

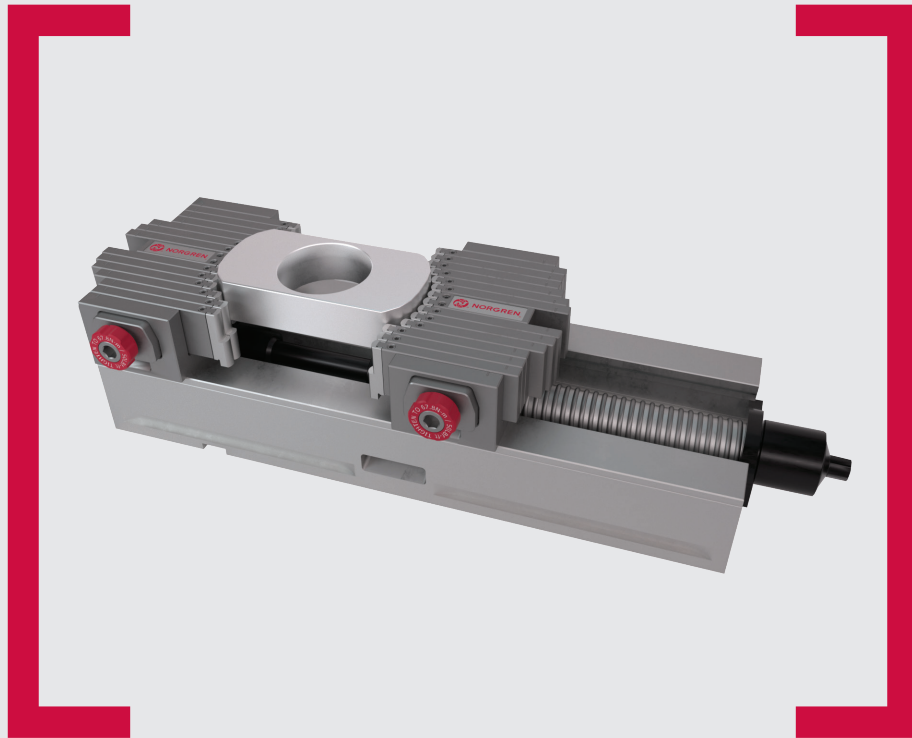


NORGREN

[Workholding]

Operation Manual

The Adaptix™ Soft Jaw



Before starting work read these instructions.

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1.0- Product information

1.1- Intended use

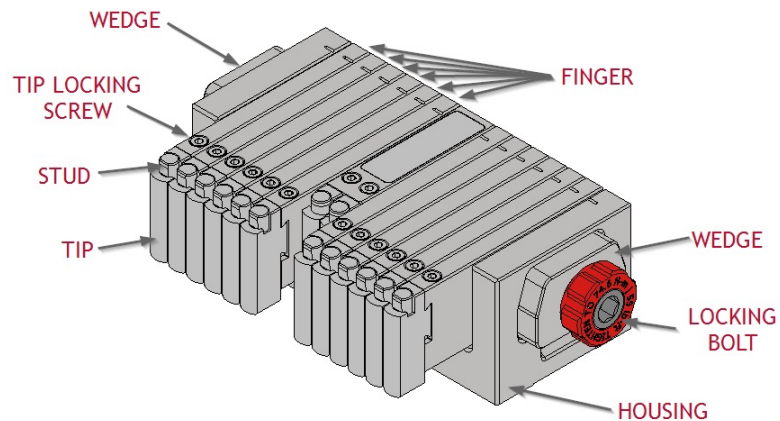
The Adaptix™ adaptable soft jaw (Adaptix™ or the "ASJ"), when used in compliance with the Safety, Operation, and Maintenance sections provided herein, is designed for stationary work-holding in milling machine operations utilizing single station, fixed-jaw machine vises.

The manufacturer accepts no liability for any damage arising from use that is not compliant with the aforementioned sections provided herein. Avoiding misapplication is necessary for safety, satisfactory performance and product life.

