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Service Letter

Date : Jan 05, 2020
Ref. No.: HGS-HSM-SL-21-001

Subject: Update of HiMSEN DF engine safety function in Diesel Mode

Product: H35DF/H27DF/H22CDF

To whom it may concern,

This letter intends to inform operators of HiMSEN DF engine of safety function update in Diesel mode.

HiMSEN DF engine has additional sensors, comparison with conventional diesel engine, like cylinder pressure/vibration sensors. Those sensors are installed for safety functionality of gas mode. By applying those sensors to diesel mode also, we have improved the stability of operation. To apply this update to delivered engines, please contact us for service arrangement.

For more information, please refer to the attached technical circular, TEC2020-K2J0-YO-006-R0. Should you have any queries, please feel free to contact us.

Faithfully yours,

KN,Park, Team leader of Machinery service team 2 (HiMSEN)

Service Division

http://www.hyundai-gs.com

HiMSEN

TECHNICAL CIRCULAR

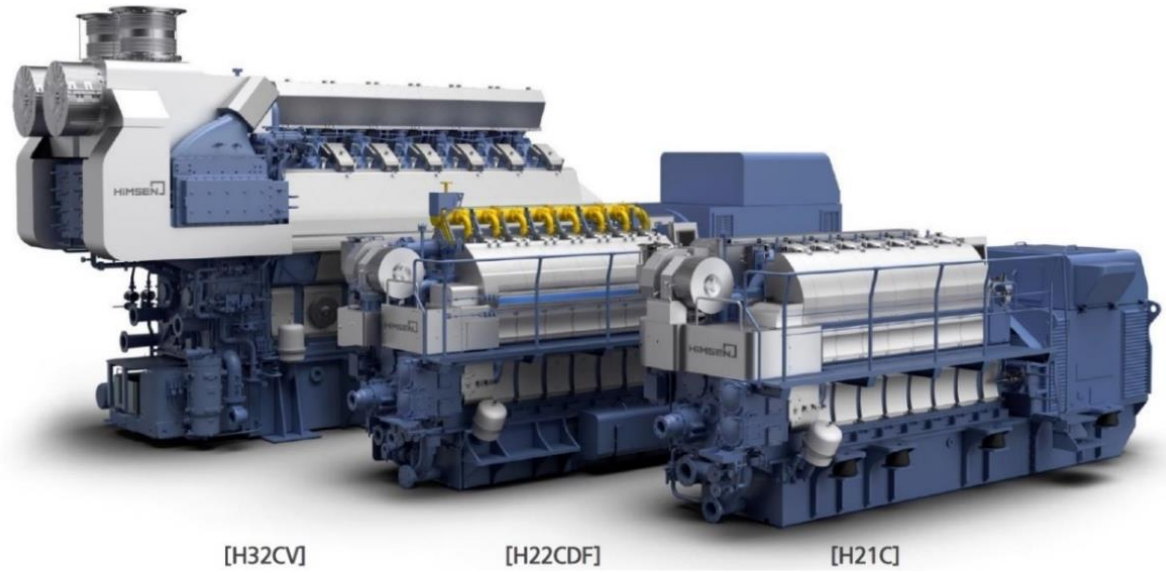
SUBJECT: IMPROVEMENT OF SAFETY FUNCTION WITH ADVANCED DIAGNOSTIC FEATURE in DIESEL MODE

TYPE: H35DF/H27DF/H22CDF

DOC No.: TEC2020-K2J0-YO-006-R0

DISTRIBUTION

Marine	☑ Ship yard	☑ Ship owner
Stationary	☐ Power plant	



Date	A.C.	Wrote	Checked	Approved	Change	R
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[BACKGORUND]

HiMSEN DF engine recently has optimized safety function in diesel mode in order to provide stable and extensive operation range.

In case of safety functions in gas mode, HiMSEN DF engine is integrated with cylinder pressure and knock intensity monitoring functions to provide anti-knocking and cylinder combustion balancing control. These cylinder pressure and knock intensity monitoring functions are intended to protect engine from abnormal combustion in otto cycle as known as knocking in gas mode operation.

