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SERVICE LETTER

920330-01

Feed rate adjustment after installation of HJ Non-Return valves

Non return valves

Guide for feed rate adjustment after installation of HJ Non return valves.

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1 Reservations

1. Inspect the cylinder liner and piston ring condition prior to the feed rate reduction. Both the cylinder liners and the piston rings should be in good condition prior to the reductions.

2. The below-mentioned information is our guidelines/recommendations, which are based on material we have received from our customers. However, as many engine-specific conditions influence the feed rate adjustment, **the final responsibility lies with the users.**

2 Feed rate adjustment

After completing the installation of the HJ Non-return cylinder lubrication system without overhauling the piston and/or changing the cylinder liner, we recommend to adjust the cylinder oil feed rate to be as follows:

From departure to first available port inspection or to minimum 100 running hours: **1.00g/kWh**

If the cylinder condition during the port inspection is found to be satisfactory, the feed rate may be reduced by 0.10 g/kWh to **0.90g/kWh.**

Depending on engine type and engine general condition further reduction is possible, however only after a satisfactory port inspection and minimum 100 running hours, the feed rate can be reduced by steps of eg. 0.05 g/kWh down to target feed rate**.**

With a sulphur content between 1.5 % - 3.5 % and a cylinder oil with TBN 70 we recommend target feed rates down to **0.6g/kWh**, with a sulphur content beneath 1.5 % target feed rate can in some case be reduced to a level below **0.6 g/kWh**

It is recommended that scrape downs are analysed for iron wear particles and TBN residues for evaluation of further reduction, either by using on board equipment or at a laboratory.

You are always welcome to consult us in case you have questions or are in doubt about the condition of your cylinders. We should be pleased to place our knowledge and experience at our disposal.

If vessel before installation of HJ System had a lower feed rate then 1.0g/kWh, the feed rate can be set below 1.0 g/kWh. Please remember that HJ only can give recommendations regarding feed rate. It is always user responsibility to keep the best possible cylinder conditioning, and HJL cannot be held responsible for any damages of any kind.

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3 Breaking in and Running in

The engine designer's guidelines for the running-in period must be followed in case of:

1. Piston overhaul with change of piston rings only.
2. Change of cylinder liner and piston rings.
3. Cylinder liner overhauled by honing and grinding with new piston rings.

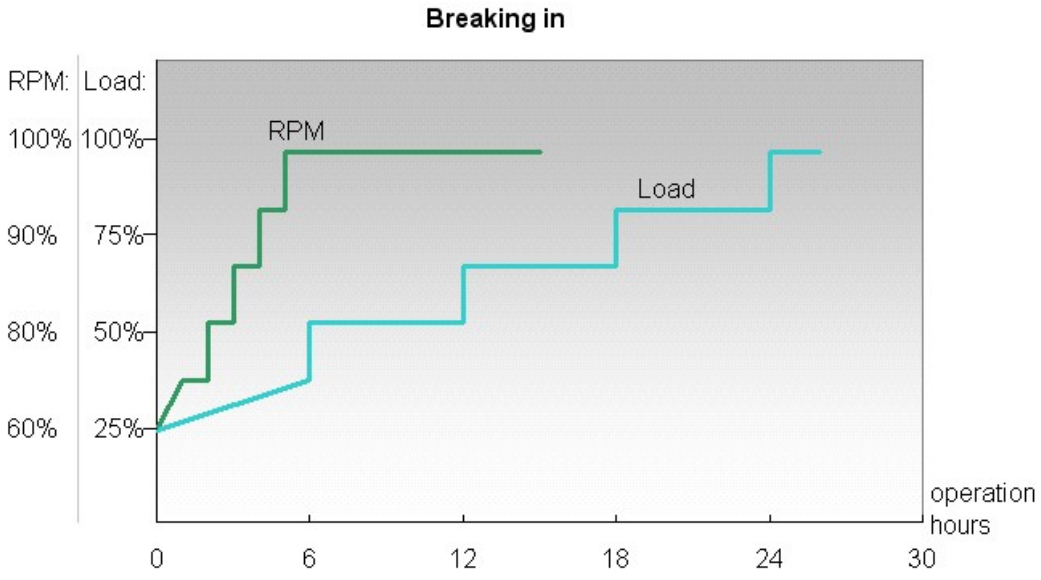
Enclosed please find graphs for "**Breaking in"** and **"Running in"** for suggested relations between main engine RPM, LOAD and Cylinder Oil Feed rates for Breaking in and Running in of new or reconditioned cylinder liners and piston rings.

