



MAINTENANCE OF WHEELMOVE IRRIGATION SYSTEMS

F. Richard Beard, Agricultural Equipment,
Structures and Electricity

Robert W. Hill, Biological & Irrigation
Engineering

Boyd Kitchen, Uintah County Extension
Agricultural Agent

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INTRODUCTION

A wheelmove irrigation system, also known as wheel line, side roll, or lateral roll system, constitutes a major investment on the part of a farming operation. Regular maintenance of wheelmove equipment will reduce repair costs, help the system last longer, and keep irrigation efficiency at design levels. This bulletin describes regular maintenance activities including pre-operational procedures, a schedule of regular maintenance, and guidelines for winter storage, that will maximize the life of wheelmove systems. Each wheelmove manufacturer provides guidelines and manuals for equipment operation and maintenance. Such information is the preferred source and should be referenced when performing irrigation equipment repair and maintenance.



WHEELMOVE COMPONENTS

The wheelmove is a mechanical irrigation system that can be moved intact, from one location in a field to another, by means of an internal combustion engine. A wheelmove system consists of a power mover, lateral pipe with wheels, sprinklers, couplers, connectors, and flexible supply line.





The power mover is mounted in the center of the wheelmove system and provides the power to move or drive the irrigation system. The joints of pipe that make up the lateral pipeline serve as the axle for the wheelmove system and are supported above the ground by wheels mounted midway along their length. Sprinklers are located at the connections and ends of the lateral pipe, positioning a sprinkler head midway between each wheel and at the ends of the lateral pipeline. Normally, a wheelmove system has impact sprinkler heads with levelers to keep the sprinklers in an upright position. Located adjacent to each sprinkler is a drain that automatically empties the lateral pipeline when water pressure drops off. The couplers between the pipe joints provide a watertight connection and also transmit torque, produced by the power mover, to the entire length of the system. One end of the lateral line is connected via a flexible hose to a pressurized mainline pipe with risers at suitable intervals.

SPRING MAINTENANCE OF THE WHEELMOVE SYSTEM

A wheelmove system should be tested and any necessary repairs completed prior to the start of irrigation season. All irrigation systems should receive special attention at the end and prior to the beginning of each irrigation season. If a wheelmove system has been properly prepared for winter storage, spring maintenance is much easier. The following maintenance should be completed during the spring pre-operational inspection of the wheelmove unit.

1. If the engine and/or transmission components were removed for repair or storage during the winter, they should be reinstalled and all gears and chains should be replaced according to manufacturer's specifications.
2. The chain and gears of the drive mechanism should have dirt or debris removed and the teeth and chains should be lubricated. If necessary the drive chains should be realigned. Follow manufacturer's recommendations for lubricant selection and application.
3. Check the oil level in the engine crankcase and fill it as needed, taking special care not to overfill. If the engine oil is dirty or it was



not changed last year, this would be a good time to drain and replace the engine oil.

4. Clean the air filter or replace it, depending on what the manufacturer recommends. Normally, the air filters in smaller engines may be cleaned and reused several times before they must be replaced. A clean air filter is critical for prolonged engine life.
5. Remove dirt, oil, and debris from the exterior engine surfaces, paying special attention to the cooling fins, the surfaces near the air intake, and the carburetor linkages.
6. Check the fluid reservoir of the hydraulic transmission. If needed, fill it to the proper level. If the fluid appears dirty it may require changing. If there is an inline filter in the pickup line of the transmission, this should be serviced also.
7. Make sure the fuel tank is free of debris and fill the tank with clean fuel. If the fuel tank was not emptied at the end of last season, drain the tank and fill it with new fuel. Try not to use gasoline left over from the previous season.
8. Inspect the entire length of the wheelmove unit, inspecting the wheels and power mover for loose bolts, equipment wear, and winter damage. Repair as necessary.
9. Grease wheel axles and main drive hub bearings with water resistant, multipurpose grease. If available, follow manufacturer's recommendations concerning lubrication selection and application. This bulletin provides generic information for the type and frequency of lubrication.
10. To test the nozzles and connections, water must be pumped through the wheelmove system. The cover on the power mover should be closed before turning the irrigation water on. The wheelmove cover should be closed whenever the power mover is not being worked on. Check all nozzles and



impact sprinklers for plugging, mismatched sizes, breakage, corrosion or other damage caused by wear or winter weather. Check couplers and connections for leaks, and do repairs/ replacements early. It is a good practice to identify problem components at the end of the irrigation season and to have the replacement parts on hand for spring installation.