Through our experience and outstanding research, current safety function has been improved to provide extended safety function in diesel mode

As a result, HiMSEN DF engine has the advanced safety function based on diagnostic feature of cylinder monitoring system in diesel mode operation.

[ADVANCED DIAGNOSTIC FEATURES OF CYLINDER MONITORING]

HiMSEN DF engine has been basically integrated with sophisticated cylinder monitoring function to provide stable operation in gas mode. This monitoring function is intended to improve efficiency release gas trip against abnormal combustion in gas mode.

In addition to this cylinder monitoring in gas mode, HHI-EMD has continuously developed the advanced diagnostic features of cylinder monitoring in diesel mode in order to prevent the damage of engine very quickly.

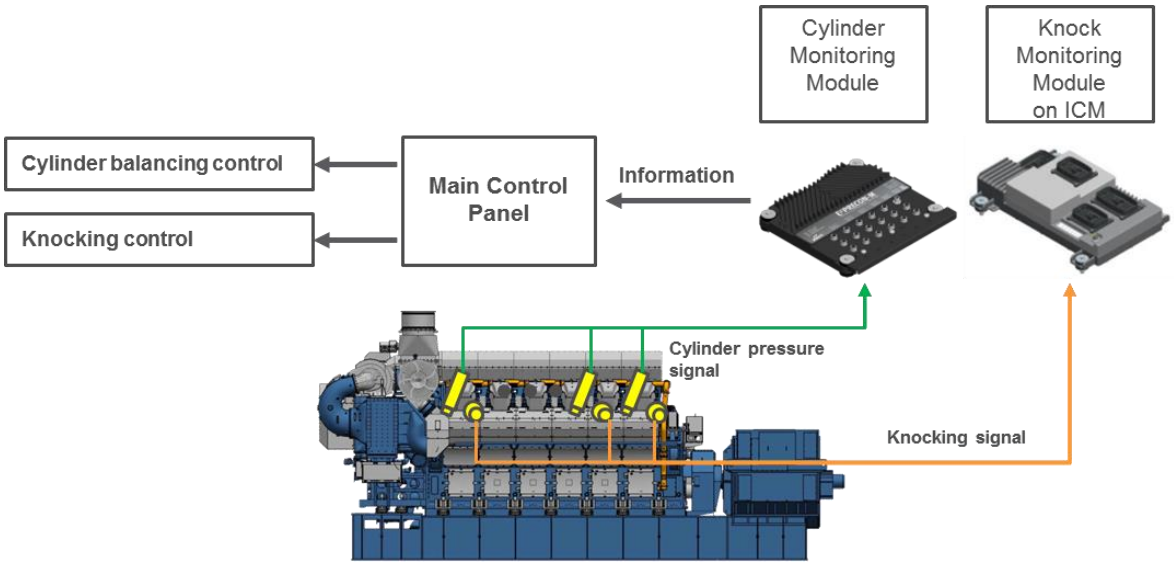

Figure 1. HiMSEN DF engine cylinder monitoring system

[ADVANCED SAFETY FUNCTION in DIESEL MODE]

HiMSEN DF engine has developed detection function of cylinder vibration by measuring knock intensity in diesel mode.

With the advanced safety function, HiMSEN DF engine can provide more safe operation in diesel mode to protect engine under severe condition.

Table 1. Updated safety logic in diesel mode

Failure source	Safety conditions	Fuel mode	Action
Knock intensity and Cylinder pressure	Cylinder vibration high & Cylinder pressure deviation low	Diesel / Backup mode	**Shutdown**
	Cylinder vibration high & Cylinder pressure sensor failure	Diesel / Backup mode	**Shutdown**

Cylinder vibration high detection in diesel mode

In case of high signal level from knock vibration sensor in diesel mode, new shutdown function to be triggered according to above combined conditions to avoid misjudgment.
Vibration level setting from knock sensor is same as heavy knocking level setting in gas mode.
Below figure is example of engine shutdown against high vibration signal from knock sensor in diesel mode.

