Notes (not all of these may be applicable):

1)      Check that the laser wavelength is 800 nm, if they are still using a Vitesse, it should still be 800 nm, but check.  If the Vitesse fails to mode lock, for example, it will not have a broad pulse, and the wavelength can differ.

2)      Reduction of power should be by a waveplate polarizer into beam dump assembly.  Rotating the waveplate into the isoloator may not work, and may damage the isolator.  Note that you can’t reduce he power ever by adjusting the Vitesse.  The Vittesse has to make at least 240-260 mW , or it fails to modelock (see #1).  For whatever reason, the waveplate polarizer power adjustment was always a separate assembly from the GDC itself.  Has it been removed from the table?

3)      Do not remove the isolator, the beam should go down the center of the isolator.  It may not hit the center of M1; however the GDC was aligned with the isolator in place.  The rest of the alignment should be close if the beam goes through the center of the isolator (as long as other mirrors have not been touched).

4)      Adjustments of halfwave plates prior to the grating can cause poor transmission through the grating sequence.  If I recall correctly, the input to the GDC must be horizontally polarized with respect to the table.  The Vitesse is horizontally polarized.    If the beam path from the Vitesse to the GDC was altered with an over and sideways mirror combo, this could change the polarization.

5)      Viewing the grating with the IR viewer, or viewing the diffraction from the grating at the lens, should reveal a wide stripe for at least one of the spots.  If you don’t have a wide stripe, the Vitesse may not be modelocking.

6)      As long at the wavelength is 800nm, the grating angle should not need to be adjusted.  If for whatever reason it was adjusted, the diffracted strip should be centered in the lens and on the retroreflecting mirror behind the lens by adjusting the grating angle (do not do this unless you are sure it is wrong).

7)      If by centering the beam and fine adjustment into the isolator, the laser power is present in the OFR fiberport then the alignment is is mostly OK. Without the fiber installed, some light should be present on an IR card held behind the FC bulkhead.  This is somewhat tricky because the fiber is actually FC/APC (angle polish).  This requires that the beam be offset slightly in the fiberport lens.

8)      The fiber input face should be inspected with a microscope for damage.  If the core is cratered, the fiber will need to be repolished or replaced.  Diamond connectors are somewhat difficult to repolish – they are not necessary.

9)      Once you get any, if even a small amount of light through the core, maximize with the steering mirror in front of the OFR port.  Then adjust the X-Y and the 3 plunger focus screws on the OFR port to maximize power.  Then repeat steering and maximizing the port iteratively.

10)   Be careful adjusting the X-Y screws on the OFR port.  If adjusted too far, and particularly if he 3 plunger screws are pulled back (loosened) a great deal, the lens, which is magnetically held to slip plate within the port, can disengage from the leaf spring, and the X-Y screws on the OFR port essentially no longer work.  You have to disassemble the OFR port and reposition with the leaf spring in place.  Directions to adjust the OFR port are here:

<http://www.ofr.com/tech_paf_alignment.htm>

Note that the OFR port has a locking screw and the 3 plunge screws – if these are tightened the OFR port wont adjust.  It is possible during the original install that these would have been tightened, as once the alignment is good, minor drift can be compensated by the input mirror (the 2 knobs on the top of the covered box) without touching the OFR port.

11)   If you have an 800 nm fiber coupled light source (like diode laser, you can buy these from Thorlabs) this can be invaluable in allighment for the fiber port.  Plug in the fiber so light is going backwards through the system.  Then adjust the fiber port and final steering mirror so the backwards and forwards light overlap.

12)   The alignment procedure for the factory is extreme, because it assumes that none of the mirrors may be aligned too well.  As long as none of the sequence of mirrors has been touched, it should be possible to iteratively align down the axis of the isolator and then use the final steering mirror to align into the fiber without touching anything else.  Do that iteratively. Then adjust the three Z-axis plungers on the OFR port to maximize the power through.