



Application for Certification

VJLXT03.0PTC

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Range Rover, Range Rover
Sport

Part 1

Issued: 03/16/26

Application for Emissions Certification

Model Year: 2027
Manufacturer Name: Jaguar Land Rover

Test Group: VJLXT03.0PTC
Test Group Description: 3.0 liter I-6 LDT, PHEV

Durability Group: VJLXGPGNNHTR
Durability Group Description: Positive ignition - Four stroke Gasoline
Fuelled
Direct Fuel Injection
Ceramic Monolith Pd/Rh Catalyst

Evaporative Group: VJLXR0175M1C

Applicable Standards
CARB / EPA FTP Standard: Federal - Tier 3 Bin 30 California – LEV III
SULEV30

Carlines Covered: 309: Range Rover 460PS PHEV
311: Range Rover P550 PHEV
234: Range Rover Sport P460 PHEV
235: Range Rover Sport P550 PHEV

EPA & CARB Response Requested By: June 5th 2026

For Questions, Contact: Vahakn Varjabedian (201) 818 – 8139
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**5. Test Group Description**

- | | | |
|--------|---|---|
| 5.1. | Test Group name | VJLXT03.0PTC |
| 5.2. | Summary Sheet number(s) | CSI- VJLXT03.0PTC - VJLXR0175M1C |
| 5.3. | Engine displacement | 3.0L |
| 5.4. | Arrangement and number of cylinders: | |
| 5.4.1. | Arrangement of cylinders: | In-line. |
| 5.4.2. | Number of cylinders: | 6 |
| 5.5. | Emission standards | |
| 5.5.1. | Vehicle class covered | Federal – LDT4
California – LDT2 |
| 5.5.2. | Participation in NLEV | Not applicable |
| 5.5.3. | Emission standards class | Federal – Tier 3 Bin 30
California – LEV III SULEV30 |
| 5.5.4. | Applicable emission standards | Refer to Enclosure 1 of Section 7. |

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**Range Rover, Range Rover Sport****Part 1****Issued: 03/16/26****6. Test Vehicle Description****6.1. Test Vehicles**

Carline	Test Vehicle No.	Cfg. No.	Engine Displ. (cm ³)	Emission Control System	Engine Code	Trans	ETW	Axle Ratio	Remarks
310	3KMHT319	00	2996	WR-H02S/TWC/HO2S(2)/DFI/TC/CAC	3.0AJPH-23	L8	6500	3.73	Range Rover EDV
311	3KRTT017	00	2996	WR-H02S/TWC/HO2S(2)/DFI/TC/CAC	3.0AJPM-23	L8	6500	3.73	Range Rover FEDV 21" Tires
311	3RRTT075	00	2996	WR-H02S/TWC/HO2S(2)/DFI/TC/CAC	3.0AJPM-23	L8	6500	3.73	Range Rover FEDV 23" Tires
235	3KRTT074	00	2996	WR-H02S/TWC/HO2S(2)/DFI/TC/CAC	3.0AJPM-23	L8	6500	3.73	Range Rover Sport FEDV 21" Tires
234	3RRTT075	01	2996	WR-H02S/TWC/HO2S(2)/DFI/TC/CAC	3.0AJPM-23	L8	6500	3.73	Range Rover Sport FEDV 23" Tires
311	3PNM1021	00	2996	WR-H02S/TWC/HO2S(2)/DFI/TC/CAC	3.0AJPH-23	L8	6500	3.73	Range Rover Evaps EDV

For complete vehicle descriptions, refer to Vehicle Information submitted to the EPA Central Data Exchange (CDX) EV-CIS System, or to the Summary Sheet enclosed in Section 7 of this application.

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EV-CIS VI Outputs

Test Vehicle Information Submission

Test Vehicle Information Details

Information Process Code : N**EPA Manufacturer Code : JLX****Vehicle Identification Text : 3KNHT319****Vehicle Configuration Number : 0**

Vehicle Configuration Details

Vehicle Description Details

Manufacturer Vehicle Configuration Number : 0**Test Group Name : PJLXT03.0PTC****Evaporative Refueling Family Name : PJLXR0175M1C****Model Year : 2023****Actual Test Vehicle Make Text : LAND ROVER****Actual Test Vehicle Model Text : New Range Rover PHEV**

Drive Source Details

Drive Source Identifier : C**Fuel Identifier : G**

Drive Source Details

Drive Source Identifier : E**Fuel Identifier : EL****Fuel Cell Indicator : N****Rechargeable Energy Storage System Indicator : Y****Rechargeable Energy Storage Device Identifier : B****Off Board Charge Capability Indicator : N****Test Drive Code : 4****Shift Indicator Light Usage Identifier : 1****Aged Component Usage Identifier : 4**

Odometer Correction Details

Correction Initial Value : 0**Correction Factor Value : 1.00****Correction Sign Identifier : -****Correction Units Code : M****Engine Code Text : 3.0AJPH-23****Engine Rated Horsepower Value : 510****Engine Displacement Value : 3.0**

Air Aspiration Details

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Air Aspiration Method Identifier : TS
Air Aspiration Device Count : 2
Air Aspiration Configuration Identifier : PS

Charge Air Cooler Identifier : L
Vehicle Specifications Details
Curb Weight Value : 6275
Equivalent Test Weight Value : 6500
Gross Vehicle Weight Rating Value : 7605
NV Ratio Value : 26.8
Axle Ratio Value : 3.73

Transmission Specifications Details
Light Duty Transmission Type Identifier : A
Transmission Lockup Indicator : Y
Transmission Creeper Gear Indicator : N
Transmission Gear Count : 1

