fuel economy values into the following equation:

\[
\text{MPG}_{\text{sub}} = \frac{1}{0.55 \frac{\text{MPG}}{\text{sub}} + 0.45 \frac{\text{MPG}}{\text{base}}}
\]

\[
\text{MPG}_{\text{base}} = \frac{1}{0.55 \frac{\text{MPG}}{\text{sub}} + 0.45 \frac{\text{MPG}}{\text{base}}}
\]

\[
\text{MPG}_{\text{base}} = 31.3
\]


APPENDIX III TO PART 600—SAMPLE FUEL ECONOMY LABEL CALCULATION

Suppose that a manufacturer called Mizer Motors has a product line composed of eight car lines. Of these eight, four are available with the 3.0 liter, 6 cylinder, sequential multi-point fuel injection, 4-valve per cylinder, and 3-way catalyst engine. These four car lines are:

- Ajax
- Boredom III
- Dodo
- Castor (Station Wagon)

A. A car line is defined in subpart A (with additional guidance provided in EPA Advisory Circular 89) as a group of vehicles within a make or division which has a degree of commonality in construction. Car line does not consider any level of decor or opulence and is not generally distinguished by such characteristics as roofline, number of doors, seats, or windows. Station wagons and light duty trucks are, however, identified separately from the remainder of each car line. In other words, a Castor station wagon would be considered a different car line than the normal Castor car line made up of sedans, coupes, etc.

B. The engine considered here is defined as a basic engine in subpart A of this part (with additional guidance provided in EPA Advisory Circular 83A). A basic engine is a unique combination of manufacturer, engine displacement, number of cylinders, fuel system, catalyst usage and other engine and emission control system characteristics specified by the Administrator. A model type is a unique combination of car line, basic engine, and transmission class. Thus Ajax is a car line but Ajax 3.0 liter, 6 cylinder manual four-speed transmission is a model type whereas Ajax 3.0 liter, 6 cylinder automatic three-speed transmission is a different model type.

C. The following calculations provide an example of the procedures described in subpart C of this part for the calculation of vehicle configuration and model type fuel economy values. In order to simplify the presentation, only city fuel economy values are included (as determined by either the derived 5-cycle method or vehicle-specific 5-cycle based method). The procedure is identical for highway and combined fuel economy values.

Step I. Input data as supplied by the manufacturer or as determined from testing conducted by the Administrator.

Manufacturer—Mizer Motors

Basic Engine: (3.0 liter, 6 cylinder, sequential multi-point fuel injection, 4-valve per cylinder, 3-way catalyst).

<table>
<thead>
<tr>
<th>Test vehicle carline</th>
<th>Engine code</th>
<th>Trans</th>
<th>Inertia weight</th>
<th>Axle ratio</th>
<th>Harmonically averaged city MPG</th>
<th>Specific label MPG</th>
<th>Vehicle config. sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ajax ..................</td>
<td>1</td>
<td>M-4</td>
<td>3500</td>
<td>2.73</td>
<td>16.1001</td>
<td>16</td>
<td>15,000</td>
</tr>
<tr>
<td>Ajax ..................</td>
<td>2</td>
<td>A-3</td>
<td>3500</td>
<td>2.56</td>
<td>15.9020</td>
<td>16</td>
<td>35,000</td>
</tr>
<tr>
<td>Ajax ..................</td>
<td>3</td>
<td>M-4</td>
<td>4000</td>
<td>3.08</td>
<td>14.3383</td>
<td>14</td>
<td>10,000</td>
</tr>
<tr>
<td>Boredom III ...........</td>
<td>4</td>
<td>M-4</td>
<td>4000</td>
<td>3.08</td>
<td>15.0000</td>
<td>15</td>
<td>15,000</td>
</tr>
<tr>
<td>Boredom III ...........</td>
<td>8</td>
<td>A-3</td>
<td>4000</td>
<td>2.56</td>
<td>13.8138</td>
<td>14</td>
<td>25,000</td>
</tr>
<tr>
<td>Boredom III ...........</td>
<td>5</td>
<td>A-3</td>
<td>4500</td>
<td>3.08</td>
<td>13.2203</td>
<td>13</td>
<td>20,000</td>
</tr>
<tr>
<td>Castor ................</td>
<td>5</td>
<td>A-3</td>
<td>5000</td>
<td>3.08</td>
<td>10.6006</td>
<td>11</td>
<td>40,000</td>
</tr>
</tbody>
</table>

Step II. Group vehicle fuel economy and sales data according to base level combinations within this basic engine.
### Environmental Protection Agency

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<table>
<thead>
<tr>
<th>Base level</th>
<th>Transmission class</th>
<th>Inertia weight</th>
<th>Miles per gallon</th>
<th>Projected vehicle configuration sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Manual-4</td>
<td>3,500</td>
<td>16.1001</td>
<td>15,000</td>
</tr>
<tr>
<td>B</td>
<td>Automatic-3</td>
<td>3,500</td>
<td>15.9020</td>
<td>35,000</td>
</tr>
<tr>
<td>C</td>
<td>Manual-4</td>
<td>4,000</td>
<td>14.2343</td>
<td>10,000</td>
</tr>
<tr>
<td>D</td>
<td>Automatic-3</td>
<td>4,000</td>
<td>15.0000</td>
<td>15,000</td>
</tr>
<tr>
<td>E</td>
<td>Automatic-3</td>
<td>4,500</td>
<td>13.8138</td>
<td>25,000</td>
</tr>
<tr>
<td>F</td>
<td>Automatic-3</td>
<td>5,000</td>
<td>10.6006</td>
<td>40,000</td>
</tr>
</tbody>
</table>

**Step III. Determine base level fuel economy values.**

A. For all the base levels except the base level which includes 4,000 pound, manual four-speed transmission data, the base level fuel economy is as noted in Step II since only one vehicle configuration was tested within each of these base levels.

