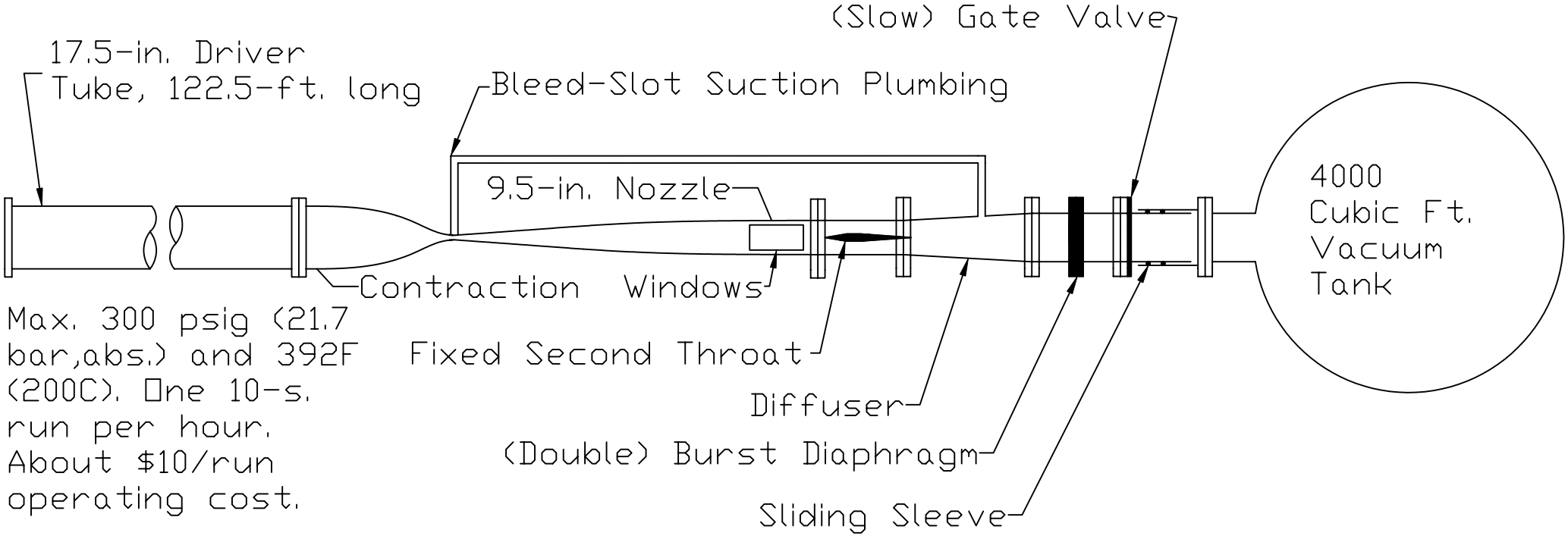
The Boeing/AFOSR Mach-6 Quiet Tunnel at Purdue University
An Image Gallery
Prof. S.P. Schneider's Research Group

Tunnel has a 9.5-inch exit diameter, runs for about 10-sec. about once an hour for about $10/shot. Uses Ludwieg tube concept. Designed to achieve laminar nozzle-wall boundary layers for study of laminar-turbulent transition processes under low-noise conditions comparable to flight. See, for example, AIAA Paper 2002-0302, January 2002.

Built during 1995-2001 with major funding from the Boeing Company and The Air Force Office of Scientific Research. Additional funding from the Ballistic Missile Defense Organization, Sandia National Laboratory, and a gift in memory of Kenneth Hobbie.

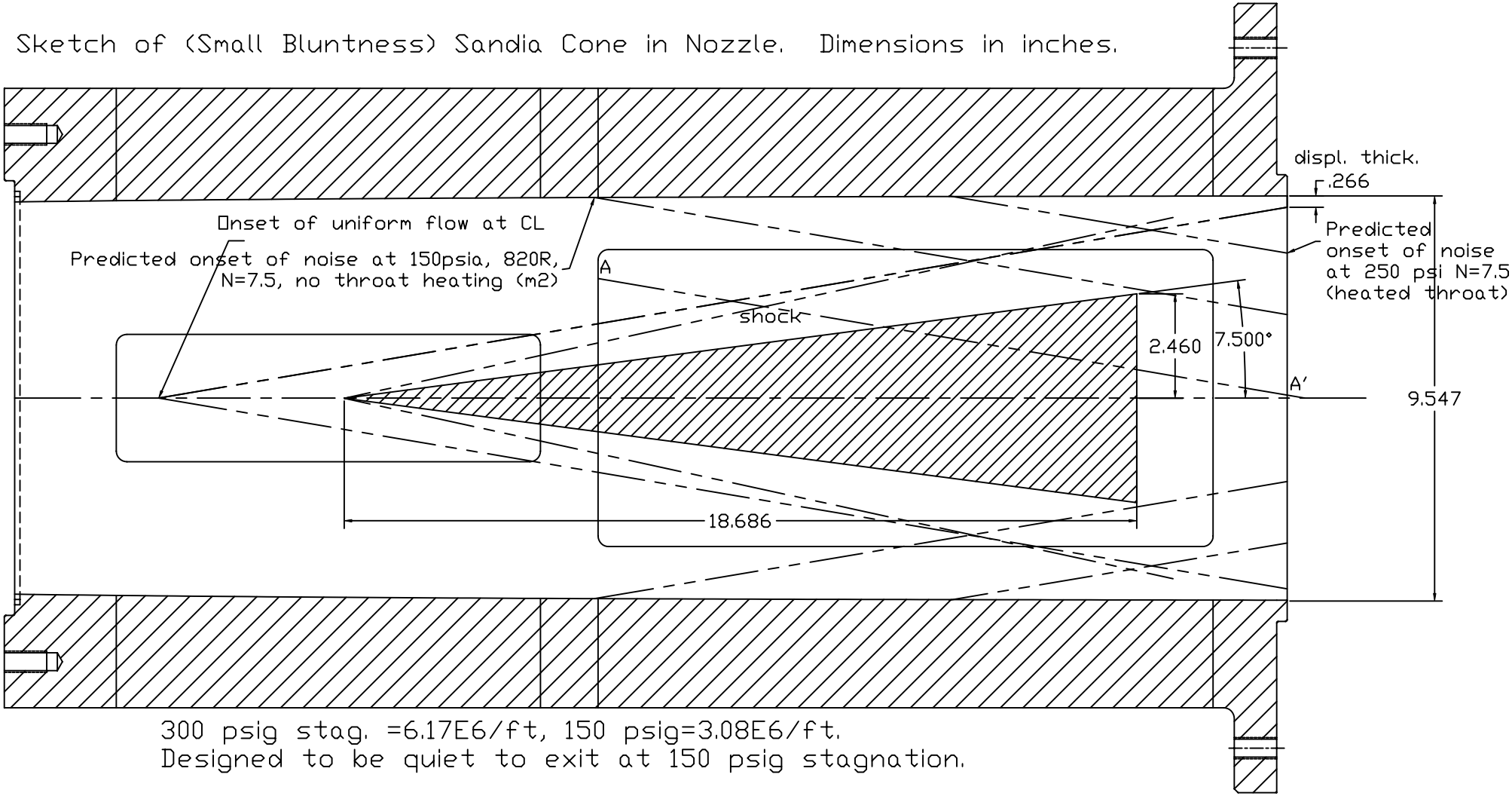
sps 5-30-01

All Clean Stainless Steel from Second-Throat Section Upstream
Unique Low-Noise Flow due to Laminar Nozzle-Wall Boundary Layer



