



Brake Routing Quality Assessment

1 Scope

Note: Nothing in this standard supercedes applicable laws and regulations.

Note: In the event of conflict between the English and domestic language, the English language shall take precedence.

1.1 Purpose. This standard describes the process of measuring the clearances between specific brake components and surrounding vehicle components in order to demonstrate compliance to Best Practice clearance requirements.

This Test Procedure is used just before production to audit the routing of cars built on the production assembly line.

A similar Test Procedure (GMW15105) is used well before production to develop and validation routing of articulated and steered components (hoses, WSS wiring, parking brake cables).

1.2 Foreword.

1.2.1 The purpose of performing a Brake Routing Quality Assessment (RQA) audit is to evaluate, and record brake component (Brake Pipe, Brake Hose, Park Brake Cable, Wheel Speed Sensor/Harness) clearance to surrounding components and subsystems with respect to Best Practice clearance requirements.

1.2.1.1 Each brake component is reviewed, utilizing the appropriate clearance criteria, along its entire length.

1.2.1.2 This audit will be performed both virtually and physically at different stages of the program.

1.2.1.3 The virtual audit is to validate design clearances.

1.2.1.4 The physical audits are to reconfirm design clearances due to potential unknown design changes in the surrounding components and to validate the routing under the inherent aspects of part and process variation.

1.2.2 Proper clearance or restraint between routed components is critical for the long-term reliability of these subsystems.

1.2.2.1 Clearance zones are in part determined by environmental factors, location within the vehicle, as well as movement of the surrounding components.

1.2.2.2 Reviewing these clearances is a due care process that focuses attention to any discrepancy to established Best Practice clearances.

1.2.2.3 As these discrepancies are uncovered, focused engineering analysis can be performed on the specific issue and appropriate action can be driven.

1.2.3 The brake RQA audit is a static procedure utilized only to measure routing clearances. This procedure does not replace or satisfy any requirements of the Brake Articulation Test procedure GMW15105.

1.2.4 This RQA audit procedure focuses on the following parts:

- Brake Lines
- Brake Hoses
- Park Brake Cables
- Wheel Speed Sensor/Harness

1.2.5 The recommendation is that the RQA Audit shall be performed at least (but not limited to) three times during the course of vehicle development.

1.3 Applicability. This standard applies to all vehicles.

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2 References

Note: Only the latest approved standards are applicable unless otherwise specified.

2.1 External Standards/Specifications.

None

2.2 GM Standards/Specifications.

GMW15105

2.3 Additional References.

Best Practice

CG1753

3 Resources

3.1 Facilities. Test requires a vehicle hoist for under vehicle inspections.

3.1.1 Calibration. The test facilities and equipment shall be in good working order and shall have a valid calibration label.

3.1.2 Alternatives. Alternative test facilities and equipment may also be used. However, all measuring variables as specified in this standard shall be determined correctly with respect to their physical definition.

3.1.3 Test requires a vehicle hoist for under vehicle inspections.

3.2 Equipment.

3.2.1 Digital camera.

3.2.2 Measurement devices (vernier, caliper, and ruler, etc.).

3.2.3 Miscellaneous tools (for minor disassembly, if required).

3.2.4 RQA Audit Template or, if available, the previous RQA Audit File for the specific program.

3.3 Test Vehicle/Test Piece.

3.3.1 Test Vehicle. It is recommended that the RQA Audit be performed at least (but not limited to) three times during the course of vehicle development.

3.3.1.1 The recommended audit schedule is shown in Appendix A, Table A1.

3.3.1.2 The test vehicle should be built with the latest released parts for all underbody components.

3.3.2 Test Piece.

3.3.2.1 The audit vehicle should be equipped with the latest released:

- Brake Lines
- Brake Hoses
- Park Brake Cables
- Wheel Speed Sensor/Harness

3.4 Test Time.

Calendar time: 1 day

Test hours: (4 to 8) h per vehicle

Coordination hours: Not applicable.

3.5 Test Required Information.

3.5.1 Use of the Brake Routing Quality Audit Template CG1753 is required. The template is available in Engineering Document Management (EDM) in the Standard Forms and Templates library.

3.5.2 The Brake RQA Audit can be a virtual test or a physical test. Modify this procedure where necessary for the type of test being performed.

3.5.3 If available, the previous RQA Audit File for the specific program may be used to report additional testing for the program.

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