INSTRUCTION MANUAL

No 1201-01

PRECISION MACHINE VISES

TYPE 6620, 6621, 6622, 6623, 6624

Read your instructions !

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TABLE OF CONTEST:

1. SCOPE OF MANUAL

The manual covers characteristic, operating and maintenance of precision machine vises of 6620, 6621, 6622, 6623 and 6624 type.

2. PRECISION MACHINE VISES APPLICATIONS

Precision machine vises are used for precision milling and grinding operations on CNC and conventional machine tools. The design, accuracy and quality ensure exact positioning the workpiece and obtaining large clamping forces. Vises may be also set up into machining units directly on machine table for clamping large workpieces or multi-machining.

3. CONSTRUCTION OF PRECISION MACHINE VISES

Construction of precision machine vises of 6620 is shown at Fig. 1 and 2.

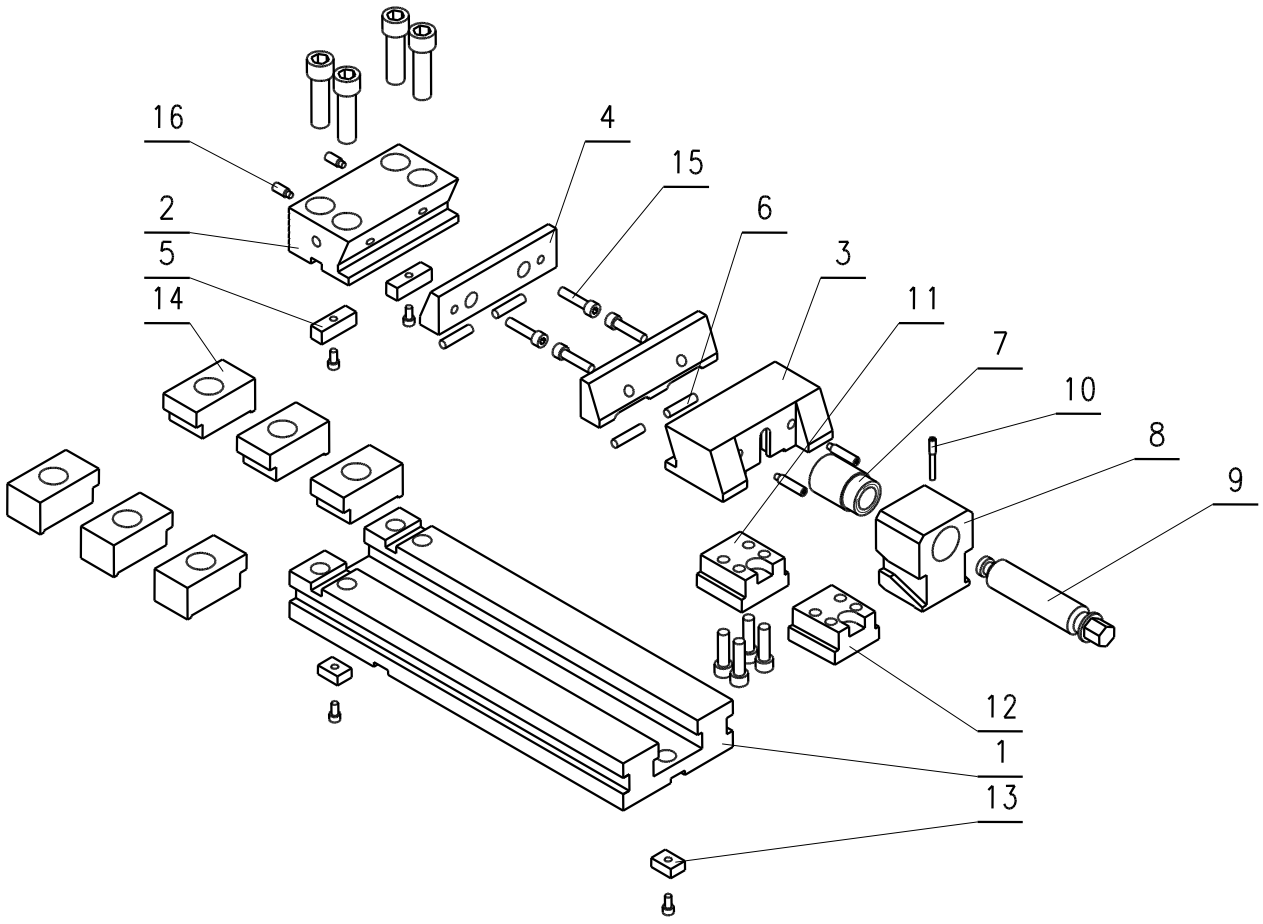

Fig. 1. Construction of precision machine vises of 6620.

The cross-section of precision machine vise of 6620 type is shown at Fig. 2.

