Kodak

Automatic Pallet Loader

Lubricating Linear Rails

Document Number

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Revision History

Revision	Date	Author	Comments
1	23 Nov 2007	A.Blignaut	Initial draft release
2	18 Dec 2007	A.Blignaut	Corrections made from Jeff's redline.
3	20 Mar 2008	A.Blignaut	Added procedures for lubricating the picker gantry rail, the picker shoe slider rails, and the picker p-cup assembly rails.

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1. OVERVIEW

All linear rails on the APL must be lubricated at six month intervals—usually during the planned maintenance procedure. Use only Microlube GL261 grease and use the correct size grease syringe for each linear rail as outlined in this document.

The grease is applied through a small hole or port in the linear rail sliders. While it is better to apply grease to the ports on both sides of a slider to reduce the risk of air locks, some sliders may only have one port or one side of the slider may be inaccessible. Whenever possible, move the slider being greased back and forth along the linear rail while applying the grease. This will help to distribute the grease evenly and reduce further possibility of an air lock in the slider cavity.

Tip: For easier access to some of the linear rail sliders, gently give the syringe needles a 30 degree bend.



2. PARTS/TOOLS

The pre-filled grease syringes and grease gun below are included in the APL planned maintenance kit 518-02982A.

- Syringe with a 1.8 mm needle (402-00247)
- Syringe with a 1.2 mm needle (402-00296)
- Syringe with a 0.9 mm needle (402-00295)
- Grease gun (390-00152)

3. LUBRICATING THE APL LINEAR RAILS

3.1 Lubrication Guidelines

Follow these guidelines when applying grease to the linear rail sliders:

- Note the size of the linear rail grease port and use the appropriate grease syringe.
- Move the slider back and forth along the rail while applying grease.
  The actuator motors will be idle when the APL doors are opened. For some rails, you may need to turn off the compressed air at the manifold and disconnect the relevant tubes.
- Apply grease to the grease port at both ends of the sliders where access allows.
- Apply grease until the slider cavity is full and the excess grease is oozing from beneath the slider onto the rail.
- Wipe any excess grease from the rails and grease ports to prevent plate contamination.

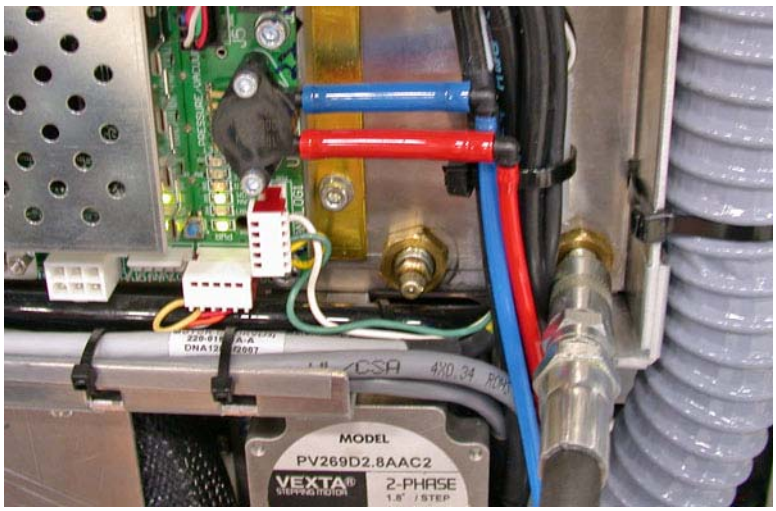
3.2 Picker Linear Rails

For easier access to the picker tower rails, move the picker to the front of the APL (home position) and extend the picker shoes (this can also be done by hand by turning the pulley at the bottom of the picker tower leadscrew).

3.2.1 Picker gantry rail

This is the long rail located on the underside of the gantry frame between the picker towers. Each tower has two grease nipples that are greased with a grease gun.

1. Idle the X-drive so that the picker towers can be moved by hand.
   Type `>>apl picker x idle .`
2. Attach the grease gun to the first nipple and move the tower in the X direction while squeezing grease into the linear bearing. Squeeze grease into the bearing until it starts to ooze out.



