2.1. Surface of parts should not have sharp edges, burrs, and scratches.

2.2. Limit deviations of surfaces, if they are not specified in drawings or in technical specifications for article, determine as per

table 1.

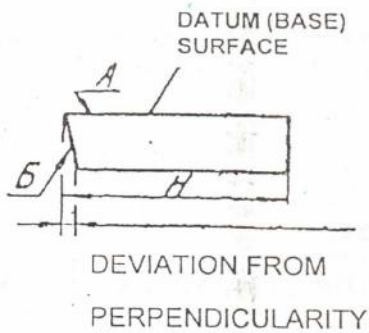
Table 1

Term	Drawing	Determination
Deviation from parallelism		<p>Deviation from parallelism of surface A relative to surface B should be within tolerance range on dimensions <math>H_1</math>.</p> <p>Deviation from parallelism of surface B relative to surface B should be within tolerance range on dimensions <math>H_2</math>.</p>
		<p>Deviation from parallelism of surface A relative to surface B should be within tolerance range on dimensions <math>H_3</math>.</p> <p>Deviation of parallelism of axis 1 relative to axis 2 should be within tolerance range on dimension C.</p> <p>Deviation from parallelism of axis 3 relative to surface B should be within tolerance range on dimension <math>H_4</math>.</p>

ages

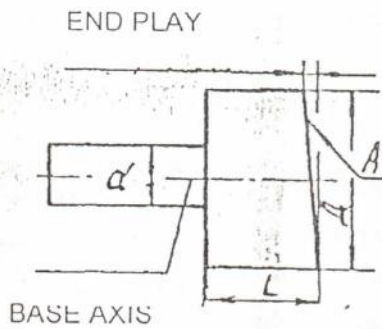
AMND	Page	No. of Doc.	Sign.	Date		520.TY1	Page no. 3 of 34

Deviation from perpendicularity



Deviation from perpendicularity of surface B relative to Surface A, should be with in tolerance range on dimension H.

End play

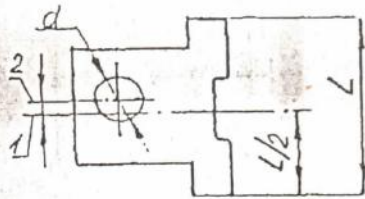


End play of surface A relative to base axis should be with in tolerance range on dimension L.

					520.TY1	Page no.
AMND	Page	No. of Doc.	Sign.	Date		4 of 34



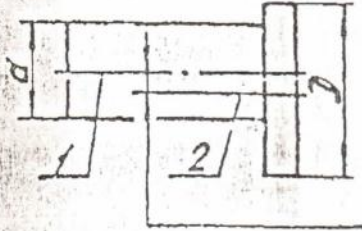
Deviation from symmetry



DEVIATION FROM SYMMETRICITY

Deviation from symmetry of axis 2 relative to axis 1 should be within tolerance range on dimensions d and L (MMC tolerance).

Deviation from coaxiality

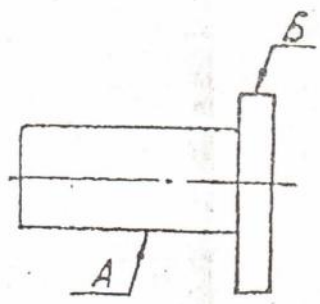


DEVIATION FROM ALIGNMENT

Deviation from co-axiality of axis 1 relative to axis 2 should be within half tolerance range on dimensions d and D (MMC tolerance).

AMND	Page	No. of Doc.	Sign.	Date	520.TY1	Page no. 5 of 34

Run out



Radial run out of surface B relative to surface A should be within doubled tolerance range on coaxiality.

- 2.3. Limit deviation of shapes of cylindrical surfaces should be within tolerance range of diameter.
- 2.4. Dimension determining positions of surface of parts with technological allowance need not be checked.
- 2.5. Threaded holes to be reamed at angles from  $90^{\circ}$  to  $120^{\circ}$  upto external diameter of threads.
- 2.6. While making threads by rolling, it is allowed to decrease diameter of unmachined parts of rod upto mean diameter of threads.
- 2.7. Unspecified limit deviation of chamfer should be as per table 2.