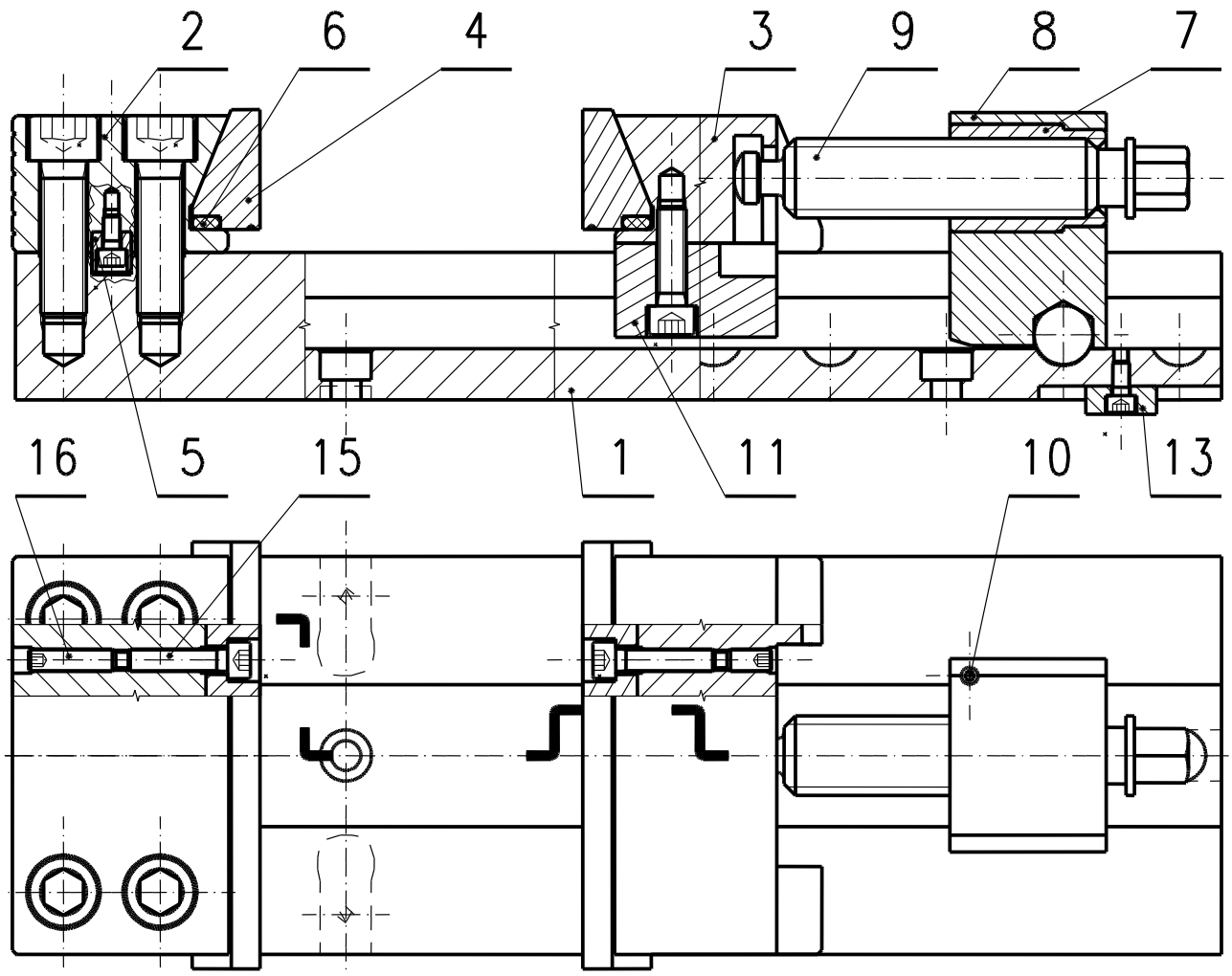

Fig. 2. Cross-section of precision machine vise of 6620 type

1. Base
2. Fixed jaw
3. Movable jaw
4. Clamping insert
5. Key
6. Thrust plate
7. Sleeve
8. Holder
9. Lead screw
10. Screw
11. Guide plate
12. Self-aligning guide plate
13. Fixture key
14. Clamping lug
15. Bolt
16. Screw

4. BASIC SPECIFICATIONS OF PRECISION MACHINE VISES

Basic specifications of precision machine vises - type 6620 and 6621 are shown at Fig. 3 and Table 1.

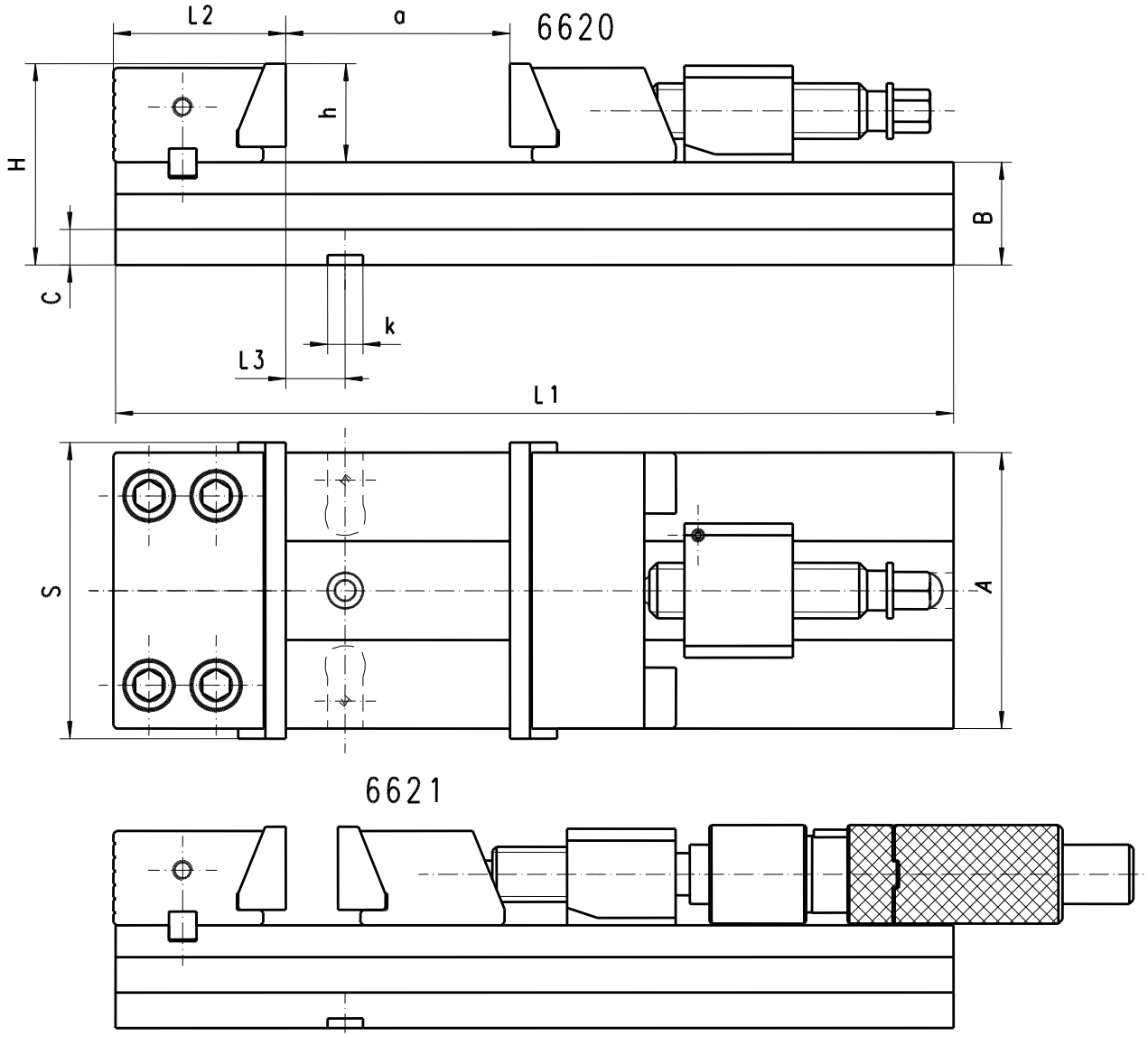

Fig. 3. Basic dimensions of precision machine vises- type 6620 and 6621.

Table 1. Basic specifications of precision machine vises - type 6620 and 6621.

Type	S	A	B *-0,02*	C	H	L1	L2	L3 *±0,02*	a	h	k *M6*	Max.clamping force *daN*	Weight *kg*
6620-100-320/165	100	85	35	13	65	320	61,8	18	165	30	12	2000	9,84
6620-125-335/165	125	105	42	15	82	335	68	24	165	40	12	3000	15,71
6620-150-425/210	150	140	52	18	102	425	87,29	30,2	210	50	18	4100	31,95
6620-150-475/260						475			260				35,18
6620-150-520/305						520			305				36,96
6620-200-535/260	200	165	61	20	121	535	109,43	47,07	260	60	18	4500	58,95
6620-200-585/310						585			310				61,66
6620-200-635/360						635			360				64,36

NOTE !

Dimension h in 6620 type vises is different then that in vises of 6566; 6567; 6568; 6569-M; 6571 and 6577

Basic specifications of precision machine vises - type 6622 and 6623 are shown at Fig. 4 and Table 2.

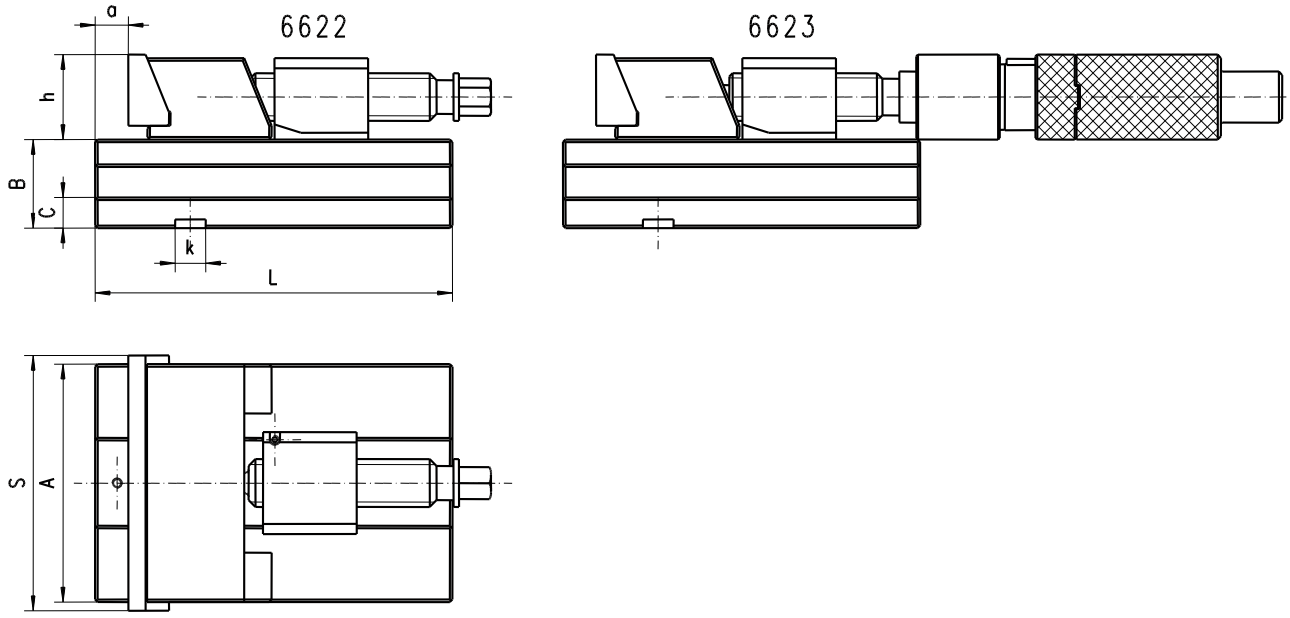

Fig. 4. Basic dimensions of precision machine vises - type 6622 and 6623.

Table 2. Basic specifications of precision machine vises - type 6622 i 6623.

Type	S	A	B *-0,02*	C	L	a	h	k *M6*	Max.clamping force *[daN]*	Weight *[kg]*
6622-100	100	85	35	13	140	48	30	12	2000	5,3
6622-125	125	105	42	15	160	60	40	12	3000	8,7
6622-150	150	140	52	18	210	86	50	18	4000	19,1
6622-200	200	165	61	20	240	78	60	18	4500	33,9

Basic specifications of precision machine vises - type 6624 are shown at Fig. 5 and Table 3.

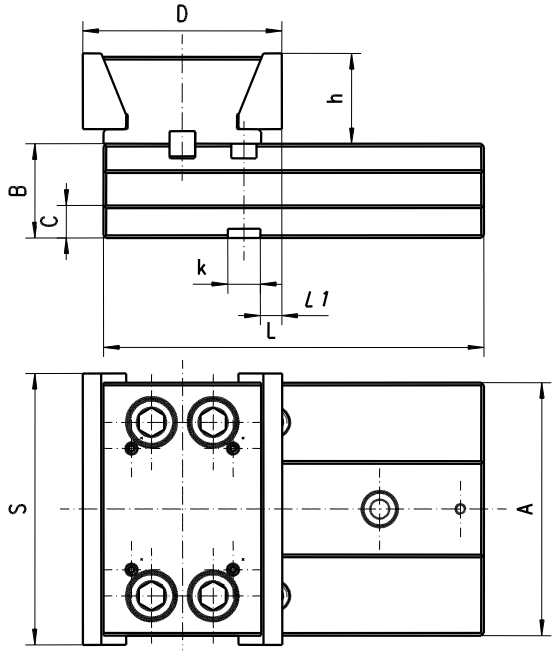

Fig. 5. Basic dimensions of precision machine vises- type 6624.

Table 3. Basic specifications of precision machine vises - type 6624.

Type	S	A	B *-0,02*	C	D *±0,04*	L	L1 *±0,02*	h	k *M6*	Max. clamp force *[daN]*	Weight *[kg]*
6624-100	100	85	35	13	80	155	10	30	12	2000	4,4
6624-125	125	105	42	15	84	160	10	40	12	3000	6,7
6624-150	150	140	52	18	110	210	12	50	18	4000	14,5
6624-200	200	165	61	20	127	240	15,5	60	18	4500	26,5

5. OPERATION

5.1. Preparation the vise to operation

After unpacking the vise please:

- Check if none of parts is missing,
- Remove the preservative from vise surfaces,
- The mating surfaces of clamping inserts (4), fixed jaw (2) and movable jaw (3) should be covered with some grease,
- While transporting the vise to machine tool make sure that the holder is protected against self-tilting by means of the screw (10),
- Screw (10) should not be screwed to the vise guides,
- Before attempting the operation check the gap width between clamping inserts and jaws as stated in point 5.5.

5.2. Vise positioning on machine tool

Use the parallel and longitudinal keyways and fixture keys (13) to position the vise on the machine-tool table.

5.3. Fastening vises on the machine-tool table

Machine vises of 6620 type may be fastened on machine-tool table in longitudinal and transverse way. The transverse fastening with clamping lugs, delivered with vises, is able on tables with dimensions as shown in Fig.7 and Table 4. Location of clamping lugs is shown in Fig. 6.

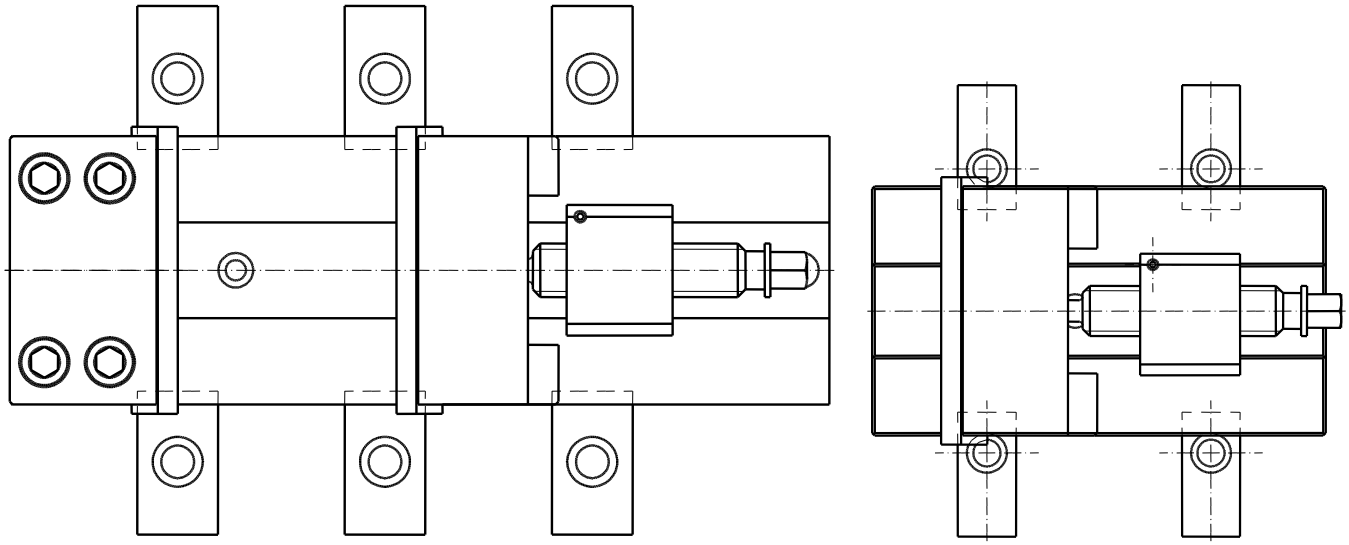

Fig. 6. The way of fastening machine vises of 6620 type on machine-tool table.

