

STURAA TEST

7 YEAR

200,000 MILE BUS

from

ARBOC Mobility LLC.

MODEL SOM23G

JANUARY 2009

PTI-BT-R0812



**The Thomas D. Larson
Pennsylvania Transportation Institute**

201 Transportation Research Building (814) 865-1891
The Pennsylvania State University
University Park, PA 16802

Bus Testing and Research Center

2237 Old Route 220 N. (814) 695-3404
Duncansville, PA 16635

EXECUTIVE SUMMARY

ARBOC Mobility LLC. submitted a model SOM23G, gasoline-powered 20 seat (including the driver) 23-foot bus, built on a GM G3500 chassis for a 7 yr/200,000 mile STURAA test. The odometer reading at the time of delivery was 471 miles. Testing started on July 30, 2008 and was completed on January 9, 2009. The Check-In section of the report provides a description of the bus and specifies its major components.

The primary part of the test program is the Structural Durability Test, which also provides the information for the Maintainability and Reliability results. The Structural Durability Test was started on September 10, 2008 and was completed on November 28, 2008.

The interior of the bus is configured with seating for 20 passengers including the driver. Free floor space will accommodate 9 standing passengers resulting in a potential load of 29 persons. At 150 lbs per person, this load results in a measured gross vehicle weight of 12,960 lbs. The first segment of the Structural Durability Test was performed with the bus loaded to a GVW of 12,960 lbs. The middle segment was performed at a seated load weight of 11,800 lbs and the final segment was performed at a curb weight of 8,870 lbs. Durability driving resulted in unscheduled maintenance and failures that involved a variety of subsystems. A description of failures, and a complete and detailed listing of scheduled and unscheduled maintenance is provided in the Maintainability section of this report.

Accessibility, in general, was adequate, components covered in Section 1.3 (Repair and/or Replacement of Selected Subsystems) along with all other components encountered during testing, were found to be readily accessible and no restrictions were noted.

The Reliability section compiles failures that occurred during Structural Durability Testing. Breakdowns are classified according to subsystems. The data in this section are arranged so that those subsystems with more frequent problems are apparent. The problems are also listed by class as defined in Section 2. The test bus encountered no Class 1 or Class 2 failures. Of the thirty-three reported failures, twenty-three were Class 3 and ten were Class 4.

The Safety Test, (a double-lane change, obstacle avoidance test) was safely performed in both right-hand and left-hand directions up to a maximum test speed of 45 mph. The performance of the bus is illustrated by a speed vs. time plot. Acceleration and gradeability test data are provided in Section 4, Performance. The average time to obtain 50 mph was 15.38 seconds.

The Shakedown Test produced a maximum final loaded deflection of 0.155 inches with a permanent set ranging between -0.006 to 0.006 inches under a distributed static load of 10,875 lbs. The Distortion Test was completed with all subsystems, doors and escape mechanisms operating properly. No water leakage was observed throughout the test. All subsystems operated properly.

The test bus submitted for testing was not equipped with any type of tow eyes or tow hooks, therefore, the Static Towing Test was not performed. The Dynamic Towing Test was performed by means of a front-lift tow. The towing interface was accomplished using a hydraulic under-lift wrecker. The bus was towed without incident and no damage resulted from the test. The manufacturer does not recommend towing the bus from the rear, therefore, a rear test was not performed. The Jacking and Hoisting Tests were also performed without incident. The bus was found to be stable on the jack stands, and the minimum jacking clearance observed with a tire deflated was 4.8 inches.

A Fuel Economy Test was run on simulated central business district, arterial, and commuter courses. The results were 4.35 mpg, 4.77 mpg, and 7.84 mpg respectively; with an overall average of 5.13 mpg.

A series of Interior and Exterior Noise Tests was performed. These data are listed in Section 7.1 and 7.2 respectively.