

June 27, 2014

[REDACTED]
Vehicle Integrity Division
Office of Defects Investigation
[REDACTED]

NVS-212ef
PE14-011

RE: Preliminary Evaluation PE14-011 Information Request to Robert Bosch LLC dated April 28, 2014 regarding the Bosch Power Express Charging Station

Dear [REDACTED]

The attached document contains the response of Robert Bosch LLC to NHTSA's information request in PE14-011 sent to Robert Bosch LLC and dated April 28, 2014 regarding the Bosch Power Express Charging Station. It should be noted that Bosch Automotive Service Solutions LLC is the indirect subsidiary of Robert Bosch LLC responsible for the Bosch Power Express Charging Station; therefore, the information and documentation in the response below is largely related to Bosch Automotive Service Solutions, LLC.

Much of Bosch's response is confidential information. That information is being supplied to the Chief Counsel's office. The various confidential attachments have the individual documents (sometimes e-mail strings or e-mails with attachments) separated by blank pink sheets of paper, containing only a BATES stamp. Bosch has also used the same method to separate the documents for which no claim of confidentiality is being made.

Bosch is providing a privilege log related to privileged documents. In reviewing documents for privilege, it was decided that some documents had been inappropriately marked and those documents are being produced as appropriate. Bosch has removed the name of the attorney and the nomenclature "Privileged and Confidential" from those documents that we are producing.

If you have any questions, please contact me.

Yours sincerely,
[REDACTED]

Vice-President-Deputy General Counsel
Robert Bosch

BOSCH'S RESPONSE TO NHTSA'S INFORMATION REQUEST IN PE14-011 DATED APRIL 2014:

The following contains the NHTSA questions followed by Bosch's responses:

1. *State the number of subject chargers Bosch has manufactured for sale or lease in the United States. Separately, for each subject charger manufactured to date by Bosch, state the following:*
 - a. *Date of manufacture;*
 - b. *Serial number;*
 - c. *Date warranty coverage commenced; and,*
 - d. *The State in the United States where the charger was originally sold or leased (or delivered for sale or lease).*

Bosch Response:

See Attachment "A" entitled "Confidential Production Data", supplied to the Office of Chief Counsel under separate cover with a request for confidential treatment. Attachment A is responsive to subparts a-d of this question. The Power Xpress charging station (the "Subject Component") was manufactured by North Shore Safety with sales beginning May 2011 through the present. This data was compiled from the Bosch Automotive Service Solutions ERP System (BAAN), the Bosch Automotive Service Solutions Tech Support Management System, the Bosch Automotive Service Solutions EVSE Support System and from information provided by the manufacturer, North Shore Safety. This spreadsheet is current as of June 18, 2014.

- a. The date of delivery is provided in Attachment A.
 - b. The serial number is on Attachment A unless there was not a serial number on the product. Bosch began to place serial numbers on the Power Xpress in July, 2011.
 - c. The warranty coverage commences on the date of delivery which is listed in Attachment A. The Power Xpress charging station is warranted against defects in materials and workmanship for one year from the date of installation. The charging station cables and connectors are warranted against defects in materials and workmanship for 90 days from the date of delivery.
 - d. The state where the charging station was sold is provided in Attachment A.
2. *State the number of each of the following, received by Bosch, or of which Bosch is otherwise aware, which relate to, or may relate to, the alleged defect in the subject chargers:*
 - a. *Consumer complaints, including those from fleet operators;*
 - b. *Field reports, including dealer field reports;*

- c. *Reports involving an injury or fatality;*
- d. *Reports involving a fire;*
- e. *Property damage claims; and*
- f. *Third-party arbitration proceedings where Bosch is or was a party to the arbitration; and*
- g. *Lawsuits, both pending and closed, in which Bosch is or was a defendant or codefendant.*

For subparts a through g, state the total number of each item (e.g., consumer complaints, field reports, etc.) separately. Multiple incidents involving the same charger are to be counted separately. Multiple reports of the same incident are also to be counted separately (i.e., a consumer complaint and a field report involving the same incident in which a fire occurred are to be counted as a fire report, a field report and a consumer complaint).

In addition, for items c through g, provide a summary description of the alleged problem and causal and contributing factors and Bosch's assessment of the problem, with a summary of the significant underlying facts and evidence. For items f and g, identify the parties to the action, as well as the caption, court, docket number, and date on which the complaint or other document initiating the action was filed.

