

SUBCOMMITTEE D02.B STANDARD GUIDE FOR TEST HARDWARE CONTROL IN ASTM D02.B TEST METHODS AND PRACTICES

1. Scope

1.1 Subcommittee D02.B recognizes there are numerous variables inherently a part of many of the test methods employed for the evaluation of petroleum products and lubricants. These variables include, among others, differences in hardware as defined in Section 3.2.1. For example, in many full-scale engine test methods, it is necessary to use new hardware each test and, therefore, consume large quantities of hardware as the test life progresses. This high hardware usage rate is compounded by the fact that each test method may be run by numerous laboratories, each requiring its own inventory of hardware. Because of the potential for variations in hardware resulting in a negative impact on the precision and severity of each test method, Subcommittee D02.B has found it desirable to formalize a standard guide which describes the actions recommended to ensure the uniform manufacture, procurement, distribution, storage and consumption of hardware by all involved testing facilities.

1.2 The purpose of this guide, therefore, is to maintain and improve the quality of test hardware, ensure that a consistent quality of hardware is used among laboratories, ensure availability of hardware and thus guard against interruption of testing, provide accountability and traceability of hardware, promote concurrent hardware batch turnover within industry, aid in tacking and quantifying severity and precision trends as related to hardware, and promote a concurrent parts phase out to the end of test life (see note 1).

Note 1 – Committee D-2 Guidelines for Equipment Supply, Listing and Replacement in ASTM Test Methods and Practices (revised 8/14/89) shall govern.

2. Reference Documents

2.1 ASTM Regulations Governing ASTM Technical Committees

2.2 Committee D-2 Guidelines for Equipment Supply, Listing and Replacement in ASTM Test Methods and Practices (revised 8/14/89).

3. Terminology

3.1 Definitions

3.1.1 First-In First-Out (FIFO) – inventory method in which hardware is used or distributed in the same order in which it is received.

3.2 Definitions of Terms Specific to this Standard

3.2.1 Batch – a specific grouping of hardware which is manufactured to defined specifications and acceptable levels of variability given the prescribed manufacturing process and statistical sampling methods as determined by the supplier with the agreement of the Committee.

3.2.2 Central Parts Distributor (CPD) – organization or agent used to procure or manufacture, document, and distribute critical and other hardware as directed by the appropriate Committee.

3.2.3 Critical Parts – That hardware for which variability is known to affect test severity.

3.2.4 Hardware – test components, solvents, cleaning reagents, and fuel used or consumed during a test.

3.2.5 Industry – all laboratories which conduct testing under ASTM standards and methods which are under the jurisdiction of Subcommittee D02.B.

3.2.6 Service Parts – that hardware available through the OEM dealer or agent network.

3.2.7 Special Test Parts – that hardware required for the test but not within the categories defined in items 3.2.3, 3.2.6 or 3.2.7.

3.2.8 Test Developer/Sponsor – the organization or agency recognized by the Committee as having developed a test, or manufactured/supplied the parts for the life of that test, before its standardization in ASTM, and which continues to be involved with the test in respect to modifications in the test method, supply of parts, etc.

4. Summary of Guide

That hardware categorized as having an impact on test severity or precision shall be tracked and distributed by a designated organization. Minimum and maximum inventories to be held by the distributing organization and testing laboratories, respectively, will be established as well as usage and tracking guidelines. When a laboratory approaches the end of a batch life, a voluntary redistribution system can be implemented among all laboratories involved in the affected test method.

5. Significance and Use

5.1 This guide was designed to minimize test variability resulting from inherent batch-to-batch differences in hardware specified for use in many test methods. This guide is useful in tracking the parts and consumables used in test methods and, therefore, as a means of relating severity and precision of the test to changes made in any of these components.

5.2 This guide should be used for any test method, new or existing, under the jurisdiction of Subcommittee D02.B in which new hardware deemed to influence test severity are used each test or in which the potential exists for different laboratories to use hardware from different batches in the same test method at a given time. For existing test methods, the Committee may decide that the inventory or redistribution requirements set forth in this guide may be inappropriate since decisions as to the initial purchase, and resulting investment of inventories, were made without the restrictions set forth herein.

5.3 This guide does not imply that the hardware used in the affected test methods is not suited for use outside of these methods, but that under the controlled conditions of ASTM Test Methods, variability within and among laboratories can be minimized. Furthermore, this guide is not intended to imply that all test severity and precision variability is related to test hardware as defined in Section 3.2.1. It is widely recognized that the overall test processes including test procedures, build techniques, test stand

configuration, rating methods, audit mechanisms, and reference oils must be considered and controlled for optimal testing.

