

ETA-HITP11

Revision 0

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Vehicle Verification

Prepared by

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1.0 Objective

The objective of this procedure is to identify a common protocol to verify mandatory requirements for vehicles participating in HICEV America. Verification shall be completed prior to completion of HICEV America testing activities.

2.0 Purpose

This procedure identifies mandatory vehicle requirements contained in the HICEV America Vehicle Specification which shall be verified as part of HICEV America. Vehicles submitted for testing in HICEV America must meet all of these requirements for inclusion of the vehicle in HICEV America.

3.0 Documentation

Documentation addressed by this procedure shall be consistent, easy to understand, easy to read and readily reproducible. Basis documents are referenced where appropriate. This documentation shall contain enough information to "stand alone"; that is, be self-contained to the extent that all individuals qualified to review it could be reasonably expected to reach a common conclusion, without the need to review additional documentation. Storage and retention of records shall be completed as described in Procedure ETA-HIAC01, "Control, Close-out and Storage of Documentation."

4.0 Prerequisites

- 4.1 Individuals assigned to complete this procedure will be knowledgeable of the HICEV America Technical Requirements.
- 4.2 Individuals assigned to complete this activity will have received the appropriate training in accordance with ETA-HIAC05, "Training and Certification of Personnel Utilizing ETA Procedures."
- 4.3 Prior to commencing this activity, a meeting of the involved personnel will be held to discuss the following:
 - 4.3.1 Data required
 - 4.3.2 Data available
 - 4.3.2 Data sources
 - 4.3.4 Contingencies
 - 4.3.5 Safety requirements
- 4.4 Verification of all mandatory requirements resented herein must be completed prior to conduct of HICEV America testing, unless specifically exempted herein.

- 4.5 All documentation required to document the activities addressed by this procedure shall be completed, approved and issued prior to commencing the testing it addresses.

5.0 Verification Requirements

The requirements in Section 5 are derived from the HICEV America Vehicle Specification. Vehicles participating in HICEV America shall meet these minimum requirements. Vehicles which cannot meet the requirements defined by HICEV America can be accepted for testing but only as a Prototype (non-Production) Vehicle.

Should a vehicle participate in HICEV America more than once, a new check-sheet shall be completed each time it is presented. The testing authority may choose not to re-verify all items. Items not re-verified shall be documented in a Test Exception Report in accordance with ETA-HITP02, "Control of Test Conduct."

Appendix A identifies all mandatory requirements of the HICEV America Vehicle Specification. Many mandatory requirements can be verified by a physical inspection or document review as described in Section 5.1. However, some mandatory requirements require measurement or dynamic test for validation. The methods for conduct of these measurements or dynamic tests are listed in Section 5.2.

5.1 Minimum Vehicle Requirements

Vehicle compliance with mandatory requirements of the HICEV America Vehicle Specification listed in Appendix A which are verifiable by inspection or review of the Supplier's required submittals (HICEV America Technical Specification, Appendix A) shall be recorded in Appendix A. Any requirements not fully met shall be indicated on Appendix A by marking "no" and completing a Non-Conformance Report, Appendix B. The Non-Conformance Report shall be transmitted to the vehicle supplier within two business days of issuance. Further verification of mandatory vehicle requirements verifiable by inspection (Section 5.1) may continue while a Non-Conformance Report is unresolved. However, no testing (Section 5.2) shall proceed until all Non-Conformance Reports concerning mandatory vehicle requirements verifiable by inspection (Section 5.1) are resolved such that Appendix A can be marked "Yes" for all such requirements.

5.2 Dynamic Verification Requirements

The following tests shall be conducted to verify mandatory requirements of the HICEV America Vehicle Specification listed in Appendix A which are not verifiable by inspection or review of the Supplier's required submittals and require measurement or dynamic testing. The results of such measurement or testing shall be recorded in Appendix A. Any requirements not fully met shall be indicated on Appendix A by marking "No" and by completing a Non-Conformance Report,

Appendix B. The Non-Conformance Report shall be transmitted to the vehicle supplier within two business days of issuance.

