

January 13, 2021

The Honorable James C. Owens
Deputy Administrator
National Highway Traffic Safety Administration
1200 New Jersey Avenue, SE
West Building
Washington, DC 20590

The attached letter from the NTSB Chairman provides information about the NTSB's November 13, 2020, report *Safety Risks to Emergency Responders from Lithium-Ion Battery Fires in Electric Vehicles* (SR-20/01). The details of this accident investigation and the resulting safety recommendations may be found in the attached report, which can also be accessed at <http://www.nts.gov>.

The NTSB is vitally interested in these recommendations because they are designed to prevent accidents and save lives. We would appreciate a response within 90 days of the date of this letter, detailing the actions you have taken or intend to take to implement these recommendations. When replying, please refer to the safety recommendations by number (for example, H-20-30 and -31). We encourage you to submit your response to ExecutiveSecretariat@ntsb.gov. If your reply exceeds 20 megabytes, including attachments, please e-mail us at the same address for instructions on how to send larger documents. Please do not submit both an electronic copy and a hard copy of the same response.



Executive Secretariat-crb
Executive Secretariat
Office of the Managing Director
National Transportation Safety Board
490 L'Enfant Plaza SW
Washington, DC 20594

Email: ExecutiveSecretariat@ntsb.gov



Office of the Chairman

National Transportation Safety Board

Washington, DC 20594

January 13, 2021

The Honorable James C. Owens
Deputy Administrator
National Highway Traffic Safety Administration
1200 New Jersey Avenue, SE
West Building
Washington, DC 20590

Dear Mr. Owens:

This letter provides information about the National Transportation Safety Board's (NTSB) November 13, 2020, report titled *Safety Risks to Emergency Responders from Lithium-Ion Battery Fires in Electric Vehicles* (SR-20/01). The details of the NTSB's investigation and the resulting safety recommendations may be found in the attached report, which can also be accessed at <http://www.nts.gov>.

As a result of its investigation, the NTSB identified the following safety issues:

- Inadequacy of vehicle manufacturers' emergency response guides for minimizing the risks to emergency personnel who respond to high-voltage lithium-ion battery fires in electric vehicles.
- Gaps in safety standards and research related to high-voltage lithium-ion batteries involved in high-speed, high-severity crashes.

Accordingly, the NTSB makes the following safety recommendations to the National Highway Traffic Safety Administration. Additional information regarding these recommendations can be found in the noted section of the report.

- When determining a vehicle's US New Car Assessment Program score, factor in the availability of a manufacturer's emergency response guide and its adherence to International Organization for Standardization standard 17840 and SAE International recommended practice J2990. (H-20-30) (See section 5.1.6.)
- Convene a coalition of stakeholders to continue research initiated by your organization on ways to mitigate or deenergize the stranded energy in high-voltage lithium-ion batteries and to reduce the hazards associated with thermal runaway resulting from high-speed, high-severity crashes. Publish the research results. (H-20-31) (See section 5.2.)

The NTSB is vitally interested in these recommendations because they are designed to reduce safety risks and save lives. We would appreciate a response from you within 90 days of the

date of this letter, detailing the actions you have taken or intend to take to implement these recommendations. When replying, please refer to the safety recommendations by number (Safety Recommendations H-20-30 and -31). We encourage you to submit your response to ExecutiveSecretariat@ntsb.gov. If your reply, including attachments, exceeds 20 megabytes, please e-mail us at the same address for instructions. Please do not submit both an electronic copy and a hard copy of the same response.

Sincerely,

[Original Signed]

Robert L. Sumwalt, III
Chairman

January 13, 2021

Mr. Bryan Jacobs
Vice President, Government and External Affairs
BMW Group

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant accidents in other modes of transportation—railroad, highway, marine, and pipeline. We determine the probable cause of the accidents and issue safety recommendations aimed at preventing future accidents. In addition, we carry out special studies concerning transportation safety and coordinate the resources of the federal government and other organizations to provide assistance to victims and their family members affected by major transportation disasters.

The attached letter from the NTSB Chairman provides information about the NTSB's November 13, 2020, report *Safety Risks to Emergency Responders from Lithium-Ion Battery Fires in Electric Vehicles* (SR-20/01). The details of this accident investigation and the resulting safety recommendations may be found in the attached report, which can also be accessed at <http://www.nts.gov>. For more information about NTSB and our recommendation process, please see the attached one-page summary.

The NTSB is vitally interested in these recommendations because they are designed to prevent accidents and save lives. We would appreciate a response within 90 days of the date of this letter, detailing the actions you have taken or intend to take to implement these recommendations. When replying, please refer to the safety recommendations by number (for example, H-20-32). We encourage you to submit your response to ExecutiveSecretariat@ntsb.gov. If your reply exceeds 20 megabytes, including attachments, please e-mail us at the same address for instructions on how to send larger documents. Please do not submit both an electronic copy and a hard copy of the same response.

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National Transportation Safety Board

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Office of the Chairman

January 13, 2021

Mr. Bryan Jacobs
Vice President, Government and External Affairs
BMW Group
900 G Street NW, Suite 600
Washington, DC 20001

Dear Mr. Jacobs:

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant accidents in other modes of transportation—railroad, highway, marine, and pipeline. We determine the probable cause of the accidents and issue safety recommendations aimed at preventing future accidents. In addition, we carry out special studies concerning transportation safety and coordinate the resources of the federal government and other organizations to assist victims and their family members affected by major transportation disasters.

We are providing the following information to urge the BMW Group to act on the safety recommendation in this letter because we believe your organization can help improve transportation safety and save lives. For more information about the NTSB and our recommendation process, please see the attached one-page summary.

This letter also includes information about our November 13, 2020, report titled *Safety Risks to Emergency Responders from Lithium-Ion Battery Fires in Electric Vehicles* (SR-20/01). The details of the NTSB's investigation and the resulting safety recommendations may be found in the attached report, which can also be accessed at <http://www.nts.gov>.

As a result of its investigation, the NTSB identified the following safety issues:

- Inadequacy of vehicle manufacturers' emergency response guides for minimizing the risks to emergency personnel who respond to high-voltage lithium-ion battery fires in electric vehicles.
- Gaps in safety standards and research related to high-voltage lithium-ion batteries involved in high-speed, high-severity crashes.

Accordingly, the NTSB makes the following safety recommendation to the BMW Group (the recommendation applies to BMW and MINI electric vehicles). Additional information regarding the recommendation can be found in the noted section of the report.

Model your emergency response guides on International Organization for Standardization standard 17840, as included in SAE International recommended practice J2990, and incorporate vehicle-specific information on (1) fighting high-voltage lithium-ion battery fires; (2) mitigating thermal runaway and the risk of high-voltage lithium-ion battery reignition; (3) mitigating the risks associated with stranded energy in high-voltage lithium-ion batteries, both during the initial emergency response and before moving a damaged electric vehicle from the scene; and (4) safely storing an electric vehicle that has a damaged high-voltage lithium-ion battery. (H-20-32) (See section 5.1.6.)

The NTSB is vitally interested in this recommendation because it is designed to reduce safety risks and save lives. We would appreciate a response within 90 days of the date of this letter, detailing the actions you have taken or intend to take to implement the recommendation. When replying, please refer to the safety recommendation by number (Safety Recommendation H-20-32). We encourage you to submit your response to ExecutiveSecretariat@ntsb.gov. If your reply exceeds 20 megabytes, including attachments, please e-mail us at the same address for instructions. Please do not submit both an electronic copy and a hard copy of the same response.

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Sincerely,

Robert L. Sumwalt, III
Chairman

January 13, 2021

Mr. Patrick Duan
Vice President, Operations
BYD Motors

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National Transportation Safety Board

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Office of the Chairman

January 13, 2021

Mr. Patrick Duan
Vice President, Operations
BYD Motors
1800 S. Figueroa
Los Angeles, CA 90015

Dear Mr. Duan:

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant accidents in other modes of transportation—railroad, highway, marine, and pipeline. We determine the probable cause of the accidents and issue safety recommendations aimed at preventing future accidents. In addition, we carry out special studies concerning transportation safety and coordinate the resources of the federal government and other organizations to assist victims and their family members affected by major transportation disasters.

We are providing the following information to urge BYD Motors to act on the safety recommendation in this letter because we believe your organization can help improve transportation safety and save lives. For more information about the NTSB and our recommendation process, please see the attached one-page summary.

This letter also includes information about our November 13, 2020, report titled *Safety Risks to Emergency Responders from Lithium-Ion Battery Fires in Electric Vehicles* (SR-20/01). The details of the NTSB's investigation and the resulting safety recommendations may be found in the attached report, which can also be accessed at <http://www.nts.gov>.

As a result of its investigation, the NTSB identified the following safety issues:

- Inadequacy of vehicle manufacturers' emergency response guides for minimizing the risks to emergency personnel who respond to high-voltage lithium-ion battery fires in electric vehicles.
- Gaps in safety standards and research related to high-voltage lithium-ion batteries involved in high-speed, high-severity crashes.

Accordingly, the NTSB makes the following safety recommendation to BYD Motors. Additional information regarding the recommendation can be found in the noted section of the report.

Model your emergency response guides on International Organization for Standardization standard 17840, as included in SAE International recommended practice J2990, and incorporate vehicle-specific information on (1) fighting high-voltage lithium-ion battery fires; (2) mitigating thermal runaway and the risk of high-voltage lithium-ion battery reignition; (3) mitigating the risks associated with stranded energy in high-voltage lithium-ion batteries, both during the initial emergency response and before moving a damaged electric vehicle from the scene; and (4) safely storing an electric vehicle that has a damaged high-voltage lithium-ion battery. (H-20-32) (See section 5.1.6.)

The NTSB is vitally interested in this recommendation because it is designed to reduce safety risks and save lives. We would appreciate a response within 90 days of the date of this letter, detailing the actions you have taken or intend to take to implement the recommendation. When replying, please refer to the safety recommendation by number (Safety Recommendation H-20-32). We encourage you to submit your response to ExecutiveSecretariat@ntsb.gov. If your reply exceeds 20 megabytes, including attachments, please e-mail us at the same address for instructions. Please do not submit both an electronic copy and a hard copy of the same response.

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Sincerely,

[Original Signed]

Robert L. Sumwalt, III
Chairman

January 13, 2021

Mr. Mark Chernoby
Chief Technical Compliance Officer
FCA Group

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant accidents in other modes of transportation—railroad, highway, marine, and pipeline. We determine the probable cause of the accidents and issue safety recommendations aimed at preventing future accidents. In addition, we carry out special studies concerning transportation safety and coordinate the resources of the federal government and other organizations to provide assistance to victims and their family members affected by major transportation disasters.

