



8/30/2022

Mr. Tristin Rojeck  
Vehicle Programs and Compliance Division  
Environmental Protection Agency  
2000 Traverwood,  
Ann Arbor, MI 48105

Subject: Request for issuance of a new Certificate of Conformity - initial application

Tesla, Inc. requests that the EPA issue a Certificate of Conformity for the subject test group.

Attached to this request is the Part 1 Application. Tesla believes that the test group complies with all applicable regulations contained within Title 40 of the CFR, California Amendments to Subparts B, C, and S, Part 86 and Part 88, Title 40 of the CFR and Title 13 of the California Code of Regulations

Vehicle Category:	Light Duty Vehicle (< 8000 lbs. GVW)
Durability Group:	PTSLEEVNNL2X
Test Group:	PTSLV00.0L2X
Summary Sheet No:	NA
Durability Group Description:	NA
Durability Vehicle:	NA
OBD Group:	NA
Test Group Description:	Tesla differentiates test groups based on: 1) battery type, 2) number of drive motors, and 3) vehicle line.  L - Lithium Ion Battery 2 - Dual AC motors S - Model X Line of vehicles
Applicable Standards:	FEDERAL Tier 3 BIN 0 & CALIFORNIA ZEV
Carlines Covered by this certificate:	Model X

Your early review and issuance of the certificate will be greatly appreciated. If you have any questions, please contact me at our office at (510) 249 8749

Sincerely,

Suraj Nagaraj  
Director - Vehicle Homologation

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## **1 COMMUNICATIONS**

### **1.01 Mailing information**

#### **01.01.01 Certification information**

Tesla, Inc.  
3500 Deer Creek Road  
Palo Alto, CA 94304

#### **01.01.02 Responsible officials**

##### **01.01.03 - Primary Contact**

Mr. Suraj Nagaraj, Sr Director- Vehicle Homologation  
Telephone 510-249-8749

##### **01.01.04 - Secondary Contact**

Mr. Ray Wang, Sr Homologation Engineer - Vehicle Homologation  
Telephone 240-994-5639

## **3 FACILITIES, EQUIPMENT AND TEST PROCEDURES**

Internal range test reports are on file at Tesla

### **3.01 Procedure to determine mass emissions of the fuel-fired heater**

Not applicable; vehicle not equipped with a fuel fired heater.

### **3.02 Battery pre-conditioning procedures**

The lithium ion battery cells are cycled by the battery cell manufacturer before they are assembled into battery packs. There is no further pre-conditioning necessary.

### **3.03 Vehicle Configurations and sub configurations**

Refer to Appendix 03.03

### **3.04 TEST PROCEDURES**

SAE J1634 (as revised 2012-10) was followed for all Range testing and SAE J2263 (as issued 1996-10) was followed for Road load measurement.

## **SPECIAL TEST INSTRUCTIONS**

- See attachment

### **04.00 Statement of Compliance**

This vehicle conforms to US EPA Federal Tier 3 Bin 0 and State of California regulations applicable to 2023 Model Year new ZEV Light-duty Vehicles

**05.00 RESERVED**

**06.00 MAINTENANCE**

**6.01 Test vehicle scheduled maintenance**

Not applicable.

**6.02 Recommended customer maintenance schedule**

See owner's manual.

**6.03 Lubricants and heater fuels**

**Heater fuel:**

Not applicable

**Transmission lubricant:**

Factory Fill

Capacity

2350 mL (Front) 2750 mL (Rear)

Make

SK

Trade name

ATF-1351-G

Type

Synthetic

Viscosity

9210 cP at -40°C

Viscosity

5.9 cSt at 100°C

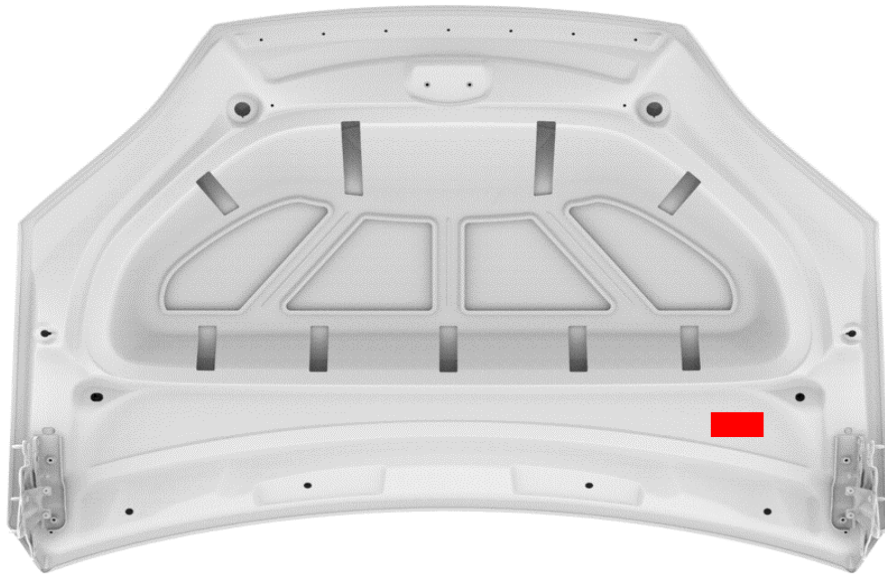
**Test Vehicle**

Same as factory fill

**07.00 LABELS**

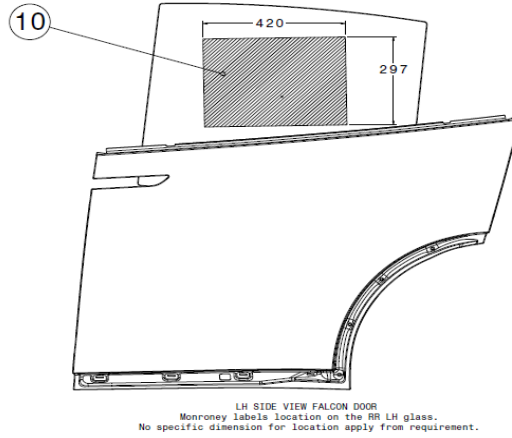
**07.01 Label locations**

VECI Emission Label



See 07.02

Monroney Label



See 07.03

**07.02 Emission Control Information label: 2023 Model Year**

(Mandated in CFR Title 40, Part 86; §86.1807. Label format agreed with EPA)

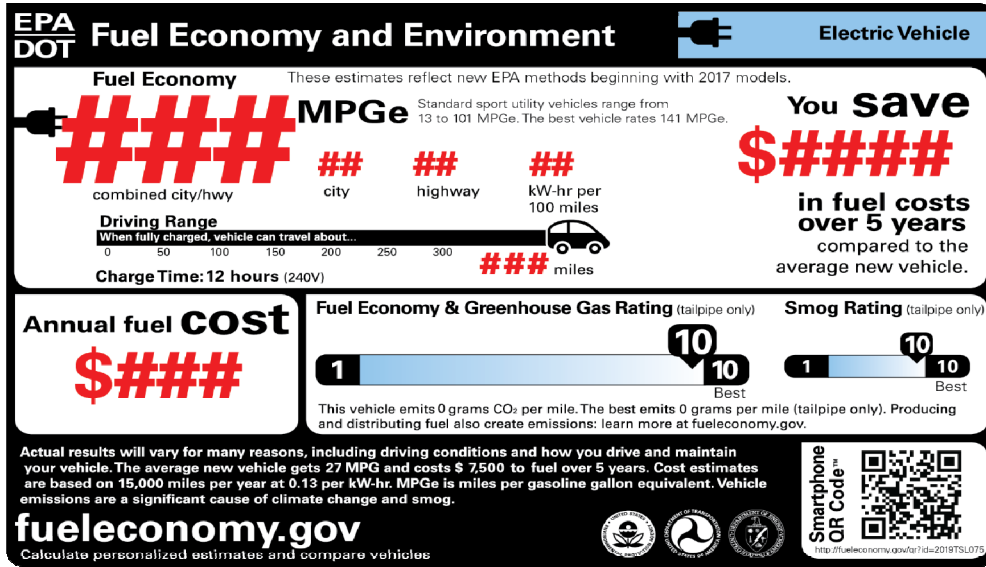
**VEHICLE EMISSION CONTROL INFORMATION**