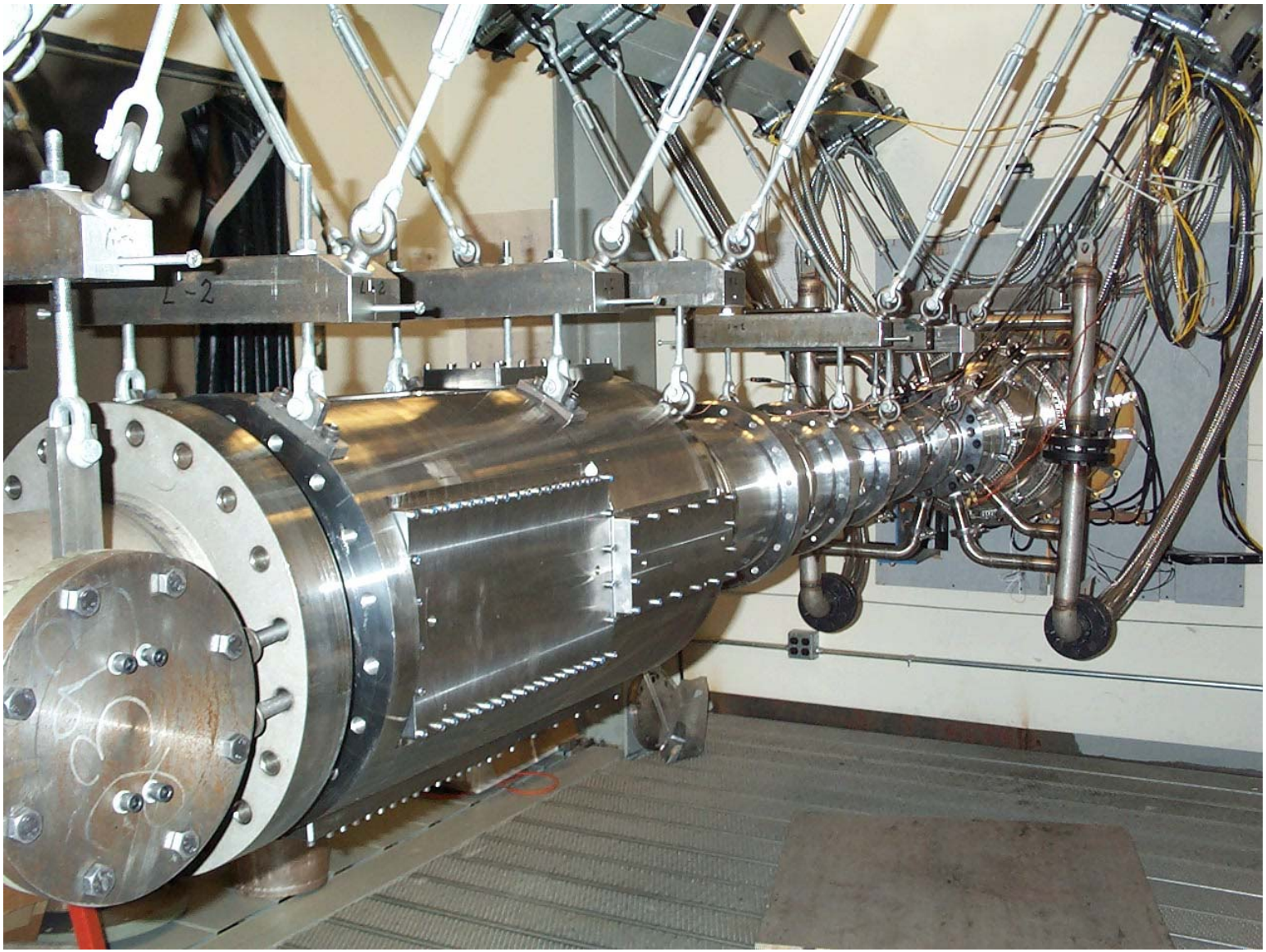
Schematic of Boeing Mach-6 Quiet-Flow Ludwieg Tube

Sketch of (Small Bluntness) Sandia Cone in Nozzle. Dimensions in inches.

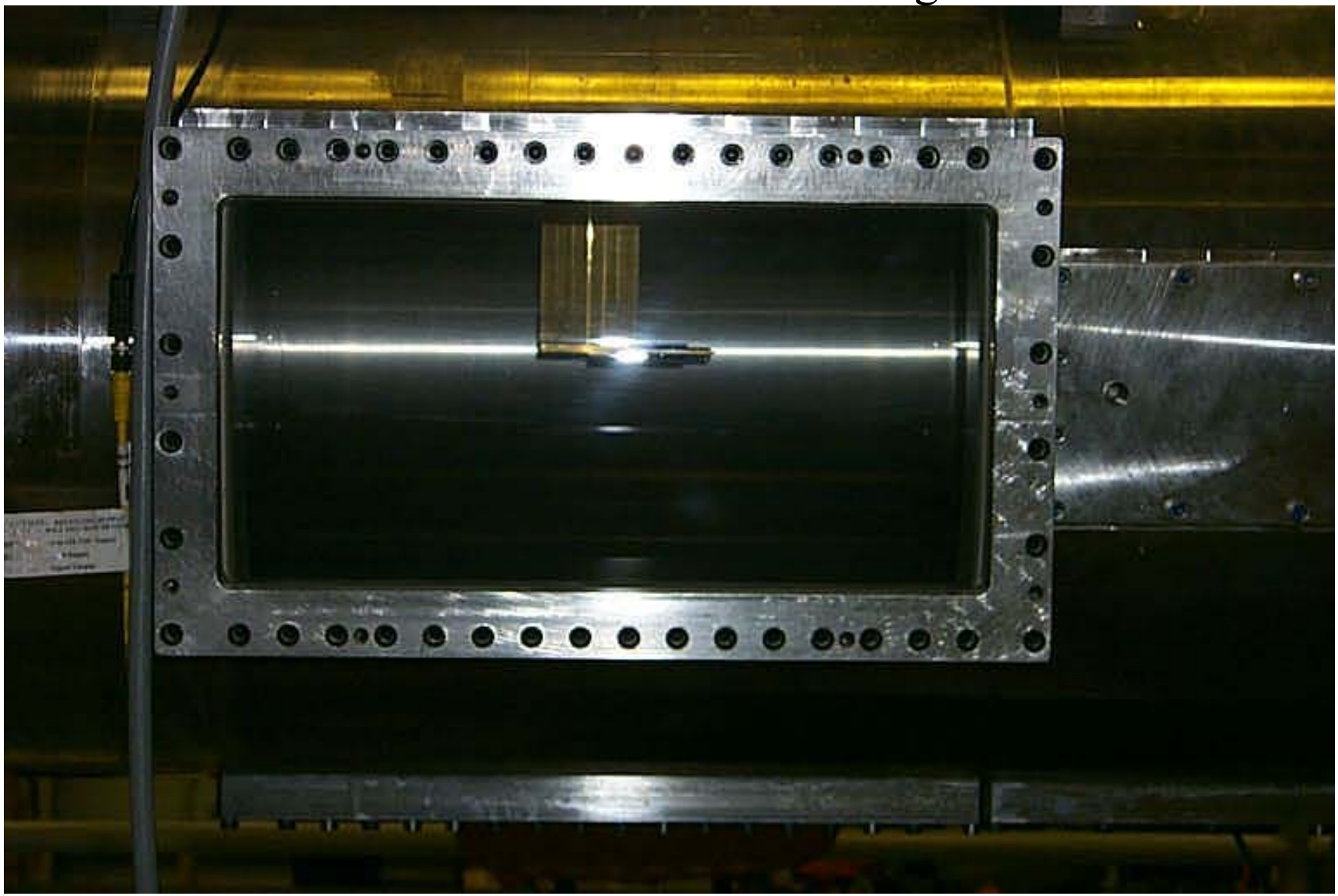


300 psig stag. =6.17E6/ft, 150 psig=3.08E6/ft.
Designed to be quiet to exit at 150 psig stagnation.

