

(b) The overall test consists of prescribed sequences of fueling, parking, and operating conditions.

(c) The exhaust emission test is designed to determine hydrocarbon (gasoline-fueled, natural gas-fueled and liquefied petroleum gas-fueled motorcycles), methanol, formaldehyde, and hydrocarbon (methanol-fueled motorcycles), carbon monoxide and oxides of nitrogen mass emissions while simulating an average trip in an urban area. The test consists of engine startups and motorcycle operation on a chassis dynamometer, through a specified driving schedule. A proportional part of the diluted exhaust emissions is collected continuously for subsequent analysis, using a constant volume (variable dilution) sampler.

(d) Except in cases of component malfunction or failure, all emission control systems installed on or incorporated in a new motorcycle shall be functioning during all procedures in this subpart. Maintenance to correct component malfunction or failure shall be authorized in accordance with subpart E of this part.

(e) Background concentrations are measured for all species for which emissions measurements are made. For exhaust testing, this requires sampling and analysis of the dilution air. (When testing methanol-fueled motorcycles, manufacturers may choose not to measure background concentrations of methanol and/or formaldehyde, and then assume that the concentrations are zero during calculations.)

[54 FR 14551, Apr. 11, 1989, as amended at 59 FR 48515, Sept. 21, 1994; 60 FR 34357, June 30, 1995]

#### § 86.528-78 Transmissions.

(a) Vehicles equipped with transfer cases, multiple sprockets, etc., shall be tested in the manufacturer's recommended configuration for street or highway use. If more than one configuration is recommended or if the recommendation is deemed unreasonable by the Administrator, the Administrator will specify the test configuration.

(b) All tests shall be conducted with automatic transmissions in "Drive" (highest gear). Automatic clutch-torque converter transmissions may be

shifted as manual transmissions at the option of the manufacturer.

(c) Idle modes shall be run with automatic transmissions in "Drive" and the wheels braked, manual transmission shall be in gear with the clutch disengaged; except first idle, see §§ 86.536 and 86.537.

(d) The vehicle shall be driven with minimum throttle movement to maintain the desired speed. No simultaneous use of brake and throttle shall be permitted.

(e) Acceleration modes shall be driven smoothly. Automatic transmissions shall shift automatically through the normal sequence of gears; manual transmissions shall be shifted as recommended by the manufacturer to the ultimate purchaser (unless determined to be unreasonable by the Administrator) with the operator closing the throttle during each shift and accomplishing the shift with minimum time. If the vehicle cannot accelerate at the specified rate, the vehicle shall be operated with the throttle fully opened until the vehicle speed reaches the value prescribed for that time in the driving schedule.

(f) The deceleration modes shall be run in gear using brakes or throttle as necessary to maintain the desired speed. Manual transmission vehicles shall be downshifted using the same shift points as when upshifting or as recommended by the manufacturer in the vehicle owner's manual. All downshifts shall be made smoothly, disengaging the clutch while shifting and engaging the clutch once the lower gear has been selected. For those modes which require the vehicle to decelerate to zero, manual transmission clutches shall be disengaged when the speed drops below 15 km/h (9.3 mph) for vehicles with engine displacements equal to or greater than 280 cc (17.1 cu. in.), when the speed drops below 10 km/h (6.2 mph) for vehicles with engine displacements less than 280 cc (17.1 cu. in.), when engine roughness is evident, or when engine stalling is imminent.

(g) If downshifting during deceleration is not permitted in the vehicle owner's manual, manual transmissions will be downshifted at the beginning of or during a power mode if recommended by the manufacturer or if

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the engine obviously is lugging. For those modes which require these vehicles to decelerate to zero, manual transmission clutches shall be disengaged when the speed drops below 25 km/h (15.5 mph) for vehicles with engine displacement equal to or greater than 280 cc (17.1 cu. in.), when the speed drops below 20 km/h (12.4 mph) for vehicles with engine displacements less than 280 cc (17.1 cu. in.), when engine roughness is evident, or when engine stalling is imminent. While the clutch is disengaged and during these deceleration modes, the vehicle shall be shifted to the appropriate gear for starting the next mode.

