



Crankshaft Tuning Fork Bending Fatigue 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. This standard provides a procedure to determine the bending fatigue life of crankshaft sections for comparison of designs, materials, and/or manufacturing processes.

1.2 Applicability. Applies to all crankshafts.

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.

None

2.3 Additional References. None.

3 Resources

3.1 Facilities.

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.

3.2.1 The Complex Engineering, Inc. (Project Number 1220, Serial Number 1220-100) Test System available in the Pontiac Component Test Laboratory, i.e., the tuning fork control console and mounting fixtures. See Figure 1. Reference print 1 through print 13 Complex Engineering, Inc. Job No. 1220.

3.2.2 Tuning fork assembly PE-E-1149-A.

3.2.3 Tuning fork PE-E-1299-B.

3.2.4 Slotted bushing (2 required) PE-C-1149-D.

3.2.5 Hydraulic ram.

3.2.6 Top plate PE-D-952-B-1.

3.2.7 Eye bolt (8 required) PE-D-952-B-3.

3.2.8 Bottom plate PE-D-952-B-2.

3.2.9 Load cell and mounting block.

3.2.10 Strain indicator.

3.2.11 Tuning weights (Steel plates).

Figure 1: Example Tuning Fork Fixture Setup



3.3 Test Vehicle/Test Piece. Test to be performed on front and rear crankshaft sections. Minimum ten (10) crankshafts for Single-step test, and twenty-five (25) crankshafts for Staircase test.

3.4 Test Time.

Calendar time: 2 w to 8 w
 Test time: 1 d to 3 d per section
 Coordination time: 1 d to 2 d

3.5 Test Required Information. Test type, test moments.

3.6 Personnel/Skills.

3.6.1 A test technician to install the crankshaft sections in the fixtures, start the control equipment, and collect data.

3.6.2 A test engineer to supervise the test setup, control the test sequence, and report the data.

4 Procedure

4.1 Preparation.

4.1.1 All crankshafts to be tested will be tagged by the testing technician, test engineer, or supervisor upon receipt with the test number and any other pertinent information.

4.1.2 Cut two (2) sections from each crank. The front section will include the first and second main journals and included pin journals. The rear section will include the last and next to last main journals and included pin journals.

4.1.3 Identify each crankshaft section on both ends with an identification number and a front or rear designation.