Fig. 7 shows correct location of the vise on machine-tool table. Only unloaded part of the vise base may project outside the table (the one beyond the holder). Cases shown in Fig. 8 are forbidden.

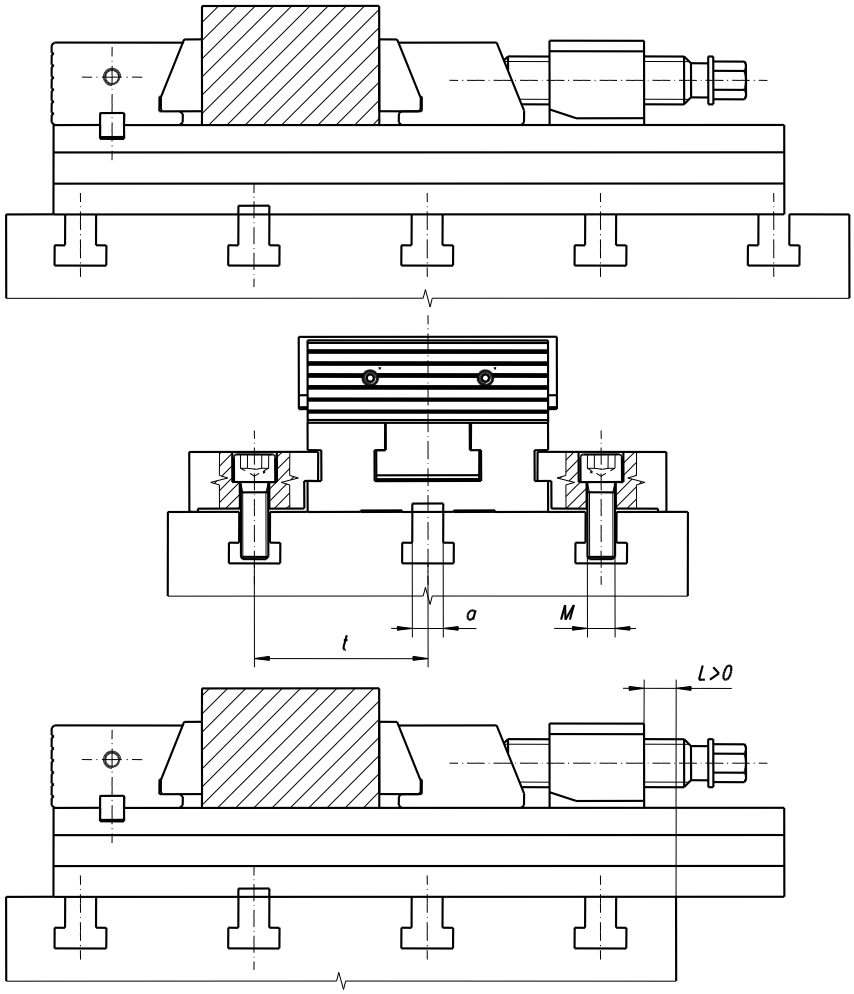

Fig. 7. Correct location of vise on machine-tool table

Table 4. Machine-tool table dimensions

Type	Machine-tool table dimensions		
	a	t	M
100	12	50; 100	M10x35-10.9
125	12	32; 63	M10x35-10.9
150	18	50; 100	M16x45-10.9
200	18	63; 125	M16x45-10.9

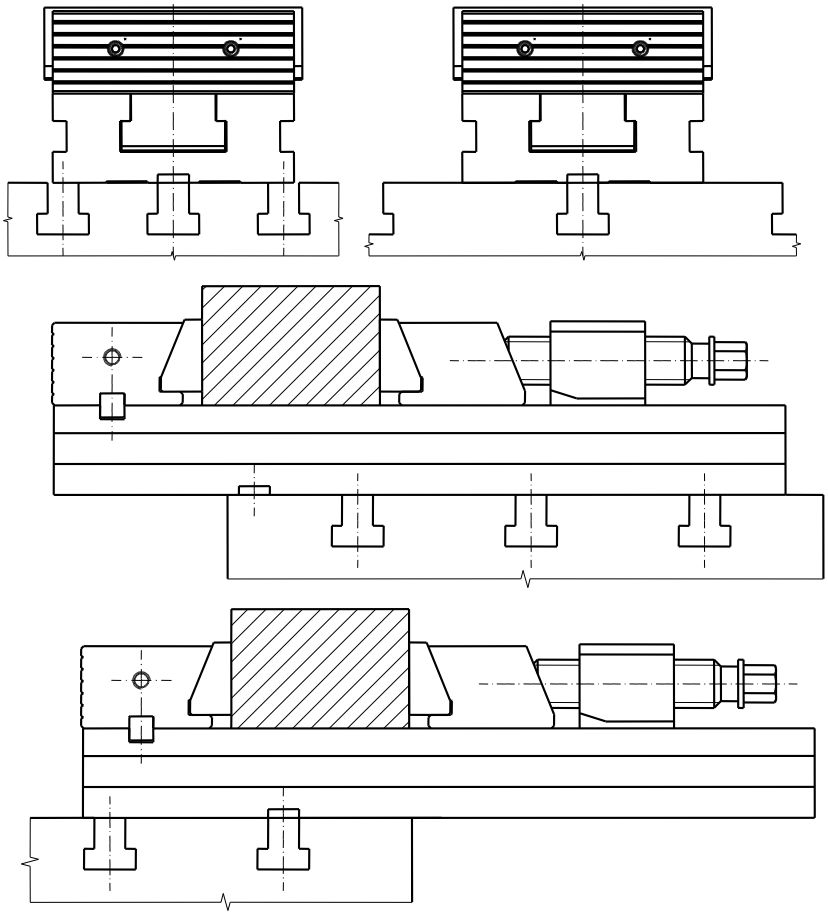

Fig. 8. Forbidden location of vise on machine-tool table.

5.4. Changing the opening range

Before changing the opening range clean vise base (1), lead screw (9) and holder (9). To change the opening range just tilt the holder (8) forward and move it to engage the proper recess in the base (Fig. 9).

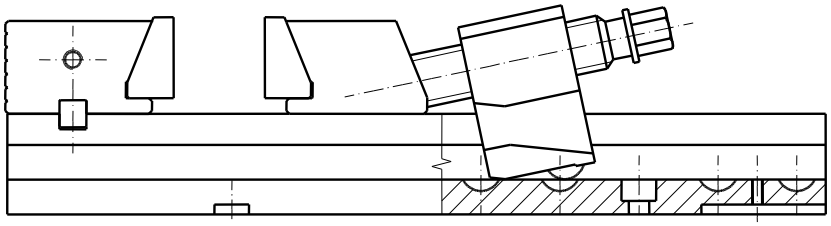

Fig. 9. Changing the opening range

The screw (10) located in holder (8) secures the holder from self-tilting and accidental movement of whole assembly: holder-lead screw-movable jaw.