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National Transportation Safety Board

Washington, D.C. 20594

Office of the Chairman

January 13, 2021

Mr. Mark Chernoby
Chief Technical Compliance Officer
FCA Group
1000 Chrysler Drive
Auburn Hills, MI 48326

Dear Mr. Chernoby:

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant accidents in other modes of transportation—railroad, highway, marine, and pipeline. We determine the probable cause of the accidents and issue safety recommendations aimed at preventing future accidents. In addition, we carry out special studies concerning transportation safety and coordinate the resources of the federal government and other organizations to assist victims and their family members affected by major transportation disasters.

We are providing the following information to urge the FCA Group to act on the safety recommendation in this letter because we believe your organization can help improve transportation safety and save lives. For more information about the NTSB and our recommendation process, please see the attached one-page summary.

This letter also includes information about our November 13, 2020, report titled *Safety Risks to Emergency Responders from Lithium-Ion Battery Fires in Electric Vehicles* (SR-20/01). The details of the NTSB's investigation and the resulting safety recommendations may be found in the attached report, which can also be accessed at <http://www.nts.gov>.

As a result of its investigation, the NTSB identified the following safety issues:

- Inadequacy of vehicle manufacturers' emergency response guides for minimizing the risks to emergency personnel who respond to high-voltage lithium-ion battery fires in electric vehicles.
- Gaps in safety standards and research related to high-voltage lithium-ion batteries involved in high-speed, high-severity crashes.

Accordingly, the NTSB makes the following safety recommendation to the FCA Group (the recommendation applies to Chrysler and Fiat electric vehicles). Additional information regarding the recommendation can be found in the noted section of the report.

Model your emergency response guides on International Organization for Standardization standard 17840, as included in SAE International recommended practice J2990, and incorporate vehicle-specific information on (1) fighting high-voltage lithium-ion battery fires; (2) mitigating thermal runaway and the risk of high-voltage lithium-ion battery reignition; (3) mitigating the risks associated with stranded energy in high-voltage lithium-ion batteries, both during the initial emergency response and before moving a damaged electric vehicle from the scene; and (4) safely storing an electric vehicle that has a damaged high-voltage lithium-ion battery. (H-20-32) (See section 5.1.6.)

The NTSB is vitally interested in this recommendation because it is designed to reduce safety risks and save lives. We would appreciate a response within 90 days of the date of this letter, detailing the actions you have taken or intend to take to implement the recommendation. When replying, please refer to the safety recommendation by number (Safety Recommendation H-20-32). We encourage you to submit your response to ExecutiveSecretariat@ntsb.gov. If your reply exceeds 20 megabytes, including attachments, please e-mail us at the same address for instructions. Please do not submit both an electronic copy and a hard copy of the same response.

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Sincerely,

[Original Signed]

Robert L. Sumwalt, III
Chairman

January 13, 2021

Mr. Desi Ujkashevic
Global Director, Automotive Safety Office
Ford Motor Company

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Office of the Chairman

January 13, 2021

Mr. Desi Ujkashevic
Global Director, Automotive Safety Office
Ford Motor Company
Fairlane Plaza South, Suite 400
330 Town Center Drive
Dearborn, MI 48126-2738

Dear Mr. Ujkashevic:

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant accidents in other modes of transportation—railroad, highway, marine, and pipeline. We determine the probable cause of the accidents and issue safety recommendations aimed at preventing future accidents. In addition, we carry out special studies concerning transportation safety and coordinate the resources of the federal government and other organizations to assist victims and their family members affected by major transportation disasters.

We are providing the following information to urge Ford Motor Company to act on the safety recommendation in this letter because we believe your organization can help improve transportation safety and save lives. For more information about the NTSB and our recommendation process, please see the attached one-page summary.

This letter also includes information about our November 13, 2020, report titled *Safety Risks to Emergency Responders from Lithium-Ion Battery Fires in Electric Vehicles* (SR-20/01). The details of the NTSB's investigation and the resulting safety recommendations may be found in the attached report, which can also be accessed at <http://www.nts.gov>.

As a result of its investigation, the NTSB identified the following safety issues:

- Inadequacy of vehicle manufacturers' emergency response guides for minimizing the risks to emergency personnel who respond to high-voltage lithium-ion battery fires in electric vehicles.
- Gaps in safety standards and research related to high-voltage lithium-ion batteries involved in high-speed, high-severity crashes.

Accordingly, the NTSB makes the following safety recommendation to Ford Motor Company (the recommendation applies to Ford and Lincoln electric vehicles). Additional information regarding the recommendation can be found in the noted section of the report.

Model your emergency response guides on International Organization for Standardization standard 17840, as included in SAE International recommended practice J2990, and incorporate vehicle-specific information on (1) fighting high-voltage lithium-ion battery fires; (2) mitigating thermal runaway and the risk of high-voltage lithium-ion battery reignition; (3) mitigating the risks associated with stranded energy in high-voltage lithium-ion batteries, both during the initial emergency response and before moving a damaged electric vehicle from the scene; and (4) safely storing an electric vehicle that has a damaged high-voltage lithium-ion battery. (H-20-32) (See section 5.1.6.)

The NTSB is vitally interested in this recommendation because it is designed to reduce safety risks and save lives. We would appreciate a response within 90 days of the date of this letter, detailing the actions you have taken or intend to take to implement the recommendation. When replying, please refer to the safety recommendation by number (Safety Recommendation H-20-32). We encourage you to submit your response to ExecutiveSecretariat@ntsb.gov. If your reply exceeds 20 megabytes, including attachments, please e-mail us at the same address for instructions. Please do not submit both an electronic copy and a hard copy of the same response.

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Sincerely,

[Original Signed]

Robert L. Sumwalt, III
Chairman

January 13, 2021

Ms. Regina Carto
Executive Director, Global Safety Field Investigations and Systems Engineering
General Motors Company

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Office of the Chairman

January 13, 2021

Ms. Regina Carto
Executive Director, Global Safety Field Investigations and Systems Engineering
General Motors Company
Sloan Engineering Center, GM Global Technical Center
Warren, MI 48092-2025

Dear Ms. Carto:

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant accidents in other modes of transportation—railroad, highway, marine, and pipeline. We determine the probable cause of the accidents and issue safety recommendations aimed at preventing future accidents. In addition, we carry out special studies concerning transportation safety and coordinate the resources of the federal government and other organizations to assist victims and their family members affected by major transportation disasters.

We are providing the following information to urge General Motors Company to act on the safety recommendation in this letter because we believe your organization can help improve transportation safety and save lives. For more information about the NTSB and our recommendation process, please see the attached one-page summary.

This letter also includes information about our November 13, 2020, report titled *Safety Risks to Emergency Responders from Lithium-Ion Battery Fires in Electric Vehicles* (SR-20/01). The details of the NTSB's investigation and the resulting safety recommendations may be found in the attached report, which can also be accessed at <http://www.nts.gov>.

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- Inadequacy of vehicle manufacturers' emergency response guides for minimizing the risks to emergency personnel who respond to high-voltage lithium-ion battery fires in electric vehicles.
- Gaps in safety standards and research related to high-voltage lithium-ion batteries involved in high-speed, high-severity crashes.

Accordingly, the NTSB makes the following safety recommendation to General Motors Company (the recommendation applies to Buick, Cadillac, Chevrolet, and GMC electric vehicles). Additional information regarding the recommendation can be found in the noted section of the report.

Model your emergency response guides on International Organization for Standardization standard 17840, as included in SAE International recommended practice J2990, and incorporate vehicle-specific information on (1) fighting high-voltage lithium-ion battery fires; (2) mitigating thermal runaway and the risk of high-voltage lithium-ion battery reignition; (3) mitigating the risks associated with stranded energy in high-voltage lithium-ion batteries, both during the initial emergency response and before moving a damaged electric vehicle from the scene; and (4) safely storing an electric vehicle that has a damaged high-voltage lithium-ion battery. (H-20-32) (See section 5.1.6.)

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Robert L. Sumwalt, III
Chairman

January 13, 2021

Mr. Greg Vismara
Vice President Engineering
Gillig LLC

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The NTSB is vitally interested in these recommendations because they are designed to prevent accidents and save lives. We would appreciate a response within 90 days of the date of this letter, detailing the actions you have taken or intend to take to implement these recommendations. When replying, please refer to the safety recommendations by number (for example, H-20-32). We encourage you to submit your response to ExecutiveSecretariat@ntsb.gov. If your reply exceeds 20 megabytes, including attachments, please e-mail us at the same address for instructions on how to send larger documents. Please do not submit both an electronic copy and a hard copy of the same response.

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National Transportation Safety Board

Washington, D.C. 20594

Office of the Chairman

January 13, 2021

Mr. Greg Vismara
Vice President Engineering
Gillig LLC
451 Discovery Drive
Livermore, CA 94551

Dear Mr. Vismara:

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant accidents in other modes of transportation—railroad, highway, marine, and pipeline. We determine the probable cause of the accidents and issue safety recommendations aimed at preventing future accidents. In addition, we carry out special studies concerning transportation safety and coordinate the resources of the federal government and other organizations to assist victims and their family members affected by major transportation disasters.

We are providing the following information to urge Gillig LLC to act on the safety recommendation in this letter because we believe your organization can help improve transportation safety and save lives. For more information about the NTSB and our recommendation process, please see the attached one-page summary.

This letter also includes information about our November 13, 2020, report titled *Safety Risks to Emergency Responders from Lithium-Ion Battery Fires in Electric Vehicles* (SR-20/01). The details of the NTSB's investigation and the resulting safety recommendations may be found in the attached report, which can also be accessed at <http://www.nts.gov>.

As a result of its investigation, the NTSB identified the following safety issues:

- Inadequacy of vehicle manufacturers' emergency response guides for minimizing the risks to emergency personnel who respond to high-voltage lithium-ion battery fires in electric vehicles.
- Gaps in safety standards and research related to high-voltage lithium-ion batteries involved in high-speed, high-severity crashes.

Accordingly, the NTSB makes the following safety recommendation to Gillig LLC. Additional information regarding the recommendation can be found in the noted section of the report.

Model your emergency response guides on International Organization for Standardization standard 17840, as included in SAE International recommended

practice J2990, and incorporate vehicle-specific information on (1) fighting high-voltage lithium-ion battery fires; (2) mitigating thermal runaway and the risk of high-voltage lithium-ion battery reignition; (3) mitigating the risks associated with stranded energy in high-voltage lithium-ion batteries, both during the initial emergency response and before moving a damaged electric vehicle from the scene; and (4) safely storing an electric vehicle that has a damaged high-voltage lithium-ion battery. (H-20-32) (See section 5.1.6.)

