10/1/2019

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 to include a running change – Addition of Model 3 Standard Range Plus Variant to the RWD Model 3 Platform

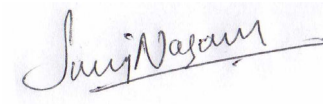
Tesla, Inc. requests that the EPA issue a Certificate of Conformity for the subject test group.

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:	LTSLR000NNRL13
Test Group:	LTSLV00.0L13
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 1 - RWD Motor 3 - Model 3 Line of vehicles
Applicable Standards:	FEDERAL Tier 3 BIN 0 & CALIFORNIA ZEV
Carlines Covered by this certificate:	Model 3 Long Range, Model 3 Mid Range, Model 3 Standard Range Plus, Model 3 Standard Range

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, Director- Vehicle Homologation
Telephone 510 249 8749

01.01.04 - Secondary Contact
Mr. Kyle Strohmaier
Telephone 763 370 3496

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
This vehicle shall only be tested on a 4 wheel dyno.
Vehicle Settings

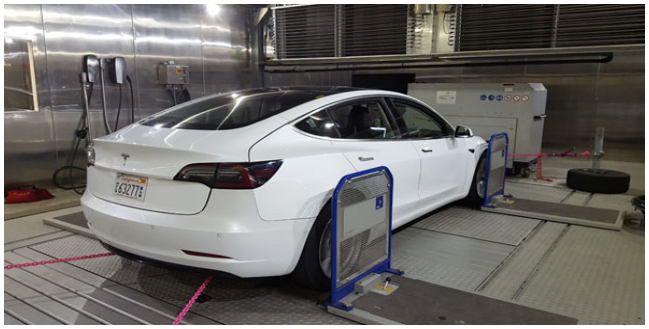
- Battery stabilized on the vehicle for 1000 miles.
- Vehicle charged to 100% SOC
- Dyno Mode ON – This setting prevents TC faults.
- Regen – Standard
- Climate OFF
- Headlights OFF
- Screen brightness set to default (50%)
- Radio OFF

Instrumentation

- Battery voltage and Current measurement – Hioki 3390-10
- AC recharge – Hioki 3390-10

Lock car upon exit

Pic of Car on Dyno - Tesla Fremont Facility

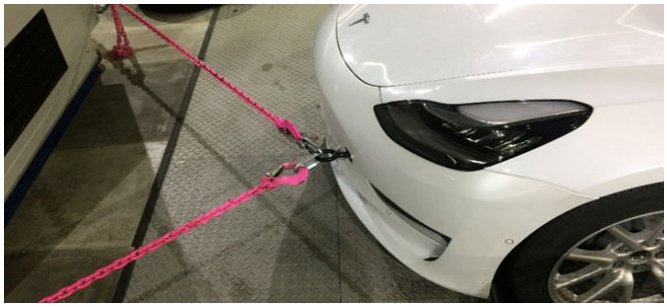


Pic of Hioki connection - Rear Motor

Pic of Hioki connection - DC/ DC to HV BUS

Pic of Hioki connection - High Voltage Ancillaries

Pic of Front strap to tie on dyno



Pic of rear strap to tie on dyno

04.00 Statement of Compliance

This vehicle conforms to US EPA Federal Tier 3 Bin 0 and State of California regulations applicable to 2020 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 Hand Book.