Table 2

In millimeters

Dimension of chamfer	0.3-0.4	0.5-1.0	1.2-3.0	3.5-5.0
Allowed deviation	$\pm 0.2$	$\pm 0.3$	$\pm 0.5$	$\pm 1$

2.8. Permissible limit deviation of radius should be as per table 3.

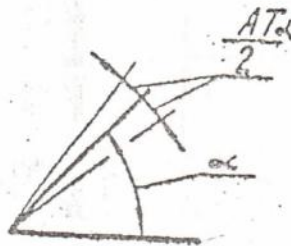
AMND	Page	No. of Doc.	Sign.	Date	520.TY1	Page no.
						6 of 34



Table 3

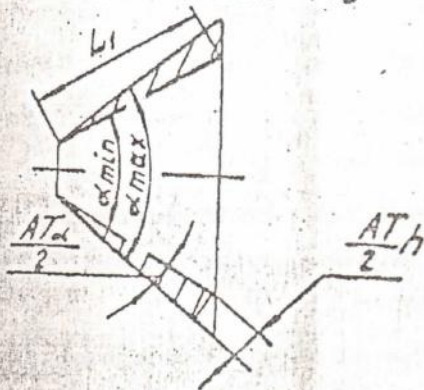
		In millimeters								
Dimension of radius	0.2	0.3-0.4	0.5 to 1.0	Above 1 to 3.0	Above 3 to 6.0	Above 6 to 15	Above 15 to 25	Above 25 to 30	Above 30	
permissible deviations	±0.1	±0.2	±0.3	±0.5	±1.0	±2.0	±3.0	±4.0	±5.0	

2.9. Unspecified limit deviation of angular dimensions should be as per table 4.

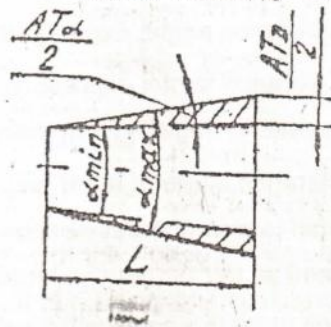


$$\alpha \pm \frac{AT_\alpha}{2} \text{ (SYMMETRICALLY)}$$

WHEN TAPER IS  $> 1:3$



WHEN TAPER IS  $\leq 1:3$



no.

4

AMND	Page	No. of Doc.	Sign.	Date	520.TY1	Page no. 7 of 34
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ab. 1600 to 2500

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Page no.  
of 34

2.10. Deviation from perpendicularity of axis of threaded holes to supporting surfaces not more than  $1^{\circ}30'$  is allowed (MMC tolerance).

2.11. Unspecified limit deviation of linear dimensions in design documentation, except fillet radii and chamfer, should be as per:

Holes as per H14;

Shafts as per h 14;

Others as per  $\pm \frac{IT16}{2}$  as per table 5.

Table 5

In millimeters

Nominal dimensions	Limit deviation of dimensions			
	Holes		Shaft	
	H14	h14	$\pm \frac{IT 14}{2}$	$\pm \frac{IT 16}{2}$
Less than 1	+0.10 0	0 -0.10	$\pm 0.050$	$\pm 0.07$
From 1 to 3	+0.25 0	0 -0.25	$\pm 0.125$	$\pm 0.30$
Above 3 to 6	+0.30 0	0 -0.30	$\pm 0.150$	$\pm 0.37$
Above 6 to 10	+0.36 0	0 -0.36	$\pm 0.180$	$\pm 0.45$
Above 10 to 18	+0.43 0	0 -0.43	$\pm 0.215$	$\pm 0.55$
Above 18 to 30	+0.52 0	0 -0.52	$\pm 0.260$	$\pm 0.65$
Above 30 to 50	+0.62 0	0 -0.62	$\pm 0.310$	$\pm 0.80$

AMND	Page	No. of Doc.	Sign.	Date	520.TY1	Page no. 9 of 34



Above 2500 to 3150	+5.40 0	0 -5.40	$\pm 2.700$	$\pm 6.75$
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2.12 Changing from one surface to another is carried out as per radius with tool (fig. 1a, b). Dimensions are to be ensured by tool.

2.13. Taper angle in holes with drill bit, reamer or other tools need not be checked (fig. 1b). Dimensions are to be ensured by tool.

