



hartridge

Sabre CRi Expert

Advanced, Compact, All-Makes
Common Rail Injector Tester

NEW
High
Pressure

New
Advanced
Software

Unique
Patented
Technology

Award
Winning
Platform





The Sabre CRi Expert

Key Features Overview

- Up to 2700 bar pressure
- High flow output for heavy duty CR testing
- Smarter pay-as-you-go licencing
- New magmah^{Touch} software
- Patented Closed-Loop power management
- Advanced temperature monitoring
- Comprehensive test plan database
- Expert level testing

Simplified Usability



Flexible & Adaptable



Innovative Design



OE Heritage



Future Ready Testing

The new Sabre CRi Expert is a progression of the Sabre platform. The Expert model isn't replacing the Master model, but instead opens up other opportunities for a workshop to advance & grow on a platform which is centred on easy use throughout.

A number of components within this award winning, compact platform are unique to the Sabre CRi Expert; setting it apart while retaining its roots as a firm workshop favourite. New features and functions have been engineered from the ground up to provide a future ready testing solution that stays ahead of the market.



Touch screen operated



Expert diagnostic testing opportunities for the workshop



Injector & application installed

New Software Developed

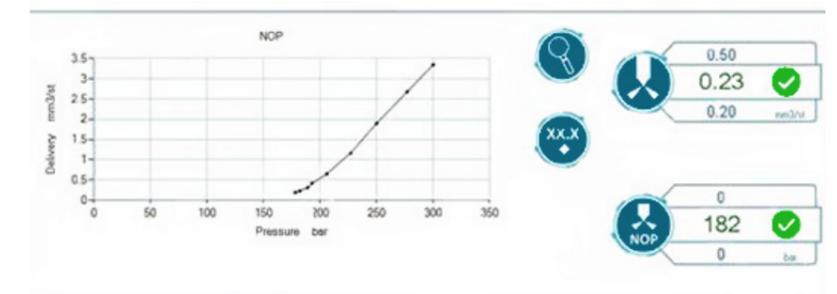
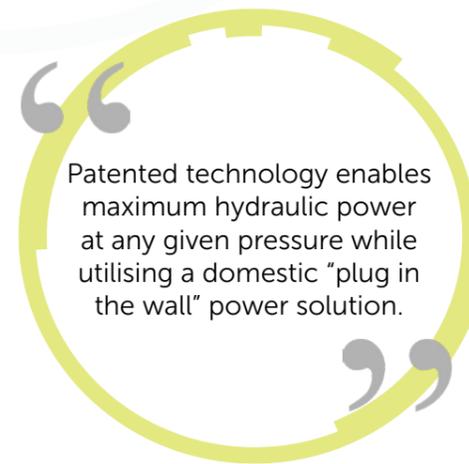
Hartridge has developed brand new, next generation magmah software for the Sabre CRi platform. The magmah^{Touch} software is so intuitive that even a brand new user can achieve a superior level of injector testing. The software shows the technician dynamic, real-time testing, on-board machine diagnostics, and new test plan tools. Thanks to unprecedented levels of customisation for the workshop, the magmah^{Touch} software can evolve as the business evolves. The magmah^{Touch} licence is completely free and fully supported for the lifetime of the machine.

Advanced Test Steps

Built into the software are a number of additional test steps to offer further levels of expert diagnostics for the latest high pressure applications. **Nozzle Opening Pressure (NOP)** checks for correct mechanical function of the nozzle to open at the required pressure to achieve the intended atomisation.

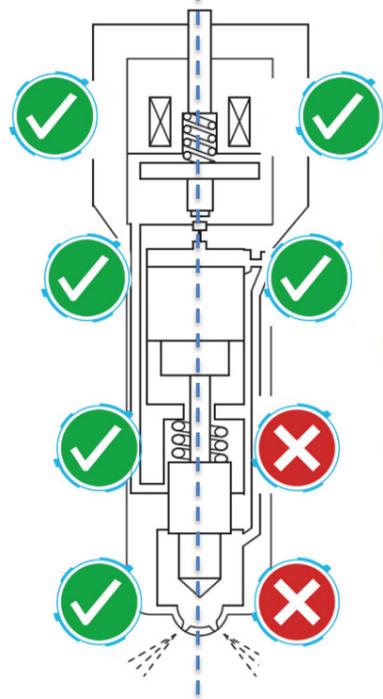
Minimum Drive Pulse (MDP) is a dynamic delivery sweep test that provides the MDP measurement & also the ability to determine the profile of the delivery curve thanks to the new graph functions implemented into the magmah^{Touch} software.

