ALLEY VAC MANUAL

Covered by one or more of the following patents:

U.S. Patent No. 7,797,789 B2

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OPERATION

CONNECTING TO THE TRACTOR

The alley vac needs 12V power to operate as well as hydraulic fluid power supplied from the tractor. The female cord adaptor supplied from Nuhn has a blue and white wire coming off of the plug. The blue wire needs to be connected to the power supply and the white needs to be grounded.

The hydraulic outlet sets are horizontal on the tractor. One set of hydraulics goes straight to the hydraulic motors on the blade, the other set goes to an aluminum solenoid block that is controlled by the remote controlled unit.

The hydraulic set for the radio block has a one way check valve, allowing oil through the block only in one direction. Therefore if the hydraulic lever is pulled in one direction and the machine is not operating when a button is pushed on the remote, reverse the direction the hydraulic lever is positioned.

USING THE ALLEY VAC

When cleaning alleys, the PTO needs to be activated, the pump needs to be on “Vacuum”, the front valve needs to be opened and the blade needs to be down and extended. Note, for extended pump life, the tractor PTO speed should be 1000RPM.

To get the best performance out of the machine, the tank can be ‘precharged’ with vacuum before cleaning the alleys. Simply turn the PTO on when the pump is on ‘Vacuum’ and the valves are shut a minute before entering the alley. This technique will increase cleaning performance.

When at the end of an alley, close the front valve and lift the blade. The PTO can be disengaged as well.

When offloading the tank, turn the pump on “Pressure”, activate PTO, and open the Spread valve. Again, the PTO can be running to pressurize the tank on the way to the discharge area. This will decrease unloading times.

MAINTENANCE SCHEDULE

DAILY

IMAGE	DESCRIPTION
	**MONITOR OIL LEVEL** The vacuum pump should never run dry. Always monitor oil levels and make sure that the oil injection pump is in fact metering oil to the pump.
	**DRAIN SECONDARY TRAP** The ball valve on the bottom of the secondary air trap should be opened to let out any moisture, and then closed again.

WEEKLY

IMAGE	DESCRIPTION
	**CLEAN AIR FILTER** The air filter on the vacuum pump should be cleaned weekly. For optimum performance, it should be cleaned daily. To clean filter, remove the three nuts and blow it with compressed air.
	**CLEAN FRONT AND REAR VALVE** The rear and front valves should be cleaned. Take a sharp point and scrape out valve cavity of packed sand. To access the front valve, remove four bolts to disconnect hose.
	**GREASE PTO DRIVE LINE COMPONENTS** The bearings and yokes on the driveline should be greased.
	**CHECK TIRE PRESSURES** Keep tires at the pressure recommended by the manufacturer, as indicated on the side of the tire.

MONTHLY

IMAGE	DESCRIPTION
 	**GREASE STEERING MECHANISM** The grease fittings on the steerable axle should be greased. There are also fittings on the hitch drawbar that should be greased as well.
	**CHECK WHEEL NUT TORQUE** Wheel nut torque should be 300 ft-lb. (406Nm)

YEARLY

IMAGE	DESCRIPTION
	**FLUSH VACUUM PUMP** It may be necessary to flush your pump to remove any gum or varnish buildup inside the pump that causes the vanes to stick inside their slots. This is a simple maintenance operation, and should be the first step when troubleshooting a loss of vacuum in the system. Refer to owner's manual for procedure.
	**CHECK VACUUM PUMP BELTS** The vacuum pump belts should be checked to ensure proper tension.

SAFETY

HYDROGEN SULFIDE

Hydrogen sulfide is formed as a result of the decomposition of organic material. It is a clear, colourless gas and can be recognized in small concentration by its rotten egg odour. However, human ability to smell this gas disappears rapidly as a result of continued exposure and with increased exposure.

Liquid manure systems can produce relatively large concentrations of hydrogen sulfide (as well as carbon dioxide). Many barns are constructed with slatted floors directly over the liquid manure tank. As the liquid rises and may eventually be forced above the floor. Confined livestock are in danger under these circumstances. The greatest danger period from hydrogen sulfide occurs during the agitation of the tanks. The turbulence created may cause trapped gases to be liberated and may force gas up into the barn.

