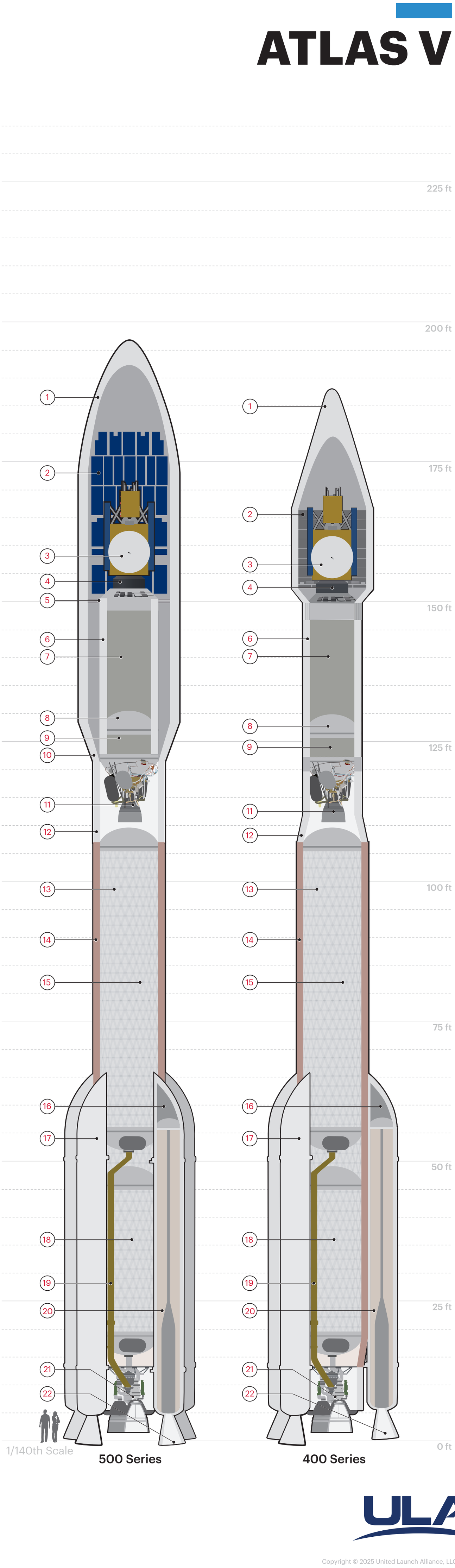
ATLAS V



Since 2002, Atlas V rockets have delivered vital national security, science and exploration, and commercial missions for customers across the globe including the U.S. Air Force, the National Reconnaissance Office and NASA.

The spacecraft is encapsulated in either a 5-m (17.8-ft) or a 4-m (13.8-ft) diameter payload fairing (PLF). The 4-m-diameter PLF is a bisector (two-piece shell) fairing consisting of aluminum skin/stringer construction with vertical split-line longerons. The Atlas V 400 series offers three payload fairing options: the large (LPF, shown at left), the extended (EPF) and the extra extended (XPF). 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 upper stage and the spacecraft, which separates using a debris-free pyrotechnic 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.

The Centaur upper 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-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 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 V booster 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. It 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 solid rocket boosters (SRBs), 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.

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. Spacecraft
4. Payload Adapter
5. Centaur Forward Load Adapter (5m Only)
6. Centaur
7. Centaur Fuel (LH2) Tank
8. Common Bulkhead
9. Centaur Oxidizer (LO2) Tank
10. Boattail (5m Only)
11. Centaur Engine (RL10)
12. Interstage Adapter
13. Booster Oxidizer (LO2) Tank
14. Common Core Booster
15. Isogrid Structure
16. Nose Cone
17. Solid Rocket Booster
18. Booster Fuel (RP-1) Tank
19. Booster Oxidizer (LO2) Feedline
20. Solid Rocket Propellant
21. Booster Engine (RD-180)
22. Solid Rocket Booster Nozzle

The height of the Atlas V 4-meter rocket with the LPF is 57.3 m (188 ft), 58.2 m (191 ft) with the EPF and 59.1 m (194 ft) with the XPF. The 5-meter vehicle's height with the short PLF is 59.7 m (196 ft), 62.5 m (205 ft) with the medium PLF and 65.5 m (215 ft) with the long PLF.

Atlas V rockets are built in ULA's state-of-the-art production facility in Decatur, Alabama.

Atlas V launches from Space Launch Complex-41 at Cape Canaveral Space Force Station in Florida.

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