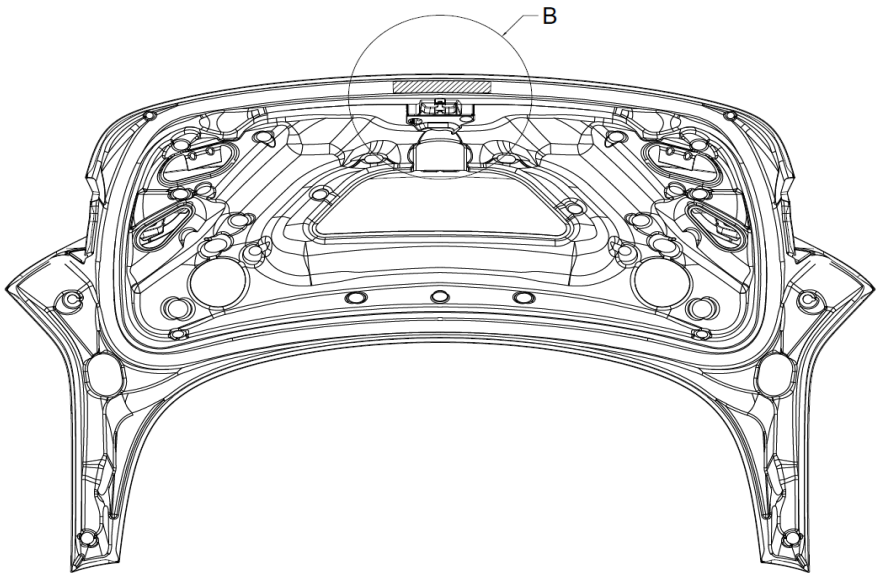
6.03 Lubricants and heater fuels

Heater fuel:	Not applicable
Transmission lubricant:	Factory Fill
Capacity	2750 mL
Make	SK
Trade name	ZIC ATF - 9
Type	Synthetic
Viscosity	7100 cP at -40°C
Viscosity	5.9 cSt at 100°C