Hydrogen sulfide is classified as a toxic chemical. In high concentration, it will lead to almost instantaneous poisoning and death. Exposure to smaller concentrations may cause nausea, coughing, headache, dizziness, and eye irritation.

All sources of entry into a liquid manure system should be secured. Prior to agitation and pumping, all people and animals should be evacuated from the barn. Thorough ventilation should be provided during agitation and pumping process.

NOTE: Safety rods should always be covering the fill hole.

NO ONE should ever enter a liquid manure holding tank or a spreader without following these rules for confined space entry:

- wash out spreader using wash system and re- circulate
- remove cleanout doors
- blow air in the top hopper using a large fan for at least 30 minutes
- use a Hydrogen Sulfide Detector
- use a self-contained breathing device
- use a life line for evacuation

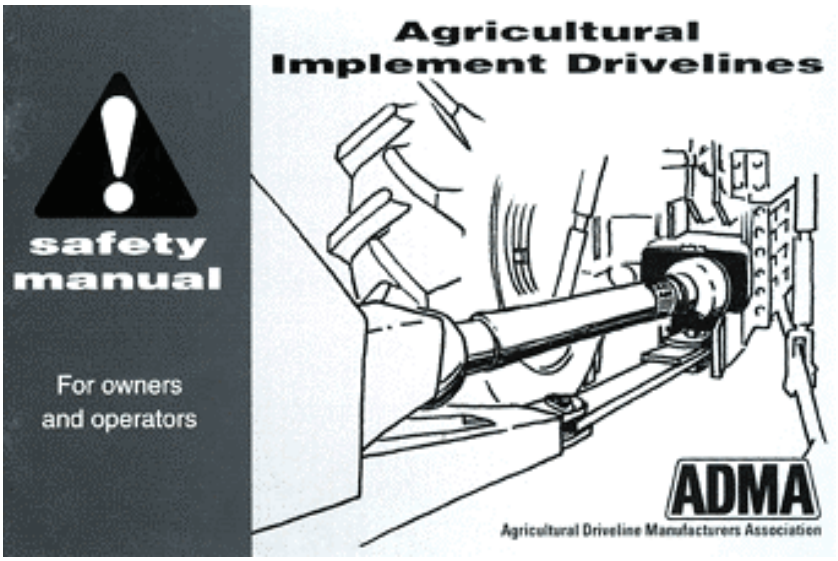
DO NOT go into the tank after a downed person, you will be overcome too.
NO ONE is immune to the danger. **USE EXTREME CAUTION**.

MOVING PARTS

USE CAUTION WHILE WORKING NEAR MOVING PARTS.
Avoid pinch areas or places where moving parts could entangle or injure.

PTO SHAFT

USE CAUTION WHEN WORKING NEAR ROTATING PTO SHAFT.
Loose clothing or objects may be caught up and pulled into the rotating shaft. Never reach over the shaft for this same reason. Keep a safe distance from this danger zone when the shaft is in motion.



FORWARD

This Safety Manual is intended to point out some of the basic safety situations which may be encountered during the normal operation and maintenance of your driveline system and to suggest possible ways of dealing with these conditions. This manual is not a substitute for the manufacturer's manual(s). Additional precautions may be necessary depending on attachments used and conditions at the worksite or in the service area. The manufacturer has no direct control over machine application, operation, inspection, lubrication, or maintenance. Therefore, it is YOUR responsibility to use good safety practices in these areas. The information provided in this manual supplements the specific information about your machine that is contained in the manufacturer's manual(s). Other information which may affect the safe operation of your machine may be contained on safety signs, in vocational-agricultural and extension training materials, or in insurance requirements, employer's safety programs, safety codes, local, state/provincial, and federal laws, rules, and regulations.

