

Galfre Compact Drum Mower Assembly Guide



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Section 1 Mower Assembly

Scope and Purpose

This guide is limited to the Galfre model 105 and 130 drum mowers sold by Tractor Tools Direct. The guide covers models manufactured in 2014 and forward.

This manual is a guide to aid in the assembly of the drum mower models listed above. Consult the operations manual for instructions on usage and safety.

Uncrating

Your crate will look like this when you receive it.

It will weigh about 780 pounds in the crate, so you will need a forklift, front loader with forks or a delivery truck with a lift gate to unload it at your location.

You can assemble the unit outside, but on a smooth floor indoors is easier. If outside, putting down a tarp makes finding dropped hardware easier.



Figure 1 crate for Galfre 130 drum mower

If you have a forklift or a loader that you can lift the heavier assemblies out, then use that with a lift strap.



Figure 2 lifting the drum assembly

If no lift is available, then the crate will need to be cut open removing one long side. You will take out the smaller parts first, then when only the unit with the 2 drums remains, slide the drums out of the crate onto the

ground or floor. Having 2 people is easier. It will not hurt anything to drag it across the floor. The drum mower bottoms drag across the ground anyway.

Layout the parts so you can see everything in one place.



Figure 3 parts ready to assemble.

Take the bag of parts and sort them out in like groupings. It makes finding the hardware easier. The bag on the left is for the Black Hole conditioning system, leave them in the bag as they get used all at once.



Figure 4 bag of hardware.



Figure 5 hardware sorted out.

Grease the PTO driveline universal joints before assembly. Also grease the plastic fittings on the free rotating plastic guards. It's much easier to do before assembly. 10 places as shown in figure 6.



Figure 6 ten grease points on 2 PTO shafts.

Blade Installation

The 6 blades are installed and changed with the blade tool. The Blade tool is stored on the back of the 3 point hitch.

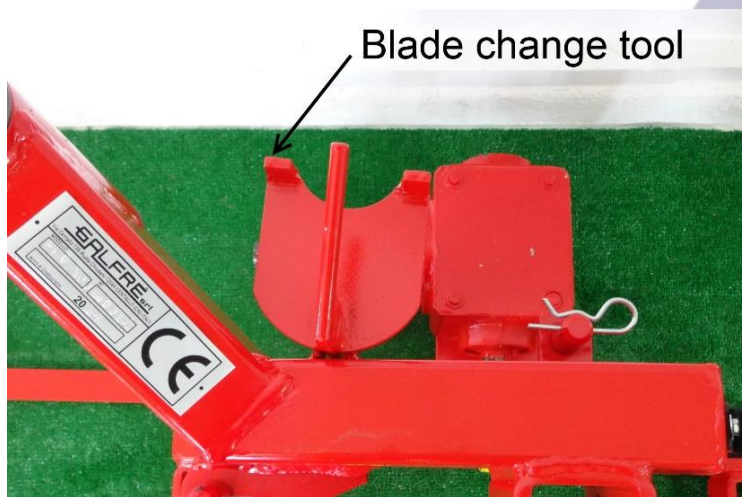


Figure 7 blade change tool.

Find the 6 blades and separate them. Install them with the beveled edges face up.

Using the blade tool, pry open the drums and install the blade by fitting the hole of the blade over the pin inside.

Never put your hand or fingers inside the opened drum. The blade tool will slip off if it is raised too high.

Position the tool, raise the arm, install blade let the tool arm down. Be sure the blade is on the pin and swings freely.



Figure 8 installing a blade.

Three Point Hitch

Move the 3 point hitch assembly over to the back of your tractor. Attach your linkage arms and install the lynch pins.



Figure 9 attaching linkage arms

Now attach the top link.



Figure 10 attach top link

Lift the 3 point hitch unit up and install the second pin in the top link and the tractor. Adjust the top link to make the 3 point hitch close to straight up and down.



Figure 11 level the 3 point assembly with the top link

Now that the 3 point hitch is attached to the tractor, install the PTO guard.



PTO Guards use these three holes.

Figure 12 PTO guard mounting holes

Find the PTO end guard that is notched, locate it on the right angle gearbox facing to the back as shown. This notch allows the PTO to fold back when in transport position.