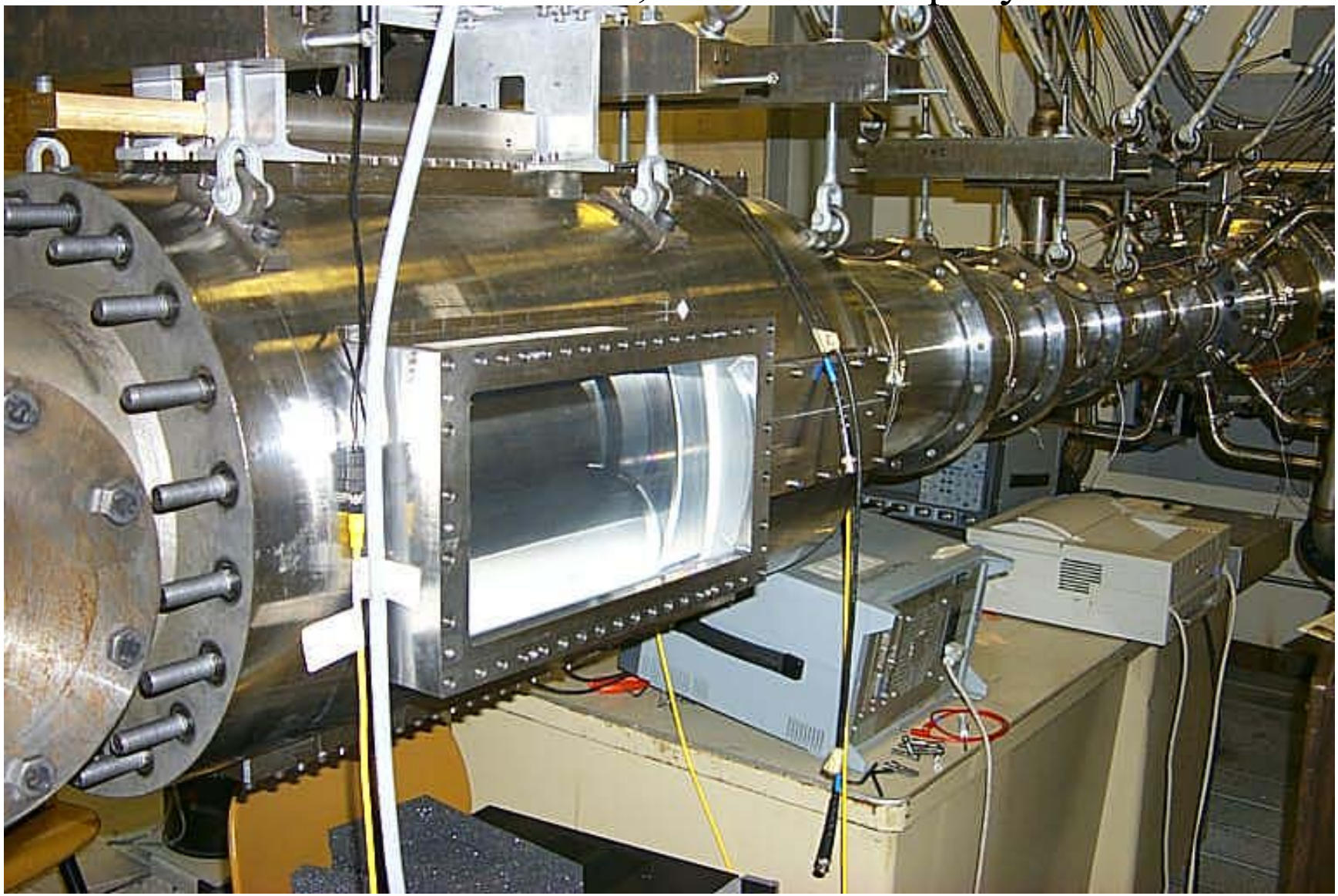
Mach-6 Quiet Nozzle and Contraction



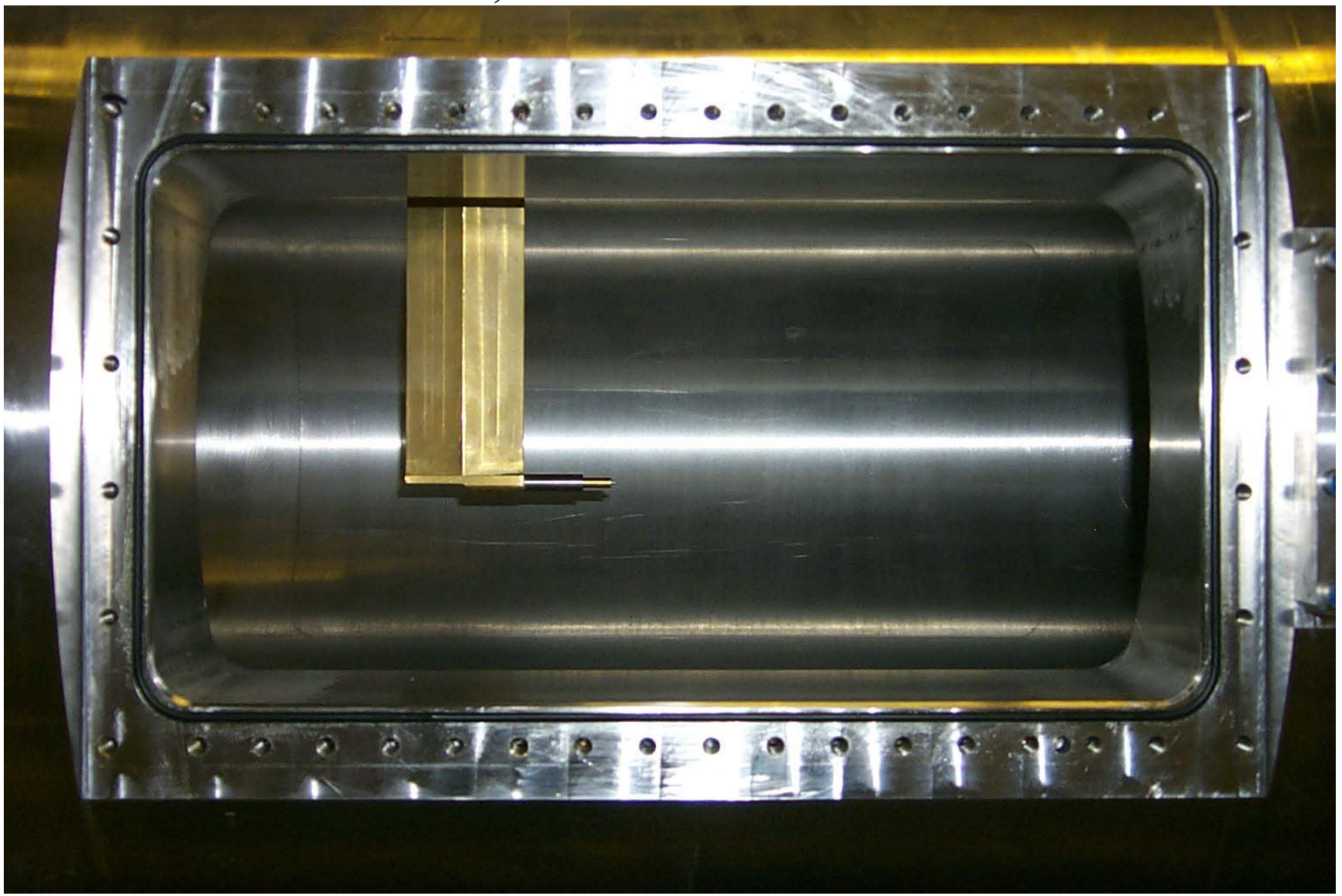
Pitot Probe in Nozzle Viewed Through Window