**THIS VEHICLE CONFORMS TO U.S. EPA REGULATIONS APPLICABLE TO 2023 MODEL YEAR NEW TIER 3 BIN 0 LIGHT-DUTY VEHICLES AND TO CALIFORNIA REGULATIONS APPLICABLE TO ZEV PASSENGER CARS AND IS CERTIFIED FOR SALE IN CALIFORNIA.**

**MODEL: 2023 TESLA MODEL X  
MOTOR: 3 PHASE AC  
TEST GROUP: PTLV00.0L2X  
EVAPORATIVE FAMILY: PTLR0000L2X**

**07.03 California Environmental Performance Index label: 2023 Model Year**

(Mandated in California Environmental Performance Label Specifications for 2009 and Subsequent Model Passenger Cars, Light-Duty Trucks and Medium-Duty Passenger Cars. Label format agreed with EPA/ CARB)



FE Label

**07.04 Projected sales information (Confidential)**

**08:00 GENERAL TECHNICAL DESCRIPTION**

**08.01 DESCRIPTION OF PROPULSION SYSTEM**

**Front Drive Unit:**

Traction motor × 1,  
Fixed ratio gearbox,  
Drive inverter

**Rear Drive Unit:**

Traction motor × 1,  
Fixed ratio gearbox,  
Drive inverter

**8.02 DESCRIPTION OF MOTOR(S)**

**Front Motor:**

3-phase AC internal permanent magnet motors utilizing a six-pole, high-frequency design with inverter-controlled magnetic flux.

**Rear Motor:**

3-phase AC internal permanent magnet motors utilizing a six-pole, high-frequency design with inverter-controlled magnetic flux.

**8.03 DESCRIPTION OF BATTERIES**

The battery packs used in the Tesla Model X is one of the largest and technically most advanced lithium-ion battery packs in the world. Using customized automotive grade lithium-ion cells, the Tesla battery achieves unmatched energy density and enables the long range capability of the vehicle. The low-profile flat packaging enables an efficient and functional occupant area. The battery has a replaceable fuse that is accessible with the battery removed from the vehicle and a set of contactors inside the pack that disconnect high voltage from the positive and negative terminals on the battery pack. To disable contactors from closing during vehicle service, the 12V power feed can be disconnected in the vehicle fuse box. The battery control system consists of the Battery Monitoring System (BMS) which controls the contactors, measures pack current and voltages, electrical isolation of the battery from chassis ground and monitors cell brick voltages, module temperatures, and faults from the Battery Monitor Boards (BMBs) installed on each of the many modules.

**08.03.01 Battery charging capacity**

The battery when fully charged contains the approximate amount of energy based on the type of battery fitted onto the vehicle.

**08.03.02 Self-discharge information**

The self-discharge rate of the battery is likely to be less than 4% per month.

### **08.03.03 Description of thermal management system**

The Tesla battery pack contains an integrated cooling system to ensure that the individual cells are maintained at, or close to, their optimum operating temperature. Incorporated in the vehicle system is an inline heating element to raise and a chiller to lower the pack temperature, when required.

### **08.03.04 Definition of end-of-life**

The battery pack end-of-life shall be determined by Tesla's local service centers with Proper inspection and test methods.

### **08.03.05 Description of battery disposal plan**

Tesla's lithium ion battery packs do not contain heavy metals such as lead, Cadmium, or mercury. They are exempt from hazardous waste disposal standards in the USA under the Universal Waste Regulations. However, they do contain recyclable materials, and Tesla plans to recycle all battery packs removed from vehicles.

Tesla highly recommends that all battery packs be taken to local Tesla service facilities and recycled by Tesla or Tesla authorized agencies, so that the battery packs can be recycled in a safe and efficient manner.

If disposing independently, without return to Tesla, then the owner must assume responsibility for recycling in a safe and legal manner. If an owner does assume this responsibility, Tesla recommends consulting with the appropriate local, state or federal authorities to determine the appropriate methods for disposal and recycling. Keep in mind that disposal regulations may vary dependent on location.

For more information on the recycling of Tesla custom battery packs, please call Tesla Customer Service at 1-877-79TESLA (1-877-798-3752).

## **08.04 DESCRIPTION OF CONTROLLER / INVERTER**

The drive inverter performs several critical functions in the Tesla Model X including torque control, power and torque limit enforcement, and status monitoring. The drive inverter is an integral part of the drive unit.

## **08.05 DESCRIPTION OF TRANSMISSION**

The Tesla Model X transmission is a fixed ratio, mechanical, transversely mounted gearbox with integral final drive unit (transaxle configuration).

The shift lever is mounted to the steering column. The lever has four detents—one reverse, one drive, and two neutral positions. Selecting either forward or reverse position enables drive current to the motor to generate the appropriate torque. There is no physical reverse gear needed.

In addition, the lever has a park button which is used to operate the electrically-actuated park brake.

## **8.06 DESCRIPTION OF CLIMATE CONTROL SYSTEM**

### **General Specifications:**

The Model X climate control modes include Defrost (Panel, Floor and any combination of these three). The system consists of four panel vents, two front row floor vents, defroster vent, second row floor vents, second row console vents with positive air shut off and turning vane manual control.

### **08.06.01 Electric cabin heater**

The heater unit incorporating a variable speed electric fan is located in the front of the chassis tub with ducting directing the blown air to defrosting, face level and floor level vents in the passenger compartment. The heater element is of the positive temperature coefficient (PTC) type, drawing HV electrical energy from the battery pack High Voltage

### **08.06.02 Fuel-fired heater**

Not applicable

### **08.06.03 Air conditioning**

The Model X air conditioner system is an R134a refrigerant consists of a high voltage electric scroll type with integrated inverter with High Voltage Interlock Loop. The compressor Oil is Poly Olefin Ester oil that is non-conducting.

### **08.06.04 Climate control system logic**

Remote Climate Control Module printed circuit board activates actuators and responds to evaporator air outlet temperature sensor, PTC heater outlet temperature sensor and air duct temperature sensors, as well as user demands from center display.

#### **08.06.05 Tamper resistance of climate control system that includes a fuel-fired heater**

Not applicable

#### **08.07 DESCRIPTION OF REGENERATIVE BRAKING SYSTEM**

Regenerative braking (RGB) occurs when the driver lifts their foot from the accelerator pedal while the vehicle is moving; the experience is analogous to engine braking on a gasoline-powered car with a conventional manual transmission. The friction braking system of the Tesla Model X is independent of RGB.

The amount of RGB torque generated is proportional to accelerator pedal position – full torque when the accelerator pedal is fully released; less as the pedal is depressed, reaching zero torque when the pedal reaches its neutral torque position (a position that is in fact a function of vehicle speed). The max RGB deceleration also varies depending on vehicle speed. The maximum RGB profile is defined as a target total deceleration rate as a function of vehicle speed. The max RGB profile is tailored to everyday driving conditions, which typically exhibit higher deceleration rates at lower speeds.

When the battery pack is near maximum capacity, regenerative braking function will be limited to ensure the maximum capacity of the battery is not exceeded. Any RGB limiting will be ramped in gradually to allow the driver to adapt to the changing RGB performance. When the battery pack is below 0 degrees, RGB will not be allowed because the batteries are not rated to accept charge below this temperature. Any RGB limiting will be ramped in gradually to allow the driver to adapt to the changing RGB performance. . The vehicle notifies the driver of any limits of the regenerative braking function.

#### **08.08 DESCRIPTION OF VEHICLE ELECTRICAL SUPPLY EQUIPMENT (CHARGER)**

The Tesla Model X is capable of accepting energy either from a permanent facility installed at the owners location or from many readily available power outlets when 'on the road'.

The dedicated High Power Connector (HPC) can be purchased separately from the vehicle and a certified electrician will confirm the capabilities of the residential supply circuit at the vehicle owner's location. Confirmation of a satisfactory residential electrical Supply will lead to the installation of a hard-wired HPC unit, this will expedite vehicle charging at the most efficient rate. The HPC can supply available current up to a maximum of 80 amps and incorporates electronic systems that communicate with the vehicle control systems to indicate the maximum available current so that the vehicle can determine the amount and rate of charge required.

Charging at rates lower than 80A can also be achieved via a mobile connector. The universal mobile connector is included as standard in the purchase of every Model X and is an individual cable that connects the vehicle to any available domestic power outlet and can deliver current to a maximum of 40 amps. The Mobile Connector incorporates the same electronic circuitry as the HPC to communicate with the vehicle and manage the charging process.

The vehicle is also capable of accepting DC current up to 225A from an off-board charger (Supercharger).