- 5.2.1 Verify the compliance of the vehicle to the requirements of the FMVSS applicable on the date of manufacture by conducting the following:
 - 5.2.1.1 Locate the FMVSS Certification Label(s) on the vehicle
 - 5.2.1.2 Verify that the label(s) indicates the vehicle is fully certified
 - 5.2.1.3 If the vehicle is a conversion, verify that both the OEM FMVSS label and the Converter's FMVSS label are present. The Converter's FMVSS label SHALL NOT be installed in a manner that precludes full view of the OEM label.
- 5.2.2 Verify the payload capability of at least 400 pounds as follows:
 - 5.2.2.1 Upon receipt, the vehicle shall be weighed to determine the vehicle's standard (as-delivered condition) curb weight.
 - 5.2.2.2 Obtain the GVWR rating from the FMVSS label affixed to the vehicle.
 - 5.2.2.3 Subtract the curb weight determined in Step 5.2.2.1 from the GVWR determined in 5.2.2.2.
 - 5.2.2.4 The calculated difference shall be considered the vehicle's payload capability. Record this value.
- 5.2.3 If the vehicle is a conversion, it shall not have a GVWR or GAWR greater than the OEM specified values. This shall be verified as follows:
 - 5.2.3.1 Locate the OEM FMVSS label. Note the GVWR and GAWRs. Record these values.
 - 5.2.3.2 Locate the Converter's FMVSS label. Note the GVWR and the GAWRs. Record these values.
 - 5.2.3.3 Compare the two GVWRs and verify that the GVWR listed on the Converter's FMVSS label is not greater than that listed by the OEM.
 - 5.2.3.4 Compare the two GAWRs and verify that the GAWRs listed on the Converter's FMVSS label are not greater than the OEM's listed GAWRs.
- 5.2.4 Verify that the tires supplied with the vehicle being inspected are commercially available by conducting the following:
 - 5.2.4.1 Identify the manufacturer, type and size of the tire.
 - 5.2.4.2 Verify that the tires are available for purchase. This may be done via the Internet or by calling tire dealers. Make this verification for quantities of one, four and 20 tires. If available,

attempt to obtain the price of the tire, excluding amounts for taxes, mounting, balancing, road hazard insurance and all other fees and costs.

- 5.2.5 Verify that the passenger space is not intruded upon by the Hydrogen Fuel Storage System (HFSS) or other conversion materials, as follows:
 - 5.2.5.1 The HFSS cannot be accessed by a vehicle occupant.
 - 5.2.5.2 The HFSS enclosure cannot be opened from inside the passenger compartment.
 - 5.2.5.3 The HFSS enclosure does not intrude into the space normally occupied by an individual while that individual is occupying a seat formally defined as such.
 - 5.2.5.4 Conversion materials do not intrude into the space normally occupied by an individual while that individual is occupying a seat formally defined as such.
- 5.2.6 Verify that the engine utilizes hydrogen fuel injection with the injectors located to inject fuel at either the throttle body, intake port or directly into the cylinder.
- 5.2.7 Verify successful completion of ETA-HITP05, “HICE Vehicle Rough Road Course Test” without damage to or failure of the vehicle or its systems
- 5.2.8 Verify vehicle temperature durability in accordance with ETA-HITP05, “HICE Vehicle Rough Road Course Test”
- 5.2.9 Verify vehicle repair time shall requirement in accordance with ETA-HIAC02, “Conduct of Test”, Section 6.1.
- 5.2.10 Verify Pressure Relief Devices
 - 5.2.10.1 Verify that each cylinder or assembly is protected by an appropriate pressure relief device.
 - 5.2.10.2 Verify that all pressure relief devices are either pressure or temperature operated.
 - 5.2.10.3 Verify that all pressure relief devices are connected to the fuel cylinder or assembly or integral with the body of the isolation valve joined to the fuel cylinder or assembly.
 - 5.2.10.4 Verify that no valve is installed between the pressure relief device and the fuel cylinder.

