

APPENDIX XIV

PRECISION OF LABORATORY TESTS FOR AUTOMOTIVE GEAR LUBRICANTS INTENDED FOR API GL-4, GL-5, and GL-6 SERVICE

Sufficient documentation is not available to provide absolute precision limits for these test procedures. However, sufficient data are available to provide the following general statements concerning the precision of these tests.

CHANNELING CHARACTERISTICS

CRC L-15 or FTM-3456.1

The National Research Council, Canada, carried out an extensive program and could find no correlation between this test and field performance.

SEPARATION CHARACTERISTICS

CRC L-22 or FTM-3455.1

No precision data are available on this test.

MOISTURE CORROSION

CRC L-13 or FTM-5315.1

No precision data have been published on this test procedure.

CRC L-21

Although no data are available, the test was replaced by CRC L-33 when it became available which indicates lack of correlation with field performance.

CRC L-33 or FTM-5326.1

The repeatability of the CRC L-33 Moisture Corrosion Test is very good for gear lubricants which exhibit good anti-corrosion characteristics. Based upon cover plate corrosion, duplicate tests conducted with a good anti-corrosion type gear lubricant should show a difference of less than 5% corrosion with respect to the total area of the cover plate. However, the repeatability of this test

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when conducted with a gear lubricant possessing marginal or poor anti-corrosion characteristics is poor and differences of as much as 50% corrosion with respect to the total area of the cover plate can be expected.

Similarly, the reproducibility of the CRC L-33 Moisture Corrosion Test is very good when conducted with a lubricant which has good anti-corrosion characteristics, but is poor when testing lubricants with poor anti-corrosion characteristics. Results from two laboratories testing a good lubricant should not differ by more than 5% corrosion with respect to the total area of the cover plate. Results from two laboratories testing a marginal or poor lubricant can be expected to differ by as much as 55% corrosion with respect to the total area of the cover plate.

FALEX PIN CORROSION

Ford BJ 5-1

No repeatability or reproducibility information is available.

MOTORED REAR AXLE TEST

Ford BJ 15-1

Precision information is not available.

THERMAL OXIDATION STABILITY TEST

FTM-2504

No precision data are available. In an initial round-robin by CRC, using RGO-120-69, a serious lack of reproducibility appeared. Test modification and continued evaluations using RGO-120-70 (a lower quality lubricant) are in progress.

CRC L-19 or FTM 6504-T

Gear units utilized for this test are no longer available. No precision data were obtained during the life of this test.

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CRC L-20 or FTM-5317.1

The gear units for this test are the same as those used for the CRC L-37 Test. No precision data have been obtained.

CRC L-42 or FTM-6507.1

The scoring tendency of CRC L-42 test gears varies considerably from one production batch to another. Therefore, evaluations of CRC L-42 High Speed and Shock Load Tests are based upon a comparison of the test results of the candidate lubricant and reference lubricants RGO-108 and RGO-110 conducted with the same production batch of test gears.

Duplicate CRC L-42 gear tests conducted at one laboratory and using test gears from the same production batch, when run with RGO-108 reference oil can be expected to show less than a 50% difference in scoring level. Duplicate CRC L-42 gear tests conducted by one laboratory on RGO-110 reference oil can be expected to show less than an 8% difference in scoring level. CRC L-42 gear tests conducted at different laboratories, but utilizing the same production batch of test gears and RGO-108 reference oil can be expected to show scoring levels which differ by no more than 72%. The same tests conducted with RGO-110 reference oil can be expected to show less than an 11% difference in scoring level.

CRC L-37 or FTM-6506.1

No reference oil was established for this test and, therefore, no precision data are available.

Vehicle Rear Axle Score Test, Ford BJ 15-1

No precision data are available.

Controlled Slip Differential

No precision data are available.