Minimum Viable Product for Aftersales and Product Information

Simplifying Product Information for Electric Vehicles

To help create some structure around the concern of product information and to hopefully make the whole undertaking a little less daunting, I've developed a Minimum Viable Product for Aftersales Checklist. It breaks all product information into two categories: Service Information and Owner Information, then further defines all the aspects of each.

Of course, every company is different, and every product is unique. **This list serves as a starting point for discussion and consultation**.

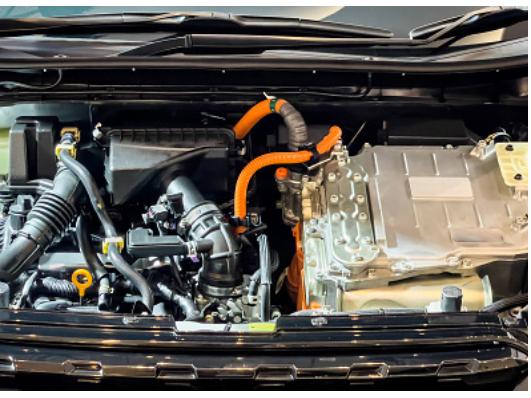
By examining this list, companies might consider:

- Which internal areas generate which pockets of raw data and information
- What end users need to access the information deliverables
- How best to aggregate and prepare that information for optimal maintenance
- How best distributed to the appropriate users in the smartest possible way

The goal for any vehicle start-up should be establishing an information strategy with legs and efficiency, one that responds easily to engineering and design changes to create a high-integrity, trouble-free information flow for both the manufacturer and the end-user.

And so, without further ado, on to the checklist(s).

Minimum Viable Product (MVP) Checklist for Service Information



- [ ] Removal and Installation Procedures
- [ ] Diagnostic Procedures (traditional or guided)
- [ ] Flat Rate Studies
- [ ] Accessory Installation Sheets
- [ ] Wiring Diagrams
- [ ] Body Repair Information
- [ ] Electronic Parts Catalogue

Removal and Installation Procedures

Process instructions for the installation and removal of vehicle components. Prescribes approximate timing for each operation.

Inputs: Engineering drawings and CAD data (drawn from Engineering)

Relevance: Quite simply, offering removal and installation procedures encourages technicians to work on your product by resolving uncertainty or unfamiliarity with your product. Without this content, the end-user (consumer, fleet owner, etc.) can't get anyone to service your products. The skeletal structure of an entire service operation rests on this material.

Accessory Installation Sheets

Similar to Removal and Installation Procedures, but specifically designed for non-essential aftermarket accessories.

Relevance: From performance parts to cosmetic modifications, after-market accessories constitute a lucrative method for increasing part sales. Accessories create an added layer of customer engagement and satisfaction. When accessories—and their installations—are OEM-official, they enjoy the additional distinction of branded quality.

Body Repair Information

Necessary for the removal, installation and replacement of vehicle body components.

Relevance: Body repair is critical to the longevity of a vehicle. Certain types of body damage can impact mechanical operation and create major safety concerns. Body repair information enables OEM service outlets to perform body repairs—opening that income stream for the manufacturer—and can also be sold to third party service outlets.

Diagnostic Procedures (Traditional or Guided)

Process instructions for the installation and removal of vehicle components. Prescribes approximate timing for each operation.

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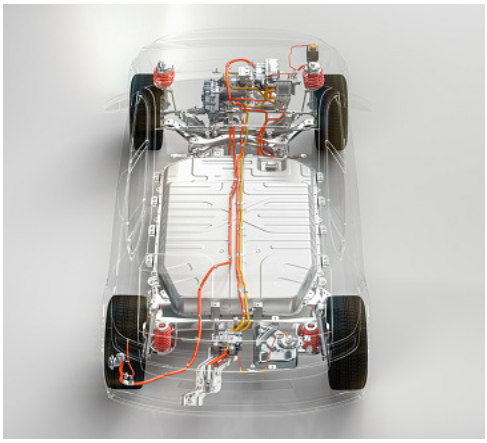
Wiring Diagrams

Layouts and schematics for all wiring, component modules and connectors employed on a vehicle.