Test Vehicle
Same as factory fill

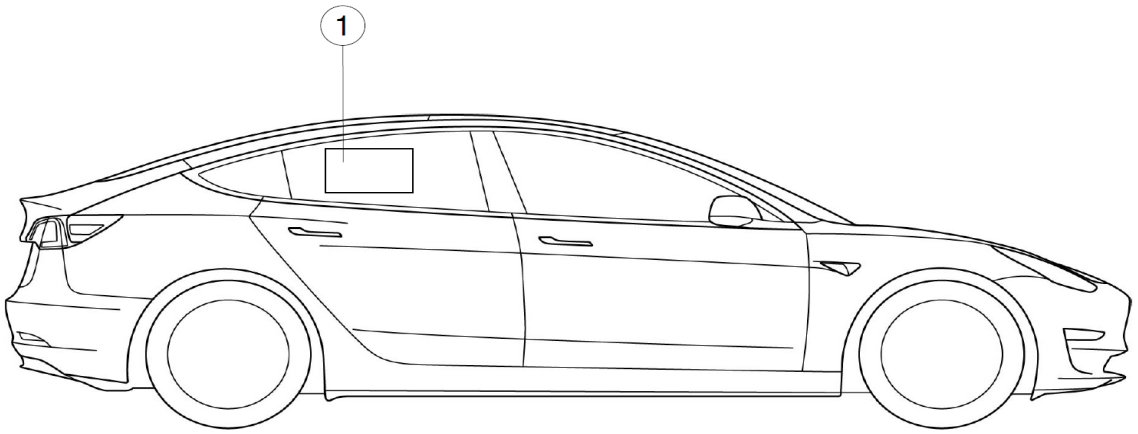
07.00 LABELS

07.01 Label locations
VECI Emission Label



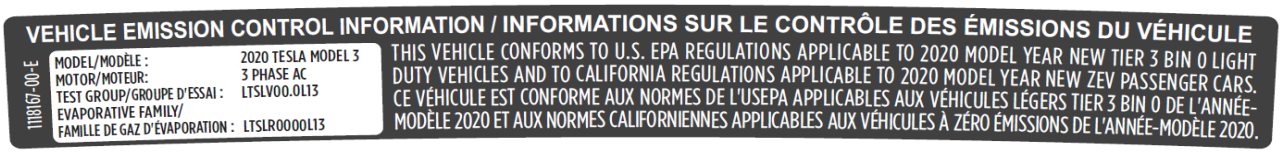
See 07.02

Monroney Label



See 07.03

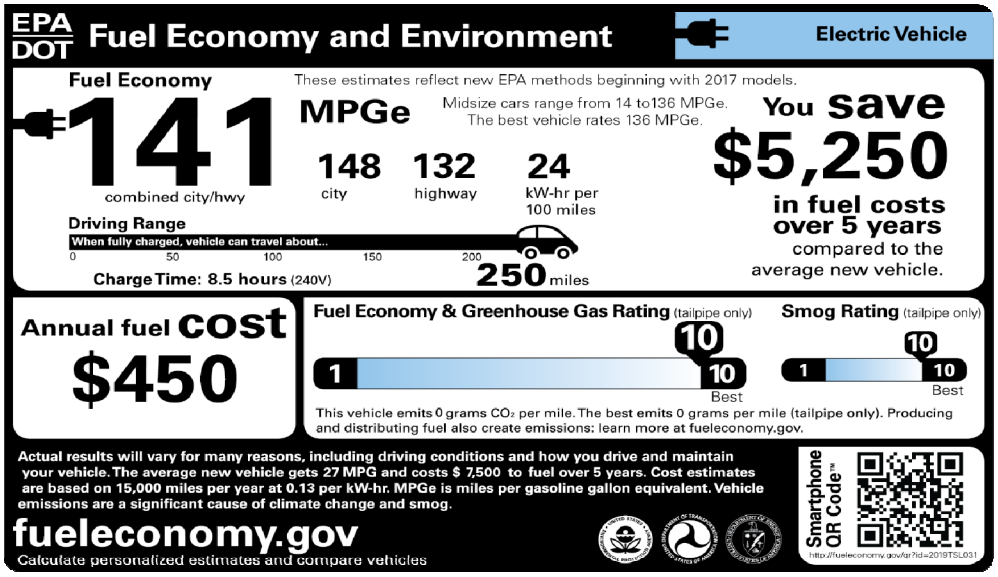
07.02 Emission Control Information label: 2020 Model Year
(Mandated in CFR Title 40, Part 86; §86.1807. Label format agreed with EPA



07.03 California Environmental Performance Index label: 2020 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)

Model 3 Standard Range Plus - FE Label



07.04 Projected sales information (Confidential)

08:00 GENERAL TECHNICAL DESCRIPTION

08.01 DESCRIPTION OF PROPULSION SYSTEM

The Tesla Model 3 propulsion system consists of a drive unit and a high voltage battery pack. The drive unit contains a single electric traction motor, a fixed gearbox, and the drive inverter.
The Model 3 drive unit is connected to the rear wheels via a fixed ratio transmission through the independent suspension-equipped rear axle.

8.02 DESCRIPTION OF MOTOR(s)

The motor is a 3-phase AC internal permanent magnet motor 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 3 is one of the most technically 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 replaceable active short circuit protection that is accessible with the battery in the vehicle via an access panel. A set of switches inside the pack disconnect high voltage from the positive and negative terminals on the battery pack when not in use. To disable the switches from closing during vehicle service, the 12V power feed can be disconnected at the low voltage wiring connector into the battery pack. The battery control system consists of the Battery Monitoring System (BMS) which controls the switches, measures pack current and voltages, electrical isolation of the battery from chassis ground and monitors cell voltages and module temperatures from the Battery Monitor Boards (BMBs) installed on each of the modules. The battery is rated at 400V and is capable of delivering in excess of 1000 Amperes. The battery mass is less than 500 kg.

08.03.01 Battery charging capacity
The fully charged battery contains a minimum amount of usable energy when new, based on the battery type/option fitted to the vehicle.

08.03.02 Self-discharge information
The self-discharge rate of the High Voltage battery is likely to be less than 0.5% 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

08.05 DESCRIPTION OF TRANSMISSION

The 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 five detents— that can select Reverse, Neutral, Drive, Cruise and Autopilot (if equipped). 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.

Transmission Shift lever - Steering column

8.06 DESCRIPTION OF CLIMATE CONTROL SYSTEM
General Specifications:

The Model 3 climate control is a Dual Zone system with Automatic Temperature control. The modes include Defrost, Panel and Floor (or combination of these three). The system consists of two 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 3 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

Vehicle Controller printed circuit boards activate 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 his 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. Because this is a rear wheel drive vehicle, the RGB system applies torque only to the rear wheels of the vehicle. The friction braking system is independent of RGB.

The amount of RGB torque generated depends on the accelerator pedal position – largest when the accelerator pedal is fully released, decreasing as the pedal is depressed, reaching zero torque when the pedal reaches its neutral torque position (a position that is 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 on the regenerative braking function.

08.08 DESCRIPTION OF VEHICLE ELECTRICAL SUPPLY EQUIPMENT (CHARGER)

The Tesla Model 3 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'.

Optional - 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. But the current standard on-board charger is limited to 48A. So the charging duration is 8.5 hrs. at the rate of 48 Amps.

Standard - Charging at rates lower than or equal to 32A can also be achieved via a mobile connector. The universal mobile connector is included as standard in the purchase of every Model 3 and is an individual cable that connects the vehicle to any available domestic power outlet and can deliver current to a maximum of 32 Amps. The Mobile Connector incorporates similar electronic circuitry as the HPC to communicate with the vehicle and manage the charging process. The charging duration is 12 hrs. at the rate of 32 Amps.