A WORD TO THE USER/OPERATOR

It is YOUR responsibility to read and understand this safety manual and the manufacturer's manual(s) before operating your equipment. Remember that you are the key to safety. Good safety practices not only protect you but also protect the people around you. Practice all other usual and customary safe working precautions and above all: **REMEMBER, SAFETY IS UP TO YOU. YOU CAN PREVENT SERIOUS INJURY OR DEATH!**

YOU HAVE TOO MUCH TO LOSE

The area between the tractor and the PTO-driven implement is a DANGER zone. This can be one of the most dangerous places on your farm – for you, every member of your family, and employees. We know that almost every driveline accident happens during the day and near the barnyard.

Certain operating conditions are particularly dangerous:

- If your equipment is missing guards or shields
- If you are not paying attention
- If children are playing near where you are working
- If you are operating a stationary piece of equipment
- If you are wearing loose-fitting clothes
- If you are tired or in a hurry to get finished

Do you know that most driveline accidents happen when drivelines are operated without shields or guards or they are improperly maintained?

THE FUNCTION OF PTO DRIVELINE AND SHIELDING

What is the function of a PTO driveline and shielding system?

The PTO driveline transmits power from the tractor to the implement. It must be able to operate safely across a wide range of performance demands and different environmental conditions. The driveline shielding system can help you ensure your own personal safety and the safety of others. The purpose of the driveline shielding system is to help prevent inadvertent contact and entanglement in the driveline. The total shielding system includes the tractor master shield, driveline guards, and implement shield.

Keep all guards and shields in place. The tractor master shield and implement shield must be installed to work with the driveline guard and provide the intended coverage.

THE OPERATOR'S MANUAL

- Read the manual
- Understand the contents
- Heed all safety messages in the operator's manual and safety signs on machines

PRE-OPERATION REQUIREMENTS

- Be sure to disengage the PTO shaft and turn off the tractor before making any inspections or working around the PTO driveline.
- Follow the manufacturer's recommendation for attaching the implement to the tractor. Make sure the distance from the tractor PTO shaft to the hole in the drawbar is the distance recommended by the implement manufacturer in the operator's manual.
- If your drawbar has an offset end, be sure it is in the down position so it won't interfere with the driveline guard when you are using PTO-driven equipment. Make sure your three-point hitch and drawbar are correctly positioned so neither interferes with the driveline. Lock the three-point hitch when you are not using it.
- Use a drawbar hitch pin with a low head. When the hitch pin or other parts of the drawbar connection are too close to the driveline, field operation on uneven or terraced terrain will often result in guard damage.
- Don't weld any protruding device onto the head of your hitch pin. Be especially careful to remove clevis straps mounted on top of the drawbar.
- The driveline must be attached securely to the tractor and the implement. If a set screw or bolt is the recommended means for attachment, make sure it is the correct length and follow the original manufacturer's recommendations. Don't attach drivelines with bolts or pins which are longer than recommended. They can not only catch loose clothing, boot-laces or a pant cuff, but, while spinning rapidly, they can cause serious bodily injury.
- The driveline shielding system is one of the most important components for your safety and the safety of others. Make sure all guards are in good repair and in place prior to hooking up your driveline. This will greatly reduce the risk of an accident, serious injury, or even death.
- Make sure the driveline guard can rotate independent of the shaft a full rotation and can telescope freely.
- If the driveline has been provided with a retaining chain, make sure the chain is in place and has been properly connected to the tractor or the implement attachment point.
- Make sure that any shear pins are correctly installed and that the proper replacement pins are readily available. Check any other overload devices to ensure they are operable and have been serviced according to the manufacturer's instructions.

- For stationary equipment which is not attached to the tractor, proper spacing must be maintained. After setting the tractor brake, block the wheels on both the tractor and implement to insure proper spacing at all times.
- Before operating, determine what the recommended PTO operating speed is for the implement and make sure it will not be exceeded. Consult implement operator's manual.

