



KURT WORKHOLDING

3600H™

VERSATILELOCK®

HYDRAULIC VISE

Operating Instruction Manual
3600H/3610H(Reverse)



ENGLISH

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WISE 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
KURTHOLDING.COM**

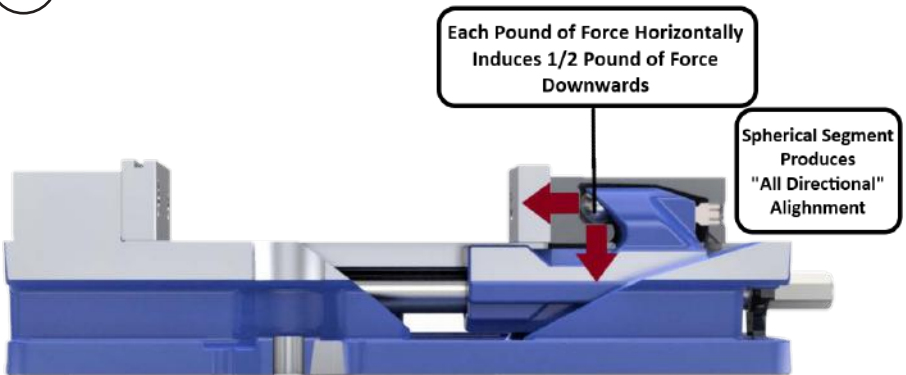
INTRODUCTION

Thank you for purchasing a Kurt 3600H. 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 is built to last when used and maintained properly.

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

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

Fig.1



SET-UP INSTRUCTIONS

Now that you have your new Kurt Vise, it's time to set-up and begin using it. You will see that your new vise comes with a Kurt swivel handle and chip guard in the shipping carton (instruction manual available online at www.kurtworkholding.com). The chip guard rests between the ways of the vise and can be trimmed to size (see pg. 14) to help keep the chips away from 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 any chips, dirt, or debris of any kind. The mounting surface can be honed if necessary. Clean the bottom of the vise with solvent or another cleaner if needed.

To minimize vise bed deflection, clamp your Kurt vise to your machine table, pallet, or sub-plate using the built-in clamping slots or through the body holes provided.

Additional clamping can be used, but 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 applying the machine pressure.

Manually

3600H/3610H

Hydraulically

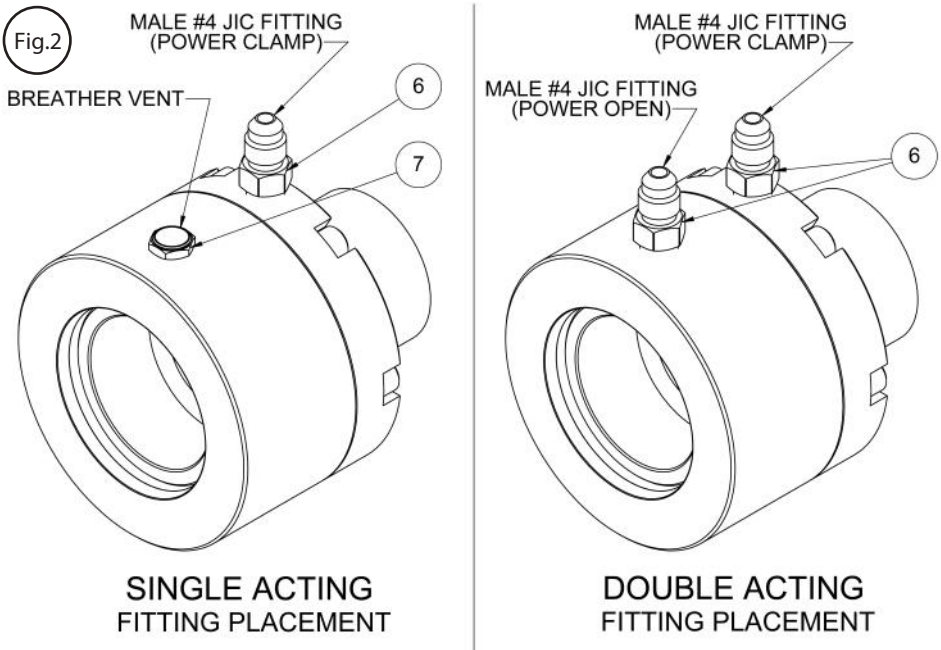
Manually		Hydraulically	
Torque Ft.-Lbs.	Clamping Force Lbs.	Hydraulic PSI	Clamping Force Lbs.
10	650	400	900
20	1700	800	1500
30	2200	1200	2750
40	3000	1600	3650
50	3800	2000	4600
60	4400	2400	5500
70	5500	2800	6400
80	6350	3200	7350

HYDRAULIC OPERATING INSTRUCTIONS

The 3600H/3610H can be operated hydraulically by hooking up the Kurt 6" Hydraulic Unit with a typical hydraulic pump or an air over hydraulic pump. Kurt offers a few solutions for hydraulic applications. Kurt's KHP3 offers air over hydraulics. Kurt offers other pump solutions and can be found on kurtworkholding.com.

The hydraulic unit (KHU6), on the end of the 3600H/3610H, has a 1/4 inch stroke. The KHU6 can be used in both single and double acting applications. For single acting, a spring will return the vise to the opened position when hydraulics are disengaged. If double acting is desired, both ports on the hydraulic unit will need to be hooked up to a pump (See figure 2).

