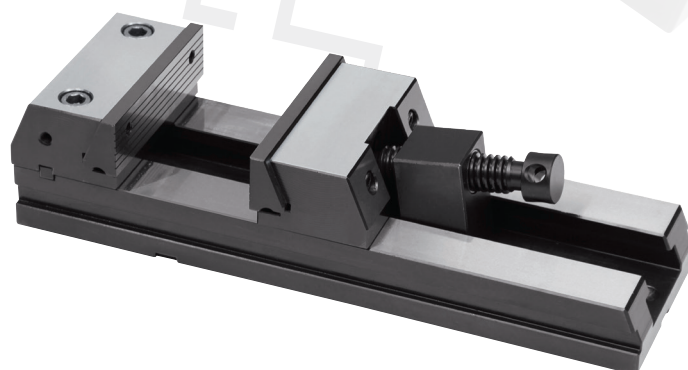




**Production vices
PRD Y PRD G series
with descending effect**

User manual



PRD, Production

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■ 1. TECHNICAL FEATURES

Made from carburizing treatment material DIN 14 CrMo13 (F155)

Casehardened layer: 1 mm

Hardness 60HRc. steel.

Fully grinded.

G8 (D dimensions) finished tolerance.

Parallel tolerance, varies from 0.03 to 0.06 according to the length of the body. (SEE FIG 1.1)

Negative perpendicular alignment of the jaws from 0.025 to 0.04 mm. Jaws are made in negative angle in order to countertrack the deformation during the tightening

Jaws with descending effect. Due to its geometry, when the part is tighten it goes down. (SEE SECTION 2)

Jaws-holder with oscilating effect. (SEE SECTION 3).

Fastening to the machine with clamps or with the two L holes. (SEE SECTION 4)

Selection of fast mobile jaws-holder position, by ball insertion (SEE SECTION 5)

Interchangeable spindle: mechanical, hydraulic or with mechanical multiplier. (SEE SECTION 6)

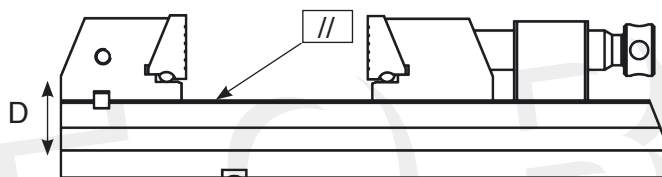


Figure 1.1

■ 2. DESCENDING EFFECT JAWS

By tightening, the parts goes down.

There are 4 screws to hold jaws and 4 return rubber that make jaws return to is original position when pressure stops.

To get descending effect: untighten the 4 screws approximately 1/2 turn. (The more you loosen them the greater the jaws descend.)

To avoid descending effect, tighten the four screws, by that way, the jaw will be blocked in the lowest position.

Advice on the descending effect.

Change the rubbers once a year.

Release the jaws from time to time to clean them and greasing them.

For very high precision works, apply only the des-cending effect to the movable jaw.

For works where is not useful or it is harmful, avoid descending effect in both jaws.

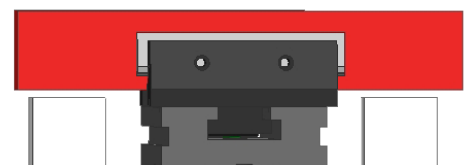


Figure 2.1



Figure 2.2

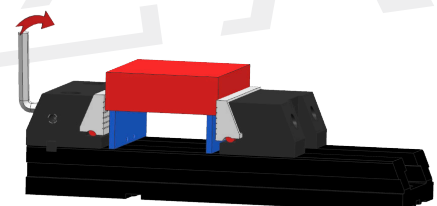


Figure 2.3

■ 3. MOVABLE JAW-HOLDER GUIDE

The unguided vices have the oscillating movable jaws-holders.

This allows the jaws-holder to adapt perfectly to irregular pieces.

Significantly improves tightening in roughing, forging, casting parts or badly finished parts. (SEE FIG 3.1)

If we tie an irregular part with a guided vice, the part will be fasten only in a point.

As much as we fasten the part, it will be released when milling (SEE FIG 3.2)

With the non guided vices you can not make lateral moorings. To do it, you have to put a limit block .

Usually one screw and one nut are enough. (SEE FIG 3.3)

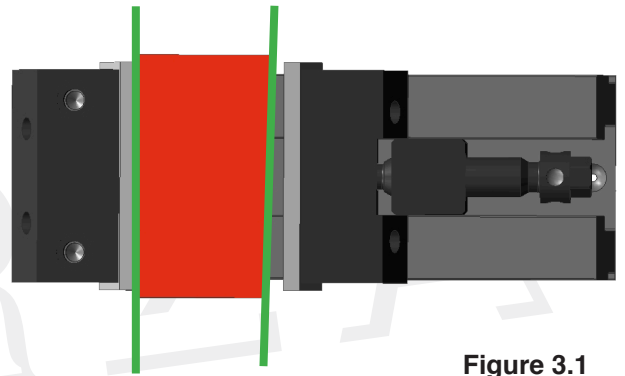
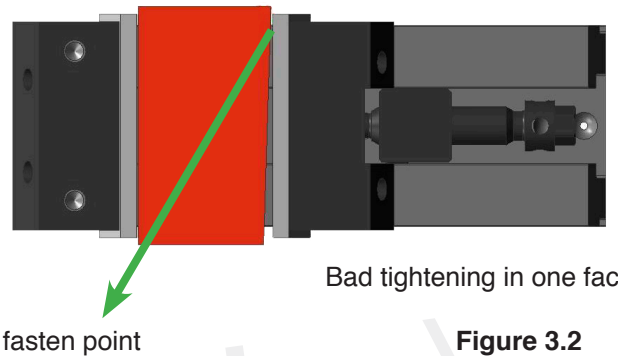


