MOVES5 : **CHEAT SHEET (Onroad)**

Regulatory Class

ID	regClassName	regClassDesc (see EPA-420-R-24-019 for more information)
10	MC	Motorcycles
20	LDV	Light Duty Vehicles
30	LDT	Light Duty Trucks
41	LHD2b3	Chassis-certified Class 2b and 3 Trucks (8,500 lbs < GVWR ≤ 14,000 lbs)
42	LHD45	Class 4 and 5 Trucks (14,000 lbs < GVWR ≤ 19,500 lbs) & "incomplete" Class 3 Trucks
46	MHD67	Class 6 and 7 Trucks (19,500 lbs < GVWR ≤ 33,000 lbs)
47	HHD8	Class 8a and 8b Trucks (GVWR > 33,000 lbs)
48	Urban Bus	Urban Buses
49	Gliders	Gliders

Source Type

ID	HPMS Type	sourceTypeName
11	10	Motorcycle
21	25	Passenger Car
31	25	Passenger Truck*
32	25	Light Commercial Truck*
41	40	Other Buses
42	40	Transit Bus
43	40	School Bus
51	50	Refuse Truck†
52	50	Single Unit Short-haul Truck†
53	50	Single Unit Long-haul Truck†
54	50	Motor Home†
61	60	Combination Short-haul Truck†
62	60	Combination Long-haul Truck†

* Light-duty: 4 wheels *and* GVWR ≤10,000 lbs
† Heavy-duty: 6+ wheels *or* GVWR >10,000 lbs

HPMS Vehicle Type

ID	sourceTypeName
10	Motorcycles
25	Light-duty Vehicles
40	Buses
50	Single Unit Trucks
60	Combination Trucks

Fuel Type and Engine Technology

fuelTypeID	engTechID	Description
1	1	Gasoline
2	1	Diesel
3	1	CNG
5	1	E-85
9	30	Electric: Battery
9	40	Electric: Fuel Cell

Speed Bin

ID	Speed Bin Range
1	Speed < 2.5 mph
2	2.5 mph ≤ Speed < 7.5 mph
3	7.5 mph ≤ Speed < 12.5 mph
4	12.5 mph ≤ Speed < 17.5 mph
5	17.5 mph ≤ Speed < 22.5 mph
6	22.5 mph ≤ Speed < 27.5 mph
7	27.5 mph ≤ Speed < 32.5 mph
8	32.5 mph ≤ Speed < 37.5 mph
9	37.5 mph ≤ Speed < 42.5 mph
10	42.5 mph ≤ Speed < 47.5 mph
11	47.5 mph ≤ Speed < 52.5 mph
12	52.5 mph ≤ Speed < 57.5 mph
13	57.5 mph ≤ Speed < 62.5 mph
14	62.5 mph ≤ Speed < 67.5 mph
15	67.5 mph ≤ Speed < 72.5 mph
16	72.5 mph ≤ Speed
0	Output only, used for Off-Network Idling and Project Scale

Activity Type

ID	Activity Type
1	Distance traveled
2	Source Hours
3	Extended Idle Hours
4	Source Hours Operating
5	Source Hours Parked
6	Population
7	Starts
13	Hotelling Diesel Auxiliary Power Units Use
14	Hotelling Shore Power / AC Plug-in
15	Hotelling Battery Use / Engine Off

Road Type

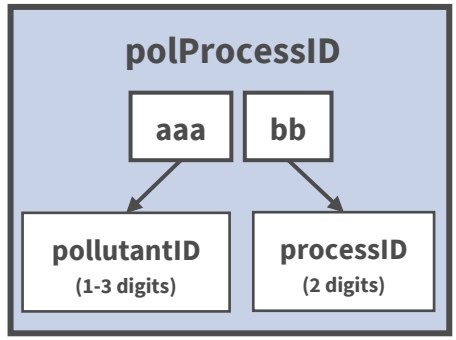
ID	Road Type
1	Off-Network
2	Rural Restricted Access
3	Rural Unrestricted Access
4	Urban Restricted Access
5	Urban Unrestricted Access

