



DEVELOPMENT SPRINT REVIEW

CALENDAR WEEK 46.21

GENERAL (1/5)

HIGHLIGHTS:

- All Squads moved to Jira
- After-IPO: wave of contracts for new employees
- Wave of purchase orders sent out
- Crossfunctional Board for crossfunctional requests → Group Coordination Meeting on Monday with all Squad POs (before: only R&D Squads)
- Chassis: most cross-functional steering blockers resolved
- Progression Fusa item definition
- CAE Load case overview: awareness and fill rate increased - 227 simulation activities, result feedback ~50%

GENERAL (2/5)

- FVC Mounting: Space between FVC and windshield - DONE
- FVC stray light cover design clarification and support - DONE
- Move camera closer to the windshield to achieve a clearance of 2.3mm (per benchmark) - DONE
- Alignment between supplier and Sono Infotainment Team - DONE

IN PROGRESS:

- CAE data of Center Information Display (CID) for crash analysis - IN REVIEW
- Update charging lid styling to new E/E package - IN REVIEW
- Interior interface status: No progress since 5th Nov. (nightletter) → Focus topic for upcoming sprint
- PMCS input: Good progress, but not finished - 11% open for S1 and S0
- DTs: Progress made, but still items open (nightletter)
- Each squad will deliver CAE models derived from SVC3 design release CAD till 17-Dec-2021
- Chassis to deliver CAE models required for crash & safety assessments based on design release CAD data by 17th Dec2021

GENERAL (4/5)

- HV Battery to deliver CAE models required for Crash&Safety assessments based on Design Release CAD data till 17-Dec-2021
- PO sent to supplier to source PABD / Hazard Light Switch / Brake Light Switch
- Towing Capability vs Target
- BOM for Purchasing & Cost Accounting & Project Engineering
- Rear LF Antennas located in Rear Bumper for SVC3
- Headcount Plan Update E/E
- Resolve clash between HVAC and VCM CAD data
- Receive crash simulations from Level 3 for HU for crash analysis

LOWLIGHTS:

- No DVP available for SVC3 → solutions to be defined next sprint
- 3 parties-NDAs take too long
- Finalize Rear view camera packaging proposal for SVC3
- PMCS Input E/E: S0 &S1 = 100%
- Provide EE team IHU Device Transmittal Information

BODY CLOSURE (1/2)

HIGHLIGHTS:

- NEVS work package discussions > lots of scope
 - DVP purchase
 - Materials & fixing testing (additional cost = PVL/SBP testing corrosion, climate chamber, cycling, shaker)
 - SVC3 closures testing
 - SSTS/CTS continues
 - Tolerance analysis (experience & software analysis)
- NEVS support more engaged



BODY CLOSURE (2/2)

IN PROGRESS:

- Closures drives ME purchasing

LOWLIGHTS:

- Spare parts strategy for SVC3 - currently planned 5x sets > squads need direction here
- SVC3 parts sourcing - task returns to product owners - plan B, C, D required

BODY STRUCTURE (1/2)

HIGHLIGHTS:

SVC3

- PO signed with NEVS → corrosion testing
- Implemented all change wishes from other squads which were highlighted until 11.11.21
- Jira work process goes better and better
- CAD export tool → We can right now the CAD data with the information of the revision and maturity status in the data name

IN PROGRESS:

- Latest crash test simulations (CAE) showed need for minor design changes according to change management process (SVC3)
- Still change request from other squads --> cannot be considered for SVC3 anymore

BODY STRUCTURE (2/2)

LOWLIGHTS:

- SVC3 body structure build
 - Single part sourcing is open → official status is that supplier will source all parts
 - because of market situation → prototype builder have to order raw material
- Discussion about re-numbering the enterprise item number for SVC3 take a lot of time
- Decision of sheet metal material not done (last needed information expected in the beginning of next week) → No reservation of raw material possible right now (purchasing)

INTERIOR (1/2)

HIGHLIGHTS:

- Supplier sourcing (sun visor, soft trims)
 - To send PO to supplier for the sun visors (waiting feedback on cost targets) / done
 - Supplier search for soft trims has been kicked-off due to response delays from the production-intend supplier / done
 - Supplier has been identified as alternative cost-efficient supplier from Turkey /done
- Cross functional data status for the completion of interior development
- Tooling POs to be sent to suppliers

INTERIOR (2/2)

IN PROGRESS:

- Overhead console thus headliner design heavily affected by eCall and wiring (on hold)
- Frunk detailed design on-hold due to underneath package clarifications (OBC/MCU)

LOWLIGHTS:

- Deadline to raise issues in PMCS to be specified or PMCS issues should be raised with design-freeze data to manage workload/priorities
- Cross functional issues highlighted in the night letter

INFOTAINMENT (1/4)

HIGHLIGHTS:

- Item Definition - infotainment - DONE
- Item Definition - connectivity - DONE
- Instrument Cluster - item definition - DONE
- Bench testing H/W and S/W requirement is completed and shared with the development team: on bench test H/W and S/W requirement - DONE .
- DT for eCall is shared with all the connector details: DT for eCALL - DONE, harness team has to update the schematic accordingly.
- Provided 2nd version of security document between VCM and BCM.: Provide supplier basic functionality of CAN security between VCM and BCM. - DONE

INFOTAINMENT (2/4)

- Next step: plan timeline for provisioning at the assembly: Early provisioning for factory update - DONE
- Next step: update requirements with new proposed method: Follow up on RTC high level requirement - DONE

IN PROGRESS:

- Received new CID CAD data for head impact area: follow-up on CID to meet ECE R21 head impact - DONE
- SW benchmark for complete e-cockpit will be done in this week, Sync with Sono Digital team to sync with the SW release plan: software release plan for infotainment system - PARKED

INFOTAINMENT (3/4)

- Based on the functionalities CAN messages are prepared will be in progress till design Freeze: CAN.dbc for IHU - IN PROGRESS
- CAN details are updated and shared for development team, will be in progress till design freeze: CAN details for all the tell tales list - IN PROGRESS
- eCALL - item definition - DONE
- Straight connector is available but the final decision will require testing. Next step: alignment between harness team and supplier: confirm VCM 12-pin main connector - IN REVIEW
- Supplier for SoS (ECall) Button is in progress waiting for the quotation expected early next week: supplier for eCall button - DONE

INFOTAINMENT (4/4)

LOWLIGHTS:

- Complete the release of all infotainment components - PARKED
- Screw type not finalized: Confirm screw length and torque for VCM - PARKED
- Wire-frame for the instrument cluster application is required for further development.

THERMAL (1/2)

HIGHLIGHTS:

Series:

- ESP planning 2022 done → Quote tbd

SVC3

- A lot of POs for SVC3 have been sent out
- Technical follow ups with coolant pipes, refrigerant pipes and air ducts suppliers done
- Power steering clash with air ducts solved → air ducts is smaller to clear power steering motor, but motor will get moved back anyway due to clash with HVAC unit
- Kick off with supplier (TXV)
- Supplier meeting (pumps and suppressor plan B) done
- Supplier meeting (coolant valves) today
- CAD review coolant pipes with ESP

THERMAL (2/2)

- Clash VCM to HVAC air pipe solved
- Blocked air evacuation path to pressure relief drafter by interior panel solved
- Parts already released : chiller, pumps, surge tank, pressure relief valves
- Manufacturing engineering update

IN PROGRESS:

- Supplier meeting cancelled due to office regulations (COVID)

LOWLIGHTS: None

- no reply from supplier (TXV)
- 3D Data DAT sensor missing

CHASSIS

HIGHLIGHTS: None.

