Lacquering / Black spots on cylinder liner

Dear Sirs,

This service information covers the technical explanation for formation of lacquering on the cylinder liner, and how to deal with this condition.

Installing modern HJ lubrication technology on 2-stroke diesel engines gives the potential to improve cylinder condition as well as to reduce the cylinder oil feed rate.

We do however in rare cases see that customers experience lacquering on the cylinder liner running surface, also known as black spots, after the installation of HJ lubrication technology.

How to deal with lacquering

Experience has shown that normal cylinder condition is maintained despite the presence of black spots. Lacquering is a fully harmless symptom which in general has no negative effect on the operational condition of the engine, and there is therefore no problem in continuing engine operation despite the presence of black spots.

We recommend disregarding the presence of black spots when evaluating the cylinder condition, and determine the cylinder oil feed rate based on other parameters such as piston and piston ring condition as well as analysis of scrape down oil.

Action level: ***When convenient***

Examples of Lacquering / Black spots

Concerning

Customers experiencing lacquering / Black spots

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Signs of lacquering / black spots on cylinder liner walls

Hans Jensen Lubricators A/S
Smedevænget 1-3
9560 Hadsund
Telefone: +45 9857 1911
Fax: +45 9857 1387

Hans Jensen Lubricators Singapore Pte. Ltd
15 Jalan Kilang Barat, Frontech Center 06-07
Singapore 159357
Telefone: +65 6274 1911

Hans Jensen Lubricators China
Danish Export Association
Shangai Rep. Office
Rm 1703, 1277 Beijing Xi Lu
Telefone: +86 21 6279 2090

It is a common misconception that the cylinder oil feed rate must be increased as a countermeasure to deal with the condition. This is not recommended, as this may result in over lubrication, causing compromised cylinder condition.

Why does lacquering occur

Lacquering occurs on areas of the cylinder wall, which at a previous point has been exposed to additional corrosive wear causing the area to be slightly retracted from the running surface which is in contact with the piston rings. This situation causes that deposits can build up on the slightly retracted area, as this area is exposed to less wear as compared to the remaining area.

What is lacquering

The deposits forming on the slightly retracted areas of the cylinder originate from a chemical reaction during the combustion between additives from the cylinder oil, the Sulphur content of the fuel oil and the humidity from the scavenge air. This is also the reason why lacquering is more prone to occur on vessels operating in tropical areas where air humidity is higher.

The chemical reaction causes deposits of Calcium Sulphate and combustion residues to form in the retracted areas. The dark or black colors of the spots originate from soot and other combustion residues. Lacquering is a condition which can occur regularly and is removed by detergents from the cylinder oil and normal wear.

Lacquering in relation to HJ lubrication technology

With HJ load dependent lubrication systems the cylinder oil feed rate is reduced as compared to traditional lubrication systems. This will result in reduced amount of cylinder oil additives, thereby less detergent is available to dissolve and remove the deposits.

With HJ SIP – Swirl Injection Principle, the cylinder oil distribution inside the cylinder is improved as compared to traditional lubrication systems; hence the normal wear rate is reduced.

It is therefore possible to experience lacquering after the installation of HJ load dependent lubrication systems, and that it with HJ SIP Lubrication takes more hours of operation before the lacquering is removed – due to the lower cylinder liner wear rate.

For more information please contact our technical department at technicalsupport@hjlubri.dk or by telephone.

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