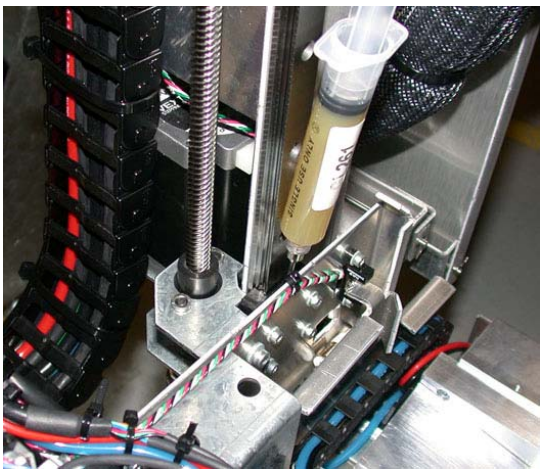
3. Attach the grease gun to the other grease nipple on the same tower and apply grease as in step 2.
4. Similarly, apply grease to the two grease nipples on the other picker tower.
5. Clean of any excess grease from the rails and grease nipples.

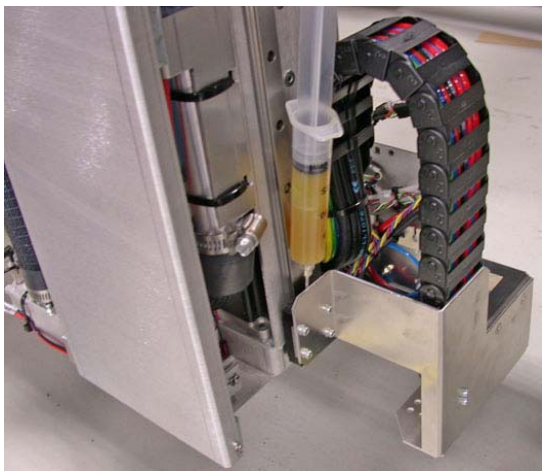
3.2.2 Picker shoe Z-rails

Each picker tower has a picker shoe that moves up and down on two linear rails—one on either side of the picker tower. Each rail has one slider.

To lubricate the right side picker shoe Z-rails:

1. Locate the grease port on the top of the slider.
2. Insert the 1.8 mm needle syringe into the grease port and press grease into the slider cavity while moving the shoe up and down by hand.





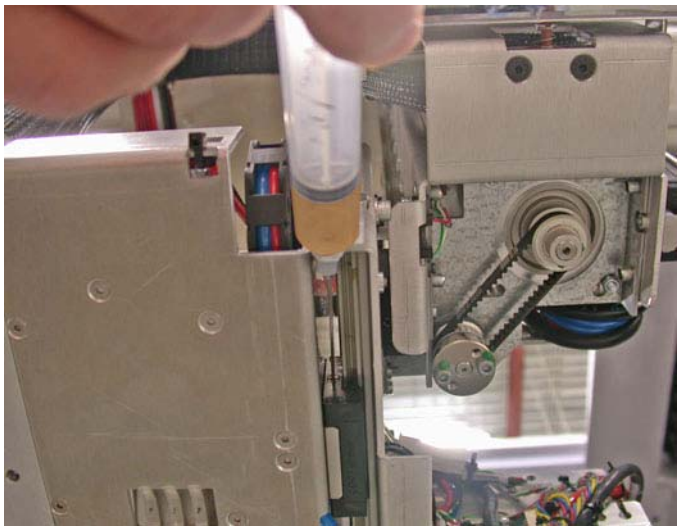
3. Lubricate the linear rail slider on the other side of the picker tower.

Similarly, lubricate the two Z-rails on the left picker tower shoe.

3.2.3 Picker shoe slider rails

There is one picker shoe slider rail per tower. For this procedure, the picker gantry should be in the home position, the shoes extended, and the APLs air supply OFF.

