

V O L V O

Common Application for Certification

2027 Model Year

Test Groups:

VVVXT00.0ZVG
VVVXT00.0ZPG
VVVXT00.0ZVH
VVVXT00.0ZPH
VVVXV00.0ZVI
VVVXV00.0ZVJ
VVVXT02.0S30 (*)
VVVXT02.0P34 (*)
VVVXT02.0S34 (*)

Evaporative Families:

VVVXR0142EP6
VVVXR0142E50
VVVXR0142E58

Durability Groups:

VVVXEEVNNBEV
VVVXHHGVNLV3
VVVXGPGNNN07
VVVXGPGNNN05

For Questions, Contact:

Bruno DiGennaro, Phone 201-218-7106

() Test Groups will be submitted at a later time*

		<i>Cover page</i>
		<i>Table of Contents</i>
01		CORRESPONDENCE & COMMUNICATIONS
01.01	Common Application	Correspondence & Communications
02		DURABILITY GROUP DESCRIPTION
02.01	Test Group Application	Durability Group Description
03		EVAPORATIVE / REFUELING FAMILY DESCRIPTION
03.01	Common Application	ORVR Safety Information
03.02.01	Test Group Application	Evaporative Family Description
03.02.02	Test Group Application	Evaporative Code Characteristics
03.02.03	Test Group Application	Evaporative Test Vehicle Connections
03.02.04	Test Group Application	Evaporative System General Features
04		DURABILITY PROCEDURE DESCRIPTION
04.01	Common Application	Evaporative Bench Aging Procedure description
04.02.01	Test Group Application	Evap Deterioration Factors & Ozone Statement
		Evaporative family VVVXR0142EP6
		Evaporative family VVVXR0142E50
		Evaporative family VVVXR0142E58
04.02.02		Statement Ozone resistance
04.03	Common Application	Exhaust Emissions Durability Test Procedure
04.03.01		Volvo Customized Bench Aging Procedure (VCBAP)
04.03.02		Volvo Customized Bench Aging Procedure (VCBAP2)
04.03.03		Volvo Customized Bench Aging Procedure (VCBAP3)
04.03.04		Alternative Durability Procedures Approval
04.04		Exhaust Emission Deterioration Factors
04.04.01	Test Group Application	Test Group Deterioration Factors (incl. CREE)
04.05	Test Group Application	Battery Aging Procedure Description
04.06	Test Group Application	Battery Aging Simulation Data
05.01	Test Group Application	Test Group Description
05.02	Test Group Application	Engine Codes Summary
06		TEST VEHICLE DESCRIPTION
06.01	Test Group Application	Statement (Refer to Section 12)

07		TEST RESULTS
07.01	<i>Test Group Application</i>	<i>VERIFY Certification Summary Information Report</i>
07.02	<i>Test Group Application</i>	<i>Evaporative Emission Test Results Log</i> <i>Evaporative family VVVXR0142EP6</i> <i>Evaporative family VVVXR0142E50</i> <i>Evaporative family VVVXR0142E58</i>
07.03	<i>Test Group Application</i>	<i>Exhaust Emission Test Results Log</i>
07.03.01		<i>Emission & Fuel Economy Data Vehicles</i>
07.03.02		<i>SFTP Test Results</i>
07.03.03		<i>Determining procedure for FE label calculation. (Litmus Test)</i>
07.03.04		<i>Cycle specific and combined cycle energy data (PHEV&BEV)</i>
08		EMISSION TESTING WAIVER STATEMENT
08.01	<i>Common Application</i>	<i>Statement of Compliance</i>
09		OBD SYSTEM
09.01	<i>Test Group Application</i>	<i>Federal OBD compliance statement & referral to separate OBD Application</i>
09.02	<i>Test Group Application</i>	<i>Approval Letters</i>
10	<i>Test Group Application</i>	DESCRIPTION OF ALTERNATE FUELED VEHICLES
10.01		<i>Description of Alternate-fueled vehicles</i>
10.02.01		<i>High Voltage Battery Charging Information (PHEV&BEV)</i>
10.02.02		<i>Charger inlet including adapters (PHEV&BEV)</i>
10.03		<i>Vehicle Safe Operation (PHEV&BEV)</i>
10.04		<i>Method for determining battery SOC (PHEV&BEV)</i>
10.05		<i>Instruction for safe operation (PHEV&BEV)</i>
10.06		<i>Description of the Charging system (PHEV&BEV)</i>
10.07		<i>Description of the Propulsion system (PHEV&BEV)</i>
10.08		<i>Description of the Energy Storage system (PHEV&BEV)</i>
10.09		<i>Description of the climate control system (PHEV&BEV)</i>
11		AECD DESCRIPTIONS
11.01.01	<i>Test Group Application</i>	<i>List of AECD Hardware</i>
11.01.02	<i>Test Group Application</i>	<i>List of AECD Software</i>
11.02.01	<i>Test Group Application</i>	<i>AECD Descriptions Hardware</i>
11.02.02	<i>Test Group Application</i>	<i>AECD Descriptions Software</i>
11.03	<i>Common Application</i>	<i>Engineering Evaluation of Cold NMHC @ High Altitude</i>
11.04	<i>Common Application</i>	<i>LBT (Lean Best Torque)</i>
11.05	<i>Common Application</i>	<i>“Alternative Maps” Calibration Description</i>

