

Appendix E-SRB/RSRM Figures



Figure No. E-1. SRB Development Motor-1 (DM-1) in test stand at Morton Thiokol facility at Wasatch, Utah, July 18, 1977.

Source: NASA Johnson Space Center, Image Repository, S77-27676.



Figure No. E-2. SRB Qualification Motor-1 (QM-1) in test stand at Morton Thiokol facility at Wasatch, Utah, July 13, 1979.

Source: NASA Marshall Space Flight Center, MSFC-7997301, accessed at <http://nix.ksc.nasa.gov/>.



Figure No. E-3. Test firing of Development Motor-8 (DM-8) in test stand at Morton Thiokol's Wasatch, Utah, facility, August 27, 1987.

Source: NASA Marshall Space Flight Center, MSFC-8780135, accessed at <http://nix.ksc.nasa.gov/>.



Figure No. E-4. Flight Support Motor (FSM)-17 test, February 25, 2010, at ATK in Promontory, Utah. This was the last RSRM test of the Space Shuttle program.
Source: NASA, accessed at http://www.nasa.gov/images/content/429987main_179307_002.jpg.



Figure No. E-5. Solid rocket booster drop tests at the Long Beach Naval Shipyard, California, 1973.

Source: NASA Marshall Space Flight Center, MSFC-7038201, accessed at <http://nix.ksc.nasa.gov/>.

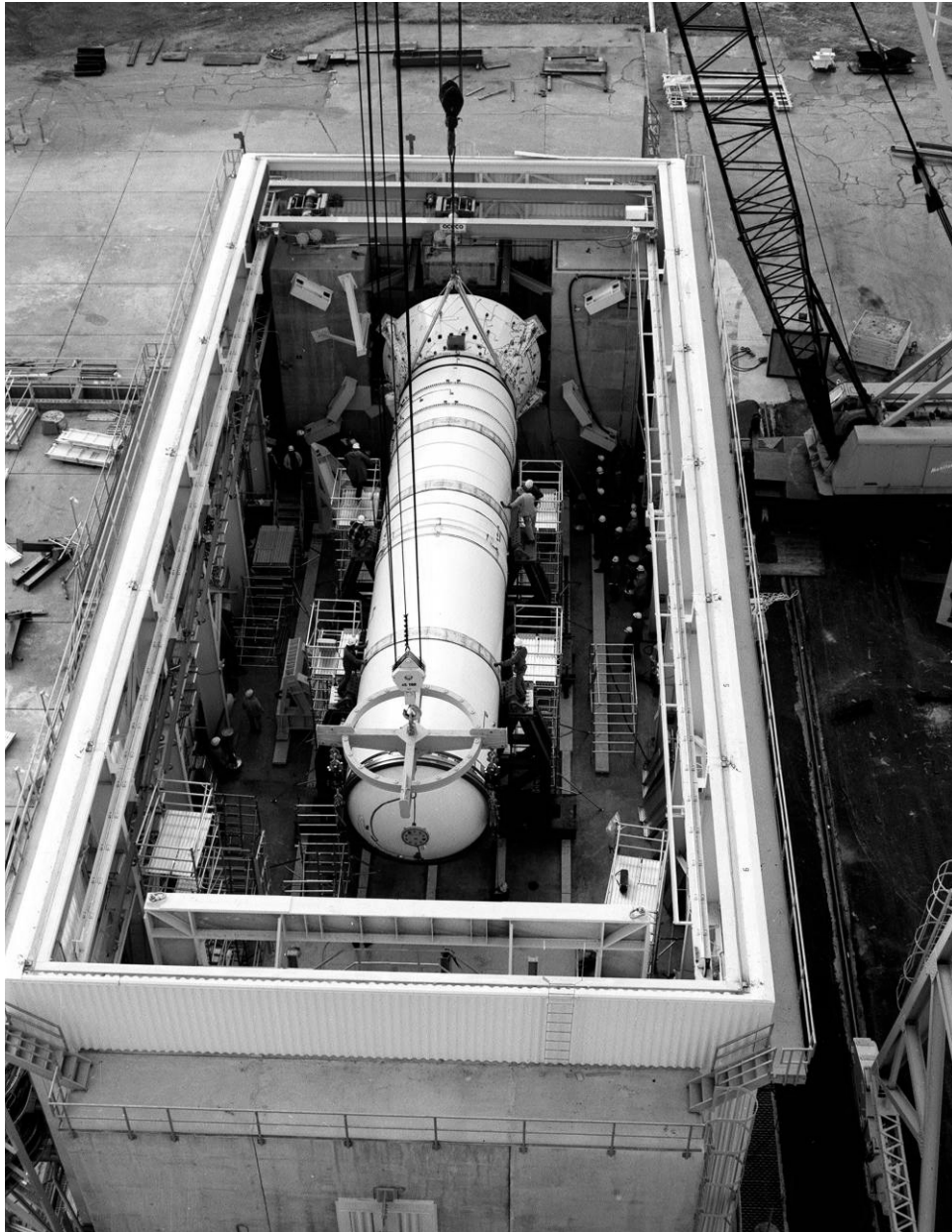


Figure No. E-6. Solid Rocket Booster Structural Test Article being installed at test facility at MSFC, December 1, 1977.

Source: NASA Marshall Space Flight Center, MSFC-7885404, accessed at <http://nrx.ksc.nasa.gov/>.



Figure No. E-7. Solid Rocket Booster Structural Test Article at MSFC, November 1, 1978.
Source: NASA Marshall Space Flight Center, MSFC-7884999, accessed at <http://nix.ksc.nasa.gov/>.



Figure No. E-8. Space Shuttle Solid Rocket Booster Drop Test Vehicle (SRB-DTV) first release from NB-52B, August 13, 1977.

Source: NASA Dryden Flight Research Center, EC77-8184, accessed at <http://www.dfrc.nasa.gov/Gallery/Photo/B-52/HTML/EC77-8184.html>.

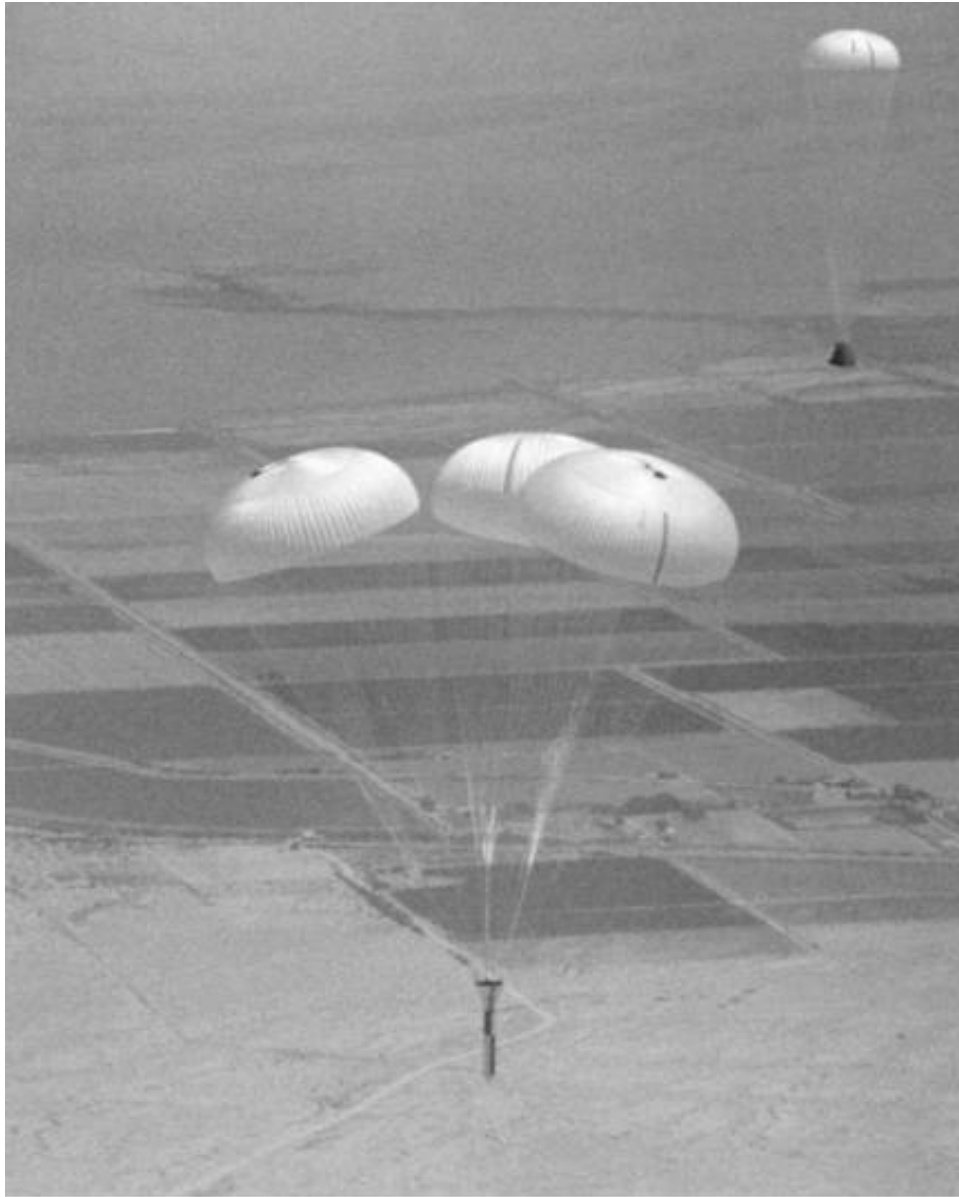


Figure No. E-9. Space Shuttle Solid Rocket Booster Drop Test Vehicle (SRB-DTV) with chutes open after release from NB-52B, January 29, 1979.
Source: NASA Dryden Flight Research Center, NASA Photo: EC79-10168, accessed at <http://www.dfrc.nasa.gov/Gallery/Photo/index.html>.



Figure No. E-10. Space Shuttle SRB separation motor test firing at Test Stand 116 at MSFC, March 28, 2007.

Source: NASA Marshall Space Flight Center, MSFC-0700508, accessed at <http://nix.ksc.nasa.gov/>.

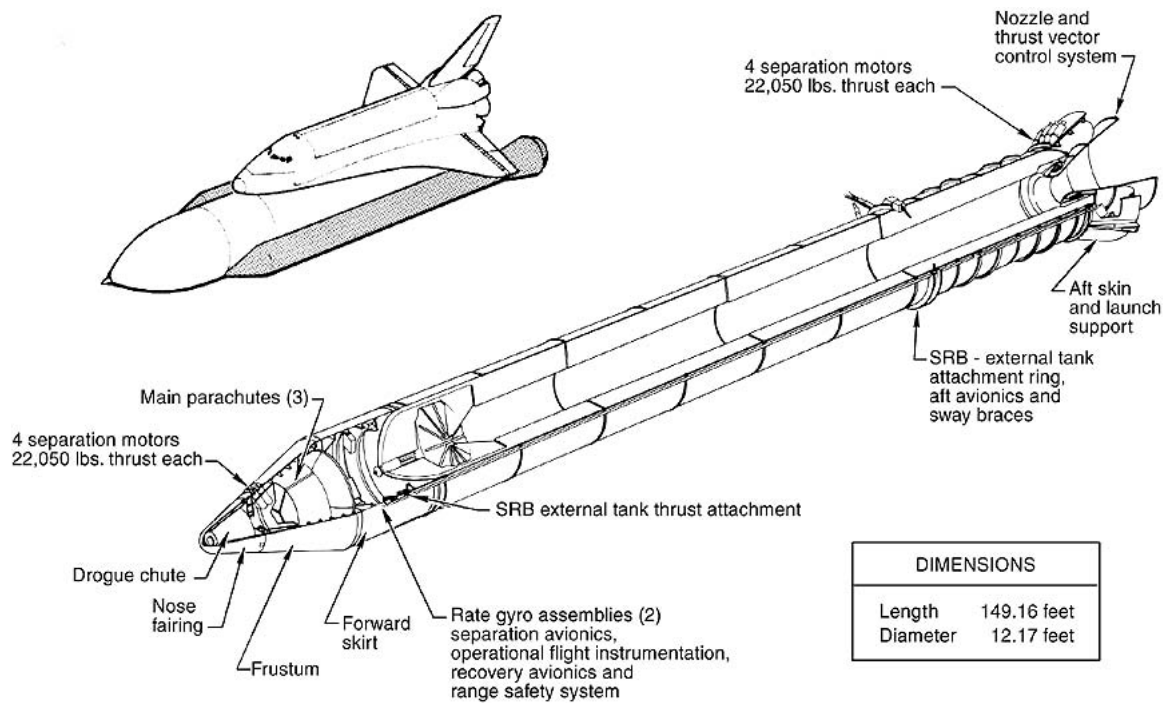


Figure No. E-11. Solid Rocket Booster, general information.
 Source: USA, *Shuttle Crew Operation Manual*, 1.4-1.