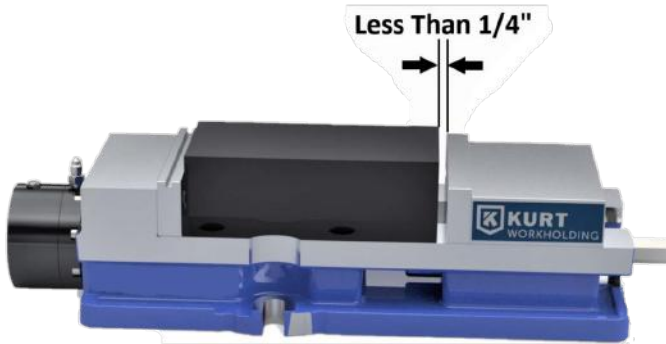
CAUTION: ALL NPT CONNECTIONS IN HYDRAULIC SYSTEM MUST UTILIZE PIPE DOPE, NOT TEFLON TAPE. TEFLON TAPE CAN GET DISLODGED BY FLUID AND END UP IN PUMP OR UNIT, POSSIBLY VOIDING WARRANTY.



Note: A female #4 JIC fitting(s) is required at the end of the hydraulic line to mate up with the male #4 JIC fitting(s) on the hydraulic unit.

HYDRAULIC OPERATING INSTRUCTIONS

Fig.3



Jaw Positioning:

Once all plumbing is set up, it time to position jaws for hydraulic clamping.

1. Position jaws less than 1/4 inch from the part being clamped as is shown in figure 3 above. This is done manually by putting the handle onto the hex end and turning the screw until the jaws are in position.
2. Make sure the jaws are less than 1/4 inch from the part since the hydraulic unit has only a 1/4 inch stroke.
3. The vise is now ready to have the hydraulics engaged for clamping the part.

For basic hydraulic set-up instructions, go to the next page (pg. 7)

HYDRAULIC OPERATING INSTRUCTIONS

Basic Hydraulic Set-Up:

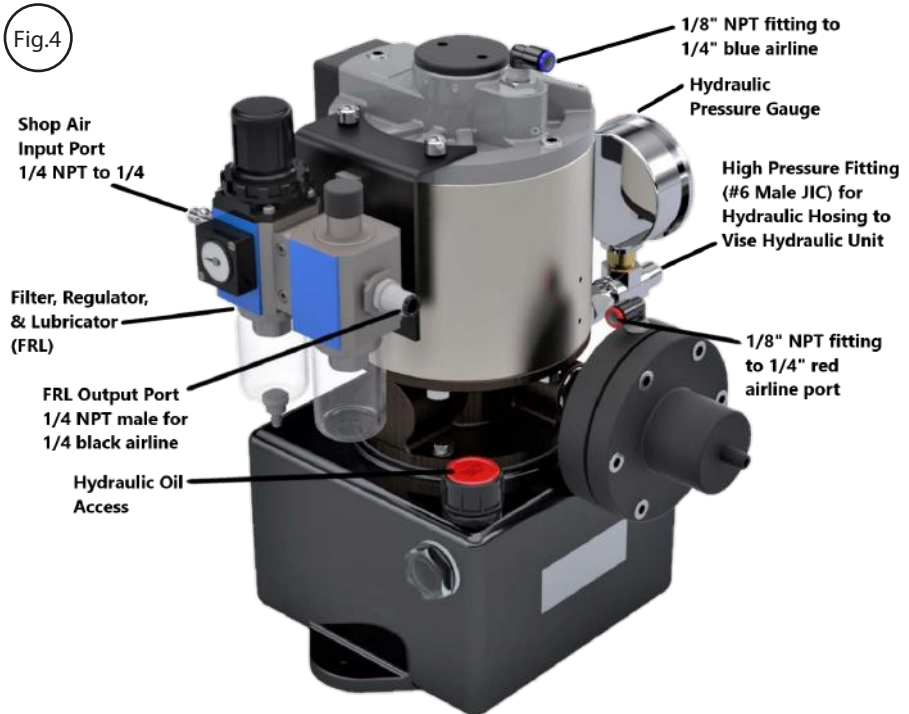
NOTE - The following set-up is specifically for the KHP3 pump

1. Remove plastic caps from pressure and release ports on Hydraulic pump. Install 90° fittings.
2. Remove plastic caps from pressure and release ports on hand or foot valve. Install straight fitting.
3. Install straight fitting on the Hydraulic Unit (1/8 NPTF) of the 3600H vise.
4. A filter-lubricator-regulator combination is recommended to insure clean air coming into the unit. See Clamping Force Chart for air pressure required to attain desired clamping force (pg. 5 & 9).
5. Connect the FRL to the input air port on the KHP3 hydraulic pump (See Fig. 4)
6. Connect the hydraulic line to the hydraulic unit on the vise and then to the output side of the hydraulic pump (Fig.2 & 4)
7. If using a hand valve or foot valve, connect the 3-line color-coded airline cluster to the corresponding ports on the valve and pump (Fig. 3 & 4).
8. Apply air pressure (80 PSI maximum) to system. Loosen swivel fitting at vise and bleed air. Tighten fitting. Release air pressure.
9. Repeat previous step until all air is purged
10. The KHP3 hydraulic pump will come pre-filled with oil (use #13 or DTE lite if needed)
11. System is now ready for use.

NOTE: For multiple vise hook-ups, call factory for recommendations.

HYDRAULIC SET-UP

NOTE - The following set-up is specifically for the KHP3 pump



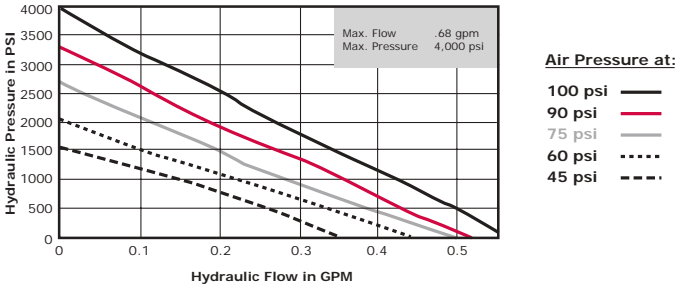
HYDRAULIC OPERATING INSTRUCTIONS

Air Pressure Input to Hydraulic Pressure Output for Kurt Hydraulic Pump, KHP3

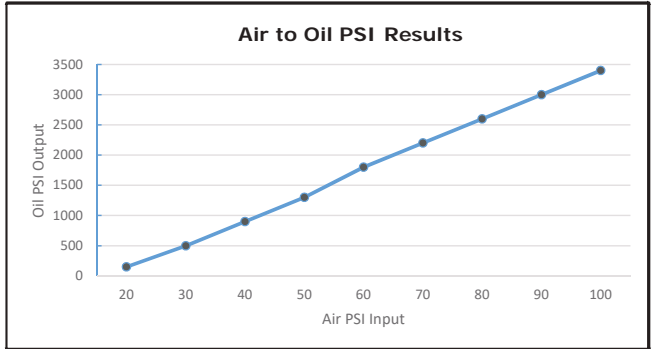
Fig.4

Flow and Pressure Performance Guides

KHP3 Fluid Flow Against Pressure



Air PSI Input	Oil PSI Output
20	150
30	500
40	900
50	1300
60	1800
70	2200
80	2600
90	3000
100	3400



MANUAL OPERATING INSTRUCTIONS

For proper vise operation, insert the handle on to the hex end of the vise. Rotate clockwise to clamp and counterclockwise to unclamp your 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. **DO NOT** use any other type of pressure to open or close your vise.

The uses of handle extensions, air impact wrenches, breaker bars, or hammer strikes are not recommended and will void the warranty if used. This will also 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. 5 on next page)

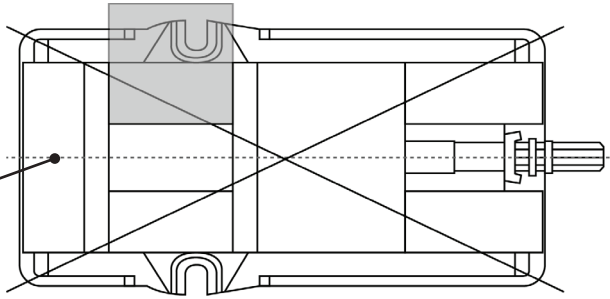
If one-sided clamping is necessary, you **MUST** use a dummy part on the other side. When using parallels or step jaws, you must select a size that keeps the bottom of the clamped part at or below the top of the movable and stationary jaws. Always use jaw plates for clamping. If jaw plates are not used,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

Fig.5

Sketch #2A

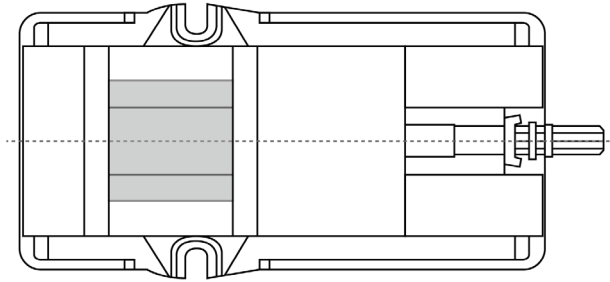
Incorrect part clamping.

Vise width centerline



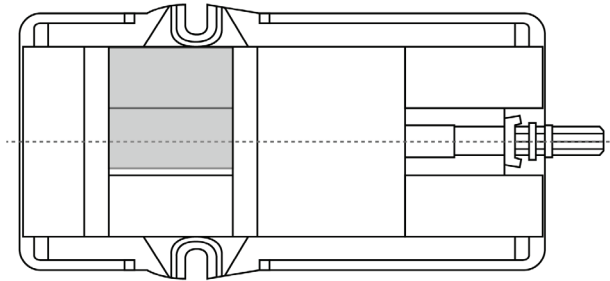
Sketch #2B

Correct part clamping.



Sketch #2C

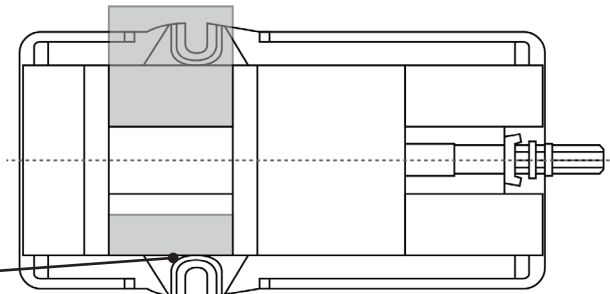
Correct part clamping.



Sketch #2D

Correct part clamping.