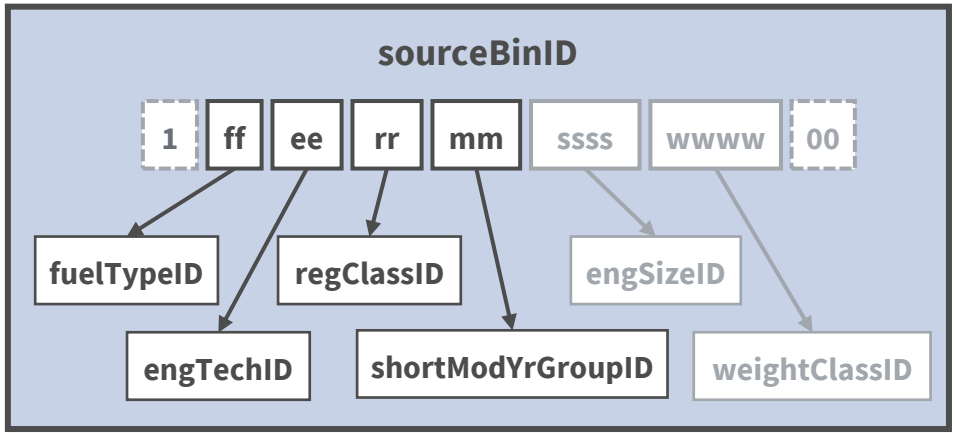
Day ID

ID	dayName
2	Weekend
5	Weekday

Emission Process

ID	Process Name
1	Running Exhaust
2	Start Exhaust
9	Brakewear
10	Tirewear
11	Evap Permeation
12	Evap Fuel Vapor Venting
13	Evap Fuel Leaks
15	Crankcase Running Exhaust
16	Crankcase Start Exhaust
17	Crankcase Extended Idle Exhaust
18	Refueling Displacement Vapor Loss
19	Refueling Spillage Loss
90	Extended Idle Exhaust
91	Auxiliary Power Unit Exhaust
93	Shore Power





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MOVES5 : CHEAT SHEET (Onroad)

Operating Modes: Running

ID	Name	VSP Range	Speed Range
0	Braking		
1	Idling		
11	Low Speed Coasting	VSP < 0	1 mph ≤ Speed < 25 mph
12	Cruise / Acceleration	0 ≤ VSP < 3	1 mph ≤ Speed < 25 mph
13	Cruise / Acceleration	3 ≤ VSP < 6	1 mph ≤ Speed < 25 mph
14	Cruise / Acceleration	6 ≤ VSP < 9	1 mph ≤ Speed < 25 mph
15	Cruise / Acceleration	9 ≤ VSP < 12	1 mph ≤ Speed < 25 mph
16	Cruise / Acceleration	12 ≤ VSP	1 mph ≤ Speed < 25 mph
21	Moderate Speed Coasting	VSP < 0	25 mph ≤ Speed < 50 mph
22	Cruise / Acceleration	0 ≤ VSP < 3	25 mph ≤ Speed < 50 mph
23	Cruise / Acceleration	3 ≤ VSP < 6	25 mph ≤ Speed < 50 mph
24	Cruise / Acceleration	6 ≤ VSP < 9	25 mph ≤ Speed < 50 mph
25	Cruise / Acceleration	9 ≤ VSP < 12	25 mph ≤ Speed < 50 mph
27	Cruise / Acceleration	12 ≤ VSP < 18	25 mph ≤ Speed < 50 mph
28	Cruise / Acceleration	18 ≤ VSP < 24	25 mph ≤ Speed < 50 mph
29	Cruise / Acceleration	24 ≤ VSP < 30	25 mph ≤ Speed < 50 mph
30	Cruise / Acceleration	30 ≤ VSP	25 mph ≤ Speed < 50 mph
33	Cruise / Acceleration	VSP < 6	50 mph ≤ Speed
35	Cruise / Acceleration	6 ≤ VSP < 12	50 mph ≤ Speed
37	Cruise / Acceleration	12 ≤ VSP < 18	50 mph ≤ Speed
38	Cruise / Acceleration	18 ≤ VSP < 24	50 mph ≤ Speed
39	Cruise / Acceleration	24 ≤ VSP < 30	50 mph ≤ Speed
40	Cruise / Acceleration	30 ≤ VSP	50 mph ≤ Speed
501	Brakewear ; stopped		