Target Set Coefficient Details
Test Procedure Dynamometer Coefficients Category : C-H-E
Target CoefficientA Value : 66.274
Target CoefficientB Value : -0.42092
Target CoefficientC Value : 0.03418
Set CoefficientA Value : 9.554
Set CoefficientB Value : -0.51339
Set CoefficientC Value : 0.032338

Target Set Coefficient Details
Test Procedure Dynamometer Coefficients Category : US06
Target CoefficientA Value : 66.274
Target CoefficientB Value : -0.42092
Target CoefficientC Value : 0.03418
Set CoefficientA Value : 9.554
Set CoefficientB Value : -0.51339
Set CoefficientC Value : 0.032338

Target Set Coefficient Details
Test Procedure Dynamometer Coefficients Category : Cold-CO
Target CoefficientA Value : 72.901
Target CoefficientB Value : -0.46302
Target CoefficientC Value : 0.03760
Set CoefficientA Value : 9.554

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Set CoefficientB Value : -0.51339

Set CoefficientC Value : 0.032338

Manufacturer Comment Text : New Range Rover 3.0L I6 PHEV.

EPA Generated Test Vehicle Details

Original Receipt Date : 20220606

Hybrid Vehicle Indicator : Y

Adjusted Loaded Vehicle Weight Value : 6940

Loaded Vehicle Weight Value : 6575

Total Road Load Horsepower Value : 17.4

Transaction Status Details

Transaction Status Identifier : ACCEPTED

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Range Rover, Range Rover Sport**Part 1****Issued: 03/16/26**

Test Vehicle Information Submission

Test Vehicle Information Details

Information Process Code : N**EPA Manufacturer Code : JLX****Vehicle Identification Text : 3PNM1021****Vehicle Configuration Number : 0**

Vehicle Configuration Details

Vehicle Description Details

Manufacturer Vehicle Configuration Number : 0**Test Group Name : PJLXT03.0PTC****Evaporative Refueling Family Name : PJLXR0175M1C****Model Year : 2023****Actual Test Vehicle Make Text : LAND ROVER****Actual Test Vehicle Model Text : New Range Rover PHEV**

Drive Source Details

Drive Source Identifier : E**Fuel Identifier : EL**

Drive Source Details

Drive Source Identifier : C**Fuel Identifier : G****Fuel Cell Indicator : N****Rechargeable Energy Storage System Indicator : Y****Rechargeable Energy Storage Device Identifier : B****Off Board Charge Capability Indicator : N****Test Drive Code : 4****Shift Indicator Light Usage Identifier : 1****Aged Component Usage Identifier : 4**

Odometer Correction Details

Correction Initial Value : 0**Correction Factor Value : 1.00****Correction Sign Identifier : -****Correction Units Code : M****Engine Code Text : 3.0AJPH-23****Engine Rated Horsepower Value : 440****Engine Displacement Value : 3.0**

Air Aspiration Details

Air Aspiration Method Identifier : TS**Air Aspiration Device Count : 2****Air Aspiration Configuration Identifier : PS**

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Charge Air Cooler Identifier : L

Vehicle Specifications Details

Curb Weight Value : 6275**Equivalent Test Weight Value : 6500****Gross Vehicle Weight Rating Value : 7605****NV Ratio Value : 26.8****Axle Ratio Value : 3.73**

Transmission Specifications Details

Light Duty Transmission Type Identifier : A**Transmission Lockup Indicator : Y****Transmission Creeper Gear Indicator : N****Transmission Gear Count : 1**

Target Set Coefficient Details

Test Procedure Dynamometer Coefficients Category : Cold-CO**Target CoefficientA Value : 72.901****Target CoefficientB Value : -0.46285****Target CoefficientC Value : 0.03760****Set CoefficientA Value : 9.554****Set CoefficientB Value : -0.51339****Set CoefficientC Value : 0.032338**

Target Set Coefficient Details

Test Procedure Dynamometer Coefficients Category : C-H-E**Target CoefficientA Value : 66.274****Target CoefficientB Value : -0.42077****Target CoefficientC Value : 0.03418****Set CoefficientA Value : 9.554****Set CoefficientB Value : -0.51339****Set CoefficientC Value : 0.032338**

Target Set Coefficient Details

Test Procedure Dynamometer Coefficients Category : US06**Target CoefficientA Value : 66.274****Target CoefficientB Value : -0.42077****Target CoefficientC Value : 0.03418****Set CoefficientA Value : 9.554****Set CoefficientB Value : -0.51339****Set CoefficientC Value : 0.032338****Manufacturer Comment Text : New Range Rover 3.0L I6 PHEV Evaps EDV.**

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EPA Generated Test Vehicle Details

Original Receipt Date : 20220617

Hybrid Vehicle Indicator : Y

Adjusted Loaded Vehicle Weight Value : 6940

Loaded Vehicle Weight Value : 6575

Total Road Load Horsepower Value : 17.4

Transaction Status Details

Transaction Status Identifier : ACCEPTED

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6.2. EDV Selection

According to 86.1828-01 the Range Rover is expected to be worst-case for exhaust emission compliance within this test group. The configuration with the highest road-load power was selected as worst-case. The EDV and DDV were tested in the worst-case driver mode for all test cycles. The worst-case driver mode for this test group is normal mode. Driver modes are described in section 12.3.

All the vehicle configurations certified are covered by data from the above EDVs.