1.2- Description of device

The system uses two sets of six adjustable laminated plates (i.e., fingers), constrained by a housing and symmetrical clamping apparatuses (i.e., wedges) fixtured by a transverse screw (i.e., locking bolt). Each individual plate mates with a workpiece interface component (i.e., tip) via a dovetail feature. This component utilizes a highly precise bore to house interchangeable 'studs' that contact machine workpieces; as well as a shelf to justify workpieces in the vertical Z-axis. The system replaces similarly sized soft jaws for common machining operations by mounting directly to the vise, using the original method.

1.2.1- Definition of parts



1.3- Description of function

The ASJ replaces both the OEM jaw and soft jaw components used in single station, fixed-jaw machine vises. The ASJ allows the laminated plates to be freely adjusted to any linear, clamping-axis position within 1 inch (25.4mm) from the fully retracted state.

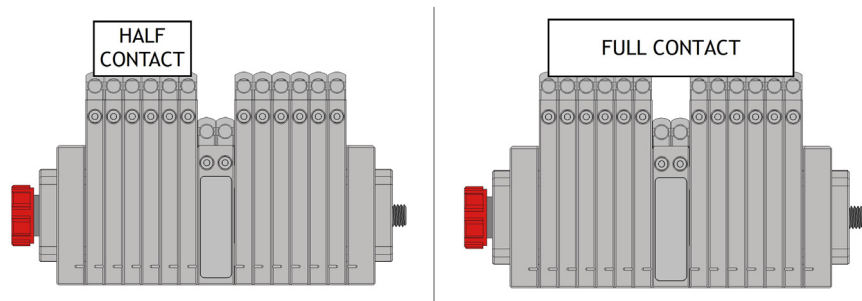
(i.e., when the tip is completely justified against the front face of the jaw).

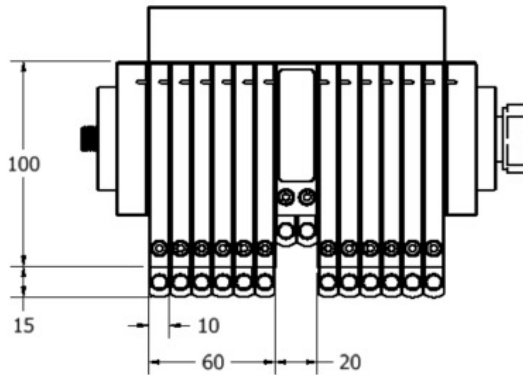
The plates are locked into a rigid body via clamping force applied by the transverse screw.

When the system is locked, the shape setting is maintained as the rigid body. The system can then be used to effectively clamp parts by matching their parameter. The ASJ clamps parts by using the same mechanism and method as the vise it is paired to.

1.4- Technical data

Device Technical Data



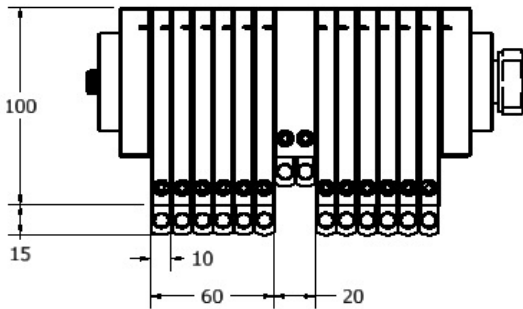
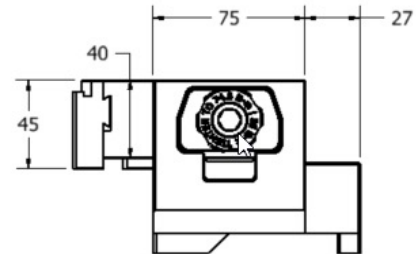
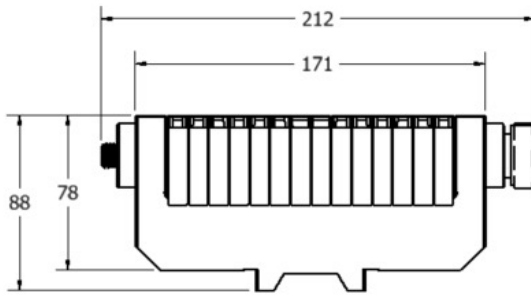