The NTSB is vitally interested in this recommendation because it is designed to reduce safety risks and save lives. We would appreciate a response within 90 days of the date of this letter, detailing the actions you have taken or intend to take to implement the recommendation. When replying, please refer to the safety recommendation by number (Safety Recommendation H-20-32). We encourage you to submit your response to ExecutiveSecretariat@ntsb.gov. If your reply exceeds 20 megabytes, including attachments, please e-mail us at the same address for instructions. Please do not submit both an electronic copy and a hard copy of the same response.

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Sincerely,

[Original Signed]

Robert L. Sumwalt, III
Chairman

January 13, 2021

Mr. Dave Gardner
Executive Vice President of National Operations
American Honda Motor Company, Inc.

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant accidents in other modes of transportation—railroad, highway, marine, and pipeline. We determine the probable cause of the accidents and issue safety recommendations aimed at preventing future accidents. In addition, we carry out special studies concerning transportation safety and coordinate the resources of the federal government and other organizations to provide assistance to victims and their family members affected by major transportation disasters.

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National Transportation Safety Board

Washington, D.C. 20594

Office of the Chairman

January 13, 2021

Mr. Dave Gardner
Executive Vice President of National Operations
American Honda Motor Company, Inc.
1919 Torrance Boulevard
Torrance, CA 90501

Dear Mr. Gardner:

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant accidents in other modes of transportation—railroad, highway, marine, and pipeline. We determine the probable cause of the accidents and issue safety recommendations aimed at preventing future accidents. In addition, we carry out special studies concerning transportation safety and coordinate the resources of the federal government and other organizations to assist victims and their family members affected by major transportation disasters.

We are providing the following information to urge American Honda Motor Company to act on the safety recommendation in this letter because we believe your organization can help improve transportation safety and save lives. For more information about the NTSB and our recommendation process, please see the attached one-page summary.

This letter also includes information about our November 13, 2020, report titled *Safety Risks to Emergency Responders from Lithium-Ion Battery Fires in Electric Vehicles* (SR-20/01). The details of the NTSB's investigation and the resulting safety recommendations may be found in the attached report, which can also be accessed at <http://www.nts.gov>.

As a result of its investigation, the NTSB identified the following safety issues:

- Inadequacy of vehicle manufacturers' emergency response guides for minimizing the risks to emergency personnel who respond to high-voltage lithium-ion battery fires in electric vehicles.
- Gaps in safety standards and research related to high-voltage lithium-ion batteries involved in high-speed, high-severity crashes.

Accordingly, the NTSB makes the following safety recommendation to American Honda Motor Company (the recommendation applies to Honda and Acura electric vehicles). Additional information regarding the recommendation can be found in the noted section of the report.

Model your emergency response guides on International Organization for Standardization standard 17840, as included in SAE International recommended practice J2990, and incorporate vehicle-specific information on (1) fighting high-voltage lithium-ion battery fires; (2) mitigating thermal runaway and the risk of high-voltage lithium-ion battery reignition; (3) mitigating the risks associated with stranded energy in high-voltage lithium-ion batteries, both during the initial emergency response and before moving a damaged electric vehicle from the scene; and (4) safely storing an electric vehicle that has a damaged high-voltage lithium-ion battery. (H-20-32) (See section 5.1.6.)

The NTSB is vitally interested in this recommendation because it is designed to reduce safety risks and save lives. We would appreciate a response within 90 days of the date of this letter, detailing the actions you have taken or intend to take to implement the recommendation. When replying, please refer to the safety recommendation by number (Safety Recommendation H-20-32). We encourage you to submit your response to ExecutiveSecretariat@ntsb.gov. If your reply exceeds 20 megabytes, including attachments, please e-mail us at the same address for instructions. Please do not submit both an electronic copy and a hard copy of the same response.

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Sincerely,

[Original Signed]

Robert L. Sumwalt, III
Chairman

January 13, 2021

Brian Latouf
Chief Safety Officer
Hyundai Motor North America

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant accidents in other modes of transportation—railroad, highway, marine, and pipeline. We determine the probable cause of the accidents and issue safety recommendations aimed at preventing future accidents. In addition, we carry out special studies concerning transportation safety and coordinate the resources of the federal government and other organizations to provide assistance to victims and their family members affected by major transportation disasters.

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National Transportation Safety Board

Washington, D.C. 20594

Office of the Chairman

January 13, 2021

Brian Latouf
Chief Safety Officer
Hyundai Motor North America
10550 Talbert Avenue
Fountain Valley, CA 92709

Dear Mr. Latouf:

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant accidents in other modes of transportation—railroad, highway, marine, and pipeline. We determine the probable cause of the accidents and issue safety recommendations aimed at preventing future accidents. In addition, we carry out special studies concerning transportation safety and coordinate the resources of the federal government and other organizations to assist victims and their family members affected by major transportation disasters.

We are providing the following information to urge Hyundai Motor North America to act on the safety recommendation in this letter because we believe your organization can help improve transportation safety and save lives. For more information about the NTSB and our recommendation process, please see the attached one-page summary.

This letter also includes information about our November 13, 2020, report titled *Safety Risks to Emergency Responders from Lithium-Ion Battery Fires in Electric Vehicles* (SR-20/01). The details of the NTSB's investigation and the resulting safety recommendations may be found in the attached report, which can also be accessed at <http://www.nts.gov>.

As a result of its investigation, the NTSB identified the following safety issues:

- Inadequacy of vehicle manufacturers' emergency response guides for minimizing the risks to emergency personnel who respond to high-voltage lithium-ion battery fires in electric vehicles.
- Gaps in safety standards and research related to high-voltage lithium-ion batteries involved in high-speed, high-severity crashes.

Accordingly, the NTSB makes the following safety recommendation to Hyundai Motor North America. Additional information regarding the recommendation can be found in the noted section of the report.

Model your emergency response guides on International Organization for Standardization standard 17840, as included in SAE International recommended

practice J2990, and incorporate vehicle-specific information on (1) fighting high-voltage lithium-ion battery fires; (2) mitigating thermal runaway and the risk of high-voltage lithium-ion battery reignition; (3) mitigating the risks associated with stranded energy in high-voltage lithium-ion batteries, both during the initial emergency response and before moving a damaged electric vehicle from the scene; and (4) safely storing an electric vehicle that has a damaged high-voltage lithium-ion battery. (H-20-32) (See section 5.1.6.)

The NTSB is vitally interested in this recommendation because it is designed to reduce safety risks and save lives. We would appreciate a response within 90 days of the date of this letter, detailing the actions you have taken or intend to take to implement the recommendation. When replying, please refer to the safety recommendation by number (Safety Recommendation H-20-32). We encourage you to submit your response to ExecutiveSecretariat@ntsb.gov. If your reply exceeds 20 megabytes, including attachments, please e-mail us at the same address for instructions. Please do not submit both an electronic copy and a hard copy of the same response.

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Sincerely,

[Original Signed]

Robert L. Sumwalt, III
Chairman

January 14, 2021

Dr. Lance Zhou
Chief Executive Officer
Karma Automotive LLC

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant accidents in other modes of transportation—railroad, highway, marine, and pipeline. We determine the probable cause of the accidents and issue safety recommendations aimed at preventing future accidents. In addition, we carry out special studies concerning transportation safety and coordinate the resources of the federal government and other organizations to provide assistance to victims and their family members affected by major transportation disasters.

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National Transportation Safety Board

Washington, D.C. 20594

Office of the Chairman

January 13, 2021

Dr. Lance Zhou
Chief Executive Officer
Karma Automotive LLC
9950 Jeronimo Road
Irvine, CA 92618

Dear Dr. Zhou:

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We are providing the following information to urge Karma Automotive to act on the safety recommendation in this letter because we believe your organization can help improve transportation safety and save lives. For more information about the NTSB and our recommendation process, please see the attached one-page summary.

This letter also includes information about our November 13, 2020, report titled *Safety Risks to Emergency Responders from Lithium-Ion Battery Fires in Electric Vehicles* (SR-20/01). The details of the NTSB's investigation and the resulting safety recommendations may be found in the attached report, which can also be accessed at <http://www.nts.gov>.

As a result of its investigation, the NTSB identified the following safety issues:

- Inadequacy of vehicle manufacturers' emergency response guides for minimizing the risks to emergency personnel who respond to high-voltage lithium-ion battery fires in electric vehicles.
- Gaps in safety standards and research related to high-voltage lithium-ion batteries involved in high-speed, high-severity crashes.

Accordingly, the NTSB makes the following safety recommendation to Karma Automotive. Additional information regarding the recommendation can be found in the noted section of the report.

Model your emergency response guides on International Organization for Standardization standard 17840, as included in SAE International recommended practice J2990, and incorporate vehicle-specific information on (1) fighting high-voltage lithium-ion battery fires; (2) mitigating thermal runaway and the risk of high-voltage lithium-ion battery reignition; (3) mitigating the risks associated with stranded energy in high-voltage lithium-ion batteries, both during the initial emergency response and before moving a damaged electric vehicle from the scene; and (4) safely storing an electric vehicle that has a damaged high-voltage lithium-ion battery. (H-20-32) (See section 5.1.6.)

The NTSB is vitally interested in this recommendation because it is designed to reduce safety risks and save lives. We would appreciate a response within 90 days of the date of this letter, detailing the actions you have taken or intend to take to implement the recommendation. When replying, please refer to the safety recommendation by number (Safety Recommendation H-20-32). We encourage you to submit your response to ExecutiveSecretariat@ntsb.gov. If your reply exceeds 20 megabytes, including attachments, please e-mail us at the same address for instructions. Please do not submit both an electronic copy and a hard copy of the same response.

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Sincerely,

[Original Signed]

Robert L. Sumwalt, III
Chairman

January 13, 2021

Mr. Lewis Thompson
Senior Service Information and Equipment Manager
Kia University

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant accidents in other modes of transportation—railroad, highway, marine, and pipeline. We determine the probable cause of the accidents and issue safety recommendations aimed at preventing future accidents. In addition, we carry out special studies concerning transportation safety and coordinate the resources of the federal government and other organizations to provide assistance to victims and their family members affected by major transportation disasters.

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National Transportation Safety Board

Washington, D.C. 20594

Office of the Chairman

January 13, 2021

Mr. Lewis Thompson
Senior Service Information and Equipment Manager
Kia University
111 Peters Canyon Road
Irvine, CA 92606

Dear Mr. Thompson:

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We are providing the following information to urge Kia Motors to act on the safety recommendation in this letter because we believe your organization can help improve transportation safety and save lives. For more information about the NTSB and our recommendation process, please see the attached one-page summary.

