



Wiring Guide for LS1 to BRZ/86/FRS

This guideline is put together to help people wire an older LS1 into their BRZ/86/FRS. The LS1's do not use Canbus like the BRZ/86/FRS or the later LS3's do, and therefore full integration is not as easy. You can however still use this engine with basic functionality. There are many ways you can wire up this engine, and there is no right or wrong way. This guide was documented to the way we usually wire them up.

The LS1 houses the engine computer (ECU/PCM) inside the vehicle. This is usually behind the glovebox, which is also where the original BRZ/86/FRS engine computer is located. Most of the connections from the LS1 "stand alone" style loom and the BRZ/86/FRS and the vehicle can be done near the original ECU wiring. It is also a good spot to add the Canbus Translator wiring.

The LS1 engine loom and ECU need to be modified to run "stand alone". Many businesses offer this service, and there are also many online resources for people to do it themselves. In most cases the "stand alone" harness will come with a fuse and relay box for fuses and relays for the engine, fans and fuel pump. We like to keep the engine relay and fuel pump relay (and associated fuses), however we prefer to use the BRZ/86/FRS radiator fan relays and we wire the LS1 ECUs fan relay triggers to the BRZ/86/FRS fan relays. This technique saves running extra wiring to the radiators as you can re-use the factory wiring.

Two extra sensors are required to be added to the engine to provide signalling to the dash.

A temperature sender is required (wired to the Canbus Translator) to allow an engine temperature measurement for the gauge. The AGT Canbus translator can accept eight different types of sensors and the sensors can be installed on the engine, or in the radiator piping via a "coolant sensor hose adaptor".

An oil pressure sender (switch type) is required for the oil pressure warning lamp. This needs to be added to the oil pressure gallery and is wired to directly drive the globe in the dash cluster.

Other wiring required from the LS1 computer to the Canbus translator include the TACHOMETER signal and the MIL indicator (Malfunction Indicator Lamp / Check Engine Lamp).

Wiring from the translator to the vehicle include the two CANBUS wires, and the Cruise Control Switch (for menu screen display and parameter adjustment).

For more information on the wiring of the translator, consult the Canbus Translator V2 manual.

Also remember with the LS1 stand-alone system, you need to remove the VATS (immobiliser) from the engine ECU tune and alter the tune slightly to suit the stand-alone operation.

The following information is derived from LS1 wiring from an Australian LS1 VX Commodore. Other variants (particularly USA models) may vary. Please check each connection against the diagrams for your version of the LS1 wiring and alter if required. The stand alone harness you have (or build yourself) may connect slightly different to others (or as shown below), so consult the instructions from your harness builder. We cannot provide assistance with the wiring of the LS1 systems, particularly overseas models. There are many individuals and companies who specialise in these systems that do the “stand alone” harness modifications.

Function	LS1 Harness	Canbus Translator	Vehicle
Battery Positive (constant) - Power	Usually wired in the stand alone harness to the various fuses in the fuse/relay block		Connect direct to Battery
Ignition Sense (Run)	Wired to various components in the LS1 harness. Wired to LS1 ECU X1(Blue) pin19 (Orange Wire)	Pin1	ECU Plug A33 Pin27 (Grey Wire)
Low Speed Fan	Wired to LS1 ECU X1(Blue) pin42 (Most cases it needs to be added)		ECU Plug A35 Pin11 (Red/Yellow Wire)
High Speed Fan	Wired to LS1 ECU X2(Red) pin33 (Blue/White Wire)		ECU Plug A35 Pin12 (Black/Red Wire)
Tacho	Wired to LS1 ECU X2(Red) pin10 (Brown Wire - it may need to be added))	Pin4 (set to 4cylinder pulse on translator)	Also connect to Authentication ECU (if pushbutton start model).
Start Relay	Wire to constant ground (or if LS1 ecu has relay control you can wire to that)		ECU Plug A35 Pin26C (Black/Blue Wire)
Temperature Gauge Sender		Pin3 (See translator manual for further details)	
Cruise Control Switch		Pin6	ECU Plug A33 Pin30 (White/Blue Wire)
Oil Pressure Warning			Connect to dash cluster Pin14 (Light Green)
Canbus – High		Pin7	ECU Plug A33 Pin19 (Orange Wire)
Canbus – Low		Pin8	ECU Plug A33 Pin18 (Orange Wire)
Ground	(as required)	Pin14	Connect to Chassis ground (also connect to cruise switch ground ECU plug A33 Pin4 (Black/Blue Wire)



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