GM WORLDWIDE ENGINEERING STANDARDS	General Specification	GMW16044

Design Review Based on Test Results

1 Introduction

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 document defines the process and requirements for conducting a Design Review Based on Test Results (DRBTR).

1.2 Applicability. This procedure shall be followed whenever a DRBTR is executed. DRBTRs are typically conducted at the end of reliability and durability tests and any other tests where the part or assembly may accumulate damage. DRBTRs may also be conducted at specific points during a test when observation of the potential damage accumulation is desired. DRBTR has applicability and can be extended for use in performance tests and even warranty part returns.

1.3 Remarks. Not applicable.

2 References

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

2.1 External Standards/Specifications.

None

2.2 GM Standards/Specifications.

GMW3059

2.3 Additional References.

CG1579 DRBTR Template (available from GM Engineering Standards Forms Library)

3 Requirements – High Level Process Description and General Requirements

3.1 Process Description. Design Review Based on Test Results is a quality improvement process used to identify Quality, Reliability and Durability (QRD) issues and eliminate them prior to production. These issues are identified through close examination of the parts, components, subsystems and/or systems and their interfaces, and understanding of the root cause(s) of all observed conditions (e.g., wear, discoloration, cracking) and their potential to ultimately impact the customer.

3.2 Participants and Roles. The participants in the DRBTR will come from GM and, when Supplier parts are involved, the Supplier. The following descriptions describe roles and may be performed by people with varying job titles within GM or Supplier organizations.

- **Subsystem Validation Engineer:** Schedules, facilitates and participates in the DRBTR and ensures its closure.
- **Performance/Development Engineer:** Participates in the DRBTR as appropriated and, under some circumstances, may assume the responsibilities of the Subsystem Validation Engineer.
- **Test Engineer:** Supports the Subsystem Validation Engineer and participates in the DRBTR. In some instances, it may be appropriate for the Test Engineer to assume the responsibilities of the Subsystem Validation Engineer.
- **Designing/Design Release Engineer(s):** Participates in the “Review” phase of the DRBTR.

© Copyright 2014 General Motors Company All Rights Reserved

Documents
Document Sharing Hub

Copyright General Motors Company
Provided by IHS Markit under license with General Motors Company
Reproduction, distribution or publication of these standards is expressly prohib
Licensee=/, User=,
Not for Resale,
Full document details: GMW GMW16044 2014

- **Manufacturing Engineer(s):** Participates in the "Review" phase of the DRBTR.
- **Senior "Expert" Engineer(s) (Technical Integration Engineer, Subsystem Leadership Team Leader and Other Subject Matter Experts):** Participate in the "Review" phase of the DRBTR.

The participants become part of the DRBTR Expert Team.

3.3 DRBTR Worksheet. The DRBTR worksheet (CG1579) shall be used to facilitate the DRBTR process. The template is in the GM Engineering Standards Forms Library with instructions for use.

Note: The worksheet is a tool. It is not the product of the process. Some functions and regions may add information to the worksheet to facilitate good discussion and follow-up.

3.4 Storage and Retention Requirements. The completed DRBTR worksheet is not a GM Business Record. It is a Non-Business Record and should be managed according to established Information Lifecycle Management (ILM) retention requirements.

3.5 Action Items/Lessons Learned. Any action items or lessons learned must be transferred from the active/complete DRBTR worksheet into a problem resolution process, issue tracing system, lessons learned system or other closed-loop database at GM or at the Supplier.

3.6 Scheduling and Preparation for DRBTR.

3.6.1 Scheduling. Schedule the DRBTR when the End of Test date is known. The DRBTR should occur soon after the End of Test, preferably within two (2) weeks.

3.6.2 Location. Schedule the DRBTR at the test site or in a location where the parts and/or assemblies can be laid out for review. There should be sufficient lighting and tools for close examination. Whenever possible, conduct the teardown at the time of review.

3.6.3 Tools and Equipment. Provide magnifying glasses and other simple disassembly and measurement tools (e.g., calipers, rulers) that will assist the expert team in examining the parts and their findings. Ensure that the DRBTR location has available photographic equipment (e.g. camera, cell phone) to document findings.

3.6.4 Reference Information/Parts. Provide the following reference information and parts: drawings/math representation of the design, new (untested) parts assembled and possibly disassembled for reference comparison to tested parts. Also consider and review Information from test reports, Problem Resolution Tracking System Plus (PRTS+) issues, Design Failure Mode Effects Analysis (DFMEA) or Design Review Based on Failure Mode (DRBFM) of Changes to the parts that were tested.

3.6.5 DRBTR Worksheet Preparation. Download the latest version of the DRBTR worksheet (CG1579) and enter header information in cells 1 (one) thru 7 (seven).

3.7 DRBTR Process Phases and Steps.

A DRBTR occurs in two (2) phases (see Appendix A, Figure A1). Both phases are identical for the first five (5) steps; Phase II adds two (2) steps.

Note: Although the two-phase process is preferable, there may be circumstances where it is more beneficial to execute the process in one (1) combined even with the Expert Team involved in both phases of the DRBTR. The phases are:

3.7.1 DRBTR Process Phases. In this section, "part" may refer to a part, component, subsystem or system.

3.7.1.1 Phase I: Initial Analysis of Test Results and Parts. In Phase I, the Subsystem Validation Engineer and/or Test Engineer examines the test results, the part and any surrounding parts, looking for condition that might ultimately result in a part failure or other customer complaint. The location on the part where each condition was observed, the actual observed condition and a probable cause are documented. An assessment of the observed condition's potential effect on the customer is make, its severity assessed and a solution proposed to prevent its occurrence.

Note: Phase I is executed by the Subsystem Validation Engineer. However, there may be instances when it is more appropriate for the Test Engineer or Development Engineer to conduct the initial analysis.

Note: Phase I is comprised of five (5) steps. The DRBTR worksheet cells used in Phase I are marked with a "T" for Test (see Appendix A, Figure A2).

3.7.1.2 Phase II: In-depth Review and Development of Action Plans. In Phase II, the Expert Team reviews and discusses the Phase I observations, conclusions and recommendations. In addition, the Expert Team conducts a second in-depth analysis of the parts, identifies any additional observed conditions, determines their

© Copyright 2014 General Motors Company All Rights Reserved

Documents
Document Sharing Hub
Copyright General Motors Company
Provided by IHS Markit under license with General Motors Company
Reproduction, distribution or publication of these standards is expressly prohib
Licensee=/, User=,
Not for Resale,
Full document details: GMW GMW16044 2014