

Confidential

JAPAN ENGINE CORPORATION

SERVICE ENGINEERING DEPARTMENT, SERVICE ENGINEERING SECTION
1, MINAMIFUTAMI, FUTAMI-CHO, AKASHI-CITY 674-0093, JAPAN

TEL. +81-78-949-0804 (direct), e-mail: sales2@j-eng.co.jp (parts & engineer order), service@j-eng.co.jp (technical inquiry)

(1/2)

Subject : Notice for Using Low Sulfur Fuel Oil (less than 1.5%)	Application	UEC Diesel Engine
	Type	All UEC
	No.	USI-10011E
If necessary		

Generally, the sulfur content in fuel oil is well recommended to be from 1.5% to 3.5% as marine engine fuel oil, however nowadays it is increased to have the opportunities when still lower sulfur content fuel oil is supplied due to an environmental compliance, and the inconvenience on engines supposedly caused by the supply of this kind of fuel oil has been reported.

Some kinds of low sulfur fuel oils have a possibility to be the flame resistant fuel oil having characteristics such as two steps burning and after-burning or the FCC fuel oil containing hard particles.

When these fuel oils are once used, they have severely affected on running performance of piston ring and cylinder liner, so a reduction in cylinder oil feed rate by taking consideration of only neutralization of sulfur does not always lead to the solution.

It has been worried so far that the combination of low sulfur fuel oil and higher BN cylinder oil educes some components (calcium, etc.) in additives of cylinder oil, which become sludge and have the adverse effect on running performance of piston ring and cylinder liner such as piston ring sticking.

However, in the case of changing the cylinder oil to lower BN one, special attention has to be paid because a drop in extreme pressure oil performance and/or a drop in detergent dispersant performance of the cylinder oil may occur in some cases and as a result of it, the inconvenience of engines is worried. (It has been actually reported that the inconvenience of engines may occur due to use of lower BN cylinder oil)

Taking the above into consideration, when low sulfur fuel oil have to be used, we would like to ask you to consult with the lubricating oil maker about the existence of drops in performance of extreme pressure and detergent dispersant for applicable cylinder oils in advance.

Please refer to our service information USI-10004 (Lubricating oil list for UEC engines).

In the case of using low sulfur fuel oil, it is generally recommended to take the following measures.

1. Inspect the current condition (before using low sulfur fuel oil) on piston rings and cylinder liners from scavenging trunk.
 - Sketching & photographing the running surface condition
 - Measuring the piston ring gap (or wear measurement of piston rings and cylinder liners)
 - Sketching & photographing the contaminated condition on piston ring land and piston head
2. In case that FCC content exceed the recommended value described on service information (USI-10014), increase cylinder oil feed rate more than 10 % and set cylinder cooling water outlet temperature to lower 10°C than the standard set value. (outlet temp. approx. 75°C)
In case of slow-speed operation, please refer to our service information USI-10001.

The action priority indicated at the upper right corner is settled by Japan Engine Corporation originally and it does not decide the action of users.

Further, it is not guaranteed the every action carried out according to this service information.

The service information issued by Japan Engine Corporation included not only copyright but also all rights is reverted on Japan Engine Corporation.

Plan record	Newly issued 13th Dec. 2017 MSI-0551 R1(14th Mar.2016)/No.0245(27th May 2005)	Approved	<i>T. Yamamoto</i>	SERVICE ENGINEERING DEPARTMENT
		Checked	<i>N. Nakashima</i>	ENGINEERING DEPARTMENT
		Designed	<i>T. Fujimoto</i>	DATE OF ISSUE :13th Dec. 2017

3. If cylinder liner temperature monitor is equipped, always watch liner temperatures during engine operation.
4. After 200 to 300 running hours, inspect piston rings and cylinder liners from scavenging trunk and compare their condition with the record mentioned in the item 1 of the above.
5. Carry out the following actions if necessary due to the above inspections.
In the case of improper running condition on piston rings and cylinder liners;
 Increase cylinder oil feed rate (by approx. 0.14 g/kWh) [approx. 0.1 g/PSh]
In the case of increase of contamination on piston head top surfaces, etc.
 Reduce cylinder oil feed rate (reduction of one time: approx. 0.07 g/kWh)
 [approx. 0.05 g/PSh]

 Or review BN of cylinder oil.
 Return cylinder cooling water temperature to the standard set value (80~90°C).

If, as the result of analyzing the bunkered fuel oil, it is expected that the above FCC particles are mixed into the engine fuel oil system, the following actions should be generally carried out.

- ① Discharge the drain of the settling tank and the service tank frequently (several times a day) and discharge sludge including FCC particles on their tank bottoms.
This is carried out in order to prevent FCC particles, which have been accumulated on the tank bottom and highly concentrated, entering the engine inside by stirring during rough sea condition. In addition, since there is a possibility that discharged sludge includes a great deal of FCC particles, waste it or burn it in the boiler without returning it to the tank.
- ② If the service tank has two suction inlets for "High" and "Low", use the higher inlet in order to prevent sludge on the tank bottom from sucking in.
- ③ Operate all purifiers in parallel and each purifier with the lowest flow ratio, and increase the efficiency of removing sludge.
- ④ For the engine equipped with the fine filter, do not bypass the filter while supplying fuel oil.
- ⑤ For the engine equipped with cylinder liner temperature monitoring unit, operate the engine carefully by watching it always and pay attention to the abnormal rise or fluctuation of temperature.
- ⑥ It is recommended to pay attention to fuel oil properties by taking samples of fuel oil at bunkering and analyzing fuel oil always by the facility for analysis.

As for the details, refer to our Service Information USI-10013 (Prevention of Inadaptability due to Use of FCC Fuel Oil).

After that, inspect piston rings and cylinder liners periodically and follow the condition sufficiently.

Please refer to the following related service information

USI-10001	Instruction for Continuous Slow-Speed Operation
USI-10002	Recommendable cylinder oil BN and the guidance of cylinder oil feed rate
USI-10003	Notice for using low sulfur / low viscosity fuel oil
USI-10004	Lubricating Oil List for UEC Engines
USI-10014	Fuel Oil Quality Recommendation