This letter also includes information about our November 13, 2020, report titled *Safety Risks to Emergency Responders from Lithium-Ion Battery Fires in Electric Vehicles* (SR-20/01). The details of the NTSB's investigation and the resulting safety recommendations may be found in the attached report, which can also be accessed at <http://www.nts.gov>.

As a result of its investigation, the NTSB identified the following safety issues:

- Inadequacy of vehicle manufacturers' emergency response guides for minimizing the risks to emergency personnel who respond to high-voltage lithium-ion battery fires in electric vehicles.
- Gaps in safety standards and research related to high-voltage lithium-ion batteries involved in high-speed, high-severity crashes.

Accordingly, the NTSB makes the following safety recommendation to Kia Motors. Additional information regarding the recommendation can be found in the noted section of the report.

Model your emergency response guides on International Organization for Standardization standard 17840, as included in SAE International recommended practice J2990, and incorporate vehicle-specific information on (1) fighting high-voltage lithium-ion battery fires; (2) mitigating thermal runaway and the risk of high-voltage lithium-ion battery reignition; (3) mitigating the risks associated with stranded energy in high-voltage lithium-ion batteries, both during the initial emergency response and before moving a damaged electric vehicle from the scene; and (4) safely storing an electric vehicle that has a damaged high-voltage lithium-ion battery. (H-20-32) (See section 5.1.6.)

The NTSB is vitally interested in this recommendation because it is designed to reduce safety risks and save lives. We would appreciate a response within 90 days of the date of this letter, detailing the actions you have taken or intend to take to implement the recommendation. When replying, please refer to the safety recommendation by number (Safety Recommendation H-20-32). We encourage you to submit your response to ExecutiveSecretariat@ntsb.gov. If your reply exceeds 20 megabytes, including attachments, please e-mail us at the same address for instructions. Please do not submit both an electronic copy and a hard copy of the same response.

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Sincerely,

[Original Signed]

Robert L. Sumwalt, III
Chairman

January 13, 2021

Mr. Bernhard Glaser
Director of Product Management
Mercedes-Benz, AMG, Maybach, and smart
Mercedes-Benz USA, LLC

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant accidents in other modes of transportation—railroad, highway, marine, and pipeline. We determine the probable cause of the accidents and issue safety recommendations aimed at preventing future accidents. In addition, we carry out special studies concerning transportation safety and coordinate the resources of the federal government and other organizations to provide assistance to victims and their family members affected by major transportation disasters.

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Office of the Chairman

January 13, 2021

Mr. Bernhard Glaser
Director of Product Management
Mercedes-Benz, AMG, Maybach, and smart
Mercedes-Benz USA, LLC
1 Mercedes-Benz Drive
Sandy Springs, GA 30328

Dear Mr. Glaser:

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant accidents in other modes of transportation—railroad, highway, marine, and pipeline. We determine the probable cause of the accidents and issue safety recommendations aimed at preventing future accidents. In addition, we carry out special studies concerning transportation safety and coordinate the resources of the federal government and other organizations to assist victims and their family members affected by major transportation disasters.

We are providing the following information to urge Mercedes-Benz USA to act on the safety recommendation in this letter because we believe your organization can help improve transportation safety and save lives. For more information about the NTSB and our recommendation process, please see the attached one-page summary.

This letter also includes information about our November 13, 2020, report titled *Safety Risks to Emergency Responders from Lithium-Ion Battery Fires in Electric Vehicles* (SR-20/01). The details of the NTSB's investigation and the resulting safety recommendations may be found in the attached report, which can also be accessed at <http://www.nts.gov>.

As a result of its investigation, the NTSB identified the following safety issues:

- Inadequacy of vehicle manufacturers' emergency response guides for minimizing the risks to emergency personnel who respond to high-voltage lithium-ion battery fires in electric vehicles.
- Gaps in safety standards and research related to high-voltage lithium-ion batteries involved in high-speed, high-severity crashes.

Accordingly, the NTSB makes the following safety recommendation to Mercedes-Benz USA. Additional information regarding the recommendation can be found in the noted section of the report.

Model your emergency response guides on International Organization for Standardization standard 17840, as included in SAE International recommended practice J2990, and incorporate vehicle-specific information on (1) fighting high-voltage lithium-ion battery fires; (2) mitigating thermal runaway and the risk of high-voltage lithium-ion battery reignition; (3) mitigating the risks associated with stranded energy in high-voltage lithium-ion batteries, both during the initial emergency response and before moving a damaged electric vehicle from the scene; and (4) safely storing an electric vehicle that has a damaged high-voltage lithium-ion battery. (H-20-32) (See section 5.1.6.)

The NTSB is vitally interested in this recommendation because it is designed to reduce safety risks and save lives. We would appreciate a response within 90 days of the date of this letter, detailing the actions you have taken or intend to take to implement the recommendation. When replying, please refer to the safety recommendation by number (Safety Recommendation H-20-32). We encourage you to submit your response to ExecutiveSecretariat@ntsb.gov. If your reply exceeds 20 megabytes, including attachments, please e-mail us at the same address for instructions. Please do not submit both an electronic copy and a hard copy of the same response.

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Sincerely,

[Original Signed]

Robert L. Sumwalt, III
Chairman

January 13, 2021

Mr. Stephane Thiriez
Director, Regulatory Affairs
Mitsubishi Motors R&D of America, Inc.

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant accidents in other modes of transportation—railroad, highway, marine, and pipeline. We determine the probable cause of the accidents and issue safety recommendations aimed at preventing future accidents. In addition, we carry out special studies concerning transportation safety and coordinate the resources of the federal government and other organizations to provide assistance to victims and their family members affected by major transportation disasters.

The attached letter from the NTSB Chairman provides information about the NTSB's November 13, 2020, report *Safety Risks to Emergency Responders from Lithium-Ion Battery Fires in Electric Vehicles* (SR-20/01). The details of this accident investigation and the resulting safety recommendations may be found in the attached report, which can also be accessed at <http://www.nts.gov>. For more information about NTSB and our recommendation process, please see the attached one-page summary.

The NTSB is vitally interested in these recommendations because they are designed to prevent accidents and save lives. We would appreciate a response within 90 days of the date of this letter, detailing the actions you have taken or intend to take to implement these recommendations. When replying, please refer to the safety recommendations by number (for example, H-20-32). We encourage you to submit your response to ExecutiveSecretariat@ntsb.gov. If your reply exceeds 20 megabytes, including attachments, please e-mail us at the same address for instructions on how to send larger documents. Please do not submit both an electronic copy and a hard copy of the same response.

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National Transportation Safety Board
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National Transportation Safety Board

Washington, D.C. 20594

Office of the Chairman

January 13, 2021

Mr. Stephane Thiriez
Director, Regulatory Affairs
Mitsubishi Motors R&D of America, Inc.
2200 Clarendon Boulevard, Suite 1401
Arlington, VA 22201

Dear Mr. Thiriez:

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant accidents in other modes of transportation—railroad, highway, marine, and pipeline. We determine the probable cause of the accidents and issue safety recommendations aimed at preventing future accidents. In addition, we carry out special studies concerning transportation safety and coordinate the resources of the federal government and other organizations to assist victims and their family members affected by major transportation disasters.

We are providing the following information to urge Mitsubishi Motors to act on the safety recommendation in this letter because we believe your organization can help improve transportation safety and save lives. For more information about the NTSB and our recommendation process, please see the attached one-page summary.

This letter also includes information about our November 13, 2020, report titled *Safety Risks to Emergency Responders from Lithium-Ion Battery Fires in Electric Vehicles* (SR-20/01). The details of the NTSB's investigation and the resulting safety recommendations may be found in the attached report, which can also be accessed at <http://www.nts.gov>.

As a result of its investigation, the NTSB identified the following safety issues:

- Inadequacy of vehicle manufacturers' emergency response guides for minimizing the risks to emergency personnel who respond to high-voltage lithium-ion battery fires in electric vehicles.
- Gaps in safety standards and research related to high-voltage lithium-ion batteries involved in high-speed, high-severity crashes.

Accordingly, the NTSB makes the following safety recommendation to Mitsubishi Motors. Additional information regarding the recommendation can be found in the noted section of the report.

Model your emergency response guides on International Organization for Standardization standard 17840, as included in SAE International recommended

practice J2990, and incorporate vehicle-specific information on (1) fighting high-voltage lithium-ion battery fires; (2) mitigating thermal runaway and the risk of high-voltage lithium-ion battery reignition; (3) mitigating the risks associated with stranded energy in high-voltage lithium-ion batteries, both during the initial emergency response and before moving a damaged electric vehicle from the scene; and (4) safely storing an electric vehicle that has a damaged high-voltage lithium-ion battery. (H-20-32) (See section 5.1.6.)

The NTSB is vitally interested in this recommendation because it is designed to reduce safety risks and save lives. We would appreciate a response within 90 days of the date of this letter, detailing the actions you have taken or intend to take to implement the recommendation. When replying, please refer to the safety recommendation by number (Safety Recommendation H-20-32). We encourage you to submit your response to ExecutiveSecretariat@ntsb.gov. If your reply exceeds 20 megabytes, including attachments, please e-mail us at the same address for instructions. Please do not submit both an electronic copy and a hard copy of the same response.

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Sincerely,

[Original Signed]

Robert L. Sumwalt, III
Chairman

January 13, 2021

Mr. Chris Reed
Senior Vice President, R&D
Nissan Americas

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant accidents in other modes of transportation—railroad, highway, marine, and pipeline. We determine the probable cause of the accidents and issue safety recommendations aimed at preventing future accidents. In addition, we carry out special studies concerning transportation safety and coordinate the resources of the federal government and other organizations to provide assistance to victims and their family members affected by major transportation disasters.

The attached letter from the NTSB Chairman provides information about the NTSB's November 13, 2020, report *Safety Risks to Emergency Responders from Lithium-Ion Battery Fires in Electric Vehicles* (SR-20/01). The details of this accident investigation and the resulting safety recommendations may be found in the attached report, which can also be accessed at <http://www.nts.gov>. For more information about NTSB and our recommendation process, please see the attached one-page summary.

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National Transportation Safety Board

Washington, D.C. 20594

Office of the Chairman

January 13, 2021

Mr. Chris Reed
Senior Vice President, R&D
Nissan Americas
39001 Sunset Drive
Farmington Hills, MI 48331

Dear Mr. Reed:

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant accidents in other modes of transportation—railroad, highway, marine, and pipeline. We determine the probable cause of the accidents and issue safety recommendations aimed at preventing future accidents. In addition, we carry out special studies concerning transportation safety and coordinate the resources of the federal government and other organizations to assist victims and their family members affected by major transportation disasters.

