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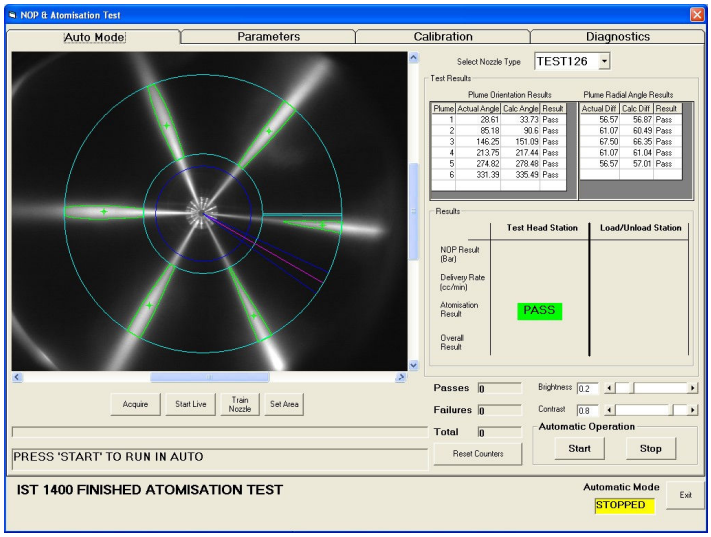
CURTIS NOP & ATOMISATION TEST MACHINE

Description:

Designed for measuring the pressure at which a diesel injector nozzle opens (NOP) and analysing the pattern and makeup of the injection plumes. The system is capable of testing numerous types of nozzles. Features include counting the number of plumes present, the angle from one plume to the next and the angle each plume makes with the feed hole. A PC based vision system acquires an image of the injection pattern at the moment of injection while an ICS3000 unit is used to measure the injection pressure. The system uses a two position dial plate to enable loading and unloading of components while another is under test. Upon analysis of the atomisation image and evaluation of the NOP result, the tested component is returned to the operator and a clear pass/fail indication provided.
All system parameters, limits pass/fail criteria and diagnostics functions are accessed via the touch screen HMI interface. All important features of the system are password protected to prevent unauthorised access. Full diagnostics functions are provided as are batch counters and calibration routines for all system transducers. A database is used to store test parameters and criteria so enabling the test parameters and criteria to be individually defined for each nozzle type.

NOP & Atomisation Test Machine



Screen Grab of Operator Interface

Operation:

The components are manually loaded into the dial plate where a manual orientation operation is carried out; when the orientation device has been replaced and the guard closed the component is indexed into the test fixture. Once under the test fixture, the component is clamped in place, the required load is applied to the lift pin and the system is purged ready for testing.

The Test Sequence:

The first test performed is the NOP test. This fires the nozzle a predefined number of times before taking an average for the NOP reading over a specified number of injections. The injection chamber is cleared of mist using an air purge ready for the atomisation test. During the atomisation test the pressure is gradually increased until the nozzle fires, at which point an image of the injection is captured. This is then automatically analysed to determine the atomisation part of the test result. Following completion of the atomisation test, the component is unclamped and indexed to the load/unload station where the operator is given a clear pass or fail indication.

Specifications:

NOP Measurement:

Measure NOP values up to 200 bar.
Measure the delivery rate
Measure the chatter

Atomisation:

Measure the Relative angle between plumes
Measure the absolute angle from the feed hole (requires nozzle orientation)
Count the number of plumes
Check for hosing injection holes

General:

Fluid Filtration of 3 microns
Fluid Temperature range between ambient and 50°C
Cycle time of 20 seconds
Capable of inspecting nozzles with up to 16 injection holes
Extensive diagnostics capabilities built in

The test fluid used is ISO 4113