12		DESCRIPTIONS OF VEHICLES COVERED BY CERTIFICATE AND TEST PARAMETERS
12.01	<i>Test Group Application</i>	<i>Transmission Description</i>
12.02		Test Vehicle Selection & Information
12.02.01	<i>Test Group Application</i>	<i>EDV / DDV Selection</i>
12.02.02	<i>Test Group Application</i>	<i>FE Label Test Selection</i>
12.02.03		<i>VERIFY Test Vehicle Information</i>
12.02.03.01	<i>Test Group Application</i>	<i>Exhaust / FE (see VERIFY info)</i>
12.02.03.02	<i>Test Group Application</i>	<i>Evaporative family VVVXR0142EP6</i>
		<i>Evaporative family VVVXR0142E50</i>
		<i>Evaporative family VVVXR0142E58</i>
12.02.04	<i>Test Group Application</i>	<i>Test Vehicle Description</i>
12.02.05	<i>Common Application</i>	<i>Test Vehicle Maintenance and break-in period</i>
12.02.06	<i>Test Group Application</i>	<i>Test Vehicles Generating Data</i>
12.03		Label Format
12.03.01	<i>Test Group Application</i>	<i>Vehicle Emission Control Label</i>
12.03.02	<i>Common Application</i>	<i>Fuel Economy & Environment Label Information</i>
12.04		Vehicle Test Parameters & Related Descriptions
12.04.01	<i>Test Group Application</i>	<i>List of vehicle parameters</i>
12.04.02	<i>Common Application</i>	<i>Description of Road Load Determination</i>
12.04.03	<i>Common Application</i>	<i>Active Aerodynamic Device Description</i>
12.04.04	<i>Test Group Application</i>	<i>Active Aerodynamic Device DATA</i>
12.04.05	<i>Common Application</i>	<i>Description of Dyno Mode used for Dyno testing</i>
12.05	<i>Test Group Application</i>	<i>List of Certified Vehicles</i>
12.06	<i>Common Application</i>	<i>Adjustable Parameters on ERC</i>
12.07	<i>Common Application</i>	California Evaporative Supplemental Information
12.07.01		<i>Data for Generation of Temperature and Pressure Profiles</i>
12.07.02		<i>Measured Temperature and Pressure Profiles</i>
12.07.03		<i>Ambient Conditions</i>
12.07.04		<i>Corrected Temperature Profiles</i>
12.08	<i>Common Application</i>	Catalyst Configuration Description
12.09	<i>Test Group Application</i>	<i>Drive Modes Description</i>
12.10	<i>Common Application</i>	<i>Stop-Start Disable Criteria</i>
12.11	<i>Test Group Application</i>	<i>Description of DCF (BEV only)</i>
12.12	<i>Test Group Application</i>	<i>Climate settings for Certification Testing</i>

13		PROJECTED SALES & EPA COMPLIANCE
13.01.01	<i>Common Application</i>	<i>Test Group & Durability Group Sales</i>
13.01.02		<i>Evaporative Family Sales</i>
13.02		<i>Tier4 Phase-In</i>
13.03		<i>Tier4 NMOG+NOx FTP & SFTP compliance</i>
13.04		<i>Tier4 Cold NMHC compliance</i>
13.05		<i>Tier4 Evaporative compliance</i>
14		REQUEST FOR CERTIFICATION
14.01	<i>Test Group Application</i>	<i>Request for Certificate</i>
15		OTHER INFORMATION
15.01	<i>Test Group Application</i>	<i>Fee Filing Form EPA</i>
15.02		<i>Fee Filing Form EPA (Receipt)</i>
15.03		<i>Compliance Invoice Adjustment Form (CARB)</i>
16		CONFIDENTIAL INFORMATION
16.01	<i>Test Group & common Application</i>	<i>Statement of Confidentiality</i>
17		CALIFORNIA ARB INFORMATION
17.01	<i>Test Group Application</i>	<i>Fill pipes and Openings of Fuel Tank</i>
17.02		<i>Fill pipe and Opening Specifications</i>
17.03	<i>Common Application</i>	<i>Compliance Plan / Phase in / Fleet average</i>
17.03.01		<i>LEV III FTP & SFTP NMOG+NOx compliance</i>
17.03.02		<i>LEV III Evaporative compliance</i>
17.03.03		<i>LEV III FTP & US06 PM compliance</i>
17.03.04		<i>LEV III Bench Leak Rate compliance</i>
17.03.05		<i>LEV III PZEV Anti-backsliding compliance</i>
17.04	<i>Test Group Application</i>	<i>California Emission Test Results</i>
17.04.01		<i>50F Test Results</i>
17.05	<i>Common Application</i>	<i>California & EPA warranty</i>
17.06	<i>Test Group Application</i>	<i>California High Priced Parts List</i>
17.07	<i>Test Group Application</i>	<i>California Compliance Statements & summary information</i>
17.08	<i>Test Group Application</i>	<i>CARB Certification Review Sheet</i>
17.09	<i>Test Group Application</i>	<i>Warranty Booklet Reference</i>