##### **08.08.01 Proper recharging procedures**

The charging system adjusts automatically to the available AC line voltage, frequency and current, within limits. The charging system in the vehicle works in conjunction with either of the three external charging stations; the permanently installed HPC, the permanently installed supercharger or the portable Mobile Connector.

Anytime the EV Inlet door is opened, the vehicle will prepare to enter CHARGE state. Once the user connects either supply cable to the vehicle, the charging system signals to the vehicle that it is ready to deliver the charge. The vehicle locks the cable onto the vehicle and then indicates that it is ready to accept energy and charging will commence. Failure of any of these steps will result in fault condition and lack of charge.

**Prepare to charge state**

**Charging Indication**



If the battery temperature is near or below freezing temperatures, normal charging will not occur. The vehicle will identify this condition and will begin heating the battery coolant and circulating the coolant to raise the battery temperature to enable charge. When the pack temperature rises to a temperature within the allowable charging range, heating will reduce or stop and charging will commence.

#### **08.08.02 Power requirements necessary to recharge vehicle**

If there are two on-board chargers installed in the vehicle it is designed to accept AC current from 110-120V or 208-240V outlets with a supply of up to 80A. If there is a single on-board charger installed in the vehicle, then the AC current will be limited to 40A.

#### **08.10 OTHER UNIQUE FEATURES (i.e. solar panels)**

Not applicable; vehicle is not equipped with any such features.

#### **08.11 DESCRIPTION OF WARNING SYSTEM(S) FOR MAINTENANCE / MALFUNCTION**

The Tesla Model X is equipped with a tell-tale lamp located in the instrument pack to indicate battery malfunctions; the lamp illuminates yellow for a minor defect and red for a major fault.

The tell-tale is complemented by more detailed information exhibited on the Center Display. An additional driver aid which indicates the nature of the malfunction as well as a wide range of additional vehicle data, such as when maintenance is needed.

#### **08.11.01 Cut-off terminal voltages for prevention of battery damage**

The control electronics inside of the Drive Unit and Charger are programmed not to allow the unit to drive the voltage of the battery above or below hard voltage limits. If the battery pack is unable to achieve a desired response from these systems and the voltage reaches above or below a set limit, the two contactors inside the battery pack will open, disabling the entire high voltage system in the car.

#### **8.12 DESCRIPTION OF DYNO MODE**

Tesla, Inc. implemented user interface (UI) features that enable access to our “Dyno Mode” for all users. This feature is required to be enabled to maintain representative driving controls while testing on a chassis dynamometer.

In order to preserve the proper driving functionality and behavior, Dyno Mode executes the following features:

- Disable Stability Control to ensure no false interaction with the dyno.
- Disable Traction Control to ensure no false interaction with the dyno.
- Disable Active Drive Line Damping to avoid inducing oscillations in the dyno.
- Force the torque split to be as it would be under normal straight-line driving conditions
- Disable Brake Disk Wipe
- Disable vehicle movement plausibility monitor to ensure the availability of autonomous brake actuation on Dyno.

When the Stability Control and Traction Control systems become faulted, as is the case on a dynamometer where driving is detected but movement is not, regenerative braking is disabled so that unintended braking torque does not lead to loss of traction or control on low friction surfaces. Disabling Stability Control and Traction Control prevents those systems from disrupting regenerative braking behavior, maintaining the most representative driving energy consumption.

Dyno Mode can be activated by the user, according to the steps in the driver's guide.

Dyno Mode can be deactivated by the user by pressing the “Power Off” button within the Safety & Security tab of the UI.

### **8.13 DESCRIPTION OF COASTDOWN MODE**

To engage Coastdown Mode:

1. Press and hold Tesla T to bring up Access Code prompt
2. Type "coastdown"

Vehicle Behavior:

UI will send out a binary signal in the message on the right bus. The thermal controller should consume this message and unconditionally close the louver and turn off the refrigerant system.

Display "COASTDOWN" in cluster where we display other mode info like "VALET" and "CHILL"  
Coastdown Mode will turn OFF after drive cycle is complete.

### **09.00 RESERVED**

### **10.00 RESERVED**

### **11.00 STARTING AND SHIFTING SCHEDULES**

#### **11.01 Starting**

The Model X does not have a traditional starter switch and instead has a smart entry system for greater safety and customer convenience. The smart entry system comprises of a smart key, a weight sensor embedded into the driver seat, and the brake pedal. When the driver enters the vehicle with the smart key and sits on the driver's seat, the vehicle controller, attempts to validate the unique key code by reading the key code. If successful interaction between the coded key and vehicle controller occurs, the system deactivates the immobilizer. The vehicle then enters accessory mode analogous to a “ACC” position on a conventional IC engine. In this mode, low voltage (12V) is supplied to the vehicle allowing operation of the radio and other accessories connected to the accessory rail. High Voltage (HV) necessary to enable vehicle propulsion is enabled only by the closing of the contactors, which can only be triggered when the following conditions are both satisfied,

1. Smart key is detected and key code is validated AND
2. Brake pedal is depressed.

By requiring brake pedal activation, along with the appropriate key code, this system ensures the safety of vehicle occupants by not allowing self mobility of the vehicle without the driver providing proper control inputs (i.e., service brake activation) and appropriate driver authorization (i.e., presence of the key code). If either the service brake is not activated or the key code not present, the vehicle controller will not close the connectors and self-mobility is not possible.

If the brake pedal is depressed and the proper key code present, the drive rail will activate and allows the transmission to be shifted out of Park.

#### **11.02 SHIFTING**

Not applicable – the vehicle has a single-speed transmission.

#### **12:00 -16:00 RESERVED**

#### **17:00 CALIFORNIA REQUIREMENTS**

##### **17:01 Statement of Compliance**

###### **17.01.01 General Statement**

The production vehicles which are subject to registration or sale in the State of California will be, in all material respects, substantially the same in construction as test vehicles which are certified by the California Air Research Board; and will meet all the applicable emissions standards which are promulgated by the California Air Research Board in accordance with Section 43101 of the Health and Safety Code.

Tesla attests that the vehicle emission control label complies with the label durability requirements of the “California Motor Vehicle Emission Control and Smog Index Label Specifications”, Title 13, CCR, Section 1965.

###### **17.01.02 Drivability statement**

This statement is no longer included in the California Exhaust Emission Standards and Test Procedures for 2001 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles (as of January 01 2006); as was the case in previous versions.

##### **17.02 Supplemental data and certification review sheets**

See attached

##### **17.03 Engineering evaluation of zero evaporative emissions under any and all operating conditions (for vehicles equipped with fuel-fired heater only)**

Not applicable; vehicle is not equipped with fuel-fired heater.

##### **17.04 Credits**

###### **17.04.01 Description of multi-manufacturer arrangements**

Not applicable; Tesla has no such agreements in place.

#### **17.05 VEHICLE SAFETY**

##### **17.05.01 All Information for safe operation of vehicle**

Tesla owner's manual is available at website <https://www.tesla.com/ownersmanual>

##### **17.05.02 Information on safe handling of battery system**

###### **HANDLING**

Do not short circuit, puncture, incinerate, crush, immerse, force discharge, or expose the battery pack to temperatures outside the specified maximum storage temperature range of -20°C to 60°C.

The battery pack has a nominal operating voltage of 400 VDC. The battery pack is sealed in a rigid metal case and its exterior is isolated from high voltage. Handling the battery pack is electrically safe provided the enclosure remains closed.

The battery pack contains hermetically sealed lithium ion cells that contain a number of chemicals and materials of construction. Risk of exposure to electrode materials and Liquid electrolyte will only occur in cases of mechanical or thermal abuse of the battery Pack.

###### **STORAGE**

Do not store the battery pack in a manner that allows terminals to short circuit. Do not place near heating equipment, nor expose to direct sunlight for long periods. The battery pack should only be stored in approved packaging and stacked no more than two (2) packages high. To maintain service life, the battery pack should be stored at a state of charge (SOC) of 15 to 50%.

## **TRANSPORT**

Lithium ion batteries are regulated as Class 9 Miscellaneous dangerous goods (also known as “hazardous materials”) pursuant to the International Civil Aviation Organization.

