

TP-500-02
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U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

LABORATORY TEST PROCEDURE
FOR
FMVSS 500, Low-Speed Vehicles



ENFORCEMENT
Office of Vehicle Safety Compliance
Room 6115, NVS-220
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Washington, DC 20590

OVSC LABORATORY TEST PROCEDURE NO. **500**
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REVISION CONTROL LOG
FOR OVSC LABORATORY TEST PROCEDURE
TP **500**, LOW-SPEED VEHICLES

TEST PROCEDURE		FMVSS 500		DESCRIPTION
REV. No.	DATE	AMENDMENT	EFFECTIVE DATE	
00	6/16/00	63FR33194 6/17/98	6/17/1998	Final Rule issued
01	8/17/05	68FR43964 7/25/03 68FR55544 9/26/03 70FR48313 8/17/05	See below 1/22/04 10/3/2005	Windshield conformance to 49 CFR 571.205 – ANSI/SAE Z26.1 Corrected effective date Revised LSV Definition
02	4/19/06	71FR20026 4/19/06	6/5/06	GVWR limit for LSV's increased to 1,361kilograms (3,000 pounds)
03				

1. PURPOSE AND APPLICATION

The Office of Vehicle Safety Compliance (OVSC) provides contractor laboratories with Laboratory Test Procedures as guidelines for obtaining compliance test data. The data are used to determine if a specific vehicle or item of motor vehicle equipment meets the minimum performance requirements of the subject Federal Motor Vehicle Safety Standard (FMVSS). The purpose of the OVSC Laboratory Test Procedures is to present a uniform testing and data recording format, and provide suggestions for the use of specific equipment and procedures. These Laboratory Test Procedures do not constitute an endorsement or recommendation for use of any product or method. If any contractor views any part of an OVSC Laboratory Test Procedure to be in conflict with a FMVSS or observes deficiencies in a Laboratory Test Procedure, the contractor is required to advise the Contracting Officer's Technical Representative (COTR) and resolve the discrepancy prior to the start of compliance testing.

The OVSC Laboratory Test Procedures are not intended to limit or restrain a contractor from developing or utilizing any testing techniques or equipment that will assist in procuring the required compliance test data. However, the application of any such testing technique or equipment is subject to prior approval of the COTR.

NOTE: The OVSC Laboratory Test Procedures, prepared for the limited purpose of use by independent laboratories under contract to conduct compliance tests for the OVSC, are not rules, regulations or NHTSA interpretations regarding the meaning of a FMVSS. The Laboratory Test Procedures are not intended to limit the requirements of the applicable FMVSS(s). In some cases, the OVSC Laboratory Test Procedures do not include all of the various FMVSS minimum performance requirements. Recognizing applicable test tolerances, the Laboratory Test Procedures may specify test conditions that are less severe than the minimum requirements of the standard. In addition, the Laboratory Test Procedures may be modified by the OVSC at any time without notice, and the COTR may direct or authorize contractors to deviate from these procedures, as long as the tests are performed in a manner consistent with the standard itself and within the scope of the contract. Laboratory Test Procedures may not be relied upon to create any right or benefit in any person. Therefore, compliance of a vehicle or item of motor vehicle equipment is not necessarily guaranteed if the manufacturer limits its certification tests to those described in the OVSC Laboratory Test Procedures.

2. GENERAL REQUIREMENTS

FMVSS 500 specifies requirements for Low-Speed Vehicles (LSV). The purpose of this standard is to ensure that low-speed vehicles operated on the public streets, roads, and highways, are equipped with the minimum motor vehicle equipment appropriate for motor vehicle safety.

Each LSV shall be a motor vehicle that –

Has 4 wheels in contact with the ground in normal operation,

Has a speed attainable in 1.6 km (1 mile) of more than 32 kilometers per hour (20 miles per hour) and not more than 40 kilometers per hour (25 miles per hour) on a paved level

surface, and

Has a gross vehicle weight rating (GVWR) of less than 1,361 kilograms (3,000 pounds).

Each LSV shall be equipped with ten items of safety equipment and a compliance certification label.

This Laboratory Test Procedure is applicable to an LSV that has electric propulsion. A different procedure will apply to an LSV with an internal combustion engine.

3. SECURITY

The contractor shall provide appropriate security measures to protect the OVSC test vehicles and parts during the entire compliance testing program. The contractor is also financially responsible for any acts of theft and/or vandalism which occur during the storage of test vehicles. Security problems which arise shall be reported by telephone to the COTR and the Industrial Property Manager (IPM), Office of Contracts and Procurement (OCP), within 2 working days after the incident. A letter containing specific details of the security problem shall be sent to the IPM (with copy to the COTR) within 4 working days. The contractor shall protect and segregate all photographs and data that evolve from compliance testing. No information concerning the vehicle safety compliance testing program shall be released to anyone except the COTR, unless specifically authorized by the COTR or the COTR's Branch or Division Chief.

NO INDIVIDUALS, OTHER THAN CONTRACTOR PERSONNEL DIRECTLY INVOLVED IN THE COMPLIANCE TESTING PROGRAM, SHALL BE ALLOWED TO WITNESS ANY VEHICLE COMPLIANCE TEST UNLESS SPECIFICALLY AUTHORIZED BY THE COTR.

4. GOOD HOUSEKEEPING

Contractors shall maintain the entire vehicle compliance testing area, test fixtures and instrumentation in a neat, clean and painted condition with test instruments arranged in an orderly manner consistent with good test laboratory housekeeping practices.

5. TEST SCHEDULING AND MONITORING

The contractor shall submit a test schedule to the COTR prior to testing. Tests shall be completed as required in the contract. Scheduling shall be adjusted to permit sample motor vehicles to be tested to other FMVSS as may be required by the OVSC. All testing shall be coordinated to allow monitoring by the FMVSS No. 500 COTR.

