

James de Havilland takes a closer look at the intricacies of current machinery, this month looking at the Toro Reelmaster 5610

The anatomy of... a Fairway Mower



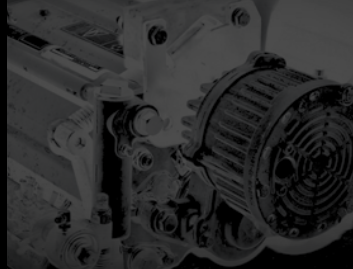
It's all about the DPA cutting units...

There are three models in the Toro Reelmaster 5010 series, the 35.5hp RM5410-D with 5 inch, 8- or -11 blade reels and the 35.5hp RM5510-D and 44.2hp RM5610-D, both with 7 inch reels and a choice of 8- or 11-blades. These differences apart, each model shares the same basic running gear and DPA reel design. Here we take a closer look at the range-topping 5610...

ABOVE:
With a ground bearing pressure of around 10psi, the five-gang Toro Reelmaster 5160 can operate in less than ideal conditions. The 7 inch diameter units can be specified with a choice of 8- or 11-blades.

Step-by-step Analysis...

Toro Reelmaster 5610



Ride-on Fairway mowers have evolved to the point where modern units can now deliver a consistent quality cut at outputs that would have been considered impossible perhaps even a decade ago. To suggest there have been huge developments that have enabled this would be wrong, but subtle design tweaks have been combined to make the Toro Reelmaster 5610-D a deservedly popular model.

Of equal importance, Toro, and indeed all the key manufacturers, have taken the maintenance demands of their mowers into consideration. No point in developing a mower that can deliver high levels of performance if this needs to be matched to intensive workshop care.

In the case of the Reelmaster 5010 Series, a key development has been the adoption of Toro's now well proven DPA, Dual Precision Adjustment, cutting units. A key DPA design feature is the use of a cast alloy main structure. Unlike traditional welded tubular cutting unit frames, Toro claim the rigid cast alloy frame of a DPA unit is easier to build 'true' in the factory and, once in service, remain that way. This means there is no parallel adjustment built in to accommodate any difference in end-to-end reel to bedknife clearance; the company suggests it will not be needed.

Other DPA design features include a removable cast support frame for the bedknife. This is designed to not only make it simpler to remove the bedknife for sharpening but to also allow the bedknife clearance to the reel to remain constant and at the same level as it is adjusted to accommodate wear/sharpening. According to the company, this prevents the bedknife having to be lowered as it wears, so doing away with 'bulldozing' the sward before it can be acted upon by the cutting action of the reel. The aim is to ensure a consistent cut as the reels are reground and across the full 2.54m cut width.

The EdgeMax bedknife comes as part of the Toro package when new, although a standard steel bedknife is available as a lower price replacement. The company suggest, however, that the EdgeMax design will retain its sharpness up to three times longer than standard steel. This is thanks to the increased wear resistance of the cutting lip. When the EdgeMax needs to be reground it can still be sharpened using a standard grinding wheel.

An interesting point is that



Operator orientated features include adjustable side arm and steering column. The seat can be specified with pneumatic suspension. This has the advantage of automatically setting the spring rate to suit the weight of the operator.



Toro first introduced its DPA - Dual Precision Adjustment - cutting units on its greens mowers, the cast alloy units progressively being introduced to other models including the Reelmaster 5010 series of fairway mowers in 2006.



The rear mounted engine radiator and hydraulic cooling package is easy to access for routine cleaning. Positioning the coolers at the rear of the mower helps reduce noise reaching the operator and allows Toro to offer a cab as an option.



Ribbed front rollers are made of Teflon coated alloy. A choice of groomer or 'groomer broomer' can be specified along with a choice of rear roller scraper or brush. Toro fit their Reelmaster 5410 with 5 inch reels. These are well suited to links and undulating ground.



Separate pumps are fitted for steering, traction, unit raise and reel drive. Note extensive use of solid hydraulic lines. Behind the pumps are the valves that are used to set the reel speed in relation to forward speed. Consistent clip rate is claimed for an even finish.



The rear engine hood tilts to provide good daily service access with all check points, including the battery, on the same side. Open frame design aids cooling and helps to prevent debris build-up around key components.



Adjustable side arm houses key controls. It can also be raised to allow access from the offside; useful in sheds where the mower may be parked with poor nearside access. Visibility from the seat and a general lack of clutter make it easier to accurately place the mower.



A simple stop if flipped up to limit the maximum mowing speed by limiting the travel pedal. Adjusted by adding or removing washers, the system allows the mower's speed to be easily set in the workshop, the operator flipping the stop down for full travel speed.

Toro advocates setting the reel to bedknife with light contact and not have an 'air gap'. This light contact, suggest the company, helps retain a 'square' edge on both the bedknife and face of the reel blades. In service, the units should make a characteristic 'singing' noise. To adjust the clearance, a single click on the ratchet adjusters on each side of the unit will make 9/10th of a Thou adjustment.