(ICAO) Technical Instructions for the Safe Transport of Dangerous Goods by Air, International Air Transport Association (IATA) Dangerous Goods Regulations, the International Maritime Dangerous Goods (IMDG) Code, European Agreements concerning the International Carriage of Dangerous Goods by Rail (RID) and Road (ADR), and applicable national regulations such as the USA’s hazardous materials regulations (see 49 CFR 173.185). These regulations contain very specific packaging, labelling, marking, and documentation requirements. The regulations also require that individuals involved in the preparation of dangerous goods for transport be trained on how to properly package, label, mark and prepare shipping documents.

### **17.05.03 Description of emergency procedures**

#### **HIGH VOLTAGE EXPOSURE**

If one of the Tesla products has been visibly damaged or its enclosure compromised, then practice appropriate high voltage preventative measures until the danger has been assessed (and dissipated if necessary).

#### **FIREFIGHTING MEASURES**

If a fire or explosion occurs when the battery pack is charging, shut off power to the charger. In case of burning lithium ion fires, flood the area with water. The water may not extinguish them, but will cool the adjacent batteries and control the spread of the fire. CO<sub>2</sub>, dry chemical and foam extinguishers are preferred for small fires, but also may not extinguish burning lithium ion batteries. Burning batteries will burn themselves out. Virtually all fires involving lithium ion batteries can be controlled with water. When water is used, however, hydrogen gas may be a by-product which can form an explosive Mixture with air. LITH-X (powdered graphite) or copper powder fire extinguishers, sand, dry ground dolomite or soda ash may also be used. These materials act as smothering agents.

Damaged or opened cells or batteries can result in rapid heating (due to exothermic reaction of constituent materials) and the release of flammable vapors. Water (and other items listed above) disperses heat when applied in sufficient quantity to a fire. Extended heat exposure can lead to ignition of adjacent cells with a potential complete envelopment of the battery pack if not cooled. An extinguished lithium ion battery fire can re-ignite due to the exothermic reaction of constituent materials from broken or damaged cells. To avoid this, remove sources of ignition and cool the burned mass by flooding with (or immersing in) water. Fire-fighters should wear self-contained breathing apparatus. Cells or batteries may flame or leak potentially hazardous organic vapors if exposed to excessive heat, fire or over voltage conditions. These vapors include HF, oxides of carbon, aluminum, lithium, copper, and cobalt. Additionally, volatile phosphorus pentafluoride may form at temperatures above 230° Fahrenheit. Never cut into the sealed battery pack enclosure due to the high voltage and electrocution risks.

If a decision is made to fight a battery fire aggressively, then large amounts of water should be applied from a safe distance with the intent of flooding the battery pack enclosure as completely as possible. Alternatively, if a decision is made to fight a battery fire defensively, then the fire crew should pull back a safe distance and allow the battery to burn itself out. Fire crews may choose to utilize a water stream or fog pattern to protect exposures or control the path of smoke.

#### **FIRST AID MEASURES**

Under normal conditions of use, the constituent battery cells are hermetically sealed. Contents of an open (broken) constituent battery cell can cause skin irritation and/or chemical burns. If materials from a ruptured or otherwise damaged cell or battery contact skin, flush immediately with water and wash affected area with soap and water. For eye contact, flush with significant amounts of water for 15 minutes and see physician at once. Avoid inhaling any vented gases. If a chemical burn occurs or if irritation persists, seek medical assistance. Seek immediate medical assistance if an electrical shock or electrocution has occurred (or is suspected).

### **17.06 Description of fuel-fired heater / fuel tank evaporative system**

Not applicable; vehicle is not equipped with fuel-fired heater.

### 3.03 Vehicle Configuration and sub-configurations

<b>Make</b> <b>Carline</b> <b>Type</b> <b>Test Group</b> <b>Final Drive ratio</b> <b>Emission Control</b> <b>Exhaust</b> <b>Evap</b> <b>Model Type</b> <b>Basic Engine code (F/R)</b> <b>Transmission Type / Code</b> <b>Vehicle ID tested</b>	Tesla Model X Battery Electric Vehicle NTSLV00.0L2X 1 NA (BEV) NA (BEV) NA (BEV) <b>Model X</b> L2X AV/1 XD321-325808
<b>Vehicle Configuration #</b>	0
<b>Sub configuration #</b> Gross Vehicle Weight (lbs) 33% Curb Mass (lbs) Loaded Vehicle Weight (lbs) Equivalent Test Weight (lbs)  Base wheel / Tire (F&R)  Target Road Load A lbf B lbf/mph C lbf/mph <sup>2</sup> RLHP @ 50mph	0 6250 5219 5519 5500  265/45R20 (F) 275/45R20 (R)  33.56 0.4237 0.0168 12.91
<b>Sub configuration #</b> Gross Vehicle Weight (lbs) 33% Curb Mass (lbs) Loaded Vehicle Weight (lbs) Equivalent Test Weight (lbs)  Wheel / Tire  Target Road Load A lbf B lbf/mph C lbf/mph <sup>2</sup> Road Load HP @ 50mph	1 6250 5219 5519 5500  265/35R22 (F) 285/35R22 (R)  37.07 0.6125 0.0141 13.72

Fuel Economy Data Vehicle (FEDV) Selection Justification – FEDV curb mass vehicle accounts for options that have a greater than 33% take rate and highest sold wheel/tire combination that collectively represents a vehicle configuration / sub configuration that has the largest sales volume within that Model Type. Tesla affirms that the road load power, and the target coefficients are those that are appropriate for the ETW of the vehicle.



### Certification Summary Information Report

<b>Test Group</b>	PTSLV00.0L2X	<b>Evaporative/Refueling Family</b>	--
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**Models Covered by this Certificate**

Carline Manufacturer	Division	Carline	Certification Region Code(s)	Drive System	Trans - Type	- # of Gears	Trans - Lockup
Tesla, Inc.	1 - Tesla Motors	73 - Model X	Federal	All Wheel Drive	Automatic	1	No
Tesla, Inc.	1 - Tesla Motors	73 - Model X	California + CAA Section 177 states	All Wheel Drive	Automatic	1	No

**Engine Description**

<b>Hybrid Type</b>	--	<b>Hybrid Description</b>	--
<b>Engine Type</b>	--	<b>Mfr Engine Description</b>	--
<b>Engine Block Arrangement</b>	--	<b>Mfr Engine Block Arrangement Description</b>	--
<b>Camless Valvetrain Indicator</b>	--	<b>Oil Viscosity/Classification</b>	
<b>Number of Cylinders/Rotors</b>	--	<b>Mechanically Variable Compression Ratio Indicator</b>	--

**After Treatment Device(s) (ATD)**

<b>Mfr After Treatment Device (ATD) Comments</b>	--
<b>Direct Ozone Reduction (DOR) Device</b>	--
<b>Mfr Emission Control Device Comments</b>	--

**Official Test Numbers**

Test Group	Fuel	FTP	US06	SC03	Cold CO	Highway	EPA City Litmus Value	EPA City Litmus Threshold	EPA Highway Litmus Value	EPA Highway Litmus Threshold	CREE Weighting Factor
Electricity		--	--	--	--	--	--	--	--	--	--

**Official Charge Depleting Test Numbers**

Test Group Fuel	UDDS	Highway
Electricity	MTSL10071388	MTSL10071389

## Certification Summary Information Report

Test Group	PTSLV00.0L2X	Evaporative/Refueling Family	--
<b>Hybrid Electric Vehicle And Fuel Cell Information</b>			
Rechargeable Energy Storage System	Battery(s)	Rechargeable Energy Storage System, if Other	--
Battery Type	Lithium Ion	Number of Battery Packs	1
Total Voltage of Battery Packs	408	Battery Energy Capacity	256
Battery Specific Energy	187	Battery Charger Type	On-Board
Number of Capacitors	--	Capacitor Rating (In Farads)	--
Mfr Capacitor Comments	--		
Hydraulic System Description	--		
Regenerative Braking Type	Electrical Regen Brake		
Regenerative Braking Source	Both	Driver Controlled Regenerative Braking	No
Mfr Regenerative Braking Description	--		
Drive Motor(s)/Generator(s)	2		
Motor/Generator Type 1	AC Permanent Magnet	Rated Motor/Generator Power	248
Motor/Generator Type 2	AC Permanent Magnet	Rated Motor/Generator Power	243
Mfr Fuel Cell Description	--		
Fuel Cell On-Board H2 Storage Capacity (kg)	--	Usable H2 Fill Capacity (kg)	--
Mfr Hybrid Electric/ Electric Vehicle Comments	1 carline (Model X) is available for 2023 MY Model X vehicles.		

