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# Dynamometer Drive Schedules

On this page:


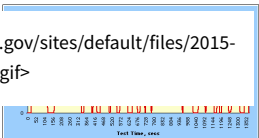
- EPA Vehicle Chassis Dynamometer Driving Schedules
- California EPA Air Resources Board Dynamometer Driving Schedules
- Economic Commission for Europe Dynamometer Operating Cycles
- Driving schedules specified in Japanese Technical Standards
- Vehicle Chassis Dynamometer Shift Schedule Formatting Guidance



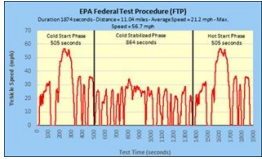
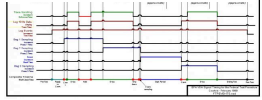






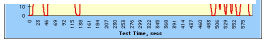
This page provides the chassis dynamometer driving schedules and shift schedules used by EPA for vehicle emissions and fuel economy testing. **This page also provides detailed information on those drive schedules in addition to technical information on drive schedules used by states, Europe, and Japan for reference.**




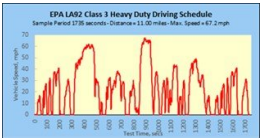

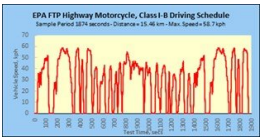
The Code of Federal Regulations <<https://epa.gov/laws-regulations/regulations#find>> is the official source of EPA’s vehicle/engine certification test procedures.

## Graphic Review of Driving Schedules






### EPA Vehicle Chassis Dynamometer Driving Schedules (DDS) – files contain tab delimited ASCII columns

<p>The EPA Urban Dynamometer Driving Schedule (UDDS) is commonly called the "city test" and represents city driving conditions. It is used for light duty vehicle testing. The UN/ECE Regulation 53 refers to the EPA UDDS as the "Test Equivalent to the Type 1 Test (verifying emissions after a cold start)."</p> <ul style="list-style-type: none"><li>•  Urban Dynamometer Driving Schedule (txt) &lt;<a href="https://www.epa.gov/sites/default/files/2015-10/uddscol.txt">https://www.epa.gov/sites/default/files/2015-10/uddscol.txt</a>&gt; (12.3 KB)</li></ul>	<p>&lt;<a href="https://epa.gov/sites/default/files/2015-10/uddsdds.gif">https://epa.gov/sites/default/files/2015-10/uddsdds.gif</a>&gt;</p>  <p>EPA Urban Dynamometer Driving Schedule (Click image to see larger.)</p>
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<p>The Federal Test Procedure (FTP) is composed of the UDDS followed by the first 505 seconds of the UDDS. It is often called the EPA75. The dynamometer portion of the test procedure has a very complex timeline of events.</p> <ul style="list-style-type: none"> <li>•  Federal Test Procedure (txt) &lt;<a href="https://www.epa.gov/sites/default/files/2015-10/ftpcol.txt">https://www.epa.gov/sites/default/files/2015-10/ftpcol.txt</a>&gt; (97.9 KB)</li> <li>•  UDDS plus first 505 seconds of UDDS (txt) &lt;<a href="https://www.epa.gov/sites/default/files/2015-10/ftp10hztable.txt">https://www.epa.gov/sites/default/files/2015-10/ftp10hztable.txt</a>&gt; (97.9 KB)</li> </ul>	  <p>Time Line for the Federal Test Procedure (Click image to see larger.)</p>
<p>The Highway Fuel Economy Driving Schedule (HWFET) represents highway driving conditions under 60 mph.</p> <ul style="list-style-type: none"> <li>•  Highway Fuel Economy Test (txt) &lt;<a href="https://www.epa.gov/sites/default/files/2015-10/hwycol.txt">https://www.epa.gov/sites/default/files/2015-10/hwycol.txt</a>&gt; (7.1 KB)</li> <li>•  HWFET plus 15 idle seconds plus HWFET (txt) &lt;<a href="https://www.epa.gov/sites/default/files/2015-10/hwy10hztable.txt">https://www.epa.gov/sites/default/files/2015-10/hwy10hztable.txt</a>&gt; (89.5 KB)</li> </ul>	 <p>EPA Highway Fuel Economy Test Driving Schedule (Click image to see larger.)</p>
<p>The New York City Cycle (NYCC) features low speed stop-and-go traffic condition</p> <ul style="list-style-type: none"> <li>•  New York City Cycle (txt) &lt;<a href="https://www.epa.gov/sites/default/files/2015-10/nycccol.txt">https://www.epa.gov/sites/default/files/2015-10/nycccol.txt</a>&gt; (4.9 KB)</li> </ul>	 <p>New York City Cycle Driving Schedule (Click image to see larger.)</p>
<p>The US06 is a high acceleration aggressive driving schedule that is often identified as the "Supplemental FTP" driving schedule.</p> <ul style="list-style-type: none"> <li>•  US06 Supplemental FTP Driving Schedule (txt) &lt;<a href="https://www.epa.gov/sites/default/files/2015-10/us06col.txt">https://www.epa.gov/sites/default/files/2015-10/us06col.txt</a>&gt; (5.6 KB)</li> </ul>	 <p>US06 or Supplemental FTP Driving Schedule (Click image to see larger.)</p>