Dummy spacer

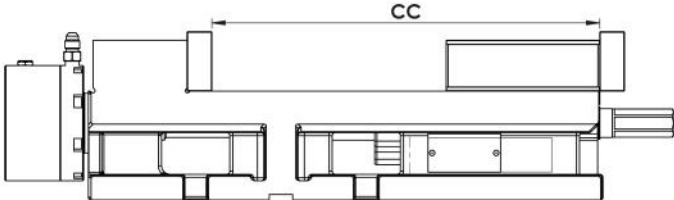
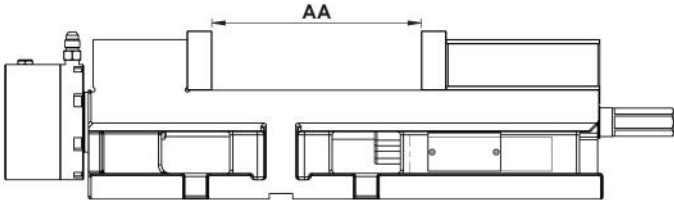


JAW POSITIONING

Fig.6

Note: Dimensions below are in inches unless specified.

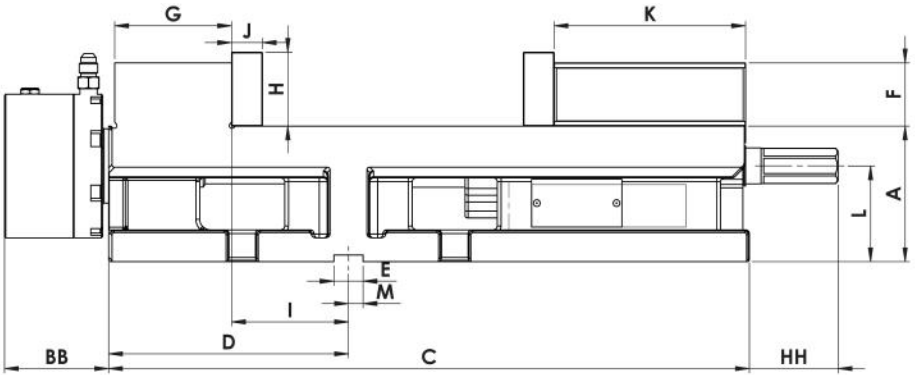
AA	6.000
CC	11.250



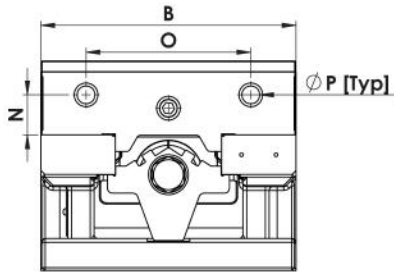
SIDE & END VIEW

Fig.7

Note: Dimensions below are in inches unless specified.



A	3.187
B	6.000
C	15.060
D	5.640
E	0.688
F	1.485
G	2.750
H	1.735
J	0.725
K	4.500
L	2.250
M	0.344
N	0.937
O	3.875
P	1/2-13
BB	2.449
HH	2.089

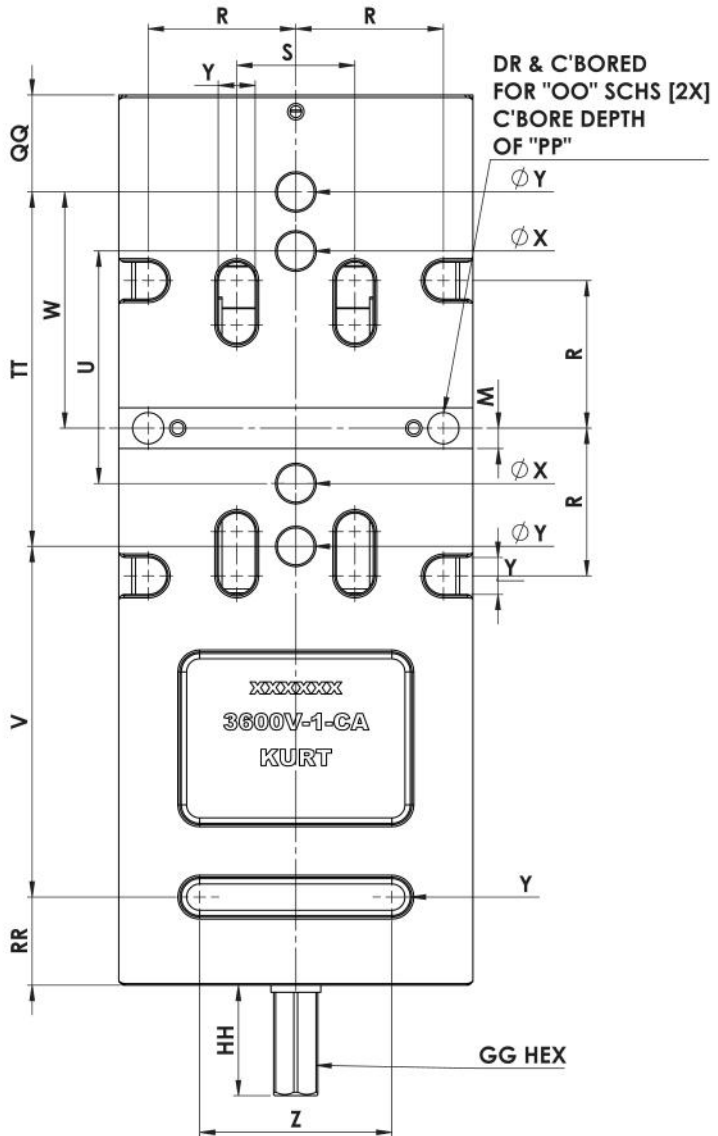


MOUNTING LOCATIONS

Fig.8

Note: Dimensions below are in inches unless specified.

M	0.344
R	2.500
S	2.00
U	100 mm
V	5.938
W	4.000
X	16 mm
Y	0.625
Z	3.255
GG	3/4
HH	1.87
OO	1/2 (M12)
PP	0.671
QQ	1.643
RR	1.493
TT	6.000



SURFACE MOUNT USING SINE KEYS

Mounting the new 3600H can be done by the use our new sine keys as well as our standard keys. The fixture keys are available in several different sizes that are listed on our website at www.kurtworkholding.com. The keys are sold in sets of 2 per package.

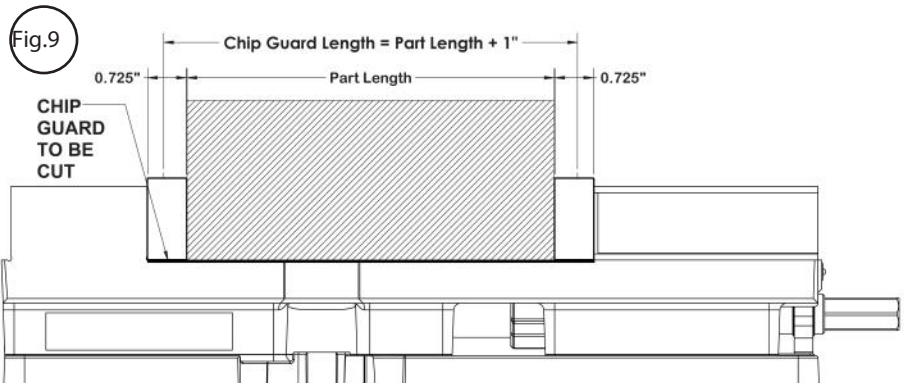
English Mounting:

The 3600H can be properly located using the two English sine key holes indicated by the Y's in figure 5 above or by using a standard 11/16 fixture key in the key way. The 3600H can be bolted down using the two 1/2" bolt holes indicated in figure 5 above by OO. The 3600H vise can also be mounted using the 4 bolt slots on the sides of the vise as well.

Metric Mounting:

The 3600H can be properly located using the two Metric sine key holes indicated by the X's in figure 5 above.

PROPER CHIP GUARD INSTALLATION AND USAGE



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.

Example: Part plus 1 inch = Length of Chip Guard.

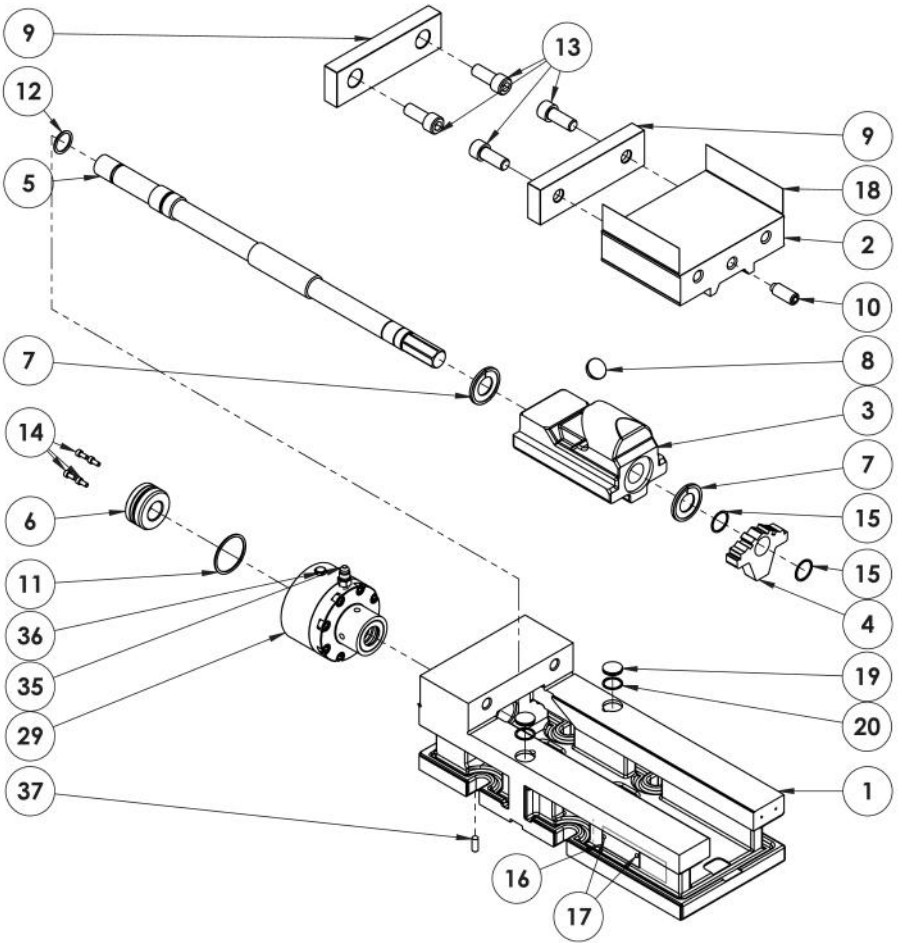
Note: Remove Chip Guard stock. If left uncut, the excess material could cause injury.

