

Using the Tier 4 Exhaust Cleaning Devices on Your New L3560, L4060, L4760, L5060, L5460, or L6060 Kubota Tractor

This series of tractors has really nice highly efficient engines, as well as some additional devices that reduce the toxic gases like carbon monoxide, and the soot particles that would be released in the exhaust. These make it much safer for you to breathe the air around your tractor while you are working or warming it up. Use of these devices, especially the **Diesel Particulate Filter (dpf)**, does require you to pay attention to your tractor, however.

The **dpf** filters the exhaust and removes soot particles, and would get clogged eventually. A process called **regeneration** is needed to clean it out every once in a while. During regeneration the temperature of the exhaust gas passing through the dpf filter is raised high enough that the soot particles are incinerated. Information to cover regeneration is in your Operator's Manual starting on page 20.

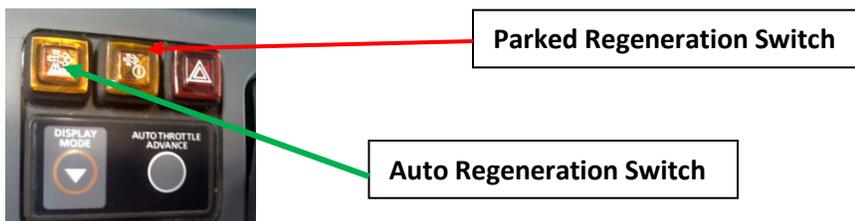
Sitting on your tractor with the engine running, find the **Display Mode Button**, it is at the lower left corner of the instrument panel.

Screen 5



Each time you push this button you will change the display in the center of the screen through 6 different displays (see p58 for more information on the displays). Screen 5 shows the buildup of particulate matter (PM = soot) in the dpf filter. If you leave this display up as you use the tractor you will see the bar graph creep to the right and the per cent value gradually increase. When the dpf filter reaches 100%, the tractor will “ask” to perform a regeneration to return the accumulation to 0.

Next determine the regeneration “mode” that you will be operating under for the day's work. The regeneration mode is set by you by pushing the **auto regeneration switch**, which is the leftmost button on the left hand side of the steering column. This switch will allow or prevent the tractor from automatically going into regeneration when it reaches 100%. On some models, when the tractor is turned on, the default mode is “inhibit regen” and the button looks like the one shown in the picture. Pushing the button toggles it on or off; if it is illuminated it means **auto regeneration** is enabled.



In more recent models, the default mode when the tractor is first started up is to enable auto regeneration; to inhibit automatic regen, you have to push the regeneration switch, which Kubota now refers to as the DPF INHIBIT SWITCH. In this case the switch button looks similar to the one above, but has a diagonal line through the symbol: If the Particulate Matter level is approaching 100% AND you are working under conditions that would allow a high engine RPM, and are not in a highly flammable environment, leave the tractor in the enable auto regeneration mode. If for some reason you do not want it to initiate a regeneration until you are ready, push the DPF Inhibit Switch. Keep in mind it cannot be postponed indefinitely, and pay attention to the **regeneration indicator**.



DPF Inhibit Switch

Next, find the **regeneration indicator**:



Regeneration Indicator

RPM Increase Indicator

The tractor tells you that the dpf filter has reached 100% and is ready to regenerate by causing the **regeneration indicator** to flash. This is a symbol above and to the right of the rabbit on the panel. (Identify this indicator location, it is not normally illuminated except for a few seconds as you start the tractor.) This symbol will flash when a regen is needed regardless of whether or not you have put the tractor in **auto regeneration mode** or **inhibit mode**.

When the tractor is in **auto regen mode**, if the conditions for regeneration are met (the tractor is warmed up, and the engine rpm is high enough) the tractor's computer will allow regeneration to proceed while you continue working. The **regeneration indicator** will stop blinking and be lit steadily which tells you regeneration has started. The Intellipanel display will also tell you "Regenerating". All you have to do is keep the RPM up with the hand throttle, and the regeneration will be complete in 10 or 15 minutes. (Note: it is best to take the tractor out of auto throttle so the rpm doesn't drop if you take your foot off the "go pedal".) If the rpm is not high enough, the **RPM increase indicator** will blink (lower right of the instrument panel, an engine symbol with an up pointing arrow.) Increase the hand throttle until it stops blinking. When the tractor has completed regeneration the **regeneration indicator** will go off and the bar graph and PM percent will return to 0. Ninety

nine percent of the time that's all there is to it! If you are doing something like mowing at the right rpm for PTO operation, it may regenerate without your even noticing or doing anything. It is best not to interrupt regeneration by lowering the RPM or shutting off the tractor. That can result in diesel contaminating the oil.

Now look at the PM screen: if your tractor was warming up from a cold start (half max RPM, about 1350) , by now there is a good chance the PM level will have increased 2 or 3%. The characteristic behavior of this system is that it will increase a certain amount every time it has to go from a cold start to operating temp. The rate of accumulation and the frequency of regeneration is specific to the model and to the way that it is used. After it is warmed up, the PM level will go up very slowly depending on the use. Loader work in auto throttle goes up faster than carrying buckets of manure out to the back pasture at full throttle. Mowing at PTO rpm in the summer will actually cause the PM level to go down, it can burn off 15% of the PM in about 2 hrs of mowing (this process has been called passive regeneration.) Idling causes it to accumulate particles the quickest. To avoid frequent regenerations, plan to work at as high an RPM as makes sense for the job (safety being important!), turn the tractor off rather than leaving it in idle (the good news is these tractors are really easy to start), and consolidate projects so that the number of cold starts is minimized. This usage costs less in fuel than you might expect because these engines are highly fuel efficient at high rpm's.

So now you ask, "What if.....I wasn't paying attention and didn't notice the blinking light, and the rpm was too low or??? and now it is beeping at me!"

The tractor communicates with you by illuminating lights that are both in the panel and within the buttons that control automatic regeneration and parked regeneration. These lights can be illuminated steadily or flash. It also can sound a buzzer at different frequencies. You can communicate with it by pressing buttons or by operating controls on the tractor such as the throttle. The situations that require this complicated communication are not so frequent that anyone is likely to remember the details. Kubota has provided two tables to decode what the tractor has to say, and which tell you what you should do when you see or hear them. One table applies if the tractor is in "permit auto regeneration" mode (p24), and the other if the tractor is in "inhibit regeneration mode" (p26).

You have a total of 30 minutes from the time the **regeneration indicator** light first starts to flash to COMPLETE a regeneration. So if a regeneration typically takes about 15 minutes you can postpone an auto regen for about 15 minutes. This postponing can happen by pushing the inhibit mode button, by turning the tractor off, or by having an rpm that is too low. Beyond 30 minutes the tractor will ask for a **parked regeneration**.

So if you don't see the light flashing and it is in inhibit mode, or the RPM is insufficient in auto mode, or the engine temperature (measured by coolant temperature) has been too low for it to start regenerating, the tractor will try to get your attention by adding a buzzer that sounds every 5 seconds. This sound tells you (if you look at one of the tables) that you are in "PM warning level 2". It also tells you that you can either start regeneration in auto regen mode or you can initiate a **parked regeneration**. A parked regen requires that you set the throttle to idle, the gears to neutral, put the parking brake on, push the parked regen switch button, and so forth. The process is outlined on p22.

There are abbreviated instructions in decals on the fenders, but we recommend that you either keep the operator's manual in the compartment behind the seat back, or copy the key pages involving regeneration and keep them there for reference. The L60 series tractors has the major advantage that the Intellipanel lets you know that a regeneration will or will not be required soon, and you can pay attention to the tractor when it is needed. Enjoy your new tractor!