

# SOLAS Retrofit Solutions

Available at your Cat® Dealer



## The difference is protection

- The International Convention of Safety of Life at Sea (SOLAS) provides a series of regulations designed to improve the safety of shipping—including measures to reduce the risk of fire in marine engines.
- Strict enforcement of these regulations for all ships in service, regardless of build date, went into effect July 1, 2003. Ships are being searched randomly and, if found non-compliant, aren't allowed to enter or leave port.
- To help you maintain your current vessel certification, have free access to all ports and continue safe operations, **we offer three retrofit solutions to meet SOLAS regulations—double-walled lines, hot surface insulation and improved joint screening.**

Caterpillar. The difference counts.™

Cat Dealers define world-class product support. We offer you the right parts and service solutions, when and where you need them.

The Cat Dealer network of highly trained experts keeps your entire fleet up and running to maximize your equipment investments.

**CATERPILLAR®**

# SOLAS Retrofit Solutions



The goal of SOLAS regulations is to prevent fires in the engine room by keeping fuel or oil leaks from being sprayed directly onto any hot surface. To do so, they require marine engines to have:

- Double-walled fuel and oil lines with leak collection and alarm systems
- Insulation of hot surfaces
- Screening of joints and flanges for low-pressure piping

Our retrofit solutions are designed to meet these regulations for all your Caterpillar brands of marine engines—so you can get back to work quickly and safely.

Retrofit solutions vary depending on the type of engine—electronic or mechanical. Both types require joint screening and may require hot surface insulation. Mechanical engines require double-walled lines.

*Mechanical engine*



## Double-walled fuel or oil lines\*

- Protects all external high-pressure fuel or oil delivery lines between the pumps and injectors with a jacketed piping system, which is capable of containing fuel or oil from a high-pressure failure
- Features an outer pipe into which the high-pressure fuel pipe is placed, forming a permanent assembly
- Includes a leakage collection system with an alarm
- Meets SOLAS regulation 15.2.9

*Mechanical or Electronic engine*



## Improved joint screening

- Screens low-pressure oil and fuel lines to prevent leaks from spraying hot surfaces, machinery intakes or other sources of ignition
- Meets SOLAS regulation 15.2.11

*Mechanical or Electronic engine*



## Hot surface insulation

- Insulates all surfaces with temperatures above 220°C (428°F), which can be impinged as a result of a fuel system failure
- Insulates the turbocharger exhaust casing when the turbocharger exceeds temperatures of 220°C (428°F)—If the compressor doesn't exceed the temperature limit, insulation is not needed
- Meets SOLAS regulation 15.2.10

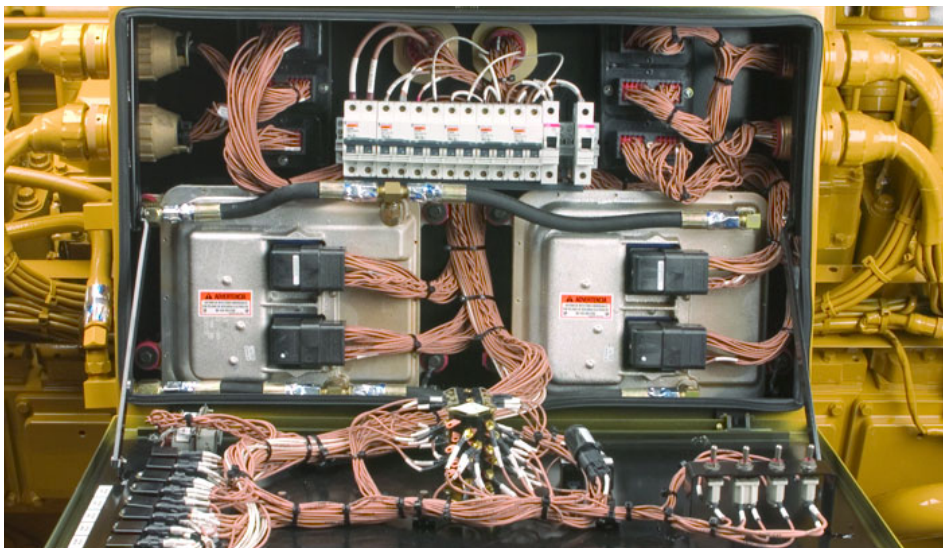
\* Note: Double-walled lines are not required for any engine below a 375 kW rating if it was built before July 1, 1998. All engines with high-pressure fuel or oil lines installed after July 1, 1998, do require double-walled fuel lines. Some Cat engines (D346, D348, D349, D353, and 3126B) don't have all the components necessary to meet this regulation. We'll work with you on a case-by-case basis to develop a solution.

# SOLAS Retrofit for Electronic Engines



## Joint screening on oil and fuel lines

- Due to lower operating pressure, all oil and fuel filter bases, fuel-priming pumps and oil-sump connections require joint screening.



## Joint screening on electronic control module

- Microcomputer systems must be protected to control the heat flow.
- Low-pressure fuel cools the electronic control module.
- Heat is generated from an electrical current going to the solenoid. Joint screening protects the analog and/or digital electronics of the microcomputer.

Electronic engines are made up of countless analog and digital electronics, all of which are elements of the circuit. Operationally, this affects the memory elements, the design and application of assembly for all of the computer hardware and software as well as the structure of the microcomputer. It is essential that the electronic engine have the joint screening on all oil and fuel lines retrofitted, as well as the electronic control module.

As heat is generated from the circuit current going to the solenoid, the electronic control module requires joint screening to protect it by redirecting a possible leak or spray away from the electronic control module. This ensures:

- Elements and circuit stay operational
- Electronic hardware and microcomputer software is protected
- Vessel is compliant with regulations

# SOLAS Retrofit for Mechanical Engines



The mechanical engine has many factors that affect the performance and safety of the engine. Positioning, velocity, acceleration, material behavior during heat transfer and reaction during stress and strain determine the performance of the mechanical engine. During heat transfer there is a dynamic flow motion of oil and fuel. By double-walling the oil and fuel lines and screening low-pressure lines, you protect against ignition caused by high pressure leaks and sprays and against contact with hot surface areas causing combustion.

## Double-walled oil and fuel lines and joint screening

- Double-walled lines contain high-pressure fluids going into the cylinders. Turbulent flow motion mandates this jacketed piping system which protects high pressure flow motion from failure.
- Double-walled lines with leaking fluid will flow the leakage down to a drain line and capture the excess. An alarm sounds when contents reach certain levels.
- Low-pressure lines going to and from the filter are screened to prevent leaks or sprays near hot surfaces which can cause ignition.

As your Cat Dealer, we can service Caterpillar and other brands of marine engines. Some of these retrofit solutions may differ slightly depending on the size and type of your engine.

For more information about SOLAS regulations, enforcement and our retrofit solutions, please contact us today.

**CATERPILLAR®**