

OPERATOR'S MANUAL

US Small Farm Equipment Co.

Potato Digger Models

D-10M

D-10T

FORWARD

Thank you for purchasing your new US Small Farm Equipment Co. potato digger. The D-10M and D-10T potato diggers were designed for use on small farms or test plots. They are intended to provide a conveniently sized, light weight, reliable digger to plant potatoes or other tuber crops where larger machines do not fit well. When used as intended, the digger should give many years of service.

The US Small Farm Equipment Co. D-10M and D-10T potato diggers will provide good performance when used within the guidelines presented in this manual. Please read the manual through before operating the digger. Pay particular attention to any safety warnings. While this digger is simple to operate and maintain, we believe you will profit from the information in the manual by becoming more knowledgeable about your digger.

SPECIFICATIONS CHANGE

Specifications and design are subject to change without notice.

US Small Farm Equipment Co. makes every effort to provide a well designed, well built product made from good quality materials and components for the user. Therefore we attempt to improve the product to give you, the customer, the best value we can. This requires that we make changes in the design of our products to meet the changing needs of our customer base. In meeting these market needs, we reserve the right to make product changes without obligation to purchasers of equipment previously sold.

LIMITED WARRANTY

If within two digging seasons or two years from date of purchase, whichever is less, this digger fails due to defect in material or workmanship, the faulty parts will be replaced free of charge. Modification to the digger or use for purposes other than its intended use will void this warranty. For all warranty and service questions, contact:

Customer Service
US Small Farm Equipment Co.
2117 Big Horn Ave
Worland, WY 82401
Phone: 307-431-9555
e-mail: ussmallfarm@yahoo.com
www.ussmallfarm.com

SAFETY CONSIDERATIONS:

You are responsible for the safe operation and maintenance of your US Small Farm Equipment Co. potato digger. You must insure that you or anyone else who is going to operate, maintain, or work around the digger knows proper operating and maintenance procedures and related safety information contained in this manual. This manual alerts you to good safety practices that should be adhered to while operating this equipment. Good safety practices not only protect you but also the people around you. Make these practices a working part of your safety program. Be sure that everyone operating this equipment is familiar with the recommended operating and maintenance procedures and follows all of the safety precautions. Most accidents can be prevented. Do not risk injury or death by ignoring good safety practices for the sake of saving some time.

OSHA Regulation 1928.57 requires the owner of this potato digger to give all operators instructions before operating the digger. This instruction must be repeated annually thereafter. These instructions must be given in a language the operator understands.

It is the operator's responsibility to fully understand the instructions in this manual before using the equipment.

Do not modify the equipment in any way. Unauthorized modification may impair the function and/or safety of the machine.

SAFETY CONSIDERATIONS:

1. Read and understand the operator's manual before attempting to use the digger.
2. Do not allow riders on the digger at any time. Make adjustments with the machine stopped. If observation under field conditions is necessary, always have sure footing and a firm handhold. Be sure the tractor operator knows the whereabouts of all personnel.
3. Never work under the digger without blocking it up.
4. Use a large enough tractor. Greater tractor weight and wider tire spacing increase the stability and safety of operation
5. Weight the front of the tractor adequately so there is good traction for steering safely. Empty the chain bed before transporting at high speeds.
6. Never stand between tractor and digger when the tractor is backing for hookup.
7. Be sure any required safety equipment is in place before travelling over public roads.
8. Exercise extreme care when travelling across or digging side sloping areas.
9. Be aware of sharp parts to avoid serious injury.
10. Keep all fasteners tight. Make it a practice to frequently check the tightness of all critical fasteners such as hitch mount bolts, wheel mounts and lug bolts, especially during the first season of use.
11. Keep all safety decals clean. If they become damaged or illegible, replace promptly.
12. Pressurized hydraulic oil can penetrate skin. Do not run hand along lines to find leaks.
13. Hydraulic oil under normal operating conditions gets hot enough to cause severe burns. Avoid physical contact with the drive system.
14. Keep clear of the chain when it is in motion. Do not attempt to pick produce from it while it is running.
15. If the chain stalls, turn off drive system before clearing the chain bed.

GENERAL INFORMATION

Many of the service parts needed to keep your digger running smoothly are available at your local farm supply store. Service parts which are not available locally are carried in stock at the factory. Our goal is to keep your digger operating at the times you need it without concern for parts availability..

For service or parts, contact:

Customer Parts and Service
US Small Farm Equipment Co.
2117 Big Horn Ave.
Worland, WY 82401
Phone: 307-431-9555
Email: ussmallfarm@yahoo.com

DIGGER SPECIFICATIONS:

	Model D-10M	Model D-10T
Number of rows	1	1
Tractor requirement	25 HP	25 HP
Hitch requirement	Cat I or II 3-point	Draw-bar
Digging speed	.5 to 1.5 MPH	.5 to 1.5 MPH
Length	79"	170"
Width (varies with config.)	37"	53"
Height	40"	51"
Cleaning bed length	48"	100"
Blade width	26"	26"
Weight (estimated)	615 pounds	1150 pounds

ASSEMBLY:

The digger was shipped to you partially disassembled to protect the hydraulic drive parts from damage and make it more compact.

D-10M 3-point hitch mounted digger:

CAUTION:

The hitch assembly is heavy and awkward to handle, so use good lifting methods to prevent physical injury.

ATTENTION: The hydraulic oil tank is full. Even though it is capped with a vent plug, it should be kept fairly level during the unpacking and assembly process.

1. Lift the pump and motor from the chain bed of the digger. Set the motor at the left rear of the machine.
2. Unfasten hitch assembly with tank attached and set in front of the digger with the 3-point brackets facing forward keeping the pump to the front of the hitch.
3. Unpack and attach the parking legs with the bolts provided. This requires raising the rear of the digger and blocking it high enough to attach the legs.
4. Set the hitch to the desired position (centered or offset to up to 18 inches) on the pads and attach with the U-bolts.
5. Remove the shipping tie wire from the chain bed.
6. Remove the anti-rotation motor mount, noting which holes are used to mount the motor. While holding the motor mount with the tang to the lower right, install the motor on the left end of the rear shaft and tighten the set screw on the key. Reattach the mount to the motor with the hoses oriented to the left.
7. Hook up the planter to the tractor hitch points. Connect the pump to the tractor PTO shaft. The hoses on the pump may be adjusted to a better angle if needed by loosening the lock nut on the 90 degree fitting. Tighten securely.

D-10T Pull type digger:

CAUTION:

The hitch assembly is heavy and awkward to handle, so use good lifting methods to prevent physical injury.

ATTENTION: The hydraulic oil tank is full and even though it is capped should be kept fairly level during the unpacking and assembly process.

1. Unfasten the hitch assembly from the digger bed chain with the tank, pump, and motor attached and set in front of digger. Remove the wheels and axle and set aside.
2. Jack up the rear of the digger to attach the axle.

CAUTION: Block the digger before working under it.

The diagram at the end of this manual shows the most popular position for the axle. The digger bed angle can be changed by using a different set of mounting holes. For even steeper bed angle, the axle can be turned over. Loosen the axle mounting brackets and attach the axle to them with the bolts provided. Draw up the slack in all of the bolts to bring the parts into position before final tightening. Install the wheels.

3. Attach the tongue to digger frame with the two $\frac{3}{4}$ " bolts provided.
4. Attach the cylinder to the eyes on the upper cylinder mount and the tongue. Check for binding by moving the tongue through the full cylinder stroke by hand. If binding exists invert the cylinder and recheck. The design is intended to use an 8" ag cylinder with 1" pins.
5. Remove the shipping tie wires from the chain bed.
6. Pass the motor through the left triangle in the upper cylinder mount frame and install on the drive shaft at the left rear of the digger. Tighten the set screw on the key. Remove the lower nuts from the left rear bearing and install the motor anti-rotation bracket. The motor should be free to "rattle". The shaft should be centered in the frame clearance hole when tightening the bearing nuts.
7. Lower the rear portion of the frame by extending the turnbuckle to its maximum length. This will assure there is adequate slack in the hoses in the extended position. Tie the motor hoses to the frame as indicated in the diagram at the back of this manual.
8. Hook up the tongue to the tractor drawbar and slip pump adapter onto the tractor PTO shaft. Attach the short length of chain to pump mount arm and fasten around the drawbar. Some adjustment may have to be made in the angular position of the pump fittings. Loosen the locking nut on the fitting and rotate to a suitable position. If the large suction hose is too long, it may be shortened. To shorten the hose when the tank is full of oil, raise the pump so that the suction hose end is level with the tank top. Loosen fitting and drain the tank into a clean container. Use an abrasive cut-off saw to shorten the hose because it has hard steel wire reinforcement. Flush hose to remove any debris from cutting and re-assemble into the system. Refill the tank.

START-UP:

1. The hydraulic tank should be filled to within 1-1/2 inches of the tank top (not filler neck). Use only clean good quality all-season hydraulic oil.

Note: Normally, the tank is filled with hydraulic oil before shipping.

2. There is a pressure relief adjustment in the flow control valve. If there is inadequate pressure to turn the chain bed, a higher pressure may be needed. See flow control instructions at the back of this manual to adjust.

3. If the digger bed speed needs to be decreased, this can be done at the flow control valve on the side of the hitch. Note: If the flow is reduced too much at the flow control valve, excessive heating of the hydraulic oil can occur. If the tractor has adequate power, this situation can be avoided by operating the tractor in a higher gear and reducing the PTO speed.

4. The hydraulic oil filter should be replaced after the first 10 hours of operation. See MAINTENANCE section for instructions.

GENERAL OPERATION of the DIGGER:

Digger bed angle:

Setting the digger bed angle steeper will remove more dirt. Sandier soils need a less steep digger bed than heavy soils to remove soil from produce.

Shaker use:

Shakers are used to remove soil as the material passes over the digger bed. Since shaking can damage produce, it is important to shake the bed only enough to remove the extra soil. A good rule is to carry the dirt as far as possible to cushion the produce for as long as possible. Shakers can be removed and replaced with rollers to lessen the shaking. They can also be moved to various positions along the chain path to work most effectively. Sandy soils need less shaking to remove the soil. When picking up potatoes by hand, it is not necessary to remove all of the soil.

Chain speed:

Setting the digger bed chain to the best speed will result in less bruising and skinning of the potatoes. The bed chain should normally run 10% faster than the ground speed of the digger. Sometimes in wet or heavier soils more shaking is needed to remove the dirt. It is better to use more aggressive shakers than to run the bed at too high of speed, although sometimes there is no alternative when soils vary greatly in a field.

Blade position:

The blade angle and position are determined by the digging conditions. The flow onto the chain is a good indicator of correct setting. If the soil is tough and tends to clump, the blade should be set low so that the chain breaks the soil as it comes off the blade. In lighter soils, the blade can be set in a higher position so it delivers the material more in line with the chain. If material piles up on the blade, raise the blade or lower the front of the chain at the nose roller. If that still does not resolve the problem, a different blade may need to be fitted to the nose. Making the angle of the digger bed less steep may help as well.

Vegetation:

Removal of vegetation improves the flow of material through the inlet of the digger. A “bush hog” mower or string trimmer does a good job. If a mower is used, the vegetation must be well shredded. The string trimmer has the advantage of leaving the vines longer and cuts closer to the ground without injuring the crop. Since long vegetation wraps around the nose wing of the digger causing it to plug, it may be necessary to rake the vines to the side of the row to be dug.

Plugging caused by weeds:

If soil builds up at the blade and does not travel back to the chain, weeds may be wrapped over the cutting edge. Under wet conditions weed roots may not be cut off or weeds may get caught on the blade before it fully enters the ground and not be cut off. With the PTO off lower the blade while backing the digger a foot or so, turn on the PTO and drive forward, continuing to lower the blade. When you are past the original position in the row, raise the blade to the original position. If this does not work, you will need to raise the blade above the ground so the weed can be removed. **Turn off the PTO and the tractor engine before attempting to clear the debris.**

Rocks:

If the digger bed suddenly stops moving in otherwise reasonable digging conditions, a rock may have jammed the chain. Most of the time, it is difficult to see the rock. Use the following procedure to get the chain to run.

1. Raise the digger, **turn off the PTO and turn off the tractor engine.**
2. Reach under the rear of the digger and jerk the chain toward you.
3. If the chain moves a fair amount, stand clear and start the tractor engine and turn on the PTO.
4. If it doesn't move, you will probably need to clear the area around the front cone rollers and look for the rock, then pry or drive the rock out of the space between the cone roller and the chain.

Pulling crooked:

D-10T models equipped with an offset tongue may pull crooked and not track well behind the tractor. This usually happens when digging deep in heavy soils that require more power. Adding the sweet potato coulters option will improve the situation greatly. They act as guide discs to align the digger with the row.

Picking Table Option:

The picking table allows the produce to be gathered without picking it up from the ground, reducing the manpower and increasing the speed of harvest. The stringy vines of sweet potatoes may require one person to remove the vines ahead of the person picking the produce.

Warning: When picking produce from the table area, do not wear loose clothing, including neck scarves or gloves. They can become entangled in the machinery and cause severe injury or death.

Do not ride the machine at any time.

DIGGER ADJUSTMENTS

Change the slope of the bed by adjusting the top link length on 3-point models. Move the axle to a different set of holes on the pull type models. One additional higher position is available if needed by removing the axle and turning it upside down.

Change the blade angle and position by using a different set of holes.

If the chain tends to drag behind the blade, removal of a link may be necessary. An alternative is to lower the blade or raise the cone roller at the front of the chain.

Adjust the digger chain speed with the hydraulic flow control valve. If the flow is reduced too much at the flow control valve, excessive heating of the hydraulic oil can occur. If the tractor has adequate power, this situation can be avoided by operating the tractor in a higher gear and reducing the PTO speed. If the speed required is difficult to obtain, contact US Small Farm Equipment Co. for assistance. Your digger was set up to work within a certain range. Variables such as tractor size, minimum ground speed in 1st gear, and soil type can cause operation outside that range. US Small Farm Equipment Co. will be happy to assist you in optimizing the digger for your conditions.

MAINTENANCE:

Keep hydraulic oil tank filled to proper level.

Grease bearings on rear shaft weekly and at the end of the digging season.

Check for oil leaks and promptly repair.

Coat blade with protective paint or other coating after paint wears off.

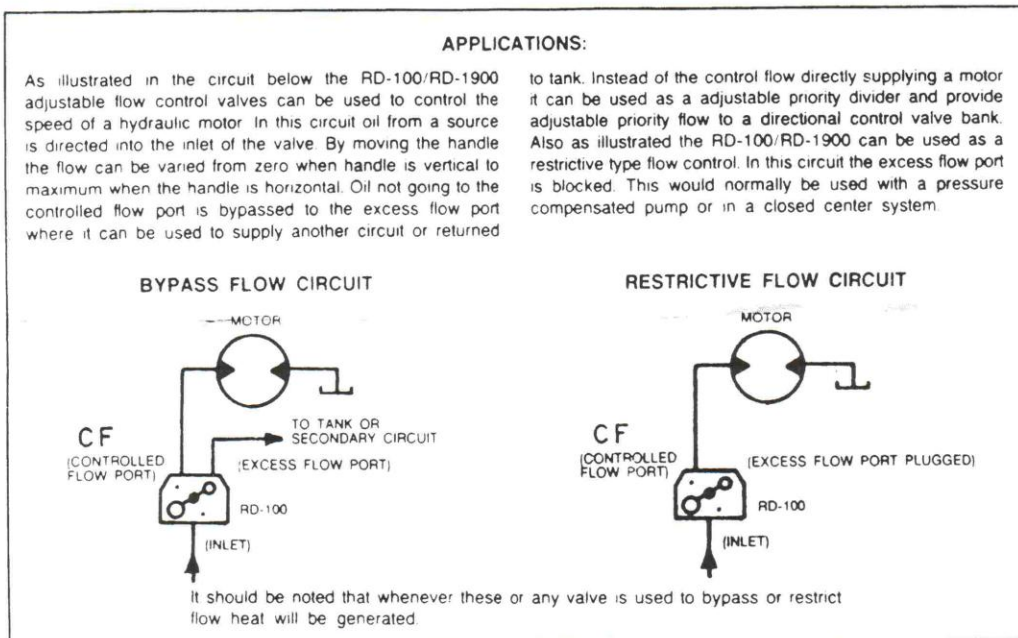
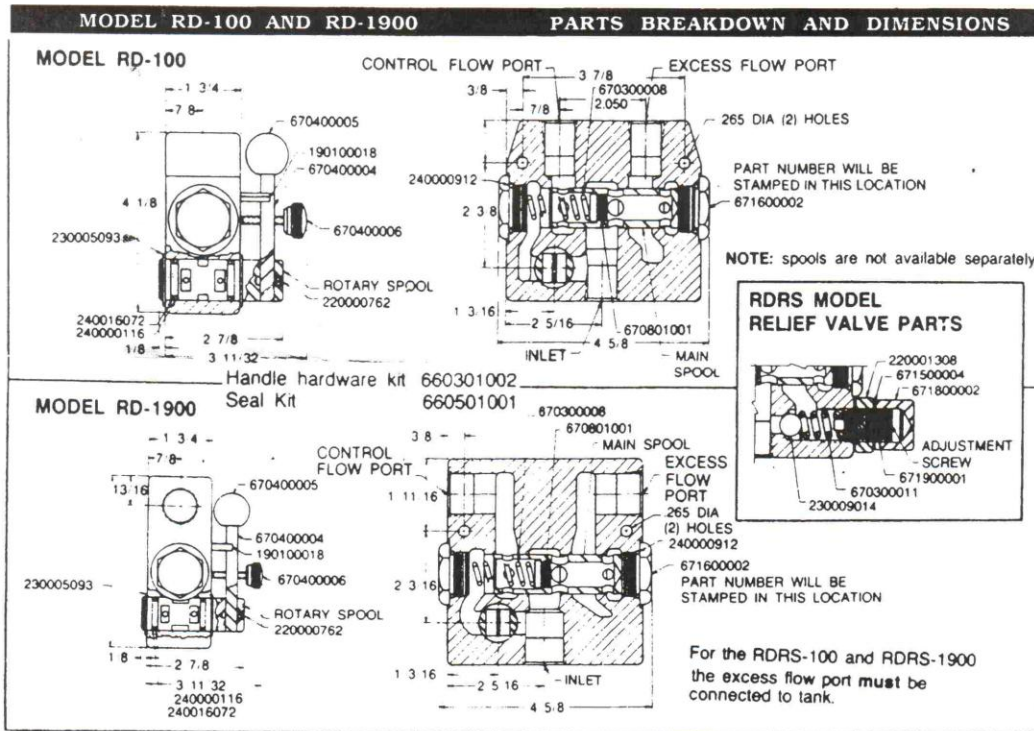
Change hydraulic oil filter after 10 hours and every 50 hours thereafter.

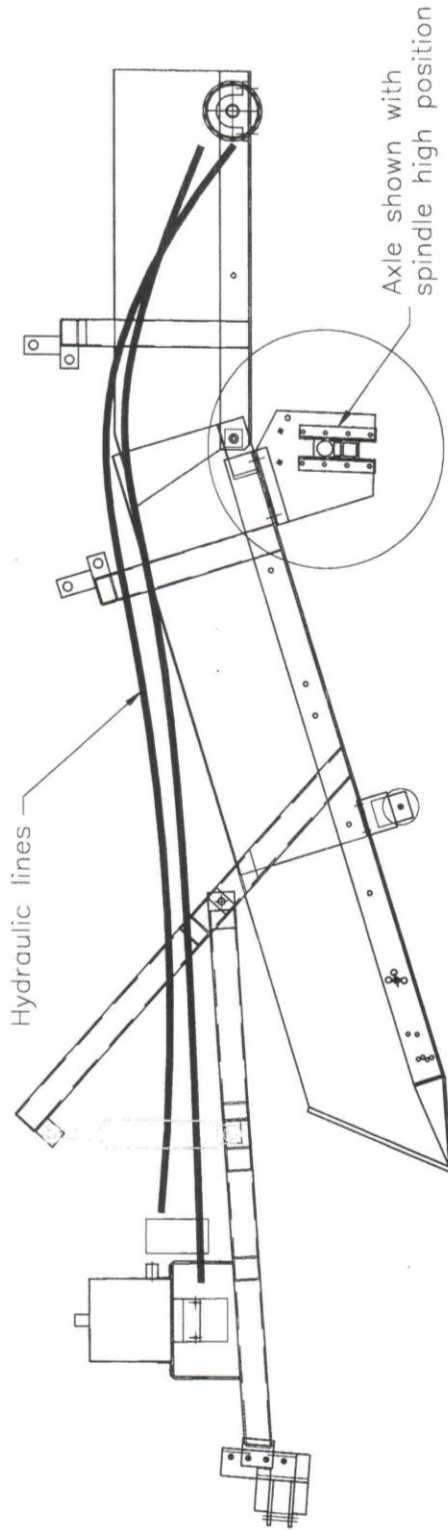
To change the filter, clean the outside of the filter including the top where it attaches to the filter head. Loosen the filter so that a manageable stream comes out and catch in a clean, light colored container. Once the tank is empty, the filter can be removed with minimum oil spillage. Discard the old filter and all oil still in it. Install the new filter and refill the oil tank to within 1-1/2 inches of the top of the tank. Do not reuse the oil if any contaminants such as water or dirt have gotten into it. Inspect the bottom of the container for metallic particles. If there are particles and the system was working well, refill with new oil. If the system is not working well, the pump and motor should be inspected for damage.

TROUBLESHOOTING:

Symptoms	Possible Cause	Potential Solution
Inadequate dirt removal	Inadequate shaking Chain pitch too small	Add more aggressive shakers Replace chain with larger pitch
Losing small potatoes	Too large chain pitch	Replace chain with smaller pitch
Inadequate power to move chain	Digging deeper than necessary Hydraulic motor worn Hydraulic pump worn Low hyd pressure Motor too small	Set digger to dig less deep Replace motor Replace pump Increase relief pressure Contact US Small Farm
Hydraulic oil gets hot	Low oil Flow control set too low	Add oil to tank Contact US Small Farm
Low power after oil warms up	See "Hydraulic oil gets hot"	Use for shorter periods until problem is resolved

Note: The control valve on your machine may vary from the illustration. The relief valve may be located in a different position, but will be located under a cap nut. Make any necessary adjustments in small 1/4 turn increments. Do not bottom the relief valve so there is no relief. This may damage the pump.





Side view of Digger