We are providing the following information to urge Nissan Americas to act on the safety recommendation in this letter because we believe your organization can help improve transportation safety and save lives. For more information about the NTSB and our recommendation process, please see the attached one-page summary.

This letter also includes information about our November 13, 2020, report titled *Safety Risks to Emergency Responders from Lithium-Ion Battery Fires in Electric Vehicles* (SR-20/01). The details of the NTSB's investigation and the resulting safety recommendations may be found in the attached report, which can also be accessed at <http://www.nts.gov>.

As a result of its investigation, the NTSB identified the following safety issues:

- Inadequacy of vehicle manufacturers' emergency response guides for minimizing the risks to emergency personnel who respond to high-voltage lithium-ion battery fires in electric vehicles.
- Gaps in safety standards and research related to high-voltage lithium-ion batteries involved in high-speed, high-severity crashes.

Accordingly, the NTSB makes the following safety recommendation to Nissan Americas (the recommendation applies to Infiniti and Nissan electric vehicles). Additional information regarding the recommendation can be found in the noted section of the report.

Model your emergency response guides on International Organization for Standardization standard 17840, as included in SAE International recommended practice J2990, and incorporate vehicle-specific information on (1) fighting high-voltage lithium-ion battery fires; (2) mitigating thermal runaway and the risk of high-voltage lithium-ion battery reignition; (3) mitigating the risks associated with stranded energy in high-voltage lithium-ion batteries, both during the initial emergency response and before moving a damaged electric vehicle from the scene; and (4) safely storing an electric vehicle that has a damaged high-voltage lithium-ion battery. (H-20-32) (See section 5.1.6.)

The NTSB is vitally interested in this recommendation because it is designed to reduce safety risks and save lives. We would appreciate a response within 90 days of the date of this letter, detailing the actions you have taken or intend to take to implement the recommendation. When replying, please refer to the safety recommendation by number (Safety Recommendation H-20-32). We encourage you to submit your response to ExecutiveSecretariat@ntsb.gov. If your reply exceeds 20 megabytes, including attachments, please e-mail us at the same address for instructions. Please do not submit both an electronic copy and a hard copy of the same response.

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Sincerely,

[Original Signed]

Robert L. Sumwalt, III
Chairman



National Transportation Safety Board

Washington, D.C. 20594

Office of the Chairman

January 13, 2021

Mr. Tim LaFon
Vice President Regulatory Affairs
Volvo Group North America, LLC
7900 National Service Road
Greensboro, NC 27409

Dear Mr. LaFon:

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant accidents in other modes of transportation—railroad, highway, marine, and pipeline. We determine the probable cause of the accidents and issue safety recommendations aimed at preventing future accidents. In addition, we carry out special studies concerning transportation safety and coordinate the resources of the federal government and other organizations to assist victims and their family members affected by major transportation disasters.

The safety recommendation in this letter applies to electric vehicles manufactured by Nova Bus. We urge your organization to act on the safety recommendation because we believe it can help improve transportation safety and save lives. For more information about the NTSB and our recommendation process, please see the attached one-page summary.

This letter includes information about our November 13, 2020, report titled *Safety Risks to Emergency Responders from Lithium-Ion Battery Fires in Electric Vehicles* (SR-20/01). The details of the NTSB's investigation and the resulting safety recommendations may be found in the attached report, which can also be accessed at <http://www.nts.gov>.

As a result of its investigation, the NTSB identified the following safety issues:

- Inadequacy of vehicle manufacturers' emergency response guides for minimizing the risks to emergency personnel who respond to high-voltage lithium-ion battery fires in electric vehicles.
- Gaps in safety standards and research related to high-voltage lithium-ion batteries involved in high-speed, high-severity crashes.

Accordingly, the NTSB makes the following safety recommendation to Nova Bus. Additional information regarding the recommendation can be found in the noted section of the report.

Model your emergency response guides on International Organization for Standardization standard 17840, as included in SAE International recommended practice J2990, and incorporate vehicle-specific information on (1) fighting high-voltage lithium-ion battery fires; (2) mitigating thermal runaway and the risk of high-voltage lithium-ion battery reignition; (3) mitigating the risks associated with stranded energy in high-voltage lithium-ion batteries, both during the initial emergency response and before moving a damaged electric vehicle from the scene; and (4) safely storing an electric vehicle that has a damaged high-voltage lithium-ion battery. (H-20-32) (See section 5.1.6.)

The NTSB is vitally interested in this recommendation because it is designed to reduce safety risks and save lives. We would appreciate a response within 90 days of the date of this letter, detailing the actions you have taken or intend to take to implement the recommendation. When replying, please refer to the safety recommendation by number (Safety Recommendation H-20-32). We encourage you to submit your response to ExecutiveSecretariat@ntsb.gov. If your reply exceeds 20 megabytes, including attachments, please e-mail us at the same address for instructions. Please do not submit both an electronic copy and a hard copy of the same response.

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Sincerely,

[Original Signed]

Robert L. Sumwalt, III
Chairman



Office of the Chairman

National Transportation Safety Board

Washington, D.C. 20594

January 13, 2021

Mr. George Feygin
Vice President, Legal and General Counsel
Porsche Cars North America
One Porsche Drive
Atlanta, GA 30354

Dear Mr. Feygin:

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant accidents in other modes of transportation—railroad, highway, marine, and pipeline. We determine the probable cause of the accidents and issue safety recommendations aimed at preventing future accidents. In addition, we carry out special studies concerning transportation safety and coordinate the resources of the federal government and other organizations to assist victims and their family members affected by major transportation disasters.

We are providing the following information to urge Porsche Cars North America to act on the safety recommendation in this letter because we believe your organization can help improve transportation safety and save lives. For more information about the NTSB and our recommendation process, please see the attached one-page summary.

This letter also includes information about our November 13, 2020, report titled *Safety Risks to Emergency Responders from Lithium-Ion Battery Fires in Electric Vehicles* (SR-20/01). The details of the NTSB's investigation and the resulting safety recommendations may be found in the attached report, which can also be accessed at <http://www.nts.gov>.

As a result of its investigation, the NTSB identified the following safety issues:

- Inadequacy of vehicle manufacturers' emergency response guides for minimizing the risks to emergency personnel who respond to high-voltage lithium-ion battery fires in electric vehicles.
- Gaps in safety standards and research related to high-voltage lithium-ion batteries involved in high-speed, high-severity crashes.

Accordingly, the NTSB makes the following safety recommendation to Porsche Cars North America. Additional information regarding the recommendation can be found in the noted section of the report.

Model your emergency response guides on International Organization for Standardization standard 17840, as included in SAE International recommended practice J2990, and incorporate vehicle-specific information on (1) fighting high-voltage lithium-ion battery fires; (2) mitigating thermal runaway and the risk of high-voltage lithium-ion battery reignition; (3) mitigating the risks associated with stranded energy in high-voltage lithium-ion batteries, both during the initial emergency response and before moving a damaged electric vehicle from the scene; and (4) safely storing an electric vehicle that has a damaged high-voltage lithium-ion battery. (H-20-32) (See section 5.1.6.)

The NTSB is vitally interested in this recommendation because it is designed to reduce safety risks and save lives. We would appreciate a response within 90 days of the date of this letter, detailing the actions you have taken or intend to take to implement the recommendation. When replying, please refer to the safety recommendation by number (Safety Recommendation H-20-32). We encourage you to submit your response to ExecutiveSecretariat@ntsb.gov. If your reply exceeds 20 megabytes, including attachments, please e-mail us at the same address for instructions. Please do not submit both an electronic copy and a hard copy of the same response.

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Sincerely,

[Original Signed]

Robert L. Sumwalt, III
Chairman

January 13, 2021

Mr. Rick Huibregtse
Senior Vice President of Engineering
Proterra

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant accidents in other modes of transportation—railroad, highway, marine, and pipeline. We determine the probable cause of the accidents and issue safety recommendations aimed at preventing future accidents. In addition, we carry out special studies concerning transportation safety and coordinate the resources of the federal government and other organizations to provide assistance to victims and their family members affected by major transportation disasters. The attached letter from the NTSB Chairman provides information about the NTSB's November 13, 2020, report *Safety Risks to Emergency Responders from Lithium-Ion Battery Fires in Electric Vehicles* (SR-20/01). The details of this accident investigation and the resulting safety recommendations may be found in the attached report, which can also be accessed at <http://www.nts.gov>. For more information about NTSB and our recommendation process, please see the attached one-page summary.

The NTSB is vitally interested in these recommendations because they are designed to prevent accidents and save lives. We would appreciate a response within 90 days of the date of this letter, detailing the actions you have taken or intend to take to implement these recommendations. When replying, please refer to the safety recommendations by number (for example, H-20-32). We encourage you to submit your response to ExecutiveSecretariat@ntsb.gov. If your reply exceeds 20 megabytes, including attachments, please e-mail us at the same address for instructions on how to send larger documents. Please do not submit both an electronic copy and a hard copy of the same response.

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National Transportation Safety Board

Washington, D.C. 20594

Office of the Chairman

January 13, 2021

Mr. Rick Huibregtse
Senior Vice President of Engineering
Proterra

383 Cheryl Lane
City of Industry, CA 91789

Dear Mr. Huibregtse:

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant accidents in other modes of transportation—railroad, highway, marine, and pipeline. We determine the probable cause of the accidents and issue safety recommendations aimed at preventing future accidents. In addition, we carry out special studies concerning transportation safety and coordinate the resources of the federal government and other organizations to assist victims and their family members affected by major transportation disasters.

We are providing the following information to urge Proterra to act on the safety recommendation in this letter because we believe your organization can help improve transportation safety and save lives. For more information about the NTSB and our recommendation process, please see the attached one-page summary.

This letter also includes information about our November 13, 2020, report titled *Safety Risks to Emergency Responders from Lithium-Ion Battery Fires in Electric Vehicles* (SR-20/01). The details of the NTSB's investigation and the resulting safety recommendations may be found in the attached report, which can also be accessed at <http://www.nts.gov>.

As a result of its investigation, the NTSB identified the following safety issues:

- Inadequacy of vehicle manufacturers' emergency response guides for minimizing the risks to emergency personnel who respond to high-voltage lithium-ion battery fires in electric vehicles.
- Gaps in safety standards and research related to high-voltage lithium-ion batteries involved in high-speed, high-severity crashes.

