

CIRCULAR 79-2-1

SELECTION OF TEST VEHICLES

INTRODUCTION

1. This Circular should be read in conjunction with the General Circular 0-2-11 "General Procedures for Selection of Vehicles and Components for ADR Compliance Testing" containing requirements applicable to all ADRs.
2. This circular is applicable for any version of ADR 79 currently in force. It details the criteria to be considered in selecting the variants of a vehicle model to be tested. The Administrator will usually accept tests conducted in accordance with these criteria as having demonstrated compliance for all variants in the model range. Additional tests may be required for combinations of characteristics not anticipated in this circular.

This circular has been written to facilitate the reduction of tests performed for the initial certification of a vehicle type and extension of approval to additional variants. Where a previously tested and certified vehicle undergoes specification changes or an additional variant is added, only the affected vehicle system/s will be required to have the applicable Type test/s performed. The conditions where retesting is required are contained within the selection criteria below.

The Administrator will consider requests for further reductions in the number of tests on receipt of documented evidence that the emissions of the untested vehicles will not exceed that of the tested vehicle. That documented evidence may include simulated or calculated emission results for the untested vehicle with any such simulations or calculations being traceable to similar comparisons between tested vehicles.

3. It remains the responsibility of the vehicle manufacturer to ensure that every vehicle supplied to the Australian market complies with the applicable version of ADR 79.

SELECTION REQUIREMENTS

TYPE I TEST

4. The Administrator will accept a test on one vehicle as representative of another for the purposes of demonstrating compliance with the requirements of the Type I test provided that, when compared with the untested vehicles, the test vehicle shall have:
 - 4.1 the same type of device or system that converts stored energy into mechanical energy (e.g., internal combustion engine, hybrid internal combustion engine / electric motor, fuel cell, etc.);
 - 4.2 an engine of the same "Engine Family", i.e., identical with respect to:
 - 4.2.1 the same nominal Net Engine Power (NEP) and Engine Speed at Maximum Power;
Note: To allow for variations in the NEP caused by the effects of variations in the design of the sound reduction and induction systems installed to different body variants (e.g., sedan, hatch, coupe, etc.), an allowance of +/- 2% on the untested vehicle's NEP shall be given when compared to the tested vehicle.



- 4.2.2 the nominal bore centre to centre dimensions;
- 4.2.3 the nominal dimension from the centreline of the crankshaft to the centreline of the camshaft(s);
- 4.2.4 the nominal dimension from the centreline of the crankshaft to the top of the cylinder block where the cylinder head is mounted;
- 4.2.5 the number of cylinders and their configuration (e.g., IL6, 90° V8 etc.);
- 4.2.6 the method of engine cooling (e.g., water or air cooling, etc.);
- 4.2.7 the engine capacity (+/- 15%);
- 4.2.8 the compression ratio and design of the combustion chamber;
- 4.2.9 the configuration of the intake and exhaust valves i.e., identical in respect to:
 - 4.2.9.1 the number, location and geometry of the intake and exhaust valves;
 - 4.2.9.2 the dimensions of the intake and exhaust valves and ports (within a 4mm range);
 - 4.2.9.3 the method of actuation, lift and timing of the valves (and the method and strategy of varying the lift and timing, if variable valve timing is fitted).
- 4.2.10 the method of fuel intake (e.g., indirect injection, direct injection, etc.);
- 4.2.11 the method of air aspiration (e.g., natural or forced, supercharged or turbocharged, intercooled or non-intercooled, etc.);
- 4.2.12 the type of combustion process;
- 4.2.13 the same engine air intake system i.e. identical with respect to:
 - 4.2.13.1 the same air cleaner;
 - 4.2.13.2 the intake manifolds (including the method of control and strategy of variable length intake runners, if fitted).
- 4.2.14 the same fuel type(s) (e.g., premium unleaded petrol, LPG) specified by the manufacturer for use in the vehicle;
- 4.2.15 the same ignition system, i.e., identical with respect to:
 - 4.2.15.1 the type of ignition (i.e., spark ignition or compression ignition);
 - 4.2.15.2 if by spark ignition, the method of control of the spark timing (i.e., Engine Control Unit (ECU), Ignition Control Module, Mechanical Advance Mechanism).
- 4.2.16 The same fuel delivery system;
- 4.2.17 the same exhaust system i.e. identical with respect to:
 - 4.2.17.1 engine exhaust manifolds and heat shields;
 - 4.2.17.2 location, number, design and type of catalytic converter(s) including:
 - 4.2.17.2.1 the size and shape of the catalytic converter i.e., volume of monolith +/- 10 %;



