



Linda S. Adams
Secretary for
Environmental Protection

Air Resources Board

Mary D. Nichols, Chairman
1001 I Street • P.O. Box 2815
Sacramento, California 95812 • www.arb.ca.gov



Arnold Schwarzenegger
Governor

TO: George Lew, Chief
Engineering and Certification Branch

FROM: Frances Cameron *F. Cameron*
Air Resources Engineer

Date: November 24, 2009

SUBJECT: 2009 VEHICLE MATRICES FOR CERTIFICATION TESTING OF PHASE II VAPOR RECOVERY SYSTEMS

Several test matrices of vehicles, by make and model year, were prepared to be used in certifying Phase II vapor recovery systems by the California Air Resources Board (ARB). The efficiency of a Phase II system to reduce emissions of gasoline vapors is measured for dispensing gasoline to a test matrix of vehicles. The age, type of vehicle and manufacturer of the vehicles in the test group are selected to be representative of vehicles in use on California roads. The vehicle matrices were prepared according to ARB Test Procedure 201.2A, Determination of Vehicle Matrix for Phase II Systems. The 2009 matrices are listed below as Tables 1, 2, 3 and 4:

Table 1: 200 Vehicle Matrix for 2009

Model Years	Chrysler	Ford	G.M.	Toyota	Honda	Niss/Dat	VW/Volvo	others	Totals
2006-2009	3	4	6	8	4	2	3	6	36
2003-2005	3	5	7	7	4	2	3	5	36
1999-2002	4	8	8	7	5	3	2	6	43
1992-1998	3	9	8	6	5	2	3	6	42
1962-1991	3	8	12	5	3	3	3	6	43
Totals	16	34	41	33	21	12	14	29	200

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our website: <http://www.arb.ca.gov>.

California Environmental Protection Agency

Table 2: 100 Vehicle Matrix for 2009									
Model Years	Chrysler	Ford	G.M.	Toyota	Honda	Niss/Dat	VW/Volvo	others	Totals
2006-2009	1	2	3	4	2	1	1	3	17
2003-2005	1	3	4	3	2	1	1	3	18
1999-2002	2	4	4	3	2	2	1	3	21
1992-1998	2	5	4	3	2	1	1	3	21
1962-1991	2	4	6	3	2	2	1	3	23
Totals	8	18	21	16	10	7	5	15	100

Table 3: 50 Vehicle Matrix for 2009									
Model Years	Chrysler	Ford	G.M.	Toyota	Honda	Niss/Dat	VW/Volvo	others	Totals
2006-2009	1	1	1	2	1	1	1	1	9
2003-2005	1	1	2	2	1	1	1	1	10
1999-2002	1	2	2	2	1	1	1	1	11
1992-1998	1	2	2	1	1	0	1	1	9
1962-1991	1	2	3	1	1	1	1	1	11
Totals	5	8	10	8	5	4	5	5	50

Table 4: 30 Vehicle Matrix for 2009 (ASTs)											
Model Years	Chrysler	Ford	G.M.	Toyota	Honda	Niss/Dat	VW/Volvo	others	Totals	% ORVR in model year groups	% non-ORVR in model year groups
2006-2009	0	1	1	1	1	0	0	1	5	100	0
2003-2005	0	1	1	1	1	0	0	1	5	93	7
1998-2002	1	2	2	1	1	1	0	1	9	53	47
1992-1997	0	1	1	1	1	0	0	1	5		100
1962-1991	0	1	2	1	1	0	0	1	6		100
Totals	1	6	7	5	5	1	0	5	30		

Table 4, a 30 vehicle matrix, was added as the vehicle test matrix for certifying Phase II enhanced vapor recovery for aboveground storage tanks (ASTs). A population of ten ORVR and ten non-ORVR vehicles must be included for testing the efficiency of the

George Lew
November 24, 2009
Page 3 of 3

vapor recovery system, as stated in the Certification Procedure for Vapor Recovery Systems at Gasoline Dispensing Facilities Using Aboveground Storage Tanks, Section 5.1.1, adopted May 2, 2008. Using this matrix will provide ten ORVR and ten non-ORVR vehicles, as well as provide a group of test vehicles that are representative of in-use vehicles on California roads.

The above matrices were prepared from projections for on-road gasoline-powered passenger cars, light duty trucks, and medium duty vehicles (< 8500 lbs gross vehicle weight rating). It is estimated that passenger cars account for 53 percent of vehicle miles traveled (VMT) on California roads, light duty trucks account for 36 percent, and medium duty vehicles account for 11 percent.

The matrices were calculated from the following two reports:

- (1) The report of the number of registered vehicles by model year and make as of January 3, 2009, from the California Department of Motor Vehicles (DMV). Tuan Quan of the DMV's Information Systems Branch provided a printed copy of the report.
- (2) The statewide projected vehicle populations and miles traveled per day in 2009 by model year for the gasoline-powered vehicles listed above. Tom Scheffelin of ARB's Planning and Technical Support Division provided the report from ARB's Emission Factors Model (EMFAC2007), Version 2.3.

If you have questions or need further information, please contact Frances Cameron via email at fcameron@arb.ca.gov or by phone at (916) 445-9314.

cc: Manjit Ahuja, Acting Chief
Monitoring and Laboratory Division

Cindy Castronovo, Chief
Northern Laboratory Branch

Ranjit Bhullar, Manager
Vapor Recovery In-Use Section

Pat Bennett, Manager
Vapor Recovery Certification Section

Louis Dinkler, Manager
Engineering Evaluation Section

Angus MacPherson, Manager
Testing and Certification Section