Single Car Air Brake Test
S-486 – Code of Air Brake System Tests for Freight Equipment – Single Car Test

Circular Letter

Subject: Implementation of 2013 Revisions to AAR MSKF Section 8, BRAKES AND BRAKE EQUIPMENT, S-486 CODE OF AIR BRAKE SYSTEM TESTS FOR FREIGHT EQUIPMENT – SINGLE CAR TEST

To: All Subscribers

The AAR Brake System Committee (BSC) in cooperation with the Federal Railroad Administration (FRA) and major airbrake suppliers have implemented a new revision to S-486. Comments were previously solicited with C-11590 and C-11950. All industry comments were discussed and some resulted in revisions to the procedure. The main objective of the revision was to clarify certain sections and organize steps within the procedure to improve efficiency. Details of the revisions to each section are listed below. Significant technical revisions are highlighted in the attached PDF file.

The revised cost/benefit analysis for this procedure is provided below after the details of the revisions.

### Section 2.1.3

**Description of Revision**

- **2.1.3.1** Choke diameters of Position 5 and the 3/8 cock have changed:
  - Position 5 diameter changed from 0.147" to 0.136" reducing the discharge rate to prevent unintended emergency on cars with short brake pipes.
  - The choke in the 3/8 cock valve changed from 0.266" (0.68 mm) to 0.313" (7.94 mm) increasing the discharge rate to ensure emergency application on cars with long brake pipes.

All changes to choke sizes must be performed during the next scheduled 92 day calibration of the test device. The calibration certificate should include documentation showing that the rotary valve modifications have been performed per Section 5.0 (stamps “13” and “F”). All devices must be modified within 1 year of the implementation date of this circular. For specific machining procedures regarding the test device modifications please contact the respective OEM.

### Section 2.1.2 – 2.1.6

- **2.1.2** Revised for clarification with no technical changes.
- **2.1.4** Added a reference to use IFP 9999 (hook-and-eye) as the adjustment procedure.
- **2.1.5** No technical changes, revised into step-by-step procedure.
- **2.1.6** Steps related to safety were moved up in the procedure so they could be performed first. Appendix A was added for troubleshooting. The specific location for the BC gage was added. Setup instructions for the retaining valve was added.
- **2.1.7** Details regarding operation of the Empty/Loud valve were clarified and added.
- **2.2** Revised for clarification with no technical changes.
- **2.2.1** Added a requirement to soap all fittings to check for leakage during the system leakage test.
- **2.2.2** More detail added to check for slack during handle release.
- **2.2.3** New section added to condition slack adjusting at the beginning of the test with blocks.

http://paxr0123root/Admin/aarcircularees/5044b4414a14b3e58853f589030b524984592ac4d120311d3a6b825/611/2013
CODE OF AIR BRAKE SYSTEM TESTS FOR FREIGHT EQUIPMENT—SINGLE CAR TEST

Standard
S-486
Adopted: 1994; Last Revised: 2015

减压阀

减压阀

3/8 in. Cock

浮阀

浮阀

浮阀

浮阀
The mandatory implementation date of S-486-2013 is June 1, 2014. The calibration certificate must include documentation showing that the rotary valve modifications have been performed per Section 5.0 (stamp “13” and “F”). All devices must be modified by June 1, 2014.
1.0 INTRODUCTION

1.1 This standard is intended to produce performance uniformity between automated single-car test devices (ASCTDs) regardless of manufacturer. It describes the recommended single-car test procedure and the minimum performance that must be demonstrated to achieve AAR approval.

Note: Maintain the main air supply pressure as recommended by the manufacturer of the automated single-car test device. If the manufacturer’s recommendation is unknown, maintain the main air supply between 100 psi and 110 psi.

1.2 The use of a hose or combination of hose and pipe between the test device and the end hose of the car is permissible. If such a hose or hosepipe combination is used, it is recommended that it be a minimum of 2/4-in. ID with 1/2-in. pipe connections. The test device hose in combination must pass all requirements of this standard. The ASCTD must have a label affixed indicating the length of hose that must be used with that particular device during calibration and testing.

