



hartridge

Toledo HEUi Master

Advanced, Compact, All-Makes
Hydraulic Electronic Unit Injector Tester

HEUI
Testing
Made Easy

Unique
Patented
Technology

Touch
Screen
Software

Award
Winning
Platform



Key Features

- New Patented Technology
- New magmah^{Touch} Software
- Unique, Easy Injector Installation
- Comprehensive HEUI Parc Coverage
- Only Domestic Power Supply Needed
- Compact, Plug & Play Test Bench
- Trolley Available For Mobility In The Workshop

Simplified Usability



Flexible & Adaptable



Innovative Design



OE Heritage



HEUI Testing Made Easy

As a result of the ground up research & development process at Hartridge the Toledo HEUI Master combines the instantly recognisable and trusted platform from the Sabre CRi Master with brand new features developed specially for HEUI technology.

Thanks to the same exacting engineering principals stemming from our OE heritage we have developed a new platform which has unparalleled benefits for the workshop and covers most of the HEUI injector parc.

The Toledo focuses on ease of use at every stage so that a technician who is new to HEUI technology can effectively test injectors, as well as having more advanced settings available ready to progress as the workshop evolves.

Patented Technology

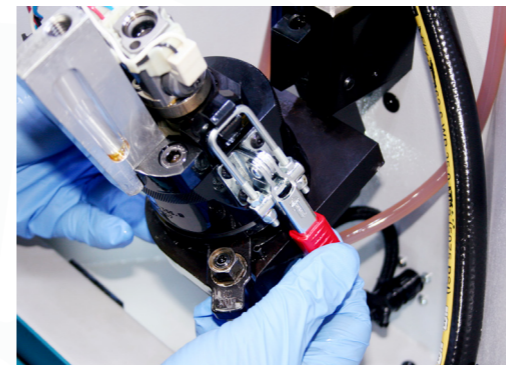
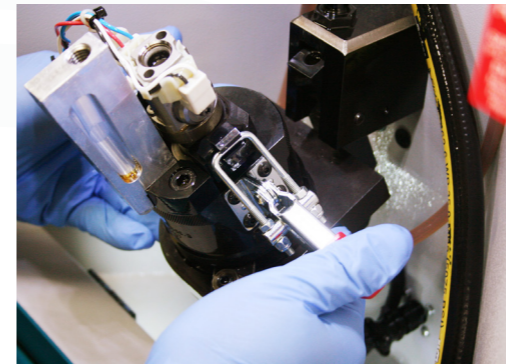
The Toledo HEUI Master incorporates multiple patents pending including innovations developed specifically for this machine, as well as patented technology from the Sabre CRi Master. The lower mount of the fixturing tilts forwards. This patent pending design makes it possible to fit the larger injectors in situ with ease. We also have developed a patent pending nozzle sealing tool which works with the injector applications to lift and place the nozzle sealing cap.

Unique Installation

Another patent pending feature is found in each application kit. Each injector is secured into place to fully seal the nozzle for testing thanks to two quick clamping levering arms. They help to ensure the injector is engaged quickly and released rapidly with the minimum of effort. The injector application kits devised for the Toledo HEUI Master use Hartridge's simplified click-in-place cabling and are tailored for both side feed and top feed injectors.

Splash Guarding

Testing HEUI injectors has historically been messy. Once they are out of place from the engine it results in lots of fluid being sprayed out during testing & can be problematic to control. Thanks to the splash guards in the application kits the testing fluid is directed down to the bottom of the testing chamber which flows directly back into the tank. These special adaptations make HEUI testing clean, easy and safe for the workshop and no wasted fluid means that just a 10L tank is sufficient.