6. TEST DATA DISPOSITION

The contractor shall make all vehicle preliminary compliance test data available to the COTR on location within 4 hours after the test. Final test data shall be furnished to the COTR within 5 working days. Additionally, the contractor shall analyze the preliminary test results as directed by the COTR. All backup data sheets, technical notes, etc., shall be either sent to the COTR or destroyed at the conclusion of each delivery order,

purchase order, etc.

7. GOVERNMENT FURNISHED PROPERTY (GFP)

ACCEPTANCE OF TEST VEHICLES

The Contractor has the responsibility of accepting each test vehicle whether delivered by a new vehicle dealership or another vehicle transporter. In both instances, the contractor acts in the OVSC's behalf when signing an acceptance of the test vehicle delivery. When a vehicle is delivered, the contractor must check to verify the following:

- A. All options listed on the "window sticker" are present,
- B. Tires and wheels are new and the same as listed,
- C. There are no dents or other interior or exterior flaws,
- D. The vehicle has been properly prepared and is in running condition, and
- E. Owner's manual, warranty document, consumer information, and extra set of keys are present.

A Vehicle Condition form will be supplied to the contractor when the test vehicle is transferred from a new vehicle dealership or between test contracts. The contractor must complete a Vehicle Condition form for each vehicle and deliver it to the COTR with the Final Test Report or the report will not be accepted for payment.

NOTIFICATION OF COTR

The COTR must be notified within 24 hours after a vehicle has been delivered. In addition, if any discrepancy or damage is found at the time of delivery, a copy of the Vehicle Condition form shall be sent to the COTR immediately.

8. CALIBRATION OF TEST INSTRUMENTS

Before the contractor initiates the safety compliance test program, a test instrumentation calibration system shall be implemented and maintained in accordance with established calibration practices. The calibration system shall be set up and maintained as follows:

- A. Standards for calibrating the measuring and test equipment will be stored and used under appropriate environmental conditions to assure their accuracy and stability.
- B. All measuring instruments and standards shall be calibrated by the contractor, or a commercial facility, against a higher order standard at periodic intervals NOT TO EXCEED TWELVE (12) MONTHS! Records, showing the calibration traceability to the National Institute of Standards and Technology (NIST), shall be maintained for all measuring and test equipment.

- C. All measuring and test equipment and measuring standards will be labeled with the following information:
 - (1) Date of calibration
 - (2) Date of next scheduled calibration
 - (3) Name of the technician who calibrated the equipment
- D. A written calibration procedure shall be provided by the contractor that includes as a minimum the following information for all measurement and test equipment:
 - (1) Type of equipment, manufacturer, model number, etc.
 - (2) Measurement range
 - (3) Accuracy
 - (4) Calibration interval
 - (5) Type of standard used to calibrate the equipment (calibration traceability of the standard must be evident)
- E. Records of calibration for all test instrumentation shall be kept by the contractor in a manner which assures the maintenance of established calibration schedules. All such records shall be readily available for inspection when requested by the COTR. The calibration system will need the acceptance of the COTR before the test program commences. Further guidance is provided in the International Standard ISO 10012-1, "Quality Assurance Requirements for Measuring Equipment" and American National Standard ANSI/NCSL Z540-1, "Calibration Laboratories and Measuring and Test Equipment - General Requirements".

9. PHOTOGRAPHIC DOCUMENTATION

Photographs shall be 8 x 10 inches, and properly focused for clear images. A label or placard identifying the test vehicle model, NHTSA number and date or item of equipment part number and date shall appear in each photograph and must be legible. Each photograph shall be labeled as to the subject matter.

As a minimum, the following photographs shall be included in each final test report, where applicable:

- A. 3/4 frontal view from left side of vehicle, with and without removable doors, windows, etc.
- B. 3/4 rear view from right side of vehicle, with and without removable doors, windows, etc.
- C. Close-up view of vehicle's certification label
- D. Close-up view of vehicle tire information placard or label (if so equipped)
- E. Close-up view of other vehicle labels (instructions, hazard, warning, etc.)
- F. Close-up view of speed measuring instrumentation mounted on vehicle
- G. Photos of vehicle being weighed at the Unloaded Vehicle Weight condition
- H. Photos required to document required safety equipment

I. Photos to document any apparent test failure

10. DEFINITIONS

Designated Seating Capacity (DSC) -

Means the number of designated seating positions provided.

Gross Axle Weight Rating (GAWR) –

Means the value specified by the vehicle manufacturer as the load-carrying capacity of a single axle system, as measured at the tire-ground interfaces.

Gross Vehicle Weight Rating (GVWR) –

Means the value specified by the manufacturer as the loaded weight of a single vehicle.

Low-Speed Vehicle (LSV) –

- (a) a 4-wheeled motor vehicle,
- (b) whose speed attainable in 1.6 km (1 mile) is more than 32 kilometers per hour (20 miles per hour) and not more than 40 kilometers per hour (25 miles per hour) on a paved level surface, and
- (c) whose GVWR is less than 1,361 kilograms (3,000 pounds).

Maximum speed –

Means the maximum attainable vehicle speed at any point in a distance of 1.6 km (1 mile):

- (a) on the test surface described in Section 13 of this test procedure,
- (b) from a standing start and repeated in the opposite direction within 30 minutes, and
- (c) with the vehicle at UVW plus 78 kg (170 lb).

Unloaded Vehicle Weight (UVW) –

Means the weight of a vehicle with maximum capacity of all fluids necessary for operation of the vehicle, but without cargo, occupants, or accessories that are ordinarily removed from the vehicle when they are not in use.