4 Breaking in

The first 24 hours after overhaul

As regards the unit(s) which is/are to be run in:

1. Adjust the feed rate to 1.30 g/kWh prior to departure.
2. Reduce the load as far down as practically possible i.e. full maneuvering corresponding to 25% load and then raise to full load over 24 running hours.
3. Raise RPM slowly from full maneuvering corresponding to 65% RPM to full RPM over the first 5 hours.



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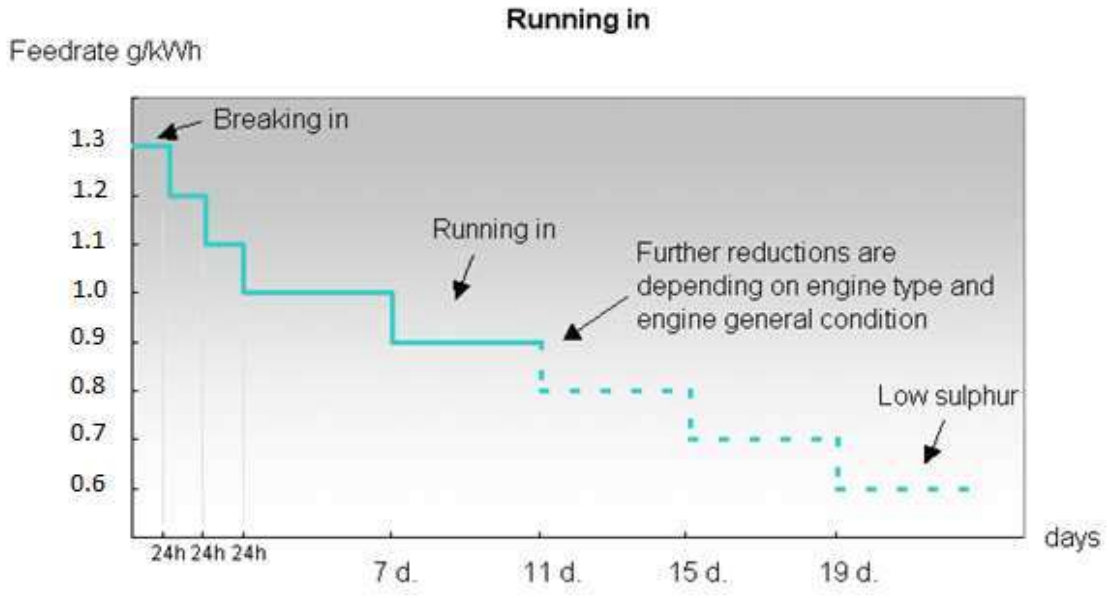
5 Running in

The period of time after overhaul until target feed rate has been reached

continued from previous page:

4. After 24 running hours, reduce the feed rate to 1.20 g/kWh.
5. After 24 running hours, reduce the feed rate to 1.10 g/kWh.
6. After 24 running hours, reduce the feed rate to 1.00 g/kWh.

Subsequently, follow the recommendations on page 1 for further feed rate reductions.



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6 Feedrate calculation

When using this guideline, the following equation should be used for calculating the feed rate:

$$\boldsymbol{Feed\ rate\ at\ 100\%}\left[{}^{\boldsymbol{g}}/_{\boldsymbol{kWh}}\right] = \frac{\boldsymbol{s} * \boldsymbol{d}^2 * \boldsymbol{n} * \boldsymbol{k} * \boldsymbol{0,9}}{{}^{\boldsymbol{kW}}/_{\boldsymbol{cyl}} * \boldsymbol{22,5}}$$

s = Strokelength of the lubricator

d = Piston diameter of the lubricator

n = Engine rpm

k = No of valves per cylinder

kw/cyl = Output i KW per cylinder

Conversion of g/Bhph to g/kWh = g/Bhph * 1.36

Conversion of g/kWh to g/Bhph = g/kWh * 0.735