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Jennifer Timian  
Office of Defects Investigation Enforcement  
Recall Management Division – NVS 215  
National Highway Traffic Safety Administration  
1200 New Jersey Avenue, SE  
Washington, D.C., 20592

**Re: NHTSA Recall Campaign No. 09V-371**

Dear Ms. Timian,

This report is being submitted to the National Highway Traffic Safety Administration (“NHTSA”) to be made part of the public record related to **NHTSA Recall Campaign Number 09V-371**, which resulted from a Vehicle Defect Initial Information Report (the “Defect Report”) filed by North American Bus Industries, Inc. (“NABI”) on September 28, 2009. Although the vehicle defect identified as part of NHTSA Recall Campaign Number 09V-371 has been remedied, Empire disputes the stated cause of the vehicle defect set forth by NABI in its Defect Report. Accordingly, this information is submitted as supplementation to the NABI Defect Report and is necessary in order to provide NHTSA, and the public at large, with a complete and accurate record of the facts and circumstances regarding NHTSA Recall Campaign Number 09V-371.

In its Defect Report, NABI described the subject defect related to NHTSA Recall Campaign Number 09V-371 as follows:

Certain 40’ and 45’ NABI City Transit Buses, as identified above, may contain a defective alternator cable assembly. This cable assembly supplies power from the alternator to the batteries. NABI and supplier, Empire, have determined that some of these cables have a defective crimp on the cable end and the terminal may overheat when high amperage passes through the cable.

As seen, NABI's Defect Report alleges that NABI and Empire “determined that some of these cables have a defective crimp on the cable end and the terminal may overheat when high amperage passes through the cable.” **Empire Wire did not ultimately reach this conclusion, was not consulted by NABI regarding its conclusions contained in its NHTSA submission, and disputes the overall accuracy of NABI’s Defect Report regarding the cause of the reported defect. Empire’s own investigation does not support NABI’s conclusions.**

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NABI's Defect Report concluded that a defect pertained to certain 40' and 45' NABI City Transit Buses located in Westchester County, New York, and Los Angeles, California. NABI initially concluded that these buses contained a defective regulator. This conclusion, however, was modified to target only the alternator cable assembly. Specifically, NABI hypothesized that these cables have a defective crimp on the cable end<sup>1</sup> and the terminal may overheat when high amperage passes through the cable. See Defect Report. Based on the preceding, the Office of Defect Investigation (ODI) issued its National Highway Travel Safety Administration (NHTSA) Recall Campaign, No. 09V-371, which noted that the defect will be remedied by replacing the cable.

However, subsequent investigation by Empire – including an analysis of NABI's investigation and results – points to an improperly tightened bolt intended to secure the cable lug to the B+ Terminal output located on the alternator. NABI's own specifications regarding securing the bolt to the terminal ring/cable lug that is placed on the alternator output terminal generally require specific torque pressure to be applied to the bolt and cable lug/terminal ring, depending on the size of the bolt. Indeed, NABI's own requirements specifically state, regardless of the size of the bolt that is used to secure the cable lug/terminal ring to the alternator output terminal, that the "ring terminals shall be attached to components with enough torque to prohibit movement of the ring terminal using average force by hand."<sup>2</sup> However, when Empire personal inspected the cable lug attachments on the alternators in the hybrid buses at L.A. Metro, California, it was noted that the bolt and terminal rings were "finger loose" and clearly had not be tightened per NABI's own specified torque standards.<sup>3</sup>

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<sup>1</sup> Empire notes that NABI's specifications specifically called for a "soldered and crimped" sequence, which Empire followed per NABI's precise specifications. Indeed, NABI directed Empire in writing to follow industry standards "unless superceded" by NABI's expressed requirements. Accordingly, any crimping "issues" originated with NABI's specifications, not with Empire's manufacturing processes.

<sup>2</sup> NABI "Electrical Standards: Wiring Harnesses and Cable and Cable Assemblies," DWG NO. 5002734, Rev. 21, NO8-07841, ¶34, 09/16/08.