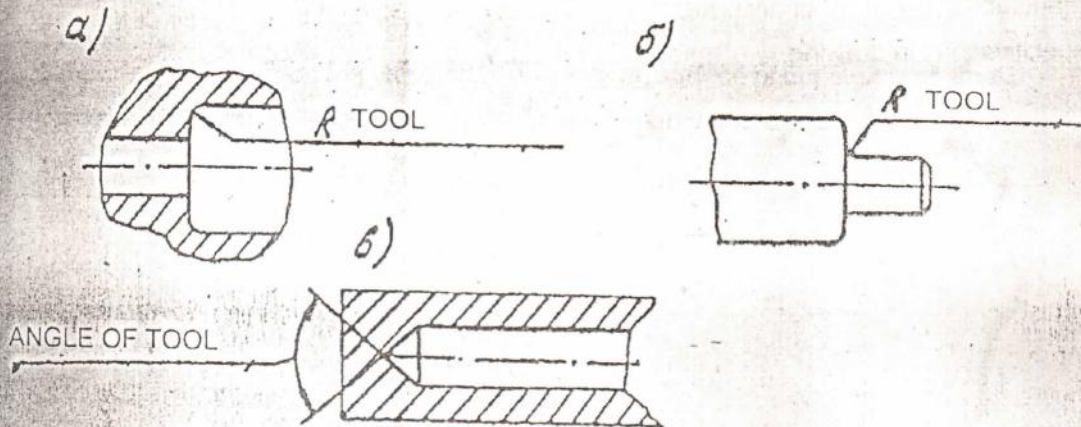


FIGURE 1

2.14. Blunting is carried out on external and internal angles of radii or by chamfering:

for external angles 0.2-0.5 mm;

for internal angles not more than 0.5 mm.

2.15. In holes surface finishing is as per 14 and lower, carried out by drilling, it is allowed to decrease diameters for values, equal to the half of tolerance range of surface finishing 12 for these diameters, except 172.54.003c5-3.

no.

34

AMND	Page	No. of Doc.	Sign.	Date	520.TY1	Page no. 11 of 34
------	------	-------------	-------	------	---------	----------------------



2.16. it is allowed to make standard bolts, screws and studs with tolerance range 6h and 8h, in place of 6g and 8g and in case of necessity, it is allowed to measure zinc plating surface, during assembly.

2.17. While making threads by rolling, transition radius from cylindrical part to thread and chamfer on rod after rolling need not be checked.

2.18. Displacement of marks on parts with left threading, carried out as per GOST 2904-91, need not be checked.

2.19. Non-standard nuts, heads of non-standard bolts and screws should be manufactured at level of accuracy B as per GOST 1759.1-82, if there are no other specifications in drawing.

AMND	Page	No. of Doc.	Sign.	Date	520.TY1	Page no. 12 of 34



### 3. REQUIREMENTS FOR PARTS, MANUFACTURED BY METHODS OF COLD STAMPING

3.1 Defects from raw materials, specified in compliance with standards and technical specifications of these materials are allowed on the surface of parts.

3.2 Traces of process of stamping as figures and bulge holes manufactured by extrusion, flanging, shaping and with bending, as well as local pressing and stamping of working surfaces of dies in depth not more than 12 % of actual thickness of parts is allowed on surfaces of parts.

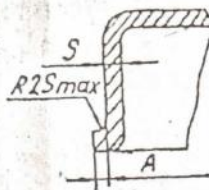
3.3 For parts, subjected to cutting after drawing, on surface of cut along external contour, edges A are allowed to project depending upon the overall dimensions of parts:

upto 150 mm not more than 0.5 mm;

upto 500 mm not more than 0.8 mm;

more than 500 mm not more than 1.2 mm;

At transition radii not more than 1.5 mm.



3.4 Projecting burrs of plane not more than 20 % thickness of parts, but not more than 1 mm, except specified in drawings on stamping parts.

3.5 On surface of cutting of parts from sheet material, draft, shrinkage of edges, double chips are allowed.

3.6 Dimensions, unspecified tolerances, given for design of tool and on parts need not be checked.

3.7 Decreasing of thickness of sheet above minus tolerance by 0.3 mm for thickness of 6mm and by 0.4 mm for thickness 8 mm and more are allowed during stamping thick sheet parts.

3.8 Other requirements as per OST 3-4343-87.

Page no.  
734

								Page no. 13 of 34
AMND	Page	No. of Doc.	Sign.	Date	520.TY1			



#### 4. REQUIREMENTS FOR PARTS MANUFACTURED BY METHODS OF DIE FORGING

4.1 Permissible deviation for rough dimensions of parts as per GOST 7505-89.

4.2 Drafts not more than  $7^{\circ}$ .

4.3 Unspecified fillet radii not more than 3 mm.

4.4 Local defects such as dents from scaling, burrs, taper cutting etc, as well as complete cutting or finishing defects on condition that dimensions of forging remain within tolerance range, on un-machined surfaces of forging.

4.5 Defects specified in standards or technical specifications on base material are allowed on un-machined surfaces of parts.

4.6 Thinning of cross section, while removing dents not more than 2 % above lower deviation is allowed on machined surfaces of parts.