6.3. EV-CIS Test Numbers

Vehicle-ID	Config.	Test	Test Number
3KNHT319	00	FTP- E10 (Charge sustain)	PJLX10075656
		HWFET- E10 (Charge sustain)	PJLX10075657
		US06- E10 (Charge sustain)	PJLX10075658
		SC03-E10 (Charge sustain)	PJLX10075659
		FTP20 - E10 (Charge sustain)	PJLX10075663
		FTP50 – E10 (Charge sustain)	PJLX10076934
3PNM1021	00	3-day- SET A	PJLX10075832
		Running Loss- SET A	PJLX10075839
		ORVR- SET A	PJLX10076399
		3-day- SET B	PJLX10075835
		Running Loss- SET B	PJLX10075875
		ORVR- SET B	PJLX10075874

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7. Test Results (Cover page)

Refer to the enclosed Certification Summary Information Report processed by the EPA EV-CIS system.

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8. Emission Testing Waiver Statements

High Altitude Testing

Based on an engineering evaluation of appropriate high-altitude emission testing Jaguar state that light-duty vehicles included in this application comply with the applicable emission standards at high altitude.

According to 40 CFR §86.1829-01(b)(1)(ii)(B) Jaguar Land Rover waive high altitude emissions data submittal on the basis of this statement.

Data submittal waiver for Idle CO Testing

Based on an engineering evaluation of appropriate Idle CO emissions Jaguar Land Rover state that light-duty vehicles included in this application comply with all applicable idle CO emission standards.

According to 40 CFR §86.1829-01(b)(5)(ii) Jaguar Land Rover waive Idle CO emissions data submittal on the basis of this statement.

Data submittal for 2-Day Evaporative Testing

Based on an engineering evaluation of appropriate evaporative emission testing, Jaguar Land Rover state that all vehicles in evaporative/refuelling family VJLXR0175M1C comply with the applicable two-day evaporative emission standard.

Jaguar Land Rover waive 2-Diurnal Evaporative emissions testing on this basis.

91 RON (Knock Sensor)

Pursuant to VPCD-97-01, Jaguar Land Rover's engineering evaluation states the city and highway fuel economy test result differences between 91 RON operation and 96 RON operation is within 3%, and there are no emissions increases (beyond normal test variability) using 91 RON fuel when tested on the FTP.

Data submittal waiver for Formaldehyde (HCHO) Measurement

Based on an engineering evaluation, Jaguar Land Rover states that light-duty vehicles included in this application comply with all applicable HCHO standards.

Data submittal waiver for Non-Methane Organic Gas (NMOG) Measurement

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Based on test data from engineering programmes Jaguar Land Rover use the following

NMOG:NMHC ratios in order to express NMOG emissions:

Cold and Hot Start tests, E0 fuels: $\text{NMOG} = \text{NMHC} \times 1.03$

Cold Start tests, E10 fuels: $\text{NMOG} = \text{NMHC} \times 1.10$

Hot Start tests, E10 fuels: $\text{NMOG} = \text{NMHC} \times 1.03$

Data submittal waiver for Spit-Back testing

All Jaguar Land rover Gasoline fuelled vehicles are certified to the refuelling emissions standards in §86.1811-04(e), and inherently meet the fuel dispensing spitback standards as part of compliance with the refueling emissions requirements.

Compliance with the applicable standards is for the Full Useful life of the vehicle.

Fuel dispensing spitback testing of Jaguar Land rover vehicles is therefore waived in accordance with §86.1810-01(l).

Evaporative Leak Detection

JLR OBD system conforms to current OBD requirements covered in Section 1968.2 of Title 13, CCR.

JLR OBD system is capable of detecting 0.020" inch diameter orifice leakage in the evaporative emissions system.

SC03 Test Procedures

Jaguar Land Rover attests that NMOG+NO_x and CO exhaust emissions for vehicles tested using the SC03 test procedures incorporated in the "California 2026 and Subsequent Model Year Criteria Pollutant Exhaust Emission Standards and Test Procedures for Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles", comply with the standards in 13 CCR 1961.4.(d)(4).

Quick Drive-away

Vehicles in this test group are not part of JLR's phase in for Quick drive-away as set forth in 13 CCR 1964.1(d)(2)(C)1(a))

Partial Soak

Vehicles in this test group are not part of JLR's phase in for Partial Soak as set forth in 13 CCR 1964.1(d)(2)(B)1)

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**9. OBD Compliance Statement**

Jaguar Land Rover states that the OBD system for this test group meets the full intent of the clean air act as amended in 1970 section 202(m), and the applicable federal OBD regulations, contained in 40 CFR §86.005-17 and 40 CFR §86.1806-01. Furthermore, Jaguar Land Rover states that the OBD system complies with all the requirements of Title 13 CCR 1968.2.

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12. Description of Vehicles Covered by Certificate and Test Parameters**12.1. Description of Vehicle**