Figure 13 PTO end guard with notch

This will require a 10mm socket with an extension. The washers go inside the guard. Don't over tighten, it's just plastic.



Figure 14 use 10mm socket with extension

The front guard that faces the tractor should be installed later after the PTO is cut. Instructions will be given later in the text.

Attaching the Arms to the Three Point

Place the drum mower section so that it is oriented as shown. Be sure the PTO spline shafts face each other. The drum section is shown with arms connected so you can better locate it.



Figure 15 move the drum assembly over to the three point assembly like this

You will use this subassembly shown to link the three point hitch assembly to the arms that connect to the drum unit.



Figure 16 swivel tee identification

Put the round tee with bushings through the hole so that the cap is on top. You will need either an adjustable wrench, or a 30mm socket. Don't tighten all the way, the cap screw will need to come back out to mount the top arm later.



Figure 17 swivel tee in place for next step

Next get the shorter of the 2 pins.



Figure 18 short pin identification

Align the two holes on the support arm so that they are concentric. The pin will not go through and the plastic bushings will be damaged if the holes are not well aligned first.



Figure 19 align holes in arm to swivel tee

Use a large dead blow mallet to fine adjust the centers of the holes to be concentric. It may also be necessary to take a flat file and file a lead angle on the plastic bushings outer faces, at the bottom to aid in starting it between the inner flats on the fork. If the fit is still tight, sand or grind the paint off the inside faces where the bushings

go on both sides. Use sandpaper wrapped around a flat file or a sanding disk. Keep this face smooth so it does not wear the plastic bushing.



Figure 20 face shown sanded for better fit between bushings

Drive the pin through. Fit the washer and the nut. The nut fits a 30mm wrench. Do not over tighten, just snug.



Figure 21 pin through and nut started

The top spring arm will fit onto the top cap as shown. Again do not over tighten as it needs to be able to move.



Figure 22 top spring arm installed with nut started

The next hardware you will need is shown here.



Figure 23 use this hardware to attach spring arm to lower arm

Connect the lower arm to the top arm by aligning the holes.



Figure 24 top spring arm attaches to lower arm here

The top spring arm has an adjustable slide for locking the position in place. There are two positions, the first shown is for transport, the second in for use when cutting so that the arm may extend.



Figure 25 transport position keeps spring arm from extending in transport position



Figure 26 use position allows spring arm to extend when using mower

Attaching the Drum Assembly

Position the drum mower subassembly so that the center pivot holes will line up when the arm assembly is pushed down.



Figure 27 holes line up step 1

If the plastic bushings on the arm will not start to go between the lower pivot, file a lead angle on the bottom of the outer face of the bushing. The fit will be snug. If the fit is still too tight, sand or grind the paint off the inside faces where the bushings go on both sides. Use sandpaper wrapped around a flat file or a sanding disk. Keep these faces smooth so they do not wear the plastic bushings.

The centers must be lined up before driving the pin through the hole. Use a tapered pin or something smaller than the pin to line up the holes. The chamfer on the pin will only line up a 1/32" of mismatch. Do not force the pin through, as you can damage the plastic bushings. A little oil can help. Use the top link to adjust the angle, adjust the three point height on the tractor to put in best position. Nudge the drum assembly to get both holes aligned at the same time.



Figure 28 holes are close to being aligned

Put the washer and nut on the pin but do not over tighten.



Figure 29 pin is through and the nut is started

PTO Driveline

The

PTO shorter driveline is installed between the 3 point hitch and the drum mower. Install the big end with the free running clutch so that it is on the drum assembly. If you have not greased all the fittings do so now. Don't forget the two plastic fittings on the shaft guard.

Attach the guard chains so that the guards do not spin for safety.



Figure 30 guard chains attached to keep PTO shields from spinning

Guards Installation

The front top guard has 6 holes and a pin as shown.

