Template OperationDiagram.pdf

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Abstract

The operation diagram document is used to understand the functionality of your Emergency Brake System (EBS) system. It is used to show the interaction of the different EBS parts, as well as the failure detection mechanisms.

1 Document Requirements

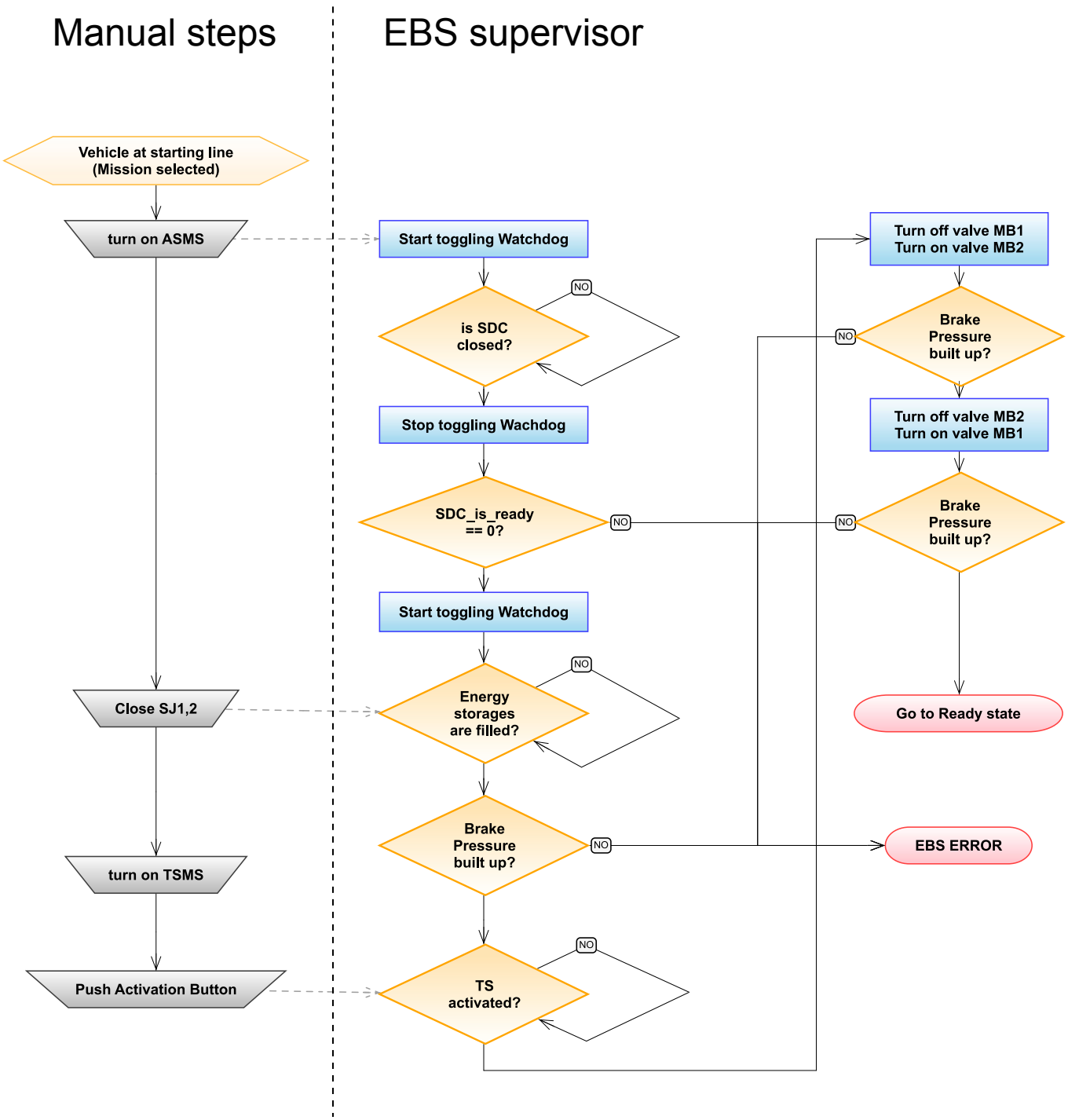
The document must show a high level block diagram showing the interaction of different EBS parts. The diagram is similar to the one shown as example for the wiring diagram but give a more detailed view especially to the connection of the EBS to the vehicles brake system and less details on the electronics. As it is a higher level view it must also contain a blocks for external ECUs involved in the EBS handling (like e.g. a car PC) and their communication interface to the EBS (e.g. CAN).

Further more the document needs to show a flowchart for the EBS startup procedure (focused on the initial checks performed before the system transits to ready) as well as a flowchart of the continuous monitoring performed by the EBS supervisor. If you use Stateflow® you may use these diagrams here as well, if your sates are properly named and the transitions are clear. Otherwise please draw a separate flowchart here.