The vehicle is also capable of accepting DC current up to 525A 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 **full charging capability**. Vehicle could still charge on low power if handle lock is not engaged.

Prepare to charge state

Low Power Charging Indication

High Power 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

Model 3 comes with one on-board charger is capable of a maximum of 48A on 208V or 240V outlets and 12A on 120V outlets.

Model 3 Standard Range Plus comes with one on-board charger is capable of a maximum of 32A on 208V or 240V outlets and 12A on 120V outlets.

08.10 OTHER UNIQUE FEATURES (i.e. solar panels)
Not applicable; vehicle is not equipped with any such features.

08.11 DESCRILPTION OF WARNING SYSTEM(S) FOR MAINTENANCE / MALFUNCTION
The Tesla Model 3 is equipped with a tell-tale lamp located in the instrument pack to indicate any malfunctions through user alerts e.g. “battery failure” with battery symbol.

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 switches inside the battery pack will open, disabling the entire high voltage system in the car.

8.12 DESCTIPTION OF DYNO MODE

Tesla, Inc. is currently completing the implementation of 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. Access to Dyno Mode will be introduced at the start of production on October 7th, 2019, and will be deployed to the entire Tesla fleet in version 2019.40 over the month of October 2019.

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

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 following steps:
1. Vehicle must be in Park.
2. While holding down left (turn signal) stalk, press and hold the Tesla "T" logo at the top of the screen.
3. Enter the Dyno Mode activation password, "dynotest".

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

We are targeting completion of this Dyno Mode feature for installation in all new production vehicles by October 7th, 2019. Over the month of October, we will be rolling out this feature to our US fleet, enabling all Tesla vehicles to enter Dyno Mode.

09.00 RUNNING CHANGE VEHICLE DESCRIPTION

Refer to appendix 09.00, if applicable

10.00 ROAD LOAD DATA

See Verify application

11.00 STARTING AND SHIFTING SCHEDULES

11.01 Starting

The Model 3 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 an authenticated phone (using Bluetooth Low Energy or internet connectivity) or key card (using Near Field Communication), a weight sensor embedded into the driver seat, and the brake pedal.

ENTERING

An authenticated phone can be used to passively unlock the car when connected, in range and a door handle is pulled or trunk release button is pressed.
The Tesla mobile app on an authenticated phone can be used to manually unlock the vehicle.
A key card can be used to unlock the car by scanning the card on the b-pillar.
After a successful key card scan on the b-pillar or center console:
a. Vehicle is authorized to Drive within a reasonable time period. Time period is extended based on additional user interaction which include: driver opening their door, driver sitting down, driver closing their door while seated.
b. If time period is exceeded, upon brake press, instruct driver to rescan key card on the center console to reauthorize Drive.
c. Accessory Mode functions will be available without the user having to rescan their key card.

LOCKING
An authenticated phone can be used to passively lock the car when the phone is disconnected or moved away from the vehicle. This passive function can be disabled in controls on the touchscreen.
The Tesla mobile app on an authenticated phone can be used to manually lock the vehicle.
A key card can be used to lock the car by scanning the card on the b-pillar. There is no passive locking with key cards (car does not auto lock).
Note: Using a key card to lock/unlock will be equivalent to an active lock/unlock—i.e., clicking on the key fob to lock and double-clicking to unlock.

STARTING

If successful interaction between authenticated phone or the key card and vehicle controller occurs, the system deactivates the immobilizer. Immobilizer deactivation only happens after 2 conditions are met below. 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. Authenticated phone or key card is authorized 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 contactors and self-mobility is not possible.

If the brake pedal is depressed and the proper key code present, the drive rail will activate (immobilizer deactivates) and allows the vehicle 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.

17.04.02 Credit calculation

Tesla a manufacturer that produces only pure battery electric vehicles is not required to produce a percentage of annual production volume as ZEV's and therefore will earn such credit on all 2013 to 2020, inclusive, model year vehicles. This vehicle is a full function ZEV with a range depending on the battery pack option chosen by the customer. Based on the UDDS of range shown in the table below, all variants will be classified as a Type III ZEV and Under the table in 13 CCR 1962.1(d)(5)(C), this means 2013 to 2020, each vehicle will earn 4 credits per vehicle.