Accordingly, the NTSB makes the following safety recommendation to Proterra, Inc. Additional information regarding the recommendation can be found in the noted section of the report.

Model your emergency response guides on International Organization for Standardization standard 17840, as included in SAE International recommended practice J2990, and incorporate vehicle-specific information on (1) fighting high-voltage lithium-ion battery fires; (2) mitigating thermal runaway and the risk of high-voltage lithium-ion battery reignition; (3) mitigating the risks associated with stranded energy in high-voltage lithium-ion batteries, both during the initial emergency response and before moving a damaged electric vehicle from the scene; and (4) safely storing an electric vehicle that has a damaged high-voltage lithium-ion battery. (H-20-32) (See section 5.1.6.)

The NTSB is vitally interested in this recommendation because it is designed to reduce safety risks and save lives. We would appreciate a response within 90 days of the date of this letter, detailing the actions you have taken or intend to take to implement the recommendation. When replying, please refer to the safety recommendation by number (Safety Recommendation H-20-32). We encourage you to submit your response to ExecutiveSecretariat@ntsb.gov. If your reply exceeds 20 megabytes, including attachments, please e-mail us at the same address for instructions. Please do not submit both an electronic copy and a hard copy of the same response.

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Sincerely,

[Original Signed]

Robert L. Sumwalt, III
Chairman

January 13, 2021

Ms. Joanna Foust
Vice President, Government Affairs
North American Subaru, Inc.

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant accidents in other modes of transportation—railroad, highway, marine, and pipeline. We determine the probable cause of the accidents and issue safety recommendations aimed at preventing future accidents. In addition, we carry out special studies concerning transportation safety and coordinate the resources of the federal government and other organizations to provide assistance to victims and their family members affected by major transportation disasters.

The attached letter from the NTSB Chairman provides information about the NTSB's November 13, 2020, report *Safety Risks to Emergency Responders from Lithium-Ion Battery Fires in Electric Vehicles* (SR-20/01). The details of this accident investigation and the resulting safety recommendations may be found in the attached report, which can also be accessed at <http://www.nts.gov>. For more information about NTSB and our recommendation process, please see the attached one-page summary.

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National Transportation Safety Board

Washington, D.C. 20594

Office of the Chairman

January 13, 2021

Ms. Joanna Foust
Vice President, Government Affairs
North American Subaru, Inc.
1001 G Street NW, Suite 300 East
Washington, DC 20001

Dear Ms. Foust:

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant accidents in other modes of transportation—railroad, highway, marine, and pipeline. We determine the probable cause of the accidents and issue safety recommendations aimed at preventing future accidents. In addition, we carry out special studies concerning transportation safety and coordinate the resources of the federal government and other organizations to assist victims and their family members affected by major transportation disasters.

We are providing the following information to urge North American Subaru to act on the safety recommendation in this letter because we believe your organization can help improve transportation safety and save lives. For more information about the NTSB and our recommendation process, please see the attached one-page summary.

This letter also includes information about our November 13, 2020, report titled *Safety Risks to Emergency Responders from Lithium-Ion Battery Fires in Electric Vehicles* (SR-20/01). The details of the NTSB's investigation and the resulting safety recommendations may be found in the attached report, which can also be accessed at <http://www.nts.gov>.

As a result of its investigation, the NTSB identified the following safety issues:

- Inadequacy of vehicle manufacturers' emergency response guides for minimizing the risks to emergency personnel who respond to high-voltage lithium-ion battery fires in electric vehicles.
- Gaps in safety standards and research related to high-voltage lithium-ion batteries involved in high-speed, high-severity crashes.

Accordingly, the NTSB makes the following safety recommendation to North American Subaru. Additional information regarding the recommendation can be found in the noted section of the report.

Model your emergency response guides on International Organization for Standardization standard 17840, as included in SAE International recommended practice J2990, and incorporate vehicle-specific information on (1) fighting high-voltage lithium-ion battery fires; (2) mitigating thermal runaway and the risk of high-voltage lithium-ion battery reignition; (3) mitigating the risks associated with stranded energy in high-voltage lithium-ion batteries, both during the initial emergency response and before moving a damaged electric vehicle from the scene; and (4) safely storing an electric vehicle that has a damaged high-voltage lithium-ion battery. (H-20-32) (See section 5.1.6.)

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Sincerely,

[Original Signed]

Robert L. Sumwalt, III
Chairman

January 13, 2021

Mr. Al Prescott
Vice President, Legal
Tesla, Inc.

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant accidents in other modes of transportation—railroad, highway, marine, and pipeline. We determine the probable cause of the accidents and issue safety recommendations aimed at preventing future accidents. In addition, we carry out special studies concerning transportation safety and coordinate the resources of the federal government and other organizations to provide assistance to victims and their family members affected by major transportation disasters. The attached letter from the NTSB Chairman provides information about the NTSB's November 13, 2020, report *Safety Risks to Emergency Responders from Lithium-Ion Battery Fires in Electric Vehicles* (SR-20/01). The details of this accident investigation and the resulting safety recommendations may be found in the attached report, which can also be accessed at <http://www.nts.gov>. For more information about NTSB and our recommendation process, please see the attached one-page summary.

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Executive Secretariat-crb
Office of the Managing Director
National Transportation Safety Board
490 L'Enfant Plaza SW
Washington, DC 20594
Email: ExecutiveSecretariat@ntsb.gov



National Transportation Safety Board

Washington, D.C. 20594

Office of the Chairman

January 13, 2021

Mr. Al Prescott
Vice President, Legal
Tesla, Inc.
3500 Deer Creek Road
Palo Alto, CA 94304

Dear Mr. Prescott:

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant accidents in other modes of transportation—railroad, highway, marine, and pipeline. We determine the probable cause of the accidents and issue safety recommendations aimed at preventing future accidents. In addition, we carry out special studies concerning transportation safety and coordinate the resources of the federal government and other organizations to assist victims and their family members affected by major transportation disasters.

We are providing the following information to urge Tesla, Inc., to act on the safety recommendation in this letter because we believe your organization can help improve transportation safety and save lives. For more information about the NTSB and our recommendation process, please see the attached one-page summary.

This letter also includes information about our November 13, 2020, report titled *Safety Risks to Emergency Responders from Lithium-Ion Battery Fires in Electric Vehicles* (SR-20/01). The details of the NTSB's investigation and the resulting safety recommendations may be found in the attached report, which can also be accessed at <http://www.nts.gov>.

As a result of its investigation, the NTSB identified the following safety issues:

- Inadequacy of vehicle manufacturers' emergency response guides for minimizing the risks to emergency personnel who respond to high-voltage lithium-ion battery fires in electric vehicles.
- Gaps in safety standards and research related to high-voltage lithium-ion batteries involved in high-speed, high-severity crashes.

Accordingly, the NTSB makes the following safety recommendation to Tesla, Inc. Additional information regarding the recommendation can be found in the noted section of the report.

Model your emergency response guides on International Organization for Standardization standard 17840, as included in SAE International recommended practice J2990, and incorporate vehicle-specific information on (1) fighting high-voltage lithium-ion battery fires; (2) mitigating thermal runaway and the risk of high-voltage lithium-ion battery reignition; (3) mitigating the risks associated with stranded energy in high-voltage lithium-ion batteries, both during the initial emergency response and before moving a damaged electric vehicle from the scene; and (4) safely storing an electric vehicle that has a damaged high-voltage lithium-ion battery. (H-20-32) (See section 5.1.6.)

The NTSB is vitally interested in this recommendation because it is designed to reduce safety risks and save lives. We would appreciate a response within 90 days of the date of this letter, detailing the actions you have taken or intend to take to implement the recommendation. When replying, please refer to the safety recommendation by number (Safety Recommendation H-20-32). We encourage you to submit your response to ExecutiveSecretariat@ntsb.gov. If your reply exceeds 20 megabytes, including attachments, please e-mail us at the same address for instructions. Please do not submit both an electronic copy and a hard copy of the same response.

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Sincerely,

[Original Signed]

Robert L. Sumwalt, III
Chairman

January 13, 2021

Mr. Tom Stricker
Vice President
Toyota Motor North America

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National Transportation Safety Board

Washington, D.C. 20594

Office of the Chairman

January 13, 2021

Mr. Tom Stricker
Vice President
Toyota Motor North America
325 7th Street NW, Suite 1000
Washington, DC 20004

Dear Mr. Stricker:

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant accidents in other modes of transportation—railroad, highway, marine, and pipeline. We determine the probable cause of the accidents and issue safety recommendations aimed at preventing future accidents. In addition, we carry out special studies concerning transportation safety and coordinate the resources of the federal government and other organizations to assist victims and their family members affected by major transportation disasters.

We are providing the following information to urge Toyota Motor North America to act on the safety recommendation in this letter because we believe your organization can help improve transportation safety and save lives. For more information about the NTSB and our recommendation process, please see the attached one-page summary.

This letter also includes information about our November 13, 2020, report titled *Safety Risks to Emergency Responders from Lithium-Ion Battery Fires in Electric Vehicles* (SR-20/01). The details of the NTSB's investigation and the resulting safety recommendations may be found in the attached report, which can also be accessed at <http://www.nts.gov>.

As a result of its investigation, the NTSB identified the following safety issues:

- Inadequacy of vehicle manufacturers' emergency response guides for minimizing the risks to emergency personnel who respond to high-voltage lithium-ion battery fires in electric vehicles.
- Gaps in safety standards and research related to high-voltage lithium-ion batteries involved in high-speed, high-severity crashes.

Accordingly, the NTSB makes the following safety recommendation to Toyota Motor North America (the recommendation applies to Lexus and Toyota electric vehicles). Additional information regarding the recommendation can be found in the noted section of the report.

Model your emergency response guides on International Organization for Standardization standard 17840, as included in SAE International recommended practice J2990, and incorporate vehicle-specific information on (1) fighting high-voltage lithium-ion battery fires; (2) mitigating thermal runaway and the risk of high-voltage lithium-ion battery reignition; (3) mitigating the risks associated with stranded energy in high-voltage lithium-ion batteries, both during the initial emergency response and before moving a damaged electric vehicle from the scene; and (4) safely storing an electric vehicle that has a damaged high-voltage lithium-ion battery. (H-20-32) (See section 5.1.6.)

The NTSB is vitally interested in this recommendation because it is designed to reduce safety risks and save lives. We would appreciate a response within 90 days of the date of this letter, detailing the actions you have taken or intend to take to implement the recommendation. When replying, please refer to the safety recommendation by number (Safety Recommendation H-20-32). We encourage you to submit your response to ExecutiveSecretariat@ntsb.gov. If your reply exceeds 20 megabytes, including attachments, please e-mail us at the same address for instructions. Please do not submit both an electronic copy and a hard copy of the same response.