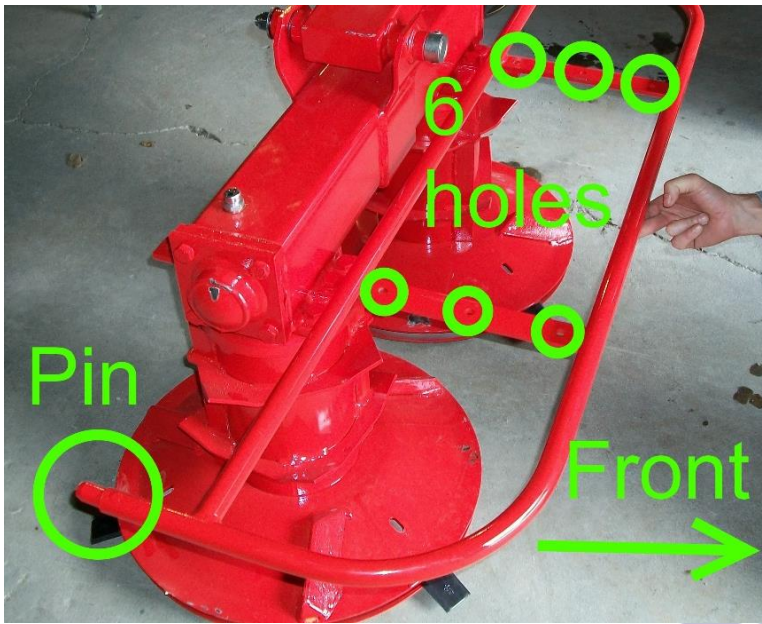


Figure 31 front guard has 6 holes and a pin

The 8 sets each of hardware shown here are used to fasten the top guards and after the curtain is attached, the front toe guard. Install the rear guard aligning the pin to the hole then bolt on.

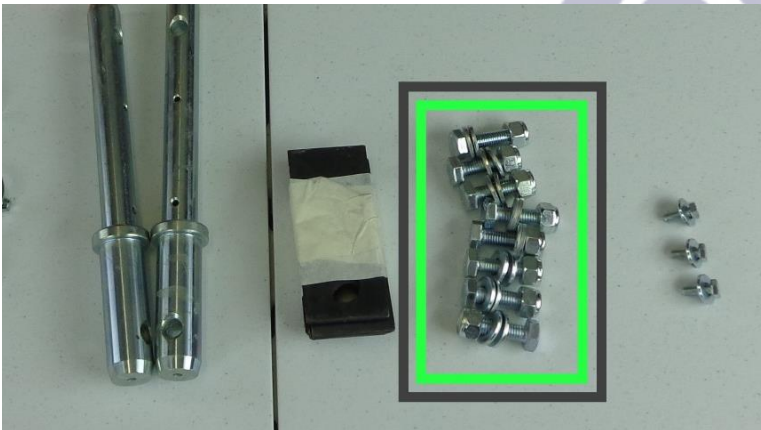


Figure 32 eight sets of fasteners used for attaching guard frame

You will need 2 wrenches that are 17mm for these nuts and cap screws. Install the curtain with the 2 holes facing forward, as the toe guard goes through these holes.



Figure 33 curtain installed with 2 holes for toe guard facing forward

Secure the toe guard with the remaining four cap screws from the underside.



Figure 34 curtain straps secure to the guard frame

Verify that there is oil in the 2 gearboxes and lubricate all grease points. Some of the grease points will take more grease than usual the first time they are lubricated due to filling up the air space between the bushings.

Section 2 Using the Mower with Your Tractor

PTO Safety Warnings

Read the manual that is supplied with your PTO before operating the machinery. Failure to follow all safety procedures in the manufactures literature could lead to equipment damage, personal injury or death.

PTO shafts are supplied long because the length of the draw arms on tractors vary. It is typical to have to remove excess length from the PTO before using the implement with your tractor. If you have more than one tractor, it is important to cut the shaft for the tractor you will be using the implement with. Mark the PTO with permanent marker as to which tractor it is to be used with to avoid confusion that could lead to damage. Using a PTO shaft that is too short can cause the PTO to separate during use that could lead to damage, injury or worse.

The PTO shaft must never completely collapse in use, because to do so would put the weight of the implement attached to the tractor pushing against the PTO's of the tractor and implement. The output bearings are not designed for thrust forces pushing the PTO forward into the gearbox, and could cause severe damage. This could be an expensive repair on the tractor if the PTO bearings or gearing were damaged due to an improperly fitted PTO shaft. If you have to lift the implement to attach the PTO, then the PTO shaft is too long and must be cut.

The PTO shaft going to the tractor should have 2 inches of space to retract when the distance between the splines on the tractor and implement are at minimum. If this is not the case, the PTO must be cut to avoid damaging the tractor or the PTO shaft. If you need to cut the PTO shaft, see the instructions that came with the shaft.