18	<i>Common Application</i>	CANADIAN INFORMATION
18.01		<i>Projected Sales</i>
18.01.01		<i>Test Group and Durability Group sales</i>
18.01.02		<i>Evap Family sales</i>
18.02		<i>Emission Compliance & Sales Information</i>
18.03		<i>Canada FE Label Selection</i>
18.04		<i>Canada Compliance Plan / Fleet average</i>
19		<i>APPLICATION REVISIONS</i>
19.01	<i>Common Application</i>	<i>Application Revisions</i>
20	<i>Test Group Application</i>	<i>INFORMATION FROM AUTHORITIES</i>
20.01		<i>EPA Certificate of Conformity</i>
20.02		<i>CARB executive order</i>

Section 01

CORRESPONDENCE AND COMMUNICATIONS

This list contains persons authorized to communicate in CAP 2000 compliance issues:

***Documents related to Certification should be mailed to: Bruno DiGennaro
Documents related to IUVP should be mailed to: Bruno DiGennaro
Documents related to OBD should be mailed to: Bruno DiGennaro***

***Mailing Address: Volvo Cars USA, LLC,
Dept. Quality | Americas , 270 Three Point Drive, Ridgeville SC 29472***

<u>Name</u>	<u>Mailing Address</u>	<u>Phone number</u>	<u>E-mail address</u>	<u>Responsibility</u>
Bruno DiGennaro	Volvo Car USA, LLC Quality Americas 270 Three Point Drive, Ridgeville SC 29472	1-201-218-7106	bruno.digennaro@volvocars.com	Senior Manager, Emissions Certification & Compliance, OBD VC-US EPA/CARB Contact
Bryant Lowry	Volvo Car USA, LLC Quality Americas 270 Three Point Drive, Ridgeville, SC 29472	1-843-276-3791	bryant.lowry@volvocars.com	Emission Certification Engineer Compliance, OBD
Peter Barcia	Volvo Car USA, LLC Quality Americas 270 Three Point Drive, Ridgeville, SC 29472	1-201-310-0440	peter.barcia@volvocars.com	IUVP Engineer
Benjamin Ladd	Volvo Car USA, LLC Quality Americas 270 Three Point Drive, Ridgeville, SC 29472	1-551-251-9918	benjamin.ladd@volvocars.com	Government Reporting Engineer
Christian Andersson	Volvo Car USA, LLC Quality Americas 270 Three Point Drive, Ridgeville, SC 29472	1-843-513-8195	christian.l.andersson@volvocars.com	Senior Compliance Expert Emission Compliance & FE Exhaust Durability Procedure
Ulf Nordgren	Volvo Car Corporation Dept. 98430, PVD2 405 31 Gothenburg, SWEDEN	+46 76 6210536	ulf.nordgren@volvocars.com	Manager Homologation Integration Volvo Cars, Sweden
Per-Anders Lennvi	Volvo Car Corporation Dept. 98430, PVD2 405 31 Gothenburg, SWEDEN	+46 76 6210927	per-anders.lennvi@volvocars.com	Senior Compliance Expert Emission Compliance & FE Evap Durability Procedure CAFE & GHG reporting
Mats Evertsson	Volvo Car Corporation Dept. 58820, PVD2 405 31 Gothenburg, SWEDEN	+46 76 6210997	mats.evertsson@volvocars.com	Senior Compliance Expert Emission Compliance & FE
Marie Weberberger	Volvo Car Corporation Dept. 58820, PVD2 405 31 Gothenburg, SWEDEN	+46 73 9245737	marie.weberberger@volvocars.com	Senior Compliance Expert Emission Compliance & FE
Damien Eymeric	Volvo Car Corporation Dept. 58820, PVD2 405 31 Gothenburg, SWEDEN	+46 72 8870173	damien.eymeric@volvocars.com	Compliance Expert Emission Compliance & FE CAFE & GHG reporting

Section 03.01

ORVR Safety Information

This information contains Volvo Car Corporation’s ORVR safety-related information submission to satisfy the information reporting requirements contained in EPA’s Dear Manufacturer Letter CCD-05-03.

EPA letter CCD-05-03, dated February 15, 2005, provides manufacturers with guidance when submitting ORVR safety applications. This guidance letter replaces the earlier guidance letters VPCD-98-15 and CCD-00-10.

For all vehicles in 2027 MY Volvo does not plan to introduce any changes into our ORVR systems that could affect the safety of the ORVR system. Therefore, the information submitted for 2027 MY, follows the application requirements in Attachment A of CCD-05-03, carryover from a previously certified Evaporative / ORVR Family by an OEM.

