The Wärtsilä RTA injection timing automation (RITA) system provides automated realtime adjustment of the cylinder firing pressures to the optimal set-point. This can mean up to 1.5% fuel savings.

Key benefits of RITA
- Up to 1.5% fuel savings
- Automated ‘closed loop’ control
- Adjustment of maximal firing pressures according to load and ambient conditions
- Operation within design criteria (according to IMO emission regulations)
- Easy to install

Vessel operation today is focused on the reduction of fuel oil consumption and ensuring compliance with current emission legislation, while minimising maintenance effort. RTA type two-stroke diesel engines are operated in a so-called ‘open loop’ control, requiring manual adjustments of injection timing by means of a Fuel Quality Setting (FQS). This calls for frequent measurements of cylinder pressure and performance data (e.g. after a new fuel was bunkered or after an engine overhaul) by the crew on board the vessel. These manual adjustments are often not done on a regular basis. Consequently, the engine does not operate at its optimal point, resulting in higher-than-optimal fuel oil consumption.

Optimal performance in all conditions
Wärtsilä RTA injection timing automation system ensures that the engine is operated according to its original shop test performance. The permanently working ‘closed loop’ control allows the engine to run at its optimal set-point. The system works automatically in real time, and is independent of the fuel used and the ambient conditions on board.

Firing pressure adjustment
The optimal firing pressure set-point is calculated to match site conditions at each actual operating point of the engine. This ensures that cylinder pressure is adjusted according to the design criteria, and the engine is not overloaded while full fuel saving potential is exploited.

Adaptation to changes
Real-time adaptation to climate and day/night changes is handled via additional temperature and pressure sensors installed upstream of the turbocharger compressor and in the scavenge air receiver.
“The most important benefit that we gained is that we achieved the expected 1.5% reduction of fuel consumption. Both the simplicity of the system and the fact that it gives us a clear understanding of the fuel saving function are truly positive. This solution supports us in our efforts to optimise the operational costs of the engines by reducing the fuel consumption. Would we recommend other ship owners to do a similar installation? Yes, without a doubt.”

Fleet Manager
Columbus Shipmanagement, a daughter company of Hamburg Süd

Estimated savings

**MV “B” 9RTA96C-B (51’480KW@102RPM)**

The calculation of potential fuel savings is based on performance measurements and the load profile of the engine.

**LOAD OPERATING PROFILE:**
- 25% of the time at 25% engine load
- 35% of the time at 50% engine load
- 15% of the time at 70% engine load

In total 6,000 hrs/year (Fuel cost 400 US$/ton)

<table>
<thead>
<tr>
<th>Engine Load</th>
<th>rpm</th>
<th>Hours Year</th>
<th>Savings Hour (liter)</th>
<th>Savings Year (ton)</th>
<th>Savings US$</th>
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<tbody>
<tr>
<td>25%</td>
<td>62</td>
<td>1’800</td>
<td>45</td>
<td>77</td>
<td>30’800</td>
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<tr>
<td>50%</td>
<td>82</td>
<td>2’200</td>
<td>30</td>
<td>63</td>
<td>25’200</td>
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<tr>
<td>70%</td>
<td>84</td>
<td>1’000</td>
<td>10</td>
<td>9</td>
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<tr>
<td>75%</td>
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</table>

**CONCLUSIONS**

MV “B” Savings are well over 59,000 US$/year.
The total savings for the considered fleet (9x 9RTA96C-B) are **531,000 US$/year**

Expected payback period 11 months