### Certification Summary Information Report

<b>Test Group</b>	PTSLV00.0L2X	<b>Evaporative/Refueling Family</b>	--
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**Emission Data Vehicle Information**

Vehicle ID / Configuration	XD321-325808 / 0	Manufacturer Vehicle Configuration Number	0
Original Test Group Name	MTSLV00.0L2X	Original Evaporative/Refueling Family	--
Original Test Vehicle Model Year	2021		
<b>Vehicle Model</b>			
Represented Test Vehicle Make	Tesla	Represented Test Vehicle Model	Model X Long Range

**Leak Family Details**

Leak Family Identifier	--	Leak Family Name	--
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**Drive Sources and Fuel System Details**

Drive Source and Fuel#	Drive Source	Fuel
1	Electric Motor	Electricity

Hybrid Indicator	No		
Multiple Fuel Storage	--	Multiple Fuel Combustion	--
Fuel Cell Indicator	No	Rechargeable Energy Storage System Indicator	Yes
Rechargeable Energy Storage System	Battery(s)	Rechargeable Energy Storage System, if 'Other'	--
Off-board charge Capable Indicator	Yes		
Odometer Correction -- Initial	1	Odometer Correction Factor	1
Odometer Correction Sign	- = System Miles is equal to (Test odometer reading - Initial system miles) * Correction factor		
Odometer Correction Units	Miles		
Engine Code	L2X	Rated Horsepower	658
Displacement (liters)	0.001		
Air Aspiration Method	Naturally Aspirated	Air Aspiration Method, if 'Other'	
Number of Air Aspiration Devices	--	Air Aspiration Device Configuration	--
Charge Air Cooler Type	--	Drive Mode While Testing	4-Wheel Drive
Shift Indicator Light Usage	Not equipped	Aged Emission Components	4,000 (mi)
Curb Weight (lbs)	5219	Equivalent Test Weight (pounds)	5500
GVWR (lbs)	6250	N/V Ratio	102.7
Axle Ratio	1		
Transmission Type	Direct Drive	# of Transmission Gears	1
Transmission Lockup	No	Creeper Gear	No

**Dynamometer Coefficients:**

Coefficient Category	Target Coefficients			Set Coefficients			EPA Calculated Total Road Load Horse Power for City/Highway/Evap Coefficients
	A (lbf)	B (lbf/mph)	C (lbf/mph**2)	A (lbf)	B (lbf/mph)	C (lbf/mph**2)	
<b>City/Highway/Evap</b>	33.56	0.4237	0.0168	-11.15	0.3165	0.0142	12.9
<b>Cold CO</b>	36.92	0.466	0.0185	-19.53	0.1999	0.0169	N/A

## Certification Summary Information Report

<b>Test Group</b>	PTSLV00.0L2X	<b>Evaporative/Refueling Family</b>	--
<b>Emission Control Device Comments</b>	No emissions control Device - Pure Electric Vehicle		
<b>Manufacturer Test Vehicle Comments</b>	This is a Long Range configuration vehicle Individual HP is 244 kw Front / 248 kw Rear N/V Ratio F: 85.9 R: 102.7		
<b>Test #</b>	<b>MTSL10071390</b>	<b>Test Procedure</b>	<b>2 - CVS 75 and later (w/o can. load)</b>
<b>Exhaust Test # for this Evap Test</b>	--	<b>Test Fuel Type</b>	62 - Electricity
<b>Test Date</b>	08/24/2021	<b>Fuel</b>	Electricity
<b>Fuel Batch ID</b>	--	<b>Fuel Calibration Number</b>	--
<b>Vehicle Class</b>	LDV/Passenger Car	<b>DF Type</b>	EPA Assigned
<b>Verify Test Lab ID</b>	Tesla Kato		
<b>E10 Evaporative Test Measurement Method</b>	--		
<b>Test Start Odometer Reading</b>	2736	<b>Odometer Units</b>	M
<b>4WD Test Dyno</b>	Yes	<b>Diesel Adjustment Factor Usage</b>	--
<b>State of Charge Delta</b>	--		
<b>Drive Cycle Speed Tolerance Criteria</b>	Used Part 86 (+/- 2 mph, +/- 1 sec)	<b>Road Speed Fan Usage</b>	Yes

## Test Results

Test Result Name	Unrounded Test Result	Verify Calculated FE Equivalent Value (kilowatt-hour per 100 miles)
CO (Carbon Monoxide)	0	--
DT-ASCR (Drive Trace Absolute Speed Change Rating)	0.1205	--
DT-EER (Drive Trace Energy Economy Rating)	-0.0104	--
DT-IWRR (Drive Trace Inertia Work Ratio Rating)	0.7145	--
MFR FE (Manufacturer Fuel Economy)	20.2552	166.3770291
NOX (Nitrogen Oxide)	0	--
NMOG (Non-methane organic gases)	0	--

Test Result Name	Unrounded Test Result	Verify Calculated CREE/OPT-CREE
Carbon-Related Exhaust Emissions	0	0

## Manufacturer Test Comments

Internal Test results (CVS-75 UDDS Ambient) for MY2021 Model X Long Range. AC wh/mi @ 50 % SOC - Bag 1 - 229.1; Bag 2- 192.6; Bag 3 - 223.4; Bag 4 - 192.3;

Certification Region	Useful Life	Standard Level	Emission Name	Rounded Result	RAF	NMOG/NM HC Ratio	Diesel Adjustment Factor	Add DF	Mult DF	Certification Level	Standard	Pass/Fail
Fed	150,000 miles	Federal Tier 3 Bin 0	CO	0.0	--	--	--	0	--	0	0	Pass
CA	150,000 miles	California ZEV	CO	0.0	--	--	--	0	--	0	0	Pass

## Certification Summary Information Report

<b>Test Group</b>	PTSLV00.0L2X	<b>Evaporative/Refueling Family</b>	--
<b>Test #</b>	<b>MTSL10071391</b>	<b>Test Procedure</b>	<b>3 - HWFE</b>
<b>Exhaust Test # for this Evap Test</b>	--	<b>Test Fuel Type</b>	62 - Electricity
<b>Test Date</b>	08/24/2021	<b>Fuel</b>	N/A
<b>Fuel Batch ID</b>	--	<b>Fuel Calibration Number</b>	--
<b>Vehicle Class</b>	N/A	<b>DF Type</b>	EPA Assigned
<b>Verify Test Lab ID</b>	Tesla Kato		
<b>E10 Evaporative Test Measurement Method</b>	--		
<b>Test Start Odometer Reading</b>	2736	<b>Odometer Units</b>	M
<b>4WD Test Dyno</b>	Yes	<b>Diesel Adjustment Factor Usage</b>	--
<b>State of Charge Delta</b>	--		
<b>Drive Cycle Speed Tolerance Criteria</b>	Used Part 86 (+/- 2 mph, +/- 1 sec)	<b>Road Speed Fan Usage</b>	Yes

## Test Results

Test Result Name	Unrounded Test Result	Verify Calculated FE Equivalent Value (kilowatt-hour per 100 miles)
<b>DT-ASCR (Drive Trace Absolute Speed Change Rating)</b>	2.0297	--
<b>DT-EER (Drive Trace Energy Economy Rating)</b>	1.0478	--
<b>DT-IWRR (Drive Trace Inertia Work Ratio Rating)</b>	2.4	--
<b>MFR FE (Manufacturer Fuel Economy)</b>	22.3094	151.0574018
<b>NOX (Nitrogen Oxide)</b>	0	--
<b>NMOG (Non-methane organic gases)</b>	0	--

Test Result Name	Unrounded Test Result	Verify Calculated CREE/OPT-CREE
<b>Carbon-Related Exhaust Emissions</b>	0	0

## Manufacturer Test Comments

Internal Test results (HWY 3) for MY2021 Model X Long Range. The HFET result from the full discharge MCT is used for the 2-part and 5-part calculations. AC wh/mi - 223.1

