

RMC mode	Time in mode (seconds)	Engine speed	Torque (percent) <sup>1,2</sup>
1b Transition .....	20	Engine Governed .....	Linear transition.
2a Steady-state .....	101	Engine Governed .....	10.
2b Transition .....	20	Engine Governed .....	Linear transition.
3a Steady-state .....	277	Engine Governed .....	75.
3b Transition .....	20	Engine Governed .....	Linear transition.
4a Steady-state .....	339	Engine Governed .....	25.
4b Transition .....	20	Engine Governed .....	Linear transition.
5 Steady-state .....	350	Engine Governed .....	50.

<sup>1</sup> The percent torque is relative to maximum test torque.  
<sup>2</sup> 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.

EFFECTIVE DATE NOTE: At 73 FR 37241, June 30, 2008, appendix II to part 1039 was revised, effective July 7, 2008. For the convenience of the user, the revised text is set forth as follows:

APPENDIX II TO PART 1039—STEADY-STATE DUTY CYCLES

- (a) The following duty cycles apply for constant-speed engines:
  - (1) The following duty cycle applies for discrete-mode testing:

D2 mode number	Engine speed	Torque (percent) <sup>1</sup>	Weighting factors
1 .....	Engine governed .....	100	0.05
2 .....	Engine governed .....	75	0.25
3 .....	Engine governed .....	50	0.30
4 .....	Engine governed .....	25	0.30
5 .....	Engine governed .....	10	0.10

<sup>1</sup> The percent torque is relative to maximum test torque.

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

RMC mode	Time in mode (seconds)	Engine speed	Torque (percent) <sup>1, 2</sup>
1a Steady-state .....	53	Engine governed .....	100.
1b Transition .....	20	Engine governed .....	Linear transition.
2a Steady-state .....	101	Engine governed .....	10.
2b Transition .....	20	Engine governed .....	Linear transition.
3a Steady-state .....	277	Engine governed .....	75.
3b Transition .....	20	Engine governed .....	Linear transition.
4a Steady-state .....	339	Engine governed .....	25.
4b Transition .....	20	Engine governed .....	Linear transition.
5 Steady-state .....	350	Engine governed .....	50.

<sup>1</sup> The percent torque is relative to maximum test torque.  
<sup>2</sup> 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.

- (b) The following duty cycles apply for variable-speed engines with maximum engine power below 19 kW:

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

G2 mode number	Engine speed <sup>1</sup>	Torque (percent) <sup>2</sup>	Weighting factors
1 .....	Maximum test speed .....	100	0.09
2 .....	Maximum test speed .....	75	0.20
3 .....	Maximum test speed .....	50	0.29
4 .....	Maximum test speed .....	25	0.30
5 .....	Maximum test speed .....	10	0.07
6 .....	Warm idle .....	0	0.05

<sup>1</sup> Speed terms are defined in 40 CFR part 1065.  
<sup>2</sup> The percent torque is relative to the maximum torque at the commanded test speed.

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

RMC mode	Time in mode (seconds)	Engine speed <sup>1, 3</sup>	Torque (percent) <sup>2, 3</sup>
1a Steady-state .....	41	Warm idle .....	0.
1b Transition .....	20	Linear transition .....	Linear transition.

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RMC mode	Time in mode (seconds)	Engine speed <sup>1,3</sup>	Torque (percent) <sup>2,3</sup>
2a Steady-state .....	135	Maximum test speed .....	100.
2b Transition .....	20	Maximum test speed .....	Linear transition.
3a Steady-state .....	112	Maximum test speed .....	10.
3b Transition .....	20	Maximum test speed .....	Linear transition.
4a Steady-state .....	337	Maximum test speed .....	75.
4b Transition .....	20	Maximum test speed .....	Linear transition.
5a Steady-state .....	518	Maximum test speed .....	25.
5b Transition .....	20	Maximum test speed .....	Linear transition.
6a Steady-state .....	494	Maximum test speed .....	50.
6b Transition .....	20	Linear transition .....	Linear transition.
7 Steady-state .....	43	Warm idle .....	0.

<sup>1</sup> Speed terms are defined in 40 CFR part 1065.  
<sup>2</sup> The percent torque is relative to the maximum torque at the commanded engine speed.  
<sup>3</sup> 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, and simultaneously command a similar linear progression for engine speed if there is a change in speed setting.

(c) The following duty cycles apply for variable-speed engines with maximum engine power at or above 19 kW:

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

C1 mode number	Engine speed <sup>1</sup>	Torque (percent) <sup>2</sup>	Weighting factors
1 .....	Maximum test speed .....	100	0.15
2 .....	Maximum test speed .....	75	0.15
3 .....	Maximum test speed .....	50	0.15
4 .....	Maximum test speed .....	10	0.10
5 .....	Intermediate test speed .....	100	0.10
6 .....	Intermediate test speed .....	75	0.10
7 .....	Intermediate test speed .....	50	0.10
8 .....	Warm idle .....	0	0.15

<sup>1</sup> Speed terms are defined in 40 CFR part 1065.  
<sup>2</sup> The percent torque is relative to the maximum torque at the commanded test speed.

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

RMC mode	Time in mode (seconds)	Engine speed <sup>1,3</sup>	Torque (percent) <sup>2,3</sup>
1a Steady-state .....	126	Warm Idle .....	0.
1b Transition .....	20	Linear Transition .....	Linear Transition.
2a Steady-state .....	159	Intermediate Speed .....	100.
2b Transition .....	20	Intermediate Speed .....	Linear Transition.
3a Steady-state .....	160	Intermediate Speed .....	50.
3b Transition .....	20	Intermediate Speed .....	Linear Transition.
4a Steady-state .....	162	Intermediate Speed .....	75.
4b Transition .....	20	Linear Transition .....	Linear Transition.
5a Steady-state .....	246	Maximum Test Speed .....	100.
5b Transition .....	20	Maximum Test Speed .....	Linear Transition.
6a Steady-state .....	164	Maximum Test Speed .....	10.
6b Transition .....	20	Maximum Test Speed .....	Linear Transition.
7a Steady-state .....	248	Maximum Test Speed .....	75.
7b Transition .....	20	Maximum Test Speed .....	Linear Transition.
8a Steady-state .....	247	Maximum Test Speed .....	50.
8b Transition .....	20	Linear Transition .....	Linear Transition.
9 Steady-state .....	128	Warm Idle .....	0.

<sup>1</sup> Speed terms are defined in 40 CFR part 1065.  
<sup>2</sup> The percent torque is relative to the maximum torque at the commanded engine speed.  
<sup>3</sup> 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, and simultaneously command a similar linear progression for engine speed if there is a change in speed setting.

**APPENDIX III TO PART 1039—STEADY-STATE DUTY CYCLES FOR VARIABLE-SPEED ENGINES WITH MAXIMUM POWER BELOW 19 kW**

(a) The following duty cycle applies for discrete-mode testing of variable-speed engines with maximum power below 19 kW:

G2 mode number	Engine speed <sup>1</sup>	Observed torque (percent) <sup>2</sup>	Weighting factors
1 .....	Maximum test speed .....	100	0.09