APPENDIX VIII

LOAD-CARRYING CHARACTERISTICS OF UNIVERSAL GEAR LUBRICANTS IN AXLES UNDER CONDITIONS OF HIGH SPEED

1. SCOPE

1.1 This procedure is intended for use in determining the load-carrying characteristics of universal gear lubricants in axles under conditions of high speed.

2. APPARATUS

2.1 The apparatus shall consist of the following:

2.1.1 Axle.—The test unit shall be a new Chevrolet hypoid third member assembly (3657302) 9-37 ratio. This assembly shall be installed in the axle housing of a Chevrolet passenger vehicle, for which it was designed.

3. PREPARATION OF EQUIPMENT

3.1 Equipment used in the conduct of this test shall be prepared in the manner described below:

Clean the axle housing and axle shafts thoroughly by spraying with or dipping in a petroleum solvent and drying with dry air.

Install the assembly in vehicle.

Fill the housing with the test lubricant.

Check tire inflation to 28 pounds.

4. TEST CONDITIONS AND PROCEDURE

4.1 The test conditions and procedure for the road test shall be as outlined below. The same procedure may be followed on a chassis dynamometer, provided that the roll torque throughout the entire speed range and the kinetic energy of the rolls at 70.2 m. p. h. are identical with the effective road conditions and proven for any given installation by check evaluations:

Run 5 to 25 miles at not over 25 m. p. h.

Engage the clutch in high gear and accelerate (full throttle) to 40 m. p. h. Upon reaching 40 m. p. h., close the throttle and coast to 10 m. p. h. with clutch engaged. Repeat for a total of four times.

Gradually accelerate in high gear to 60 m. p. h. Upon reaching 60 m. p. h., open the throttle wide and accelerate to 80 m. p. h. Immediately close the throttle completely, and coast to 60 m. p. h. with clutch engaged. Repeat the drive and coast between 60 and 80 m. p. h., for a total of 10 times.

Return the vehicle to the inspection point under the same conditions outlined in the first subparagraph of 4.1.

Drain the test lubricant, and remove the third member assembly.

If under inspection there is no scoring of the ring-gear and pinion-gear teeth in the original test, a duplicate test shall be made using fresh lubricant and a new and unused third member assembly. If scoring of the ring gear or pinion teeth occurs in any test and is attributed to abnormal conditions, that test shall be voided, and the test shall be rerun using fresh lubricant and a new and unused third member assembly.

5. INSPECTION

5.1 The inspections shall be made as follows:

Examine pinion and ring gear surfaces on drive and coast sides of teeth for evidence of scoring, scuffing, ridging, rippling, pitting, or other unusual surface characteristics. Examine pinion and carrier bearings, spacer block, and differential gear pins for evidence of wear, corrosion, or pitting.

NOTES:

1. Rebuilt third member assemblies shall not be used, and no change in any of the tooth contacts or bearing adjustments shall be made. Third member assemblies especially selected by the manufacturer for test work shall be used.

ORDER No. — Orders shall be placed with Chevrolet-Gear & Axle, Division of General Motors Corp., 1340 Holbrook Avenue, Detroit 12, Mich., Attn: Engineering Department. They shall specify "Third Member Assemblies for Oil Tests, to be checked by the Gear Engineering Department." For the third member assembly the part number is 657302; and for the complete rear axle assembly, the part number is 8657300.
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FIGURE 1A.—Water pan for axle test.

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FIGURE 1B.—Water pan for axle test.