3600H Parts List

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	3600V-1	BODY, MACHINED	1
2	3600V-2	MOVABLE JAW	1
3	3600V-3	NUT	1
4	3600V-224B	SCREW SUPPORT	1
5	360HU-5	SCREW	1
6	3600V-8-CP	2 PIECE RETAINING NUT	1
7	3600V-211	INTERNAL BRUSH SEAL	2
8	D60-9	SEGMENT	1
9	D60-7	JAW PLATE	2
10	01-3938	HDOG SHSS 1/2-13 X 1.25 LG	1
11	3600V-128	O-RING	1
12	3600V-99	O-RING	1
13	00-1419	SHCS 1/2-13 X 1.25 LG	4
14	00-1191	SHCS 8-32 X .375 LG	4
15	3600V-147	RETAINING RING, SPIRAL, SMALLEY #WS-84	2
16	3600H-102a	MODEL/SERIAL TAG	1
17	07-0230	SCREW DRIVE #2 X 0.25	2
18	3600V-111	KURT LOGO TAG	2
19	3600V-191	PROTECTIVE PLUG	2
20	DLU4-96	O-RING	2
29	KHU6	HYDRAULIC UNIT	1
35	2404-04-02	FITTING, 4MJ - 2MP	1
36	PCFBR-02	1/8 NPT BREATHER	1
37	01-3278	SHSS CONE PT 1/4-20 X .75 LG	1

3600H Mechanical Drawing

Fig.10

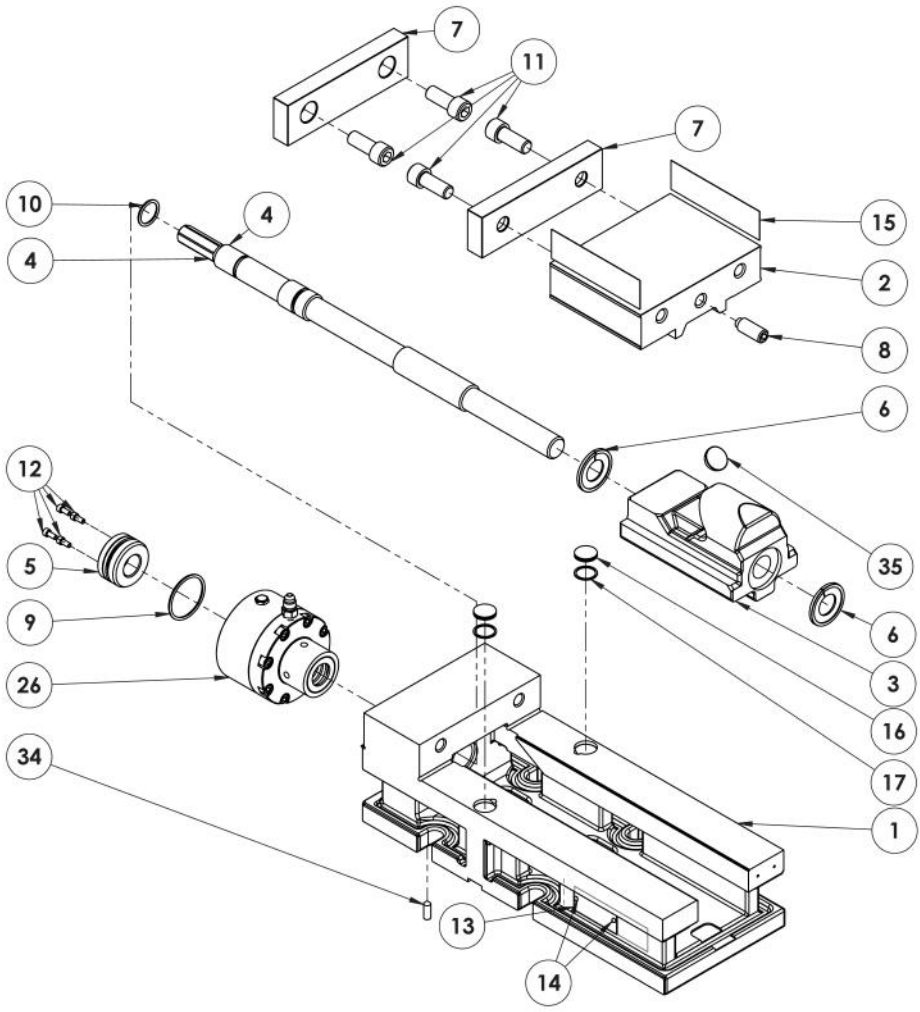


3610H Parts List

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	3600V-1	BODY, MACHINED	1
2	3600V-2	MOVABLE JAW	1
3	3610V-3	NUT	1
4	361HU-5-CP	SCREW	1
5	3600V-8-CP	2 PIECE RETAINING NUT	1
6	PT400-211	INTERNAL BRUSH SEAL	2
7	D60-7	JAW PLATE	2
8	01-3938	HDOG SHSS 1/2-13 X 1.25 LG	1
9	3600V-128	O-RING	1
10	3600V-99	O-RING	1
11	00-1414	SHCS 1/2-13 X 3/4 LG	4
12	00-1191	SHCS 8-32 X .375 LG	4
13	3610H-102a	MODEL/SERIAL TAG	1
14	07-0230	SCREW DRIVE, #2X0.25	2
15	3600V-111	KURT LOGO TAG	2
16	3600V-191	PROTECTIVE PLUG	2
17	DLU4-96	O-RING, BUNA N, #014	2
26	KHU6	HYDRAULIC UNIT	1
34	01-3278	SHSS CONE PT 1/4-20 X .75 LG	1
35	D60-9	SEGMENT	1

