DEVELOPMENT SPRINT REVIEW
CALENDAR WEEK 22.22

GENERAL (1/2)

HIGHLIGHTS:

- Technical description sheets for type approvals are ready (homologation)
- Rework the rear bumper at assembly partner and identify/confirm all parts in the inventory list
- In-Vehicle Infotainment (IVI) B-sample display is working and tested internally
- E/E despite many obstacles, a good preparation of the Yellow Board was successful
- Thermal software released for SVC3
- Overall good performance in providing harnesses for SVC3
- Design change of extension end plates for new radiator mounting brackets
- The DC charging function will be implemented in the parts which will be delivered in June.
- Cell testing with a German institute progressing (dimensions, capacity, charge times).
- Cell tab over temperature caused by HV cables used for testing and not cell tab welds.

GENERAL (2/2)

IN PROGRESS:

- Graining of exterior parts to be defined
- HVAC-water management Issue -> manufacturing change
- Torque rod issue under 3 kN load due to offset (side collapse of rod main bushing) → requires re-designing for SVC3 → supplier on track to do this

LOWLIGHTS:

- Infotainment head unit (IHU) software development slows ADAS down
- Powertrain squad supporting HV battery is taking up a significant amount of time and impacting other tasks.
- Bidirectional charging long lead times for components
- Challenge to achieve AC V2H/G on time
- Unsourced items holding up instrument panel (IP), shroud, steering wheel and driver airbag for SVC3

BODY CLOSURE

HIGHLIGHTS:

- CNC supplier parts shipped -> done
- CA for SVC3 -> done

IN PROGRESS:

- Tailgate series specification type system (SSTS)/common type system (CTS) review

LOWLIGHTS:

- Tolerance chain calculations -> postponed
- Series specification type system (SSTS)/common type system (CTS) hood -> postponed

EXTERIOR (1/3)

HIGHLIGHTS:

- Support the SVC3 general assembly at assembly partner
- Cantrail - Sion logo depth update
- Replace CD-pillar cover clips
- Adapt fender interface to bumper
- Update logo on headlamp bezel
- Review and finalize optical performance for lights
- A-pillar - design change driven by the cantrail
- B-pillar - CAD corrections
- B-pillar - GD&T corrections
- Provide all parts for batch 1 general assembly

EXTERIOR (2/3)

IN PROGRESS:

- Graining of exterior parts to be defined
- Rocker - fixing points to be moved due to crash issue
- Investigate new shield to reduce the amount of water in the rear undertray
- SVC3 - vehicle audit at general assembly partner: tbd. Functions to be checked by product owner
- Outlook market vehicles functionality
- Create overview component technical specifications (CTS), material testing system (MTS), sub-system technical specification (SSTS) [for initial assessment]
- Direct/indirect purchasing attribute sanity check

EXTERIOR (3/3)

LOWLIGHTS:

- Provide documents/information about the parts to be delivered by supplier
- Perform release management for rear bumper fascia
- Various geometric dimensioning and tolerancing (GD&T) corrections
- Packaging proposals for underbody protection (UBP) wheel
- Front underbody protection (UBP) aero modification
- Finalize windscreen cover assembly design
- SVC3 crash and safety part breakdown
- Rear screen device transmittal (DT)
- Sourcing - windshield cover drain hoses

BODY STRUCTURE

HIGHLIGHTS: None

IN PROGRESS:

- Ongoing investigation of potential design optimizations of body structure for industrialization, cost down program and tolerance concept → potentially impact costs and timing

LOWLIGHTS: None

HIGHLIGHTS: None

IN PROGRESS: SVC3

- Cross functional data status for the completion of interior development
- Overhead console thus headliner design heavily affected by eCall and wiring
- Steering Column updates lead to cross car beam (CCB) & instrument panel (IP) changes post design review (DR)
- Unsourced items holding up instrument panel (IP), shroud, steering wheel and driver airbag
- Unsourced E/E multimedia-ADAS switches holding up steering wheel

LOWLIGHTS:

- Instrument panel (IP) cables to (central information display) CID
- Instrument panel (IP), console, door trim design validation plan (DVP) completion

INFOTAINMENT (1/3)

HIGHLIGHTS:

- Development path for infotainment system has been chosen: 2022-06-23 infotainment development path selection → new tier 1 supplier
  - Infotainment head unit
  - SW development for SVC3 release is nearly completed
- Power management & touch feature will be included in subsequent releases after display is fully up and running.
- In-vehicle infotainment (IVI) b-sample display is working and tested internally.
- Vehicle connectivity module(VCM): successfully able to write VIN to VCM, provision and connect to the backend
- eCall: eCall module is fully embedded with all components and complete functionality testing in progress.

INFOTAINMENT (2/3)

IN PROGRESS:

- Tell-tales List for SVC4: Had a workshop with battery management system (BMS) module owner to gather the list of BMS tell-tales list to be populated on the instrument cluster display.
- Rest bus simulation (RBS): tool development for SION is in progress and under testing based on the SION CAN .dbc file.
- Instrument cluster (IC) and in-vehicle infotainment (IVI) display: 9-set of B-sample of displays are delivered to general assembly and 2-set B-sample to Sono Motors HQ.
- eCall: 4 pieces of eCall fully functional will be shipped to general assembly next week.
- SVC4: Instrument cluster (IC) and in-vehicle infotainment (IVI) display further development is in progress with regards to mounting strategy based on Interior team/ engineering partner feedback.

INFOTAINMENT (3/3)

LOWLIGHTS:

- Infotainment head unit
  - Software partner continues to be delayed
  - Engineers requesting design review for beta boards due to quality concerns
- Vehicle connectivity module (VCM): remote commands not functioning properly due to not sending messages continuously → Planned to be fixed in next release
- SVC3: Need to have a temporary solution to meet SVC3 requirements in parallel with production intent infotainment system → additional costs and resources
- USBs: Due to high lead times with supplier, purchasing currently looking into other suppliers
- Antennas: Printed circuit board (PCB) issue with antennas requires new samples

THERMAL (1/2)

HIGHLIGHTS:

- HV qualification
- Software released for SVC3
- Software @ complete vehicle level - standardization - feedback on documents - supplier SW artifacts
- Provide all parts for batch 1 general assembly (GA)
- SVC4/5 purpose of built vehicles
- SVC3 provision of assembly instructions
- Torque value definition

THERMAL (2/2)

IN PROGRESS:

- HVAC-water management issue -> manufacturing change
- Thermal requirements for SVC4
- Timeplan thermal regarding supplier lead times for SVC4 and series
- Alignment with Body in White (BiW), interior, body closure, chassis

LOWLIGHTS:

- Update logistic costs
- SVC3 - vehicle audit at general assembly partner: functions to be checked by product owner?
- measurement equipment

HIGHLIGHTS:

- Steering history
- Vertical damping (VD) inputs for rear axle K&C results latest
- Finalized spindle zesting
- Rear spindle development started
- Initiated SVC4-series knuckle design
- Updated knuckle supplier timeline for the project
- Shipped parts to test supplier
- Finalized knuckle testing details
- Change torque rod mounting to M14x1.5 grade 10
- Design change of extension end plates for new radiator mounting brackets
- Investigate NVH feasibility of reducing the size of rear lower control arm (LCA) stiffener

CHASSIS (2/2)

IN PROGRESS:

- Vertical damping (VD) inputs from chassis engineering and simulation partner
- Sion chassis history

LOWLIGHTS: None

E/E (1/3)

HIGHLIGHTS:

- E/E Integration
  - Body electronics:
    - Despite many obstacles, a good preparation of the Yellow Board was successful
- ADAS:
  - Good progress on ADAS requirements reviews
- Wiring Harness:
  - Overall good performance in providing harnesses for SVC3
- CAD Integration:
  - Virtual built of released parts are going well
  - Assembly instructions are in progress
  - V5 connector issue is solved!!
- Overall: Successful roadmap trainings for whole group Sion