Bosch Response:

- a. See Confidential Attachment "B", entitled "Overheating Incidents/Warranty Data." supplied to the Office of Chief Counsel under separate cover with a request for confidential treatment. This data was compiled from Bosch Automotive Service Solutions Tech Support Management System and direct customer communication. This information is current as of June 18, 2014. There are ten (10) consumer complaints which relate to the Subject Component which include a total of fifteen (15) charging stations. Some of the customers have more than one charging station.
 - b. None.
 - c. None.
 - d. There have been no fires, however, there have been reports of melting contained within the fire retardant coupler housing.
 - e. See Confidential Attachment B.
 - f. None.
 - g. None.
3. *Separately, for each item (complaint, report, claim, notice, or matter) within the scope of your response to Request No. 2, state the following information:*

- a. *Bosch's file number or other identifier used;*
- b. *The category of the item, as identified in Request No. 2 (i.e., consumer complaint, field report, etc.);*
- c. *Charger owner or fleet name (and fleet contact person), address, and telephone number;*
- d. *Charger's serial number;*
- e. *Indicent date;*
- f. *Report or claim date;*
- g. *Whether a fire is alleged;*
- h. *Whether property damage is alleged;*
- i. *Number of alleged injuries, if any; and,*
- j. *Number of alleged fatalities, if any.*

Bosch Response:

See Confidential Attachment B. Attachment B is responsive to subparts a-j of Request No. 3. This information was compiled from direct communications with each customer. This information is current as of June 18, 2014.

- a. See Confidential Attachment B.
 - b. Bosch has only received customer complaints.
 - c. See Confidential Attachment B.
 - d. See Confidential Attachment B.
 - e. See Confidential Attachment B.
 - f. See Confidential Attachment B.
 - g. There have been reports of melting contained within the fire retardant coupler housing, but no fires have been alleged in any incident.
 - h. See Confidential Attachment B.
 - i. No injuries have occurred.
 - j. No fatalities have occurred.
4. *Produce copies of all documents related to each item within the scope of Request No. 2. Organize the documents separately by category (i.e., consumer complaints, field reports, etc.) and describe the method Bosch used for organizing the documents.*

Bosch Response:

See Attachment C entitled "Documents Related to Consumer Complaints" which contains a variety of documents related to the specific customer incidents in Confidential Attachment B. Attachment C contains two tabs relating to each incident in Attachment B. Tabs 1, 2, etc. contain those documents for which Bosch is seeking confidential treatment. Tabs 1A, 2A, etc. contains those documents for which Bosch does not seek confidential treatment. Tab 16 contains documents related to multiple incidents for which confidential treatment is being sought. These documents, including attachments, are in chronological order within each tab. The documents were obtained from available records, including the email system. This information is current as of May 31, 2014. Those portions of Attachment C for which Bosch seeks confidential treatment have been supplied to the Office of Chief Counsel under separate cover.

5. *State, by date of manufacture and serial number, a total count for all of the following categories of claims, collectively, that have been paid by Bosch to date that relate to, or may relate to, the alleged defect in the subject chargers: warranty claims; extended warranty claims; claims for good will services that were provided; field, zone, or similar adjustments and reimbursements; and warranty claims or repairs made in accordance with a procedure specified in a technical service bulletin or customer satisfaction campaign.*

Separately, for each such claim, state the following information:

- a. *Bosch's claim number;*
- b. *Charger owner or fleet name (and fleet contact person) and telephone number;*
- c. *Serial number;*
- d. *Repair date;*
- e. *Repairing dealer's or facility's name, telephone number, city and state or ZIP code;*
- f. *Labor operation number;*
- g. *Problem code;*
- h. *Replacement part number(s) and description(s);*
- i. *Concern stated by customer; and,*
- j. *Comment, if any, by dealer/technician relating to claim and/or repair.*

Bosch Response:

See Confidential Attachment B entitled "Overheating Incidents/Warranty Data." Confidential Attachment B is responsive to subparts a through j of Request No. 5. This information was obtained from the Bosch Automotive Service Solutions Tech

Support Management System and direct customer communication. This information is current as of June 18, 2014.