Figure 3.1



One fasten point

Figure 3.2

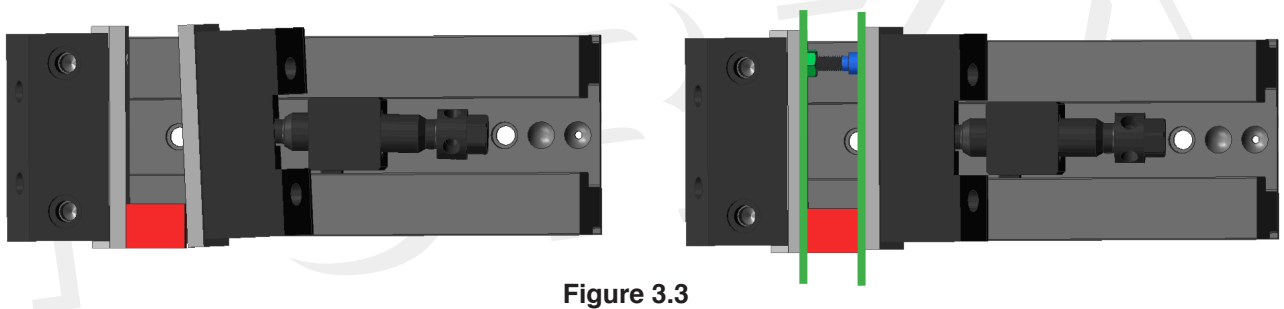


Figure 3.3

Guided machine vices DO NOT present the oscillating movable jaw.

They are supplied with a spare T-piece to have this effect. (SEE FIG 3.4)

Pay special attention when working with guided jaws.

If the piece to be machined is not perfect, it can have a bad tie. It is convenient to change the T part to have the oscillating effect (SEE FIG 3.5)

Fastening lateral parts like the one in figure 3.6 is incorrect, the mooring will be very light and the piece can be released.

When attaching lateral pieces, be sure to perform very light operations.



Figure 3.4

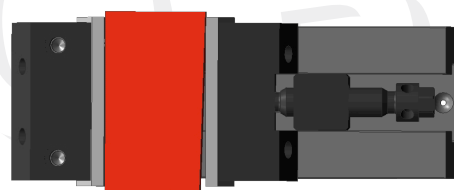


Figure 3.5

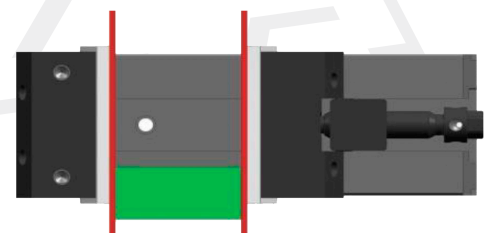


Figure 3.6

■ **4. VICE FITING**

4.1. With clamps:

To FIT the vice in the machine we have to tie-down clamps and alignment key-nuts.

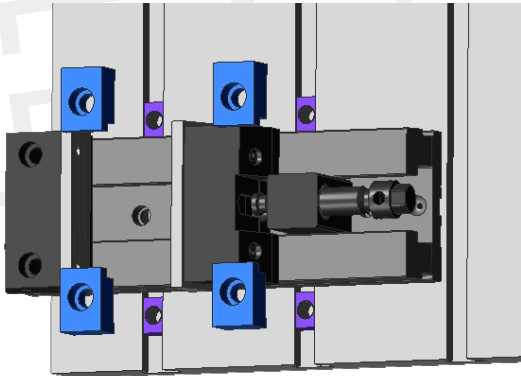


Figure 4.1

1. Use alignment key-nuts.
2. Place clamps as close as possible to the jaws.
3. Tighten clamps.
4. Align with clock. Lock the fixed jaw

IMPORTANT

It is very important to tighten the fixed jaw before passing the dial gauge, so that it is perfectly located in its lower position.

Never align the vice without lowering the fixed jaw. It will produce errors.

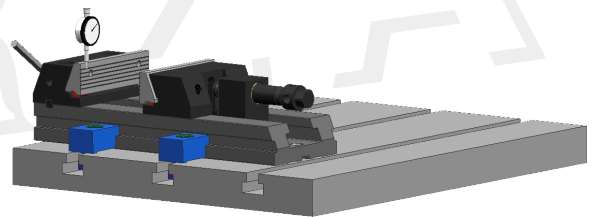


Figure 4.2

4.2. Without clamps:

To place the clamp in the longitudinal direction, the body has two holes to screw directly to the slotted table.

1. Use the key-nuts for rough alignment.
2. Tighten the screws.
3. Align with the dial gauge.
4. Remember that the vice is only fastened with two screws.
5. For higher strength works add lateral clamps.

■ 5. SPINDLE FITING

Quick course selection.