11. Before testing the power mover, the stakes and/or tie-downs that anchored the irrigation system during winter should be removed. It is a good ideal to complete the majority of maintenance activities before attempting to relocate the wheelmove unit.
12. Special attention should be directed at the carburetor of gasoline engines. If fuel is left in the carburetor through the winter, fuel passages may have become clogged by sediment, residue, or additives, which remain after the fuel evaporates and/or ages. If gas is not entering the engine cylinder from the carburetor (the engine does not try to start or the engine will not continue running after starting), the carburetor may require adjustment or cleaning before the engine will start and operate properly.



13. If the engine on the power mover has not operated since last fall, the following activities are good practices to follow. Make sure the drive mechanism of the wheelmove unit is disengaged before attempting to start the engine. Remove the sparkplug to clean and set the spark gap of the electrode. If the sparkplug is damaged or the electrode shows excessive heat erosion it should be replaced. Pour a tablespoon of clean engine oil into the sparkplug hole to lubricate the piston and rings. With the sparkplug removed and the sparkplug wire positioned away from the cylinder head, rotate the engine crankshaft to lubricate the cylinder and rings. Reinstall the sparkplug, attach the ignition coil wire, and prime the carburetor. Some engines do not have a manual method of priming the engine and must rely on the engine choke to prime the engine. When cold starting (engine has not been in operation recently) a small engine, completely filling the fuel tank often improves the starting characteristics. Set the carburetor linkage in the start position and pull the starting rope. If in good repair, the engine should start without difficulty. Once the engine starts, blue smoke will exit the exhaust system for a few moments as the oil burns from the piston chamber and rings. If the engine will not start there are three things that should be checked. These are the ignition spark, fuel delivery, and cylinder compression. If any of these items are not working properly, the engine will not provide the necessary power and often the engine will not start.
14. To check the operation of the power mover, engage the transmission and slowly power the wheelmove unit forward or backward to make sure all wheels, chains, and gears are working properly. When attempting to operate the power mover, make sure the wheelmove unit is straight or the ends are slightly lagging behind the power mover's direction of travel. Also, wheelmove units should not be moved with water in the pipeline.

Special Attention

During spring maintenance activities, the engine and transmission of the wheelmove unit should receive special attention. If they fail to operate during the growing season, the irrigation equipment will not readily advance across the field and, in addition to frustration, the producer risks yield losses. Careful attention to these components will contribute to an irrigation season with fewer problems.

MAINTENANCE OF THE WHEELMOVE SYSTEM DURING IRRIGATION SEASON

Regular maintenance of the wheelmove system during the irrigation season will prevent many of the problems that can occur during a busy irrigation season. An operator will obtain far better service and performance from the wheelmove unit when it is regularly maintained throughout the irrigation season. The daily maintenance procedures that wheelmove operators should perform are listed below.

1. The wheelmove unit must be moved with the irrigation pipe (axles of the system) straight or with the ends lagging slightly behind the mover. If the pipeline becomes crooked, or an end gets ahead of the center mover, the operator should manually pull the pipeline into proper position. This should be done when the wheelmove system first begins to advance. Do not attempt to operate the wheelmove unit with the ends ahead of the power mover. If the ends are in front of the power mover, they will tend to roll toward the center, which can buckle the pipeline line.
2. Do not move the wheelmove unit with water in the pipeline. When the irrigation water is turned off the pressure release valves should drain the pipeline. Allow the water to drain before relocating the irrigation unit. A wheelmove system - specifically the pipe couplers - are not designed to carry the additional weight of water when being moved.



3. Lubricate the wheel chains every two weeks with SAE 30 oil. Adjust chain linkage to correct for chain stretch, and sprocket wear. Realign chain sprockets when improper tracking occurs.
4. Lubricate the wheel axle, main drive hub, and jack shaft bearings every two weeks with water-resistance, multipurpose grease.
5. If water leaks occur at joints or drain plugs during irrigation, check the gaskets and pipeline

connections for wear or cracks and replace them as needed. Check and tighten the couplers and connectors as required.

6. Check and replace worn nozzles and impact sprinklers. This will keep the irrigation pattern and application rate at design specifications.
7. Inspect and tighten bolts and nuts on the wheels, power mover, and engine mounts.

POWER MOVER

The power mover is mounted in the center of the wheelmove system and includes the engine, transmission, and drive wheels.

Maintaining the engine and transmission during the irrigation season is vital to irrigation scheduling. The following are daily maintenance operations for the wheelmove engine.