1. Locate the picker shoe slider on one of the picker towers. The photo below is viewed from the bottom upwards.

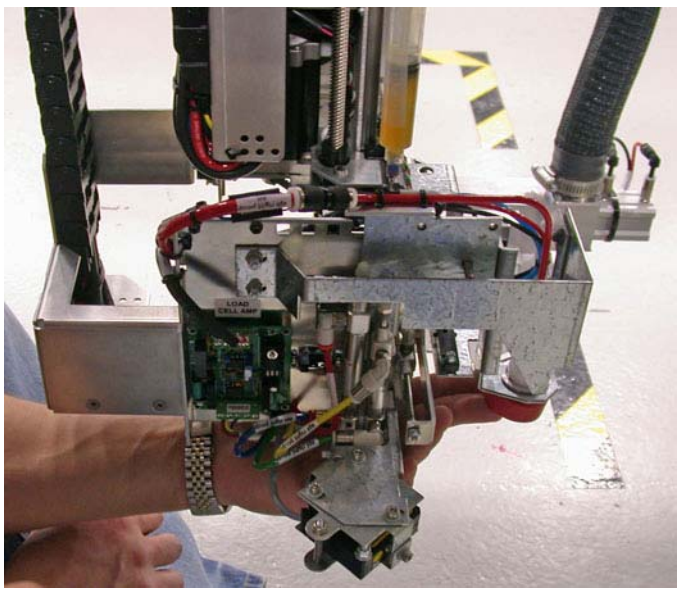


2. Apply grease to the slider with the 1.8 mm needle syringe while moving the picker shoe up and down by hand. Bending the syringe needle a little helps to access these grease ports.
3. Locate and grease the picker shoe slider rail on the other tower.

3.2.4 Picker P-cup assembly rails

There is one P-cup assembly rail per picker tower. For this procedure, the picker gantry should be in the home position, the shoes extended, and the APLs air supply OFF.

1. Locate the P-cup assembly rail on one of the picker towers.



2. Apply grease to the grease port with the 0.9 mm needle syringe while moving the P-cup assembly up and down.

3. Locate and grease the P-cup assembly rail on the other tower.

3.3 Pusher Linear Rails

For easier access, move the pusher to the rear of the APL and open the rear doors.

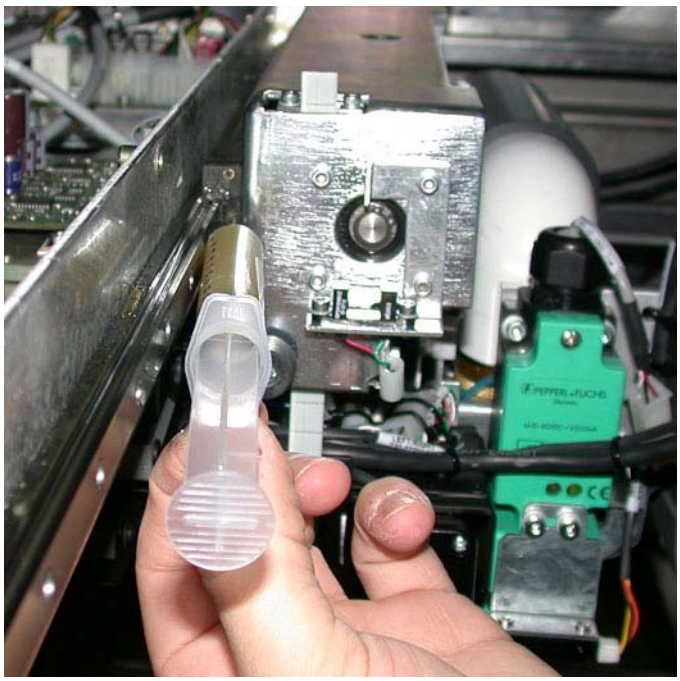
3.3.1 Pusher Z-motor linear rail

The Z-motor linear rail is located on the rear face of the pusher crossbeam. There are six sliders in total on the rail—three sliders for the left pusher Z-motor assembly and three sliders for the right pusher Z-motor assembly. The procedure for lubricating each side is identical.

To lubricate the three left side pusher Z-motor assembly sliders:

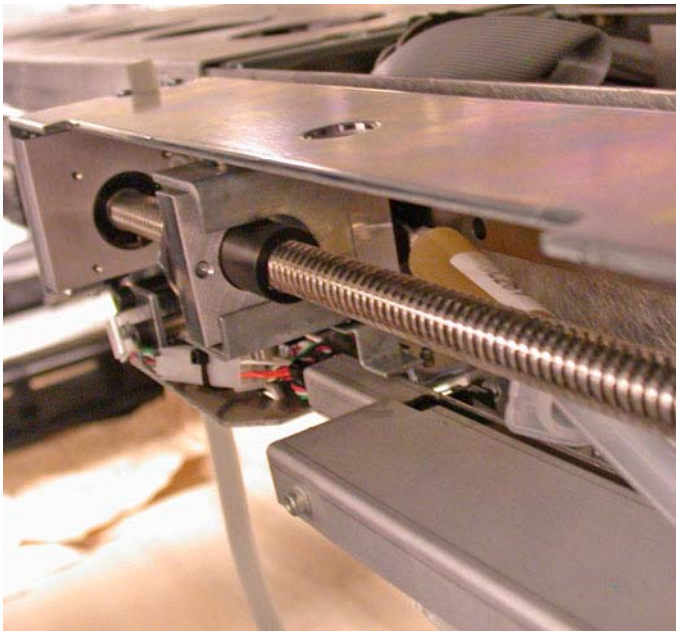
1. Locate the slider's grease port on the side of the pusher carrier furthest from the carriage motor.

