



National Motor Vehicle  
Theft Reduction  
Council

# Vehicle ID Standards

An international scan and  
assessment, and proposed  
testing procedures

September 2021

**PREPARED BY:**  
IAG Research Centre

**Informing Australia  
on vehicle crime.**

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## 1. Executive Summary

As part of the agreed 2021 work package, IAG Research Centre has carried out work to enable the NMVTRC to continue to build the case for maintaining secure vehicle ID as a regulatory requirement in Australia.

We have:

- conducted an international scan of secure vehicle ID assessments; and
- assessed the current secure vehicle ID labels and documented proposed secure vehicle ID testing procedures.

### 1.1 International scan

We reached out to our partners in RCAR as well as several vehicle manufacturers in the Australian market (OEMs).

We have received seven responses from RCAR members and three responses from OEMs. The responses from the RCAR members show mixed results regarding the concern about identification labels.

The two outstanding responses were from the United Kingdom and China. The UK because of the depth of the testing they go to, and China because of the insights gained from the quality-control related requirements of the label.

The responses from the manufacturers indicate either no immediate changes to the existing labels used (BMW, Ford) or a manufacturer yet to make a decision on whether to keep using the existing security label (Hyundai).

### 1.2 Proposed secure ID assessment procedures

The testing framework is largely derived from the suggested assessment procedure provided in the document *NMVTRC Technical Specification: Secure Compliance Labels and Vehicle Security Labels (2005 revised)*, with a few minor additions.

Due in part to the proposed ADR changes that are set to take place in July 2021, we felt the physical testing component is best suited for assessment after this event takes place. As such, that portion of the report is incomplete pending the results of those tests.

### 1.3 Potential areas of focus in the future

During our research we have identified two areas which - although out of scope - could mean an increased risk of theft or easy method of vehicle identity replication. These are:

- Ability to reprint and replace vehicle compliance label by an OEM dealer
- Targeted theft of specific vehicle body parts replacing traditional whole-vehicle theft.

The ability to reprint and replace a vehicle compliance label does have the potential to reduce cost of certain insurance claims (where damaged compliance label impacts residual value of the vehicle). However, strong control mechanisms and safeguards should be put in place to ensure that this ability cannot provide an opportunity to alter a vehicle's identity and create a potential for fraudulent activity.

Although secure ID labels are important contextually regarding whole-vehicle theft, we anticipate that future theft trends will begin moving toward high-value components instead. Expensive items such as sensors, radar units, headlights, and rare-earth metals contained in exhaust components, that are quick and easy to remove and are less risky to steal than a whole vehicle, will increasingly become the target of thieves in the coming years.

Mechanisms to identify certain high-value parts and link these parts to the VIN should be considered and in place. This could be done by physically labelling or by software programming the part for it to be accepted by the vehicle information and data architecture.

## 2. Project Summary

### 2.1 Context

The conversion of stolen vehicles into cash has historically relied upon the manipulation of vehicle identities and state and territory registration systems to on-sell stolen vehicles into the domestic second-hand market.

The NMVTRC's vehicle laundering disruption strategy has therefore been developed based on increasing the effort and risk associated with the re-identification process and reducing the potential reward through providing government agencies, industry, and consumers with accurate real-time vehicle status information.

The strategy has been based on four equally important, interrelated pillars (the four pillars) encompassing the

- secure application of the Vehicle Identification Number (VIN) to the vehicle prior to its supply to the market;
- timely exchange of stolen vehicle data;
- effective recording and management of written-off vehicle identities; and
- introduction of specialised, pre-registration vehicle identity inspections for high-risk vehicles, including returning write-offs.

Following the Commonwealth Government's decision to drop the Australian Design Rule requirement for road vehicles to be fitted with an Identification Plate (commonly referred to as the compliance label) from mid-2021, the NMVTRC successfully lobbied for the creation of a secure vehicle marking standard.

The consultation draft of ADR 61-03 (Vehicle Marking; refer to Appendix 2) includes a requirement for a secure ID label. However, in the NMVTRC's assessment, the amendment lacks sufficient guidance as to what constitutes appropriate tamper evident, fraud resistance and self-destructive qualities, such as

- leaving a discernible footprint or residue if removed;
- not being able to be removed intact by heating or freezing;
- not being able to be easily duplicated by known copying or scanning methods; and
- being able to be confirmed as genuine by a simple, in-situ, non-destructive field test.