1) Reference Evaporative / Refueling Family Name, Vehicle Models 2027 MY vs. 2026 MY

Evaporative Family Name	Vehicle Models	ORVR related change vs. 2026 MY
VVVXR0142EP6	XC90 T8 AWD	New routing of fuel lines in engine compartment EVAP Purge Pump position change (does not effect ORVR properties)
	XC60 T8 AWD	
VVVXR0142E50	XC90 B6 AWD	No EVAP or ORVR changes.
VVVXR0142E58	XC60 B5 AWD	New routing of fuel lines in engine compartment EVAP Purge Pump position change (does not effect ORVR properties)
	XC90 B5 AWD	

2) No Substantial Changes from Previously Certified Systems

- **2027MY Evaporative Family VVVXR0142EP6** is the same as last year's family **TVVXR0119EP4** regarding ORVR safety.
- **2027MY Evaporative Family VVVXR0142E50** is is the same as last year's family **TVVXR0142E50** regarding ORVR safety.
- **2027MY Evaporative Family VVVXR0142E58** is is the same as last year's family **TVVXR0142E55 & TVVXR0142E56** regarding ORVR safety.

3) List of Changes

Please see items 1 + 2 above.

4) In-use problems

Volvo has not had any safety related in-use problems, defects or recalls on systems and components similar to our 2027 MY ORVR systems and components. None of the components of the ORVR systems used on Volvo's past model year vehicles have been identified as having safety related in-use problems or defects that required action by Volvo. This includes defect reports, service notifications, recalls, campaigns or bulletins to retailers.

CARB formed an ORVR / Stage II Compatibility Committee in which AAMA and AIAM participated. AAMA and AIAM developed an ORVR safety analysis which concluded that ORVR systems result in no incremental safety risks from the vehicle side. On October 23, 1996, CARB hosted a committee meeting to review the safety findings. At the meeting, CARB and the Fire Marshal's office announced its conclusions that there were no incremental safety problems on the vehicle side.

2005MY ORVR Safety Approval Letter



Volvo Cars of North America, LLC

*Logged in
4-8-0*

OPTIONAL FORM NO. 1740		# of pages > 1
FAX TRANSMITTAL		
To: <i>G. Buffalino</i>	From: <i>L. Sohacki</i>	
Org./Agency: <i>VOLVO</i>	Phone #: <i>734-214-4851</i>	
Fax #: <i>201-784-4889</i>	Fax #:	
NSN 7540-01-017-7000 5000-101		GENERAL SERVICES ADMINISTRATION

March 31, 2004

Ms. Lynn Sohacki
 Certification and Compliance Division
 Office of Transportation and Air Quality
 U.S. Environmental Protection Agency
 National Vehicle & Fuel Emissions Lab
 2000 Traverwood Drive
 Ann Arbor, Michigan 48105

4/29/04
EPA review complete.
L. Sohacki
renew includes an e-mail
from G. Buffalino dated 4/26/04.

Subject: ORVR Safety Information For 2005 MY Volvo Vehicles

Dear Ms. Sohacki:

This letter and its attachments comprise Volvo Cars of North America, LLC (Volvo's) ORVR safety-related information submission to EPA in order to satisfy the reporting requirements contained in EPA's December 21, 1998, Dear Manufacturer letter VPCD-98-15 and August 3, 2000 letter CCD-00-10. Volvo herein provides information reporting requirements in response to the guidance letters for the certification of our 2005 model year vehicles all of which are equipped with ORVR systems.

EPA intends to work with the National Highway Traffic Safety Administration (NHTSA) to evaluate the safety of ORVR systems prior to issuing Federal Certificates of Conformity. The enclosure to EPA letter VPCD-98-15 and the body of EPA letter CCD-00-10 contain information reporting requirements which EPA is proposing as the basis for their evaluation.

As you will see in the attachment, Volvo intends to certify seven evaporative/refueling families. Of these seven, four are identical to the families previously submitted last model year and the three new families, 5VVXR0130EV4, 5VVXR0130ET1 and 5VVXR0124ZER, are substantially similar to previously certified families and are designed to meet the new Tier 2/Lev II or California zero evaporative standards. All four identical families will be completely carried over (from an EPA/CARB evaporative family/ORVR certification point of view) from MY 2004, while the remaining three families will be substantially similar to last year's 4VVXR0130EV3 and 4VVXR0130ZER families in terms of ORVR system design and on-vehicle configuration and operation. In addition, to lessen some of EPA's and NHTSA's concerns expressed in Dear Manufacturer letter CCD-00-10, Volvo would like to state that we do not incorporate mechanical seals in any of our ORVR system designs.

As we are planning to launch our new MY 2005 vehicles by the beginning of June, we request that you review the information provided herein as expeditiously as possible, with a target date of April 30, 2004.

Volvo Cars of North America, LLC
 Volvo Drive
 Redleigh, NJ 07647

Telephone
 201-766-7300

<http://www.volvocars.com>

Volvo 2027MY Alternative Durability Procedure Approval Request

Page 1	Table of contents
Page 2	Background
Page 3	2027MY Durability Group Overview
Page 4	2027MY Equivalency Factor and R-Factor Overview
Page 5	2027MY Proposed DF's
Page 6	EPA Approval of Volvo's Alternative Durability Procedures for the 2008 and Subsequent Model Years

Background

"Manufacturers must meet the requirements of today's action beginning with the 2008 model year. EPA is not making any changes to the carryover provisions in the current regulations (ref. 40 CFR 86.1839-01). These provisions allow manufacturers to use durability data that was previously generated and used to support certification provided that the data "represents worst case or equivalent rate of deterioration". Beginning in the 2008 model year, if manufacturer can meet these requirements, it may use existing durability data (i.e., DF's or aged hardware) to support certification.