Judicious backlapping is also recommended by Toro. The key is to do the job little and often and not waiting for a noticeable drop in quality of cut before reaching for the lapping compound. Diligent maintenance of the bedknife to reel clearance and sensible backlapping are keys to extending the periods between a regrind, suggest the company.

The best way to assess how well the units are cutting is to of course look at the job they are doing. The simple workshop test is, of course, to use paper strips to check the units, ensuring they are cut cleanly when the strips are sliced from the vertical.

A Teflon coated ribbed alloy roll is fitted as standard to DPA units and a groomer or 'Groomer Broomer', with integral brush, may be specified. The grooming attachments both have permanent drive that will keep then spinning when raised out of work. This prevents debris building up on the groomer / brush. The working position of both is adjusted via a single click control with a distinct 'handle' enabling each one to be set at the same height as its neighbour.

In the UK, most Reelmaster 5610 mowers are specified with a powered rear roller brush, a scraper coming as part of the standard specification. The rear brushes have a spiral design that both vertically and laterally sweeps the roll and so prevents the build up of grass, worm casts and other debris.

To help control float over undulations, a spring compensation unit is fitted to each unit. A simple threaded rod adjustment can stiffen the spring as required. In most cases a single compensation spring is sufficient, but a second can be added to cope with more severely undulating fairways.

Running gear

The Reelmaster 5010 Series all share the same layout and running gear. Unusually, Toro offer four-wheel drive as an easy retrofit option. If two-wheel drive turns out to be the wrong choice, adding a

driven steering axle will not break the bank.

An integral part of the four-wheel drive package is CrossTrax traction control. In broad outline CrossTrax is designed to prevent wheelslip, automatically diverting 'power' from a front wheel with low grip its opposite number at the rear. This idea is not necessarily unique but users suggest it can help cut slip on damp, dewy mornings.

The four-cylinder Kubota engine, which is turbocharged on the 5610, drives four separate hydraulic pumps. Each pump is dedicated to one job; steering, unit raise lower, traction and sending oil to the unit motors. According to Toro this ensures the cutting units are not starved of power as they are raised out of work when the operator starts to make a turn. Of equal importance, the units will be more likely to be up to speed sooner when they are dropped back into work following a turn.

It is also interesting to see the amount of solid hydraulic pipe that is used, Toro using hose only where necessary. Solid pipe is better at dispersing heat than hose and, because it can be fixed in place, is less liable to wear. As with other manufacturers, Toro see hydraulic hoses as wear items, with a recommended service life of two years. In practice most users prefer to keep an eye on the hoses, replacing those that show signs of fatigue. Sensible routine maintenance, in other words, is a key to ensuring any weak hoses are replaced before they can have a chance to fail in service.

Operator area

The operator area is free of levers and clutter, the steering column adjusting to suit different sizes of driver. The standard suspension seat can be up-graded to a pneumatic version, the key advantage of which is that the seat automatically adjusts to accommodate the weight of the person sitting on it. This can make a huge difference to operator comfort as few will take the time to set up the seat when swapping between machines.

All key controls are mounted on a side arm, a pair of bolts enabling the arm's height and level to be adjusted. There are no levers, a joystick operating the raise and lower with toggle switches for reel engagement. Ergonomics have really come a long way in the past 10 years, Toro working to ensure all their ride-on mowers share the same basic control systems. This is

a real help when swapping between different mowers.

One simple but interesting development introduced with the 5010 series is the working speed control. Comprising an adjustable stop, the control is flipped up to limit pedal travel. This prevents the operator exceeding a pre-set speed. When travelling between fairways, the stop is simply flicked back down to allow the travel pedal to be pushed down fully. To adjust the set working speed, washer spacers are added or removed as required, a decal in front of the stop indicating how fast the mower will go with a given number of washers installed.

Maintenance

The rear engine hood has a swing out rear screen. This is easy to blow clean. The hydraulic cooling radiator pivots on pins at its base, allowing it to be either blown clean when tilted back or lifted and cleaned whilst resting on the ground. Having the radiator pack at the rear of the mower also means less noise from the cooling fan reaches the operator, as well as reducing the amount of heat behind the seat.

With the radiator screen closed, the engine hood can be tilted to provide nearside access to all key daily checks. This includes the battery. There is also a good deal of space around the engine, so getting at filters is easier. The chassis is also 'open', a useful point when it comes to giving the mower a cleaning blast of compressed air.

The operator seat platform tilts to the offside so again providing nearside access to the hydraulic and the reel speed valves. Again, Toro have tried to design the 5010 Series so they are easier to look after and, when work is needed, make the job of the mechanic less complex.

Summary:

Quality of cut is a key design priority with any mower designed to produce a good finish. What is interesting is the way in which ideas first seen on greens mowers have filtered through to fairway mowers. A Toro Reelmaster 5010 is equally at home mowing fairways as a premier league sports pitch. The quality of cut it produces is that good.

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