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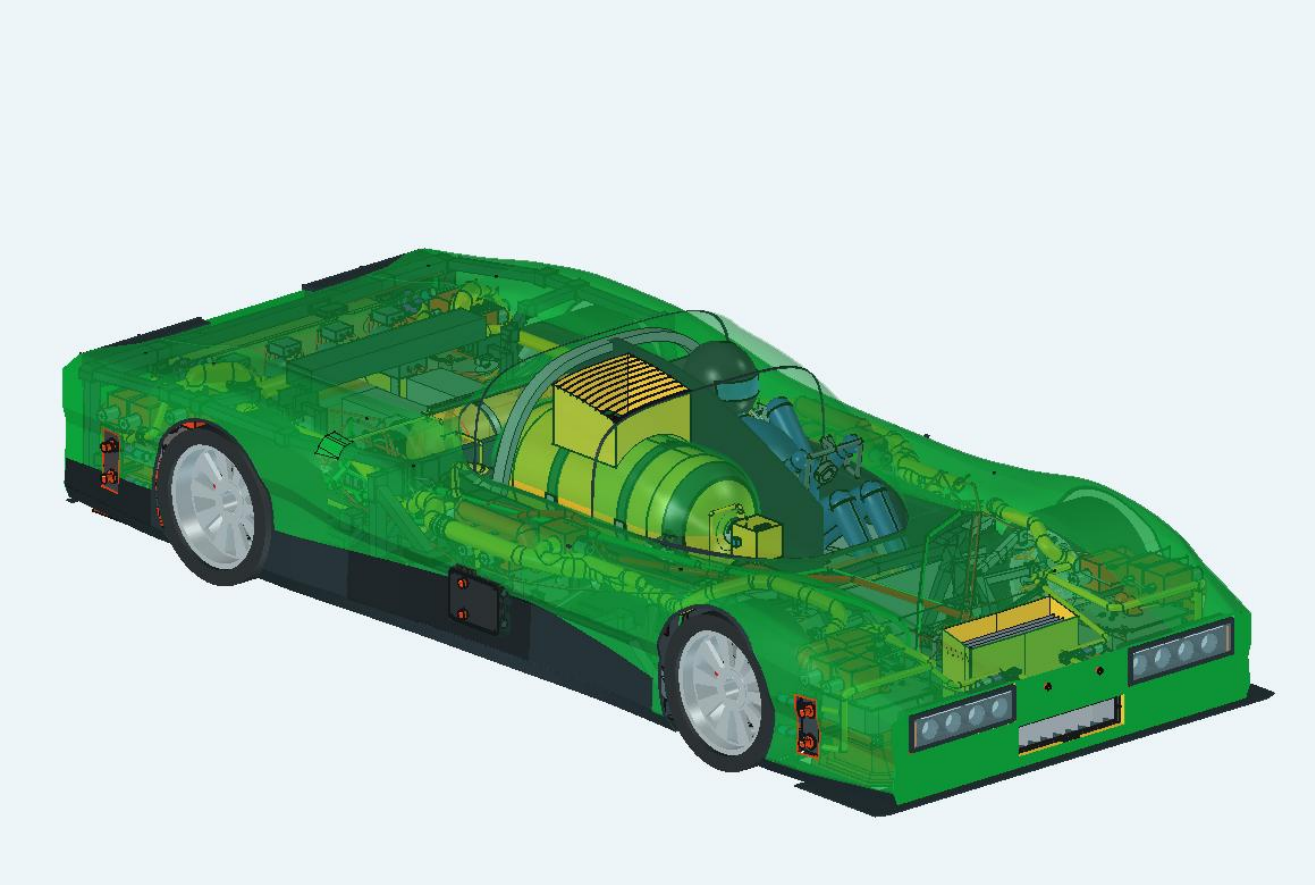
Argon R07. Alternative Technical Specification and Implementation Plan

R1.1 • 23.11.2026 • V1 panel_fit / V2 rear_cover



V2 rear_cover · R07 native CAD view from the 23 November 2026 atlas

Requirements, design alternatives and decision stages for the project owner and expert committee.