- a. See Customer Incident column in Attachment B.
 - b. See Charging Station Owner column in Attachment B.
 - c. See Serial Number column in Attachment B.
 - d. See Repair Date column in Attachment B.
 - e. See Repairing Facility column in Attachment B.
 - f. Not applicable.
 - g. Not applicable.
 - h. See Comments on Repair Claim column in Attachment B.
 - i. See Customer Concern column in Attachment B.
 - j. None.
6. *Describe in detail the search criteria used by Bosch to identify the claims identified in response to Request No. 5, including the labor operations, problem codes, part numbers and any other pertinent parameters used. Provide a list of all labor operations, labor operation descriptions, problem codes, and problem code descriptions applicable to the alleged defect in the subject chargers. State by date of manufacture and serial number, the terms of the warranty coverage offered by Bosch on the subject chargers (i.e., the number of months for which coverage is provided and the component systems that are covered). Describe any extended warranty coverage option(s) that Bosch offered for the subject chargers and state by date of manufacture and serial number, the number of chargers that are covered under each such extended warranty.*

Bosch Response:

Claims identified in Confidential Attachment B – “Overheating Incidents/Warranty Data” are identified by two primary methods: Formal and Informal. Formal claims are those received via an incoming call to Bosch Automotive Service Solutions technical support center. These calls are logged and then follow a prescribed escalation process that includes priority treatment for any claim if an overheating condition is suspected (as identified by either the “Excessive Coupler Heat” or “Stuck Coupler” categorization during the claims analysis process).

Informal claims are those received via our internal sales, product management or business development teams. Our organization is well known in the EV charging community and often established relationships are leveraged to inquire about or submit claims from the field. Typically our customer experience team engages in the resolution process at this time, often with the support of the technical support center.

The Power Xpress charging station is warranted against defects in materials and workmanship for one year from the date of installation. The charging station cables and connectors are warranted against defects in materials and workmanship for 90 days from the date of delivery.

Currently there is no Extended Warranty available for the Power Xpress, nor has there ever been.

7. *Produce copies of all service, warranty and other documents that relate to, or may relate to, the alleged defect in the subject chargers, that Bosch has issued to any dealers, regional or zone offices, field offices, fleet purchasers, or other entities. This includes, but is not limited to, bulletins, advisories, informational documents, training documents, or other documents or communications, with the exception of standard shop manuals. Also include the latest draft copy of any communication that Bosch is planning to issue within the next 120 days.*

Bosch Response:

Documents produced in response to NHTSA Request No. 7 are contained in two attachments, D1 and D2. Confidential Attachment D1 contains two documents containing confidential information that Bosch prepared and/or presented to customers, which have been supplied to the Office of Chief Counsel under separate cover. Attachment D2 contains documents which are not considered to be confidential. There are no current plans to issue any communications in the next 120 days.

8. *Describe all assessments, analyses, tests, test results, studies, surveys, simulations, investigations, inquiries and/or evaluations (collectively, „actions“) that relate to, or may relate to , the alleged defect in the subject chargers that have been conducted, are being conducted, are planned, or are being planned by, or for, Bosch. For each such action, provide the following information:*
 - a. *Action title or identifier;*
 - b. *The actual or planned start date;*
 - c. *The actual or expected end date;*
 - d. *Brief summary of the subject and objective of the action;*
 - e. *Engineering group(s)/supplier(s) responsible for designing and for conducting the action; and,*
 - f. *A brief summary of the findings and/or conclusions resulting from the action.*

For each action identified, provide copies of all documents related to the action, regardless of whether the documents are in interim, draft or final form. Organize the documents chronologically by action.

Bosch Response:

Confidential Attachment E is entitled "Tests and Analyses" and has been sent to the Chief Counsel's Office with a request for confidential treatment. The first document is a spreadsheet at the beginning of Attachment E which is responsive to subparts a-f of Request No. 8. Confidential Tests of REMA, Yazaki, Intertek, Amphenol and Bosch are all included within Attachment E. For those tests when another organization is requesting confidential treatment, Certificates and Memoranda supporting confidential treatment have been sought from such organization.

9. *Describe all modifications or changes made by, or on behalf of, Bosch in the design, material, composition, manufacture, quality control, supply, or installation of the subject component, from the start of production to date, which relate to, or may relate to, the alleged defect in the subject chargers. For each such modification or change, provide the following information:*
- a. The date or approximate date on which the modification or change was incorporated into component production;*
 - b. A detailed description of the modification or change;*
 - c. The reason(s) for the modification or change;*
 - d. The part number(s) (service and engineering) of the original component;*
 - e. The part number(s) (service and engineering) of the modified component;*
 - f. Whether the original unmodified component was withdrawn from production and/or sale, and if so, when;*
 - g. When the modified component was made available as a service component; and,*
 - h. Whether the modified component can be interchanged with earlier production components.*

Also, provide the above information for any modification or change that Bosch is aware of which may be incorporated into charger production within the next 120 days.

Bosch Response:

There have been three changes made which are related to the cable/coupler of the Subject Component.

The first change is a change in the supplier of the cable/coupler assembly from REMA USA LLC ("REMA") to Amphenol-Tuchel Electronics GmbH ("Amphenol"). This change was made in June 2012, prior to any customer complaint, and the decision to change suppliers was a purchasing decision unrelated to design or performance. The REMA part number is 901218002. The Amphenol part numbers are CA430A1130021001 and CA430A1130021002. The REMA part was withdrawn

from production in June 2012. The Amphenol part numbers were made available for service in June 2012. Serial number 3122 or lower is the REMA part. Serial numbers 3123-3600 are a mix of REMA and Amphenol parts. Serial number 3601 and higher are Amphenol parts. The REMA and Amphenol parts are interchangeable. There are no current plans to make additional changes to the Subject Component in the next 120 days.

The second change was a change from the REMA cable/coupler service part to the Amphenol cable/coupler service part which was directly related to the change of supplier referenced in the previous paragraph. The part numbers for the REMA and the Amphenol service parts have remained the same: EL50600-6A is the part number for the 18 foot cable/coupler assembly, EL50650-6 is the part number for the 25 foot cable/coupler assembly.

The third change was a unilateral change made by Amphenol from bare copper beryllium finish to silver plated terminal material finish of the coupler sleeves. This production change was made in approximately September 2013 due to requirements from other Amphenol customers. This change affected the Subject Component as well as the service part.

10. Produce two of each of the following:

- a. Exemplar samples of each design version of the subject component;*
- b. Field return samples of the subject component exhibiting the subject failure mode; and,*
- c. Any kits that have been produced, released, or developed for or by Bosch for use in service repairs to the subject component/assembly which relate, or may relate, to the alleged defect in the subject chargers.*

Bosch Response:

- a. Two (2) new EL-50600A representative samples of the Power Xpress with the Amphenol coupler are being provided in conjunction with this RFI response, but under separate letter. Bosch currently has only one (1) new sample of the Power Xpress with the REMA coupler in its possession in the United States. Bosch is securing an additional new Power Xpress with the REMA coupler and will provide NHTSA two (2) samples when Bosch receives them. In the event NHTSA requests Bosch to send the single sample with the REMA coupler currently in its possession, Bosch would require that the sample is available to Bosch for possible future testing. No destructive testing would occur without notifying NHTSA in time for NHTSA to provide meaningful input.
- b. As soon as reasonably possible, Bosch will forward representative field returns with the Amphenol coupler. Per Attachment B, Bosch has only received two (2) field return samples with the REMA coupler, both of which are currently disassembled and being used for investigation and testing as described in the response to Request No. 8.

- c. The two kits described in response to Request No. 11 are currently on order with the supplier, Amphenol, and we will provide these two kits to NHTSA upon receipt. Kits with REMA couplers are no longer available.

11. Describe any kits that have been produced, released, or developed, for or by Bosch for use in service repairs to the subject component assembly. For each kit please provide the following:

- a. Part number and number of kits sold.
- b. The date or approximate date the kit was made available; and,
- c. A detailed description of the parts included in the kit.

For each component part number of the kit, provide the supplier's name, address, and appropriate point of contact (name, title, and telephone number). Also identify by make and model, any other chargers of which Bosch is aware that contain the identical component, whether installed in production or in service, and state the applicable dates of production or service usage.