11. TEST EQUIPMENT

The following test equipment or equivalent shall be used:

- A. Non-contact or mechanical fifth wheel to measure vehicle velocity, minimum 50 km/hr range with an accuracy of ± 0.5 km/hr.
- B. On-board Data Acquisition System (DAS), i.e. computer, or equivalent, to measure and record the vehicle velocity and distance traveled for the entire duration of the speed runs. The DAS shall have an accuracy equal to or greater than the fifth wheel. The DAS readout shall provide data to the 0.1 km/hr (velocity) and 0.1 m (distance traveled). The road speed data shall be sampled and recorded along with the distance traveled at least once per second for the duration of the speed run.

- C. On-board power supply, i.e. battery, to provide necessary power for the DAS and velocity measuring equipment.
- D. Temperature gage to record ambient test temperatures, 0 to 38° C with an accuracy of $\pm 0.5^\circ$ C and a scale graduation of 1 deg.
- E. Anemometer to measure wind speed. Ten m/s range with ± 1 m/s accuracy at 5 m/s and a scale graduation of 1 m/s.
- F. Platform scale or scales to measure individual wheel loads. Platform scale or scales shall have a minimum capacity of 600 kg per wheel with an accuracy of $\pm 1\%$ of the reading and a scale graduation of 1 kg maximum. Vehicle wheels shall maintain a horizontal level plane while loads are being measured.
- G. Multimeter to measure battery voltage. Minimum range of 90 volts with an accuracy of $\pm 0.5\%$ and a scale graduation of 0.1 volt.
- H. Tire pressure gage to measure tire inflation pressure. Range of 600 kPa with a maximum scale graduation of 10 kPa.

12. PRETEST REQUIREMENTS

Prior to conducting any compliance tests, contractors are required to submit a detailed in-house compliance test procedure to the COTR which includes a step-by-step description of the methodology to be used and a detailed check-off list.

The contractor's test procedure shall contain a complete listing of test equipment actually used. The list of test equipment shall include instrument accuracy and calibration due dates. The contractor shall conspicuously identify revisions to its in-house procedures and ensure that obsolete documents are not used.

There shall be no contradiction between the OVSC Laboratory Test Procedure and the contractor's in-house test procedure. Written approval must be obtained from the COTR before initiating the compliance test program so that all parties are in agreement.

TEST DATA LOSS

A compliance test is not to be conducted unless all of the various test conditions specified in the applicable OVSC Laboratory Test Procedure have been met. Failure of a contractor to obtain the required test data and to maintain acceptable limits on test parameters in the manner outlined in the applicable OVSC Laboratory Test Procedure may require a retest at the expense of the contractor. The retest costs will include the cost of the replacement vehicle (with the same equipment as the original vehicle) or item of motor vehicle equipment and all costs associated with conducting the retest. The original test specimen (vehicle or equipment item) used for the invalid test shall remain the property of OVSC, and the retest specimen shall remain the property of the contractor. If there is a test failure, the contractor shall retain the retest specimen for a period not exceeding 180 days. If there is no test failure, the Contractor may dispose of the test specimen upon notification from the COTR that the final test report has been

accepted.

The Contracting Officer of NHTSA is the only official authorized to notify the contractor that a retest is required. The retest shall be completed within two (2) weeks after receipt of notification by the Contracting Officer that a retest is required. If a retest is conducted, no test report is required for the original test.

13. GENERAL TEST CONDITIONS

Where a range of conditions is specified, the vehicle shall be capable of meeting the requirements at all points within the range.

TEST AREAS

- A. The vehicle shall be kept in a clean, dry, level surfaced area during storage, vehicle inspection, and safety equipment verification.
- B. The ambient temperature for the speed test shall be between 0° C and 40° C.
- C. The wind speed shall not exceed 5 m/s.
- D. The track surface shall produce a peak friction coefficient (PFC) of 0.9 when tested in accordance with ASTM Method E1337-90.
- E. The test track surface shall have no more than a 1% gradient in the direction of testing and not more than a 2% gradient perpendicular to the direction of testing. It shall be free from standing water, contamination by any liquid and foreign objects of any kind which could affect the speed test.
- F. The test track straightaway shall be at least 2 km in length and at least 3.5 m wide.
- G. The test track shall be marked at a 1000 ± 1 meter interval for pre and post-test field calibration.

VEHICLE PREPARATION - Maximum Speed Test

- A. The vehicle shall complete the manufacturer's recommended break-in agenda prior to beginning the performance tests. Record on data sheet 3.
- B. All vehicle openings (doors, windows, hood, trunk, convertible top, cargo doors etc.) shall be closed except as required for instrumentation purposes.
- C. The vehicle shall be conditioned in an ambient air temperature within 5° C of the ambient temperature of the speed test area for at least three hours.
- D. Prior to beginning the performance tests, propulsion batteries shall be fully charged as per manufacturer charging instructions. No further charging of any propulsion batteries is permissible.

PERMANENT RECORDING OF DATA

Where permanent trace recording is not required, data shall be recorded on standard report forms. Changes or corrections shall be made by drawing a line through the original entry, which must remain legible, adding the change above or alongside, and initialed.

Prior to conducting any compliance tests, contractors are required to submit a detailed in-house compliance test procedure and equipment list to the COTR which includes a step-by-step description of the methodology to be used and a detailed check-off list. Written approval must be obtained from the COTR before commencing testing so that all parties are in agreement.

The contractor's test procedure shall contain a complete listing of test equipment and a detailed check-off list. There shall be no contradiction between the OVSC Laboratory Test Procedure and the contractor's in-house test procedure. The list of test equipment shall include instrument accuracy and calibration dates.