Cutting the PTO Shaft to Fit the Tractor

I will show the process for the tractor we have in the shop for equipment demonstrations. The process measurements will be different for other models of tractor, so do not use my measurements as they will probably not work for another make and model tractor.

First, have the implement attached to the tractor so that it is adjusted as it will be used, and that the PTO on the tractor and the implement are at the same height so the distance between them is at the minimum condition. Attach both ends of the PTO to the tractor and to the implement with the PTO split apart in two pieces. Note the slip clutch end goes to the gearbox on the 130 mower. The PTO guard on the gearbox is removed for better visibility. Orient the shafts so that they pass by one another as parallel as possible.

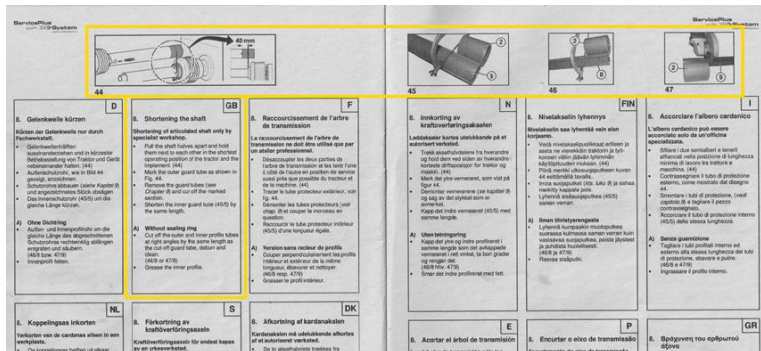


Figure 35 instructions that shipped with the PTO at time of writing of this guide



Figure 36 PTO's installed to mark overlap

Marking the PTO to Cut

Using a straight edge, transfer a mark from the end of the tube section to the other section as shown here and in the manual that comes with the PTO. This line represents how much the shafts are too long to fit together. The manufacturer of the PTO shafts recommends adding 40mm (about an inch and a half) to the amount to cut off the plastic tube and the steel telescoping tube of each half of the PTO.



Figure 37 mark overlap length

The overlap length is 150mm for our tractor. Add 40mm to that for our cutoff length. The amount to cut off is 190mm. That will be 19 cm on a typical ruler. I am working in metric because the instructions given by the manufacturer of the PTO are in metric.



Figure 38 cut off length marked

Cutting the PTO

Cut the 190mm length of tube, leaving the steel shaft inside not cut.



Figure 39 plastic tube cut

Use the cut length of plastic tube to mark the remaining 3 cuts. Align the end of the tube with the end of the shaft.



Figure 40 align end of tube to end of shaft

Use the other end of the tube to mark the cut length on the steel shaft.



Figure 41 use tube to mark the cut length to steel shaft

Now the shaft is marked to cut the same length as the plastic tube.



Figure 42 shaft is marked to cut off same length as plastic tube

When cutting the steel shaft, clamp it in a vise using the discard end to clamp on. The type of saw could be abrasive cut-off, reciprocating with a fine tooth blade for metal, a powered band saw for metal or the common hacksaw shown here. Be careful and wear your eye protection.



Figure 43 clamp on the part of the shaft that is being cut off then cut

Repeat the process so that both shaft halves have had the same length removed. If your shaft has 3 points instead of the 2 shown here, look for the one with the flat, it is different than the other two. The ones with the flat must align or they will not fit together.

De-burr the PTO

When the cut is complete, there will be shavings and burrs that need to be removed.



Figure 44 burrs and shavings must be removed

Using a file, grinder, wire wheel, flap wheel, grinding disk or what have you, de-burr the shafts after you cut them.



Figure 45 burrs removed with a file, grinder and power wire wheel.

Clean and Lubricate PTO

Before re-assembling the shafts, push a rag down into each shaft and then around the outside with something like a used hacksaw blade, then remove the rag to clear out the debris and shavings.



Figure 46 push towel into and around shaft to remove shavings

Now that both shaft halves are clean inside and out, wipe off that used hacksaw blade and spread some lithium based all-purpose grease, or whatever you use in your grease gun, into the inside of the bigger shaft. The smaller shaft will fit inside the bigger shaft. Spread it out so it does not just get pushed down to the end. You could spread it on the outside of the inner shaft as well.