A manufacturer may not, however, continue to use CAP 2000 durability processes to generate new data starting with the effective date of the new regulations. When the proposed rule becomes effective, manufacturers must use durability procedures that have been approved under the new rules to generate new durability demonstrations.

2027MY Durability Group Overview

Durability Group	Test Group	Vehicle Models	DF Method	DDV Original Info		Exhaust DF Request
				Test Group	MY	
VVVXHHGVNLV3	VVVXT02.0P34	XC90 T8 AWD XC60 T8 AWD	Bench Aging VCBAP2	VVVXHHGVNLV3	2027	NEW DF's. DF's generated using VCBAP2, which correlates to the durability regulation 86.1823-08 (Bench aging).
VVVXGPGNNO7	VVVXT02.0S34	XC90 B5 AWD XC60 B5 AWD XC40 B5 AWD	Bench Aging VCBAP2	VVVXGPGNNO7	2027	NEW DF's. DF's generated using VCBAP2, which correlates to the durability regulation 86.1823-08 (Bench aging).
TVVXGPGNNO5	VVVXT02.0S30	XC90 B6 AWD	Mileage Accumulation SWVDP using SRC Cycle	NVVXJ02.0S33	2022	Test Data used to calculate Exhaust DF's are C/O from previous MY DF's generated using SWVDP (Mileage Accumulation), which correlates to the durability regulation 86.1823-08.

All Test Groups containing BEV/ZEV's will have a CREE DF=Zero, and no DF Method, neither DDV original info is applicable.

- VCBAP: Volvo Customized Bench Aging Procedure as described in Application for Certification, section 04.03.01
- VCBAP2: Volvo Customized Bench Aging Procedure Version2 as described in Application for Certification, section 04.03.02
- VCBAP3: Volvo Customized Bench Aging Procedure Version3 as described in Application for Certification, section 04.03.03
- SRC: Standard Road Cycle according to § 86.1823-08
- SWVDP: Standard Whole Vehicle Durability Procedure as described in § 86.1823-08

2027MY Equivalency Factor and R-Factor Overview
(Equivalency Factor / R-Factor not applicable for BEV/ZEV's)

Durability Group	Test Group	Engine		Equivalency Factor	R-Factor
VVVXHHGVNLV3	VVVXT02.0P34	HD	B4204TH	1,000	16600
VVVXGPGNNN07	VVVXT02.0S34	M2	B4204T	1,000	16600
VVVXGPGNNN05	VVVXT02.0S30	06	B4204TE	1,000	17800

2027MY Proposed DF's (Additive)

Durability Group	Test Group	DF Calculation Method	Valid for Emissions Cycles	DF's (Additive)											
				THC [g/mile]	NMHC [g/mile]	NMOG [g/mile]	CO [g/mile]	NOx [g/mile]	CO2 [g/mile]	N2O [g/mile]	CH4 [g/mile]	PM [g/mile]	CREE [g/mile]	Valid mileage	
VVVXEEVNNBEV	All BEVs	Additive	All	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	4K - 50K
				n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	0.00	4K - 120K	
				n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	4K - 150K	
VVVXHHGVNLV3	VVVXT02.0P34	Additive	All	n.a	n.a	n.a	TBD	n.a	n.a	n.a	n.a	n.a	n.a	4K - 50K	
				TBD	TBD	n.a	TBD	n.a	TBD	TBD	TBD	n.a	TBD	4K - 120K	
				n.a	n.a	TBD	TBD	TBD	n.a	n.a	n.a	TBD	n.a	4K - 150K	
VVVXGPGNNN07	VVVXT02.0S34	Additive	All	n.a	n.a	n.a	TBD	n.a	n.a	n.a	n.a	n.a	n.a	4K - 50K	
				TBD	TBD	n.a	TBD	n.a	TBD	TBD	TBD	n.a	TBD	4K - 120K	
				n.a	n.a	TBD	TBD	TBD	n.a	n.a	n.a	TBD	n.a	4K - 150K	
VVVXGPGNNN05	VVVXT02.0S30	Additive	All	n.a	n.a	n.a	0.02	n.a	n.a	n.a	n.a	n.a	n.a	4K - 50K	
				0.001	0.0010	n.a	0.04	n.a	0	0.0000	0.0006	n.a	0.07	4K - 120K	
				n.a	n.a	0.0014	0.05	0.002	n.a	n.a	n.a	0.0000	n.a	4K - 150K	

(*1) Separate CREE DF calculated, see section 04.04.01-2.

The Combined Composite Multiplicative CD/CS CREE DF (Multiplicative) will be applied to the GHG reports

Exhaust DF factors for VVVXHHGVNLV3 & VVVXGPGNNN07 are still not finalized at the time of this submission. Will be included in the Application for Certification of Test Group VVVXT02.0P34 & VVVXT02.0S34

V O L V O



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
NATIONAL VEHICLE AND FUEL EMISSIONS LABORATORY
2565 PLYMOUTH ROAD
ANN ARBOR, MICHIGAN 48105-2498

JUN 4 2007

OFFICE OF
AIR AND RADIATION

Mr. Greg Buffalino
Manager, Emission Certification and Compliance
Technical and Regulatory
Volvo Cars of North America, LLC
15 Volvo Drive, Building D
Rockleigh, NJ 07647-0913

Subject: Approval of Volvo's Alternative Durability Procedures for the 2008 and
Subsequent Model Years

Dear Mr. Buffalino:

We received your request of May 25, 2007 for the approval of your alternative whole vehicle and bench-aging durability procedure for the 2008 and subsequent model years.

