



Application for Certification - Part 1

Test Group (CBI)

- **Model Year:** 2027
- **Manufacturer Name:** Hyundai Motor Company
- **Test Group:** VHXYV02.5GP5
- **Test Group Description:** 2.5 Liter / I4 Turbo GDPI / Otto-cycle
- **Durability Group:** VHXYGPGNNGP5
- **Durability Group Description:** Monolith, TWC
- **Vehicle Class:** LDV
- **Applicable Standards:** FED: Interim Tier-4 Bin 50 / Tier-4 Evap
CAL: LEV-IV ULEV 50 / LEV-IV Evap
- **Vehicle tested:** IK_U4L3TA015A/0 (Exh)
RG3U1L5TA082A/0 (Evap)
- **Carlines Covered by Certificate:** G70 AWD, G70 RWD
- **EPA Response Requested by:** June 5, 2026
- **For Questions, Contact:** Stephanie Wright
734-273-1904
E-mail: swright@hatci.com

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01.00 Correspondence and Communications

Please refer to Common Section 01.00.

For questions, call Stephanie Wright (734-273-1904).

02.00 Durability Group Description

- | | | |
|---|---|--------------------------|
| 1. Durability Group Name | : | VHYXGPGNNGP5 |
| 2. Combustion Cycle | : | Otto cycle / four stroke |
| 3. Engine Type | : | Piston / Water cooled |
| 4. Fuel Used | : | Gasoline |
| 5. Basic Fuel Metering System | : | Direct & Port Injection |
| 6. Catalyst Construction and location | : | See Section 02.02 |
| 7. Precious Metals in Catalyst | : | See Section 02.02 |
| 8. Precious Metal Loading for all Catalysts in the Durability Group | : | See Section 02.02 |
| 9. Range of Catalyst Grouping Statistics | : | See Section 02.02 |
| 10. Type of particulate filter | : | None |

02.01 List of Vehicles in Durability Groups

Please refer to Common Section 02.01.

03.00 Evaporative/Refueling Family Description

03.00.01 Evaporative/Refueling Family Name: VHYXR0132GPG (C/O from 20MY SONATA 2.5)

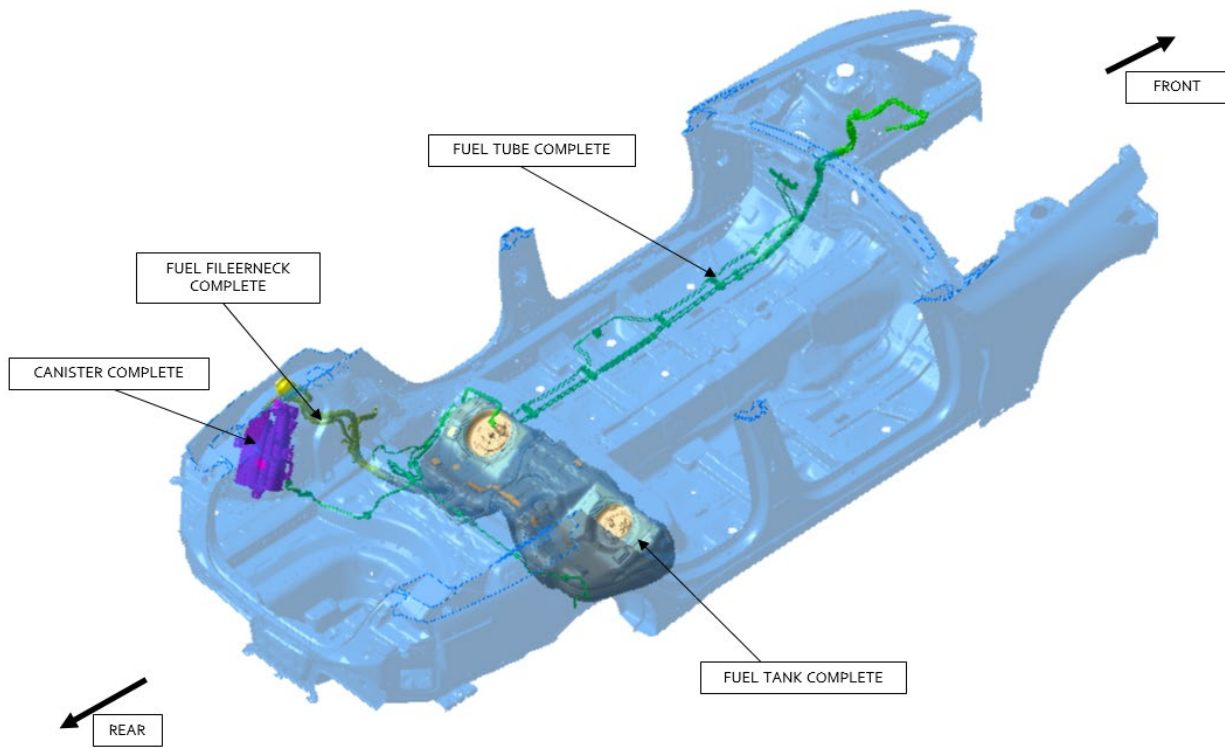
03.00.01.01 Evaporative/Refueling Family Parameters

1. Type of Vapor Storage Device: Canister(1EA), Air cleaner(1EA)
2. Basic canister design

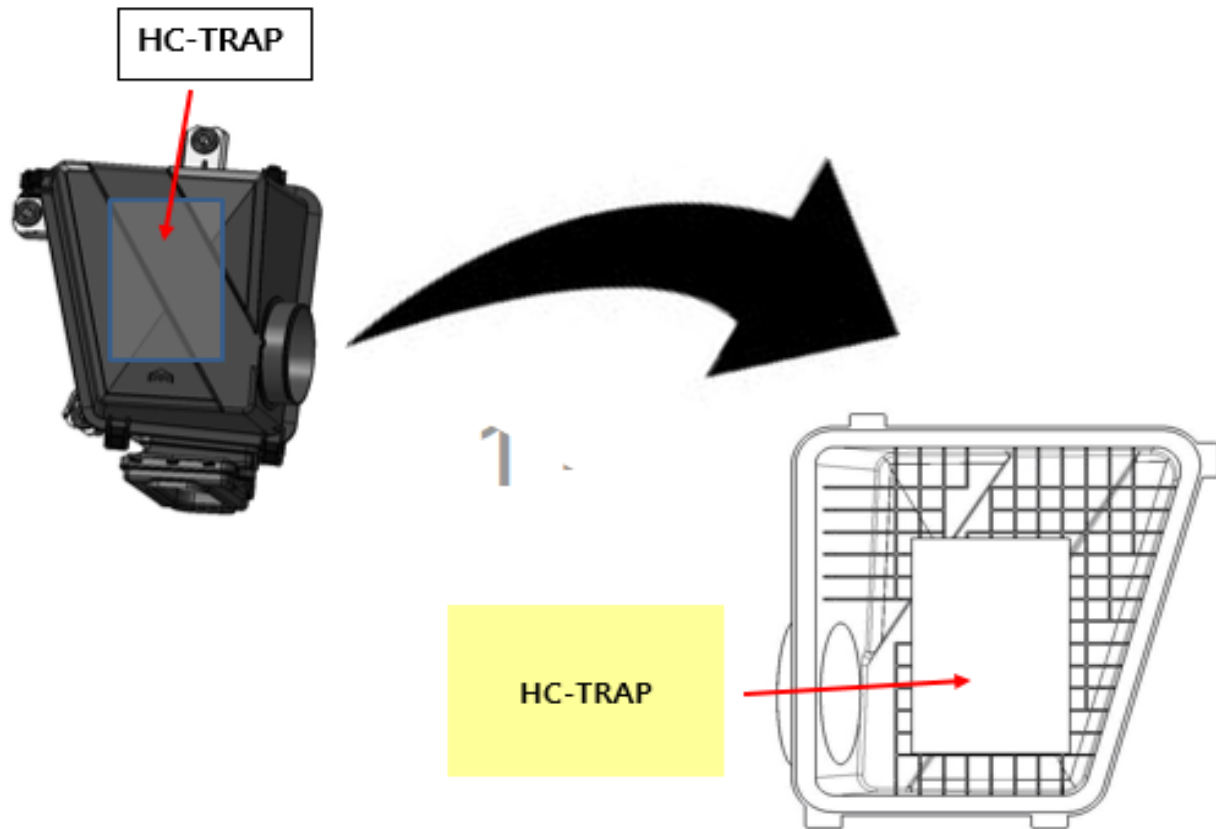
Evap. Code	Absorption Flow Rate (g/hr)	Nominal Working Capacity(g)	Size (cc)	Material	Medium	Nominal Fuel Tank Capacity (gal)
132GPG	15	132	2300	Plastic	Activated Carbon	15.9

3. Fuel system: Returnless fuel system
4. Type of refueling emission control system: Integrated type
5. Fillpipe seal mechanism: Liquid seal type
6. Vapor control system or method of vapor line to the canister:
 - a. Fill limit Vent valve (ORVR)
 - b. Overfill Limiter (2way valve)
 - c. Canister close valve
7. Purge control system
 - a. Type of valve: Duty
 - b. Purge control strategy: Controlled by ECU
 - c. High load purge system : Yes
 - d. Active purge system : No
8. Vapor hose material: Rubber
9. Fuel tank material: Plastic
10. HC-Trap
 - 10.1 Media : Carbon sheet type
 - 10.2 Working capacity: 0.5g

03.00.01.02 Evaporative/Refueling Schematic



03.00.01.03 HC-Trap Schematic



03.01 Evaporative/Refueling General Description

Please refer to Common Section 03.01.

03.02 List of Vehicles in Evaporative Families

Please refer to Common Section 03.02.

05.00 Test Group Description

Test Group Name	:	VHYXV02.5GP5
Engine Displacement (L) Covered	:	2.5L
Arrangement/Number of Cylinders	:	I4
Vehicle Class(s) Covered	:	LDV
Sales Location/Emission Standard	:	FED: Interim Tier-4 Bin 50 CAL: LEV-IV ULEV 50 See CSI report for emission standard levels

06.00 Test Vehicle Description

1. Exhaust Durability Data Vehicle

Verify Processing Report

Total Datasets Submitted: 1
Accepted Datasets: 1
Rejected Datasets: 0

The original datasets are listed below. In addition, any information generated by the Verify system is also included. For any rejected datasets, the reason(s) the dataset was rejected is provided below in the Transaction Report for that particular dataset.

Test Vehicle Information Submission

Test Vehicle Information Details

Information Process Code : C
EPA Manufacturer Code : HYY
Vehicle Identification Text : IK5F5HU15B3
Vehicle Configuration Number : 0

Vehicle Configuration Details

Vehicle Description Details

Manufacturer Vehicle Configuration Number : 0
Test Group Name : RHYXV02.5GP4
Evaporative Refueling Family Name : RHYXR0132GPG
Leak Family Identifier : IK1
Leak Family Name : RHYXR0132GPG-IK1
Model Year : 2024
Actual Test Vehicle Make Text : Genesis
Actual Test Vehicle Model Text : G70

Drive Source Details

Drive Source Identifier : C
Fuel Identifier : G

Test Drive Code : R
Shift Indicator Light Usage Identifier : 1
Aged Component Usage Identifier : 4

Odometer Correction Details

Correction Initial Value : 86
Correction Factor Value : 1.0078
Correction Sign Identifier : -
Correction Units Code : M

Engine Code Text : G4KR-AC
Engine Rated Horsepower Value : 300
Engine Displacement Value : 2.5

Air Aspiration Details

Air Aspiration Method Identifier : TC
Air Aspiration Device Count : 1
Air Aspiration Configuration Identifier : N

Charge Air Cooler Identifier : L

Vehicle Specifications Details

Curb Weight Value : 3829
Equivalent Test Weight Value : 4250
Gross Vehicle Weight Rating Value : 4916
NV Ratio Value : 26.5
Axle Ratio Value : 3.54

VHYXV02.5GP5 – Hyundai G70 2.5L T-GDPI – Part 1
Issued : 04-30-2026
Revised:

Transmission Specifications Details

Light Duty Transmission Type Identifier : SA
Transmission Lockup Indicator : Y
Transmission Creeper Gear Indicator : N
Transmission Gear Count : 8

Target Set Coefficient Details

Test Procedure Dynamometer Coefficients Category : C-H-E
Target CoefficientA Value : 37.970
Target CoefficientB Value : 0.52958
Target CoefficientC Value : 0.018422
Set CoefficientA Value : 16.483
Set CoefficientB Value : 0.26280
Set CoefficientC Value : 0.019184

Target Set Coefficient Details

Test Procedure Dynamometer Coefficients Category : US06
Target CoefficientA Value : 37.970
Target CoefficientB Value : 0.52958
Target CoefficientC Value : 0.018422
Set CoefficientA Value : 16.483
Set CoefficientB Value : 0.26280
Set CoefficientC Value : 0.019184

Target Set Coefficient Details

Test Procedure Dynamometer Coefficients Category : Cold-CO
Target CoefficientA Value : 41.767
Target CoefficientB Value : 0.58254
Target CoefficientC Value : 0.020264
Set CoefficientA Value : 4.097
Set CoefficientB Value : 0.01138
Set CoefficientC Value : 0.023569

Manufacturer Comment Text : IK5F5HU15B3 was tested with aged(SBC) converter for DDV. Target and set coefficients are corrected.

EPA Generated Test Vehicle Details

Original Receipt Date : 20230731
Hybrid Vehicle Indicator : N
Adjusted Loaded Vehicle Weight Value : 4372
Loaded Vehicle Weight Value : 4129
Total Road Load Horsepower Value : 14.7

Transaction Status Details

Transaction Status Identifier : ACCEPTED

Verify Processing Report

Total Datasets Submitted: 1
Accepted Datasets: 1
Rejected Datasets: 0

The original datasets are listed below. In addition, any information generated by the Verify system is also included. For any rejected datasets, the reason(s) the dataset was rejected is provided below in the Transaction Report for that particular dataset.

Test Vehicle Information Submission

Test Vehicle Information Details

Information Process Code : C
EPA Manufacturer Code : HYX
Vehicle Identification Text : IK5F5HD21B3
Vehicle Configuration Number : 0

Vehicle Configuration Details

Vehicle Description Details

Manufacturer Vehicle Configuration Number : 0
Test Group Name : RHYXV02.5GP4
Evaporative Refueling Family Name : RHYXR0132GPG
Leak Family Identifier : IK1
Leak Family Name : RHYXR0132GPG-IK1
Model Year : 2024
Actual Test Vehicle Make Text : Genesis
Actual Test Vehicle Model Text : G70

Drive Source Details

Drive Source Identifier : C
Fuel Identifier : G

Test Drive Code : R
Shift Indicator Light Usage Identifier : 1
Aged Component Usage Identifier : 4

Odometer Correction Details

Correction Initial Value : 86
Correction Factor Value : 1.0078
Correction Sign Identifier : -
Correction Units Code : M

Engine Code Text : G4KR-AC
Engine Rated Horsepower Value : 300
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Air Aspiration Details

Air Aspiration Method Identifier : TC
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Air Aspiration Configuration Identifier : N

Charge Air Cooler Identifier : L

Vehicle Specifications Details

Curb Weight Value : 3829
Equivalent Test Weight Value : 4250
Gross Vehicle Weight Rating Value : 4916
NV Ratio Value : 26.5
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Transmission Specifications Details

Light Duty Transmission Type Identifier : SA
Transmission Lockup Indicator : Y
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Set CoefficientA Value : 4.097
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Target Set Coefficient Details

Test Procedure Dynamometer Coefficients Category : US06
Target CoefficientA Value : 37.970
Target CoefficientB Value : 0.52958
Target CoefficientC Value : 0.018422
Set CoefficientA Value : 16.483
Set CoefficientB Value : 0.26280
Set CoefficientC Value : 0.019184

Manufacturer Comment Text : IK5F5HD21B3 was tested with fresh converter for DDV. Target and set coefficients are corrected.

