

MACHINERY SERVICING

Roland Taylor gives some handy tips which should help you make the most of your machinery this season

My New Year brought with it a heavy head cold. It was while taking various potions to get rid of it, that I got to think how many similarities a piece of machinery, especially the engine, has with the human body.

With that first flush of new growth only a few weeks away, if the equipment has not already been serviced, now is the ideal time to carry out this important work. Modern machinery requires less servicing than in the past, but it is still vital that it is done, as laid down by the manufacturer, if optimum performance is to be maintained.

Bearing in mind my original thoughts, lets first take a look at the heart of all powered equipment - the engine. This component requires the most attention and there are generally four areas of importance, fuel, lubrication, air and coolants - similarly our bodies require all these. A deficiency in any one will have detrimental effects on both our performance and machinery we use.

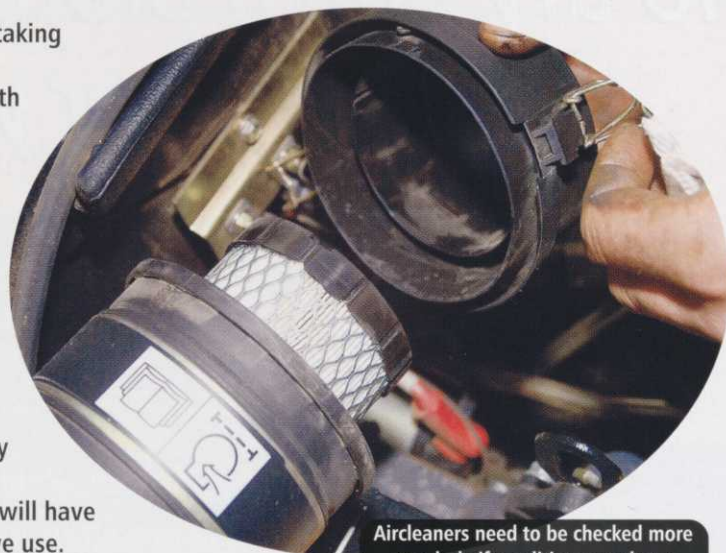
FUEL

There are two factors that can effect fuel's efficiency, contamination and sell-by-date. Where modern petrol has been left in the engine's fuel system it becomes stale, and may have done considerable damage to the carburettor's components. This is a common reason why an engine fails to start and means the whole system needs to be thoroughly cleaned down and fresh fuel used. In storage it will also go off. A solution to both these problem is to use a fuel additive. This is reasonably cheap and will keep petrol fresh for up to 24 months. It is available from leading engine manufacturers and is worth the investment.

We do not like drinking dirty liquid, nor does an engine. Contamination of fuel can occur in a number of forms. The most obvious one is dirt and this can get into an engine's system via the fuel container and/or the method of filling the tank. Some form of clean filter funnel is required. Water is another agent that could find its way inside a power unit. A by-product of the considerable heat, combustion generates, is condensation. Water can also gain entry via the the fuel supply system.

LUBRICATION

Going back to the comparison between machinery and the human body, our joints need some form of lubrication otherwise we would seize up. But there is a greater problem. When our hands are cold we rub them together and this creates friction, which in turn produces heat. In the context of engineering, two metal surfaces rubbing against each other results in a considerable increase in surface temperature. If this is not dissipated they will eventually become welded together. The main function of oil is to provide a protective film between two surfaces. This keeps them apart so they move smoothly with minimal heat generated. Oil also acts a coolant, helping to disperse the heat. Any changes in this vital film, if left unchecked, could have a number of unpleasant possibilities including poor performance, a reduction in the equipment's life span or a complete seizure. It also causes downtime and, top of the list, costs money. The crazy thing about this situation is that the quantity of oil involved is relatively inexpensive, especially when compared to the bill for, say, a replacement engine. Combustion is a filthy process and generates carbon and moisture coupled to this



Aircleaners need to be checked more regularly if conditions are dusty

the ingress of dirt from outside and it is easy to see how polluted and ineffective oil can become. This also applies to other lubricants such as grease.

Lack of a reduction in oil efficiency, due to contamination, decreases the film layer and brings the two surfaces closer together so heat builds up and in turn starts burning off what little oil is left. It is not long before metal is rubbing against metal. Oil needs changing at the recommended times and the levels checked every time a piece of equipment is used. When it comes to oil, saving pence at the expense of quality is definitely false economy.

