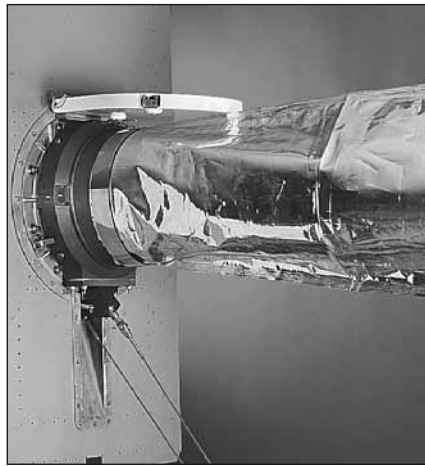




Umbilicals, Jettisonable inter-stage or Booster connectors separation Cryogenic feed thru

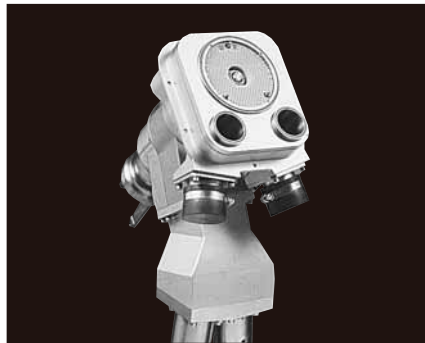


Pneumatic umbilicals

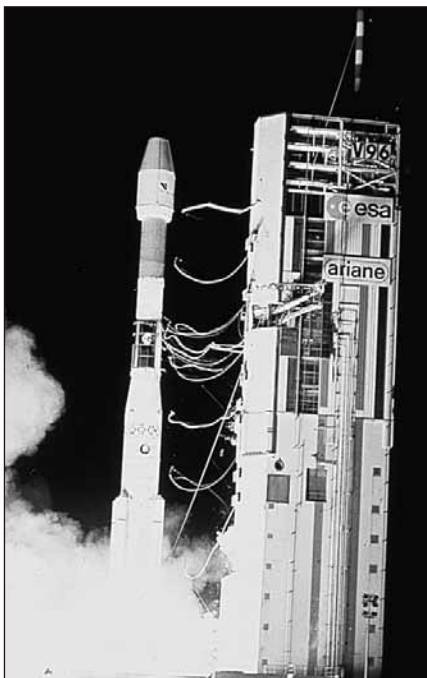


Pneumatic umbilicals are used for air conditioning of satellites with purified dry air during pre-launch phase. Disconnection is ensured by the vehicle.

Electric umbilicals



Interconnections between the launching vehicle and the pad to provide electric signals, power, 1553B Bus as well as cooling air ducts. Each harness features a dead-face concept on the launcher side and a last minute plug released by pull out slings as rocket lifts off.



