

your ability to show that engines comply with all applicable emission standards.

§ 1065.378 NO₂-to-NO converter conversion verification.

(a) *Scope and frequency.* If you use an analyzer that measures only NO to determine NO_x, you must use an NO₂-to-NO converter upstream of the analyzer. Perform this verification after installing the converter, after major maintenance and within 35 days before an emission test. This verification must be repeated at this frequency to verify that the catalytic activity of the NO₂-to-NO converter has not deteriorated.

(b) *Measurement principles.* An NO₂-to-NO converter allows an analyzer that measures only NO to determine total NO_x by converting the NO₂ in exhaust to NO.

(c) *System requirements.* An NO₂-to-NO converter must allow for measuring at least 95% of the total NO₂ at the maximum expected concentration of NO₂.

(d) *Procedure.* Use the following procedure to verify the performance of a NO₂-to-NO converter:

(1) *Instrument setup.* Follow the analyzer and NO₂-to-NO converter manufacturers' start-up and operating instructions. Adjust the analyzer and converter as needed to optimize performance.

(2) *Equipment setup.* Connect an ozonator's inlet to a zero-air or oxygen source and connect its outlet to one port of a 4-way cross fitting. Connect an NO span gas to another port. Connect the NO₂-to-NO converter inlet to another port, and connect an overflow vent line to the last port.

(3) *Adjustments.* Take the following steps to make adjustments:

(i) With the NO₂-to-NO converter in the bypass mode (i.e., NO mode) and the ozonator off, adjust the NO and zero-gas flows so the NO concentration at the analyzer is at the peak total NO_x concentration expected during testing. Verify that gas is flowing out of the overflow vent.

(ii) With the NO₂-to-NO converter still in the bypass mode, turn on the ozonator and adjust the ozonator so the NO concentration measured by the analyzer decreases by the same amount as maximum concentration of NO₂ ex-

pected during testing. This ensures that the ozonator is generating NO₂ at the maximum concentration expected during testing.

(4) *Data collection.* Maintain the ozonator adjustment in paragraph (d)(3) of this section, and keep the NO_x analyzer in the NO only mode (i.e., bypass the NO₂-to-NO converter).

(i) Allow for stabilization, accounting only for transport delays and instrument response.

(ii) Calculate the mean of 30 seconds of sampled data from the analyzer and record this value as NO_{ref}.

(iii) Switch the analyzer to the total NO_x mode (that is, sample with the NO₂-to-NO converter) and allow for stabilization, accounting only for transport delays and instrument response.

(iv) Calculate the mean of 30 seconds of sampled data from the analyzer and record this value as NO_{xmeas}.

(v) Turn off the ozonator and allow for stabilization, accounting only for transport delays and instrument response.

(vi) Calculate the mean of 30 seconds of sampled data from the analyzer and record this value as NO_{xref}.

(5) *Performance evaluation.* Divide the quantity of (NO_{xmeas} - NO_{ref}) by the quantity of (NO_{xref} - NO_{ref}). If the result is less than 95%, repair or replace the NO₂-to-NO converter.

(e) *Exceptions.* The following exceptions apply:

(1) You may omit this verification if you can show by engineering analysis that for your NO_x sampling system and your emission calculations procedures, the converter always affects your brake-specific NO_x emission results by less than 0.5% of the applicable NO_x standard.

(2) You may use a converter that you determine does not meet this verification, as long as you try to correct the problem and the measurement deficiency does not adversely affect your ability to show that engines comply with all applicable emission standards.

PM MEASUREMENTS

§ 1065.390 PM balance verifications and weighing process verification.

(a) *Scope and frequency.* This section describes three verifications. The first