



Hot Weather Exposure Test

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. To subject a vehicle to a test of its systems and components in an actual severe hot weather environment and permit an evaluation of their operating characteristics in hot weather.

1.2 Applicability. This specification is applicable to passenger vehicles and light duty trucks. GMW15730 is used to evaluate vehicles being sold in the following Extreme Hot countries:

Afghanistan	Cote d'Ivoire	Lesotho	Saudi Arabia
Algeria	Cyprus	Libya	Senegal
Argentina	Djibouti	Madagascar	Seychelles
Australia	Egypt	Malawi	Sierra Leone
Azerbaijan	Equatorial Guinea	Mali	Somalia
Bahrain	Eritrea	Malta	South Africa
Bangladesh	Ethiopia	Mauritania	Spain
Benin	Gambia	Mauritius	Sudan
Bhutan	Ghana	Mexico	Swaziland
Bolivia	Gibraltar	Morocco	Syria
Botswana	Guinea	Mozambique	Tajikistan
Brazil	Guinea Bissau	Myanmar (Burma)	Togo
Bulgaria	India	Namibia	Tunisia
Burkina Faso	Iran	Nepal	Turkey
Burundi	Iraq	Niger Republic	Turkmenistan
Cambodia	Israel	Nigeria	United Arab Emirates
Cameroon	Italy	Oman	United States of America
Cape Verde	Jordan	Pakistan	Uzbekistan
Central African Republic	Kazakhstan	Paraguay	Vietnam
Chad	Kenya	Philippines	Yemen
Colombia	Kuwait	Portugal	Zaire
Comoro Islands	Laos	Qatar	Zimbabwe
Congo	Lebanon		

1.3 Remarks.

1.3.1 This test specification is intended to provide controlled hot weather exposure representative of up to 2 years of average customer operation in a severe high ambient temperature environment.

1.3.2 The primary intent of this test is to provide an accelerated assessment of thermal performance in an 8 week to 10 week period of time. For the test to run efficiently, 6 h to 7 h per test day must be at or above 32.2 °C (90 °F).

1.3.3 This test does not encompass all known customer usage treatments. Some of the limitations are due to accelerated usage and some are due to the constraints of the test site and dependence upon daily weather. If

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more rigorous exposure to unique customer usage treatments is desired, other specialized testing should be considered as part of the vehicle test plan.

2 References

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

2.1 External Standards/Specifications.

None

2.2 GM Standards/Specifications.

GMW8738 (ID)	GMW15445	GMW15552	GMW16933
GMW14264	GMW15527	GMW15555	GMW17168
GMW15444	GMW15550	GMW15677	

(ID) = This standard is limited to internal distribution within General Motors and shall not be distributed outside this company. Contact the GM Lead Engineer for further instructions.

2.3 Additional References.

- North American Ambient Temperature Study (Report PG-53238) (For information only).

2.3.1 Yuma

DR.YU.CY	DR.YU.GL	DR.YU.LI	DR.YU.SW
DR.YU.DL	DR.YU.GT	DR.YU.MV	DR.YU.TL
DR.YU.DP	DR.YU.GV	DR.YU.RL	DR.YU.VW
DR.YU.ET	DR.YU.GW	DR.YU.SG	DR.YU.WK
DR.YU.FR	DR.YU.IA	DR.YU.SP	

3 Resources

3.1 Facilities. General Motors Desert Proving Ground Yuma (DPGY), Arizona.

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.

3.2 Equipment. Some method of accurate speed indication should be provided to the driver for the accurate execution of the driving events. Some type of acceleration/deceleration rate indicator should also be provided to the driver.

A towing dynamometer is also required for portions of this test.

3.3 Test Vehicle/Test Piece. Test vehicle equipped as specified.

3.4 Test Time. See Appendices A and B.

3.5 Test Required Information. Not applicable.

3.6 Personnel/Skills. The events that comprise this test are intended to be performed by personnel specifically trained in the proper execution of the driving instructions. Refer to the appropriate proving ground driving instruction documents and related risk assessments.

Different driver license requirements, knowledge of test content, and mandatory health checks for involved personnel have to be considered.

4 Procedure

4.1 Preparation. Current maximum allowable vehicle speeds are to be supplied by test responsible personnel for driver reference. If the vehicle is equipped with a manual transmission, the shift point speeds should also be determined and provided.

4.1.1 Measurement of adjustments and settings may be made as deemed necessary to document the condition of the vehicle. These measurements must be made without significantly affecting the adjustment or setting being

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considered. The intent of these measurements is to document the condition of the vehicle without changing the state of the original assembly.

4.1.2 Vehicles being operated on this test for any other purposes (e.g., design evaluation) should be prepared in a manner appropriate to that particular test intent.

4.1.3 This procedure uses a towing dynamometer. Therefore, the test vehicle should be equipped with the appropriate trailer hitch.

4.2 Conditions. Portions of the test have specific ambient temperature requirements as shown in Appendix B.

4.2.1 Environmental Conditions. The test must be conducted at the DPGY during the months of May through September to allow temperature management of portions of the test. In order to ensure successful completion of this test, the vehicle should start the test before the end of July.

However, test operation is most efficient during the peak hot weather season, which is generally June to August. Therefore, it is recommended that vehicles start this test in June to take advantage of the peak season.

Most driving procedures can be performed in all types of weather; however, in situations where severe weather makes certain driving events unsafe they should be postponed until road conditions improve. Refer to each local proving ground driving instruction to determine if dry road conditions are required.

4.2.2 Test Conditions. Deviations from the requirements of this standard shall have been agreed upon. Such requirements shall be specified on component drawings, test certificates, reports, etc.

4.2.3 Ballast. Ballast definitions are explained in GMW15445 Vehicle Ballast. The ballast calculation worksheets in GMW15445 should be used to determine proper Light Vehicle Mass (LVM) and Gross Vehicle Mass (GVM) ballast conditions.

4.2.3.1 GVM – Phase 1. During the GVM portion of Phase 1 of this test, vehicles will use the GVM passenger ballast configuration. If equipped with a regular production option (RPO) luggage rack, remove 45.3 kg (100 lb) from the cargo area and secure the ballast on the luggage rack.

4.2.3.2 GVM - Phase 2. During the GVM portion of Phase 2 of this test, Sport Utility Vehicles (SUV) and other vehicles with configurable cargo areas (excluding sedans and coupes) will use the GVM cargo ballast configuration. Sedans and coupes will use the GVM passenger ballast configuration. No weight is placed on luggage racks during these phases.

4.3 Instructions. Refer to the Specified Events listed in Appendices A and B.

4.3.1 Test Scheduling Guidelines.

4.3.1.1 Linear Test Content. In order to subject the vehicle to a reasonable simulation of customer usage in a linear manner of operation, distribute the event/ballast combinations as evenly as possible throughout each phase of this test. While a suggested ballast distribution is listed for the Durability Loop event, it is intended that this event be executed as efficiently as possible without regard to ballast.

4.3.1.2 Vehicle Break-in. The vehicle should not receive any break-in miles unless such are specifically required or recommended in the Owner's Manual in such terms that more than 90% of the vehicle purchasers or users would be expected to follow the recommendation. The intention of this Durability Test is to subject the vehicle to more severe than average operation and it is believed that the omission of break-in miles is more severe than is their inclusion.

If the test requester determines that "break-in" mileage is required, then the "break-in" procedure should be completed prior to execution of this test procedure.

4.3.1.3 It is recognized that the scheduling of a vehicle on a test of this scope is complex. It is recommended that every effort be made to complete one phase before proceeding to the next.

4.3.1.4 In the event that some test events are specified which start and end at a location which is not near the Durability Loop (DR.YU.DL), or any other test event which is already specified, it is intended that the driver proceed to the starting point by taking the most convenient and efficient route. All miscellaneous mileage should be driven at posted speeds and consist of light accelerations/decelerations minimizing any conflicts with existing durability traffic.

4.3.2 Controlled Temperature Exposure Guidelines.

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