In this type of vices, the selection of spindle course is very fast. Just lift the spindle, move it to its new position and lower it back again.

This mechanism also allows changing very easily the vice tightening type.

Just take the spindle placed in the vice and put another one of the other optional tightening that we have.

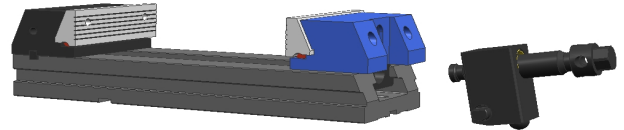


Figure 5.1

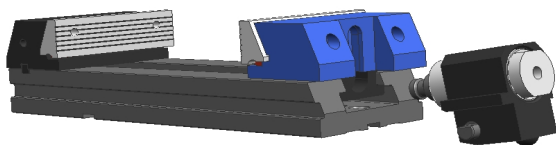


Figure 5.3

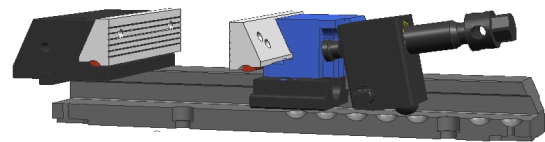


Figure 5.2

■ 6. SPINDLE TYPES

Any of our vices can use indifferently the tightening spindle listed below. These spindles can be easily changed.

Therefore, with the same vice, the user can obtain the most convenient tightening for each job at any time.

6.1 Selection of the appropriate spindle

Each piece that is going to work, requires a different tightening effort. Before selecting the type of mooring, keep in mind:

More strength does not necessarily mean better tightening.

All the jaws are deformed under pressure. Thus, the clamping force is the enemy of the precision.

Descending jaw vices need less tightening pressure than straight ones, because they make a cone effect over workpiece and they guarantee the perfect placement of it during working tie, avoiding vibrations..

A correct selection of work stops and clamping points in workpieces is as important as clamping strength (SEE SECTION 8).

TABLE 6.1 Characteristics of the different types of tightening

	Mecanico	Multiplicador mecánico	Multiplicador Hidráulico	Oleoneumático
Price/Quality	Best	Medium	Worst	Medium
Maintenance	Not necessary	Hardly any	Oil leak, joint	Joint
Clamping Speed	East	Medium	Slowest	Very fast
Comfort	Normal	Normal	Normal	The most comfortable
Spindle stroke	unlimited	unlimited	1 mm	14 o 27 mm
Force control	Torque Range	Moment clock	Marked Spindle	Air pressure
Kind of work	Almost any	For great working effort	A few	Large series short cycles
Loose clamping force while using	No	No	20 al 30%	No
Work Safety	Completely	Completely	Oil leaks hard to detect	Oil leaks hard to detect

6.2 Importance of the precision effort:

Vices bend when making strengths, therefore we should take into account the following advice:

Kinds of deformation:

A workpiece leaned against the jaw, can bend and slide about 0,1 mm with pressures of 5 to 6 Tons.

Elasticity of the vice:

It is very important that the vice is made of elastic material, because when applying the same strength it will also bend. Therefore, always check clamping strength in accurate works.

FORZA vice are made of case hardened steel (**F155 hardened and tempered**) which characteristics are the following ones:

- Yield point until 460-530 MPa.
- Mechanical strength: 720-910 MPa.

Steel is 3 more elastic than cast.

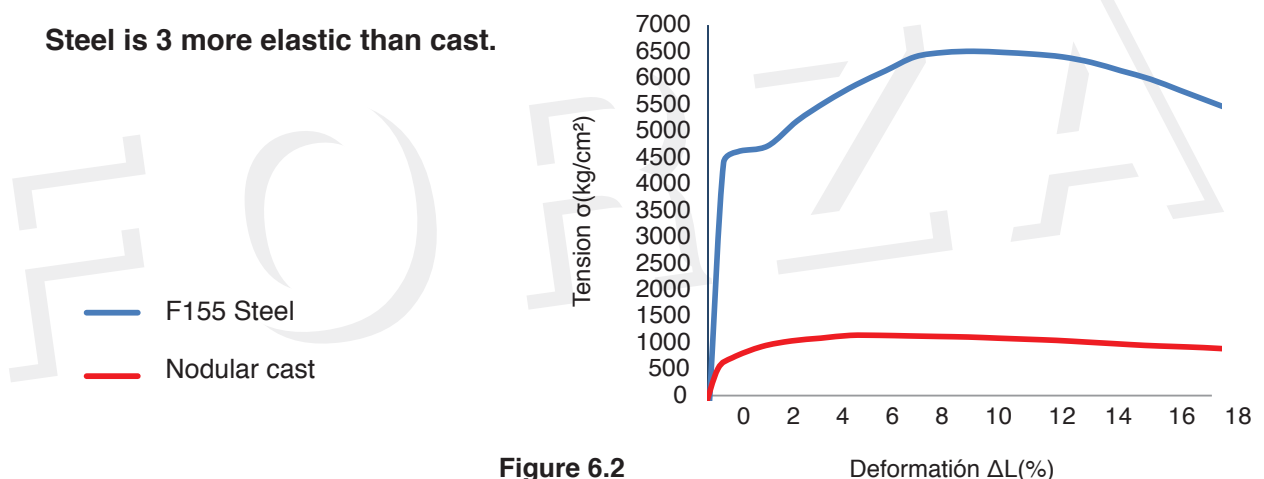


Figure 6.2

6.3 Mechanical spindle

It is the most advisable spindle for 90% of the milling works (SEE TABLE BELOW). It can work with handle, hexagonal or torque wrench. It is always recommended to use torque wrenches to make a better control of clamping strength.

