

§ 1066.240

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(ii) Repeat the steps in paragraph (c)(1)(i) of this section for the maximum speed expected during testing and at least two additional evenly spaced speed points between the starting speed and the maximum speed point.

(iii) Compare the calculated roll speed, v_{act} , to each corresponding speed set point, v_{ref} , to determine values for speed error at each set point, v_{error} , using the following equation:

$$v_{error} = v_{act} - v_{ref}$$

Eq. 1066.235-2

Example;

$$v_{act} = 8.3053 \text{ m/s}$$

$$v_{ref} = 8.3000 \text{ m/s}$$

$$v_{error} = 8.3053 - 8.3000 = 0.0053 \text{ m/s}$$

(2) *Frequency method.* Install a piece of tape in the shape of an arrowhead on the surface of the dynamometer roll near the outer edge. Put a reference mark on the deck plate in line with the tape. Install a stroboscope or photo tachometer on the deck plate and direct the flash toward the tape on the roll. The stroboscope or photo tachometer must be calibrated according to the instrument manufacturer's instructions and be capable of measuring with enough accuracy to perform the procedure as specified in this paragraph (c)(2). Determine the speed error as follows:

(i) Set the dynamometer to speed-control mode. Set the dynamometer speed to a speed value of approximately 4.5 m/s (10 mph). Tune the stroboscope or photo tachometer until the signal matches the dynamometer roll speed. Record the frequency. Determine the roll speed, y_{act} , using Eq. 1066.235-1, using the stroboscope or photo tachometer's frequency for f .

(ii) Repeat the steps in paragraph (c)(2)(i) of this section for the maximum speed expected during testing and at least two additional evenly spaced speed points between the starting speed and the maximum speed point.

(iii) Compare the calculated roll speed, v_{act} , to each corresponding speed set point, v_{ref} , to determine values for speed error at each set point, y_{error} , using Eq. 1066.235-2.

(d) *Performance evaluation.* The speed error determined in paragraph (c) of this section may not exceed ± 0.02 m/s at any speed set point.

§ 1066.240 Torque transducer verification.

Verify torque-measurement systems by performing the verifications described in §§ 1066.270 and 1066.275.

§ 1066.245 Response time verification.

(a) *Overview.* This section describes how to verify the dynamometer's response time to a step change in tractive force.

(b) *Scope and frequency.* Perform this verification upon initial installation, within 370 days before testing (i.e., annually), and after major maintenance.

(c) *Procedure.* Use the dynamometer's automated process to verify response time. You may perform this test either at two different inertia settings corresponding approximately to the minimum and maximum vehicle weights you expect to test or using base inertia and two acceleration rates that cover the range of acceleration rates experienced during testing (such as 0.5 and 8 mph/s). Use good engineering judgment to select road-load coefficients representing vehicles of the appropriate weight. Determine the dynamometer's settling response time, t_s , based on the point at which there are no measured results more than 10% above or below the final equilibrium value, as illustrated in Figure 1 of this section. The observed settling response time must be less than 100 milliseconds for each inertia setting.