Carline	Model Name	Vehicle Class Fed/CAL	Emission Control System Description						Engine Code	N° Valves/ Cyl	Sales Area	Trans & Over-drive	Standard Tire Size	N/V Ratio	ETW - lb.	Fuel Tank Volume - gal
			Type	Catalyst Config	EGR	Air Pump	Fuel System Type	Intake Air Aspiration Method								
311	Range Rover P550 PHEV	LDT2/ LDT4	Catalyst	TWC	N/A	N/A	DFI	Turbo Charged	3.0AJPH-23	4	50-state	8P80XPH	255/60R20	25.8	6500	18.9
311	Range Rover P550 PHEV	LDT2/ LDT4	Catalyst	TWC	N/A	N/A	DFI	Turbo Charged	3.0AJPH-23	4	50-state	8P80XPH	275/55R20	25.9	6500	18.9
311	Range Rover P550 PHEV	LDT2/ LDT4	Catalyst	TWC	N/A	N/A	DFI	Turbo Charged	3.0AJPH-23	4	50-state	8P80XPH	275/50R21	26.0	6500	18.9
311	Range Rover P550 PHEV	LDT2/ LDT4	Catalyst	TWC	N/A	N/A	DFI	Turbo Charged	3.0AJPH-23	4	50-state	8P80XPH	285/45R22	25.8	6500	18.9
309	Range Rover P460 PHEV	LDT2/ LDT4	Catalyst	TWC	N/A	N/A	DFI	Turbo Charged	3.0AJPH-23	4	50-state	8P80XPH	255/60R20	25.8	6500	18.9
309	Range Rover P460 PHEV	LDT2/ LDT4	Catalyst	TWC	N/A	N/A	DFI	Turbo Charged	3.0AJPH-23	4	50-state	8P80XPH	275/55R20	25.9	6500	18.9
309	Range Rover P460 PHEV	LDT2/ LDT4	Catalyst	TWC	N/A	N/A	DFI	Turbo Charged	3.0AJPH-23	4	50-state	8P80XPH	275/50R21	26.0	6500	18.9
309	Range Rover P460 PHEV	LDT2/ LDT4	Catalyst	TWC	N/A	N/A	DFI	Turbo Charged	3.0AJPH-23	4	50-state	8P80XPH	285/45R22	25.8	6500	18.9
234	Range Rover Sport P460 PHEV	LDT2/ LDT4	Catalyst	TWC	N/A	N/A	DFI	Turbo Charged	3.0AJPH-23	4	50-state	8P80XPH	255/60R20	25.8	6500	18.9
234	Range Rover Sport P460 PHEV	LDT2/ LDT4	Catalyst	TWC	N/A	N/A	DFI	Turbo Charged	3.0AJPH-23	4	50-state	8P80XPH	275/55R20	25.9	6500	18.9

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234	Range Rover Sport P460 PHEV	LDT2/ LDT4	Catalyst	TWC	N/A	N/A	DFI	Turbo Charged	3.0AJPM-23	4	50- state	8P80XPH	275/50R21	26.0	6500	18.9
234	Range Rover Sport P460 PHEV	LDT2/ LDT4	Catalyst	TWC	N/A	N/A	DFI	Turbo Charged	3.0AJPH-23	4	50- state	8P80XPH	285/45R22	25.8	6500	18.9
234	Range Rover Sport P460 PHEV	LDT2/ LDT4	Catalyst	TWC	N/A	N/A	DFI	Turbo Charged	3.0AJPH-23	4	50- state	8P80XPH	285/40R23	25.8	6500	18.9
235	Range Rover Sport P550 PHEV	LDT2/ LDT4	Catalyst	TWC	N/A	N/A	DFI	Turbo Charged	3.0AJPH-23	4	50- state	8P80XPH	255/60R20	25.8	6500	18.9
235	Range Rover Sport P550 PHEV	LDT2/ LDT4	Catalyst	TWC	N/A	N/A	DFI	Turbo Charged	3.0AJPH-23	4	50- state	8P80XPH	275/55R20	25.9	6500	18.9
235	Range Rover Sport P550 PHEV	LDT2/ LDT4	Catalyst	TWC	N/A	N/A	DFI	Turbo Charged	3.0AJPH-23	4	50- state	8P80XPH	275/50R21	26.0	6500	18.9
235	Range Rover Sport P550 PHEV	LDT2/ LDT4	Catalyst	TWC	N/A	N/A	DFI	Turbo Charged	3.0AJPH-23	4	50- state	8P80XPH	285/45R22	25.8	6500	18.9
235	Range Rover Sport P550 PHEV	LDT2/ LDT4	Catalyst	TWC	N/A	N/A	DFI	Turbo Charged	3.0AJPH-23	4	50- state	8P80XPH	285/40R23	25.8	6500	18.9

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12.2 Engine Starting Procedure

With the transmission in P or N, the Smart key inside the vehicle and the brake pedal pressed, press and release the START/STOP button to start the engine.

12.3 Transmissions

Automatic Transmissions

Type 8P80XPH

A/T code	Class	No. of fwd gears	Overdrive	Gear ratios
8P80XPH	Automatic	8	Yes	5.500
				3.520
				2.200
				1.720
				1.301
				1.000
				0.833
				0.64

General Description

The 8P80XPH is an electronically controlled, fully automatic, synchronous 8 speed overdrive transmission with input through a three phase, single stage torque converter. The torque converter incorporates an internal friction clutch which transmits engine torque mechanically when applied in either locked or controlled slip phase.

The shift points and converter clutch application are functions of throttle pedal position and vehicle speed. Each transmission calibration contains the individual shift points for the corresponding transmission application.

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Special Features:

Electric Motor

- Permanent Magnet Synchronous Motor (Compact & powerful)
- Max power: 105kW
- Max Torque: 275Nm/202lb/ft
- Max power is not completely additional to ICE engine max power, as peak powers occur at different engine speeds
- Located coaxially within the auto transmission

Belt Driven Starter Motor also known as 'Belt ISG'

- Additional starter to provide instant, quiet re-starts of ICE engine during hybrid operation
- Rotates engine using serpentine belt on front of engine
- Conventional starter retained for cold engine start
- Although ISG hardware has generating capability, this is not used on the PHEV
- High Voltage Battery
- 398.2V Lithium-ion Battery (NMC Chemistry)
- 38.2kWh maximum capacity (31.8kWh usable)
- 453V Maximum Voltage
- 277 kg weight
- 51 miles EV range
- Samsung SDI supplier
- Non-servicable item

Regen Braking:

- Done through the Electric Machine
- Driver lifts off the accelerator pedal, VSC does a periodic calculation on how much electric braking that can be offered based on:
 1. EM Speed
 2. De-rate
 3. How much energy the battery can take(Limited by SOC & Battery temp)
- Capability is sent to the ABS and then the decision on how much regen braking should be done is then sent back to the VSC.
- During overrun the vehicle attempts to decelerate within a given profile, some of this is done with the EM
- The ABS system is the arbitrator of regen braking

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Transmission Shifting

Gear-shift Interlock

A brake pedal/gear-shift interlock is incorporated in the gear selector mechanism. The gear selector lever may only be moved from the Park position if the ignition is "on" and footbrake is pressed.

Single Mode

During normal forward operation of the vehicle the transmission shifts automatically when the transmission selector is positioned in "Drive".

User Selectable Modes

Jaguar Land Rover has developed a range of driver selectable modes. Not all modes are available on all products and not all modes are considered to be on-road modes.

These driver selectable modes change driveability and transmissions calibratable comfort functions. The driveability functions which are modified are the comfort filters to provide a balance of control, response and comfort to suit the selected mode. The relationship between the physical driver pedal position and the ECU pedal position is changed, effectively making the vehicle feel more or less responsive. The functionality of emissions control strategies is not altered.

In Dynamic Drive mode, The PCM applies a scalar to make the accelerator pedal more sensitive. The transmission applies the same shiftpoints as in Normal drive mode. The PCM applies a scalar to make the accelerator pedal more sensitive.

Driver mode	On/Off-road
Normal mode	On-road
Dynamic mode	On-road
Grass - Gravel - Snow mode	Off-road
Dynamic mode	Off-road
Mud & Ruts mode	Off-road
Sand mode	Off-road
Low Range	Off-road

Chassis Dynamometer Operation

If the vehicle is going to be operated on a chassis dynamometer, disable the traction control facility immediately after selecting drive.

Shift Schedules

As defined in EV-CIS

Manual Transmission

Manual Transmissions are not available.

12.4 Special Testing Procedures

Cooling Fans

Additional cooling fans are not required for any of the standard emissions or fuel economy test cycles. Use of a speed tracking fan is optional for the FTP and Highway test cycles.

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**12.2.4 Dynamometer Loading Information (LVW):**

Model	ETW (lbs)	Tire size	Target Coefficients			Set Coefficients*			TRLHP@50
			A	B	C	a	b	c	
Ranger Rover	6500	255/60R20	60.9	-0.223	0.03254	60.901	-0.22287	0.032542	17.5
Ranger Rover	6500	275/55R20	66.6	-0.223	0.03211	Untested	Untested	Untested	18.1
Ranger Rover	6500	275/50R21	56.1	-0.223	0.03272	Untested	Untested	Untested	16.9
Ranger Rover	6500	285/45R22	60.9	-0.223	0.03254	Untested	Untested	Untested	17.5
Ranger Rover Sport	6500	255/60R20	60.9	-0.223	0.03315	Untested	Untested	Untested	17.7
Ranger Rover Sport	6500	275/55R20	61.9	-0.223	0.03365	Untested	Untested	Untested	18.0
Ranger Rover Sport	6500	275/50R21	59.934	-0.22287	0.031709	5.598	-0.246	0.02918	17.1
Ranger Rover Sport	6500	285/45R22	60.9	-0.223	0.03315	Untested	Untested	Untested	17.7
Ranger Rover Sport	6500	285/40R23	59.9	-0.223	0.03383	4.950	-0.32399	0.031779	17.8

* 4WD Dynamometer

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12.2.5 Evaporative/Refuelling Data

12.2.5.1 Evaporative Testing Parameters

Canister Loading

Load at standard rate – 15 g/hr.

Fuel Tank Parameters

Fuel tank volumes

Carline	Evaporative Code	Nominal Capacity	Useable 40% Fill	Vapor volume at 40% Fill
Range Rover	MLAP-23	18.9	7.6	13.4
Range Rover Sport	MLAP-23	18.9	7.6	13.4

All volumes expressed in US gallons

Fuel tank temperature profiles (FTTP)

FTTP procedure

Fuel tank temperature profiles were determined according to the procedure described in 40CFR Part 86.129-94(d).

FTTP
codes

Carline	Evaporative Code	FTTP code
Range Rover	MLAP-23	FTPP460
Range Rover Sport	MLAP-23	FTPP461

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FTTPs		
Time_s	Fuel_T_ °C	Vapour_T_ °C
0	96.8	92.3
60	96.4	92.7
120	96.2	93.1
180	96.2	93.5
240	96.1	93.8
300	96.3	94.3
360	97.2	94.8
420	97.5	95.5
480	98.0	95.9
540	98.4	96.4
600	98.6	96.9
660	99.1	97.2
720	99.5	97.6
780	99.7	98.0
840	99.9	98.4
900	100.6	98.9
960	101.2	99.4
1020	101.7	99.8
1080	102.0	100.3
1140	102.3	100.7
1200	102.5	101.2
1260	103.0	101.6
1300	103.3	102.0
1360	103.7	102.5
1420	104.3	102.9
1480	104.8	103.4
1540	105.2	103.9
1600	105.7	104.2
1660	106.0	104.6
1720	106.3	105.2
1780	107.1	105.8
1840	107.6	106.3
1900	108.0	106.7
1960	108.1	107.3
2020	108.7	107.8
2080	109.5	108.2
2140	109.6	108.9

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**Range Rover, Range Rover Sport****Part 1****Issued: 03/16/26**

2200	110.4	109.4
2260	111.1	109.9
2320	111.7	110.5
2380	111.9	111.1
2440	112.8	111.6
2500	113.1	112.0
2560	113.3	112.6
2620	113.8	113.1
2680	114.8	113.5
2740	115.1	114.2
2800	115.5	114.7
2860	116.3	115.1
2920	116.5	115.5
2980	116.9	116.0
3040	117.0	116.5
3100	117.2	116.9
3160	118.2	117.5
3220	118.6	117.5
3280	118.7	118.0
3340	119.0	118.2
3400	119.1	118.6
3460	119.2	118.9
3520	119.8	119.3
3580	119.9	119.6
3640	120.3	119.8
3700	120.3	120.3
3760	120.7	120.7
3820	120.9	121.0
3880	121.1	121.3
3940	121.6	121.5
4000	121.8	122.0
4060	122.4	122.5
4120	122.7	122.9
4180	123.0	123.2
4240	123.7	123.6
4300	124.1	124.1

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12.2.5.2 Fuel Tank Temperature Profile Report

Compiled By: Lee Dunn Date: June 2021

Subject

Fuel tank temperature profile for Range Rover PHEV

Summary

Vehicle tests were conducted to determine a fuel tank temperature profile for the MLA PHEV Evaporative family.

Conclusion

The fuel tank temperature profile determined by this test complies with Environmental Protection Agency procedure detailed in 40CFR 86.129.94.

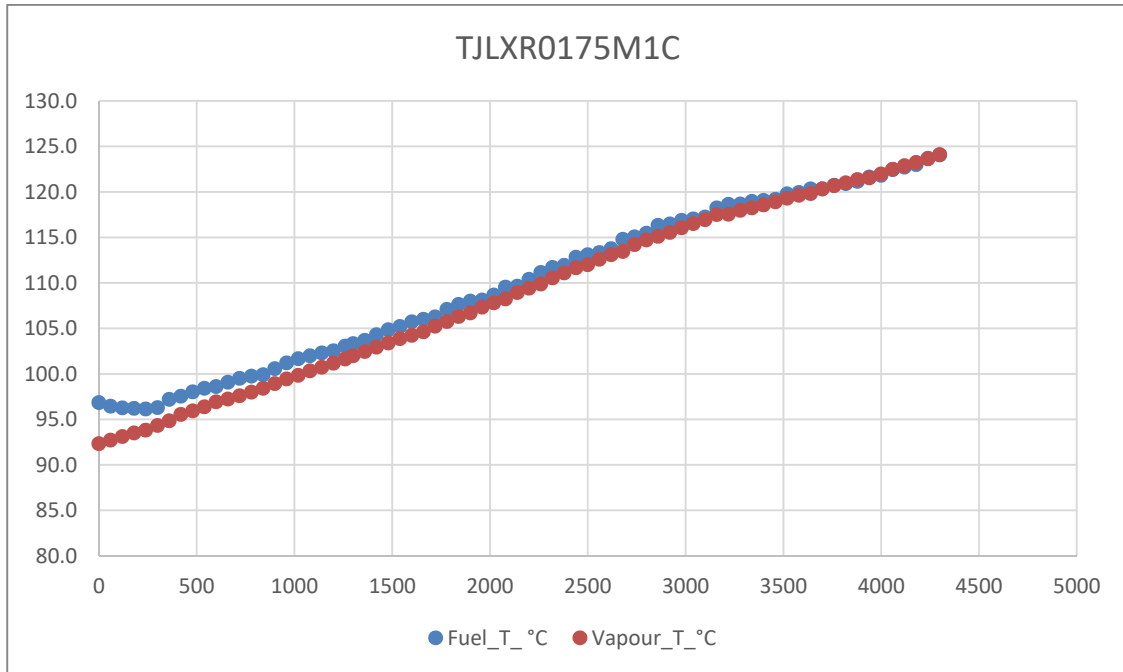
Test Vehicle Specification

Evap Family: PJLXR0175M1C
Model: Range Rover PHEV
Transmission: 8 speed automatic
Fleet identity: 3KNVB005
Test Weight: 6500lbs

Test Location

Exponent Test Facility, 1850 W Pinnacle Peak Road, Phoenix, Az, 85027,
USA

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14. Request for Certification

14.1 Statement of Compliance

Refer to Common Section, Section 14.

14.2. Request for certificate

Based on Jaguar Land Rover's good engineering judgment, all the vehicles described in this Application for Certification comply with all applicable intermediate and full useful life standards.

Therefore, Jaguar Land Rover herewith applies for a federal Certificate of Conformity and a California ARB Executive Order for Test Group VJLXT03.0PTC.

This Test Group complies with all applicable regulations contained in Title 40, Code of Federal Regulations, Part 86 and the California Code of Regulations.

Ian Munden
Manager
Emissions Certification for North America
Jaguar Land Rover

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15. Other Information

15.1. Label according to 40 CFR § 86.1807-01 and according to California Motor Vehicle Emission Control Label Specifications.

15.1.1



15.1.2 Label Location: Under-bonnet.

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15.2. Fee Filing Form

See attached page.

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15.3. OBD Letter

See attached page.

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**Adjustable Parameters**

There are no parameters present on any vehicle covered by this application that can be considered adjustable within the context of 40CFR Part 86.1833-01.