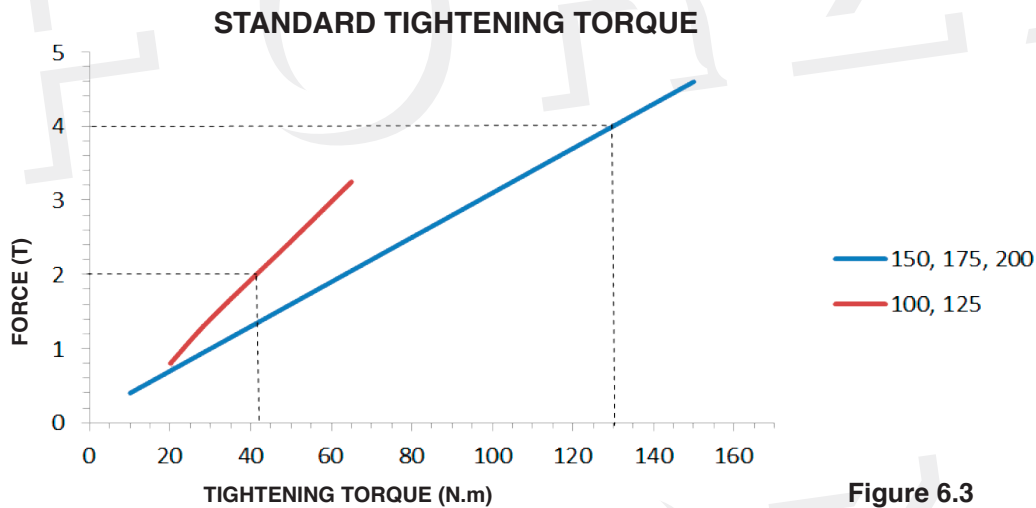
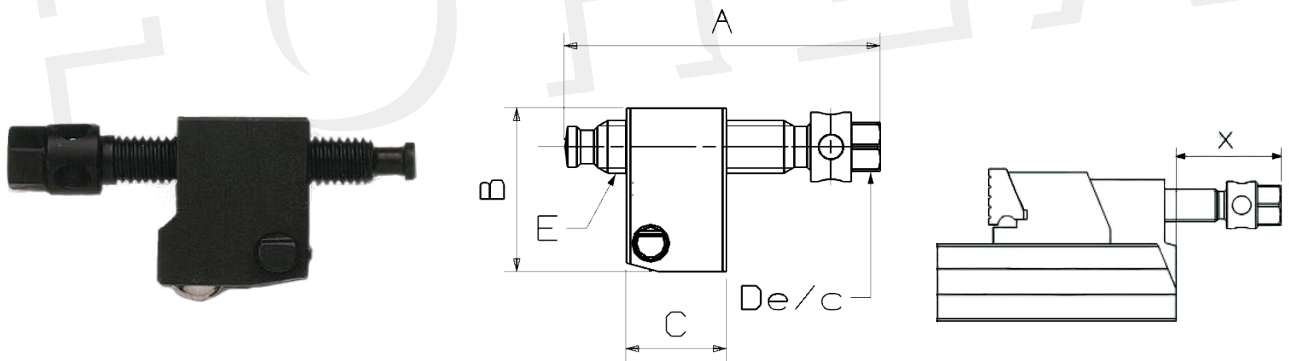


Figure 6.3

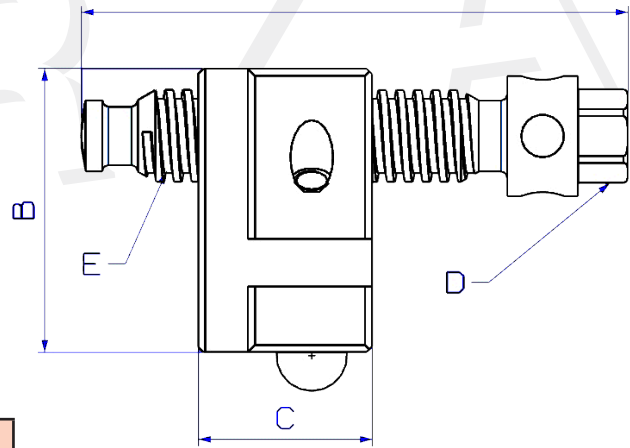
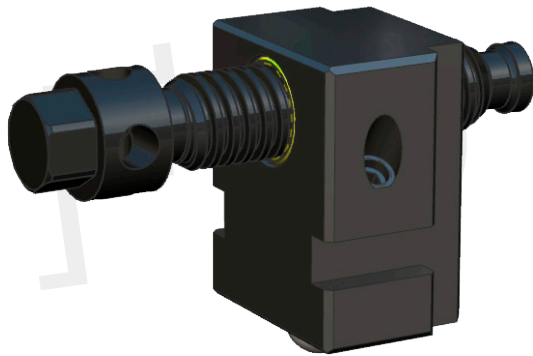
6.3.1 Mechanical spindle horizontal position