2. Apply grease to the slider with the 1.8 mm needle syringe while moving the Z-motor assembly back and forth by hand.

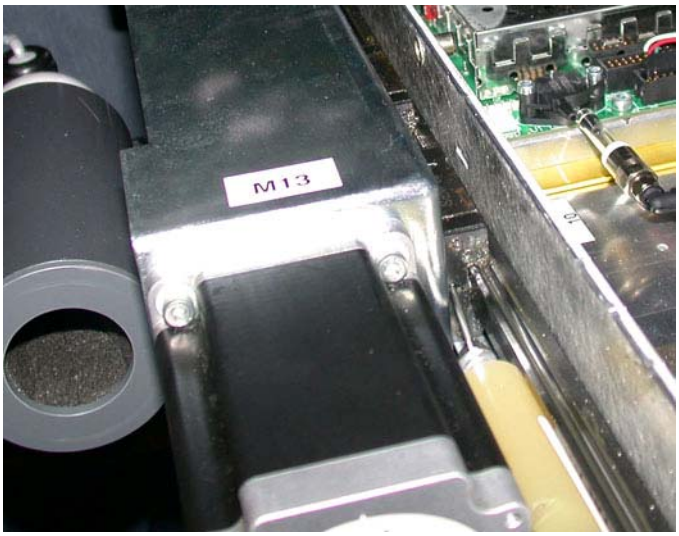


3. Locate the grease port on the middle slider.

4. Apply grease to the slider with the 1.8 mm needle syringe while moving the Z-motor assembly back and forth by hand.



5. Locate the grease port on the slider closest to the Z-motor.
6. Apply grease to the slider with the 1.8 mm needle syringe while moving the Z-motor assembly back and forth by hand.



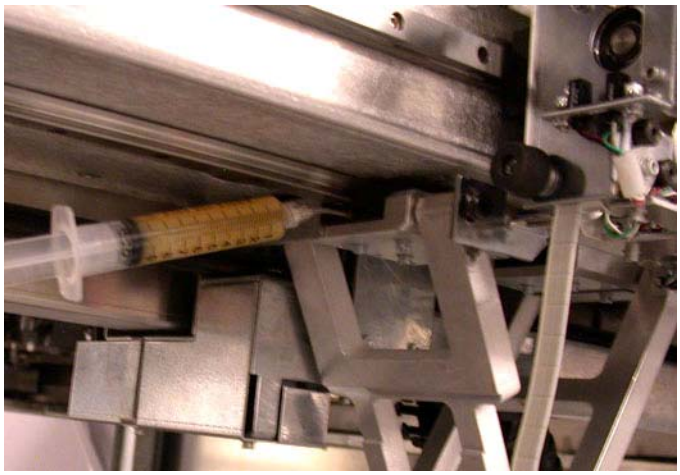
Similarly, lubricate the three sliders for the right side pusher Z-motor assembly.

3.3.2 Pusher carrier linkage rail

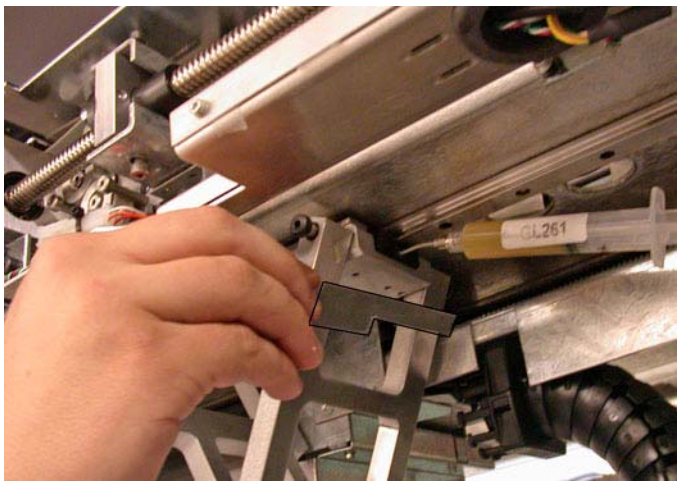
The pusher linkage linear rail is located on the underside of the pusher crossbeam. There are four sliders in total on the rail—two sliders for the left pusher and two sliders for the right pusher. The procedure for lubricating each side is identical.