IN PROGRESS:

- OK: ESP, ESC, tires, wheels, hubs, calipers, valves, balancing weights, accelerator, EVP, disks, knuckle, fasteners, brake pedals, RTB & sub-frame, tire repair kit, wheel speed sensors.
- Missing: brake booster, steering, ARB, drop-links, spindle, brake hoses, dampers

LOWLIGHTS:

- ESP speed on RTB and sub-frame design.

HIGHLIGHTS:

- **E/E Integration**

- SCCM Supplier proposal received and matches our requirements
- GEM Supplier committed to SVC3 and Series
- Start/Stop Button Supplier committed to deliver for SVC4 and series (piece price meets target)
- DFMEA for body electronics started
- HARA for some of the functions completed (LV Energy management & wash and wipe)
- Item definition for FuSa team almost completed (85%)

- **CAD Integration:**

- SVC3 release process started

E/E (2/4)

- **ADAS:**

- Supplier: Many topics are solved in one sprint (radar/front camera/rear view camera packaging is clear to avoid delays in the future)
- For all three components DTs is from supplier side ready
- Really good understanding about the RVC (alignment between ADAS & infotainment & supplier) a decision next week from Infotainment
- Jira helps a lot in supplier consulting period

- **Wiring Harness:**

- Connection boxes 3Dx are ready (PV panels) --> a lot of meeting with solar team
- Grommet supplier onboard

E/E (3/4)

- **Overall:**

- Nearly all item definitions are ready and we are in the next stage: HARA
- PMCS deliverables S0/S1 - Great progress but still not all done, due to capacity bottlenecks.

IN PROGRESS:

- **Body Electronics:**

- Start/Stop Button for SVC3 might be an after sale switch. No CAD, No DTs.
- Supplier (vehicle access and start) PO not signed yet. Working on a plan B where access only via smartphone.
- LabCAR progress slower than expected because of missing components.

E/E (4/4)

- **ADAS:**

- Indication that supplier will might not provide all ADAS functions until SOP → plan B would be to update them over the air (3-6 month after SOP) → would not affect SOP and homologation
- Waiting for NDA from supplier (steering alignment)

LOWLIGHTS:

- Miscommunication with supplier (working on the same)
- Suppliers refuse to collaborate to provide necessary step files for components (retainers) → Plan B: New supplier
- Misalignment between brake system requirements from ADAS and the current brake system (chassis and functional safety team)

POWERTRAIN (1/2)

HIGHLIGHTS:

- Driveshaft supplier nominated with piece cost lower than target (~ 125 Euros lower) and incl. bearing bracket + bearing -> 31 million euros saving over vehicle lifetime.
- Progression of system test procedure authoring with NEVS.
- NEVS manufacturing support
- Contract offer for DVP engineer.
- Purchase orders for vehicle misuse simulation and PT mounts CAE raised.

IN PROGRESS: None

- Engineering support from external EDU team improved but room for improvement (still chasing latest CAD).
- Eng. support from supplier VCU H/W team and SVC3 quote still outstanding (meeting on 26.11.21)

POWERTRAIN (2/2)

LOWLIGHTS:

- No headcount for powertrain DVP engineer, powertrain attribute engineer and powertrain control engineer → recruitment ongoing
- More resources and support required on controls side (system controls architecture).

BI-DIRECTIONAL (1/2)

HIGHLIGHTS:

- Good progress on hiring
- Bidirectional charging system - item definition done

IN PROGRESS:

- OBC casing - lifting points & MCU mounting still ongoing
- Risk with supplier achieving 11 kW AC for SVC3 ---> V2G/H functionality on time for SOP → plan B as risk mitigation
- Risk mitigation would be the OBC-features: to be decided which features are coming for SVC3 (eg. 11kW AC V2H etc) and which feature come for SOP or later

BI-DIRECTIONAL (2/2)

LOWLIGHTS:

- Still no PO with supplier for PLC module
- Hiring for PLC development engineer bidirectional charging system ongoing

HV BATTERY (1/3)

HIGHLIGHTS:

- Update HV battery dimensions, mounting concept and BIW cutout, communicate changes to supplier
- Confluence page on positioning of MSD, HV battery pack in BIW and its virtual validation
- Simulation plan for
 - According ECE R100 r2, UN 38.3, LV124, vehicle crash pulse
 - Internal planned simulations
 - BIW and complete vehicle related
- Define requirements and cost (machine, license, maintenance costs etc.) of performing the simulations.
- Screws BIW-HVB dimension preliminary calculation on static loads

HV BATTERY (2/3)

- Implement error calculation for reference and obtained speeds from simulation. Tune PID to meet error specs of ISO 8714.
- Testing the electric motor and battery model , its integration and do some improvements to the model.
- Communicate BMS / battery pack warnings icon for infotainment team (refer to UN ECE R121)
- Confluence page for simulations why, what, how and work until now
- Release version 1.0 of HV SSTS
- Finalize HV cable size, connector and LV interfaces for battery pack.
- Align battery BoM cost, budget for planned DVP and other development activities
- Finalize the length at 1680 mm

HV BATTERY (3/3)

IN PROGRESS:

- Finalize BMS diagnostic list
- Get quote of complete DVP or part of tests in battery pack DVP
- Release PO for cell storage and testing jig on hold

LOWLIGHTS:

- Internal / external support for defining BMS hardware / software functionalities.

PURCHASING

HIGHLIGHTS:

- Young company disclaimer has been removed
- Moving forward with supplier nominations

IN PROGRESS:

- reviewing all costs in the BOM which costs quite a lot of time

LOWLIGHTS: None

QUALITY (1/3)

HIGHLIGHTS:

SVC3/SOP

- **SQA:**

- SQA PPAP requirements with full technology suppliers ongoing for SVC3 - no concerns reported by our suppliers on this point.
- PFD and PFMEA reviews planned for supplier battery pack wk47
- supplier (of Kombi, eCall, speakers etc) DFMEA reviewed. The supplier DFMEA require considerable work to avoid failures.
- Follow up DFMEA review with supplier planned this week for the EPB and floating brake caliper
- It seems unlikely that 3DX will be able to incorporate the GD&T features so 2D drawings will be necessary. This is critical as suppliers will not be able to supply PPAP with dimensional reports without a basic 2D drawing.

QUALITY (2/3)

- Solar Cell supplier audit is now set for Dec as the PFMEA had issues that need to be resolved by supplier before the process audit
- Foundation FMEA training is now run virtually to allow greater participation and will be ongoing until Holiday break

Sustainability

- **LCA2:**
 - Conduct LCI workshop with FfE - done
 - First calculation of comparison LCA (ICE vs. Sion) - done

QUALITY (3/3)

IN PROGRESS:

SVC3/SOP

- Lack of design features on the drawing will be an impediment for SVC3

LOWLIGHTS: None

PRODUCTION (1/2)

HIGHLIGHTS:

- Hiring
 - First actions for restarting hiring are done. Invitation will follow.
- Contracting
 - Negotiation about cover letter has started
 - Agreement for R&D support is signed and assure support for SM R&D by NEVS R&D and ME
 - Adjustments for the SVC3 offer by NEVS are initiated
- Organization and Process
 - Orientation phase of NEVS is finished
 - List for support functions by NEVS for R&D SM is available

PRODUCTION (2/2)

- First action to activate additional resources is done
- Starting using Jira for sprints
- Simultaneous engineering: limited support for aluminium welding will be compensated by other supplier

IN PROGRESS:

- Hiring: Ongoing
- Organization and Process
 - Work around for SVC3 parts ordering should be evaluated due to limited resources

LOWLIGHTS: None

SIMULATION (1/2)

HIGHLIGHTS:

- Defining expectations of PM ==> Mainly complete vehicle simulations
- Plannings until 05/2022 created
 - Alignment PO and attribute lead: scope and project timeline
 - Alignment ESP/Supplier: execution
- Closures & exterior durability
 - Adding information/input on Abaqus MoCa (90% of work done)
 - Durability LC standards (50% of work completed)