Inputs: CAD, Prototype vehicle, Pre-production vehicle, circuit diagrams, circuit list, signal/name/function list, PIA information, harness prints, connector views, pre-harness connectors, module topology and DTC list.

Relevance: Wiring diagrams aid factory assembly, but they're essential to any technician who needs to work on—or even work around—the installed electrical.



Flat Rate Studies

Time studies establish industry standards for reasonable time-to-complete specific service operations on a particular product. These standard times make it possible to charge fixed fees for each technical service operation.

Inputs: Prototype/validation vehicle for teardown, plus all information from Diagnostic Procedures, plus SBOM

Relevance: Flat rate offers a competitive advantage in that customers see fixed fee scales as being more fair than hourly. Flat rates allow service outlets to set clear expectations around their team's efficiency. A proficient technician—one who can complete accurate repairs in a shorter amount of time—can earn more money in a flat-rate environment.

Electronic Parts Catalog

Parts ordering traditionally involved static (printed or PDF) parts catalogs and lots of phone calls. Electronic parts catalogs (or EPCs) simplify that process—and eliminate the phone calling. The most advanced options offer multiple search options, and let technicians locate parts visually through exploded 2-D and 3-D assembly views. These cutting edge EPCs are linked to the original assembly Bill of Materials so that as parts, part names or suppliers change, the catalog itself automatically updates accordingly.

Relevance: EPCs remove friction from the parts ordering process. This helps the OEM sell more parts. Advanced EPCs also save money for dealerships and service outlets by reducing human error and eliminating incorrectly ordered parts.

Minimum Viable Product (MVP) Checklist for Owner Information

- [ ] Operator's Manual
- [ ] Essential Information Guide (printed)
- [ ] Quick reference Guide (printed)
- [ ] 1st Responder's Guide
- [ ] Service and Warranty Manual

Operator's Manual

A complete and detailed description of every aspect of vehicle operation. All critical warranty/regulatory/compliance/disclaimer information. Single source of truth for product.

Inputs: CAD, product feature list, prototype/pre-prod vehicle, engineering and legal approval.)

Relevance: Operator information is critical to product operation and operator experience. It plays a role in everything from safety to product feature awareness. Operator content is required by law as the definitive repository of all vehicle information. Complicating matters, different countries and regions hold their own unique requirements regarding where and how this information is to be made available and in what format.

Service and Warranty Manual

Tells the owner know which warranties cover a product, along with the limits, parameters and duration of those coverages. It also identifies product service requirements.

Area Responsible: CAD, product feature list, prototype/pre-prod vehicle, engineering and legal approval.

Relevance: This documentation is required by federal law.

Essential Information Guide (Printed)

Process instructions for the installation and removal of vehicle components. Prescribes approximate timing for each operation.

Area Responsible: CAD, product feature list, prototype/pre-prod vehicle, engineering and legal approval.

Relevance: The Essential Information Guide (EIG) provides important coverage for manufacturing brands by communicating relevant safety disclaimers and other mandated information, e.g., what to do in an emergency, how to change a road wheel, etc.

Quick Reference Guide

An abbreviated version of the more detailed Operator's Manual. Emphasis on brevity, need-to-know or step-by-step instructions.

Area Responsible: CAD, product feature list, prototype/pre-prod vehicle, engineering and legal approval.

Relevance: End-users often reach for their Quick Reference Guide (QRG) first when they need to solve a problem quickly or on the road. While not typically required by law, the QRG represents an important and much-appreciated courtesy for end-users and provides real business value by creating ease-of-use and end-user satisfaction. And while QRGs are sometimes offered in digital form, printed QRGs offer far greater access and provide greater value.

First Responder's Guide

Critical safety information and invaluable regulatory compliance.

Area Responsible: CAD, product feature list, prototype/pre-prod vehicle, engineering and legal approval.

Relevance: In the immediate aftermath of an emergency, the First Responder's Guide is designed to ensure the safety of the rescue teams arriving at the scene. EV batteries in particular raise a number of post-accident safety concerns both for rescue crews and vehicle occupants. As one example, it may tell fire fighters how to shut down an EV's high voltage system, information that could prevent severe or even fatal injuries. First Responder Guides feature critical information on vehicle handling to protect everyone involved and are an invaluable facet of regulatory compliance.