E/E (2/3)

IN PROGRESS:

- E/E Integration:
  - Adas
    - Infotainment head unit (IHU) software development slows ADAS down
    - UX/UI requirements for rear view camera (RVC) slows ADAS down
    - Getting requirements from infotainment head unit (IHU)
- CAD Integration:
  - Harness connector instance IDs have been reset. → Working with a complete vehicle team to have the node names re-added.
  - Errors with bringing SVC3 harnesses across to SVC4 BOM (because SVC3 BOM is not fixed for harnesses) → probably solved next week

E/E (3/3)

- All low frequency (LF) antennas need location update for SVC4 after discussions with supplier → probably solved next week
- Upgraded a V6 profile in 3Dx for electrical distribution system (EDS)

LOWLIGHTS: None

POWERTRAIN (1/3)

HIGHLIGHTS:

- Successful electric drive unit (EDU) technology roadmap shared with supplier → sharing of requirements for next gen. EDUs.
- SVC3 general assembly partner testing quotation has come down following reviews → sourcing decision tbd
- Two new colleagues onboarding were successful.
- Build 1D vehicle performance & efficiency model to generate powertrain status for SVC3 and series.
- New resource taking over HV functional architecture forum and driving powertrain network architecture topics.
- Moving EDU forward by 8 mm to resolve dynamic clash with steering column looks feasible (WIP).
- Timing plan (strength targets, CAE, design freeze, validation) agreed with Boge for powertrain

POWERTRAIN (2/3)

IN PROGRESS:

- Torque rod issue under 3 kN load due to offset (side collapse of rod main bushing) → requires re-designing for SVC3 → supplier on track to do this.
- Quality topics (Production part approval process (PPAP) light for SVC3) need to be driven with suppliers → e.g. due to lack of focus SVC3 dimensional report not provided for powertrain mounts prior to shipping.
- Lifetime study for towing feasibility kicked off by supplier
- Tasks demand more time than planned (supplier work).
- Solution for missing chassis CAN on vehicle control unit (VCU) still WIP (3 options being explored).

POWERTRAIN (3/3)

LOWLIGHTS:

- Contract manufacturer engineers for powertrain required ASAP to progress assembly design.
- Cross-functional teams adding too many tasks to sprint without alignment.
- Powertrain squad supporting HV Battery is taking up a significant amount of time and impacting other tasks.

BIDIRECTIONAL

HIGHLIGHTS:

- New team member started 1. June as test/validation engineer.
- The DC charging function will be implemented in the parts which will be delivered in June.

LOWLIGHTS:

- Long lead times for components
- Challenge to achieve AC V2H/G on time
- DCU:
  - Pinning issue → Temperature measurement combined charging system (CCS) connector
  - Pinning issue → Missing power line charger (PLC) connection
  - DC charging HW and SW improvement needed

HV BATTERY (1/2)

IHIGHLIGHTS:

- New powertrain project and battery management system (BMS) engineers started → onboarding and handovers in progress.
- Battery supplier working on plan to provide 2 x bill of materials (BoM) for B sample beta packs (old level cells) to support marketing vehicles → SM team pushing hard on this.
- Cell testing with a German institute progressing (dimensions, capacity, charge times).
- HV Battery pack design validation plan (DVP) close to being finalized
- HV Battery workshop being kicked off to review key design issues and uptrain team.
- Cell tab over temperature caused by HV cables used for testing and not cell tab welds.