3610H Mechanical Drawing

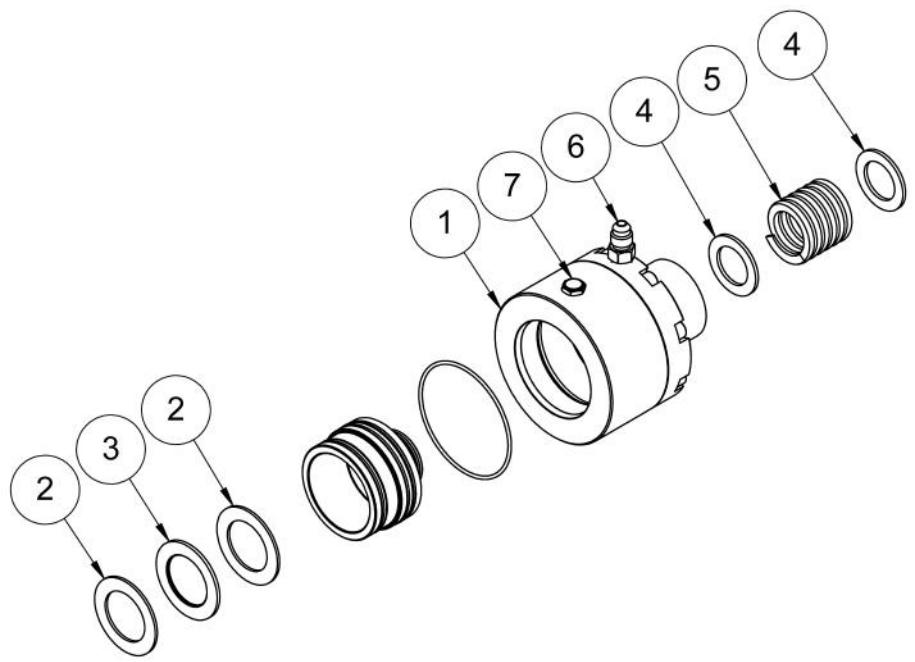
Fig.11



KHU6 Mechanical Drawing

Fig.12

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	KHU6	HYDRAULIC UNIT 6"	1
2	3600V-42	THRUST WASHER	2
3	D80-41	THRUST BEARING	1
4	360HU-230	WASHER	2
5	360HU-87A	SPRING, COMPRESSION	1
6	2404-04-02	FITTING, 4MJ-2MP	2
7	PCFBR-02	1/8" NPT BREATHER	1



Maintenance Schedule

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

Daily/ Weekly

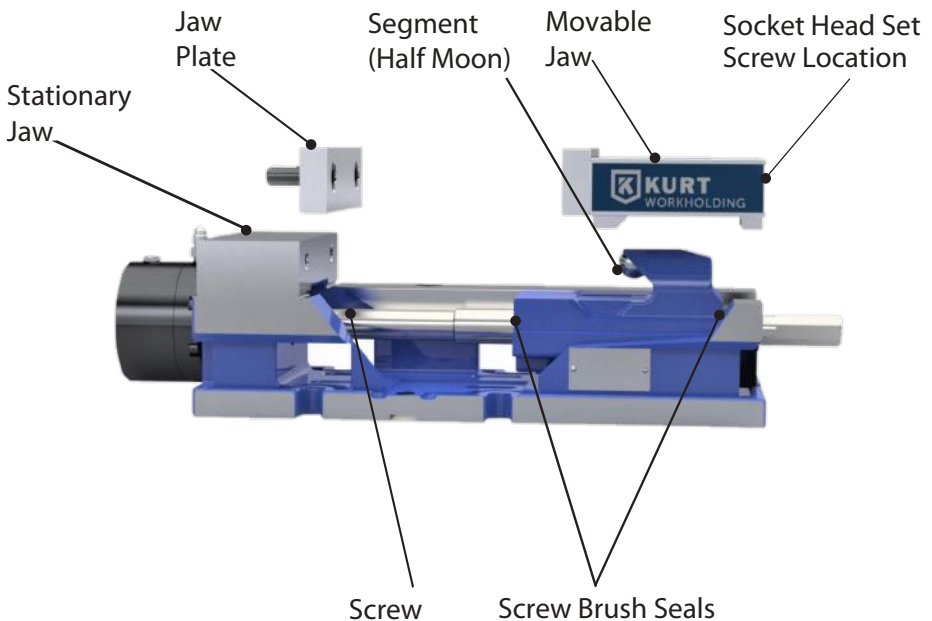
1. Remove chips from surface of vise.
2. Visually inspect seals for damage and cleanliness.
3. Visually inspect for chip entrapments and remove when necessary.
4. Air-dry and apply rust inhibiting oil to the machined surface of the vise.

Monthly

1. Open the vise to the maximum opening.
2. In the back of the movable jaw (handle end, center hole) 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 Jaw off of the vise bed.
3. Slide the Jaw slightly toward the stationary jaw and lift up to remove the jaw from the “beak” of the nut.
Note: A spherical segment (shaped as $\frac{1}{2}$ 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. Also clean the spherical segment.
5. Remove chips, clean and apply a light coat of machine oil to the machined surface of the following item:
 - 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 re-assemble the movable jaw, apply a “glob” of grease to the under side of the movable jaw in the pocket. Place the spherical segment in the mating pocket and push into the grease. The grease will hold the segment in place when the jaw is turned over to replace.