Specific testing has also been developed for the new internal pressure sensor in **Denso's latest injector technology, i-ART**, measuring the fluctuations of pressure to ensure accurate testing. Thanks to these enhanced features the workshop can offer a wider range of services.



Graphs are plotted in real time during the test

Hartridge Competitor FERT Products



The Sabre CRi Expert includes these events in testing

High Pressure Capability

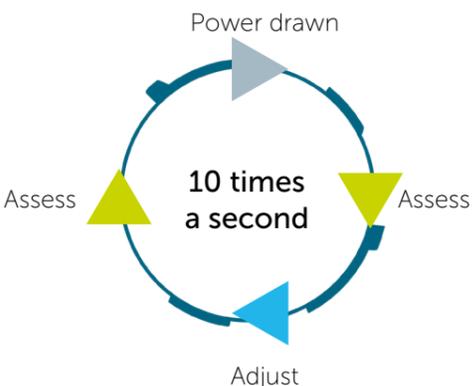
The powerful pump and rail within this compact solution generates 2700 bar. A range of unique features provide stable performance at high pressure. As a result the available flow also allows for testing injectors that require high flow but not high pressure. The Sabre CRi Expert is capable of testing upcoming high pressure injectors including Euro 6 heavy duty Delphi F2X injectors, Euro 4 Delphi Smart, Bosch 117 family, Bosch CRIN twin coil injectors, and Denso i-ART. The workshop can be ready for the future of injection technology and maximise the return on investment.

Full Event Response Time (FERT)

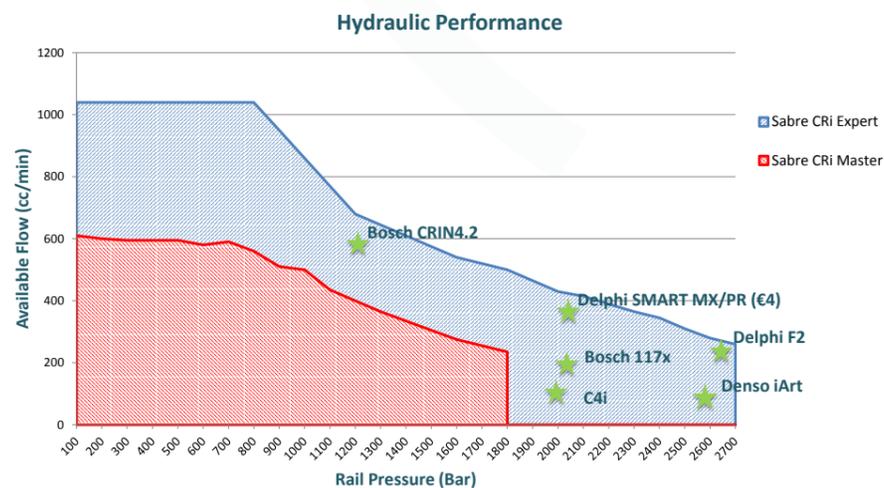
Unlike other methods of measuring injector response time which only monitor electrical signals to determine solenoid actuation, Hartridge measures the full event. FERT includes all internal elements of the injector to give you a complete view of the response time of the injector from electrical activation to the injection event.