Holder (8) must be secured from self-tilting by screwing on the screw (10) when:

- ***transporting or repositioning the vise on the machine-tool***
- ***using the vise in vertical position***

The screw (10) should not be screwed to the vise guides.

5.5. Clamping the workpieces

Clamping inserts are seated in vise jaws with play ensuring correct clamping the workpieces. The value of play should be L = 0.2 mm with accuracy of positioning *±0.01 mm*. The difference between “L” dimensions in movable and fixed jaw should not exceed 0.01 mm. Accuracy of positioning of clamping insert is shown in Fig. 10.

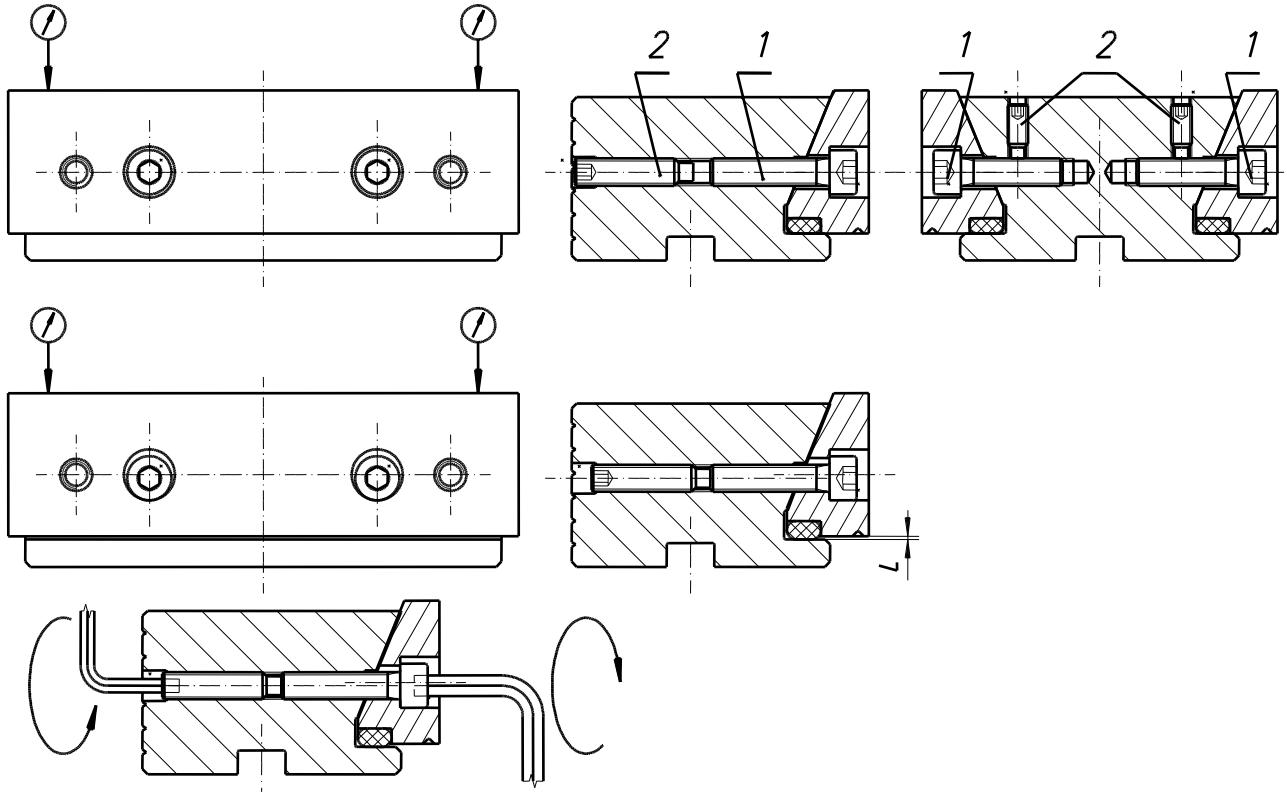

Fig. 10. Accuracy of positioning of clamping insert.

To obtain the required positioning of clamping insert do as follows:

1. Loosen set screws (2).
2. Tighten the bolts (1) to make the clamping insert seat in jaw guide.
3. Check with dial gauge the parallelism of clamping insert toward the vise base.
4. By loosing bolts (1) set required value of L = 0.2 (± 0.01) mm.
5. Check with dial gauge the parallelism of clamping insert toward the vise base, parallelism of clamping insert toward the vise base should be the same as measured in point 3.
6. By tightening set screws (2) secure bolts (1).

Perform above steps for setting clamping inserts both in fixed jaw and movable jaw. The proper clamping conditions is obtained when clamping inserts seat into jaw guides. That assures the best clamping accuracy.

Each time after end of machining:

- ***clean thoroughly the base guides, clamping inserts, jaws and lead screw,***
- ***pay special attention to clean the gap between clamping inserts and jaws (L dimension on Fig. 10).***

If during the clamping, inserts do not seat on jaw guides:

- ***dismantle clamping inserts,***
- ***clean insert surfaces mating the jaws and cover them with some grease***
- ***by means of mounting bolts set the correct position of inserts to obtain the required value of L.***

Hammering the clamping inserts or the workpiece, base guides or the wrench when clamping is forbidden.

Do not lengthen the wrench while clamping.

Inadmissible shape, thickness and way of clamping workpieces in vise jaws presented in Fig. 9 are inadmissible. The workpieces should be clamped at the A-B section of clamping insert (Fig. 11). The thickness of clamped workpieces (“P” dimension as in Fig. 11) should not be less then 1/3 h (the “h” values as presented in Fig. 3).

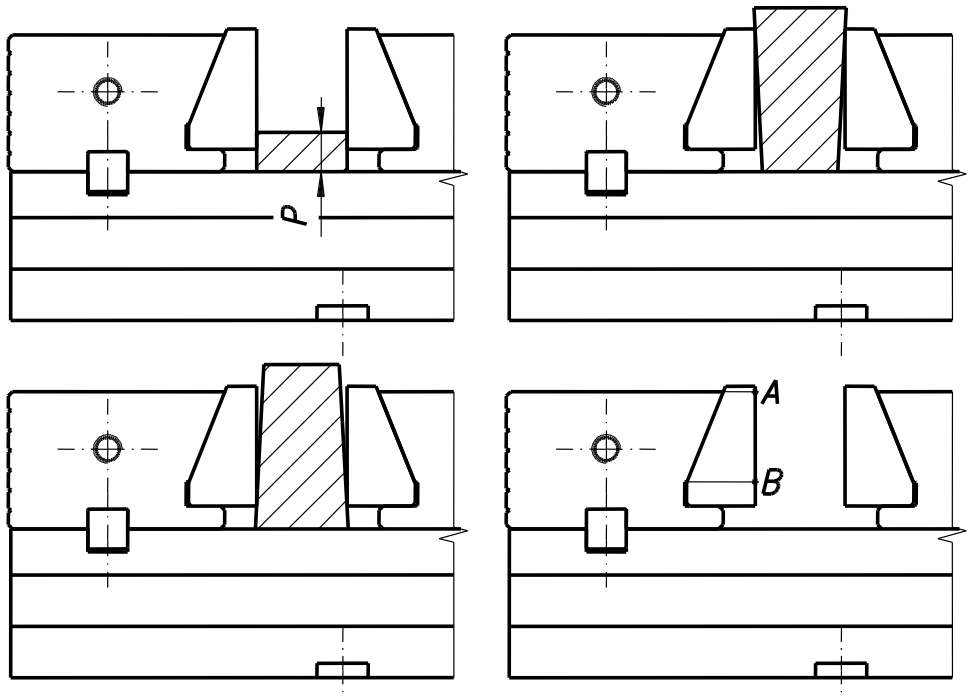

Fig. 11. Inadmissible shape of workpiece.

