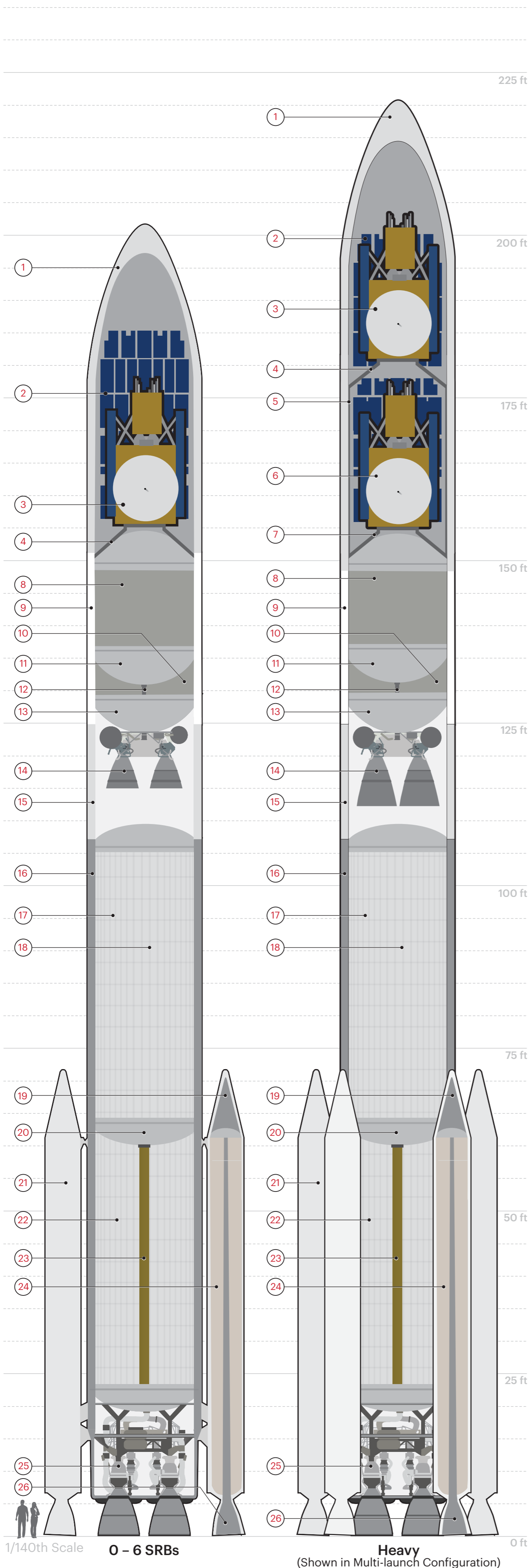


VULCAN CENTAUR



The Vulcan Centaur rocket design leverages the flight-proven success of the Delta IV and Atlas V launch vehicles while introducing new technologies and innovative features to ensure a reliable and affordable space launch service. Vulcan Centaur will service a diverse range of markets including commercial, civil, science, cargo and national security space customers.

The spacecraft is encapsulated in a 5.4-m- (17.7-ft-) diameter payload fairing (PLF), a sandwich composite structure made with a vented aluminum-honeycomb core and graphite-epoxy face sheets. The bisector (two-piece shell) PLF encapsulates the spacecraft. The payload attach fitting (PAF) is a similar sandwich composite structure creating the mating interface from spacecraft to second stage. The PLF separates using a debris-free horizontal and vertical separation system with spring packs and frangible joint assembly. The payload fairing is available in the 15.5-m (51-ft) standard and 21.3-m (70-ft) long configurations.

The Centaur upper stage is 5.4 m (17.7 ft) in diameter and 11.7 m (38.5 ft) long with a 120,000-lb propellant capacity. Its propellant tanks are constructed of pressure-stabilized, corrosion-resistant stainless steel. Centaur is a liquid hydrogen/liquid oxygen-fueled vehicle, with two RL10C engines. The Vulcan Centaur Heavy vehicle, flies the upgraded Centaur using RL10CX engines with nozzle extensions. The cryogenic tanks are insulated with spray-on foam insulation (SOFI) to manage boil off of cryogenics during flight. An aft equipment shelf provides the structural mountings for vehicle electronics.

The Vulcan Centaur booster is 5.4 m (17.7 ft) in diameter and 33.3 m (109.2 ft) long. The booster's tanks are structurally stable and constructed of orthogrid aluminum barrels and spun-formed aluminum domes. Vulcan Centaur booster propulsion is provided by a pair of BE-4 engines, each producing 550,000 lbs of thrust. The Vulcan Centaur vehicle is controlled by an avionics system that provides guidance, flight control and vehicle sequencing functions during the booster and Centaur phases of flight.

The solid rocket boosters (SRBs), with a diameter of 160.3 cm (63.1 in) and a length of 21.9 m (71.8 ft), are constructed of a graphite-epoxy composite with the throttle profile designed into the propellant grain. The SRBs burn for approximately a minute and a half, following SRB burnout they are jettisoned from the core vehicle.

With the addition of up to six solid rocket boosters, the Vulcan Centaur is available in four configurations. The two and six SRB variants are the standard offering, with the zero and four SRB variants offered on a mission-unique basis.

The rocket's height with the standard PLF is approximately 61.6 m (202 ft) and 67.4 m (221 ft) with the long PLF.

Performance

GTO	2,900 - 14,400 kg (6,400 - 31,700 lb)
LEO	10,600 - 27,200 kg (23,400 - 60,000 lb)

GTO = Geosynchronous Transfer Orbit 35,786 x 185 km (19,323 x 100 nmi) at 27.0°
LEO = Low Earth Orbit 200 km (108.0 nmi) circular at 28.7°

1. Payload Fairing
2. Fairing Acoustic Panels
3. Spacecraft
4. Payload Attach Fitting
5. Multi-Launch Adapter
6. Spacecraft
7. Aft Payload Attach Fitting
8. Centaur Fuel (LH2) Tank
9. Centaur
10. Centaur Oxidizer (LO2) Tank
11. Common Bulkhead
12. Centaur Fuel (LH2) Feedline
13. Centaur Aft Bulkhead
14. Centaur Engine (RL10)
15. Interstage Adapter
16. Booster
17. Booster Oxidizer (LO2) Tank
18. Orthogrid Structure
19. Nose Cone
20. Common Bulkhead
21. Solid Rocket Booster
22. Booster Fuel (LNG) Tank
23. Booster Oxidizer (LO2) Feedline
24. Solid Rocket Propellant
25. Booster Engine (BE-4)
26. Solid Rocket Booster Nozzle

The Vulcan Centaur rocket is built at ULA's 1.6-million square-foot, state-of-the-art production facility in Decatur, Alabama.

Vulcan Centaur will launch from Space Launch Complex-41 at Cape Canaveral Air Force Station in Florida and Space Launch Complex-3 at Vandenberg Air Force Base in California.

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