COOLANTS

For small engines these are water, air or a combination of both. As already mentioned oil also helps to dissipate heat.

From a human point of view we all know how lethargic we become in hot weather if there is nothing to keep us cool. With engines the heat build up results in a decline in performance, more fuel is used and the chances of damage occurring is considerably increased.

AIR

To be efficient, air-cooling requires a large surface area. On engines and hydrostatic systems this is achieved by creating a series of fins. The air is sucked or blown over these by some form of fan. In the event of these airways becoming blocked up with dirt, debris or dried grass the flow becomes restricted and hot spots start occurring. If nothing is done to clear these, then there is every possibility of a fire breaking out.

WATER

This is pumped around a system and into a reservoir (radiator) where air again is used to cool it. The same applies, as far as blocked fins are concerned, the water is then not cooled sufficiently before being returned into the system. Hydraulic oil is dealt with in a similar way. The level of liquid is also critical. If it is too low, then the cooling process becomes highly inefficient.

With both these methods, cleanliness and regular checking of liquid levels (topping up) are key operations.

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AIR FILTERS

With head colds you generally have a stuffed up feeling, it is hard to breathe and one is left thoroughly debilitated. This is what happens with an engine.

In addition to producing correct power output, the air filtration system is a major factor in the level of emissions an engine puts out. An efficient combustion process requires an air and fuel mixture in the right ratios. Less air means more fuel is used and this is emitted into the atmosphere. Another symptom is poor starting. There is also an increased possibility that foreign bodies will enter the engine.

Air filtration systems are generally in the form of paper cartridges often with a pre-cleaning element. Although, in some cases these can be cleaned, for the amount of money they cost, it is better to replace them with new ones. In dry, dusty conditions the elements will need to be checked more regularly and cleaned or renewed. Oil baths are less commonly found. Where they are fitted the level and condition of the oil needs to be constantly monitored.

SPARK PLUGS

Electronic ignitions are virtually trouble free, thank goodness! Some readers will remember contact points and the fiddly process to ensure the gap was set correctly in relation to the pistons top-dead-centre. While these have long disappeared, there is one part of the ignition system that does require attention - the spark plug. Combustion is a dirt process with carbon and some oil being by products. This accumulates around the plug's electrode and as a result reduces the quality of spark and in extreme cases it eliminates it. The symptoms of spark plug problems include poor starting, increased fuel consumption and a considerably reduced performance. In the old days sand blasting was the method of cleaning spark plugs. However much they were cleaned afterwards some minute particles of sand were still retained. These rattling around in the engine, in alloy models quickly heralded its demise. A spark plug is not an expensive component, so badly corroded or worn ones should be dumped and new ones fitted.

OTHER THINGS TO LOOK OUT FOR

Where a recoil starter is fitted, the rope needs to be checked regularly for any signs of fraying or wear. An electric starting system includes a battery that may require inspection. Connectors and terminals will benefit from a smearing of grease.

Having looked at servicing, as far as the power source is concerned, it is time to consider the rest of the equipment. Each machine will have its own specific requirements, but there are areas that are common to all.

At this point it is worth considering overall cleanliness. Because of the types of condition these units are used in there is always plenty of dirt, dust and abrasive compounds around, plus build-ups of debris. It is easy to forget that the modern machine is often a sophisticated piece of technology, built to exacting tolerances and therefore can be easily damaged by the ingress of foreign bodies. For this reason alone, it is wise to keep equipment as clean as possible. This policy also has other spin-offs. It is much more pleasant to operate and work on and there is less chance of a problem being hidden from sight by a layer of grime. In some cases if it has been maintained and kept to a high standard of cleanliness its resale value can be higher than one that has not been looked after. The modern pressure washer is ideal for the job, but beware of forcing water into electronic components.



Check oil levels every time the unit is used

BLADES

There are a number of possibilities that need consideration when it comes to poorly maintained cutting systems.

- Regardless of the system, the common denominators of all are sharpness and balance.
- Blunt worn or damaged blades are unsafe. An unbalanced unit will set up destructive levels of vibration and is highly dangerous.
- More stress is placed on all the machine's components thus shortening their lives.
- A bigger risk of a major breakdown which will result in down time and inconvenience.
- Increased fuel and oil consumption.
- It takes longer to carry out the work.
- Increased costs.
- Damaged turf, especially the finer grass.
- Higher levels of emissions into the atmosphere and an increase in noise levels.

