

COMBINE CLEAN-UP

Tom Ryan, Teagasc, Kildalton

The combine is probably the most expensive machine on the farm or in a contractors fleet and, if not stored properly, can deteriorate more during the off-season than when working in the field. Time spent in cleaning, repairing and servicing the combine will leave it ready to go for next years harvest.

It is important to get it cleaned up as soon as possible after the harvest. This will make the cleaning operation and any service and repair jobs that have to be done a lot easier. Cleaning should be done before any servicing and repair work is undertaken. Clean out the machine on a dry day soon after the harvest, and do it in an area that can be cleaned up, or at least away from the storage site, to avoid attracting vermin.

Cleaning equipment

Useful tools to help you with the cleaning process are a compressor, an industrial vacuum cleaner, an airline and brushes. The compressor and the industrial vacuum cleaner may be got from a local hire firm. Everyone involved should wear goggles and a dust mask when the compressor is being used. Using a long piece of pipe helps to keep the point of action of the compressor away from the user. Buy a coupling for the compressor pipe and attach it to a 20-25mm diameter piece of gunbarrel pipe. The narrow bore pipe will give a good shot of air and can be flattened a bit at its end, if necessary.

If you are using extension leads to bring power near to the combine make sure that the supply is protected with an RCD (residual current device). If there's none in the fuse box use a portable one. Plug the extension lead into it.

Some people recommend using a rust inhibitor for the shiny metal parts. In practice very few people use it but it does prevent specks of rust forming on components like the fingers, lifters, augers, auger bottoms and elevator chains and housings. Preferably use the type that does not stay sticky when it dries. Another option is to apply a light mist of oil with a parafin gun on the end of a compressor. Use new oil. Adding a drop of diesel to the oil will help it spread better, although, it does cause a bit of an unpleasant smell in the store. If no compressor is available brush on a light coat of oil or spray on WD 40. Its probably best to remove the knife, protect it with a light coat of oil and store it separately.

Methodical approach

The most obvious place to start is at the front of the machine. Clean the table and the intake elevator housing. Take note of any damage as you go along.

Make sure that stone traps are cleaned out and leave them open to allow air to pass freely through the machine to dry it out after the harvest.

Remove all loose debris, such as straw, stones and soil from the drum and concave. Check for wear and stone damage.

Open the guards and clean all shelves, ledges and the grain pan. Remove the sieves and clean them thoroughly. Any grains left stuck in the sieves will only attract vermin. Remove any straw, awns and other debris trapped in the straw walkers.

After cleaning all loose material, run the machine with all the elevator, auger and inspection covers open to loosen any remaining debris. First, make sure all equipment and spanners are gathered up and no other people are in the vicinity.

If elevator and auger housings are coated with mud and crop residue the elevator chains and augers should be removed to facilitate cleaning. If these residues are allowed to bake hard they will be difficult to remove and will cause rapid wear to drive belts and chains.

The outside panels of the combine should get a wash down. Generally there is no need to steam clean the combine. However, some people may want to steam clean certain parts. If this is the case it should be done when there is very good drying. If you want to use a steam cleaner protect all the electrics and sealed bearings with plastic coverings. Water entering sealed bearings will cause corrosion leading to rapid wear. Fill all nipple bearings with grease. Be careful not to aim the jet directly at bearings or electrical components. After cleaning remove the plastic covers, regrease the nipple bearings with a small amount of grease. If you can't get conditions dry enough and you want to steam clean, say, the engine compartment, why not clean out the loose debris and wait until just before next harvest to do the steam cleaning.

Maintenance

The best way to prevent any delays and unnecessary breakdowns at next years harvest is to make sure that the combine is fully serviced and any damaged or worn parts are repaired or replaced. Ideally all this should be done in the off-season after the machine has been cleaned ready for storage. Leaving repairs and maintenance to the last minute leads to rushed jobs and will not help to get next years harvest off to a good start. It puts pressure on dealers at a time when they need to be free to cope promptly with breakdowns.

Modern combines will have 5-6 seasons done before any major repairs or maintenance are necessary. The main dealers provide a very good mobile service and most combine owners are using it, some even for routine maintenance.

Use the operator's manual to tease out the finer points of maintaining and setting your machine. While recommendations are generally the same for all makes your manual provides specific information for your machine, e.g. the correct lubricants and service intervals, etc. On modern combines a lot more thought has been given to providing easier access for the carrying out maintenance and repair work.

