SURFACE VEHICLE RECOMMENDED PRACTICE

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Superseding J2191 JAN2010

Recommended Practice for Identification of Standardized Truck and Tractor Electrical Circuits

RATIONALE

The SAE J2191 document is being revised to provide additional circuit ID nomenclature to the Supplemental Circuit Identifications for the following sections: Power, Instrumentation, Monitoring (Warn Sys), Control (Fuel, Engine, Cruise), Serial/Data Communication, Operator Convenience, Entertainment, Navigation, Accessories, Emergency/Vision, and Engine Accessories.

1. SCOPE

This SAE document defines a recommended practice for implementing circuit identification for electrical power and signal distribution systems of the Class 8 trucks and tractors. This document provides a description of a supplemental circuit identifier that shall be utilized in conjunction with the original equipment manufacturer's primary circuit identification as used in wire harnesses but does not include electrical or electronic devices which have pigtails. The supplemental circuit identifier is cross-referenced to a specified subsystem of the power and signal distribution system identified in Section 5.

1.1 Purpose

This document will provide a common method of identifying circuit function for commercially available Class 8 vehicles. It will guide the service technician in diagnosing vehicle electrical subsystems. The identification method will supplement component OEM circuit identification for each major subsystem.

2. REFERENCES

2.1 Applicable Documents

The following publications form a part of this specification to the extent specified herein. Unless otherwise indicated, the latest issue of SAE publications shall apply.

TO PLACE A DOCUMENT ORDER: **Tel: 877-606-7323 (inside USA and Canada)**
Tel: +1 724-776-4970 (outside USA)
Fax: 724-776-0790
Email: CustomerService@sae.org
SAE WEB ADDRESS: **http://www.sae.org**

SAE values your input. To provide feedback on this Technical Report, please visit
http://www.sae.org/technical/standards/J2191_201402

2.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or 724-776-4970 (outside USA), www.sae.org.

SAE J1587 Electronic Data Interchange Between Microcomputer Systems in Heavy-Duty Vehicle Applications

SAE J1708 Serial Data Communications Between Microcomputer Systems in Heavy-Duty Vehicle Applications

SAE J1922 Powertrain Control Interface for Electronic Controls Used in Medium- and Heavy-Duty Diesel On-Highway Vehicle Applications

SAE J1939-11 Physical Layer, 250K bits/s, Twisted Shielded Pair

SAE J1939-15 Reduced Physical Layer, 250K bits/sec, Un-shielded Twisted Pair (UTP)

SAE J2284 High-Speed CAN (HSC) for Vehicle Applications at 500 KBPS

3. DEFINITIONS

3.1 ELECTRICAL CIRCUIT

An electrical circuit includes all of the components and connecting cables, starting from the electrical energy source, going to the functional component(s) and the return route through the energy source.

3.2 GROUND

An electrical conductor used as a common return for an electric circuit(s) and with a relative zero potential.

3.3 HARNESS

A group of two or more conductors bundled together.

3.4 WIRING

Collectively, the cable, terminations, and supporting accessories used in the electrical distribution system.

3.5 ORIGINAL EQUIPMENT MANUFACTURER

Truck/Engine/Transmission/etc. Manufacturer

4. CIRCUIT IDENTIFICATION SYSTEM

4.1 Primary Circuit Identification

The OEM method of circuit identification will be known as the primary circuit identification system.

4.2 Supplemental Circuit Identification

The supplemental circuit identification system is a four character code with the first two characters referencing a general subsystem and the second two characters referencing a more specific circuit function. The subsystems and circuit functions can be found in the list of general categories shown as follows:

a. Braking/Traction System (Air System)

b. Charging

c. Control (Fuel, Engine, Cruise, After Treatment)

d. Emergency/Vision/Collision Avoidance

e. Engine Accessories

f. Ground

g. HVAC

h. Instrumentation, Monitoring (Warning Systems)

i. Lighting Systems

j. Operator Convenience, Entertainment, Navigation, Accessories

k. Power

l. Serial/Data Communication

m. Trailer Systems

n. Transmission and Drive Train (Rear Axles)

o. Body Functions

p. Hybrid

4.3 Separator

The “#” character is to be used to separate the primary OEM circuit identifier from the supplemental suffix. The single space on each side of the “#” character is required for improved clarity.

4.4 Application

The methods used to apply the supplemental circuit identification to the cables shall be specified by the OEMs.

4.4.1 Test

The application durability of the supplemental circuit characters must meet the OEMs specification for abrasion and fluid resistance.

4.5 Application to Technical Document

The individual OEM shall determine the documents by which the supplemental circuit identification information will be furnished to their service organization.

4.6 Example

The primary OEM circuit identifier C123 would be supplemented with #1512 to indicate the type of subsystem and circuit function as in Figure 1:

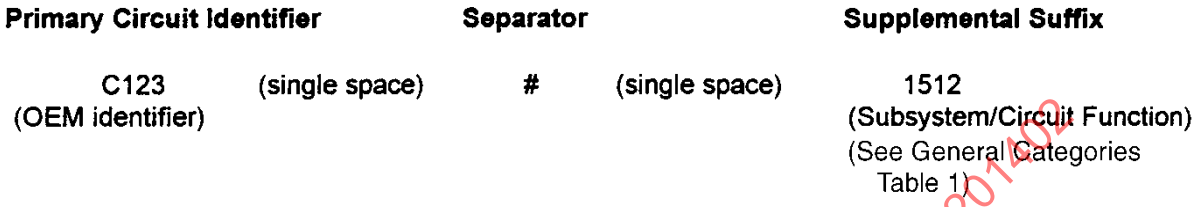

FIGURE 1 - EXAMPLE OF CIRCUIT IDENTIFICATION

5. SAE PROCEDURE FOR GENERAL SUBSYSTEM IDENTIFICATION (GSID) AND SPECIFIC CIRCUIT IDENTIFICATION (SCID) ASSIGNMENT

5.1 Purpose

To outline the procedure for the assignment of additional GSID and SCID elements within this document.

5.2 General

GSIDs and SCIDs will be requested using the request form in Appendix A. All requests for GSIDs and SCIDs will be processed by the Truck and Bus Electrical Systems Committee.

5.3 Verification of Request

To ensure that your request is accepted for ballot and inclusion in SAE J2191 please provide all of the information requested on the form. If information is missing the request will not be processed. If the information is complete, SAE will forward the request to the committee for approval. When the request has been approved the requester will be notified by SAE staff.

6. GENERAL CATEGORIES

6.1 See Table 1. General Categories

TABLE 1 - GENERAL CATEGORIES

Suffix	Subsystem Description	Circuit Function
1001	Charging	Alternator Output
1002	Charging	Starter Relay Output
1003	Charging	Alternator Field/Regulator/I&R Term
1004	Charging	Starter Relay and Controls
1005	Charging	Alternator - A/C Output (TR System)
1006	Charging	Starter Lockout/Overcrank
1101	Power	Battery Bus Feed
1102	Power	Ignition Bus Feed
1103	Power	Battery Disconnect, Isolators and Savers
1104	Power	Key Switch Feed
1105	Power	Cab Feed
1106	Power	Acc Bus Feed
1107	Power	Battery Cable
1108	Power	Ignition Spare
1109	Power	Battery Spare
1110	Power	Accessory Spare
1111	Power	Ignition Bus Control - Control of bus relay by Vehicle ECU
1112	Power	APU Battery (Auxiliary Power Unit)
1201	Ground	Instrument Ground
1202	Ground	Starter Ground
1203	Ground	Lighting Ground
1204	Ground	Cab Ground
1205	Ground	Engine Ground
1206	Ground	Electronic Ground
1207	Ground	Alternator Ground
1208	Ground	Chassis Ground
1209	Ground	Battery Ground
1301	Lighting Systems	Headlamps
1302	Lighting Systems	Park
1303	Lighting Systems	Clearance
1304	Lighting Systems	Gauge (Inst) Lamp
1305	Lighting Systems	Sign
1306	Lighting Systems	Spot
1308	Lighting Systems	Fog/Road (Forward Facing)
1309	Lighting Systems	Fog (Rear Facing)
1310	Lighting Systems	ID Lamps
1311	Lighting Systems	Dome (Interior) Lps
1312	Lighting Systems	Flood
1313	Lighting Systems	Turn (Directional)
1314	Lighting Systems	Lighted Mirror
1315	Lighting Systems	Tail
1316	Lighting Systems	Stop

TABLE 1 - GENERAL CATEGORIES (CONTINUED)

