

CIRCULAR 31/02 - 2 - 1

SELECTION OF TEST VEHICLES

1. INTRODUCTION

1.1 This circular should be read in conjunction with circular 0-2-11 "General Procedures for Selection of Vehicles and Components for ADR Compliance Testing" containing requirements applicable to all ADRs. This circular is applicable to all vehicles certifying to ADR 31/02.

1.2 The intention of the criteria in this circular is to reduce the number of vehicle specifications required to be tested. This circular 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 the 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.

1.3 The Administrator will consider requests for further reductions in the number of tests than established by criteria in this circular on receipt of documented evidence that if tested, the braking test results of the untested vehicles would not result in a less favourable result compared to the tested vehicle. The untested vehicle evidence may be simulated or calculated with any such simulations or calculations being traceable to similar comparisons between tested vehicles.

1.4 It remains the responsibility of the vehicle manufacturer to ensure that every vehicle to which an identification plate is affixed complies with ADR 31/02 as applicable.

2. SELECTION REQUIREMENTS FOR BRAKING SYSTEMS

Grouping of Braking Systems

2.1 Each unique braking system shall be tested. To be considered as the same unique braking system, systems must have a combination of components that have the same physical (material or metallurgical), functional and dimensional properties. Any variation of the components of a braking system will constitute a different unique braking system except for:

- 2.1.1. the length, diameter, material or routing of hydraulic, vacuum, or electrical wiring included in the system;
- 2.1.2. the location of valves, fittings or other devices within a hydraulic or vacuum line.

Grouping of Vehicle Variants

2.2 It is considered that an untested vehicle variant, with the same unique braking system as a tested vehicle variant, will not require testing of the braking system if when compared to the tested vehicle it:

2.2.1 has the same calibration of any ECU controlling the braking system;

Note: For vehicles types having a complete chassis control system with multiple functions (e.g. ABS, TCS, ESC etc.) within the main calibration: If a manufacturer can demonstrate that a change in a calibration function such as TCS or ESC will not alter the normal braking performance, the calibrations shall be considered the same.

2.2.2 has the same configuration of axles;

2.2.3 has tyres that are smaller, the same or no more than 2% greater in diameter;

2.2.4 has tyres of the same or greater section width;

2.2.5 has greater or equal brake cooling airflow;

2.2.6 has no higher a road speed per 1,000 rpm for the gear ratio required for the Service Brake Fade Test unless the tested vehicle was fitted with an automatic transmission such that negligible engine braking is provided (e.g. a system with a fluid coupling torque converter);

2.2.7 for vehicles without ABS or a load sensing variable proportioning system fitted:

2.2.7.1 has no less of the proportion of the unladen mass on the rear wheels;

2.2.7.2 has a wheelbase no shorter than 10% less in length;

2.2.8 has no greater Maximum Loaded Test Mass;

2.2.9 for vehicles that are unable to achieve the 45 second braking cycle time in the Type I test, the untested vehicle has a braking cycle time that is no less than that of the tested vehicle;

2.2.10 has an equal or lower unbraked trailer mass.

Note: If an untested vehicle has a permissible unbraked trailer mass greater than that of its corresponding tested vehicle an additional SE form for the untested vehicle will be required so that the performance calculations for the unbraked trailer mass can be assessed. In this case the untested vehicle will be treated as a tested vehicle (and shown as such on the SFVBS form), even though all the physical test data will be common to the tested vehicle's SE form. Refer ADR 31/02, Appendix A, Annex3, Clause 2.1.2.

3. SELECTION REQUIREMENTS FOR ELECTRONIC STABILITY CONTROL (ECS) SYSTEMS

Grouping of Electronic Stability Control (ESC) system variants

3.1 Each unique ESC system shall be tested. To be considered the same ESC system, systems shall have the same active components (e.g. sensors, ECU, actuation device (i.e. ABS unit), and brake type/combination (e.g. 4 wheel discs or disc/drum etc.).

Grouping of Vehicle Variants

3.2 Vehicle variants sharing the same ESC system (as defined in paragraph 3.1) shall be grouped for selection of testing of the ESC system. Grouped variants shall have the same;

3.2.1 suspension type (e.g. McPherson strut, wishbones, live axle, IRS, etc.), design and configuration;

3.2.2 drive configuration (i.e. front, rear or all-wheel drive);

Note: "All-wheel drive" refers to variants where this drive configuration is designed to be used during normal high speed driving conditions (i.e. does not include variants where selection of this mode is intended only for off-road, low speed use).

3.2.3 wheelbase (+/- 5 %).

Selection of Variant/s for Testing

3.3 The least dynamically competent variant of any group of variants sharing an ESC system shall be tested. In determining the least *dynamically competent* (see note below) vehicle variant, manufacturers should consider the following criteria:

Note: "Dynamically Competent" describes the handling behaviour of a vehicle as an attribute when tested to the dynamic ESC requirements of ADR 31/02. A vehicle's dynamic competence is relative to the level of assistance and when (in relation to the rate of yaw) that the ESC system will be required to intervene to assist the driver to maintain the intended/steered direction of a vehicle (i.e. the least Dynamically Competent vehicle will require earlier and/or greater intervention).