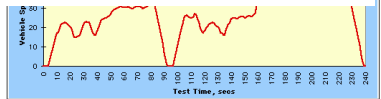
<p>The SC03 is the Air Conditioning "Supplemental FTP" driving schedule.</p> <ul style="list-style-type: none"> <li>  SC03 - a Supplemental FTP Driving Schedule (txt)   <a href="https://www.epa.gov/sites/default/files/2015-10/sc03col.txt">https://www.epa.gov/sites/default/files/2015-10/sc03col.txt</a> (5.4 KB) </li> </ul>	<p><a href="https://epa.gov/sites/default/files/2015-10/sc03dds.gif">https://epa.gov/sites/default/files/2015-10/sc03dds.gif</a></p>  <p>SC03 - Speed Correction Driving Schedule (Click image to see larger.)</p>
<p>The LA-92 is for Class 3 Heavy-Duty vehicles. The first 1,435 seconds are the Hot LA-92 driving schedule.</p> <ul style="list-style-type: none"> <li>  LA92 Heavy Duty Driving Schedule (txt) <a href="https://www.epa.gov/sites/default/files/2021-01/la92col.txt">https://www.epa.gov/sites/default/files/2021-01/la92col.txt</a> </li> </ul>	
<p>While Class II and III Highway Motorcycles (at or above 170 cc) still follow the standard FTP, Class I-B Motorcycles (50 to &lt; 170 cc) follow this reduced-speed Motorcycle FTP. It is equivalent to the standard FTP except from 164 to 332 seconds, and again from 1533 to 1701 seconds. It is represented here in kilometers per hour (kph).</p> <ul style="list-style-type: none"> <li>  Federal Test Procedure Motorcycle 1-B (txt) <a href="https://www.epa.gov/sites/default/files/2021-01/ftpmc1b.txt">https://www.epa.gov/sites/default/files/2021-01/ftpmc1b.txt</a> </li> </ul>	

## Vehicle Chassis Dynamometer Shift Schedule Formatting Guidance



- Graphics images and one hertz text files for the driver's traces for the FTP, HWFET and other drive schedules are available on this page.
- 10 Hertz Text Files for some of traces are also available on this page.
-  Sample Formatting Tool (xls) <https://www.epa.gov/sites/default/files/2015-10/ssformat.xls> (41.5 KB) for putting shift schedule data into the CFEIS shift schedule format.
-  Draft Guidance for submission of shift schedules to the NVFEL (txt) <https://www.epa.gov/sites/default/files/2015-10/ssguide.txt> (4.9 KB) .
- Example EPA 5 speed FTP, HWFET and US06 shift schedules are in the following files.
  -  EPA 5 speed FTP (txt) <https://www.epa.gov/sites/default/files/2015-10/ftp5spd.txt> (3.4 KB)
  -  EPA 5 speed HWFET (txt) <https://www.epa.gov/sites/default/files/2015-10/hwy5spd.txt> (917 bytes)
  -  US06 shift schedules (txt) <https://www.epa.gov/sites/default/files/2015-10/us065spd.txt> (2.9 KB)


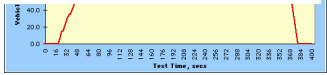

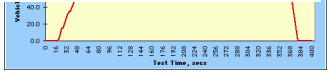
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## State Program Dynamometer Driving Schedules

<p>The California Air Resources Board uses the Hot LA-92, i.e. the first 1,435 seconds of the LA-92 Dynamometer Driving Schedule shown above as an emission inventory improvement tool. Compared to the FTP, the LA-92 has a higher top speed, a higher average speed, less idle time, fewer stops per mile, and a higher maximum rate of acceleration.</p> <ul style="list-style-type: none"> <li>•  Hot LA-92 Dynamometer Driving Schedule (txt) &lt;<a href="https://www.epa.gov/sites/default/files/2015-10/la92dds.txt">https://www.epa.gov/sites/default/files/2015-10/la92dds.txt</a>&gt; (25.3 KB)</li> </ul>	
<p>The LA-92 Short contains just the first 969 seconds of the LA-92 Dynamometer Driving Schedule.</p> <ul style="list-style-type: none"> <li>•  LA-92 Short Dynamometer Driving Schedule (txt) &lt;<a href="https://www.epa.gov/sites/default/files/2015-10/la92shortdds.txt">https://www.epa.gov/sites/default/files/2015-10/la92shortdds.txt</a>&gt; (17.1 KB)</li> </ul>	
<p>While no longer required for EPA certification, the IM240 may be useful for Inspection and Maintenance programs.</p> <ul style="list-style-type: none"> <li>•  IM240 Inspection &amp; Maintenance Driving Schedule (txt) &lt;<a href="https://www.epa.gov/sites/default/files/2015-10/im240col.txt">https://www.epa.gov/sites/default/files/2015-10/im240col.txt</a>&gt; (2.2 KB)</li> </ul>	<p>&lt;<a href="https://www.epa.gov/sites/default/files/2015-10/im240dds.gif">https://www.epa.gov/sites/default/files/2015-10/im240dds.gif</a>&gt;</p>  <p>IM240 - Inspection and Maintenance Driving Schedule (Click image to see larger.)</p>


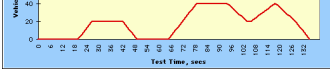

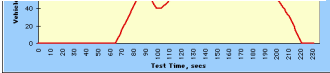

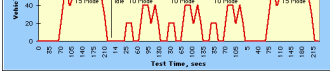
## Economic Commission for Europe Dynamometer Operating Cycles - Official guidance is found in the United Nations Economic Commission for Europe (UN/ECE) WP.29 1958 Agreement and its Addenda. Guidance is specifically found in Regulation 83 of the Regulations for the Construction of Vehicles.

<p>The UN/ECE Elementary Urban Cycle is Part 1 of the ECE Type 1 Test.</p> <ul style="list-style-type: none"> <li>•  UN/ECE Elementary Urban Cycle (Part One of the Type 1 Test) (txt) &lt;<a href="https://www.epa.gov/sites/default/files/2015-10/ececol.txt">https://www.epa.gov/sites/default/files/2015-10/ececol.txt</a>&gt; (1.6 KB)</li> </ul>	<p>&lt;<a href="https://www.epa.gov/sites/default/files/2015-10/ecedds.gif">https://www.epa.gov/sites/default/files/2015-10/ecedds.gif</a>&gt;</p>  <p>UN/ECE Elementary Urban Cycle (Part 1) (Click image to see larger.)</p>

<p>The UN/ECE Extra-Urban Driving Cycle is Part 2 of the ECE Type 1 Test.</p> <ul style="list-style-type: none"> <li>  UN/ECE Reg 83 Extra-Urban Driving Cycle (Part 2 of the Type 1 Test) (txt) &lt;<a href="https://www.epa.gov/sites/default/files/2015-10/eudccol.txt">https://www.epa.gov/sites/default/files/2015-10/eudccol.txt</a>&gt; (4.7 KB) </li> </ul>	<p>&lt;<a href="https://epa.gov/sites/default/files/2015-10/eudcdds.gif">https://epa.gov/sites/default/files/2015-10/eudcdds.gif</a>&gt;</p>  <p>UN/ECE Extra - Urban Driving Cycle (Part 2) (Click image to see larger.)</p>
<p>The UN/ECE Extra-Urban Driving Cycle (Low Powered Vehicles) is an alternative for Low-Powered Vehicles for Part 2 of the ECE Type 1 Test.</p> <ul style="list-style-type: none"> <li>  UN/ECE Reg 83 Extra-Urban Driving Cycle for Low-Powered Vehicles (Part 2 of the Type 1 Test) (txt) &lt;<a href="https://www.epa.gov/sites/default/files/2015-10/eudclcol.txt">https://www.epa.gov/sites/default/files/2015-10/eudclcol.txt</a>&gt; (3.9 KB) </li> </ul>	<p>&lt;<a href="https://epa.gov/sites/default/files/2015-10/eudcldds.gif">https://epa.gov/sites/default/files/2015-10/eudcldds.gif</a>&gt;</p>  <p>UN/ECE Extra-Urban Driving Cycle (Part 2) (Click image to see larger.)</p>

