

VicRoads Submission - IM240 test alternative proposal for Individually Constructed Vehicles (ICVs) in Victoria.

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SPECIALTY VEHICLES AUSTRALIA

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About VACC

The Victorian Automobile Chamber of Commerce (VACC) is Victoria's peak automotive industry association, representing the interests of more than 5,300 members in over 20 retail automotive sectors that employ over 50,000 Victorians.

VACC members range from new and used vehicle dealers (passenger, truck, commercial, motorcycles, recreational and farm machinery), repairers (mechanical, electrical, body and repair specialists, i.e. radiators and engines), vehicle servicing (service stations, vehicle washing, rental, windscreens), parts and component wholesale/retail and distribution and aftermarket manufacture (i.e. specialist vehicle, parts or component modification and/or manufacture), and automotive dismantlers and recyclers.

The VACC is also an active member of the Motor Trades Association of Australia (MTAA) and contributes significantly to the national policy debate through Australia's peak national automotive association.

About SVA

SVA, is a special interest group within the General Division of the Victorian Automobile Chamber of Commerce (VACC). SVA represents vehicle builders, suppliers, enthusiast groups and engineering support businesses in Victoria.

The focus of the group is to advance, promote, protect and support this niche industry in Australia and to preserve the interests of members. SVA has consistently lobbied for the removal of the IM240 test requirement for club and fully registered ICVs due to the financial and compliance burden for consumers and small businesses.

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Executive Summary

VACC and Specialty Vehicles Australia (SVA) welcomes the opportunity to provide the following submission to VicRoads regarding IM240 test alternative for Individually Constructed Vehicles (ICVs) in Victoria. This submission is timely given the recent closure of the only IM240 test facility in Victoria which has resulted in major disruption to both the ICV and modified vehicle industries.

This submission considers the environmental impact of replacing the IM240 test requirement with a common sense and sustainable option such as the Four/Five Gas Analyser test. Our research demonstrates the negative effect that heavy regulatory requirements will have on the growth of a niche industry.

VACC recommends the test be replaced with a comparable, more sustainable alternative that meets the requirements of both government and business.

The closure of Vipac, the only IM240 testing facility in Victoria on 3 December 2018, caused many businesses including ICV builders and modified vehicle production enthusiast's severe financial hardship. Current projects have been placed on hold or have been towed to NSW for testing which has added significant costs for vehicle certification. In a niche industry, the current situation is likely to cause many small businesses to cease operation.

VACC research shows positive economic growth is expected for ICV builders should the IM240 test be replaced with a comparable emission test. It is expected such a change will benefit consumers economically by reducing the cost of building a car and allowing for faster completion of ICV projects. Environmental impact is considered minuscule given the small number of ICV builds per annum, compared to the total number of vehicles on Victorian roads.

Results from a recent VACC member survey¹ show, on average, there are 23 ICVs built in Victoria each year. Available motor vehicle census data shows 4,923,032² vehicles were registered in Victoria as of 31 January 2018. In comparative terms, ICVs represent 0.00047 per cent of the current Victorian vehicle fleet. Generally, ICVs are driven on weekends or special occasions. The 90-day club permit scheme is a fair reflection regarding the amount of days ICVs would be driven per year. On this basis, VACC concludes that ICVs represent a small environmental risk given the low fleet numbers.

¹ N=34 respondents

²

<http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/9309.031%20Jan%202018?OpenDocument>

The key objectives of the VACC/SVA proposal will ensure:

- All vehicles meet a minimum standard of environmental protection through emission control
- The scheme is not 'location discriminatory' i.e. people do not have to travel from Melbourne to another state or where there is only one provider in Victoria
- End user creativity, flexibility and choice of power plant is available
- Legislation benefits consumers and business

while

- Promoting competition so that costs are kept to a minimum
- Applying a two-option system to emissions testing
- Shifting from a one provider solution - do not want to repeat previous situation

Individually constructed vehicles are becoming cost prohibitive for Victorians interested in building these types of vehicles. While there are many different factors contributing to rising costs, government regulations and stringent vehicle standards are key issues affecting the industry.

