

MD Taximeter Testing Software

Operation Manual



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Introduction

The MDTaxiTester software is designed to test the meters commonly used in taxi meters. Separate tests exist to determine if the meter correctly measures distances and times. Allowances for error tolerances are provided and are customizable by the user. In addition, basic taxi rate information can be entered into the program so that various testing parameters (for example, interference speed) can be determined automatically. In addition to the testing procedures, the program also provides data entry screens where additional information can be entered. After the data entry and testing procedures are completed, a form is printed out which contains a complete record of the test. In addition, the results are archived to the computer's hard disk drive for later retrieval. Test records can be backed up from within the program to a secondary storage location such as a floppy disk, or network drive. To facilitate additional reporting and customization, the test records can also be exported. Once exported, the test records can then be imported into Microsoft Access or other databases.

For maximum flexibility, all data entry and testing procedures are optional. Any data not entered—or any test not run—will simply be omitted from the test report. The user of the software, therefore, has complete control over which tests are ran, and in what order.

The following table summarizes the testing procedures provided by the software:

Test	Description
<i>Initial Time Test</i>	This test determines if the time that it takes for the meter to make its initial time drop is within spec.
<i>Non-Initial Time Test</i>	This test determines if the time that it takes for the meter to make subsequent time drops is within spec.
<i>Initial Mileage Test, 1 and 2</i>	This test determines if the distance that it takes for the meter to make its initial mileage drop is within spec.
<i>Non-Initial Mileage Test</i>	This test determines if the distance that it takes for the meter to make subsequent mileage drops is within spec.
<i>Average Mileage Test</i>	This test also determines if the distance that it takes for the meter to make subsequent mileage drops is within spec.
<i>Interference Test</i>	This test also determines if the distance that it takes for the meter to make subsequent mileage drops is within spec. However, during this test the taxi is driven around the interference speed.

Understanding Over- and Under Registration

Over registration refers to the condition in which a meter makes a drop too early. For example, if the initial time interval is five seconds, but the meter drops after only four, then over registration occurs. Because the meter is dropping early—and therefore overcharging the customer—very little tolerance is allowed for this condition.

Under registration refers to the condition in which a meter makes a drop too late. For example, if the initial time interval is again five seconds, but the meter doesn't drop until 6 seconds, under registration occurs. Because the customer is being *under* charged, a greater tolerance is allowed in this case than is made for over registration.

The error tolerances used by the software can be customized for all tests, and over- and under registration can be set separately. Appendix A of this manual contains instructions. Unless otherwise noted, all the error tolerances described in this manual represent the defaults that ship with the software.

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.

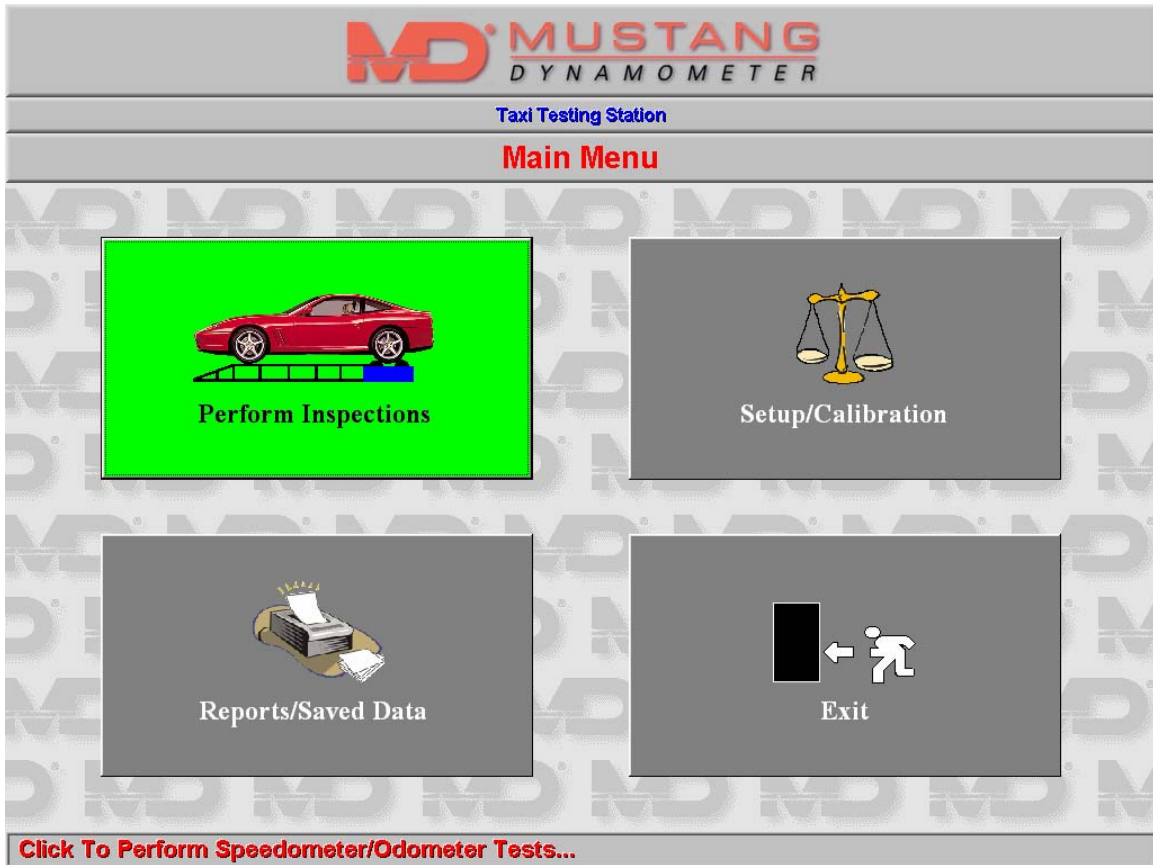
Assuming that the serial interface cable is connected and that the control box is turned on and operating normally, the problem is probably that the software is attempting to use an RS-232 serial port other than the port that the RS-232 serial cable is connected to. In this event, the following series 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

PROMPT:	<i>Can't Connect To Serial Controller; Try New Values?</i>
ACTION:	Click the “Yes” button.
PROMPT:	<i>Enter True/False For BeActive:</i>
ACTION:	Enter “True” and click the “OK” button.
PROMPT:	<i>Enter Serial Port Number:</i>
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.
PROMPT:	<i>Enter Baud Rate:</i>
ACTION:	Enter “9600” and click the “OK” button.
PROMPT:	<i>Enter Serial Parity Value (E/O/N):</i>
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 above; this 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 step one of the configuration screens.

No hardware calibration is required on this system. The basic properties of *roll diameter* and *speed encoder pulses per revolution* are all that the operator is required to set. These values only need to be set once from within the software.

Configuring the software consists of several steps; use the *Next* and *Back* buttons located on the button bar at the bottom of the screen to navigate between the steps. The button bar is used in the same manor throughout the program.

Configuration Step 1

MD MUSTANG
DYNAMOMETER

Taxi Testing Station

System Setup

Step 1: Hardware

Roll Diameter	0.000
Primary Speed Pulses/Rev	0.000
Secondary Speed Pulses/Rev	0.000

Automatic Lift Control?