Operating Modes: Starts

ID	Soak Time Range		
101		Soak Time	< 6 minutes
102	6 minutes ≤	Soak Time	< 30 minutes
103	30 minutes ≤	Soak Time	< 60 minutes
104	60 minutes ≤	Soak Time	< 90 minutes
105	90 minutes ≤	Soak Time	< 120 minutes
106	120 minutes ≤	Soak Time	< 360 minutes
107	360 minutes ≤	Soak Time	< 720 minutes
108	720 minutes ≤	Soak Time	

Operating Modes: Hotelling

ID	Description
200	Extended Idling
201	Auxiliary Power Units Use
203	Shore Power / AC Plugin
204	Battery Use / Engine Off

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Pollutants

ID	pollutantname	ID	pollutantname
1	Total Gaseous Hydrocarbons	84	Pyrene particle
2	Carbon Monoxide (CO)	86	Total Organic Gases
3	Oxides of Nitrogen (NOx)	87	Volatile Organic Compounds
5	Methane (CH4)	88	NonHAPTOG
6	Nitrous Oxide (N2O)	90	Atmospheric CO2
20	Benzene	91	Total Energy Consumption
21	Ethanol	92	Petroleum Energy Consumption
23	Naphthalene particle	93	Fossil Fuel Energy Consumption
24	1,3-Butadiene	98	CO2 Equivalent
25	Formaldehyde	99	Brake Specific Fuel Consumption (BSFC)
26	Acetaldehyde	100	Primary Exhaust PM10 - Total
27	Acrolein	106	Primary PM10 - Brakewear Particulate
30	Ammonia (NH3)	107	Primary PM10 - Tirewear Particulate
31	Sulfur Dioxide (SO2)	110	Primary Exhaust PM2.5 - Total
32	Nitrogen Oxide (NO)	111	Organic Carbon
33	Nitrogen Dioxide (NO2)	112	Elemental Carbon
34	Nitrous Acid (HONO)	115	Sulfate Particulate
35	Nitrate (NO3)	116	Primary PM2.5 - Brakewear Particulate
36	Ammonium (NH4)	117	Primary PM2.5 - Tirewear Particulate
40	2,2,4-Trimethylpentane	118	Composite - NonECPM
41	Ethyl Benzene	119	H2O (aerosol)
42	Hexane	121	CMAQ5.0 Unspeciated (PMOTHR)
43	Propionaldehyde	122	Non-carbon Organic Matter (NCOM)
44	Styrene	123	Total Organic Matter (TOM)
45	Toluene	124	Residual PM (NonECNonSO4NonOM)
46	Xylene	130	1,2,3,7,8,9-Hexachlorodibenzo-p-Dioxin
51	Chloride	131	Octachlorodibenzo-p-dioxin
52	Sodium	132	1,2,3,4,6,7,8-Heptachlorodibenzo-p-Dioxin
53	Potassium	133	Octachlorodibenzofuran
54	Magnesium	134	1,2,3,4,7,8-Hexachlorodibenzo-p-Dioxin
55	Calcium	135	1,2,3,7,8-Pentachlorodibenzo-p-Dioxin
56	Titanium	136	2,3,7,8-Tetrachlorodibenzofuran
57	Silicon	137	1,2,3,4,7,8,9-Heptachlorodibenzofuran
58	Aluminum	138	2,3,4,7,8-Pentachlorodibenzofuran
59	Iron	139	1,2,3,7,8-Pentachlorodibenzofuran
60	Mercury Elemental Gaseous	140	1,2,3,6,7,8-Hexachlorodibenzofuran
61	Mercury Divalent Gaseous	141	1,2,3,6,7,8-Hexachlorodibenzo-p-Dioxin
62	Mercury Particulate	142	2,3,7,8-Tetrachlorodibenzo-p-Dioxin
63	Arsenic Compounds	143	2,3,4,6,7,8-Hexachlorodibenzofuran
65	Chromium 6+	144	1,2,3,4,6,7,8-Heptachlorodibenzofuran
66	Manganese Compounds	145	1,2,3,4,7,8-Hexachlorodibenzofuran
67	Nickel Compounds	146	1,2,3,7,8,9-Hexachlorodibenzofuran
68	Dibenzo(a,h)anthracene particle	168	Dibenzo(a,h)anthracene gas
69	Fluoranthene particle	169	Fluoranthene gas
70	Acenaphthene particle	170	Acenaphthene gas
71	Acenaphthylene particle	171	Acenaphthylene gas
72	Anthracene particle	172	Anthracene gas
73	Benz(a)anthracene particle	173	Benz(a)anthracene gas
74	Benzo(a)pyrene particle	174	Benzo(a)pyrene gas
75	Benzo(b)fluoranthene particle	175	Benzo(b)fluoranthene gas
76	Benzo(g,h,i)perylene particle	176	Benzo(g,h,i)perylene gas
77	Benzo(k)fluoranthene particle	177	Benzo(k)fluoranthene gas
78	Chrysene particle	178	Chrysene gas
79	Non-Methane Hydrocarbons	181	Fluorene gas
80	Non-Methane Organic Gases	182	Indeno(1,2,3,c,d)pyrene gas
81	Fluorene particle	183	Phenanthrene gas
82	Indeno(1,2,3,c,d)pyrene particle	184	Pyrene gas
83	Phenanthrene particle	185	Naphthalene gas

