

## Diesel Particulate Filter (DPF) Operation Awareness

Diesel particulate filters (DPF) are now fitted to the latest IC Forklift truck engines to ensure they comply with stage V legislation to reduce harmful emissions (January 2019).

A DPF traps most of the soot (PM - Particulate Matter) produced during combustion and holds it until a certain soot level is reached. A process called 'regeneration' is used in order to clear the soot trapped in the DPF.

### There are 3 types of DPF burn off:

**Passive** regeneration occurs when the exhaust system gets to optimum temperature and burns off the soot unaided. No intervention is required by the operator.

**Active** regeneration occurs automatically when the soot level reaches a certain point in the DPF. The soot level is constantly monitored by the Engine Control Unit, which triggers 'active regeneration' when necessary, raising the exhaust temperature and burning off the soot. No intervention is required by the operator.

**Manual** regeneration is triggered by the operator pressing the manual burn button on the dash. This is only active when you have at least 2 bars on the soot load meter.

Due to high exhaust temperatures, it is the operator's responsibility to make sure the exhaust is clear of debris before every shift.

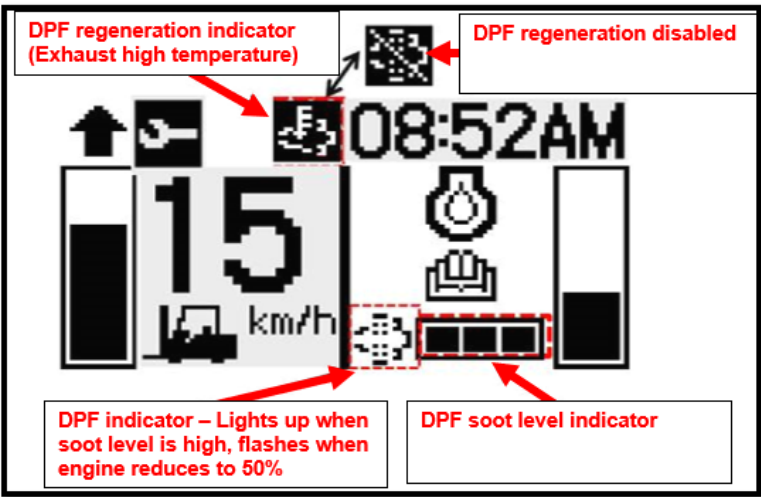
Problems occur when the conditions for 'regeneration' are not met and the following can accelerate the soot loading in the DPF -

- Low usage / Short runs – Not allowing engine to warm up to optimum temperature (Less than 10-15mins)
- Excess time for engine spent idling / engine ticking over

If either of the above apply, changes to your operation may be necessary to effectively run a diesel machine. If such changes are not possible or impractical, an LPG or electric model may be better suited to your normal usage.

It is recommended that all operators read the Operation and Maintenance Manual and pay particular attention to section 2.5.16 explaining the DPF system, icons, warnings and use of the manual regeneration switch.























Truck Display



DPF/HEST warning icons & system description

\*BLINK: Warning icon black and white inversion

DPF Level	DPF warning icon	DPF soot accumulation meter	Multi-purpose warning icon	Other warning icon	Description
0~1					The soot level is low and the DPF do not need regeneration at this stage.
2			OFF		Automatic Regeneration is active. At this stage, the soot level is low and the engine can be stopped. Automatic regeneration may be performed at the next operation. Automatic regeneration will start (HEST warning  comes ON) when the engine is at designated temperature. The automatic regeneration cycle could be more than 15 minutes. <div><div>CAUTION</div><div>If you continue to interrupt the automatic regeneration cycle by turning the engine OFF when the HEST warning lights are ON, the cycle cannot be performed and could move to next level.</div></div>

3		OFF		Manual Regeneration is required. At this stage, the soot level become middle and the Automatic regeneration could not be possible. Prepare for perform manual regeneration.
4		OFF		Manual Regeneration is immediately required to perform. At this stage, the soot level is quite high and the Automatic regeneration could not be possible. Perform manual regeneration as soon as possible. Engine failure could occur or the truck may go into limp mode.
5		ON +error code "D-87" on display  		Engine is reduced to 50% power. Manual Regeneration is required to perform immediately. At this stage, the soot level is higher and the Automatic regeneration could not be possible. Park the truck in a nonoperating area and perform manual regeneration immediately.
6		Blink +error code "D-98" on display  	    	Engine remains at 50% power. At this stage, manual regeneration is not possible. Contact your authorized dealer service to perform the Service DPF regeneration. If operation continues, soot will accumulate in the DPF, and engine failure will result.
7		Blink +error code "D-98" on display  	    	Engine remains at 50% power. At this stage, manual regeneration is not possible. Park the truck in a non-operating area and remove the key. Attach a "DO NOT OPERATE" or similar warning tag to the truck. Contact your authorized dealer to clean or change DPF. If operation continues, serious engine failure will result.

## **User Acceptance of Procedure**

I have read the above and confirm my understanding of the operation and procedures involved in the use of this machine.

Customer Name .....

Signature .....

Printed Name .....

Position .....

Date .....