Horizontal spindle table

Ref.	Vice	A	B	C	D	Ton	E	X
10090	100	115	52	45	21	2	M18x2,5	65
12590	125	130	52	45	21	2	M18x2,6	60
15090	150-200	154	80	49	24	4	TR26x5	95
25090	250	154	99	50	24	4	TR26x5	85
30090	300	189	105	68	28	6	TR30x5	100

6.3.2 Mechanical spindle vertical position



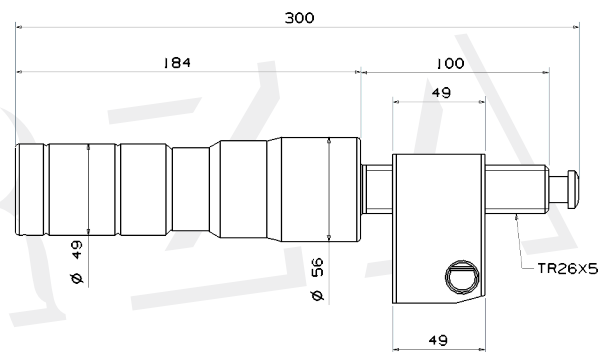
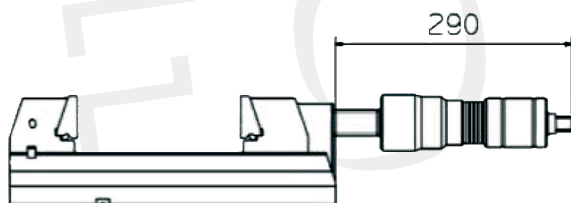
Ref.	Vice	B	C
12595	125	60	39
15095	150-200	80	49
25095	250	99	49

6.4 Hydraulic spindle for 150, 175 and 200 vices

It is only used with 150, 175, and 200mm jaw vices.

5T force can be perform on these vices.

It is advisable to carry out periodic clamping pressure controls (every 6 months), due to leaks are very difficult to detect. (SEE TABLE).

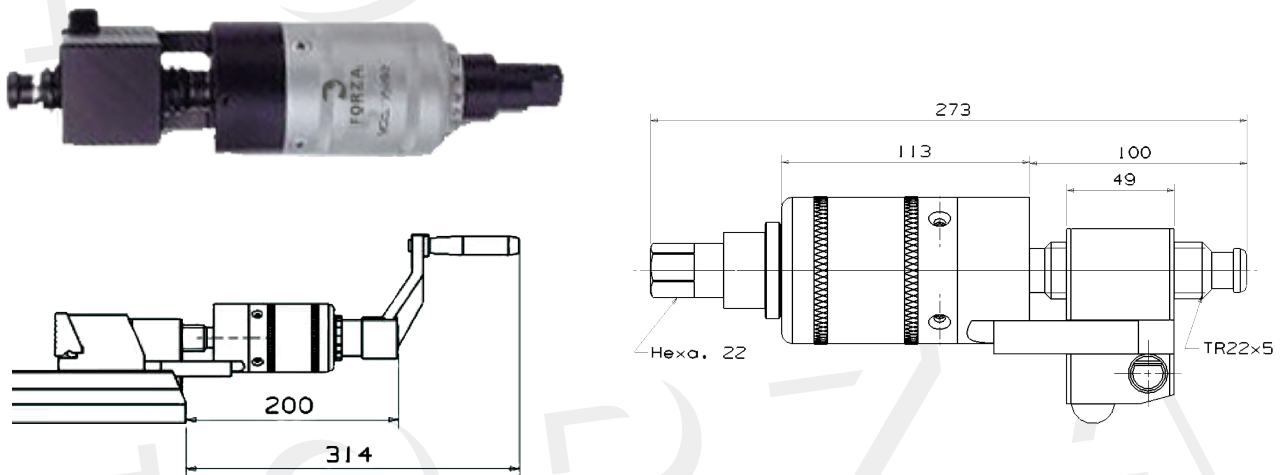


6.5 Mechanical multiplier. For 150, 175 and 200 vices

Comfortable: It allows to multiply the tightening force by 4 times

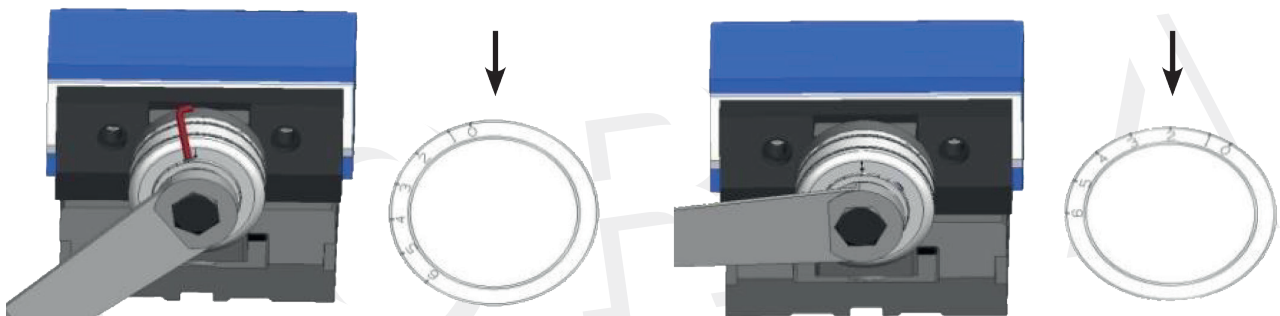
Quickly: One turn of spindle gives 4 Ton.