All blades that are sharpened must also be balanced. Most of us, who drive cars, have at sometime experienced an unbalanced wheel. Whatever the travelling speed, it is not a very pleasant experience and we take immediate steps to rectify it as soon as possible. A rotary blade is spinning at 120mph plus, so if it is damaged or worn and unbalanced it becomes lethal. The vibration generated will eventually shake the machine to bits.

In the case of cylinder mower systems the settings are critical, not only for a quality cut, but also so the grass is subjected to as little stress as possible. A badly adjusted unit, where the reel is too hard onto the bedknife, will give a poor finish, and act like a brake on the engine. Similarly, a cylinder not set close enough to the bedknife will tend to snatch at the grass rather than cut it. This damages the plants and makes them more susceptible to disease. The whole mower is subjected to more stress, the job takes longer and the quality of finish is not acceptable.

After the power source, the sharpness of the cutting system is critical to all round performance.

HYDRAULIC SYSTEMS AND OTHER DRIVES

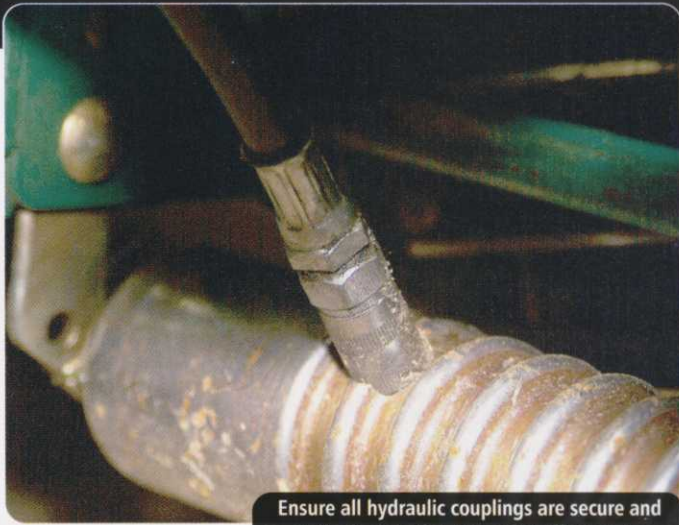
The cooling of these is similar to that of an engine, so where fins are involved they need to be kept free of debris so the airflow can circulate freely. Check the oil levels regularly and top up if necessary. An inspection should be carried out to ensure all the hose connections are not leaking and there are no signs of them being of chaffed or worn. Spots of hydraulic fluid on the storage area floor or lower levels in the tanks require further investigation.

Where belts or chains are used, they should be adjusted to the correct tension, especially in the case of belts if these are loose they will quickly heat up and can cause a fire.

TYRES & GUARDS

Having the correct tyre pressure is important, if incorrect it could increase ground pressure resulting in compaction. Take a look at treads for signs of wear or 'foreign bodies'. Missing or damaged safety guards should be repaired or replaced.

Having a good service schedule pays dividends across the board.



Ensure all hydraulic couplings are secure and be on the lookout for signs of chaffing on hoses



Replace heavily contaminated air filters

LINKAGES & JOINTS

They tell us to take cod liver oil to lubricate our joints. Where grease nipples are fitted it is an indication that something requires attention, be sparing how much you apply. Modern grease guns can pump a lot of lubricant and there is a possibility it will push out a seal or come out the joints, to hang in dollops that attract dirt and sand to form an ideal abrasive paste which will wear away components. It is a good idea to spray all joints, cables and connectors with WD40, AS it will help to keep them mobile and rust at bay.

Finally, check all nuts, bolts and fasteners are up tight or engaged.

Having a tight servicing schedule pays dividends all round, as can be seen from the following list: I make no apology for repeating some points already mentioned because, to quote the medical profession, 'prevention is better than cure'.

- Machinery is less likely to break down.
- It is more efficient in work output.
- On fine turf the possibility of stressing the turf is virtually eliminated making for a stronger sward.
- From a Health & Safety angle, you are looking after operator's interests and keeping the equipment in a safe condition.
- There can be significant reduction in the noise and emissions a machine emits.
- Well-kept machinery is likely to fetch a better price when it comes to trading in.

Next time you are feeling under the weather and lethargic you will have some inkling of the effects poor maintenance can have on your equipment.

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