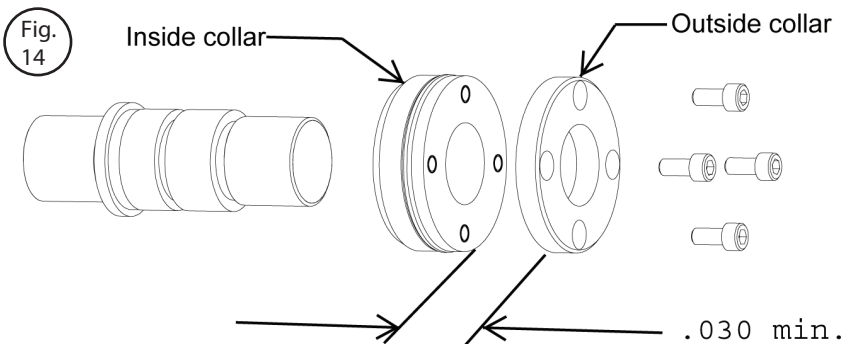
7. Tip the jaw so the front of the jaw (the side with the jaw plate) is on the vise bed. Lower the jaw on to the bed so that the segment contacts the hook part of the nut and rest the jaw on to the vise bed.
8. Tighten the setscrew to firmly contact the nut. Back off the setscrew $\frac{1}{4}$ turn (approx.).
Note: DO NOT leave the setscrew 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. Your vise is now ready for use. Open and close your vise to check for proper operation. Center the part to be clamped in the vise and close. Your parts should be centered from side to side to ensure proper clamping.

Fig.13



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 the vise screw.
4. Remove the screw support from the vise body.
5. Remove the two-piece locking collar by removing the four SHCS.
6. With one screw still half-way out spin off the first collar.
7. Using a pin or screw reach into the second collar and spin it off to expose the bearings.
8. Remove the bearing pack assembly consisting of (2) thrust washers and (1) thrust bearing from the counter bore in the end of the body.
9. Clean and inspect the counter bore, thrust washers and thrust bearing.
10. Apply water resistant grease to the bearing pack (i.e. marine grade grease)
11. Install bearing pack assembly on the screw in the reverse manner.
12. Install the first collar by threading onto the screw until it stops.
(See Fig. 10)
13. Install the second collar behind the first and thread on until it stops. At this point the screw holes may or may not be lined up.
14. Turn the second collar counterclockwise until a hole lines up.
15. Then turn the collar back TWO (2) more screw holes. This will allow proper separation for the collar sections to lock on the threads and keep the bearings firmly in place. (See Fig. 10)
16. Install the four SHCS and tighten in a star pattern.
17. Install the screw support in the body on the screw (Hex end) and secure using the spiral retaining ring.
18. Your vise is now ready to use.



Troubleshooting Tips

If properly maintained, the Kurt DX6 Series 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: My vise turns hard.

Tip: As a new vise the brush seal could be stiff. Allow for break in of vise.

Tip: As a used vise, it could be filled with chips and threads could be jammed. Properly clean and grease vise.

Problem: My vise will not turn in either direction.

Tip: The vise is jammed with debris. Disassemble and clean as needed.

Problem: My vise won't hold tolerance.

Tip: You may be experiencing jaw lift from clamping too high or on one side of the jaw. Lower the part in the vise jaw and clamp more material.

Problem: My vise is stiff when clamping on a part or is difficult to back off a part.

Tip: The vise's thrust bearing pack may need to be replaced.

Problem: My vise is not clamping at a high clamping force.

Tip: The vise's thrust bearing pack may need to be replaced.

MAINTENANCE LOG/NOTES:

LIFETIME WARRANTY IRON CLAD™

All Kurt Manufacturing Company industrial workholding products and parts with the exceptions noted below, are warranted against defects in material and workmanship for the life of the product or part. (The life of the product is defined as that point in time when such item no longer functions due to normal wear and tear.) Failure to properly maintain and/or properly operate the product or part that has been worn out, abused heated ground or otherwise altered, used for a purpose other than that for which it was intended, or used in a manner inconsistent with any instructions regarding its use. The sole obligation of Kurt Manufacturing Company, Inc. (Kurt) and the purchaser's SOLE AND EXCLUSIVE REMEDY hereunder, shall be limited to the replacement or repair of any Kurt product or part (by an authorized Kurt technician) which are returned to Kurt Manufacturing Company's place of business, transportation, shipping and postal charges prepaid, and there determined by Kurt Manufacturing Company to be covered by the warranty contained herein.

THE LIMITED WARRANTY DESCRIBED HEREIN IS MADE EXPRESSLY IN LIEU OF ANY OTHER EXPRESSED OR IMPLIED WARRANTIES, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. KURT MANUFACTURING COMPANY IS NOT RESPONSIBLE FOR THE IMPROPER USE OF ITS PRODUCTS. KURT SHALL NOT BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL SPECIAL OR CONSEQUENTIAL DAMAGES, INCLUDING BUT NOT LIMITED TO, LOSS OF USE, REVENUE OR PROFIT.

KURT ASSUMES NO LIABILITY FOR, AND MAKES NO WARRANTY REGARDING ANY PURCHASE ITEMS WHERE THE MANUFACTURER OF SUCH ITEM EXTENDS A SEPARATE WARRANTY.



KURT WORKHOLDING

**Thank you for your
purchase! If you
have any feedback
or questions please
contact us at.**

kurtworkholding.com

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