3.3.1 ride height (i.e. Centre of gravity);

3.3.2 suspension settings (e.g. Spring, sway bar, shock absorber rates);

3.3.3 tyre specifications (i.e. Rim diameter, tyre width, profile and diameter);

3.3.4 and overall mass and mass distribution (including polar moment of inertia);

Note: Where a manufacturer is unable to determine a single variant that is the least dynamically competent variant from a group of vehicle variants, multiple variants may be required to be tested (see also paragraph 6.2).

4. PARTIAL TESTING OF VEHICLE VARIANTS

4.1 A previously tested vehicle variant fitted with a variation of a unique braking system may be partially tested to demonstrate compliance of the variation in the braking system. The conditions where a vehicle may be subject to a partial test are described below.

Note: The varied braking/ESC system should be assigned its own unique identifier. For the variations requiring retesting described in clauses 4.1.1, 4.1.2 and 4.1.3 below, the relevant SE form shall contain the results of all in motion tests conducted relevant to the base braking system, not just those conducted resulting from the design variation (or additional test/s). The test report for the varied braking system referenced on the SE form shall reference the original

full test report. Extension sheets attached to the original test report shall reference and collate the additional tests.

4.1.1 the parking brake system shall be tested to Appendix A, Annex 3, Clause 2.3.

4.1.2 the ABS system shall be tested to Appendix A, Annex 6.

Note: The manufacturer shall be able to demonstrate that any change to the ABS system's active components will not adversely affect any previous normal braking or ESC test.

4.1.3 the ESC system shall be tested to Appendix A, Annex 9 (or GTR 8) or in the case of vehicles over 1735 kg UNECE R13-11 Annex 21 (as applicable).

Note: The manufacturer shall be able to demonstrate that any change to the ESC system's active components will not adversely affect any previous braking test/s.

4.2 As an alternative to paragraph 4.1.3, vehicle types that have been tested and meet the technical requirements of ADR 31/01, but have not been tested to the ESC requirements of ADR 31/02 as well as vehicle types that have been issued with an ECE 13H approval that does not include ESC, may demonstrate compliance by the following:

Note: All other non - ESC requirements from ADR 31/02 and ECE R13H (up to and including supplement 6) as applicable must be met.

4.2.1 for ADR 31/01 tested vehicles: the complete test results of the original brake tests as well as the additional ESC test results shall be entered into the SE form;

4.2.2 for ECE 13H approved vehicles: enter the approval number and the ESC test results into the SE form.

4.3 For vehicle types that have been issued with an ECE 13H approval that includes ESC: A manufacturer may perform an assessment of the specification of additional variants that are not listed on the approval note and determine that a test or simulation is not required to demonstrate compliance (see also paragraphs 6.2 and 7).

5. FLEET SELECTION FORM (SFVBS) REQUIREMENTS

5.1 Any variants shown on the SFVBS form that require demonstration of compliance to the ESC requirements (i.e. variants other than those equipped with ESC that are listed on an appropriate ECE approval document) shall be shown on the SFVBS form as "T", "S" or "NT":

5.1.1 variants subjected to practical testing shall be shown as tested "T";

5.1.2 variants demonstrating compliance by simulation shall be shown as "S";

5.1.3 Variants not requiring demonstration of compliance to the ESC requirements by practical testing or simulation shall be shown as "NT" (see Paragraph 6.2).

5.2 Variants that are equipped with ESC and have been issued with an ECE approval but does not include ESC on the approval note: The variant chosen to be tested shall be shown as "ECE-T" or "ECE-A" as applicable (see paragraphs 4.2.2 and 7).

6. ALTERNATIVES TO PRACTICAL TESTING (ESC SYSTEMS)

- 6.1 If simulation (Annex 9, Appendix 1) is used to demonstrate compliance, the manufacturer shall hold the original practical test report, the validating simulation on an identically specified vehicle (paragraphs 3.1, 3.2 and 3.3) and the simulation results of the variant for which compliance is being demonstrated. The simulation shall be performed using the same simulator and the test report must reference the validation tests.
- 6.2 A manufacturer may elect to perform (and document) an assessment of an additional variant or group of variants sharing the criteria in paragraphs 3.1 and 3.2, and determine additional testing is not required (see paragraph 3.3). The manufacturer shall hold documentary evidence of this assessment.

7. ALTERNATIVE STANDARDS

- 7.1 An untested variant which 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 the circular being applied. All variants to be covered in the application shall be included on the fleet selection 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-A"
- 7.2 An untested variant that 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 if:
- 7.2.1 the tested variant/s is listed in an appropriate ECE approval document and;
- 7.2.2 the untested variant/s, when compared to the tested variant, meets the criteria of this circular (paragraph 2 and 3).
- 7.3 In this case, the variant/s 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 fleet selection form. A variant marked as Untested may only be compared with a relevant variant which is either "ECE - Tested" or "Tested".
- 7.4 A vehicle variant fitted with a variation of a unique braking system (under the conditions set out in paragraph 4) may be certified on the basis of comparison to a vehicle variant shown as "ECE – Tested" on the SF form. In this case, the variant shall be listed on the SF form and shown as "Tested– Partial".