METRIC UNITS

As a general rule, use of the metric system of weights and measures is preferred. Performance parameters and test conditions in FMVSS 500 are specified in metric units. In this Laboratory Test Procedure metric values may be followed by English units only for reference (not necessarily equal). If test equipment is not available for direct measurement in metric units, the test laboratory shall calculate the exact metric equivalent by means of a conversion factor carried out to at least 5 significant digits before rounding consistent with the specified metric requirement. Metric units shall be used in Final Test Reports.

14. COMPLIANCE TEST EXECUTION

14.1 Visual Inspection

Verify that the LSV is equipped with the required safety equipment and certification labeling. Record data on Data Sheet 1.

- A. Headlamps (S5(b)(1)) - Verify function and describe method of activation.
- B. Front and Rear Turn Signal Lamps (S5(b)(2)) - Describe turn signal lamp lens color and location. Verify function and describe method of activation. Note if system has a self-canceling feature.
- C. Taillamps (S5(b)(3)) - Note taillamp lens color. Verify function and describe method of activation.
- D. Stop Lamps (S5(b)(4)) - Note stop lamp color and location. Verify function when the service brake pedal is depressed.
- E. Reflex Reflectors (S5(b)(5)) - The vehicle shall have one red reflector on each side as far to the rear as possible and one red on the rear. Describe reflector material (plastic or tape), color and shape. Note location of reflectors on vehicle.
- F. Mirrors (S5(b)(6)) - The vehicle shall have a driver's side exterior mirror and either a passenger side exterior mirror or an interior mirror. Note mirror location, design (flat or convex), and method for adjustment.
- G. Parking Brake (S5(b)(7)) - Describe type of parking brake (hand lever or foot pedal) and location. Note how brake applies braking force (purely mechanical and/or hydraulic etc.). Verify function by rolling vehicle forward and backward on a level surface without brake applied and then with brake applied.
- H. Windshield (S5(b)(8)) – A windshield that conforms to glazing materials specified in FMVSS 205. Windshield shall be marked with “DOT”, manufacturer code, and “AS-1” or “AS-4” to identify composition. Record any visible labeling.
- I. Vehicle Identification Number (VIN) (S5(b)(9)) – A VIN that conforms to the requirements of Part 565 Vehicle Identification Number including 17 digit alpha-numeric number. Note the location(s) of all VIN's. Ensure all VINs are identical.
- J. Seat Belts (S5(b)(10)) - All seat belts at each designated seating position must conform with FMVSS 209 “Seat Belt Assemblies” including Type 1 (lap) or Type 2 (lap and harness). Record location and type of each seat belt. Document any visible labeling. Labeling shall include year of manufacturer, model, and name or trademark of manufacturer or distributor.
- K. Certification Label - Note location of label and Vehicle Type identified on label.

14.2 Vehicle Loading

- Each LSV must have a Certification Label GVWR less than 1,361 kg.
- The measured weight of the vehicle at Unloaded Vehicle weight (UVW) with 68 kg at each designated seating position plus the rated cargo load, if specified, cannot exceed the rated GVWR.

Record data on Data Sheet 2.

- Record GVWR and GAWR values on vehicle's certification label. Verify GVWR is less than 1,361 kg (3,000 lb). If not, contact the COTR.
- Determine the vehicle's designated seating capacity (DSC) by recording the number of designated seating positions, i.e., those equipped with seat belts. Note: if a seat appears large enough to accommodate a 5 percentile female (hip width approximately 3300 mm (13 inches)) and is not equipped with a seat belt, contact the COTR.
- Determine the vehicle's unloaded vehicle weight (UVW) by weighing the vehicle with the maximum capacity of all fluids necessary for operation of the vehicle, but without luggage, cargo, occupants or accessories that are ordinarily removed from the vehicle when they are not in use. Record total vehicle weight and front and rear axle loads. This may be done in conjunction with steps B and C in Section 14.3, Speed Test.
- To the vehicle's UVW, add 68 kg (150 lb) at each designated seating position. For each seat, place 22 kg (50 lb) on the floor in front of the seat and 46 kg (100 lb) on the seat cushion. Weigh and record total vehicle weight and front and rear axle loads.
- Contact the COTR if total vehicle weight exceeds the vehicle's GVWR (non-conformance with 49 CFR 567) or if a front or rear axle load exceeds a GAWR (information).
- Examine the vehicle and vehicle owner's manual for any recommendations by the vehicle manufacturer regarding vehicle capacity weight (the rated cargo and luggage load plus 68 kg (150 lb) times the vehicle's DSC) or the vehicle's rated cargo and luggage load. If either is specified, add the appropriate cargo and luggage load in a location that is consistent with the vehicle manufacturer's recommendation. If location is not specified, place the load in the center of the trunk or cargo and luggage storage area. Contact the COTR as necessary for guidance. Weigh and record total vehicle weight and front and rear axle loads.
- Contact the COTR if total vehicle weight exceeds the vehicle's GVWR (possible non-conformance with 49 CFR 567) or if a front or rear axle load exceeds a GAWR (information).
- If no cargo and luggage load is specified, calculate the value (GVWR – total vehicle weight from step D) and record (information).

14.3 Maximum Speed Test

Each LSV must be capable of attaining in 1.6 km more than 32.0 km/hr and not more than 40.0 km/hr in each of both directions on a paved straight and level surface. No adjustment, repair or replacement of any component is allowed after the start of the first performance test.