4.7 On parts, manufactured from rod or sheets by the method of cutting on shear, drafts not more than  $7^{\circ}$  and folds are allowed.

4.8 Other technical requirements as per GOST 8479-70 and GOST 7505-89.

4.9 On parts, manufactured from rod or sheet by the method of bending, following are allowed:

- Thinning or ovality of cross section in place of bending not more than 10%;
- Occasional dents and folds at surfaces of bends.

					520.TY1	Page n
AMND	Page	No. of Doc.	Sign.	Date		14 of 34



## 5. REQUIREMENTS FOR CASTING

### 5.1 Requirements:

- For structural steel casting as per 172.TY4;
- For castings from special steel casting as per 172.TY5;
- For ferrous casting as per 172.TY6;
- For non-ferrous casting as per 172.TY7;
- For steel castings by investment casting as per 172.TY10.

Above specified technical specifications are obligatory for parts in drawings, which have reference to 432.TY4, 432.TY5, 432.TY6, 432.TY7, and 432.TY10.

5.2 While manufacturing parts from antifriction cast-iron of grade A4C-1 GOST 1585-85, hardness should be 180-240 HB.

AMND	Page	No. of Doc.	Sign.	Date	520.TY1	Page no. 15 of 34



## 6. REQUIREMENTS FOR MATERIALS AND ALTERNATE-MATERIALS

6.1 It is allowed to replace sheets with thickness 3.9 mm GOST 16523-97 of sheets with thickness 4 mm GOST 1577-93 with same grade of steel.

6.2 For all parts, which are stipulated in working drawings are manufactured from thin-sheet steel grade 08кп and 10кп GOST 16523-97, it is allowed to manufacture from steel 08nc and 10nc GOST 16523-97 and from 08кп and 08nc GOST 9045-93.

6.3 While manufacturing parts from rolled stock as per GOST 16523-97 of thickness from 2 to 3.9 mm, it is allowed to use rolled stock of III<sup>rd</sup> group of finished surface.

6.4 For manufacturing parts from low alloy steel. Steel 09Г2 GOST 19281-89, thickness higher than 5 mm, it is allowed to use steel from 6 to 12 categories.

It is allowed to use steel 09Г2Д GOST 19281-89 in place of steel 09Г2 of same category.

6.5 For all parts, which are stipulated in working drawings are manufactured from angular rolled stock of grade Ст3сн and Ст3кп GOST 380-94, it is allowed to manufacture from angular rolled stock of grades 09Г2 and 09Г2Д as per GOST 19281-89 of category 2 for rolled stock thickness of 4 mm and category 6 and 12 with thickness of 5 mm and higher and from angular rolled stock of type Ст3сн and 09Г2 as per TY 14-1-3023-80; but for parts from angular rolled stock grades 09Г2 and 09Г2Д as per GOST 19281-89, it is allowed to manufacture from angular rolled stock Ст3пс, Ст3сн and Ст3кп as per GOST 380-94 and from angular rolled stock of grades Ст3сн and 09Г2 as per TY 14-1-3023-80, except 175.64.093-1.

6.6 For all parts, which are stipulated in working drawings, are manufactured from aluminum alloy sheet grade Аmг6БМ GOST 21631-76, it is allowed to manufacture from aluminum alloy sheet Аmг6М GOST 21631-76 for all parts.

6.7 Parts, which are manufactured from copper grades М3 GOST 859-78 of all types of rolled stock, it is allowed to manufacture from copper grade М1 and М2 GOST 859-78.

					520.TY1	Page no.
AMND	Page	No. of Doc.	Sign.	Date		16 of 34



6.8 In assembly units and parts, where hot tinning and soldering with solder ПООСy-30-2 or ПООСy -40-2 is carried out, it is allowed to use solder grade ПООС-30 GOST 21930-76 or GOST 21931-76.

6.9 In place of solder ЛK62-0.5 and ЛO60-1, it is allowed to use soldering grade Л63 GOST 16130-90.

6.10 Bolts, screws and studs, of strength class 4.6 and screws with strength class 8, may be manufactured from steel grade 20nc GOST 10702-78, as well as steel grades 15 and 20 as per TY 3-80-80, during this for bolts, screws and studs strength class 5.8 is permitted, and for steel 40 GOST 1050-88 with specifications in accompanied documentation of strength class as per basic documentation.