Figure 47 spread grease in outer shaft

Re-assemble the PTO.

Install PTO

After you have cut the PTO driveline to the correct length for your tractor, you will install it on the drum mower.

The Galfre 130 Drum mower uses a torque limiting slip clutch to protect the gearing on the mower and on your tractor. This is a high quality German made PTO driveline assembly that uses hardened steel balls to lock into place on the splined shafts of your tractor and the right angle gearbox on the drum mower.

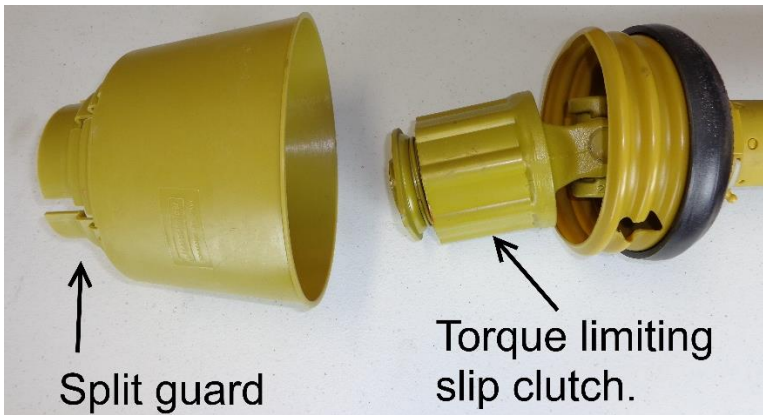


Figure 48 longer PTO has a torque limiter slip clutch to connect to mower gearbox

The release plate must be all the way back to release the locking balls so the PTO can be connected and disconnected.

The ends of the rotating PTO driveline must be covered with a guard for safety. Reaching the release plate with both hands is a tight fit. The supplied guard has a split end to provide an easy way install the guard.

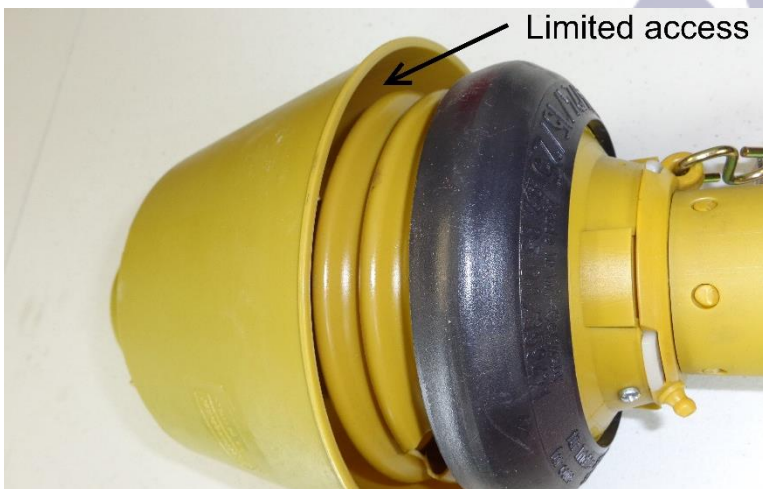


Figure 49 there is little room for hands to reach the release plate on the PTO

Instead of trying to get your hands inside and release the PTO release plate, remove the guard and place it over the clutch end of the PTO so that the release plate is sticking through.



Figure 50 the split end of the guard will fit over the clutch end of the PTO shaft

Put the clamp on the gearbox so it will be there when you need it, and you won't have to take it apart. Install the PTO with the guard over the clutch, then install the guard on the gearbox. For safety, it's important that the guard does not turn.

To remove the PTO from the gearbox, just remove the worm gear clamp and slide the guard over the release for access.



Figure 51 PTO installed on implement with guard in place

The PTO should now fit between the tractor and the implement when the implement end is installed. There should be sufficient clearance to start the end that attaches to the tractor when the PTO splines are at the same height.

You are done with assembly. Go back and check that you tightened everything and have installed all pins and chains, checked oil levels and lubricate all grease points.

Now have a sit down and read the owner's manual before attempting to operate the drum mower.

This guide is only intended as an assembly guide. Consult the owner's manual for instructions on operation and safety related matters.