- A. Inflate tires to the maximum permissible pressure molded on the tire sidewall.
- B. Using a platform scale or scales, measure and record the individual wheel loads, axle loads and UVW.
- C. Determine the weight of the driver and instrumentation that should be 78 - 90 kg. Ballast if required. If weight of driver and instrumentation without any ballast exceeds 90 kg, the COTR should be consulted for further guidance.
- D. Using a platform scale or scales, measure and record the individual wheel loads, axle loads and vehicle test weight (VTW). Re-check if difference between VTW and UVW + driver, instrumentation and ballast (if used) weight is greater than 2 kg.
- E. Verify that all pretest conditions have been met and required pretest data have been recorded on Data Sheet 3.
- F. As a pre-test calibration test, using 1000 meter (± 1 m) markings previously established on the track, position the vehicle such that the front tires are centered over the zero meter mark on the track. Verify data acquisition system is energized and the distance measuring device is properly installed. From a stationary position, with the front tires centered over the zero mark on the track, release the service brake/parking brake and press the accelerator control to achieve a slow constant speed of 5 - 10 km/hr. Maintain the constant speed over the marked track length. Steering shall be kept to a minimum during the field calibration check. Approaching the end of the marked track length, vehicle speed should be reduced gradually to stop the vehicle such that the front tires are centered on the final meter mark on the track. Record the data acquisition system measured distance traveled to the closest 0.1 m.
- G. Repeat the above calibration check in the opposite direction within 10 - 20 minutes of the first field calibration check. If the recorded distance deviates from the known 1000 m value by more than ± 2 m, the data acquisition system should be re-calibrated, the field calibration distance re-measured, and other possible causes investigated. Consult the COTR for further guidance.
- H. Fully charge propulsion batteries per manufacturer charging instructions and condition vehicle in ambient air within 5° C of the temperature of the speed test area. Move vehicle to starting point for speed testing without using battery power.
- I. As defined in the owner's manual, set controls for street operation. An LSV may have alternate settings including "golf" or "turf" which limit the maximum speed. If the vehicle has multiple transmission or gear settings, use the control position

that attains the highest road speed. If necessary, consult the COTR for further guidance.

- J. Conduct the first 1.6 km (Pass # 1) speed run. From a stationary position, release the service brake/parking brake and immediately press the accelerator control to achieve maximum acceleration. Maintain the accelerator control in the maximum acceleration position the entire length of the track (1.6 km). Steering shall be kept to a minimum during the speed run. Record the maximum speed at any point within the 1.6 km distance on Data Sheet 4.

Position the vehicle in preparation for the second speed run (Pass #2) that must be conducted in the opposite direction and within 10-20 minutes of Pass # 1.

- K. Verify all speed run data for the entire 1.6 km (Pass # 1) was recorded and stored. Ensure all available data required on data sheet # 2 has been recorded. If speed run data was not recorded and stored, the speed run test should be cancelled. A retest must be conducted after the test instrumentation problem is resolved and the vehicle propulsion batteries have been recharged.
- L. Repeat speed run J above for the second 1.6 km speed run (Pass # 2). Vehicle speed versus time data sheets for each speed run should be included in the final test report.
- M. Within 20 minutes after completion of the second speed test run (Pass #2), repeat the data acquisition system field calibration check for distance as described in steps F and G above.
- N. If the vehicle fails the speed test, check for speed accuracy by driving at a steady 32 km/h (20 mph) \pm 1.6 km/h (1 mph) measured from installed instrumentation not the vehicle speedometer. Approach the 1000 meter track mark and upon crossing, begin timing with stopwatch or other timing device. At the end of the 1000 meters, stop the timing device and record time elapsed. Repeat in the opposite direction. If the recorded time deviates from the known 112 second target value by more than \pm 1 second, the data acquisition system should be re-calibrated, the field calibration distance re-measured, and other possible causes investigated. Consult the COTR for further

15. INSTRUCTIONS FOR COMPLETING DATA SHEETS

Data is to be furnished in every data blank provided on the report forms, or if not applicable, insert "NA". Corrections are to be made by drawing a line through the data, leaving it legible and adding the correct entry, initials, and date.

Record any unusual results that occurred during the testing.

Every sheet of any document relating to a test, including automatic continuous recorder data, will contain the NHTSA number of the vehicle, date, vehicle, and test identification.

16. POST TEST REQUIREMENTS

After the required tests are completed, the contractor shall:

Verify all instrumentation, test data records and photographs;

Restore the vehicle to its original configuration, if necessary;

Plot speed and distance data against time for final report and identify maximum and minimum (after initial acceleration) speed points. Include in final report a printout of speed run data including speed at each 1 second interval, distance traveled, and time.

Copy applicable pages of the vehicle Owner's Manual for attachment to the final test report.

Complete the Vehicle Condition Report form including word description of the vehicle's post test condition;

Move the test vehicle to a secure area; and

Place all original records in a secure and organized file awaiting test data disposition.

17. Reports

17.1 Monthly Status Reports

The contractor shall submit a monthly Test Status Report and a Vehicle Status Report to the FMVSS 500 COTR. The Vehicle Status report shall be submitted until all FMVSS 500 vehicles are transferred to another FMVSS or otherwise disposed of. Samples of the required reports are found in the report forms section.

17.2 Apparent Test Failure

Any indication of an test failure shall be communicated by telephone or to the COTR within 24 hours with written notification mailed within 48 hours (Saturday and Sunday hours excluded). A Notice of Test Failure (see report forms section) with a copy of the particular compliance test data sheet(s) and preliminary data plot(s) shall be included.

If possible, repeat that portion of the test where the failure was noted to ensure that there is a test failure.

In the event of a test failure, a post test calibration check of some critically sensitive test equipment and instrumentation (if applicable) may be required for verification of accuracy. The necessity for the calibration shall be at the COTR's discretion and shall be performed without additional costs to the OVSC.

17.3 Final Test Reports

17.3.1 Copies

In the case of an apparent test failure, 7 copies of the Final Test Report shall be submitted to the COTR for acceptance within 3 weeks of test completion.

