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40 CFR Ch. I (7-1-10 Edition)

conditions are maintained in the engine induction system.

(3) On air cooled engines, the fan shall be installed.

(4) Additional accessories (e.g., oil cooler, alternators, air compressors, etc.) may be installed with advance approval by the Administrator.

(d) All emission control systems installed on or incorporated in a new motor vehicle engine shall be functioning during all procedures in this subpart. In cases of component mal-

function or failure, maintenance to correct component failure or malfunction shall be authorized in accordance with § 86.079-25.

§ 86.335-79 Gasoline-fueled engine test cycle.

(a) The following test sequence shall be followed in dynamometer operation tests of gasoline-fueled heavy-duty engines. Diesel engines are covered in § 86.336.

Cycle No.	Mode No.	Mode	Observed torque (percent of maximum observed)	Time in mode-seconds	Cumulative time-seconds	Weighting factors
1	1	Idle	.....	60	60	0.232
1	2	Cruise	25	60	120	.077
1	3	PTA	55	60	180	.147
1	4	Cruise	25	60	240	.077
1	5	PTD	10	60	300	.057
1	6	Cruise	25	60	360	.077
1	7	FL	90	60	420	.113
1	8	Cruise	25	60	480	.077
1	9	CT	.....	60	540	.143
2	10	Cruise	25	60	600	.077
2	11	PTA	55	60	660	.147
2	12	Cruise	25	60	720	.077
2	13	PTD	10	60	780	.057
2	14	Cruise	25	60	840	.077
2	15	FL	90	60	900	.113
2	16	Cruise	25	60	960	.077
2	17	CT	.....	60	1,020	.143
2	18	Idle	.....	60	1,080	.232

(b) Except for idles, the engine dynamometer shall be operated at a constant speed of 2000 rpm±100 rpm. Speed deviations, not to exceed 200 rpm, will be allowed during the first 10 seconds of each mode.

(c) The times in-mode specified in paragraph (a) for the CT modes are ±2 seconds. All other times in-mode are ±4 seconds.

(d) The first 35 seconds of each 60 second engine power mode is allowed for engine-dynamometer stabilization. After this stabilization period the torque must be held at the specified value ±5 percent until the exhaust gas analysis period. During the exhaust gas analysis period, the last 10 seconds of each nonclosed throttle mode the engine torque must be at the specified value ±2 percent of the maximum torque observed. For example, mode 3 torque shall be held between 53 and 57 percent of maximum torque (55±2 percent) during the exhaust analysis pe-

riod. Prior to the analysis period but excluding the first 35 seconds of the mode, the torque shall be held between 50 and 60 percent of maximum torque (55%±5%).

(e) The idle operating mode shall be carried out at the manufacturer's recommended curb-idle engine speed. Arrive at the last idle mode by closing the throttle, braking the dynamometer to the engine idle speed, and unloading the dynamometer.

(f) The CT operating mode shall be carried out at the same engine speed as specified in paragraph (b) of this section.

(g) If the Administrator determines that an engine shall be tested as an automatic transmission code engine, then a load shall be applied by the dynamometer during the idle modes (1 and 18) such that the engine speed is decreased from the recommended dynamometer-idle speed to the recommended curb-idle speed. The engine

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idle torque recorded for the calculations in § 86.345 shall be zero.

(h) If the operating conditions specified in paragraph (a) of this section for modes 2 through 8, and 10 through 16 cannot be maintained, the Administrator may authorize deviations from the specified load conditions. Such deviations shall not exceed 5 percent of the maximum torque at the test speed. The minimum deviations, above and below the specified load, necessary for stable operation shall be determined by the manufacturer and approved by the Administrator prior to the test run. Emission tests shall be performed by operating the engine at the higher ap-

proved load setting during cycle 1 and at the lower approved load setting during cycle 2. The weighting factors shall be as specified in paragraph (a) of this section.

(Secs. 206, 301(a), Clean Air Act as amended (42 U.S.C. 7525, 7601(a)))

[42 FR 45154, Sept. 8, 1977, as amended at 44 FR 16917, Mar. 20, 1979; 47 FR 49813, Nov. 2, 1982]

§ 86.336-79 Diesel engine test cycle.

(a) The following 13-mode cycle shall be followed in dynamometer operation tests of heavy-duty Diesel engines. Gasoline-fueled engines are covered in § 86.335.

Test Segment	Mode No.	Engine Speed	Observed torque (percent of maximum observed)	Time in mode (minutes)		Maximum cumulative time (minutes)
				Minimum	Maximum	
1	1	Curb-idle	4.5	6.0	42
1	2	Intermediate	2	4.5	6.0	
1	3 .....	.....do	25	4.5	6.0
1	4 .....	.....do	50	4.5	6.0
1	5 .....	.....do	75	4.5	6.0
1	6 .....	.....do	100	4.5	6.0
1	7	Curb-idle	4.5	6.0	36
2	8	Rated	100	4.5	6.0	
2	9 .....	.....do	75	4.5	6.0
2	10 .....	.....do	50	4.5	6.0
2	11 .....	.....do	25	4.5	6.0
2	12 .....	.....do	2	4.5	6.0
2	13	Curb-idle .....	.....	4.5	6.0

(b) During each mode the specified speed shall be held to within 50 rpm. Torque for each mode must be held at the specified value ±2 percent of the maximum torque observed. For example, mode 4 torque shall be held between 48 and 52 percent of maximum torque (50 ±2%).

(c) If the operating conditions specified in paragraph (b) of this section for modes 3, 4, 5, 9, 10, and 11 cannot be maintained, the Administrator may authorize deviations from the specified load conditions. Such deviations shall not exceed 10 percent of the maximum torque at the test speed. The minimum deviations, above and below the specified load, necessary for stable operation shall be determined by the manufacturer and approved by the Administrator prior to the test run. Emission tests shall be performed at each of the approved load settings, one above and one below the operating conditions

specified in paragraph (a) of this section. The emission values obtained shall be calculated in accordance with § 86.345 except that the weighting factor shall be 0.04.

(d) If the Administrator determines that an engine shall be tested as an automatic transmission code engine, then a load shall be applied by the dynamometer during the idle modes (1, 7, and 13) such that the engine speed is decreased from the recommended dynamometer-idle speed to the recommended curb-idle speed. The engine-idle torque recorded for the calculations in § 86.345 shall be zero.

§ 86.337-79 Information.

The following information, as applicable, shall be recorded for each test:

(a) *Engine description and specification.* A copy of the information specified in this paragraph must accompany each engine sent to the Administrator