

# Delta IV

## 5-Meter

The Delta IV common booster core (CBC) is 5.1 m (16.7 ft) in diameter and 40.8 m (133.9 ft) long. It is structurally rigid and constructed of isogrid aluminum barrels, spun-formed aluminum domes, machined aluminum tank skirts, and a composite centerbody. Delta IV first-stage propulsion is provided by the RS-68 engine system. The RS-68 burns cryogenic liquid hydrogen and liquid oxygen and delivers 2,949 kN (663,000 lbf) of thrust at sea level. The booster's cryogenic tanks are insulated with a combination of spray-on and bond-on insulation and helium-purged insulation blankets. The Delta IV vehicle is controlled by an avionics system, which provides guidance, flight control, and vehicle sequencing functions during CBC and second-stage phases of flight.

In the 5-m configuration, shown here, the spacecraft is encapsulated inside the 5.1 m (16.8 ft) payload fairing (PLF), consisting of a composite bisector (two-piece shell) fairing.

The second-stage is 5.1 m (16.7 ft) in diameter and 13.0 m (42.8 ft) long. The propellant tanks are structurally rigid and constructed of isogrid aluminum ring forgings, spun-formed aluminum domes, machined aluminum tank skirts and a composite intertank truss. The second stage is also a cryogenic liquid hydrogen/liquid oxygen-fueled vehicle. It uses a single RL10 engine that produces 110 kN (24,750 lbf) of thrust. Like the CBC, the second-stage cryogenic tanks are insulated with a combination of spray-on and bond-on insulation, and helium-purged insulation blankets. An equipment shelf attached to the aft dome of the second-stage liquid oxygen tank provides the structural mountings for vehicle electronics. The structural and electronic interfaces with the satellite are provided via the payload attach fitting (PAF).

The solid rocket motors (SRM), with a 152-cm (60-in) diameter and 16.2-m (53-ft) length, are constructed of a graphite-epoxy composite. The SRMs burn for approximately a minute and a half and are jettisoned approximately 100 seconds into flight.

The vehicle's height is approximately 66.2 m (217 ft).

### Performance

GTO	5,020 - 7,020 kg (11,060 - 15,470 lb)
LEO	10,640 - 13,360 kg (23,470 - 29,440 lb)

GTO = Geosynchronous Transfer Orbit 35,786 x 185 km (19,323 x 100 nmi) at 27.0°  
LEO = Low Earth Orbit 407 km (220 nmi) circular at 28.5°

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| 1. Payload Fairing                               | 14. First-Stage Engine (RS-68)                       |
| 2. Acoustic Blankets                             | 15. Spacecraft                                       |
| 3. Payload Attach Fitting                        | 16. High-Pressure Helium Bottle                      |
| 4. Second-Stage Fuel (LH <sub>2</sub> ) Tank     | 17. Second-Stage Equipment Shelf                     |
| 5. Second-Stage Intertank Truss Assembly         | 18. Interstage Adapter                               |
| 6. Second-Stage Oxidizer (LO <sub>2</sub> ) Tank | 19. Anti-slosh Baffle                                |
| 7. Hydrazine Bottle                              | 20. First-Stage Oxidizer (LO <sub>2</sub> ) Feedline |
| 8. Second-Stage Engine (RL10)                    | 21. Solid Rocket Motor Nosecone                      |
| 9. First-Stage Oxidizer (LO <sub>2</sub> ) Tank  | 22. Solid Rocket Propellant                          |
| 10. Common Booster Core                          | 23. Isogrid Structure                                |
| 11. Centerbody                                   | 24. First-Stage Fuel (LH <sub>2</sub> ) Feedline     |
| 12. First-Stage Fuel (LH <sub>2</sub> ) Tank     | 25. Solid Rocket Motor Nozzle                        |
| 13. Solid Rocket Motor                           | 26. Thermal Shield                                   |

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.

The Delta IV launch vehicle is available in two 5-m configurations; the Medium+ (5,2) includes two solid rocket motors while the Medium+ (5,4) includes four solid rocket motors.

Delta IV 5-m configurations deliver vital national security missions for our nation including the Air Force's Wideband Global SATCOM (WGS) satellites.

Launch of the Delta IV 5-m rockets takes place from Space Launch Complex-37 at Cape Canaveral Air Force Station in Florida and Space Launch Complex-6 at Vandenberg Air Force Base in California.