OK Cancel << Back Next >>

Enter The Roll Diameter In Inches...

Please see the table on the following page for a description of each field on this screen.

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Field Name	Description
Roll Diameter:	The physical diameter of the speedometer tester's rolls, in inches, typically 8.575".
Primary Pulses/Rev:	The number of encoder pulses on the primary speed encoder on the speedometer tester, typically 60.
Secondary Pulses/Rev:	The number of encoder pulses on the secondary speed encoder on the speedometer tester, typically 60.
Automatic Lift Control	If this field is enabled (i.e. with a green checkmark, as shown above), the software will automatically prompt the operator to raise and lower the lift on the testing unit as necessary. Otherwise, raising/lowering the lift must be done manually; this can be done through software by clicking on the 'Raise Lift' and 'Lower Lift' buttons found on the testing screen.

Configuration Step 2

MUSTANG DYNAMOMETER
Taxi Testing Station
System Setup

Step 2: Taxi Rate Setup

Initial Time Interval, in seconds	51	Subsequent Time Interval, in seconds	60
Initial Time Interval, in dollars (\$)	0.40	Subsequent Time Interval, in dollars (\$)	0.40
Initial Distance Interval, in miles	0.2	Subsequent Distance Interval, in miles	0.2
Initial Distance Interval, in dollars (\$)	2.50	Subsequent Distance Interval, in dollars (\$)	0.40

Basic Time Rate (\$), per hour: 24
Interference Speed (mph) 14

OK Cancel << Back Next >>

Click to go back to the last screen.

Please see the table on the following page for a description of each field on this screen.

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The following tables summarizes the user-definable rate information that must be setup correctly for the testing procedures to function.

Field	Description
Initial Time Interval, in seconds	This field represents the time value, in seconds, that it takes for the meter to make its first drop.
Initial Time Interval, in dollars	This field represents the monetary amount that will be added to the meter after the initial time interval expires.
Initial Distance Interval, in miles	This field represents the distance interval, in fractions of a mile, that will cause the meter to drop for the first time.
Initial Distance Interval, in dollars	This field represents the monetary amount that will be added to the meter when the Initial Distance Interval has been registered.
Subsequent Time Interval, in seconds	This field represents the time value, in seconds, per meter drop after the initial drop.
Subsequent Time Interval, in dollars	This field represents the monetary amount that will be added to the meter after each subsequent time interval expires.
Subsequent Distance Interval, in miles	This field represents the distance interval, in fractions of a mile, that will cause the meter to drop after the initial Distance Interval.
Subsequent Distance Interval, in dollars	This field represents the monetary amount that will be added to the meter after each subsequent distance Interval is registered.

After the above fields have been filled in, two additional fields are calculated automatically:

Field	Formula
Basic Time Rate Per Hour, in Dollars	$\text{Basic Time Rate} = 3600 * \text{Subsequent Time in Dollars} / \text{Subsequent Time in Seconds.}$
Interference Speed	$\text{Interference Speed} = \text{Basic Time Rate} * \text{Subsequent Distance in Miles} / \text{Subsequent Time Interval in Dollars} + 2$

If the *Basic Time Rate Per Hour* or the *Interference Speed* appear to be wrong, it is an indication that some of the other fields have been entered incorrectly.

Configuration Step 3

The screenshot shows the 'System Setup' dialog box for 'Step 3: Customization'. The dialog box is titled 'Step 3: Customization' and contains the following instructions and fields:

Enter a description of the rate information as you want it to appear on the printed form. This description is not used by the computer; it is printed as is.

Line 1	RATE INFORMATION
Line 2	\$2.50 FIRST 1/6 MILE \$.30 EACH ADDITIONAL 1/6
Line 3	\$.30 EACH ADDITIONAL 45 SECONDS IF LESS THA

Enter a textual description of your organization. This information will be printed as is in the upper left hand corner of the test report.

Line 1	1
Line 2	2
Line 3	3
Line 4	4
Line 5	5

Print Logo Instead of the above text on the report?

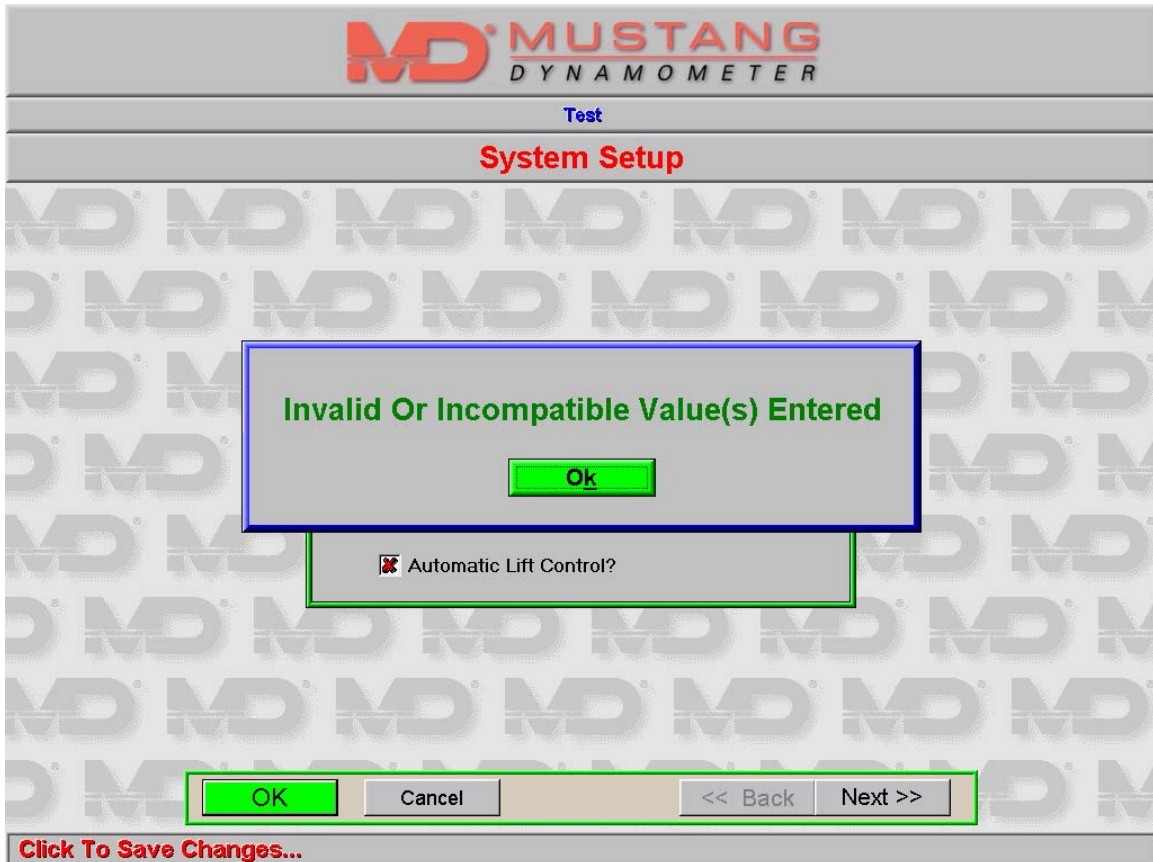
Enter a one-line description to be displayed in the titlebar.

