DIRECT v3

Jupiter-241 - Lunar EDS Launch Vehicle Configuration

Vehicle Concept Characteristics - LV 41.4002.08001

UPPER STAGE

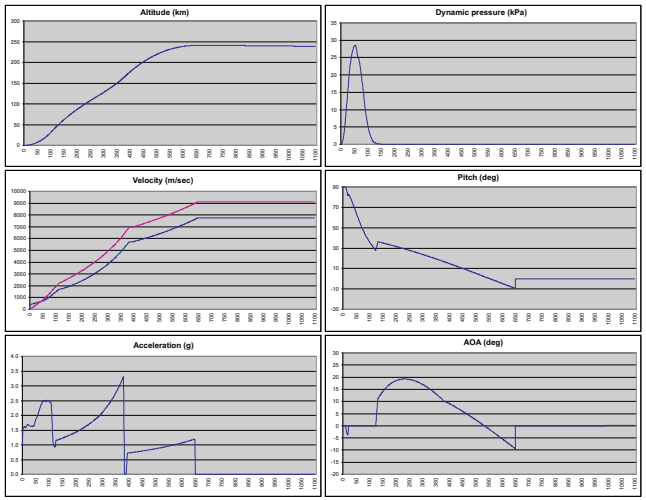
Design Heritage	Boeing ACES / Lockheed-Martin WBC
Propellants	LOX / LH2
Maximum Gross Propellant	400,519lb (181,672kg)
Usable Ascent Propellant	159,634lb (72,409kg)
Ascent Flight Performance Reserve	6,677lb (3,029kg)
Usable Post-Ascent Propellant	227,955lb (103,399kg)
Post-Ascent Flight Performance Reserve	2,303lb (1,044kg)
Unusable Residuals	3,911lb (1,774kg)
Ascent In-Flight Losses	39lb (18kg)
RCS Propellant	992lb (450kg)
Propellant Offload	0.00%
Stage pmf	0.9282
Dry Mass	26,785lb (12,150kg)
Burnout Mass	30,696lb (13,924kg)
# Engines / Type	1 / J-2X
Engine Thrust (@ 100%) Vac	294,000lbf (133,356kgf / 1,307,777N)
Engine Isp (@ 100%) Vac	448.0s
Mission Power Level	100.0%
Upper Stage Ascent Burn Time	261.9s
LEO Loiter Period	4 + 1 days
Pre-TLI Overboard Mass	6,677lb (3,029kg)
ASE*	1,102lb (500kg)

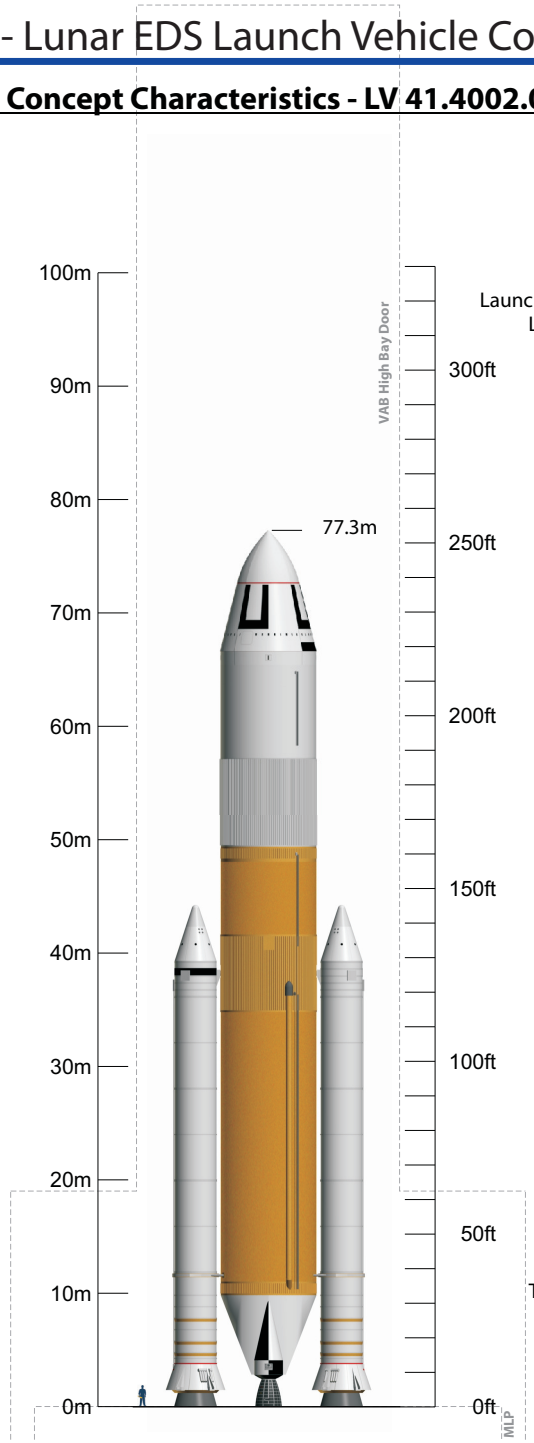
DYNAMICS

Thrust : Weight @ Liftoff	1.527 : 1
Max Dynamic Pressure	598.9psf (28,676Pa)
Max g's During Ascent	3.31g
Insertion Altitude	130.0nmi (240.8km)

ASCENT PERFORMANCE

Delivery Orbit	130.0 x 130.0nmi, 29.0°
Payload w/ regular NASA GR&A's	232,352lb (105,393kg)
Payload w/ additional 10% Reserve	**209,117lb (94,854kg)**





Launch Site	**KSC LC-39 (Latitude: 28.6084°)**
GLOW	**4,817,530lb (2,185,195kg)**
Payload Fairing	27.6 x 0.0ft (8.4 x 0.0m)
Payload Envelope	25.0 x 0.0ft (7.6 x 0.0m)
Payload Fairing Jettison Mass	8,724lb (3,957kg)
Payload Fairing Jettison	306.7s @ 70.4nmi
Launch Abort System Jettison Mass	-
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

Dry Mass	11,664lb (5,291kg)

EDS TLI PERFORMANCE

	2-Launch EOR
TLI dV (Adj. for Gravity Losses)	3,175.0m/s (+ FPR)
LEO Loiter Period	5.0 days
TLI Payload Performance*	**175,772lb (79,729kg)**

Work In Progress

6th June 2009

* ASE is part of the Payload, not additional