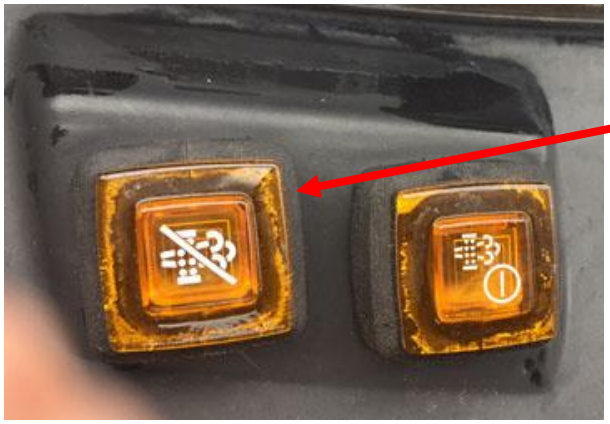
Using the Tier 4 Exhaust Cleaning Devices on Your New L3301, L3901, or L4701 series Kubota Tractor

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. Detailed information to cover regeneration is in your Operator's Manual starting on page 13.

There are two buttons on your instrument panel that relate to regeneration. The left hand one is the **DPF Inhibit Switch**. Choose whether it is on or off depending on the work you have planned.



DPF Inhibit Switch This switch, if pressed, and if illuminated, prevents the tractor from beginning a regeneration. Under most conditions, you leave it unlit, which is the default when you start the tractor, and which allows automatic regeneration when needed. You might press this inhibit button during operation if you are, for example, working in a dusty, highly flammable environment. The exhaust pipe gets HOT during regeneration!

Next, locate 5 lights on the right hand side of the instrument cluster. The top one, the **Regeneration Indicator** will blink when the dpf filter is "full", and regeneration needs to occur. **<u>It is important to glance at this light from time to time when you are working</u>!** Several conditions must be satisfied for successful regeneration, and you may need to adjust your engine rpm or move the tractor to a non-flammable environment. The next light down, an engine symbol with an up arrow, **Engine RPM Increase Indicator**, will blink if you need to increase the rpm.

Regeneration Indicator
This light will blink when regeneration is needed, and will glow steadily once regeneration is underway, and until regeneration is complete.

Engine RPM Increase Indicator will blink when it is necessary to increase the RPM with the hand throttle. Increase the RPM until it stops blinking. (A little extra is good.) Go on working.

The tractor tells you that the dpf filter has reached 100% and is ready to regenerate by causing the **regeneration indicator** to flash. (Be sure to 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. 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. If the rpm is not high enough, the **RPM increase indicator** will blink, so increase the hand throttle until it stops blinking, and preferably with some kind of work load. When the tractor has completed regeneration the **regeneration indicator** will go off. 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.

The characteristic behavior of this system is that particulates 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 particulate level will go up very slowly depending on the use. Loader work may cause it to go 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 at any temperature, as well as starts from a cold engine. 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 to 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. Most L01 users keep a log of how often regeneration is required so they have some idea of when the next regen is expected.

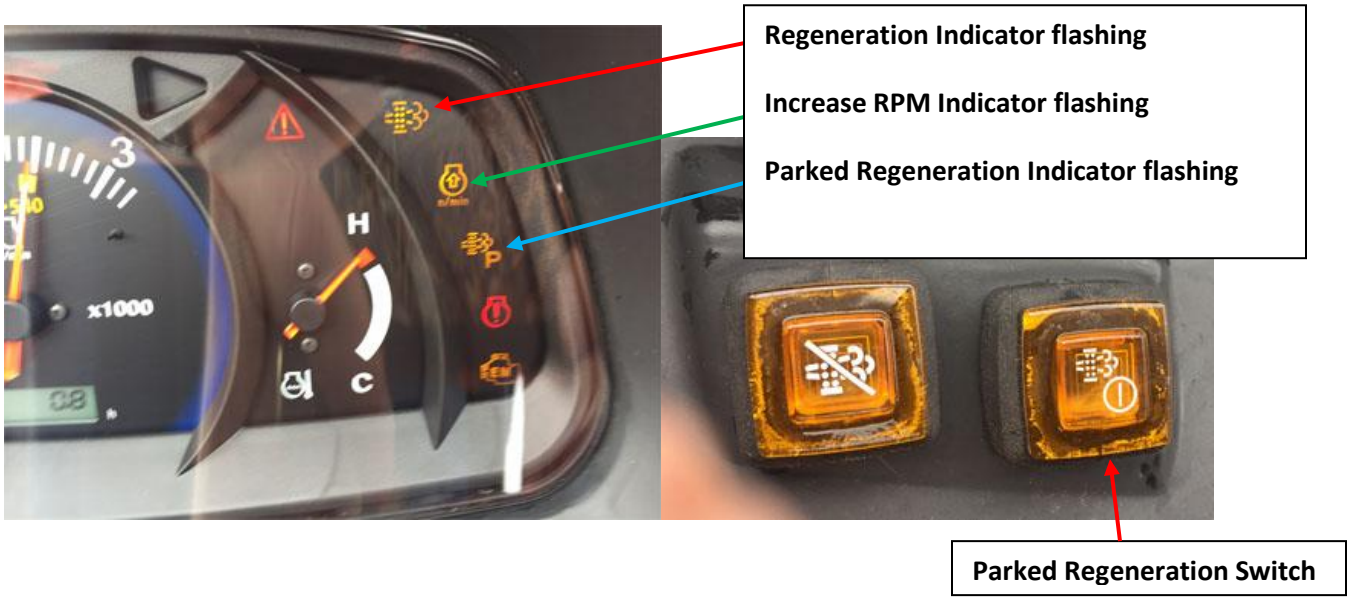
So now you ask, "What if…..I wasn't paying attention and didn't notice the blinking light, and the rpm was too low or??? and now it is beeping at me!"

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 (p16), and the other if the tractor is in "inhibit regeneration mode" (p18).

You have a certain length of time from the moment 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 this length of time (30 min on the L60s) the tractor will ask for a **parked regeneration**.

So if you don't notice the Regeneration Indicator 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". You will also have the **Parked Regeneration Indicator** blinking, making possibly 3 lights on the dash that are blinking. This tells you that you can either start regeneration in auto regen mode by cancelling the Inhibit Regen button, or you can initiate a **parked regeneration**.



A parked regen requires that you lower implements and turn off PTO if on, 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 p19.

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. Enjoy your new tractor!

Sheepfarmer

Illustrations thanks to 8upbowhunter