

Safety in the Turf Care Machinery Industry

Safety has always been of paramount importance for all those involved in the turf care machinery industry. But with the sharper legal focus on employee health and safety, it is becoming an even more prominent issue. Today it impacts directly on how Course Managers and Greenkeepers manage their machinery fleets.



For everyone responsible for course management, the regulations governing the safety and operation of course machines are clear. They can be found in The Provision and Use of Work Equipment Regulations (PUWER) 1998, which in part state that equipment provided for use at work must be:

- 'Safe for use, maintained in a safe condition and, in certain circumstances, inspected to ensure this remains the case.'
- 'Used only by people who have received adequate information, instruction and training.'

So let's look at these two key statements in turn:

1. Safe for use, maintained in a safe condition and, in certain circumstances, inspected to ensure this remains the case.

Daily Maintenance Checklist
Duplicate this page for routine use

Maintenance Check Item	For the week of:						
	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Sun.
Check the safety interlock operation							
Check the brake operation							
Check the engine oil and fuel level							
Drain the water/fuel separator							
Check the air filter restriction indicator							
Check the radiator and screen for debris							
Check unusual engine noises (1)							
Check unusual operating noises							
Check the hydraulic system oil level							
Check the hydraulic filter indicator (2)							
Check hydraulic hoses for damage							
Check for fluid leaks							
Check the tyre pressure							
Check the instrument operation							
Check the reel-to-bedknife adjustment							
Check the height-of-cut adjustment							
Check all grease fittings for lubrication (3)							
Touch-up damaged paint							

1. Check the glow plug and injector nozzles if hard starting, excess smoke, or rough running is noted.
2. Check with the engine running and the oil at operating temperature.
3. Immediately after every washing, regardless of the interval listed.

Notation for Areas of Concern

Inspection performed by:		
Item	Date	Information
1		
2		
3		
4		
5		
6		
7		
8		

Implementing and following a machine maintenance schedule has many benefits, but improving the performance of the machine and aftercut appearance is the primary aim though following maintenance schedules and looking after your machine will give other benefits. Chief among these are operator safety, machine reliability - resulting in less downtime - and a reasonable return on the residual price when the time comes to sell.

Daily checks differ from course to course, though standard check-sheets can be found in the operator's manuals supplied with the machine.

Most daily checks are second nature with experienced operators and take little time to complete. Checking for fluid leaks, damaged hoses and units can be carried out with a cursory glance and investigated further if required, whereas interlock switches, braking, steering and instrument operation are normally checked the moment the operator drives from the shed. Checking oil levels, air filter and tyre pressures becomes routine and takes little time to do. It is possible with some greens machines that a difference of 1 psi in the tyre pressure will give a 0.25mm mismatch, which is visible to the naked eye.

At the end of a day's work, it is worth taking the time to wash units down with low-pressure water - lubricate to purge any water and top up the diesel tank to minimise any condensation forming in the tank over night.

One of the most important daily checks is to verify the unit is on cut. This will reduce the risk of damage to the reel, excessive wear on the moving parts and give a better quality of cut. There are so many variables that can affect quality of cut and it is important to understand all factors involved.

It is important to check the following to maintain reel mower performance on a daily basis:

- **Bedknife to Reel Adjustment** - Both the reel and knife's cutting edges need to be straight and sharp, so grind as necessary and back lap little and often. The reel should be adjusted to the bedknife so that it pinches paper when placed between the two and cuts paper when it is passed over the bedknife into the path of the reel. This is one of the most effective preventative maintenance practices.
- **Attitude Adjustment** - where units have this capability, is normally set for the height of cut used. 'Attitude' refers to the bottom of the bedknife and the ground plane under the cutting unit. A large angle is referred to as an aggressive bedknife attitude. The opposite applies to a small angle and in this less aggressive set-up the bedknife can be riding on the turf. This is one of the first places greenkeepers should look when troubleshooting aftercut appearance issues. Designs in units, such as the DPA unit and the Bedbar pivot location, now allow for operators to maintain a virtually-constant aggressiveness as the reel wears.
- **Rollers need to be set parallel with the cylinder** using a set-up plate and at the same time roller bearings should be checked for excessive play. Modern components such as the DPA unit have rollers that are parallel with the reel throughout and do not require the need to 'parallel'.
- **Height of cut needs to be checked for desired finish.** As with tyre pressures, errors in setting the height of cut on a greens machine by as little as a 0.25mm mismatch will be visible to the naked eye. With courses achieving ever-lower heights of cut on their greens, it is becoming more critical to achieve continuity through setting heights of cut.

It is important to maintain continuity across all cutting units and ideally to ensure the same person sets all units. Again, this is another area to look at when trouble-shooting aftercut appearance issues.

