

Regeneration in PTO Mode
 D11, D13, D16
 VAH, VHD, VN

FSB 210-045, Regeneration in PTO Mode

(June 2015)

When a vehicle is being operated in PTO mode and a diesel particulate filter (DPF) regeneration is commanded (either automatically or manually), the engine must be run at a speed above the minimum speeds listed in the tables below (according to the altitude and ambient temperature in which the vehicle is being operated) so that sufficient heat can be generated in the catalyst for regeneration to occur.

This is important to note, because the rated speed of the PTO must not be exceeded. For example; if the maximum rated speed of the PTO is 900 rpm, the regeneration will not occur while the PTO is engaged. When specifying a PTO for a chassis equipped with a DPF, a PTO having a maximum rated speed above the minimum engine speed listed in the tables below must be specified.

D11F

	Ambient Temperatures in Degrees C (F)		
	-30° C (-22° F)	0° C (32° F)	30° C (86° F)
Altitude in Meters (ft)	Minimum Engine Speed, RPM		
Sea Level	1050	1050	1050
1951 (6400)	1100	1100	1100
4267 (14,000)	1300	1300	1300

D13F

	Ambient Temperatures in Degrees C (F)		
	-30° C (-22° F)	0° C (32° F)	30° C (86° F)
Altitude in Meters (ft)	Minimum Engine Speed, RPM		
Sea Level	1300	1200	1150
1951 (6400)	1300	1300	1200
4267 (14,000)	1300	1300	1400

D11H

	Ambient Temperatures in Degrees C (F)		
	-30° C (-22° F)	0° C (32° F)	30° C (86° F)
Altitude in Meters (ft)	Minimum Engine Speed, RPM		
Sea Level	1200	1200	1200
1951 (6400)	1200	1200	1200
4267 (14,000)	1250	1250	1250

D13H

	Ambient Temperatures in Degrees C (F)		
	-30° C (-22° F)	0° C (32° F)	30° C (86° F)
Altitude in Meters (ft)	Minimum Engine Speed, RPM		
Sea Level	1250	1250	1250
1951 (6400)	1325	1325	1325
4267 (14,000)	1370	1370	1370

OBD13, OBD15, D11J

	Ambient Temperatures in Degrees C (F)			
	-30° C (-22° F)	-20° C (-4° F)	-10° C (14° F)	-1° C (30° F) and above
Altitude in Meters (ft)	Minimum Engine Speed, RPM			
Up to 500 (1650)	1050	1050	1050	1050
1500 (4900)	1150	1150	1150	1150
2500 (8200)	1250	1250	1250	1250
4270 (14,000)	1300	1300	1300	1300

OBD13, OBD15, D13J

	Ambient Temperatures in Degrees C(F)			
	-30° C (-22° F)	-20° C (-4° F)	-10° C (14° F)	-1° C (30° F) and above
Altitude in Meters (ft)	Minimum Engine Speed, RPM			
Up to 500 (1650)	1100	1100	1100	1100
1500 (4900)	1175	1175	1175	1175
2500 (8200)	1251	1251	1251	1251
4270 (14,000)	1325	1325	1325	1325

OBD13, OBD15, D16J

	Ambient Temperatures in Degrees C(F)			
	-30° C (-22° F)	-20° C (-4° F)	-10° C (14° F)	-1° C (30° F) and above
Altitude in Meters (ft)	Minimum Engine Speed, RPM			
Up to 500 (1650)	900	900	900	900
1500 (4900)	950	950	950	950
2500 (8200)	985	985	985	985
4270 (14,000)	1050	1050	1050	1050

Manual Stationary Regeneration

If manual stationary regenerations with the PTO engaged are required, the vehicle must be configured as follows:

- For US07 and US10, parameter code JAC (Enable Manual Regen during PTO) must be set to "TRUE" in VCADS. For OBD13 and beyond, it no longer exists and the feature is on by default.

Note: A connection to central systems is necessary in order to set parameter code JAC.

- The PTO electrical interface must be connected to the vehicle electronic control unit (VECU).
- Manual stationary regeneration must be initiated by using the stalk switch.
- The electronic hand throttle (engine speed control) must be active and set to an engine speed greater than the minimum speeds listed in the preceding charts, taking into account the altitude and ambient temperatures in which the vehicle is being operated.

If the vehicle is not configured as listed above, manual stationary regeneration with the PTO engaged will not occur. When regeneration does not take place, the DPF will become soot-loaded, resulting in engine derate and eventual engine shutdown.

Chassis Equipped with Clean Idle Engine

Effective January 2008, the California Air Resources Board (CARB) requires that vehicles operated in California be equipped with engines having tamper-resistant software which limits the time at which the engine can idle at speeds above low idle (550–700 rpm). With the vehicle stationary and without a PTO engaged, idle time at speeds above low idle are limited to approximately 15 minutes. After 15 minutes, the Engine Management System (EMS) will command the engine to revert back to low idle.

When installing a PTO on a vehicle equipped with a Clean Idle engine, it is very important that the PTO be activated by a switch that provides both engagement and speed inputs to the VECU so that the EMS knows when, and at what speed the PTO is operating. If the PTO is activated through a pneumatic actuator with no electrical input to the vehicle control system, the Clean Idle function will command the engine back to low idle after approximately 15 minutes. This may result in possible damage to the PTO, equipment or to the product being unloaded.

Aftertreatment System Conditioning (ASC)

Effective mid-March 2008, an Aftertreatment System Conditioning (ASC) function was implemented into the engine management system software. This function increases engine speed periodically in order to increase the temperature inside the diesel particulate filter so that unburned diesel fuel can be oxidized. On these chassis, it is important that PTO be activated by a switch which provides PTO engagement and speed input to the VECU so that the EMS knows the status of the PTO. If the engine speed control and PTO engage inputs are not enabled and the PTO is engaged, the ASC function will increase engine speed when commanded, resulting in damage to the PTO, equipment or to the product being unloaded. The ASC function will not increase engine speed if the heat mode target speed is greater than the speed selected with the engine speed control.

Summary of PTO Engagement Information

- For vehicles equipped with diesel particulate filter, the PTO **MUST** be activated by a switch that provides both engagement and speed information to the VECU when the PTO is engaged, and the vehicle operator must use engine speed control to set engine speed when the PTO is in operation.
- For vehicles equipped with diesel particulate filter, and prolonged periods of engine idle time are required, the engine speed control **SHOULD NOT** be used to increase engine speed. The engine must be allowed to idle as normal. If prolonged engine idling is necessary, it is recommended that the EMS ECU be programmed with CARB compliant files.
- For vehicles with a diesel particulate filter and a Clean Idle engine, the PTO **MUST** be activated by a switch that provides engagement and speed information to the VECU when the PTO is engaged, and the vehicle operator **MUST** use engine speed control to set engine speed when the PTO is in operation.

Note: The optional PTO dedicated switches provide input information to the VECU only. The VECU cannot provide a signal to engage a PTO.

Note: In general, a front engine-mounted PTO does not require speed or engagement information to the VECU except for those instances where the engine speed must **NOT** be lowered during PTO operation. As an example, in concrete mixer applications when an increase in engine speed is required to rotate the barrel at a faster speed, PTO input to the VECU is required and engine speed control must be enabled, otherwise, engine speed may either revert to low idle or may increase due to the lack of interaction with the engine management system.