EPA Generated Test Vehicle Details

Original Receipt Date : 20230731
Hybrid Vehicle Indicator : N
Adjusted Loaded Vehicle Weight Value : 4372
Loaded Vehicle Weight Value : 4129
Total Road Load Horsepower Value : 14.7

Transaction Status Details

Transaction Status Identifier : ACCEPTED

2. Exhaust & Evaporative Emission Data Vehicle

Please refer to CSI report in 07.00

07.00 Test Results

07.01.01 EV-CIS Certification Summary Information

Certification Summary Information Report submitted to EV-CIS.

See 18.00.00.

07.02 Litmus Test Sheet

Litmus Test of EDV

EDV	FTP(75°F)	Cold FTP (20°F)	HFET	US06	SC03
BAG1	23.8	21.4	39.6	16.2	20.7
BAG2	24.0	23.1		29.5	
BAG3	28.7	27.9			
TOTAL	25.1			25.0	

(1) Determining the City FE Method

5 Cycle City Criteria (Specific 5 cycle City FE $\geq$ 0.96 Mpg Based City FE)	Passed
---	--------

		UNROUNDED	ADJ. ROUNDED	Examination	Decision
CITY FE	MPG BASED	19.87671527	19.1	Applicable	
	5-CYCLE	20.24734391	20.2	Applicable	Selected
	Ratio of 5CYCLE to 0.96 MPG-BASED		105.76		

CRITERIA : 100%

(2) Determining the Hwy FE Method

5 Cycle Highway Criteria (Specific 5 cycle HWY FE $\geq$ 0.95 Mpg Based HWY FE)	Passed
--	--------

		UNROUNDED	ADJ. ROUNDED	Examination	Decision
HWY FE	MPG BASED	27.8704	26.5	Not Applicable	
	5-CYCLE	27.4170	27.4	Select This	Selected
	MODIFIED	27.3894	27.4	Not Applicable	
	Ratio of 5CYCLE to 0.95 MPG-BASED		103.40		

CRITERIA : 100%

VHYXV02.5GP5 – Hyundai G70 2.5L T-GDPI – Part 1

Issued : 04-30-2026

Revised:

08.00 Emission Compliance Statement

Please refer to Common Section 08.00.

09.00 OBD System Description

The on-board diagnostic (OBD) system complies with 40 CFR 86.1806-17, 86.1806-27 per the compliance option allowing demonstration of compliance with California OBD II requirements in Title 13 California Code of Regulation 1968.2 (13 CCR 1968.2) approved on November 30, 2022.

Please refer to OBD application uploaded in EV-CIS system.

10.00 Description of Alternate-Fueled Vehicles: Not Applicable

12.00 Description of Vehicles Covered by Certificate and Test Parameters

12.01 Vehicle Parameters

Carline		333	334
Model Name		G70 AWD	G70 RWD
Vehicle Classification		LDV	
Emission Control System Description	Type, number and configuration of catalyst(s)	See Sec. 02.02	
	EGR Type	N/A	
	Air pump type	N/A	
	Fuel system type	DFI, SFI	
	Intake air aspiration method	Turbocharger, Charge Air Cooler	
	Other	-	
Engine Code		G4KR-AC	
Number of Valves Per Cylinder		4	
Engine Displacement (L)		2.5	
Sales Area		50-State	
Transmission		SA8	
SIL		N/A	
Tire Size		Front : 225/40R19 Rear : 255/35R19 (Michelin)	
N/V Ratios		26.5	
ETW(lb)		4250 (AWD) 4000 (RWD)	
Elec. Dyno. Target Coefficient	A	Please refer to 12.02.01.	
	B		
	C		
Fuel tank volume(gal)		15.9	

VHYXV02.5GP5 – Hyundai G70 2.5L T-GDPI – Part 1

Issued : 04-30-2026

Revised:

12.02.02 Engine Starting Procedures

Please refer to Common Section 12.02.02.

12.02.03 Shift Schedules

Automatic transmission: Please refer to Common Section 12.02.03.01

Manual transmission: Not Applicable

12.02.04 Transmission / Advanced Technology System Test Modes

Please refer to Common Section 12.02.04

13.00 Projected Sales

Please refer to Common Section 13.00.

14.00 Request for Certification



Ms. Kathryn Kochunas
Certification Division
Mobile Source Pollution Control
U.S. Environmental Protection Agency
2000 Traverwood Drive
Ann Arbor, Michigan

Subject: Request for Certificate of Conformity for 2027 Model Year Test Group
VHYXV02.5GP5/ Evaporative Family VHYXR0132GPG

Dear Ms. Kathryn Kochunas:

Hyundai Motor Company requests that EPA issue a Certificate of Conformity for the test group subjected above.

All vehicles within the test group mentioned above comply with the applicable regulations contained in 40 CFR 86.1844-01(d)(14) including the provisions of 40 CFR Parts 85, 86 and 600. This test group also complies with the California Air Resources Board, Final Regulation Order, Sections 1961.4 and 1961.3 (1962.4 and 1962.3 for zero-emission vehicles) Title 13, California Code of Regulations.

The Part 1 Application for Certification has been prepared in accordance with the standardized format recommended by EPA via its guidance document CD-14-19 (LDV/LDT/OCO/LIMO) Subject: Certification Application Reporting Guidance, dated November 24, 2014.

If you have any questions regarding the Certificate of Conformity, do not hesitate to contact Stephanie Wright at swright@hatci.com or (734) 273-1904.

Sincerely,

A handwritten signature in black ink, appearing to read 'Ji H. Ji'.

C. H. Ji
General Manager
Regulation & Certification Team2
Kia Corporation

VHYXV02.5GP5 – Hyundai G70 2.5L T-GDPI – Part 1
Issued : 04-30-2026
Revised:



Ms. Robin U. Lang, Chief
Emissions Certification and Compliance Division
California Air Resources Board
4001 Iowa Ave.
Riverside, California 92507

Subject: Request for an Executive Order for 2027 Model Year Test Group VHYXV02.5GP5/
Evaporative Family VHYXR0132GPG

Dear Ms. Robin U. Lang:

Hyundai Motor Company requests that California Air Resources Board (CARB) issue an Executive Order for the above subject test group.

All vehicles within the test group mentioned above comply with the applicable regulations contained in 40 CFR 86.1844-01(d)(14) including the provisions of 40 CFR Parts 85, 86 and 600. This test group also complies with the California Air Resources Board, Final Regulation Order, Sections 1961.4 and 1961.3 (1962.4 and 1962.3 for zero-emission vehicles) Title 13, California Code of Regulations.

The Part 1 Application for Certification has been prepared in accordance with the standardized format recommended by EPA via its guidance document CD-14-19 (LDV/LDT/OCO/LIMO) Subject: Certification Application Reporting Guidance, dated November 24, 2014.

If you have any questions regarding the Executive Order, do not hesitate to contact Stephanie Wright at swright@hatci.com or (734) 273-1904.

Sincerely,

A handwritten signature in black ink, appearing to read 'C. H. Ji', written over a horizontal line.

C. H. Ji
General Manager
Regulation & Certification Team2
Kia Corporation

15.00	Other Information
15.01	Certification Fee Filing Form

US EPA Fee Form

[Help and EPA Instructions](#)

* Required Field

General Information

Date: 03/03/2026

Process Code *

Submit New Fee Filing Form

Manufacturer Code *

HYX

Manufacturer Name *

Hyundai

Contact Name *

Jennifer Cherry

Contact Email Address *

jcherry@hatci.com

Contact Phone *

7343372259

Calendar Year complete application submitted
to EPA *

2026

PLEASE NOTE: These fees apply to complete certification applications received by EPA from January 1, 2026, through December 31, 2026. The applicable fee is determined by the

calendar year in which the complete certification application is received, not the model year.

Engine Family / Evaporative Family / Test Group *

VHYXV02.5GP5

Certificate Request Type (Industry Sector Code)

Certificate Request Type *

- ☒ On-Highway LDV, LTD, MDVPV, HDV Chassis Cert (Federal) (A, B, D, J, T, V)
- ☐ On-Highway HDE Dyno Cert (Federal) (E, H)
- ☐ On-Highway LD ICI, MDPV ICI, HDV ICI (A, B, D, J, T, V)
- ☐ On-Highway Motorcycle (C)
- ☐ On-Highway HDV Evap (F)
- ☐ On-Highway LDV, LTD, MDVPV, HDV Chassis Cert (California-Only) (A, B, D, J, T, V)
- ☐ On-Highway HDE Dyno Cert (California-Only) (E, H)
- ☐ Nonroad CI (L)
- ☐ Nonroad SI (B, S)
- ☐ Locomotive (G, K)
- ☐ All Nonroad Recreational, excluding Marine engines (X, Y)
- ☐ All Marine (Including IMO) (M, N, W)
- ☐ Component Certification for Evaporative Emissions (P)

IMO Name (Required for dual US/IMO Marine Only)

ICI VIN Number (Required for ICIs Only)

Do you qualify for a Reduced Fee? *

No

Payment Information

Amount Owed

\$32,317.00

Payment Type *

Offline Wire

Comments

EPA Form Number 3520-29

OMB Control No.2060-0545

Approval expires 7/31/2027

The public reporting and recordkeeping burden for this collection of information is estimated to average 12 minutes per response. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques to the Director, Collection Strategies Division, U.S. Environmental Protection Agency (2822T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Include the OMB control number in any correspondence. Do not send the completed forms to this address.

The content of this document may contain Sensitive But Unclassified (SBU) data and/or Controlled Unclassified Information (CUI).

15.02 Vehicle Emission Control Information (VECI) Label

		HYUNDAI MOTOR COMPANY VEHICLE EMISSION CONTROL INFORMATION	
Conforms to regulations:		2027 MY	
U.S.EPA: Interim T4B50 LDV		OBD: CA II	Fuel: Gasoline
California: LEV IV ULEV50 PC		OBD: CA II	Fuel: Gasoline
No adjustments needed.		DFI, SFI, WR-HO2S, HO2S, TWC, TC, CAC	
Group: VHYXV02.5GP5 Evap.: VHYXR0132GPG			32450-2T077

15.03 ORVR Safety Statement

Hyundai uses standard technology in all ORVR systems for 2027 model year vehicles. In accordance with EPA Guidance Letter Cisd-06-06, ORVR applications will not be submitted.

15.04 New Technology System Description

Please refer to Common Section 15.04.

15.05 Engine Oil Information

Please refer to Common Section 15.05.

16.00 California ARB Information

16.01 Exhaust Emission Control System (Tune-up label)

Test Group Name	Model	Trans.	Exhaust Emission Control System
VHYXV02.5GP5	G70 AWD G70 RWD	SA8	DFI, SFI, WR-HO2S, HO2S, TWC, TC, CAC, OBD-II

Note: HO2S : Heated Oxygen Sensor
WR-HO2S : Wide Range Heated Oxygen Sensor
TWC : Three Way Catalyst
DFI : Direct Fuel Injection
SFI : Sequential multiport Fuel Injection
OBD-II : On-Board Diagnostics II
TC : Turbo Charger
CAC : Charge Air Cooler
(Use abbreviations per SAE J1930 October 08)

16.02 Test Procedures

Please refer to Common Section 16.02

16.03.00 Fill Pipe Access Zones Statement and Specifications

16.03.01 Fill Pipe Access Zones Statement

Please refer to Common Section 16.03.01.

16.04.00 Request for Certification

Please refer to 14.00.

16.04.01 Statement of Compliance

Please refer to Common Section 16.04.01.

16.04.02 Supplemental Data Sheet

Please refer to E-cert data.

16.05.00 Emission Testing Waiver Statement

Please refer to Common Section 16.05.00.

16.06.00 Projected Sales

Please refer to Common Section 13.00.

16.07.00 OBD-II System Description

Please refer to section 09.00.

16.08.00 New Technology System Description

Please refer to Common Section 15.04.

16.09.00 Environmental Performance Label

Pursuant to CALIFORNIA ENVIRONMENTAL PERFORMANCE LABEL SPECIFICATIONS FOR 2009 AND SUBSEQUENT MODEL YEAR PASSENGER CARS, LIGHT-DUTY TRUCKS, AND MEDIUM-DUTY PASSENGER VEHICLES (adopted May 2, 2008, last amended September 2, 2015), 2012, Hyundai Motor Group complies to the Environmental Performance Label requirement by affixing the Federal Fuel Economy and Environment Label in accordance to 40 CFR Parts 85, 86, and 600 as promulgated on July 6, 2011.

16.10.00 AECD General Statements

The vehicles contained in this test group are not equipped with a defeat device and are not equipped with alternative mapping strategies. Furthermore, all AECDs have been declared and described in the application.

As described in our application, the vehicle's transmission is not part of any AECD. However, the transmission gear is an input for the emissions control strategy, as described in that application. The ECU does not provide an output to the TCU to control emissions strategy.

When driving conditions on the road can be properly represented on the dynamometer, the transmission will perform in the same manner. However, there are some different driving conditions, such as an uphill or downhill grade, extreme heat or extreme cold conditions, heavy braking, and curved road driving conditions, which cannot be appropriately represented on the dynamometer. In these conditions where necessary to protect the transmission or to prevent an unnatural shift pattern, a different shift pattern may be executed. It is our understanding that this is commonly used throughout the industry.

The Hyundai-Kia American Technical Center and the Hyundai Motor Group Research and Development Center in Namyang, Korea have endeavored to respond based on our understanding of the regulatory definition of an AECD, the past certification reviews of AECDs conducted by ARB, existing guidance regarding AECDs issued by ARB, and, of course, EPA's and ARB's increased interest in this area. We will continue to monitor guidance issued by ARB regarding the level of information and detail desired in a certification application, and will continue to evaluate AECD issues to ensure transparency with respect to our vehicle and engine performance.

16.11.00 California Warranty Compliance

Please refer to Common Section 16.11.00.

16.12.00 Description of the Propulsion System: Not Applicable

16.13.00 ZEV Compliance: Not Applicable

17.00.00 Service of Process

Please refer to Common Section 01.00.

