LS4 Camera: Pumpout procedures

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Contents:

WARNINGS:

DO NOT connect the 220-V AC line to the camera solenoid valve until the turbo pump is running (steps 1 to 6) and the foreline is fully pumped down. Sudden loss of vacuum could result, damaging the camera dewar and CCDs.

MAKE SURE power to the the solenoid valve is disconnected before shutting down the turbo pump (step 12).

Initial pump down of warm camera at atmospheric pressure

1. Put telescope in stow position (zero hour angle, +50 deg Dec).

*****Disable the telescope servos so the telescope can not be moved*****

2. Open the telescope hatch, raise the platform, and attach the stainless steel pipe and hose to the pumpout flange on the camera. The flange is at the bottom of the camera, on the corrector side. It is a QF-40 flange.

Hang the pipe on the hatch opening and secure in place

3. Attach a long vacuum hose between the turbo pump and the stainless steel pipe

4. Attach filtered, high pressure air to the quick-connect fitting near the telescope hatch. Adjust to 75 PSI.

5. Plug in the turbo pump into an AC outlet on the floor. Do not turn on.

6. Open the dewar valve by connecting the orange, US-standard AC cord from the turbo pump to the US-standard plug near the telescope hatch.

******The orange cord must be plugged into the power strip inside the pump controller, and only into the position next to the one providing power to the roughing pump. This is to ensure that the solenoid valve will close in the event of a pump failure.******

7. Plug in the turbo pump into an AC outlet on the floor and turn on the turbo pump by pressing the start/stop button.

In a few minutes, the turbo pump should ramp up to speed at 75,000 rpm. If it does not, check and tighten all the vacuum seals at the flanges.

******If the pump does not come up to speed, shut it off and do not proceed further. ******

9. Pump until pressure reading inside the dewar below 1.0 mTorr. This could take ~24 hours

10. When pumpout is complete, close the dewar valve by unplugging the power to the valve solenoid.

11. Disconnect the pressurized air from the quick-connect fitting near the hatch.

12. Turn off the turbo pump and wait for it to wind down.

To speed the wind-down of the turbo pump, very slightly loosen the bleed valve on the side of the turbo pump. You will immediately hear the pump wind down. Allow the pump line to come to atmosphere.

13. Disconnect the pump line, unplug the pump and roll it away.

14. Park the telescope at the meridian, 0 degrees declination.

Warmup of cold camera under vacuum

1. Put telescope in stow position (zero hour angle, +50 deg Dec).

*****Disable the telescope servos so the telescope can not be moved*****

2. Open the telescope hatch, raise the platform, and attach the stainless steel pipe and hose to the pumpout flange on the camera. The flange is at the bottom of the camera, on the corrector side. It is a QF-40 flange.

Hang the pipe on the hatch opening and secure in place

3. Attach a long vacuum hose between the turbo pump and the stainless steel pipe

4. Attach filtered, high pressure air to the quick-connect fitting near the telescope hatch. Adjust to 75 PSI.

5. Plug in the turbo pump into an AC outlet on the floor and turn on the turbo pump by pressing the start/stop button.

In a few minutes, the turbo pump should ramp up to speed at 75,000 rpm. If it does not, check and tighten all the vacuum seals at the flanges. Wait 10 minutes for the pump hose to pump out.

***** If the pump does not come up to speed, shut it off and do not proceed further. ******

6. Attach the high pressure line from the large compress tank to the quick-connect fitting near the telescope hatch. Adjust to 75 PSI.

7. Check the dewar pressure again and make sure it is below 1 Torr.

Normal readings for the gauge on the west side of the telescope are "0.0", which means less than 0.1 millitorr.

***** If the pressure reading is "1.0 Torr" or higher, do not proceed further *****

8. Open the dewar valve by connecting the orange, US-standard AC cord from the turbo pump to the US-standard plug near the telescope hatch.

*****__The orange cord must be plugged into the power strip inside the pump controller, and only into the position next to the one providing power to the roughing pump. This is to ensure that the solenoid valve will close in the event of a pump failure. ***__

9. Watch the dewar pressure. It should start dropping immediately after opening the dewar.

***** If the dewar pressure rises, immediately unplug the orange cord to close the dewar valve. Do not procede further. *****

10. Turn off the cryocooler compressors and water chillers. The camera dewar will begin to warm up.

After ~24 hours, the dewar will have warmed to room temperature and the internal getters will have outgassed. The dewar pressure should read "0.0" (< 0.1 mTorr).

11. When pumpout is complete, unplug the power to the valve solenoid.

12 Disconnect the pressurized air from the quick-connect fitting near the hatch.

13. Turn off the turbo pump and wait for it to wind down.

To speed the wind-down of the turbo pump, very slightly loosen the bleed valve on the side of the turbo pump. You will immediately hear the pump wind down. Allow the pump line to come to

atmosphere.

14. Disconnect the pump line, unplug the pump and roll it away.

15. Park the telescope at the meridian, 0 degrees declination.