6. Procedure

6.1 The Committee shall designate all hardware used for a test method as Critical, Non-Production, Service or Special and publish this classification listing in the standard test method.

6.2A Central Parts Distributor(s) shall be designated. If the Original Equipment Manufacturer (OEM) which developed or sponsors the applicable test does not elect to perform the duties of a CPD as outlined in this guide, the OEM shall appoint a CPD according to the criteria outlined below. The Committee shall review the CPD's performance on an annual basis and make appropriate recommendations resulting from that review to the OEM. In the case where an OEM is neither the Test Developer nor Test Sponsor, the Committee shall elect a CPD according to the criteria outlined below.

6.2.1 The CPD shall demonstrate knowledge of quality control concepts.

6.2.2 The CPD shall demonstrate active involvement in various ASTM panels as a voting or non-voting member.

6.2.3 The CPD shall have the capability to serialize or batch code and track all applicable test hardware.

6.2.4 The CPD shall have the capability to provide shipping, controlled environment storage, and appropriate security warehousing. A split storage or warehousing capability can be required to ensure a constant supply of parts in the event of a natural disaster.

6.2.5 The CPD must be able to demonstrate financial stability.

The following criteria are preferred but not mandatory:

6.2.6 The CPD should have in-house machine capability.

6.2.7 The CPD should have in-house inspection capability.

6.3 The Committee shall define the party or parties responsible for all hardware as define in Section 3.2.1 as well as reporting requirements on the status and inventory of the hardware to the Committee.

6.4 The Committee shall implement parts procurement, inventory, and usage procedures outlined below.

6.4.1 All hardware is to be distributed and consumed on a FIFO basis.

6.4.2 To ensure a concurrent industry turnover, the CPD is required to maintain an inventory of Critical Parts as specified by the Committee and must also rotate this inventory according to the FIFO process. The maximum order quantity, in terms of estimated inventory utilization time, of critical parts allowed to be distributed to any laboratory shall also be specified by the Committee. Laboratory order quantities for Non-Production, Service, and Special Test Parts should be as small as practical to avoid excess material on-hand if a part becomes obsolete or is upgraded.

6.4.3 No laboratory shall maintain an inventory greater than that established, in terms of estimated utilization time, by the Committee. Minimum inventories are encouraged to ensure a concurrent industry turnover and to avoid excess material on-hand if a part becomes obsolete or is upgraded. However, consideration should be given to ensure that adequate inventories are on-hand to continue testing despite an unforeseen interruption in hardware supply.

6.4.4 All Critical Parts are to be identified by serial number or by batch lot control numbers.

6.4.5 The Committee shall establish a monitoring process to test fuel, solvent, and cleaning reagent quality at delivery and over time in order to detect deterioration or contamination.

6.4.6 All hardware is to be used as received unless modifications are specified in the standard test method.

6.4.7 A process of hardware traceability and accountability to determine if hardware is consumed or rejected by a laboratory will be maintained as prescribed by the Committee. If any Critical or Special Test Parts are rejected by a laboratory, the reason for rejection must be stated and reported to the Test Developer/Sponsor, Central Parts Distributor (if other than the Test Developer/Sponsor), and the ASTM Test Monitoring

Center. Test reports shall include a hardware documentation section which lists critical part batches used for that particular test.

6.4.8 A service parts list is to be updated periodically. No part number deviations from this list are permitted without written authorization from the Committee and must then be recorded in the accompanying test report or summary.

6.4.9 When a laboratory approaches the end of a particular batch of Critical Parts, a redistribution among laboratories may take place if so agreed by those laboratories and in a manner specified by the Committee. If the end of test life is caused by the inability to obtain a further supply of hardware, such as the loss or changeover of plant production capacity, the final phase of the redistribution process will be the voluntary concurrent phase out of hardware throughout the industry.

7. Applicable Regulations

7.1 All recommendations for changes shall go through the full ASTM letter ballot approval process at such time as these or other changes result in a proposed revision of the applicable standard.

7.2 The ASTM Regulations Governing ASTM Technical Committees shall be in effect with full appeal process.

8. Review of Guide

A complete review of this Guide shall be carried out two years after their adoption and at least every five (5) years thereafter, and the resultant Guide shall be rebaloted. This review and rebalot is based on the concern that the total impact of the Guide on a voluntary system is unforeseeable and a formal second look is in order to assure that the Guide have the desired effect of improving Committee operations and test method performance.

KEYWORDS

Batch

Committee

Consumables

Critical

Distribution

FIFO

Fuel

Hardware

Industry

Inventory

Laboratory

Non-Production

Reagents

Redistribution

Service

Solvent

Special

Storage

Test Developer

Test Sponsor