Fuel Specifications

Fuels Recommended to the Owner

Full statements concerning fuel recommendations are contained in the Vehicle Owners Handbooks.

Test and Service Accumulation Fuel

All test and service accumulation fuels relating to this Application for Certification are equivalent to those specified in 40CFR Part 86, Subpart S, and the California Exhaust Emission Standards and Test Procedures for 2001 and Subsequent Model Passenger Cars, Light -Duty Trucks, and Medium-Duty Vehicles. Specifications and/or analyses will be supplied on request.

Lubricant specifications**Engine**

	Factory fill	Recommended to ultimate purchaser	To be used in test vehicles
Generic type	Hydrocarbon	Hydrocarbon	Hydrocarbon
Service designation	STJLR.03.5006 Castrol LG3 BOT 938	STJLR.03.5006 Castrol LG3 BOT 938	STJLR.03.5006 Castrol LG3 BOT 938
Viscosity	SAE 0W20	SAE 0W20	SAE 0W20

Automatic Transmissions

The transmissions are sealed for life and the factory fill materials are listed below. All lubricants are hydrocarbon based and contain no friction modifiers.

ZF 8P80XPH 8 Speed Automatic Transmission: ZF Lifeguard

Manual Transmissions

S6-45 6 Speed Manual Transmission: Castrol

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Litmus Test

EDV/FEDV input data:	Vehicle-Specific 5-Cycle FE: \$600.114-12	<i>Litmus threshold</i> \$600.115-11	Derived 5-Cycle FE: (MPG-Approach) \$600.210-12	
Normal temperature FTP75:	5-Cycle City Label:		MPG-Approach City Label:	
C1 2022-02-19 01	Start FC (City) 0.0035166		City Intercept 0.004091	
UDDS Bag 1 ₂₅ FE 20.0350	Running FC (City) 0.0427557		City Slope 1.1601	
UDDS Bag 2 ₂₅ FE 24.2520	5-cycle City FE Adj/Unmd 19.5582		5-cycle City FE Adj/Unmd 18.4947	
UDDS Bag 3 ₂₅ FE 25.3430	5-cycle City Litmus value 19.6	17.8	5-cycle City FE Adj/Rnd 18.5	
UDDS Bag 4 ₂₅ FE 23.8560	City Label 20		City Label 16	MPG Approach City value in band
FE RND (EPA) 23.2				
Cold Temperature FTP20:	5-Cycle Highway Label:		MPG-Approach Highway Label:	
20190614 AETC	Start FC (Highway) 0.0002403		Highway Intercept 0.003191	
UDDS Bag 1 ₂₀ FE 15.6071	Running FC (Highway) 0.0528757		Highway Slope 1.2945	
UDDS Bag 2 ₂₀ FE 21.5842	5-cycle Highway FE Adj/Unmd 17.0382		5-cycle Highway FE Adj/Unmd 23.5239	
UDDS Bag 3 ₂₀ FE 22.5969	5-cycle Highway Litmus value 17.0	22.3	5-cycle Highway FE Adj/Rnd 23.5	
UDDS Bag 4 ₂₀ FE	Highway Label 17		Highway Label 24	
FE RND (EPA) 20.2				
Highway Fuel Economy Test:			3-Cycle Highway Label:	
C1 2022-02-19 02			Start FC (Highway) 0.0002488	
HFET FE Unmd 32.9230			Running FC (Highway) 0.0530187	
FE RND (EPA) 32.9			3-cycle Highway FE 17	
Supplemental FTP:				3-cycle calcs: 0.0002488 0.0530187 16.9897
US06				
C6 2022-05-05 15				
US06 City FE 24.5				
US06 Highway FE 17.3				
US06 FE RND 22.4				
SC03				
C1 2022-02-19 05				
SC03 FE RND 20.4				
Start Fuel:				
Start Fuel _{avg} 0.0349582				
Start Fuel ₂₀ 0.0713433				

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**17. California ARB Information****17.1. Statements**

Vehicles covered by this application are not fitted with defeat devices.

All AECDs used on vehicles covered by this application are declared and described in section 16 of the application and the common section.

Test and production vehicles covered by this application do not use multiple maps in the engine management system. Modes used during on-road operation are identical to those used in testing.

Vehicles covered by this application do not use transmission calibrations which interact with the engine management or emission control systems in order to assist engine or catalyst warm-up.

The transmission calibration does not include different modes for on-road and dynamometer operation. Transmission behaviour is identical in both cases.

Also refer to Common Section, Section 17

17.2 Fill Pipe Specification

Refer to Common Section, Section 17

17.3 Projected Sales

Refer to Common Section, Section 16, Confidential Information

17.4 Evaporative Emission Deterioration**17.4.1.1. Worst Case Selection**

Worst Case selection is carried out according to the provisions in 40 CFR § 86.1828-01 (b)(3). Using good engineering judgment, JLR believe the Range Rover data are representative of a worst case vehicle for Range Rover and Range Rover Sport. The worst-case vehicle selection is highlighted in yellow in the table on the next page.

Canister size, canister material, fuel tank material, purge strategy and flow rates and refueling characteristics are common between all vehicles within the evaporative family.

Driver mode for evaporative testing was "Normal mode – D".