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Sincerely,

[Original Signed]

Robert L. Sumwalt, III
Chairman

January 13, 2021

Mr. Filip Van Hool
Chief Executive Officer
Van Hool NV

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant accidents in other modes of transportation—railroad, highway, marine, and pipeline. We determine the probable cause of the accidents and issue safety recommendations aimed at preventing future accidents. In addition, we carry out special studies concerning transportation safety and coordinate the resources of the federal government and other organizations to provide assistance to victims and their family members affected by major transportation disasters.

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National Transportation Safety Board

Washington, D.C. 20594

Office of the Chairman

January 13, 2021

Mr. Filip Van Hool
Chief Executive Officer
Van Hool NV
Bernard Van Hoolstraat 58
B-2500 Lier (Koningshooikt), Belgium

Dear Mr. Van Hool:

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant accidents in other modes of transportation—railroad, highway, marine, and pipeline. We determine the probable cause of the accidents and issue safety recommendations aimed at preventing future accidents. In addition, we carry out special studies concerning transportation safety and coordinate the resources of the federal government and other organizations to assist victims and their family members affected by major transportation disasters.

We are providing the following information to urge Van Hool NV to act on the safety recommendation in this letter because we believe your organization can help improve transportation safety and save lives. For more information about the NTSB and our recommendation process, please see the attached one-page summary.

This letter also includes information about our November 13, 2020, report titled *Safety Risks to Emergency Responders from Lithium-Ion Battery Fires in Electric Vehicles* (SR-20/01). The details of the NTSB's investigation and the resulting safety recommendations may be found in the attached report, which can also be accessed at <http://www.nts.gov>.

As a result of its investigation, the NTSB identified the following safety issues:

- Inadequacy of vehicle manufacturers' emergency response guides for minimizing the risks to emergency personnel who respond to high-voltage lithium-ion battery fires in electric vehicles.
- Gaps in safety standards and research related to high-voltage lithium-ion batteries involved in high-speed, high-severity crashes.

Accordingly, the NTSB makes the following safety recommendation to Van Hool NV. Additional information regarding the recommendation can be found in the noted section of the report.

Model your emergency response guides on International Organization for Standardization standard 17840, as included in SAE International recommended practice J2990, and incorporate vehicle-specific information on (1) fighting high-voltage lithium-ion battery fires; (2) mitigating thermal runaway and the risk of high-voltage lithium-ion battery reignition; (3) mitigating the risks associated with stranded energy in high-voltage lithium-ion batteries, both during the initial emergency response and before moving a damaged electric vehicle from the scene; and (4) safely storing an electric vehicle that has a damaged high-voltage lithium-ion battery. (H-20-32) (See section 5.1.6.)

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Sincerely,

[Original Signed]

Robert L. Sumwalt, III
Chairman

January 13, 2021

Mr. Matthew Renna
Vice President, Electric Vehicles
North American Region for Volkswagen Group of America

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant accidents in other modes of transportation—railroad, highway, marine, and pipeline. We determine the probable cause of the accidents and issue safety recommendations aimed at preventing future accidents. In addition, we carry out special studies concerning transportation safety and coordinate the resources of the federal government and other organizations to provide assistance to victims and their family members affected by major transportation disasters.

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National Transportation Safety Board

Washington, D.C. 20594

Office of the Chairman

January 13, 2021

Mr. Matthew Renna
Vice President, Electric Vehicles
North American Region for Volkswagen Group of America
3087 North 1st Street
San Jose, CA 95134

Dear Mr. Renna:

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant accidents in other modes of transportation—railroad, highway, marine, and pipeline. We determine the probable cause of the accidents and issue safety recommendations aimed at preventing future accidents. In addition, we carry out special studies concerning transportation safety and coordinate the resources of the federal government and other organizations to assist victims and their family members affected by major transportation disasters.

We are providing the following information to urge Volkswagen Group of America to act on the safety recommendation in this letter because we believe your organization can help improve transportation safety and save lives. For more information about the NTSB and our recommendation process, please see the attached one-page summary.

This letter also includes information about our November 13, 2020, report titled *Safety Risks to Emergency Responders from Lithium-Ion Battery Fires in Electric Vehicles* (SR-20/01). The details of the NTSB's investigation and the resulting safety recommendations may be found in the attached report, which can also be accessed at <http://www.nts.gov>.

As a result of its investigation, the NTSB identified the following safety issues:

- Inadequacy of vehicle manufacturers' emergency response guides for minimizing the risks to emergency personnel who respond to high-voltage lithium-ion battery fires in electric vehicles.
- Gaps in safety standards and research related to high-voltage lithium-ion batteries involved in high-speed, high-severity crashes.

Accordingly, the NTSB makes the following safety recommendation to Volkswagen Group of America (the recommendation applies to Audi and Volkswagen electric vehicles). Additional information regarding the recommendation can be found in the noted section of the report.

Model your emergency response guides on International Organization for Standardization standard 17840, as included in SAE International recommended practice J2990, and incorporate vehicle-specific information on (1) fighting high-voltage lithium-ion battery fires; (2) mitigating thermal runaway and the risk of high-voltage lithium-ion battery reignition; (3) mitigating the risks associated with stranded energy in high-voltage lithium-ion batteries, both during the initial emergency response and before moving a damaged electric vehicle from the scene; and (4) safely storing an electric vehicle that has a damaged high-voltage lithium-ion battery. (H-20-32) (See section 5.1.6.)

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Sincerely,

[Original Signed]

Robert L. Sumwalt, III
Chairman

January 13, 2021

Mr. Tim LaFon
Vice President Regulatory Affairs
Volvo Group North America, LLC

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National Transportation Safety Board

Washington, D.C. 20594

Office of the Chairman

January 13, 2021

Mr. Jan Ivarsson
Director and Senior Technical Advisor Safety
Volvo Car Corporation
Volvo Cars Safety Center, Dept. 91400
SE-405 31 Göteborg, Sweden

Dear Mr. Ivarsson:

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant accidents in other modes of transportation—railroad, highway, marine, and pipeline. We determine the probable cause of the accidents and issue safety recommendations aimed at preventing future accidents. In addition, we carry out special studies concerning transportation safety and coordinate the resources of the federal government and other organizations to assist victims and their family members affected by major transportation disasters.

We are providing the following information to urge Volvo Car Corporation to act on the safety recommendation in this letter because we believe your organization can help improve transportation safety and save lives. For more information about the NTSB and our recommendation process, please see the attached one-page summary.

This letter also includes information about our November 13, 2020, report titled *Safety Risks to Emergency Responders from Lithium-Ion Battery Fires in Electric Vehicles* (SR-20/01). The details of the NTSB's investigation and the resulting safety recommendations may be found in the attached report, which can also be accessed at <http://www.nts.gov>.

As a result of its investigation, the NTSB identified the following safety issues:

- Inadequacy of vehicle manufacturers' emergency response guides for minimizing the risks to emergency personnel who respond to high-voltage lithium-ion battery fires in electric vehicles.
- Gaps in safety standards and research related to high-voltage lithium-ion batteries involved in high-speed, high-severity crashes.

Accordingly, the NTSB makes the following safety recommendation to Volvo Car Corporation. Additional information regarding the recommendation can be found in the noted section of the report.

Model your emergency response guides on International Organization for Standardization standard 17840, as included in SAE International recommended practice J2990, and incorporate vehicle-specific information on (1) fighting high-voltage lithium-ion battery fires; (2) mitigating thermal runaway and the risk of high-voltage lithium-ion battery reignition; (3) mitigating the risks associated with stranded energy in high-voltage lithium-ion batteries, both during the initial emergency response and before moving a damaged electric vehicle from the scene; and (4) safely storing an electric vehicle that has a damaged high-voltage lithium-ion battery. (H-20-32) (See section 5.1.6.)

The NTSB is vitally interested in this recommendation because it is designed to reduce safety risks and save lives. We would appreciate a response within 90 days of the date of this letter, detailing the actions you have taken or intend to take to implement the recommendation. When replying, please refer to the safety recommendation by number (Safety Recommendation H-20-32). We encourage you to submit your response to ExecutiveSecretariat@ntsb.gov. If your reply exceeds 20 megabytes, including attachments, please e-mail us at the same address for instructions. Please do not submit both an electronic copy and a hard copy of the same response.

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Sincerely,

[Original Signed]

Robert L. Sumwalt, III
Chairman

January 13, 2021

Mr. Rob Brown
Interim CEO and Executive Director
International Association of Fire Chiefs

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant accidents in other modes of transportation—railroad, highway, marine, and pipeline. We determine the probable cause of the accidents and issue safety recommendations aimed at preventing future accidents. In addition, we carry out special studies concerning transportation safety and coordinate the resources of the federal government and other organizations to provide assistance to victims and their family members affected by major transportation disasters.

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Office of the Chairman

January 13, 2021

Mr. Rob Brown
Interim CEO and Executive Director
International Association of Fire Chiefs
4795 Meadow Wood Lane, Suite 100
Chantilly, VA 20151-4209

Dear Mr. Brown:

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant accidents in other modes of transportation—railroad, highway, marine, and pipeline. We determine the probable cause of the accidents and issue safety recommendations aimed at preventing future accidents. In addition, we carry out special studies concerning transportation safety and coordinate the resources of the federal government and other organizations to assist victims and their family members affected by major transportation disasters.

We are providing the following information to urge the International Association of Fire Chiefs to act on the safety recommendation in this letter because we believe your organization can help improve transportation safety and save lives. For more information about the NTSB and our recommendation process, please see the attached one-page summary.

This letter also includes information about our November 13, 2020, report titled *Safety Risks to Emergency Responders from Lithium-Ion Battery Fires in Electric Vehicles* (SR-20/01). The details of the NTSB's investigation and the resulting safety recommendations may be found in the attached report, which can also be accessed at <http://www.nts.gov>.

As a result of its investigation, the NTSB identified the following safety issues:

- Inadequacy of vehicle manufacturers' emergency response guides for minimizing the risks to emergency personnel who respond to high-voltage lithium-ion battery fires in electric vehicles.
- Gaps in safety standards and research related to high-voltage lithium-ion batteries involved in high-speed, high-severity crashes.

Accordingly, the NTSB makes the following safety recommendation to the International Association of Fire Chiefs. Additional information regarding the recommendation can be found in the noted section of the report.

Inform your members about the circumstances of the fire risks described in this report and the guidance available to emergency personnel who respond to high-voltage lithium-ion battery fires in electric vehicles. (H-20-33) (See section 5.1.6.)