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Allowable Source Type / Fuel Type Combinations		Motorcycles	Passenger Cars	Passenger Trucks	Light Commercial Trucks	Other Buses	Transit Buses	School Buses	Refuse Trucks	Short-Haul Single Unit Trucks	Long-Haul Single Unit Trucks	Motor Homes	Short-Haul Combination Trucks	Long-Haul Combination Trucks
		11	21	31	32	41	42	43	51	52	53	54	61	62
Gasoline	1	X	X	X	X	X	X	X	X	X	X	X	X	
Diesel	2		X	X	X	X	X	X	X	X	X	X	X	X
CNG	3					X	X	X	X	X	X	X	X	X
E85-Capable	5		X	X	X									
Battery Electric	9		X	X	X	X	X	X	X	X	X	X	X	X
Fuel Cell Electric	9					X	X	X	X	X	X	X	X	X

Allowable Source Type / Regulatory Class Combinations		Motorcycles	Passenger Cars	Passenger Trucks	Light Commercial Trucks	Other Buses	Transit Buses	School Buses	Refuse Trucks	Short-Haul Single Unit Trucks	Long-Haul Single Unit Trucks	Motor Homes	Short-Haul Combination Trucks	Long-Haul Combination Trucks
		11	21	31	32	41	42	43	51	52	53	54	61	62
MC	10	X												
LDV	20		X											
LDT	30			X	X									
LHD2b3	41			X	X			X	X	X	X	X		
LHD45	42					X	X	X	X	X	X	X		
MHD67	46					X	X	X	X	X	X	X	X	X
HHD8	47					X	X	X	X	X	X	X	X	X
Urban Bus	48						X							
Gliders	49												X	X

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