1. Check the engine oil once each week or every five operating hours. Change the engine oil after every 25 hours of engine operation. Engine oil should be changed more often if the air cleaner shows evidence of extremely dusty or dirty operating conditions. When adding or changing engine oil, fill the crankcase to the proper level. Under or over filling the crankcase can damage the engine.
2. Inspect the air filter every time the oil is checked (once each week). Clean the air filter or replace it after every 25 hours of engine operation. More frequent cleaning or replacement is required under extremely dusty or dirty operating conditions. The air filters in smaller engines may be cleaned and reused several times before they must be replaced. Follow the manufacturer's guidelines for air filter cleaning and replacement. A clear air filter is critical for prolonged engine life.
3. Periodically remove the sparkplug to clean and set the spark gap of the electrode. If the sparkplug is damaged or the electrode shows excessive heat erosion it should be replaced.
4. Remove dirt, oil, and debris from the exterior engine surfaces, paying special attention to the cooling fins, those surfaces near the air intake, and the carburetor linkages.
5. Check the fluid reservoir of the hydraulic transmission after every 25 operating hours. If needed, fill it to the proper level. If the fluid appears dirty it may require changing. If there is an in-line filter in the pickup line of the transmission, this should be serviced also.

PREPARING THE WHEELMOVE SYSTEM FOR WINTER

1. After the last irrigation in the fall, relocate the wheelmove unit to the edge of the field next to a fence or to an area where it will be out of the way during the winter. Each wheelmove manufacturer provides guidelines for equipment operation and maintenance. Such information is the preferred source when performing wheelmove repair and

maintenance. The following guidelines are the general steps for winterizing a wheelmove irrigation system.

2. Remove the end plug(s) and empty any remaining water, debris or sediment that may have accumulated in the ends of the pipe, then replace the end plugs to keep birds and other animals out of the pipeline. This will reduce the effects of corrosion.
3. Leave the pipe joints coupled together and anchor the entire wheelmove system so the wind cannot roll it. Tie the unit to a fence or secure it with posts or anchors in the ground. Secure the wheelmove unit every 200 to 400 feet depending on wind conditions in the area. If the field is used for winter pasture, secure the irrigation system every 100 to 150 feet to prevent livestock from moving or damaging the wheelmove system
4. Water sediment is abrasive and can damage sprinklers and nozzles. During the late fall, with the wheelmove unit operating, evaluate the system components and look for problems. Mark for repair, worn impact sprinklers, nozzles, leaky pipes, gaskets and drain gaskets. Note these problems during the fall irrigation season and purchase replacement equipment for installation during the spring maintenance activities.
5. Lubricate all chains or remove and store them in a dry place to prevent rust and corrosion.
6. Grease wheel axles and main drive hub bearings with water resistant, multipurpose grease.
7. Secure the fiberglass cover over the engine for the winter months. This cover should be latched or tied in place to keep wind from blowing it open and exposing it to winter weather.

PREPARING THE ENGINE AND TRANSMISSION FOR WINTER

After each season's final irrigation, position the wheelmove at the edge of the field or out of the way for the winter. All irrigation equipment should receive special attention at the end and prior to the beginning of each irrigation season. If a wheelmove system is properly prepared for winter storage, placing the system in operation during the spring is much easier. The following guidelines are the general steps for winterizing the engine and transmission of a wheelmove unit.

1. If the engine is to be removed during the winter months, the engine maintenance can be completed after the engine is removed.
2. Start the engine and after it has run for a few minutes, turn off the fuel tank and let the engine (carburetor) run out of fuel. Drain/siphon all of the fuel from the tank and flush any debris from the tank. In some cases it may be necessary to start the engine, stop the engine, drain the tank, and restart the engine, for the fuel to be



removed from the carburetor. Storing the engine without fuel in the carburetor will improve the chances of trouble free starting in the spring.

3. Check the engine oil and change it if needed, filling the crankcase to the proper level.
4. Clean or replace the air filter as necessary.
5. Remove the sparkplug and pour a tablespoon of clean motor oil into the sparkplug hole. Position the sparkplug wire away from the cylinder opening and rotate the crankshaft by hand to lubricate the piston and the rings. Replace the sparkplug.
6. The engine should remain covered to protect it from the winter weather. Exposure to moisture is the major problem that must be controlled.
7. If appropriate, check the fluid reservoir of the hydraulic transmission. If needed, fill it to the proper level. If the fluid appears dirty it may require changing. If there is an inline filter in the pickup line of the transmission, this should be serviced also.

The information included in this bulletin is provided to increase the life and operating effectiveness of your wheelmove system. More detailed information concerning wheelmove systems may also be obtained from manufacturers and dealers of irrigation equipment. Please contact a wheelmove manufacturer or local dealer for replacement parts and complete operating guidelines.

WHERE ELSE CAN YOU GET HELP?

Utah State University - Extension Service

Agriculture Systems Technology
1498 North 800 East
Logan, UT 84322-2300
rbeard@cc.usu.edu
(435) 797-0573

Biological and Irrigation Engineering
4105 Old Main Hill
Logan, UT 84322-4105
bobh@ext.usu.edu
(435) 797-2791

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