Suffix	Subsystem Description	Circuit Function
1317	Lighting Systems	DRL
1318	Lighting Systems	Interior Sleeper Lighting
1319	Lighting Systems	Hook Lps
1320	Lighting Systems	Side Turn
1321	Lighting Systems	Miscellaneous
1322	Lighting Systems	Back Up
1323	Lighting Systems	Beacon and Emergency Lp
1324	Lighting Systems	Cargo Lamp
1401	Instrumentation, Monitoring (Warn Sys)	Tachographs
1402	Instrumentation, Monitoring (Warn Sys)	Fuel Low & Water in Fuel Indicator
1403	Instrumentation, Monitoring (Warn Sys)	Fuel Level Gauge
1404	Instrumentation, Monitoring (Warn Sys)	Fuel Pressure Gauge
1405	Instrumentation, Monitoring (Warn Sys)	Main Trans Temp
1406	Instrumentation, Monitoring (Warn Sys)	Engine Speed
1407	Instrumentation, Monitoring (Warn Sys)	Turn Indicators (Dash Mtd)
1408	Instrumentation, Monitoring (Warn Sys)	Miscellaneous Gauges
1409	Instrumentation, Monitoring (Warn Sys)	Engine Oil Pressure/Level Ind.
1410	Instrumentation, Monitoring (Warn Sys)	Oil Temp Gauge
1411	Instrumentation, Monitoring (Warn Sys)	Turbo Boost Gauge
1412	Instrumentation, Monitoring (Warn Sys)	Auxiliary Trans Temp
1413	Instrumentation, Monitoring (Warn Sys)	RTO
1414	Instrumentation, Monitoring (Warn Sys)	Driver Information Display
1415	Instrumentation, Monitoring (Warn Sys)	Lamp Monitoring
1416	Instrumentation, Monitoring (Warn Sys)	Hi Water Temp
1417	Instrumentation, Monitoring (Warn Sys)	Oil Pressure Gauge
1418	Instrumentation, Monitoring (Warn Sys)	Pyrometer
1419	Instrumentation, Monitoring (Warn Sys)	Vehicle Speed
1420	Instrumentation, Monitoring (Warn Sys)	Low Coolant Lamp
1421	Instrumentation, Monitoring (Warn Sys)	Water Temp Gauge
1422	Instrumentation, Monitoring (Warn Sys)	Rear Axle Indicators
1424	Instrumentation, Monitoring (Warn Sys)	Warning Lamp
1425	Instrumentation, Monitoring (Warn Sys)	Driver Position (LH/RH) Selection
1426	Instrumentation, Monitoring (Warn Sys)	Voltage and Amperage
1427	Instrumentation, Monitoring (Warn Sys)	Brake (Air/Hydr.) Ind. and Gauge
1428	Instrumentation, Monitoring (Warn Sys)	Ambient Air Temp.
1429	Instrumentation, Monitoring (Warn Sys)	TPM –Tire Pressure Monitor
1430	Instrumentation, Monitoring (Warn Sys)	MIL (OBD – On Board Diagnoistics)
1431	Instrumentation, Monitoring (Warn Sys)	Lane Departure Warning
1432	Instrumentation, Monitoring (Warn Sys)	Telematics
1501	Control (Fuel, Engine, Cruise)	Engine Shutdown
1502	Control (Fuel, Engine, Cruise)	Engine Retard/Exhaust Brake
1503	Control (Fuel, Engine, Cruise)	Idle Timers or Shutdown
1504	Control (Fuel, Engine, Cruise)	Cruise On/Off
1506	Control (Fuel, Engine, Cruise)	Throttle (RPM Set)
1507	Control (Fuel, Engine, Cruise)	Clutch
1508	Control (Fuel, Engine, Cruise)	Cruise Set/Resume

TABLE 1 - GENERAL CATEGORIES (CONTINUED)