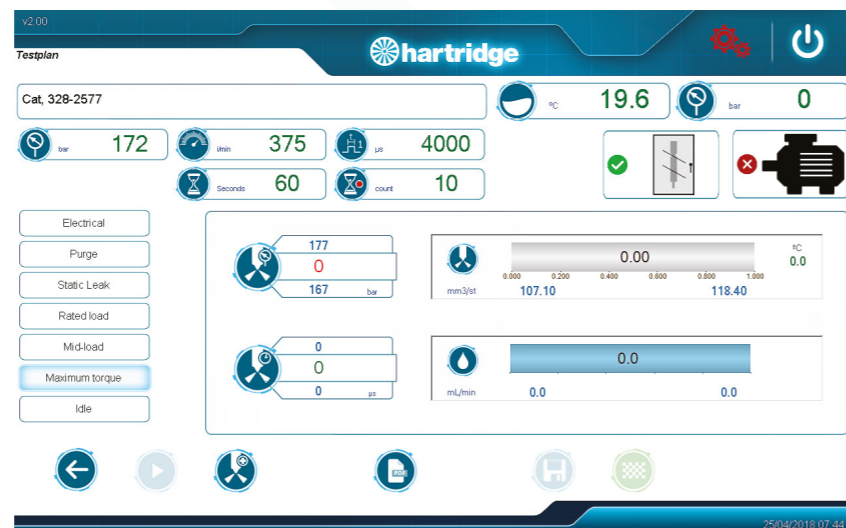
The quick clamping arms



The Toledo HEUI Master



The testing chamber



A test screen within the magmah^{Touch} software



The patent pending tilting injector mount

Application Kits

As part of our mission to make HEUI testing easy we have purposefully sought to develop the most possible cross over of injectors in our application kits. As a result only 7 application kits are required to test the majority of all HEUI injectors including:

- ✓ Ford Powerstroke 4.5L V6, 6.0L V8, 7.3L V8
- ✓ Navistar DT444E 7.3L
- ✓ Navistar DT446E 7.6L
- ✓ Navistar DT530E 8.7L
- ✓ Navistar DT570 & HT570 9.3L
- ✓ Navistar VT275 4.5L
- ✓ Navistar VT365 6.0L
- ✓ Isuzu 4JX1 3.1L
- ✓ Caterpillar 3408 18.0L
- ✓ Caterpillar 3412 27.0L
- ✓ Caterpillar 3116E 6.6L
- ✓ Caterpillar 3126A 7.2L
- ✓ Caterpillar 3126B 7.2L
- ✓ Caterpillar C7 7.2L
- ✓ Caterpillar C9 8.8L

Accessories also work across multiple kits to avoid unnecessary duplication. A benefit of having the hydraulic fuel & intensifier lines permanently connected to the unique fixturing as standard is that there are less components & cost for the workshop to invest in, as well as speed when installing the injector for testing.

Test plans

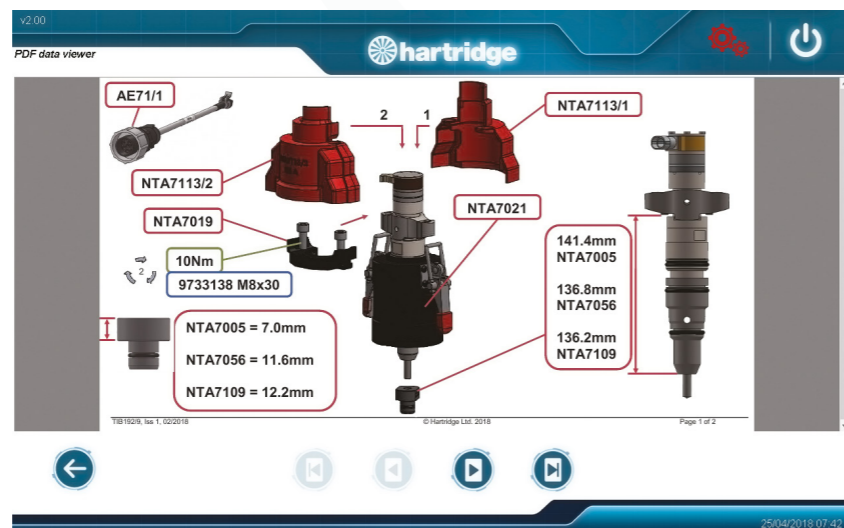
We have applied our decades of experience with OE test plan creation processes to develop test plans with validated limits for all test conditions and machine to machine repeatability. When testing an injector the technician has the ability to auto-run a full test, manually select single steps, skip test steps, or ask that the test stops should a test step fail providing ultimate control. Hartridge test plans provide comprehensive part number level coverage for a vast number of HEUI injectors.