Engine maintenance

With the engine compartment clean and spotless its time for engine maintenance. Drain the engine oil, change the filter and replenish with the correct oil. This new oil will give better protection to the engine surfaces while in storage. Change the fuel filters and make sure that the radiator and oil coolers, if fitted, are thoroughly cleaned. There is usually no need to drain and flush the radiator every year. Do so if the coolant is rusty coloured or if the concentration of anti-freeze is low. Service the hydraulic systems according to the schedules outlined in your manual. Make sure all drain taps and plugs are in place and securely tightened.

Keep the engine dry by preventing oil and diesel leaks and spillages. Leaks in the engine compartment will increase the risk of fire during the harvest.

Electrics and electronics

Pay particular attention the starter system. Any loose connections here could cause sparks possibly leading to a fire. Be especially careful disconnecting or connecting up batteries - disconnect the negative first and reconnect it last. Faulty solenoid switches have been known to cause fires on tractors and combines. Get in to the habit of using the isolator switch. Modern combines use electronics to monitor and control functions. These systems are generally very reliable and relatively inexpensive to repair. Dealer service personnel have diagnostic equipment to pinpoint problems. Many minor faults can be sorted out from the manual or over the phone by referring to error codes. Error codes are displayed on the dashboard to indicate the source of a particular problem.

Precision farming systems are likely to be more commonplace in future. A basic kit provides on-the-go yield and moisture information. When you're ready for a full scale mapping system the yield and moisture sensors can be used in conjunction with a position receiver and computer software to produce yield maps. These systems are expensive and the benefits should be carefully considered before purchase. Contractors will generally be in a better position to justify the investment by offering it as a service to their clients.

Fuel

Make sure there is no sediment and water in the fuel tank from the previous harvest. During the storage period water will collect in partially filled fuel tanks as a result of condensation. Fuel tanks should be completely filled when the machine is being laid up at the end of the season.

Header

All the parts of the header; the reel, cutterbar, dividers, feed auger and intake elevator must be well maintained and adjusted properly. Remove the guards from the drive side of the header. Check the condition and tension of all belts and chains. Generally, the correct tension for all belts is 12mm of deflection for each 300mm length, checked on the longest run. Chains should deflect only 6mm per 300mm of length.

The chains in the intake elevator need a close look. These chains take a lot of hardship and if a chain breaks it can cause a lot of damage. The auger can be damaged if stones get in under the flights. It is good to have the auger slip clutch reasonably slack to help prevent too much damage.

Examine the condition of all other drive mechanisms and gearboxes ensuring that there are no leaks and oil levels are correct. Wobble box oil should be changed at the end of the season, not the beginning, otherwise water in the oil from condensation will lead to rust. Excessive movement of any part will indicate wear and tear that should be attended to.

Drum and Concave

If the drum and concave are faulty good threshing will be difficult to achieve. Look for bent or damaged rasp bars, worn serrations on the rasp bars, worn concave bars and broken concave wires. If the serrations on the rasp bars are worn, the threshing action will be below par. Much of the damage comes from picking up stones, and working in lodged dirty crops. Remove the inspection covers on each side of the drum and check to see if the concave is out of shape or worn. Many concaves have more clearance in the middle because they are bellied-out. This has to be sorted out. You can either have it rebuilt or have a more robust one fitted to cope with heavy crops and tough conditions. A concave with a belly in it will give poor threshing, broken straw and inefficient use of power.

Bearings, Belts and Chains

There is no excuse for delays at harvest due to dry or worn bearings. The bearings used in combines are all fairly standard types and sizes. They are readily available and not too expensive. Be careful removing bearings off shafts – use a pullers if possible. If other methods – hammer, chisel or punch are used, wear suitable eye protection. High velocity fragments can fly off bearing parts very easily.

Look at belts for cracks and damage. Its not easy to know when to replace belts – you'll have to make a decision based the replacement cost and the amount of work you have to do. Belts

should not be over-tightened when replaced or be forced over a pulley flange. Instead the adjuster should always be slackened off. Adjust the tension later when the new belts have bedded-in. Recent models may have more sophisticated belt tensioning systems.

The tension on elevator chains should be set right. On the front elevator the chains should not be rubbing off the bottom housing and on the grain and returns elevators the chain should be just gently tight on the bottom sprocket. A loose chain on a grain elevator can cause grain crackage. Check the condition of the chain especially at the joiner links.