18.00.00 Attachment

1. CSI Report

Certification Summary Information Report

Manufacturer	Hyundai Motor Company	Manufacturer Code	HYX
Test Group	VHYXV02.5GP5	Evaporative/Refueling Family	VHYXR0132GPG
Certificate Number	--	CARB Executive Order #	--
Certificate Issue Date	--	Certificate Revision Date	--
Certificate Effective Date	--	Conditional Certificate	--
CSI Revision #	--	CSI Submission/Revision Date	04/24/2026 01:37:05 AM
Model Year	2027		

Test Group Information

CSI Type	New	Running Change Reference Number	--
GHG Exempt Status	Not Exempt		

Drive Sources and Fuel(s)

Drive Source #1: Combustion Engine

Fuel	Basic Fuel Metering System	Lean Burn Strategy Indicator
Gasoline	Spark Ignition direct & ported injection	No

Hybrid Indicator	No		
Multiple Fuel Storage	--	Rechargeable Energy Storage System Indicator	--
Multiple Fuel Combustion	--	Off-board Charge Capable Indicator	--
Fuel Cell Indicator	--	EPA Vehicle Class	LDV
Federal Clean Fuel Vehicle	No	Federal Clean Fuel Vehicle Standard	--
Federal Clean Fuel Vehicle ILEV	No	California Partial Zero Emissions Vehicle Indicator	No
Durability Group Name	VHYXGPGNNGP5	Durability Group Equivalency Factor	1.0
Reduced Fee Test Group	No	Certification Region Code(s)	FA, CA
Complies with HD GHG 2b/3 regulations?	No		
Introduction into Commerce Date	--	CAP2000 Conditional Certificate?	N/A
Independent Commercial Importer?	--	Alternative Fuel Converter Certificate?	--
SFTP Federal Composite Compliance Identifier	Tier 3	SFTP Tier 2 Composite CO Option	No
SFTP LEV-III Composite Compliance Indicator	No		
OBD Compliance Type	CARB	OBD Demonstration Vehicle Test Group	VHYXV02.5UP3
Test Group OBD Compliance Level	Full - no deficiencies	Number of Test Group OBD Deficiencies	0
OBD Deficiencies Comments	--		
Mfr Test Group Comments	The fuel for Litmus test is E10 of Comfort mode. Litmus result(Value/Threshold): City(20.2/19.1) HWY(27.4/26.5). Test No: RHYX10080615(FTP),RHYX10080617(HWY),RHYX10080616(US06),RHYX10080618(SC03),RHYX10080619(Cold).		
Mfr Exhaust / Evap Standards Comments	--		

Certification Summary Information Report

Test Group	VHXYV02.5GP5	Evaporative/Refueling Family	VHXYR0132GPG				
Evaporative/Refueling Family Information							
Evaporative Summary Information Type	New	Submission/Correction Date	04/24/2026 01:28:12 AM				
Integrated ORVR?	Yes	Fuel(s)	Gasoline				
Multiple Fuel Storage	--						
Bladder Fuel Tank?	No						
Fuel Tank Material	Plastic	Fuel Tank Material Description	PLASTIC				
Fill Pipe Seal Type	Liquid seal						
Air Intake System Vapor Storage Device?	Yes	Air Intake System Vapor Storage Device Description	HC-Trap				
Fuel System Vapor Storage Canister?	Yes	Other Vapor Storage	--				
Fuel System Vapor Storage Canister(s) Total Working Capacity (grams)	132	Number of Primary Canisters	1				
Number of Bleed Canisters	0	Bleed Canister Total Working Capacity (grams)	--				
Mfr Evaporative/Refueling Family Comments	--						
Leak Family Details							
Leak Family Indicator	Yes						
Canister Bleed Test Indicator	Yes	Applicability of Evaporative Canister Bleed Test	50 State				
Evaporative Canister Bleed Test Comments	--						
CARB Fuel Only (Rig) Test Indicator	No	Applicability of CARB Fuel Only (Rig) Test	--				
CARB Fuel Only (Rig) Test Comments	--						
Leak Family Name	Applicability of Leak Family Requirements	Leak Family Standard (inches)	Leak Family Description				
VHXYR0132GPG-IK1	50 State	0.02	--				
Models Covered by this Certificate							
Carline Manufacturer	Division	Carline	Certification Region Code(s)	Drive System	Trans - Type	- # of Gears	Trans - Lockup
Hyundai Motor Company	2 - GENESIS	333 - G70 AWD	Federal	All Wheel Drive	Semi-Automatic	8	Yes
Hyundai Motor Company	2 - GENESIS	333 - G70 AWD	California + CAA Section 177 states	All Wheel Drive	Semi-Automatic	8	Yes
Hyundai Motor Company	2 - GENESIS	334 - G70 RWD	Federal	2-Wheel Drive, Rear	Semi-Automatic	8	Yes
Hyundai Motor Company	2 - GENESIS	334 - G70 RWD	California + CAA Section 177 states	2-Wheel Drive, Rear	Semi-Automatic	8	Yes
Engine Description							
Hybrid Type	--	Hybrid Description	--				
Engine Type	4-Stroke Spark Ignition	Mfr Engine Description	--				
Engine Block Arrangement	Inline	Mfr Engine Block Arrangement Description	--				
Camless Valvetrain Indicator	No	Oil Viscosity/Classification	0W-30				
Number of Cylinders/Rotors	4	Mechanically Variable Compression Ratio Indicator	N				

Certification Summary Information Report

Test Group	VHYXV02.5GP5	Evaporative/Refueling Family				VHYXR0132GPG					
After Treatment Device(s) (ATD)											
ATD Number		ATD Type		ATD Precious Metal		Substrate Material		Substrate Construction			
1		Three-way catalyst		Platinum + Palladium + Rhodium		Ceramic		Monolith			
Mfr After Treatment Device (ATD) Comments											
		--									
Direct Ozone Reduction (DOR) Device		Not Equipped									
Mfr Emission Control Device Comments		--									
Engine Configuration Number 1											
Engine Displacement (liters)		2.5		Engine Rated Horsepower		300					
Number of Inlet Valves Per Cylinder		2		Number of Exhaust Valves Per Cylinder		2					
Air Aspiration Method		Turbocharged		Number of Air Aspiration Devices		1					
Air Aspiration Device Configuration		Single		Charge Air Cooler Type		Liquid					
Air Aspiration Drive Method(s)		Mechanical									
Cylinder Deactivation		No									
Cylinder Deactivation Description		--									
Variable Valve Timing		Yes									
Variable Valve Timing System Description		APPLY CVVT									
Variable Valve Lift?		No									
Variable Valve Lift System Description		--									
Number of Knock Sensors		1		Number of Air/Fuel Sensors		2					
Air/Fuel Sensor # 1 Type		Other		Air/Fuel Sensor # 1 Description		WR-HO2S					
Air/Fuel Sensor # 2 Type		Heated oxygen		Air/Fuel Sensor # 2 Description		--					
Mfr Air/Fuel Sensor Comments		--									
Exhaust Gas Recirculation		No		Cooled Exhaust Gas Recirculation		No					
EGR Type		--		Exhaust Gas Recirculation Description if 'Other'		--					
Closed Loop Air Injection System		No		Air Injection Type if 'Other'		--					
Air Injection Type		--									
Mfr Engine Configuration Comments		--									
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
Gasoline		RHYX10080615	RHYX10080616	RHYX10080618	RHYX10080619	RHYX10080617	24.0	228.2	35.8	286.1	--

Certification Summary Information Report

Test Group	VHYYXV02.5GP5	Evaporative/Refueling Family	VHYYXR0132GPG
SFTP LEV-III Official Test Numbers			
Test Group Fuel	FTP	US06	SC03
Gasoline	RHYYX10080615	RHYYX10080616	RHYYX10080618

Certification Summary Information Report

Test Group	VHYXV02.5GP5	Evaporative/Refueling Family	VHYXR0132GPG					
Emission Data Vehicle Information								
Vehicle ID / Configuration	IK_U4L3TA015A / 0	Manufacturer Vehicle Configuration Number	0					
Original Test Group Name	RHYXV02.5GP4	Original Evaporative/Refueling Family	RHYXR0132GPG					
Original Test Vehicle Model Year	2024							
Vehicle Model								
Represented Test Vehicle Make	Genesis	Represented Test Vehicle Model	G70					
Leak Family Details								
Leak Family Identifier	IK1	Leak Family Name	RHYXR0132GPG-IK1					
Drive Sources and Fuel System Details								
	<table border="1"> <thead> <tr> <th>Drive Source and Fuel#</th> <th>Drive Source</th> <th>Fuel</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Combustion Engine</td> <td>Gasoline</td> </tr> </tbody> </table>	Drive Source and Fuel#	Drive Source	Fuel	1	Combustion Engine	Gasoline	
Drive Source and Fuel#	Drive Source	Fuel						
1	Combustion Engine	Gasoline						
Hybrid Indicator	No							
Multiple Fuel Storage	--	Multiple Fuel Combustion	--					
Fuel Cell Indicator	--	Rechargeable Energy Storage System Indicator	--					
Rechargeable Energy Storage System	--	Rechargeable Energy Storage System, if 'Other'	--					
Off-board charge Capable Indicator	--							
Odometer Correction -- Initial	86	Odometer Correction Factor	1.0078					
Odometer Correction Sign	- = System Miles is equal to (Test odometer reading - Initial system miles) * Correction factor							
Odometer Correction Units	Miles							
Engine Code	G4KR-AC	Rated Horsepower	300					
Displacement (liters)	2.5							
Air Aspiration Method	Turbocharged	Air Aspiration Method, if 'Other'						
Number of Air Aspiration Devices	1	Air Aspiration Device Configuration	Single					
Charge Air Cooler Type	Liquid	Drive Mode While Testing	2-Wheel Drive, Rear					
Shift Indicator Light Usage	Not equipped	Aged Emission Components	4,000 (mi)					
Curb Weight (lbs)	3829	Equivalent Test Weight (pounds)	4250					
GVWR (lbs)	4916	N/V Ratio	26.5					
Axle Ratio	3.54							
Transmission Type	Semi-Automatic	# of Transmission Gears	8					
Transmission Lockup	Yes	Creep Gear	No					

Certification Summary Information Report

Test Group		VHYXV02.5GP5			Evaporative/Refueling Family			VHYXR0132GPG	
Dynamometer Coefficients:									
Target Coefficients				Set Coefficients			EPA Calculated Total Road Load Horse Power for City/Highway/Evap Coefficients		
Coefficient Category	A (lbf)	B (lbf/mph)	C (lbf/mph**2)	A (lbf)	B (lbf/mph)	C (lbf/mph**2)			
City/Highway/Evap	37.97	0.52958	0.018422	16.483	0.2628	0.019184	14.7		
Cold CO	41.767	0.58254	0.020264	4.097	0.01138	0.023569	N/A		
US06	37.97	0.52958	0.018422	16.483	0.2628	0.019184	N/A		
Emission Control Device Comments		--							
Manufacturer Test Vehicle Comments		24MY IK 2.5T AWD 8AT 19inch AS tire (EDV) Set Coefficients of City, Highway for FE(E0 fuel) tests are A=17.735, B=0.19916, C=0.019835 Type of Charge Air Cooler is changed from Air to Liquid as TYPO. Target and set coefficients are corrected.							

Certification Summary Information Report

Test Group	VHYYXV02.5GP5	Evaporative/Refueling Family	VHYYXR0132GPG
Test #	RHYYX10080615	Test Procedure	21 - Federal fuel 2-day exhaust (w/can load)
Exhaust Test # for this Evap Test	--	Test Fuel Type	48 - Tier 3 E10 Regular Gasoline (9 RVP @Low Alt.)
Test Date	04/25/2023	Fuel	Gasoline
Fuel Batch ID	21T-01	Fuel Calibration Number	1
Vehicle Class	LDV/Passenger Car	DF Type	Mfr. Determined
Verify Test Lab ID	772-1, Jangduck-Dong		
E10 Evaporative Test Measurement Method	--		
Test Start Odometer Reading	4687	Odometer Units	M
4WD Test Dyno	No	Diesel Adjustment Factor Usage	--
State of Charge Delta	--		
Drive Cycle Speed Tolerance Criteria	Used Part 1066 (+/- 2.0 mph, +/- 1.0 sec)	Road Speed Fan Usage	Yes

Test Results

Test Result Name	Unrounded Test Result	Verify Calculated FE Equivalent Value (miles per gallon)
CO2 BAG 1 (Bag 1 Carbon Dioxide)	362	--
FE BAG 1 (Bag 1 Fuel Economy)	23.8	23.8
CO2 BAG 2 (Bag 2 Carbon Dioxide)	361	--
FE BAG 2 (Bag 2 Fuel Economy)	24	24
CO2 BAG 3 (Bag 3 Carbon Dioxide)	302	--
FE BAG 3 (Bag 3 Fuel Economy)	28.7	28.7
CO (Carbon Monoxide)	0.3444	--
DT-ASCR (Drive Trace Absolute Speed Change Rating)	3.83	--
DT-EER (Drive Trace Energy Economy Rating)	1.22	--
DT-IWRR (Drive Trace Inertia Work Ratio Rating)	5.52	--
MFR FE (Manufacturer Fuel Economy)	25.087	25.087
NOX (Nitrogen Oxide)	0.0084	--
HC-NM (Non-methane Hydrocarbon)	0.0112	--
NMOG (Non-methane organic gases)	0.0123	--
PM (Particulate Matter)	0.001	--
HC-TOTAL (Total Hydrocarbon)	0.0149	--

Test Result Name	Unrounded Test Result	Verify Calculated CREE/OPT-CREE
Carbon-Related Exhaust Emissions	346	999

Certification Summary Information Report

Test Group		VHYXV02.5GP5		Evaporative/Refueling Family				VHYXR0132GPG				
		Test Result Name		Unrounded Test Result		Verify Calculated CO2						
		Carbon dioxide		345.2253		--						
Manufacturer Test Comments		24MY IK PE2 2.5T AWD 19" AS E10 - FTP										
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	120,000 miles	Federal Tier 3 Bin 50	CREE	999	--	--	--	0.242171	--	999	--	--
Fed	150,000 miles	Federal Tier 3 Bin 50	CO	0.34	--	--	--	0.04	--	0.4	1.7	Pass
Fed	150,000 miles	Federal Tier 3 Bin 50	CO-COMP	0.33	--	--	--	0	--	0.3	4.2	Pass
Fed	150,000 miles	Federal Tier 3 Bin 50	NMOG	0.0123	--	1.10	--	0.0029	--	0.015	99.999	Pass
Fed	150,000 miles	Federal Tier 3 Bin 50	NMOG+NOX	0.0207	--	--	--	--	--	0.030	0.050	Pass
Fed	150,000 miles	Federal Tier 3 Bin 50	NMOG+NOX-COMP	0.0246	--	--	--	0	--	0.025	0.050	Pass
Fed	150,000 miles	Federal Tier 3 Bin 50	NOX	0.0084	--	--	--	0.0067	--	0.015	99.999	Pass
Fed	150,000 miles	Federal Tier 3 Bin 50	PM	0.0010	--	--	--	0.0000	--	0.001	0.003	Pass
CA	150,000 miles	California LEV-IV ULEV50	CO	0.34	--	--	--	0.04	--	0.4	1.7	Pass
CA	150,000 miles	California LEV-IV ULEV50	NMOG	0.0123	--	1.10	--	0.0029	--	0.015	99.999	Pass
CA	150,000 miles	California LEV-IV ULEV50	NMOG+NOX	0.0207	--	--	--	--	--	0.030	0.050	Pass
CA	150,000 miles	California LEV-IV ULEV50	NOX	0.0084	--	--	--	0.0067	--	0.015	99.999	Pass
CA	150,000 miles	California LEV-IV ULEV50	PM	0.0010	--	--	--	0.0000	--	0.001	0.003	Pass
NOTE: For Non-charge depleting tests, the Rounded Result for CREE/OPT-CREE Emission names are Verify-calculated values.												