Installing an injector

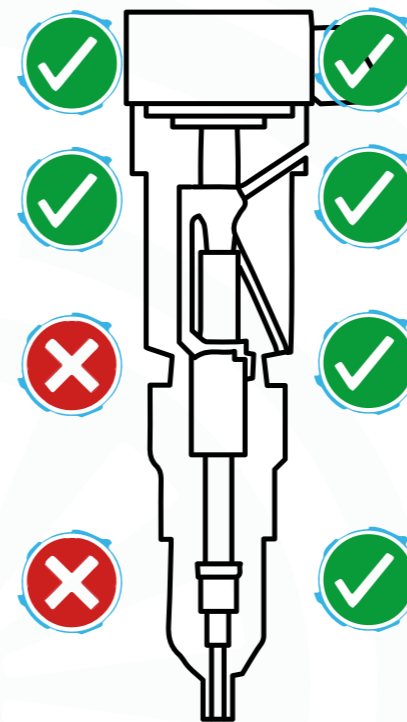


Components of the application kits



An in-screen guide to the application components required

Competitor Products vs Hartridge FERT



Internal events included in FERT

Intuitive Touch Screen

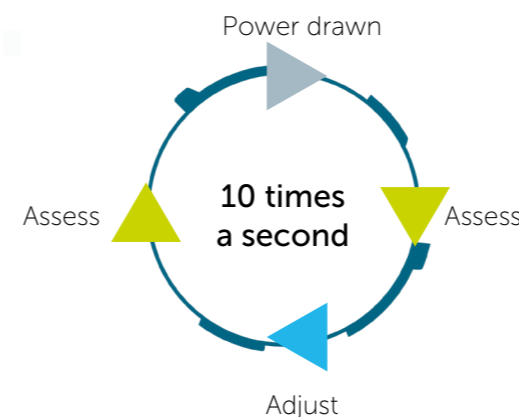
The Toledo is operated from a web enabled, app-style touch screen tablet with magmah^{Touch} software. The interface designed by Hartridge with unique programming and icons makes HEUI testing easy. Picture guides clearly show what tooling is required, and the rapid streamlined test plan selection method still allows the technician to customise a test if required. The software provides a dynamic real-time view of the test progress, and can save test results for later use.

Closed-Loop Technology

Hartridge's unique, patented Closed-Loop technology constantly monitors the power used by the internal pump 10 times a second to make sure the Toledo's operation remains stable, & that full power of the pump is available to maximise flow output at high pressures. Not only does it ensure that the power draw is constantly balanced, but it means the Toledo HEUI Master can be powered by domestic power supplies making installation & use in the workshop straightforward & instant.

FERT Testing

Unlike other methods of measuring injector response time which only monitor electrical signals to determine solenoid actuation, Hartridge measures the Full Event Response Time (FERT). FERT testing gives you a complete view of the response time of the injector from electrical activation to the injection event. Using Hartridge test plans FERT has the advantage of helping to identify a fault that would otherwise be left undiagnosed, despite fuel delivery tests being within limits.



The patented Closed-Loop cycle



Intuitive operation of the Toledo HEUI Master

Specification



Installation Requirements

Two domestic electrical mains connections are required:

- High voltage: 1 of 200-240 Vac (10amps) & 1 of 200-240 Vac (16amps)
- Low voltage: 1 of 100-120 vac (10amps) & 1 of 200-240 Vac (16amps)

The machine weighs 160kg fully loaded with calibration fluid, & 150kg dry. You must use Hartridge specified fluid Rock Valley C3112 Type 2 which is available from Hartridge with part number 8802010. Dimensions are 610mm (W), 610mm (D), & 1100mm (H)



Technical Specification

- Intensifier Pressure Control: 20-280 bar
- Injected Fuel Pressure Control: 3 bar (fixed)
- Injection Speed: 120-1300 ipm
- Pulse Width: 100-4000 μ S
- Tank capacity: 10 litres
- Tank filtration: 2 front mounted fuel filters
- Fluid cooling: Air-to-oil heat exchangers

Injector Measurements

- Injector Coil Resistance: 0-200 Ω
- Injector Inductance: 0-20 mH
- Response time measurements: 0-999 μ S
- Spill/Return flow: 0-2000 cc/min
- Delivery measurements: 0-400 mm³/str



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Continuous development is taking place. Hartridge reserves the right to alter the design &/or specification without prior notice.
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