Commercial Vehicles Special
Fuel Consumption study - under practical operating conditions in Singapore

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It's 2017, where the buzzword is about ‘going green’ with hybrid cars, or even fully electric cars such as the Tesla, and even as consumers buy normal petrol variants, invariably one of the major questions would be – “what's the fuel consumption like?” In the effort to ‘go green’ – consumers are increasingly getting used to the new mobility options such as pooling together to ride with Private Hire Cars as a real means of transport in support of the notion of reducing the number of cars on the road.

One often overlooked fact is that there are actually a significant number of commercial vehicles that form the backbone of commerce in Singapore. The numerous vans, and buses that ply the roads every day that consumes fuel in the form of diesel instead of petrol. How much do they burn, and are they a lot worse than cars?

In this study, MSS has taken a closer look into the world of these vehicles – are diesel vehicles getting more advanced in technology, since there are no hybrids in the market yet? How much diesel do they really burn in real world conditions, under workloads? Litre for litre of diesel vs petrol, are they more efficient than the average car? We also realized that whilst many reports and reviews are written about cars and commercial vehicles, much of the content is based on writer’s opinions, technical specifications but seldom focus on the real-life fuel consumption in a practical usage pattern.

We then decided to find out the fuel consumption of a total of 6 of such vehicles in a ‘diesel consumption shootout’ style, consisting of 4 panel vans and 2 medium sized buses in a controlled test that simulates real usage conditions in Singapore.

In order to ensure we are comparing apple to apple, each of the vehicles were tested over the following parameters that remain the same for all:

1. Same planned route of 138km that covers a healthy mix of urban areas such as Orchard Road, Marina Bay, highways, and even Mount Faber.

2. Tests conducted only on weekdays, start and end time of 10am to 4pm with not more than 30 mins of variance.

3. Classes of vehicles to be driven by the same driver as personal habits could differ.
4. Fueling of each vehicle to be done only at the same station, down to the same exact fuel pump.

5. Each class of vehicle being loaded with the exact same loads:
   a. Panel Vans - 680kg of sandbags, 228kg for 3 adults (test personnel) and a full tank of diesel, representing 60-70% of a typical panel van's maximum payload
   b. Buses - 794kg of sandbags representing 13 adults, 228kg for 3 adults (test personnel) and a full tank of diesel.

6. Vehicles included a mix of vans and buses with a mixture of manual and automatic transmissions.

7. Tyre pressures were checked and adjusted to each manufacturer's recommended levels at the start of each test.

Vehicle specifications for the vehicles were researched and obtained from manufacturer's marketing materials.
Test route 1 – 10am to 12pm.

Test route 2 – 1pm to 3pm
Results.

As we took the vehicles for a ride through the routes, we started to understand what these workhorses were capable of, lugging such weights under these conditions in the city and even up Mount Faber and down again. The following table shows some surprising results. We found that the vans actually consume around the same amount of fuel as cars, even under tremendously heavy combined load of 3 persons (228kg) and 680kg of sandbags. Another surprise was that the Mercedes-Benz vans, with the latest diesel turbo technology, fared very well with 13.85km/l and 16.13km/l.

For the buses, we got what we expected: Loaded with the test crew of 3 people and sandbags simulating an additional 13 adults, we arrived at numbers of 6.53km/l for the Toyota Coaster and 8.72km/l for the Mercedes-Benz Sprinter.

<table>
<thead>
<tr>
<th>Vehicle on test</th>
<th>Pax</th>
<th>Sandbags</th>
<th>Ambient Temp (Deg C)</th>
<th>Start mileage</th>
<th>End mileage</th>
<th>Distance covered</th>
<th>Fuel consumed</th>
<th>Fuel consumption (km/l)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mercedes-Benz Vito 114</td>
<td>3</td>
<td>680.1kg</td>
<td>30</td>
<td>11159</td>
<td>11298</td>
<td>139</td>
<td>10.036</td>
<td>13.85</td>
</tr>
<tr>
<td>Toyota Hiace Panel Van</td>
<td>3</td>
<td>680.1kg</td>
<td>31</td>
<td>341</td>
<td>479</td>
<td>138</td>
<td>13.32</td>
<td>10.36</td>
</tr>
<tr>
<td>Mercedes-Benz Vito 109</td>
<td>3</td>
<td>680.1kg</td>
<td>30</td>
<td>11791</td>
<td>11942</td>
<td>151</td>
<td>9.361</td>
<td>16.13</td>
</tr>
<tr>
<td>Nissan NV350</td>
<td>3</td>
<td>680.1kg</td>
<td>31</td>
<td>214</td>
<td>358</td>
<td>144</td>
<td>14.706</td>
<td>9.79</td>
</tr>
<tr>
<td>Toyota Coaster</td>
<td>4</td>
<td>794.0kg</td>
<td>29</td>
<td>35956</td>
<td>36096</td>
<td>140</td>
<td>21.437</td>
<td>6.53</td>
</tr>
<tr>
<td>Mercedes-Benz Sprinter</td>
<td>4</td>
<td>794.0kg</td>
<td>26</td>
<td>9063</td>
<td>9200</td>
<td>137</td>
<td>15.718</td>
<td>8.72</td>
</tr>
</tbody>
</table>
Conclusion.

There you have it. We feel relieved to find that with advancement of diesel technology, these work-horses on the road do consume fuel at similar rates to passenger cars even as they are subjected to heavy loads, and still comply with Euro 5 and 6 standards in terms of emissions. It was an interesting insight into the world of commercial vehicles and how they perform under such conditions, and we are looking forward to further advancement in this area. Hybrid, or fully electric commercial vans and buses, anyone?