## Certification Summary Information Report

<b>Test Group</b>	PTSLV00.0L2X	<b>Evaporative/Refueling Family</b>	--
<b>Test #</b>	<b>MTSL10071393</b>	<b>Test Procedure</b>	<b>90 - US06</b>
<b>Exhaust Test # for this Evap Test</b>	--	<b>Test Fuel Type</b>	62 - Electricity
<b>Test Date</b>	08/24/2021	<b>Fuel</b>	N/A
<b>Fuel Batch ID</b>	--	<b>Fuel Calibration Number</b>	--
<b>Vehicle Class</b>	N/A	<b>DF Type</b>	EPA Assigned
<b>Verify Test Lab ID</b>	Tesla Kato		
<b>E10 Evaporative Test Measurement Method</b>	--		
<b>Test Start Odometer Reading</b>	2736	<b>Odometer Units</b>	M
<b>4WD Test Dyno</b>	Yes	<b>Diesel Adjustment Factor Usage</b>	--
<b>State of Charge Delta</b>	--		
<b>Drive Cycle Speed Tolerance Criteria</b>	Used Part 86 (+/- 2 mph, +/- 1 sec)	<b>Road Speed Fan Usage</b>	Yes

## Test Results

Test Result Name	Unrounded Test Result	Verify Calculated FE Equivalent Value (kilowatt-hour per 100 miles)
CO (Carbon Monoxide)	0	--
DT-ASCR (Drive Trace Absolute Speed Change Rating)	-1.0785	--
DT-EER (Drive Trace Energy Economy Rating)	-1.7193	--
DT-IWRR (Drive Trace Inertia Work Ratio Rating)	-2.5882	--
MFR FE (Manufacturer Fuel Economy)	31.096	108.3740674
NOX (Nitrogen Oxide)	0	--
NMOG (Non-methane organic gases)	0	--

## Manufacturer Test Comments

Internal Test results (US 06) for MY2021 Model X Long Range. US 06 AC wh/mi @ 50% SOC - City: 311.0; Hwy: 295.9.

## Certification Summary Information Report

<b>Test Group</b>	PTSLV00.0L2X	<b>Evaporative/Refueling Family</b>	--
<b>Test #</b>	<b>MTSL10071394</b>	<b>Test Procedure</b>	<b>95 - SC03</b>
<b>Exhaust Test # for this Evap Test</b>	--	<b>Test Fuel Type</b>	62 - Electricity
<b>Test Date</b>	08/24/2021	<b>Fuel</b>	N/A
<b>Fuel Batch ID</b>	--	<b>Fuel Calibration Number</b>	--
<b>Vehicle Class</b>	N/A	<b>DF Type</b>	EPA Assigned
<b>Verify Test Lab ID</b>	Tesla Kato		
<b>E10 Evaporative Test Measurement Method</b>	--		
<b>Test Start Odometer Reading</b>	2736	<b>Odometer Units</b>	M
<b>4WD Test Dyno</b>	Yes	<b>Diesel Adjustment Factor Usage</b>	--
<b>State of Charge Delta</b>	--		
<b>Drive Cycle Speed Tolerance Criteria</b>	Used Part 86 (+/- 2 mph, +/- 1 sec)	<b>Road Speed Fan Usage</b>	Yes

## Test Results

Test Result Name	Unrounded Test Result	Verify Calculated FE Equivalent Value (kilowatt-hour per 100 miles)
<b>CO (Carbon Monoxide)</b>	0	--
<b>DT-ASCR (Drive Trace Absolute Speed Change Rating)</b>	0.3683	--
<b>DT-EER (Drive Trace Energy Economy Rating)</b>	0.0503	--
<b>DT-IWRR (Drive Trace Inertia Work Ratio Rating)</b>	0.3506	--
<b>MFR FE (Manufacturer Fuel Economy)</b>	26.9993	124.8180508
<b>NOX (Nitrogen Oxide)</b>	0	--
<b>NMOG (Non-methane organic gases)</b>	0	--

## Manufacturer Test Comments

Internal Test results (SC 03) for MY2021 Model X Long Range. AC wh/mi - 270.0 at 50% SOC.

## Certification Summary Information Report

Test Group	PTSLV00.0L2X	Evaporative/Refueling Family	--
<b>Test #</b>	<b>MTSL10071388</b>	<b>Test Procedure</b>	<b>81 - Charge Depleting UDDS</b>
<b>Exhaust Test # for this Evap Test</b>	--	<b>Test Fuel Type</b>	62 - Electricity
<b>Test Date</b>	08/24/2021	<b>Fuel</b>	Electricity
<b>Fuel Batch ID</b>	--	<b>Fuel Calibration Number</b>	--
<b>Vehicle Class</b>	LDV/Passenger Car	<b>DF Type</b>	EPA Assigned
<b>Verify Test Lab ID</b>	Tesla Kato		
<b>E10 Evaporative Test Measurement Method</b>	--		
<b>Test Start Odometer Reading</b>	2736	<b>Odometer Units</b>	M
<b>4WD Test Dyno</b>	Yes	<b>Diesel Adjustment Factor Usage</b>	--
<b>State of Charge Delta</b>	--		
<b>Drive Cycle Speed Tolerance Criteria</b>	Used Part 86 (+/- 2 mph, +/- 1 sec)	<b>Road Speed Fan Usage</b>	Yes
<b>PHEV/EV Charge Depleting Test Information</b>			
<b>Recharge Event Voltage</b>	208	<b>Recharge Event Energy (kiloWatt-hours)</b>	114.97
<b>Charge Depleting Range (Calculated miles)</b>	494	<b>Charge Depleting Range (Actual miles)</b>	494
<b>All Electric Range Unadjusted (miles)</b>	--	<b>Derived 5-Cycle Coefficient Model Year</b>	--
<b>Equivalent All Electric Range (miles)</b>	494		
<b>Number of Charge Depleting Bags/Phases Conducted</b>	4	<b>Transition Bag/Phase Number</b>	--
<b>Charge Depleting Bag/Phase</b>			
Charge Depleting Bag/Phase #	Test Result/Emission Name	Unrounded Test Result	
1	Carbon Monoxide	0	
2	Carbon dioxide	0	
3	Carbon-Related Exhaust Emissions	0	
4	Drive Trace Absolute Speed Change Rating	1.6204	
5	Drive Trace Energy Economy Rating	1.7575	
6	Drive Trace Inertia Work Ratio Rating	3.0978	
7	Manufacturer Fuel Economy	144.69	
8	Nitrogen Oxide	0	
9	Non-methane organic gases	0	
10	Non-methane organic gases plus Nitrogen Oxides	999.999	
11	Particulate Matter	0	
12	System End State of Charge Watt-hours	99.976	
13	System Start State of Charge Watt-hours	0	
<b>Manufacturer Test Comments</b>	Internal Test results for MY2021 Model X Long Range. Range determined by using SAE J1634 Multi-cycle test procedure. END-SOC 99976 wh (system gave error limited to 4 digits). MCT dc wh/mi is attached with EPA application. Added NMOG Test results.		

### Certification Summary Information Report

Test Group		PTSLV00.0L2X				Evaporative/Refueling Family				--		
Certification Region	Useful Life	Standard Level	Emission Name	Rounded Result	RAF	NMOG/NM HC Ratio	Diesel Adjustment Factor	Add DF	Mult DF	Certification Level	Standard	Pass/Fail
Fed	150,000 miles	Federal Tier 3 Bin 0	CO	0.0	--	--	--	--	1	0	0	Pass
Fed	150,000 miles	Federal Tier 3 Bin 0	CREE	0	--	--	--	--	1	0	--	--
CA	150,000 miles	California ZEV	CO	0.0	--	--	--	0	--	0	0	Pass
CA	150,000 miles	California ZEV	CREE	0	--	--	--	0	--	0	--	--