- 4.2.17.2.2 type of catalytic activity (e.g., oxidising, three way etc.);
 - 4.2.17.2.3 precious metal load i.e., identical or higher;
 - 4.2.17.2.4 precious metal ratio i.e., +/- 15%;
 - 4.2.17.2.5 substrate i.e., structure and material; 4.2.17.2.6;
 - 4.2.17.2.6 cell density;
 - 4.2.17.2.7 type of casing of the catalytic converter(s);
 - 4.2.17.2.8 the approximate location of catalytic converter(s) such that the temperature of the exhaust gas at the inlet of the catalytic converter shall be +/- 50 K when checked under stabilised conditions at 120 km/h under the load conditions of the Type I test.
- 4.2.17.3 the placement, type and number of exhaust gas sensors in relation to the catalytic converter(s);
 - 4.2.17.4 the particulate trap (if fitted);
 - 4.2.18 the same components, control methods and strategy that comprise the Emission Control System (e.g., Exhaust Gas Recirculation system, Secondary Air Injection, Urea Injection System, etc.);
 - 4.2.19 the same Periodically Regenerating System (if fitted).
- 4.3 In regards to the vehicle specification, when compared with the untested vehicles, the test vehicle shall have:
- 4.3.1 an identical emission limit as stated in the relevant clause of the ADR;
 - 4.3.2 the same type of transmission and manner of operation (e.g., Automatic, Manual, Continuously Variable Transmission);
 - 4.3.3 no lesser number of transmission ratios and for each transmission ratio on the tested vehicle $E \leq 0.08$ where:

$$E = (V2 - V1) / V1$$

and V1 and V2 are respectively the speed at 1,000 rpm of the tested and untested vehicles using the transmission ratio;

- 4.3.4 the same general body shape as the tested vehicle or, if the untested vehicle does not have the same general body shape as the tested vehicle, has a dynamometer road power absorption value no more than 10% greater than the tested vehicle;

Note: The effect of bodywork additions and aerodynamic aides such as large front and rear spoilers, wheel arch extensions and side skirts as well as wide section tyres shall be taken into consideration by the manufacturer when selecting representative vehicles for determining the road absorption power.

- 4.3.5 a Test Inertia Mass no more than two categories higher;



- 4.3.6 the same number of axles and road wheels and the same number of driven axles or, if the untested vehicle differs in this regard to the tested vehicle, has a dynamometer road power absorption value no more than 10% greater than the tested vehicle.

TYPE III TEST

5. The Administrator will accept a test on one vehicle as representative of another for the purposes of demonstrating compliance with the requirements of the Type III test provided the following criteria are met.
- 5.1 When compared with the untested vehicles, the test vehicle shall have an engine identical with respect to:
- 5.1.1 the method of fuel intake e.g., indirect injection, direct injection etc.;
- 5.1.2 the crankcase emission control system shall be the same i.e., identical in respect to:
- 5.1.2.1 the number of cylinders and their configuration (e.g., I4, 90° V8 etc.);
- 5.1.2.2 the design and construction of the cylinder block;
- 5.1.2.3 the functional design of the crankcase ventilation system plumbing;
- 5.1.2.4 the design and construction of piston rings and engine seals.

TYPE IV TEST

6. The Administrator will accept a test on one vehicle as representative of another for the purposes of demonstrating compliance with the requirements of the Type IV test provided the following criteria are met.
- 6.1 When compared with the untested vehicles, the test vehicle shall be identical with respect to:
- 6.1.1 the Fuel Evaporation Control System i.e., identical in respect to:
- 6.1.1.1 the method of sealing and venting the fuel metering system;
- 6.1.1.2 the method of storage of the fuel vapour shall be identical (e.g.; trap form and volume, storage medium, etc.);
- 6.1.1.3 the shape, design (e.g., location of filler neck and breather orifices, filler cap, etc.) of the fuel tank and the material of the fuel tank and liquid fuel hoses;
- Note: If the vehicle selected for testing when compared to the untested vehicle has a fuel tank with design features the same as defined in Para 6.1.1.3. except for the capacity, then the untested vehicle's fuel tank volume may be within the range of +/- 10 % when compared to the tested vehicle.*
- 6.1.1.4 the method and strategy of purging the stored vapour (if fitted);
- 6.1.1.5 the pressure relief valve (if fitted) in between the fuel tank and the charcoal canister;
- 6.1.1.6 the functional design of the breather lines and valves in relation to the vehicle's fuel tank, charcoal canister, engine and evaporative purge control system (if fitted).