To lubricate the two left side pusher Z-linkage sliders:

1. Extend the pusher shoes to gain access to the rail sliders on the underside of the pusher crossbeam.
2. Locate the slider's grease port on the side of the pusher linkage furthest from the Z-motor.
3. Apply grease to the slider with the 1.8 mm needle syringe while moving the carrier back and forth by hand.



4. Locate the grease port on the slider closest to the Z-motor.
5. Apply grease to the slider with the 1.8 mm needle syringe while moving the linkage assembly back and forth by hand.



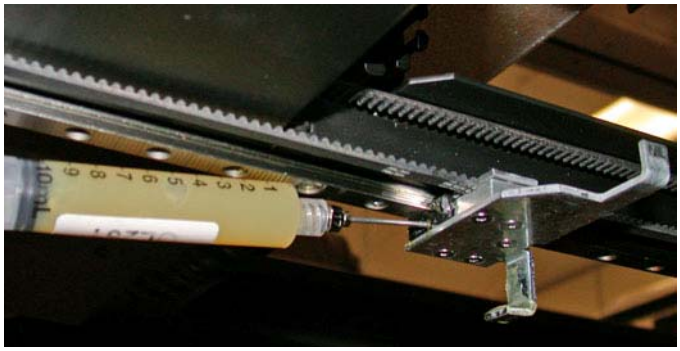
Similarly, lubricate the two right side pusher Z-linkage sliders.

3.3.3 Pusher plate hook rails

There are two pusher plate hook rails—one on each pusher carrier. They are located on the underside of the pusher carrier shoe.

To lubricate the left side plate hook rail:

1. With the pusher carrier still retracted (up), locate the plate hook slider grease ports.
2. Apply grease to both sides of the slider with the 1.2 mm needle syringe while moving the plate hook back and forth by hand.



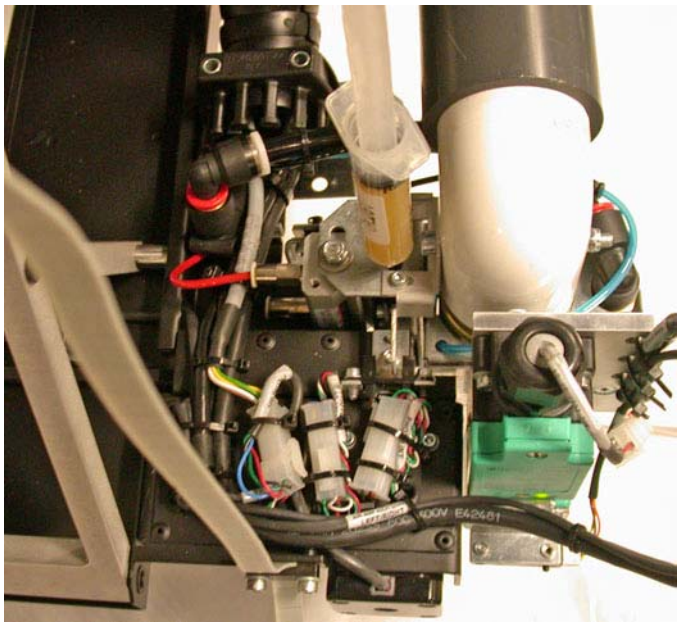
Similarly, lubricate the right side plate hook rail.

3.3.4 Pusher air amplifier rails

There are two pusher air amplifier rails—one on each pusher carrier.

To lubricate the left side air amplifier assembly rail:

1. Locate the grease port on the air amplifier rail slider.
2. Apply grease to the slider with the 1.2 mm needle syringe while moving the assembly up and down by hand.



Similarly, lubricate the right side air amplifier assembly rail.

3.4 Float Bar Linear Rails

3.4.1 Float bar extend rails

There are two float bar extend rails—one on the left side of the float bar and one on the right side of the float bar. The rails are mounted on the outside of the picker gantry beam.

To lubricate the right float bar extend rail:

1. Locate the slider's grease nipple on the top of the slider.
2. Apply grease to the slider with the grease gun while moving the float bar back and forth in the Y direction.



Similarly, lubricate the left side float bar extend rail.

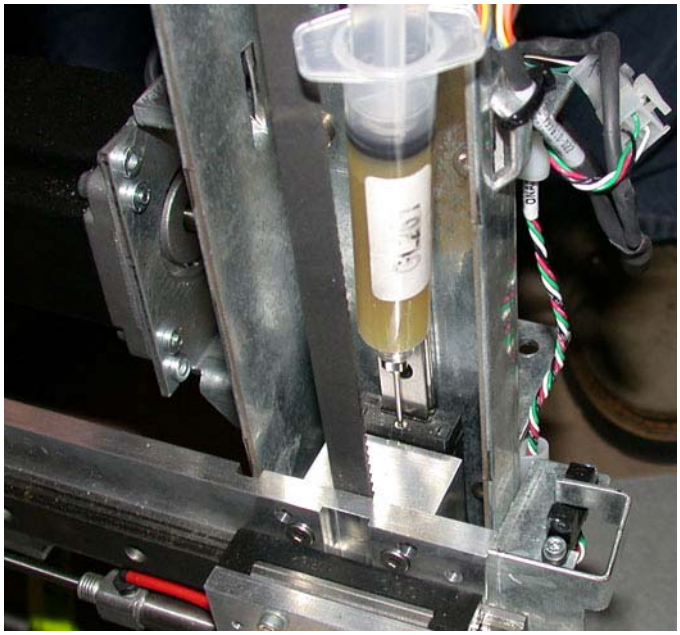
3.4.2 Float bar Z-rails

There are two float bar Z-rails—one on the left side of the float bar and one on the right side of the float bar. The rails are mounted on the inside of the float bar's upright frame.

To lubricate the right side float bar Z-rail:

1. Locate the grease port on the Z-rail's slider.

2. Apply grease to the slider with the 1.2 mm needle syringe while moving the float bar up and down.



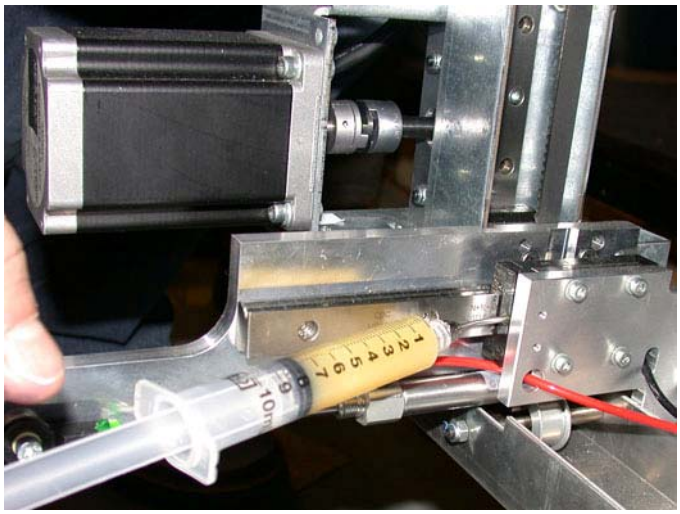
Similarly, lubricate the left side float bar Z-rail.

3.4.3 Float bar X-rails

There are two float bar X-rails—one on either side of the float bar. These rails are only installed on APLs up to EP6. Machines after that will no longer have these rails.

To lubricate the right side float bar X-rail:

1. Locate the grease port on the X-rail slider.
2. Apply grease to the slider with the 1.8 mm needle syringe.



Similarly, lubricate the left side float bar X-rail.

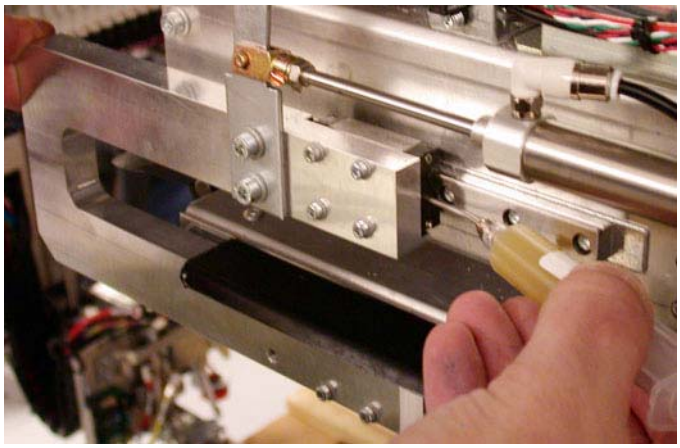
3.5 Plate Transfer Module Linear Rails

3.5.1 Table gate rails

There are two table gate rails. Both rails are located on the eject side of the table.

To lubricate the two table gate rails:

1. Locate the grease port on the top table gate rail slider.
2. Apply grease to the slider with the 1.2 mm needle syringe.



3. Locate the grease port on the lower table gate slider.
4. Apply grease to the slider with the 1.2 mm needle syringe.