SRB System Components

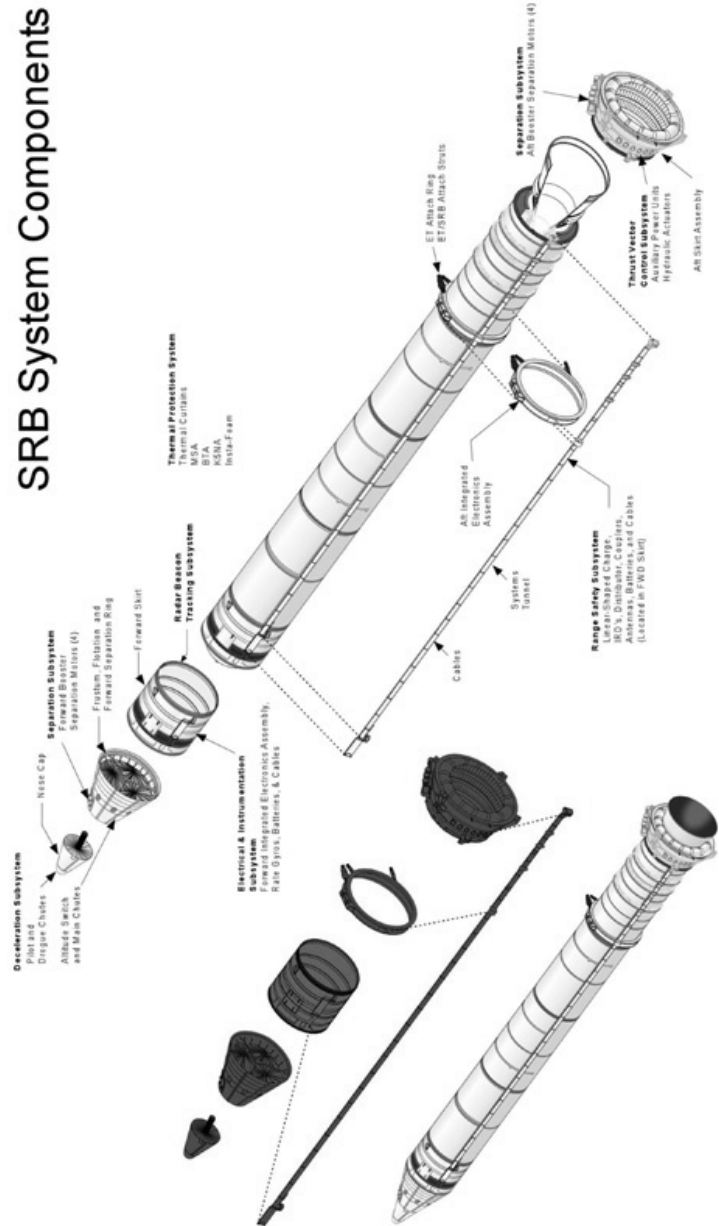


Figure No. E-12. SRB System Components.
 Source: USA, *Solid Rocket Booster Illustrated Systems Manual*, 6.

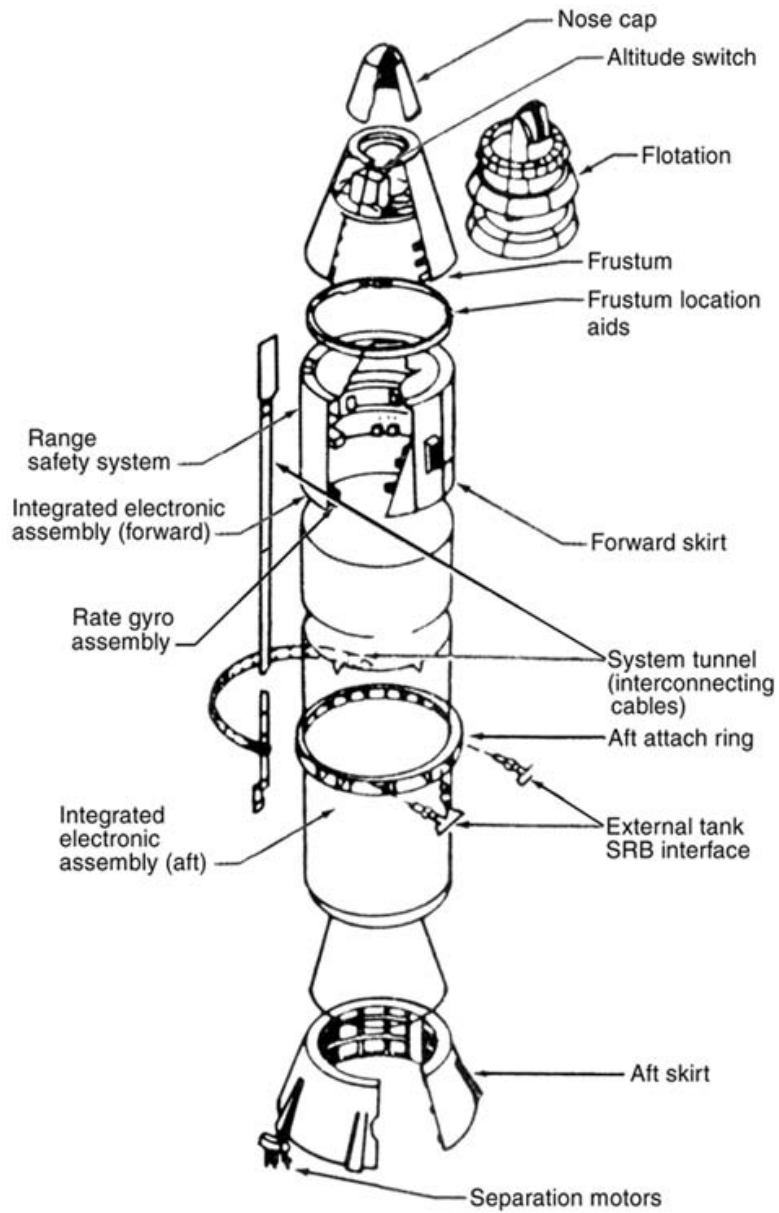


Figure No. E-13. SRB Exploded View.
Source: USA, *Shuttle Crew Operation Manual*, 1.4-4.

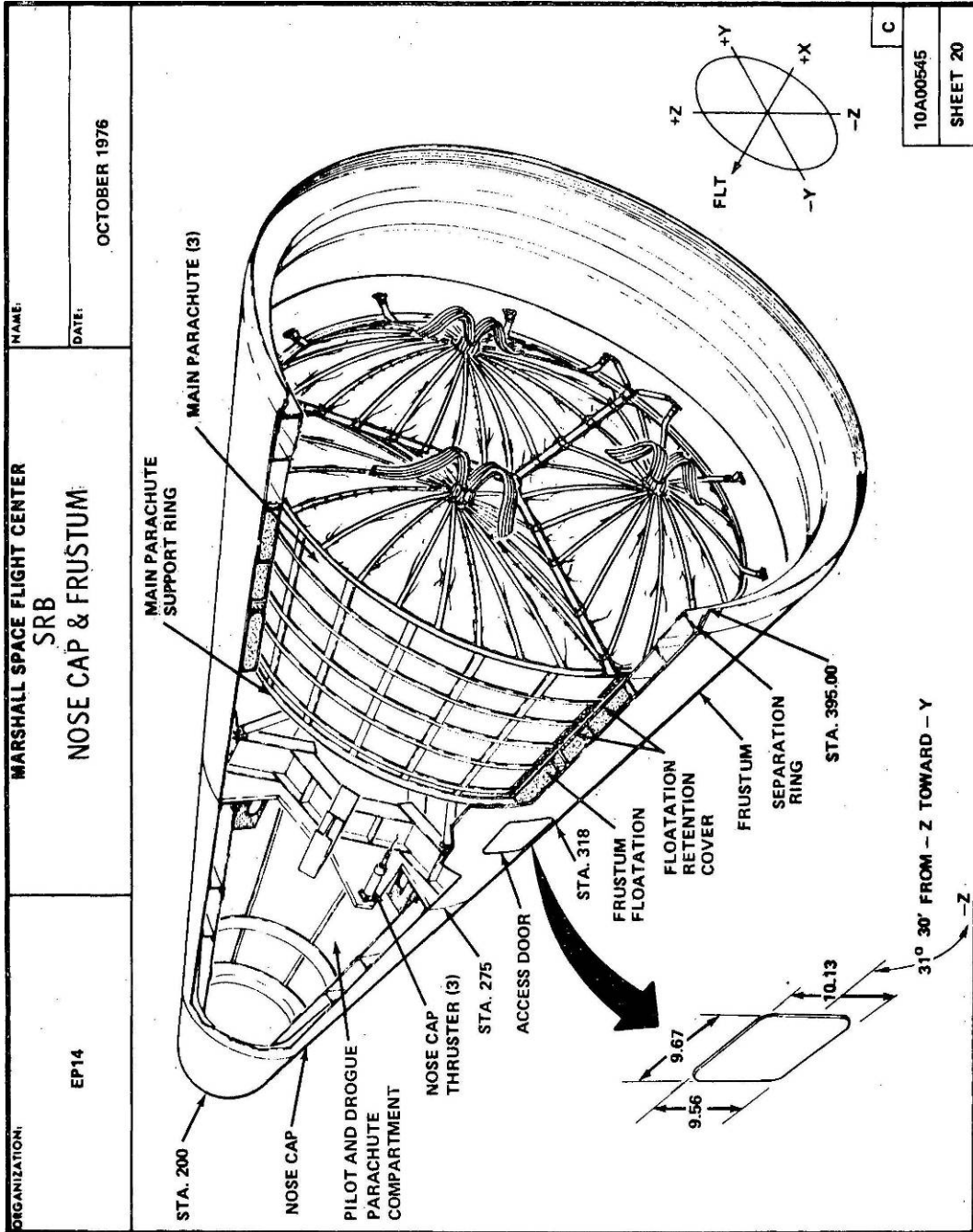


Figure No. E-14. Diagram of SRB nose cap and frustum.

Source: Griner, et al., *Space Shuttle Solid Rocket Booster Pictorial Representations*, sheet 20.

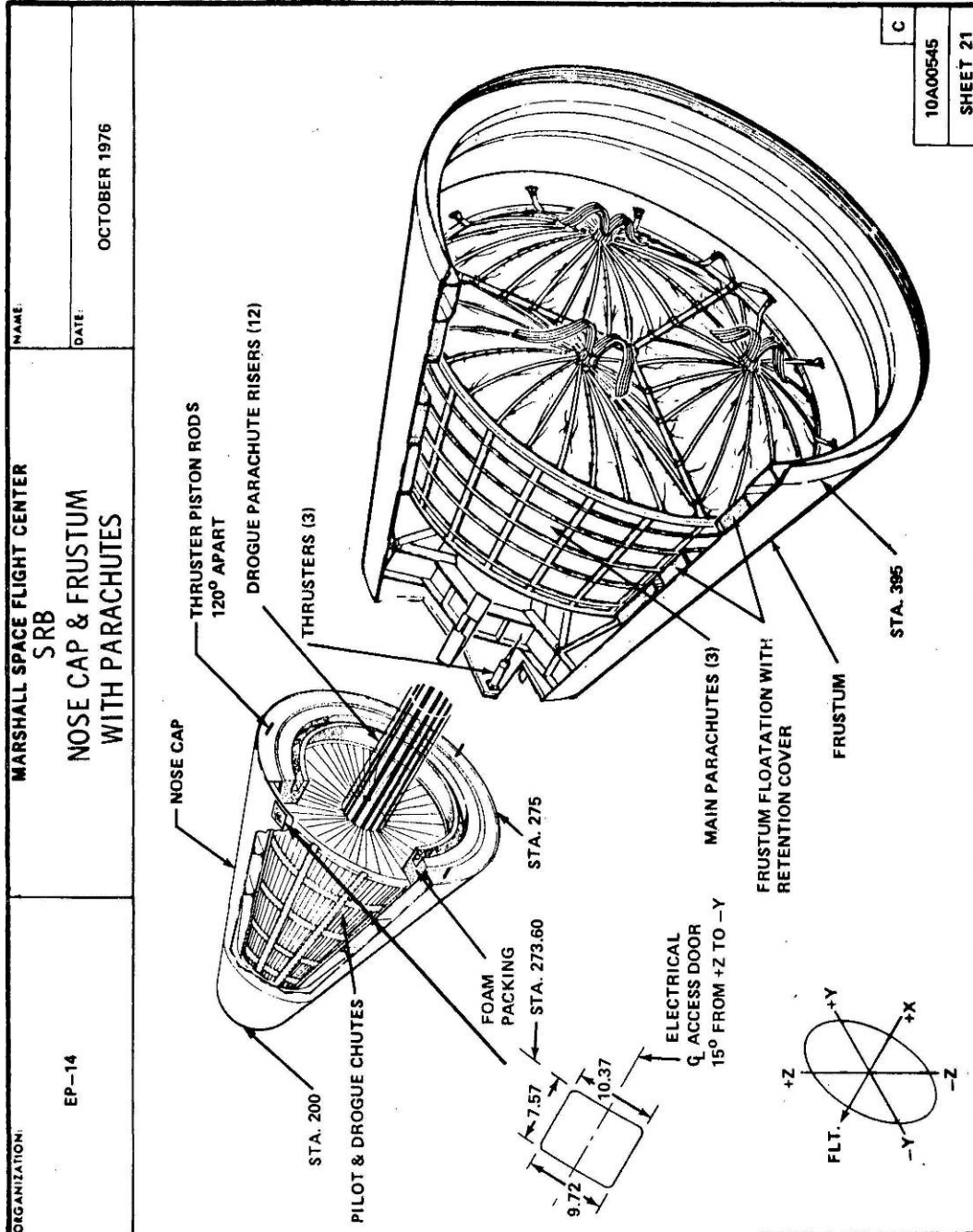


Figure No. E-15. Diagram of SRB nose cap (with parachute) and frustum.
 Source: Griner, et al., *Space Shuttle Solid Rocket Booster Pictorial Representations*, sheet 21.