To assist you in responding to Safety Recommendation H-20-33, we are also attaching an article that you may use, either in its entirety or modified to fit the length and style considerations of your publication and/or website that addresses the topics raised in the recommendation. We ask that you publish it, or similar content, in the next issue of your newsletter and/or website, and that you send us a copy of the newsletter or a link to the website article once it has been published. If you would like to discuss the article, please contact NTSB investigator Dr. Thomas Barth (thomas.barth@ntsb.gov).

The NTSB is vitally interested in this recommendation because it is designed to reduce safety risks and save lives. We would appreciate a response within 90 days of the date of this letter, detailing the actions you have taken or intend to take to implement the recommendation. When replying, please refer to the safety recommendation by number (Safety Recommendation H-20-33). We encourage you to submit your response to ExecutiveSecretariat@ntsb.gov. If your reply exceeds 20 megabytes, including attachments, please e-mail us at the same address for instructions. Please do not submit both an electronic copy and a hard copy of the same response.

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Sincerely,

[Original Signed]

Robert L. Sumwalt, III
Chairman

January 13, 2021

Harold Schaitberger
General President
International Association of Fire Fighters

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The attached letter from the NTSB Chairman provides information about the NTSB's November 13, 2020, report *Safety Risks to Emergency Responders from Lithium-Ion Battery Fires in Electric Vehicles* (SR-20/01). The details of this accident investigation and the resulting safety recommendations may be found in the attached report, which can also be accessed at <http://www.nts.gov>. For more information about NTSB and our recommendation process, please see the attached one-page summary.

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National Transportation Safety Board

Washington, D.C. 20594

Office of the Chairman

January 13, 2021

Harold Schaitberger, General President
International Association of Fire Fighters
1750 New York Avenue NW, Suite 300
Washington, DC 20006-5395

Dear Mr. Schaitberger:

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant accidents in other modes of transportation—railroad, highway, marine, and pipeline. We determine the probable cause of the accidents and issue safety recommendations aimed at preventing future accidents. In addition, we carry out special studies concerning transportation safety and coordinate the resources of the federal government and other organizations to assist victims and their family members affected by major transportation disasters.

We are providing the following information to urge the International Association of Fire Fighters to act on the safety recommendation in this letter because we believe your organization can help improve transportation safety and save lives. For more information about the NTSB and our recommendation process, please see the attached one-page summary.

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As a result of its investigation, the NTSB identified the following safety issues:

- Inadequacy of vehicle manufacturers' emergency response guides for minimizing the risks to emergency personnel who respond to high-voltage lithium-ion battery fires in electric vehicles.
- Gaps in safety standards and research related to high-voltage lithium-ion batteries involved in high-speed, high-severity crashes.

Accordingly, the NTSB makes the following safety recommendation to the International Association of Fire Fighters. Additional information regarding the recommendation can be found in the noted section of the report.

Inform your members about the circumstances of the fire risks described in this report and the guidance available to emergency personnel who respond to

high-voltage lithium-ion battery fires in electric vehicles. (H-20-33) (See section 5.1.6.)

To assist you in responding to Safety Recommendation H-20-33, we are also attaching an article that you may use, either in its entirety or modified to fit the length and style considerations of your publication and/or website that addresses the topics raised in the recommendation. We ask that you publish it, or similar content, in the next issue of your newsletter and/or website, and that you send us a copy of the newsletter or a link to the website article once it has been published. If you would like to discuss the article, please contact NTSB investigator Dr. Thomas Barth (thomas.barth@ntsb.gov).

The NTSB is vitally interested in this recommendation because it is designed to reduce safety risks and save lives. We would appreciate a response within 90 days of the date of this letter, detailing the actions you have taken or intend to take to implement the recommendation. When replying, please refer to the safety recommendation by number (Safety Recommendation H-20-33). We encourage you to submit your response to ExecutiveSecretariat@ntsb.gov. If your reply exceeds 20 megabytes, including attachments, please e-mail us at the same address for instructions. Please do not submit both an electronic copy and a hard copy of the same response.

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Sincerely,

[Original Signed]

Robert L. Sumwalt, III
Chairman

January 13, 2021

Trina Wafle
Interim Director
National Alternative Fuels Training Consortium

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant accidents in other modes of transportation—railroad, highway, marine, and pipeline. We determine the probable cause of the accidents and issue safety recommendations aimed at preventing future accidents. In addition, we carry out special studies concerning transportation safety and coordinate the resources of the federal government and other organizations to provide assistance to victims and their family members affected by major transportation disasters.

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National Transportation Safety Board

Washington, D.C. 20594

Office of the Chairman

January 13, 2021

Trina Wafle, Interim Director
National Alternative Fuels Training Consortium
West Virginia University
886 Chestnut Ridge Road
Morgantown, WV 26505-2742

Dear Ms. Wafle:

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant accidents in other modes of transportation—railroad, highway, marine, and pipeline. We determine the probable cause of the accidents and issue safety recommendations aimed at preventing future accidents. In addition, we carry out special studies concerning transportation safety and coordinate the resources of the federal government and other organizations to assist victims and their family members affected by major transportation disasters.

We are providing the following information to urge the National Alternative Fuels Training Consortium to act on the safety recommendation in this letter because we believe your organization can help improve transportation safety and save lives. For more information about the NTSB and our recommendation process, please see the attached one-page summary.

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Accordingly, the NTSB makes the following safety recommendation to the National Alternative Fuels Training Consortium. Additional information regarding the recommendation can be found in the noted section of the report.

Inform your members about the circumstances of the fire risks described in this report and the guidance available to emergency personnel who respond to high-voltage lithium-ion battery fires in electric vehicles. (H-20-33) (See section 5.1.6.)

To assist you in responding to Safety Recommendation H-20-33, we are also attaching an article that you may use, either in its entirety or modified to fit the length and style considerations of your publication and/or website that addresses the topics raised in the recommendation. We ask that you publish it, or similar content, in the next issue of your newsletter and/or website, and that you send us a copy of the newsletter or a link to the website article once it has been published. If you would like to discuss the article, please contact NTSB investigator Dr. Thomas Barth (thomas.barth@ntsb.gov).

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Sincerely,

[Original Signed]

Robert L. Sumwalt, III
Chairman

January 13, 2021

Jim Pauley
President and CEO
National Fire Protection Association

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National Transportation Safety Board

Washington, D.C. 20594

Office of the Chairman

January 13, 2021

Jim Pauley, President and CEO
National Fire Protection Association
1 Batterymarch Park
Quincy, MA 02169-7471

Dear Mr. Pauley:

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We are providing the following information to urge the National Fire Protection Association (NFPA) to act on the safety recommendation in this letter because we believe your organization can help improve transportation safety and save lives. For more information about the NTSB and our recommendation process, please see the attached one-page summary.

This letter also includes information about our November 13, 2020, report titled *Safety Risks to Emergency Responders from Lithium-Ion Battery Fires in Electric Vehicles* (SR-20/01). The details of the NTSB's investigation and the resulting safety recommendations may be found in the attached report, which can also be accessed at <http://www.nts.gov>.

As a result of its investigation, the NTSB identified the following safety issues:

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Accordingly, the NTSB makes the following safety recommendation to the NFPA. Additional information regarding the recommendation can be found in the noted section of the report.

Inform your members about the circumstances of the fire risks described in this report and the guidance available to emergency personnel who respond to

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To assist you in responding to Safety Recommendation H-20-33, we are also attaching an article that you may use, either in its entirety or modified to fit the length and style considerations of your publication and/or website that addresses the topics raised in the recommendation. We ask that you publish it, or similar content, in the next issue of your newsletter and/or website, and that you send us a copy of the newsletter or a link to the website article once it has been published. If you would like to discuss the article, please contact NTSB investigator Dr. Thomas Barth (thomas.barth@ntsb.gov).

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Sincerely,

[Original Signed]

Robert L. Sumwalt, III
Chairman

January 13, 2021

Heather Schafer, CAE
Chief Executive Officer
National Volunteer Fire Council

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National Transportation Safety Board

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Office of the Chairman

January 13, 2021

Heather Schafer, CAE
Chief Executive Officer
National Volunteer Fire Council
712 H Street NE, Suite 1478
Washington, DC 20002-3627

Dear Ms. Schafer:

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant accidents in other modes of transportation—railroad, highway, marine, and pipeline. We determine the probable cause of the accidents and issue safety recommendations aimed at preventing future accidents. In addition, we carry out special studies concerning transportation safety and coordinate the resources of the federal government and other organizations to assist victims and their family members affected by major transportation disasters.

We are providing the following information to urge the National Volunteer Fire Council to act on the safety recommendation in this letter because we believe your organization can help improve transportation safety and save lives. For more information about the NTSB and our recommendation process, please see the attached one-page summary.

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As a result of its investigation, the NTSB identified the following safety issues:

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Accordingly, the NTSB makes the following safety recommendation to the National Volunteer Fire Council. Additional information regarding the recommendation can be found in the noted section of the report.

Inform your members about the circumstances of the fire risks described in this report and the guidance available to emergency personnel who respond to high-voltage lithium-ion battery fires in electric vehicles. (H-20-33) (See section 5.1.6.)

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Sincerely,

[Original Signed]

Robert L. Sumwalt, III
Chairman

January 13, 2021

Cynthia J. Martineau
Executive Director
Towing and Recovery Association of America

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Washington, D.C. 20594

Office of the Chairman

November 13, 2021

Cynthia J. Martineau, Executive Director
Towing and Recovery Association of America
700 12th Street NW, Suite 700
Washington, DC 20002-4434

Dear Ms. Martineau:

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant accidents in other modes of transportation—railroad, highway, marine, and pipeline. We determine the probable cause of the accidents and issue safety recommendations aimed at preventing future accidents. In addition, we carry out special studies concerning transportation safety and coordinate the resources of the federal government and other organizations to assist victims and their family members affected by major transportation disasters.

We are providing the following information to urge the Towing and Recovery Association of America to act on the safety recommendation in this letter because we believe your organization can help improve transportation safety and save lives. For more information about the NTSB and our recommendation process, please see the attached one-page summary.

This letter also includes information about our November 13, 2020, report titled *Safety Risks to Emergency Responders from Lithium-Ion Battery Fires in Electric Vehicles* (SR-20/01). The details of the NTSB's investigation and the resulting safety recommendations may be found in the attached report, which can also be accessed at <http://www.nts.gov>.

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Accordingly, the NTSB makes the following safety recommendation to the Towing and Recovery Association of America. Additional information regarding the recommendation can be found in the noted section of the report.

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