Nozzle Window, Viewed Obliquely

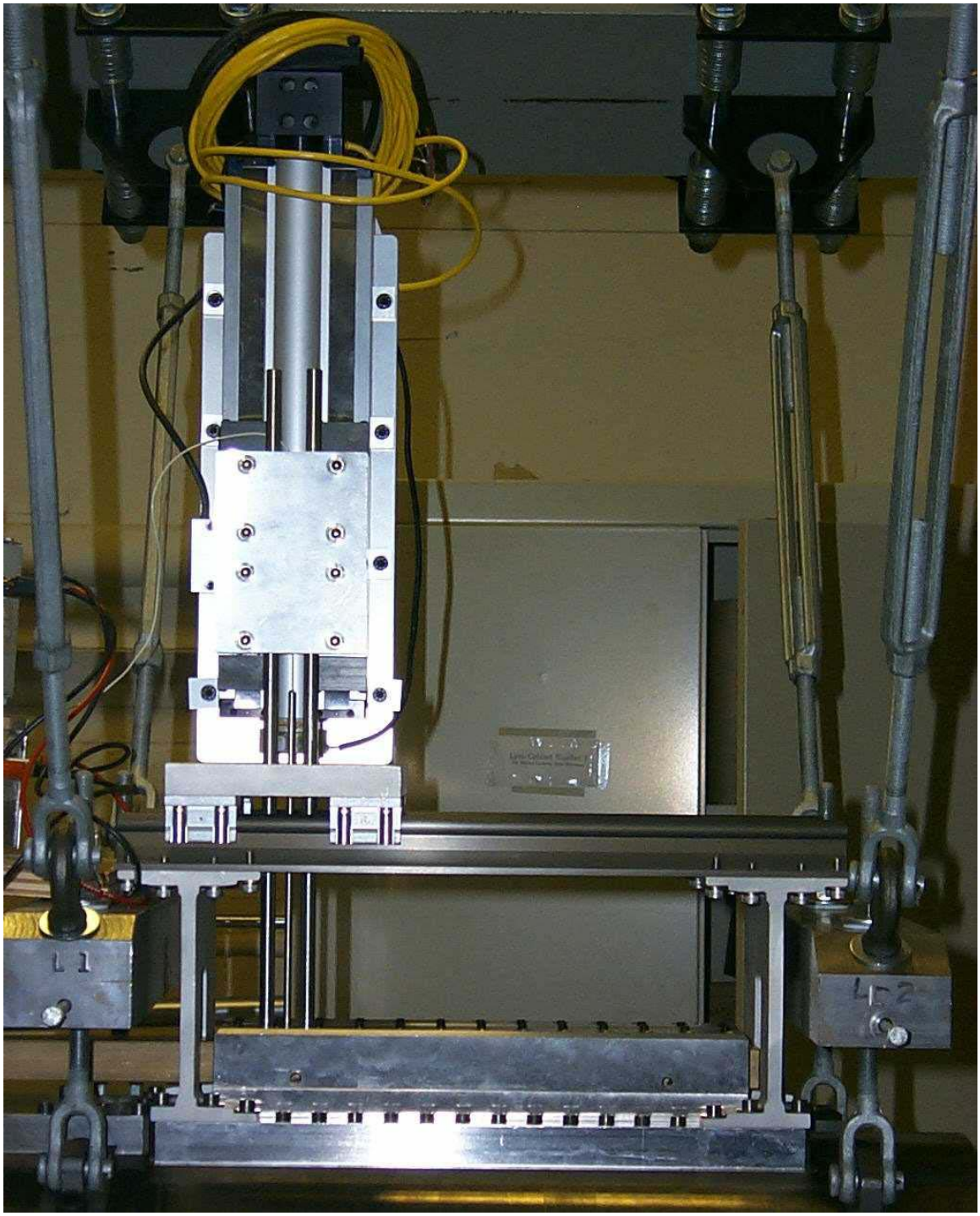


Probe in Nozzle, Viewed With Window Removed

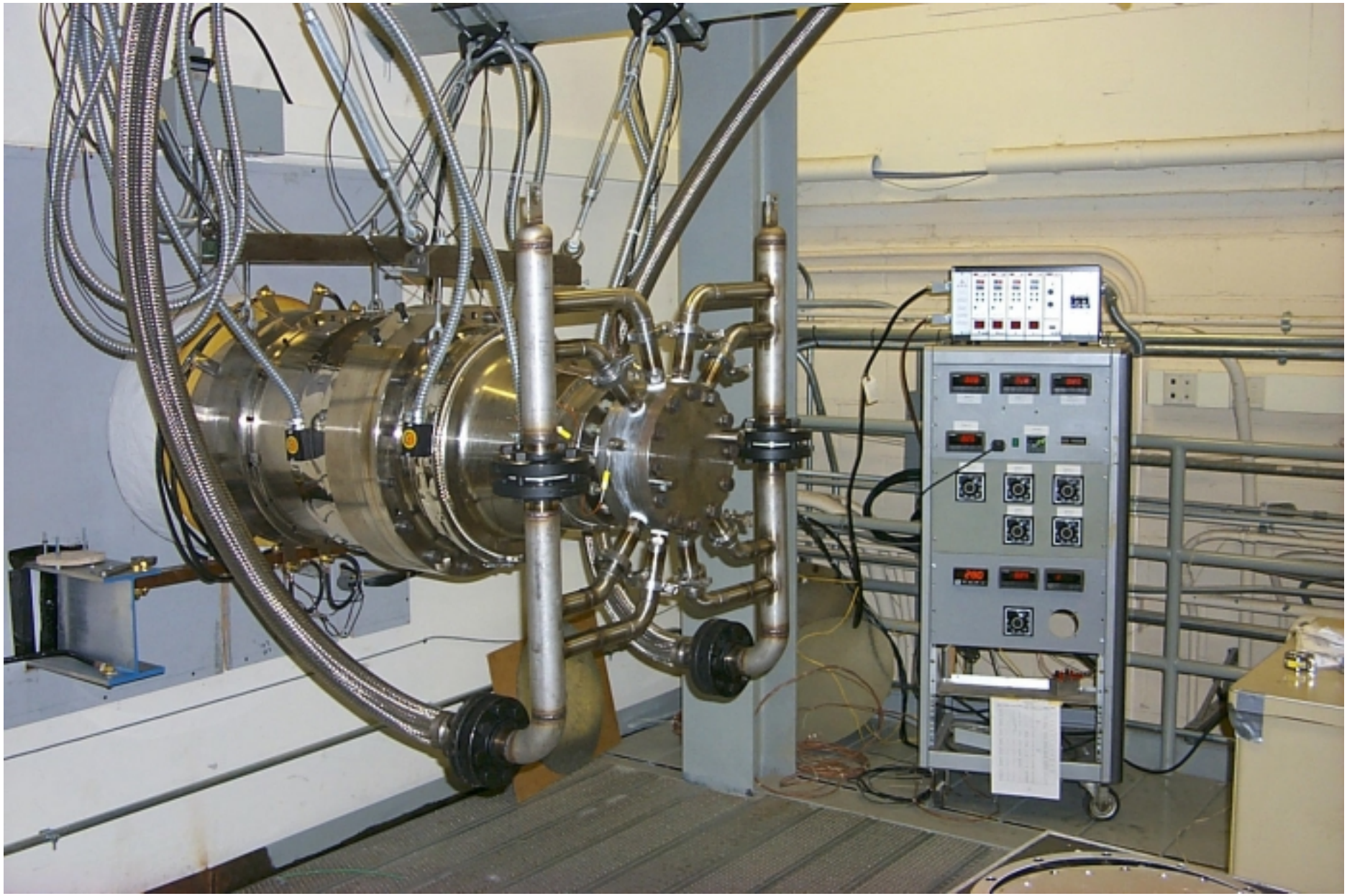


S.P. Schneider, Purdue AAE 4/16/2002