<sup>3</sup> According to alternator installation materials from C.E. Neihoff & Co., a standard "B+ Terminal ½-13 bolt (C803D: M12)" requires "torque to 30Nm/22 lb. ft." NABI set forth its own torque requirements in its cable assembly standards, reflected on "DWG. NO. 500734." Therein, NABI describes the amount of torque pressure that must be used in properly securing the terminal ring/cable lug with bolts to placed on the alternator output terminal. Significantly, NABI warns that the cable lug/terminal ring "shall be attached with enough torque to prohibit movement of the ring terminal using average force by hand." Based upon the inspection of cables at the L.A. Metro facility by Empire personal, prior to the retrofit of the cables, *all* of the lugs were finger loose. A similar observation was also made personnel at L.A. Metro.



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The failure to use the required torque pressure to properly secure the bolt and cable lug to the B+ Terminal output meant that the bolt and lug were loose. Such a loose fitting will naturally lead to chafing and movement of the cable lug along the alternator terminal during operation of the bus, which could cause a possible voltage drop, overheating, arcing, sparks or fire. These results are consistent with the observations described by Empire personnel (and, as Empire later learned, by personnel at L.A Metro).

In further support of this conclusion, Empire Wire notes that no excessive heat was reported on the cable connection to the battery, but only on that part of the cable connection to the alternator – the site of the alleged problem. Additionally, the buses were assembled by NABI personnel in its facility in Alabama and were supposedly tested and screened before being released to their destinations in California and New York. If a defective “crimp” was the issue, causing an alleged voltage drop and related thermal/overheating events in the alternator, this defect should have been discovered immediately after the buses were driven from Alabama to California and New York. This was not the case.

Furthermore, Empire also had a chance to inspect some of the suspect Empire cables defined as “defective” by NABI. A batch was received from NABI that had been removed from buses at L.A. Metro, California. Empire’s inspection of the 500-8500-056 cables showed that a number of the cables were not from Empire at all and of those shipped to Empire, some had been improperly altered by NABI or others. In short, the heating problem described by NABI apparently also occurred when non-Empire cables were being used and installed, strongly suggesting that the problem does not lie with the cable itself, but may in fact lie with the improper method of securing the bolt with the proper torque pressure in order to tighten the cable lug to the B+ Terminal output of the alternator and, thereby, ensure continuous contact and prevent any movement or chafing of the cable lug along the alternator output during operation of the bus.

In sum, the Empire cables were built as specifically approved by NABI and NABI’s own standards and specifications for the cable assemblies – set forth in its ‘DWG. NO. 5002734’ – and those standards were fully complied with to the letter by Empire. Based upon its own investigation and observations by personnel in the field, Empire has concluded that the **vehicle defect identified in NABI’s Defect Report, which resulted in NHTSA Recall Campaign Number 09V-371, was caused by NABI’s own failure to properly tighten the cable lug to the B+ Terminal output of**

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**the alternator with the required torque pressure specification when installing the Empire cables on the subject buses.**

Additionally, Empire has subsequently learned that NABI became aware that the cause of the voltage drop and overheating was the result of the subject cables not being installed by NABI to its own torque specifications. Approximately three weeks before NABI submitted its Defect Report to NHTSA, wherein it stated the cause of the defect was a defective crimp in the cables produced by Empire, it received information from its customer, L.A. Metro, that the "positive cables at the alternator are not being tightened properly which causes the arcing and damage to the cable end and the alternator." L.A. Metro further noted that it was "lucky we didn't have another fire bus. *Everything we are seeing* is that the cables are no[t] tightened down properly." (Emphasis added). Despite receipt of this information, NABI proceeded to file its Defect Report with NHTSA wrongly identifying the cables manufactured by Empire as *the cause* of the defect, making no mention of the issue related to the improper installation of the cables by NABI. In short, NABI's decision to wrongly blame Empire for the vehicle defect that resulted in NHTSA Recall Campaign Number 09V-371 necessitates the filing of this report so that it can be made a part of the public record.

Should you have any questions regarding any of the foregoing, please feel free to contact me directly at your convenience.

Regards,

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