



Engine Conversion Guidelines for Australian BRZ/GT86

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1 Overview

This guideline is put together to help Australian customers doing an engine conversion into a Subaru BRZ / Toyota 86.

Australia has some of the toughest rules and regulations in regards to vehicle modifications. Many people still believe you cannot transplant a 6.2L Holden V8 into a modern vehicle that originally only came in 2L and get it street legal in Australia.

This general brief guideline will describe some of the main rules and regulations. Some states have slightly different rules, and some of these rules can be interpreted differently by the certifying officer. It is therefore important to talk to your local certifier BEFORE starting any conversion work to get a clear understanding of what his requirements are in your state's jurisdiction.

2 Disclaimer

This guideline is not to be used as a guaranteed source of information for certification. Consult with your engineer and/or state transport office for clarification on any rules. The information contained within this guide was obtained from our own experience getting an LS3 conversion certified in NSW as well as experience from many of our customers from states including NSW, QLD, VIC, SA and the NT. The rules do vary slightly state to state.

Some people believe they can get anything engineered, such as an LS1 conversion. This is simply not possible with the current rules. There has been one instance of a V8 swapped 86/BRZ, where the compliance was audited by the state authorities and deemed to be non-compliant. The vehicles registration was cancelled.

3 Engine Choice

There are a few things concerning engine choice that are important including:

Capacity – The old VSB14 rules used to state the maximum engine capacity (in cc) was to be no larger than 5 x the original chassis weight (which is ~ 1200kg for the BRZ/86).

With this rule the maximum capacity is $1200 \times 5 = 6000\text{cc}$ (or 6L). Some states have removed this rule, however the engineers still use it as a guide. In saying this, a slight increase is now possible (such as the LS3 6.2L) with the engineer's discretion.

Before deciding on an engine, check with your engineer to see what the highest capacity engine they will allow.

Engine Age – The general rule of thumb here is that you should use an engine that was manufactured (or identical to) the same year or younger than the year the BRZ/86 was

manufactured. The main concern here is for compliance of the emissions standards applicable to the vehicle at the time of manufacture.

For example, a 2013 Holden Commodore would have complied with the emissions standards set in 2013.

Engine Type – Most people doing an engine swap in Australia use a GM V8 because of its easy fitment, easy to source, is relatively cheap, and is easy to get the safety systems fully functional and meet the certification requirements.

Other engines can be used, however, to date the only way to retain all safety functions is to use a supported aftermarket ECU, which adds further complications to the certification process.

4 Engine Fitment and Mechanical Modifications

One of the main factors with engine fitment is no structural modifications, so:

- No modification or cutting of the front crash bar
- No modifications or cutting to the firewall or tunnel
- No modifications to the structural ribbed section of the bonnet
- Adequate clearance between engine components and fixed components (such as chassis rails, steering components etc)

AGT engineering manufacture a K frame mount kit which places the engine in a position to meet the requirements above and for good clearance to the firewall for wiring, heater and A/C lines.

There are also a number of other manufacturers producing mount kits for left hand drive vehicles (primarily within the USA). From experience of our customers, we have not heard of any LHD LS to BRZ mount kits that fits well in a RHD vehicle (even if they state they do fit RHD). Because of this issue we decided to manufacture our own basic mount kit in 2020 to complement our wiring/Canbus translator kits.

5 Retention of Vehicle Safety Features

To keep the vehicle road legal, you need to retain all safety related features of the vehicle in an operable condition. This includes the SRS airbag, ABS and traction/stability control systems.

The issue here is that the traction/stability control, relies on the engine management system to cut engine torque on a loss of traction. This is one of the main functions of our Canbus Translator.

Some aftermarket management systems can also be used for traction control.

Some engineers may require evidence the traction control safety system is working, which may be just a simple drive, a statement from AGT, to a specially organised track test.

6 Vehicle Emissions Standards

The engine conversion must keep the emissions standards as applicable to the year the BRZ/86 was manufactured.

The easiest way to prove this is to use a stock engine that is the same year or younger than the chassis, using the OEM management and standard tune that was available with the new engine at the time it was new. A modified engine (such as one that is cammed) or using an aftermarket ECU may raise concerns with the certifier and may need extra emissions testing done on the vehicle prior to certification.

You will also need to keep the emissions components applicable to the engine as standard or to standard specifications, such as using original catalytic converters or ones that meet or exceed original specifications. You may also need to run the post catalytic converter o2 sensors.

7 Noise Testing

The engine conversion will generally require an exhaust noise test. This should be less than 92dB at 2/3 redline (4000rpm).

If the engine has a modified air intake (most will). The engineer may require a rolling noise test. This test requires the measurement of the noise of the vehicle while accelerating at around 60km/h as measured from the roadside.

8 Brakes

Brake requirement is a little hard to document as the requirement experiences with customers varies greatly. Some certifiers will not require any sort of brake upgrades, whereas others will require you to upgrade the brakes slightly.

If brakes are required to be upgrade there are many options, including new upgraded aftermarket brake kits, to upgrading to bigger brakes as found on the later model "sti" variants, to using brake components from the WRX.

If brakes are upgraded there may be a requirement to do brake testing, this can be anything from a simple "Platetronic" brake test, to a full on brake test exercise on a racetrack.