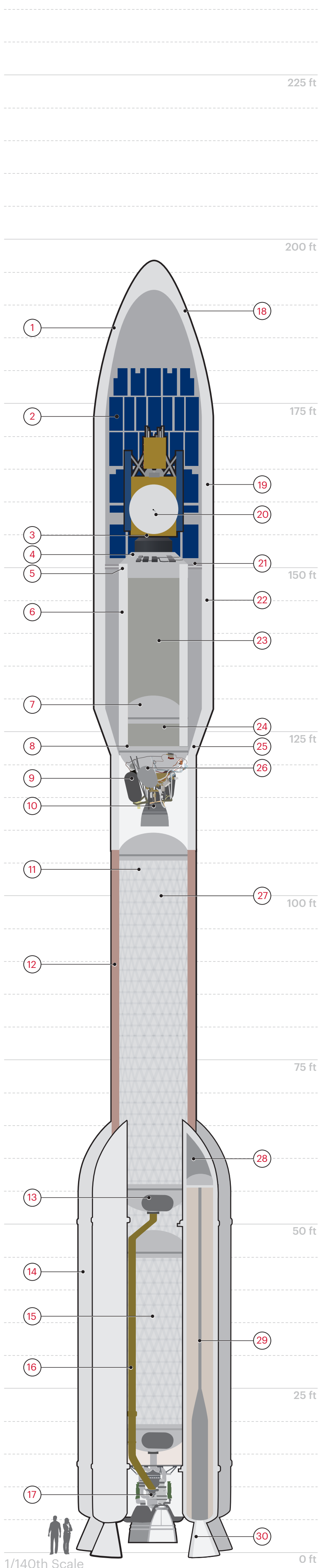


# ATLAS V

## 500 Series



The Atlas V common core booster (CCB) is 3.8 m (12.5 ft) in diameter and 32.5 m (106.5 ft) long. The booster's tanks are structurally stable and constructed of isogrid aluminum barrels, spun-formed aluminum domes, and intertank skirts. Atlas first-stage propulsion is provided by the RD-180 engine system (a single engine with two thrust chambers). The RD-180 burns RP-1 (Rocket Propellant-1 or highly purified kerosene) and liquid oxygen, and delivers 3,827 kN (860,300 lbf) of thrust at sea level. The Atlas V 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 spacecraft is encapsulated in the Atlas V 5-m (17.8-ft) diameter payload fairing (PLF). The 5-m PLF is a sandwich composite structure made with a vented aluminum-honeycomb core and graphite-epoxy face sheets. The bisector (two-piece shell) PLF encapsulates both the Centaur and the spacecraft, which separates using a debris-free pyro-technic actuating system. Payload clearance and vehicle structural stability are enhanced by the all-aluminum forward load reactor (FLR), which centers the PLF around the Centaur upper stage and shares payload shear loading. The Atlas V 500 series offers three payload fairing options, the short (shown at left), medium, and long payload fairings.

The Centaur second stage is 3.1 m (10 ft) in diameter and 12.7 m (41.6 ft) long. Its propellant tanks are constructed of pressure-stabilized, corrosion resistant stainless steel. Centaur is a liquid hydrogen/liquid oxygen- (cryogenic-) fueled vehicle. It uses a single RL10 engine producing 99.2 kN (22,300 lbf) of thrust. The cryogenic tanks are insulated with a combination of helium-purged insulation blankets, radiation shields, and closed-cell foam insulation. The Centaur forward adapter (CFA) provides the structural mountings for vehicle electronics and the structural and electronic interfaces with the spacecraft.

The solid rocket boosters (SRB), with a diameter of 158 cm (62.2 in) and a length of 20 m (65.6 ft) are constructed of a graphite-epoxy composite with the throttle profile designed into the propellant grain. The SRBs are jettisoned by thrusters following a burn lasting approximately a minute and a half.

The vehicle's height with the short PLF is approximately 59.7 m (196 ft). The vehicle's height with the medium PLF is 62.5 m (205 ft), and with the long PLF it is 65.5 m (215 ft).

### Performance

GTO	3,780 - 8,900 kg (8,320 - 19,620 lb)
LEO	7,940 - 18,510 kg (17,510 - 40,800 lb)

GTO = Geosynchronous Transfer Orbit 35,786 x 185 km (19,323 x 100 nmi) at 27.0°  
LEO = Low Earth Orbit 400 km (216 nmi) circular at 28.5°

1. Payload Fairing
2. Acoustic Panels
3. Payload Adapter
4. Centaur Forward Adapter
5. Cylindrical Adapter
6. Centaur Second-Stage
7. Common Bulkhead
8. Aft Bulkhead
9. High-Pressure Helium Bottle
10. Centaur Second-Stage Engine (RL10)
11. First-Stage Oxidizer (LO2) Tank
12. Common Core Booster
13. High-Pressure Helium Bottle
14. Solid Rocket Booster
15. First-Stage Fuel (RP-1) Tank
16. First-Stage Oxidizer (LO2) Feedline
17. First-Stage Engine (RD-180)
18. Payload Fairing Ogive Nose Section
19. Payload Fairing Module
20. Spacecraft
21. Centaur Forward Load Reactor Deck
22. Payload Fairing Base Module
23. Centaur Fuel (LH2) Tank
24. Centaur Oxidizer (LO2) Tank
25. Fairing Boattail
26. Hydrazine Bottle
27. Isogrid Structure
28. Solid Rocket Booster Nose Cone
29. Solid Rocket Propellant
30. Solid Rocket Booster Nozzle

Developed by the United States Air Force to assure access to space for Department of Defense and other government payloads, the Evolved Expendable Launch Vehicle (EELV) program supports the full range of government mission requirements, while delivering on schedule and providing significant cost savings over heritage launch systems. The EELV program includes the Atlas V and Delta IV families of launch vehicles.

With the addition of up to five solid rocket boosters, the Atlas V 500 series launch vehicle is available in six configurations.

Atlas V 500 series configurations deliver vital national security, exploration and commercial missions for our nation including Advanced Extremely High Frequency (AEHF) satellites and Orbital Test Vehicle (OTV) missions for the U.S. Air Force, Mobile User Objective System (MUOS) satellites for the U.S. Navy, classified missions for the National Reconnaissance Office and missions to Pluto, Jupiter and Mars for NASA.

Launch of Atlas V 500 series rockets takes place 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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