SAE International

SURFACE VEHICLE RECOMMENDED PRACTICE

SAE J2247 SEP2013

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Truck Tractor Power Output for Trailer ABS

RATIONALE

The SAE J2247 Document was updated to remove reference to the ISO3731 document which has since been included in the SAEJ560 document. Also additional clarification has been added to Section 5, the test procedure, and recommendations to determine the source of voltage drop added in Section 5.7.1.

1. SCOPE

This SAE Recommended Practice identifies the minimum truck tractor electrical power output of the stop lamp and ABS (antilock brake system) circuits measured at the primary SAE J560 tractor trailer interface connector(s).

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 version of SAE publications shall apply.

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 J560 Primary and Auxiliary Seven Conductor Electrical Connector for Truck-Trailer Jumper Cable

SAE J2222 Coiled Electrical Cable - Truck and Bus

SAE J2394 Seven Conductor Cable for ABS Power - Truck and Bus

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

2.1.2 FMVSS Publications

Available from the Superintendent of Documents, U.S. Government Printing Office, Mail Stop: SSOP, Washington, DC 20402-9320.

Federal MotorVehicle Safety Standard (FMVSS) of the US Code of Federal Regulations Title 49 Part 571.108 Lamps, Reflective Devises, and Associated Equipment

Federal MotorVehicle Safety Standard (FMVSS) of the US Code of Federal Regulations - Title 49 Part 121 Air Brake Systems

3. DEFINITIONS

3.1 PRIMARY CONNECTOR

As used in this standard refers to the receptacle and cable plug that provides power to safety lighting and the ABS as required by FMVSS 108 and FMVSS 121. (Referenced from SAE J560)

4. TECHNICAL REQUIREMENTS

The minimum DC voltage measured on the stop lamp and ABS circuits of the SAE J560 Primary Connector when tested in accordance with Section 5 of this document shall be 12.5 V for new vehicles. Note that compliance with the minimum voltage requirements may not be adequate for some multiple trailer ABS applications.

5. TEST PROCEDURE

5.1 Check tractor battery condition. Tractor batteries are to be in good condition and fully charged.

5.2 Start and run engine at 1000 rpm ± 100 rpm. Measure voltage at battery. Battery voltage must measure 13.5 volts or above.

5.3 Connect a 10 A load device to the stop lamp circuit and a 10 A load to the ABS power circuit. The loads are attached to the SAE J560 primary tractor/trailer interface connector at, the trailer interface end, and grounded through the ground circuit of the SAE J560 primary connector.

a. Stop Lamp Circuit - Terminal 4 - SAE J560
10 GA/5 mm^2 Red—SAE J2394 and SAE J2222

b. Continuous ABS Power - Terminal 7 - SAE J560
10 GA/5 mm^2 Blue - SAE J2394 and SAE J2222

c. Ground Return to Towing Vehicle - Terminal 1 - SAE J560
8 GA/8 mm^2 White - SAE J2394 and SAE J2222

5.4 Turn on “normal” electrical loads - such as heaters, AC, lights, radios, etc.

5.5 Check load device output after 5 min and adjust if necessary to ensure 10 A per circuit draw and confirm that the battery terminal voltage is 13.5 VDC minimum.

CAUTION: The electrical load devices may be HOT and cause injury if touched or ignite flammable material.

5.6 Measure and record the voltage on the stop lamp and ABS circuits on the trailer load side of the SAE J560 Primary Connector as near as practical to the connector terminals. The minimum voltage should be 12.5 VDC at 20 °C ± 10 °C between each circuit to the ground terminal. See Figure 1 - If not, proceed to 5.7.

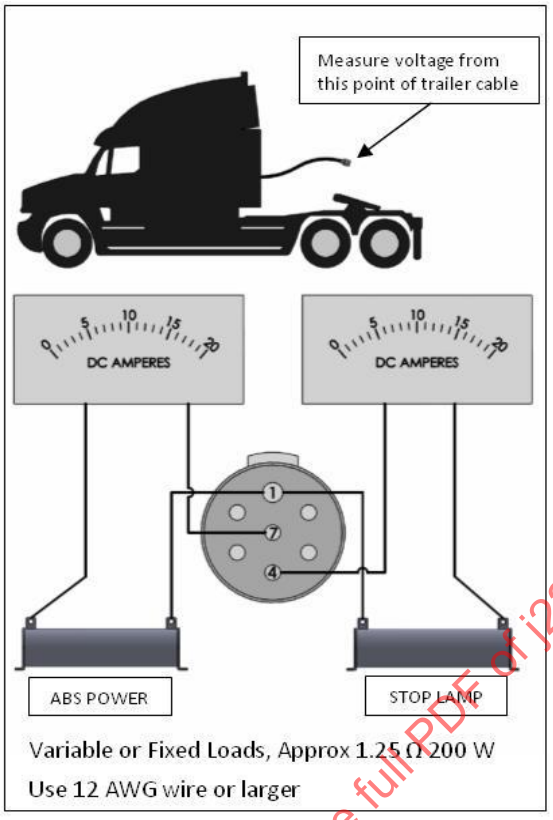

FIGURE 1 – TRACTOR POWER TEST CIRCUITS

NOTE: Both the stop lamp and ABS power circuits are loaded simultaneously at the time of measurement.

5.7 To meet the 12.5 VDC minimum voltage requirement may require an upgrade in the alternator rated output, circuit design revisions to reduce the voltage drop, or a combination of these options. Note for the given test conditions, the combination of all the electrical loads including the test loads must be below 75% of the alternator rated output

5.7.1 If the minimum voltage requirement is not met it may be helpful to determine if the excessive voltage drop occurred in the circuits within the tractor or within the seven conductor cord and connections. The total voltage drop can be calculated by subtracting the voltage measured at the end of the seven conductor cord from the voltage measured at the battery. The above test procedure can be performed again at the connection on the tractor without the seven conductor cord to determine the voltage drop in just the tractor circuits. The difference between the total voltage drop and the voltage drop in just the tractor circuits is the voltage drop in the seven conductor cord.

It may also be helpful to determine if the excessive voltage drop occurred in the high side of the circuit (between battery positive and the load) or in the ground path (between battery negative and the load). These measurements can be made directly by utilizing a multimeter with long leads. The total voltage drop should be split approximately equally between the high side of the circuit and the ground side of the circuit. Note that twice as much current is flowing in the ground side of the circuit so the ground side must have about half the resistance of the high side.

To comply with the recommended tractor-trailer interface power requirements, modify the electrical system (tractor circuits and/or seven conductor circuits) as required and repeat the test procedure to verify performance.