The ways of clamping the workpieces of irregular shapes are shown at Fig. 12, 13 and 14.

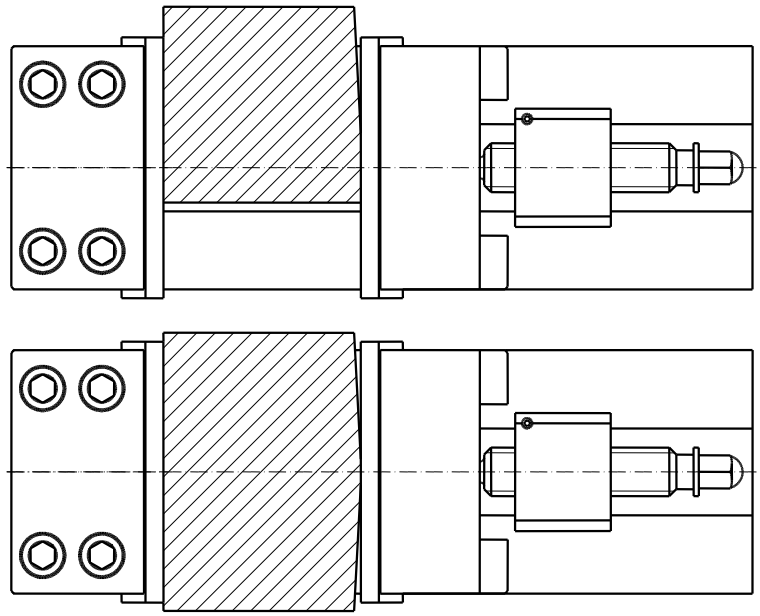

Fig.12. The way of clamping the workpiece of irregular shape.

The right effectiveness of clamping is achieved when S_{min} >1/2 S.

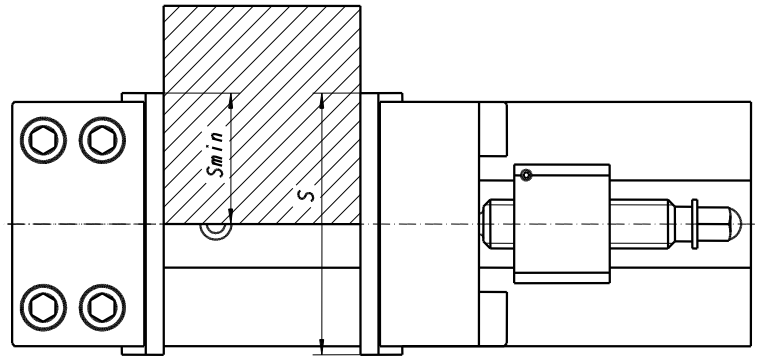

Fig. 13. The way of clamping the workpiece of irregular shape.

The clamping the workpiece with taper lower then 1:100 may be effective only when it is clamped at entire length of jaws.

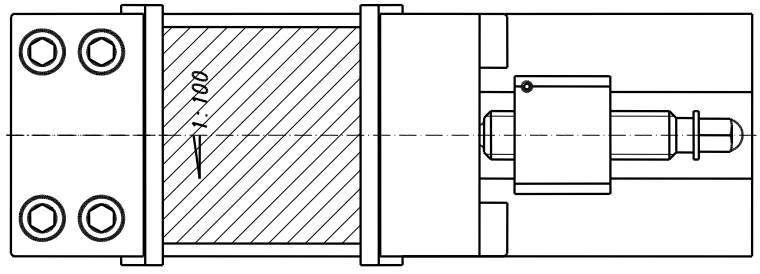

Fig. 14. The way of clamping the workpiece of irregular shape.

Jaw insert should be mounted on jaw guides when:

- Clamping the workpiece with jaw edges
- Clamping the workpiece with grooved surface of stationary jaw
- Clamping the workpiece with the prismatic or stepped jaw inserts (Fig. 22, Fig. 23)
- Clamping the workpiece with the grooved jaw inserts (Fig. 21),

When clamping shafts with the prismatic jaw insert (Fig. 23) the other jaw insert must have plain surface.

For clamping the workpieces with irregular shapes the swinging leading plate can be used which allows the movable jaw to swivel by about ± 2°.

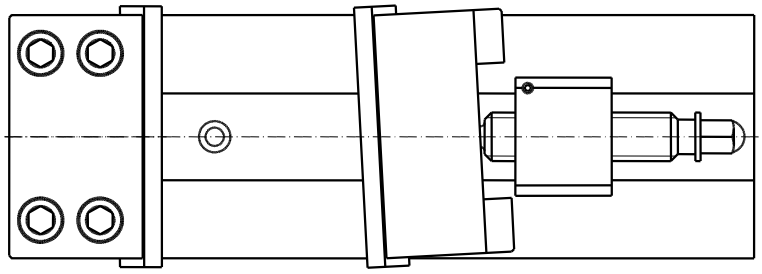

Fig. 15. Usage of self-aligning guide plate.

5.6. Using the sets of vises

Precision machine vises may be assembled in machining sets. It enables machining large workpieces or multi-machining. Examples of clamping positions with the use of vises of 6620; 6621; 6622; 6623; 6624; 6568; 6569M; 6571; 6577 type are shown in Fig. 17.

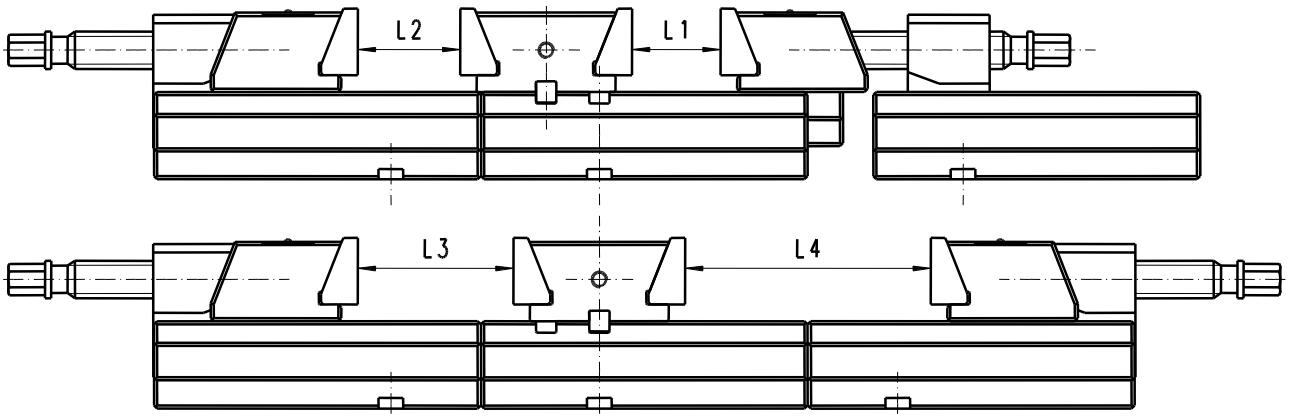

Fig. 16. Examples of clamping.

