



Mar 11, 2021

Freeze Drier Vacuum Pump Oil Change Protocol

Josh Birlingmair¹¹USDA-ARS**1** *Works for me* This protocol is published without a DOI.

PDI Test

Josh Birlingmair
USDA-ARS

SUBMIT TO PLOS ONE

ABSTRACT

Protocol for changing the oil of a Freeze Drier Vacuum

PROTOCOL CITATION

Josh Birlingmair 2021. Freeze Drier Vacuum Pump Oil Change Protocol. **protocols.io**
<https://protocols.io/view/freeze-drier-vacuum-pump-oil-change-protocol-bs8dnhs6>

KEYWORDS

Freeze, Drier, Vacuum, Pump, Oil, Change, Protocol

LICENSE

————— This is an open access protocol distributed under the terms of the [Creative Commons Attribution License](#), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited

CREATED

Mar 11, 2021

LAST MODIFIED

Mar 11, 2021

PROTOCOL INTEGER ID

48101

Removing Pump from Freeze Drier

- 1 Take fill plug out of top end of pump reservoir with Allen wrench
- 2 Open Oil drain valve on back of pump and drain oil into small drain pans dumping as needed into gallon jug marked used oil.
- 3 Unplug pump from Freeze Drier
- 4 Disconnect Intake Port and Filter from Exhaust Port from top of Pump make sure to keep the clamping rings and O-ring seals with the proper ports the screened seal always goes on the intake port.

Put Oil absorbency pads on half of Stainless Steel Cart

5

- 6 Pull Pump from bottom of Freeze Drier and put on Stainless Steel Cart on pads using extendable handle and under motor to support. Using just handle can break the handle the pumps are very heavy. If the pump is dropped it will break, and destroy the pump.



The drain is on the right bottom corner and the fill plug is above the sight glass. The intake port is on the top right and the exhaust port is on the top left.

Changing Filters and Oil

- 7 Remove four Allen bolts from the motor to the reservoir with 3/8 ratchet and Allen socket or flex Allen wrench. They will be the four on the corners that you can see the heads. Set the motor aside with the bolts.
- 8 With drain valve open and a drain pan on the floor under tip the pump up and turn the slip clutch where the motor connects clockwise 20 + time to flush the excess oil out of the vein chambers of the pump. When the oil stops running it's done.
- 9 Remove the five Allen bolts holding the reservoir on with 3/8 ratchet and Allen socket. Separate the reservoir from the frame and wipe out clean.



Take the four Allen bolts out to take the reservoir off.



Examples of the Reservoir, motor, filter, filter frame, and spring tension rods.

- 10 Remove old gasket and dispose of.
- 11 Remove two **L –Shaped** spring tensioned rods from top of filter frame on top of pump by lifting the ends out of the grooves in the frame then remove the frame and the filter. Dispose of filter.
- 12 Clean outside of pump and inside of reservoir with brake cleaner.

- 13 Install new filter (ES39026012) on top of pump install frame over filter with then pull spring tensioned rods up into grooves in frame and make sure they are seated properly.
- 14 Install new reservoir gasket over end of pump and be sure that the small dowels line up on the appropriate holes in the gasket.



- 15 Slide reservoir over end of pump and line up on the dowels. Hold tight while starting Allen screws and snugging. Make sure gasket is aligned and not wrinkled before tightening. Starting with top bolt snug in a clock-wise rotation. Once all five are snug go back around in the same order and tighten more. Make sure they are tight but **Do Not Over Tighten** this is aluminum and they can be stripped very easily.
- 16 Try to get the slip clutch close to being aligned before trying to mount the motor on the pump. Put the motor on the pump then install the four Allen screws in the motor snugging in a clockwise order the tightening the same. **Do Not Over Tighten**.
- 17 Remove canister from exhaust filter base, unscrew inner filter support, dispose of old filter, and clean out canister.
- 18 Remove canister from exhaust filter base, unscrew inner filter support, dispose of old filter, and clean out canister.
- 19 Install new filter onto filter support, screw filter support back onto base, then screw canister back onto base make sure drain valve is closed.

Reinstalling the Pump and Filling the Oil

- 20 Using handle and under Motor, lift Pump and slide back in the bottom of the Freeze Drier. Feed electric cable through to the front side of the Freeze Drier.
- 21 Connect the intake to the port next to the Motor don't forget to install the O-Ring seal with the screen then tighten Ring Clamp.
- 22 Connect the Exhaust Filter on the exhaust port, use O-Ring seal and Ring Clamp.
- 23 Make sure drain valve is closed on reservoir. Fill Vacuum pump oil until the site glass is showing full. Replace fill plug and tighten with Allen wrench.

Plug in pump and push the Vacuum button on the control panel. Run the pump for about 2 or 3 minutes. Push Vacuum

- 24 button to shut pump off then check the oil level in the site glass. The site glass should show the oil level about a quarter of an inch below the top. Sustain that level while operating the Freeze Drier.