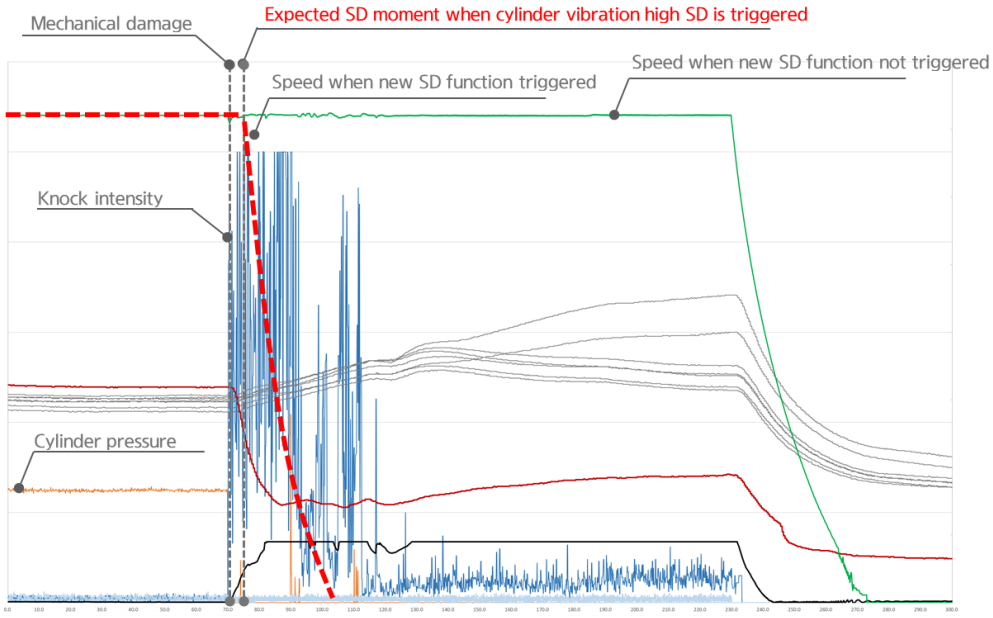

Figure 2. Example of Engine shutdown against high vibration signal from knock sensor

For application of new safety function, the software of HiMSEN DF engine control system is required to be updated with the same or higher version in below table.
Above feature is integrated in MCP module but rest of part is recommended to be updated together.

Table 2. Software version of HiMESN DF engine control system

MCP module	LOP HMI	Parameter setting
1.2.6-e1	1.1.5	Corresponding setting updated

In case of vessel before delivery, update task to be performed by HHI-EMD.

In case of vessel already in field operation, update task to be guided by HGS based on provided update manual (Doc. no.: B94-307216-7.x) to let ship operator update the SW.

Along with software update of HiMSEN DF engine control system, corresponding information is added in communication I/O interface of vessel monitoring system. The submitted drawing such as Alarm & Modbus list can be revised upon request. However, update of this interface is not mandatory since common shutdown event will be sent and detailed information can be checked via LOP.

[CONCLUSION]

The advanced safety function based on diagnostic feature of cylinder monitoring system in diesel mode will be applied to HiMSEN DF engine, which can provide more stable operation in diesel mode to protect abnormal combustion under severe condition.

Advanced safety function : Engine shutdown against Cylinder vibration high detection in diesel mode

In case of high signal level from knock vibration sensor in diesel mode, new shutdown function to be triggered according to above combined conditions to avoid misjudgment.

This new safety function will be required to update HiMSEN DF engine control system software with the latest version successfully completed on verification test.

Along with software update of HiMSEN DF engine control system, corresponding information is added in communication I/O interface with vessel monitoring system. The submitted drawing such as Alarm & Modbus list can be revised upon request. However, update of this interface is not mandatory since common shutdown event will be sent and detailed information can be checked via LOP.

If you need more detail information about this technical circular, please contact your nearest HiMSEN service station or follow the links below.

- Hyundai global service: http://www.hyundai-gs.com/eng/Main.do
- Hyundai heavy industries - Engine & Machinery Business unit
  : http://www.hyundai-engine.com/customer/customer07.asp

[The end]

Yours sincerely,

J.H.PYO / Senior Engineer
Head of Engine Control Engineering Dep't