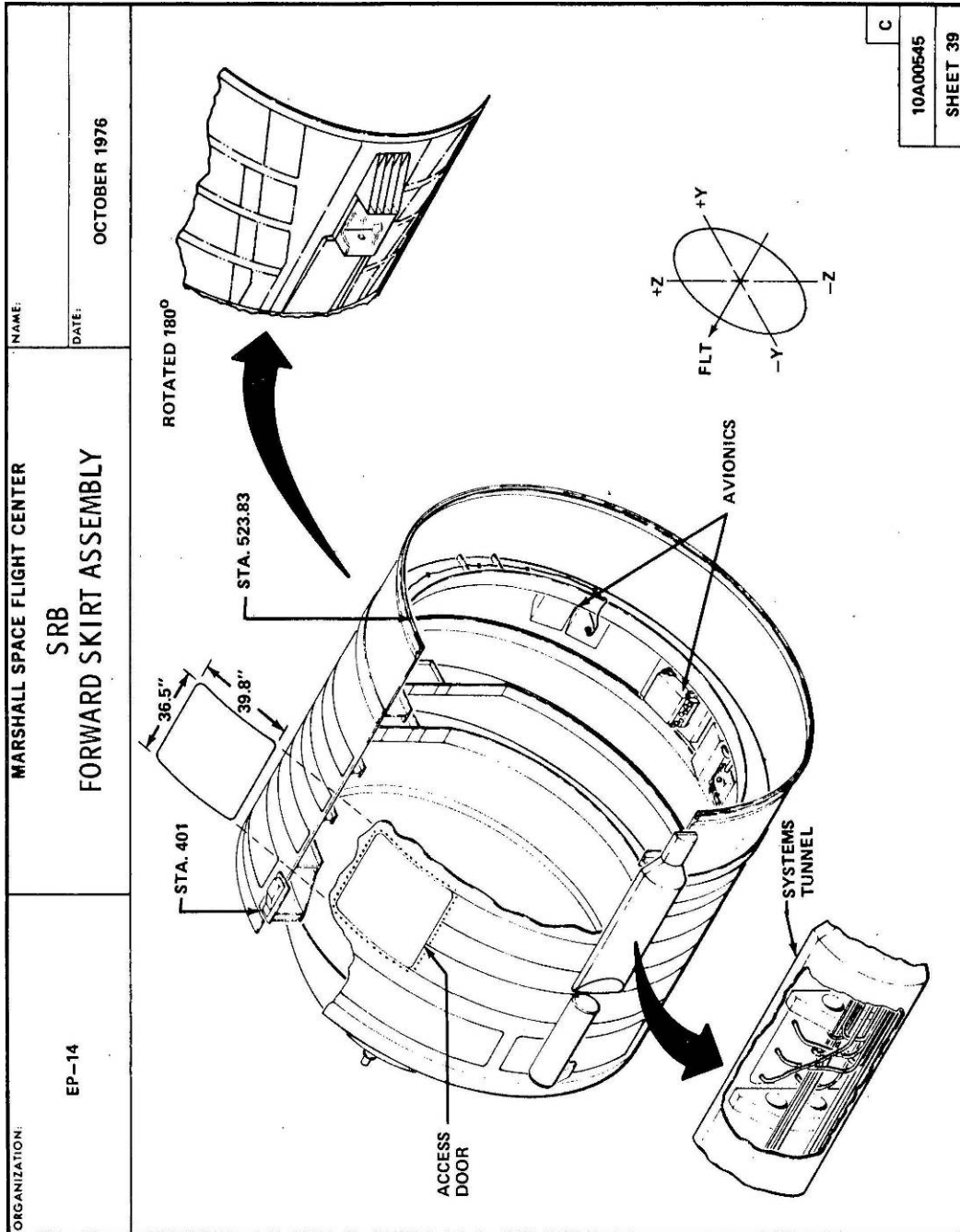


Figure No. E-16. Diagram of SRB forward skirt.
Source: Griner, et al., *Space Shuttle Solid Rocket Booster Pictorial Representations*, sheet 39.

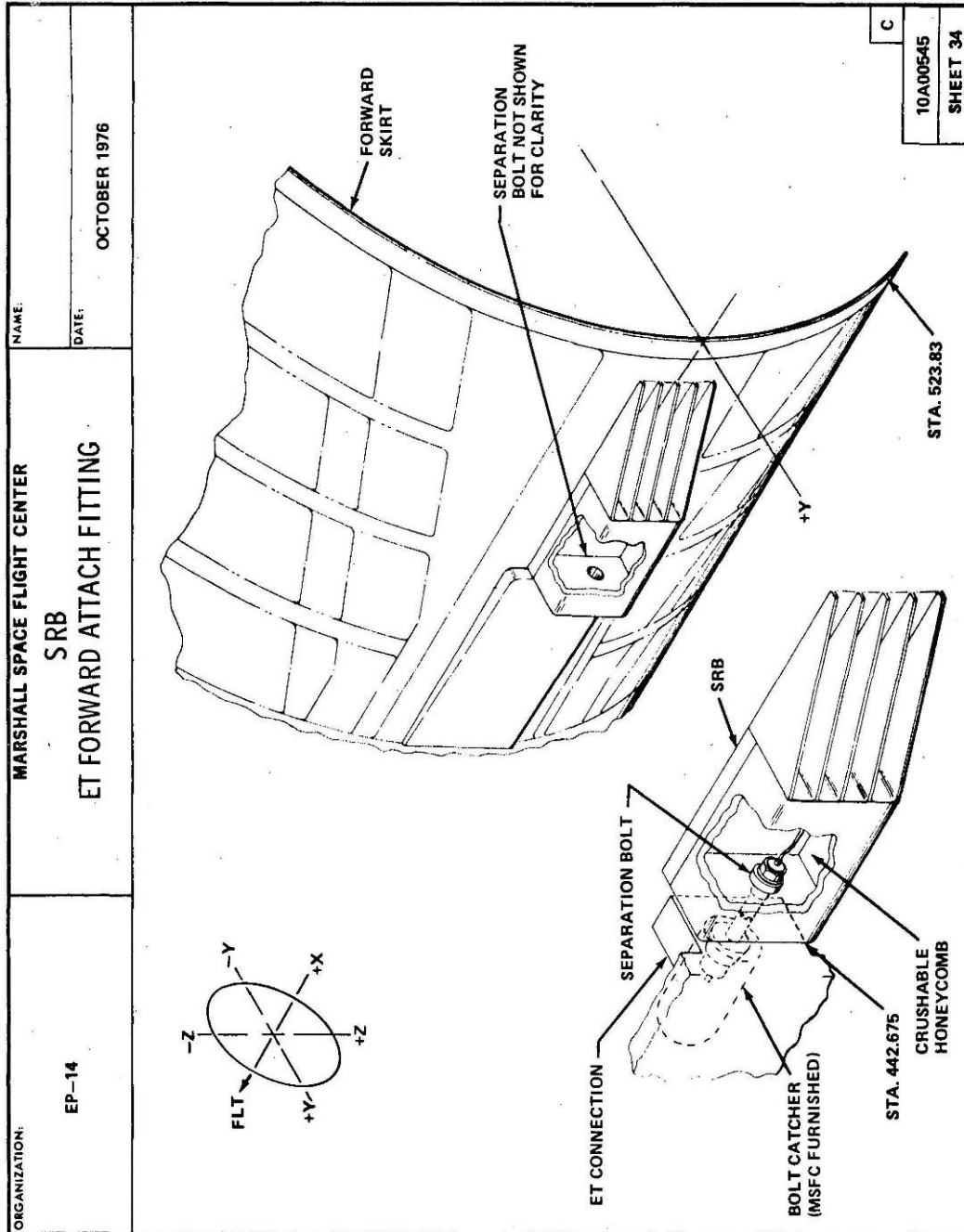


Figure No. E-17. Diagram of SRB/ET forward attach fitting.
Source: Griner, et al., *Space Shuttle Solid Rocket Booster Pictorial Representations*, sheet 34.

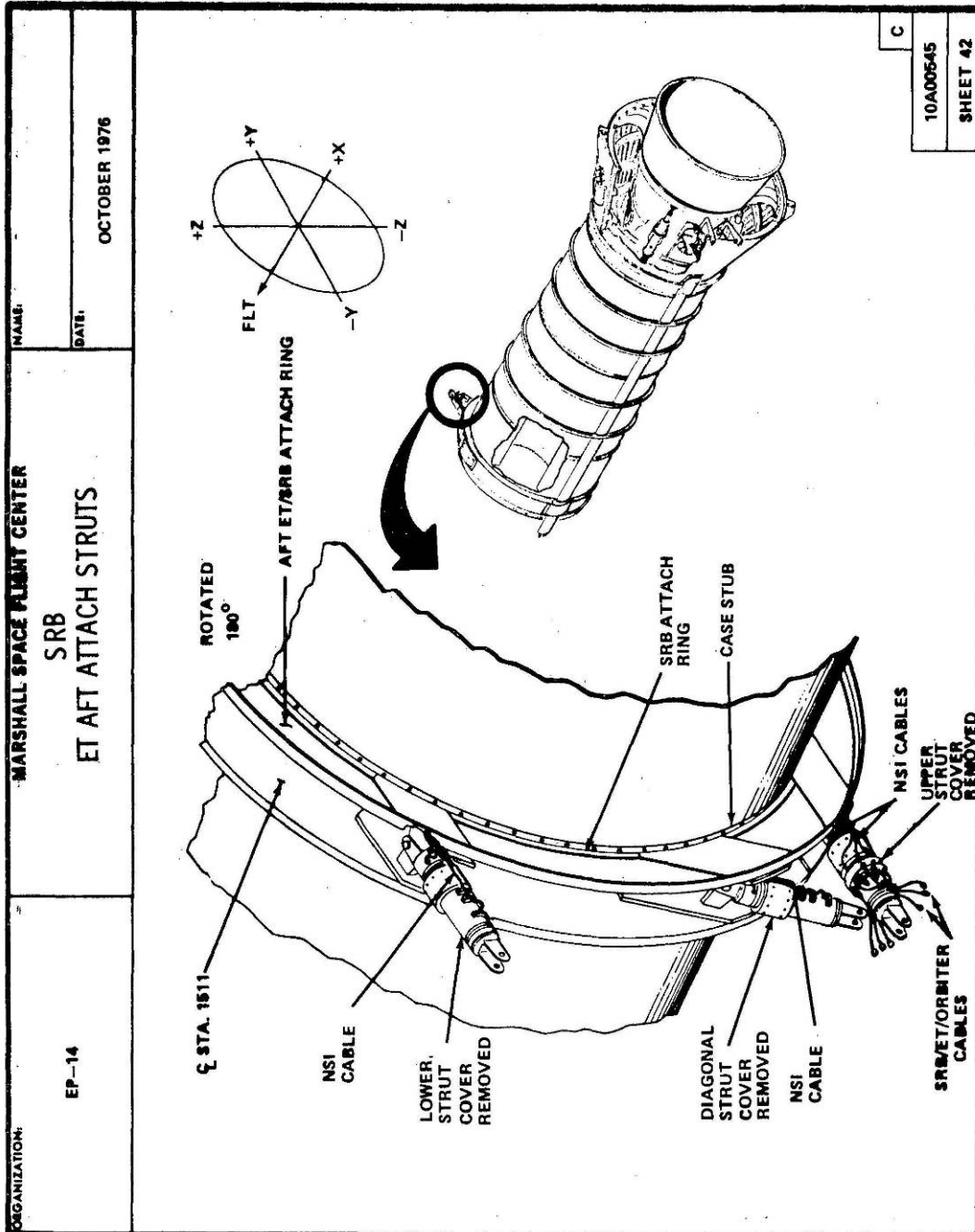


Figure No. E-18. Diagram of SRB/ET aft attach struts.

