that using these procedures would result in measurements that are significantly unrepresentative and that changes to the procedures will result in more representative measurements that do not decrease the stringency of emission standards or other requirements, we will specify changes to the procedures. In your notification to us, you should recommend specific changes you think are necessary.

(ii) You may ask to use emission data collected using other test procedures, such as those of the California Air Resources Board or the International Organization for Standardization. We will allow this only if you show us that these data are equivalent to data collected using our test procedures.

(iii) You may ask to use alternate procedures that produce measurements equivalent to those obtained using the specified procedures. In this case, send us a written request showing that your alternate procedures are equivalent to the test procedures of this part. If you prove to us that the procedures are equivalent, we will allow you to use them. You may not use alternate procedures until we approve them.

(iv) You may ask to use special test procedures if your vehicle cannot be tested using the specified test procedures (for example, it is incapable of operating on the specified transient cycle). In this case, send us a written request showing that you cannot satisfactorily test your engines using the test procedures of this part. We will allow you to use special test procedures if we determine that they would produce emission measurements that are representative of those that would result from measuring emissions during in-use operation. You may not use special procedures until we approve them.

[67 FR 68347, Nov. 8, 2002, as amended at 69 FR 2442, Jan. 15, 2004; 70 FR 40499, July 13, 2005]

§ 1051.505 What special provisions apply for testing snowmobiles?

Use the following special provisions for testing snowmobiles:

(a) You may perform steady-state testing with either discrete-mode or ramped-modal cycles. You must use the type of testing you select in your application for certification for all testing you perform for that engine family. If we test your engines to confirm that they meet emission standards, we will do testing the same way. We may also perform other testing as allowed by the Clean Air Act. Measure steady-state emissions as follows:

(1) For discrete-mode testing, sample emissions separately for each mode, then calculate an average emission level for the whole cycle using the weighting factors specified for each mode. In each mode, operate the engine for at least 5 minutes, then sample emissions for at least 1 minute. Calculate cycle statistics for the sequence of modes and compare with the specified values in 40 CFR 1065.514 to confirm that the test is valid.

(2) For ramped-modal testing, start sampling at the beginning of the first mode and continue sampling until the end of the last mode. Calculate emissions and cycle statistics the same as for transient testing.

(3) Measure emissions by testing the engine on a dynamometer with one or more of the following sets of duty cycles to determine whether it meets the steady-state emission standards in § 1051.103:

(i) The following duty cycle applies for discrete-mode testing:

TABLE 1 OF § 1051.505—5-MODE DUTY CYCLE FOR SNOWMOBILES

Mode No.	Speed (percent) [1]	Torque (percent) [2]	Minimum time in mode (minutes)	Weighting factors
1	100	100	3.0	0.12
2	85	51	3.0	0.27
3	75	33	3.0	0.25
4	65	19	3.0	0.31
5	([3])	0	3.0	0.05

[1] Percent speed is percent of maximum test speed.

[2] Percent torque is percent of maximum test torque at maximum test speed.
[3] Idle.

(ii) The following duty cycle applies for ramped-modal testing:

TABLE 2 OF § 1051.505—RAMPED-MODAL CYCLE FOR TESTING SNOWMOBILES

RMC mode	Time in mode	Speed (percent) [1]	Torque (percent) [2,3]
1a Steady-state	27	Warm Idle	0
1b Transition	20	Linear Transition	Linear Transition.
2a Steady-state	121	100	100
2b Transition	20	Linear Transition	Linear Transition.
3a Steady-state	347	65	19
3b Transition	20	Linear Transition	Linear Transition.
4a Steady-state	305	85	51
4b Transition	20	Linear Transition	Linear Transition.
5a Steady-state	272	5	33
5b Transition	20	Linear Transition	Linear Transition.
6 Steady-state	28	Warm Idle	0

[1] Percent speed is percent of maximum test speed.
[2] Advance from one mode to the next within a 20-second transition phase. During the transition phase, command a linear progression from the torque setting of the current mode to the torque setting of the next mode.
[3] Percent torque is percent of maximum test torque at maximum test speed.

(b) During idle mode, operate the engine with the following parameters:

(1) Hold the speed within your specifications.

(2) Keep the throttle at the idle-stop position.

(3) Keep engine torque under 5 percent of maximum test torque.

(c) For the full-load operating mode, operate the engine at wide-open throttle.

(d) Ambient temperatures during testing must be between 20 °C and 30 °C (68 °F and 86 °F), or other representative test temperatures, as specified in paragraph (f) of this section.

(e) See 40 CFR part 1065 for detailed specifications of tolerances and calculations.