- 5.2.10.5 Verify that pressure relief device vent system do not vent such that hydrogen can accumulate within or under any vehicle structure.
- 5.2.11 Verify fuel storage tank piping systems
 - 5.2.11.1 Verify that all fuel storage tank piping systems are rigid stainless steel.
 - 5.2.11.2 Verify that all fuel storage tank piping systems are secured to the vehicle at least every 24 inches.
- 5.2.12 Verify flexible tubing
 - 5.2.12.1 Verify that flexible tubing is used only to connect two sections of fuel or vent pipe where relative motion between the two pipe sections can reasonably be expected.
 - 5.2.12.2 Verify that flexible tubing is no longer than 16" in length.
 - 5.2.12.3 Verify that flexible tubing is only installed after the first pressure regulator.
- 5.2.13 Verify that each storage tank is equipped with an isolation valve
- 5.2.14 Verify shutoff valve(s)
 - 5.2.14.1 Verify that the fuel system is equipped with a manual or automatic shutoff valve.
 - 5.2.14.2 Verify that the shutoff valve(s) isolates the fuel storage system from the remainder of the fuel system including the Fueling Connection Device.
 - 5.2.14.3 Verify that the shutoff valve(s) require no more than 90° of handle rotation to close the valve.
 - 5.2.14.4 Verify that the shutoff valve is securely mounted to the vehicle and is not supported by the fuel piping.
 - 5.2.14.5 Verify that the shutoff valve is clearly labeled.
 - 5.2.14.6 Verify that the shutoff valve is accessible from outside the vehicle.
- 5.2.15 Verify pressure regulator(s)
 - 5.2.15.1 Verify that pressure regulator(s) is located as close as possible to the shutoff valve(s).
 - 5.2.15.2 Verify that a pressure relief valve is located on the regulated side of the first stage regulator.

- 5.2.15.3 Verify that the pressure relief valve venting system is designed to prevent accumulation of hydrogen within or under any vehicle structure.
- 5.2.16 Verify that the Fueling Connection Device is securely mounted to the vehicle and not supported by inlet piping
- 5.2.17 Verify Fueling Connection Device piping
 - 5.2.17.1 Verify that the Fueling Connection Device piping is rigid stainless steel
 - 5.2.17.3 Verify that Fueling Connection Device piping is connected to the body and/or frame at least every 24 inches.
- 5.2.18 Verify fuel quantity indicating device
 - 5.2.18.1 Verify that the fuel system is equipped with a fuel quantity indicating device.
 - 5.2.18.2 Verify that a fuel gauge installed in the passenger compartment is electrically operated with the pressurized sending unit installed in the fuel system outside any passenger spaces.

6.0 Glossary

- 6.1 Effective Date - The date, after which a procedure has been reviewed and approved, that the procedure can be utilized in the field for official testing.
- 6.2 Program Manager - As used in this procedure, the individual within Electric Transportation Applications responsible for oversight of the HICEV America Performance Test Program. [Subcontract organizations may have similarly titled individuals, but they are not addressed by this procedure.]
- 6.3 Hydrogen Fuel Storage System (HFSS) - Components, including but not limited to, tanks, piping, valves, filters, regulators, relief devices and instrumentation which are "wetted" by hydrogen fuel.
- 6.4 Shall - Items which require adherence without deviation. Shall statements identify binding requirements. A go, no-go criterion.
- 6.5 Should - Items which require adherence if at all possible. Should statements identify preferred conditions.
- 6.6 Test Director - The individual within Electric Transportation Applications responsible for all testing activities associated with the HICEV America Performance Test Program.

- 6.7 Test Director's Log - A daily diary kept by the Test Director, Program Manager, Test Manager or Test Engineer to document major activities and decisions that occur during the conduct of a Performance Test Evaluation Program. This log is normally a running commentary, utilizing timed and dated entries to document the days activities. This log is edited to develop the Daily Test Log published with the final report for each vehicle.
- 6.8 Test Engineer - The individual(s) assigned responsibility for the conduct of any given test. [Each contractor/subcontractor should have at least one individual filling this position. If so, they shall be responsible for adhering to the requirements of this procedure.]
- 6.9 Test Manager - The individual within Electric Transportation Applications responsible for the implementation of the test program for any given vehicle(s) being evaluated to the requirements of the HICEV America Performance Test Program. [Subcontract organizations may have similarly titled individuals, but they are not addressed by this procedure.]

7.0 References

- 7.1 HICEV America Vehicle Specification
- 7.2 ETA-HIAC01 - "Control, Close-out and Storage of Documentation"
- 7.3 ETA-HIAC02 - "Control of Test Conduct."
- 7.4 ETA-HIAC04 - "Review of Test Results"
- 7.5 ETA-HIAC05 - "Training and Certification of Personnel Utilizing ETA Procedures"
- 7.6 ETA-HITP06 - "Receipt Inspection"
- 7.7 ETA-HITP07 - "Control of Measuring and Test Equipment"
- 7.8 ETA-HITP04 - "Constant Speed Range Test"

**APPENDIX-A
Vehicle Minimum Requirements
Review Check List (Page 1 of 7)**

VIN Number: _____

HITP011 Ref:	T/S Ref:	Requirement:	Requirement Met:			Initials:	Date:
			Yes	No	N/A		
5.2.1	1.1	Vehicle shall comply with Federal Motor Vehicle Safety Standards applicable on the date of manufacture. Such compliance shall be certified by the Supplier in accordance with 49 CFR 567.	Yes	No	N/A		
5.1	1.1	Suppliers shall provide a completed copy of Appendix A and Appendix B with their proposal, providing vehicle specifications and the method of compliance with each required section of 49 CFR 571.	Yes	No	N/A		
5.1	1.4	Suppliers shall supply Material Safety Data Sheets (MSDS) for all unique hazardous materials supplied with the vehicle	Yes	No	N/A		
5.1	1.5	Compressed gas storage tanks shall comply with the requirements of FMVSS304 and NGV2.	Yes	No	N/A		
5.1	1.6	Suppliers shall provide recycling plans for hazardous materials including how the plan has been implemented.	Yes	No	N/A		
5.2.2	2.1	Vehicle shall have a minimum payload of 400 pounds.	Yes	No	N/A		
5.1	2.2	Suppliers shall provide the gross vehicle weight rating (GVWR), curb weight and rated payloads of their vehicles	Yes	No	N/A		
5.2.3		For conversion vehicles, Suppliers shall specify the OEMs gross vehicle weight rating (GVWR). For conversions, OEM GVWR shall not be increased.					
5.1	2.3	Suppliers shall provide Gross Vehicle Axle Weight Ratings (GAWR) and axle weights for the vehicle as delivered, and at full rated payload	Yes	No	N/A		
5.2.3		For conversions, OEM GAWR shall not be increased	Yes	No	N/A		

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Vehicle Minimum Requirements
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VIN Number: _____

TP011 Ref:	T/S Ref:	Requirement:	Requirement Met:			Initials:	Date:
5.2.4	2.6	Tires shall be subject to the following requirements: <ul style="list-style-type: none"> • Tires provided with the vehicle shall be the standard tire offered by the HICEV Supplier for the vehicle being proposed. • Tires shall correspond to the requirements of the placard installed in accordance with 49 CFR 571.109, 110, 119 and 120, as applicable. • Suppliers shall specify manufacturer, model and size of the standard tire. • Tires sizes and inflation pressures shall be in accordance with the requirements of the placard. • At no time shall the tire’s inflation pressure exceed the maximum pressure imprinted upon that tire’s sidewall. • The tire shall be operable across the entire operation/load range of that vehicle. • Replacement tires shall be commercially available to the end user in sufficient quantities to support the purchaser’s needs. • Tires provided as original equipment by the HICEV manufacturer shall not have warranty restrictions in excess of those of the tire’s manufacturer, unless the Supplier is the sole warrantor for the tires. • If the vehicle may be equipped with more than one standard tire, this information shall be provided for each type/manufacturer of each standard tire. • Tires provided as original equipment by the HICEV Supplier shall not have warranty restrictions in excess of those of the tire’s manufacturer, unless the Supplier is the sole warrantor for the tires. 	Yes	No	N/A		
			Yes	No	N/A		
			Yes	No	N/A		
			Yes	No	N/A		
			Yes	No	N/A		
			Yes	No	N/A		
			Yes	No	N/A		
			Yes	No	N/A		
			Yes	No	N/A		
			Yes	No	N/A		
			Yes	No	N/A		

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Vehicle Minimum Requirements
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VIN Number: _____