(h) If shift speeds are not recommended by the manufacturer, manual transmission vehicles shall be shifted as follows:

(1) For Class I and II motorcycles:

Shift	Speed
1st to 2d gear .....	19 km/h (11.8 mi/h).
2d to 3d gear .....	33 km/h (20.5 mi/h).
3d to 4th gear .....	44 km/h (27.3 mi/h).
4th to 5th gear .....	53 km/h (32.9 mi/h).

(2) For Class III motorcycles:

Shift	Speed
1st to 2d gear .....	30 km/h (18.6 mi/h).
2d to 3d gear .....	45 km/h (28.0 mi/h).
3d to 4th gear .....	60 km/h (37.3 mi/h).
4th to 5th gear .....	75 km/h (46.6 mi/h).

(3) Higher gears may be used at the manufacturer's option.

§ 86.529-78 Road load force and inertia weight determination.

(a) Road load as a function of speed is given by the following equation:

$$F = A + CV^2$$

The values for coefficients *A* and *C* and the test inertia are given in Figure F78-9. Velocity (*V*) is in km/h and force (*F*) is in newtons. The forces given by this equation shall be simulated to the best ability of the equipment being used.

(b) The inertia given in Figure F78-9 shall be used. Motorcycles with loaded vehicle mass outside these limits shall be tested at an equivalent inertial mass and road load force specified by the Administrator.

FIGURE F78-9

Loaded vehicle mass (kg)	Equivalent inertial mass (kg)	Force coefficients		Force at 65 km/h (nt)	70 to 60 kn/h coastdown calibration times		
		A (nt)	C (nt/(km/h) <sup>2</sup> )		Target time (sec)	Allowable tolerance	
						Longest time (sec)	Shortest time (sec)
95-105 .....	100	0.0	0.224	94.8	2.95	3.1	2.8
106-115 .....	110	0.82	.0227	96.8	3.18	3.3	3.0
116-125 .....	120	1.70	.0230	98.8	3.39	3.6	3.2
126-135 .....	130	2.57	.0233	100.9	3.60	3.8	3.4
136-145 .....	140	3.44	.0235	102.9	3.80	4.0	3.6
146-155 .....	150	4.32	0.230	104.9	3.99	4.2	3.8
156-165 .....	160	5.19	.0241	107.0	4.10	4.4	4.0
166-175 .....	170	6.06	.0244	109.0	4.36	4.6	4.2
176-185 .....	180	6.94	.0246	111.0	4.53	4.7	4.3
186-195 .....	190	7.81	.0249	113.1	4.69	4.9	4.5
196-205 .....	200	8.69	.0252	115.1	4.85	5.1	4.6
206-215 .....	210	9.56	.0255	117.1	5.00	5.2	4.8
216-225 .....	220	10.43	.0257	119.2	5.15	5.4	4.9
226-235 .....	230	11.31	.0260	121.2	5.30	5.5	5.1
236-245 .....	240	12.18	.0263	123.2	5.43	5.7	5.2
246-255 .....	250	13.06	.0266	125.3	5.57	5.8	5.4
256-265 .....	260	13.93	.0268	127.3	5.70	5.9	5.5
266-275 .....	270	14.80	.0271	129.3	5.82	6.1	5.6
276-285 .....	280	15.68	.0274	131.4	5.95	6.2	5.7
286-295 .....	290	16.55	.0277	133.4	6.06	6.3	5.8
296-305 .....	300	17.43	.0279	135.4	6.18	6.4	6.0
306-315 .....	310	18.39	.0282	137.5	6.29	6.5	6.1
316-325 .....	320	19.17	.0285	139.5	6.40	6.6	6.2
326-335 .....	330	30.05	.0288	141.6	6.50	6.7	6.3
336-345 .....	340	20.92	.0290	143.6	6.60	6.8	6.4
346-355 .....	350	21.80	.0293	145.6	6.70	6.9	6.5
356-365 .....	360	22.67	.0296	147.7	6.80	7.0	6.6
366-375 .....	370	23.54	.0299	149.7	6.89	7.1	6.7
376-385 .....	380	24.42	.0301	151.7	6.98	7.2	6.8