

YANMAR SERVICE NEWS

Subject	Prevention of FO Injection Pump Sticking of HFO Direct Starting Spec. Engines	No. :08-2-G-07-005-O-Rev.2 June 2009	
Engine Model	All Models	Use	Marine Aux. Engines
		Engine Nos.	_____

It is reported to us recently that the FO injection pump of the HFO direct starting engines has caused sticking. In the case of sticking of the FO rack and pinion, the engine caused over speed. In the case of sticking of the plunger guide, locating under these parts, FO injection was not possible and in the worst case, the plunger flange was broken.

In order to prevent such sticking, we recommend you to implement following items:



Fig.1: Broken Plunger Flange

1. In the HFO direct starting engines, we obtain no flushing effect since FO is not switched to MDO upon stopping the engine.

When the temperature of HFO remaining in the pump has dropped, the kinetic viscosity rises and this can cause sticking. In general, the factors that cause the temperature of HFO to drop are as follows:

- 1) HFO circulation, while the engine is being stopped, was not normal.
- 2) The thermal insulation equipment of the HFO piping was not functioning normally.
- 3) The FO injection pump case cover, that should ensure the thermal insulation effect of the FO injection pump was removed at all times.
- 4) The engine cooling water pre-heater didn't work normally.

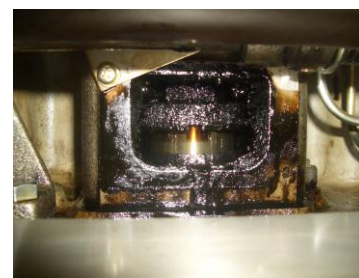


Fig.2: Sticking and Contamination of FO Injection Pump

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2. We recommend you to implement following items in order to prevent FO injection pump sticking of the HFO direct starting engines, as follows:

- 1) Ensure that both the FO and jacket CW temperatures, while the engine is being stopped, be heated to appropriate temperatures as are heated appropriately while the engine is being operated. We recommend to install the FO injection pump case cover at all times.
 - In addition to the above, check that the steam trace, etc. work normally.
 - Pre-heat HFO to 11~14cSt at the engine inlet.
(The appropriate temperature is 125~135deg. for 180cSt and 135~145deg. for 380cSt.)
 - Keep the CW temperature, while the engine is being stopped, at 65~75deg.
- 2) Check that HFO is circulating normally inside the fuel main pipe of the engine while the engine is being stopped.
 - If FO temperature tends to drop in spite of pre-heating, it is possible that fuel oil is not circulating normally.
- 3) Check from time to time that the pinion rack is lubricated appropriately, (while running the engine).
Alternatively, in the HFO direct starting engines, adjust the lubrication to an extra amount than the usual amount.

LO flow regulating valve
LO 注油量調整弁

Check plug for Lubricating
滴下量確認用栓



Fig.3: Lubricating Pipe of Pinion Rack

- 4) In the case of stopping the engine for a long time or overhauling the engine, switch to MDO operation in order not to leave HFO inside the FO system and check that FO is fully replaced by MDO before stopping the engine.
- 5) Disassemble, inspect and clean the FO injection pump to remove HFO inside the pump according to the instructions of the operation manual, (implement this procedure every 4000~5000 hours as the standard.)

3. Mechanism of the plunger flange breakage