Suffix	Subsystem Description	Circuit Function
1509	Control (Fuel, Engine, Cruise)	Overspeed Protection
1510	Control (Fuel, Engine, Cruise)	PTO Control
1511	Control (Fuel, Engine, Cruise)	Stop Sw. Signal
1512	Control (Fuel, Engine, Cruise)	Electronic Engine Control
1513	Control (Fuel, Engine, Cruise)	Spare Relay Control - Control of spare relay by Vehicle ECU
1514	Control (Fuel, Engine, Cruise)	Customer Defined Feature - Control of feature by Vehicle ECU
1515	Control (Fuel, Engine, Cruise)	Air Management Control
1516	Control (Fuel, Engine, Cruise)	Exhaust Aftertreatment (Sensing)
1517	Control (Fuel, Engine, Cruise)	DEF Injection
1518	Control (Fuel, Engine, Cruise)	DEF Sensing
1519	Control (Fuel, Engine, Cruise)	NG (Natural Gas) System Control
1601	Serial/Data Communication	SAEJ1587/J1708
1602	Serial/Data Communication	SAEJ1922
1603	Serial/Data Communication	SAEJ1939-11/J1939-14/J1939-15
1604	Serial/Data Communication	SAEJ2284
1701	Braking/Traction System (Air System)	ABS
1702	Braking/Traction System (Air System)	Steer by Wire
1703	Braking/Traction System (Air System)	Traction Control and Axle Lock
1704	Braking/Traction System (Air System)	Brake by Wire
1705	Braking/Traction System (Air System)	Air Dryer
1706	Braking/Traction System (Air System)	Heated Drain Valve
1707	Braking/Traction System (Air System)	Park Brake
1708	Braking/Traction System (Air System)	Pneumatic/Hyd. Controls
1709	Braking/Traction System (Air System)	Brake Wear Sensor
1801	Transmission and Drive Train (Rear Axles)	Shift Control
1802	Transmission and Drive Train (Rear Axles)	Steer by Wire
1803	Transmission and Drive Train (Rear Axles)	Electronic Controlled Transmission
1804	Transmission and Drive Train (Rear Axles)	Two Speed Rear Axle
1805	Transmission and Drive Train (Rear Axles)	Transmission Retarders
1807	Transmission and Drive Train (Rear Axles)	Electronic Controlled Suspensions
1901	Trailer Systems	Refrigeration Wiring
1902	Trailer Systems	Trailer Fan
1903	Trailer Systems	Trailer Connector
1904	Trailer Systems	Controls
1905	Trailer Systems	Dome Lamps
1906	Trailer Systems	ABS
1907	Trailer Systems	Trailer Lamps
1908	Trailer Systems	Brake by Wire
2001	Operator Convenience, Entertainment, Navigation, Accessories	Audio
2004	Operator Convenience, Entertainment, Navigation, Accessories	VCR/VCP
2005	Operator Convenience, Entertainment, Navigation, Accessories	Power Windows

TABLE 1 - GENERAL CATEGORIES (CONTINUED)

Suffix	Subsystem Description	Circuit Function
2006	Operator Convenience, Entertainment, Navigation, Accessories	Keyless Entry and Security System
2007	Operator Convenience, Entertainment, Navigation, Accessories	Vehicle Communications, Navigation and Tracking
2008	Operator Convenience, Entertainment, Navigation, Accessories	Vehicle Communications, Navigation and Tracking
2009	Operator Convenience, Entertainment, Navigation, Accessories	Data Logger
2010	Operator Convenience, Entertainment, Navigation, Accessories	Seat Power (heated & other)
2011	Operator Convenience, Entertainment, Navigation, Accessories	Power Mirror
2012	Operator Convenience, Entertainment, Navigation, Accessories	Clock/Alarms
2013	Operator Convenience, Entertainment, Navigation, Accessories	Phone, Fax, Modem
2015	Operator Convenience, Entertainment, Navigation, Accessories	Television
2016	Operator Convenience, Entertainment, Navigation, Accessories	Electronic Windshield
2017	Operator Convenience, Entertainment, Navigation, Accessories	Power Locks
2018	Operator Convenience, Entertainment, Navigation, Accessories	Noise Cancellation
2019	Operator Convenience, Entertainment, Navigation, Accessories	Sleeper Accessories
2020	Operator Convenience, Entertainment, Navigation, Accessories	Cab Entry Assist
2021	Operator Convenience, Entertainment, Navigation, Accessories	Cab/Hood Lift
2022	Operator Convenience, Entertainment, Navigation, Accessories	Power Inverters and Converters
2023	Operator Convenience, Entertainment, Navigation, Accessories	Oil and Lubrication Automation
2024	Operator Convenience, Entertainment, Navigation, Accessories	Operator’s Computer
2025	Operator Convenience, Entertainment, Navigation, Accessories	Power Generator, Auxiliary
2026	Operator Convenience, Entertainment, Navigation, Accessories	CPAP- Sleep Apnea
2101	Emergency/Vision	Air Bags
2102	Emergency/Vision	Windshield Wipers
2103	Emergency/Vision	Heated Mirrors
2104	Emergency/Vision	Seat Belt
2105	Emergency/Vision	Collision Avoidance
2106	Emergency/Vision	Headlamp Washers
2107	Emergency/Vision	Horn
2108	Emergency/Vision	Side/Rear Vision Systems
2109	Emergency/Vision	Central Tire Inflation
2110	Emergency/Vision	Vehicle Motion Alarm and Warning
2111	Emergency/Vision	Windshield Washer
2112	Emergency/Vision	Lane Departure