Where there has been no indication of an apparent noncompliance, 3 copies of each Final Test Report shall be submitted to the COTR for acceptance within 3 weeks of test completion. No payment of contractor's invoices for conducting compliance tests will be made prior to the Final Test Report acceptance by the COTR. Contractors are requested to NOT submit invoices before the COTR is provided with copies of the Final Test Report.

Contractors are required to submit the first Final Test Report in draft form within 1 week after the compliance test is conducted. The contractor and the COTR will then be able to discuss the details of both test conduct and report content early in the compliance test program.

Contractors are required to PROOF READ all Final Test Reports before submittal to the COTR. The OVSC will not act as a report quality control office for contractors. Reports containing a significant number of errors will be returned to the contractor for correction, and a "hold" will be placed on invoice payment for the particular test.

17.3.2 Requirements

The Final Test Report, associated documentation (including photographs), are relied upon as the chronicle of the compliance test. The Final Test Report will be released to the public domain after review and acceptance by the COTR. For these reasons, each final report must be a complete document capable of standing by itself.

The contractor should use **detailed** descriptions of all compliance test events. Any events that are not directly associated with the standard but are of technical interest should also be included. The contractor should include as much **detail** as possible in the report.

Instructions for the preparation of the first three pages of the final test report are provided for standardization.

17.3.3 First Three Pages

A. FRONT COVER

A heavy paperback cover (or transparency) shall be provided for the protection of the final report. The information required on the cover is as follows:

- (1) Final Report Number such as 500-ABC-0X-001 where
 - 500 is the FMVSS tested
 - ABC are the initials for the laboratory
 - 0X is the Fiscal Year of the test program
 - 001 is the Group Number (001 for the 1st test, 002 for the 2nd test, etc.)

- (2) Final Report Title And Subtitle such as

COMPLIANCE TESTING FOR FMVSS 500
Low-Speed Vehicles

XYZ Motor Co.
200X LSV
NHTSA No. CX0101

- (3) Contractor's Name and Address such as

COMPLIANCE TESTING LABORATORIES, INC.
4335 West Dearborn Street
Detroit, Michigan 48090

NOTE: DOT SYMBOL WILL BE PLACED BETWEEN ITEMS (3) AND (4)

- (4) Date of Final Report completion
- (5) The words "**FINAL REPORT**"
- (6) The sponsoring agency's name and address as follows

U. S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Enforcement
Office of Vehicle Safety Compliance
400 Seventh Street, SW
Room 6111 (NVS-220)
Washington, DC 20590

B. FIRST PAGE AFTER FRONT COVER

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Prepared By: _____

Approved By: _____

Approval Date: _____

FINAL REPORT ACCEPTANCE BY OVSC:

Accepted By: _____

Acceptance Date: _____

- C. **SECOND PAGE AFTER FRONT COVER**
A completed Technical Report Documentation Page (Form DOT F1700.7) shall be completed for those items that are applicable with the other spaces left blank. Sample data for the applicable block numbers of the title page follows.

Block 1 — REPORT NUMBER

500-ABC-0X-001

Block 2 — GOVERNMENT ACCESSION NUMBER

Leave blank

Block 3 — RECIPIENT'S CATALOG NUMBER

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Block 4 — TITLE AND SUBTITLE

Final Report of FMVSS 500 Compliance Testing of 200X XYZ LSV,
NHTSA No. CX1301

Block 5 — REPORT DATE

March 1, 200X

Block 6 — PERFORMING ORGANIZATION CODE

ABC

Block 7 — AUTHOR(S)

John Smith, Project Manager / Bill Doe, Project Engineer

Block 8 — PERFORMING ORGANIZATION REPORT NUMBER

ABC-DOT-XXX-001

Block 9 — PERFORMING ORGANIZATION NAME AND ADDRESS

ABC Laboratories
405 Main Street
Detroit, MI 48070

Block 10 — WORK UNIT NUMBER

Leave blank

Block 11 — CONTRACT OR GRANT NUMBER

DTNH22-9X-D-12345

Block 12 — SPONSORING AGENCY NAME AND ADDRESS

US Department of Transportation
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400 Seventh Street, SW, Room 6115 (NVS-220)
Washington, DC 20590

Block 13 — TYPE OF REPORT AND PERIOD COVERED

Final Test Report
Feb. 15 to Mar. 15, 200X

Block 14 — SPONSORING AGENCY CODE

NVS-220

Block 15 — SUPPLEMENTARY NOTES

Leave blank

Block 16 — ABSTRACT

Compliance tests were conducted on the subject 200X XYZ LSV in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-500-0X for the determination of FMVSS 500 compliance.

Test failures identified were as follows:

None

NOTE: Above wording must be shown with appropriate changes made for a particular compliance test. Any questions should be resolved with the COTR.

Block 17 — KEY WORDS

Compliance Testing
 Safety Engineering
 FMVSS 500

Block 18 — DISTRIBUTION STATEMENT

Copies of this report are available from:
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 Technical Information Services (NPO-405)
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Block 19 — SECURITY CLASSIFICATION OF REPORT

Unclassified

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Unclassified

Block 21 — NUMBER OF PAGES

Add appropriate number

Block 22 — PRICE

Leave blank

17.3.4 Table of Contents

Final test report Table of Contents shall, at a minimum, include the following:

Section 1 — Purpose of Compliance Test

Section 2 — Test Procedure and Summary of Results

Section 3 — Compliance Test Data Sheets

Section 4 — Noncompliance Data (if applicable)

