Bergen 17.04.2026

SERVICE BULLETIN – SAFETY ALERT

Subject: Issues related to Lifeboat diesel engines and prolonged runtime at no-load or low load conditions.

Applies to: Sabb Lister L3 /L4 / L4T / Sabb Iveco N45-100hp N67-150 & 280 hp.
Also valid for lifeboat engines in general.

Field experience from extensive collaboration with operators:

Between 2012 and 2025, Frydenbø and operators on the Norwegian continental shelf conducted an extensive collaboration to improve the safety, performance, and reliability of lifeboat engines.

Lack of load during routine testing led to degraded engine performance and increased risk of failure.

- Testing confirmed that engines must run at a minimum of 50% load for 15 minutes (within a 25-minute test cycle) to maintain condition and performance.

Inspections and tests revealed that routine no-load testing over time, combined with unsuitable fuel, had resulted in the following engine condition:

- Severe soot accumulation and seized turbochargers
- Corrosion on critical components
- Stuck injection parts (pumps/injectors)
- Reduced engine power (up to 25%)
- Seized wastegates in turbochargers (will not open at high turbo pressure / can damage the engine).
- Poor or lacking movement in injection equipment and throttle mechanisms, affecting fuel injection and engine response/effect.
- Variable external condition of injectors, which did not necessarily reflect potentially poor internal condition due to "IDID" (Internal Diesel Injector Deposits).
- Deteriorated engine condition; Corrosion, scoring, polishing, and wear in cylinder liners, indicating unfit maintenance routines (no load capability).
- Lack of engine power, which reduced the reliability and performance of the engines during emergencies

Background facts

Marine diesel engines and diesel engines in general, are constructed in such a manner that they require load to maintain good internal working conditions. Sufficient loading of the engine ensures correct temperature and pressure for the combustion process, minimizing the risk of deposits from unburned fuel and securing a cleaner engine internal environment.

Low load and in particular no load on a diesel engine will eventually lead to several critical issues, including soot deposits, bore glazing, and oil retention loss, which can significantly affect engine performance and longevity.

Common Problems of operating a diesel engine without load or at low load:

Carbon buildup and soot deposits:
Diesel engines operated at low loads (typically below 30-40% of their rated capacity), cause incomplete combustion, leading to unburned fuel and soot accumulation in the cylinders and on the turbocharger. This buildup will over time restrict airflow and reduce engine efficiency and may potentially result in costly repairs.

Wet Stacking:
This condition occurs when unburned fuel accumulates in the exhaust system due to insufficient combustion temperatures when the engine is not running at optimal load.
Wet stacking can damage turbochargers and exhaust valves, leading to further operational issues if not addressed.

Low Cylinder Pressure:
Low load operation results in inadequate cylinder pressure, which exacerbates poor combustion. This can create a cycle where soot and unburned fuel clog piston rings, worsening the low-pressure problem.

Bore Glazing:
Low load operation can cause the cylinder walls to become glazed due to insufficient friction between the piston rings and the cylinder liner. Hot combustion gases escape past the piston rings, burning the oil on the cylinder walls and creates a smooth, enamel-like glaze that prevents proper lubrication. Eventually this can lead to oil control issues, leading to increased wear and oil consumption and resulting in a loss of compression and power.

Oil Leakage:
High crankcase pressure resulting from low load can cause oil to leak from seals and gaskets, particularly at the front and rear crankshaft seals. This is often due to poor sealing of the piston rings, which fail to maintain proper cylinder pressure.

Loss of Oil Retention:
When engines run at low loads for extended periods, the oil may not circulate effectively, leading to a drop in oil retention between the cylinder walls and piston rings. This can cause starting problems and further loss of power.

Exhaust system/piping:
Operating at low load causes accumulation of soot in the exhaust system & pipes that increases risk of chimney fire. Acid and corrosive environment will over time increase the risk of exhaust leakages inside the lifeboat.

Maintenance Concerns and Recommendations:

Regular maintenance and monitoring are essential to mitigate the effects of running at no or low load. Operators should be aware of the symptoms and take corrective actions, such as ensuring the engine operates under appropriate load conditions whenever possible.

Operating at low loads accelerates wear on engine components, necessitating more frequent maintenance. Components such as injectors and valves may require regular cleaning or replacement, increasing overall maintenance.

In summary, running a diesel engine with no load or at low load for a prolonged period will eventually lead to various operational issues that affect engine performance and longevity. It is crucial for operators to understand these problems and implement strategies to maintain optimal loading conditions. Lifeboat engine is a crucial part of safety system, that shall under all circumstances be in optimum working condition.