Certification Summary Information Report

Test Group	VHYYXV02.5GP5	Evaporative/Refueling Family	VHYYXR0132GPG
Test #	RHYYX10080619	Test Procedure	11 - Cold CO
Exhaust Test # for this Evap Test	--	Test Fuel Type	28 - Cold CO E10 Regular Gasoline (Tier 3)
Test Date	04/30/2023	Fuel	Gasoline
Fuel Batch ID	22D-01	Fuel Calibration Number	1
Vehicle Class	LDV/Passenger Car	DF Type	Mfr. Determined
Verify Test Lab ID	772-1, Jangduck-Dong		
E10 Evaporative Test Measurement Method	--		
Test Start Odometer Reading	4847	Odometer Units	M
4WD Test Dyno	No	Diesel Adjustment Factor Usage	--
State of Charge Delta	--		
Drive Cycle Speed Tolerance Criteria	Used Part 1066 (+/- 2.0 mph, +/- 1.0 sec)	Road Speed Fan Usage	Yes

Test Results

Test Result Name	Unrounded Test Result	Verify Calculated FE Equivalent Value (miles per gallon)
CO2 BAG 1 (Bag 1 Carbon Dioxide)	403	--
FE BAG 1 (Bag 1 Fuel Economy)	21.4	21.4
CO2 BAG 2 (Bag 2 Carbon Dioxide)	375	--
FE BAG 2 (Bag 2 Fuel Economy)	23.1	23.1
CO2 BAG 3 (Bag 3 Carbon Dioxide)	310	--
FE BAG 3 (Bag 3 Fuel Economy)	27.9	27.9
CO (Carbon Monoxide)	0.443	--
DT-ASCR (Drive Trace Absolute Speed Change Rating)	2.7	--
DT-EER (Drive Trace Energy Economy Rating)	0.58	--
DT-IWRR (Drive Trace Inertia Work Ratio Rating)	3.47	--
MFR FE (Manufacturer Fuel Economy)	23.7945	23.7945
NOX (Nitrogen Oxide)	0.0096	--
HC-NM (Non-methane Hydrocarbon)	0.0282	--
HC-TOTAL (Total Hydrocarbon)	0.0346	--

Test Result Name	Unrounded Test Result	Verify Calculated CO2
Carbon dioxide	362.8216	--

Manufacturer Test Comments

24MY IK PE2 2.5T AWD 19" AS E10 - 20F

Certification Summary Information Report

Test Group		VHYXV02.5GP5			Evaporative/Refueling Family					VHYXR0132GPG		
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	50,000 miles	Federal Tier 3 Bin 50	CO	0.44	--	--	--	0.01	--	0.4	10.0	Pass
Fed	120,000 miles	Federal Tier 3 Bin 50	HC-NM	0.03	--	--	--	0.0021	--	0.0	0.3	Pass
CA	50,000 miles	California LEV-IV ULEV50	CO	0.44	--	--	--	0.01	--	0.4	10.0	Pass

Certification Summary Information Report

Test Group	VHYXV02.5GP5	Evaporative/Refueling Family	VHYXR0132GPG
Test #	RHYX10080620	Test Procedure	52 - Fed. fuel 50 F exh.
Exhaust Test # for this Evap Test	--	Test Fuel Type	48 - Tier 3 E10 Regular Gasoline (9 RVP @Low Alt.)
Test Date	04/27/2023	Fuel	Gasoline
Fuel Batch ID	21T-01	Fuel Calibration Number	1
Vehicle Class	LDV/Passenger Car	DF Type	Mfr. Determined
Verify Test Lab ID	772-1, Jangduck-Dong		
E10 Evaporative Test Measurement Method	--		
Test Start Odometer Reading	4779	Odometer Units	M
4WD Test Dyno	No	Diesel Adjustment Factor Usage	--
State of Charge Delta	--		
Drive Cycle Speed Tolerance Criteria	Used Part 1066 (+/- 2.0 mph, +/- 1.0 sec)	Road Speed Fan Usage	Yes

Test Results

Test Result Name	Unrounded Test Result	Verify Calculated FE Equivalent Value (miles per gallon)
CO (Carbon Monoxide)	0.3149	--
DT-ASCR (Drive Trace Absolute Speed Change Rating)	5.4	--
DT-EER (Drive Trace Energy Economy Rating)	2.98	--
DT-IWRR (Drive Trace Inertia Work Ratio Rating)	7.2	--
MFR FE (Manufacturer Fuel Economy)	25.2358	25.2358
NOX (Nitrogen Oxide)	0.0081	--
HC-NM (Non-methane Hydrocarbon)	0.0136	--
NMOG (Non-methane organic gases)	0.015	--
HC-TOTAL (Total Hydrocarbon)	0.0178	--

Test Result Name	Unrounded Test Result	Verify Calculated CO2
Carbon dioxide	342.6357	--

Manufacturer Test Comments

24MY IK PE2 2.5T AWD 19" AS E10 - 50F

Certification Summary Information Report

Test Group		VHYXV02.5GP5			Evaporative/Refueling Family					VHYXR0132GPG		
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
CA	4,000 miles	California LEV-IV ULEV50	CO	0.31	--	--	--	0	--	0.3	1.7	Pass
CA	4,000 miles	California LEV-IV ULEV50	NMOG	0.0150	--	1.10	--	0	--	0.015	99.999	Pass
CA	4,000 miles	California LEV-IV ULEV50	NMOG+NOX	0.0231	--	--	--	--	--	0.023	0.100	Pass
CA	4,000 miles	California LEV-IV ULEV50	NOX	0.0081	--	--	--	0	--	0.008	99.999	Pass

Certification Summary Information Report

Test Group	VHYYXV02.5GP5	Evaporative/Refueling Family	VHYYXR0132GPG
Test #	RHYYX10080626	Test Procedure	21 - Federal fuel 2-day exhaust (w/can load)
Exhaust Test # for this Evap Test	--	Test Fuel Type	61 - Tier 2 Cert Gasoline
Test Date	03/05/2023	Fuel	Gasoline
Fuel Batch ID	22M-01	Fuel Calibration Number	1
Vehicle Class	LDV/Passenger Car	DF Type	Mfr. Determined
Verify Test Lab ID	772-1, Jangduck-Dong		
E10 Evaporative Test Measurement Method	--		
Test Start Odometer Reading	4104	Odometer Units	M
4WD Test Dyno	No	Diesel Adjustment Factor Usage	--
State of Charge Delta	--		
Drive Cycle Speed Tolerance Criteria	Used Part 1066 (+/- 2.0 mph, +/- 1.0 sec)	Road Speed Fan Usage	Yes

Test Results

Test Result Name	Unrounded Test Result	Verify Calculated FE Equivalent Value (miles per gallon)
CO2 BAG 1 (Bag 1 Carbon Dioxide)	393	--
FE BAG 1 (Bag 1 Fuel Economy)	22.5	22.5
CO2 BAG 2 (Bag 2 Carbon Dioxide)	411	--
FE BAG 2 (Bag 2 Fuel Economy)	21.7	21.7
CO2 BAG 3 (Bag 3 Carbon Dioxide)	349	--
FE BAG 3 (Bag 3 Fuel Economy)	25.5	25.5
METHANE (CH4 - Methane)	0.0035	--
CO (Carbon Monoxide)	0.6563	--
DT-ASCR (Drive Trace Absolute Speed Change Rating)	1.31	--
DT-EER (Drive Trace Energy Economy Rating)	0.04	--
DT-IWRR (Drive Trace Inertia Work Ratio Rating)	1.51	--
MFR FE (Manufacturer Fuel Economy)	22.8044	22.8044
NOX (Nitrogen Oxide)	0.003	--
N2O (Nitrous Oxide)	0.0002	--
HC-NM (Non-methane Hydrocarbon)	0.0122	--
NMOG (Non-methane organic gases)	0.0127	--
HC-TOTAL (Total Hydrocarbon)	0.0151	--

Test Result Name	Unrounded Test Result	Verify Calculated CREE/OPT-CREE
Carbon-Related Exhaust Emissions	391	391

Certification Summary Information Report

Test Group		VHYXV02.5GP5			Evaporative/Refueling Family				VHYXR0132GPG			
		Test Result Name		Unrounded Test Result			Verify Calculated CO2					
		Carbon dioxide		390.3856			--					
Manufacturer Test Comments		24MY IK PE2 2.5T AWD 19" AS E0 - FTP (SPORT+ mode) ADDED TEST RESULTS BY BAGs.										
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	120,000 miles	Federal Tier 3 Bin 50	CREE	391	--	--	--	0.242171	--	391	--	--
Fed	120,000 miles	Federal Tier 3 Bin 50	METHANE	0.0035	--	--	--	0.0044	--	0.008	0.030	Pass
Fed	120,000 miles	Federal Tier 3 Bin 50	N2O	0.0002	--	--	--	0.0019	--	0.002	0.010	Pass
Fed	150,000 miles	Federal Tier 3 Bin 50	CO	0.66	--	--	--	0.04	--	0.7	1.7	Pass
Fed	150,000 miles	Federal Tier 3 Bin 50	NMOG	0.0127	--	1.10	--	0.0029	--	0.016	99.999	Pass
Fed	150,000 miles	Federal Tier 3 Bin 50	NMOG+NOX	0.0157	--	--	--	--	--	0.025	0.050	Pass
Fed	150,000 miles	Federal Tier 3 Bin 50	NOX	0.0030	--	--	--	0.0067	--	0.010	99.999	Pass
CA	150,000 miles	California LEV-IV ULEV50	CO	0.66	--	--	--	0.04	--	0.7	1.7	Pass
CA	150,000 miles	California LEV-IV ULEV50	NMOG	0.0127	--	1.10	--	0.0029	--	0.016	99.999	Pass
CA	150,000 miles	California LEV-IV ULEV50	NMOG+NOX	0.0157	--	--	--	--	--	0.025	0.050	Pass
CA	150,000 miles	California LEV-IV ULEV50	NOX	0.0030	--	--	--	0.0067	--	0.010	99.999	Pass
NOTE: For Non-charge depleting tests, the Rounded Result for CREE/OPT-CREE Emission names are Verify-calculated values.												

Certification Summary Information Report

Test Group	VHXYXV02.5GP5	Evaporative/Refueling Family	VHXYXR0132GPG
Test #	RHXYX10081169	Test Procedure	21 - Federal fuel 2-day exhaust (w/can load)
Exhaust Test # for this Evap Test	--	Test Fuel Type	61 - Tier 2 Cert Gasoline
Test Date	06/14/2023	Fuel	Gasoline
Fuel Batch ID	22M-01	Fuel Calibration Number	1
Vehicle Class	LDV/Passenger Car	DF Type	Mfr. Determined
Verify Test Lab ID	772-1, Jangduck-Dong		
E10 Evaporative Test Measurement Method	--		
Test Start Odometer Reading	5118	Odometer Units	M
4WD Test Dyno	No	Diesel Adjustment Factor Usage	--
State of Charge Delta	--		
Drive Cycle Speed Tolerance Criteria	Used Part 1066 (+/- 2.0 mph, +/- 1.0 sec)	Road Speed Fan Usage	Yes

Test Results

Test Result Name	Unrounded Test Result	Verify Calculated FE Equivalent Value (miles per gallon)
CO2 BAG 1 (Bag 1 Carbon Dioxide)	338	--
FE BAG 1 (Bag 1 Fuel Economy)	26.2	26.2
CO2 BAG 2 (Bag 2 Carbon Dioxide)	342	--
FE BAG 2 (Bag 2 Fuel Economy)	26.1	26.1
CO2 BAG 3 (Bag 3 Carbon Dioxide)	296	--
FE BAG 3 (Bag 3 Fuel Economy)	30.1	30.1
METHANE (CH4 - Methane)	0.0043	--
CO (Carbon Monoxide)	0.3848	--
DT-ASCR (Drive Trace Absolute Speed Change Rating)	3.49	--
DT-EER (Drive Trace Energy Economy Rating)	1.11	--
DT-IWRR (Drive Trace Inertia Work Ratio Rating)	4.87	--
MFR FE (Manufacturer Fuel Economy)	27.055	27.055
NOX (Nitrogen Oxide)	0.0117	--
N2O (Nitrous Oxide)	0.0009	--
HC-NM (Non-methane Hydrocarbon)	0.0101	--
NMOG (Non-methane organic gases)	0.0105	--
HC-TOTAL (Total Hydrocarbon)	0.0136	--

Test Result Name	Unrounded Test Result	Verify Calculated CREE/OPT-CREE
Carbon-Related Exhaust Emissions	330	330

Certification Summary Information Report

Test Group		VHYXV02.5GP5			Evaporative/Refueling Family				VHYXR0132GPG			
		Test Result Name		Unrounded Test Result			Verify Calculated CO2					
		Carbon dioxide		328.7942			--					
Manufacturer Test Comments		24MY IK PE2 2.5T AWD 19" AS E0(MCT) - FTP (ECO mode) ADDED TEST RESULTS BY BAGs										
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	120,000 miles	Federal Tier 3 Bin 50	CREE	330	--	--	--	0.242171	--	330	--	--
Fed	120,000 miles	Federal Tier 3 Bin 50	METHANE	0.0043	--	--	--	0.0044	--	0.009	0.030	Pass
Fed	120,000 miles	Federal Tier 3 Bin 50	N2O	0.0009	--	--	--	0.0019	--	0.003	0.010	Pass
Fed	150,000 miles	Federal Tier 3 Bin 50	CO	0.38	--	--	--	0.04	--	0.4	1.7	Pass
Fed	150,000 miles	Federal Tier 3 Bin 50	NMOG	0.0105	--	1.10	--	0.0029	--	0.013	99.999	Pass
Fed	150,000 miles	Federal Tier 3 Bin 50	NMOG+NOX	0.0222	--	--	--	--	--	0.032	0.050	Pass
Fed	150,000 miles	Federal Tier 3 Bin 50	NOX	0.0117	--	--	--	0.0067	--	0.018	99.999	Pass
CA	150,000 miles	California LEV-IV ULEV50	CO	0.38	--	--	--	0.04	--	0.4	1.7	Pass
CA	150,000 miles	California LEV-IV ULEV50	NMOG	0.0105	--	1.10	--	0.0029	--	0.013	99.999	Pass
CA	150,000 miles	California LEV-IV ULEV50	NMOG+NOX	0.0222	--	--	--	--	--	0.032	0.050	Pass
CA	150,000 miles	California LEV-IV ULEV50	NOX	0.0117	--	--	--	0.0067	--	0.018	99.999	Pass
NOTE: For Non-charge depleting tests, the Rounded Result for CREE/OPT-CREE Emission names are Verify-calculated values.												

Certification Summary Information Report

Test Group	VHYYXV02.5GP5	Evaporative/Refueling Family	VHYYXR0132GPG
Test #	RHYYX10080617	Test Procedure	3 - HWFE
Exhaust Test # for this Evap Test	--	Test Fuel Type	48 - Tier 3 E10 Regular Gasoline (9 RVP @Low Alt.)
Test Date	04/25/2023	Fuel	Gasoline
Fuel Batch ID	21T-01	Fuel Calibration Number	1
Vehicle Class	LDV/Passenger Car	DF Type	Mfr. Determined
Verify Test Lab ID	772-1, Jangduck-Dong		
E10 Evaporative Test Measurement Method	--		
Test Start Odometer Reading	4698	Odometer Units	M
4WD Test Dyno	No	Diesel Adjustment Factor Usage	--
State of Charge Delta	--		
Drive Cycle Speed Tolerance Criteria	Used Part 1066 (+/- 2.0 mph, +/- 1.0 sec)	Road Speed Fan Usage	Yes

Test Results

Test Result Name	Unrounded Test Result	Verify Calculated FE Equivalent Value (miles per gallon)
CO (Carbon Monoxide)	0.1119	--
DT-ASCR (Drive Trace Absolute Speed Change Rating)	8.76	--
DT-EER (Drive Trace Energy Economy Rating)	0.55	--
DT-IWRR (Drive Trace Inertia Work Ratio Rating)	10.74	--
MFR FE (Manufacturer Fuel Economy)	39.5558	39.5558
NOX (Nitrogen Oxide)	0.0046	--
HC-NM (Non-methane Hydrocarbon)	0	--
NMOG (Non-methane organic gases)	0	--
HC-TOTAL (Total Hydrocarbon)	0.0003	--

Test Result Name	Unrounded Test Result	Verify Calculated CREE/OPT-CREE
Carbon-Related Exhaust Emissions	219	999

Test Result Name	Unrounded Test Result	Verify Calculated CO2
Carbon dioxide	218.6211	--

Manufacturer Test Comments 24MY IK PE2 2.5T AWD 19" AS E10 - HWY

Certification Summary Information Report

Test Group		VHYXV02.5GP5			Evaporative/Refueling Family					VHYXR0132GPG		
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	120,000 miles	Federal Tier 3 Bin 50	CREE	999	--	--	--	0.242171	--	999	--	--
Fed	150,000 miles	Federal Tier 3 Bin 50	NMOG	0.0000	--	1.03	--	0.0029	--	0.003	99.999	Pass
Fed	150,000 miles	Federal Tier 3 Bin 50	NMOG+NOX	0.0046	--	--	--	--	--	0.014	0.050	Pass
Fed	150,000 miles	Federal Tier 3 Bin 50	NOX	0.0046	--	--	--	0.0067	--	0.011	99.999	Pass
CA	150,000 miles	California LEV-IV ULEV50	NMOG	0.0000	--	1.03	--	0.0029	--	0.003	99.999	Pass
CA	150,000 miles	California LEV-IV ULEV50	NMOG+NOX	0.0046	--	--	--	--	--	0.014	0.050	Pass
CA	150,000 miles	California LEV-IV ULEV50	NOX	0.0046	--	--	--	0.0067	--	0.011	99.999	Pass

NOTE: For Non-charge depleting tests, the Rounded Result for CREE/OPT-CREE Emission names are Verify-calculated values.