OPERATING RECOMMENDATIONS AND PRECAUTIONS

- Be certain only a properly trained and physically able person will operate the machinery.
- Wear close fitting clothes and keep long hair tied back or under a hat.
- Don't allow any hydraulic hoses, electric cords, ropes, or other items to drape over the driveline guard. This could result in damage to the hoses, cords, or guards.
- When you turn, be careful not to hit the driveline with tractor tires. This often happens in non-working conditions.
- Never allow guards to pull apart. Guards could be cut or crushed when pushed back together.
- Be certain to disengage PTO shaft and to turn off the tractor before making any operational maintenance inspections or repairs. Keep clear of the machine until all parts have stopped moving.
- Don't remove the tractor master shield or the implement shield and continue to operate.
- Remember that a protrusion anywhere is a potential entanglement hazard.
- Don't remove the driveline guard or expose guarded parts of the driveline by cutting or enlarging the grease access holes.
- Be aware of special precautions for stationary equipment. Avoid contact with drivelines in this close working environment. Do not step on or over a driveline.

Never operate an implement with driveline guards in a damaged condition.

- To transport the machinery, follow the implement manufacturer's recommendation for storing the driveline. If no provision for storage is available, make sure the driveline is properly secured to prevent damage to the guarding system during transport.

MAINTENANCE

Driveline & Shielding System

- Inspect driveline shielding system including tractor master shield, driveline guard, and implement shield. If the driveline guard does not rotate free from the shaft, is damaged, or the safety signs are missing or illegible, parts must be repaired or replaced. Perform maintenance per operator manuals.
- Check connection means for securing tractor to implement.
- Check Quick Disconnect Pin, Slide, or Twist Collar attachment yoke.
- Check clamp bolts and set screws for proper torque.
- Store your equipment inside and do not allow the driveline to rest on the ground.

Make sure the driveline is stored in a manner which will not damage guards. Rust and mud may interfere with the driveline locking device or you could unknowingly run over it with the tractor or other farm equipment.

- To replace driveline guards and safety signs, go to your farm equipment dealer. Brand name original equipment replacement parts are recommended. If they cannot supply the guarding or safety signs needed, contact the equipment manufacturer. If the manufacturer is not able to supply the guarding, retrofits are available at dealers or farm stores.

When replacing the driveline guard:

- Make sure the proper guard bearings are used for installation.
- Lubricate the bearing grooves per implement manufacturer's recommendation.
- Make sure the ADMA safety sign is on the replacement guard.
- If the driveline is old and will not accept a guard, replace the driveline!
- Don't modify the driveline when you repair or replace it. The driveline was engineered and manufactured for a specific implement application.
- Proper maintenance of all shields, guards, and overload devices is important to safe operation. A shield must be fitted to the implement input connection so that it will overlap with the driveline guard.

MAINTENANCE OVERLOAD DEVICES

Overrunning Clutch

- Lubricate per the manufacturer's recommendation.

Shear Bolt Torque Limiter

- Replace sheared bolts with the manufacturer's recommended diameter, length, and grade only.
- Lubricate per the manufacturer's recommendation.

Friction Disc Clutch

- To avoid damage to the implement, driveline, or tractor, do not exceed the manufacturer's recommended settings, or use a spring that is not recommended.
- All friction clutches should be inspected for freeze-up after long periods of non-use.
- Check the operator's manual or consult your equipment dealer for the proper procedure to re-establish the correct torque setting.

Other Clutches

- Maintain according to manufacturer's recommendations.

REMEMBER, SAFETY FIRST

- Exercise extreme caution when operating machinery.
- Stay at least your height away from a rotating driveline.
- Never operate equipment without proper guarding.
- You have an obligation to keep children away. There is NO reason for any child to be near operating equipment.
- If the elderly are assisting with farm work, their physical limitations need to be recognized and accommodated.
- It only takes a moment for a shoelace, a pants cuff, or even a strand of hair to become entangled in a driveline.
- Don't wear loose fitting clothes, windbreakers, or jackets with long drawstrings.
- Keep long hair tucked securely under a hat.
- Never step across any driveline.
- Don't use the tractor drawbar or the implement tongue as a step.
- Never use the driveline as a step.
- Slippery conditions increase your risk of injury.
- Fatigue is a warning you should never ignore.
- Heed all safety warnings in the operator's manual and on safety sign.