Tier 3 Evap/OBD Summary Presentation

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This document is intended as a brief summary of some of the Tier 3 evaporative and OBD requirements for light-duty and heavy-duty vehicles. No representations are made regarding its completeness or accuracy. For example, the tables and information in this document do not include all the Tier 3 evaporative and OBD requirements for light-duty and heavy-duty vehicles and should not be relied upon or cited. The requirements that are summarized in this document may be found at 40 CFR Part 86 Subparts B and S; Part 1065 and Part 1066.

Tier 3 Evap Emission Standards

- Program based on nationwide ABT for hot soak + diurnal; (4 averaging sets, 25mg FEL gradation, no cross avg set credit exchanges, 5 yr credit carry forward/3yr carry back)
- Must meet all applicable Tier 3 evap requirements (or options) in a given MY to qualify as Tier 3 evap for phase-in percentages; in addition to evap this includes refueling and spit back for 2017 and later MY and leak standard for 2018 and later MY
- Includes ORVR for complete Class 3 HDVs in 2018 MY and all other complete HDVs in 2022 MY (mostly HDGVs)
- Evap and refueling emission standards apply to all volatile fuels; leak standard applies to volatile liquid fuels.
- Upgraded OBD for 2017 MY for vehicles ≤ 14,000 lbs GVWR.

Vehicle Category/ Averaging Set	*Highest Diurnal + Hot-soak of 2&3-day(g/test)*	*FEL Cap (g/test)*	*High Altitude at 7.8 RVP (g/test)*[2]	*Running Loss (g/mi)*	*Canister Bleed Emissions Test (g/test)*	*Leak Standard*[3] *(equivalent orifice diameter)*
LDV	0.300	0.500	0.65	0.05	0.020	0.02”
LDT1		0.650				
LDT2	0.400	0.650	0.85	0.05	0.020	0.02”
LDT3	0.500	0.900	1.15	0.05	0.020	0.02”
LDT4		0.900				
MDPV		1.000	1.25			
LHDV	0.600	1.4	1.75	0.05	0.030	0.02”
HHDV[4]		1.9	2.3			NA

[1] EPA Tier 3 evap to be met on Tier 3 test fuel; 9 RVP E10
[2] applies to all options and categories; no averaging for high altitude, bleed, or leak standards; refueling and spit back apply also
[3] applies to all Tier 3 and LEV III carryover vehicles certified by EPA starting in MY 2018; no averaging permitted but high altitude standard is adjusted with FEL
[4] LHDVs: are GVWR >8500 lbs but ≤ 14,000 lbs ; HHDVs are > 14,000 lbs GVWR .