VACC is not advocating for the relaxation of vehicle standards; however, in the absence of an emissions testing facility in Victoria or where other comparative tests can be used to ensure compliance to Australian design rules and standards, then other options should be investigated.

VACC supports the SVA in its endeavor to replace the IM240 test with a Four/Five Gas Analyser test based on the evidence provided in this submission. WA reverted to pre IM240 testing requirements in 2015; a similar policy from VicRoads would have a positive impact on industry, including significant red-tape reduction.

VACC acknowledges there may be a need for further analysis of the Four/Five Gas Analyser test, in comparison to the IM240 test, to determine suitable levels. SVA members are prepared to voluntarily perform correlation testing between IM240 test and a before and after Four/Five Gas Analyser test at a Sydney facility. The results could be compared and presented to support the following proposal. Funding of this initiative is required and is to be determined.

Recommendation

Based on the activities of other states, the SVA would like to propose a two-option system.

Two-Option System for Emissions Testing

The following section outlines the proposed two-option system for emissions testing. This includes an examination of Comparative Assessment and Objective Observation and Four/Five Gas Analysis.

1.1. Comparative Assessment and Objective Observation

Comparative Assessment and Objective Observation is intended for ADR79/01 or greater compliant engines where a vehicle maintains existing an engine control unit (ECU), catalytic converter, charcoal canister etc. Under this scenario, the inspector is required to check ECU operation via a scan tool to ensure the engine is operating within design specifications (i.e. no-fault codes) and the catalytic converter is heating up by using a heat gun check.

1.2. Four/Five Gas Analysis

Four/Five Gas Analysis is intended for all vehicles that choose to, or do not fit the above mention criteria. Targets are to be set by the age of the engine (similar to WA). Engines will not be limited to motor vehicle engines i.e. motorcycles engine may also be included.

Risk Benefit Analysis

Current: There is no accredited testing facility in Victoria to allow ICV builders / modified builders to demonstrate compliance which has a major effect on small businesses and consumers due to increased costs associated with transporting vehicles interstate.

1.3. Proposed System Risks:

- Increase in the number of people conducting physical gas testing. This will require an auditing process for approved operators to ensure system integrity.
- Possible increase of older engines re-entering the Australian fleet even though it has passed a Four/Five Gas Analysis.

1.4. Proposed System Benefits

- Provides a clear understanding to the builder, that if a 79/01 compliant engine and all systems within correct operating specifications is used, then the vehicle will be approved (currently a builder has no vision until a test is conducted).
- Increased competition due to an increase in Four/Five Gas Analysis testers, which minimises costs for consumers.
- Ensures a consistent, strong environmental message that matches the highest possible emissions regulations for ICV builders and modified production.

- Ensures there is not a repeat of a one supplier scenario that has led to the current crisis.
- The system can be introduced with minimal expenditure and no cost to VicRoads or the EPA.

Background

Individually constructed vehicles are vehicles that are not a mass production vehicle or modified production vehicle. They are usually a one-off type vehicle built to an individual plan or design. They include vehicles constructed to the builder's own unique design, kit cars and replicas of production vehicles³.

The IM240 Emissions test is a 240 second simulation that runs a car through a range of engine load and revolutions per minute scenarios on a dynamometer. It involves connecting the car's exhaust to a bank of gas analysers to measure noxious gasses in grams per kilometer. The test covers approximately 3.1 km with a maximum speed of 91.2km/h and an average speed of 47.3km/h. It is the minimum requirement under the national code of practice for light vehicle construction and modification where the engine has been modified or swapped. It involves measuring tailpipe emissions, namely carbon monoxide (CO), carbon dioxide (CO₂), total hydrocarbons (HC) and nitrogen oxides (NO_x). A test report is provided, and the assessment is completed by a VASS engineer who will determine which vehicle standard and limits the vehicle must meet. Victorians are now required to transport their vehicle to Sydney to have this test completed.

In comparison, the Five Gas Analyser test is another form of vehicle emissions testing and considered an accepted method for roadworthiness of vehicles under VSI26. It is also a method the Western Australian (WA) Government adopted in May 2015 to revert its vehicle emissions testing policy as it was prior to the implementation of the IM240 Test in April 2009⁴.

