



Vehicle Concept Characteristics - LV 41.4003.10051

UPPER STAGE

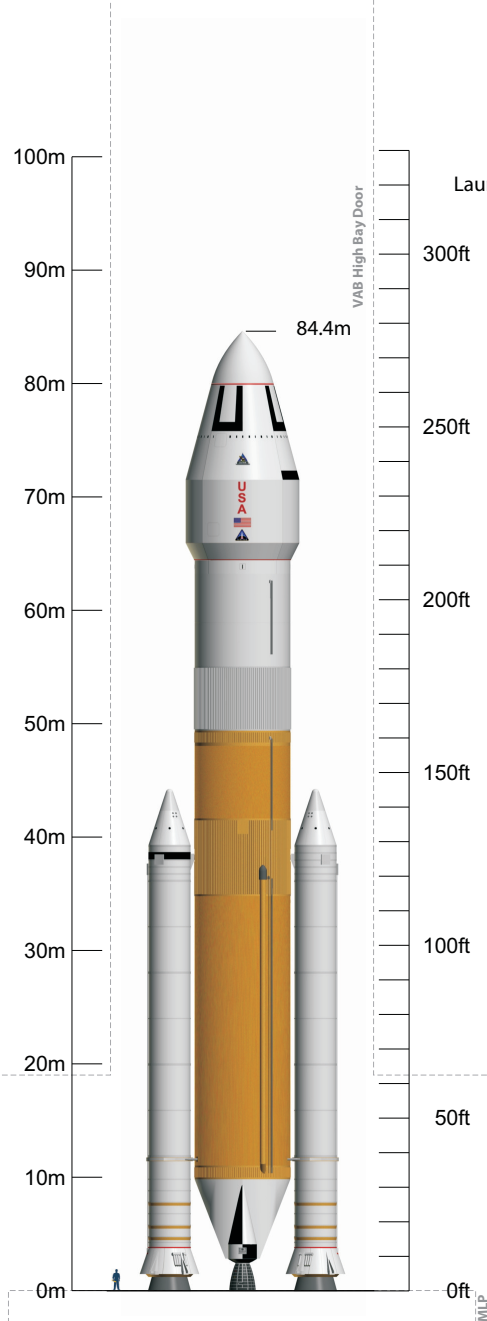
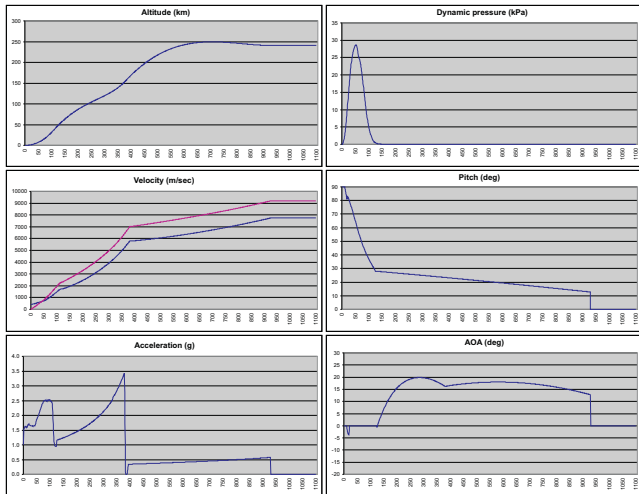
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|--|-----------------------------------|
| Design Heritage | Boeing ACES / Lockheed-Martin WBC |
| Propellants | LOX / LH2 |
| Maximum Gross Propellant | 385,805lb (174,998kg) |
| Usable Ascent Propellant | 152,399lb (69,127kg) |
| Ascent Flight Performance Reserve | 6,494lb (2,946kg) |
| Usable Post-Ascent Propellant | - |
| Post-Ascent Flight Performance Reserve | - |
| Unusable Residuals | 3,788lb (1,718kg) |
| Ascent In-Flight Losses | 261lb (118kg) |
| RCS Propellant | 992lb (450kg) |
| Propellant Offload | 57.19% |
| Stage pmf | 0.9336 |
| Dry Mass | 23,372lb (10,601kg) |
| Burnout Mass | 27,160lb (12,320kg) |
| # Engines / Type | 7 / RL-10A-4-2 |
| Engine Thrust (@ 100%) Vac | 22,300lbf (10,115kgf / 99,195N) |
| Engine Isp (@ 100%) Vac | 445.2s |
| Mission Power Level | 100.0% |
| Upper Stage Ascent Burn Time | 541.9s |
| LEO Loiter Period | 4 + 1 days |
| Pre-TLI Overboard Mass | - |
| ASE* | 1,102lb (500kg) |

DYNAMICS

| | |
|---------------------------|---------------------|
| Thrust : Weight @ Liftoff | 1.532 : 1 |
| Max Dynamic Pressure | 599.0psf (28,678Pa) |
| Max g's During Ascent | 3.43g |
| Insertion Altitude | 130.0nmi (240.8km) |

ASCENT PERFORMANCE

| | |
|-----------------------------------|-------------------------------|
| Delivery Orbit | 130.0 x 130.0nmi, 29.0° |
| Payload w/ regular NASA GR&A's | 222,501lb (100,925kg) † |
| Payload w/ additional 10% Reserve | 200,251lb (90,832kg) † |



Launch Site

KSC LC-39 (Latitude: 28.6084°)

GLOW

| | |
|-----------------------------------|-----------------------------|
| Payload Fairing | 4,801,148lb (2,177,764kg) |
| Payload Envelope | 32.8 x 18.4ft (10.0 x 5.6m) |
| Payload Fairing Jettison Mass | 30.2 x 18.4ft (9.2 x 5.6m) |
| Payload Fairing Jettison | 15,916lb (7,219kg) |
| Launch Abort System Jettison Mass | 335.5s @ 72.2nmi |
| Launch Abort System Jettison | - |

BOOSTERS (each)

| | |
|----------------------------|---|
| Design Heritage | Shuttle RSRM - Flown Unchanged |
| Propellants | PBAN |
| Usable Propellant | 1,111,604lb (504,215kg) |
| Stage pmf | 0.8561 |
| Dry Mass | 183,948lb (83,437kg) |
| Burnout Mass | 186,864lb (84,760kg) |
| # Boosters / Type | 2 / 4-segment Shuttle RSRM |
| Booster Thrust (@ 0.7s) SL | 2,892,912lbf (1,312,203kgf / 12,868,314N) |
| Vac | 3,142,302lbf (1,425,324kgf / 13,977,656N) |
| Booster Isp (@ 0.7s) SL | 237.0s |
| Vac | 269.1s |
| Booster Burn Time | 123.8s |

CORE STAGE

| | |
|-----------------------------|--------------------------------------|
| Design Heritage | Shuttle Super Light Weight Tank ET |
| Propellants | LOX / LH2 |
| Gross Propellant | 1,621,191lb (735,360kg) |
| Usable Ascent Propellant | 1,604,979lb (728,006kg) |
| Unusable Residuals | 16,047lb (7,279kg) |
| In-Flight Losses | 325lb (147kg) |
| Propellant Offload | 0.00% |
| Stage pmf | 0.9075 |
| Dry Mass | 147,479lb (66,895kg) |
| Burnout Mass | 163,526lb (74,174kg) |
| # Engines / Type | 4 / SSME-Block-II |
| Engine Thrust (@ 104.5%) SL | 392,326lbf (177,956kgf / 1,745,155N) |
| Vac | 490,847lbf (222,644kgf / 2,183,396N) |
| Engine Isp (@ 104.5%) SL | 361.4s |
| Vac | 452.2s |
| Mission Power Level | 104.5% |
| Core Burn Time | 384.1s |

INTERSTAGE

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|----------|-------------------|
| Dry Mass | 8,748lb (3,968kg) |
|----------|-------------------|

* ASE is part of the Payload, not additional

† Ascent Performance for Jupiter-247 protects for Upper Stage Single-Engine-Out and full FPR