Certification Summary Information Report

Test Group	VHYYXV02.5GP5	Evaporative/Refueling Family	VHYYXR0132GPG																														
Test #	RHYYX10080627	Test Procedure	3 - HWFE																														
Exhaust Test # for this Evap Test	--	Test Fuel Type	61 - Tier 2 Cert Gasoline																														
Test Date	03/05/2023	Fuel	Gasoline																														
Fuel Batch ID	22M-01	Fuel Calibration Number	1																														
Vehicle Class	LDV/Passenger Car	DF Type	Mfr. Determined																														
Verify Test Lab ID	772-1, Jangduck-Dong																																
E10 Evaporative Test Measurement Method	--																																
Test Start Odometer Reading	4115	Odometer Units	M																														
4WD Test Dyno	No	Diesel Adjustment Factor Usage	--																														
State of Charge Delta	--																																
Drive Cycle Speed Tolerance Criteria	Used Part 1066 (+/- 2.0 mph, +/- 1.0 sec)	Road Speed Fan Usage	Yes																														
Test Results																																	
<table border="1"> <thead> <tr> <th>Test Result Name</th> <th>Unrounded Test Result</th> <th>Verify Calculated FE Equivalent Value (miles per gallon)</th> </tr> </thead> <tbody> <tr> <td>CO (Carbon Monoxide)</td> <td>0.1096</td> <td>--</td> </tr> <tr> <td>DT-ASCR (Drive Trace Absolute Speed Change Rating)</td> <td>0.35</td> <td>--</td> </tr> <tr> <td>DT-EER (Drive Trace Energy Economy Rating)</td> <td>0.05</td> <td>--</td> </tr> <tr> <td>DT-IWRR (Drive Trace Inertia Work Ratio Rating)</td> <td>0.37</td> <td>--</td> </tr> <tr> <td>MFR FE (Manufacturer Fuel Economy)</td> <td>34.5415</td> <td>34.5415</td> </tr> <tr> <td>NOX (Nitrogen Oxide)</td> <td>0.0017</td> <td>--</td> </tr> <tr> <td>HC-NM (Non-methane Hydrocarbon)</td> <td>0.0032</td> <td>--</td> </tr> <tr> <td>NMOG (Non-methane organic gases)</td> <td>0.0033</td> <td>--</td> </tr> <tr> <td>HC-TOTAL (Total Hydrocarbon)</td> <td>0.0067</td> <td>--</td> </tr> </tbody> </table>				Test Result Name	Unrounded Test Result	Verify Calculated FE Equivalent Value (miles per gallon)	CO (Carbon Monoxide)	0.1096	--	DT-ASCR (Drive Trace Absolute Speed Change Rating)	0.35	--	DT-EER (Drive Trace Energy Economy Rating)	0.05	--	DT-IWRR (Drive Trace Inertia Work Ratio Rating)	0.37	--	MFR FE (Manufacturer Fuel Economy)	34.5415	34.5415	NOX (Nitrogen Oxide)	0.0017	--	HC-NM (Non-methane Hydrocarbon)	0.0032	--	NMOG (Non-methane organic gases)	0.0033	--	HC-TOTAL (Total Hydrocarbon)	0.0067	--
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Manufacturer Test Comments	24MY IK PE2 2.5T AWD 19" AS E0 - HWY (SPORT+ mode)																																

Certification Summary Information Report

Test Group		VHYXV02.5GP5			Evaporative/Refueling Family					VHYXR0132GPG		
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	120,000 miles	Federal Tier 3 Bin 50	CREE	258	--	--	--	0.242171	--	258	--	--
Fed	150,000 miles	Federal Tier 3 Bin 50	NMOG	0.0033	--	1.03	--	0.0029	--	0.006	99.999	Pass
Fed	150,000 miles	Federal Tier 3 Bin 50	NMOG+NOX	0.0050	--	--	--	--	--	0.015	0.050	Pass
Fed	150,000 miles	Federal Tier 3 Bin 50	NOX	0.0017	--	--	--	0.0067	--	0.008	99.999	Pass
CA	150,000 miles	California LEV-IV ULEV50	NMOG	0.0033	--	1.03	--	0.0029	--	0.006	99.999	Pass
CA	150,000 miles	California LEV-IV ULEV50	NMOG+NOX	0.0050	--	--	--	--	--	0.015	0.050	Pass
CA	150,000 miles	California LEV-IV ULEV50	NOX	0.0017	--	--	--	0.0067	--	0.008	99.999	Pass

NOTE: For Non-charge depleting tests, the Rounded Result for CREE/OPT-CREE Emission names are Verify-calculated values.

Certification Summary Information Report

Test Group	VHYYXV02.5GP5	Evaporative/Refueling Family	VHYYXR0132GPG																														
Test #	RHYYX10081168	Test Procedure	3 - HWFE																														
Exhaust Test # for this Evap Test	--	Test Fuel Type	61 - Tier 2 Cert Gasoline																														
Test Date	06/11/2023	Fuel	Gasoline																														
Fuel Batch ID	22M-01	Fuel Calibration Number	1																														
Vehicle Class	LDV/Passenger Car	DF Type	Mfr. Determined																														
Verify Test Lab ID	772-1, Jangduck-Dong																																
E10 Evaporative Test Measurement Method	--																																
Test Start Odometer Reading	5100	Odometer Units	M																														
4WD Test Dyno	No	Diesel Adjustment Factor Usage	--																														
State of Charge Delta	--																																
Drive Cycle Speed Tolerance Criteria	Used Part 1066 (+/- 2.0 mph, +/- 1.0 sec)	Road Speed Fan Usage	Yes																														
Test Results																																	
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Manufacturer Test Comments	24MY IK PE2 2.5T AWD 19" AS E0 (MCT) - HWY (ECO mode)																																

Certification Summary Information Report

Test Group		VHYXV02.5GP5			Evaporative/Refueling Family					VHYXR0132GPG		
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	120,000 miles	Federal Tier 3 Bin 50	CREE	216	--	--	--	0.242171	--	216	--	--
Fed	150,000 miles	Federal Tier 3 Bin 50	NMOG	0.0009	--	1.03	--	0.0029	--	0.004	99.999	Pass
Fed	150,000 miles	Federal Tier 3 Bin 50	NMOG+NOX	0.0048	--	--	--	--	--	0.014	0.050	Pass
Fed	150,000 miles	Federal Tier 3 Bin 50	NOX	0.0039	--	--	--	0.0067	--	0.011	99.999	Pass
CA	150,000 miles	California LEV-IV ULEV50	NMOG	0.0009	--	1.03	--	0.0029	--	0.004	99.999	Pass
CA	150,000 miles	California LEV-IV ULEV50	NMOG+NOX	0.0048	--	--	--	--	--	0.014	0.050	Pass
CA	150,000 miles	California LEV-IV ULEV50	NOX	0.0039	--	--	--	0.0067	--	0.011	99.999	Pass

NOTE: For Non-charge depleting tests, the Rounded Result for CREE/OPT-CREE Emission names are Verify-calculated values.

Certification Summary Information Report

Test Group	VHXXV02.5GP5	Evaporative/Refueling Family	VHXXR0132GPG
Test #	RHXX10080616	Test Procedure	90 - US06
Exhaust Test # for this Evap Test	--	Test Fuel Type	48 - Tier 3 E10 Regular Gasoline (9 RVP @Low Alt.)
Test Date	04/25/2023	Fuel	Gasoline
Fuel Batch ID	21T-01	Fuel Calibration Number	1
Vehicle Class	LDV/Passenger Car	DF Type	Mfr. Determined
Verify Test Lab ID	772-1, Jangduck-Dong		
E10 Evaporative Test Measurement Method	--		
Test Start Odometer Reading	4718	Odometer Units	M
4WD Test Dyno	No	Diesel Adjustment Factor Usage	--
State of Charge Delta	--		
Drive Cycle Speed Tolerance Criteria	Used Part 1066 (+/- 2.0 mph, +/- 1.0 sec)	Road Speed Fan Usage	Yes

Test Results

Test Result Name	Unrounded Test Result	Verify Calculated FE Equivalent Value (miles per gallon)
CO2 BAG 1 (Bag 1 Carbon Dioxide)	534	--
FE BAG 1 (Bag 1 Fuel Economy)	16.2	16.2
CO2 BAG 2 (Bag 2 Carbon Dioxide)	293	--
FE BAG 2 (Bag 2 Fuel Economy)	29.5	29.5
CO (Carbon Monoxide)	0.2546	--
DT-ASCR (Drive Trace Absolute Speed Change Rating)	-1.31	--
DT-EER (Drive Trace Energy Economy Rating)	-0.43	--
DT-IWRR (Drive Trace Inertia Work Ratio Rating)	-1.33	--
MFR FE (Manufacturer Fuel Economy)	25.0266	25.0266
NOX (Nitrogen Oxide)	0.0117	--
HC-NM (Non-methane Hydrocarbon)	0.0049	--
NMOG (Non-methane organic gases)	0.005	--
PM (Particulate Matter)	0.0017	--
HC-TOTAL (Total Hydrocarbon)	0.0068	--

Test Result Name	Unrounded Test Result	Verify Calculated CO2
Carbon dioxide	346.3083	--

Manufacturer Test Comments

24MY IK PE2 2.5T AWD 19" AS E10 - US06

Certification Summary Information Report

Test Group		VHYXV02.5GP5				Evaporative/Refueling Family				VHYXR0132GPG		
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 50	CO	0.2546	--	--	--	0.04	--	0.295	99.999	Pass
Fed	150,000 miles	Federal Tier 3 Bin 50	NMOG	0.0050	--	1.03	--	0.0029	--	0.008	99.999	Pass
Fed	150,000 miles	Federal Tier 3 Bin 50	NMOG+NOX	0.0167	--	--	--	--	--	0.026	99.999	Pass
Fed	150,000 miles	Federal Tier 3 Bin 50	NOX	0.0117	--	--	--	0.0067	--	0.018	99.999	Pass
Fed	150,000 miles	Federal Tier 3 Bin 50	PM	0.0017	--	--	--	0.0000	--	0.002	0.006	Pass
CA	150,000 miles	California LEV-IV ULEV50	CO	0.25	--	--	--	0.04	--	0.3	9.6	Pass
CA	150,000 miles	California LEV-IV ULEV50	NMOG	0.0050	--	1.03	--	0.0029	--	0.008	99.999	Pass
CA	150,000 miles	California LEV-IV ULEV50	NMOG+NOX	0.0167	--	--	--	--	--	0.026	0.060	Pass
CA	150,000 miles	California LEV-IV ULEV50	NOX	0.0117	--	--	--	0.0067	--	0.018	99.999	Pass
CA	150,000 miles	California LEV-IV ULEV50	PM	0.0017	--	--	--	0.0000	--	0.002	0.006	Pass

Certification Summary Information Report

Test Group	VHYYXV02.5GP5	Evaporative/Refueling Family	VHYYXR0132GPG
Test #	RHYYX10080618	Test Procedure	95 - SC03
Exhaust Test # for this Evap Test	--	Test Fuel Type	48 - Tier 3 E10 Regular Gasoline (9 RVP @Low Alt.)
Test Date	04/26/2023	Fuel	Gasoline
Fuel Batch ID	21T-01	Fuel Calibration Number	1
Vehicle Class	LDV/Passenger Car	DF Type	Mfr. Determined
Verify Test Lab ID	772-1, Jangduck-Dong		
E10 Evaporative Test Measurement Method	--		
Test Start Odometer Reading	4764	Odometer Units	M
4WD Test Dyno	No	Diesel Adjustment Factor Usage	--
State of Charge Delta	--		
Drive Cycle Speed Tolerance Criteria	Used Part 1066 (+/- 2.0 mph, +/- 1.0 sec)	Road Speed Fan Usage	Yes

Test Results

Test Result Name	Unrounded Test Result	Verify Calculated FE Equivalent Value (miles per gallon)
CO (Carbon Monoxide)	0.2769	--
DT-ASCR (Drive Trace Absolute Speed Change Rating)	3.2	--
DT-EER (Drive Trace Energy Economy Rating)	2.6	--
DT-IWRR (Drive Trace Inertia Work Ratio Rating)	4.09	--
MFR FE (Manufacturer Fuel Economy)	20.6689	20.6689
NOX (Nitrogen Oxide)	0.0082	--
HC-NM (Non-methane Hydrocarbon)	0	--
NMOG (Non-methane organic gases)	0	--
HC-TOTAL (Total Hydrocarbon)	0.0026	--

Test Result Name	Unrounded Test Result	Verify Calculated CO2
Carbon dioxide	419.2302	--

Manufacturer Test Comments

24MY IK PE2 2.5T AWD 19" AS E10 - SC03

Certification Summary Information Report

Test Group		VHYXV02.5GP5				Evaporative/Refueling Family				VHYXR0132GPG		
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 50	CO	0.2769	--	--	--	0.04	--	0.317	99.999	Pass
Fed	150,000 miles	Federal Tier 3 Bin 50	NMOG	0.0000	--	1.03	--	0.0029	--	0.003	99.999	Pass
Fed	150,000 miles	Federal Tier 3 Bin 50	NMOG+NOX	0.0082	--	--	--	--	--	0.018	99.999	Pass
Fed	150,000 miles	Federal Tier 3 Bin 50	NOX	0.0082	--	--	--	0.0067	--	0.015	99.999	Pass
CA	150,000 miles	California LEV-IV ULEV50	CO	0.28	--	--	--	0.04	--	0.3	1.7	Pass
CA	150,000 miles	California LEV-IV ULEV50	NMOG	0.0000	--	1.03	--	0.0029	--	0.003	99.999	Pass
CA	150,000 miles	California LEV-IV ULEV50	NMOG+NOX	0.0082	--	--	--	--	--	0.018	0.050	Pass
CA	150,000 miles	California LEV-IV ULEV50	NOX	0.0082	--	--	--	0.0067	--	0.015	99.999	Pass

Certification Summary Information Report

Test Group	VHYXV02.5GP5	Evaporative/Refueling Family	VHYXR0132GPG					
Emission Data Vehicle Information								
Vehicle ID / Configuration	RG3U1L5TA082A / 0	Manufacturer Vehicle Configuration Number	0					
Original Test Group Name	MHYXV03.5HT5	Original Evaporative/Refueling Family	MHYXR0142HTG					
Original Test Vehicle Model Year	2021							
Vehicle Model								
Represented Test Vehicle Make	Genesis	Represented Test Vehicle Model	G80					
Leak Family Details								
Leak Family Identifier	RG3	Leak Family Name	MHYXR0142HTG-RG3					
Drive Sources and Fuel System Details								
	<table border="1"> <tr> <th>Drive Source and Fuel#</th> <th>Drive Source</th> <th>Fuel</th> </tr> <tr> <td>1</td> <td>Combustion Engine</td> <td>Gasoline</td> </tr> </table>	Drive Source and Fuel#	Drive Source	Fuel	1	Combustion Engine	Gasoline	
Drive Source and Fuel#	Drive Source	Fuel						
1	Combustion Engine	Gasoline						
Hybrid Indicator	No							
Multiple Fuel Storage	--	Multiple Fuel Combustion	--					
Fuel Cell Indicator	--	Rechargeable Energy Storage System Indicator	--					
Rechargeable Energy Storage System	--	Rechargeable Energy Storage System, if 'Other'	--					
Off-board charge Capable Indicator	--							
Odometer Correction -- Initial	0	Odometer Correction Factor	0.9948					
Odometer Correction Sign	+ = System Miles is equal to (Test odometer reading * Correction factor) + Initial system miles							
Odometer Correction Units	Miles							
Engine Code	G6DS-AC	Rated Horsepower	375					
Displacement (liters)	3.5							
Air Aspiration Method	Turbocharged	Air Aspiration Method, if 'Other'						
Number of Air Aspiration Devices	2	Air Aspiration Device Configuration	Parallel					
Charge Air Cooler Type	Liquid	Drive Mode While Testing	2-Wheel Drive, Rear					
Shift Indicator Light Usage	Not equipped	Aged Emission Components	4,000 (mi)					
Curb Weight (lbs)	4497	Equivalent Test Weight (pounds)	4750					
GVWR (lbs)	5567	N/V Ratio	24.8					
Axle Ratio	3.54							
Transmission Type	Semi-Automatic	# of Transmission Gears	8					
Transmission Lockup	Yes	Creep Gear	No					
Dynamometer Coefficients:								
	Target Coefficients		Set Coefficients					
Coefficient Category	A (lbf)	B (lbf/mph)	C (lbf/mph**2)					
City/Highway/Evap	44.566	0.44728	0.017087					
	21.698	0.14745	0.018759					
			EPA Calculated Total Road Load Horse Power for City/Highway/Evap Coefficients					
			14.6					
Emission Control Device Comments	--							