TP011 Ref:	T/S Ref:	Requirement:	Requirement Met:			Initials:	Date:
			Yes	No	N/A		
5.1	3.1	Seating capacity shall be a minimum of 1 driver and 1 passenger. Suppliers shall specify seating capacity (available seat belt positions) for their vehicle.	Yes	No	N/A		
5.1	3.1	For conversion vehicles, if the vehicle's seating capacity is changed from that specified by the OEM on their FMVSS placard, the seat(s) being added or abandoned shall be modified as required by 49 CFR 571.207, et al, and a new FMVSS placard installed as required by 49 CFR 567, 568 or 571, as applicable.	Yes	No	N/A		
5.2.5	3.2	For conversion vehicles, the OEM passenger space shall not be intruded upon by the Hydrogen Fuel Storage System (HFSS) or other conversion materials.	Yes	No	N/A		
5.2.6	4.4	The engine shall utilize hydrogen fuel injection with the injectors located to inject fuel at either the throttle body, intake port or directly into the cylinder.	Yes	No	N/A		
5.1	4.5	Vehicles shall comply with the requirements of 49 CFR 571.105.S5.2.1, or alternatively, 49 CFR 571.105.S5.2.2 for parking mechanisms.	Yes	No	N/A		
5.2.7	5.5	Vehicles shall be capable of completing the HICEV America Performance Test Procedure ETA-HITP05, "Hydrogen Internal Combustion Engine Vehicle Rough Road Course Test." without damage to or failure of the vehicle or its systems	Yes	No	N/A		
5.2.8	5.5	Vehicles shall be capable of standing for extended periods in extreme temperatures without damage to or failure of the vehicle or its systems.	Yes	No	N/A		
5.2.9	5.5	Vehicles shall be capable of completing all HICEV America tests without repairs exceeding a cumulative total of 72 hours.	Yes	No	N/A		
5.1	6.1	Fuel shall be stored onboard the vehicle in gaseous form.	Yes	No	N/A		
5.1	6.2	Fuel storage tanks shall be installed as per the requirements of NFPA 52, Section 5.3	Yes	No	N/A		
5.1	6.2	The hydrogen fuel storage system or other conversion components shall not penetrate into or pass through the OEM cabin or other spaces designated for carrying passengers.	Yes	No	N/A		

**APPENDIX-A
Vehicle Minimum Requirements
Review Check List (Page 4 of 7)**

VIN Number: _____

TP011 Ref:	T/S Ref:	Requirement:	Requirement Met:			Initials:	Date:
5.1	6.2	Connection to the fuel storage tank shall utilize the fuel storage tank manufacturer's specified fittings	Yes	No	N/A		
5.2.10.1	6.2	Each fuel cylinder or assembly shall be protected by a pressure relief device(s).	Yes	No	N/A		
5.2.10.2	6.2	Such pressure relief device shall be either temperature activated or pressure activated.	Yes	No	N/A		
5.1	6.2	The pressure relieving devices shall be rated for hydrogen use by its manufacturer and acceptable for use by the cylinder manufacturer.	Yes	No	N/A		
5.2.10.3	6.2	The pressure relief device(s) shall be directly connected to the fuel cylinder or assembly or integral with the body of the isolation valve joined to the fuel cylinder or assembly.	Yes	No	N/A		
5.2.10.4	6.2	A valve shall not be installed between the pressure relief device and the fuel cylinder	Yes	No	N/A		
5.1	6.2	The pressure relief device(s) vent shall be designed such that the vent system can withstand the pressures that result from venting.	Yes	No	N/A		
5.2.10.5	6.2	The pressure relief device(s) vent shall not allow vented gas to accumulate within or under any vehicle structure.	Yes	No	N/A		
5.2.11.1	6.2	Fuel Piping shall be rigid stainless steel.	Yes	No	N/A		
5.1	6.2	Fuel Piping shall comply with the requirements of ASTM A269 or A213/A213M.	Yes	No	N/A		
5.1	6.2	Fuel piping shall be installed as per the requirements of NFPA 52, Section 5.5.	Yes	No	N/A		
5.2.11.2	6.2	Fuel piping shall be secured to the vehicle at least every 24 inches.	Yes	No	N/A		
5.2.12.1	6.2	Flexible fuel piping shall only be used to connect two sections of fuel or vent pipe where relative motion between the two can reasonably be expected.	Yes	No	N/A		
5.2.12.2	6.2	Any one section of flexible piping shall be limited to 16" in length.	Yes	No	N/A		
5.2.12.3	6.2	Flexible tubing shall only be installed after the first pressure regulator.	Yes	No	N/A		
5.1	6.2	Flexible tubing shall be certified by its manufacturer for use with hydrogen.	Yes	No	N/A		
5.2.13	6.2	Each fuel storage tank shall be provided with an isolation valve.	Yes	No	N/A		

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Vehicle Minimum Requirements
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VIN Number: _____

