



Speedometer Tester
Software Operation Manual



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Software Installation

Installation of the software is very straight-forward, following the Windows standard for software installation routines.

The following steps are required to perform the software installation:

- 1) Turn on your PC and allow Windows to load.
- 2) Once Windows is running, exit any applications that are automatically loaded or that you have been using. This is done to allow the installation software to update any system files that must be updated without interference.
- 3) Insert software installation disk #1.
- 4) In Windows, click the "Start" button.
- 5) On the Start menu, select the "Settings" sub-menu.
- 6) On the "Settings" menu select "Control Panel".
- 7) In Control Panel, select "Add / Remove Programs".
- 8) On the "Install / UnInstall" panel, click the "Install" button.
- 9) On the next screen click the "Next" button.
- 10) Windows may automatically detect the installation program on the "A:" drive, if not another screen will show up where you can:
- 11) Click the "Browse" button.
- 12) Using the file select dialog box that pops up, select the "A:" drive, and then select the "Setup.Exe" program (the ".Exe" portion of the name may not be displayed depending on your Windows settings).
- 13) Click the "Finish" button to install the software.

When the installation program starts, please accept all of the default values, particularly the installation directory. Selecting an alternative installation directory will require manual editing of the software configuration file to achieve proper functioning.



Hardware Connection

The connection between the PC software and the speedometer tester controller hardware is achieved via an RS-232 serial interface.

There are normally 2 RS-232 serial interface ports on the back of a standard PC. Each RS-232 serial interface port will be a slightly “D” shaped connector with either 9 or 25 pins / holes in it. Newer PCs typically have 2 9-pin connectors, while older PCs typically have 1 9-pin and 1 25-pin connector. The connecting cable provided with your system will have a 9-pin connector, and must therefore be plugged into a 9-pin connector on your PC, unless a 9-to-25 pin connector adapter is used.

Since the software is configured to use the serial port designated at “COM1” during software installation, you must either connect the serial cable to the serial port designated “COM1” or re-configure the software to use the serial port you actually connect the cable to. If your software is not configured correctly for the serial port connector you select, you will be prompted to enter the correct serial port number and parameters when you start the software for the first time.

Before starting the software you must make sure that the serial connector is connected and that the speedometer tester control box is turned on, or the software will refuse to execute.

Re-Configuring The Serial Interface

When you first run the PC software, the software will attempt to connect to the speedometer tester control system via the RS-232 serial interface cable. If the controller is not connected, or the controller is turned off, or if the software configuration does not match the actual cabling configuration, you will have to resolve the problem before the software will run.

Assuming that the serial interface cable is connected and that the control box is turned on and operating normally, the problem is probably that the software is attempting to use an RS-232 serial port other than the port that the RS-232 serial cable is connected to. In this event, the following series of prompts will be shown, to allow the operator to select the actual RS-232 serial interface port that the cable is connected to. If the software starts running following this series of prompts, the serial interface will be operating correctly, and the new parameters will be used for future sessions.

