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Class A Multiplexing Actuators

RATIONALE

This document has been determined to contain basic and stable technology which is not dynamic in nature.

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FOREWORD

This SAE Information Report is the fourth in a series of Class A Multiplexing information reports. The intent of this document is to introduce the reader to Multiplexed Class A actuators. It is not a "Recommended Practice" report. The document is intended only to inform the reader of some of the issues involved in multiplexing Class A actuators.

These actuators fall into two general categories: analog actuators and digital actuators. This document is not all-inclusive but is meant to be used as a tool for the system engineer designing and developing a Class A Multiplex network application.

There are many SAE documents that define Class B and Class C technology (e.g., SAE J1850, J1979, and J2178). This document re-examines multiplexing to define Class A terminology which has some new issues as compared with the previously defined classes of multiplexing. For example, the resistive encoded steering-wheel switch assembly is a Class A Multiplex application.

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1. SCOPE

The Class A Task Force of the Vehicle Network for Multiplex and Data Communications Committee is publishing this SAE Information Report to provide insight into Class A Multiplexing. Multiplexed actuators are generally defined as devices which accept information from the multiplexed bus. A multiplexed actuator can be an output device controlled by the operator or an intelligent controller. A Multiplex actuator can also be a display device that reports the status of a monitored vehicle function. This document is intended to help the network system engineers and is meant to stimulate the design thought process.

A list of multiplexed actuator examples is provided in Appendix A, Figure A1. Many other examples can be identified.

1.1 Three Classes of Multiplex Networks

The Vehicle Network for Multiplex and Data Communications Committee has previously defined three classes of vehicle data communication multiplexing: Class A, Class B, and Class C. A hierarchical relationship exists between the three classes. Class A multiplexing is a subset of Class B and Class B multiplexing is a subset of Class C. Definitions of all three classes are included in this document for reader convenience.

1.1.1 A Class Multiplexing

Class A Multiplexing contains many of the direct operator controlled functions and the displays monitored by the operator. Some examples of actuator outputs would be the operator control of powered convenience features such as power windows, door locks, and windshield wiper.

1.1.2 B Class Multiplexing

Class B Multiplexing provides the data communications between different modules, internal and external to the vehicle, for the purpose of sharing common data about the vehicle. An example of this is the diagnostic information shared between an internal (on-vehicle) module and an external (hand-held) module for service repair.