GasR2 gas system · A GUIv4 driver package · One hardware configuration for all qualifying modes

1. Scope and first-priority decisions

Edition R1.1 dated 23 November 2026 is the bilingual presentation issue of the R1 requirements baseline. Status: draft for agreement by the owner and expert committee. The subject is the experimental Argon vehicle. The baseline native assemblies are V1 panel_fit and V2 rear_cover. The geometry revision remains R07.

Owner's objective. Assess whether one hardware configuration can exceed the comparable performance of the original Tesla Roadster Rocket by 20%. Retain the enlarged GasR2 vessels, the rear module at Y=3465 mm in the R01 frame and the A GUIv4 driving position for a driver 192 cm tall and weighing 98 kg. Retain both branches until compared under the same conditions. For the selected branch establish one physical-vehicle identifier, one installed BOM and one set of CAD hashes.

Decision	Proposed wording
Architecture	V2 is the first development candidate. V1 is the reserve for digital development and hover bench research. Closure of a branch requires a separate decision after the checks in Section 3.
Mode qualification	The experts' first priority is a programme of individual starts with replenishment. The owner's full programme additionally includes both orders of a series without refilling, repetitions and partial replenishment.
Original vehicle performance	Approve the Tesla variant, measured quantity, conditions and source for each KPI. Maintain separate baselines for the demonstration run and the Rocket estimate.
Funding	The first priority is the mass statement with vessel documentation, measurements of an experimental gas branch, and coupled acceleration and four-wheel landing analyses. Body tooling, the final frame and full-scale testing require a separate decision based on these results.

Deliverable. For architecture selection submit two comparable V1/V2 configuration records and a register of accepted, rejected and open requirements. For qualification submit the actual vehicle and evidence for each claimed mode. A negative result with an identified cause is a complete research-stage outcome.

2. Vehicle variants and programme scope

Variant	Purpose and retained configuration	Condition for continuation
Upgraded V2	Priority candidate. Distributed gas storage, independent supports and access to the P117 cassette. In the full-charge Encore calculation its mass is 3015.50 kg without new vessel tare; Y/Z CG = 2900.3/538.1 mm.	Confirm usable gas, the mass limit and installation of all systems. Check loaded suspension, GasR2 access and the control implications of CG movement.
V1 reserve	Retain P114 and A GUIv4 and the ability to study a larger gas reserve. Calculated mass is 3913.08 kg without new vessel tare; Y/Z CG = 3295.7/791.5 mm.	Compare with V2 for the same mission. Show the load path around P114, driver egress and downforce deficit separately. Selecting V1 for the entire programme requires its own complete justification.
Rework both branches	An acceptable outcome if configuration, delivery or controllability do not close for either version.	State the controlling deficit with units, the mass and energy cost of changing the solution, and the next discriminating experiment.

Programme O — individual starts. One installed hardware configuration for acceleration, maximum speed, road range, ramp, Hover, Encore and Kickflip. Documented refilling, charging and cooling are permitted between qualification starts. The expert working target for the ground gas cycle is readiness for the next start within 20 min, with 15 min as the target objective. Measure from safe completion of the preceding start to clearance of the next start with the required p/T and reserve; record traction-battery charging separately.

Programme C — series using the same hardware. Submit Encore → Kickflip, the reverse order, repetition of one mode and the inclusion of Hover/yaw. Distinguish full, partial and zero refilling. Carry forward actual gas, SOC, temperatures, tyre condition and landing reserve between episodes. For the two previous separate manoeuvres, summed consumption exceeds the enlarged reserves by 349.50 kg for V1 and 219.33 kg for V2. These sums justify checking the series and do not predict the second start. Moving to Programme O alone changes the owner's objective and requires the owner's signature.

