

HEUI Fuel Systems



The revolutionary HEUI injector design is critical to the precision, performance, economy and proven reliability of the HEUI Fuel System.

Advanced technology yields higher performance

The HEUI (Hydraulically Actuated Electronically Controlled Unit Injector) Fuel System represents one of the most significant innovations in diesel engine technology in decades. HEUI surpasses many of the limitations of mechanical and conventional electronic injectors, and sets new standards for fuel efficiency, reliability and emission control.

Available as standard equipment on an ever-widening range of Cat® Engines and machines, the highly sophisticated HEUI system uses hydraulic energy instead of mechanical energy to operate fuel injectors. Working in tandem with the engine's ECM (Electronic Control Module), the HEUI system provides extremely precise control of fuel metering and timing, resulting in unmatched engine performance and economy.



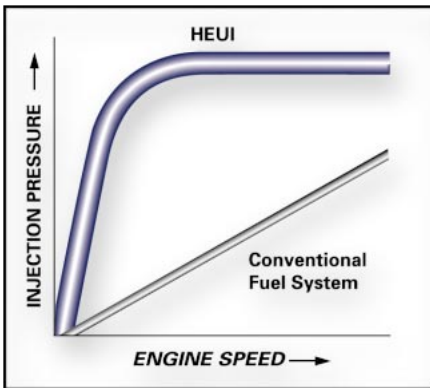
HEUI Fuel Systems

Meeting the demand for lower emissions, better fuel economy and higher performance.

HEUI injector technology is changing the way equipment owners, technicians and operators think about diesel engine performance. HEUI performance surpasses mechanical unit injectors and conventional electronic unit injectors, bringing new value to your investment in Cat Engines and machines.

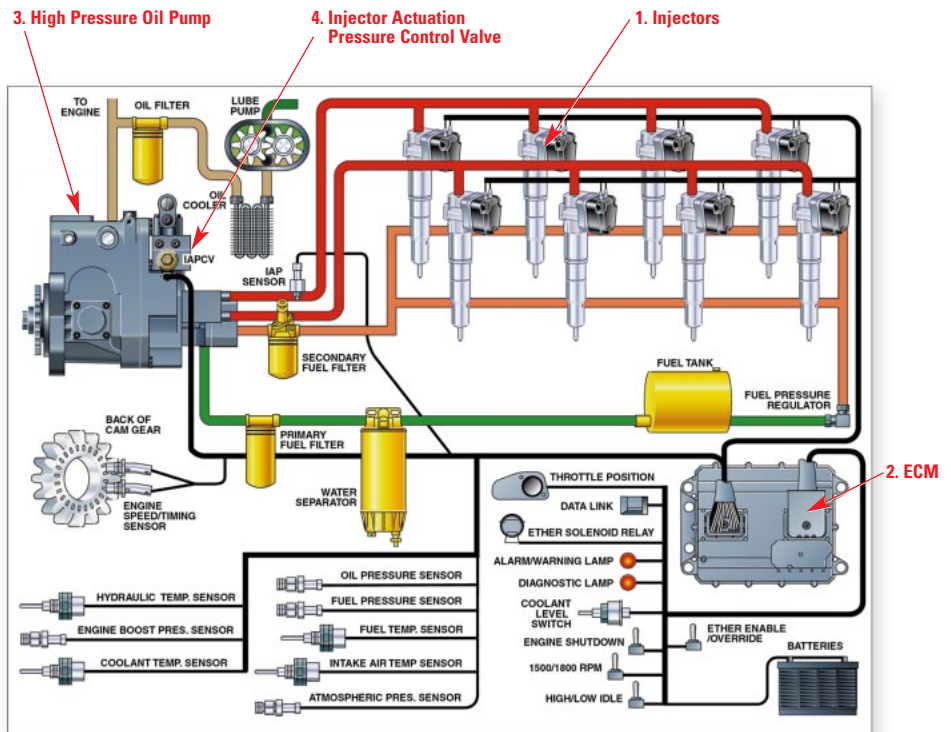
Precise injection pressure at any engine speed

In the traditional common rail fuel system, the entire fuel line is under high pressure. With the HEUI system, fuel remains at low pressure until it is injected into the cylinder. Fuel pressure is created hydraulically in response to a signal from the Electronic Control Module (ECM).



Injection pressure in a HEUI fuel system is independent of engine speed.

HEUI controls injection pressure electronically. This unique capability means the regulation of injection pressure is completely independent of crankshaft speed. Peak injection pressure can be achieved under acceleration and lug conditions, providing better fuel economy, better response and reduced smoke.



Four basic components work together to bring precision, reliability and simplified maintenance to the HEUI fuel system.

A close look at the HEUI System

The HEUI fuel system consists of four basic components:

1. HEUI Injector Uses hydraulic energy (as opposed to mechanical energy from the engine camshaft) from pressurized engine lube oil for injection. The pressure of the incoming oil (800 to 3300 psi) controls the rate of injection, while the amount of fuel injected is determined by the ECM.

