



DX4[®] AngLock[®] Vise Base Assembly

Operating Instructions Manual

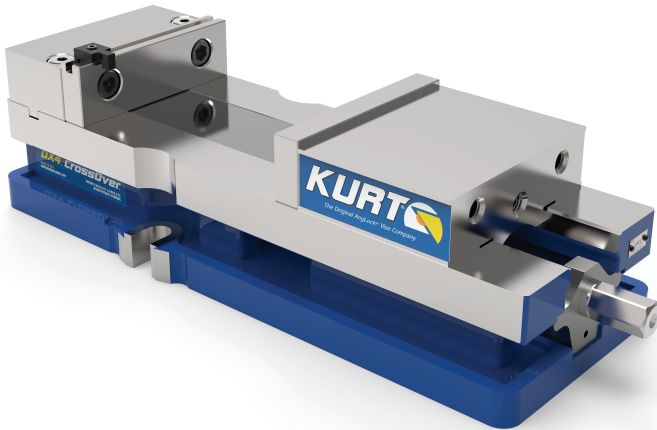


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CAUTION:

Is used when your action or lack of action may cause serious injury.

Vise Data

Use this to fill out information about your vise for quick reference.

Purchase Date: _____ - _____ - _____

Purchase Order: _____

Purchased From: _____

Delivery Date: _____

Serial No.: _____

Note:

Make sure to register your warranty online at kurtworkholding.com

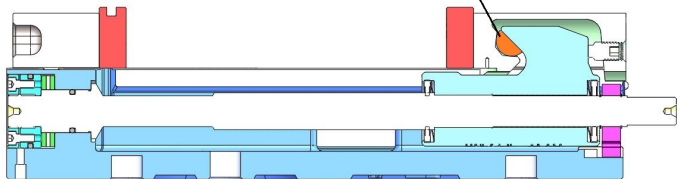
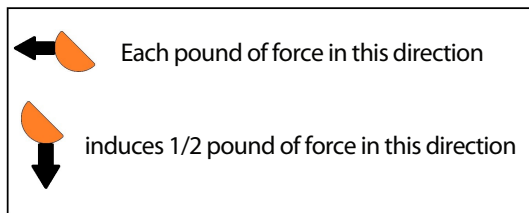
Introduction

Thank you for purchasing a Kurt DX4 vise. You have just purchased one of the best machine vises in the industry. The outstanding accuracy of this product is second to none. Backed by a lifetime warranty against workmanship and material defects, this product will last for years when used and maintained properly.

The original Kurt AngLock vises were designed for precision clamping on basic machine tools such as knee-type mills, grinders, and machining centers. They can be used for, but are not limited to, operations like precision boring, drilling, tapping, grinding, and finishing.

The patented AngLock design allows the movable jaw to advance in such a way that each pound of force forward induces a ½ pound force downward which minimizes the jaw lift and increases accuracy. This, combined with larger needle bearings and the pull type design, increases jaw clamping pressure. Other features include: 80,000 psi ductile iron body, hardened vise bed & jaw plates, and semi-hard steel screw.

Spherical segment induces all-directional alignment



Setup Instructions

Now that you have your new Kurt vise, it's time to set it up and begin using it. You will see that your new vise comes with a Kurt swivel handle and chip guard. The chip guard rests between the ways of the vise and can be trimmed to size (see page 7) to help keep the chips out of the screw. The handle is specifically designed to provide maximum torque to your vise (clamping force provided below). Your vise should be mounted to a clean, flat surface. The surface and the vise must be free of chips, dirt, or debris of any kind. The mounting surface can be honed, if necessary. Clean the bottom of the vise with solvent or other cleaner if needed.

To minimize vise bed deflection, clamp your Kurt vise to your machine table, pallet, or subplate using the built-in clamping slots.

Additional clamping can be used, but it may not be necessary. Please be sure to exercise good judgment when securing your vise to the mounting surface. Be sure your vise is secured and will not move when machining forces are applied.