Taxi Testing Station

At the bottom of the dialog box, there are four buttons: 'OK', 'Cancel', '<< Back', and 'Next >>'. Below the dialog box, a red text prompt reads: 'Click to proceed to the next step.'

The fields shown on this screen provide additional customization of the software.

Invalid Values Entered Error Message



The above screen is brought up if the user clicks 'OK' but there are invalid values entered in one of the setup screens. For example, if the Roll Diameter (entered on Step 1) is zero, this message will be displayed. To correct the error, look for invalid field fields, fix them, and press 'OK' again.

Reports/Saved Data Setup Screen

MD MUSTANG DYNAMOMETER
Taxi Testing Station

Old Test Report Reprinting

Test Report Reprint Search Criteria

Test Was Performed Between And

Cab Company is

Cab Number is

VIN is

Airport Number

Meter Serial Number

ANY security Seal number*

(* Searches through all the security seals on the form.)

TIP: Enter a wide date range, for example 1/1/80 to 1/1/2010, to view all your records....

Enter The Starting Search Range Date...

This screen allows the operator to perform reprint previous test reports and to backup the data used by this program. While reviewing previous test results, it is also possible to export the records. The next sections outline the procedures for performing these operations.

Reviewing Previous Reports

The screenshot shows the Mustang Dynamometer software interface. At the top, the logo reads "MUSTANG DYNAMOMETER". Below it, the text "Taxi Testing Station" is displayed. The main title of the window is "Old Test Report Reprinting".

The central window is titled "Search Progress / Matching Records". It features a search progress bar, input fields for "Records To Search" (set to 10), "Current Record" (set to 10), and "Matching Records" (set to 1). An "Export Data" button is located below these fields.

To the right of the input fields is a table with the following data:

Double-Click Desired Entry to preview or re-print Test Report				
Cab Compan	Cab Number	UIN	Meter Ser	DD/MM/YY
Yellow	12345678			08/Feb/2001

Below the table are three buttons: "Backup Test Data", "New Search", and "Cancel". At the bottom of the window, a red text prompt reads "Click here to perform indicated funtion...".

To review tests in the system you can fill-in the onscreen fields. For example, to see a list of all test reports that have been run for a specific cab company, (i.e. "Yellow") only the *Cab company* field needs to be filled in. To limit the search to "Yellow" cabs which were tested during a certain date range, the starting and ending dates can be filled in as well. As a general rule of thumb, the fewer fields that are filled in, the more tests will be returned.

After the search criteria has been entered and the "Begin Search" button has been pressed, the computer then brings up a list of all matching test results. The records will be displayed in the white box shown above. To view one of the records, double click on it and it will be displayed on the screen as shown on the following page.

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Print Preview

<input type="button" value="Print"/> <input style="background-color: #90EE90;" type="button" value="Done"/> <input type="button" value="Print Preview"/>			
2 3 4 5	INSPECTION REPORT <input type="checkbox"/> ROAD SIMULATOR TEST <input type="checkbox"/> ROAD TEST	CAB NO.	
<input type="checkbox"/> ROUTINE <input type="checkbox"/> RE-CHECK <input type="checkbox"/> COMPLAINT <input type="checkbox"/> PLACED IN SERVICE <input type="checkbox"/> OTHER:			
DATE: 02/19/2001		TIME IN: _____	
CAB COMPANY: _____		REG. OWNER: _____	
ADDRESS: _____		PHONE NO.: _____	
CITY: _____ STATE: _____ ZIP: _____	CITY: _____ STATE: _____ ZIP: _____	AIRPORT NUMBER: _____	
PHONE: _____	LICENSE NO.: _____	YR: _____ NO: _____	
VEHICLE BODY # / CHASSIS NUMBER: _____			
DRIVE WHEELS: FRONT <input type="checkbox"/> REAR <input type="checkbox"/>			
POSTED SIZE: _____	ACTUAL: _____	METER: _____ MODEL: _____ SERIAL NUMBER: _____	
POSTED PRESSURE: _____	ACTUAL: L: _____ R: _____	RATE OF DRIFTATION: 0.20% PER HOUR 10000 TO 20000 MILES 0.30% PER HOUR 20000 TO 40000 MILES 0.40% PER HOUR 40000 TO 60000 MILES 0.50% PER HOUR 60000 TO 80000 MILES 0.60% PER HOUR 80000 TO 100000 MILES	
CONDITION: GOOD <input type="checkbox"/> BALD <input type="checkbox"/>			
TOTALIZER			
CLOCK TEST			
INITIAL NON-INITIAL AND AVERAGE			
SEC RING	ELAPSED TIME	METER READING ACTUAL RESULT	
STARTING	0-10 SEC	2.50 - 2.90 +5 <input type="checkbox"/> PASS <input type="checkbox"/> FAIL	
RATES POSTED FRONT/BACK: <input type="checkbox"/> YES <input type="checkbox"/> NO	10 + 3 MIN	2.90 - 4.10 -239 <input type="checkbox"/> PASS <input type="checkbox"/> FAIL	
METER LIGHT: <input type="checkbox"/> YES <input type="checkbox"/> NO	MILEAGE TEST		
INITIAL NON-INITIAL AND AVERAGE			
WEIGHTS & MEASURES SEALS INTACT	TIME	MPH METER READING REV ACTUAL RESULT	
PAPER: <input type="checkbox"/> YES # <input type="checkbox"/> NO	OFF	< 30 2.50 - 2.90 200 <input type="checkbox"/> PASS <input type="checkbox"/> FAIL	
SECURITY: <input type="checkbox"/> YES # <input type="checkbox"/> NO	OFF	< 30 2.50 - 4.50 1000 <input type="checkbox"/> PASS <input type="checkbox"/> FAIL	
TRANSMISSION SEAL: <input type="checkbox"/> YES <input type="checkbox"/> NO	OFF	< 30 4.90 - 6.90 1000 <input type="checkbox"/> PASS <input type="checkbox"/> FAIL	
RESULTS			
INTERFERENCE TEST			
NON-INITIAL			
<input type="checkbox"/> METER PASSED	TIME	MPH METER READING REV ACTUAL RESULT	
PAPER SEAL #:	ON	14 - 15 2.90 - 4.90 1000 <input type="checkbox"/> PASS <input type="checkbox"/> FAIL	
SECURITY SEAL #:	MILEAGE A AND MILEAGE B ARE WITHIN 0.010 OF EACH OTHER <input type="checkbox"/> YES <input type="checkbox"/> NO		
TOTAL:			

Reprinting the report is as easy as clicking the print button. Because the entire form cannot be displayed on the screen at one time, use the mouse or arrow keys to view more of the form.

Exporting Data

It is possible to export data from the Taxi Meter Testing program into a format that can be used to Microsoft Access and other databases.