Accurate: It always allows controlling with great accuracy working strength over workpiece (SEE SECTION 6, importance of strength with accuracy).



Measurement of clamping force:

- a) Turn the spindle handily, until jaws touch the workpiece.
- b) With an Allen wrench, loosen the grub screw of the force measuring ring.
- c) Set the arrow to zero.
- d) Now when you tighten, you will directly measure the force in tons. You can continue working with equal parts without changing the position of the ring.

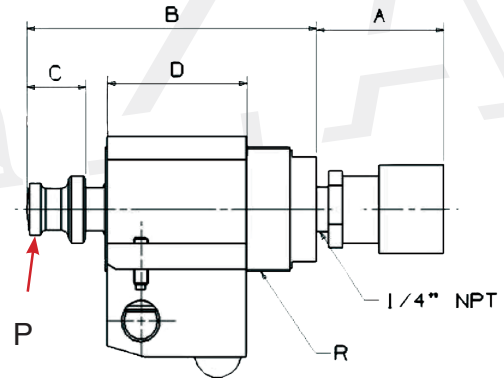
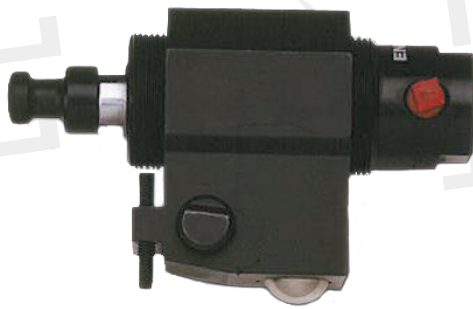


Set to 0 with the first piece.

Measure the force in the rest of the parts.

6.6 Oilpneumatic spindle

Specially designed spindle for very fast moorings in medium or large series.

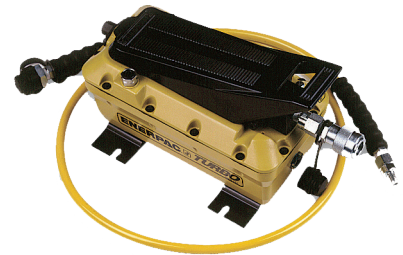


NOTE: Make sure that the point "P" is tightened against the piston road.

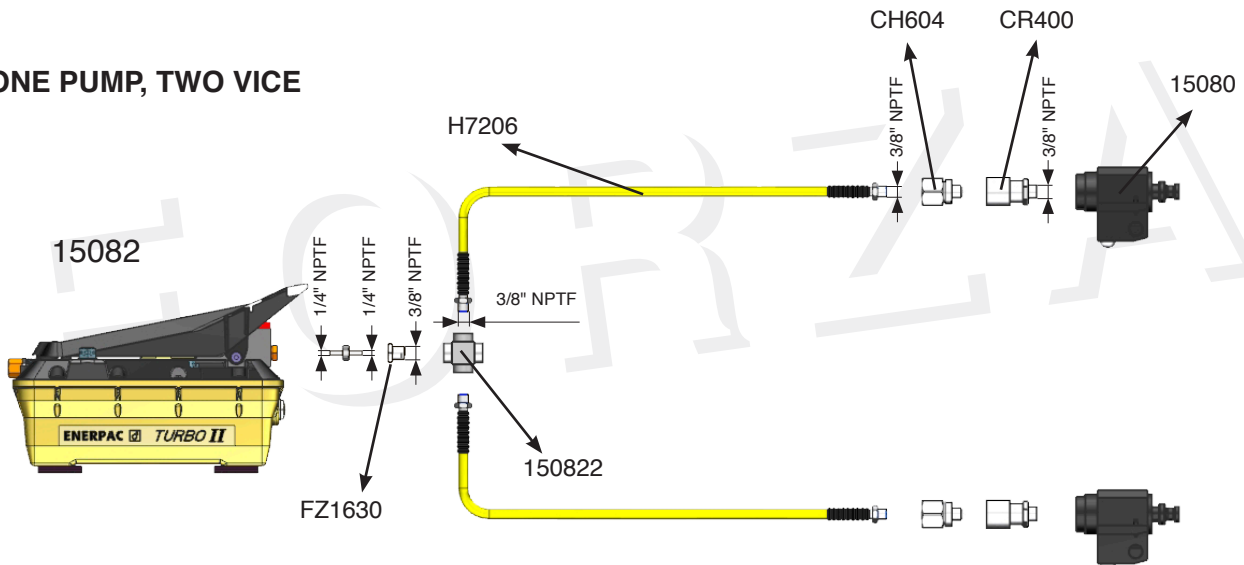
Ref.	Vice	A	B	C	D	R	E
10080	100	53	95	23	45	M36x1,5	2
12580	125	53	95	23	48	M36x1,5	2
20080	150-200	53	128	25	58	M48x1,5	5
25080	250	53	128	25	51	M48x1,5	5

* 2 or 3 outputs adapters available.