Type	L1	L2	L3	L4
100	0 – 43	0 – 40	7 – 64	50 – 107
125	0 – 43	0 – 50	8 – 76	52 – 120
150	0 – 62	0 – 75	12 – 106	67 – 166
200	0 – 57	0 – 65	13 – 104	75 – 166

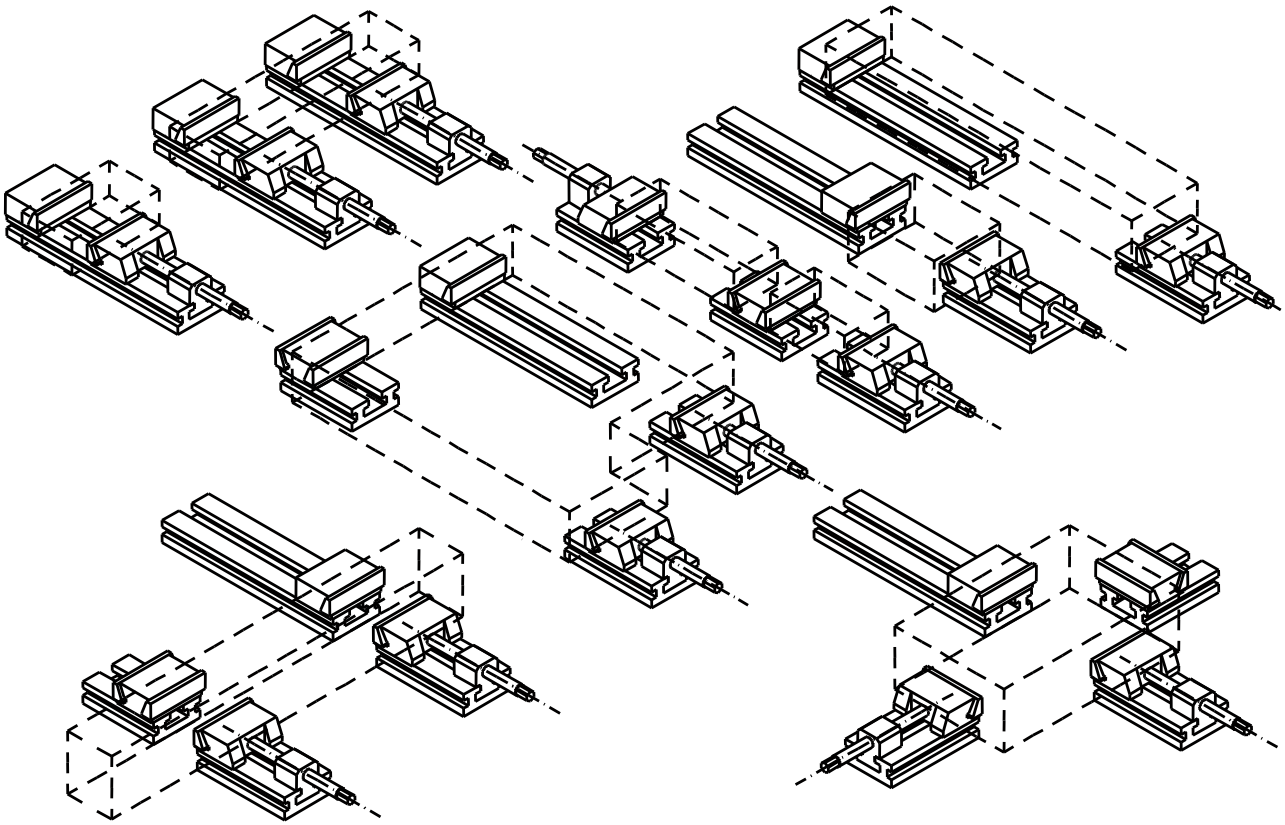

Fig. 17. Examples of clamping positions.

6. ACCESSORIES

6.1. Standard accessories

Standard accessories for the precision vises include:

Item	Type				
	6620	6621	6622	6623	6624
Wrench	1	–	1	–	–
Clamping lug	6	6	4	4	4
Self-aligning guide plate	1	1	1	1	–
Wrench type 6596	–	1	–	1	–
Fixture key	2	2	2	2	2
Fixture key screws	2	2	2	2	2

6.2. Optional accessories

The optional accessories of precision vises include:

- Lead screw block - it may be replaced with hydraulic spindle block or may be a spare part

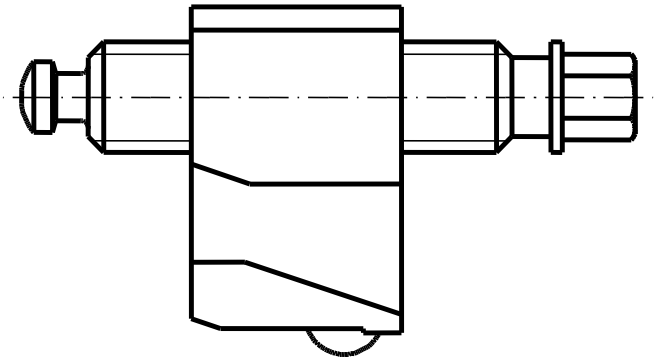

Fig. 18. Lead screw block.

- Hydraulic spindle block - it may be replaced with lead screw block or may be a spare part

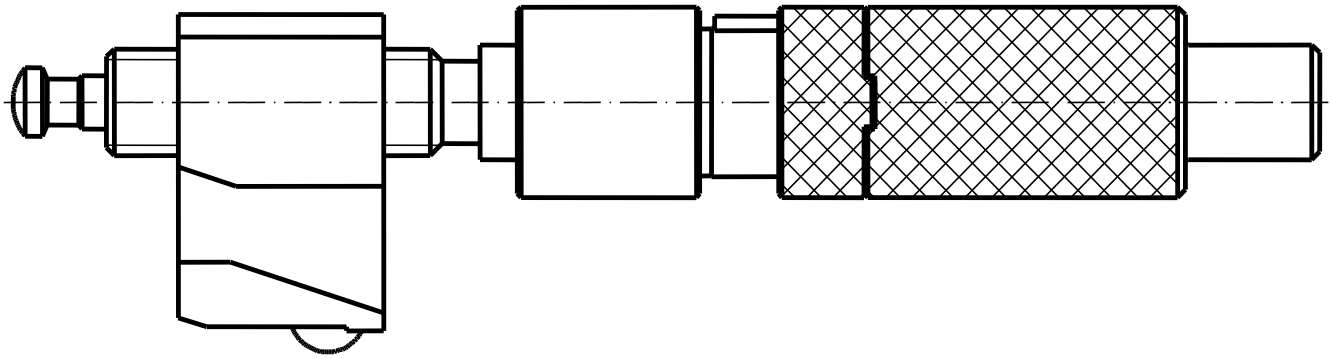

Fig. 19. Hydraulic spindle block.

- clamping inserts plain

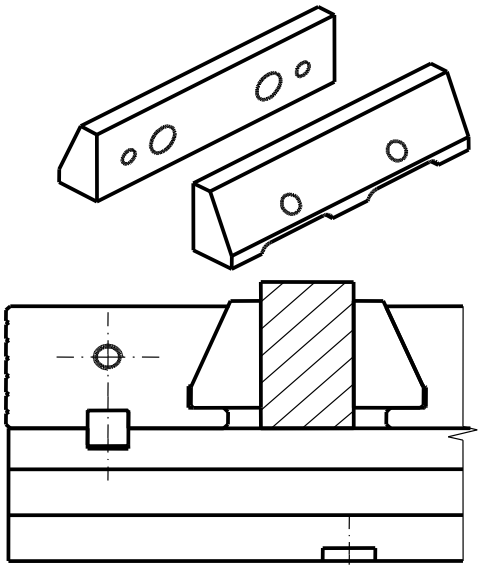

Fig. 20. Clamping insert - plain.

