SAE International

SURFACE VEHICLE RECOMMENDED PRACTICE

SAE J2191

REV. JAN2004

Issued 1997-02
Revised 2004-01

Superseding J2191 DEC2002

Recommended Practice for Identification of Standardized Truck and Tractor Electrical Circuits

1. ***Scope***—This SAE Recommended Practice defines a recommended practice for implementing circuit identification for the circuits of the 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 Publications—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.

2.1.1 SAE PUBLICATIONS—Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

SAE J1587—Joint SAE/TMC 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/s, Unshielded Twisted Pair

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

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potential.

3.3 Harness—A group of two or more cables 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)
d. Emergency/Vision
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)

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:

Primary Circuit Identifier		Separator		Supplemental Suffix
C123 (OEM identifier)	(single space)	#	(single space)	1512 (Subsystem/Circuit Function) (See General Categories Table 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 shown in Figure 2. All requests for GSIDs and SCIDs will be processed by the SAE Staff. A confirmation of the request form will be sent to the requester stating the date the form will be reviewed.

5.3 Verification of Request—The request form will be reviewed to ensure all required fields are provided by the requester. If information is missing, the request form shall be returned to the requester asking for additional information. If the information is complete, SAE will complete the form by filling in the date and time of the next SAE Truck and Bus Wiring and Connector meeting. They will make two copies of the request form. Send the original copy to the Chairman of the Truck and Bus Wiring and Connector Committee for review and committee approval, file one copy in a SAE staff maintained file of requests, and send a copy of the request to the requester.

The SAE Truck and Bus Wiring and Connector Committee Chairman may self approve the request or if he has concerns or questions, will present the request at the next Truck and Bus Wiring and Connector meeting. The completed request form will be sent to the SAE Staff. The SAE Staff will verify that all requests were satisfied and notify the requester by sending a copy of the completed form to the requester. The original form should be filed in the SAE Staff completed request file. The copy of the request form which was filed in the request file should be removed at this time.

Requester Name _____

Requester Address _____
_____
_____

Company Name _____
Phone _____
Fax _____

Request Type _____ General Subsystem Identification (GSID)

_____ Specific Circuit Identifications (SCID)

Description of GSID/SCID

_____
_____
_____
_____
_____
_____
_____

FOR USE BY SAE ONLY

Approved _____ Disapproved _____ Signature _____

New GSID _____ New SCID _____

Date of Next SAE J2191 Committee Meeting _____
Location _____ Time _____
Incomplete Information _____
(Please complete items marked)

Please mail or FAX completed form to:

SAE
SAE J2191 Standardized Circuit ID Committee
400 Commonwealth Drive
Warrendale, PA 15096-0001
(724) 776-4841 FAX: (724) 776-0243

Figure 2—SAE Standardized Circuit GSID, SCID Request FOrm

6. General Categories—See Table 1.

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 Buss Feed
1102	Power	Ignition Buss Feed
1103	Power	Battery Disconnect, Isolators and Savers
1104	Power	Key Switch Feed
1105	Power	Cab Feed
1106	Power	Acc Buss Feed
1107	Power	Battery Cable
1108	Power	Ignition Spare
1109	Power	Battery Spare
1110	Power	Accessory Spare
1111	Power	Ignition Buss Control - Control of buss relay by Vehicle ECU
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
1317	Lighting Systems	DRL
1318	Lighting Systems	Interior Sleeper Lighting
1319	Lighting Systems	Hook Lps

TABLE 1—GENERAL CATEGORIES (CONTINUED)

Suffix	Subsystem Description	Circuit Function
1320	Lighting Systems	Side Turn
1321	Lighting Systems	Miscellaneous
1322	Lighting Systems	Back Up
1323	Lighting Systems	Beacon and Emergency Lp
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)	PTO
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.
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
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
1601	Serial/Data Communication	J1587/J1708
1602	Serial/Data Communication	J1922
1603	Serial/Data Communication	J1939-11/J1939-15

TABLE 1—GENERAL CATEGORIES (CONTINUED)

Suffix	Subsystem Description	Circuit Function
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
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