Source: Griner, et al., *Space Shuttle Solid Rocket Booster Pictorial Representations*, sheet 42.

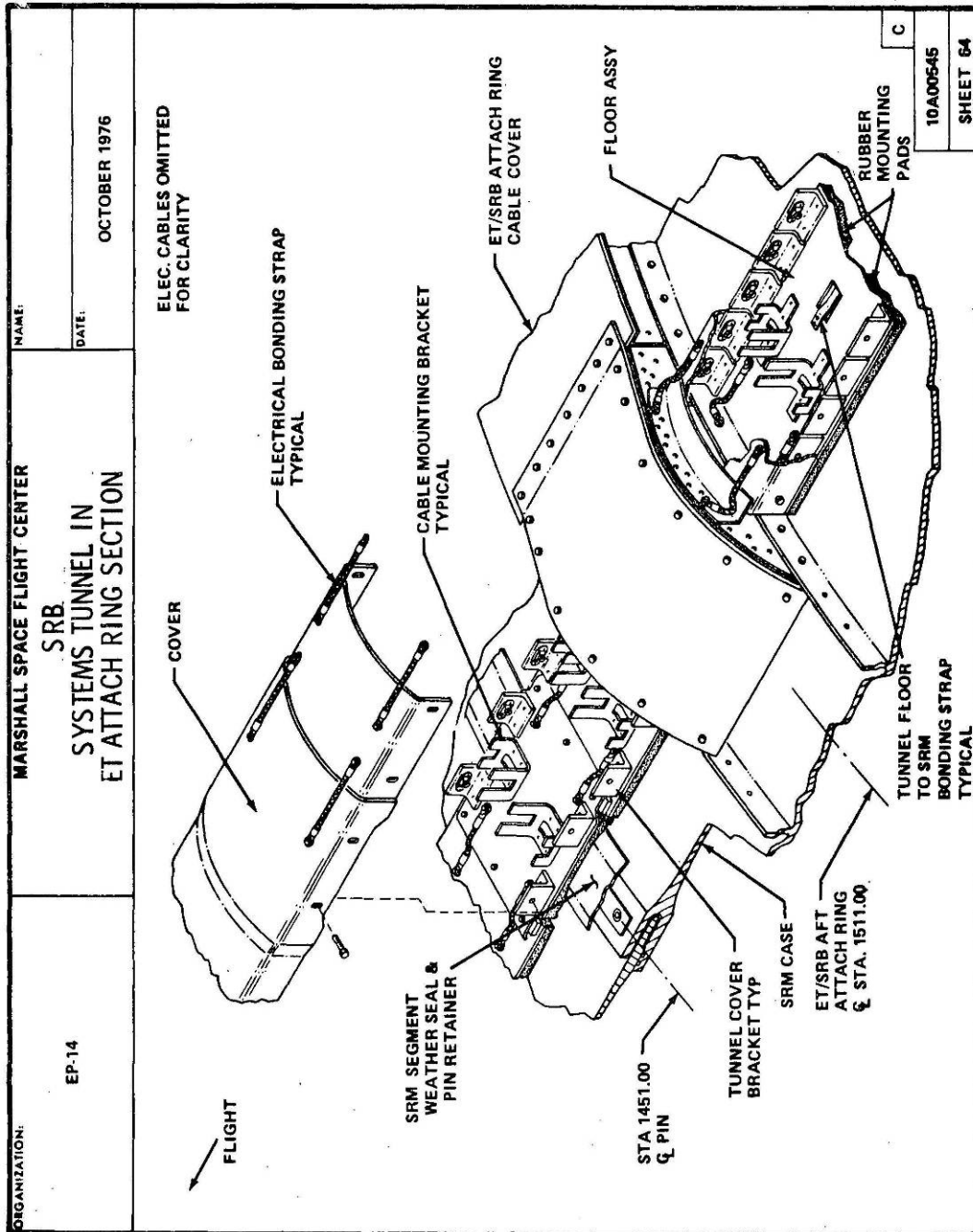


Figure No. E-19. Diagram of a portion of SRB systems tunnel.
 Source: Griner, et al., *Space Shuttle Solid Rocket Booster Pictorial Representations*, sheet 64.

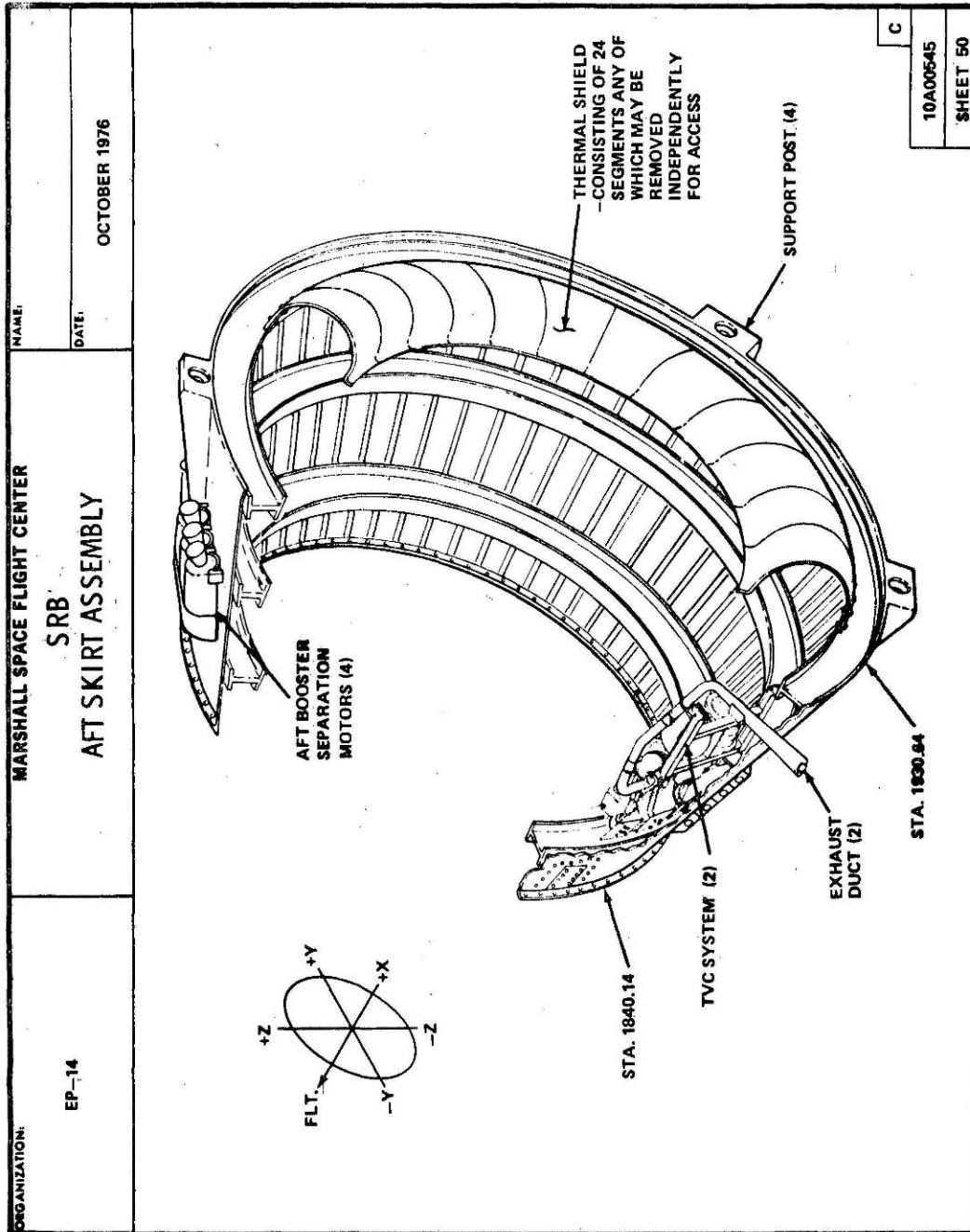


Figure No. E-20. Diagram of SRB aft skirt.

Source: Griner, et al., *Space Shuttle Solid Rocket Booster Pictorial Representations*, sheet 50.

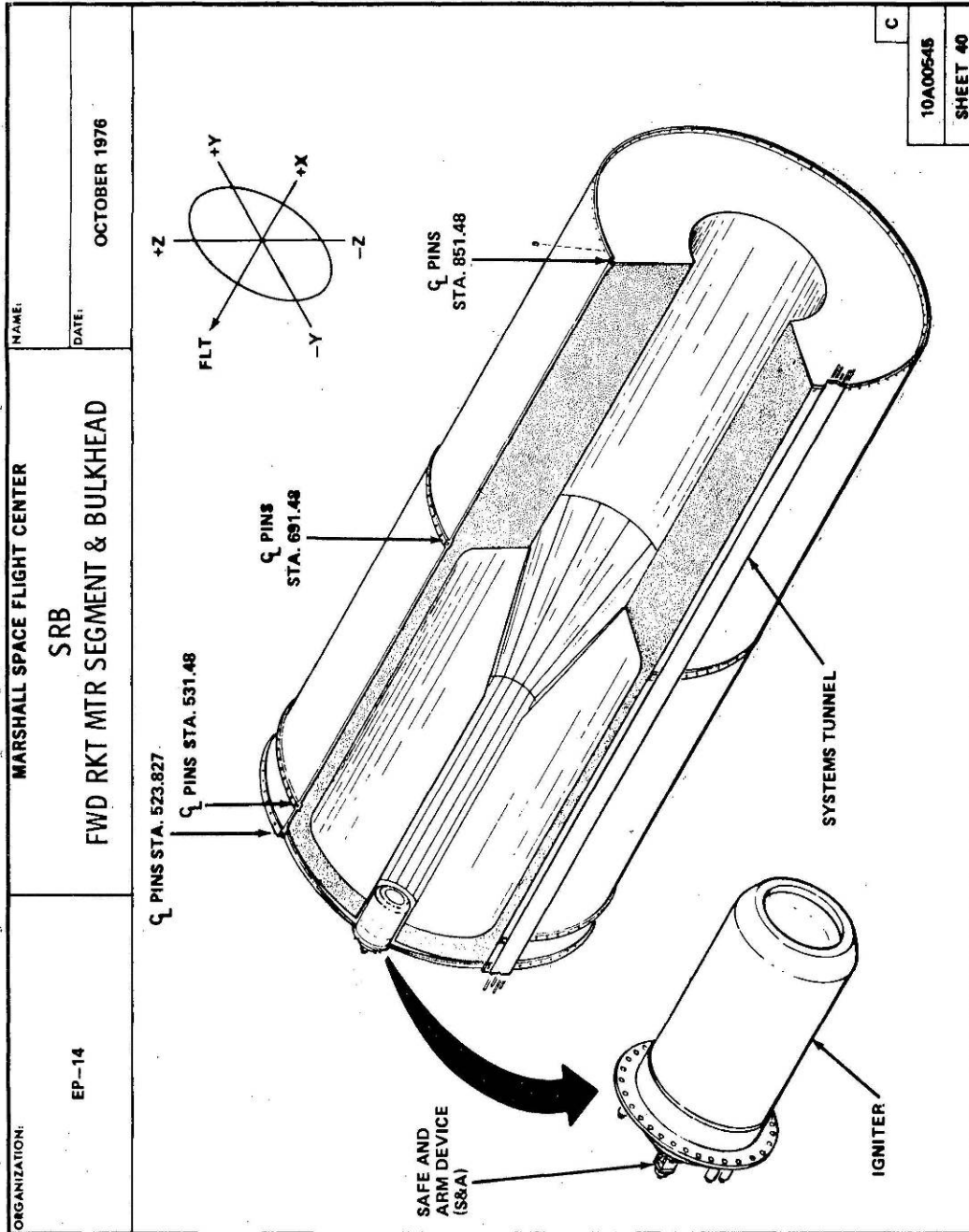


Figure No. E-21. Diagram of SRB forward motor segment.
 Source: Griner, et al., *Space Shuttle Solid Rocket Booster Pictorial Representations*, sheet 40.

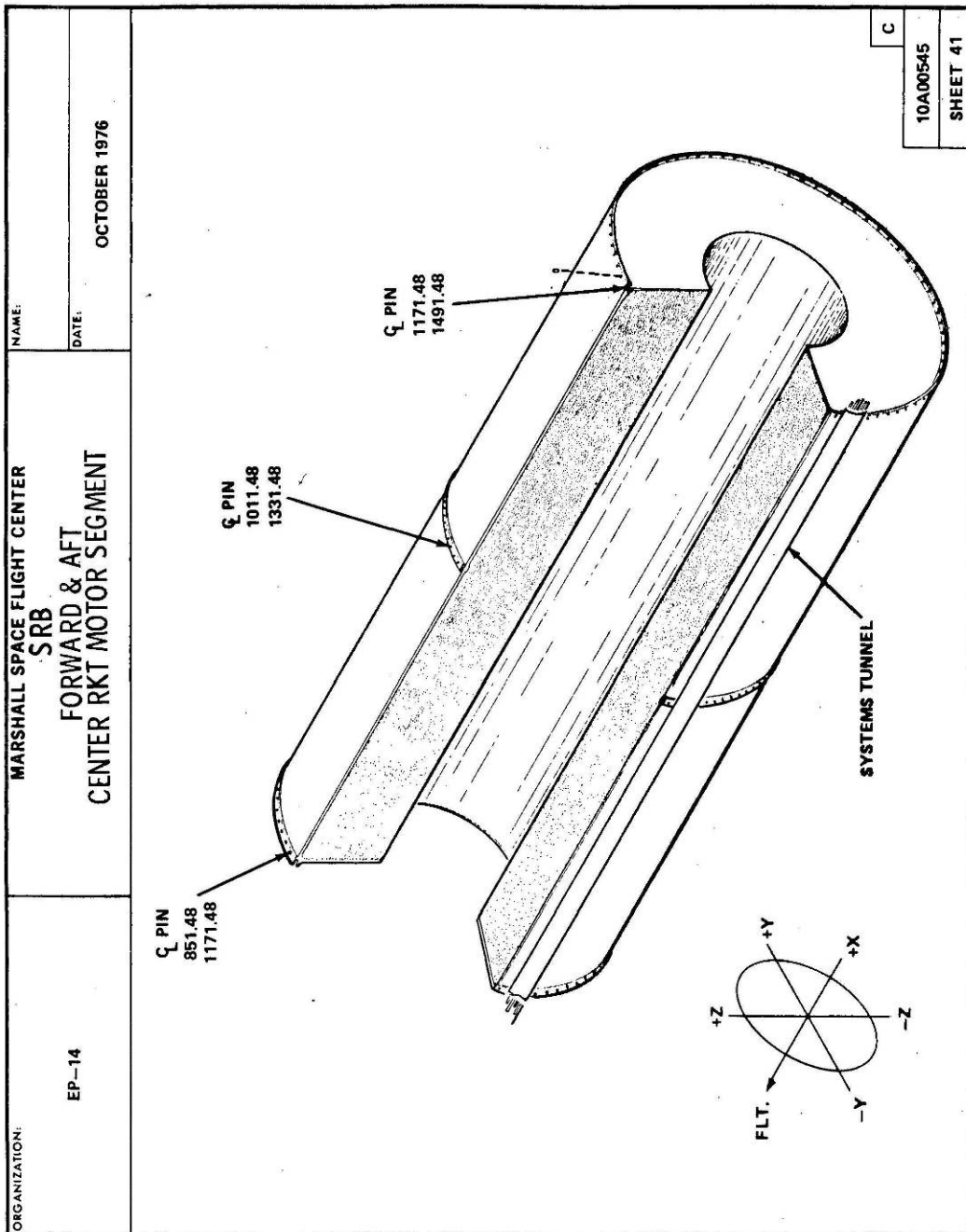


Figure No. E-22. Diagram of SRB center motor segments.
 Source: Griner, et al., *Space Shuttle Solid Rocket Booster Pictorial Representations*, sheet 41.

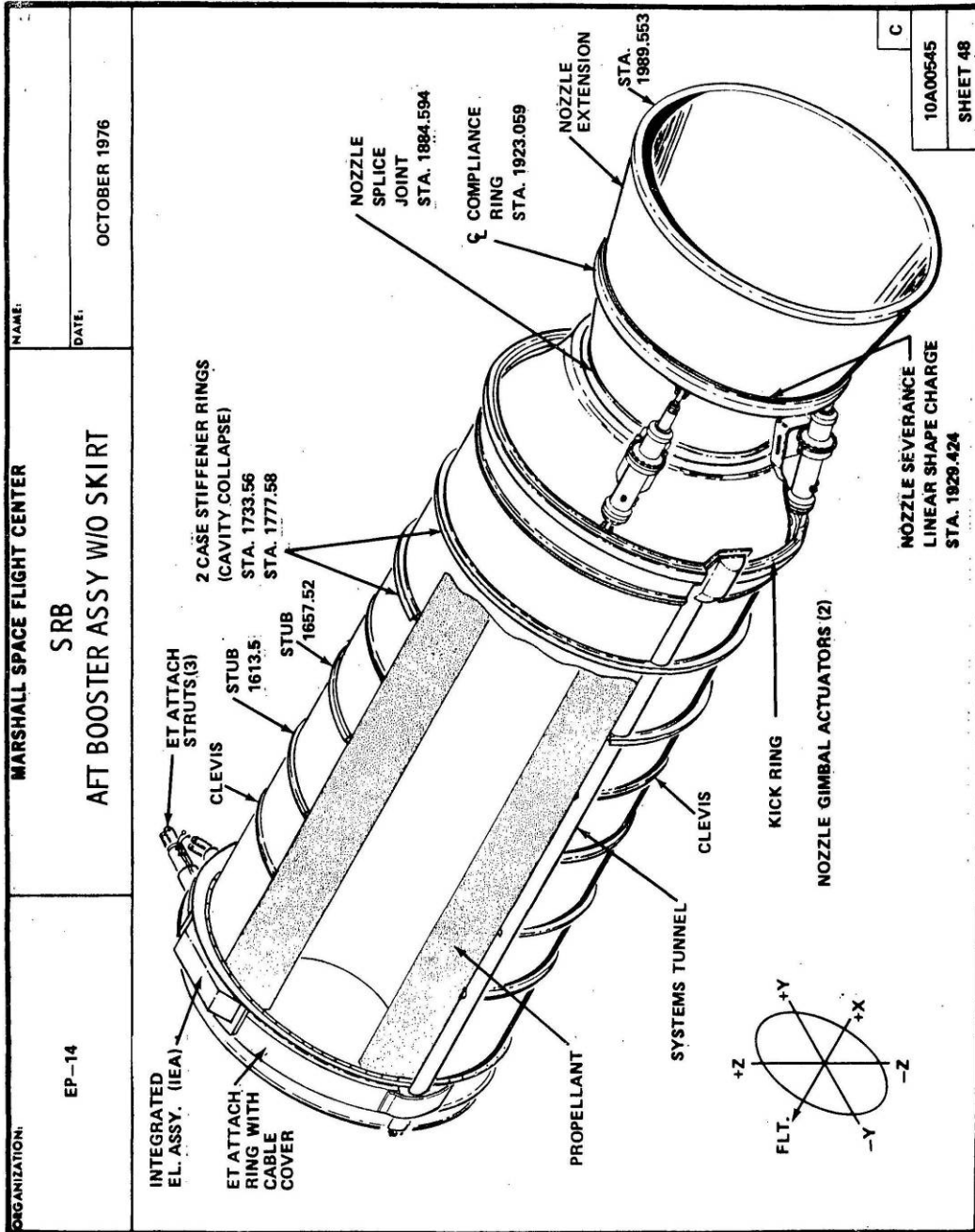


Figure No. E-23. Diagram of SRB aft booster assembly without skirt.
 Source: Griner, et al., *Space Shuttle Solid Rocket Booster Pictorial Representations*, sheet 48.

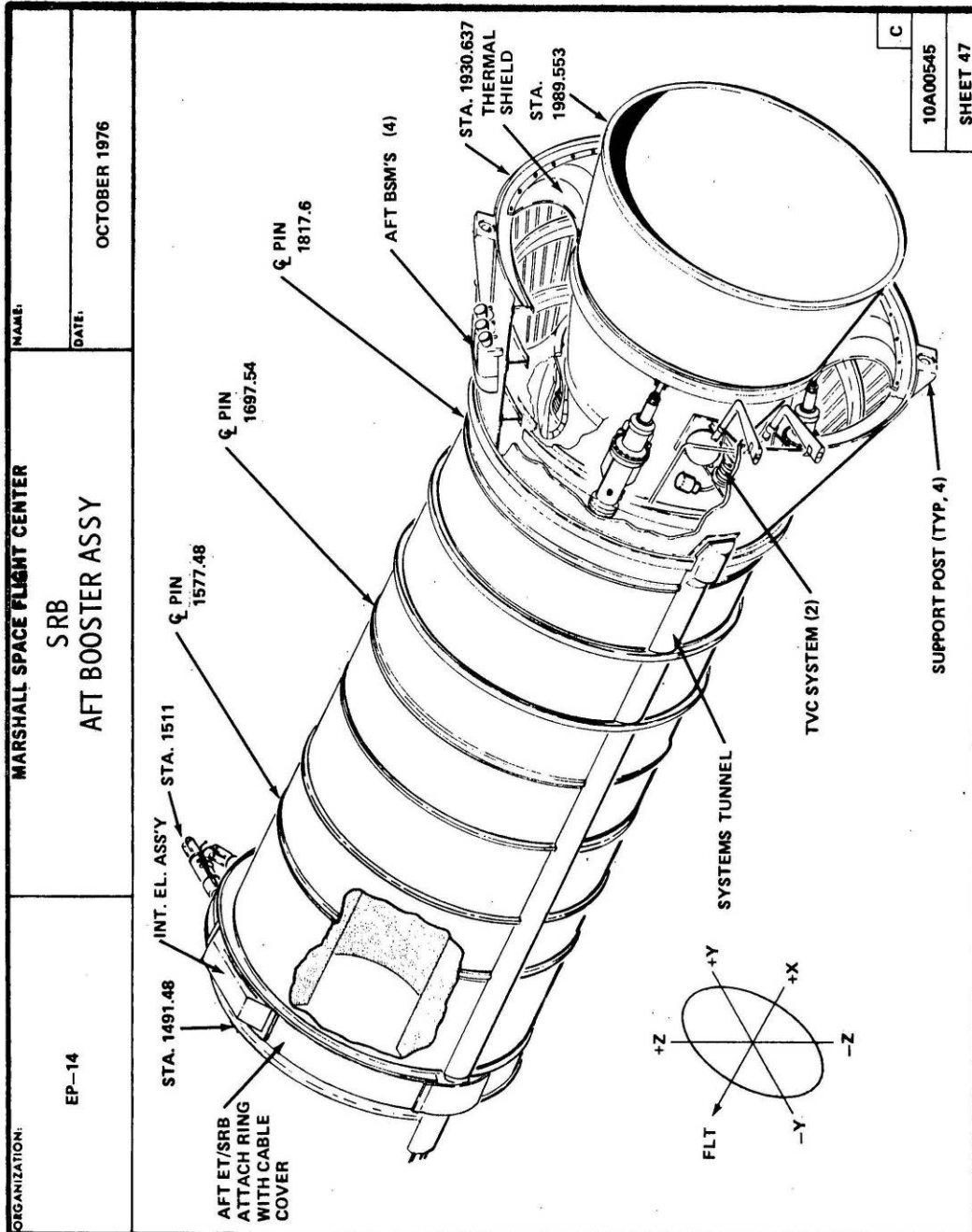


Figure No. E-24. Diagram of SRB aft booster assembly with skirt.
 Source: Griner, et al., *Space Shuttle Solid Rocket Booster Pictorial Representations*, sheet 47.