Patented Closed-Loop Technology

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



Patented Closed-Loop Technology



High pressure & high flow capability for heavy duty common rail testing



An award winning platform



Select advanced test steps easily

Injector Coding

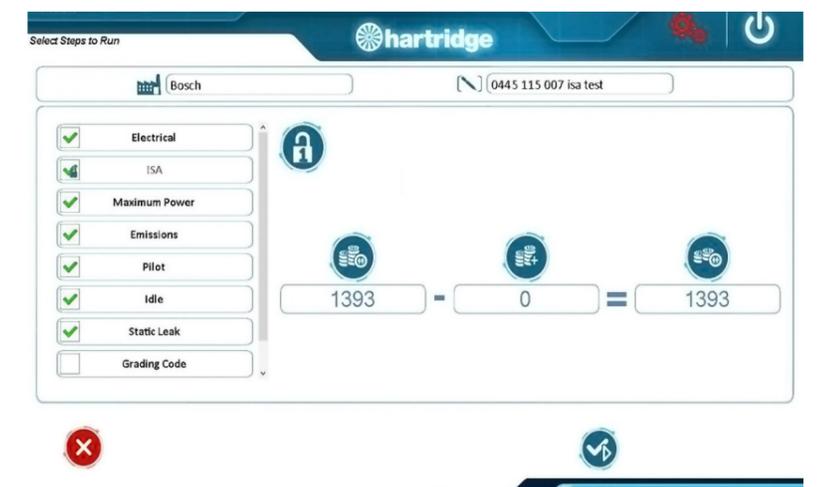
Hartridge coding is derived from our rigorous testing development process to generate coding with validated parameters. For easy and fast testing in the workshop the software locks in the mandatory test steps required to generate coding for that injector. The resulting code is a part of test results document which can be saved in the software.

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. A full test is fast, typically around 5-6 minutes for a standard test. If advanced steps are added the time will increase by approx. 1 minute per step. There are various testing modes which make testing straight forward for a new user or more customisable for advanced use. Many test plans are provided unlocked on the machine, additional test plans are purchased with the credit system

Smarter Licencing

The Sabre CRi Expert is now more flexible than ever with new pay-as-you-go functionality. The workshop can now unlock functions, test steps, and coding only when they need to & do not need to pay for functionality they wouldn't use. The uploading of credit bundles is secure and unique to your machine; ensuring the user has a ready supply of credits to unlock functions as needed & maintain smooth operation in the workshop.



Smarter licencing allows the user to unlock only what they need

Specification



Door safety interlocks

Installation Requirements

Two domestic electrical mains connections are required:

- Machine input: 100-120Vac, or 200-240Vac, 50/60Hz (either supply must be capable of 10amps)
- Motor input: 200-240Vac, 50/60Hz (15amps)

You must use Hartridge ISO4113-AW2 calibration fluid with the protective Antiwear 2 properties. Dimensions are 610mm (W), 610mm (D), & 1100mm (H). The machine weighs 145kg unladen.

Technical Specification

- | | |
|-----------------------------|----------------------------|
| • Rail pressure: | 1-2700 bar |
| • Injection speed: | 120-3000 inj/m |
| • Pulse width: | 0-4000 μ S |
| • Time delay: | 0-600 seconds |
| • Tank capacity: | 10 litres |
| • Tank filtration: | 2 μ m |
| • Metering unit filtration: | 60 μ m |
| • Backleak filtration: | 7 μ m |
| • High pressure flow: | 1050-250 cc/min |
| • Fluid cooling: | Air-to-oil heat exchangers |
| • Coil Drive: | Twin coil |



Simplified click in place application

Injector Measurements

- | | |
|-------------------------------------|------------------------------|
| • Coil resistance: | 0-200 Ω |
| • Inductance (coil injectors only): | 0-20 mH |
| • Capacitance (piezo injectors): | 0-12 μ F |
| • Response time measurements: | 0-999 μ S |
| • Backleak flow measurements: | 0-1800 mL/min |
| • Delivery measurements: | 0.2-400 mm ³ /str |
| • Backleak temperature: | 0-180°C |

For technical specification of the Sabre CRi Master please refer to the brochure for the Sabre CRi Master

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Continuous development is taking place. Hartridge reserves the right to alter the design &/or specification without prior notice.
Hartridge 2018 / Sabre CRi Expert V1.0



You must use the correct protective fluid for testing- ISO4113-AW2