DX4 Clamping Force

Torque Ft.-Lbs.	Clamping Force (lbs.)
20	1900
30	3065
40	4315
50	5365
60	6455
70	7440

Operating Instructions

For proper vise operation, install the handle onto the hex end of the vise. Rotate the handle clockwise to clamp and counterclockwise to unclamp the vise. This handle, combined with the correct amount of torque, will provide you with all the clamping force you will need to machine your parts. The only other acceptable tool to tighten the vise is a torque wrench set at 70 ft-lbs or less. The use of a torque wrench is advantageous for consistent clamp force.

The use of handle extensions, air impact wrenches, breaker bars, or hammer strikes is not recommended and will void the warranty. This will cause damage to the thrust bearing and screw threads. If you need more clamping force, you may require a larger vise.

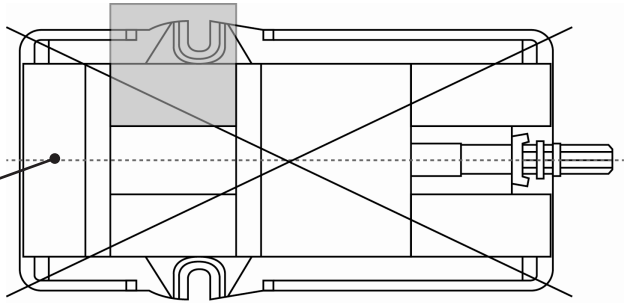
To properly clamp a part in your Kurt vise, you should place the part in the center of the jaws, resting on the ways of the vise. Clamping only on one side or above the movable and stationary jaws can result in jaw lift or loss of accuracy. *(see Fig. 1 on next page)*

If one-sided clamping is necessary, you **MUST** use a dummy part on the other side. When using parallels or step jaws, you must select a size that keeps the bottom of the clamped part at or below the top of the movable and stationary jaws. Always use jaw plates for clamping. If jaw plates are not used, damage to the mounting surface of the movable and stationary jaw will occur. This will result in reduced clamping accuracy and repeatability.

