News

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NEW TECHNOLOGIES AND SLEEK DESIGN MAKE COMMODORE THE MOST ECONOMICAL YET

- **Holden reduces Commodore Evoke overall mass by 43 kg**
- **Commodore improves fuel economy for every model in the range**
- **Introduction of aluminium components, including bonnet and boot lid**
- **Electric power steering and improved aerodynamics aid fuel economy gains**

With clever use of lightweight technology and improved aerodynamics, the new VF Commodore delivers a big boost in fuel efficiency, reduced running costs and lower CO_2 emissions.

Holden was able to make the significant fuel economy improvements with the help of the Australian Government's *Green Car Innovation Fund* (GCIF). The $39.8 million GCIF grant allowed Holden to add a range of advanced fuel economy enablers to Commodore, including the aluminium componentry, electric power steering and aerodynamic improvements.

The grant also facilitated the introduction of GM's *Global A* electrical architecture on Commodore which is an advanced-technology driver for many of the fuel saving features.

The best overall fuel economy performer in the new VF Commodore range is Evoke sedan, which returns an enviable, 8.3 litres per 100 kilometres[1], better than some four-cylinder cars.

Holden's range opener has improved on its Model Year 2012 figure of 8.9 litres per 100km and has seen a 23 per cent improvement since VE launched in 2006.

Every new Commodore and Caprice model offers significant fuel economy improvements, with the SV6 manual ute the star performer using 8.2 per cent less petrol than its Model Year 2012 predecessor.

Holden's V8 sports models give performance enthusiasts more bang for their fuel economy buck with all SS, SS V-Series and Redline models returning less than 12 litres per 100km – an average improvement of 5 per cent.

Holden's VF Lead Development Engineer, Andrew Howell, said the engineering team set itself challenging fuel ecomony targets for every model.

"Our aim with VF was to achieve the best-ever fuel economy performance for Commodore. We also wanted to make this the best-equipped, most technologically-advanced Commodore which means more equipment and more weight," he said.

"The fact that we've delivered a vehicle that's packed with the high-tech features yet still manages to offer remarkable gains in fuel economy is a tribute to the depth of engineering and design talent we have here at Holden.

"Our teams focussed on the 'big three' fuel economy enablers - increased aerodynamic efficiency, mass reduction and the introduction of electric power steering."

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[1] *All fuel economy measures refer to ADR81/02 combined cycle*

Aerodynamic design

Holden designers and engineers worked in close collaboration to sculpt Commodore's slippery new shape, making extensive use of virtual modelling and wind tunnel test technology.

In design terms, they succeeded in making a powerfully impressive design statement. In aerodynamic terms, the team achieved remarkable efficiency improvements to produce Commodore's drag co-efficient (Cd) rating. The VF Commodore now has a drag co-efficient of 0.309, compared to 0.330 for the MY12 VE.

For aerodynamic advantage, frontal areas of the wheel arches have been modified to reduce turbulent airflow. At the rear, the re-designed boot lid sits higher in the airstream and proficiently controls air separation off the back via an integrated spoiler.

"Every detail is tuned to the nth degree; even the fine vertical crease that runs through the sedan tail lamps has a purpose beyond good looks," Mr Howell said.

"Other contributors include optimised grille openings, redesigned fog lamps, front air dam and rear valance profile. Air deflectors on the rear wheels and air intake modifications to reduce air bleed also help VF's exceptional fuel economy performance."

Mass optimisation – shedding the kilos brings fuel efficiency and handling gains

Mr Howell said light-weighting initiatives to boost fuel efficiency were a major focus for the VF engineering program.

"We applied multiple mass reduction and optimisation measures applied across all engineering and design elements of the car. Together they reaped big rewards in real world fuel savings – and at the same time the drive character, structural strength and safety performance was made better than ever."

Evoke wins the 'biggest loser' title, courtesy of a range of modifications which include the fitment of a single exhaust system, a lighter driveline and high efficiency differential.