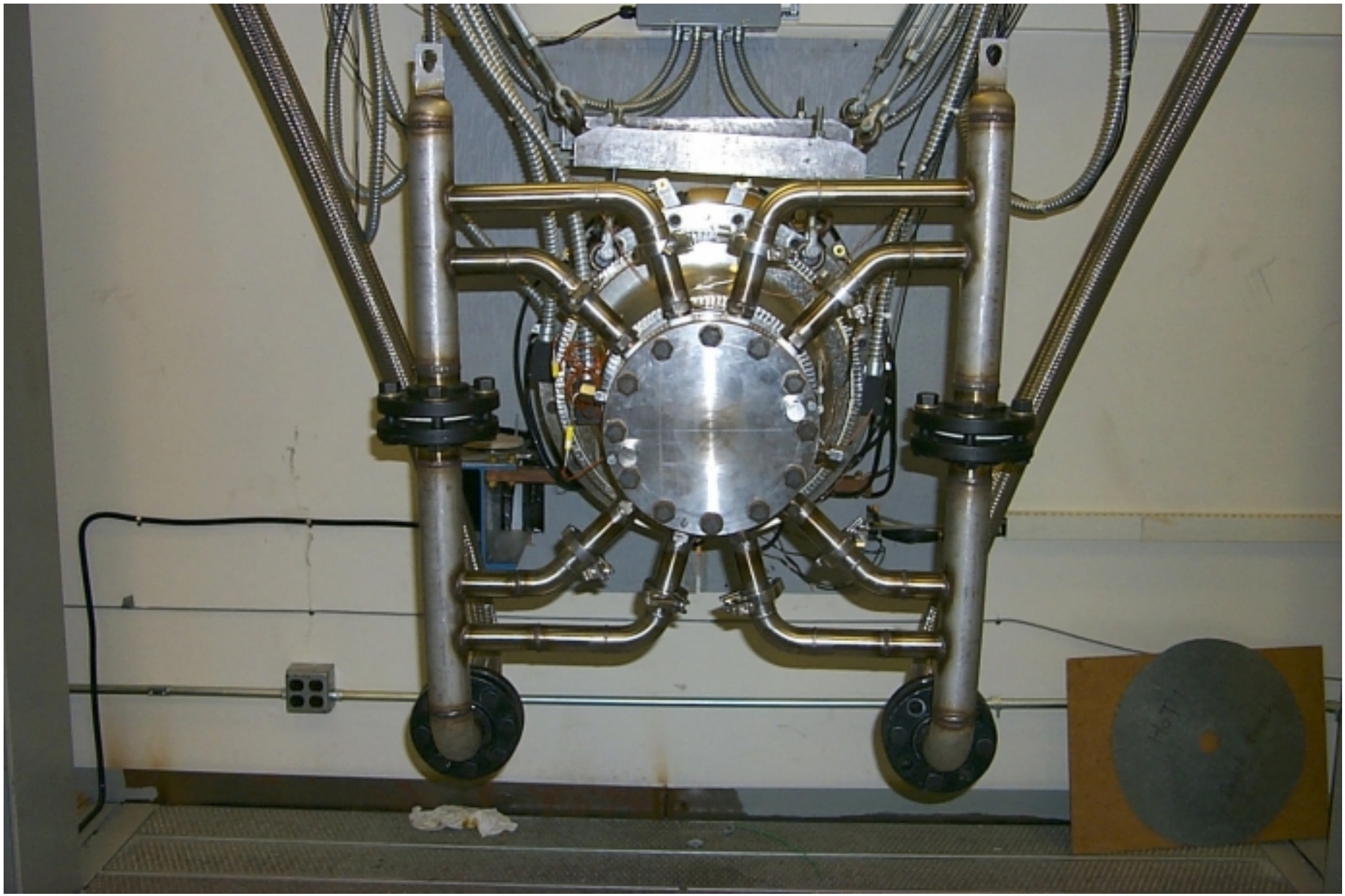
Probe Traverse with Vertical Automation



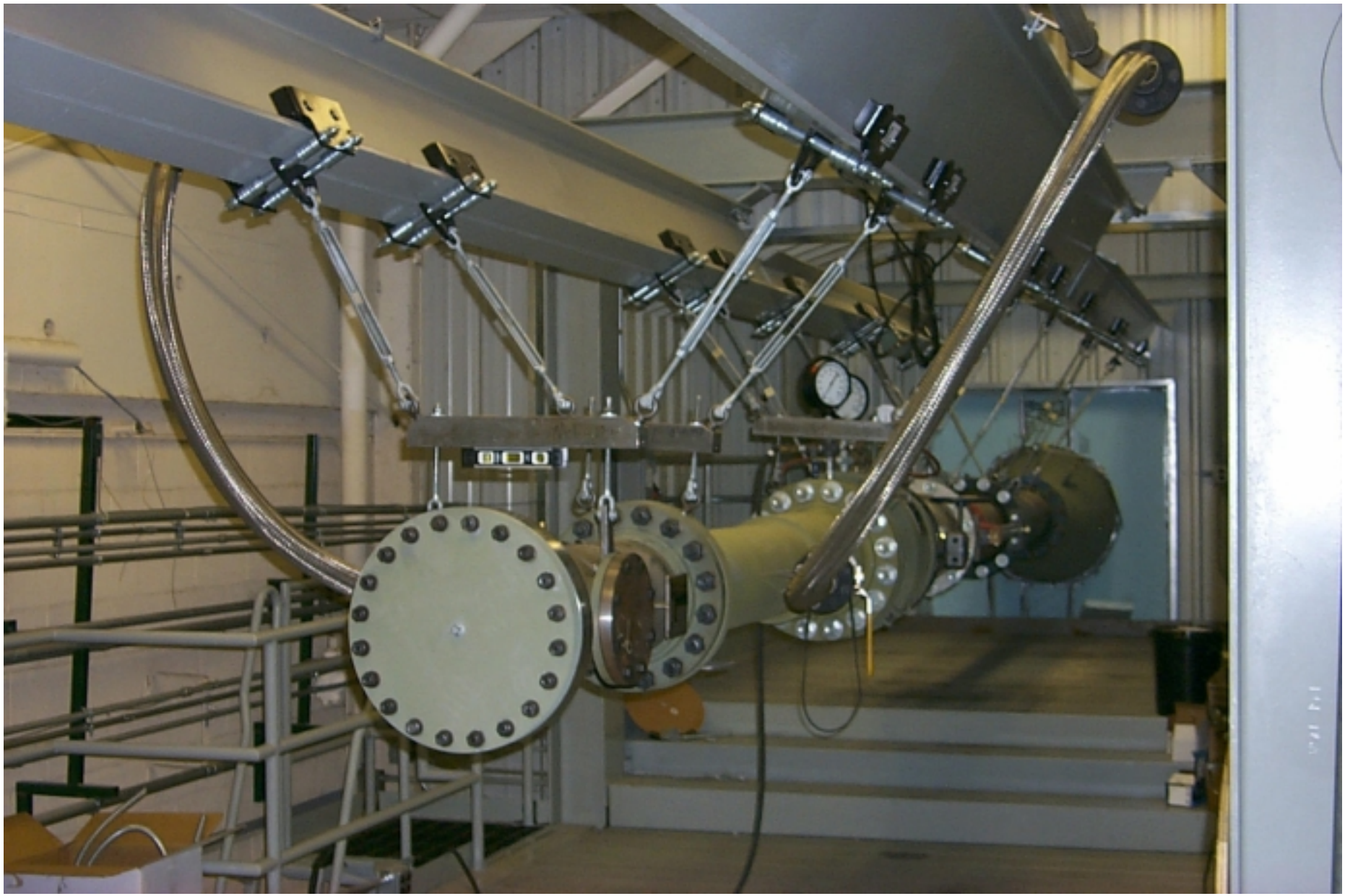
Contraction and Bleed Vacuum with Heaters