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					Fuel System (86.1821-01 (b) (3))							Fuel Evaporative Emissions Control System Components							
Engine size	ETW	Carline	Working Capacity 86.1821-01 (b) (2) (i))	Canister Geometry, Construction & Materials (86.1821-01 (b) (2) (iii))	Fuel tank	Fuel Pump	Fuel Lines	Fuel Injection Components	Fuel System Vents	Type of refueling emission control system (86.1821-01 (b) (4))	Fillpipe seal mechanism (mechanical, liquid trap, other) (86.1821-01 (b) (5))	Type of Vapor Storage Device (86.1821-01 (b) (1))	Vapour control system or method of controlling vapour flow through the vapour line to the canister (e.g. type of valve, vapour control strategy) (86.1821-01 (b) (6))	Purge control system (e.g. type of valve, purge control strategy) (86.1821-01 (b) (7))	Vapour hose material (86.1821-01 (b) (8))	Fuel Tank Material (86.1821-01 (b) (9))	FEL for testing at low-altitude conditions (86.1821-01 (b) (10))	Fuel Tank Usable Volume (L)	
3.0L	6500lbs	Range Rover	175g	2.0L BAX 1500 + 0.8L BAX 1100	Underfloor Saddle Tank	In-tank turbine pump - Pulse width modulated (PWM) controlled. Electronic returnless fuel system (ERFS)	Multi-layer plastic	High pressure direct fuel injection	In-tank vent valves connected to charcoal canister - with fuel tank inline isolation valve between tank and canister	Non-integrated	Twin seal mechanic	Carbon Canister	FTIV fuel tank isolation valve	PWM Controlled Solenoid Valve	Nylon multi-layer with PVDF barrier	Steel	0.500 g/test	71.5	
3.0L	6500lbs	Range Rover Sport	175g	2.0L BAX 1500 + 0.8L BAX 1100	Underfloor Saddle Tank	In-tank turbine pump - Pulse width modulated (PWM) controlled. Electronic returnless fuel system (ERFS)	Multi-layer plastic	High pressure direct fuel injection	In-tank vent valves connected to charcoal canister - with fuel tank inline isolation valve between tank and canister	Non-integrated	Twin seal mechanic	Carbon Canister	FTIV fuel tank isolation valve	PWM Controlled Solenoid Valve	Nylon multi-layer with PVDF barrier	Steel	0.500 g/test	71.5	

**17.4.3.2. Test Vehicle Description for Evap. Family VJLXR0175M1C**

Vehicle Identification Number	3PNM1021
Evaporative Emission Code	MLAP-23
Model	Range Rover
Emission Control System:	WR-HO2S/TWC/HO2S(2)/DFI/TC/CAC
Displacement	2996 cm ³
Engine Code	3.0AJPH-23
Evaporative Family	PJLXR0175M1C
Equivalent Test Weight	6500 lb.
Actual Vehicle Weight	
Curb Weight	6275 lb.
Drive Axle Weight	7605 lb.
Air Conditioning	Yes
Transmission Type	S8
Transmission Code	8P75PH
Axle Ratio	3.73
N/V Ratio	26.8
Tire Manufacturer	Pirelli
Tire Size	285/45R22

17.4.5.2.2.EPA Profile and Ambient Conditions

The temperature correction was conducted in accordance with the Federal Evaporative Emission Standards and Test Procedures after the following equation:

$$T_{i, \text{profile}} = T_i - T_o$$

T_i is the series of observed liquid fuel temperature during the drive (°F) where i is the incremental measurement in time

T_o is the liquid fuel temperature observed at the start of the specified driving schedule (°F).

$T_{i, \text{profile}}$ is the series of temperatures that comprise the relative temperature profile for table of T_i refer to Enclosure 1 of Section 12.

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17.4.6. Test Results for Evaporative Emissions

17.4.6.1 Enhanced Evaporative Emissions Test

17.4.6.1.1 Test Results of Durability Data Vehicle, Calculation of Evaporative Emission and Running Losses Deterioration Factor:

		3-Diurnal + Soak	Running Losses	ORVR
Miles		(g/test)	(g/mile)	(g/gallon)
4000	Set A	0.223	0.00053	0.005
4000	Set B	0.190	0.00059	0.036
	Average	0.2065	0.00056	0.0209
150000	Set A	0.139	0.00033	0.006
150000	Set B	0.121	0.00074	0.020
	Average	0.1102	0.000537	0.0132

Deterioration factors, Manufacturer Assigned:

0.0000	0.0000	0.0000
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Standards:

0.5	0.05	0.2
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17.4.6.1.2. Test Results of Emission Data Vehicle

4K Evaporative Emission Test Data			Deterioration Factors	Compliance with Std. Test Data + DF	Standard	Unit
Test Vehicle	Model VIN	Range Rover 3KNMP1021				
Enhanced Evaporative Test		0.2065	0.0000	0.2065	0.5	g
Running Loss Test		0.00056	0.0000	0.00056	0.01	g/mi.
Refueling Test		0.0209	0.0000	0.0209	0.20	g/gal

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17.6. Vehicle weights

17.6.1. Curb weight:

6420 lb Range Rover P550 PHEV
6315 lb Range Rover P460 PHEV
6135 lb Range Rover Sport P460 PHEV
6330 lb Range Rover Sport P550 PHEV

17.6.2. Gross vehicle weight rating:

7670 lb Range Rover P550 PHEV
7670 lb Range Rover P460 PHEV
7605 lb Range Rover Sport P460 PHEV
7605 lb Range Rover Sport P550 PHEV

17.6.3. Equivalent test weight:

6500 lb Range Rover P550 PHEV
6500 lb Range Rover P460 PHEV
6500 lb Range Rover Sport P460 PHEV
6500 lb Range Rover Sport P550 PHEV

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18. Revision Log

<u>Revision No.</u>	<u>Revision Date</u>	<u>Pages Affected</u>	<u>Description of Revision</u>
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