- **3,500 lb**/M4 transmission: 16.1001 mpg.
- **3,500 lb**/A3 transmission: 15.9020 mpg.
- **4,000 lb**/A3 transmission: 13.8138 mpg.

B. Since data from more than one vehicle configuration are included in the 4,000-pound, manual four-speed transmission base level, this fuel economy is harmonically averaged in proportion to the percentage of total sales of all vehicle configurations tested within that base level represented by each vehicle configuration tested within that base level.

**Base level fuel economy =**

\[
\frac{1}{\frac{1}{\text{Fraction of total sales represented by configuration No. 1 sales}}} + \frac{1}{\text{Fraction of total sales represented by configuration No. 2 sales}}
\]

**Base level: M4 transmission, 4000 pounds:**

\[
\frac{1}{\frac{1}{10000}} + \frac{1}{15000} = 14.6840 \text{ miles per gallon}
\]

Therefore, the 4000 pound, M4 transmission fuel economy is 14.6840 miles per gallon.

Step IV. For each model type offered by the manufacturer with that basic engine, determine the sales fraction represented by each inertia weight/transmission class combination and the corresponding fuel economy.

<table>
<thead>
<tr>
<th>Model</th>
<th>Transmission</th>
<th>Weight/lb</th>
<th>Fuel Economy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ajax</td>
<td>M4</td>
<td>3,500</td>
<td>16.1001</td>
</tr>
<tr>
<td></td>
<td>A3</td>
<td>3,500</td>
<td>14.6840</td>
</tr>
<tr>
<td>Dodo</td>
<td>M4</td>
<td>3,500</td>
<td>16.1001</td>
</tr>
<tr>
<td></td>
<td>A3</td>
<td>3,500</td>
<td>15.9020</td>
</tr>
</tbody>
</table>

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Step V. Determine fuel economy for each model type (that is, car line/basic engine/transmission class combination).

Ajax, 3.0 liter, 6 cylinder, A3 transmission, model type MPG is calculated as follows:

\[
\frac{1}{0.4000} + \frac{0.6000}{16.1001} = 15.2185, \text{ which rounds to } 15 \text{ MPG} \]

Similarly, Ajax and Dodo 3.0 liter, 6 cylinder, M4 model type MPG is calculated as follows:

\[
\frac{1}{0.3000} + \frac{0.7000}{15.9020} = 14.3803 \text{ mpg, which rounds to } 14 \text{ MPG} \]

Boredom III 3.0 liter 6 cylinder M4 model type MPG = 14.6840 mpg, which rounds to 15 ml/gal \(^1\)

Boredom III 3.0 liter, 6 cylinder, A3 model type MPG is calculated as follows:

\[
\frac{1}{0.3000} + \frac{0.7000}{13.8138} = 14.6840 \text{ mpg, which rounds to } 15 \text{ ml/gal} \]

\(^1\) The model type fuel economy values rounded to the nearest mile per gallon, are the fuel economy values listed in the EPA Fuel Economy Guide and used on the general labels (window stickers) for production vehicles for that model year.
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\[
\begin{bmatrix}
0.2500 \\
13.8138
\end{bmatrix} + \begin{bmatrix}
0.7500 \\
13.2203
\end{bmatrix} = 13.3638, \text{ which rounds to 13 MPG}
\]

Castor 3.0 liter, 6 cylinder, A3 model type
MPG is calculated as follows:

\[
\begin{bmatrix}
0.2000 \\
13.2203
\end{bmatrix} + \begin{bmatrix}
0.8000 \\
10.6006
\end{bmatrix} = 11.0381, \text{ which rounds to 11 MPG}
\]

Note that even though no Dodo was actually tested, this approach permits its fuel economy figure to be estimated, based on the inertia weight distribution of projected Dodo sales within a specific engine and transmission grouping.

[71 FR 77958, Dec. 27, 2006]

APPENDIX IV TO PART 600 [RESERVED]

APPENDIX V TO PART 600 [RESERVED]

APPENDIX VI TO PART 600—SAMPLE FUEL ECONOMY LABELS AND STYLE GUIDELINES FOR 2013 AND LATER MODEL YEARS

This appendix illustrates label content and format for 2013 and later model years. Manufacturers must make a good faith effort to conform to these templates and follow these formatting specifications. EPA will make available electronic files for creating labels.

A. GASOLINE-FUELED VEHICLES, INCLUDING HYBRID GASOLINE-ELECTRIC VEHICLES WITH NO PLUG-IN CAPABILITIES

![Fuel Economy Label Example](image)