The NMVTRC has since been advised that the Commonwealth Government has not accepted the NMVTRC's calls to include detailed requirements for secure ID labels in the ADR itself, and this decision leaves the qualitative requirements open to manufacturer and vehicle importer interpretation, therein providing scope for manufacturers to reduce ADR vehicle compliance costs.



This image is an example of a secure ID label, known also as a compliance label or compliance plate.

With a cost of approximately A\$1.30 each for a high-security label (such as the one above), and almost 500,000 of the 917,000 new vehicles sold using said label, a lower security (and cheaper) label presents a significant cost savings opportunity for manufacturers and importers.

## 2.2 Objective

The aim of this project is to continue to build the case for maintaining secure vehicle ID as a regulatory requirement in Australia and assess the utility of manufacturers' candidate labels in respect of their real-world performance.

## 2.3 Scope

It is expected that this project will involve the IAGRC conducting

- An international scan of insurance experiences via R-CAR in respect of any like assessments conducted internationally; and
- Testing of security of popular brand ID labels produced in response to ADR 61-03. (This is even more important given the Commonwealth Government's decision to not provide, in the NMVTRC's view, sufficient guidance as to what constitutes appropriate tamper evident, fraud resistance and self-destructive qualities for secure ID labels.)

Since ADR 61-03 comes into effect from 1 July 2021, it is not practically possible for IAG RC to test labels introduced by the manufacturers or their importers before this date. Pending changes to the labels by manufacturers, testing of the candidate labels can be performed after 1 July 2021.

Learnings from this project will also inform changes to the IAG vehicle security index for insurance rating purposes.

## 3. International Scan of Secure ID Assessments

### 3.1 Context

We reached out to our international partners in RCAR to gain further insight and to find out whether they partake in active testing of compliance labels. We posed the following questions to them:

1. Have you ever done, or are currently doing, any assessment of vehicle security identification features?
2. If so, what specific testing methods do you use and what parameters do you test for to prove sufficient tamper evidence, fraud resistance and self-destructiveness of vehicle identification?
3. How do you deal with damaged vehicles which are not written off but have damaged secure vehicle identification?

The following summaries are the responses we received.

### 3.2 China

There are some regulations and policies regarding vehicle label and VIN requirements. Below is an example of a Chinese BMW 530Le (PHEV) label.



The label must meet the requirement GB/T25978 and GB-16735. There are 3 VIN identifiers on a vehicle. First is on the label, the second is on the windshield, and the third is on the front panel. In addition, the vehicle certificate will have VIN and engine number.

There are also two vehicle ID licenses, including VIN, engine number, owner details and vehicle license plate number. If people want to sell and resell their cars, all the licenses and VIN need to be same, resulting in almost no possibility to counterfeit (they claim). If the label is damaged in an accident, it needs to be customised by the manufacturer.

China provided a copy of one of their labels, as well as some interesting insights, especially when reading through their GB/T 25978-2018 requirements. They have also cancelled theft insurance in September 2020 due to the small number of underwriters because theft rates are so low.

### 3.3 Germany

In Germany vehicles are required to have punched-in VINs at non-detachable parts of the body in white, no further legal requirements or generic insurance demands have been sourced at the time of writing.

### 3.4 Japan

Our Japanese research contacts in JKC do not have any experience regarding the assessment of secure vehicle identification.

### 3.5 Mexico

At Cesvi Mexico, vehicles are analysed in the following ways:

- Review of the type of marking.

- Review of the minimum characteristics established by NOM-SSP-001.
- A check that labels are placed in immovable parts of the vehicle.
- Review that they are durable labels.
- A check for a laminated label or with plastic protection.
- A check if it has destruction locks.
- A check if it has holograms.
- A check if it has hidden information that is revealed under UV light.

In dealing with damaged vehicles that are not written off but have a damaged compliance label, they stated that there are currently no regulations that indicate the proper handling of damaged units.

Some of the common practices of the market to handle this scenario is that insurance companies keep records of vehicles with damaged labels, and also that manufacturers of heavy vehicles carry out the destruction of the chassis rods and document said operation so the identifiers are entirely removed from the market.