Holden engineers were able to remove a total of 72.5 kg of mass from the car, but added in an extra 29.5 kg in improved features, including the fuel-saving Electric Power Steering rack and higher standard equipment. In total, it returns a net weight reduction of 43 kg.

Aluminium components

"The switch from steel to an aluminium boot lid and bonnet breaks new ground for Holden," Mr Howell said.

"The new panels are made in Adelaide by Hirotec and are just as strong as their steel equivalents but are 30 per cent lighter. This is a huge mass saving and means we can support the bonnet with a single gas strut.

"Commodore also uses a light-weight aluminium instrument panel beam, made by Diver Industries in Melbourne. Again it's stiffer and just as strong as the steel support it replaces, but also brings refinement benefits, with reductions in noise and vibration."

Other fuel-saving contributors include the use of aluminium suspension components and the increased application of stronger, advanced high strength steels in Commodore's world-standard rigid body structure.

Electric power steering

VF's new variable assist electric power steering system (EPS) offers multiple benefits, not least of which are substantial fuel efficiency gains in real world driving conditions[2].

Unlike hydraulic systems with conventional power steering pumps that draw engine power continuously, electric power steering draws power only when in use. EPS saves approximately 0.2 litres per 100km, compared with the hydraulic system it replaces.

Other steps taken in the process of improving VF fuel economy included modifications to patented Regulated Voltage Control (RVC) technology, which reduces energy consumed by the alternator to make the engine run more efficiently.

Fuel economy by model

			Combined Fuel Consumption (L/100km)		
VEHICLE DESCRIPTION	**ENGINE**	**TRANS**	**MY12**	**MY14**	**Improvement**
SEDAN					
Evoke	3.0L SIDI V6	6-SPD AT	8.9	**8.3**	6.7%
Calais	3.6L SIDI V6	6-SPD AT	9.5	**9.0**	5.3%
Calais V					
SV6					
SV6	3.6L SIDI V6	6-SPD MT	9.7	**9.0**	7.2%
SS	6.0L V8	6-SPD AT	12.3	**11.5**	6.5%
SSV					
Calais V				**11.7**	4.9%
SSV Redline				**11.8**	4.1%
SS	6.0L V8	6-SPD MT	12.2	**11.5**	5.7%
SSV					
SSV Redline				**11.8**	3.3%
Evoke	3.6L V6 LPG	6-SPD AT	11.8	**11.5**	2.1%
SV6			12.3	**11.9**	3.5%
LWB					
Caprice V	6.0L V8	6-SPD AT	12.3	**11.7**	4.9%
Caprice	3.6L V6 LPG	6-SPD AT	12.3	**12.1**	2.0%
UTE					
MY12 Omega	3.0L SIDI V6	6-SPD AT	9.6	**NA**	
MY14 Ute	3.6L SIDI V6	6-SPD AT	NA	**9.0**	6.3%
SV6			9.8		
SV6	3.6L SIDI V6	6-SPD MT	9.8	**9.0**	8.2%
SS	6.0L V8	6-SPD AT	12.4	**11.5**	7.3%
SSV					
SSV Redline				**11.8**	4.8%
SS	6.0L V8	6-SPD MT	12.3	**11.5**	6.5%
SSV					
SSV Redline				**11.8**	4.1%
SPORTWAGON					
Evoke	3.0L SIDI V6	6-SPD AT	8.9	**8.6**	3.4%
SV6	3.6L SIDI V6	6-SPD AT	9.8	**9.3**	5.1%
Calais					
Calais V					
SS	6.0L V8	6-SPD AT	12.3	**11.7**	4.9%
SS V					
SS V Redline				**11.8**	4.1%
Calais V			12.4	**11.7**	5.6%
Evoke	3.6L V6 LPG	6-SPD AT	12.3	**11.8**	4.5%
SV6				**12.1**	2.0%

[2] *See separate chassis media release*

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