To export data, follow these steps:

1. From the Main Menu of the Taxi Meter Testing program, click on 'Reports/Saved Data'
2. Enter in a search criterion with which to locate some records. For example, if you want to export the tests ran today, enter today's date for the starting and ending dates.
3. A list of records come up.
4. Click on the 'Export Data' button.
5. Type in the filename that you want to export the record to, for example "C:\RECORDS.TXT."
Note: It is important that the filename have an extension of '.TXT'; otherwise Microsoft Access won't recognize it as a text file.
6. Assuming all went well, you'll get a message saying that the data was exported successfully.

To import the data into Microsoft Access, follow these steps:

1. Load Microsoft Access.
2. Click on File; Click on Open.
3. Find the file that you exported above and open it.
4. A Wizard opens which says 'Link Text Wizard' in the title bar. This wizard will help you import the data.
5. Make sure the option button that says "Delimited" has the dot next to it.
6. Click on Next.
7. Put a checkmark in the field that says 'First Row contains Field Names.'
8. Click on Finish.
9. The data should now be in the table you just created.

The procedure outlined above for importing the data into access assumes that you want to import the data into a blank database; anything more involved is beyond the scope of this manual. (Please consult Microsoft's documentation.) Also, a working knowledge of Microsoft Access will be necessary in order to do anything nontrivial with the imported data.

Note on the format of the exported data:

The format that the taxi meter test records are exported in is known as a comma delimited text file. Each field is separated from the previous one by a comma; records (lines) are separated by carriage returns/line feed combinations. Additionally, the first line of the file has the ASCII names of the fields in the same format.

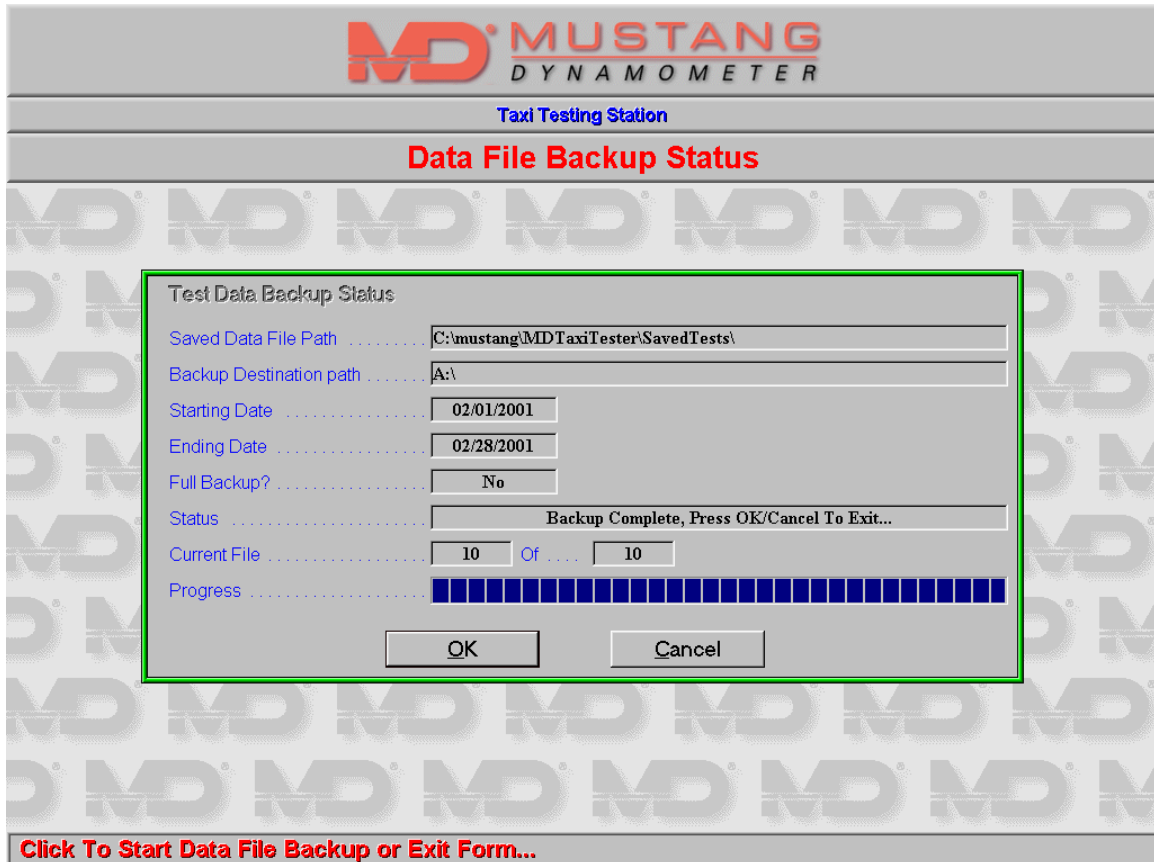
Backing Up Your Data



To backup the data in the program, click Backup on the button bar. You will then be presented with the screen shown above.

Note that you must enter the destination (“dest”) path; in other words, you have to tell the program where to backup the data to. Normally, you will want to backup the data to your floppy (“A:\”) drive. After you put the disk in the drive, you must choose to do either a Full or Partial (“range”) backup. It is a good idea to backup all your data periodically—for example every few months—and to perform a partial backup more frequently. To perform the range backup, simply enter the beginning and ending date and click ‘Range Backup’ and all the tests performed in that data range will be backup up. Usually you will want to set the starting date to the day after the date of the last time you backed up your data. If you are doing a full backup, the date range is ignored by the software; this is because all the files will be backed up, regardless of the test date.

Backup In Progress Screen



Once the backup is completed you can then press “OK” to return to the previous menu.

Generating A Test Form

Test Form Generation Step 1

Steps 1 through 3 are data entry screens. Any data entered on these screens will be printed on the test report when it is generated. Any fields which have no data entered on them will be left blank. Also notice that all the visual tests—for example, the condition of the tire treads, etc—default to *N/A*. On the test form itself, these values are printed in the following format:

[] yes

[] no

If *N/A* is entered on the screen, then neither checkbox will have an 'X' in it. Therefore, any data that you are not interested in collecting can be left off the printed report by leaving the associated values on the screen either blank or set to *N/A*.

To move to the next field on the screen, press the *tab* key; pressing *shift+tab* will move to the previous field. (A field represents one of the white boxes on the screen where you can type in information.)

It is also possible to preview the form (with as much data filled in as you've entered so far) by clicking the button *Preview Form* on the bar at the bottom of the screen.

Test Form Generation Step 2

The screenshot shows the 'Step 2' window of the Mustang Dynamometer software. The window has a title bar that says 'Step 2'. Inside the window, there are two columns of input fields. The left column contains: License No., Year, Make, Model, Air Port Year, Air Port Number, and Vehicle ID Number. The right column contains: Meter, Model, Serial Number, Posted Size, Actual Size, Posted Pressure, Actual Pressure Left, and Actual Pressure Right. There are two radio button groups: one for tire status (Tires Good, Tires Bald, N/A) and one for drive type (Front Wheel Drive, Rear Wheel Drive, N/A). At the bottom of the window, there are four buttons: Cancel, Preview Form, << Back, and Next >>. Below the window, there is a red text prompt: 'Click to proceed to the next step.'

Step two provides additional data entry about the taxi being tested.

