



Variable Injection Timing



Safety improvement

- Reliable engine operation
- Returning to safe position in case of VIT malfunction
- Secured spare part supply

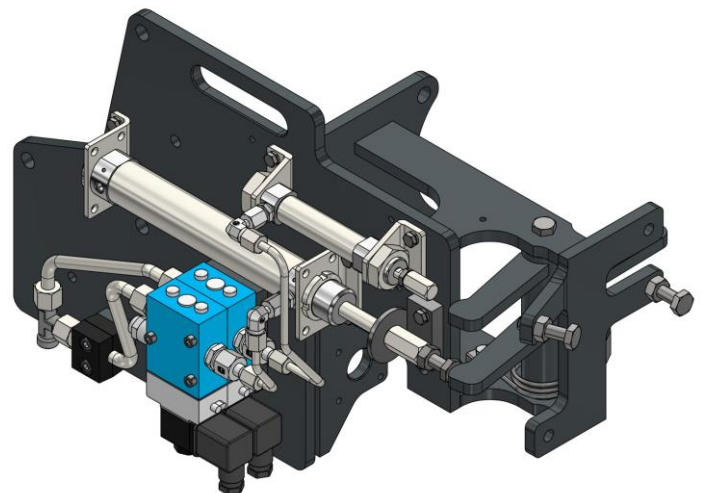


Other Benefits

- Possibility to optimize fuel consumption for 50%-70% load
- Fully integration in existing automation system
- Engine only remains IMO compliant with a fully functional VIT system

How the Solution works

- Electric VIT is replaced by pneumatic VIT
- Pneumatic Actuators apply pressure on a control piston located at the fuel camshaft, utilizing the engines compressed air system
- A helical gear converts the linear motion of the control piston into rotational movement of the camshaft
- This allows for slight adjustments to the injection timing, depending on the engine's operational load
- If no actuator is activated, the VIT automatically moves to a safe position
- This prevents damage for engine components in case of malfunctions
- IMO emission certificate for the engines fuel injection timing and set points must not be renewed
- Optional: Anti Twist Modification applicable to increase lifespan of axial seals



For further information:

Should you have any queries, our Retrofit & Upgrades team will be pleased to be of assistance.

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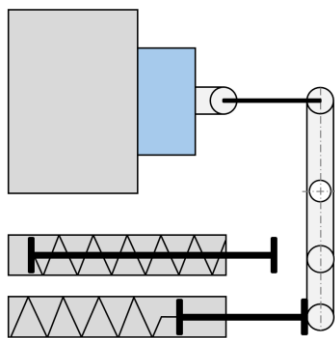
retrofit4s@everllence.com

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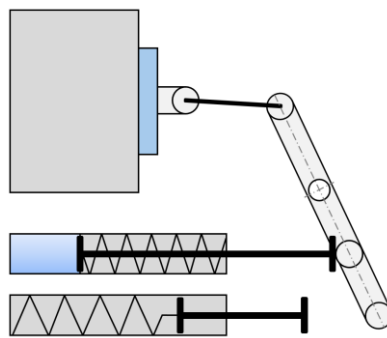


Comparison of VIT set points to safe position

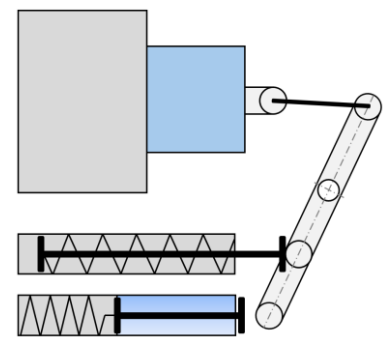
Ignition Timing	early adjustment	late adjustment
Load steps	high load (e.g. above 85% load)	engine start, low load and part load
Firing pressure	higher	lower
Fuel consumption	lower	slightly increased
NOx emissions	slightly increased	lower
Carbon Dioxid emissions	lower	slightly increased
Exhaust gas temperature	lower	higher



Safe position



Early adjustment



Late adjustment

Scope of Supply

- VIT unit with connection plate, pneumatic actuators and valves
- New VIT controller interface
- Piping for connection to engines compressed air system
- Set of cabling and installation material

Modern Technology Standard

- VIT is the primary load optimization for conventional injection
- Pneumatic VIT is the latest technology on all new engines with a conventional injection system

Field Proven

- More than 150 VIT's have been installed successfully until Q1/2025

MAN Energy Solutions is now:

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