6.11 Bolt M6x12.46.016 GOST 7798-70; Bolts M6-6gx12.66.016, M6-6gx14.66.016, M6-6gx16.66.016, M6-6gx10.66.016, 3M6-6gx10.66.016, 3M6-6gx12.66.016, 3M6-6gx16.66.016 GOST 7805-70 is allowed to manufactured from steel 40X GOST 10702-78 with heat treatment, providing strength class 6.6 GOST 1759.4-87 (heat treatment of bolts-strength class 8.8 is allowed).

6.12 Bolts M6-6gx14.66.016, M6-6gx16.66.016, M6-6gx10.66.016, 3M6-6gx10.66.016, 3M6-6gx12.66.016, 3M6-6gx16.66.016 GOST 7805-70 is allowed to manufactured as per GOST 7798-70 from steel 40X GOST 10702-78 with heat treatment, providing strength class 6.6 GOST 1759.4-87 (heat treatment of bolts-strength class 8.8 is allowed).

6.13 All Bolts and screws with designated strength class 8.8, except bolts, entering into groups 40, 43, 46, 64, it is allowed to manufacture from steel 35X and 40X GOST 4543-71 and by cold upsetting from steel 35X and 40X GOST 10702-78.

6.14 Asbestos board grade KAOH-1 GOST 2850-95, used for packing, to be ordered without markings of industrial cloth and straight lines of longitudinal knurling due to turning of drum.

6.15 It is allowed to manufacture screws GOST 17473-80 of strength class 4.6 together with screws GOST 1491-80 of strength class 4.6 except bolts M3-6gx6.46.016, M6-6gx18.46.016.

Page no. 16 of 34						520.TY1	Page no. 17 of 34
AMND	Page	No. of Doc.	Sign.	Date			



6.16 Bolts of GOST 7808-70, in designation of which shows strength class 6.6, is allowed to manufacture from steel 40X GOST 10702-78 with strength class 8.8 or 6.6.

6.17 Operating drawings, which are stipulated in working drawing are manufactured from thin sheet rolling grade ПТК of ТУ 14-11-262-89, is allowed to manufacture from steel grade 10кп of any group GOST 16523-97 for all parts.

6.18 Bolt as per GOST 7798-70 is allowed to manufacture from high forging in head not more than 1 mm, with diameter  $D \leq 0.8S$ .

6.19 Parts with which are stipulated in working drawing are manufactured from ribbon grade Y7A GOST 2283-79, is allowed to manufacture from the same tape of grades Y8A GOST 2283-79.

6.20 For all parts, which are stipulated in working drawing are manufactured from aluminum sheets and table grade АД1, АД0 GOST 4784-97 (32), is allowed to manufacture from aluminum sheets and plate grades A5, A6, A7 as per GOST 11069-74.

6.21 For all parts, which are stipulated in working drawings are manufactured from rolling with quality surface of group Б GOST 1051-73, is allowed to manufacture from same rolling with quality of surface Group B GOST 1051-73.

6.22 it is allowed to use white lead as per instructions АДК 25064.00028 in place of whitening lead hard removing МА-011-1 GOST 482-77 for packing connections.

6.23 In place of steel 20ХГНР GOST 4543-71, allowed to use steel grade 20Х2Н4А.

6.24 It is allowed to manufacture and mount bolts GOST 7795-70 and GOST 7796-70, as replaceable.

6.25 It is allowed to use washer of accuracy class A in place of accuracy class C as per GOST 6958-78, GOST 10450-78, GOST 11371-78.

6.26 It is allowed to use bakelite varnish ЛБС-1 ТУ6-07.455-93 in place of varnish ЛБС-1 GOST 901-78.

6.27 It is allowed to replace nuts M3-6H.8.40.016 GOST 5927-70 and M4-6H.8.40.016 GOST 5927-70 to M3-6H.8.20.016 GOST 5927-70 and M4-6H.8.20.016 GOST 5927-70.

					520.TY1	Page n
						18 of 3
AMND	Page	No. of Doc.	Sign.	Date		



## 7. REQUIREMENTS FOR HEAT TREATMENT OF PARTS

7.1 Hardness of heat treatment of parts, if it is not specified in drawings, they are to be checked on non working surfaces, allowances or standard samples, subjecting to heat treatment jointly with parts. During this slot for checking hardness should be:

- on un-machined surfaces of hot forging and casting not less than depth of decarbonised layer;
- on un-machined surfaces of cold stamping – not more than 1.0 mm;
- on un-machined (non operating) surfaces of parts – not more than 0.5 mm.

7.2 On parts, having hardness more than 302 HB ( $d_{\text{отн}} 3.5$ ) is allowed to check their hardness as per HRC, in separate cases for parts with cross section less than 10 mm with hardness 229-285 HB ( $d_{\text{отн}} 4.0-3.6$ ) is allowed to test hardness as per HRA.