Certification Summary Information Report

Test Group	VHYXV02.5GP5	Evaporative/Refueling Family	VHYXR0132GPG						
Manufacturer Test Vehicle Comments	21MY RG3 3.5T EVAP AWD 20"								
Test #	MHYX10062524	Test Procedure	38 - CA fuel 3-day evap.						
Exhaust Test # for this Evap Test	MHYX10062521	Test Fuel Type	46 - CARB LEV3 E10 Regular Gasoline						
Test Date	11/22/2019	Fuel	Gasoline						
Fuel Batch ID	19E-03	Fuel Calibration Number	1						
Vehicle Class	N/A	DF Type	Mfr. Determined						
Verify Test Lab ID	772-1, Jangduck-Dong								
E10 Evaporative Test Measurement Method	Calculated (1.08 x FID Total Hydrocarbons)								
Test Start Odometer Reading	4238	Odometer Units	M						
4WD Test Dyno	No	Diesel Adjustment Factor Usage	--						
State of Charge Delta	--								
Drive Cycle Speed Tolerance Criteria	Used Part 1066 (+/- 2.0 mph, +/- 1.0 sec)	Road Speed Fan Usage	No						
Test Results									
<table border="1"> <thead> <tr> <th>Test Result Name</th> <th>Unrounded Test Result</th> <th>Verify Calculated FE Equivalent Value (miles per gallon)</th> </tr> </thead> <tbody> <tr> <td>HC-TOTAL-EQUIV (Total Hydrocarbon equivalent - Evap only)</td> <td>0.1919</td> <td>--</td> </tr> </tbody> </table>				Test Result Name	Unrounded Test Result	Verify Calculated FE Equivalent Value (miles per gallon)	HC-TOTAL-EQUIV (Total Hydrocarbon equivalent - Evap only)	0.1919	--
Test Result Name	Unrounded Test Result	Verify Calculated FE Equivalent Value (miles per gallon)							
HC-TOTAL-EQUIV (Total Hydrocarbon equivalent - Evap only)	0.1919	--							
Manufacturer Test Comments									
21MY RG3 3.5L 20"(ETW:4750)-3DBL									
Certification Region	Useful Life	Standard Level	Emission Name	Rounded Result	Add DF	Certification Level	Standard	Pass/Fail	
Fed	150,000 miles	Federal Tier 3 Evap	HC-TOTAL-EQUIV	0.1919	0.000	0.192	0.300	Pass	
CA	150,000 miles	California LEV-IV Zero Evap (Option 2)	HC-TOTAL-EQUIV	0.1919	0.000	0.192	0.300	Pass	

Certification Summary Information Report

Test Group	VHYYXV02.5GP5	Evaporative/Refueling Family	VHYYXR0132GPG
Test #	MHYYX91004651	Test Procedure	27 - California fuel 2-day evap
Exhaust Test # for this Evap Test	MHYYX91004650	Test Fuel Type	46 - CARB LEV3 E10 Regular
Test Date	10/22/2020	Fuel	Gasoline
Fuel Batch ID	26757	Fuel Calibration Number	1
Vehicle Class	N/A	DF Type	Mfr. Determined
Verify Test Lab ID	--		
E10 Evaporative Test Measurement Method	Calculated (1.08 x FID Total Hydrocarbons)		
Test Start Odometer Reading	5077.1	Odometer Units	M
4WD Test Dyno	No	Diesel Adjustment Factor Usage	--
State of Charge Delta	--		
Drive Cycle Speed Tolerance Criteria	Used Part 1066 (+/- 2.0 mph, +/- 1.0 sec)	Road Speed Fan Usage	No

Test Results

Test Result Name	Unrounded Test Result	Verify Calculated FE Equivalent Value
HC-TOTAL-EQUIV (Total Hydrocarbon equivalent - Evap only)	0.207219	--

Manufacturer Test Comments

Hot_Soak_HC_(g) = 0.044611, Diurnal (gHC) = 0.162608

Certification Region	Useful Life	Standard Level	Emission Name	Rounded Result	Add DF	Certification Level	Standard	Pass/Fail
Fed	150,000 miles	Federal Tier 3 Evap	HC-TOTAL-EQUIV	0.2072	0.000	0.207	0.300	Pass
CA	150,000 miles	California LEV-IV Zero Evap (Option 2)	HC-TOTAL-EQUIV	0.2072	0.000	0.207	0.300	Pass

Test Results

Manufacturer Test Comments 21MY RG3 3.5L 20"(ETW:4750) CA E10-RL

Certification Region	Useful Life	Standard Level	Emission Name	Rounded Result	Add DF	Certification Level	Standard	Pass/Fail
Fed	150,000 miles	Federal Tier 3 Evap	HC-TOTAL-EQUIV	0.001	0.00	0.00	0.05	Pass
CA	150,000 miles	California LEV-IV Zero Evap (Option 2)	HC-TOTAL-EQUIV	0.001	0.00	0.00	0.05	Pass

Certification Summary Information Report

Test Group	VHYXV02.5GP5	Evaporative/Refueling Family	VHYXR0132GPG						
Test #	MHYX10062527	Test Procedure	24 - Federal fuel refueling test (ORVR)						
Exhaust Test # for this Evap Test	MHYX10062523	Test Fuel Type	48 - Tier 3 E10 Regular Gasoline (9 RVP @Low Alt.)						
Test Date	11/06/2019	Fuel	Gasoline						
Fuel Batch ID	18T-03	Fuel Calibration Number	1						
Vehicle Class	N/A	DF Type	Mfr. Determined						
Verify Test Lab ID	772-1, Jangduck-Dong								
E10 Evaporative Test Measurement Method	Calculated (1.08 x FID Total Hydrocarbons)								
Test Start Odometer Reading	4102	Odometer Units	M						
4WD Test Dyno	No	Diesel Adjustment Factor Usage	--						
State of Charge Delta	--								
Drive Cycle Speed Tolerance Criteria	Used Part 1066 (+/- 2.0 mph, +/- 1.0 sec)	Road Speed Fan Usage	No						
Test Results									
<table border="1"> <tr> <td>Test Result Name</td> <td>Unrounded Test Result</td> <td>Verify Calculated FE Equivalent Value (miles per gallon)</td> </tr> <tr> <td>HC-TOTAL-EQUIV (Total Hydrocarbon equivalent - Evap only)</td> <td>0.006</td> <td>--</td> </tr> </table>				Test Result Name	Unrounded Test Result	Verify Calculated FE Equivalent Value (miles per gallon)	HC-TOTAL-EQUIV (Total Hydrocarbon equivalent - Evap only)	0.006	--
Test Result Name	Unrounded Test Result	Verify Calculated FE Equivalent Value (miles per gallon)							
HC-TOTAL-EQUIV (Total Hydrocarbon equivalent - Evap only)	0.006	--							
Manufacturer Test Comments									
21MY RG3 3.5L 20"(ETW:4750) FED E10-ORVR									
Certification Region	Useful Life	Standard Level	Emission Name	Rounded Result	Add DF	Certification Level	Standard	Pass/Fail	
Fed	150,000 miles	Federal Tier 3 Evap	HC-TOTAL-EQUIV	0.006	0.00	0.01	0.20	Pass	
CA	150,000 miles	California LEV-IV Zero Evap (Option 2)	HC-TOTAL-EQUIV	0.006	0.00	0.01	0.20	Pass	

Test Group	VHYXV02.5GP5	Evaporative/Refueling Family	VHYXR0132GPG
Test #	MHYX10062528	Test Procedure	65 - Evap Canister Bleed Test
Exhaust Test # for this Evap Test	--	Test Fuel Type	46 - CARB LEV3 E10 Regular Gasoline
Test Date	11/28/2019	Fuel	Gasoline
Fuel Batch ID	19E-03	Fuel Calibration Number	1
Vehicle Class	N/A	DF Type	Mfr. Determined
Verify Test Lab ID	772-1, Jangduck-Dong		
E10 Evaporative Test Measurement Method	Calculated (1.08 x FID Total Hydrocarbons)		
Test Start Odometer Reading	4257	Odometer Units	M
4WD Test Dyno	No	Diesel Adjustment Factor Usage	--
State of Charge Delta	--		
Drive Cycle Speed Tolerance Criteria	Used Part 1066 (+/- 2.0 mph, +/- 1.0 sec)	Road Speed Fan Usage	No

Test Results

Test Result Name	Unrounded Test Result	Verify Calculated FE Equivalent Value (miles per gallon)
HC-TOTAL (Total Hydrocarbon)	0.0148	--

Manufacturer Test Comments21MY RG3 3.5L 20"(ETW:4750) CA E10-Bleed

Certification Region	Useful Life	Standard Level	Emission Name	Rounded Result	Add DF	Certification Level	Standard	Pass/Fail
Fed	150,000 miles	Federal Tier 3 Evap	HC-TOTAL	0.0148	0.000	0.015	0.020	Pass
CA	150,000 miles	California LEV-IV Zero Evap (Option 2)	HC-TOTAL	0.0148	0.000	0.015	0.020	Pass

Test Group	VHYXV02.5GP5	Evaporative/Refueling Family	VHYXR0132GPG						
Test #	MHYX10062680	Test Procedure	67 - Leak Test - Port Near Canister						
Exhaust Test # for this Evap Test	--	Test Fuel Type	48 - Tier 3 E10 Regular Gasoline (9 RVP @Low Alt.)						
Test Date	12/02/2019	Fuel	Gasoline						
Fuel Batch ID	18T-03	Fuel Calibration Number	1						
Vehicle Class	N/A	DF Type	Mfr. Determined						
Verify Test Lab ID	772-1, Jangduck-Dong								
E10 Evaporative Test Measurement Method	--								
Test Start Odometer Reading	4257	Odometer Units	M						
4WD Test Dyno	No	Diesel Adjustment Factor Usage	--						
State of Charge Delta	--								
Drive Cycle Speed Tolerance Criteria	Used Part 1066 (+/- 2.0 mph, +/- 1.0 sec)	Road Speed Fan Usage	No						
Test Results									
	<table><tr><td>Test Result Name</td><td>Unrounded Test Result</td><td>Verify Calculated FE Equivalent Value</td></tr><tr><td>LEAK-DIA (Effective Leak Diameter (inches))</td><td>0</td><td>--</td></tr></table>			Test Result Name	Unrounded Test Result	Verify Calculated FE Equivalent Value	LEAK-DIA (Effective Leak Diameter (inches))	0	--
Test Result Name	Unrounded Test Result	Verify Calculated FE Equivalent Value							
LEAK-DIA (Effective Leak Diameter (inches))	0	--							
Manufacturer Test Comments	21MY RG3 3.5L 20"(ETW:4750) FED E10-Leak Test Port Near Canister								
Certification Region	Useful Life	Standard Level	Emission Name	Rounded Result	Add DF	Certification Level	Standard	Pass/Fail	
Fed	150,000 miles	Federal Tier 3 Evap	LEAK-DIA	0.0000	0.000	0.000	0.020	Pass	
CA	150,000 miles	California LEV-IV Zero Evap (Option 2)	LEAK-DIA	0.000	0.00	0.00	0.02	Pass	

Certification Summary Information Report

Test Group	VHYXV02.5GP5	Evaporative/Refueling Family	VHYXR0132GPG						
Test #	MHYX10062681	Test Procedure	68 - Leak Test - Port Near Fuel Pipe						
Exhaust Test # for this Evap Test	--	Test Fuel Type	48 - Tier 3 E10 Regular Gasoline (9 RVP @Low Alt.)						
Test Date	12/02/2019	Fuel	Gasoline						
Fuel Batch ID	18T-03	Fuel Calibration Number	1						
Vehicle Class	N/A	DF Type	Mfr. Determined						
Verify Test Lab ID	772-1, Jangduck-Dong								
E10 Evaporative Test Measurement Method	--								
Test Start Odometer Reading	4257	Odometer Units	M						
4WD Test Dyno	No	Diesel Adjustment Factor Usage	--						
State of Charge Delta	--								
Drive Cycle Speed Tolerance Criteria	Used Part 1066 (+/- 2.0 mph, +/- 1.0 sec)	Road Speed Fan Usage	No						
Test Results									
<table border="1"> <thead> <tr> <th>Test Result Name</th> <th>Unrounded Test Result</th> <th>Verify Calculated FE Equivalent Value</th> </tr> </thead> <tbody> <tr> <td>LEAK-DIA (Effective Leak Diameter (inches))</td> <td>0</td> <td>--</td> </tr> </tbody> </table>				Test Result Name	Unrounded Test Result	Verify Calculated FE Equivalent Value	LEAK-DIA (Effective Leak Diameter (inches))	0	--
Test Result Name	Unrounded Test Result	Verify Calculated FE Equivalent Value							
LEAK-DIA (Effective Leak Diameter (inches))	0	--							
Manufacturer Test Comments									
21MY RG3 3.5L 20"(ETW:4750) FED E10-Leak Test Port Near Fuel Pipe									
Certification Region	Useful Life	Standard Level	Emission Name	Rounded Result	Add DF	Certification Level	Standard	Pass/Fail	
Fed	150,000 miles	Federal Tier 3 Evap	LEAK-DIA	0.0000	0.000	0.000	0.020	Pass	
CA	150,000 miles	California LEV-IV Zero Evap (Option 2)	LEAK-DIA	0.000	0.00	0.00	0.02	Pass	