### 3.6 Spain

CESVIMAP disclosed a document to us that they use to help appraisers in the identification of a car. The document shows an example of a compliance label and example of where to find it on a vehicle.



The manufacturer label is shown to be attached to the base of the right (driver-side) centre pillar. There are additional VINs located on the left side of the vehicle under the windscreen and die-cut in the turret on the suspension. The tyre pressure label is attached to the left (passenger-side) centre pillar.

Aside from the above information, no further label requirements were provided, and no further assessments on labels are being conducted.

The National Insurance Crime Bureau <https://www.nicb.org/> or U.S. Department of Transportation may have studies on how effective the requirements are.

In any case, there have been recorded instances of cheating involving people registering stolen\reincarnated vehicles with the VINs of other vehicles.

### 3.7 United Kingdom

Within their New Vehicle Security Assessment, our partners in the UK carry out a series of tests to the VIN label.

They promote that the security label is designed such that they have anti-counterfeit measures inbuilt. These can include holographic properties, watermarks or registered trademark or logo. For this they perform a visual inspection of the supplied label. Visual inspections are conducted using the naked eye only with no specialist tools used.

They promote that the label is designed such that it self-destructs when removed or attempts are made to remove the label. Furthermore, they adhere the product to a substrate representative of the intended application, so normally the vehicle

manufacturer would provide a section of that material with several labels attached. Once secured, they attempt to remove the label in such a way that may allow the reuse. When they attempt to remove the security label it shall be seen to distort and or disintegrate to such extremes as to prevent reuse.

Finally, they conduct a chemical and solvent resistance test to provide a means of evaluating the resistance of altering information on the label (fraud) with the following chemicals or solvents.

- Petrol.
- Acetone (nail varnish remover).
- Brake fluid.

They adhere the product to a substrate representative of the intended application. Once secured and fully cured, they apply the chemical or solvent to a clean piece of cloth and rub over the label or plate for 30 seconds. They repeat the test using a new label and a clean piece of cloth for each chemical or solvent. Upon completion, it shall not be possible to alter, erase or replace characters, the markings shall remain legible and identifiable on the label or plate.

With regards to the replacement of an accident damaged label, there is a process in place for ordering a new one from the vehicle manufacturer. The exact process is unknown as this may vary between manufacturers, but the vehicle repairer would need to obtain proof of ownership from the user.

If a manufacturer still chooses to use a VIN plate, they promote that it has unique rivets to secure it to the vehicle, that are only available to the manufacturer. In this instance, they also still apply the chemical test.

### 3.8 United States

Our insurance counterparts in the US stated they've never examined the effectiveness of VIN marking requirements as a theft deterrent.

Vehicles are required to have a non-removable VIN-placard that is visible from the outside which is usually located in the lower left corner of the windscreen. In addition, some parts are required to be marked indelibly with the VIN. The various requirements for VIN labelling are disclosed in Part 565 – Vehicle Identification Number (VIN) Requirements.

### 3.9 Summary

The responses show mixed results regarding the concern about identification labels.

The two outstanding responses were from the United Kingdom and China. The UK because of the depth of the testing they go to, and China because of the insights gained from the quality-control related requirements of the label.

## 4. Manufacturer Responses

### 4.1 Context

IAG Research Centre reached out to our network of manufacturer contacts and asked them the following question.

*"If you are currently using the Identitek high-security compliance label, do you have plans to switch to a lower-security label (i.e. one without a holographic layer) when the ADR changes on July 1 of this year?"*

The following section contains the responses.

### 4.2 BMW

BMW stated their intentions are to use the existing EU build label that meets the requirements of the ADR 61/03.

### 4.3 Ford

Ford won't make physical changes to vehicle compliance labels (ADR 61/02) or to secure vehicle identification labels (ADR 61/03) (for the RVSA legislation that for full volume Vehicle Type Approval that kicks in from 1 July 2021) until we secure approvals under the Road Vehicles Standards Act (either through OPT-IN provisions for on-going models (existing Motor Vehicles Standards Act approvals i.e., Puma, Escape, Transit, etc) or new approval applications post 1 July (i.e., new Ranger and Everest).

Physically, the new Secure Vehicle Identification (SVI) labels are planned for November 2021 production and beyond on Ford vehicles for the Australian market.