Kurt - Assembled Unit:

Height: 88mm (3.47in)
 Width: 212mm (8.35in)
 Length: 115mm (4.13in)
 Weight: 7.37kg (16.25lbs)

Fingers:

Height: 40mm (1.57 in)
 Thickness: 10mm (0.39in)
 Stroke: 25mm (0.98in)

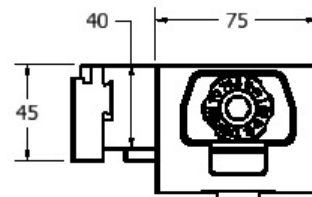
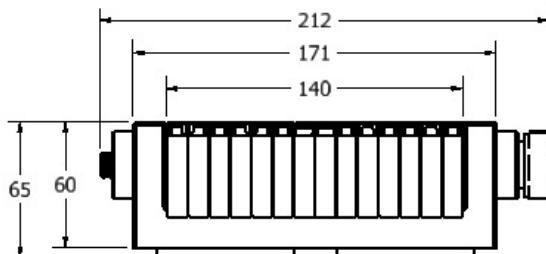


Schunk - Assembled Unit:

Height: 60mm (2.36in)
 Width: 212mm (8.35in)
 Length: 115mm (4.53in)
 Weight: 5.93kg (13.1lbs)

Fingers:

Height: 40mm (1.57 in)
 Thickness: 10mm (0.39in)
 Stroke: 25mm (0.98in)



2.0- Fingertip & Stud information

2.1- Intended use

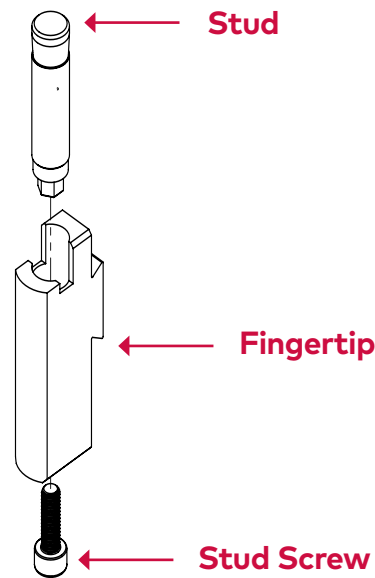
The Adaptix fingertips and studs, when used in compliance with the established technical specifications and installation procedure found below, are designed to function as the working surfaces of the Adaptix adaptable soft jaw (Adaptix or ASJ).

The manufacturer accepts no liability for any damage arising from use that is not compliant with its specifications, guidelines, and procedures. Avoiding misapplication is necessary for safety, satisfactory performance, and product life.

2.2- Description of device

The system consists of a cylindrical stud that is inserted into the mating hole of a fingertip and constrained via a screw. The fingertip and stud assembly can be exchanged with different variants and combinations to suit different workholding needs.

2.2.1- Definition of parts



2.3- Description of function

When used in pairs on opposing jaws the fingertips function like parallels via the integrated steps. The steps support the part from the bottom while the studs contact the workpiece along its profile. The studs transmit the force generated from the vise into the workpiece via the working surface. If the working surface of the stud becomes worn, the stud can be rotated into a different indexed position to utilize a new area. The stud can also be indexed for the purpose of referencing certain workpiece geometries or for reduction of blemishing.

2.4- Technical data

FINGERTIP AND STUD TECHNICAL DATA



3.0- Safety instructions

3.1- Misapplication

Applications that are not in accordance with "Intended use" are considered "Misapplication" and could lead to damage or injury. Alternative uses of the device are subject to confirmation from the manufacturer.

Examples of misapplication can include, but are not limited to:

- ▶ Clamping workpieces that extend largely beyond the width of the jaws.
- ▶ Clamping tall workpieces with insufficient contact depth or without additional fixturing.
- ▶ Clamping thin workpieces that are insufficiently supported or without additional fixturing.
- ▶ Clamping workpieces without locking the fingers to the specified minimum torque.
- ▶ Supporting workpieces via the fingertip steps without performing the initial dressing procedure.

3.3- Spare parts

To assure safety, satisfactory performance, and product life, only use original parts or parts approved by the manufacturer. Using spare parts from a third party manufacturer may lead to unintended function and elevated risk.

3.4- Fingertip & stud change

Always use the supplied torque screwdriver when changing and replacing fingertip and studs. Damage to the device may occur if the fingertips and studs are not sufficiently tightened.

3.5- Operator qualification

Installation, operation, monitoring and maintenance of this device must be carried out by personnel with relevant machining qualifications.

3.6- Personal protective equipment

Personal protective equipment must always be worn when operating this device.

We recommend using:

- ▶ Safety glasses
- ▶ Safety gloves
- ▶ Safety shoes

4.0- Operation

4.1- Upgrading vise

4.1.1- ASJ-KT

Preparing the Kurt DX6

1. Remove the chip guard.
2. Remove the free jaw set screw with a 1/4" hex drive wrench.
3. Pivot the free jaw up and towards the fixed jaw to remove it.
4. Remove the 4X fixed jaw screws with a 3/8" hex drive wrench.
5. Lift the fixed jaw straight up to remove it.

Installing the Adaptix Dovetail

6. Remove the Adaptix dovetail from the bottom of the Adaptix fixed jaw by loosening the jaw set screw with a 1/4" hex drive wrench.
7. Install the Adaptix dovetail on the vise by dropping it in place of the fixed jaw.
8. Use (2X) 7/16 SHCS supplied with the Adaptix soft jaws to fix the dovetail in place.
 - a. Torque to 50 ft-lbs (68 N-m).



Installing the Adaptix jaws

9. Apply a generous amount of the supplied grease on to the round AND flat surface of both spherical segments.
10. Install the spherical segments into the sockets on the inside of both Adaptix jaw housings.
11. Orient the Adaptix fixed jaw so that the fingertips are facing towards the center of the vise.
12. Install the Adaptix jaws on to the Adaptix dovetail and vise carriage by pivoting it down and away from the center of the vise.
13. Tighten the jaw set screws with a ¼" hex drive wrench.
 - a. Torque the fixed jaw set screw to 50 ft-lbs (68 N-m).
 - b. Tighten free jaw set screw until snug.
 - c. **IMPORTANT:** Verify the set screw head is just below or above the surface of the jaw. If it is deep, the spherical segment is not seated. Remove the jaws and repeat from step 10 taking care when inserting spherical segment.

4.1.2- ASJ-SC

Prepare the Schunk KSC-160

1. Remove the fixed and floating jaws by loosening the top mount screw with a 16mm hex drive wrench.
2. Verify the fixed jaw dowel pin is not in the carriage of the vise. Remove it if it is.

Installing the housing shims

3. Place the fixed and free Adaptix jaws on the vise body temporarily.
4. With a feeler gage, measure the gap between the housing and the vise carriage. Record this number for each jaw.
 - a. **IMPORTANT:** If there is gap < 0.001" (25µm), shims are not necessary.
5. Remove the Adaptix jaws from the vise and set aside.
6. Select and combine the supplied Adaptix housing shims to equal the size of the gap and place them on the vise carriage.

Installing the Adaptix jaws

7. Follow the field stripping procedure further in this document to expose the mounting holes of the Adaptix housings.
8. Insert the supplied dowel pin into the bottom of the Adaptix fixed housing and install on the vise. Install the Adaptix free housing on the vise.
 - a. **IMPORTANT:** Be careful not to shift the shims when installing the housings.
9. Install the supplied 4X M16 SHCS.
 - a. Torque to 100 ft-lbs (136 N-m).
10. Complete the field stripping procedure to re-assemble the Adaptix jaws.

4.2- Reversing lock position

The Adaptix locking bolt head can be reversed to access easier in certain setups or machines.

1. Remove the locking bolt with a 10mm hex drive wrench or by hand via the knob.
2. Remove the driving wedges and reverse their positions.
3. Reinstall the locking bolt.

4.3- Installing fingertips

1. Using the supplied 3mm hex drive torque screwdriver, loosen the finger clamp screw until the clamp is below the bottom surface of the finger clamp pocket.
2. Orient the fingertip so the stud mating hole is upwards.
3. Install the fingertip dovetail into the mating feature of the finger or housing. The tip should lay flat against the mating surface and the key should be engaged fully.
4. Tighten the finger clamp with the 3mm hex drive torque screwdriver until the screwdriver makes an audible "click".



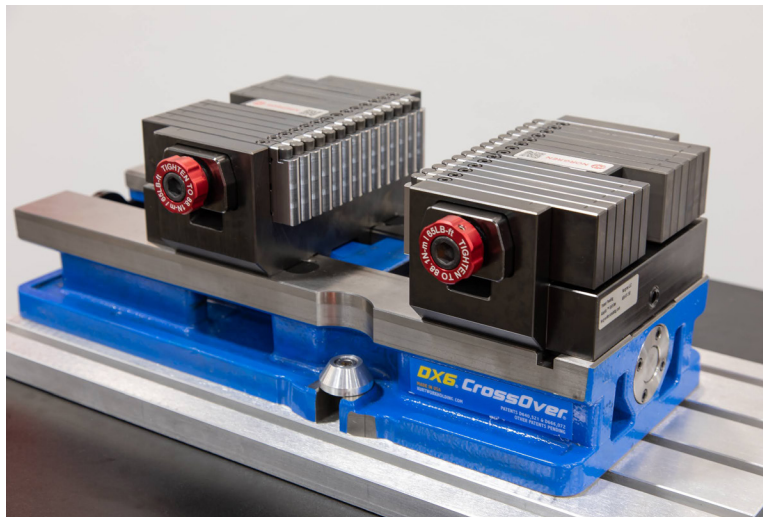
4.4- Installing studs

1. Orient the stud so that the threaded hole is facing down, and the working surface is pointing in the desired direction.
2. Insert the stud into the mating hole on the fingertip.
3. The stud should be flush or below the top surface of the fingertip. If it isn't, rotate the stud slightly and it will drop in place.
4. Install the supplied M4 SHCS into the bottom of the fingertip.
5. Tighten the stud screw with the 3mm hex drive torque screwdriver until the screwdriver makes an audible "click".

4.5- Configuring jaws

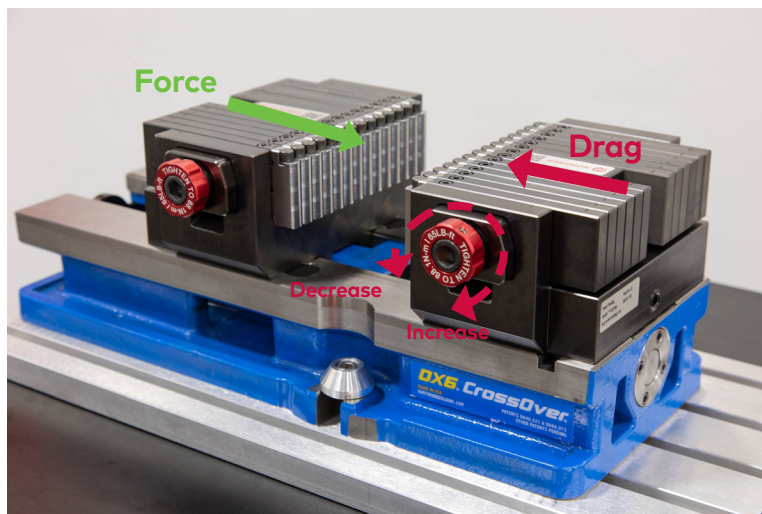
4.5.1- Square fingertip position

For certain operations, it might be desirable to use the Adaptix jaw as a standard square jaw to grip square workpieces. Pushing the fingers completely backwards until the fingertips touch the housing and locking will create a square surface that can be used like a traditional vise jaw.



4.5.2- Adjusting drag force

Tightening and loosening the locking bolt via the thumb knob will increase and decrease the drag on the fingers in each jaw. This can be used to assure fingers are stationary during setup from either adjacent fingers moving, gravity, or forces transmitted from the workpiece.





4.5.3- Locking fingers

1. Hand tighten the locking bolt via the thumb knob to fix the fingers in place.
2. With a 10mm hex drive bit and a torque wrench, tighten the bolt to the specified minimum torque.
 - a. **IMPORTANT:** Always use a torque wrench to assure the locking bolt is at the minimum torque.
 - b. **IMPORTANT:** Do not clamp the vise without assuring the locking bolt is at minimum torque.

4.6- Dressing fingertips

4.6.1- Description of dressing

Before work can be performed with the Adaptix jaws, the fingertip steps must first be first dressed on a milling machine with a cutting tool to assure the workpiece will lay flat across both jaws.

4.6.2- Procedure

1. Install the fingertips on both jaws without studs.
2. Install the vise into a vertical milling machine or other precision machining center of your choice.
3. Place a 3-2-1 block or a ¼" parallel between the jaws, resting flat on the vise ways.
4. Clamp the vise down against the 3-2-1 block.
 - a. **IMPORTANT:** The 3-2-1 block should be in contact with the housings only and not the fingertips.
5. Using a felt tip marker or some other marking method, create a witness mark across the steps of the fingertips.
6. Perform a 0.005" [0.13mm] deep skim cut with a cutting tool (0.5" [12mm] recommended across both sets of fingertips).
 - a. **IMPORTANT:** Do not adjust the z-depth between cutting the fixed and free fingertip sets.
7. Inspect the steps and assure no witness marks remain. If any remain, perform an additional 0.005" [0.13mm] deep skim cut.

4.6.3- Fingertip order

After the fingertips are dressed, it is important that they remain matched to both the finger they are fixed to as well as the jaw they are on. If the tips are removed, they can be placed back on to the same finger and their calibration will be maintained. If the finger and fingertips are removed as an assembly, they can be placed in any position on the same jaw and their calibration will be maintained.

4.6.4- Re-dressing

The fingertips can be re-dressed as many times as the fingertip step relief can accept. With each skimming, the fingertip step height will increase.

Fingertip re-dressing will be necessary in the following conditions:

- ▶ A fingertip is replaced in a set that has been previously dressed.
- ▶ Dressed fingertips are scrambled from their original order.
- ▶ Dressed fingertips and finger assemblies are placed on different jaws.

5.0- Maintenance

5.1- Field stripping the device

When following the outlined instructions; the ASJ system can be completely disassembled and reassembled in end user environments.