TP011 Ref:	T/S Ref:	Requirement:	Requirement Met:			Initials:	Date:
5.2.13	6.2	The isolation valve(s) shall either be a manually-operated or normally-closed, remotely actuated valve and shall be connected directly to the fuel cylinder.	Yes	No	N/A		
5.1	6.2	Connection of the isolation valve(s) to the fuel storage tank(s) shall utilize the fuel storage tank manufacturer's specified fittings.	Yes	No	N/A		
5.2.14.1	6.2	The fuel system shall be equipped with a manual or automatic shutoff valve.	Yes	No	N/A		
5.2.14.2	6.2	The shutoff valve shall isolated the fuel storage system from the remainder of the fuel system including the fueling connection device.	Yes	No	N/A		
5.2.14.3	6.2	The shutoff valve shall require no more than 90° of handle rotation to close the valve.	Yes	No	N/A		
5.2.14.4	6.2	The shutoff valve shall be securely mounted to the vehicle and shall no be supported in any way by the fuel piping.	Yes	No	N/A		
5.2.14.5	6.2	The location of the shutoff valve shall be clearly labeled.	Yes	No	N/A		
5.2.14.6	6.2	The location of the shutoff valve shall be accessible from outside the vehicle.	Yes	No	N/A		
5.2.15.1	6.2	Fuel pressure regulator(s) shall be located as close as practical to the shutoff valve.	Yes	No	N/A		
5.2.15.2	6.2	A pressure relief valve shall be fitted on the regulated side of the first stage of the regulator.	Yes	No	N/A		
5.1	6.2	The pressure relief valve shall be designed with a relief pressure setting designed to protect all components downstream of the regulator.					
5.1	6.2	The pressure relief valve vent shall be designed to withstand the pressures developed during venting.	Yes	No	N/A		
5.2.15.3	6.2	The pressure relief valve vent shall be designed such that vented gasses cannot accumulate within or under any vehicle structure.	Yes	No	N/A		
5.1	6.2	An automatic valve shall be installed in the fueling system that prevents the flow of hydrogen gas to the engine when the engine is not running, even if the ignition switch is in the "ON", "RUN", or "ACC" position.	Yes	No	N/A		

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VIN Number: _____

TP011 Ref:	T/S Ref:	Requirement:	Requirement Met:			Initials:	Date:
			Yes	No	N/A		
5.1	6.3	The fueling connection device shall be mechanically keyed for the nominal storage pressure using the SAE 2600 standard.	Yes	No	N/A		
5.2.16	6.3	The Fueling Connection Device shall be matched to the nominal design pressure of the fuel storage cylinder(s).	Yes	No	N/A		
5.1	6.3	The fueling connection device shall include dual check valves to prevent fuel leakage from the inlet.	Yes	No	N/A		
5.2.16	6.3	The fueling connection device shall be securely mounted to the vehicle and shall not be supported in any way by the inlet piping.	Yes	No	N/A		
5.2.17.1	6.3	Fueling piping shall be rigid stainless steel	Yes	No	N/A		
5.1	6.3	Fueling piping shall comply with the requirements of ASTM A269 or A213/A213M	Yes	No	N/A		
5.2.17.2	6.3	Fueling piping shall be secured to the body and/or frame at least every 24 inches.	Yes	No	N/A		
5.1	6.3	Piping connection to the fueling connection device shall utilize the manufacturer's recommended fittings.	Yes	No	N/A		
5.2.18.1	6.4	The fuel system shall be equipped with a fuel quantity indicating device. This device shall indicate either actual pressure (gauge pressure in pounds-per-square-inch) within the storage tank(s) or an indication of Full to Empty based on, at a minimum, actual pressure within the storage tank(s).	Yes	No	N/A		
5.2.18.2	6.4	A fuel gauge installed in the passenger compartment shall be electrically operated with the pressurized sending unit installed in the fuel system outside of any passenger spaces.	Yes	No	N/A		
5.2.18.3	6.4	The fuel gauge shall be accurate to ± 10% of full scale	Yes	No	N/A		
5.1	6.5	The Supplier shall provide recommended fuel system maintenance requirements, including requirements, if any, for periodic fuel system integrity checks.	Yes	No	N/A		
5.1	7.0	Suppliers shall specify all optional equipment required to meet the requirements of this Vehicle Specification.	Yes	No	N/A		
5.1	8.1	Non-proprietary manuals for parts, service, operation and maintenance, interconnection wiring diagrams and schematics shall accompany all vehicles submitted for testing.	Yes	No	N/A		