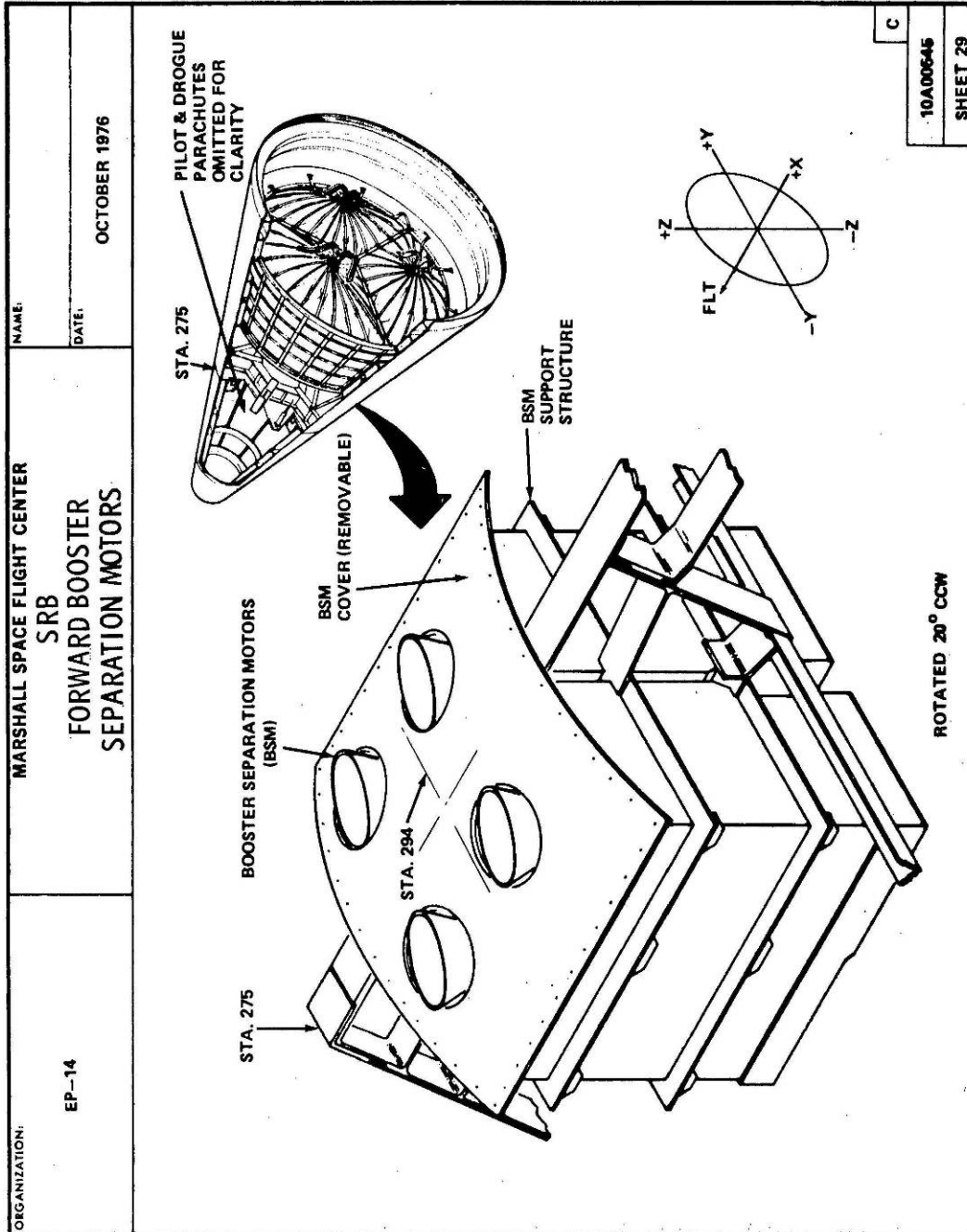


Figure No. E-25. Diagram of SRB forward booster separation motors.
Source: Griner, et al., *Space Shuttle Solid Rocket Booster Pictorial Representations*, sheet 29.

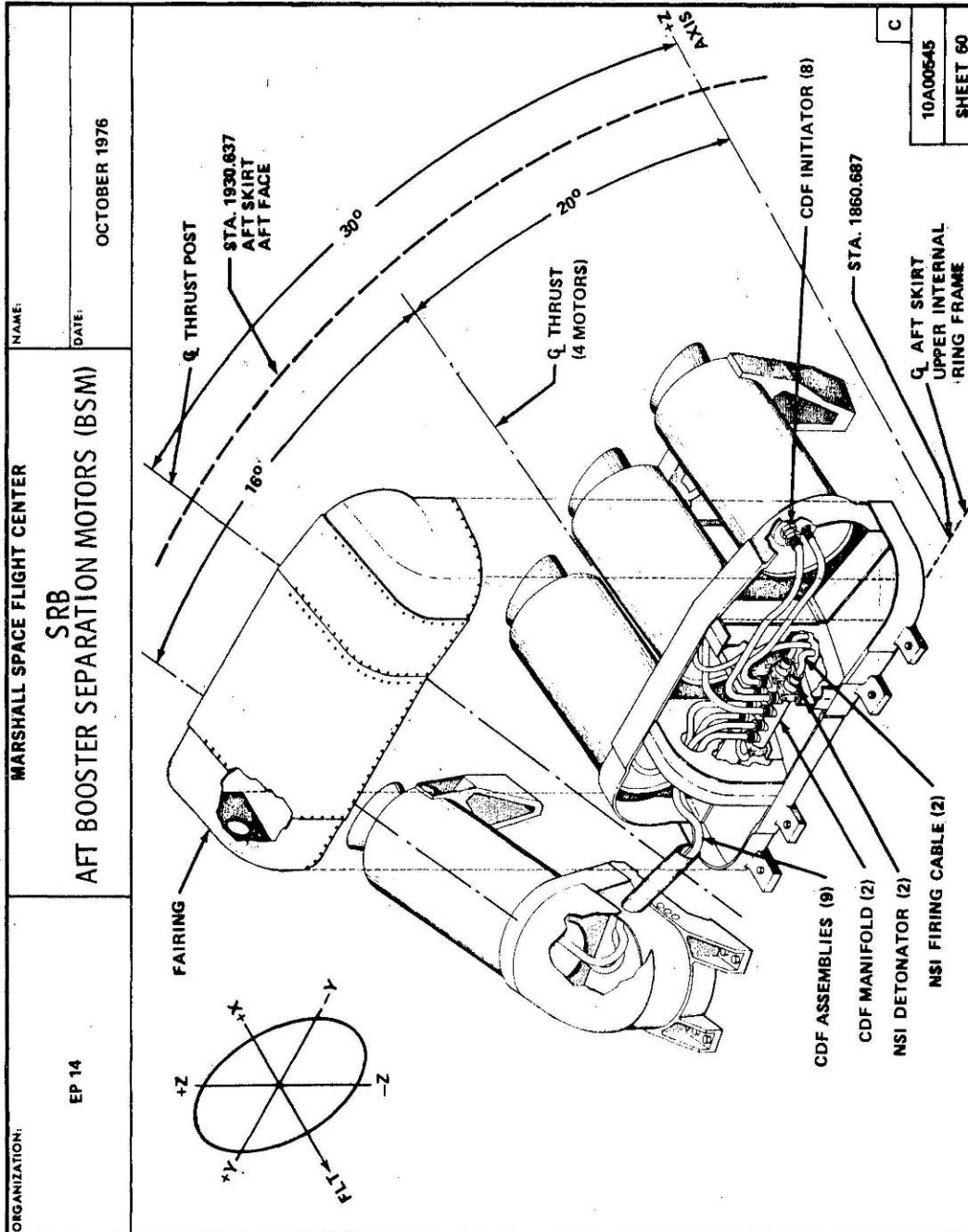


Figure No. E-26. Diagram of SRB aft booster separation motors.
 Source: Griner, et al., *Space Shuttle Solid Rocket Booster Pictorial Representations*, sheet 60.

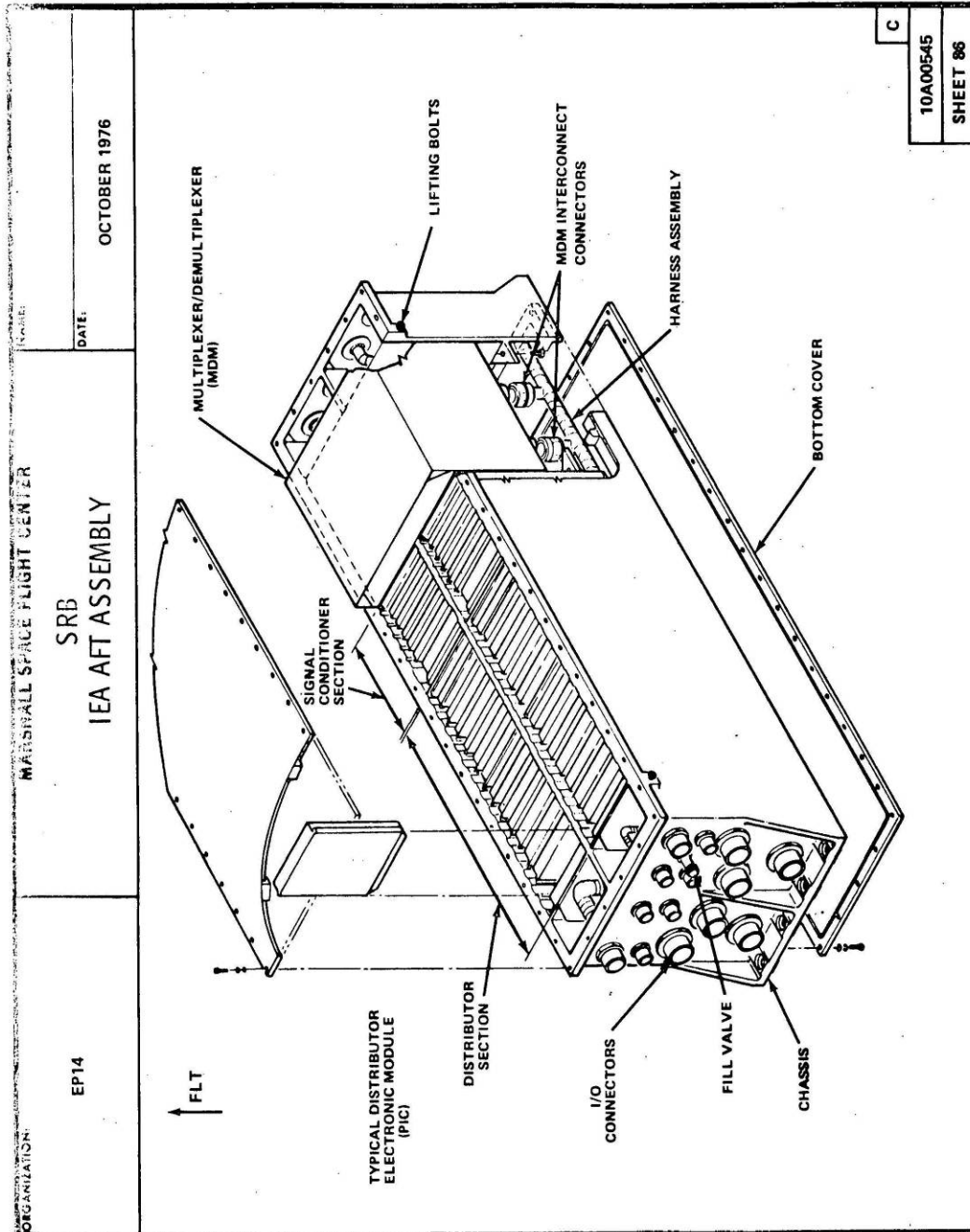


Figure No. E-27. SRB Integrated Electronic Assembly (IEA).
Source: Griner, et al., *Space Shuttle Solid Rocket Booster Pictorial Representations*, sheet 86.

