§ 1066.201 Dynamometer overview.

This subpart addresses chassis dynamometers and related equipment.

§ 1066.210 Dynamometers.

(a) General requirements. A chassis dynamometer typically uses electrically generated load forces combined with its rotational inertia to recreate the mechanical inertia and frictional forces that a vehicle exerts on road surfaces (known as “road load”). Load forces are calculated using vehicle-specific coefficients and response characteristics. The load forces are applied to the vehicle tires by rolls connected to intermediate motor/absorbers. The dynamometer uses a load cell to measure the forces the dynamometer rolls apply to the vehicle’s tires.

(b) Accuracy and precision. The dynamometer’s output values for road load must be NIST-traceable. We may determine traceability to a specific international standards organization to be sufficient to demonstrate NIST-traceability. The force-measurement system must be capable of indicating force readings to a resolution of ±0.05% of the maximum forces simulated by the dynamometer or ±0.9 N (±0.2 lbf), whichever is greater, during a test.

(c) Test cycles. The dynamometer must be capable of fully simulating applicable test cycles for the vehicles being tested as referenced in the corresponding standard-setting part.

(1) For vehicles with a gross vehicle weight rating (GVWR) at or below 14,000 lbs, the dynamometer must be able to fully simulate a driving schedule with a maximum speed of 36 m/s (80 mph) and a maximum acceleration rate of 3.6 m/s² (8 mph/s) in two-wheel drive and four-wheel drive configurations.

(2) For vehicles with GVWR above 14,000 lbs, the dynamometer must be able to fully simulate a driving schedule with a maximum speed of 29 m/s (65 mph) and a maximum acceleration rate of 1.3 m/s² (3 mph/s) in either two-wheel drive or four-wheel drive configurations.

(d) Component requirements. The dynamometer must meet the following specifications:

(1) For vehicles with GVWR at or below 14,000 lbs, the nominal roll diameter must be 1.20 to 1.25 meters. The dynamometer must have an independent drive roll for each axle being driven by the vehicle during an emission test.

(2) For vehicles with GVWR above 14,000 lbs, the nominal roll diameter must be at least 1.20 meters and no greater than 3.10 meters. The dynamometer must have an independent drive roll for each axle, except that two drive axles may share a single drive roll. Use good engineering judgment to ensure that the dynamometer roll diameter is large enough to provide sufficient tire-roll contact area to avoid tire overheating and power losses from tire-roll slippage.

(3) If you measure force and speed at 10 Hz or faster, you may use good engineering judgment to convert those measurements to 1-Hz, 2-Hz, or 5-Hz values.

(4) The load applied by the dynamometer simulates forces acting on the vehicle during normal driving according to the following equation: