

TITLE: Establishing Control of the Wire Harness Testing Process

SYNOPSIS: *When operators are involved in the wire harness testing process, things can go wrong. Several approaches are available for gaining control of the testing process to minimize defects and maintain satisfied customers.*

One of the challenges in testing wire harnesses is maintaining control of the testing process. Typically, the testing process for wire harnesses is not fully automated. Operators connect an untested wire harness to the test fixture, and remove a tested wire harness from the test fixture. After a wire harness has been tested, it must be categorized as having passed or failed, and the operator must appropriately segregate the failed harnesses from the good ones. At times, an operator may fail to properly segregate a failed wire harness, causing significant problems downstream. Another potential problem occurs when an operator fails to wait until the test is completed and removes a partially tested wire harness from the test fixture. Selecting the wrong test program is also a potential problem.

Wire harness manufacturers who have several options available to them to control the testing process to minimize the possibility of intermingling defective wire harnesses with good ones. These methods include:

- Activating a fixture clamp when the wire harness has passed all tests
- Printing a label only when the wire harness has passed all tests
- Sounding an alarm if the operator removes the wire harness before the test is completed
- Ensuring that the operator cannot alter the test program

Activating a fixture clamp:

Many high-volume manufacturers use fixture clamps to prevent the operator from removing the wire harness before the tester has verified that all tests have passed. In this scenario, a defective wire harness can only be removed from the fixture through intervention of a supervisor or other authorized personnel. This results in improved quality control.

A fixture clamp is a device that provides a means of locking a wire harness connector in place while the wire harness is being tested. Most fixture clamp designs use a mechanical locking device that engages when a connector is inserted into a holder. When all tests have passed, an electric solenoid is used to release the connector at the end of the test. It is best to use fixture clamps that are closed and held by a mechanical latch and are opened by activation of an electrical solenoid. This ensures that the clamp will remain closed even if the power is disconnected.

It is important for the tester to be able to activate the solenoid via a control port. Here is a description of the operational scenario involving the use of a fixture clamp controlled by the tester:

- When the operator inserts the wire harness connector into the fixture block, the connector becomes mechanically locked in place.
- When the wire harness passes all tests, the tester activates the solenoid which releases the harness connector.
- If the wire harness is defective, and cannot be repaired, a supervisor or other authorized person can use a security override procedure that releases the fixture clamp, allowing the defective wire harness to be removed from the fixture.



Printing a Label:

Some wire harness testers can be programmed to interface to a label printer, causing a product label to be printed when a wire harness passes all tests. This is a superior method to using pre-printed labels. Using the tester to print a label when a wire harness passes all tests ensures that only good products receive labels. This assurance does not exist when using pre-printed labels. Using the tester to print labels also allows for dynamic data to be part of the label information, such as the current date and time, operator ID, and tester ID. When only good wire harnesses get labels, it simplifies the process of segregating good product from bad.

Sounding an Alarm:

Some wire harness testers may be programmed to enter into an alarm mode when a wire harness is removed from the test fixture before the tester has completed testing. While in the alarm mode, the tester would do the following:

- Stop testing
- Sound an audible alarm
- Display a message indicating early removal of the harness
- Require activation of a security override by a supervisor or other authorized personnel to deactivate the alarm

Once testing has begun, if the wire harness is removed before testing is completed the tester enters the alarm mode. The alarm mode aborts the test, sounds a continuous alarm, and displays a message indicating that the wire harness was removed before testing was completed. This behavior continues until an authorized person activates a security override procedure. It is important that the alarm mode cannot be cleared by cycling power on the tester.

Ensuring that the operator cannot alter the test program

To prevent problems associated with running the wrong test program, the tester must have the capability to lockout unauthorized personnel from selecting the test program. This ensures that once the proper test program has been selected, the operator cannot alter the selection.

Using one or more of these approaches can enable wire harness manufacturers to improve control of the quality of their products. It is important to use a wire harness tester that can support these capabilities.