Section 5 — Photographs

Section 6 — Test Equipment List and Calibration Information

18. DATA SHEETS**FMVSS 500 - LSV INFORMATION AND TEST SUMMARY**

TEST LAB: _____ CONTRACT NO.: _____

VEHICLE MAKE/MODEL/YEAR : _____

NHTSA No.: _____ VIN: _____ DATE OF MFR: _____

TYPE PROPULSION : _____ SEATING CAPACITY: _____

GVWR _____ GAWR FRONT _____ GAWR REAR _____

DEALER INSTALLED ACCESSORIES: _____

TIRE TYPE and SIZE: _____

Safety Equipment	Pass	Fail
Headlamps (S5(b)(1))		
Turn signal lamps, front and rear (S5(b)(2))		
Taillamps (S5(b)(3))		
Stop lamps (S5(b)(4))		
Reflex reflectors, one red on each side, one on rear (S5(b)(5))		
Drivers side exterior mirror (S5(b)(6))		
Passenger side exterior mirror or interior mirror (S5(b)(6))		
Parking brake (S5(b)(7))		
Windshield, AS-1 or AS-4 composition (S5(b)(8))		
Vehicle Identification Number (VIN) (S5(b)(9))		
Seat belt assemblies - Type 1 or 2 (S5(b)(10))		
Certification label (Part 567)		

Vehicle Loading	Pass	Fail
Certification Label GVWR < 1,361 kg.		
With Occupant Weight added to UVW: GVWR ≥ total measured vehicle weight GAWRs ≥ measured axle weights		
With Occupant, Cargo & Luggage Weight added to UVW: GVWR ≥ total measured vehicle weight GAWRs ≥ measured axle weights		

Maximum Speed Test	Pass	Fail
Maximum Speed (S5(a)) _____ km/hr (more than 32.0 km/hr and not more than 40.0 km/hr)		

FMVSS 500 - DATA SHEET 1 (sheet 1 of 2)
VISUAL INSPECTION

VEHICLE MAKE/MODEL/YEAR : _____

NHTSA No.: _____

TEST DATE: _____

Headlamps: [Requirement: must be present]

Method of Activation: _____

Function (yes/no): _____

Turn Signals: [Requirement: Front and Rear must be present]

Description (color and location): _____

Method of Activation: _____

Function (yes/no): _____ Self cancelling feature (yes/no): _____

Taillamps: [Requirement: must be present]

Description (lens color): _____

Method of Activation: _____

Function (yes/no): _____

Stop Lamps: [Requirement: must be present]

Description (color and location): _____

Method of Activation: _____

Function (yes/no): _____

Reflex Reflectors: [Requirement: one red on each side as far to the rear as practicable, and one red on the rear]

Description (color, material, and shape): _____

Location: _____

Mirrors: [Requirement: exterior driver's side mirror and either an exterior passenger side mirror or an interior mirror]

Description (flat or convex): _____

Location: _____

Method for Adjustment: _____

FMVSS 500 - DATA SHEET 1 (sheet 2 of 2)**Parking Brake:** [Requirement: must be present]

Description (type): _____

Location: _____

Method of Activation and Release: _____

Function (yes/no): _____

Windshield: [requirement: Must meet the ANSI/SAE Z26.1 – 1996 specifications for AS-1 or AS-4 glazing and be marked with “DOT”, manufacturer, and “AS-1” or “AS-4”. Conformance to FMVSS 205]

Labeling: _____

Vehicle Identification Number (VIN): [Requirement: A VIN that conforms to the requirements of Part 565 – Vehicle Identification Number including 17 digit alpha-numeric number]

Location: _____

Seatbelts: [Requirement: Type 1 or type 2 belts conforming to FMVSS 209]

Type: _____

Labeling: _____

Location: _____

Certification Label: [Requirement: Complies with Part 567 Certification]

Vehicle Type identified on Label: _____

Location: _____

Certification Statement (yes/no): _____

REMARKS:

DATA INDICATES COMPLIANCE: YES____NO____

RECORDED BY: _____

DATE: _____

APPROVED BY: _____

DATE: _____

FMVSS 500 – DATA SHEET 2 (sheet 1 of 1)
VEHICLE LOADING

VEHICLE MAKE/MODEL/YEAR: _____ TEST DATE: _____

NHTSA No.: _____

Information from vehicle certification label:

GVWR: _____ kg _____ lb, GAWR F: _____ kg _____ lb, GAWR R: _____ kg _____ lb

Number of seat belt assemblies = designated seating capacity (DSC): _____

Vehicle weight measurements:

Unloaded Vehicle Weight: Vehicle _____ kg or sum (front + rear) _____ kg, Front _____ kg, Rear _____ kg

Includes maximum capacity of fluids necessary for operation of the vehicle; state fluids and amounts added, if any:

Vehicle plus occupants weight = DSC _____ x 68 kg = _____ kg

Vehicle _____ kg or sum (front + rear) _____ kg, Front _____ kg, Rear _____ kg

Cargo and Luggage Weight (if specified) = _____ kg or calculated below:

Vehicle Capacity Weight _____ kg – occupant weight _____ kg = _____ kg

Source: () label on vehicle, () owner's manual, () other

Recommended location (if specified):

Source: () label on vehicle, () owner's manual, () other

Vehicle plus occupants, cargo and luggage weight = Vehicle _____ kg or sum (front + rear) _____ kg, Front _____ kg, Rear _____ kg

Contact COTR if any vehicle weight (or sum of axle weights) exceeds GVWR or if a front or rear axle load exceeds a GAWR.