Certification Summary Information Report

Test Group	VHXYV02.5GP5	Evaporative/Refueling Family	VHXYR0132GPG
Fuel Properties			
Fuel Batch ID	19E-03	Fuel Calibration Number	1
Test Fuel Type	46 - CARB LEV3 E10 Regular Gasoline	Fuel Batch Calibration Date	08/08/2019
Fuel Batch Calibration Effective Date	10/29/2019	Fuel Batch Calibration Ineffective Date	10/29/2022
Carbon Weight Fraction NMHC	--	Carbon Weight Fraction HC	--
Exhaust Carbon Weight Fraction	--	Fuel Methanol Volume Fraction	--
Fuel Density (grams/cubic ft)	--	Fuel Specific Gravity	0.75
Fuel Ethanol Volume Percent (%)	9.6	Fuel Net Heating Value / Fuel Net Heat of Combustion (E0) (BTU/lb)	17917
Fuel Net Heat of Combustion (E10) (MJ/kg)	--	Fuel Carbon Mass Fraction (E10)	--
Fuel Blend Carbon Weight Fraction / Fuel Carbon Mass Fraction (E0)	0.827	Weight Fraction CO2	--
Fuel Batch ID	21T-01	Fuel Calibration Number	1
Test Fuel Type	48 - Tier 3 E10 Regular Gasoline (9 RVP @Low Alt.)	Fuel Batch Calibration Date	07/24/2021
Fuel Batch Calibration Effective Date	12/24/2021	Fuel Batch Calibration Ineffective Date	12/24/2024
Carbon Weight Fraction NMHC	--	Carbon Weight Fraction HC	--
Exhaust Carbon Weight Fraction	--	Fuel Methanol Volume Fraction	--
Fuel Density (grams/cubic ft)	--	Fuel Specific Gravity	0.746
Fuel Ethanol Volume Percent (%)	9.7	Fuel Net Heating Value / Fuel Net Heat of Combustion (E0) (BTU/lb)	17945
Fuel Net Heat of Combustion (E10) (MJ/kg)	--	Fuel Carbon Mass Fraction (E10)	--
Fuel Blend Carbon Weight Fraction / Fuel Carbon Mass Fraction (E0)	0.828	Weight Fraction CO2	--
Fuel Batch ID	18T-03	Fuel Calibration Number	1
Test Fuel Type	48 - Tier 3 E10 Regular Gasoline (9 RVP @Low Alt.)	Fuel Batch Calibration Date	12/10/2018
Fuel Batch Calibration Effective Date	12/11/2018	Fuel Batch Calibration Ineffective Date	12/11/2021
Carbon Weight Fraction NMHC	--	Carbon Weight Fraction HC	--
Exhaust Carbon Weight Fraction	--	Fuel Methanol Volume Fraction	--
Fuel Density (grams/cubic ft)	--	Fuel Specific Gravity	0.745
Fuel Ethanol Volume Percent (%)	10.1	Fuel Net Heating Value / Fuel Net Heat of Combustion (E0) (BTU/lb)	17781
Fuel Net Heat of Combustion (E10) (MJ/kg)	--	Fuel Carbon Mass Fraction (E10)	--
Fuel Blend Carbon Weight Fraction / Fuel Carbon Mass Fraction (E0)	0.83	Weight Fraction CO2	--
Fuel Batch ID	22M-01	Fuel Calibration Number	1
Test Fuel Type	61 - Tier 2 Cert Gasoline	Fuel Batch Calibration Date	02/14/2022
Fuel Batch Calibration Effective Date	02/14/2022	Fuel Batch Calibration Ineffective Date	02/14/2025
Carbon Weight Fraction NMHC	--	Carbon Weight Fraction HC	--

Certification Summary Information Report

Test Group	VHXYV02.5GP5	Evaporative/Refueling Family	VHXYR0132GPG
Exhaust Carbon Weight Fraction	--	Fuel Methanol Volume Fraction	--
Fuel Density (grams/cubic ft)	--	Fuel Specific Gravity	0.743
Fuel Ethanol Volume Percent (%)	--	Fuel Net Heating Value / Fuel Net Heat of Combustion (E0) (BTU/lb)	18435
Fuel Net Heat of Combustion (E10) (MJ/kg)	--	Fuel Carbon Mass Fraction (E10)	--
Fuel Blend Carbon Weight Fraction / Fuel Carbon Mass Fraction (E0)	0.867	Weight Fraction CO2	--
Fuel Batch ID	22D-01	Fuel Calibration Number	1
Test Fuel Type	28 - Cold CO E10 Regular Gasoline (Tier 3)	Fuel Batch Calibration Date	07/29/2021
Fuel Batch Calibration Effective Date	05/10/2022	Fuel Batch Calibration Ineffective Date	05/10/2025
Carbon Weight Fraction NMHC	--	Carbon Weight Fraction HC	--
Exhaust Carbon Weight Fraction	--	Fuel Methanol Volume Fraction	--
Fuel Density (grams/cubic ft)	--	Fuel Specific Gravity	0.742
Fuel Ethanol Volume Percent (%)	9.9	Fuel Net Heating Value / Fuel Net Heat of Combustion (E0) (BTU/lb)	17925
Fuel Net Heat of Combustion (E10) (MJ/kg)	--	Fuel Carbon Mass Fraction (E10)	--
Fuel Blend Carbon Weight Fraction / Fuel Carbon Mass Fraction (E0)	0.828	Weight Fraction CO2	--
Fuel Batch ID	26757	Fuel Calibration Number	1
Test Fuel Type	46 - CARB LEV3 E10 Regular Gasoline	Fuel Batch Calibration Date	07/27/2017
Fuel Batch Calibration Effective Date	07/27/2017	Fuel Batch Calibration Ineffective Date	07/27/2032
Carbon Weight Fraction NMHC	--	Carbon Weight Fraction HC	--
Exhaust Carbon Weight Fraction	--	Fuel Methanol Volume Fraction	--
Fuel Density (grams/cubic ft)	--	Fuel Specific Gravity	0.749
Fuel Ethanol Volume Percent (%)	9.8	Fuel Net Heating Value / Fuel Net Heat of Combustion (E0) (BTU/lb)	17958
Fuel Net Heat of Combustion (E10) (MJ/kg)	--	Fuel Carbon Mass Fraction (E10)	--
Fuel Blend Carbon Weight Fraction / Fuel Carbon Mass Fraction (E0)	0.827	Weight Fraction CO2	--

Certification Summary Information Report

Test Group		VHYXV02.5GP5			Evaporative/Refueling Family			VHYXR0132GPG		
Consolidated List of Standards										
Exhaust Standards										
Cert Region		Federal			Cert/In-Use Code			Cert		
Vehicle Class		LDV/Passenger Car			Standard Level			Federal Tier 3 Bin 50		
Fuel		Gasoline			Test Procedure			Cold CO		
Useful Life	Emission Name	Rounded Result	RAF	NMOG / NMHC	Upward Diesel Adjustment Factor	Downward Diesel Adjustment Factor	Mult DF	Add DF	Std	
50,000 miles	CO	--	--	--	--	--	--	0.01	10.0	
120,000 miles	HC-NM	--	--	--	--	--	--	0.0021	0.3	
Cert Region		Federal			Cert/In-Use Code			Cert		
Vehicle Class		LDV/Passenger Car			Standard Level			Federal Tier 3 Bin 50		
Fuel		Gasoline			Test Procedure			Federal fuel 2-day exhaust (w/can load)		
Useful Life	Emission Name	Rounded Result	RAF	NMOG / NMHC	Upward Diesel Adjustment Factor	Downward Diesel Adjustment Factor	Mult DF	Add DF	Std	
120,000 miles	CREE	--	--	--	--	--	--	0.242171	999	
120,000 miles	METHANE	--	--	--	--	--	--	0.0044	0.030	
120,000 miles	N2O	--	--	--	--	--	--	0.0019	0.010	
150,000 miles	CO	--	--	--	--	--	--	0.04	1.7	
150,000 miles	CO-COMP	--	--	--	--	--	--	0	4.2	
150,000 miles	HCHO	--	--	--	--	--	--	--	0.004	
150,000 miles	NMOG	--	--	1.10	--	--	--	0.0029	99.999	
150,000 miles	NMOG+NOX	--	--	--	--	--	--	0	0.050	
150,000 miles	NMOG+NOX-COMP	--	--	--	--	--	--	0	0.050	
150,000 miles	NOX	--	--	--	--	--	--	0.0067	99.999	
150,000 miles	PM	--	--	--	--	--	--	0.0000	0.003	

Certification Summary Information Report

Test Group		VHYXV02.5GP5			Evaporative/Refueling Family			VHYXR0132GPG	
Cert Region		California + CAA Section 177 states			Cert/In-Use Code			Cert	
Vehicle Class		LDV/Passenger Car			Standard Level			California LEV-IV ULEV50	
Fuel		Gasoline			Test Procedure			US06	
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	--	--	--	--	--	--	0.04	9.6
150,000 miles	NMOG	--	--	1.03	--	--	--	0.0029	99.999
150,000 miles	NMOG+NOX	--	--	--	--	--	--	0	0.060
150,000 miles	NOX	--	--	--	--	--	--	0.0067	99.999
150,000 miles	PM	--	--	--	--	--	--	0.0000	0.006
Cert Region		California + CAA Section 177 states			Cert/In-Use Code			Cert	
Vehicle Class		LDV/Passenger Car			Standard Level			California LEV-IV ULEV50	
Fuel		Gasoline			Test Procedure			Federal fuel 2-day exhaust (w/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	--	--	--	--	--	--	0.04	1.7
150,000 miles	HCHO	--	--	--	--	--	--	--	0.004
150,000 miles	NMOG	--	--	1.10	--	--	--	0.0029	99.999
150,000 miles	NMOG+NOX	--	--	--	--	--	--	0	0.050
150,000 miles	NOX	--	--	--	--	--	--	0.0067	99.999
150,000 miles	PM	--	--	--	--	--	--	0.0000	0.003
Cert Region		Federal			Cert/In-Use Code			Cert	
Vehicle Class		LDV/Passenger Car			Standard Level			Federal Tier 3 Bin 50	
Fuel		Gasoline			Test Procedure			SC03	
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	--	--	--	--	--	--	0.04	99.999
150,000 miles	NMOG	--	--	1.03	--	--	--	0.0029	99.999
150,000 miles	NMOG+NOX	--	--	--	--	--	--	0	99.999
150,000 miles	NOX	--	--	--	--	--	--	0.0067	99.999

Certification Summary Information Report

Test Group		VHYXV02.5GP5			Evaporative/Refueling Family			VHYXR0132GPG	
Cert Region		California + CAA Section 177 states			Cert/In-Use Code			Cert	
Vehicle Class		LDV/Passenger Car			Standard Level			California LEV-IV ULEV50	
Fuel		Gasoline			Test Procedure			Fed. fuel 50 F exh.	
Useful Life	Emission Name	Rounded Result	RAF	NMOG / NMHC	Upward Diesel Adjustment Factor	Downward Diesel Adjustment Factor	Mult DF	Add DF	Std
4,000 miles	CO	--	--	--	--	--	--	0	1.7
4,000 miles	HCHO	--	--	--	--	--	--	--	0.016
4,000 miles	NMOG	--	--	1.10	--	--	--	0	99.999
4,000 miles	NMOG+NOX	--	--	--	--	--	--	0	0.100
4,000 miles	NOX	--	--	--	--	--	--	0	99.999
Cert Region		Federal			Cert/In-Use Code			Cert	
Vehicle Class		LDV/Passenger Car			Standard Level			Federal Tier 3 Bin 50	
Fuel		Gasoline			Test Procedure			HWFE	
Useful Life	Emission Name	Rounded Result	RAF	NMOG / NMHC	Upward Diesel Adjustment Factor	Downward Diesel Adjustment Factor	Mult DF	Add DF	Std
120,000 miles	CREE	--	--	--	--	--	--	0.242171	999
150,000 miles	NMOG	--	--	1.03	--	--	--	0.0029	99.999
150,000 miles	NMOG+NOX	--	--	--	--	--	--	0	0.050
150,000 miles	NOX	--	--	--	--	--	--	0.0067	99.999
Cert Region		California + CAA Section 177 states			Cert/In-Use Code			Cert	
Vehicle Class		LDV/Passenger Car			Standard Level			California LEV-IV ULEV50	
Fuel		Gasoline			Test Procedure			HWFE	
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	NMOG	--	--	1.03	--	--	--	0.0029	99.999
150,000 miles	NMOG+NOX	--	--	--	--	--	--	0	0.050
150,000 miles	NOX	--	--	--	--	--	--	0.0067	99.999

Certification Summary Information Report

Test Group		VHYXV02.5GP5			Evaporative/Refueling Family			VHYXR0132GPG	
Cert Region		Federal			Cert/In-Use Code			Cert	
Vehicle Class		LDV/Passenger Car			Standard Level			Federal Tier 3 Bin 50	
Fuel		Gasoline			Test Procedure			US06	
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	--	--	--	--	--	--	0.04	99.999
150,000 miles	NMOG	--	--	1.03	--	--	--	0.0029	99.999
150,000 miles	NMOG+NOX	--	--	--	--	--	--	0	99.999
150,000 miles	NOX	--	--	--	--	--	--	0.0067	99.999
150,000 miles	PM	--	--	--	--	--	--	0.0000	0.006

Cert Region		California + CAA Section 177 states			Cert/In-Use Code			Cert	
Vehicle Class		LDV/Passenger Car			Standard Level			California LEV-IV ULEV50	
Fuel		Gasoline			Test Procedure			Cold CO	
Useful Life	Emission Name	Rounded Result	RAF	NMOG / NMHC	Upward Diesel Adjustment Factor	Downward Diesel Adjustment Factor	Mult DF	Add DF	Std
50,000 miles	CO	--	--	--	--	--	--	0.01	10.0

Cert Region		California + CAA Section 177 states			Cert/In-Use Code			Cert	
Vehicle Class		LDV/Passenger Car			Standard Level			California LEV-IV ULEV50	
Fuel		Gasoline			Test Procedure			SC03	
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	--	--	--	--	--	--	0.04	1.7
150,000 miles	NMOG	--	--	1.03	--	--	--	0.0029	99.999
150,000 miles	NMOG+NOX	--	--	--	--	--	--	0	0.050
150,000 miles	NOX	--	--	--	--	--	--	0.0067	99.999

Evaporative/Refueling Standards

Certification Summary Information Report

Test Group		VHYXV02.5GP5		Evaporative/Refueling Family		VHYXR0132GPG	
Evaporative/Refueling Family		VHYXR0132GPG		Cert Region		California + CAA Section 177 states	
Cert/In-Use Code		Cert		Standard Level		California LEV-IV Zero Evap (Option 2)	
Test Procedure		California fuel 2-day evap					
Fuel	Useful Life	Emission Name	Rounded Result	Std	Add DF		
Gasoline	150,000 miles	HC-TOTAL-EQUIV	--	0.300	0.000		
Evaporative/Refueling Family		VHYXR0132GPG		Cert Region		Federal	
Cert/In-Use Code		Cert		Standard Level		Federal Tier 3 Evap	
Test Procedure		Federal fuel refueling test (ORVR)					
Fuel	Useful Life	Emission Name	Rounded Result	Std	Add DF		
Gasoline	150,000 miles	HC-TOTAL-EQUIV	--	0.20	0.00		
Evaporative/Refueling Family		VHYXR0132GPG		Cert Region		Federal	
Cert/In-Use Code		Cert		Standard Level		Federal Tier 3 Evap	
Test Procedure		Leak Test - Port Near Canister					
Fuel	Useful Life	Emission Name	Rounded Result	Std	Add DF		
Gasoline	150,000 miles	LEAK-DIA	--	0.020	0.000		
Evaporative/Refueling Family		VHYXR0132GPG		Cert Region		California + CAA Section 177 states	
Cert/In-Use Code		Cert		Standard Level		California LEV-IV Zero Evap (Option 2)	
Test Procedure		Leak Test - Port Near Fuel Pipe					
Fuel	Useful Life	Emission Name	Rounded Result	Std	Add DF		
Gasoline	150,000 miles	LEAK-DIA	--	0.02	0.00		
Evaporative/Refueling Family		VHYXR0132GPG		Cert Region		Federal	
Cert/In-Use Code		Cert		Standard Level		Federal Tier 3 Evap	
Test Procedure		Evap Canister Bleed Test					
Fuel	Useful Life	Emission Name	Rounded Result	Std	Add DF		
Gasoline	150,000 miles	HC-TOTAL	--	0.020	0.000		