Test Form Generation Step 3

MUSTANG
DYNAMOMETER

Taxi Testing Station

Pretesting data acquisition

Step3

Beginning Totalizer Reading

Rates Posted Front/Back?

Rates Illuminated by light?

Weights/Measures Paper Seal intact? ...

Number:

Weights/Measures Security Seal(s) intact

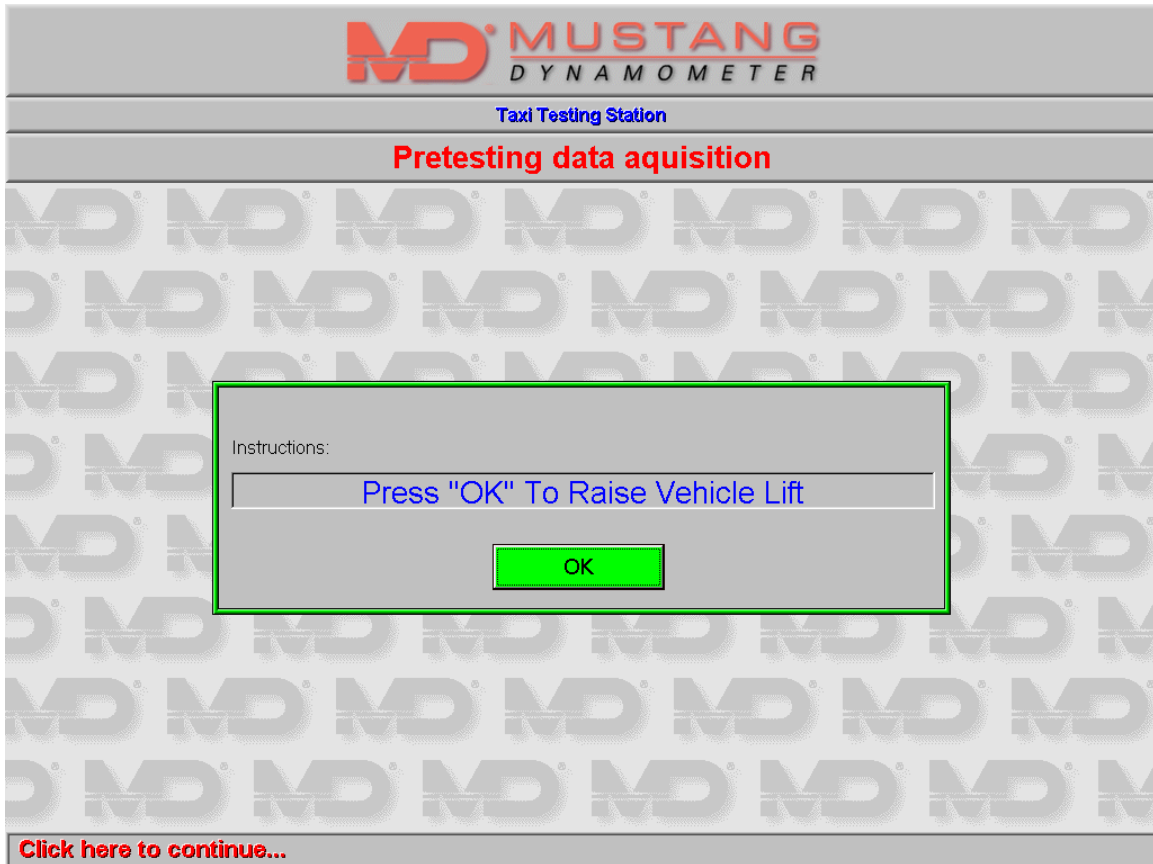
Total: Number:

Transmission Seal Intact?

Click to proceed to the next step.

Step three provides additional data entry about the taxi being tested.

Automatic Lift Control



If automatic lift control is enabled, then the screen shown above will be presented. If automatic lift control is not enabled, then the lift can be controlled manually from the testing screen, as shown on the following page.

Test Form Generation Step 4

The screenshot shows the 'Mustang Dynamometer' logo at the top, followed by 'Taxi Testing Station' and 'Testing Sequence'. The main area is titled 'Step 4' and contains a grid of test options:

Initial Time Test	Non-Initial Mileage Test
Non-Initial Time Test	Average Mileage Test
Initial Mileage Test (1)	Interference Test
Initial Mileage Test (2)	

Below the grid are 'Lift Up' and 'Lift Down' buttons. At the bottom, there are 'Cancel', 'Preview Form', '<< Back', and 'Next >>' buttons. A red instruction 'Click to cancel.' is located at the bottom left of the interface.

From this screen all the supported tests can be ran. The tests can be ran as many times as desired. After each test is completed, the *Preview Form* button may be pressed to see the results of the test that was just ran. However, only the results of the most recently ran test will be reported. In other words, if a single test is ran more than once, only the most recently ran test will show up on the test report.

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Understanding the Printed Test Results

CLOCK TEST					
INITIAL, NON-INITIAL AND AVERAGE					
ELAPSED TIME	METER READING	ACTUAL	RESULT		
0-10 SEC	2.50 - 2.90	+5	<input type="checkbox"/> PASS <input type="checkbox"/> FAIL		
10 + 3 MIN	2.90 - 4.10	-239	<input type="checkbox"/> PASS <input type="checkbox"/> FAIL		
MILEAGE TEST					
INITIAL, NON-INITIAL AND AVERAGE					
TIME	MPH	METER READING	REV	ACTUAL	RESULT
OFF	< 30	2.50 - 2.90	200		<input type="checkbox"/> PASS <input type="checkbox"/> FAIL
OFF	< 30	2.50 - 4.50	1000		<input type="checkbox"/> PASS <input type="checkbox"/> FAIL
OFF	< 30	4.90 - 6.90	1000	A	<input type="checkbox"/> PASS <input type="checkbox"/> FAIL
INTERFERENCE TEST					
NON-INITIAL					
TIME	MPH	METER READING	REV	ACTUAL	RESULT
ON	14 - 15	2.90 - 4.90	1000	B	<input type="checkbox"/> PASS <input type="checkbox"/> FAIL
MILEAGE A AND MILEAGE B ARE WITHIN 0.010 OF EACH OTHER <input type="checkbox"/> YES <input type="checkbox"/> NO					

The test results are printed on the test form in the section shown above. Only the last two columns in each table show the results of the tests; the other columns show the associated testing parameters.

Performing the Testing Procedures

The testing procedures performed with this software will generally require two people; one person to operate the software, another to operate the vehicle. It might also be possible to use an alternative input device, for example a cordless remote, so that a single operator can perform both functions.

Note on Non-Initial distance Tests

The *Non-Initial Mileage Test*, *Average Mileage Test*, and the *Interference Test* all require that the meter has dropped at least once due to distance. Furthermore, they assume that the taxi was stopped exactly on a distance interval. The recommended procedure for running these tests is to drive the initial distance, anticipating the end of the distance interval. Slow the taxi down so that the vehicle is at a complete stop precisely as the meter makes its initial distance drop. At this point, the meter is in an appropriate state to start the non-initial distance tests.

Note on Testing Tolerances

The tolerances mentioned in the following sections represent the defaults used by the application. Please refer to the Appendix in this software manual for information on customizing the tolerances.

Initial Time Test

The *Initial Time Test* tests to make sure that the time it takes the meter to make its initial drop is within spec. When the 'Now' button is pressed on the screen an internal timer is began and the user is prompted to press the button again when the meter drops. The time it took the meter to make the drop (recorded in seconds) is then compared against the time entered in the setup screen for 'Initial Time Interval, in Seconds.'

If the two values match, then the test passes. If not, there are two possibilities: the meter dropped early (over registration), or the meter dropped late (under registration).

The default error tolerances associated with each possibility are as follows:

Over registration	5% (3 seconds per minute)
Under registration	15% (9 seconds per minute)

The result is recorded and printed on the test form. However, instead of printing the recorded time, the *difference* between the recorded value and the actual value is printed. For example, if the report indicated '-4' it would mean that the meter dropped 4 seconds too early. If the report indicated a '+4' it would mean that the meter dropped four seconds too late.

After this test is ran, the *Non-Initial Time Test* is automatically started. In other words, the timing standard used to time the first non-initial time drop is started as soon as the 'Now' button is clicked to indicate the end of the initial time interval. Note: This test cannot be run if the vehicle is not stationary; if the vehicle is not stationary, an error message will be displayed.

Non-Initial Time Test

MD MUSTANG DYNAMOMETER

Taxi Testing Station

Non-Initial Time Test

Step 4

When ready to start timing, click the 'Now' button. The meter should be in time recording mode and have dropped at least once. The vehicle must be stationary.

MPH **1**

Click to begin the test procedure...

The *Non-Initial Time Test* tests to make sure that the time it takes the meter to make subsequent drops are within spec. When the 'Now' button is pressed on the screen an internal timer is began and the user is prompted to press the button again when the meter drops 4 times. In other words, this test measures the time it takes for the meter to make four consecutive drops. The time it took the meter to make the drops is then compared against the time entered in the setup screen for 'Non-Initial Time Interval in seconds' multiplied by four [representing the four drops.]

If the two values match, then the test passes. If not, there are two possibilities: the meter dropped early (over registration), or the meter dropped late (under registration).

The default error tolerances associated with each possibility are as follows:

Over registration	5% (3 seconds per minute)
Under registration	10% (6 seconds per minute)

The result is recorded and printed on the test form. However, instead of printing the recorded time, the *difference* between the recorded value and the actual value is printed. For example, if the report indicated '-4' it would mean that the meter dropped 4 seconds too early. If the report indicated a '+4' it would mean that the meter dropped four seconds too late.

Note: This test cannot be run if the vehicle is not stationary; if the vehicle is not stationary, an error message will be displayed.

Initial Mileage Test, 1 and 2

MD MUSTANG
DYNAMOMETER

Taxi Testing Station

Initial Mileage Test (1)

Step 4

Put meter in distance only mode and reset the meter. Begin driving and then Click 'Now' as soon as the meter drops.

MPH 0 NOW

Cancel Preview Form << Back Next >>

Click to begin the test procedure...

The *Initial Mileage Test* tests to make sure that the distance that it takes for the meter to make its first drop due to distance is within spec. When the test is began, an internal mileage counter is set to zero. Next, the accumulated distance that the taxi drove while on the testing unit is recorded once the user clicks on the 'Now' button. The distance that the taxi actually drove is then compared against the value entered on the setup screen for 'Initial Distance Interval, in miles.'

If the two values match, then the test passes. If not, there are two possibilities: the meter dropped early (over registration), or the meter dropped late (under registration).

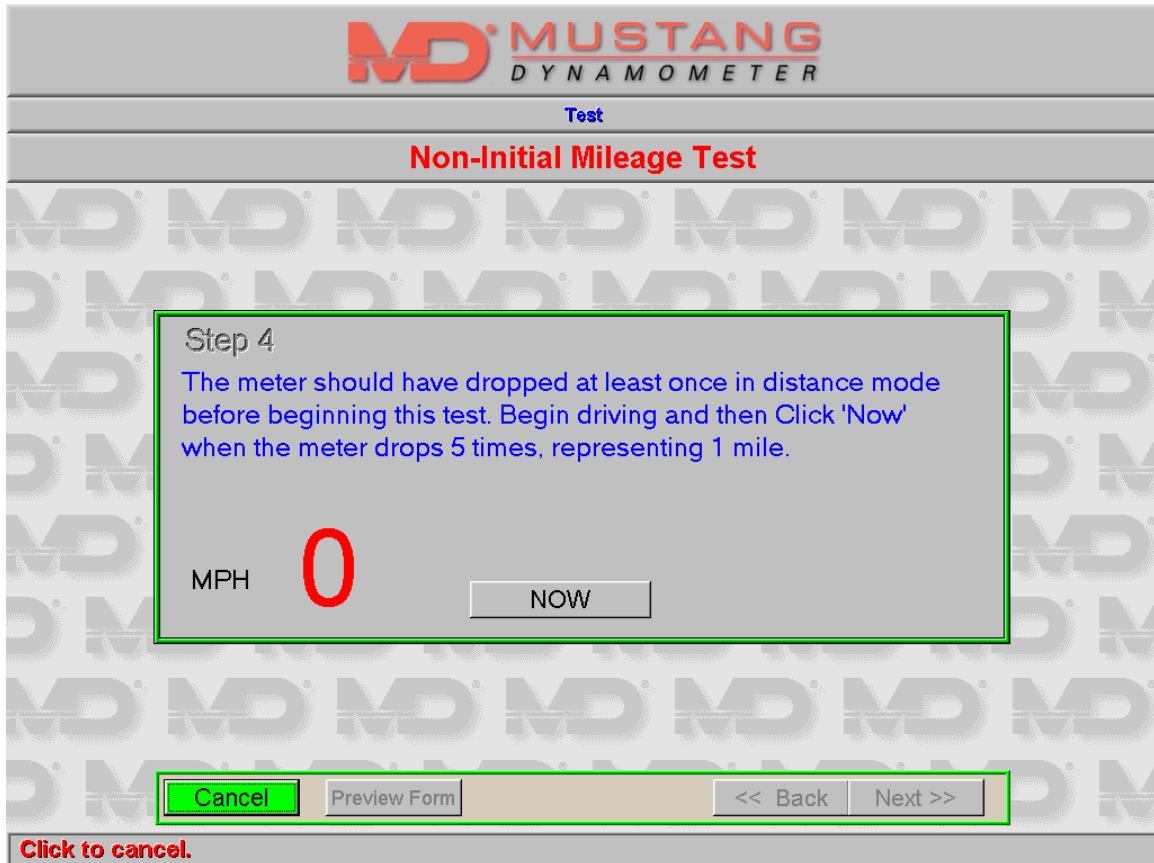
The default error tolerances associated with each possibility are as follows:

Over registration	1%
Under registration	4% + 100 feet

The software is designed to allow this test to be run twice, with reporting of both results. (That's why there's two buttons for the *Initial Mileage Test* on the screen.) When accessing a Pass/Fail status for this test, the software will assign as passing value if *either* of the tests passed. (In other words, two numerical values can be reported on the form, but only one PASS/FAIL status is available for the test. Therefore, the test is considered passing if either test passed.)

The results of the test are printed in revs. There are 1000 revs in a mile.

Non-Initial Mileage Test



The *Non-Initial Mileage Test* tests to make sure that the distance that it takes for the meter to make subsequent drops due to distance is within spec. When the test is began, an internal mileage counter is set to zero. The user is the told to click 'Now' when the meter drops *X* times, representing one mile. (The number of times the meter will drop in one mile is calculated by dividing 1 by the 'Subsequent Distance in Miles' value, and is displayed on the screen instead of an *X*.) The accumulated distance that the taxi drives while on the testing unit is recorded once the user clicks on the 'Now' button when the test is finished. The distance that the taxi actually drove is then compared to one mile.

If the two values match, then the test passes. If not, there are two possibilities: the meter dropped early (over registration), or the meter dropped late (under registration).

The default error tolerances associated with each possibility are as follows:

Over registration	1%
Under registration	4% + 100 feet

Average Mileage Test

MD MUSTANG DYNAMOMETER

Test

Average Mileage Test

Step 4

The meter should have dropped at least once in distance mode before beginning this test. Begin driving and Click 'Now' when the meter drops 5 times, representing 1 mile.

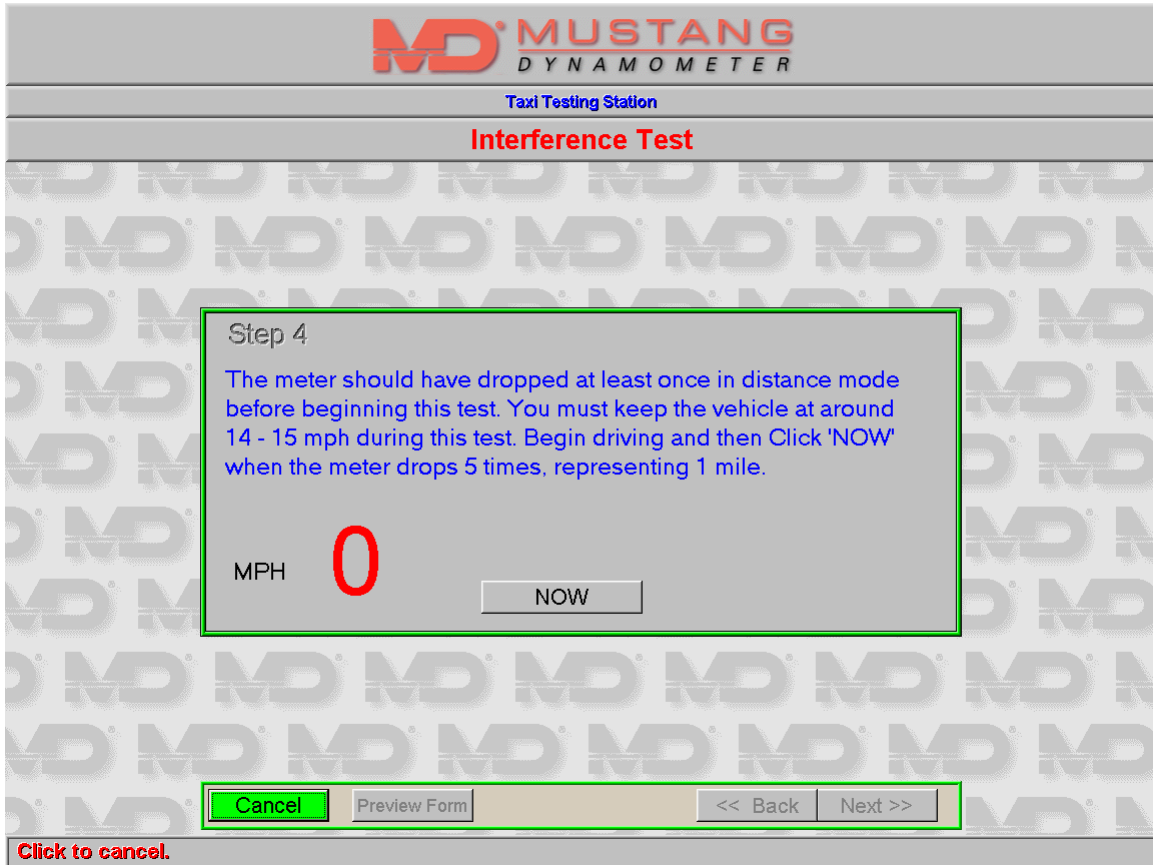
MPH **0**

Click to cancel.

The *Average Mileage Test* is ran identically to the *Non-Initial Mileage Test*. However, the difference is that the result of this test is later compared to the result of the *Interference Test*; these two values must be within ten revs of each other. In other words, the distance representing one mile registered while driving around the interference speed must be within ten revs of the distance representing one mile registered during normal driving speeds.

Also note that it is possible for the two distances to be within 10 revs of *each other* and yet still both have failed on their respective tests. In other words, it is possible for the meter to be out of calibration and yet at least be consistent in what it reports.

Interference Test



The *Interference Test* is ran identically to the *Non-Initial Mileage Test*. However, during this test the vehicle's speed must be maintained at or around the interference speed. (The speed that should be maintained is displayed on the screen.) However, the software will not abort the testing procedure if the proper speed is not maintained. It is the responsibility of those using the software to ensure that the proper speed is ensured during the testing procedures.

Test Form Generation Step 5

MUSTANG
DYNAMOMETER

Taxi Testing Station

Post Test Data Aquisition

Step 5
Radio Frequency Interference Test

Time Off
 Pass Fail N/A

Time On
 Pass Fail N/A

Cancel Preview Form << Back Next >>

Click to proceed to the next step.

On this screen the operator is asked to provide the results of the Radio Frequency Interference Test. (This test is not performed with the software; only the *results* of the test must be entered, if appropriate.) Leaving these fields set to “N/A” will leave the associated fields on the test report blank.

Test Form Generation Step 6

MUSTANG
DYNAMOMETER

Taxi Testing Station

Post Test Data Acquisition

Step 6

Ending Totalizer Reading

Remarks

Device Repairman

Device Repairman's Service Label Present? . . N/A

Security Seal Number

Security Seal Total

Date

Driver's Name:

Driver's License

Expiration

Cancel Preview Form << Back Next >>

Click to proceed to the next step.

Step 6 is another data entry screen. All data entered on this screen will be printed out on the test report; anything left blank will be omitted.