Instant actions required:

To ensure the maximum capability and functionality of your lifeboat, we recommend performing a thorough check of the condition of the diesel engine and exhaust system/piping.

- General system check and service of the engine.
- Check -and/or replace fuel injection components.
- Check -and/or replace turbocharger (if installed)
- Check -and/or clean engine for soot build-up (combustion chamber, pistons, valve stem/seats/guides, manifold and pipes).
- Check engine for compression.
- Assess following the need for overhaul / new engine -and/or Engine brake.

Further recommendations:

- Ensure use of correct fuel quality. Minimum according to EN 590 & Premium additive package.
- Consider installing the **Frydenbø Dyno Engine Brake** –or another device that ensures that engine is frequently run with adequate load.
- Update maintenance procedures – perform routine tests every 14 days with equipment that ensures engine load (approx. 30 min) and keep log of engine parameters.

Frydenbø Dyno Engine Brake is a solution that provides adjustable load (0–100%) during testing and simulates real operating conditions without launching the lifeboat.

Benefits of using **Frydenbø Dyno Engine Brake**

- Realistic load: The engine is operated to conditions that mimic real duty, without having to launch the lifeboat, while still ensuring performance and proper functioning of the components.
- Efficient combustion: Applying load during testing provides a cleaner combustion process, minimizing the risk of soot buildup and oil/diesel residues in the exhaust system.
- Initial cylinder corrosion (due to salty/humid sea air and corrosive exhaust/condensation) is also minimized/removed through 14-day routine testing with the engine brake.
- Mechanical sluggishness is prevented by load changes during testing, maintaining good/movable function in the throttle system, cables, and diesel pumps.
- Continuous testing/documentation of integrity: In the new preventive maintenance test (approximately 30 minutes), test parameters are continuously logged for control and documentation of correct engine performance and engine brake function.
- Reduces maintenance costs.
- Ensure compliance with **NORSOK S-001:2020+AC:2021** requirements for testing with load.

"The lifeboat shall be equipped with an engine that can be run at high speed (rpm) and load when stoved in the davit to prevent soot and coke build-up"

Current install base:

Over 120 Dyno Engine Brakes installed at Equinor and at other operators.

- Technology Qualification Program (TQP) completed for multiple engine types.
- New industry standard for lifeboat engine testing established.

How the Dyno Engine Brake from Frydenbø works

The Frydenbø Dyno Engine Brake, developed by Frydenbø, is a system that ensures a real load on the engine during testing. This improves the combustion process and prevents undesirable soot buildup, oil residues, and sluggishness in the fuel system. It also ensures that any initial cylinder corrosion (due to salty/humid sea air and exhaust/condensation) is minimized/removed through 14-day routine testing with the engine brake.

Principle and Function:

Activation: The engine brake is activated before testing, and the load can be adjusted from 0 to 50–100% of the engine's capacity.

Hydraulic Technology: The system includes a connected hydraulic pump that is throttled at the outlet. This resistance "demands" power from the engine, which is then converted into heat.

Heat Management: The produced heat is directed to an external cooling water system during the test, ensuring effective cooling.

Benefits and Results:

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- Efficient combustion: Applying load during testing provides a cleaner combustion process, minimizing the risk of soot buildup and oil/diesel residues in the exhaust system.

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Field examples:

Figure 1 Turbo run without load

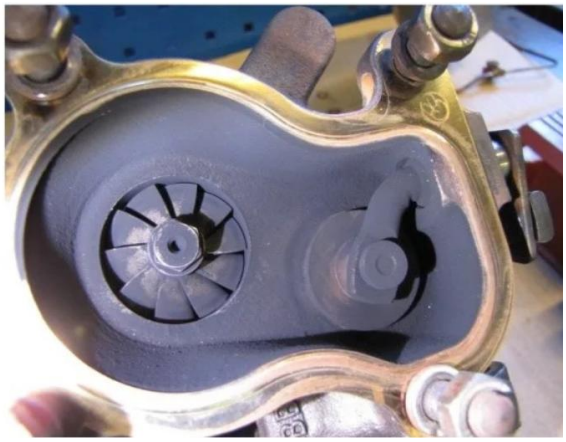

Figure 2 Turbo run with load

Figure 3, Injector with carbon deposits from unburned fuel

Figure 4, Injector run with load

Engine tested without load (exhaust valve)

Engine tested with load (exhaust valve)

For further support and questions related to this service bulletin/safety alert, we strongly recommend you contact one of our company representatives listed below.

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