The WA Government now require a Five Gas Analyser test for all modified vehicles to comply with legislative emission standards. This sets a precedent by a regulatory body and it is hoped the same method can be adopted in Victoria.

The Four/Five Gas Analyser test is an inexpensive, widely available and portable (in comparison to the IM240 set up) instrument with a tail pipe probe, designed to measure vehicle exhaust gas pollutants such as Carbon Monoxide (CO), Hydro Carbons (HC), Carbon Dioxide (CO₂), Oxygen (O₂) and Nitric Oxide (NO_x) optional. It is a suitable method for performance tuning and environmental testing and easily interfaces with chassis dynamometers. It is used on all types of internal combustion engine vehicles (e.g. cars, light trucks, heavy trucks, and off-road vehicles).

³ Definitions https://infrastructure.gov.au/vehicles/vehicle_regulation/bulletin/vsb_ncop.aspx

⁴ https://www.transport.wa.gov.au/mediaFiles/licensing/LBU_VS_IB_124.pdf

Circular 37/00-9-1 states that conformance with IM240 Test procedure is sufficient to demonstrate compliance with the ADR however other equipment orders of accuracy and procedures may be used provided it can be shown they demonstrate compliance with the ADR⁵. It is therefore proposed that a Five Gas Analyser test be considered an appropriate test due to its ability to measure five gases, including NOx.

Methods of Emission Testing

The following highlights other emissions tests available world-wide.

IM-240 - Modified IM240 (Inspection & Maintenance) Test Procedure This test is based on the first four minutes of the FTP (ADR37/00) cycle but only covers about 2km total distance. Emission results are converted to grams per kilometre for HC, CO and NOx.

ASM - Acceleration Simulation Mode Test Procedure (ASM2525) The vehicle is driven on a chassis dynamometer at a speed of 40km/h. Concentrations of raw exhaust emissions of HC, CO and NOx are measured.

SS60 - Steady State Loaded 60km/h the vehicle is driven on a chassis dynamometer at a constant 60km/h. Emissions of HC, CO and NOx are measured.

HIGH IDLE - Steady State High Idle Test Procedure With the engine running at a speed of 2500 rpm the concentrations of raw exhaust emissions are measured for HC and CO.

IDLE - Steady State Idle Test Procedure With the engine running at idle speed (accelerator not depressed) the concentrations of raw exhaust emissions are measured for HC and CO.

Correlations between short tests and ADR test results						
	ADR 27			ADR 37/00		
	HC	CO	NOx	HC	CO	NOx
IM240	0.80	0.93	0.91	0.94	0.90	0.90
ASM	0.52	0.71	0.69	0.64	0.78	0.68
SS60	0.62	0.80	0.74	0.80	0.84	0.72
Hi Idle	0.49	0.71	N/A	0.70	0.62	N/A
Idle	0.44	0.55	N/A	0.72	0.67	N/A

⁵ <http://rvcs.infrastructure.gov.au/TFI%20Manual/Circular%2037-00-9-1.pdf>

State by State Comparison

State	IM240 testing facility available	Acceptance criteria
Victoria	NO	ICV - IM240 test - acceptance criteria 200% of ADR37/01 limits (0.52 HC, 1.26 NOx, 4.2 CO) Mod Prod 86-current is 100% 37/01 limits on IM240 (0.26 HC, 0.63 NOx, 2.1 CO)
South Australia	NO	Rely on OE carry over parts on ICV or IM240 results/comparative assessment of components. Mod prod continued compliance by comparative assessment and simple tailpipe test at Regency Park
Western Australia	NO	5-gas tailpipe test accepted
Northern Territory	NO	Aligned with TAS
New South Wales/Australian Capital Territory	YES - 1 IM240 testing facility is available, free of charge	Full 37/01 limits for IM240 Limits follow vehicle original limits e.g. 79/01 etc. on IM240 (VSB14 allows 37/01 limits on 37/01 vehicles and later)
Tasmania	NO	Similar to NSW; Full 37/01 limits for IM240, usually by comparative assessment vs production vehicle. Mod prod limits to follow compliance date but no real way of testing.
Queensland	NO	

Regulatory Benchmarks

To better understand current regulatory regimes, regulations in other jurisdictions were examined. The following tables look at best practice applied in other states, including the advantages and disadvantages of a possible roll out in Victoria.

Table One Matrix - States and levels of Emission system compliance

State	Comparative Assessment	3 Gas analyzer	5 Gas analyzer	IM240		
				200% of ADR 37/01 Limits	100% of ADR 37/01 Limits	100% of ADR 79/01 Limits
VIC	Existing Rule before IM240 introduction			Current position but <i>no accredited test facility</i>		
SA	OE Carry over parts & assessment	Tailpipe test @ Regency Park			<i>IM240 Test accepted - but no accredit IM240 facility</i>	
WA			5 Gas test with in-service emission limits based on age of engine			
TAS	Comparative assessment vs production vehicle				<i>IM240 Test accepted - but no accredit IM240 facility</i>	
NT	Comparative assessment vs production vehicle				<i>IM240 Test accepted - but no accredit IM240 facility</i>	
NSW/ACT					IM240 Test @ 100% 37/01 for 37/01 complaint engine	IM240 Test @ 100% 79/01 for 79/01 complaint engine
QLD	Assessment of emissions systems (ECU with closed loop lambda ctrl enabled, CAT, Charcoal canister)					

Table 2. State by State Overview

State	Advantages	Disadvantages	Possibility of Roll out in Victoria	
SA	End user can prove compliance by either comparative assessment or gas analyzer test	Currently only 1 location providing gas analyzer test - Comparative assessment alone does not prove all fitted systems are working as intended	✓	Comparative assessment and / or simple gas analysis can be conducted by VASS signatories or approved 3rd party
WA	Gas analysis can determine compliance of all vehicles and check all fitted systems are working correctly - Test equipment is reasonable cheap (~\$5,000) allowing for multiple parties to provide the testing service - Variable targets for emissions allows for a variety of engine choices		✓	Gas analysis can be conducted by VASS signatories or approved 3rd party
TAS / NT	End user can prove compliance by either comparative assessment or buy IM240 test	There is no accredited IM240 Test facilities in Tas, therefore only option is comparative assessment - Comparative assessment alone does not prove all fitted systems are working as intended	✓	Comparative assessment can be conducted by VASS signatories
NSW/ACT	Highest emission targets in Australia Testing of vehicle is free for end user	Only 1 accredited testing site operating (this is very disruptive for people building vehicles outside of the Sydney area (local discriminatory))	NO	Victoria does not have any accredited IM240 test facilities
QLD	End user can prove compliance comparative assessment	Comparative assessment alone does not prove all fitted systems are working as intended	✓	Comparative assessment can be conducted by VASS signatories

SVA industry profile

According to a recent VACC survey, the SVA industry is worth \$60 million to the Victorian economy. It is made up of a cross section of small to medium enterprises. Many ICV builders are principally engaged in engineering services, automotive mechanical repair and service, ICVs, vehicle modifications and vehicle restoration activities.

Key survey findings show:

- 50 per cent of businesses involved with ICVs have been operating for 20 years or more, with less than 18 per cent in business for five years or less.
- 66.7 per cent of businesses have an annual turnover of between \$200,000 and \$2 million.
- On average ICV businesses employ nine people. This includes full and part time workers. A large number of small businesses, such as engineering companies, fiberglass and painters benefit as suppliers to the industry.
- Consumers typically spend between \$100,000 - \$150,000 per ICV build.
- The average cost of completing an IM240 test including transportation is between \$2,500 - \$3,000 (prior to Vipac shutdown). One respondent noted that it is costing them between \$5,000 - \$10,000 since the closure of Vipac.
- 75 per cent of respondents indicated government regulations are the key factor in limiting the growth of their business.
- Most respondents felt that the cost of between \$200 to \$600 was reasonable for an emissions test.
- Most respondents supported the removal of the IM240 Test in favour of the Four/Five Gas Analyser emissions test.