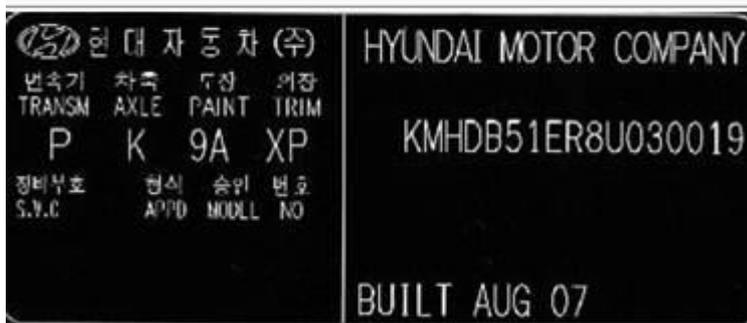
The security elements of the SVI labels will be identical to the current security elements of both the present Compliance Label and Built date labels (no change). In fact, the proposed SVI label will simply be re-purposed European VIN label or existing built date label. ADR 61/03 specifies the tamper proofing and security elements required of the SVI label.

### 4.4 Hyundai

Hyundai are still deciding on what to do with the compliance label once they opt into the new Road Vehicles Standards Act.

However, their vehicle build label (below) complies with ADR 61/03 therefore they will revert to using just the build label.

#### 2. Build Plate – Black Label



### 4.5 Summary

The responses from the manufacturers indicate either no immediate changes to the existing labels used (BMW, Ford) or a manufacturer yet to make a decision on whether to keep using the existing security label (Hyundai).

## 5. Proposed Secure ID Assessment Procedures

ADR 61-03 (refer to Appendix 1) specifies the ID label must

- (a) display at least:
  - (i) the name of the 'Manufacturer' or the 'Vehicle Make'; and
  - (ii) the 'VIN';
- (b) be firmly affixed in a conspicuous and readily accessible position on the vehicle; and
- (c) not be affixed on a part of the vehicle usually subject to replacement in use.

This makes it quite simple to comply with, since the restrictions are so few and there is no requirement for it to pass a physical or visual assessment.

### 5.1.1 Label properties and ease of replication

Label property	ADR requirement	Ease of replication
Dimensions	None	Possible
Material	None	Possible
Unique ID information	Manufacturer, Make, VIN	Difficult
Holographic property	None	Difficult
Bar code	None	Possible

If we see a new variety of low-security labels entering the market after July 2021, we propose testing these labels according to the following test procedures:

### Proposed test procedures

Test	Notes	Success / Failure Criteria
Self-voiding	<p>Insert a razor blade or other sharp item under one of the corners and carefully lift half the label from its point of contact, ensuring half of the VIN is freed.</p> <p>Gently smooth down back in place and apply firm pressure to avoid the appearance of tampering.</p> <p>Examine the label from a distance of 1.5m and perform an up-close inspection to determine obvious signs of damage, particularly noting the VIN portion and any VOID patterns.</p>	<p>Success if self-voiding makes the label easy to identify if tampered.</p> <p>Failure if label can be put back in place without obvious signs of tamper.</p>

Test	Notes	Success / Failure Criteria
Heat removal	<p>The object with this test is to remove the entire label intact.</p> <p>Using a heat gun, heat the label from different angles and distances to try and make the glue liquified enough to insert a razor underneath and remove the label intact (inch by inch).</p> <p>Note the most successful methods and temperatures, and inspect for signs of damage and tampering, especially regarding discoloration, deformation, the VIN and the VOID.</p>	<p>Success if label is wholly or partially destroyed or displays obvious signs of damage.</p> <p>Failure if label can be removed intact and without obvious signs of damage.</p>
Cold removal	<p>The object with this test is to remove the entire label intact.</p> <p>Using a cold source (dry ice, liquid nitrogen, etc) attempt to cool the label so the adhesive becomes brittle and easier to get under with a razor without damaging the label.</p>	<p>Success if label displays obvious signs of damage.</p> <p>Failure if label is removed intact.</p>
Scalpel VIN	<p>This test aims to leave the label on and intact but to carefully remove just the VIN portion of the label using a scalpel. Then replace with a new VIN portion that has been printed off separately.</p>	<p>Success if new VIN portion is easily identifiable as fake.</p> <p>Failure if new VIN portion passes a visual inspection.</p>
Counterfeit A	<p>Using an ordinary printer and office supplies, try to recreate a label on a computer and print it. Determine how authentic it looks when applied to a vehicle.</p>	<p>Success if a printed label is easily identified as fake.</p> <p>Failure if a label can be designed and printed that can mimic a genuine label closely enough to pass an inspection.</p>
Counterfeit B	<p>Using a network of contacts and third-party information, try to source a supplier of counterfeit labels or a printing company that can make them.</p>	<p>Success if a counterfeit label is sufficiently hard to acquire.</p> <p>Failure if a counterfeit label is easily or cheaply acquired.</p>