3. Architecture selection and common configuration

KT-1 — branch selection. Conduct a preliminary comparison in weeks 4–6. Plan the final decision for the end of week 8 if data are available. Compare usable gas available above the operating cutoff under declared conditions and the full vehicle mass in that same state. Outer-shell volume, charged-gas mass and the mass deliverable during a manoeuvre are three distinct quantities.

ID and owner	Selection condition	Evidence
K-01 · configuration and mass	Experts proposed 310–330 kg of usable gas for V2 at a mass no greater than 3350 kg. The working interpretation is a minimum of 310 kg and a target of 330 kg. The limit includes the 98 kg driver/equivalent, gas, all vessels, fittings, frame, cover and selected HV system. Sign off the convention in Phase 0.	BOM linked to SHA, supplier specifications and a mass balance with uncertainty. Qualification requires the lower estimate of usable gas ≥ the minimum and the upper estimate of mass ≤ the limit.
K-02 · integration	Continuous motion of the drive and suspension, movement of the service cassette, removal of GasR2 and protection of the A GUIv4 zone. Check egress, tolerances, tools and access to the secured module.	CAD checks and a record for each interface. In R07 the straight support zones give 111 intersecting pairs for V1 and 93 for V2. Maintain a pair list, corrections and recheck.
K-03 · gas and dynamics	Measured branch characteristics, a check of simultaneous delivery, and acceleration/landing assessment using the new mass, CG and inertia. The landing reserve must remain deliverable within the declared uncertainty.	Tested-branch specification, synchronised time histories, a common-supply model and a closed balance report. Record residual limits in the decision.

The V2 mass budget is especially sensitive to battery replacement. Between 3015.50 and 3350 kg, **334.50 kg** remains for all additions to the Encore scenario. If the battery mass increment of 260–300 kg is confirmed, only **34.50–74.50 kg** remains for additional gas, vessel tare, supports and everything else before crediting removed parts. Identify each removed part in the BOM. Reducing the gas charge in road mode does not reduce the mass of the permanently installed battery in flight mode.

If K-01–K-03 are met, the committee may select V2 for detail design. If evidence is insufficient, retain both branches. If V2 fails, compare V1 against the same mandatory requirements of the relevant programme. Moving V1 to reserve or archive does not close V2's road and flight KPIs.

4. Mode matrix and comparison rules

ID · mode	Measurable objective	Qualification conditions and owner
Д-01 · acceleration	0–60 mph = 0–96.56064 km/h. Following the expert recommendation, time t_0 / 1.2: 0.81 → 0.675 s for the comparative run; 0.59 → 0.4917 s (rounded to 0.492) for the Rocket estimate.	Metrology publishes time from rest and with the first foot (0.3048 m) excluded, plus surface, tyres, gas and SOC. The 0.81 s baseline in the same format still needs confirmation. Both numbers remain design objectives pending reconciliation. The more demanding mode is intended for remotely operated qualification.
Д-02 · speed	For the claimed family value of 230 mph, the +20% reference is 276 mph, or 444.18 km/h.	Aerodynamics and powertrain teams confirm the baseline's applicability to Rocket, duration, acceptable tyres, aerodynamic balance, required and available sustained power, and stopping conditions.
Д-03 · range	For the claimed family range of 310–320 miles, the reference is 372–384 miles (598.68–617.99 km).	The HV team and metrologist record the reference variant, cycle, initial/final SOC, gas charge, temperature and all loads. The range endpoints correspond to different possible baselines; select the threshold for the confirmed configuration.
B-01 · Hover	Height 3.00 ±0.15 m continuously for at least 2.16 s. The working reference is the lowest tyre point in a specified suspension state. Also record CG height.	Dynamics specifies the reference, holding band, wind and yaw profile, including a 180° turn for the replica scenario. The replica baseline used CG height; percentage improvement in clearance remains open until the references are reconciled.
B-02 · Encore and Kickflip	One signed revolution of 360° ±8°: pitch for Encore and roll for Kickflip. Encore starts from rest; the Argon Kickflip uses an entry speed of 60 km/h.	Controls records axes, unwrapped angle, position and velocity. For the jump, specify the complete obstacle envelope and positive clearance with tolerance. Every manoeuvre must satisfy all conditions in Section 5.
T-01 · Track and ramp	Traverse the approved profile, inversion and exit. All phases require acceptable reactions and no body contact with the ramp.	The chassis team checks geometry, dynamic downforce, leakage and transitions. Check a conditional airborne exit separately from a continuous approach.