Certification Summary Information Report

Test Group		VHYXV02.5GP5		Evaporative/Refueling Family		VHYXR0132GPG	
Evaporative/Refueling Family		VHYXR0132GPG		Cert Region		Federal	
Cert/In-Use Code		Cert		Standard Level		Federal Tier 3 Evap	
Test Procedure		Leak Test - Port Near Fuel Pipe					
Fuel	Useful Life	Emission Name	Rounded Result	Std	Add DF		
Gasoline	150,000 miles	LEAK-DIA	--	0.020	0.000		
Evaporative/Refueling Family		VHYXR0132GPG		Cert Region		California + CAA Section 177 states	
Cert/In-Use Code		Cert		Standard Level		California LEV-IV Zero Evap (Option 2)	
Test Procedure		California Fuel Running Loss					
Fuel	Useful Life	Emission Name	Rounded Result	Std	Add DF		
Gasoline	150,000 miles	HC-TOTAL-EQUIV	--	0.05	0.00		
Evaporative/Refueling Family		VHYXR0132GPG		Cert Region		California + CAA Section 177 states	
Cert/In-Use Code		Cert		Standard Level		California LEV-IV Zero Evap (Option 2)	
Test Procedure		CA fuel 3-day evap.					
Fuel	Useful Life	Emission Name	Rounded Result	Std	Add DF		
Gasoline	150,000 miles	HC-TOTAL-EQUIV	--	0.300	0.000		
Evaporative/Refueling Family		VHYXR0132GPG		Cert Region		Federal	
Cert/In-Use Code		Cert		Standard Level		Federal Tier 3 Evap	
Test Procedure		California Fuel Running Loss					
Fuel	Useful Life	Emission Name	Rounded Result	Std	Add DF		
Gasoline	150,000 miles	HC-TOTAL-EQUIV	--	0.05	0.00		
Evaporative/Refueling Family		VHYXR0132GPG		Cert Region		California + CAA Section 177 states	
Cert/In-Use Code		Cert		Standard Level		California LEV-IV Zero Evap (Option 2)	
Test Procedure		Evap Canister Bleed Test					
Fuel	Useful Life	Emission Name	Rounded Result	Std	Add DF		
Gasoline	150,000 miles	HC-TOTAL	--	0.020	0.000		

Certification Summary Information Report

Test Group		VHYXV02.5GP5		Evaporative/Refueling Family		VHYXR0132GPG					
Evaporative/Refueling Family		VHYXR0132GPG		Cert Region		California + CAA Section 177 states					
Cert/In-Use Code		Cert		Standard Level		California LEV-IV Zero Evap (Option 2)					
Test Procedure		Federal fuel refueling test (ORVR)									
Fuel		Useful Life		Emission Name		Rounded Result		Std		Add DF	
Gasoline		150,000 miles		HC-TOTAL-EQUIV		--		0.20		0.00	
Evaporative/Refueling Family		VHYXR0132GPG		Cert Region		Federal					
Cert/In-Use Code		Cert		Standard Level		Federal Tier 3 Evap					
Test Procedure		CA fuel 3-day evap.									
Fuel		Useful Life		Emission Name		Rounded Result		Std		Add DF	
Gasoline		150,000 miles		HC-TOTAL-EQUIV		--		0.300		0.000	
Evaporative/Refueling Family		VHYXR0132GPG		Cert Region		California + CAA Section 177 states					
Cert/In-Use Code		Cert		Standard Level		California LEV-IV Zero Evap (Option 2)					
Test Procedure		Leak Test - Port Near Canister									
Fuel		Useful Life		Emission Name		Rounded Result		Std		Add DF	
Gasoline		150,000 miles		LEAK-DIA		--		0.02		0.00	
Evaporative/Refueling Family		VHYXR0132GPG		Cert Region		Federal					
Cert/In-Use Code		Cert		Standard Level		Federal Tier 3 Evap					
Test Procedure		California fuel 2-day evap									
Fuel		Useful Life		Emission Name		Rounded Result		Std		Add DF	
Gasoline		150,000 miles		HC-TOTAL-EQUIV		--		0.300		0.000	

Certification Summary Information Report

Test Group		VHYXV02.5GP5	Evaporative/Refueling Family		VHYXR0132GPG
Glossary					
Useful Life					
4	4,000 miles		120	120,000 miles	
50	50,000 miles		150	150,000 miles	
100	100,000 miles				
Emission Name					
HC-TOTAL	Total Hydrocarbon		COMB-CREE	Combined Carbon-Related Exhaust Emissions	
CO	Carbon Monoxide		COMB-OPT-CREE	Combined Optional Carbon-Related Exhaust Emissions	
CO2	Carbon dioxide		HC-TOTAL-EQUIV	Total Hydrocarbon equivalent - Evap only	
CREE	Carbon-Related Exhaust Emissions		METHANE-COMB	Combined CH4 for HD 2b/3 vehicles only	
OPT-CREE	Optional Carbon-Related Exhaust Emissions		N2O-COMB	Combined Nitrous Oxide for HD 2b/3 vehicles only	
NOX	Nitrogen Oxide		LEAK-DIA	Effective Leak Diameter (inches)	
PM	Particulate Matter		LEAK-GAS CAP	Gas Cap Leakage (cc/min)	
PM-COMP	SFTP Composite Particulate Matter		CO2-COMB	Combined Carbon Dioxide for HD 2b/3 Vehicles Only	
HC-NM	Non-methane Hydrocarbon		KW-HRS	Integrated DC KW-HRS	
OMHCE	Organic material Hydrocarbon Equivalent		CH4 BAG 1	Bag 1 Methane	
OMNMHCE	Organic material non-methane HC equivalent		CH4 BAG 2	Bag 2 Methane	
NMOG	Non-methane organic gases		CH4 BAG 3	Bag 3 Methane	
HCHO	Formaldehyde		CH4 BAG 4	Bag 4 Methane	
H3C2HO	Acetaldehyde		CO BAG 1	Bag 1 Carbon Monoxide	
HC-NM+NOX	SFTP Non-methane Hydrocarbon + Nitrogen Oxides for US06 or SC03		CO BAG 2	Bag 2 Carbon Monoxide	
HC-NM+NOX-COMP	SFTP Composite Non-methane Hydrocarbon + Nitrogen Oxides		CO BAG 3	Bag 3 Carbon Monoxide	
CO-COMP	SFTP Composite Carbon Monoxide		CO BAG 4	Bag 4 Carbon Monoxide	
ETHANOL	C2H5OH - Ethanol		NMOG BAG 1	Bag 1 Non-methane organic gases	
FE BAG 1	Bag 1 Fuel Economy		NMOG BAG 2	Bag 2 Non-methane organic gases	
FE BAG 2	Bag 2 Fuel Economy		NMOG BAG 3	Bag 3 Non-methane organic gases	
FE BAG 3	Bag 3 Fuel Economy		NMOG BAG 4	Bag 4 Non-methane organic gases	
FE BAG 4	Bag 4 Fuel Economy		ACT-DISTANCE BAG 1	Bag 1 Actual Distance	
MFR FE	Manufacturer Fuel Economy		ACT-DISTANCE BAG 2	Bag 2 Actual Distance	
HC	Hydrocarbon for Running Loss and ORVR		ACT-DISTANCE BAG 3	Bag 3 Actual Distance	
METHANE	CH4 - Methane		ACT-DISTANCE BAG 4	Bag 4 Actual Distance	
METHANOL	CH3OH - Methanol		HC-TOTAL BAG 1	Bag 1 Total Hydrocarbon	
N2O	Nitrous Oxide		HC-TOTAL BAG 2	Bag 2 Total Hydrocarbon	
SPITBACK	Spitback Hydrocarbon in grams		HC-TOTAL BAG 3	Bag 3 Total Hydrocarbon	
AMP-HRS	Integrated Amp-hours		HC-TOTAL BAG 4	Bag 4 Total Hydrocarbon	
START-SOC	System Start State of Charge Watt-hours		WATT-HRS BAG 1	Bag 1 Watt Hours	
END-SOC	System End State of Charge Watt-hours		WATT-HRS BAG 2	Bag 2 Watt Hours	

Certification Summary Information Report

Test Group		VHYXV02.5GP5	Evaporative/Refueling Family		VHYXR0132GPG
ACT-DISTANCE	Actual Distance Driven (miles)		WATT-HRS BAG 3	Bag 3 Watt Hours	
AS-VOLT	Average System Voltage		WATT-HRS BAG 4	Bag 4 Watt Hours	
CO2 BAG 1	Bag 1 Carbon Dioxide		WATT-HRS	Watt Hours	
CO2 BAG 2	Bag 2 Carbon Dioxide		HC-NM BAG 1	Bag 1 Non-methane Hydrocarbon	
CO2 BAG 3	Bag 3 Carbon Dioxide		HC-NM BAG 2	Bag 2 Non-methane Hydrocarbon	
CO2 BAG 4	Bag 4 Carbon Dioxide		HC-NM BAG 3	Bag 3 Non-methane Hydrocarbon	
NMOG+NOX	Non-methane organic gases plus Nitrogen Oxides		HC-NM BAG 4	Bag 4 Non-methane Hydrocarbon	
NMOG+NOX-COMP	SFTP Composite Non-methane Organic Gases + Nitrogen Oxides		N2O BAG 1	Bag 1 Nitrous Oxide	
DT-IWRR	Drive Trace Inertia Work Ratio Rating		N2O BAG 2	Bag 2 Nitrous Oxide	
DT-ASCR	Drive Trace Absolute Speed Change Rating		N2O BAG 3	Bag 3 Nitrous Oxide	
DT-EER	Drive Trace Energy Economy Rating		N2O BAG 4	Bag 4 Nitrous Oxide	
Certification Region					
CA	California + CAA Section 177 states		FA	Federal	
Exhaust Emission Standard Level					
B1	Federal Tier 2 Bin 1		HDV2B340	Federal Tier 3 HD Class 2b Transitional Bin 340	
B2	Federal Tier 2 Bin 2		HDV2B250	Federal Tier 3 HD Class 2b Bin 250	
B3	Federal Tier 2 Bin 3		HDV2B200	Federal Tier 3 HD Class 2b Bin 200	
B4	Federal Tier 2 Bin 4		HDV2B170	Federal Tier 3 HD Class 2b Bin 170	
B5	Federal Tier 2 Bin 5		HDV2B150	Federal Tier 3 HD Class 2b Bin 150	
B6	Federal Tier 2 Bin 6		HDV2B0	Federal Tier 3 HD Class 2b Bin 0	
B7	Federal Tier 2 Bin 7		HDV3B630	Federal Tier 3 HD Class 3 Transitional Bin 630	
B8	Federal Tier 2 Bin 8		HDV3B570	Federal Tier 3 HD Class 3 Transitional Bin 570	
B9	Federal Tier 2 Bin 9		HDV3B400	Federal Tier 3 HD Class 3 Bin 400	
B10	Federal Tier 2 Bin 10		HDV3B270	Federal Tier 3 HD Class 3 Bin 270	
B11	Federal Tier 2 Bin 11		HDV3B230	Federal Tier 3 HD Class 3 Bin 230	
HDV1	HDV1 (Federal HD chassis Class 2b GVW 8501-10000)		HDV3B200	Federal Tier 3 HD Class 3 Bin 200	
HDV2	HDV2 (Federal HD chassis Class 3 GVW 10001-14000)		HDV3B0	Federal Tier 3 HD Class 3 Bin 0	
L2	California LEV-II LEV		L4SULEV100	California LEV-IV SULEV100	
L2OP	California LEV-II LEV Optional		L4SULEV125	California LEV-IV SULEV125	
U2	California LEV-II ULEV		L4SULEV15	California LEV-IV SULEV15	
S2	California LEV-II SULEV		L4SULEV150	California LEV-IV SULEV150	
ZEV	California ZEV		L4SULEV170	California LEV-IV SULEV170	
OT	Other		L4SULEV175	California LEV-IV SULEV175	
T1	Federal Tier 1		L4SULEV20	California LEV-IV SULEV20	
PZEV	California PZEV		L4SULEV200	California LEV-IV SULEV200	
L2LEV160	California LEV-II LEV160		L4SULEV230	California LEV-IV SULEV230	
L2ULEV125	California LEV-II ULEV125		L4SULEV25	California LEV-IV SULEV25	
L2SULEV30	California LEV-II SULEV30		L4SULEV30	California LEV-IV SULEV30	
L2LEV395	California LEV-II LEV395		L4SULEV75	California LEV-IV SULEV75	

Certification Summary Information Report

Test Group		VHYXV02.5GP5	Evaporative/Refueling Family	VHYXR0132GPG
L2ULEV340	California LEV-II ULEV340		L4SULEV85	California LEV-IV SULEV85
L2LEV630	California LEV-II LEV630		L4ULEV125	California LEV-IV ULEV125
L2ULEV570	California LEV-II ULEV570		L4ULEV200	California LEV-IV ULEV200
L3LEV160	California LEV-III LEV160		L4ULEV250	California LEV-IV ULEV250
L3ULEV125	California LEV-III ULEV125		L4ULEV270	California LEV-IV ULEV270
L3ULEV70	California LEV-III ULEV70		L4ULEV40	California LEV-IV ULEV40
L3ULEV50	California LEV-III ULEV50		L4ULEV400	California LEV-IV ULEV400
L3SULEV30	California LEV-III SULEV30		L4ULEV50	California LEV-IV ULEV50
L3SULEV20	California LEV-III SULEV20		L4ULEV60	California LEV-IV ULEV60
L3LEV395	California LEV-III LEV395		L4ULEV70	California LEV-IV ULEV70
L3ULEV340	California LEV-III ULEV340		T4B170	Federal Tier 4 MDV Bin 170
L3ULEV250	California LEV-III ULEV250		T4B150	Federal Tier 4 MDV Bin 150
L3ULEV200	California LEV-III ULEV200		T4B125	Federal Tier 4 MDV Bin 125
L3SULEV170	California LEV-III SULEV170		T4B100	Federal Tier 4 MDV Bin 100
L3SULEV150	California LEV-III SULEV150		T4B85	Federal Tier 4 MDV Bin 85
L3LEV630	California LEV-III LEV630		T4B75	Federal Tier 4 MDV Bin 75
L3ULEV570	California LEV-III ULEV570		T4B70	Federal Tier 4 Bin 70
L3ULEV400	California LEV-III ULEV400		T4B65	Federal Tier 4 Bin 65
L3ULEV270	California LEV-III ULEV270		T4B60	Federal Tier 4 Bin 60
L3SULEV230	California LEV-III SULEV230		T4B55	Federal Tier 4 Bin 55
L3SULEV200	California LEV-III SULEV200		T4B50	Federal Tier 4 Bin 50
T3B160	Federal Tier 3 Bin 160		T4B45	Federal Tier 4 Bin 45
T3B125	Federal Tier 3 Bin 125		T4B40	Federal Tier 4 Bin 40
T3B110	Federal Tier 3 Transitional Bin 110		T4B35	Federal Tier 4 Bin 35
T3B85	Federal Tier 3 Transitional Bin 85		T4B30	Federal Tier 4 Bin 30
T3SULEV30	Federal Tier 3 Transitional LEV-II SULEV30 Carryover		T4B25	Federal Tier 4 Bin 25
T3B70	Federal Tier 3 Bin 70		T4B20	Federal Tier 4 Bin 20
T3B50	Federal Tier 3 Bin 50		T4B15	Federal Tier 4 Bin 15
T3B30	Federal Tier 3 Bin 30		T4B10	Federal Tier 4 Bin 10
T3B20	Federal Tier 3 Bin 20		T4B5	Federal Tier 4 Bin 5
T3B0	Federal Tier 3 Bin 0		T4B0	Federal Tier 4 Bin 0
HDV2B395	Federal Tier 3 HD Class 2b Transitional Bin 395			
Transmission Type Code				
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)	
Drive System Code				
4	4-Wheel Drive	P	Part-time 4-Wheel Drive	

Certification Summary Information Report

Test Group		VHYYXV02.5GP5	Evaporative/Refueling Family		VHYYXR0132GPG
F	2-Wheel Drive, Front		A	All Wheel Drive	
R	2-Wheel Drive, Rear				
Additional Terms and Acronyms					
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	