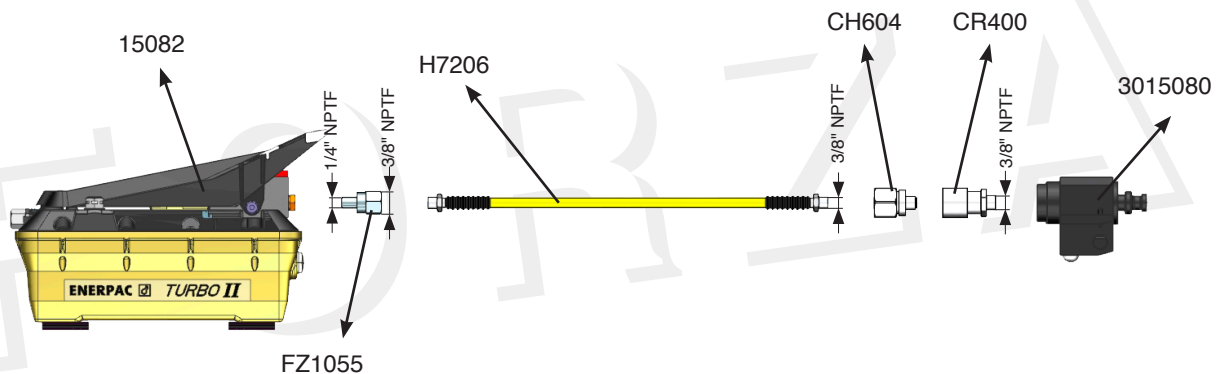
The OLN tightening requires a pump.
The maximum force of the vice is about 350Bar with air pressure. VIEW MANUAL PUMP



ONE PUMP, TWO VICE



ONE PUMP, ONE VICE



WARNING!

The vent screw is the primary means to vent the reservoir when the pump is operated in the horizontal position. It is located near the hydraulic outlet port on top of the reservoir. To use this plug, open the screw 1-2 turns.

The vent screw can NOT be used when the pump is mounted vertically! When mounting in the vertical position, use the vent/fill plug.

CAUTION:

Pump reservoir must be vented using one of the two vent options. Failure to do so may cause cavitation and pump damage.



The Vent/Fill plug is located on the air inlet end of the pump, opposite the vent screw.

1. To use as a vent: Pull up on hex plug until first detent is reached.
2. To use as a fill port: Pull hex plug up past the first detent and remove the plug from the reservoir. The oil level should be to the bottom of the port.
3. To use as a return-to-tank port: Remove the flush plug from the hex and install a return line in the 3/8 -18 NPTF port. Torque return line to 20-27 Nm in hex plug.

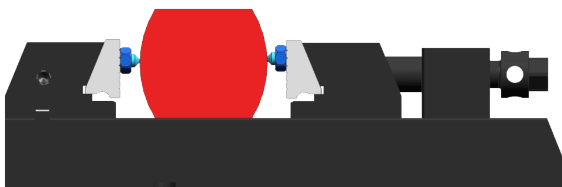
■ **7. SUGGESTIONS FOR SOME SPECIAL WORKS**



Mounting two rounds to plan. The descending effect allows this type of fastening.



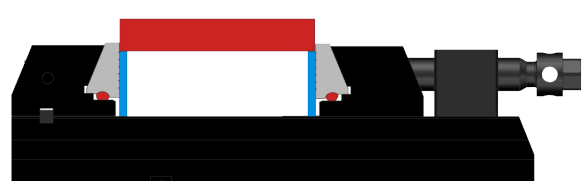
To tie pieces with round edges it is better to remove the jaws and work with the jaws-holder.



In rough pieces, (forging, casting, oxy-fuel, etc.), use positioning bolts or jaws with spikes. It improves the fastening and guarantees the accuracy of the first milling.

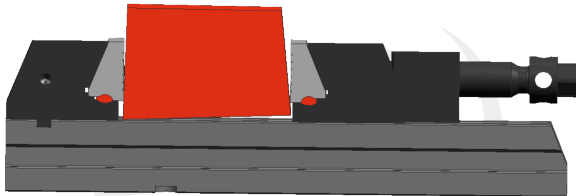


To work with thin parts, jaws with step can be used, in that case is necessary to eliminate the descending effect. If the jaws are not blocked, the part can be damaged.

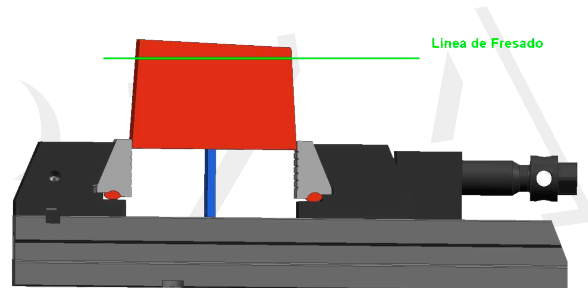


A more effective solution is to put parallels as in the figure. In this way you can use the descending effect and the piece will be perfect.

■ 8. USUAL MILLING PROBLEMS



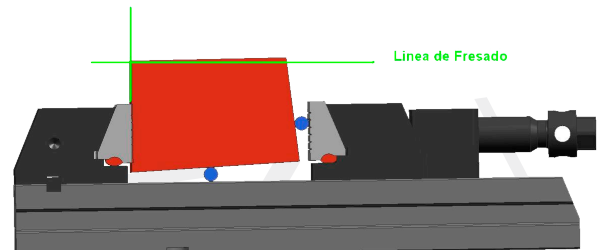
The 2 parallel faces do not come out:
the geometry of the piece makes it impossible to adapt to the vice.