The t_0/1.2 rule gives a 20% increase in mean acceleration for the same speed change interval. With the first foot excluded, the speed at the start of the timed interval is non-zero. Record the speed at the timing boundary for an exact comparison. The 0.648 and 0.472 s objectives belong to the earlier alternative of reducing time by 20%.

5. Landing and presentation of flight results

Qualification of Encore and Kickflip occurs after vehicle stabilisation. Present contact geometry, the state of each support and acceleration at the seat mounting on one timeline. The previous first-tyre contact criterion is retained within the more demanding assessment.

ID	Proposed expert limit	Evidence
П-01 · attitude	At first contact, body vertical deviation ≤5°, heading error ≤5°. Absolute roll and pitch angular rates ≤15°/s each.	Motion measurement and independent reconstruction. Explicitly define R01 and body axes, target heading and signs.
П-02 · first support	A tyre contacts first. Downward normal velocity of its contact point is between 0 and 0.50 m/s. Maintain positive clearance for the splitter and other rigid parts.	Synchronised pose, CG and body/wheel angular velocities, suspension travel, tyre deformation and contact event. Identify the tyre, time and uncertainty.
П-03 · subsequent supports	Reach stable support on four wheels within ≤0.50 s of first contact. Bottoming onto hard stops and secondary body impact are excluded.	Time histories of all four normal reactions, strut travel and speed, body height and rebound through steady motion or a stop. Agree the reaction threshold, continuous holding window and run-out conditions before analysis.
П-04 · seat and test clearance	Experts propose a peak vertical acceleration at the seat during settling of ≤3.5 g. For each authorisation define axis, inclusion of gravity, frequency band, duration and limits in other directions.	Seat-sensor and instrumented-dummy data. A biomechanical specialist and the responsible test organisation approve criteria before the physical stage. The 3.5 g figure alone does not clear a human occupant.

The previous four R06 calculations with separate enlarged charges gave first-tyre downward velocities of 0.243–0.265 m/s under the former 10° attitude tolerance. In R07, aft gas placement for V2 Encore shifts the calculated CG by 242 mm rearwards and 74 mm upwards relative to the previous flight assumption. Reassess П-01–П-04 using identified mass, full inertia tensor and a post-landing model. Separately record actual force deficit, supply saturation and side-nozzle consumption.

6. Pneumatic system, frame and cocoon alternatives

Path A. Compare the existing common network with the experts' proposed division into four sectors. Use identical conditions for configuration, usable reserve, pressure and temperature states, command sequence and the reserve allocated to landing. The objective is available force and moment over time on all axes together with consumption, equipment mass and failure states.

ID · item	Compare	Evidence to submit
Г-01 · reserve	V1 at the modelled 400 bar and V2 at 700 bar; 80 bar absolute was the previous calculation cutoff. Establish actual permissible limits from specifications.	Water volume, tare with fittings, gas composition, p/T, charge mass, deliverable mass, operating reserve and service life. Associate each with its physical vessel.
Г-02 · delivery	Inherited common Argon limit 160 kg/s. Replica lift42 peaks at 203.327 kg/s, exceeding the limit for 0.5153 s. The expert range 240–280 kg/s is a distributed-architecture hypothesis.	Measure synchronised flow, force, moment, delay, closure and branch interaction. One sector supplies model data. Confirm four-sector delivery in a combined-mode assessment.
Г-03 · gas properties	Compare dry air / nitrogen with one real-gas property model. Expert research range 50–700 bar, 180–350 K. Helium mixture and thermal buffer are separate research options.	Consistent composition, units and absolute pressure in density and energy balances; library version, applicability range and check points. Resolve the 415/527 kg/m³ discrepancy in carbon-2. Include cooling, losses, mass and energy of the options.
Г-04 · placement	Compare the aft pair and a V2 cassette arrangement with a trial 25–30% of volume moved forwards. The proposed CG Y window of 2650–2720 mm requires a controllability assessment.	Real envelopes and fittings; CG and tensor maps during gas consumption. Study nose, tunnel and sills considering previously detected intersections and egress paths.
Г-05 · load path	Compare an independently removable subframe with other load paths into the longitudinal members. Check any proposed connection to the cocoon hoop.	Load cases, joint forces, deformation, fatigue and cabin protection. Nominal and service poses of P114/V1, P117/V2 and GasR2, tool access, new cover, and a fresh first-open check of changed CAD in a separate process.