"UNOFFICIAL GUIDE"- TIER 3 VEHICLE EVAPORATIVE EMISSION STANDARDS PROGRAM OPTIONS & FUEL REQUIREMENTS – MARCH 2014							
Model Year	Program/ Zero Evap Standards	(HS + DI) & RL*	Rig	Canister Bleed	Leak (except HHDGV)[Δ]	High Altitude (HA) & Refueling/ Spit back[◇]	EPA Fuel for Confirmatory/ Surveillance Testing
MY 2015-2017 ALLOWANCES PROGRAM							
2015-2016 all classes and 2017 for > 6000 lbs GVWR	PZEV zero evap	CA Ph. 2	CA Ph. 2	N/A	N/A	EPA Tier 2 or Tier 3	Fuel used by manufacturer
	LEV III option 1	CA Ph. 3	CA Ph. 3	N/A	N/A	EPA Tier 3	Fuel used by manufacturer
	LEV III option 2	CA Ph. 3	N/A	CA Ph. 3	N/A	EPA Tier 3	Fuel used by manufacturer
	Tier 3	Tier 3	N/A	EPA Tier 3	N/A	EPA Tier 3	Fuel used by manufacturer
MY 2017 TRANSITION PROGRAM							
2017	Percentage - PZEV zero evap (carryover)	CA Ph. 2	CA Ph. 2	N/A	N/A	EPA Tier 2 or Tier 3	Fuel used by manufacturer
2017	Percentage - LEV III Opt. 1 (carryover)	CA Ph. 3	CA Ph. 3	N/A	N/A	EPA Tier 3	Fuel used by manufacturer
2017	Percentage - LEV III Opt.2	CA Ph. 3	N/A	CA Ph. 3	N/A	EPA Tier 3	Fuel used by manufacturer
2017	Percentage - Tier 3	Tier 3	N/A	EPA Tier 3	N/A	EPA Tier 3	Fuel used by manufacturer
2017	PZEV zero evap only NW(carryover)	CA Ph. 2	CA Ph. 2	N/A	N/A	EPA Tier 2 or Tier 3	Fuel used by manufacturer
2017	20/20- PZEV zero evap (carryover)	CA Ph. 2	CA Ph. 2	N/A	EPA Tier 3	EPA Tier 2 or Tier 3	Fuel used by manufacturer
2017	20/20- LEV III Opt. 1 (carryover)	CA Ph. 3	CA Ph. 3	N/A	EPA Tier 3	EPA Tier 3	Fuel used by manufacturer
2017	20/20 - LEV III Opt. 2	CA Ph. 3	N/A	CA Ph. 3	EPA Tier 3	EPA Tier 3	Fuel used by manufacturer
2017	20/20 - Tier 3	Tier 3	N/A	EPA Tier 3	EPA Tier 3	EPA Tier 3	EPA Tier 3
MY 2018-2021 PHASE-IN PROGRAM							
2018-2019	PZEV zero evap (carryover)	CA Ph. 2	CA Ph. 2	N/A	EPA Tier 2 or Tier 3	EPA Tier 2 or Tier 3	Fuel used by manufacturer
2018-2021	LEVIII Opt.1 (carryover)	CA Ph. 3	CA Ph. 3	N/A	EPA Tier 3	EPA Tier 3	For HS+DI & RL CA Phase 3 through 2019 MY, after EPA may use EPA Tier 3 or CA Phase 3; EPA Tier 3 for leak, HA , refueling and spit back
2018-2021	LEVIII Opt. 2	CA Ph. 3	N/A	CA Ph. 3	EPA Tier 3	EPA Tier 3	
2018-2021	Tier 3	Tier 3	N/A	EPA Tier 3	EPA Tier 3	EPA Tier 3	EPA Tier 3
MY 2022+ FULLY PHASED-IN PROGRAM							
2022+	LEVIII Opt. 2	CA Ph. 3	N/A	CA Ph. 3	EPA Tier 3	EPA Tier 3	For HS+DI & RL EPA may use CA Phase 3 or EPA Tier 3; EPA Tier 3 for leak, HA , refueling and spit back
2022+	Tier 3	Tier 3	N/A	EPA Tier 3	EPA Tier 3	EPA Tier 3	EPA Tier 3

* hot soak (HS) diurnal (DI) running loss (RL); [Δ] LHDGVs are heavy-duty gasoline vehicles (HDGVs) with GVWR ≤ 14,000 lbs, HHDGVs are HDGVs > 14,000 lbs. GVWR; [◇] Incomplete HDGVs without ORVR may defer demonstrating compliance with the spit back requirement on Tier 3 fuel until the 2022 MY.

Tier 3 Evap Program Basic Requirements

MY	2015-2016	2017	2018-2019[3]	2020-21	2022[4]	2023+
Program Phase	Early	Transitional	Phase-In		Complete	
Required Compliance[1] (Mfrs must meet % for each MY as well as emission standards by vehicle category on average (may use credits, allowances, or carry deficits))	N/A	40% of LDV, LDT1,2; 20% of LDV, LDT1,2 evap and 20% leak, or PZEV only evap LDV, LDT1,2 models NW	60% of all covered vehicle classes[4]	80% of all covered vehicle classes	100% of all covered vehicle classes	100% of all covered vehicle classes
Allowed Tier 3 evap compliance approaches	Early Tier 3, CARB PZEV zero evap, or LEV III (option 1 or 2)	Tier 3				
		LEV III option 2				
		LEV III option 1 carryover				
		PZEV zero evap carryover				
Tier 3 program certification fuel requirement [2]	9RVP E10 or ARB fuel from LEVIII or PZEV (CA Ph 3/ 2)	Tier 3				
		LEV III option 2 - CA Ph. 3				
		LEV III option 1 carry over - CA. Ph. 3				
		PZEV zero evap carryover - CA Ph.2				
Evaporative/refueling system useful life for Tier 3	15 yr/150K for heavier vehicles when certified to Tier 3 evap, but for LDV/ LDT1 same as exhaust if 10 yr/120K; may have different exh/evap useful life periods during early, transitional, and phase-in periods				15 yr/150K but for LDV, LDT1 use exh. if 10 yr /120K -	
Allowed non-Tier 3 evap compliance approaches	MSAT evap or equivalent; LEVII evap				N/A, except allowances	N/A
Certification fuel requirement for non-Tier 3 families including evap and refueling	Indolene or ARB fuel from LEVII or PZEV (CA Ph.2)				N/A	N/A
Evaporative/refueling system useful life for non-Tier 3	Same as current				N/A	N/A