Variant	UDDS Range (Miles)
Model 3 Standard Range Plus	372.78

17.05 VEHICLE SAFETY

17.05.01 All Information for safe operation of vehicle

Tesla will submit a copy of the finalized vehicle owner's handbook by separate letter when it becomes available.

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. CO2, 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.

18.00 FUEL ECONOMY DATASETS

Model 3 Standard Range Plus	3R020-429179
CD UDDS Test	LTSL10061714
AC Recharge Energy	59717
(AER) Unadjusted	372.8
CO2 Composite Adjusted	0 g/mi (factors into 0 g/mi on FE label)
CD Highway Test	LTSL10061715
AC Recharge Energy	59717
(AER) Unadjusted	331.6
CO2 Composite Adjusted	0 g/mi (factors into 0 g/mi on FE label)

2020 MODEL-YEAR AIR RESOURCES BOARD
SUPPLEMENTAL DATA SHEET
ZEV-PASSENGER CARS, LIGHT-DUTY TRUCKS AND MEDIUM DUTY VEHICLES
Model 3 Standard Range Plus

Manufacturer	Tesla, Inc
Engine Family	LTSLV00.0L13
Vehicle Class (es)	Passenger Car
Number of ZEV Credits per vehicle	4
Fuel Type (s)	Electro-Chemical Battery
Battery Type (s)	Lithium Ion
Total Battery Weight, Kg	378
Total Battery Volume, m3	0.400
Battery Specific Energy, Wh/Kg	144
Number of Batteries or modules per vehicle	1
Total Battery Voltage, Nominal	350
Charger(s)	On-Board
Charger(s)	Conductive
Drive Motor (s)	Other (Specify) - AC Permanent Magnet
Number of Drive Motor (s)	1
Rated Motor Power, kW	211
Drive	RWD
Regenerative Braking	Yes
Regenerative Braking	RW
Driver Controlled Regen Braking	No
Coast Regen Braking	Yes
Air Conditioning	Yes
Fuel-Fired Heater	No

Vehicle Models (If coded, see attachments)	Model 3 Standard Range Plus
Transmission Type: M5, A4 (if applicable)	AV/1
GVWR, lbs	4805
Curb Weight, 33%, lbs	3624
Loaded Vehicle Weight	3924
ETW or Test Weight, lbs	3875
DPA / RLHP or Dyno Set Coefficient, a= , lbf	-5.0897
DPA / RLHP or Dyno Set Coefficient, b= , lbf/mph	0.0071
DPA / RLHP or Dyno Set Coefficient, c= , lbf/mph^2	0.0116

Range Test Results

Vehicle ID	3R020-429179
Transmission	AV/1
ETW	3875
RLHP	9.33
City Range, miles	372.78
System AC, Wh/mile	160.19
System DC, Wh/mile	144.33
Vehicle DC, Wh/mile	141.23
Highway Range, miles	331.58
System AC, Wh/mile	180.10
System DC, Wh/mile	162.27
Vehicle DC, Wh/mile	158.78
Battery Test Results - Specific Energy, wh/kg	144
Fuel-Fired Heater Emission Results, g/mile	Not applicable

3.03 Vehicle Configuration and sub-configurations

Make	Tesla
Carline	Model 3
Type	Battery Electric Vehicle
Test Group	LTSLV00.0L13
Final Drive ratio	9.04
Emission Control	NA (BEV)
Exhaust	NA (BEV)
Evap	NA (BEV)
Model Type	**Model 3 Standard Range Plus**
Basic Engine code (F/R)	L13
Transmission Type / Code	AV/1
Vehicle ID tested	3R020-429179
Vehicle Configuration #	0
Gross Vehicle Weight (lbs)	4805
33% Curb Mass (lbs)	3624
Loaded Vehicle Weight (lbs)	3924
Equivalent Test Weight (lbs)	3875
Base wheel / Tire (F&R)	235/45 R18 - 45 PSI
Target Road Load A lbf	29.6208
B lbf/mph	0.2465
C lbf/mph^2	0.01120
RLHP @ 50mph	9.33
Sub configuration #	1
Gross Vehicle Weight (lbs)	4805
33% Curb Mass (lbs)	3624
Loaded Vehicle Weight (lbs)	3924
Equivalent Test Weight (lbs)	3875
Wheel / Tire	235/40 R19 - 42 PSI
Target Road Load A lbf	40.88
B lbf/mph	-0.1123
C lbf/mph^2	0.01730
Road Load HP @ 50mph	10.47

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.

