James de Havilland takes a closer look at the intricacies of current machinery

# The anatomy of...

# Kubota Grand L5740 HST Plus tractor

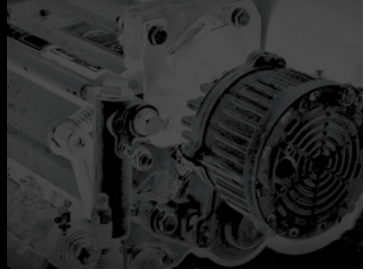

## Fixed speed cruise for working precision

When Kubota introduced its Grand L40-Series tractors in early 2008, the company's all-new HST Plus transmission was a highlight feature. So what makes HST Plus different?

With HST Plus, Kubota enables the operator to precisely manage the relationship between forward speed and engine rpm using the transmissions cruise control. The aim is to offer hydrostatic ease of operation with mechanical tractor precision.

# Step-by-step Analysis...

## Kubota Grand L5740 HST Plus tractor



**Kubota offers its HST Plus hydrostatic transmission on two Grand L40-Series tractors, the nominal 52hp L52040 and 58hp L5740. Complementing the mechanical transmission 16F/16R or 24F/16R 36hp L5040, the L5240 can be specified with or without a cab, the range topping L5740 having a cab as standard.**

With the HST Plus system, the transmission can be set using the Cruise function so it in effect 'locks' to match the forward speed and engine rpm, just like it is with a mechanical drive.

This enables the transmission to be set up to offer the same repeatability as a mechanical transmission.

This enables the operator to set a fixed speed and for this then to be accurately maintained.

Kubota is not claiming this 'fixed' drive be a unique feature HST Plus.

Both the John Deere eHydro hydrostatic and New Holland EasyDrive CVT transmissions offer similar abilities.

Where Kubota feel its system has an edge is in ease of set-up. All the operator has to do is push the dash mounted Mode control to select Cruise and set the desired engine speed on the hand throttle.

The tractor speed is then set up by firstly selecting the working ratio and then using the Cruise control lever to set the forward speed.

The latter appears on the LCD display within the main dash.

"In work, most operators set the Cruise for aeration work by looking at the work done," adds Dave Roberts.

"Once the desired settings are noted, it is easy to replicate the hole spacing by setting the throttle to the right engine speed for the PTO, selecting the right ratio and then setting a Cruise speed to get exactly the desired spacing.

What is useful with the HST system is that the travel pedal can still be used to adjust the tractor's speed.

This enables the operator to raise the aerator and then speed the tractor up to make a faster turn.

The transmission will revert to Cruise when the pedal is released and the operator does not need to re-set the desired operating speed."

It is not just in this fixed Cruise mode that the HST transmission differs from a 'traditional' hydrostatic. In transport, for example, the operator can set the throttle to Auto Throttle Advance.


The Cruise Control lever is positioned next to the low, medium and high range selector. Once the desired engine speed and working ratio have been chosen, the lever is progressively eased forward to increase and then fix the forward speed.


The steering column is home to the throttle (right), H-DS control (upper left) and (below left) the Auto Throttle Advance. The latter enables the HST travel pedal to also control the throttle, matching engine speed to the tractor speed in transport.


Where Kubota's HST Plus hydrostatic cruise control differs from normal hydrostatic drive is its ability to monitor and fix the forward speed using the tractors intellipanel.The digital display above the tachometer shows selected ratio on the left, a hare or tortoise symbol in green showing the selected high low split .

The servo-controlled travel pedal allows the operator to override the Cruise Control setting when making a turn or to alter the forward speed to meet a change in terrain or conditions. Once the pedal is released, the transmission will revert back to the cruise settings.


The HST transmission response is adjusted via a rotary knob (left), a push-button key (right) switching between transmission modes. Setting the tractor up to exploit various modes is not difficult. The transmission can be worked just like a conventional hydro using just the throttle and travel pedal.


Hydro Dual Speed, H-DS, is operated via a steering column mounted lever. H-DS essential adds a high – low split which can be selected on the move. A typical use would be when using a loader, selecting 'low' for digging and 'high' when shuttling back and forth.

Kubota suggests its HST Plus transmission is well suited to loader work, a Response Control enabling the operator to adjust how quickly the transmission reacts to travel pedal movement. A Load Sensing 'stall control' can also be selected for optimised loader performance.

In outline, this marries engine and transmission speeds to the tractor forward speed. Come to a stop, and the engine speed will drop back to idle.

Depress the travel pedal, and the engine speed will pick up in relation to how far the HST travel pedal is pressed.

In addition, there is a separate "Stall guard" feature that can be selected for applications like loader work.

With a conventional hydrostatic drive, the operator can 'stall' the engine by driving into a heap and not backing off on the travel pedal as the load on the tractor increases.

This load Sensing system detects a drop in the engine speed and simply bypasses the hydrostatic pump to prevent the engine stalling.

"The operator can also choose to use the (H-DS) Hydro Dual Speed control to select a high and low ratio on the move," adds Dave Roberts.

"This is done by simply moving a steering column mounted lever. An example of how useful this can be is to consider how you work during a turn or shuffling back and forth when loading. In work and when loading into a heap, a low ratio is engaged.

"When turning or moving between loads, a faster travel speed is desirable.

"This can be done by simply using the H-DS lever to select a higher ratio".

The HST transmission has a further control that allows the operator to select how aggressively the transmission takes up drive. In outline, soft for work on fine turf, a more aggressive setting helping boost take up in transport or when using a loader.

This is again not a new idea, but setting the system up is simple.

All that is needed is a twist of a dash mounted knob.

So, Kubota is able to offer those who demand the fixed speed abilities of a mechanical transmission with all the convenience and ease of operation more typically associated with hydrostatic drive.

The downsides?

HST is not offered on many models for a start.

If you are after a sub-60hp

Kubota with HST you can only have it on the L5240 and L5740.

Kubota also concede the transmission does sap some engine power. Realistically, if you need a 52hp tractor it should be the more powerful 5740 that you should be looking at.

And then there is price. It is always difficult to do a comparison when there are no like for like alternatives on offer, but consider HST to carry a premium of around £3,000 over a conventional mechanical tractor and you will not be too wide of the mark.

So is HST worth it?

The answer will depend upon how you use your tractors.

But if you want a power unit that you can set to operate at a speed you want to do a job, and not be tied to the speeds dictated by the available ratios in a mechanical gearbox, HST is well worth a look.

It will also be a versatile choice, ideally suited to loader work, transport as well as operating mowers, spraying and top dressing.

Cruise control can set up to operate in conventional hydrostatic mode for mowing, with load sensing accommodating changes in terrain to keep the engine speed constant. Versatility is a key feature of modern hydrostatic and CVT drives.

## Outline Specification: Kubota HST Plus L5740 tractor

**Engine type**
E-TVCS 4cyl diesel
**Max power ECE-R24 (kW/hp)**
41.5/55.6
**HST Plus transmission**
3 range hydrostatic plus H-DS splitter
**Speed range (km/h)**
0-30.7 fully variable
**2 and 4 wheel drive**
Selectable
**Guide gross weight (kg)**
1920
**Guide rear linkage capacity (kg)**
1750
**Dimensions (L : W : H) (mm)**
3245 : 1470 : 2375
**Minimum Turn radius (m)**
3.20
**Fuel tank capacity (litres)**
54
**Standard turf tyres (F:R)**
29x12.00-15:475/65-D20
**List price**
£24,600