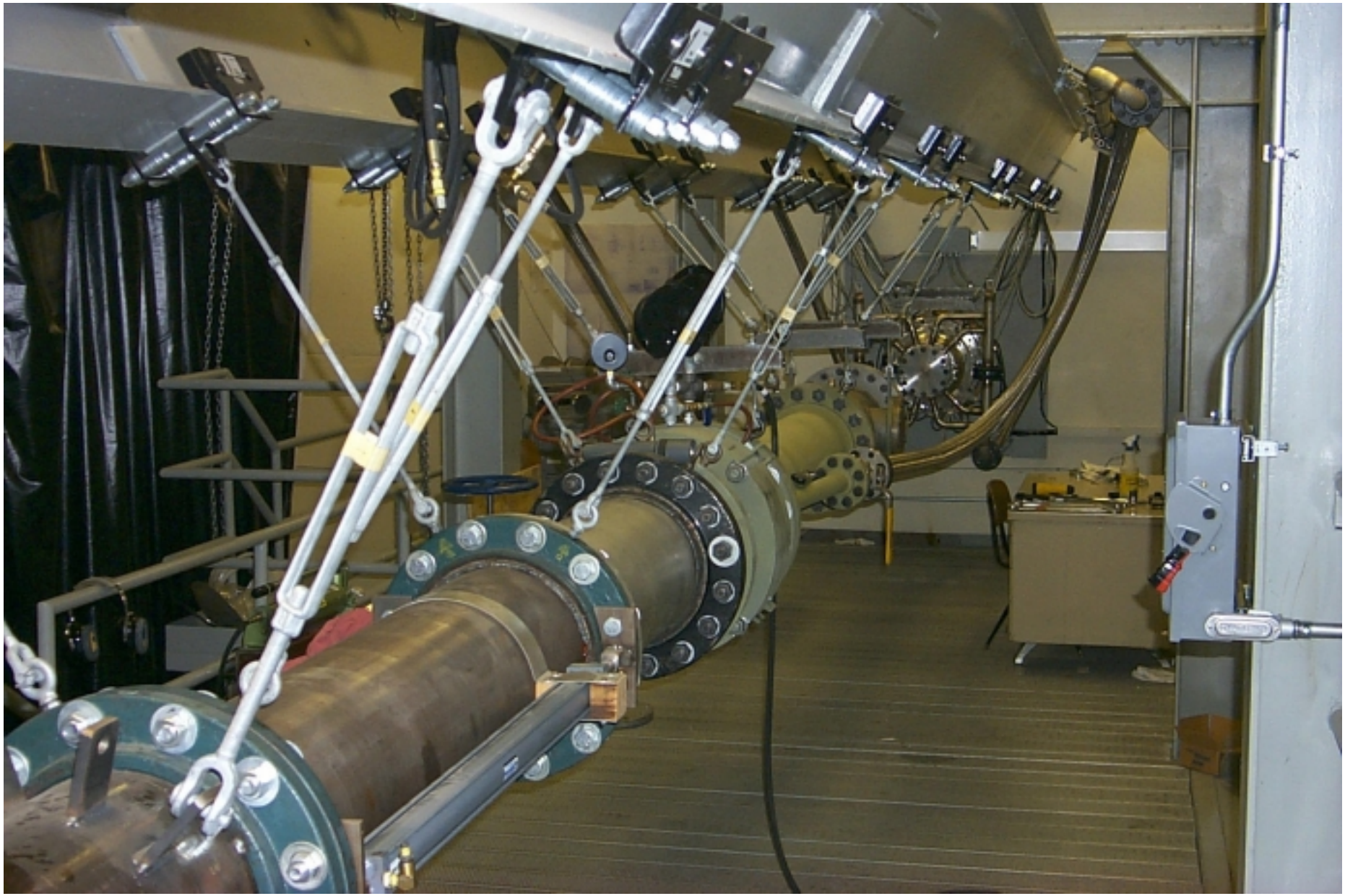
Contraction and Bleed Slot Vacuum System



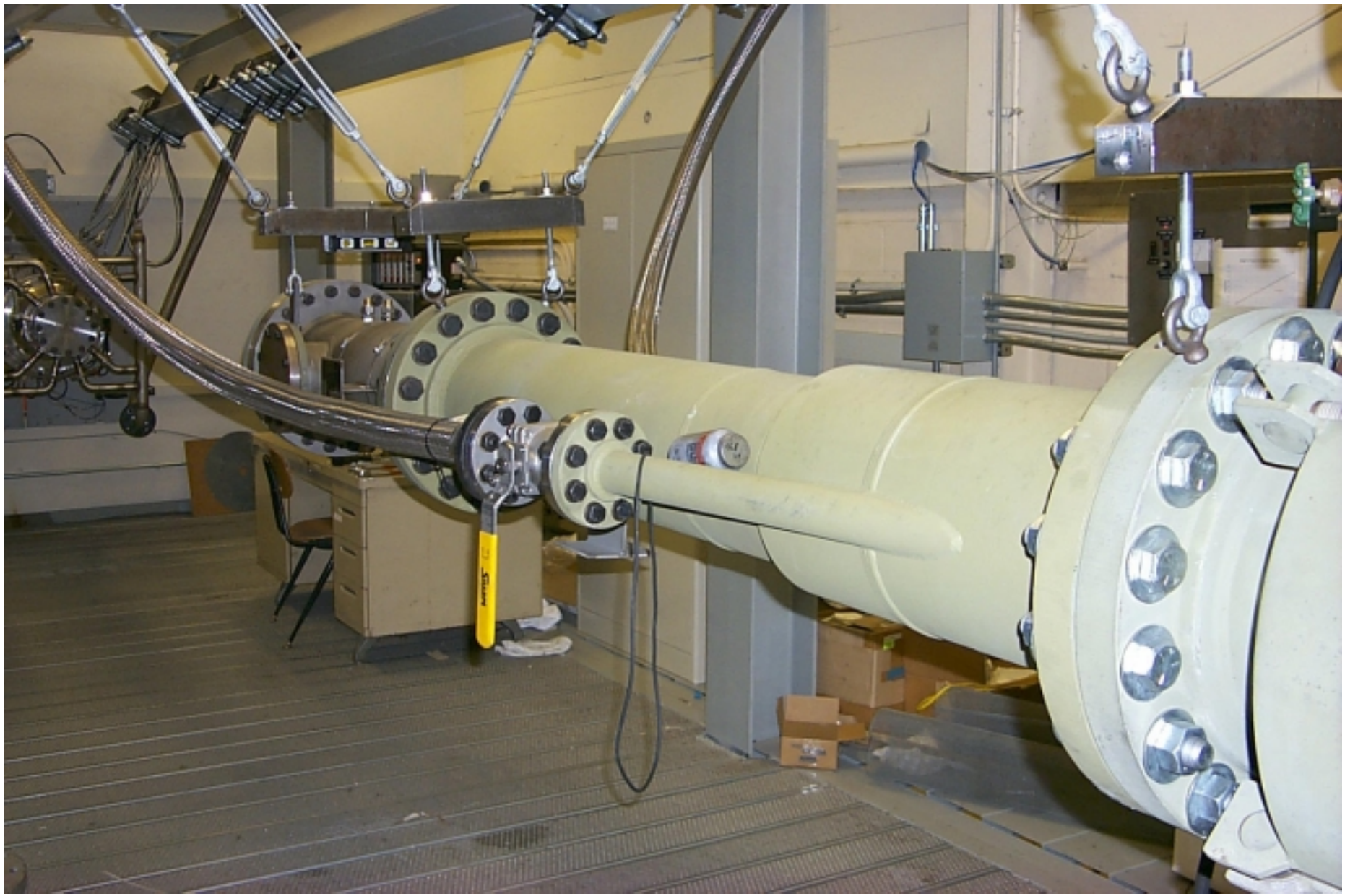
Looking Downstream from Nozzle



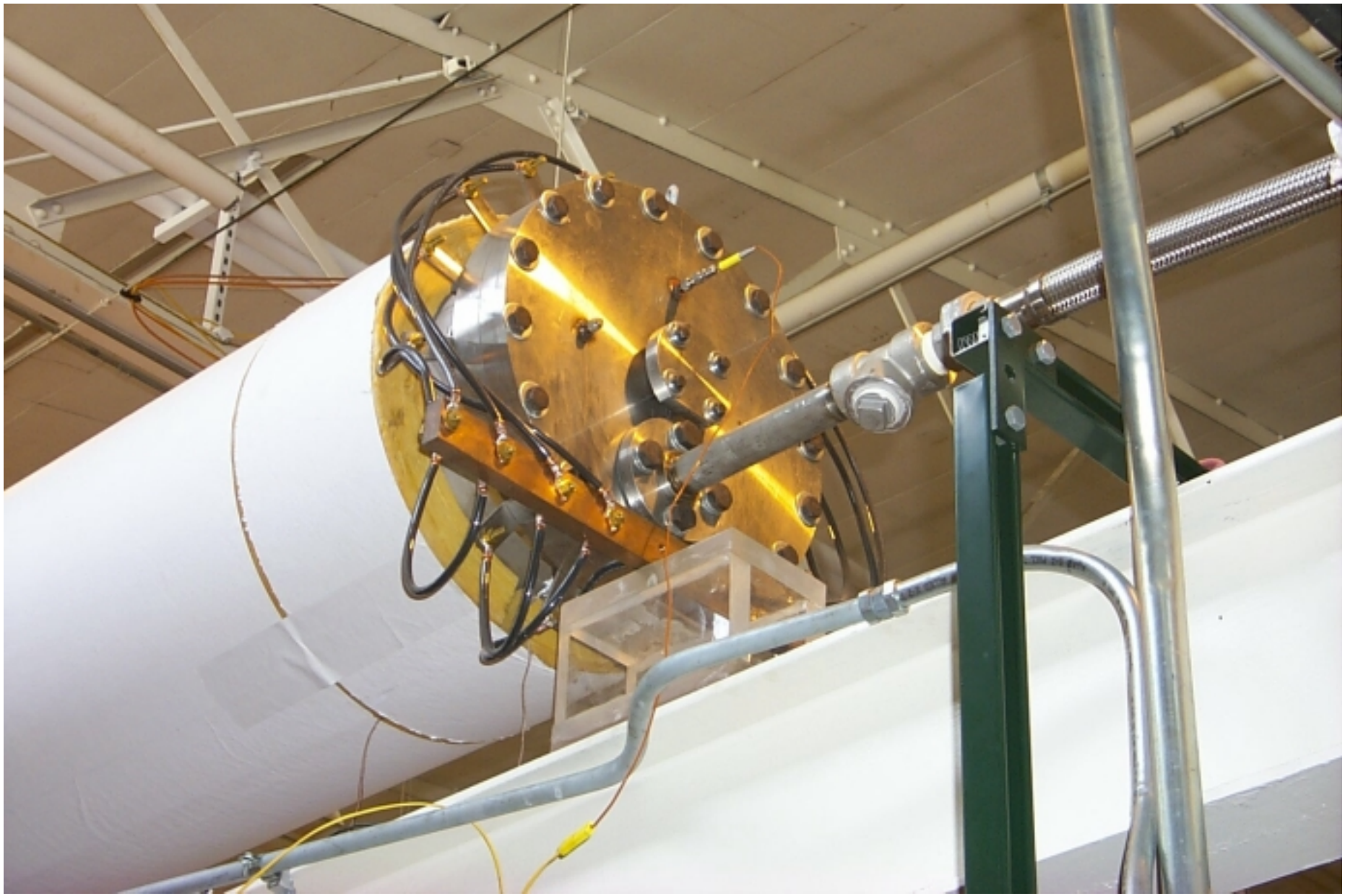
View Looking Upstream



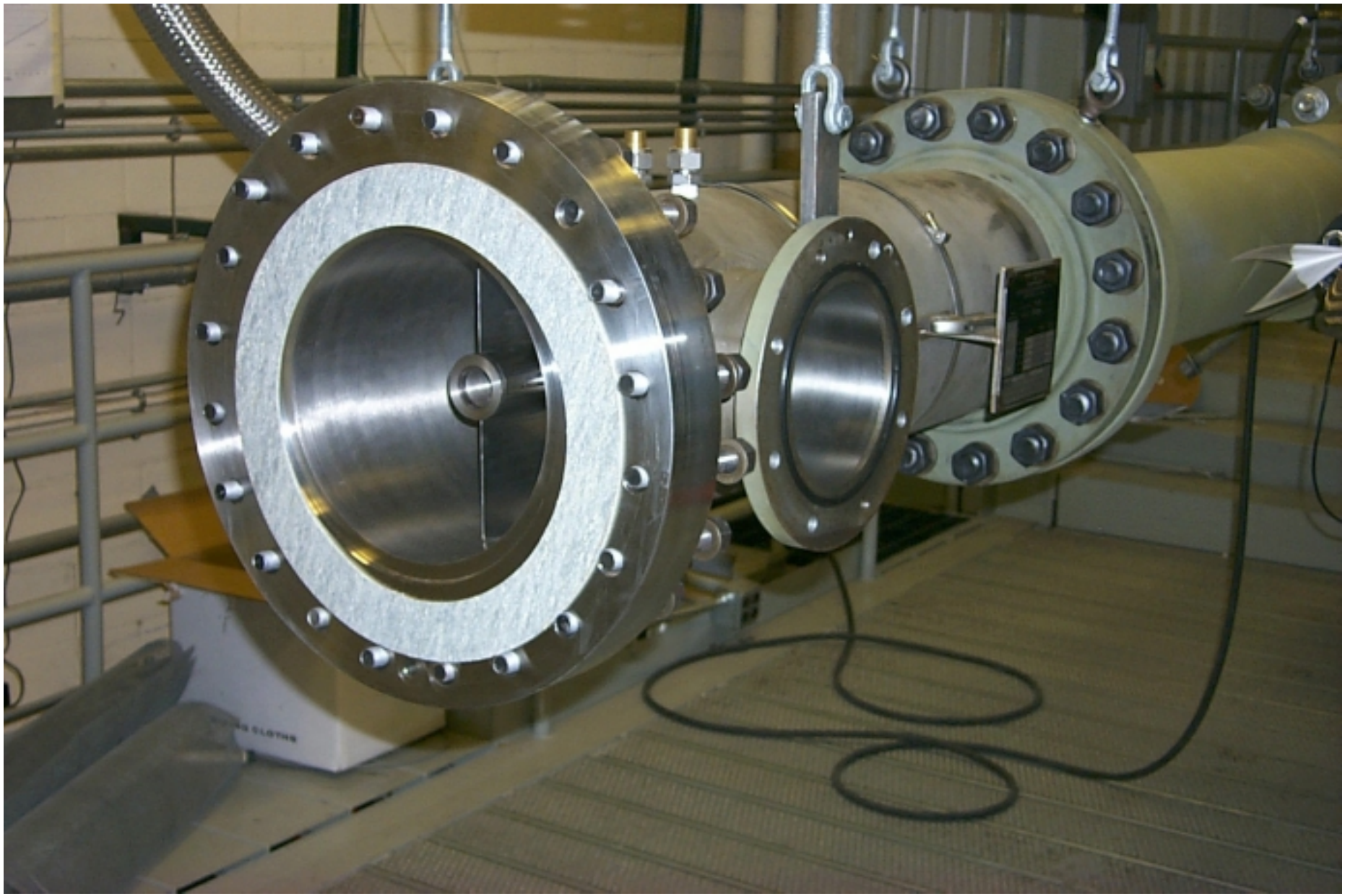
Downstream Bleed-Slot Vacuum System



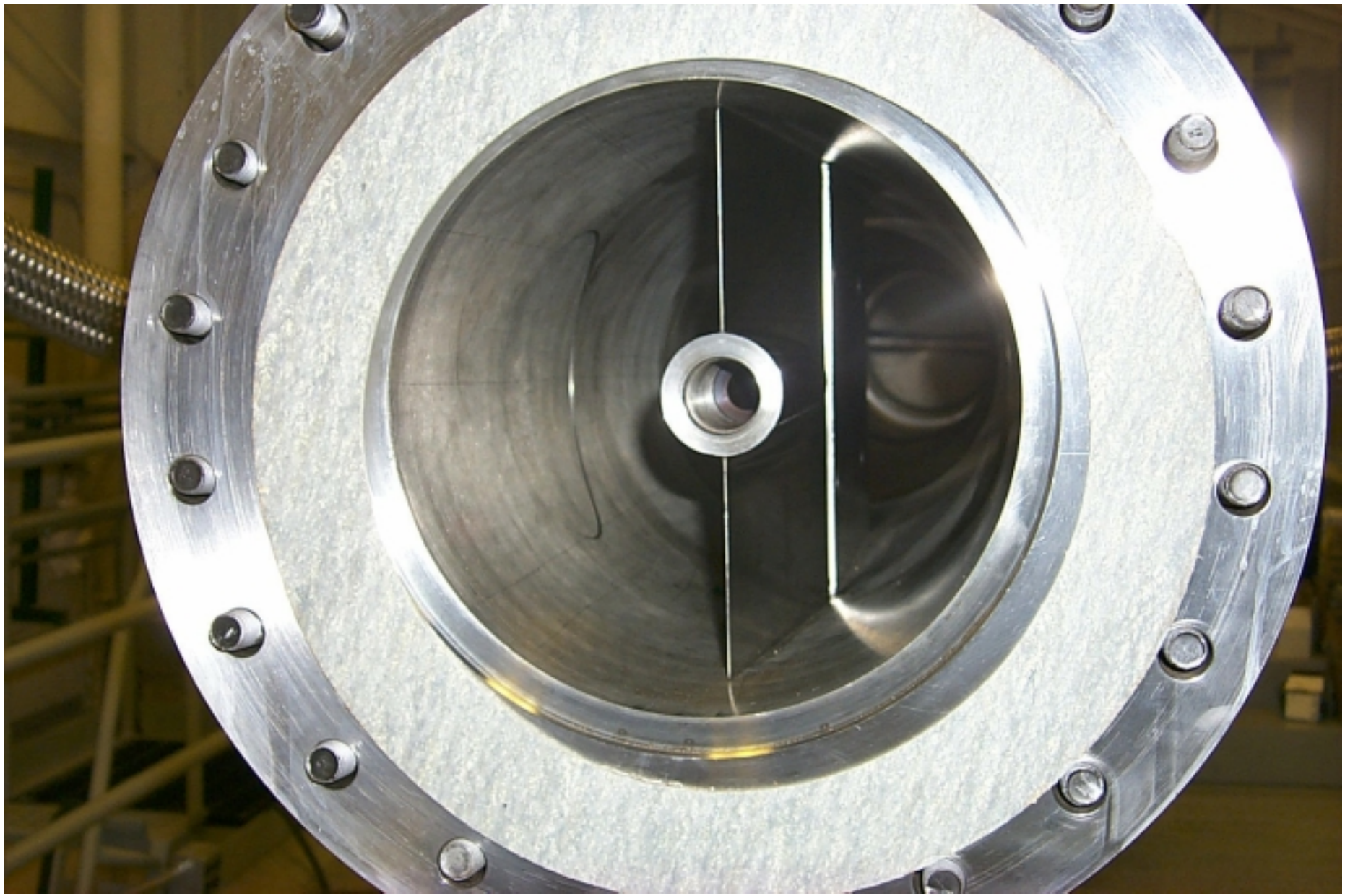
Upstream End of Driver Tube



Double-Wedge Second-Throat Section

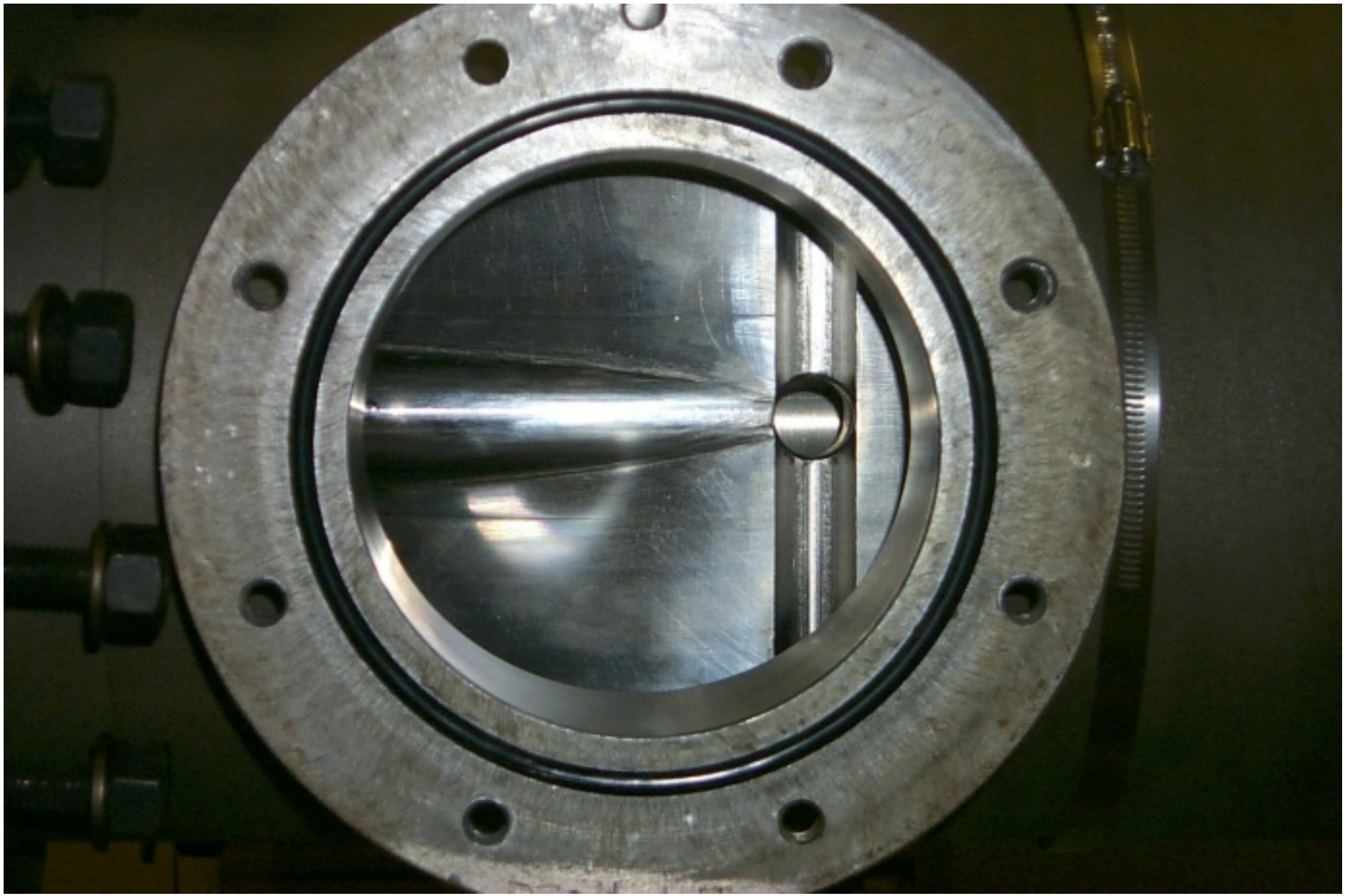


Double Wedge Sting Support



Looking Upstream into Diffuser

Side Access Port for Model Wiring



Driver Tube

Power Supplies for Driver Heating

Diaphragms and Holder

Driver-Air Filters, Circulation Heater, and Clean Supply Piping.

Double Wedge during Fabrication

Vacuum Tank(s) and Bldg. Extension

Vacuum Tanks and Lines

Compressor and Vacuum Pump Room

Automated

Air Dryer