Field Stripping Process

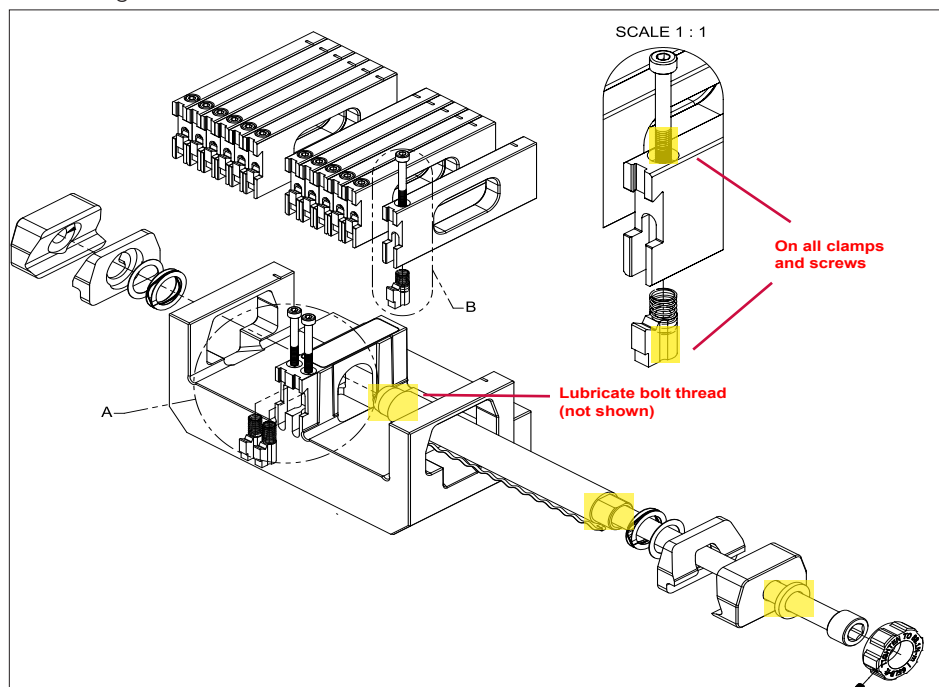
NOTE: This section excludes disassembly of fingertips and studs, for fingertip and stud disassembly instructions, refer to sections 4.3 and 4.4.

1. Ensure the use of proper PPE outlined in section 3.6.
2. Ensure the jaw(s) are not under clamping tension, and the locking bolt is loose/not under tension. Note which side the bolt head knob is installed on.
3. Unthread the bolt head knob completely, the driving wedges will be able to be removed from the housing. Set the bolt and driving wedges aside.
4. From either side of the jaw, push the locking tube out from the center of the jaw.
5. Remove the locking tube and the driven wedges from both sides of the jaw. Set the parts aside.
6. Making sure to maintain the order of the fingers, lift the fingers out from the saddle of the jaw, by one fingerpack at a time. Keep the left fingerpack and right fingerpack separate to avoid mixing.
7. For the jaw to be removed, the mounting mechanism must first be inactivated:
 - a. Kurt DX6 Crossover
 - i. Loosen and back out the set screw on the back face of the jaw, so that the set screw will not interfere with removal of the jaw from the vise.
 - b. Schunk KSC-F-160
 - i. Loosen the (2) M16x2.0 LHCS in the housing saddle.
 - ii. Completely remove the screws from the housing and set them aside.
8. Lift the housing out from the jaw mount position on the vise.
9. The ASJ system is considered completely stripped and removed from the vise.
 - a. For fingertip and stud disassembly please refer to section 4.3 and 4.4.

5.2- Cleaning and lubrication

NOTE: The ASJ system must be field stripped prior to cleaning and lubrication.

- ▶ Using a low-pressure air source (30 PSIG or lower) blow off, then wipe dry all parts.
- ▶ During reassembly, apply low-friction extreme pressure grease to the areas noted in the figure below.





6.0- Troubleshooting

6.1- Fingers moving when clamping parts

Inadequate lubrication can result in lower locking bolt tension when torqued.

1. Apply grease to the threads of the locking bolt and under the head of the locking bolt and washer.
2. If problem persists, field strip and clean the device.

6.2- Part flatness is not repeating

Part flatness may vary if finger tips are not properly seated or contaminants have settled under contact points.

1. Verify all tips are fully seated against the fingers. Redress if necessary.
2. Field strip and clean the device.

6.3- Jaw lift

Jaw lift can occur if mounted improperly

1. Verify all mounting bolts are properly torqued.
2. Verify mounting surfaces to be clean and free of imperfections.
3. Verify areas requiring grease are adequately greased.



7.0- Warranty information

Please visit <https://www.norgrenworkholding.com/en/warranty>

8.0- Notes

Norgren operates four global centres of technical excellence and a sales and service network in 50 countries, as well as manufacturing capability in Brazil, China, Czech Republic, Germany, India, Mexico UK and the USA.

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