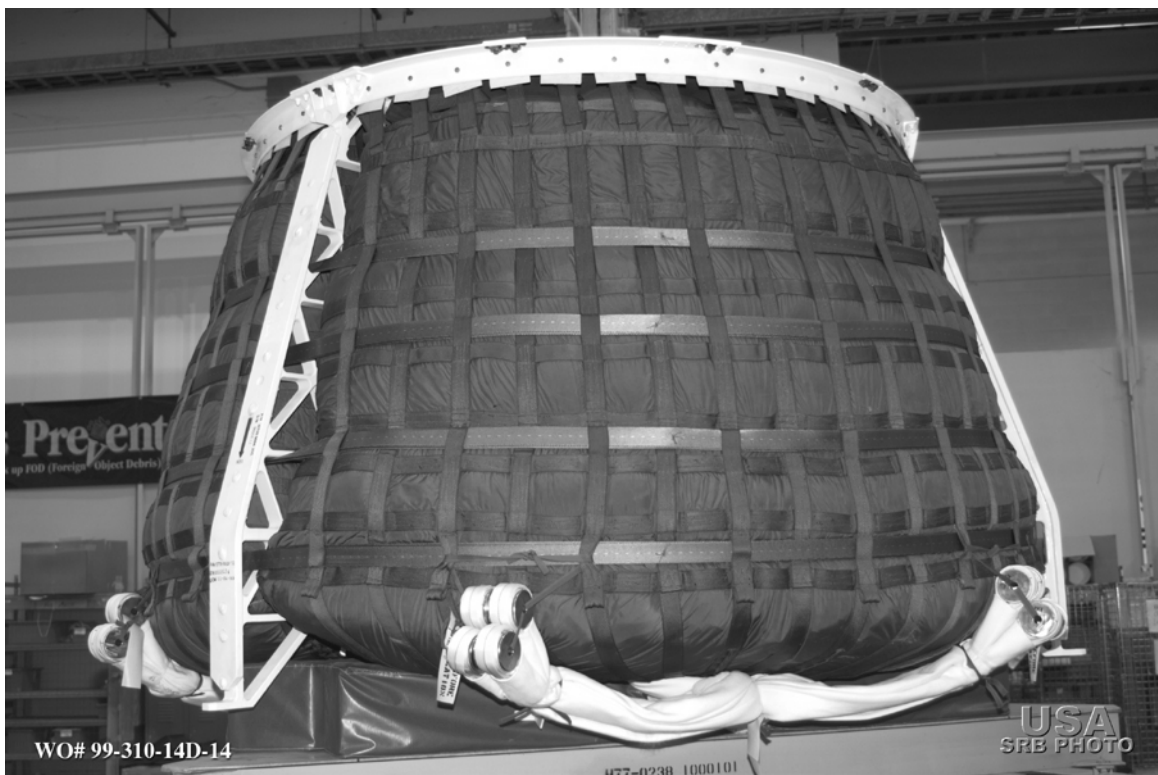


Figure No. E-28. SRB Parachute Assembly.
Source: USA, WO# 99-310-14D-14

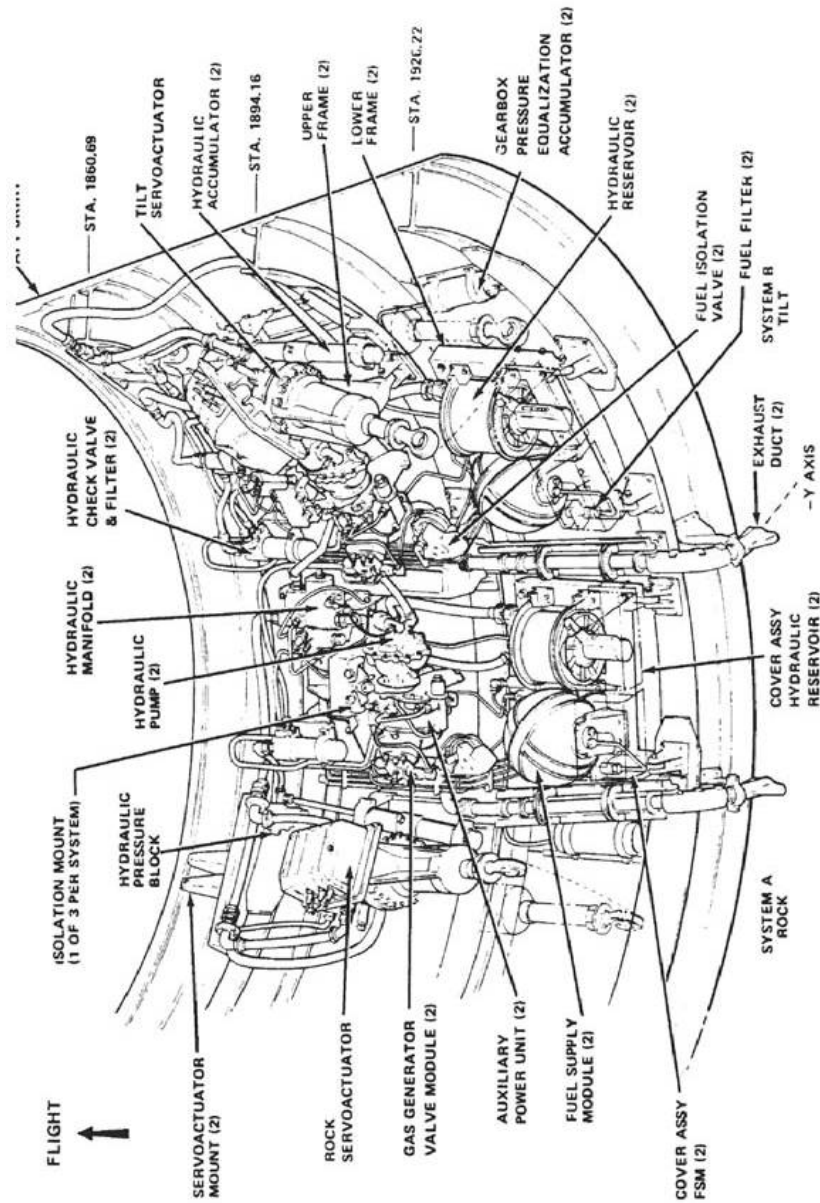
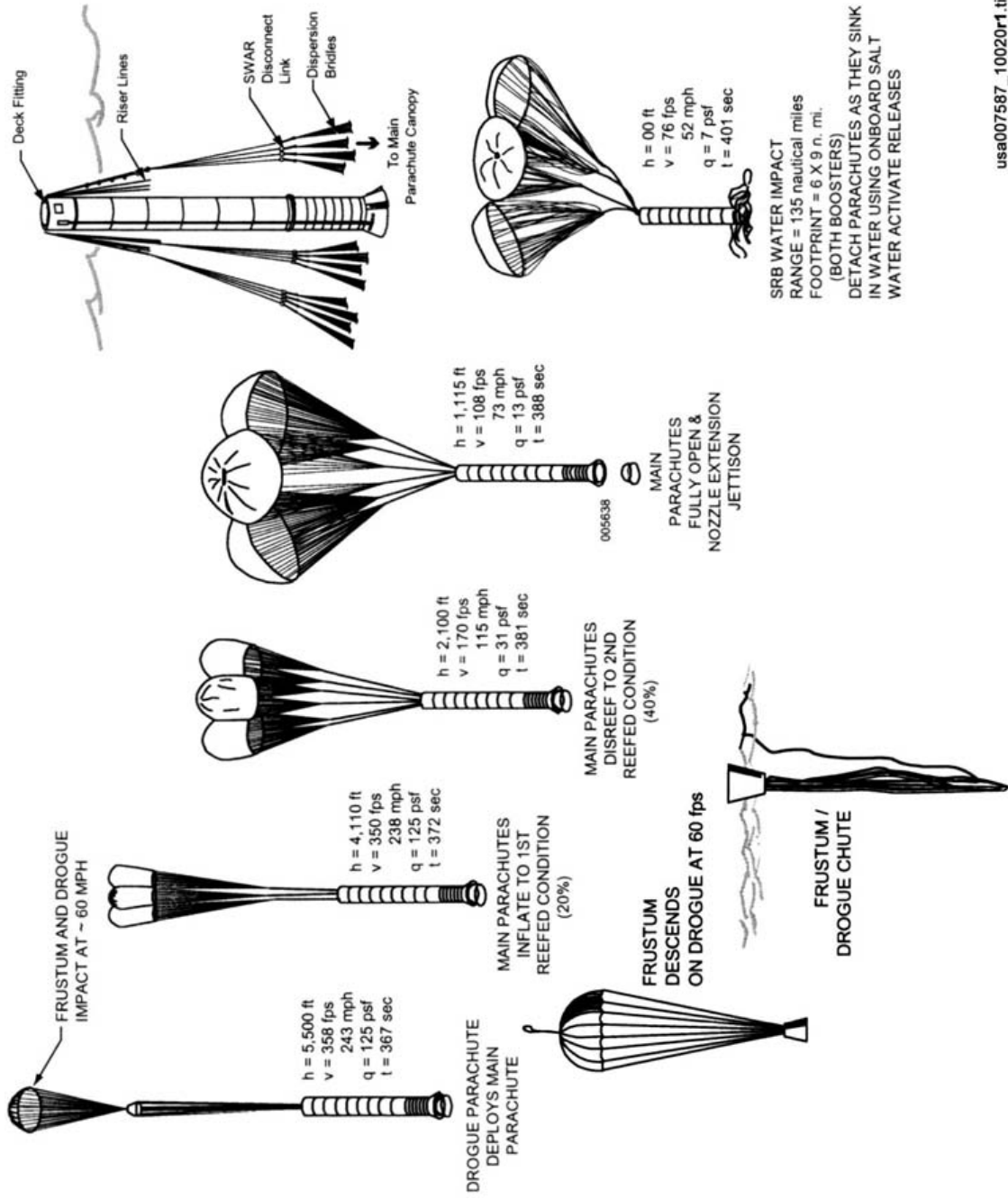


Figure No. E-29. Diagram of SRB thrust vector control subsystem.
 Source: USA. *Solid Rocket Booster Illustrated Systems Manual*, 62.



Figure No. E-30. Separation of the SRBs from the Shuttle Columbia, T+2:11, April 12, 1981.
Source: NASA Kennedy Space Center, KSC-81PC-0272, accessed at
<http://mediaarchive.ksc.nasa.gov>.



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Figure No. E-31. Diagram of SRB Recovery, from main deploy of parachutes through disconnect.

Source: USA, *Shuttle Crew Operation Manual*, 1.4-10.



Figure No. E-32. Right and left SRBs in Atlantic Ocean after jettison on December 9 (*Discovery*, STS-116), December 10, 2006.

Source: NASA Kennedy Space Center, KSC-06PD-2794, accessed at <http://mediaarchive.ksc.nasa.gov>.



Figure No. E-33. SRB retrieval ship, *Freedom Star*, towing spent SRB from the STS-114 launch, July 27, 2005.

Source: NASA Kennedy Space Center, KSC-05PD-1791, accessed at <http://mediaarchive.ksc.nasa.gov>.



Figure No. E-34. Recovered SRB arrives at Hangar AF Slip.
Source: USA, WO# 02-328-02D-13



Figure No. E-35. Crane lifts SRB used during *Atlantis*' STS-132 launch onto a tracked dolly at Hangar AF Disassembly Facility, May 18, 2010.

Source: NASA Kennedy Space Center, KSC-2010-3480, accessed at <http://mediaarchive.ksc.nasa.gov>.



Figure No. E-36. The frustum of a SRB used during *Discovery's* launch on mission STS-119 is lifted onto a transporter at the Hangar AF dock, March 18, 2009.
Source: NASA Kennedy Space Center, KSC-2009-2140, accessed at <http://mediaarchive.ksc.nasa.gov>.



Figure No. E-37. Forward skirt in Hangar AF Robot Wash Building, interior looking south.
Source: Archaeological Consultants, Inc., 2006.



Figure No. E-38. Empty RSRM segments en route to Utah following STS-122, March 5, 2008.
Source: NASA Kennedy Space Center, KSC-08PD-0630, accessed at
<http://mediaarchive.ksc.nasa.gov>.



Figure No. E-39. The first solid rocket booster solid motor segments (left and right aft segments) to arrive at KSC, February 2, 1980.

Source: NASA Ames Research Center, AC80-0107-3, accessed at <http://nix.ksc.nasa.gov/>.



Figure No. E-40. Loaded RSRM segments and two aft exit cone segments en route to the RPSF,
May 14, 2007.

Source: NASA Kennedy Space Center, KSC-07PD-1170, accessed at
<http://mediaarchive.ksc.nasa.gov>.



Figure No. E-41. SRB segment being lifted and rotated, 2004.
Source: NASA John F. Kennedy Space Center, KSC-04PD-0058, accessed at
<http://mediaarchive.ksc.nasa.gov/search.cfm>.



Figure No. E-42. Parachute from *Endeavour's* STS-126 mission is unreeled at the Parachute Refurbishment Facility, November 19, 2008.
Source: NASA Kennedy Space Center, KSC-08PD-3748, accessed at <http://mediaarchive.ksc.nasa.gov>.