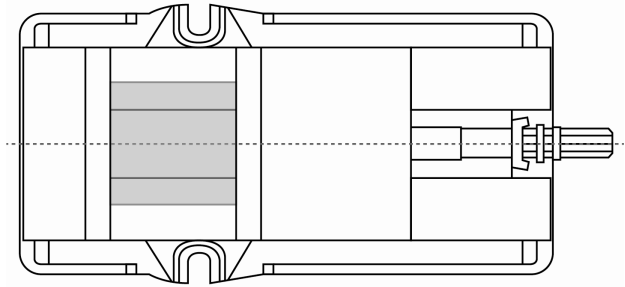
Fig.1

Sketch #1A
Incorrect part
clamping

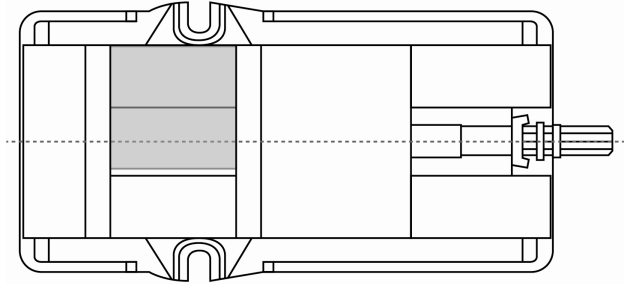
Vise width
centerline



Sketch #1B
Correct part
clamping

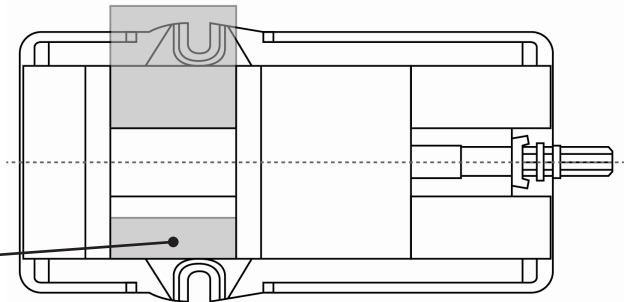


Sketch #1C
Correct part
clamping



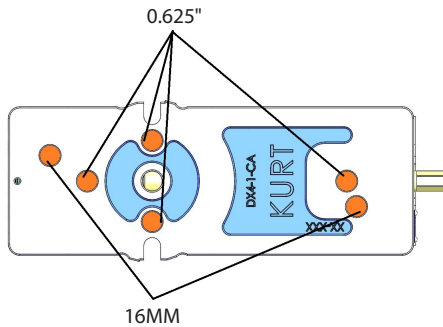
Sketch #1D
Correct part
clamping

Non-machined
spacer



Surface Mount Using Sine Keys

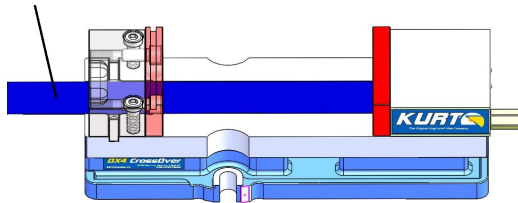
- Sine key mounting hole locations



Mounting the new DX4 with keys requires the use of sine keys instead of standard hex keys. They are available in several different sizes ranging from .4995 x .5620 to .8745 x .9995. They are available in metric as well. The keys are sold separately and in sets of 2 per package. These precision dowel holes can also be used to mount on a 2" X 2" or 40MM X 40MM grid plate.

Proper Chip Guard installation and usage

Chip guard stock to be removed



CAUTION:

Chip Guard stock shown above is provided to keep chips from the nut and screw assembly and *must be cut and deburred* to meet your application and safety needs.

*This Chip Guard stock should be cut off to fill the opening between jaw plates.

Note: Remove chip guard stock to lift vise. Corners of chip guard stock, if left extended, as shown above, could cause injury.

DX4 Parts List

ITEM#	PART #	DESCRIPTION	QTY.
1	DX4-1	Body	1
2	DL430-2	Movable	1
3	DX4-3	Nut	1
4	3400V-5A	Screw	1
5	DX4-6	Stationary	1
6	D40-7	Jaw Plate	1
7	3400V-8	Two-Piece Retaining Nut	1
8	D40-9	Segment	1
9	3400V-41	Thrust Bearing	1
10	3400V-42	Thrust Washer	2
11	3600AA-68	O-Ring #115	1
12	HDHLM4-96	O-Ring #125	1
13	DX4-102	Model/Serial Tag	1
14	DX4-111	Kurt Logo Tag	2
15	3400V-147	Spiral Retaining Ring	2
16	DX4-169	Wave Spring	2
17	PT400-211	Internal Brush Seal	2
18	DX4-223	Model Tag	1
19	3400V-224	Screw Support	1
20	WSRL46	Work Stop	1
21	00-3359	LHSHCS 3/8-16 X 1.50 LG	2
22	D40-315	Grooved Jaw Plate	1
23	07-0230	Drive Screw #2 X .25 LG	2
24	3400V-11	SHSS 3/8-16 X .625 LG	1
25	00-1353	SHCS 3/8-16 X .875 LG	4
26	00-1191	SHCS 8-32 X .375LG	4
27	D40I-10-SA	Handle Assembly	1
28	DL400-249	Chip Guard	1