7.3. Scope, methods of checking and place of measuring hardness, if this is not specified in drawings of parts, specified in technical documentation.

7.4 Standard bolts with diameter M6, M8, M10 from steel 38XC to be heat-treated till hardness 255-302 HB.

7.5 Measuring hardness of bolts is allowed to produce on face of heads or at end of rod in flush with not more 0.5 mm.

7.6 Mounting screws as per GOST 1478-93 and GOST 1481-84 of strength class 33H from steel 38XC heat treatment is allowed upto hardness 255-302 HB.

AMND	Page	No. of Doc.	Sign.	Date	520.TY1	Page no. 19 of 34



## 8. REQUIREMENTS FOR PARTS MANUFACTURED FROM PIPES FOR PIPE LINES

8.1 Corrosion, cracks, burrs, cuts and other defects are not allowed on surfaces and ends of pipes.

8.2 Ovality of pipe in places of bend not more than 15% is allowed on external diameter.

8.3 Dents with out undercutting from depth not more than 10 % from external diameter is allowed on surface of pipe.

8.4 Corrugation with height 1.5 mm for pipe with diameter not more than 20 mm and height 2 mm for pipe with diameter more than 20 mm are allowed in places of bending pipes.

8.5 Permissible thinning of wall of bended pipe should not exceed following values of primary thickness:

- for pipe from aluminum alloys – 25 %;
- for pipe from steel – 20 %;
- for pipe from copper and copper alloys – 10 %.

8.6 Edges of broken pipes should not have burrs and sharp edges.

8.7 End of pipe should be cut at angle 90° with surface finishing not less than  $Rz_{160}\sqrt{r}$ .

8.8 Expanding pipe should be projected under nipple not less than at 0.5 mm uniformly throughout the contours.

8.9 Internal surface of tank, radiators and pipelines (Pipes, branching pipe and hose connection) should be clean – presence of mechanical impurities in planes is not allowed. During this after blowing pipe with compressed air mechanical parts, visible to naked eyes on white tissue paper should not be present.

Marks of liquid, used during tests for leak tight ness are allowed.

8.10 During assembly of pipe lines with soldering rings with the method of furnace soldering for providing required gap in mating parts calibration of ends of pipes to suit is allowed.

						Page
						20 of
AMND	Page	No. of Doc.	Sign.	Date	520.TY1	



8.11 During furnace soldering, it is allowed to leak, solder on surfaces of soldered parts.

8.12 While manufacturing steel or copper pipes with the use of gas soldering and induction and casehardening is allowed to use in following soldering rings:

- 520.20.001 replace with 54.05.233;
- 520.20.001-01 replace with 54.02.517;
- 520.20.001-02 replace with 54.03.101;
- 520.20.001-04 replace with 54.42.094

Pressing of rings of pipes during assembly is allowed.

8.13 Pipes of air systems, are to be thoroughly purge with compressed gas, passed through moist-oil separator and with felted or felt filler.

8.14 Ends of pipes, branch pipes, hole and branch pipes in tanks, radiators, opened in ends of air systems should be protected from damages and getting dirt of polythene film or technological plugs.

Plugs should be carried out in type of thread caps made from metal or plastic, threaded caps or rubber cap. Plugs should be fitted tightly and should not allow entering dust and dirt.

Removing plugs or film is allowed only before connecting .

					520.TY1	Page no.
AMND	Page	No. of Doc.	Sign.	Date		21 of 34



## 9. REQUIREMENTS FOR SPRINGS

9.1 Surface of spring should not have cracks, under cuts and folds.

9.2 End (non-working) coils of spring should be pressed compressed to operating coils. After loading springs, as mentioned in drawing, residual deformation of it, is not allowed.

9.3 Permissible deviation of external diameter of spring, if they are not mentioned in drawings, should be in limits as mentioned in table 6.

Table 6

In millimeters

External diameter of spring	Upto 10 incl	ab. 10 to 30 incl	ab. 30 to 40 incl	ab. 40 to 80 incl.
Permissible deviation	±0.3	±0.5	±0.7	±1

9.4 Permissible deviation number of complete turns  $\pm 0.5$  turns.

9.5 Thickness end of supporting turn of compressed spring should have not less than  $0.15d$ , and length of arc of machined surface should be not less than  $0.75$  length of circle of turn.