(f) You may test snowmobiles at ambient temperatures below 20 °C or using intake air temperatures below 20 °C if you show that such testing complies with 40 CFR 1065.10(c)(1). You must get our approval before you begin the emission testing. For example, the following approach would be appropriate to show that such testing complies with 40 CFR 1065.10(c)(1):

(1) Using good engineering judgment, instrument a representative snowmobile built with a representative engine from the family being tested with an appropriate temperature measuring device located in the intake air plenum where fuel spitback is not likely to occur.

(2) Choose a time and location with the following weather conditions: windspeed less than 10 knots, no falling precipitation, air temperature between −20 °C and 0 °C (−4 °F and 32 °F).

(3) Operate the snowmobile until its engine reaches a steady operating temperature.

(4) Operate the snowmobile on a level surface free of other vehicle traffic. Operate the snowmobile at each specified engine speed corresponding to each mode in the emissions test specific to the engine being tested. When readings are stable, record the temperature in the intake air plenum and the ambient temperature. Calculate the temperature difference between the air in the plenum and the ambient air for each mode.

(5) Calculate the nominal intake air test temperature for each test mode as −10 °C (14 °F) plus the temperature difference for the corresponding mode determined in paragraph (f)(4) of this section.

(6) Before the emissions test, select the appropriate carburetor jetting for −10 °C (14 °F) conditions according to the jet chart. For each mode, maintain the inlet air temperature within 5 °C (9

°F) of the corresponding modal temperature calculated in paragraph (f)(5) of this section.

(7) Adjust other operating parameters to be consistent with operation at −10 °C (14 °F). For example, this may require that you modify the engine cooling system used in the laboratory to make its performance representative of cold-temperature operation.

[67 FR 68347, Nov. 8, 2002, as amended at 70 FR 40500, July 13, 2005]

§ 1051.510 What special provisions apply for testing ATV engines? [Reserved]

§ 1051.515 How do I test my fuel tank for permeation emissions?

Measure permeation emissions by weighing a sealed fuel tank before and after a temperature-controlled soak.

(a) *Preconditioning fuel soak.* To precondition your fuel tank, follow these five steps:

(1) Fill the tank with the fuel specified in §1051.501(d)(2)(i), seal it, and allow it to soak at 28 ±5 °C for 20 weeks. Alternatively, the tank may be soaked for a shorter period of time at a higher temperature if you can show that the hydrocarbon permeation rate has stabilized.

(2) Determine the fuel tank's internal surface area in square-meters accurate to at least three significant figures. You may use less accurate estimates of the surface area if you make sure not to overestimate the surface area.

(3) Fill the fuel tank with the test fuel specified in §1051.501(d)(2)(ii) to its nominal capacity. If you fill the tank inside the temperature-controlled room or enclosure, do not spill any fuel.

(4) Allow the tank and its contents to equilibrate to 28 ±2 °C.

(5) Seal the fuel tank using fuel caps and other fittings (excluding petcocks) that can be used to seal openings in a production fuel tank. In cases where openings are not normally sealed on the fuel tank (such as hose-connection fittings and vents in fuel caps), these openings may be sealed using nonpermeable fittings such as metal or fluoropolymer plugs.

(b) *Permeation test run.* To run the test, take the following steps for a tank that was preconditioned as specified in paragraph (a) of this section:

(1) Weigh the sealed fuel tank and record the weight to the nearest 0.1 grams. You may use less precise weights as long as the difference in mass from the start of the test to the end of the test has at least three significant figures. Take this measurement within 8 hours of filling the tank with test fuel as specified in paragraph (a)(3) of this section.

(2) Carefully place the tank within a ventilated, temperature-controlled room or enclosure. Do not spill or add any fuel.

(3) Close the room or enclosure and record the time.

(4) Ensure that the measured temperature in the room or enclosure is 28 ±2 °C.

(5) Leave the tank in the room or enclosure for 14 days.

(6) Hold the temperature of the room or enclosure to 28 ±2 °C; measure and record the temperature at least daily.

(7) At the end of the soak period, weigh the sealed fuel tank and record the weight to the nearest 0.1 grams. You may use less precise weights as long as the difference in mass from the start of the test to the end of the test has at least three significant figures. Unless the same fuel is used in the preconditioning fuel soak and the permeation test run, record weight measurements on five separate days per week of testing. The test is void if a linear plot of tank weight vs. test days for the full soak period for permeation testing specified in paragraph (b)(5) of this section yields r^2 below 0.8. See 40 CFR 1065.602 for the equation to calculate r^2.

(8) Subtract the weight of the tank at the end of the test from the weight of the tank at the beginning of the test; divide the difference by the internal surface area of the fuel tank. Divide this g/m^2 value by the number of test days (using at least three significant figures) to calculate the g/m^2/day emission rate. Example: If a tank with an internal surface area of 0.72 m^2 weighed 31882.3 grams at the beginning of the test and weighed 31813.8 grams after soaking for 14.03 days, then the g/m^2/day emission rate would be—