We have reviewed the attached package of materials you forwarded and deem that it is compliant with 40 CFR §86.1823-08(e). Therefore, we are approving your alternative whole vehicle and bench-aging durability procedure for the 2008 and subsequent model years.

The approved alternative whole vehicle and bench-aging durability procedures for the 2008 model year may be carried over, with EPA approval, to subsequent model years as allowed under 40 CFR §86.1823-08(h). Volvo must notify EPA in writing, prior to certification, of the intent to carry-over approved alternative whole vehicle and bench-aging durability procedures for subsequent model years. However, if the approved procedures are modified, applied to a new, significantly different durability group (e.g., new engine/vehicle technology), or do not accurately represent the durability expected in the field based on in-use data, the EPA will need to fully review Volvo's whole vehicle and bench-aging durability procedures prior to approval for that model year and subsequent model years.

 Printed on Recycled Paper

S04.03.04

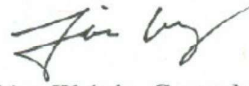
**Alternative Durability Procedure
Approval Request 2027MY**

Issued: 10 07 2025 / CA

V O L V O

If you have questions or concerns regarding this approval, please contact Mr. Arvon L. Mitcham at (734) 214-4522 or Mr. Linc Wehrly at (734) 214-4286. Thank you.

Respectfully,



Linc Wehrly, Group Manager
Light-Duty Vehicles Group
Compliance and Innovative Strategies Division

cc: Arvon L. Mitcham
Lynn Sohacki
08DUR-VOL-11215

List No	Section 08.01 Statement of Compliance
1	<p>Volvo states that any element of design, system, or emission control device installed on or incorporated in Volvo's new motor vehicles, for the purpose of complying with standards mandated in Section 202 of the Clean Air Act and 40 CFR 86.1810-17(a), will not, to the best of Volvo's knowledge, cause emissions into the ambient air of pollutants which cause or contribute to an unreasonable risk to public health or welfare except as specifically permitted by the standards prescribed under Section 202 of the Act. Volvo further states that any element of design, system, or emission control device installed on or incorporated into Volvo's new vehicles, for the purpose of complying with standards prescribed under Section 202 of the Clean Air Act, will not, to the best of Volvo's knowledge and belief, cause or contribute to an unreasonable risk to public safety. The term pollutant means:</p> <ul style="list-style-type: none"> a. Diesel particulates b. Nickel c. MMT combustion products d. Ammonia e. Sulfates f. Hydrogen sulfide g. Hydrogen cyanide h. Ruthenium combustion products i. Nitrosamines <p>Or any other pollutant which Volvo has identified which can reasonably be expected to be emitted from these vehicles.</p> <p>In establishing the physically adjustable range of each parameter on a new motor vehicle, Volvo ensures that safe vehicle driveability characteristics are available within that range, as required by section 202(a)(4) of the Clean Air Act.</p>
2	<p>Volvo also complies with the requirements of 40 CFR 86.1844-01 in that the vehicles for which certification is requested conform to the requirements in 86.1810-17 and that the descriptions of tests performed to ascertain compliance with the general standards in 86.1810-17 and the data derived from such tests are available to the Administrator upon request. Volvo states that our new motor vehicles/trucks conform to the terms of the Statement of Device Safety contained in this application.</p>
3	<p>In addition, in accordance with §86.1829-15(c), Volvo states that the test vehicles as described in this application are capable of complying with the high altitude emission standards based on an engineering evaluation of appropriate testing to measure or simulate high-altitude emissions, all vehicles comply with applicable emission standards at high altitude.</p>
4	<p>The Volvo 2027MY production vehicles are in all material respects the same as those for which certification is granted.</p>
5	<p>All vehicles Volvo tested for 2027MY certification, are in all material respects, substantially the same as production vehicles.</p>