For pressure work use the confirmed equipment envelope and the specialist test organisation's programme. The 22-branch arrangement and common-adapter restrictions in DEV44 belong to the replica. Establish Argon's topology and limitations from its own components and measurements.

7. Powertrain, aerodynamics, supports and controls

Path B. While retaining the family references of 444.18 km/h and 598.68–617.99 km, compare an upgraded permanently installed HV system against baseline R3. An alternative is to refine the baseline of the single-seat original and recalculate the objective in agreement with the owner. Different batteries or removal of vessels between disciplines require separate configuration identifiers.

ID · alternative	Inputs and hypothesis	Assessment result
Э-01 · powertrain	R3: shaft peak 248 kW, 136 kW after 10 s, terminal limit 340.83 kW, battery 56.16 kWh. Experts propose comparison with the 800–1000 V class, 1.1–1.3 MW peak, at least 1.05 MW sustained and a 135–150 kWh battery.	Torque, wheel force and power versus duration, SOC and temperature. State DC, shaft and wheel power separately. Include cooling, enclosure and mass of the completed battery.
Э-02 · acceleration and range	Compare electric drive and combined longitudinal thrust with tyre and downforce effects. The R3 model uses 90.59 kW for fans and 7.5 kW auxiliary load. At 600 km the allowable consumption for 56.16 kWh is 93.6 Wh/km.	Close force and energy balances for every start, check wheel angular speeds, time and actual acceleration. For the road cycle report energy per km and thermal state. Energy used to compress the gas is recorded separately by the station meter.
Х-01 · ramp and aerodynamics	Check entry profile, clearance changes, skirt alternatives and downforce redundancy. In R07 the static difference relative to weight with added gas is −4.58 / +4.22 kN for V1/V2 without new vessel tare.	Downforce map with leakage and failure, continuous ramp traversal and aft-cover aerodynamic balance. Historical penetrations of 0.485 / 0.322 m require geometric correction. Check drag, tyres and braking at the selected speed.
Х-02 · damping	Compare the existing and controlled suspension and energy absorption options in struts and seat while retaining A GUIv4. The target strut capability for an emergency load does not change the 0.50 m/s contact limit.	Tyre and damper maps, seat, belt, head and neck checks; joint assessment of П-01–П-04.
У-01 · control	Compare the existing controller with predictive thrust allocation for variable mass, inertia and pressure. Provide priority for the deliverable landing reserve.	Checks with valve delay, sensor loss, one branch failure and restricted power. Preserve commands, responses of all active groups, termination reasons and residual controllability.

8. Implementation plan and decision points

Weeks are counted from the agreed start. The intervals are the experts' plan assuming supplier, measurement-equipment and test-site availability. Reschedule if required inputs are absent at the decision point. Work with independent inputs may proceed in parallel.