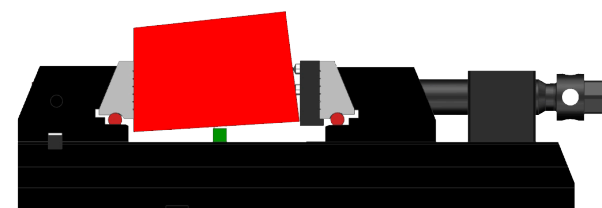
Solution:
Lift the piece to prevent the jaws from guiding. The jaws must be in a descending position. (Untighten screws)



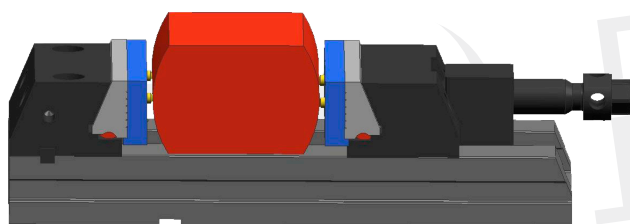
The 2 parallel faces do not come out:
The geometry of the piece makes impossible to adapt the clamp.



Solution:
Force the support in the fixed jaw. Lifting the lower seat and preventing the movable jaw from guiding.

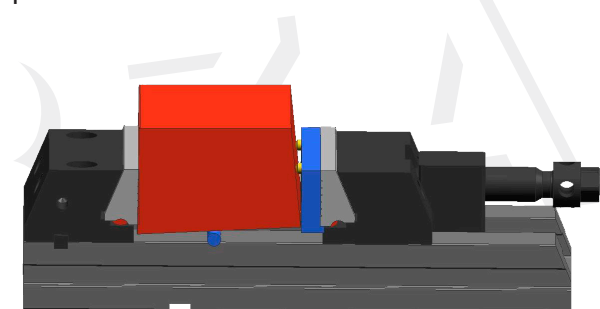


Improved Solution:
Force the support in the fixed jaw. Lifting the lower seat and preventing the movable jaw guiding using jaws with positioning pins.



Raw parts:

The use jaws with positioning pins will improve the tightening. It guarantees that the faces come out parallel.



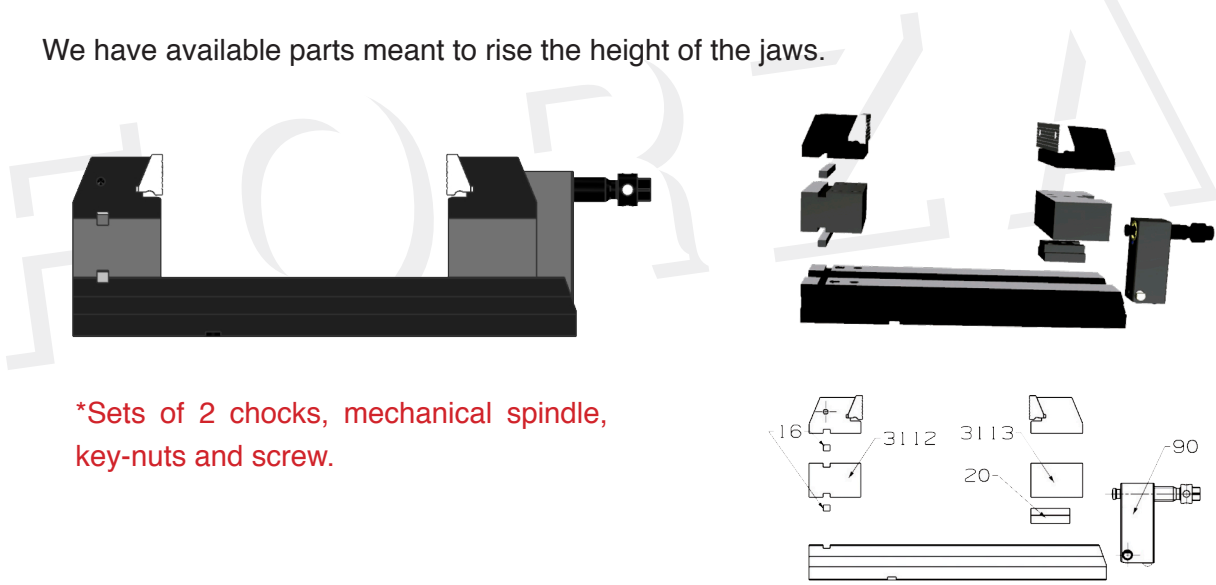
9. LENGTH EXTENDER

We have extenders to increase the opening of the vice.



10. PARTS MEANT TO ENLACE THE CLAMPING HEIGHT

We have available parts meant to rise the height of the jaws.



*Sets of 2 chocks, mechanical spindle, key-nuts and screw.

11. HINGE JOINTED HANDLE Ref: 150004

We have available an articulated wrench for the 30/150, 30/1750, 30/200 and 30/250 vices. This wrench facilitates the tightening and the turning of the vice inside the machine





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