## Certification Summary Information Report

Test Group	PTSLV00.0L2X	Evaporative/Refueling Family	--
<b>Test #</b>	<b>MTSL10071389</b>	<b>Test Procedure</b>	<b>84 - Charge Depleting Highway</b>
<b>Exhaust Test # for this Evap Test</b>	--	<b>Test Fuel Type</b>	62 - Electricity
<b>Test Date</b>	08/24/2021	<b>Fuel</b>	Electricity
<b>Fuel Batch ID</b>	--	<b>Fuel Calibration Number</b>	--
<b>Vehicle Class</b>	LDV/Passenger Car	<b>DF Type</b>	EPA Assigned
<b>Verify Test Lab ID</b>	Tesla Kato		
<b>E10 Evaporative Test Measurement Method</b>	--		
<b>Test Start Odometer Reading</b>	2736	<b>Odometer Units</b>	M
<b>4WD Test Dyno</b>	Yes	<b>Diesel Adjustment Factor Usage</b>	--
<b>State of Charge Delta</b>	--		
<b>Drive Cycle Speed Tolerance Criteria</b>	Used Part 86 (+/- 2 mph, +/- 1 sec)	<b>Road Speed Fan Usage</b>	Yes
<b>PHEV/EV Charge Depleting Test Information</b>			
<b>Recharge Event Voltage</b>	208	<b>Recharge Event Energy (kiloWatt-hours)</b>	114.97
<b>Charge Depleting Range (Calculated miles)</b>	448	<b>Charge Depleting Range (Actual miles)</b>	448
<b>All Electric Range Unadjusted (miles)</b>	--	<b>Derived 5-Cycle Coefficient Model Year</b>	--
<b>Equivalent All Electric Range (miles)</b>	448		
<b>Number of Charge Depleting Bags/Phases Conducted</b>	2	<b>Transition Bag/Phase Number</b>	--
<b>Charge Depleting Bag/Phase</b>			
Charge Depleting Bag/Phase #	Test Result/Emission Name	Unrounded Test Result	
1	Carbon Monoxide	0	
2	Carbon dioxide	0	
3	Carbon-Related Exhaust Emissions	0	
4	Drive Trace Absolute Speed Change Rating	7.7847	
5	Drive Trace Energy Economy Rating	2.5663	
6	Drive Trace Inertia Work Ratio Rating	9.7335	
7	Manufacturer Fuel Economy	131.32	
8	Nitrogen Oxide	0	
9	Non-methane organic gases	0	
10	Non-methane organic gases plus Nitrogen Oxides	999.999	
11	Particulate Matter	0	
12	System End State of Charge Watt-hours	99.976	
13	System Start State of Charge Watt-hours	0	
<b>Manufacturer Test Comments</b>	Internal Test results for MY2021 Model X Long Range. Range determined by using SAE J1634 Multi-cycle test procedure. END-SOC - 99976 wh (System error limited to 4 digits). MCT dc wh/mi is attached with application.		

### Certification Summary Information Report

<b>Test Group</b>	PTSLV00.0L2X	<b>Evaporative/Refueling Family</b>	--
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Certification Region	Useful Life	Standard Level	Emission Name	Rounded Result	RAF	NMOG/NM HC Ratio	Diesel Adjustment Factor	Add DF	Mult DF	Certification Level	Standard	Pass/Fail
Fed	150,000 miles	Federal Tier 3 Bin 0	CO	0.0	--	--	--	0	--	0	0	Pass
Fed	150,000 miles	Federal Tier 3 Bin 0	CREE	0	--	--	--	0	--	0	--	--
CA	150,000 miles	California ZEV	CO	0.0	--	--	--	0	--	0	0	Pass
CA	150,000 miles	California ZEV	CREE	0	--	--	--	0	--	0	--	--



## Certification Summary Information Report

Test Group	PTSLV00.0L2X	Evaporative/Refueling Family	--
<b>Manufacturer Test Comments</b>	Internal Test results(Cold UDDS) for MY2021 Model X Long Range. END SOC is 92320 wh (System error limited to 4 digits) for full discharge. AC wh/mi - Bag 1 - 447.7; Bag 2 - 386.6; Bag 3 - 352.4; Bag 4 - 364.7; Tesla did not use external current measurement after the full cold discharge test, since AC energy is not used in any part of the 5-cycle consumption calculation. The stated recharge energy is an estimate using the DC energy from the cold discharge test and the round trip energy efficiency from the full discharge MCT.		
<b>Fuel Properties</b>			

### Certification Summary Information Report

<b>Test Group</b>	PTSLV00.0L2X	<b>Evaporative/Refueling Family</b>	--
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#### Consolidated List of Standards

**Exhaust Standards**

<b>Cert Region</b>	California + CAA Section 177 states	<b>Cert/In-Use Code</b>	Cert
<b>Vehicle Class</b>	LDV/Passenger Car	<b>Standard Level</b>	California ZEV
<b>Fuel</b>	Electricity	<b>Test Procedure</b>	Charge Depleting UDDS

Useful Life	Emission Name	Rounded Result	RAF	NMOG / NMHC	Upward Diesel Adjustment Factor	Downward Diesel Adjustment Factor	Mult DF	Add DF	Std
150,000 miles	CO	--	--	--	--	--	--	0	0
150,000 miles	CO-COMP	--	--	--	--	--	--	0	0
150,000 miles	CREE	--	--	--	--	--	--	0	0
150,000 miles	NMOG+NOX-COMP	--	--	--	--	--	--	0	0

<b>Cert Region</b>	California + CAA Section 177 states	<b>Cert/In-Use Code</b>	Cert
<b>Vehicle Class</b>	LDV/Passenger Car	<b>Standard Level</b>	California ZEV
<b>Fuel</b>	Electricity	<b>Test Procedure</b>	Charge Depleting Highway

Useful Life	Emission Name	Rounded Result	RAF	NMOG / NMHC	Upward Diesel Adjustment Factor	Downward Diesel Adjustment Factor	Mult DF	Add DF	Std
150,000 miles	CO	--	--	--	--	--	--	0	0
150,000 miles	CO-COMP	--	--	--	--	--	--	0	0
150,000 miles	CREE	--	--	--	--	--	--	0	0
150,000 miles	NMOG+NOX-COMP	--	--	--	--	--	--	0	0

<b>Cert Region</b>	Federal	<b>Cert/In-Use Code</b>	Cert
<b>Vehicle Class</b>	LDV/Passenger Car	<b>Standard Level</b>	Federal Tier 3 Bin 0
<b>Fuel</b>	Electricity	<b>Test Procedure</b>	CVS 75 and later (w/o can. load)

Useful Life	Emission Name	Rounded Result	RAF	NMOG / NMHC	Upward Diesel Adjustment Factor	Downward Diesel Adjustment Factor	Mult DF	Add DF	Std
150,000 miles	CO	--	--	--	--	--	--	0	0

### Certification Summary Information Report

<b>Test Group</b>		PTSLV00.0L2X			<b>Evaporative/Refueling Family</b>			--		
<b>Cert Region</b>		Federal			<b>Cert/In-Use Code</b>			Cert		
<b>Vehicle Class</b>		LDV/Passenger Car			<b>Standard Level</b>			Federal Tier 3 Bin 0		
<b>Fuel</b>		Electricity			<b>Test Procedure</b>			Charge Depleting UDDS		
<b>Useful Life</b>	<b>Emission Name</b>	<b>Rounded Result</b>	<b>RAF</b>	<b>NMOG / NMHC</b>	<b>Upward Diesel Adjustment Factor</b>	<b>Downward Diesel Adjustment Factor</b>	<b>Mult DF</b>	<b>Add DF</b>	<b>Std</b>	
150,000 miles	CO	--	--	--	--	--	1	--	0	
150,000 miles	CO-COMP	--	--	--	--	--	1	--	0	
150,000 miles	CREE	--	--	--	--	--	1	--	0	
150,000 miles	NMOG+NOX-COMP	--	--	--	--	--	1	--	0	
<b>Cert Region</b>		Federal			<b>Cert/In-Use Code</b>			Cert		
<b>Vehicle Class</b>		LDV/Passenger Car			<b>Standard Level</b>			Federal Tier 3 Bin 0		
<b>Fuel</b>		Electricity			<b>Test Procedure</b>			Charge Depleting Highway		
<b>Useful Life</b>	<b>Emission Name</b>	<b>Rounded Result</b>	<b>RAF</b>	<b>NMOG / NMHC</b>	<b>Upward Diesel Adjustment Factor</b>	<b>Downward Diesel Adjustment Factor</b>	<b>Mult DF</b>	<b>Add DF</b>	<b>Std</b>	
150,000 miles	CO	--	--	--	--	--	--	0	0	
150,000 miles	CO-COMP	--	--	--	--	--	--	0	0	
150,000 miles	CREE	--	--	--	--	--	--	0	0	
150,000 miles	NMOG+NOX-COMP	--	--	--	--	--	--	0	0	
<b>Cert Region</b>		California + CAA Section 177 states			<b>Cert/In-Use Code</b>			Cert		
<b>Vehicle Class</b>		LDV/Passenger Car			<b>Standard Level</b>			California ZEV		
<b>Fuel</b>		Electricity			<b>Test Procedure</b>			CVS 75 and later (w/o can. load)		
<b>Useful Life</b>	<b>Emission Name</b>	<b>Rounded Result</b>	<b>RAF</b>	<b>NMOG / NMHC</b>	<b>Upward Diesel Adjustment Factor</b>	<b>Downward Diesel Adjustment Factor</b>	<b>Mult DF</b>	<b>Add DF</b>	<b>Std</b>	
150,000 miles	CO	--	--	--	--	--	--	0	0	

