DCA16MR011
NJT
Collision of Train 1614
Hoboken Station
Hoboken, NJ
September 29, 2016

Attachment 6

Cab Car 6036 Master Controller Test Report

NJ TRANSIT The Way To Go. Technical Services	Report Type:	*Master Controller Functional Test Report*
	Subject:	*Cab Car 6036*
	Location:	*S&I Shop*
	Date:	10/08/2016

Background:

On October 8th 2016, a functionality test was carried out on the Master Controller that was removed from the 6036. The Master Controller was installed on a fully functional cab car that was coupled and connected electrically to the consist involved in the Hoboken incident. The goal of the test was to verify that direction of travel and throttle command signals were reaching the locomotive as designed. Additionally, on October 13th 2016, the Master Controller from the 6036 was installed and tested on a Bench Test Unit (BTE) located in the Electronics Shop at the MMC Kearny, NJ. The results of both those tests are as follows:

Test procedure performed to qualify Master Controller on known good Cab Car:

1.) A 27 pin Traction Test Box was installed on the F-End Traction receptacle located on the locomotive.
2.) The Master Controller was then installed on a known good cab car that was coupled and connected electrically to the accident consist.
3.) A representative from the NTSB was stationed at the MDU located in the cab car to verify the proper commands were leaving the cab car trainline. A representative from the FRA, as well as NJT Technical Services and Locomotive Shop mechanical employees, were stationed at the Traction Test Box located at the F-End of the Locomotive to verify receipt of the appropriate trainline commands. A representative from NJT Technical Services was also located at, and operated, the Master Controller.
4.) The Master Controller was put into reverse. The reverse signal was verified at the cab car as well as at the locomotive.
5.) The Master Controller was then placed into forward. The forward signal was verified at the cab car as well as at the locomotive.
6.) The Master Controller was then placed through each of the 8 traction notches. All 8 traction notches and their associated throttle valve commands, as well as the Engine Run and Generator Field signals, were verified at the cab car as well as at the locomotive.
7.) The Master Controller was then placed in the Idle and Isolate position.
8.) Conclusion of Test

Test procedure performed to qualify Master Controller on Bench Test Equipment (BTE):

1.) Plugged in the controller to the tester.
2.) Ensured that the following indicator lights were illuminated: 'Isolate'. Connected a voltmeter to the Yellow and Black terminals on the test box. Ensured that 15 VDC was present.

NOTE: The ground lights (+&-) on the test box should always be lit. If either light goes out, it's an indication of a ground on the other leg. The ground lights stayed illuminated

throughout the test.

3.) Connected the meter to the Black and Orange terminals on the test box. Depressed the push to test switch to ensure all the lights were working.

4.) Inserted the reverser handle into the master controller and moved the handle to the Reverse position.

5.) Ensured that the Cab Makeup light was on. Depressed the Velocity Zero Simulator pushbutton.

6.) Ensured that the following indicator lights were illuminated: Idle, Traction Switch, Reverse, Cab Makeup, and Velocity Zero.

7.) Moved the master controller reverser handle to the Neutral position.

8.) Ensured that the following indicator lights are illuminated: Neutral, Cab Makeup.

9.) Moved the master controller reverser handle to the Forward position.

10.) Ensured that the Cab Makeup light was on. Depressed the Velocity Zero Simulator pushbutton.

11.) Ensured that the following indicator lights were illuminated: Idle, Traction Switch, Forward, Cab Makeup and Velocity Zero.

12.) Ensured that the voltage readout on the tester and the portable voltmeter connected to the Orange and Black terminals on the test box showed 0 VDC.

13.) Pulled throttle handle up and moved it to power position #5.

14.) Ensured that the voltage readout on the tester and the portable voltmeter connected to the Orange and Black terminals on the test box showed 3 VDC +- 5%. Acceptable range 2.85 VDC to 3.15 VDC.

15.) Moved the Throttle handle to the full power position. (Position F)

16.) Ensured that the voltage readout on the tester and the portable voltmeter connected to the Orange and Black terminals on the test box showed 6VDC +- 5%. Acceptable range 5.7 VDC to 6.3 VDC.

17.) Turned the emergency shutdown switch to the up position. Ensured that the Emergency Shutdown light was on. Turned the Emergency Shutdown switch to the down position.

18.) Moved the throttle handle to position 0 (idle) and ensured the voltage readout on the tester and the portable voltmeter connected to the Orange and Black terminals on the test box showed 0 VDC.

19.) Pulled the Throttle handle up and moved it to Dynamic Braking position #5.

20.) Ensured that the Dynamic Brake light was on. Ensured the voltage readout on the tester and the portable voltmeter connected to the Orange and Black terminals on the test box showed 3 VDC +- 5%. Acceptable range 2.85 VDC to 3.15 VDC.

21.) Moved the Throttle handle to Dynamic Braking position (F).

22.) Ensured that the Dynamic Brake light was on. Ensured the voltage readout on the tester and the portable voltmeter connected to the Orange and Black terminals on the test box showed 6 VDC +- 5%. Acceptable range 5.7 VDC to 6.3 VDC.

23.) Moved the Throttle handle to 0 (idle) position and turned the reverser to I (Isolate). Removed the handle and powered down all of the equipment.
24.) Conclusion of Test

Conclusion

The Master Controller was tested thoroughly and passed both functionality tests. No abnormalities or exceptions were noted during testing. It should be noted that the consist test was conducted on a dead locomotive because of the environmental and safety concerns with starting a locomotive inside of a shop. Also, the test was carried out in End Door and Center Door bypass as the damage to the doors on the consist was too severe to allow them to be closed completely. In addition, the bench test carried out on the Bench Test Equipment (BTE) at the MMC passed all tests with no abnormalities noted. Representatives from NJT Technical Services as well as a representative from the FRA were present. The NTSB as well as the FRA and NJT deemed the above procedures acceptable and the Master Controller was deemed to be working as intended.

NJT Master Controller Bench Test Equipment (BTE)

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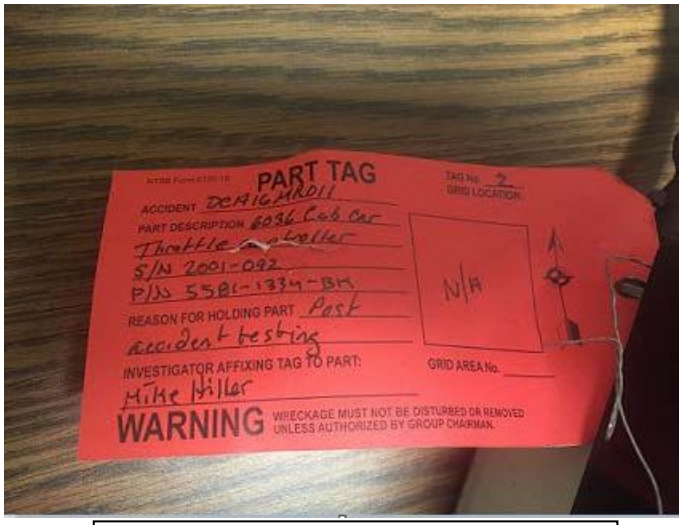
Master Controller from the 6036



Master Controller Identification Tag

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