9.6. All springs, manufactured from wires as per GOST 9389-75, should be subjected to low temperature tempering.

9.7. Dimensions without allowances need not be checked.

9.8. For spring, in drawings of which are not specified gap between supporting and operating turns – specified gap is determined as per formula  $0.15(t-d)$ ,

Where  $t$  – pitch spring;

$d$  - diameter of wire.

					520.TY1	Page 22 of
AMND	Page	No. of Doc.	Sign.	Date		



## 10 REQUIREMENTS FOR PARTS MANUFACTURED FROM NON-METALLIC MATERIALS

10.1 Acceptance and checking of rubber-industrial parts are produced as per TY 005216-99.

10.2 In drawings of rubber parts, in which connections are stipulated with gluing of cold hardening in inclined cut, it is allowed to carryout connection of edges by mating with the methods of vulcanization.

10.3 Presence of de-colorization of ingredients and products on surfaces of rubber mixture and parts.

10.4 Presence of glue layer and rubbers are allowed on rubber-metallic assembly units.

10.5 It is allowed to grind surfaces of parts to suit of mold connection.

10.6 In all before released drawings РТДИ to their republication of dimensions, indicated in drawing without tolerances, execute by tolerances as per table 7.

Table 7

In millimeters

As per overall dimensions (length, width, diameter)		In height and thickness	
Normal dimensions	Tolerance	Nominal dimensions	Tolerance
Till 5.0	±0.3	Till 2.0	±0.3
Above 5.0 to 10.0	±0.5	Above 2.0 to 5.0	±0.5
Above 10.0 to 25.0	±0.6	Above 5.0 to 10.0	±0.8
Above 25.0 to 50.0	±0.8	Above 10.0 to 20.0	±0.7
Above 50.0 to 100.0	±1.0	Above 20.0 to 50.0	±1.0
Above 100.0 to 150.0	±1.5	Above <del>50.0</del> to 100.0	±1.5
Above 150.0 to 250.0	±2.0	Above 100.0 to 150.0	±2.0
Above 250.0	±1.0 %	Above 150.0	±1.5%



10.7 Local scaling of rubber on rubber metallic assembly units is allowed to stick with gluing of cold hardening.

10.8 It is allowed to use industrial plate TY 38 105867-90, rubber mixture as per TY 38 0051166-98, to be replaced with same grades of rubbers and plates as per TY 005216-99.

10.9 It is allowed to use industrial plates HO-68-1M TY 005216-99 in place of plates HO-68-1 TY 005216-99.

					520.TY1	Page
AMND	Page	No. of Doc.	Sign.	Date		24

11. REQUIREMENTS FOR METALLIC AND NON-METALLIC  
(IN- ORGANIC) COATING

11.1 Requirements for metallic and non-metallic (In-organic) coating should comply with TY-16.

11.2 Technical specifications TY-16 are obligatory for parts and assembly units, in drawings, which have reference to 432.TY3.

11.3 Zinc coating with thickness of 3 microns (013) for bolts as per GOST 17473-80 and GOST 1491-80 with pitch of threads upto 0.45 is replaced with coating of thickness 6 micron (016).

Page no. 24 of 34						520.TY1	Page no. 25 of 34
	AMND	Page	No. of Doc.	Sign	Date		



## 12. REQUIREMENTS FOR SOLDERING EQUIPMENT WITH PIPE LINES

12.1 Soldering equipment (nipples, unions, protractors and others) with pipelines should be done by soldering, grade of which is specified in compliance with drawings.

12.2 Defects type unspecified figures, dents and other defects in permissible limits with state standards of pipes are allowed on the surface of pipeline, subjected to soldering.

12.3 Gap between fittings and pipe for copper-zinc soldering should be in limits from 0.05 to 0.45 mm (to side), but for solder ПС<sub>p</sub> from 0.05 to 0.3 mm.

12.4 checking quality of soldering fitting with pipelines, as well as other requirements of soldering as per existing instructions of chief welder, upon agreement with chief designer and representative of customer.

					520.TY1	Page
						26 of
AMND	Page	No. of Doc.	Sign.	Date		



### 13. REQUIREMENTS FOR PARTS OF INNER AND OUTER SHIELDS

13.1 Unspecified limit deviation of dimensions:

Linear  $\pm 2$  mm;

Angular  $\pm 30'$ ;

13.2 It is allowed to increase drafts in holes and slots for ensuring the removal of parts from molds.

13.3 Double images and traces from marking sign with depth not more than 3 mm is allowed during marking molding.

13.4 In holes with diameter, not more than 15 mm, trim the flash from forging in customer-factory.

13.5 Unspecified radii not more than 5 mm.

13.6 It is allowed to round up angles with radius not more than 3 mm

13.7 Dimension, except thickness, given for projecting tool are not subjected for checking.

Page no.  
34

					520.TY1	Page no. 27 of 34
AMND	Page	No. of Doc.	Sign.	Date		



#### 14. REQUIREMENTS FOR PREMISES AND WORK PLACES

14.1 Premises and operating places where assembly is carried out for parts and air pipelines and heating system, lubricating and cooling systems, hydro-systems and hydro units should be with out dust particles, falling of dirt, abrasive and foreign inclusions.

