(j) Test cell barometric pressure and humidity. You may use a central laboratory barometer if the barometric pressure in each test cell is shown to be within ±0.1% of the barometric pressure at the central barometer location.

(k) Records to verify compliance with the ambient temperature requirements throughout the test procedure and records of fuel temperatures during the running loss test.

(l) [Reserved]

(m) For CVS systems, record dilution factor for each test interval and the following additional information:

(1) For CFV and SSV testing, \( V_{\text{mix}} \) for each interval of the exhaust test.

(2) For PDP testing, test measurements required to calculate \( V_{\text{mix}} \) for each test interval.

(n) The humidity of the dilution air, if you remove \( \text{H}_2\text{O} \) from an emission sample before measurement.

(o) Temperature of the dilute exhaust mixture and secondary dilution air (in the case of a double-dilution system) at the inlet to the respective gas meter or flow instrumentation used for PM sampling. Determine minimum values, maximum values, mean values, and percent of time outside of the tolerance over each test interval.

(p) The maximum exhaust gas temperature over the course of the test interval within 20 cm upstream or downstream of PM sample media.

(q) If applicable, the temperatures of the heated FID, the gas in the heated sample line, and the heated filter. Determine minimum values, maximum values, average values, and percent of time outside of the tolerance over each test interval.

(r) Gas meter or flow measurement instrumentation readings used for batch sampling over each test interval. Determine minimum, maximum, and average values over each test interval.

(s) The stabilized pre-test weight and post-test weight of each particulate sample media (e.g., filter).

(t) Continuous temperature and humidity of the ambient air in which the PM sample media are stabilized. Determine minimum values, maximum values, average values, and percent of time outside of the tolerance over each test interval.

(u) For vehicles fueled by natural gas, the test fuel composition, including all carbon-containing compounds (including \( \text{CO}_2 \), but excluding \( \text{CO} \)). Record \( C_1 \) and \( C_2 \) compounds individually. You may record \( C_3 \) through \( C_5 \) hydrocarbons together, and you may record \( C_6 \) and heavier hydrocarbon compounds together.

(v) For vehicles fueled by liquefied petroleum gas, the test fuel composition, including all carbon-containing compounds (including \( \text{CO}_2 \), but excluding \( \text{CO} \)). Record \( C_1 \) through \( C_4 \) compounds individually. You may record \( C_5 \) and heavier hydrocarbons together.

(w) For the AC17 test in §1066.845, interior volume, climate control system type and characteristics, refrigerant used, compressor type, and evaporator/condenser characteristics.

(x) Additional information related to evaporative emissions. [Reserved]

(y) Additional information related to refueling emissions. [Reserved]

Subpart H—Cold Temperature Test Procedures

§1066.701 Applicability and general provisions.

(a) The procedures of this part 1066 may be used for testing at any ambient temperature. Section 1066.710 describes the provisions that apply for testing vehicles at a nominal temperature of 20 °C (68 °F); these procedures apply for motor vehicles as described in 40 CFR Part 86, subpart S, and 40 CFR Part 600. For other vehicles, see the standard-setting part to determine if your vehicle is required to meet emission standards outside the normal (20 to 30) °C ((68 to 86) °F) temperature range.

(b) Do not apply the humidity correction factor in §1066.615(a) for cold temperature testing.

§1066.710 Cold temperature testing procedures for measuring CO and NMHC emissions and determining fuel economy.

This section describes procedures for measuring carbon monoxide (CO) and nonmethane hydrocarbon (NMHC) emissions and determining fuel economy on a cold day using the FTP test cycle (see §1066.801). The following figure illustrates the test procedure:
(a) Follow the exhaust emission measurement procedures specified in §§ 1066.410 through § 1066.425 and § 1066.815(d), subject to the following exceptions and additional provisions:

<table>
<thead>
<tr>
<th>Step</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Winter grade fuel (optional use of FTP fuel by manufacturer)</td>
</tr>
<tr>
<td>2*</td>
<td>Full UDDS (optional use of higher temperature by manufacturer)</td>
</tr>
<tr>
<td>3</td>
<td>No time specifications</td>
</tr>
<tr>
<td>4*</td>
<td>Oil temperature at -7.0 ± 1.7 °C</td>
</tr>
<tr>
<td>5*</td>
<td>12 to 36 hours</td>
</tr>
<tr>
<td>6*</td>
<td>1 hour minimum</td>
</tr>
<tr>
<td>7</td>
<td>Full UDDS</td>
</tr>
<tr>
<td>8*</td>
<td>On dynamometer</td>
</tr>
<tr>
<td></td>
<td>Partial UDDS (first 505 s)</td>
</tr>
</tbody>
</table>

Note: If vehicle leaves -7.0 °C soak area to transfer to -7.0 °C test area and passes through a warm area (<-4.0 °C), it must be reestablished in the test cell for six times the period it was exposed to the warmer temperature.

*Temperature Specifications:
- Average: -7.0 ± 1.7 °C
- Minimum excursions: -12.0 °C, -1.0 °C
- Three-minute excursions: -9.0 °C, -5.0 °C

Figure 1 of § 1066.710 — Cold temperature testing sequence for measuring CO and NMHC emissions and determining fuel economy
(1) Measure and control ambient conditions as specified in paragraph (b) of this section.
(2) Use the vehicle’s heater and defroster as specified in paragraph (c) of this section.
(3) Precondition and stabilize the vehicle as specified in paragraphs (d) and (e) of this section. Ensure that there is no precipitation or dew on the vehicle before the emission test.
(4) For dynamometers that have independently heated bearings, start the emission test within 20 minutes after warming up the dynamometer; for other types of dynamometers, start the emission test within 10 minutes after warming up the dynamometer.
(5) Adjust the dynamometer to simulate vehicle operation on the road at \(-7 \, ^\circ C\). Base this adjustment on the road-load force profile at \(-7 \, ^\circ C\), or on a 10 percent decrease in the target coastdown time used for FTP testing.
(6) Analyze samples for NMHC, CO, and CO\(_2\). You do not need to analyze samples for other pollutants.
(1) Maintain ambient conditions as follows instead of following the specifications in subpart E of this part:
(A) Temperature for emission tests. Measure and record ambient temperature in the test cell at least once every 60 seconds during the sampling period. The temperature must be \((-7.0 \pm 1.7) \, ^\circ C\) at the start of the test and average temperature must be \((-7.0 \pm 2.8) \, ^\circ C\) during the test. Instantaneous temperature values may be above \(-4.0 \, ^\circ C\) or below \(-9.0 \, ^\circ C\), but not for more than 3 minutes at a time during the test.
(B) Temperature for preconditioning. Instantaneous ambient temperature values may be above \(-4.0 \, ^\circ C\) or below \(-9.0 \, ^\circ C\) but not for more than 3 minutes at a time during the preconditioning period. At no time may the ambient temperatures be below \(-12.0 \, ^\circ C\) or above \(-1.0 \, ^\circ C\). The average ambient temperature during preconditioning must be \((-7.0 \pm 2.8) \, ^\circ C\). You may precondition vehicles at temperatures above \(-7.0 \, ^\circ C\) or with a temperature tolerance greater than that described in this section (or both) if you determine that this will not cause NMHC, CO, or CO\(_2\) emissions to decrease; if you modify the temperature specifications for vehicle preconditioning, adjust the procedures described in this section appropriately for your testing.
(C) Ambient humidity. Maintain humidity low enough to prevent condensation on the dynamometer rolls during testing.
(D) Heat and defroster. During the test, operate the vehicle’s interior climate control system with the heat on and set to primarily defrost the front window. Turn air conditioning off. You may not use any supplemental auxiliary heat during this testing. You may set the heater to any temperature and fan setting during vehicle preconditioning.
(1) Manually controlled systems. (i) Prior to the first acceleration, 20 seconds after the start of the UDDS, set the climate control as follows (these settings may be initiated prior to starting the vehicle if allowed by the vehicle’s climate control system):
(A) Temperature. Set controls to maximum heat.
(B) Fan speed. Set the fan speed to full off or the lowest available speed if a full off position is not available.
(C) Airflow direction. Direct airflow to the front window (window defrost mode).
(D) Air source. If independently controllable, set the system to draw in outside air.
(ii) At the second idle of the test cycle, which occurs 125 seconds after the start of the test, set the fan speed to maximum. Complete by 130 seconds after the start of the test. Leave temperature and air source settings unchanged.
(iii) At the sixth idle of the test interval, which occurs at the deceleration to zero miles per hour 505 seconds after the start of the test, set the fan speed to the lowest setting that maintains air flow. Complete these changes by 510 seconds after the start of the test. You may use different vent and fan speed settings for the remainder of the test. Leave the temperature and air source settings unchanged.
(2) Automatic control systems. For vehicles with automatic control systems, you may follow the provisions of paragraph (c)(1) of this section or you may set the temperature to 72 \, ^\circ F and the air flow control to the front window defrost mode for the whole test.
(3) **Multiple-zone systems.** For vehicles that have separate driver and passenger controls or separate front and rear controls, you must set all temperature and fan controls as described in paragraphs (c)(1) and (2) of this section, except that rear controls need not be set to defrost the front window.