EPA EV Multicycle Calculator (SAE J1634 Oct 2012)

Manufacturer: Tesla Inc. — As used by EPA laboratory

Carline: Model 3 Standard Range Plus

Model Year 2020 — D.Good March 8, 2016

Vehicle

Test Number Internal test #

Comments:

Lab AVL Dyno - 47400 Kato Raod

Test Date 9/21/2019

Cycle	Energy (Wh)	Distance (mi)	ECdc_cyc	Kuwgt	Kwgt	Recharge AC WattHrs
UDDS1	1188	7.478	158.86	39.71	3.58	59717
UDDS2	1075	7.458	144.13	36.03	46.96	
UDDS3	1031	7.439	138.55	34.64	45.14	
UDDS4	1041	7.448	139.80	34.95	45.55	
HWY1	1640	10.243	160.07	80.04		
HWY2	1614	10.250	157.49	78.75		
SS1	39722	204.062	194.65			
SS2	5339	27.299	195.57			
TOTAL	**52649.20**	**281.677**				

K-Factors	UDDS1	UDDS2	UDDS3	UDDS4	HWY1	HWY2
Unweighted	0.250	0.250	0.250	0.250	0.500	0.500
Weighted	0.023	0.326	0.326	0.326	NA	NA

Results	Range (mi)	AC Wh/mi	MPGe	kWh/100mi	EPA version kWh/100mi
UDDSu	**362.26**	**164.85**			
UDDSw	**372.78**	**160.19**	**210.4020**	**16.0193**	16.01934
HWY	**331.58**	**180.10**	**187.1484**	**18.0098**	18.00977

Note:

1. Fill in yellow shaded areas to compute range and AC wh/mi results
2. Weighted results based on SAE J1634 calculations
3. Final values in green shaded area should be rounded to appropriate significant digits

Derating factor calculations

Carline	Model 3 Standard Range Plus	
Vehicle ID	3D020-429179	

	Bag Splits	**DC wh/mi**	**Description**
FE for Bag 1 75F UDDS	Bag1FE75	165.13	Tesla Data - 75°F Cold Start UDDS @~50% SOC to get Bag 1 through 4
FE for Bag 2 75F UDDS	Bag2FE75	137.38	Tesla Data - 75°F Cold Start UDDS @~50% SOC to get Bag 1 through 4
FE for Bag 3 75F UDDS	Bag3FE75	161.39	Tesla Data - 75°F Cold Start UDDS @~50% SOC to get Bag 1 through 4
FE for Bag 4 75F UDDS	Bag4FE75	135.36	Tesla Data - 75°F Cold Start UDDS @~50% SOC to get Bag 1 through 4
FE for Bag 1 20F UDDS	Bag1FE20	378.52	Tesla Data - 20°F Cold Start UDDS @~100% SOC to get Bag 1 through 4
FE for Bag 2 20F UDDS	Bag2FE20	282.24	Tesla Data - 20°F Cold Start UDDS @~100% SOC to get Bag 1 through 4
FE for Bag 3 20F UDDS	Bag3FE20	298.94	Tesla Data - 20°F Cold Start UDDS @~100% SOC to get Bag 1 through 4
FE for Bag 4 20F UDDS	Bag4FE20	283.20	Tesla Data - 20°F Cold Start UDDS @~100% SOC to get Bag 1 through 4
	US06CityFE	225.64	Single Cycle US06 @~50% SOC to get US06 City and Highway Data
	US06HwyFE	211.31	Single Cycle US06 @~50% SOC to get US06 City and Highway Data
FE from HWFET	HFETFE	155.58	Tesla Full Discharge Internal Test
FE from SC03	SC03FE95	219.57	Tesla Data - SC03 @~50% SOC
	StartFuel_75	13.45	Calculation Method § 600.114-12 w/ .905 replaced with .92
	StartFuel_20	286.48	
	StartFC_City	6.36	
	RunningFC_City	179.66	
	Cold_City	229.13	Tesla Data - Full Depletion 20°F UDDS Result
	ACFC	67.54	
	StartFC_Hwy	0.43	
	RunningFC_Hwy	204.39	
	CityFE (mi/wh-dc)	0.00	On-road adjustment factor of 0.92 was used instead of 0.905.This was to remove the 1-2% adjustment for oxygen content of gasoline fuel
	CityFE (mi/kWh-dc)	**4.95**	Convert to mi/kWh and round per § 600.210-12 (c)(1)(iii)
	CityFC (wh-dc/mi)	202.19	
	HwyFE (mi/wh-dc)	0.00	On-road adjustment factor of 0.92 was used instead of 0.905.This was to remove the 1-2% adjustment for oxygen content of gasoline fuel
	HwyFE (mi/kWh-dc)	**4.49**	Convert to mi/kWh and round per § 600.210-12 (c)(1)(iii)
	HwyFC	222.63	
	CombinedFE (mi/kWh-dc)	**4.73**	
Five Cycle FC	CombinedFC (wh/mi)	211.38	
	City Distance [miles]	372.78	Tesla Internal MCT
	City Net Energy [kWh-dc]	52.65	Tesla Internal MCT
	CityFE (mi/kWh-dc)	**7.080**	Convert to mi/kWh and round per § 600.210-12 (c)(1)(iii)
	City DC Whpm	141.23	
	City AC Wall Energy [kWh]	59.72	Tesla Internal Re-charge Measurement After MCT
	City AC whpm	160.19	
	Hwy Distance [miles]	331.58	Tesla Internal MCT
	Hwy Net Energy [kWh-dc]	52.65	Tesla Internal MCT
	HwyFE (mi/kWh-dc)	**6.298**	Convert to mi/kWh and round per § 600.210-12 (c)(1)(iii)
	Hwy DC Whpm	158.78	
	Hwy AC Wall Energy [kWh]	59.72	Tesla Internal Re-charge Measurement After MCT
	Hwy AC whpm	180.10	
	CombinedFE (mi/kWh-dc)	**6.705**	
	CombinedFC (dc wh/mi)	149.13	
Two Cycle FC	**Combined AC wh/mi**	169.15	
Derating	**Derating Factor**	**0.7055**	**Ratio of 5-cycle Combined FE to 2-cycle Combined FE**
5-Cycle Range	**Sticker Range**	**250**	
MPGe	**Sticker MPGe**	**141**	

