HEAVY-DUTY ARTICULATED 500,000-MILE BUS WITH A MINIMUM SERVICE LIFE OF 12 YEARS

5. STRUCTURAL INTEGRITY

5.6 STRUCTURAL STRENGTH AND DISTORTION TESTS - HOISTING TEST

APRIL 2006

ABBREVIATIONS

ABTC	- Altoona Bus Test Center
A/C	- air conditioner
ADB	- advance design bus
CBD	- central business district
CI	- compression ignition
CNG	- compressed natural gas
CW	- curb weight (bus weight including maximum fuel, oil, and coolant; but without passengers or driver)
dB(A)	- decibels with reference to 0.0002 microbar as measured on the "A" scale
DIR	- test director
DR	- bus driver
EPA	- Environmental Protection Agency
FFS	- free floor space (floor area available to standees, excluding ingress/egress areas, area under seats, area occupied by feet of seated passengers, and the vestibule area)
FTA	- Federal Transit Administration
GAWR	- gross axle weight rating
GL	- gross load (150 lb for every designed passenger seating position, for the driver, and for each 1.5 sq ft of free floor space)
GVW	- gross vehicle weight (curb weight plus gross vehicle load)
GVWR	- gross vehicle weight rating
hr	- hour
LNG	- liquefied natural gas
mpg	- miles per gallon
mph	- miles per hour
NBM	- new bus models
PSBRTF	- Penn State Bus Research and Testing Facility
PTI	- Pennsylvania Transportation Institute
rpm	- revolutions per minute
SAE	- Society of Automotive Engineers
SCF	- standard cubic feet
SCFM	- standard cubic feet per minute
SCH	- test scheduler
SEC	- secretary
SI	- spark ignition
SLW	- seated load weight (curb weight plus 150 lb for every designed passenger seating position and for the driver)
TD	- test driver
TM	- track manager
TP	- test personnel

5.6-I. TEST OBJECTIVE

The objective of this test is to determine possible damage or deformation caused by the jack stands on the jacking pads.

5.6-II. TEST DESCRIPTION

With the bus at curb weight, the front end of the bus is raised to a height sufficient to allow manufacturer-specified placement of jack stands under the axles or jacking pads independent of the hoist system. The bus will be checked for stability on the jack stands and for any damage to the jacking pads or bulkheads. The procedure is repeated for the rear end of the bus. The procedure is then repeated for the front and rear simultaneously.

5.6-III. TEST ARTICLE

The test article is a heavy-duty transit bus with a minimum service life of 12 years or 500,000 mi.

5.6-IV. TEST EQUIPMENT/FACILITIES/PERSONNEL

This test will be performed on a smooth level surface at the ABTC. The following test equipment and personnel are required for this test:

1. Mobile post hoists as required.
2. Heavy-duty jack stands.
3. Test personnel (TP).

5.6-V. TEST DATA

The test data consist of the Hoisting Test Data Form. Upon completion of this test, data shall be forwarded to the ABTC manager.

5.6-VI. TEST PREPARATION AND PROCEDURES

Detailed test preparation and procedures are listed in procedure 5.6-1. This section also includes Hoisting Test Data Form - 5.6.

DETAILED TEST PROCEDURES		TITLE: 5. Structural Integrity
Procedure 5.6-1		**NOMENCLATURE: 5.6 Structural Strength and Distortion Tests – Hoisting Test**
OPER STEP	**ACTION BY**	**TEST PREPARATION AND PROCEDURE**
1	TP	Record bus number on data form. Retrieve the work order for this test.
2	TP	With the bus at curb weight, position the bus on a smooth level test surface.
3	TP	Place hoists under each of the front wheels. **WARNING:** Use extreme caution when hoisting bus. Beware of possible instability.
4	TP	Using the hoists, raise the bus to a height sufficient to allow placement of jack stands under the jack pads or axles as specified by the manufacturer.
5	TP	Check the entire bus for possible instability while on the hoist.
6	TP	Place jack stands under the axles or jacking pads as specified by the manufacturer.
7	TP	Using the hoists, lower the bus onto the jack stands.
8	TP	Inspect the jack stand/bus contact; check for instability, structural deformation, or damage to the jacking pads or axles. Photograph bus on jack stands.
9	TP	Raise the bus and remove the jack stands.
10	TP	Lower the bus and remove the mobile hoist.
11	TP	Place a mobile hoist under each of the rear wheels.
12	TP	Repeat steps 4 through 10.
13	TP	Place mobile hoist under all wheels and repeat steps 4 thru 10.
14	TP	Record any problems or comments on the Hoisting Test Data Form. File the completed Hoisting Test Data Form and Work Order Form.

REVISIONS

All revisions to this test must be identified on this page. Briefly describe each revision in the space provided below.

Revision	Description	Date	Approval

HOISTING TEST DATA FORM

Bus Number:	Date:
Personnel:	Temperature (EF):

Comments of any structural damage to the jacking pads or axles while both the front wheels are supported by the jack stands:
Comments of any structural damage to the jacking pads or axles while both the rear wheels are supported by the jack stands:
Comments of any structural damage to the jacking pads or axles while both the front and rear wheels are supported by the jack stands: