



Steering Gear Performance Test Stand General Operating Procedure

1 Introduction

Note: Nothing in this standard supercedes applicable laws and regulations.

Note: In the event of conflict between the English and domestic language, the English language shall take precedence.

1.1 Purpose. To provide general guidelines for operating the Steering Gear Performance Test Stand.

1.2 Applicability. This test procedure is applicable to any rack and pinion or recirculating ball steering system whether electrically or hydraulically assisted or manual, including column electric power steering (EPS) systems.

1.3 Remarks. This document describes the general operating procedure for conducting a test on the Steering Gear Performance Test Stand. It is not a user's guide to the test machine or its control software.

2 References

Note: Only the latest approved standards are applicable unless otherwise specified.

2.1 External Standards/Specifications.

ISO 9001

2.2 GM Standards/Specifications.

None

2.3 Additional References.

MTS Systems Corporation, Eden Prairie, Minnesota

3 Resources

3.1 Facilities.

3.1.1 Calibration. The test facilities and equipment shall be in good working order and shall have a valid calibration label.

3.1.2 Alternatives. Alternative test facilities and equipment may also be used. However, all measuring variables as specified in this standard shall be determined correctly with respect to their physical definition.

3.2 Equipment. Steering Gear Performance Test Stand, including MTS Systems Corporation, FlexTest 60 Digital Controller and a Personal Computer (PC) with MTS Series 793 control and application software installed.

3.3 Test Vehicle/Test Piece. This test procedure applies to any rack and pinion or recirculating ball steering system whether electrically or hydraulically assisted or manual, including column EPS.

3.4 Test Time. Time shown is typical per test and per test specimen.

Calendar time: 1 day

Test hours: 1 hour

Coordination hours: 0.5 hour

3.5 Test Required Information. Not applicable.

3.6 Personnel/Skills. Operator must be qualified and documented as capable to run this test as required by ISO 9001.

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4 Procedure

4.1 Preparation.

Note: Interruption of communication between the MTS controller and the PC may occur when the PC goes into a non-active mode (for example, Log off, Lock or Sleep), potentially introducing errors in system configurations or settings. It is, therefore, a good practice to perform a complete system reboot on a regular basis or after an extended period of idle. The controller should be rebooted by cycling power after the PC reboots.

4.1.1 Set Up Software.

4.1.1.1 Launch Station Manager. From the PC desktop, click the Station Manager icon on the Windows taskbar or, if installed, the Start Station Manager button on the Station Desktop Organizer toolbar (Figure 1) to launch the Station Manager application (Figure 2) if it is not already open. In the following dialog boxes (Figures 3 and 4) navigate to the appropriate directories to select and open a project and the latest test stand configuration file.

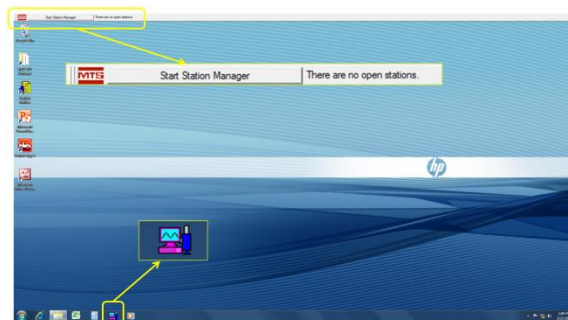
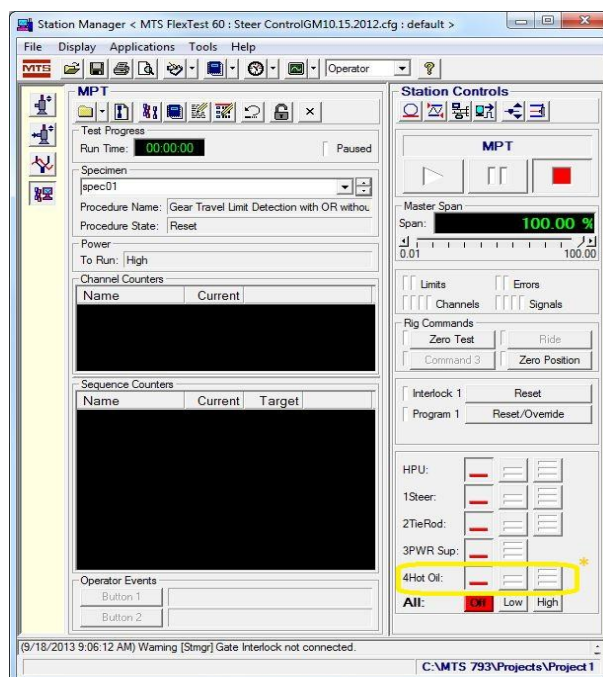


Figure 1: PC Desktop Showing the Station Manager Icon, Station Desktop Organizer Toolbar and Start Station Manager Button



Note: Number 4, Hot Oil, is available only for Hydraulic Power Steering (HPS) capable test stand.

Figure 2: Station Manager Window

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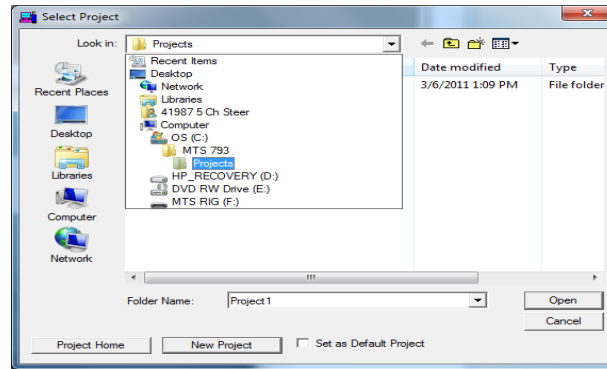


Figure 3: Select Project Dialog

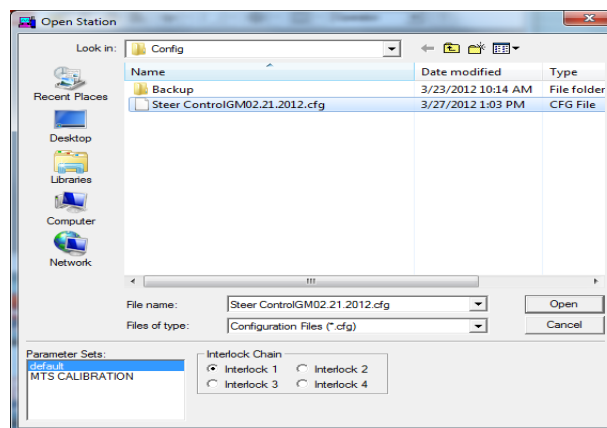


Figure 4: Open Station Dialog

4.1.1.2 Set up Scopes and Meters. A standard set of scope and meters windows should be open with the launch of Station Manager, containing the channels and signals of interest for a typical steering performance test (see Figures 5 thru 9). Use the toolbars at the top of the windows to customize the displays if necessary. Arrange the Scope 1 and Meters 1 windows so that they are both on top and unobstructed during a test. Refer to Appendix A, Table A1 for signal sign conventions.

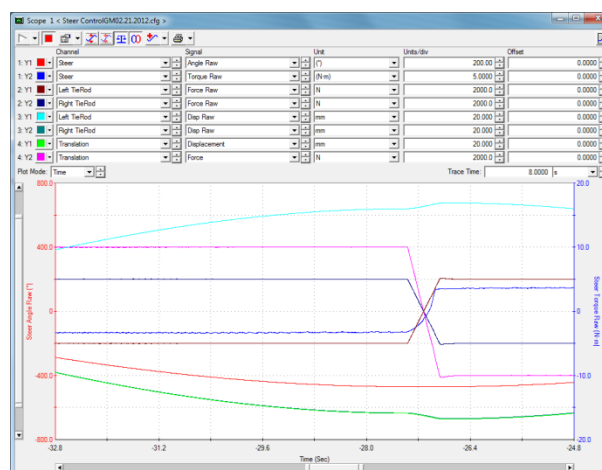


Figure 5: Scope 1 Setup to Display Time Traces of Typical Steering Signals of Interest in Real Time

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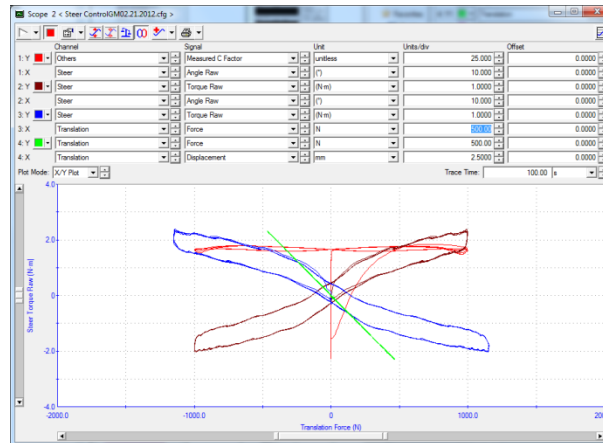


