FEDERAL TRANSIT BUS TEST

Performed for the Federal Transit Administration U.S. DOT
In accordance with 49 CFR, Part 665

Altoona Bus Testing and Research Center
Test Bus Procedure

5.6 STRUCTURAL STRENGTH AND DISTORTION TESTS – HOISTING TEST

Pass/Fail
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LTI BUS RESEARCH AND TESTING CENTER

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
LTI	Larson Transportation Institute
mpg	Miles per gallon
mph	Miles per hour
NBM	New bus models
PSTT	Penn State Test Track
rpm	Revolutions per minute
SAE	Society of Automotive Engineers
SCF	Standard cubic feet
SCFM	Standard cubic feet per minute
SCH	Test scheduler
SA	Staff Assistant
SI	Spark ignition
SLW	Seated load weight (curb weight plus 150 lb. for every designated 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 the potential damage or deformation caused by the jack stands on the jacking pads and any problems raising the vehicle using a wheel hoist.

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 and tag axels of the bus. The procedure is then repeated for the front, tag and rear simultaneously.

5.6-III. TEST ARTICLE

The test article is a transit bus with a minimum service life of 4, 5, 7, 10 or 12 years.

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).
4. Camera
5. Calibrated Thermometer

5.6-V. TEST DATA

The test data consists of the Hoisting Test Data Form. All forms must be filled out using a pen. 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.
2	TP	With the bus at curb weight, position the bus on a smooth, approximately level test surface. WARNING: Use extreme caution when hoisting bus. Beware of possible instability.
3	TP	Place wheel hoists under each of the front wheels.
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 during lifting and 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. **If tag axle is present, repeat steps 11 & 12 for tag axle.**
12	TP	Repeat steps 4 through 10.
13	TP	Place mobile hoist under all wheels and repeat steps 4 through 10.
14	TP	Upon completion of this test, data shall be forwarded to the ABTC manager.