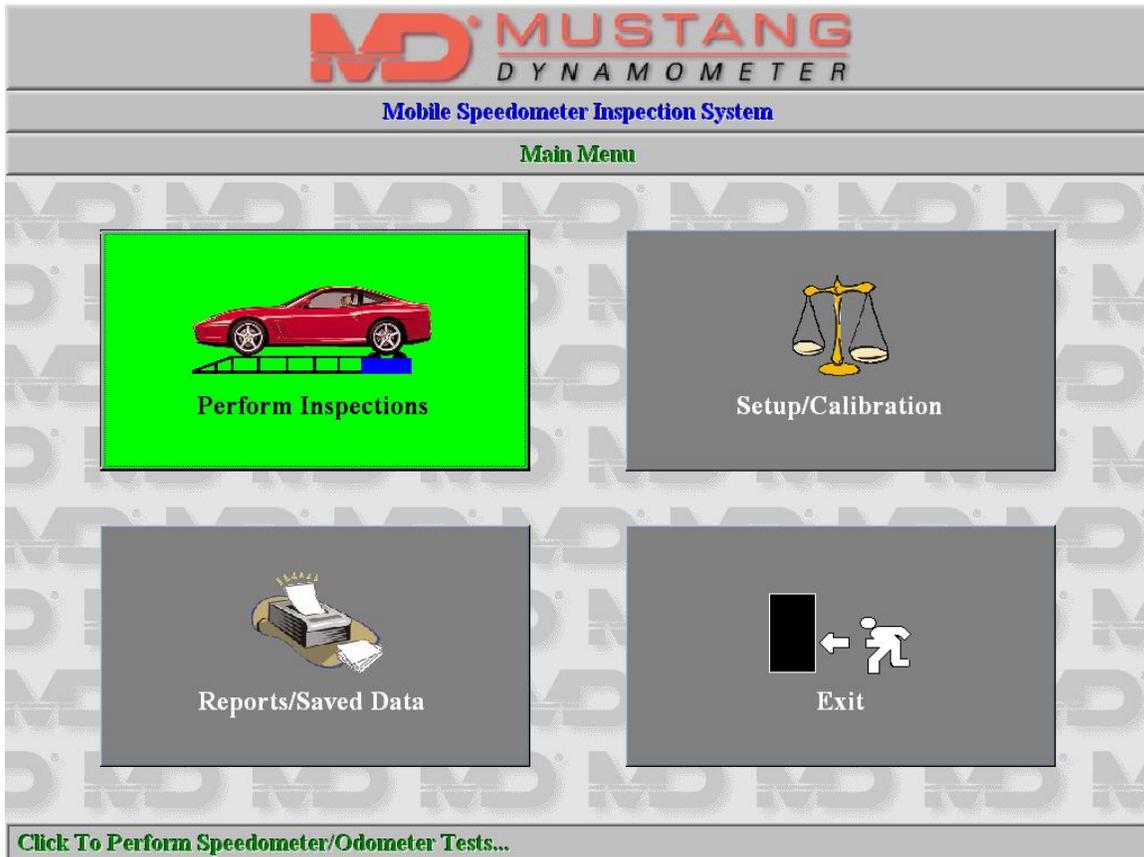
Re-Configuration Prompts

- 1) PROMPT: “Can’t Connect To Serial Controller; Try New Values?”.
- 2) ACTION: Click the “Yes” button.
- 3) PROMPT: “Enter True/False For BeActive:”.
- 4) ACTION: Enter “True” and click the “OK” button.
- 5) PROMPT: “Enter Serial Port Number:”.
- 6) ACTION: Enter the serial port number your RS-232 serial interface cable is connected to, normally either 1 or 2, and click the “OK” button.
- 7) PROMPT: “Enter Baud Rate:”
- 8) ACTION: Enter “9600” and click the “OK” button.
- 9) PROMPT: “Enter Serial Parity Value (E/O/N):”.
- 10) ACTION: Enter “N” and click the “OK” button.

Once you have selected the correct serial port number, the software will start running.

The Main Menu Screen

The main menu of the Speedometer Tester software is shown below. This simple screen provides access to all of the software functions. Each function is selected by simply clicking on the appropriate button face.



Note that the bottom line of the screen will always have a short description of the currently selected button's function, or the meaning of any currently selected data input field.

Initial Software Setup

Before the software can be operated correctly, a few calibration values must be checked and/or entered for the first time. These values are available from the main menu by clicking on the “Setup/Calibration” button, which will bring up the data entry screen shown below:



Mobile Speedometer Inspection System

Calibration Values

Station Information

Station ID	MSIS01
Station Location	Value-Club Parking Lot At 5th & Main

Calibration Values

Roll Diameter	8.575	Primary Speed Pulses/Rev	60.00
Enable Debugging Displays	<input checked="" type="checkbox"/>	Secondary Speed Pulses/Rev	60.00

Testing Parameters

Min/Max Test Speeds, Civ	25.000	80.000	Enforce MPH Limit	<input checked="" type="checkbox"/>
Min/Max Test Speeds, LEV	20.000	100.000	Enforce % Limit	<input checked="" type="checkbox"/>
Speed Tolerance, MPH / %	3.000	5.000	Pass On Either Limit (If Both Enforced)	<input checked="" type="checkbox"/>
Odometer Test Distance	1.000			
Odometer Tolerance, Miles	0.100			

[Click To Save Changes...](#)

Each editable value is described below:

- Station ID: This value is stored with each test results record, and printed on the test report. It is simply an identifier tag for use by the operators in order to track the testing unit that performed each test.

- Station Location: Similar to the “Station ID” field.

- Roll Diameter: The physical diameter of the speedometer tester’s rolls, in inches, typically 8.575”.

- Enable Debugging Displays: This is for the use of Mustang Dynamometer employees during service procedures.

- Primary Pulses/Rev: The number of encoder pulses on the primary speed encoder on the speedometer tester, typically 60.



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Secondary Pulses/Rev:	The number of encoder pulses on the secondary speed encoder on the speedometer tester, typically 60.
Min/Max Test Speeds, Civ:	The minimum and maximum speeds to check during a speedometer test performed on a civilian vehicle.
Min/Max Test Speeds, LEV:	The minimum and maximum speeds to check during a speedometer test performed on a Law Enforcement Vehicle.
Speed Tolerance, MPH/%:	<p>These 2 fields establish the pass/fail limits for a speedometer test. (Note that test reports may or may not be printed).</p> <p>The MPH field establishes a strict MPH based limit on the tolerance between the target and actual measured speeds during a speedometer test. Any measured speed that is greater than this field's value in MPH from the target speed will be considered failing.</p> <p>The % field establishes a percentage based limit on the tolerance between the target and actual measured speeds during a speedometer test. Any measured speed that is greater than this field's value in percent of the target speed from the target speed will be considered failing.</p>
Odometer Test Distance:	This field determines how far the operator is supposed to drive the vehicle in order to check the odometer's functioning, typically set to 1.0 miles.
Odometer Tolerance, Miles:	This field establishes the pass/fail limits for the odometer test. If the actual measured distance is greater than this value, in miles, from the odometer's reported distance, the odometer test will be considered failed.
Enforce MPH Limit:	If checked, the vehicle's speedometer is considered failing the test whenever the actual and reported speeds vary by more than the currently selected MPH limit.
Enforce % Limit:	If checked, the vehicle's speedometer is considered failing the test whenever the actual and reported speed vary by more than the currently selected percentage limit.
Pass On Either Limit (If Both Enforced):	If checked, the vehicle's speedometer is considered passing if either the MPH or percentage limit is met during testing. If not checked, and both limits are enforced, both criteria must be satisfied in order for the test to be passed.

Hardware Calibration

No hardware calibration is required on this system. The basic properties of roll diameter and speed encoder pulses per revolution, which are described in the previous section, are all that the operator is required to set.

Reports/Saved Data Setup Screen

This screen allows the operator to perform 3 basic functions as outlined in the following sections. The “Reports/Saved Data” setup screen is shown below.



Mobile Speedometer Inspection System

Reporting Options

Test Report Options

Saved Data File Path	C:\Mustang\SpeedometerTester\SavedTests\	...
Next Test Number	1	
Reports To Print	2	
Test Number Digits To Print	6	
Report Message Line 1	REPORT OF SPEEDOMETER CALIBRATION	
Report Message Line 2	Powered by Mustang Dynamometer	
Report Message Line 3		
Print Pass/Fail Test Results	<input checked="" type="checkbox"/>	

Report Generation

Daily Report	Weekly Report
Date 12/07/1999	Start 12/05/1999
	End 12/11/1999
Reprint Test Report...	

Test Data Backup

Range Backup	Full Backup
Start 12/01/1999	
End 12/31/1999	
Dest D:\STBackups\	...

Click To Save Changes...

Test Report Options

This section of the “Reports / Saved Data” setup screen allows the operator to enter several parameters used in the saving and printing of test data.

- Saved Data File Path:** This is the PATH where the saved test data files are stored. Note that a path always ends with a “\”, whereas a directory may or may not end with a “\”. The button with the “...” caption may be used to select the path where the test data files will be stored.
- Next Test Number:** Allows the operator to specify the next sequential test number to assign to a speedometer test.
- Reports To Print:** Allows the operator to specify how many copies of the test report will be printed.



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Test Number Digits To Print:

Allows the operator to specify how many digits will be printed when printing the sequential test number on a test report.

Report Message Line 1, 2 and 3:

Allows the operator to specify your company's address, phone number, slogan etc, which will be printed as part of the header on all test reports.

Print Pass/Fail Test Results:

If checked, a pass/fail judgment will be printed on all test reports. If not checked, the test data will be printed with no pass/fail judgement provided.

Report Generation

This section of the "Reports / Saved Data" setup screen allows the operator to print daily and weekly summary reports, and reprint saved test results.

The "Daily Report" button prints a summary report based on the tests performed on the specified date. The following screen will be displayed prior to and during generation of the daily report.

MD MUSTANG DYNAMOMETER

Mobile Speedometer Inspection System

Summary Report Status

Summary Report Status

Saved Data File Path C:\NewSP\VBsrc\SpeedoTester\SavedTests\

Starting Date 07/Dec/1999

Ending Date 07/Dec/1999

Status Press "OK" To Start Summary Report...

Current File 0 Of 0

Progress

OK **Cancel**

Click To Start Report or Exit Form...



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The “Weekly Report” button prints a summary report based on the date range specified. Note that the “Start” and “End” date fields will default to a weekly range, but other wider ranges may be specified to obtain monthly or yearly summary reports. The following screen will be displayed prior to and during generation of the daily report.

The screenshot shows a software window titled "Mobile Speedometer Inspection System" with a sub-header "Summary Report Status". The main title of the dialog is "Summary Report Status". It contains several input fields and a progress bar:

- Saved Data File Path**: C:\NewSP\VBSSrc\SpeedoTester\SavedTests\
- Starting Date**: 05/Dec/1999
- Ending Date**: 11/Dec/1999
- Status**: Press "OK" To Start Summary Report...
- Current File**: 0 Of 0
- Progress**: A horizontal progress bar is shown below the current file information.

At the bottom right, there are two buttons: a green "OK" button and a grey "Cancel" button. A footer bar at the bottom of the dialog contains the text "Click To Start Report or Exit Form..."



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The “Reprint Test Report...” button allows the operator to find and reprint saved test results. The following screen will be displayed prior to and during generation of the daily report.



Mobile Speedometer Inspection System

Old Test Report Reprinting

Old Test Report Reprint Search Criteria

Test Was Performed Between 1/1/1990 And 1/1/2000

Customer Last Name Is First

Vehicle License Plate Is Search For Matching Tests

Customer Number Is Interrupt Search

Search Progress / Matching Records

Search Progress

Records To Search Double-Click Desired Entry to Re-Print Test Report

Current Record

Matching Records

First Name	Last Name	Customer #	Lic Plate	DD/MMM/YYYY
Willy	Nelson	IAAA-SC-123	Wly-Nly	26/Ju1/1999
Jay	Hollifield	IAAA-SC-23	ABC-123	26/Ju1/1999

Exit

[Click To Search For Matching Test Records...](#)

The “Old Test Report Reprint Search Criteria” section of this screen allows the operator to enter search criteria to find the tests that the operator wishes to reprint. At least one search criteria must be entered before clicking on the “Search For Matching Tests” button. When a search is in progress it may be interrupted by clicking on the “Interrupt Search” button.

The “Search Progress / Matching Records” section shows the progress of the search, and if any matching test results are found, a list is presented in a list box. To reprint a test report, simply double-click on the test record of interest.



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Test Data Backup

This section of the “Reports / Saved Data” setup screen allows the operator to backup some or all saved test results files.

The “Range Backup” button allows the operator to backup all test data files created within the specified date range.

The “Full Backup” button allows the operator to backup all existing test data files.

The “Start” and “End” date fields allow the operator to specify the earliest and latest test results files to be backed up during a “Range Backup” operation.

The “Dest” field allows the operator to specify a PATH to which all selected test results files will be backed up.

The “...” button allows the operator to pick the backup target path using a Windows style file select dialog box.

When a “Range Backup” operation is selected or in operation, the screen shown below will be presented.

MD MUSTANG DYNAMOMETER
Mobile Speedometer Inspection System

Data File Backup Status

Test Data Backup Status

Saved Data File Path C:\NewSP\VBsrc\SpeedoTester\SavedTests\
 Backup Destination path C:\Tmp\STBackups\
 Starting Date 01/Dec/1999
 Ending Date 31/Dec/1999
 Full Backup? No

Status Press "OK" To Start Backup Process...
 Current File 0 Of 0
 Progress

OK **Cancel**

[Click To Start Data File Backup or Exit Form...](#)



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When a "Full Backup" operation is selected or in operation, the screen shown below will be presented.

Mobile Speedometer Inspection System
Data File Backup Status
Test Data Backup Status

Saved Data File Path	<input type="text" value="C:\NewSP\VBSSrc\SpeedoTester\SavedTests\"/>
Backup Destination path	<input type="text" value="C:\Tmp\STBackups\"/>
Starting Date	<input type="text" value="07/Dec/1999"/>
Ending Date	<input type="text" value="07/Dec/1999"/>
Full Backup?	<input type="text" value="Yes"/>

Status	<input type="text" value="Press 'OK' To Start Backup Process..."/>
Current File	<input type="text" value="0"/> Of <input type="text" value="34"/>
Progress	<input type="text"/>

Click To Start Data File Backup or Exit Form...



Performing Tests

During normal operation, this will be the primary function of this system. Performing a test is as simple as entering the vehicle information and following the on-screen prompts. An example of the test sequence is given below, and testing flows in a loop until the operator elects to terminate testing.

Step #1 - Vehicle information is entered using the screen shown below, and the “Start Speedometer / Odometer Test” button is pressed.


Mobile Speedometer Inspection System
Vehicle Testing Loop

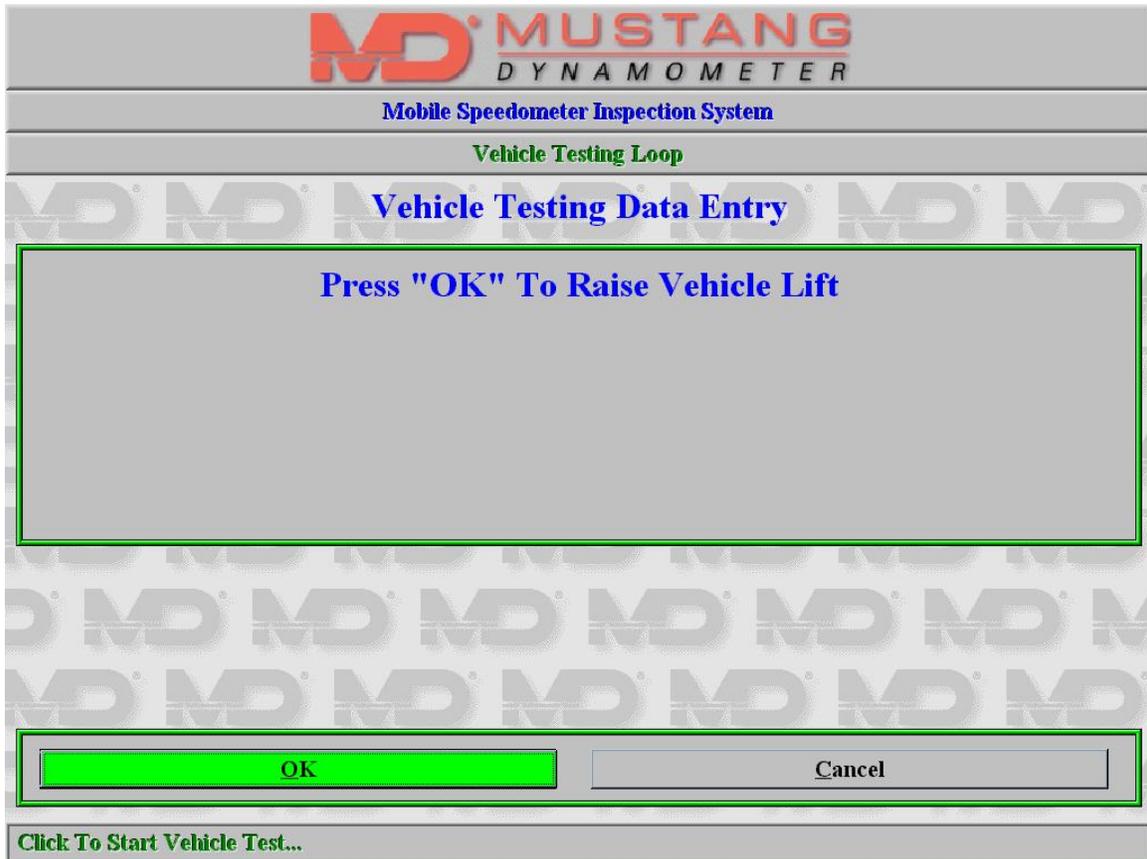
Vehicle Testing Data Entry

Customer First Name	<input type="text" value="John"/>	Vehicle License Plate	<input type="text" value="ABC-123"/>
Customer Last Name	<input type="text" value="Smith"/>	Vehicle License State	<input type="text" value="OH"/>
Customer Number	<input type="text" value="12345"/>	Vehicle Make	<input type="text" value="Ford"/>
		Vehicle Model	<input type="text" value="Taurus"/>
		Vehicle Year	<input type="text" value="1995"/>
		Is Vehicle A Motorcycle?	<input checked="" type="checkbox"/>
		Law Enforcement Vehicle?	<input checked="" type="checkbox"/>

Click To Start Vehicle Test...



Step #2 - The wheel lift is raised, if required, after the operator presses the "OK" button on the screen shown below:

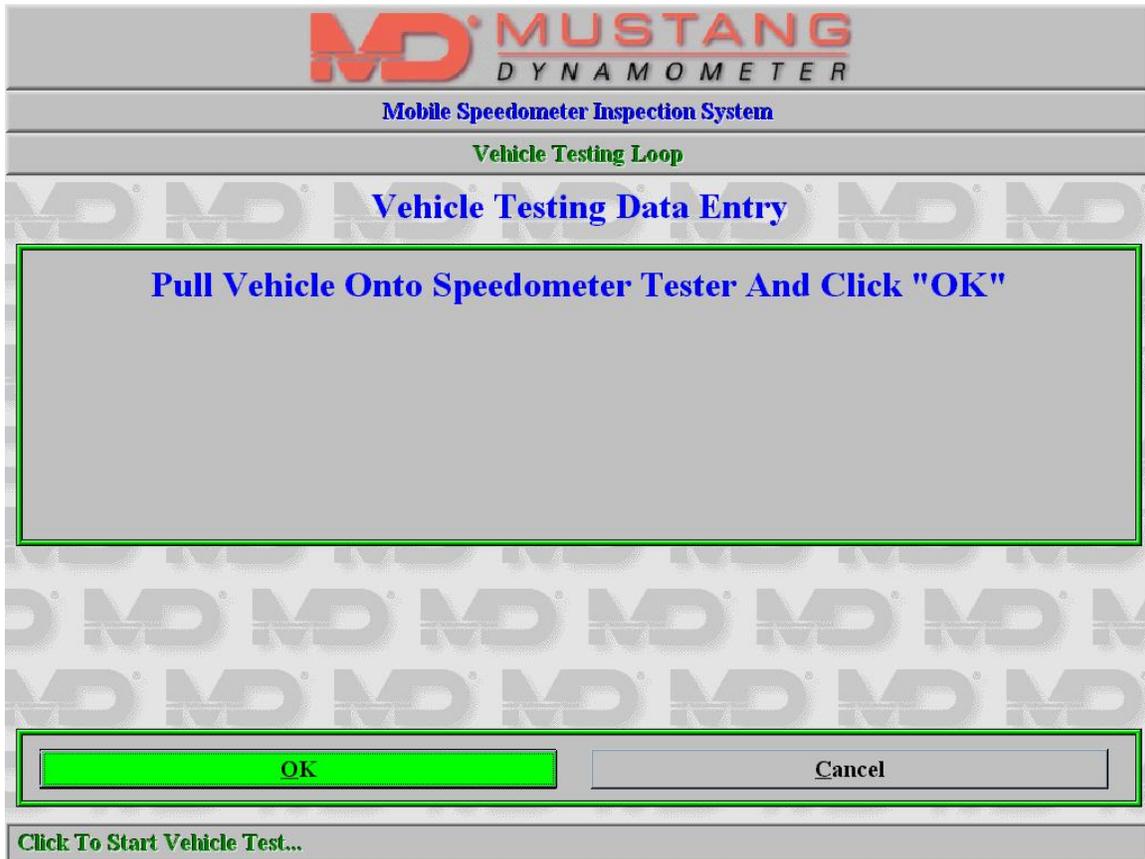




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Step #3 - The vehicle is driven onto the speedometer tester, and the wheel lift is lowered to allow vehicle testing, after the operator presses the "OK" button on the screen shown below:

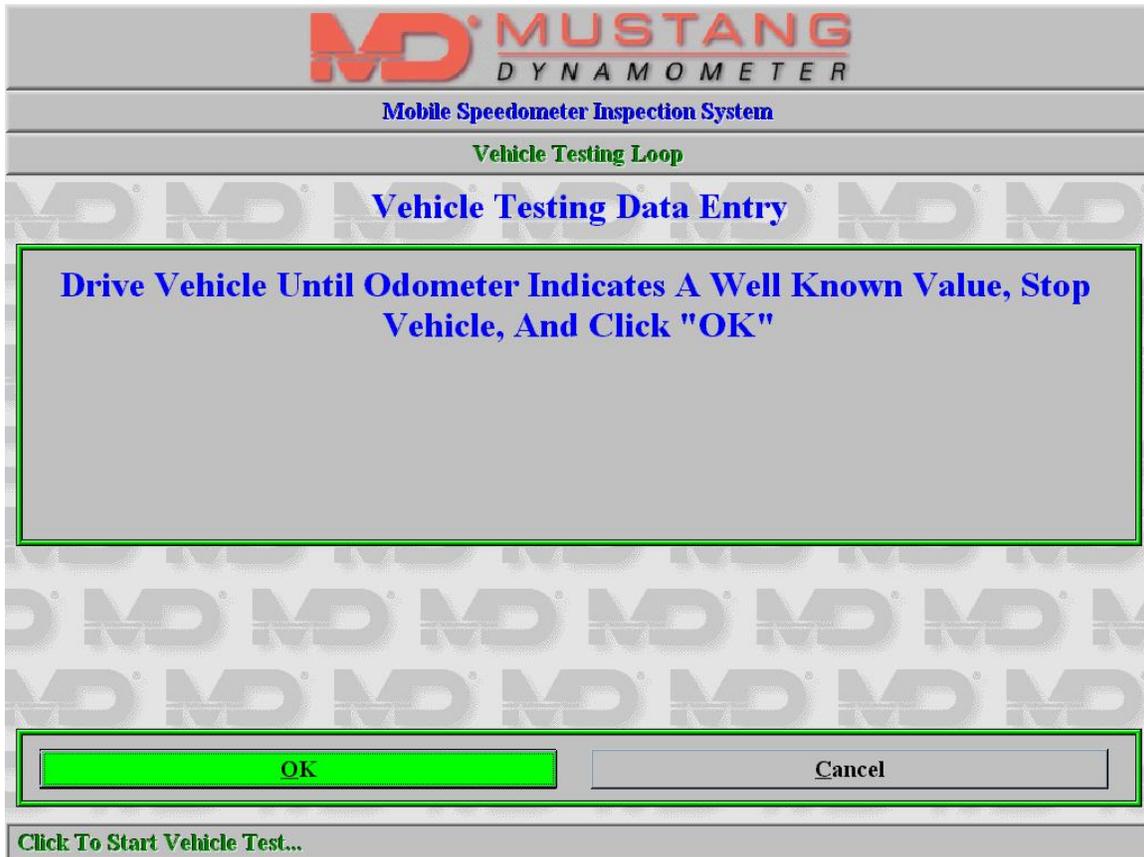




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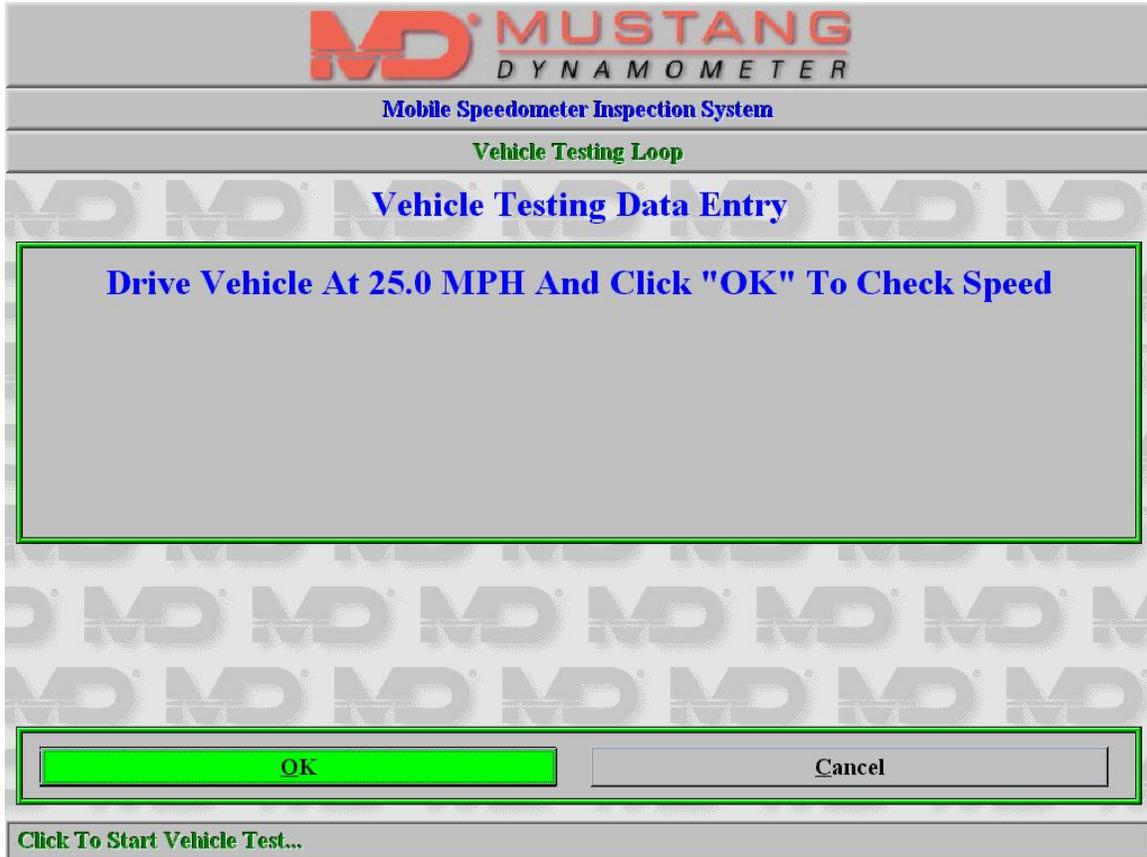


Step #4 – The operator drives the vehicle until the odometer wraps over to an even mileage value (for easier driver operation), and presses the “OK” button the screen shown below:

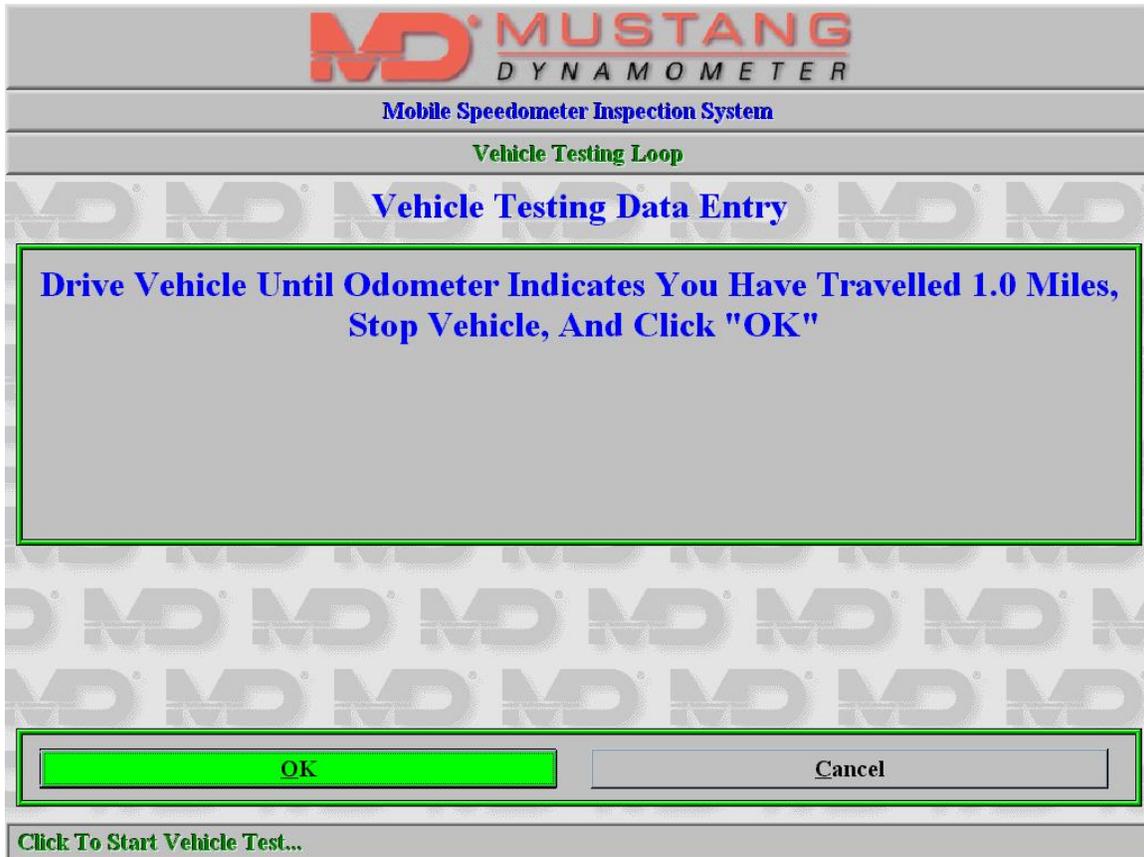




Step #5 – The operator is prompted to drive the vehicle at every 5 MPH point within the currently selected testing range, and then click the “OK” button to check the vehicle’s speed, using prompting screens as shown below:



Step #6 – The operator is prompted to continue driving the vehicle until the odometer indicates that the currently selected testing distance has been measured by the vehicle’s odometer. The operator then clicks on the “OK” button after stopping the vehicle on the speedometer tester, at which time the odometer reading is checked by the software. The prompting screen is shown below:



MD MUSTANG DYNAMOMETER

Mobile Speedometer Inspection System

Vehicle Testing Loop

Vehicle Testing Data Entry

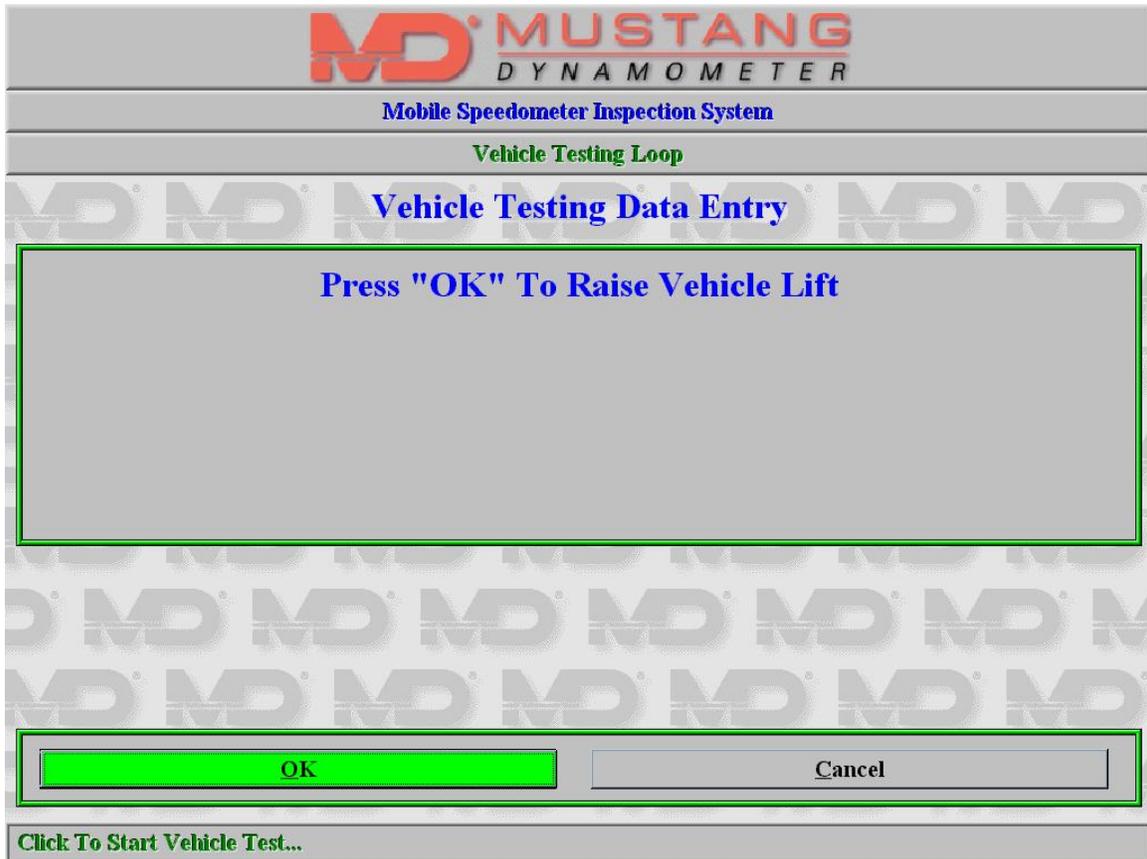
**Drive Vehicle Until Odometer Indicates You Have Travelled 1.0 Miles,
Stop Vehicle, And Click "OK"**

OK Cancel

Click To Start Vehicle Test...



Step #7 – The operator is prompted before the speedometer wheel lift is raised using the screen shown below:



Step #8 – The operator drives off of the speedometer tester and the test report is printed.

<This is the end of this manual>