SIMULATION (2/2)

IN PROGRESS:

- NVH Modelling guideline, because of high volume of activities could not fill up the guideline content ==> next sprint / no blocker currently
- Gathering information of the following modules
 - Thermal (done thermal team updated with latest results)
 - Chassis (sent follow up mail on status, waiting for the response)
 - Complete vehicle durability (sent follow up mail on status, waiting for the response)
 - Body structure (sent follow up mail on status, waiting for the response) ==> counter-measure:
 - Creating LCO consolidation with reporting purpose
 - Setting up LCO review meeting

LOWLIGHTS: Last alignments not feasible due to sickness of certain stakeholders

PERFORMANCE REQUIREMENTS (1/2)

HIGHLIGHTS:

- Jira NVH channel setup
- Jira tickets creation 100% completion
- NVH testing on SVC2 reports > 70%
 - Partial feedback given to
 - thermal squad
 - powertrain squad (clonk)
- Engine mounts development NVH support
 - Stiffness recommendations delivered
 - Validation profiles ongoing
- NVH software delivered
- Cross-functional meetings with interior & exterior

PERFORMANCE REQUIREMENTS (2/2)

IN PROGRESS:

- Preparation work to setup a weight reduction loop for SVC4
- Jira link to requirement
- OBC/MCU vibration / design support : design concept on going, CAE status and planning to SVC3 freeze still pending
- Follow CAD issues on various modules
- CAE results analysis
- AVAS system integration launched - sound package on-going

LOWLIGHTS:

- Weight: input source: BOM attributes part_source and estimated weight

DESIGN (1/2)

HIGHLIGHTS: SVC3

- **Exterior / Closures** : 95% done
 - exterior door handle updated and aligned to new engineering conditions
 - new mirror position checked
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- **Interior**: 96% done
 - greenhouse: 100% done (lower / upper trim + headliner → update for front overhead lightning unit to be expected)
 - ip: 100%
 - Center console: 99% ncap gap to cc has to be updated
 - doors 95% : interior door handle delivered to closures. First draft for driver / passenger / rear seat window switch bezel delivery

DESIGN (2/2)

- **Visualization**
 - interior / exterior rendering for SEC filing updated
- **Design Circle**
 - 5 design keywords defined
 - Honest
 - Sustainable
 - Caring
 - Intuitive
 - Bold

IN PROGRESS: None

LOWLIGHTS: None

CRASH & SAFETY (1/3)

HIGHLIGHTS:

- preSVC3 PedPro status overview is outstanding /done
- SVC3Prog PedPro is planned in 3 weeks / WIP
- SVC3Prog structural crash status to be reviewed on 21st Sep with body structures, chassis, CTO /done
- preSVC3 occupant safety vehicle model is ready with generic restraints / Done
- SVC3Prog occupant safety vehicle model is ready with updated interior and available restraints from supplier / WIP

CRASH & SAFETY (2/3)

IN PROGRESS:

- Closures to deliver CAE models required for crash & safety assessments based on design release CAD data by 17th Dec 2021
- Exterior to deliver CAE models required for crash & safety assessments based on design release CAD data by 17th Dec 2021
- Each squad will deliver CAE models derived from SVC3 design release CAD by 17th Dec 2021
- Infotainment to deliver CAE models required for crash & safety assessments based on design release CAD data by 17th Dec 2021
- HV Battery to deliver CAE models required for crash & safety assessments based on design release CAD data by 17th Dec 2021

CRASH & SAFETY (3/3)

- E/E (including EDU, MCU, OBC, HV cable etc. excluding HV Battery) to deliver CAE models required for crash & safety assessments based on design release CAD data by 17th Dec 2021
- Chassis to deliver CAE models required for crash & safety assessments based on design release CAD data by 17th Dec 2021
- Recruitment is ongoing /WIP / focus should be on crash & safety screening and interviews

LOWLIGHTS: None