HV BATTERY (2/2)

IN PROGRESS:

- Latest timing from battery supplier does not meet build timing for some SVC3s (impacted by ongoing lockdowns)
- On track with battery suppliers to improve timing.
- Significant cell temperature delta issue during charging and heating for current battery generation → could potentially impact lifetime and performance.
- Pack serviceability → improvements needed

LOWLIGHTS:

- Staffing too slow
- Diagnostic topics-critical for SVC3, diagnostic trouble codes (DTC) definition to supplier shall be provided by Sono

NVH (1/2)

HIGHLIGHTS:

- e-Coating and general assembly support from NVH side for SVC3-09 and SVC3-10 done
- Interior insulation and carpets: mounting support and instrument panel (IP) insulation prototyping
- Feedback on interior package to squad for CAD adjustments (minor)
- Testing equipment procurement: 70% complete
- Validation plan finalisations (all suppliers nominated)

NVH (2/2)

IN PROGRESS:

- Ongoing actions to support SVC3 manufacturing
- Sound design project set-up
- Testing procedures (detailed) for NVH chassis
- NVH status format definition

LOWLIGHTS:

- Slight delay in NVH software installations and delivery - should resolve in next sprint

WEIGHT MANAGEMENT

HIGHLIGHTS:

- Masses package list updated with new template

IN PROGRESS:

- SVC4 weight status report update will be released later based on SVC4 status.

LOWLIGHTS: None

RECYCLING

HIGHLIGHTS:

- Draft plastic and rubber parts marking standard
- HV qualification
- Approval international material data system (IMDS) guideline
- Discuss specs for recyclates with material supplier
- Next steps PV Module recycling partner agreed
- Deep dive body panel production with potential recycling partner
- International material data system (IMDS) guideline Sono
- Sprint process adjustments

LOWLIGHTS: None

HOMOLOGATION

HIGHLIGHTS:

- Technical description sheets for type approvals are ready (homologation)

IN PROGRESS:

- Waiting for granted initial assessment

LOWLIGHTS: None

FUNCTIONAL SAFETY (1/2)

HIGHLIGHTS:

SVC3

- Develop test methods and test targets file based on ISO
- Overview of requirements group Sion
- SVC3 - design validation plan (DVP) responsibilities
- Schedule the meeting with supplier to check ISO conformity
- Aligning timeline with testing squad
- Preparation of a document with safety goals, automotive safety integrity level (ASIL) rating , safe states and external measures for supplier
- Align homologation expectation until SOP
- Product gap analysis between track 2023 and track 2024

FUNCTIONAL SAFETY (2/2)

IN PROGRESS:

- Solar body panels (SBP) - (cross functional) requirements
- Assessment of Body in White (BiW) to state safety of their product without ISO 26262
- Measurement equipment
- SCV4/5 purpose of built vehicles
- Budget review - CV "testing & validation"

LOWLIGHTS:

- Talk to ESPs for FuSa testing
- Contact and nominate the pre-assessor / assessor

CRASH & SAFETY (1/3)

HIGHLIGHTS:

- Crash/Safety - results to supplier
- CAE models for suppliers
- Status update with body structures release 0.1
- Keyhole opening for headliner clip in roof header
- Tack weld (Heftnaht) on z-bar
- Update door-in-white
- Headliner clip resistance - evaluation of current development state
- Charger Lid - requirement "functional after is crash"
- Crash/safety CAE - SVC3 status review - low speed
- Updated front end crossmember

CRASH & SAFETY (2/3)

- Crash/safety CAE - SVC3 status review - PedPro
- SVC3 lashing eye reduced thickness
- DEBUG Passenger Seat Model
- Alternative Seat Attachment Concept
- HV safety - crash - AVAS, 12V battery, OBC
- SM-6-220 - stress/strain-curve from BiW partner
- Crash vehicle usage - crash sensing - SVC3-11 + 12

IN PROGRESS:

- OOP tests airbags requirements
- Homologation issue - Seats

CRASH & SAFETY (3/3)

- Crash/safety CAE - SVC3 status review - sensoring
- Material & joining validation
- Pre-simulation of component tests
- SVC3 point joining technology validation
- SVC3 CMT welding validation
- SVC3 body structure component testing
- Joining technology replacement and reduction
- Delay interior parts for testing

LOWLIGHTS: None