## Certification Summary Information Report

Test Group	PTSLV00.0L2X	Evaporative/Refueling Family	--
<b>Glossary</b>			
<b>Useful Life</b>			
4	4,000 miles	120	120,000 miles
50	50,000 miles	150	150,000 miles
100	100,000 miles		
<b>Emission Name</b>			
HC-TOTAL	Total Hydrocarbon	METHANOL	CH3OH - Methanol
CO	Carbon Monoxide	N2O	Nitrous Oxide
CO2	Carbon dioxide	SPITBACK	Spitback Hydrocarbon in grams
CREE	Carbon-Related Exhaust Emissions	AMP-HRS	Integrated Amp-hours
OPT-CREE	Optional Carbon-Related Exhaust Emissions	START-SOC	System Start State of Charge Watt-hours
NOX	Nitrogen Oxide	END-SOC	System End State of Charge Watt-hours
PM	Particulate Matter	ACT-DISTANCE	Actual Distance Driven (miles)
PM-COMP	SFTP Composite Particulate Matter	AS-VOLT	Average System Voltage
HC-NM	Non-methane Hydrocarbon	CO2 BAG 1	Bag 1 Carbon Dioxide
OMHCE	Organic material Hydrocarbon Equivalent	CO2 BAG 2	Bag 2 Carbon Dioxide
OMNMHCE	Organic material non-methane HC equivalent	CO2 BAG 3	Bag 3 Carbon Dioxide
NMOG	Non-methane organic gases	CO2 BAG 4	Bag 4 Carbon Dioxide
HCHO	Formaldehyde	NMOG+NOX	Non-methane organic gases plus Nitrogen Oxides
H3C2HO	Acetaldehyde	NMOG+NOX-COMP	SFTP Composite Non-methane Organic Gases + Nitrogen Oxides
HC-NM+NOX	SFTP Non-methane Hydrocarbon + Nitrogen Oxides for US06 or SC03	DT-IWRR	Drive Trace Inertia Work Ratio Rating
HC-NM+NOX-COMP	SFTP Composite Non-methane Hydrocarbon + Nitrogen Oxides	DT-ASCR	Drive Trace Absolute Speed Change Rating
CO-COMP	SFTP Composite Carbon Monoxide	DT-EER	Drive Trace Energy Economy Rating
ETHANOL	C2H5OH - Ethanol	COMB-CREE	Combined Carbon-Related Exhaust Emissions
FE BAG 1	Bag 1 Fuel Economy	COMB-OPT-CREE	Combined Optional Carbon-Related Exhaust Emissions
FE BAG 2	Bag 2 Fuel Economy	HC-TOTAL-EQUIV	Total Hydrocarbon equivalent - Evap only
FE BAG 3	Bag 3 Fuel Economy	METHANE-COMB	Combined CH4 for HD 2b/3 vehicles only
FE BAG 4	Bag 4 Fuel Economy	N2O-COMB	Combined Nitrous Oxide for HD 2b/3 vehicles only
MFR FE	Manufacturer Fuel Economy	LEAK-DIA	Effective Leak Diameter (inches)
HC	Hydrocarbon for Running Loss and ORVR	LEAK-GAS CAP	Gas Cap Leakage (cc/min)
METHANE	CH4 - Methane	CO2-COMB	Combined Carbon Dioxide for HD 2b/3 Vehicles Only
<b>Certification Region</b>			
CA	California + CAA Section 177 states	FA	Federal
<b>Exhaust Emission Standard Level</b>			
B1	Federal Tier 2 Bin 1	L3ULEV340	California LEV-III ULEV340
B2	Federal Tier 2 Bin 2	L3ULEV250	California LEV-III ULEV250
B3	Federal Tier 2 Bin 3	L3ULEV200	California LEV-III ULEV200
B4	Federal Tier 2 Bin 4	L3SULEV170	California LEV-III SULEV170
B5	Federal Tier 2 Bin 5	L3SULEV150	California LEV-III SULEV150

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Test Group	PTSLV00.0L2X	Evaporative/Refueling Family	--
B6	Federal Tier 2 Bin 6	L3LEV630	California LEV-III LEV630
B7	Federal Tier 2 Bin 7	L3ULEV570	California LEV-III ULEV570
B8	Federal Tier 2 Bin 8	L3ULEV400	California LEV-III ULEV400
B9	Federal Tier 2 Bin 9	L3ULEV270	California LEV-III ULEV270
B10	Federal Tier 2 Bin 10	L3SULEV230	California LEV-III SULEV230
B11	Federal Tier 2 Bin 11	L3SULEV200	California LEV-III SULEV200
HDV1	HDV1 (Federal HD chassis Class 2b GVW 8501-10000)	T3B160	Federal Tier 3 Bin 160
HDV2	HDV2 (Federal HD chassis Class 3 GVW 10001-14000)	T3B125	Federal Tier 3 Bin 125
L2	California LEV-II LEV	T3B110	Federal Tier 3 Transitional Bin 110
L2OP	California LEV-II LEV Optional	T3B85	Federal Tier 3 Transitional Bin 85
U2	California LEV-II ULEV	T3SULEV30	Federal Tier 3 Transitional LEV-II SULEV30 Carryover
S2	California LEV-II SULEV	T3B70	Federal Tier 3 Bin 70
ZEV	California ZEV	T3B50	Federal Tier 3 Bin 50
OT	Other	T3B30	Federal Tier 3 Bin 30
T1	Federal Tier 1	T3B20	Federal Tier 3 Bin 20
PZEV	California PZEV	T3B0	Federal Tier 3 Bin 0
L2LEV160	California LEV-II LEV160	HDV2B395	Federal Tier 3 HD Class 2b Transitional Bin 395
L2ULEV125	California LEV-II ULEV125	HDV2B340	Federal Tier 3 HD Class 2b Transitional Bin 340
L2SULEV30	California LEV-II SULEV30	HDV2B250	Federal Tier 3 HD Class 2b Bin 250
L2LEV395	California LEV-II LEV395	HDV2B200	Federal Tier 3 HD Class 2b Bin 200
L2ULEV340	California LEV-II ULEV340	HDV2B170	Federal Tier 3 HD Class 2b Bin 170
L2LEV630	California LEV-II LEV630	HDV2B150	Federal Tier 3 HD Class 2b Bin 150
L2ULEV570	California LEV-II ULEV570	HDV2B0	Federal Tier 3 HD Class 2b Bin 0
L3LEV160	California LEV-III LEV160	HDV3B630	Federal Tier 3 HD Class 3 Transitional Bin 630
L3ULEV125	California LEV-III ULEV125	HDV3B570	Federal Tier 3 HD Class 3 Transitional Bin 570
L3ULEV70	California LEV-III ULEV70	HDV3B400	Federal Tier 3 HD Class 3 Bin 400
L3ULEV50	California LEV-III ULEV50	HDV3B270	Federal Tier 3 HD Class 3 Bin 270
L3SULEV30	California LEV-III SULEV30	HDV3B230	Federal Tier 3 HD Class 3 Bin 230
L3SULEV20	California LEV-III SULEV20	HDV3B200	Federal Tier 3 HD Class 3 Bin 200
L3LEV395	California LEV-III LEV395	HDV3B0	Federal Tier 3 HD Class 3 Bin 0
<b>Transmission Type Code</b>			
AMS	Automated Manual- Selectable (e.g. Automated Manual with paddles)	M	Manual
A	Automatic	OT	Other
AM	Automated Manual	SA	Semi-Automatic
CVT	Continuously Variable	SCV	Selectable Continuously Variable (e.g. CVT with paddles)
<b>Drive System Code</b>			
4	4-Wheel Drive	P	Part-time 4-Wheel Drive
F	2-Wheel Drive, Front	A	All Wheel Drive
R	2-Wheel Drive, Rear		

## Certification Summary Information Report

Test Group	PTSLV00.0L2X	Evaporative/Refueling Family	--
<b>Additional Terms and Acronyms</b>			
AFC	Alternative Fuel Converter	ICI	Independent Commercial Importer
CSI	Certificate Summary Information	ORVR	Onboard Refueling Vapor Recovery
DF	Deterioration Factor	SIL	Shift Indicator Light
Evap	Evaporation, Evaporative	Trans	Transmission