If no cargo and luggage weight or vehicle capacity weight is specified, then calculate the following:

Cargo and luggage weight = GVWR _____ kg – vehicle plus occupants weight _____ kg (from above) = _____ kg

REMARKS:

DATA INDICATES COMPLIANCE: YES _____ NO _____ Info Only (GAWRs) _____

RECORDED BY: _____ DATE: _____

APPROVED BY: _____ DATE: _____

FMVSS 500 - DATA SHEET 3 (sheet 1 of 1)
SPEED TEST – Pre Test

VEHICLE MAKE/MODEL/YEAR : _____

NHTSA No.: _____ TEST DATE: _____

Unloaded Vehicle Weight (UVW):

LF Wheel _____ kg	RF Wheel _____ kg	Front Axle _____ kg
LR Wheel _____ kg	RR Wheel _____ kg	Rear Axle _____ kg
		Total Vehicle _____ kg

Weight of Driver, Instrumentation and required ballast : _____ kg (78 - 90 kg)

Vehicle Test Weight (UVW + weight of driver, instrumentation and required ballast):

LF Wheel _____ kg	RF Wheel _____ kg	Front Axle _____ kg
LR Wheel _____ kg	RR Wheel _____ kg	Rear Axle _____ kg
		Total Vehicle _____ kg

Actual Tire Inflation Pressure: LF _____ kPa RF _____ kPa LR _____ kPa RR _____ kPa

Maximum Tire Inflation Pressure from tire sidewall: Front _____ kPa Rear _____ kPa

Vehicle Break-in agenda specified by vehicle manufacturer: () Yes, () No.

If yes, describe: _____

Data Acquisition System Distance Field Calibration-Pre Test

	Check No. 1 (meters)	Check No. 2 (meters)
Known Distance :	1000	1000
Measured Distance: [Allowed Tolerance \pm 2 meters]		

Vehicle Conditioning: Start Time _____ End Time _____ Duration _____ (3 hr. min)

Start Temp. _____ °C End Temp. _____ °C

Vehicle conditioned within 5°C of ambient: YES ____ NO ____

Propulsion Batteries Fully Charged (yes/no): _____

REMARKS:

DATA INDICATES COMPLIANCE: YES ____ NO ____

RECORDED BY: _____

DATE: _____

APPROVED BY: _____

DATE: _____

FMVSS 500 - DATA SHEET 4 (sheet 1 of 2)
SPEED TEST

VEHICLE MAKE/MODEL/YEAR : _____
 NHTSA No.: _____ TEST DATE: _____

Conditioning Temperature Range (see data sheet 3) _____ - _____°C

Ambient Temperature: Pass 1 _____°C delta _____°C Pass 2 _____°C delta _____°C
 (delta=Conditioning Temperature minus Ambient Temperature)

Maximum Wind Speed: Pass 1 _____ m/s Pass 2 _____ m/s

Description of Vehicle Openings: _____

Vehicle Odometer and/or Hour meter reading: _____

Start Time: Pass #1 _____ End Time: Pass #1 _____
 Pass #2 _____ Pass #2 _____

Vehicle Charge Level Meter, % (if applicable): Start, Pass #1 _____ End, Pass #1 _____
 (standard on-board vehicle meter) Pass #2 _____ Pass #2 _____

Measured Battery Voltage, Volts (if applicable): Start, Pass #1 _____ End, Pass #1 _____
 (test laboratory measured with voltmeter) Pass #2 _____ Pass #2 _____

Maximum Vehicle Speed Data

Pass	Maximum Speed Visual Data (km/hr)	Maximum Speed Recorded Data (km/hr)	Time Between Passes (minutes) (10-20)
Pass # 1 (1 st 1.6 km)			
Pass # 2 (2 nd 1.6 km)			

NOTE: Vehicle speed and distance versus time data traces for each speed run are to be included in the final test report.

REMARKS:

DATA INDICATES COMPLIANCE: YES _____ NO _____

RECORDED BY: _____ DATE: _____
 APPROVED BY: _____ DATE: _____

FMVSS 500 - DATA SHEET 4 (sheet 2 of 2)
SPEED TEST – Post Test

VEHICLE MAKE/MODEL/YEAR : _____

NHTSA No.: _____

TEST DATE: _____

Data Acquisition System Distance Field Calibration-Post Test

	Check No. 1 (meters)	Check No. 2 (meters)
Known Distance:	1000	1000
Measured Distance: [Allowed Tolerance \pm 2 meters]		

Data Acquisition System Speed Field Calibration

(Traverse Known 1000 meter Distance at Constant Speed of 32km/h (20 mph) +/- 1.6km/h))

	Check No. 1 (seconds)	Check No. 2 (seconds)
Known Time:	112	112
Measured Time: [Allowed Tolerance \pm 1 seconds]		

REMARKS:

DATA INDICATES COMPLIANCE: YES ____ NO ____

RECORDED BY: _____ DATE: _____

APPROVED BY: _____ DATE: _____

19. FORMS

LABORATORY NOTICE OF TEST FAILURE TO OVSC

FMVSS NO.: **500**

TEST DATE: _____

LABORATORY: _____

CONTRACT NO.: _____ ; DELV. ORDER NO.: _____

LABORATORY PROJECT ENGINEER'S NAME: _____

TEST VEHICLE DESCRIPTION: _____

VEHICLE NHTSA NO.: _____ ; VIN: _____

VEHICLE MANUFACTURER: _____

TEST FAILURE DESCRIPTION: _____

FMVSS 500 REQUIREMENT, PARAGRAPH §____ : _____

NOTIFICATION TO NHTSA (COTR): _____

DATE: _____ ; BY: _____

REMARKS:

MONTHLY TEST STATUS REPORT
 FMVSS 500
 DATE OF REPORT: _____

No.	NHTSA No., MAKE & MODEL	SCHEDULED COMPLIANCE TEST START DATE	COMPLETED COMPLIANCE TEST DATE	PASS/ FAIL	DATE REPORT SUBMITTED	DATE INVOICE SUBMITTED	INVOICE PAYMENT DATE
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							

MONTHLY VEHICLE STATUS REPORT
FMVSS 500
DATE OF REPORT: _____

No.	NHTSA No., MAKE & MODEL	DATE OF DELIVERY	TEST COMPLETE DATE	SHIPMENT DATE	CONDITION OF VEHICLE
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					