Bosch Response:

There have two (2) kits produced by Bosch for service repairs related to the Subject Component is the cable/coupler assembly. One is an 18 foot cable/coupler assembly and one is a 25 foot cable/coupler assembly. The part number for the 18 foot cable/coupler assembly is EL-50600-6A. The part number for the 25 foot cable/coupler assembly is EL-50650-6. There have been 66 of these cable/coupler assemblies sold to customers from July 2011 to the present at a cost of \$249.00 for the 18 foot assembly and \$289.00 for the 25 foot assembly. The cable/coupler assembly is a replacement service part for a customer to use in the event the cable/coupler assembly is damaged for any reason.

Bosch sells the "Bosch Power Max" charging station in three (3) configurations. Two (2) of the three (3) configurations use a similar Amphenol cable / coupler assembly that is used for the Bosch Power Xpress.

- EL-51253 30 Amp / 18 foot cable
- EL-51254 30 Amp / 25 foot cable

From June 2013 through May 2014 Bosch has sold 4,302 Bosch Power Max charging stations. There are no customer complaints or known field issues related to those experienced with the Subject Component.

Bosch has limited knowledge regarding other manufacturers' use of the REMA and Amphenol cable / coupler assemblies which is derived from the public website www.pluginamerica.org.

12. Furnish Bosch's assessment of the alleged defect in the subject charger, including:

- a. *The causal or contributory factor(s);*
- b. *The failure mechanism(s);*
- c. *The failure mode(s);*
- d. *The risk to motor vehicle safety that it poses; and*
- e. *What warnings, if any, the operator and the other persons both inside and outside the vehicle would have that the alleged defect was occurring or subject component was malfunctioning; and,*
- f. *The reports included with this inquiry.*

Bosch Response:

Bosch has not identified any unreasonable risk to motor vehicle safety related to the alleged defect in the subject component.

Responsive to subparts a-c:

Based on Bosch's investigation and analysis, it appears that increased resistance between the EVSE coupler and cord and the vehicle receptacle and its wiring harness is the mechanism which led to melting of portions of the connector in the incidences which Bosch has investigated to date. There are likely several potential causes of increased resistance, but in the limited observations Bosch has investigated to date, it appears that increased resistance can occur in the contact or crimp areas of the coupler and receptacle. The increased resistance causes an increase in the temperature, which may eventually result in melting of the internal plastic material.

- d. Bosch has found no defect related to motor vehicle safety with relation to the subject component. The Bosch Power Xpress 240V charging station was developed and designed in conformance with UL 2251 and SAEJ1772, as well as in compliance with the following:

North America Operation

- UL 2594.Electric Vehicle Supply Equipment
- UL 2251.Plugs, Receptacles and Couplers for Electric Vehicles
- UL 1998.Firmware Operation - Software in Programmable Components
- SAE J1772.EV & PEV Hybrid Electric Vehicle Conductive Charge Coupler
- FCC Part 15.EMI/RFI Subpart B Compliant

Safety

- NEC Article 625 -Electric Vehicle Supply Equipment
- UL 2231-1 & -2 -Personnel Protection Systems for Electric Vehicle (EV) Supply Circuits: General Requirements

- UL 62 -Standard for Safety of Flexible Cord

European Union Operation

- IEC 61851-1
- IEC 61851-21 & 22
- IEC 62196 Coupler, Type 1, Type 2
- IEC 62196 Plug, Type 2, Type 3
- IEC 61000-4-2, Electrostatic Discharge

- IEC 60204-1, safety for servicing electronic equipment

In addition, the charging station is made of a fire retardant plastic material and is capable of withstanding a glow wire ignition up to 755 degrees Celsius, in accordance with the UL 2251 standard. The conditions of the products in the field which have been analyzed by Bosch show localized melting inside the coupler/receptacle interface, as would occur at 260 degrees C. There has been no evidence found of charring. Bosch has not observed any melting on the exterior of the coupler or receptacle. Consistent with this design, Bosch is not aware of any fire in the field. The information Bosch has received and the investigation of such incidents reveals that melting of portions of the connectors is the result under the most adverse conditions. Based upon its evaluation and investigation, Bosch believes that melting inside the coupler interface, though limited, is the most severe result that may arise from this overheating.

- e. The operator will feel a noticeable increase in temperature, an abnormally warm or hot connector, an elevated temperature smell or melted plastic smell in the air.
- f. Bosch's response to the reports included with this inquiry is contained in the response above.