2. Electronic Control Module (ECM) This sophisticated on-board computer precisely manages fuel injection and other engine systems. The HEUI injector solenoid is energized by an electronic signal generated in the ECM. Using input from multiple sensors, the ECM's dual microprocessors use proprietary software and customer-supplied performance parameters to produce maximum engine performance under any conditions.

3. High Pressure Oil Pump The variable displacement axial pump features a built-in reservoir to immediately supply oil at cold starts.

4. Injector Actuation Pressure Control Valve This electronically operated valve controls oil pump output and injection pressure.

HEUI brings new value to your engine and equipment investment.

Improved response Engines equipped with HEUI injectors have outstanding response and improved high altitude operation.

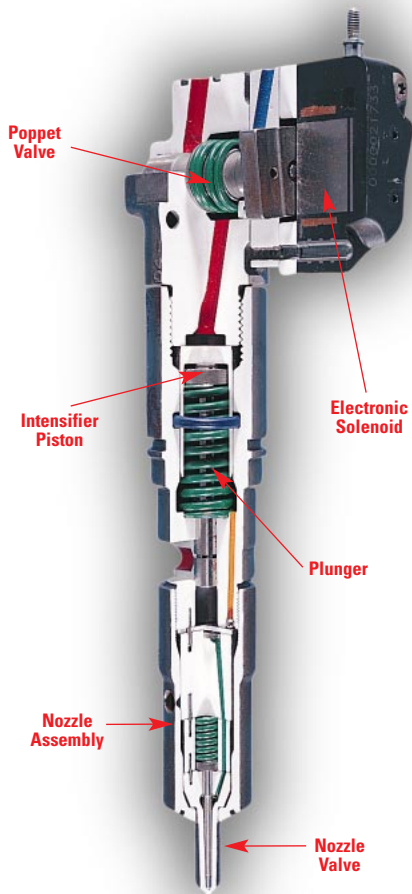
Improved fuel economy The ability to inject fuel at any crank angle results in up to 2.7 percent better fuel economy compared to scroll mechanical injectors. Optimum fuel economy also means reduced gaseous emissions and less white smoke during cold engine starts.

Optimum performance The control of fuel delivered during ignition delay and main injection, known as rate shaping, is made possible by the HEUI's ability to operate independent of engine speed. Rate shaping modifies engine heat release characteristics, which also helps reduce emission and noise levels. Rate shaping optimizes engine performance by varying the idle and light load rate characteristics independent of rated and high load conditions.

Reduced smoke and particulate emissions

Since the HEUI injector's performance does not depend on engine speed, it can maintain high injection pressures through a wide operating range. Electronic control of these pressures helps improve emissions and low-speed engine response.

Reduced engine noise A split injection feature leads to a more controlled fuel burn and lower noise levels. Additional benefits include reduced shock loads as well as less wear and tear on drive train components.



HIA450 HEUI Injector

Reman HEUI injectors are as good as new, as strong as ever

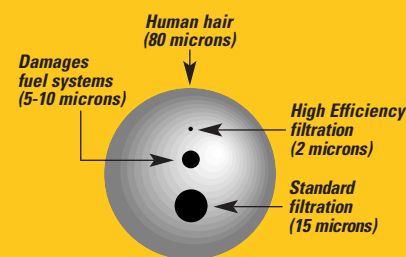
Caterpillar's remanufacturing process returns used injector components to their original performance specifications using state-of-the-art salvage techniques, strict reuse guidelines, advanced manufacturing systems and unequalled quality control. Testing is an important part of the process. Qualified technicians utilize the same kinds of sophisticated equipment used to audit the quality of new components. Caterpillar's substantial investment in state-of-the-art measuring technology ensures that the most exacting standards are met.

Protect your HEUI Fuel System with Cat High Efficiency Fuel Filters

Exclusive features like spiral roving, acrylic beads and a non-metallic center tube help Cat High Efficiency Fuel Filters protect your engine against damaging fuel contamination.

Today's Cat Engines deliver more horsepower, quicker response and better fuel economy than ever. But these precision components are also more susceptible to wear and damage from fuel system contaminants. In fact, the number one cause of premature fuel system wear is abrasive particles smaller than 10 microns.

Cat High Efficiency Fuel Filters are designed with a super-fine filtration media that removes more than 98 percent of particles 2 microns and larger. More contaminants are removed, which maximizes protection of injectors, pumps and other fuel system components.



WE'RE COMMITTED TO SERVICE AND SUPPORT

When your Cat engine needs service, our professional technicians have the training and tools to get you back to work fast. Off-the-shelf component availability is backed by the Caterpillar worldwide parts network.

Give us a call or stop by our parts counter. We'll show you how we can help lower your owning and operating costs with the highest quality engine components, a wide range of Cat Reman components, and the most comprehensive service and support available.