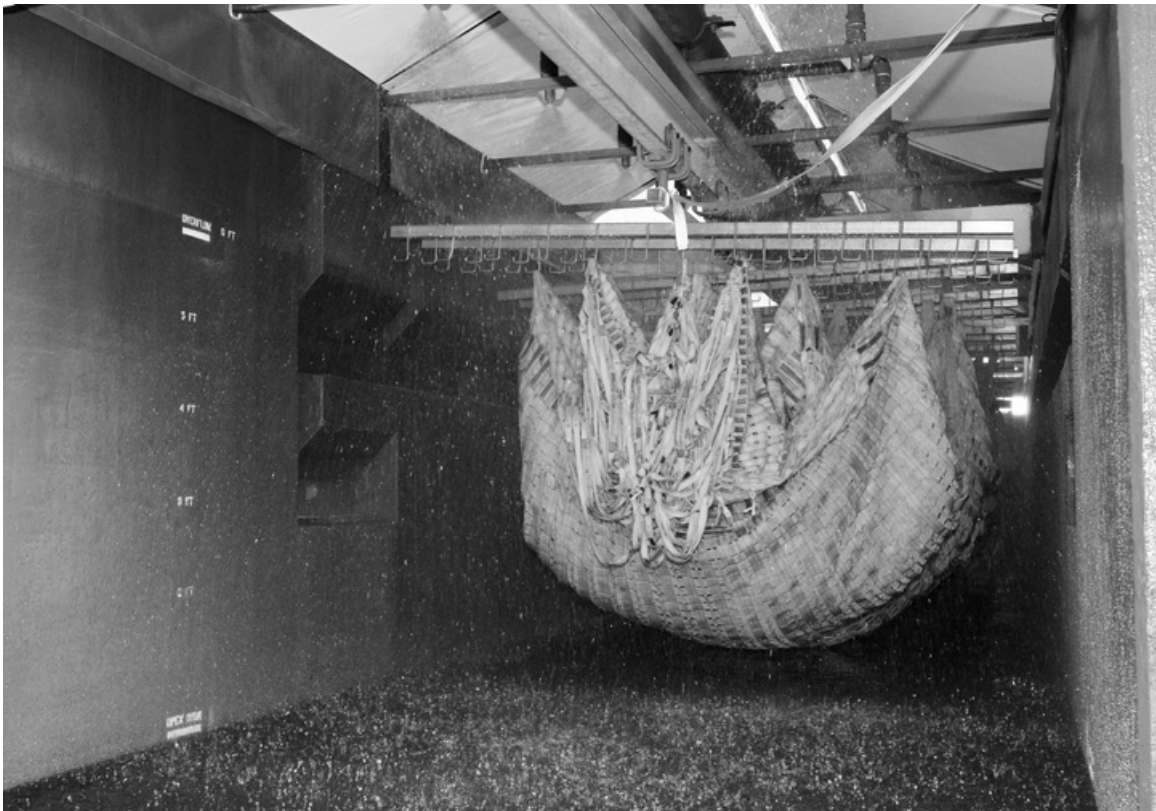


Figure No. E-43. Parachute from *Endeavour's* STS-126 mission is moved through the 30,000 gallon washer, November 19, 2008.

Source: NASA Kennedy Space Center, KSC-08PD-3747, accessed at <http://mediaarchive.ksc.nasa.gov>.



Figure No. E-44. Parachute from *Endeavour's* STS-126 mission is suspended from a hanging monorail system at the KSC Parachute Refurbishment Facility, November 19, 2008.

Source: NASA Kennedy Space Center, KSC-08PD-3740, accessed at <http://mediaarchive.ksc.nasa.gov>.



Figure No. E-45. Parachute Refurbishment Facility, packing area.
Source: Archaeological Consultants, Inc., 2006.



Figure No. E-46. SRB forward skirt in the SRB ARF cure area.
Source: Archaeological Consultants, Inc., 2006.



Figure No. E-47. The right aft booster, comprised of the aft skirt and aft motor segment, rolls out of a Surge Building at the RPSF for transfer to the VAB, where it will be stacked for *Discovery*, STS-121, January 23, 2006.

Source: NASA Kennedy Space Center, KSC-06PD-0108, accessed at <http://mediaarchive.ksc.nasa.gov>.

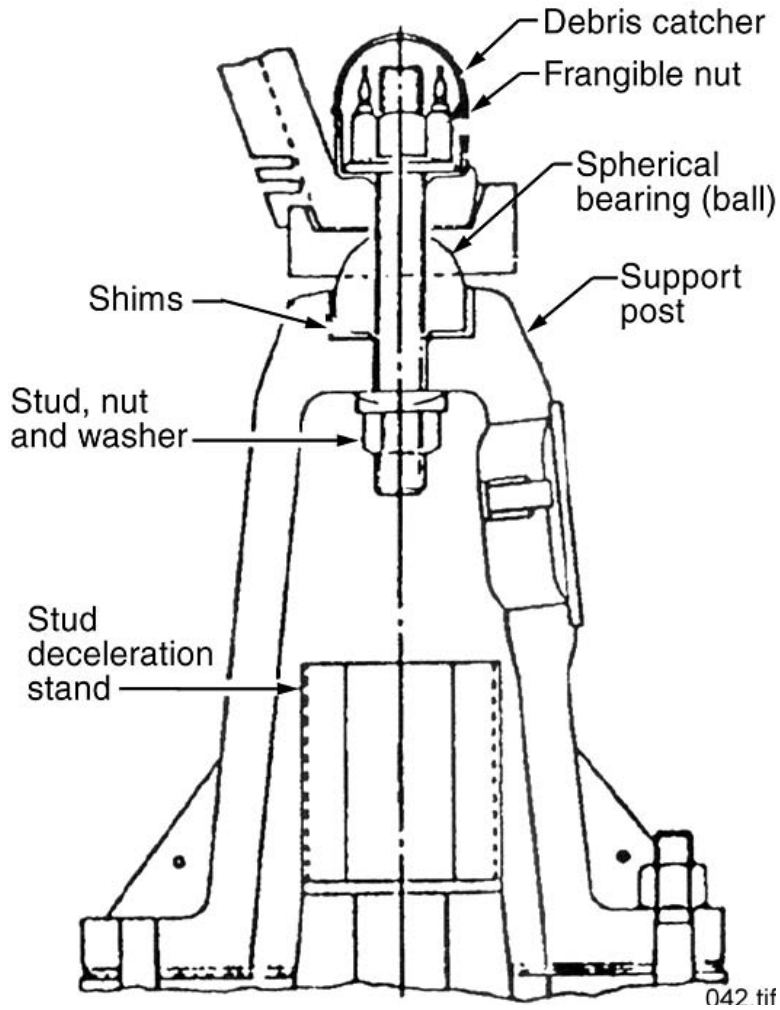


Figure No. E-48. Diagram of SRB Support/Hold-Down Post.
Source: USA, *Shuttle Crew Operation Manual*, 1.4-3.

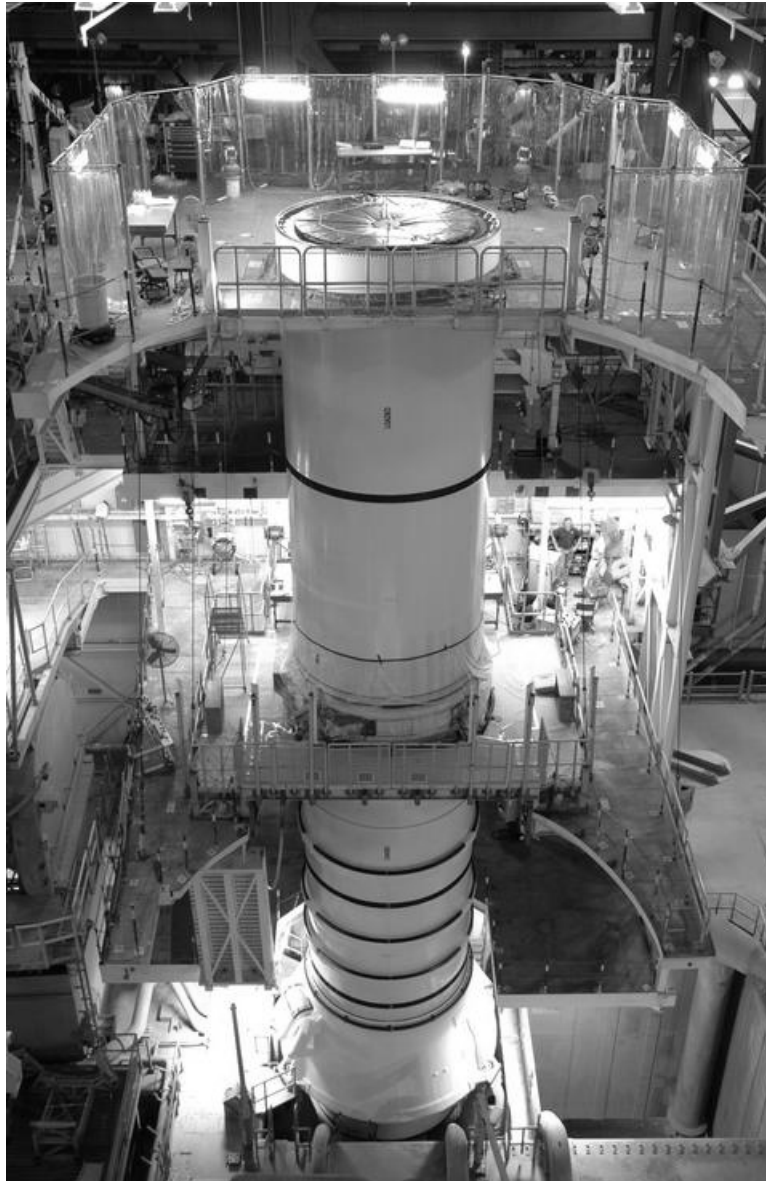


Figure No. E-49. A SRB left aft booster and left aft center segments are stacked in the VAB for STS-120, July 23, 2007.

Source: NASA Kennedy Space Center, KSC-07PD-2087, accessed at <http://mediaarchive.ksc.nasa.gov>.

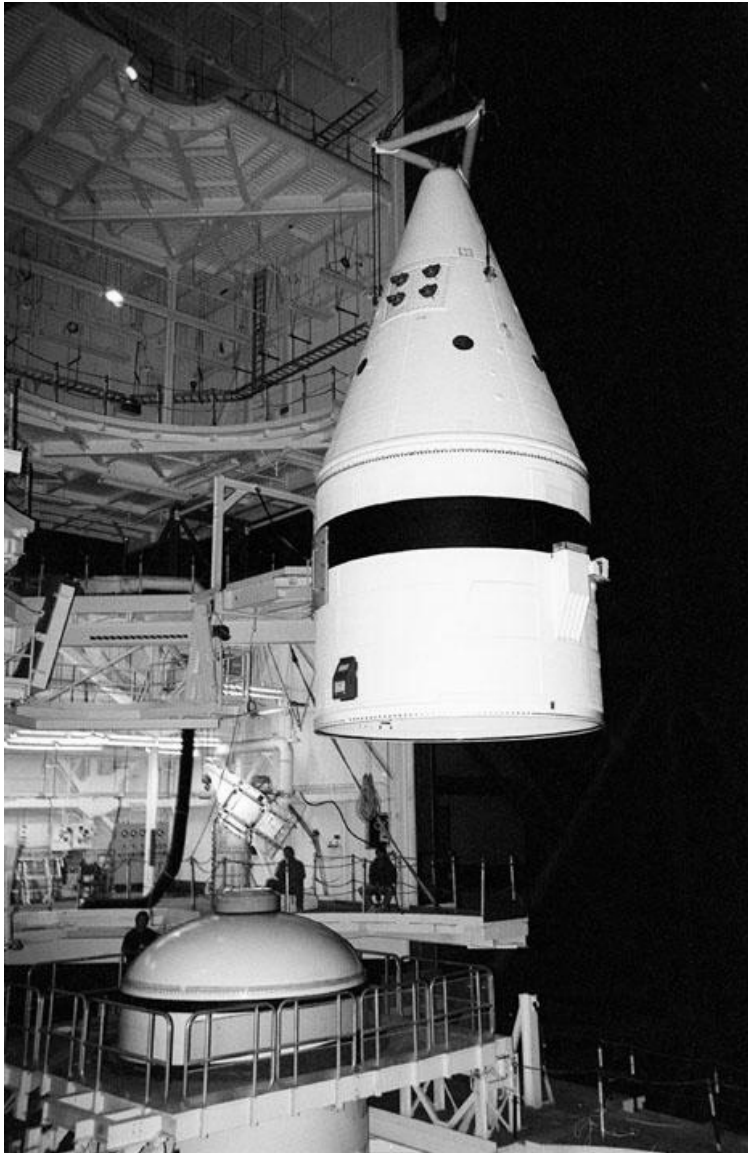


Figure No. E-50. A forward assembly is lifted in the VAB prior to stacking for STS-92,
June 29, 2000.

Source: NASA Kennedy Space Center, KSC-00PP-0853, accessed at
<http://mediaarchive.ksc.nasa.gov>.