- grooved jaw insert

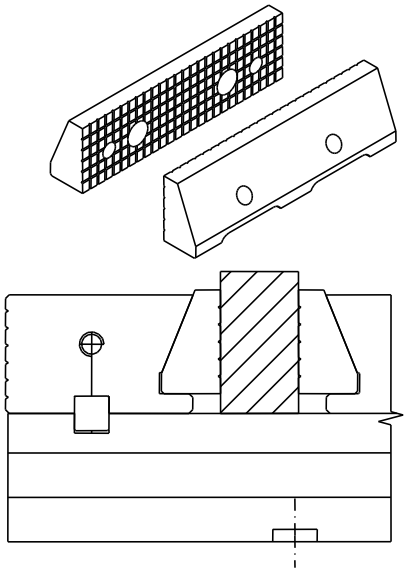

Fig. 21. Grooved jaw insert.

- stepped jaw insert

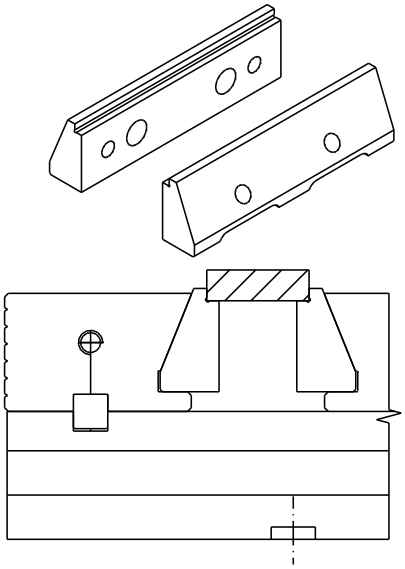

Fig. 22. Stepped jaw insert.

- prismatic jaw insert with step

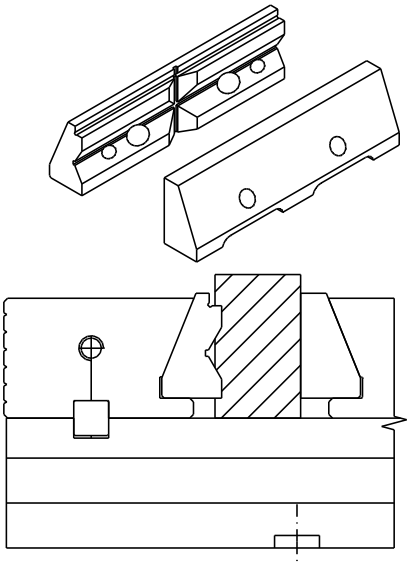

Fig. 23. Prismatic jaw insert with step.

- side stop of 6597 type - when fastened to the side of fixed jaw enables positioning of workpieces parallel to inserts surfaces

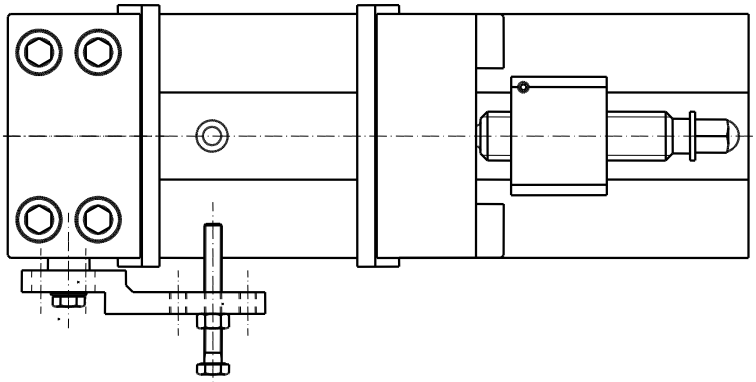

Fig. 24. Side stop of 6597 type.

- swivel base of 6586 type - enables rotating the vise around vertical axis at a required angle. The base is graduated ± 90° in 1° increment.

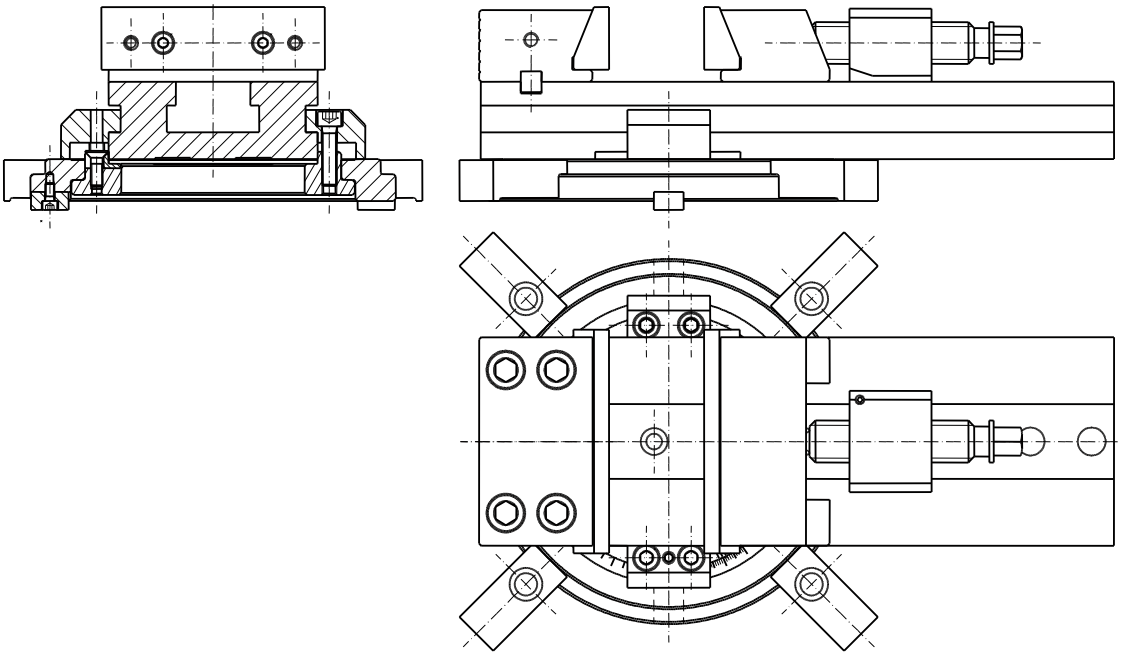

Fig. 25. Swivel base of 6586 type.

7. MAINTENANCE

Each time after end of work:

- Clean thoroughly the vise.
- Dismantle the clamping inserts.
- Clean inserts, jaws and thrust plates.
- Cover the surfaces of inserts mating with the jaws with some grease.
- By means of mounting bolts set the correct position of inserts to obtain the required value of L dimension (point 5.5).
- Preserve the vise with the anti-corrosive.

8. WORK SAFETY REGULATIONS

- Operator must read this instruction before attempting to operation.
- In case of abnormal work of spacer or damages, stop the work and inform supervision staff.
- Qualified personnel must perform repairs and overhauls.
- Except mentioned above regulations observe your local safety rules.

9. FINAL REMARKS

- Following the instructions given in this manual provides long lasting and trouble-free vice operation.
- Failing to do this will void any manufacturer warranties and liability.

Manufacturer reserves the right to make the construction changes without notice

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