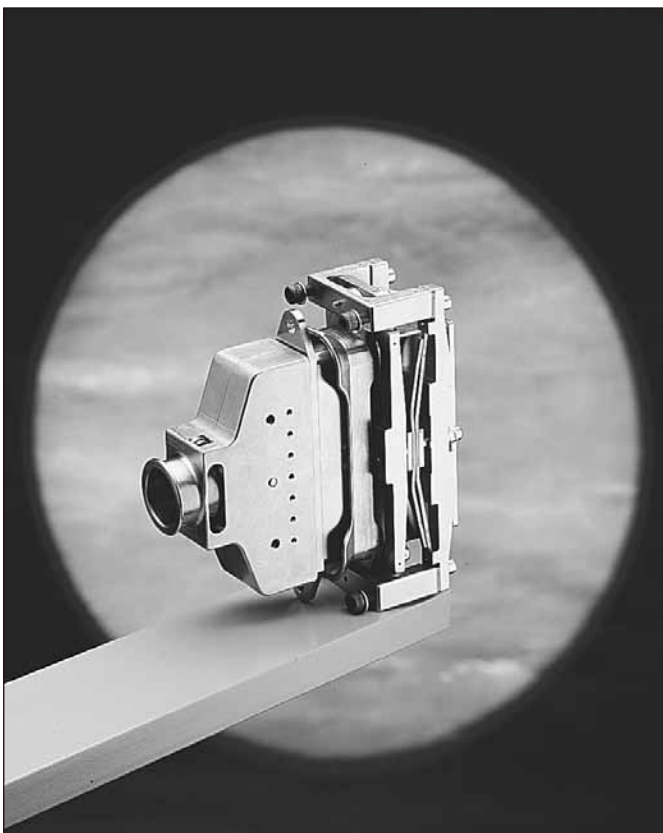
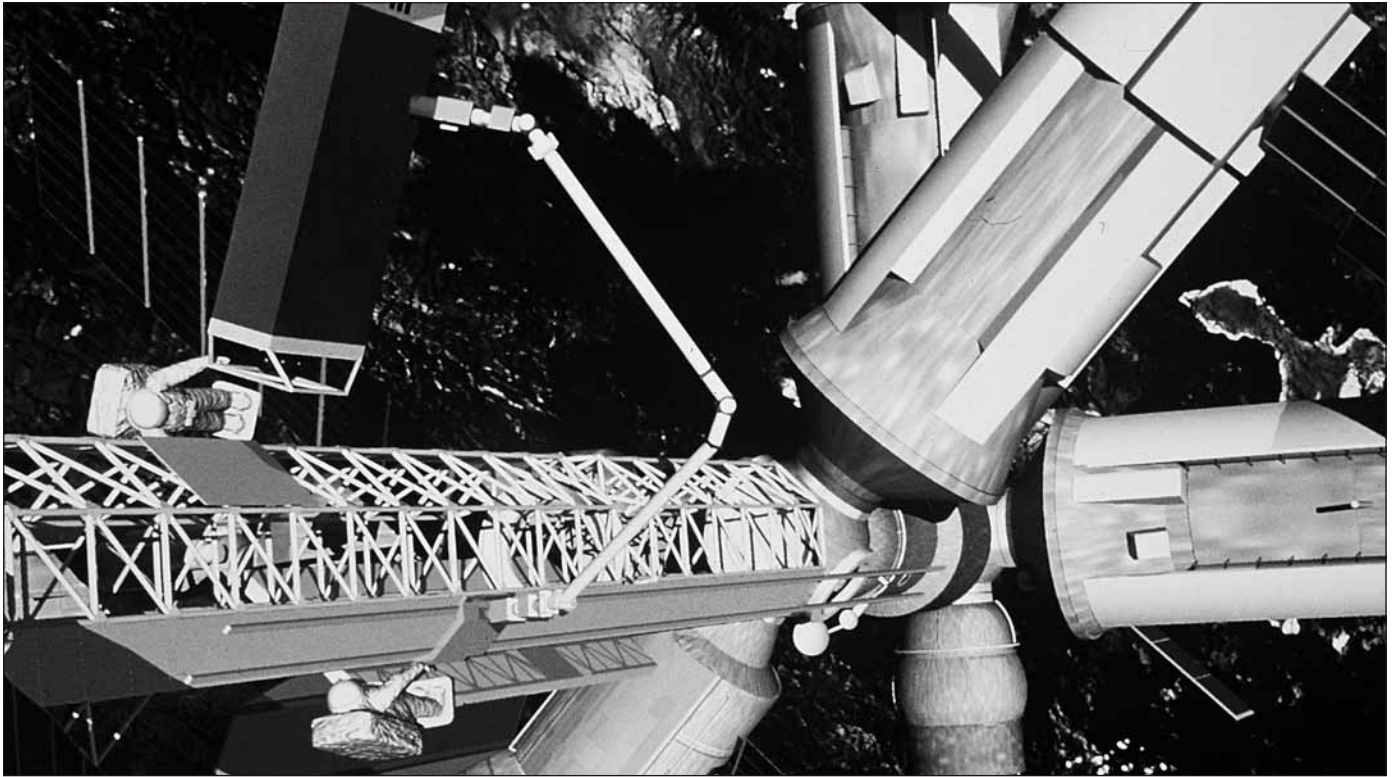
Cryogenic feed thru'



Feed thru connectors installed on Liquid Oxygen and Liquid Hydrogen tanks. Hermetically sealed from 4°K to 300°K with leakage max of $8,3 \cdot 10^8$ atm.cm³/s. Mobile plug are based on MIL-DTL-38999 series III connectors.



Robotics & Extra Vehicular Activities Connectors



For applications including connection/disconnection in the deep space vacuum with temperature gradients.

SOURIAU has developed and qualified different types of Low Insertion Force connectors guaranteed for over 6000 cycles. Contacts feature slightly mount in the insulator cavities to compensate for misalignments due to material expansion (temperature gradient over 150°C) and to avoid any cold welding phenomena.

SOURIAU's basic connector design integrates the tribologic factors due to friction of metal parts.

Connector shells are mounted on floating mechanism that accept six degrees of freedom.

Customized applications are :

- **Rendez-vous**
- **Docking-Berthing**
- **Extra Vehicular Applications**
- **Service End Effector.**



Quick Disconnect Connectors

Inter-stage, bottom, booster separation



Dead face PUSH-PULL connectors



- Circular connectors with on MIL-DTL-38999 Series III arrangements
- Dead face receptacle
- Low mating/demating force by using LIF contacts for example : 120 NMax for shell size 25 with 128 ways # 22.

Releasable connector harnesses



- SOURIAU designs and markets interconnection systems according to user specifications as for example the supply of umbilical harness for the separation of the HUYGENS probe from CASSINI platform after several years of space flight.
- One of the major requirements was to avoid any cold welding phenomena during probe release.
- Harnesses are assembled and tested in SOURIAU's class 10.000 clean room.