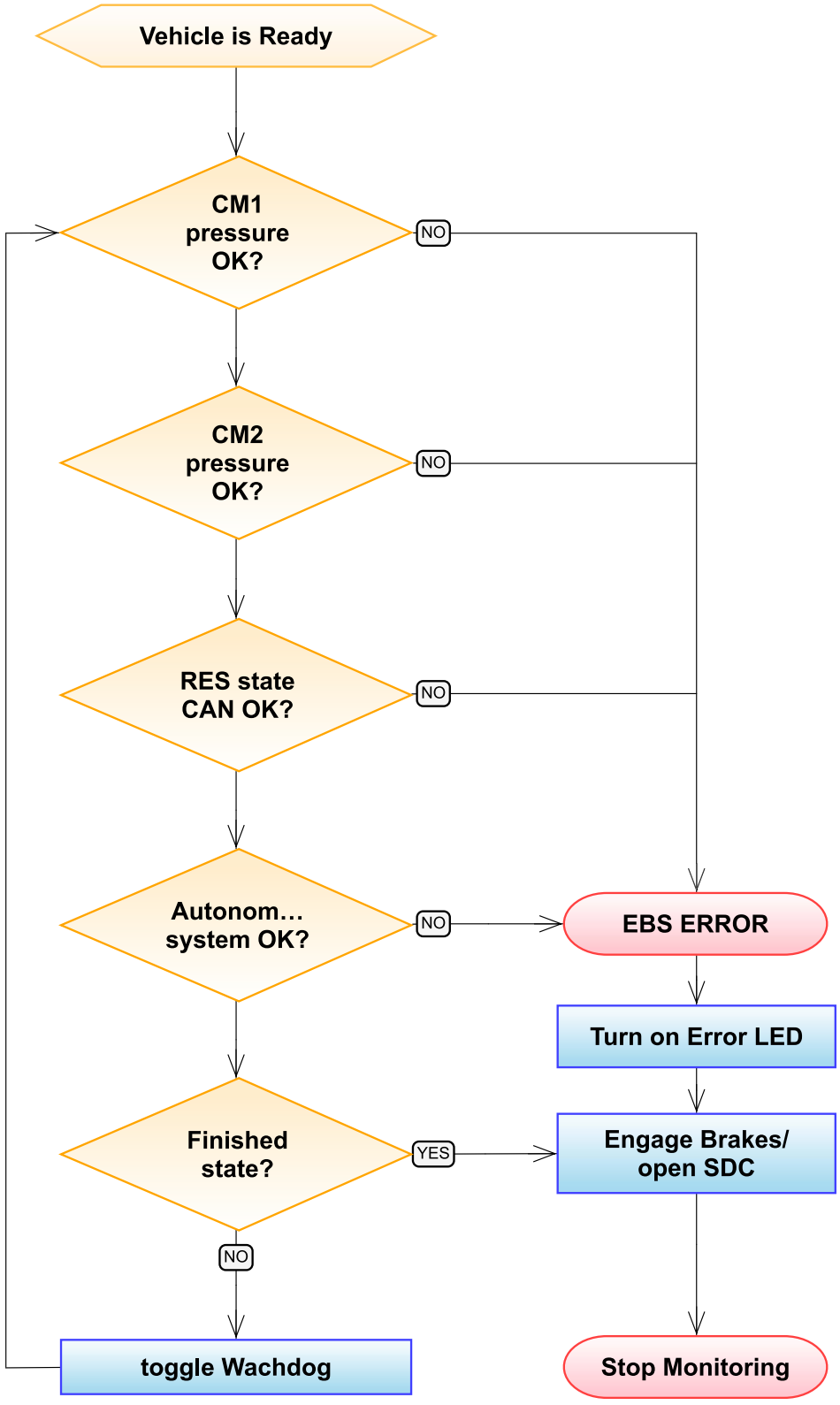
2 Example

This Example shows only the two required flowcharts. The block diagram might follow next year. The example was created with ThinkComposer (http://www.thinkcomposer.com/). Converted with online convert free (https://onlineconvertfree.com/convert-format/xps-to-svg/) and finalized in Inkscape (https://inkscape.org/de/):

Warning:	The following example shows only how the document could look like and what is meant by the different checklist points. The technical content is not necessarily compliant to the rules nor necessarily related to the other documents nor function at all.



Operation Diagram, Continuous monitoring	
Team Name: Formula Student Germany	University: FSG Academy
Car#: 000	driverless formula student germany
Document Version: V1.0	
Date: 28.02.2019	Sheet/Bl.: 1 / 2



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3 Document Checklist

The following checklist will give you an overview of the points which mandatorily have to be fulfilled to get an approval. This checklist will also be used during the review process. But the the review is not only limited to this list. We will check additional points as well.

☐ GENERAL REQUIREMENTS

1 ◯ Document is printable in DIN A4.
2 ◯ Team name, University, Car# is written on every page.
3 ◯ Pictures well sized and in good resolution (vector or 300dpi).
4 ◯ Relevant text is embedded as text and not as picture (search-able).
5 ◯ Document name is written on every page.
6 ◯ All Pages are numbered, including total number of pages e.g. Page 1/5.

☐ SPECIFIC REQUIREMENTS

7 ◯ High level block diagram included.
8 ◯ Non EBS ECUs involved in the functionality shown in the block diagram.
9 ◯ All connections between Electrical-, Mechanical- and Hydraulic-/Pneumatic system are shown.
10 ◯ Flowchart for startup procedure included.
11 ◯ Startup flowchart includes all actions form ASMS on -> AS Ready.
12 ◯ Continuous monitoring flowchart included.
13 ◯ Continuous monitoring flowchart includes all system checks during operation/driving.
14 ◯ Continuous monitoring flowchart shows the corresponding actions in case of failure.

Changelog

V1.0: Initial Version.