1.3 When making tests of cars having two or more sets of brake equipment, test each set, with the motion of brake pipe control, separately. Note: Longer car values require at least 75 ft, 80 ft preferred, of brake pipe to operate properly during the single-car test.

1.4 The ASCTD will internally store the date of test with the daily test, annual test, or car test record that is created.

1.5 Minimum operator inputs must include but are not limited to some form of operator ID and the car number of the car being tested.
Automatic Single car tests statistically demonstrates much lower rates of repeat defects than do manual Single Car tests as illustrated in the attached graphs.

Single car tests using the ASCTD are a safer testing methodology than the manual test because the ability to skip or forget part of the test code has been eliminated.

A significant risk reduction results from eliminating craftsperson exposure from the performance of manual tests that can’t discover the root cause failure of the air brake system.
February 14, 2013
Robert C. Lauby
Deputy Associate Administrator
Test Regulatory and Legislative Operations
Federal Railroad Administration
1200 New Jersey Ave SE
Washington DC 20590

Dear Mr. Lauby,

The BNSF and Union Pacific Railroad Companies (BNSF/UP) respectfully requests the FRA for permission pursuant to 49 C.F.R. part 221 for a waiver of 49 C.F.R. section 232.305(2) for cars tested with Automatic Single Car Test Devices (ASCDT). The current rule stipulates if a car is on a shop or repair track for any reason and has not had a single car air test within the previous 12 month period a single car test must be performed. When this rule was enacted the new Automatic Single Car Test Devices were not in widespread use. BNSF and UP believe FRA was not in a position at that time to differentiate between the old manual tester and the advances in the new computers controlled devices. BNSF and UP feel that sufficient time has passed and enough industry experience has been gained to establish beyond any doubt the advance in testing technology the ASCDT has over the old manual device. BNSF and UP comparisons of the manual vs the automated testers show a 11.5% improvement in solving air brake related issues. This is a clear demonstration of how the new automated device brings a greater margin of safe repair in testing methodology than the manual tester could ever achieve.

- BNSF/UP would like to make the following points for FRA to consider:
  - 81% of cars tested with a manual or automatic device under this 1 year rule discover no brake related defects according to AAR records.
  - 98% of cars tested under this rule with an ASCDT within the preceding year discover no brake related defects according to AAR records.
  - Automatic Single car tests statistically demonstrate much lower rates of repeat defects than do manual Single Car tests as illustrated in the attached graphs.
AUTOMATED SINGLE-CAR TEST PROCEDURE, CONVENTIONAL BRAKE EQUIPMENT - DESIGN AND PERFORMANCE REQUIREMENTS

This reply is in response to the February 14, 2013, petition to the Federal Railroad Administration (FRA) from the BNSF Railway (BNSF) and Union Pacific Railroad (UP) (jointly referred to as the "Petitioners"). The petition requests a waiver of compliance from certain provisions of the Federal railroad safety regulations contained in 49 Code of Federal Regulations (CFR) Part 232, Brake System Safety Standards for Freight and Other Non-Passenger Trains and Equipment: End-of-Train Device. Specifically, the Petitioners seek a waiver of compliance from 49 CFR Section 232.36(b), Single-car brake test for railroad cars tested with automatic single-car test devices (ASCTD). This request was assigned Docket Number FRA-2013-0060.

The Petitioners request that relief be granted to railroad cars tested within the previous 2 years if placed on a shop or repair track, for any non-air brake-related reason, as defined in 49 CFR 232.109(a). The Petitioners propose a test method where all cars tested with the ASCTD machine will be looked through by Association of American Railroads (AAR) bilging experts for repeat air brake repairs within the 2-year period from the last ASCTD. In addition, the Petitioners will save data from the wheel impact load and test and output wheel brake force reports to see if the test cars develop any significant deviations within the 2-year test period from the last ASCTD test. The Petitioners believe that data from this test will clearly demonstrate the effectiveness of the ASCTD device.

FRA received comments from representatives of the Brotherhood of Locomotive Engineers and Trainmen (BLET) and the Brotherhood of Railway Carmen (BRC) in opposition to the petition. These statements were considered by FRA's Railroad
QUESTIONS