**Driving schedules specified in Japanese Technical Standards – Official guidance is found in the Japanese Industrial Safety and Health Association (JISHA) Technical Standards. The 11 Mode and 13 Mode driving schedules are not yet available for posting. Technical Guidances Include:**

- Rev. 11-4-28 Technical Standard for 10¥15-Mode Exhaust Emission Measurement for Gasoline-Fueled Motor Vehicles (Jisha 899, 1983);
- Rev. 11-4-29 Technical Standard for 10-Mode and 11-Mode Exhaust Emission Measurement for Gasoline-Fueled Motor Vehicles (Jisha 899, 1983);
- Rev. 11-4-30 Technical Standard for 13-Mode Exhaust Emission Measurement for Gasoline-Fueled Motor Vehicles (Jisha 899, 1983);
- Rev. 11-4-31 Technical Standard for 10.15-Mode Exhaust Emission Measurement for Diesel-Powered Motor Vehicles (Jisha 899, 1983);
- Rev. 11-4-32 Technical Standard for 10-Mode Exhaust Emission Measurement for Diesel-Powered Motor Vehicles (Jisha 899, 1983);
- Rev. TRIAS 5-2-1990 10-Mode Fuel Economy Test Procedure for Gasoline-Fueled Motor Vehicles; and
- Rev. TRIAS 5-3-1991 Technical Standard for 10.15- Fuel Economy Test Procedure for Gasoline-Fueled Motor Vehicles.

<p>The Japanese 10 Mode Cycle is used as a component of the total driving schedule for the 10.15 Mode Exhaust Measurement and Fuel Economy Test Procedures.</p> <ul style="list-style-type: none"> <li>  Japanese 10 Dynamometer Driving Schedule (txt)  <a href="https://www.epa.gov/sites/default/files/2015-10/jpn10col.txt">https://www.epa.gov/sites/default/files/2015-10/jpn10col.txt</a> (1.1 KB) </li> </ul>	<p><a href="https://epa.gov/sites/default/files/2015-10/jpn10dds.gif">https://epa.gov/sites/default/files/2015-10/jpn10dds.gif</a></p>  <p>Japanese 10 Dynamometer Driving Schedule (Click image to see larger.)</p>
<p>The Japanese 15 Mode Cycle is used as a component of the total driving schedule for the 10.15 Mode Exhaust Measurement and Fuel Economy Test Procedures.</p> <ul style="list-style-type: none"> <li>  Japanese15 Dynamometer Driving Schedule (txt)  <a href="https://www.epa.gov/sites/default/files/2015-10/jpn15col.txt">https://www.epa.gov/sites/default/files/2015-10/jpn15col.txt</a> (1.8 KB) </li> </ul>	<p><a href="https://epa.gov/sites/default/files/2015-10/jpn15dds.gif">https://epa.gov/sites/default/files/2015-10/jpn15dds.gif</a></p>  <p>Japanese 15 Mode Dynamometer Driving Schedule (Click image to see larger.)</p>
<p>The Japanese 10.15 Mode Driving Schedule for Exhaust Measurement and Fuel Economy Test Procedures are specified in Jisha Technical Standards (Jisha 899, 1983).</p> <ul style="list-style-type: none"> <li>  Japanese 10-15 Exhaust Emission &amp; Fuel Economy Driving Schedule (txt)  <a href="https://www.epa.gov/sites/default/files/2015-10/j1015col.txt">https://www.epa.gov/sites/default/files/2015-10/j1015col.txt</a> (6.6 KB) </li> </ul>	<p><a href="https://epa.gov/sites/default/files/2015-10/j1015dds.gif">https://epa.gov/sites/default/files/2015-10/j1015dds.gif</a></p>  <p>Japanese 10-15 Exhaust Emission and Fuel Economy Driving Schedule (Click image to see larger.)</p>

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