Phase and timing	Owner and work	Output and transition condition
0 · weeks 1–3. Establish the specification	Requirements lead, metrologist and configuration engineer. Issue the KPI matrix, state identification and BOM for both SHAs. Request complete data from 2–3 suppliers. Agree sensors, units, limits and the first-priority budget.	Baseline and rule matrix, mass register and unknowns with owners, and simultaneous-measurement scheme. For mass and tensor use full charge and SOC, half gas, operating cutoff and a documented road state.
1 · weeks 4–8. Check baseline balances	Pneumatics, test team and mass engineer. Under the approved programme obtain one representative sector map, close the simultaneous-supply requirement and the V1/V2 mass balance. Dynamics performs preliminary acceleration and four-support landing calculations.	K-01–K-03 package. Select V2, continue V1 or return both architectures for rework with the cause identified. State where sector results need system-level confirmation.
2 · weeks 9–16. Link design and analysis	Integration, frame/cocoon, HV, dynamics and controls. Update CAD, masses, CFD and gas, tyre, suspension, thermal and occupant models. For the selected branch evaluate every Programme O row and the available Programme C series.	Independent assessment of numerical convergence and outcomes, including failures. Sensitivity plan: at least 500 realisations, objective 1000; input variation and statistical sufficiency criteria to be approved in advance. The commission reviews readiness for the specific test level.
3 · weeks 17–28. Qualification	Test lead, specialists and independent commission. T1 — equipment, load interfaces and static modes; T2 — protected ground and limited remotely operated modes; T3 — declared qualification programme on one vehicle.	Separate clearance record for each level and mode. First physical dynamic checks are remotely operated with an instrumented dummy of the required mass. Final output is a record for each KPI, tolerances, repeatability, deviations and open limitations.

Separate the Phase 0–1 budget from final body, frame and complete-vehicle test costs. The owner approves the estimate, supplier lead times, schedule and appointments after receiving proposals. Compare candidate sites in the Russian Federation, Texas and Germany by authorisation for the required tests, infrastructure, logistics and cost; this specification does not assign a site.

9. Acceptance, evidence and agreement sheet

One record per mode and vehicle. The header records the CAD/BOM identifier, hardware configuration and control version, driver or dummy, gas composition and charge, SOC, temperature, tyres, surface, wind and coordinate system. For each parameter state units, time interval, method and uncertainty. Measurement, calculation and video reconstruction receive distinct statuses. If the uncertainty interval crosses the acceptance boundary, the result remains open.

Decision for signature	Who agrees and when	Consequence
P-01 · acceleration baseline and qualification scope	Owner and metrologist, Phase 0. Separately select the evidence for 0.81/0.59 s, time rules, start method and applicability to Rocket.	Establish main and research rows. Acceleration in 0.675 s does not close the target derived from 0.59 s.
P-02 · series, reference and full mass	Owner, configuration and dynamics teams, Phase 0. Confirm mandatory series, 310 or 330 kg for V2 selection, contents of the 3350 kg mass, Hover reference and beginning/end of the inter-start interval.	Until signed, present calculations for both programmes using both lowest-tyre-point and CG references. Record individual-mode success separately.
P-03 · limits and methods	Strength, pressure, metrology and human-factors owners, before the relevant level. Establish loads, life, dummy/human limits and failure and stopping criteria.	Expert figures of 2.25 for structural checking and 3.5 g for the seat are initial proposals. Load cases, factors, method and applicability need separate approval.
P-04 · architecture and funding	Committee and owner at KT-1 and after Phase 2. Sign the branch-selection record and configuration of the next release.	Assign work, budget and owners or return a specific question for rework. A 28-week duration alone gives no physical test clearance.

Deliverables. The technical specification, Q01–Q42 response traceability table, original expert text and source register with SHA-256. Implementation evidence shall include a BOM, measurement maps at original resolution, uncertainties, complete series and failures, CAD/service checks and a log of superseded results. Sign off complete compliance only against the same configuration and the agreed matrix.

Sources. Expert response of 23 November 2026, lines 59–76 (four decisions), 80–101 (Paths A, B, C), 105–124 (phases and levels). Argon R07 expert dossier of 23 November 2026, M01, M02, M03, M05–M09, and independent recalculation of the lift42 record. Exact files, SHA values and the methodological source for the gas-property model are listed in this edition's source register. Requirement and decision IDs retain their Russian characters in both languages and are identical identifiers.