List No	Section 08.01 Statement of Compliance
6	<p>Volvo also states that, all the test groups subject to the Cold CO Standards for LDV's / LDT's, have CO emissions during the intermediate temperature of 25-68 degrees F, that will pass the cold testing defeat device guidance provided in §86.1809-12, based on evaluations of test results on equivalent development vehicles.</p>
7	<p>All engines require the use of premium fuel as a part of warranty.</p>
8	<p>Volvo Car Corporation chooses to exercise the fuel dispensing spitback testing waiver as allowed in 40 CFR §86.1829-15(e)(5). Volvo certifies that our gasoline fueled vehicles inherently meet the Dispensing Spitback Standard as part of the Refueling Emission Standard in 40 CFR 86.1813-17 (b)(1). This compliance applies to the full useful life of the vehicle.</p>
9	<p>The warranty statements contained in Volvo's Warranty Booklets comply with all applicable EPA and CARB regulations.</p>
10	<p>In accordance with Subsection 86.1810-01(o), Volvo will measure non-methane hydrocarbons (NMHC) in lieu of NMOG for all our 2027MY gasoline vehicles. Volvo will multiply NMHC measurements from our gasoline vehicles by an adjustment factor of 1.04 for E0 fuel before comparing it with the NMOG standard to determine compliance with that standard.</p> <p>For tests using E10 fuel Volvo will multiply NMHC measurements from our gasoline vehicles by an adjustment factor Volvo calculates according to §1066.635 before comparing it with the NMOG standard to determine compliance with that standard.</p>
11	<p>In accordance with Subsection §86.1829-15(d)(4) and "California 2015 and Subsequent Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2017 and Subsequent Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles" in lieu of testing our 2027 MY gasoline fueled vehicles for formaldehyde emissions when such vehicles are certified based upon NMHC emissions, Volvo is providing the following statement. "Based on our engineering analysis/design, previous emission tests and development data, Volvo's 2027 MY gasoline fueled vehicles comply with the applicable formaldehyde (HCHO) standards throughout their useful lives."</p>

List No	Section 08.01 Statement of Compliance
12	<p>In accordance with Subsection 86.1844-01(d)(16), Volvo has conducted an engineering analysis of our complete exhaust system to ensure that our exhaust system has been designed:</p> <ol style="list-style-type: none"> 1. To facilitate leak-free assembly, installation and operation for the vehicle's full useful life. 2. To facilitate that any necessary repairs on a properly maintained and used vehicle can be performed in such a manner as to maintain leak-free operation, using commonly available tools for the full useful life of the vehicle.
13	<p>It is Volvo's intention to follow EPA "Dear Manufacturer Letter" CCD-09-19 regarding the fuel economy testing of vehicles equipped with Select-Shift Automatic Transmissions. For our older vehicle models, Volvo intends to carry-over/carry-across the results of our previous shift survey. Volvo bases our action on good engineering judgement and select shift designs that cover vehicles that have the same or similar location and actuation of select-shift control, carline, shift gate pattern and select-shift control of individual gears. For new Volvo models, we will attempt to demonstrate that the vehicles are predominantly operated in the "Drive" position by conducting and analyzing new driver survey results where applicable.</p>
14	<p>Volvo states that the OBD application meets the requirements of 40 CFR 86.1806-05, 86.1806-17 and 86.1844-01(d)(9).</p> <p>In accordance with (86.1844-01 (d) (9) (iv) Volvo state that the diagnostic system is adequate for the performance warranty test described in 40 CFR Part 85, subpart W.</p>
15	<p>Test group are free of defeat device and strategies are adopted to avoid defeat device.</p>
16	<p>Fill pipe access zones Volvo Car Corporation certifies that the fill pipe access zones for the models covered by this application are in full compliance with the requirements specified by the California Air Resources Boards. "New 2015 and subsequent model-year gasoline and alcohol fueled passenger cars, light trucks, medium-duty vehicles, and heavy-duty vehicles shall not be sold, offered for sale, or registered in California unless such vehicles comply with the "Specifications for Fill Pipes and Openings of 2015 and Subsequent Model Motor Vehicle Fuel Tanks," adopted March 22, 2012, which is incorporated by reference. Motorcycles are exempted pursuant to Chapter 1, Article 2, Section 1976(b)". (13 California Code of Regulations, Section 2235) and are not obstructed in any manner by bumpers, body parts, body trims or accessories that are either factory or dealer installed.</p>

List No	Section 08.01 Statement of Compliance
17	<p>Fill Pipes Volvo Car Corporation also certifies that the fill pipes installed on all production models covered by this application are in compliance with all of the requirements of the California Air Resources Boards.</p> <p>"New 2015 and subsequent model-year gasoline and alcohol fueled passenger cars, light trucks, medium-duty vehicles, and heavy-duty vehicles shall not be sold, offered for sale, or registered in California unless such vehicles comply with the "Specifications for Fill Pipes and Openings of 2015 and Subsequent Model Motor Vehicle Fuel Tanks," adopted March 22, 2012, which is incorporated by reference. Motorcycles are exempted pursuant to Chapter 1, Article 2, Section 1976(b)."</p> <p>The vehicles are also designed to meet the criteria for fill pipes and openings of motor vehicle fuel tanks as specified in Manufacturers Advisory circular 81-012.</p>
18	<p>Volvo states, for all our 2027 MY test groups, that with the exception of cold-start conditions, warm-up conditions and rapid-throttle motion ("tip-in" or "tip-out" conditions), the air to fuel ratio shall not be richer at any time than, for a given engine operating condition (e.g., engine speed, manifold pressure, coolant temperature, air charge temperature, and any other parameters), the leanest air to fuel mixture required to obtain maximum torque with a tolerance of six percent of the fuel consumption.</p>
19	<p>In accordance with §86.1829-15 (e)(4), Volvo states that our vehicles applying for Certification, comply with the leak standard in Subsection 86.1813-17(a)(4) instead of submitting actual test data.</p>
20	<p>Volvo vehicle fill pipes comply with the requirements of Bench Leak Rate with reference to CCR Title 13 - §2235 - Chapter 4.4 Specification for Fill Pipes and Openings of Motor Vehicle Fuel tanks (Amended May 31, 2019), based upon our engineering judgement; This attestation is in lieu of submitting actual test data as allowed by CCR Title 13 - §2235 - Chapter 4.4.</p>
21	<p>Volvo complies with the requirements of 40 CFR 86.1844-01 by submitting the required information specified in CFR 86.1843.</p>
22	<p>Volvo states, this Test Group containing All Electric Vehicles in this application, tailpipe emissions of regulated pollutants from which are deemed to be zero with reference to 40 CFR 86.1829-15(f), based on our engineering judgement, compile with all the requirements of 40 CFR Part 86 Subpart S instead of submitting test data as allowed by § 86.1829-01(b)(4) and 40 CFR 86.1829-15(f).</p>