TYPE V TEST

7. The Administrator will accept a test on one vehicle as representative of another for the purposes of demonstrating compliance with the requirements of the Type V test provided the following criteria are met.
- 7.1 When compared with the untested vehicles, the test vehicle shall meet the following criteria of this circular: paragraphs 4.1, 4.2.2, 4.2.3, 4.2.4, 4.2.5, 4.2.6, 4.2.7, 4.2.10, 4.2.11, 4.2.12, 4.2.14, 4.2.15.1, 4.2.17.2, 4.2.17.3, 4.2.17.4, 4.2.18, 4.2.19 & 4.3.5.

TYPE VI TEST

8. The Administrator will accept a test on one vehicle as representative of another for the purposes of demonstrating compliance with the requirements of the Type VI test provided the following criteria are met.
- 8.1 When compared with the untested vehicles, the test vehicle is required to meet all the criteria in Section 4 except paragraphs: 4.1, 4.2.1, 4.2.7, 4.2.8, 4.2.9, 4.2.13, 4.2.19 & 4.3.

OBD TEST

9. The Administrator will accept the test results from the On-Board Diagnostic (OBD) test of a previously tested type of vehicle provided that the untested vehicle(s) has an OBD system of the same family.
- 9.1 For the purposes of certification to ADR 79, an untested vehicle's OBD system shall be considered to belong to the same family as the tested vehicle's OBD system if when compared to the tested vehicle, the untested vehicle:
- 9.1.1 meets the following criteria in this circular: paragraphs 4.1, 4.2.10, 4.2.12, 4.2.14 & 4.2.15.1;
- 9.1.2 is identical in respect to:
- 9.1.2.1 the manufacturer of the Monitoring Unit (MU);
 - 9.1.2.2 the type of MU;
 - 9.1.2.3 the method of engine fuelling (e.g. indirect or direct injection);
 - 9.1.2.4 the type of catalytic converter(s) (e.g., three way, oxidation, de-NOx, etc.);
 - 9.1.2.5 the type of particulate trap (if fitted);
 - 9.1.2.6 the method of indication to the vehicle driver;
 - 9.1.2.7 the monitoring system;
 - 9.1.2.8 the monitoring strategy;
 - 9.1.2.9 the fault detection calibration.

Note: Where the ECU functions as the MU component of the OBD system, if the calibration and software module(s) used by the ECU for monitoring the OBD system and activation of the MI (under the specified fault conditions) can be identified as the same on the untested vehicle as the tested vehicle, then criteria 9.1.2.2 does not apply.



GASEOUS FUELLING SYSTEMS

10. The Administrator will accept the test results of a previously tested variant of a vehicle for the purposes of deriving the 'r' factors provided that when compared with the untested vehicle(s), the test vehicle shall have a Gaseous Fuelling System (GFS) of the same family.

10.1 For the purposes of certification to ADR 79, a GFS that meets the criteria as defined in Appendix A, Annex 12, Clause 2.2 of ADR 79 shall be considered to belong to the same GFS family.

PERIODICALLY REGENERATING SYSTEMS

11. The Administrator will accept the test results of a previously tested variant of a vehicle for the purposes of deriving the K factors provided that when compared with the untested vehicle(s), the test vehicle shall have a Periodically Regenerating System (PRS) of the same family.

11.1 For the purposes of certification to ADR 79, a PRS that meets the criteria as defined in Appendix A, Annex 13, Clause 2.1.1 of ADR 79 shall be considered to belong to the same PRS family.

ALTERNATIVE STANDARDS

12. An untested vehicle variant that is listed in an appropriate ECE approval document (to one of the ECE Regulations listed as an alternative standard in the ADR) may be certified without the selection criteria in this Circular being applied. All variants to be covered in the application must be included on the Selection from Fleet (SF) form. If all variants listed on the SF form are listed in an ECE approval document the tested/untested status is to be recorded as "ECE Approved".

13. An untested vehicle variant which is not listed in an appropriate ECE approval document (to one of the ECE Regulations listed as an alternative standard in the ADR) may be certified on the basis of comparison to a vehicle variant tested in accordance with compliance to the technical requirements of an appropriate ECE Regulation and listed in an appropriate ECE approval document (to one of the ECE Regulations listed as an alternative standard in the ADR) if the untested vehicle variant(s), when compared to the tested variant, have been selected in accordance with this Circular. In this case the variants tested to the ECE Regulation and included on the ECE approval are to show the tested/untested status as "ECE - Tested", the variants not tested to the ECE Regulation but included in the ECE approval are to show the tested/untested status as "ECE - Approved" and the variants not tested to the ECE Regulation and not included on the ECE approval are to show the tested/untested status as "Untested". All variants to be covered in the application must be included on the Selection from Fleet (SF) form. A variant marked as Untested may only be compared with a relevant variant which is either "ECE - Tested" or "Tested".