					520.TY1
AMND	Page	No. of Doc.	Sign.	Date	



## 15. REQUIREMENTS FOR MOUNTING RUBBER-INDUSTRIAL PARTS (PTA)

15.1 Before mounting RIP should be cleaned from possible dirt, dust etc.

15.2 Mounting of RIP in mounting places is carried out with consideration of excluding bends and mechanical damages.

15.3 On mounting with RIP metallic surfaces sharp edges, dents and other mechanical damages are not allowed.

15.4 If while setting in mounting pin of RIP pass through groove, spline, thread it is recommended to use mandrel if necessary.

15.5 Before mounting, RIP and surface friction should be lubricated by lubricant or operating medium for preserving completeness of RIP.

15.6 Repeating setting of demounting ring and collars are not allowed.

15.7 Before assembling threads with parts, through which mounting of ring are carried out, should be lubricated by thin layer of lubricant or operating medium.

15.8 Pressing collar in bay is carried out with the help of fixture by fixing uniformly in all end surfaces of collar. During this should be carefully observe that bend of collar and damages of external rubber layer of collar.

Page							Page no.
28 of	AMND	Page	No. of Doc.	Sign.	Date	520.TY1	29 of 34



## 16. REQUIREMENT FOR NAME PLATES

16.1 Name plates should be flat, burrs are not allowed

16.2 Image on table should be short. Font as per GOST 2930-62.

16.3 Image should project or sink relative plane of tables.

16.4 It is allowed to obtain image on tables of photochemical methods.

16.5 Image or background should not be cleaned with water, oil and diesel fuels.

16.6 Table around should be covered with colour less varnish.

16.7 Dimension of words, their location and frame executed by guiding with format

					520.TY1
AMND	Page	No. of Doc.	Sign.	Date	



REFERENCE STANDARD DOCUMENTS

Designation of document	Number of sheets on which having reference
GOST 380-94	16
GOST 482-77	18
GOST 859-78	16
GOST 901-78	18
GOST 1050-88	17
GOST 1051-73	18
GOST 1478-93	19
GOST 1481-84	19
GOST 1491-80	17, 25
GOST 1577-93	16
GOST 1585-85	15
GOST 1759.1-82	11
GOST 1759.4-87	17
GOST 2283-79	18
GOST 2850-95	17
GOST 2904-91	10
GOST 2930-62	30
GOST 4543-71	17, 18
GOST 4784-97 (32)	18
GOST 5927-70	18
GOST 6958-78	18
GOST 7505-89	14

					520.TY1	Page no. 31 of 34
AMND	Page	No. of Doc.	Sign.	Date		



GOST 7795-70	18
GOST 7796-70	18
GOST 7798-70	17, 18
GOST 7805-70	17
GOST 7808-70	17
GOST 8479-70	14
GOST 9045-93	16
GOST 9389-75	22
GOST 10450-78	18
GOST 10702-78	17
GOST 11069-74	18
GOST 11371-78	18
GOST 16130-90	17
GOST 16523-97	16, 17
GOST 17473-80	17, 25
GOST 19281-89	16
GOST 21631-76	16
GOST 21930-76	16
GOST 21931-76	16
OST 3-4343-87	13
АДК 25064.00028	18
60.018TY	2
432.И6-1	2
TY3-80-80	17
TY6-07-455-93	18
TY 14-1-3023-80	16
TY 14-11-262-89	17

					520.TY1	Pat 32
AMND	Page	No. of Doc.	Sign.	Date		



TY 005216-99

TY 38 0051166-98

TY 38 105867-90

23, 24

24

24

AMND	Page	No. of Doc.	Sign	Date	520.TY1	Page no. 33 of 34



AMENDMENT SHEET

Change	Number of list (pages)				Total lists (page) in document	No. Of document	Input Number accompanying Document and Date	Signature	Date
	Changed ones	Replaced ones	New	Withdrawal ones					
81						188.49- 01			
82	18,32					188П11 -01			

					520.TY1	Page no.
AMND	Page	No. of Doc.	Sign.	Date		34 of 34