[1] covered vehicles include all LDVs, LDTs, MDPVs, and HDVs using volatile fuels; % of vehicles listed must be used in calculating compliance with standard; use of allowances and credits permitted

[2] may use different fuel in exhaust, evap/ refueling/leak during phase-in; useful life is specific to a systems Tier 3 certification status

[3] leak standard applies beginning 2018 MY to all Tier 3 and EPA certified LEV III evap vehicles using volatile liquid fuels and to all vehicles by MY2022

[4] small businesses and qualified-small volume manufacturers have until the 2022 MY to comply

Tier 3 Evap Compliance and Reporting

MY	2015-2016	2017	2018-2019	2020-21	2022
Program Phase	Early	Transitional	Phase-In		Complete
Certification Emission Testing					
Program requirements for Tier 3 evap	Allowances	40% of LDV, LDT1,2; 20% of LDV, LDT1,2 evap and 20% leak, or PZEV only evap LDV, LDT1,2 models NW	60% of all covered vehicle classes	80% of all covered vehicle classes	100% of all covered vehicle classes
Hot soak + diurnal, rig/canister bleed, running loss, high altitude, refueling & spit back	Certification using prescribed options, test procedures, and test fuels				
Leak standard (≤14,000 lb GVWR)	N/A	Certification by leak standard protocol or attestation (as applicable)			
OBD (≤14,000 lb GVWR)	N/A	OBD Evap Leak Monitoring Certification Demonstration			
		OBD Evap Leak Monitoring Production Vehicle Verification			
Mandatory Compliance Reporting					
Sales Reporting	Vehicles earning allowances	All Tier 3 and non-Tier 3 evap families except PZEV zero evap NW option	All Tier 3 and non-Tier 3 evap families		Evap families involved in generating or using credits under Tier 3
Sales Weighted Standards Compliance (hot soak + diurnal) demonstration by vehicle category	N/A	All Tier 3 and non-Tier 3 evap families except PZEV zero evap NW option	All Tier 3 and non-Tier 3 evap families		Evap families involved in generating or using credits under Tier 3
OBD (≤14,000 lb GVWR)	N/A	OBD Rate Based Monitoring			
IUVP					
Evap & refueling	As per current testing requirements				
Leak standard	N/A	All IUVP vehicles meeting leak standard evaluated using OBD information or leak test protocol			

Tier 3 Evap Flexibilities

MY	2015-2016	2017	2018-2019	2020-21	2022[1]	2023
Program Phase	Early	Transitional	Phase-In		Complete	
Generate allowances toward %	yes for all T3 evap, LEV II evap, & PZEV zero evap outside of CA & section 177 states with ZEV mandate and early LHDGV ORVR	yes for vehicles > 6000 lbs GVWR and early LHDGV ORVR	No, except for ORVR on incompletes and all complete HDGVs above 14,000 lbs GVWR		No	No
Generate credits for standard	No	**Yes for 40% and 20%/20% options for evap**	Yes	Yes	Yes	Yes
Use allowances to meet %	No	**Yes for 40% and 20%/20% option (evap only)**	Yes	Yes	Yes	No
Use credits to meet standard	No	**Yes (averaging for 40% and 20%/20% option (evap only)**	Yes	Yes	Yes	Yes
Alternative phase-in schedule[2]	N/A		(5)('18%)+(4)('19%)+(3)('20%)+(2)('21%)+(1)('22%) must ≥ 1040			N/A
		(6)('17%)+(5)('18%)+(4)('19%)+(3)('20%)+(2)('21%)+(1)('22%) must ≥ 1280 for 40% option or 1140 for 20% option[3]				