(4) **Alternative test procedures.** We may approve the use of other settings under 40 CFR 86.1840 if a vehicle’s climate control system is not compatible with the provisions of this section.

(d) Take the following steps to prepare and precondition vehicles for testing under this section:

(1) Prepare the vehicle as described in §1066.810(a).

(2) Fill the fuel tank to approximately 40% of the manufacturer’s nominal fuel tank capacity with the appropriate test fuel for cold temperature testing as specified 40 CFR Part 1065, subpart H. The temperature of the dispensed test fuel must be at or below 15.5 °C. If the leftover fuel in the fuel tank before the refueling event does not meet these specifications, drain the fuel tank before refueling. You may operate the vehicle prior to the preconditioning drive to eliminate fuel effects on adaptive memory systems.

(3) You may start the preconditioning drive once the fuel in the fuel tank reaches (12.6 to −1.4) °C. Precondition the vehicle as follows:

(i) Push or drive the vehicle onto the dynamometer.

(ii) Operate the vehicle over one UDDS. You may perform additional vehicle preconditioning with repeated driving over the UDDS, subject to our advance approval.

(iii) Turn off the test vehicle and any cooling fans within 5 minutes after completing the preconditioning drive. Ambient temperature must be between (−12.0 and −1.0) °C in the 5 minutes following the preconditioning drive.

(iv) Do not manually purge or load the evaporative canister.

(e) Soak the vehicle for (12 to 36) hours to stabilize it at test temperatures before starting the emission test as described in paragraph (e). If you move a stabilized vehicle through a warm area when transporting it to the dynamometer for testing, you must restabilize the vehicle by holding it at an ambient temperature within the range specified in paragraph (b)(1) of this section for at least six times as long as the vehicle was exposed to warmer temperatures. Use one of the following methods to reach a stabilized condition:

(1) **Cold storage.** Measure and record ambient temperature in the test cell at least once every 60 seconds during the ambient cold soak period. These ambient temperatures may be above −4.0 °C or below −9.0 °C, but not for more than 3 minutes at a time. Use measured values to calculate an hourly average temperature. Each hourly average temperature must be (−7.0 °C ±2.8) °C.

(2) **Forced-cooling or warming.** Position fans to blow temperature-controlled air onto the vehicle to stabilize the vehicle at the specified temperatures for emission testing. Position fans to target the vehicle’s drive train, engine block, and radiator rather than the oil pan. You may not place fans under the vehicle. You may consider the vehicle to be stabilized at the test temperature when the bulk oil temperature reaches (−8.7 to −5.3) °C; measure oil temperature at one or more points away from the side or bottom surfaces of the oil pan. Each oil temperature measurement must be within the specified range before stabilization is complete. Once the vehicle reaches this stabilized condition, cold soak the vehicle within the stabilized temperature range for at least one hour before starting the emission test. During this time, keep the ambient temperature within the range specified in paragraph (b)(1) of this section.

Subpart I—Exhaust Emission Test Procedures for Motor Vehicles

§ 1066.801 Applicability and general provisions.

This subpart I specifies how to apply the test procedures of this part for light-duty vehicles, light-duty trucks, and heavy-duty vehicles at or below 14,000 pounds GVWR that are subject to chassis testing for exhaust emissions under 40 CFR Part 86, subpart S. For these vehicles, references in this part 1066 to the standard-setting part include this subpart I.