Test Form Generation Step 7

MUSTANG
DYNAMOMETER

Taxi Testing Station

Post Test Data Acquisition

Step 7

Meter Passed? N/A

Paper Seal #

Security Seal#

Total

Out of Tolerance Red Out Of Tolerance, Blue N/A

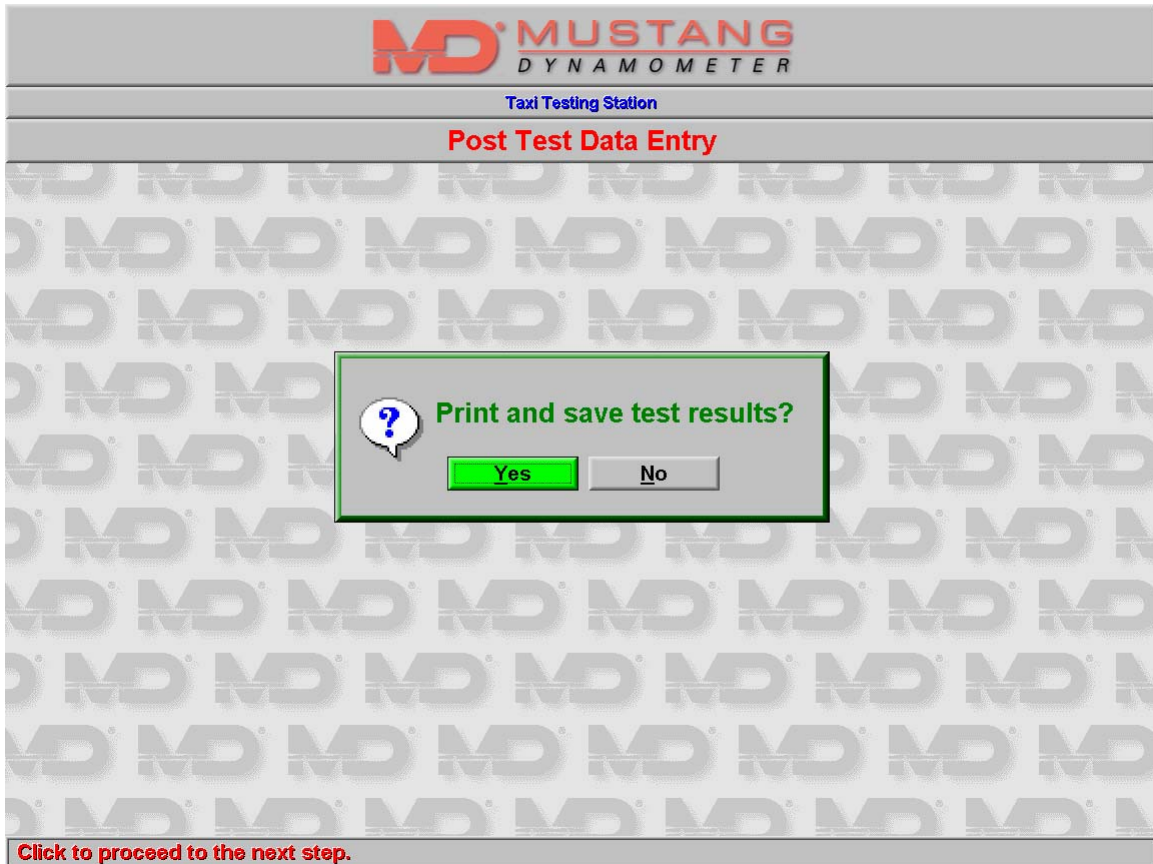
Tag Number

Cancel Preview Form << Back Next >>

Click to proceed to the next step.

Step 7 is another data entry screen. There are a number of fields on the printed report that deal with the overall passing/failing status of the taxi meter. Even though the software makes pass/fail determinations for the individual tests, the overall status of the meter must be determined by the operator.

Print and Save Test Form Prompt



After the testing procedure is complete, the software will prompt asking if the test results should be saved and printed. If the user clicks on 'Yes', a form will be generated and printed on the default Windows printer, and the test results will be archived to the fixed disk.

Appendix: Customizing The Error Tolerances

The error tolerances used by the Taximeter testing software can be customized by editing the .INI file used by the application. An .INI file is a special file used to store configuration information, and is stored in standard ASCII text format. This means that the file can be edited with any standard text editor, such as Notepad.

Step 1: Launching a Text Editor

Before proceeding, close the MDTaxiTester software if it is open. You should be at the standard Window's desktop screen, with the start menu visible in the lower left hand corner. Click on *Start*, then *Programs*, then *Accessories*, and finally *Notepad*. The notepad application will now appear on the screen.

Step 2: Finding the .INI File

To open the file, click on *File*, then *Open*.

Next type in: "C:\MUSTANG\MDTAXITESTER\MDTAXITESTER.INI" without the quotes, then press enter.

The file should open and you should see lines similar to the following on the screen:

```
[SerialSpeedoTesterLink]
Active=True
SerialPort=1
BaudRate=9600
Parity=N
...
```

Step 3: Finding the lines to edit

Scroll down in the file until you see the following lines:

```
InitialTime_OverReg_ToleranceFraction=0.05
InitialTime_UnderReg_ToleranceFraction=0.15
NONInitialTime_OverReg_ToleranceFraction=0.05
NONInitialTime_UnderReg_ToleranceFraction=0.1
DistanceToleranceFraction_UnderReg=0.04
DistanceToleranceOffsetInFeet_UnderReg=100
DistanceToleranceFraction_OverReg=0.01
DistanceToleranceOffsetInFeet_OverReg=0
```

(The values to the right of the equal signs shown above represent the default error tolerances; they are the parameters that you need to change.)

Step 4: Editing the Error Tolerances

Consult the table on the following page to learn the meanings of the fields, and make changes to them as appropriate.

Mustang Dynamometer Taximeter Testing Software
User Manual

The following table summarizes the fields and their meanings:

Field	Description
<i>InitialTime_OverReg_ToleranceFraction</i>	This value represents the amount of tolerance to apply to the <i>Initial Time Test</i> in the case of over registration. For example, a value of 0.05 would mean to allow a 5% tolerance.
<i>InitialTime_UnderReg_ToleranceFraction</i>	This value represents the amount of tolerance to apply to the <i>Initial Time Test</i> in the case of under registration. For example, a value of 0.15 would mean to allow a 15% tolerance.
<i>NONInitialTime_OverReg_ToleranceFraction</i>	This value represents the amount of tolerance to apply to the <i>Non Initial Time Test</i> in the case of over registration. For example, a value of 0.05 would mean to allow a 5% tolerance.
<i>NONInitialTime_UnderReg_ToleranceFraction</i>	This value represents the amount of tolerance to apply to the <i>Non Initial Time Test</i> in the case of under registration. For example, a value of 0.05 would mean to allow a 5% tolerance.
<i>DistanceToleranceFraction_UnderReg</i>	This value represents the amount of tolerance to apply to the distance tests in the case of under registration. For example, a value of 0.04 would mean to allow a 4% tolerance.
<i>DistanceToleranceOffsetInFeet_UnderReg</i>	This value represents an additional tolerance <i>in feet</i> to apply to the distance tests in the case of under registration. For example, to allow for a tolerance of 4% + 100 feet (as is standard), set <i>DistanceToleranceFraction_UnderReg</i> to 0.04 and set <i>DistanceToleranceOffsetInFeet_UnderReg</i> to 100.
<i>DistanceToleranceFraction_OverReg</i>	This value represents the amount of tolerance to apply to the distance tests in the case of over registration. For example, a value of 0.01 would mean to allow a 1% tolerance.
<i>DistanceToleranceOffsetInFeet_OverReg</i>	This value works the same as the <i>DistanceToleranceOffsetInFeet_UnderReg</i> field. By default this value is 0 because no offset is usually associated with an over registration condition.