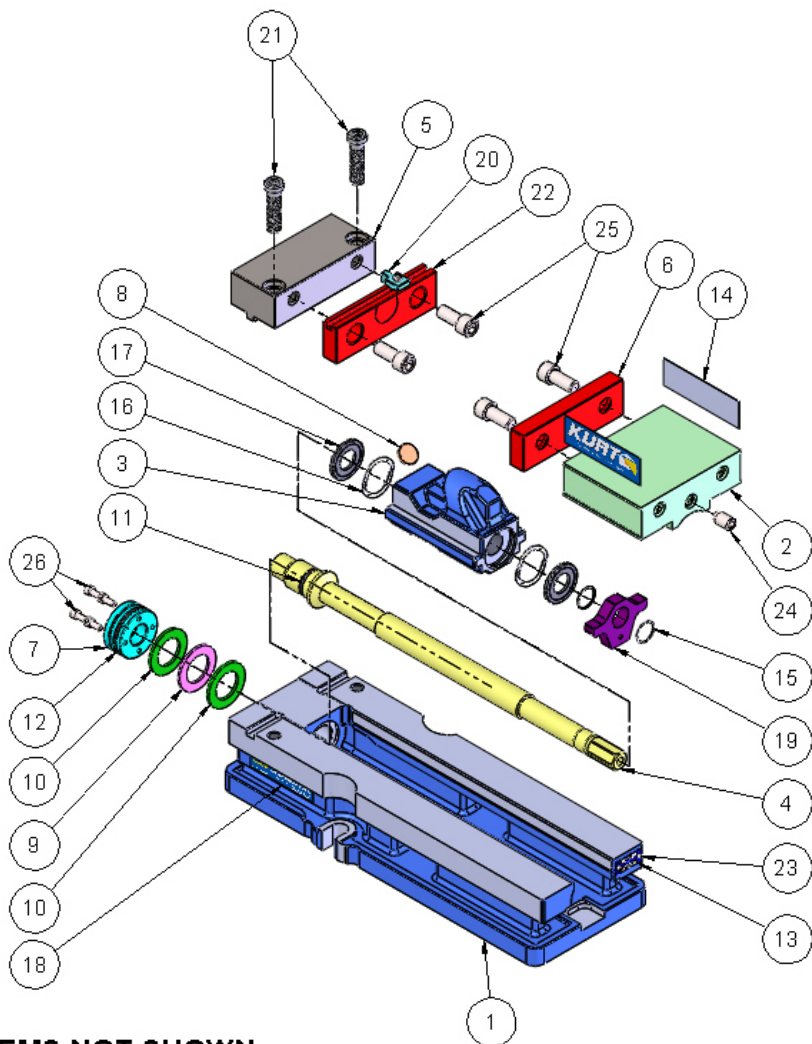
For a DX4R, the following parts are different:

3410V-5A instead of 3400V-5A

DX4R-3 instead of DX4-3

there is no 3400V-147 or 3400V-224

DX4 Mechanical Drawing



ITEMS NOT SHOWN

- 27
- 28

Maintenance Schedule

It is very important to perform regular maintenance on your Kurt vise to ensure proper operation. Improper maintenance will result in poor performance and void the warranty.

Daily/ Weekly

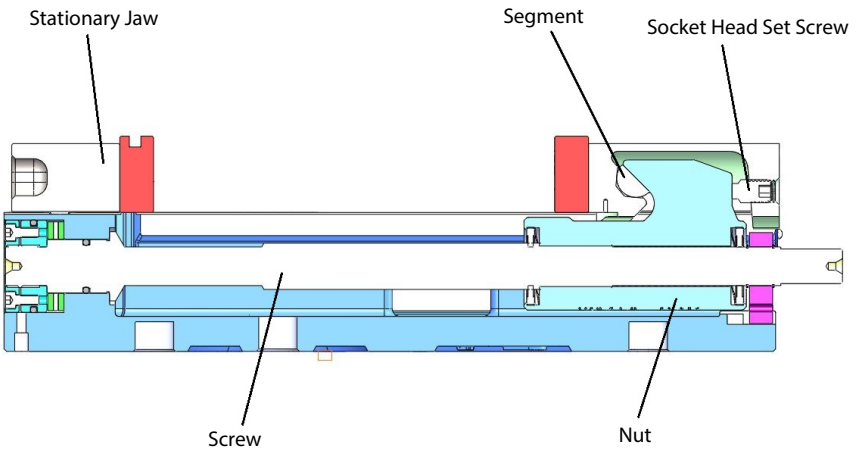
1. Remove chips from surface of vise.
2. Visually inspect seals for damage and cleanliness.
3. Visually inspect for chip entrapments and remove them.
4. Air-dry and apply rust inhibiting oil to the machined surface of the vise.

Monthly

1. Open the vise to the maximum opening.
2. In the back of the movable jaw, (see Fig. 2) loosen the socket head set screw. (approx. 6 turns) With the hex key (Allen wrench) in the set screw socket, lift up and forward to pivot the movable jaw off of the vise bed.
3. Slide the movable jaw slightly toward the stationary jaw and lift up to remove the jaw from the beak of the nut. Note: The spherical segment (looks like $\frac{1}{2}$ of a steel ball) is inside the cavity of the movable jaw and may fall out as the jaw is removed. Take care not to lose or misplace the spherical segment.
4. Turn the movable jaw over and clean the inside cavity as well as the spherical segment.
5. Remove chips, clean, and apply a light coat of machine oil to the machined surface of the following items:
 - a. Nut & screw assembly (clean exposed threads on the screw)
 - b. Bed of vise (top of rails)
 - c. Inside of the vise between the center ways
6. To reassemble the movable jaw, fill the segment pocket on the underside of the jaw with grease. Place the spherical segment in the pocket and push it into the grease. The grease will hold the segment in place when the jaw is turned over.
7. Tip the jaw so the front (the side with the jaw plate) is on the vise bed. Lower the jaw onto the bed so that the segment contacts the hook part of the nut and the rear of the movable jaw sits on the vise bed.