Note: none of the Accelerated Durability Tests outlined in “*NMVTRC Technical Specification: Secure Compliance Labels and Vehicle Security Labels (2005 revised)*” are required due in part to the fact that the above tests will be conducted on older vehicles that have likely had exposure to some or all of the conditions therein.

## 6. Appendix I: Australian Design Rule 61-03 Requirements

### 6.1 Section 6 of ADR 61-03

#### Section 6. Secure Vehicle Identification Marking

6.1. Every L-Group vehicle, and every category MA, MB, MC, MD or NA vehicle, must bear one or more items of 'Secure Vehicle Identification Marking', in the form of a durable self-adhesive label.

6.2. Every category ME, NB or NC vehicle must bear one or more items of 'Secure Vehicle Identification Marking', in the form of a durable self-adhesive label or a durable metal plate.

6.3. Every category TA, TB, TC or TD vehicle must bear one or more items of 'Secure Vehicle Identification Marking', in the form of a durable metal plate.

6.4. The 'Secure Vehicle Identification Marking' required by clause 6.1, 6.2 and 6.3 above, must:

- (a) display at least:
  - (i) the name of the 'Manufacturer' or the 'Vehicle Make'; and
  - (ii) the 'VIN';
- (b) be firmly affixed in a conspicuous and readily accessible position on the vehicle; and
- (c) not be affixed on a part of the vehicle usually subject to replacement in use.

6.4.3. Where a self-adhesive label is used for the required 'Secure Vehicle Identification Marking', it must be tamper evident, fraud resistant, and self-destructive (e.g. self-voiding) in case there is an attempt to remove the label; and all the required information must be printed indelibly on the label.

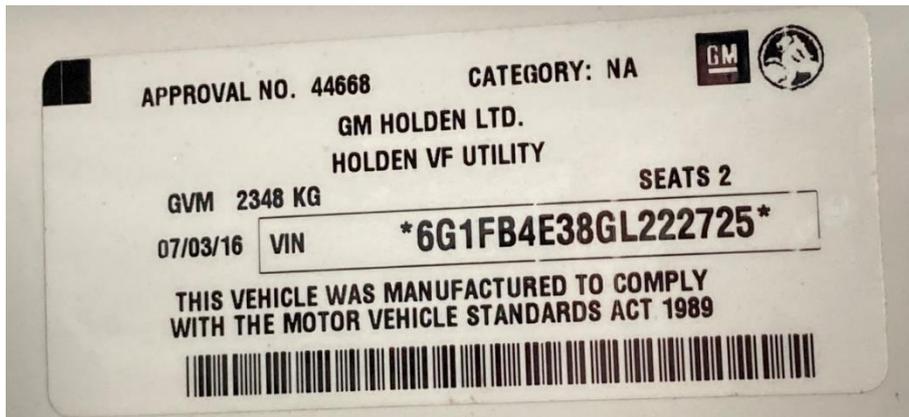
6.4.4. Where a metal plate is used for the required 'Secure Vehicle Identification Marking', it must be welded, riveted or otherwise permanently affixed to the vehicle; and all the required information must be embossed, indented, etched, engraved, or otherwise printed indelibly on the plate.

6.4.5. The 'Manufacturer' may choose to provide further information, for example a 'VIN' barcode, on a self-adhesive label or metal plate used as 'Secure Vehicle Identification Marking'.