[1] small businesses and small volume manufacturers could have until the 2022 MY to comply

[2] allowance use limited to ten percentage points in any given model year within alternate phase-in schemes

[3] Vehicles in the 20% option must meet OBD evap leak monitoring requirement

Tier 3 OBD Requirements

- IBR all current CARB OBD requirements (with a few minor exceptions) for vehicles < 14,000 lbs GVWR effective for 2017 MY
- 0.020" evap leak detection for all 2017MY vehicles [1,2]: adds a 0.020 inches leak detection monitoring threshold upstream of the purge valve for all 4 vehicle categories LDV, LDT, MDPV, and complete HDGVs up to 14,000 lbs GVWR except for those with fuel tanks larger than 25 gallons capacity (see CCR 1968.2(e)). OBD leak monitoring systems would have to identify, store, and if required signal any leak(s) equal to or greater than 0.020 inches cumulative equivalent diameter. This would thus include diagnostic trouble codes (DTC) P0440, P0442, P0446, P0455, P0456, and P0457.
  - Rule includes a scan readable function which could be used to indicate or ascertain the distance traveled since the OBD leak monitoring diagnostic was last completed successfully and if the system passed or failed (identified any leak above 0.020 inches) during that monitoring event (unless it is otherwise already required in other OBD system modes).[2]
- Rate based monitoring: IBR the full array of rate based monitoring requirements (see CCR1968.2 (d)). Meeting the rate based monitoring requirements will help to insure that, even with enable criteria, the exhaust and evaporative system monitors run frequently enough that on average a problem would be identified and signaled to the owner in operation within two weeks. EPA will accept California reports.

[1] With 1 year delay possible to 2018 provided manufacturer meets 0.020" requirement in 2016 MY for shortfall in 2017 MY

[2] Distance monitor (since evap leak monitor last ran) phases in with evaporative standard ; it is mandatory (not optional).

Tier 3 OBD Requirements

- Monitoring system demonstration: IBR provisions regarding monitoring system demonstration requirements for certification. EPA would accept submissions to CARB for purposes of compliance demonstration (see CCR 1968.2(h)).
  - Added requirement that monitoring system demonstration certification include a requirement for manufacturers to demonstrate the ability of the OBD evap leak monitoring system to find and report detect a 0.020 inch leak. Since the CARB regulation requires only a relative few vehicle models each year per manufacturer, we provide the option that manufacturers be given the option to either test the remainder for an implanted leak in the fuel/evaporative system or certify by attestation that each of their remaining families meets the requirement based on development and other information.
- Production vehicle evaluation data program: IBR the CARB production vehicle evaluation data program. This program requires manufacturers to demonstrate that the OBD system functions as designed and certified when installed on production vehicles. (see CCR 1968.2(j))
- The minor exceptions which are contained in EPA's current OBD regulations are continued and compliance with 13 CCR 1968.2(d)(1.4), pertaining to tampering protection is not not required. Also, the deficiency provisions of 13 CCR 1968.2(k) were not be adopted. In addition, demonstration of compliance with 13 CCR 1968.2(e)(15.2.1)(C), to the extent it applies to the verification of proper alignment between the camshaft and crankshaft, would apply only to vehicles equipped with variable valve timing. For all model years, the deficiency provisions of paragraph (i) of the current regulations apply only to alternative fuel vehicle/engine manufacturers selecting this paragraph for demonstrating compliance.
- We anticipate that CARB will make some changes to its OBD program in response to the LEV III exhaust emission standards. As CARB updates its OBD regulations EPA will consider these changes and propose to adopt them if appropriate. We will generally continue the current practice allowed by EPA regulations for EPA to accept CARB OBD certifications as satisfying EPA requirements provided that they include at least all of the requirements covered by the EPA regulations.