8. Tighten the set screw to firmly contact the nut. Back off the set screw 1/8-1/4 turn. DO NOT leave the set screw tightened firmly to the nut as this may cause improper operation. The movable jaw is designed to move slightly (pivot side to side) so maximum jaw plate contact is maintained when clamping out of parallel, sawed, or cast parts.
9. The vise is now ready for use. Open and close the vise to check for proper operation.

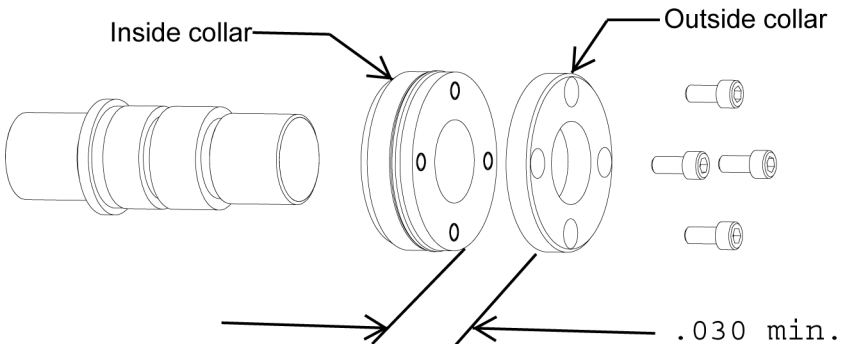
Fig.2



3 to 6 months

1. Open vise to maximum opening.
2. Loosen the set screw and remove the movable jaw.
3. Remove spiral retaining ring from handle end of vise screw.
4. Remove the screw support from the vise body.
5. Unthread the nut from the screw.
6. Clean and oil the threads on the nut and the screw.
7. Begin removing the two-piece retaining nut by removing the four SHCS.
8. Spin off the outside collar.
9. Using a pin or screw, reach in to the inside collar and spin it off, exposing the bearings.
10. Remove the thrust bearing assembly consisting of (2) thrust washers and (1) thrust bearing from the counterbore in the end of the body.
11. Clean and inspect the counterbore, thrust washers, and thrust bearing.
12. Apply water resistant grease to the thrust washer (marine grade grease).
13. Install thrust bearing assembly on the screw in the reverse manner.
14. Install the inside collar by spinning it on the screw until it stops.
15. Install the outside collar behind the inside collar and spin it until it stops. At this point, the screw holes may or may not be lined up.
16. Turn the outside collar counterclockwise until a hole lines up.
17. Turn the outside collar back TWO (2) more screw holes (1/2 turn). This will allow proper distance (about .030" - see Fig. 3) for the collar to lock on the threads and keep the bearings firmly in place.
18. Install the four SHCS and make tight.
19. Install the screw support in the body on the screw (hex end).
20. The vise is now ready to use.

Fig.3



Troubleshooting

If properly maintained, the Kurt DX4 vise will operate trouble-free for many years. In some cases, it will be necessary to troubleshoot. Use the information below to help in the process.

Problem: The vise is difficult to turn.

-If it is a new vise, the brush seals could be stiff. Allow for break in of vise.

-If it is a used vise, it could be filled with chips, and the threads could be jammed. Properly clean and grease the vise.

-The set screw on the movable jaw could be too tight. Loosen it 1/8-1/4 of a turn.

Problem: The vise will not turn in either direction.

-The vise is probably jammed with debris. Check both nut & screw assembly and center ways of vise body for chips and debris. Disassemble and clean as needed.

Problem: The vise won't hold tolerance.

-There may be jaw lift from clamping too high or on one side of the jaw. Lower the part in the vise jaw and clamp the part closer to the center of the jaws.



**Thank you for your purchase!
If you have any feedback or questions.**

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