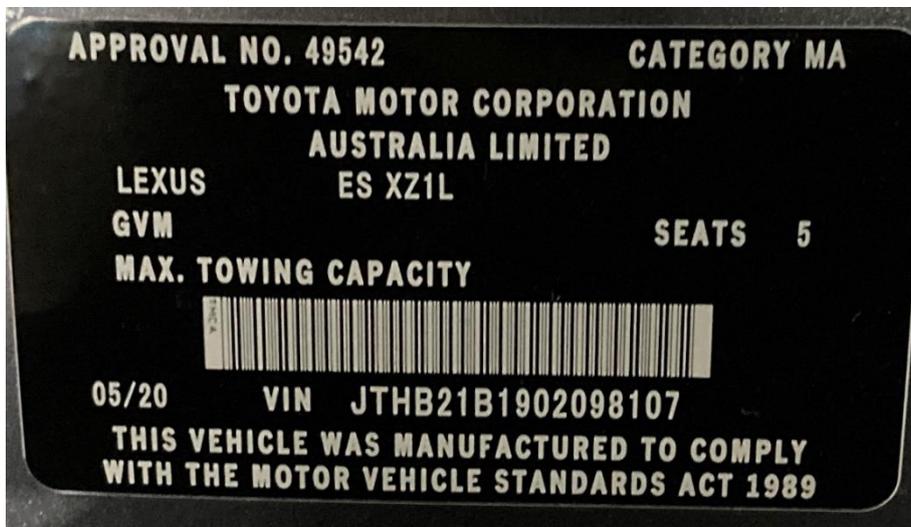
#### 6.1.1 Vehicle Type Definitions

Type	Definition	Type	Definition
L-group	Motorcycle categories	TA	Very light trailer
MA	Passenger car	TB	Light trailer
MB	Forward-control passenger vehicle	TC	Medium trailer
MC	Off-road passenger vehicle	TD	Heavy trailer
MD	Light omnibus		
ME	Heavy omnibus		
NA	Light goods vehicle		
NB	Medium goods vehicle		
NC	Heavy goods vehicle		

### 6.2 Examples of compliance labels



Example of Holden medium-security ID label, black on white.



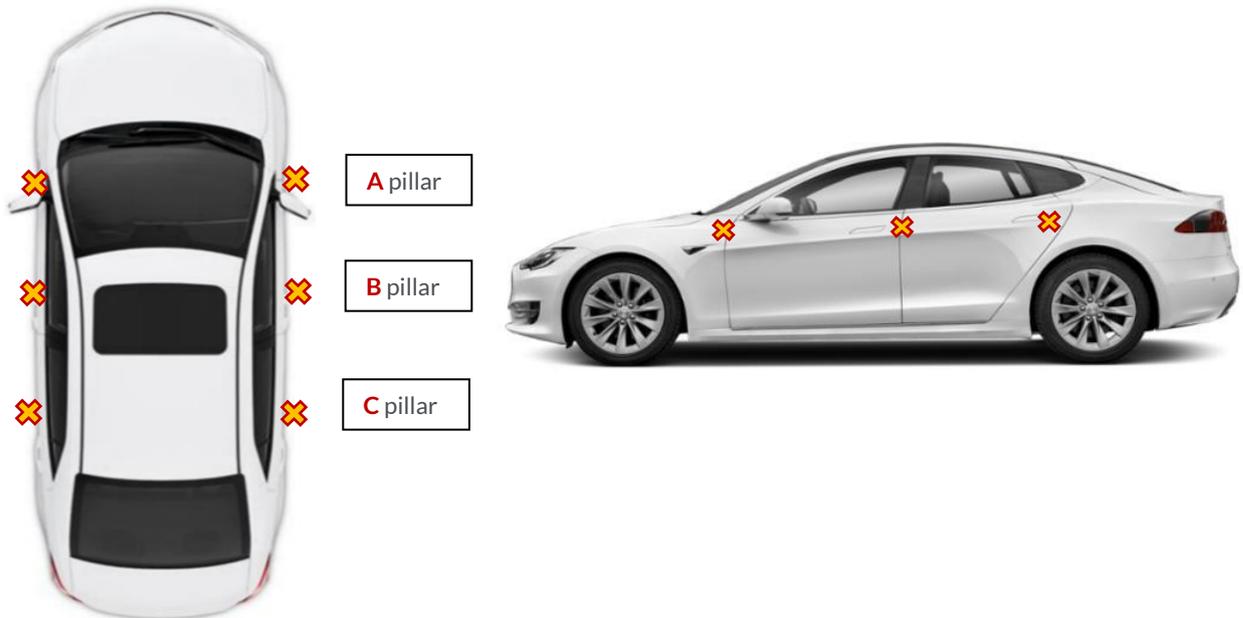
Example of Toyota medium-security ID label, white on black.



Example of BMW high-security ID label, black on white.

### 6.3 Typical locations of labels

Compliance labels can usually be found on the inside of the doors or on the pillar. The X's mark the locations of the A, B and C pillars, and the labels might be anywhere in or around these three locations.



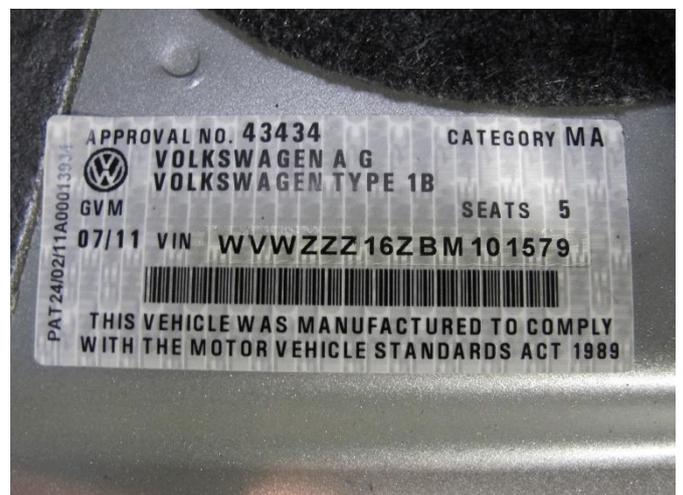
### 6.4 IAG New Vehicle Assessment criteria

As part of our New Vehicle Assessment, we assess the locations of the labels in relation to their positioning in the vehicle. Our “preferred locations” are designed to reduce the likelihood of needing the label replaced as a result of damage or repairs required.

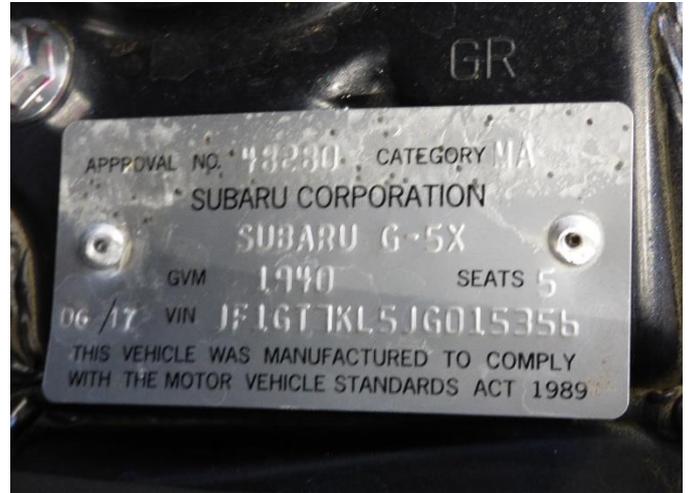
The preferred location for these identifiers includes (in descending order of preference):

- the vehicle’s firewall
- high on the A pillar, level with the dashboard
- the floor in the passenger’s compartment, and
- as far forward on the boot floor area – a minimum of 0.5 metres forward of the rear bumper exterior surface.

Labels found outside of the recommended areas incur a penalty to their overall score. For example, in some older models, we have seen cases of the label being placed inside the boot floor panel. These vehicles then incurred a penalty for being in a location that had a high likelihood of being damaged and being replaced. The following is an example provided from a 2011 Volkswagen Jetta.



Off-road vehicles are often found to contain a riveted plate that is located inside the engine bay, due to the difference in use that those vehicles are likely to endure. This would not result in additional penalties. The following is an example provided from a 2017 Subaru XV.



#### IAG guideline for scoring secure ID labels

We also score the labels according to security criteria. We assess for self-voiding (break-up on removal) ID labels with the following criteria. The higher the ranking of the label, the more points it scores for the security test.

No additional security features.

Minimal - e.g., a company logo featured using a scrambled printing technique.

Medium - in-built security counterfeit resistant features. Security features must be visible under normal light and may be a textured surface finish (e.g., embossed label background or microtext printed on label).