By Ian Sumpter

REELMASTER 5210 / 5410 / 5510 / 5610
QUICK REFERENCE AID

CHECK/SERVICE (daily)
 1. OIL LEVEL - ENGINE
 2. OIL LEVEL - HYDRAULIC TANK
 3. COOLANT LEVEL - RADIATOR
 4. FUEL/WATER SEPARATOR
 5. PRE-CLEANER - AIR CLEANER
 6. RADIATOR SCREEN
 7. BRAKE FUNCTION
 8. TIRE PRESSURE
 9. BATTERY
 10. BELTS (FAN, ALT.)
 GREASING - SEE OPERATOR'S MANUAL

FLUID SPECIFICATIONS/CHANGE INTERVALS

SEE OPERATOR'S MANUAL FOR INITIAL CHANGES	FLUID TYPE	CAPACITY	CHANGE INTERVAL	FILTER	FILTER PART NO.
A. ENGINE OIL	SAE 15W-40/34	22 QTS (20.9 L) (20.9 L) (20.9 L)	150 HRS.	100-5167	
B. HYD. CIRCUIT OIL	ISO VG 46/58	9 GALS.*	800 HRS.	SEE RECOMMENDATION	10-8877
C. AIR CLEANER				SEE RECOMMENDATION	10-8878 10-8879 10-8880 10-8881 10-8882 10-8883
D. FILTER, BRAKE FUEL			400 HRS.		99-7612
E. WATER SEPARATOR			400 HRS.		99-6764
F. FUEL TANK	NO. 2-Diesel	14 GALS.	Drain and Flush, 2 yrs.		
G. COOLANT	50/50 Ethylene glycol/water	22 QTS (20.9 L) (20.9 L) (20.9 L)	Drain and Flush, 2 yrs.		

* INCLUDING FILTER

Lastly, all these daily checks should be recorded as supporting evidence that the machine has been inspected and complies with PUWER regulations 'safe for use'. Full maintenance check-sheets can be found in the service manual. The sheets give service intervals, specifications and interval hours and can be used as a guide and recording method for the golf course mechanic. To help the mechanic, certain manufacturers have a quick-reference guide located on the machine. This incorporates useful information from the service manual, such as daily checks, engine oil type, interval hours and part numbers. Obviously, it is always recommended that any advanced maintenance is best left to a qualified person. Again all maintenance checks should be recorded as supporting evidence that the machine has been inspected and complies with PUWER regulations stated previously - 'safe for use, maintained in a safe condition and, in certain circumstances, inspected to ensure this remains the case.'

2. 'Used only by people who have received adequate information, instruction and training':

In the Continue to Learn booklet of this series of articles - volume 2, 2005 - Keith Jaynes looked at the requirements for installing machinery, and pointed out the clear distinction between installation and operator training. Therefore I shall not attempt to deal with installation again here. Suffice to say, manufacturers and golf club employers share a responsibility to ensure machines are installed legally. Before an operator uses any new machine, a competent person should always cover a comprehensive installation briefing. Those responsible for receiving machines should sign installation/delivery paperwork only when they are happy that a complete installation handover has been given.

The past few years have seen an increase in operator training courses. This has come about in part, due to the Health and Safety executive reviewing the use of machines in the agricultural/groundscare industry and the possible introduction of a mandatory licence for all operators.

Some dealers have seen this structured training as an opportunity to contribute to the safety of the industry and improve customer care and after sale satisfaction. Manufacturer's training or accredited training through Lantra, is generally available from manufacturers, training providers or local dealers. We have not yet seen the introduction of a mandatory operator's licence but casting an eye towards the construction industry, with its introduction of the CITB licence for machinery operators, I believe it is only a matter of time before we see something similar in our industry.

There are a variety of resources available for golf courses to offer in-house training. Manufacturers produce videos covering both general and machine-specific safety on the golf course. Greenkeepers using Toro equipment can now take advantage of a

variety of operator training courses run by distributor Lely UK, which are unique in the industry. Courses are part of a year-round training programme and are held over two days at Lely's St Neots training facilities. The sessions are very popular and comprise:

GOLF COURSE MANAGER'S COURSE

Designed to provide an understanding and knowledge of how best to manage a machinery fleet, including routine paperwork. Covers available information to assist turf professionals in the management of their courses. Also includes a brief look at Health and Safety on the golf course.

GROUNDSCARE OPERATOR'S MAINTENANCE COURSE

Provides an understanding and knowledge of troubleshooting, routine servicing and maintenance of Toro groundscare machinery. Covers principles and factors that affect clip, unit configuration and after-cut appearance, as well as giving training in the use of Toro equipment.

CUTTING TECHNOLOGY AND AFTER-CUT APPEARANCE

Aimed at troubleshooting, routine servicing and maintenance of cutting units. Teaches the principles and factors that affect clip, unit configuration and after cut appearance. Participants also learn about grinding procedures.

GROUNDSCARE MECHANIC'S COURSE

For troubleshooting, routine servicing and maintenance of Toro groundscare machinery. Training in the principles and factors that affect clip, unit configuration and after cut appearance, and how to use an ACE handheld system. Also covers Level 1 electrics and components, and Level 1 hydraulics and hydrostatic units.

SPRAY TECHNICIAN'S COURSE

For training in using and calibrating a pro-monitor and pro-controller. Additionally deals with troubleshooting, routine servicing and maintenance, including sonic booms.

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