Note that I have provided the drive trace ratings for the bags as a weighted value, per SAE J2951, rather than values for each individual bag. This is consistent with the strategy of using a single results table for a set of bags – As I recall, the drop-down menu for types of results included individual selections for each bag's FE, but only a single selection for drive trace ratings. Let me know if this doesn't make sense.

Also note that the FE values are all simply calculated as FE [mi/kWh-DC] = 1000/(FC [Wh/mi]).

					Matches VERIFY Coverted from Col E	used actual wh values	
5 Cycle Data	**IWRR**	**ASCR**	**EER**	**Note**	**FE (kWh/100 mi)**	**FE (kWh/100 mi)**	**FE (mi/kWh-DC)**
UDDS Bag1				Drive trace ratings are given as weighted values per SAE J2951 section 5.7.1	16.5128	16.5128	6.056
UDDS Bag2				Drive trace ratings are given as weighted values per SAE J2951 section 5.7.1	13.7383	13.7383	7.279
UDDS Bag3				Drive trace ratings are given as weighted values per SAE J2951 section 5.7.1	16.1391	16.1391	6.196
UDDS Bag4				Drive trace ratings are given as weighted values per SAE J2951 section 5.7.1	13.5362	13.5362	7.388
UDDS Full Discharge					14.1243		7.080
Cold UDDS Bag1				Drive trace ratings are given as weighted values per SAE J2951 section 5.7.1	37.8516	37.8516	2.642
Cold UDDS Bag2				Drive trace ratings are given as weighted values per SAE J2951 section 5.7.1	28.2240	28.2240	3.543
Cold UDDS Bag3				Drive trace ratings are given as weighted values per SAE J2951 section 5.7.1	29.8937	29.8937	3.345
Cold UDDS Bag4				Drive trace ratings are given as weighted values per SAE J2951 section 5.7.1	28.3200	28.3200	3.531
Cold UDDS Full Discharge					22.9130		4.364
SC03					21.9572	21.9572	4.554
US06 City					22.5644	22.5644	4.432
US06 Hwy					21.1308	21.1308	4.732
US06 Combined							
HFET				The HFET result from full discharge MCT is used for the 2 and 5-part calculations	15.5577	15.5577	6.428