Section 12.02.05 VEHICLE MAINTENANCE AND BREAK-IN PERIOD**For ICE (mHEV & PHEV) vehicles:**

For 2027 MY, no maintenance has been performed on vehicles used as DDVs (Bench Aging), EDVs or FEDVs.

All DDVs using mileage accumulation aging, have been maintained according to the corresponding owner's manual for that applicable model.

All vehicles are stabilized to 4000 miles using SRC (Standard Road Cycle according to § 86.1823-08).

For BEV/EV/ZEV vehicles:

For 2027 MY, no maintenance has been performed on vehicles used for certification.

Refer to S17.07 "California Compliance Statements & summary information including ZEV classification." subsection "Vehicle and Battery Break-in period and method".

Section 12.03

LABEL FORMAT

Section 12.03.02

Fuel Economy and Environment Label Information

This information will be included in 2027MY Final Application.

Section 12.06**Adjustable parameters on emission related components****STATEMENT**

The emission control systems used on all 2027 MY Volvo vehicles have no emission related components that have any adjustable parameters.

CATALYTIC CONVERTER OVERVIEW 2027MY (page1)

XC90 B6 AWD
Engine Code 06



**2 catalyst units,
1 partnumber (TWC)
3 oxygen sensors
(2 HO2S + WR-HO2S)**

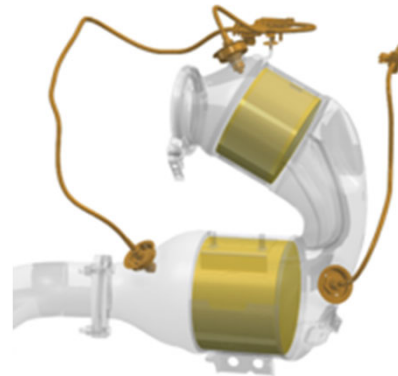
CATALYTIC CONVERTER OVERVIEW 2027MY (Page2)

XC60, XC90 T8 AWD
Engine Code HD

XC60, XC90 B5 AWD
Engine Code M2



**2 catalyst units,
1 partnumber (TWC)
3 oxygen sensors
(2 HO2S + WR-HO2S)**



**2 catalyst units,
1 partnumber (TWC)
3 oxygen sensors
(2 HO2S + WR-HO2S)**

Section 16.01 STATEMENT OF CONFIDENTIALITY

According to Class determination 3-78, the following sections in the below listed Applications are determined by Volvo to be kept as confidential.

Test Group Applications:**Sections:**

02	Durability Group Description
04.02.02	Ozone resistance
04.05	Battery Aging Procedure Description
04.06	Battery Aging Simulation Data
05.02	Engine Code Summary
09	OBD System
10.03	Vehicle Safe Operation
10.06	Identification and description of the charging system
10.07	Identification and description of the propulsion system
10.08	Identification and description of energy storage system
10.09	Identification and description of climate control system
11	AECD Descriptions
12.02.02	FE Label Testing Selection
12.04	Vehicle Test Parameters
12.09	Drive Modes Description
12.11	Description of DCF (Disc Cleaning Function)
12.12	Climate settings for Certification Testing
17.06	California High Priced Parts List (Not Confidential for Final Application)
17.09	Warranty Booklet Reference (Not Confidential for Final Application)

Common Application:**Part 1 Sections:**

04.01	Evap Bench Aging procedure description & Approval
04.03	Exhaust Emissions Durability Test Procedures
11	AECD Descriptions
12.04	Vehicle Test Parameters
12.04.01	List of Test Vehicle Parameters (Not Confidential for Final Application)
12.07	California EVAP Supplemental Information
12.10	Stop-Start Disable Criteria
12.13	AC System Description
13	US Projected Sales / Phase in / Fleet average
17.03	Compliance Plan / Phase in / Fleet average
18.01	Canada Projected Sales
18.02	Canada Compliance & Sales Information
18.03	Canada FE Label Testing Selection
18.04	Canada Compliance Plan / Phase in / Fleet average

Part 2 Sections:

02	Calibration Information
04	Actual Sales
07	Actual Sales (Canada)

Section 17.05**CALIFORNIA & EPA WARRANTY STATEMENT**

The Warranty Statements contained in Volvo's Warranty Booklets comply with all applicable EPA and CARB regulations.

For more specific information regarding California & EPA Warranty, please refer to section 17.09