Figure 6: Scope 2 Setup to Display Real Time X-Y Plots of Typical Steering Signals of Interest

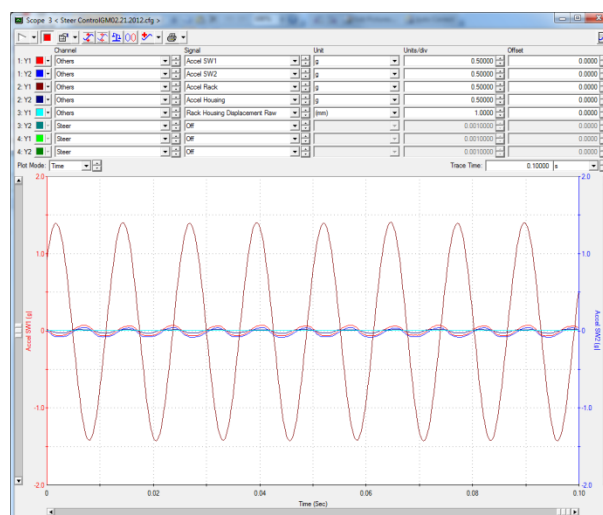


Figure 7: Scope 3 Setup to Display Time Traces of Accelerometer Signals and any Additional Channels and Signals of Interest

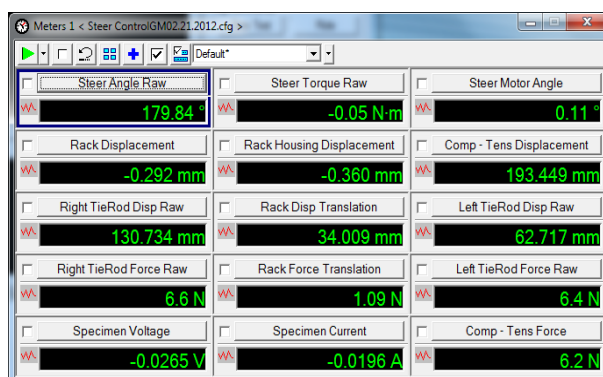


Figure 8: Meters 1 Setup to Display Typical Steering Signals of Interest during a Test in Real Time

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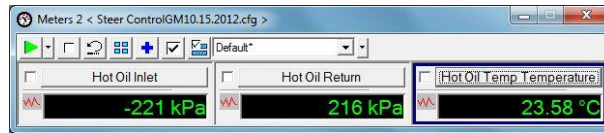


Figure 9: Meters 2 Setup to Display HPS-Specific Signals during a Test in Real Time (HPS-Capable Test Stand Only)

4.1.1.3 Define Test Specimen. Select a test specimen from the drop down specimens list in the Station Manager window (Figure 10). To define a new test specimen click the New Specimen icon, () and enter a specimen name in the specimen field (Figure 11). Click the Multi-Purpose Testware (MPT) Specimen Editor icon, () to open a separate window (Figure 12) to edit specimen information.

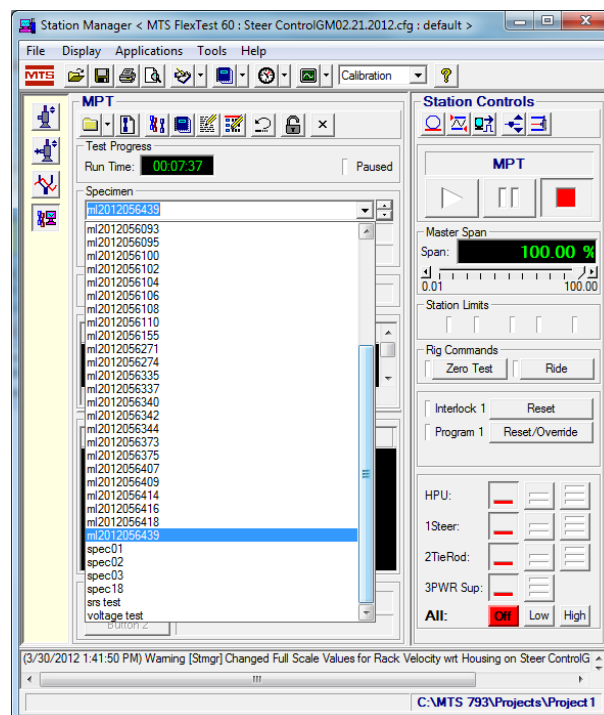


Figure 10: Specimens List

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