High - in-built high-security counterfeit-resistant features verified using a lens device (e.g., a scrambled image in label background). Security features must be visible under normal light.

IAG Research Centre is currently reviewing the scoring system and methodology used to assess new vehicles. This section of the assessment procedure is due to be updated in the next financial year. The learnings and outcomes gained from this project will help shape what the revised assessment will look like.

## 7. Appendix II: Market Share of Top 10 Makes and Models

### 2020 Top Selling Makes\*

Make	No. Sold	Market Share
Toyota	204,801	22.3%
Mazda	85,640	9.3%
Hyundai	64,807	7.0%
Ford	59,601	6.5%
Mitsubishi	58,335	6.4%
Kia	56,076	6.1%

Make	No. Sold	Market Share
Volkswagen	39,266	4.3%
Nissan	38,323	4.2%
Subaru	31,501	3.4%
Mercedes-Benz	29,455	3.2%
<b>Top 10 Total</b>	<b>667,805</b>	<b>72.8%</b>

### 2020 Top Selling Models\*

Make/Model	No. Sold	Market Share	Models using mid-security label?	Models using high-security (Identitek) label?
Toyota HiLux	45,176	4.9%	2011, 2015	
Ford Ranger	40,973	4.5%	2011, 2015	
Toyota RAV4	38,357	4.2%	2013, 2016, 2019	
Toyota Corolla	25,882	2.8%	2012, 2014, 2018	
Mazda CX-5	21,979	2.4%	2015, 2021	
Hyundai i30	20,734	2.3%		2015, 2017
Mitsubishi Triton	18,136	2.0%	2021 <sup>^</sup>	2011, 2015
Toyota Prado	18,034	2.0%	2013, 2017	
Kia Cerato	17,559	1.9%		2013, 2016, 2018
Hyundai Tucson	15,789	1.7%		2015
<b>Top 10 Total</b>	<b>262,619</b>	<b>28.6%</b>	<b>22.8% (80% of Top 10)</b>	<b>5.9% (20% of Top 10)</b>

\* data from VFACTS December 2020.

<sup>^</sup> denotes recent switch from a high-security label to an alternative.

## 8. Appendix III: Label Reprinting

Our research has seemingly uncovered the ability of some dealer networks to obtain reprinted copies of original ID labels.

In February 2021, Toyota issued a recall for vehicle that had incorrect information contained in the labels. The statement issued included the following:

*“For all involved vehicles, Toyota dealers will replace the compliance label on the vehicle free of charge to vehicle owners. It is expected that replacement of the compliance label will take approximately 30 minutes.” [7]*

This would suggest that Toyota has the ability to print their labels on site, which opens up the possibility for an easy method of illegal label replication.

Holden also has a method to obtain a new copy of a damaged label, by filling out a request form. The difference here is that it needs to be signed off by the Service Manager or an Insurance company before it gets sent to a local dealer. [4]

## 9. Appendix IV: Future Focus

During our investigations we discovered that although secure ID labels are important contextually regarding whole-vehicle theft, we envision future theft trends moving toward high-value components instead. Expensive items such as sensors, radar units, headlights, and rare-earth metals contained in exhaust components, that are quick and easy to remove and are less risky to steal than a whole vehicle, will increasingly become the target of thieves in the coming years.

We see this as an important area to investigate, especially regarding mechanisms to identify certain high-value parts and linking parts to the VIN. We should advocate that high-value and easily removable parts should have an in-built identifier, e.g. having the VIN stamped or a QR-code stamped with the vehicle information contained therein.

Another consideration is the software of these components and how the OEMs allow a new part to communicate to the ECUs, i.e. is there a safeguard built into the software to prevent any new, unverified component being introduced to the system?

Allowing OEMs and manufacturers this level of control would also bring up issues around parts pricing and right to repair and would need careful consideration and conversation before advocating for this kind of control measure.

We could also allow for the possibility to lobby government to push for regulatory and compliance change, for example, in order for new vehicles to be sold here in Australia, they must adhere to having X parts identifiable and linked to the vehicle. Sellers of scrap catalytic converters or diesel particulate filters (DPFs) should also follow local scrap metal regulations, as these can vary slightly from state to state.

These areas are of concern and relate to theft and rebirthing of vehicle parts, and likely could become a good research project in the coming year.

## 10. References

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