



NITEHAWK[®]
SWEEPERS

RAPTOR II

OWNERS MANUAL

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ABOUT YOUR SWEEPER



Congratulations on the purchase of your new NiteHawk Raptor II – the newest, most powerful and reliable sweeper on the market. Your sweeper has been designed to give you years of easy operation and trouble free service, with only a small amount of periodic maintenance.

You can contact NiteHawk for Sales, Service and Parts in a variety of convenient ways:

Our standard business hours are Monday – Friday, 8-5 PST

Phone: 800-448-9364 253-872-2077

Email: Info@nitehawksweepers.com service@nitehawksweepers.com

Web: www.nitehawksweepers.com www.buysweeperparts.com

HOW TO USE THIS MANUAL

Please read this manual thoroughly before operating your new sweeper, and then keep it in an accessible place for ready reference. By becoming familiar with the contents of this manual, you will learn more about the features and controls of your sweeper. For digital copies of this manual, please contact your NiteHawk rep

SAFETY STAND USE

Your NiteHawk Sweeper comes from the factory with a Hopper Safety Stand.



Never work under a raised hopper without a safety stand



Always remove safety stand before lowering hopper or it may cause damage

The stand must be used any time a person is working with the hopper in a raised position. Install the stand on one of the dump cylinders, accessing from behind the sweeper, and always secure the locking arm.



To assist owners and maintenance personal with proper use of the hopper safety stand, please go to the following link on the NiteHawk Sweepers YouTube channel:

<https://www.youtube.com/watch?v=2pZd0rp72zq>

Safety stands can be replaced by ordering via our Parts and Service Department, or online at buysweeperparts.com

SAFETY DECALS – IMAGES AND LOCATION



REPLACEMENT PARTS

NiteHawk Sweepers use balanced and matched system components for the entire sweeper system. These parts are made and tested to NiteHawk specifications. Non-genuine or “will fit” parts do not consistently meet these specifications. The use of non-genuine or “will fit” parts may reduce Sweeper performance, void Sweeper warranties, and present a safety hazard. Use genuine NiteHawk Sweeper parts for economy and safety. (SPNHG-01)

GENERAL SAFETY INSTRUCTIONS AND PRACTICES

A careful operator is the best operator. Safety is of primary importance to the manufacturer and should be to the owner/operator. Most accidents can be avoided by being aware of your equipment, your surroundings, and observing certain precautions. The first section of this manual includes a list of Safety Messages that, if followed, will help protect the operator and bystanders from injury or death. Read and understand these Safety Messages before assembling, operating or servicing this Implement. This equipment should only be operated by those persons who have read the Manual, who are responsible and trained, and who know how to do so responsibly.



The Safety Alert Symbol combined with a Signal Word, as seen below, is used throughout this manual and on decals which are attached to the equipment. The Safety Alert Symbol means: "ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!" The Symbol and Signal Word are intended to warn the owner/operator of impending hazards and the degree of possible injury faced when operating this equipment.

Practice all usual and customary safe working precautions and above all---remember safety is up to YOU. Only YOU can prevent serious injury or death from unsafe practices.



Indicates an imminently hazardous situation that, if not avoided, WILL result in DEATH OR VERY SERIOUS INJURY.



Indicates an imminently hazardous situation that, if not avoided, COULD result in DEATH OR SERIOUS INJURY.



Indicates an imminently hazardous situation that, if not avoided, MAY result in MINOR INJURY.



Identifies special instructions or procedures that, if not strictly observed, could result in damage to, or destruction of the machine, or the environment.



NOTE: Identifies points of particular interest for more efficient and convenient operation or repair.

READ, UNDERSTAND, and FOLLOW the following Safety Messages. Serious injury or death may occur unless care is taken to follow the warnings and instructions stated in the Safety Messages. Always use good common sense to avoid hazards.

**¡ LEA EL
INSTRUCTIVO!**



Si no lee ingles, pida ayuda a alguien que si lo lea para que le traduzca las medidas de seguridad.



Never operate the Sweeper until you have read and completely understand this manual, the Truck Operator's Manual, and each of the Safety Messages found in these manuals and those affixed to the Sweeper and its components. Learn how to stop the Sweeper's engines suddenly in an emergency. Never allow inexperienced or untrained personnel to operate the Truck and Sweeper without supervision. Make sure the operator has fully read and understood the manuals prior to operation.

In addition to the design and configuration of this Sweeper, including Safety Signs and Safety Equipment, hazard control and accident prevention are dependent upon the awareness, concern, prudence, and proper training of personnel involved in the operation, transport, maintenance, and storage of the machine. Refer also to Safety Messages and operation instruction in each of the appropriate sections of the Truck and Auxiliary Engine Manuals. Pay close attention to the Safety Signs affixed to the Sweeper.



Always maintain the safety decals in good readable condition. If the decals are missing, damaged, or unreadable, obtain and install replacement decals immediately. Consult your authorized sales representative for decal replacements



All Safety Shields, Guards and other Protective Safety devices should be used and maintained in good working condition. All safety devices should be inspected carefully at least daily for missing or broken components. **NEVER REMOVE PROTECTIVE SHIELDS AND GUARDS! NEVER MODIFY OR CUT PROTECTIVE SHIELDS OR GUARDS!** When shields or guards are removed to access areas for maintenance, they must be replaced and be in good condition before operating. Missing, broken, or worn shields, guards, and other protective devices must be replaced at once and prior to operation to reduce the possibility of injury or death from thrown objects, entanglement, or contact. The Sweeper must be equipped with a fire extinguisher, rated for all fires, in an accessible and visible area. The fire extinguisher should be inspected routinely by a certified inspector for operational use and replaced as needed. Never obstruct access to the fire extinguisher.

OPERATOR SAFETY INSTRUCTIONS AND PRACTICES

⚠ WARNING The operator of the Sweeper must be trained in the operation and safe use of this machine. The operator must read and completely understand the operator's manuals of the Sweeper, Truck engine manufacturers. New operators should be trained in an open area clear of obstructions before operating on public roadways. If operation of the entire Sweeper unit (Truck and Sweeping Components) is not completely understood, consult your authorized sales representative for a detailed explanation. Never allow an untrained or unqualified driver to operate the Sweeper.

⚠ CAUTION The Sweeper driver must meet the requirements and possess a Motor Vehicle License as determined by the state in which the Sweeper is operated if used on public roadways. Contact your local State Department of Public Safety office for special licensing requirements to operate the Sweeper in your area.

⚠ DANGER **NEVER use drugs or alcohol** immediately before or while driving or operating the Sweeper. Drugs and alcohol will affect an operator's alertness and coordination and therefore affect the operator's ability to operate the Sweeper safely. Before operating the Sweeper, an operator on prescription or over-the-counter medication must consult a medical professional regarding any side effects of the medication that would hinder their ability to operate the Sweeper safely. **NEVER** knowingly allow anyone to operate this Sweeper when their alertness or coordination is impaired. Serious injury or death to the operator or others could result if the operator is under the influence of drugs or alcohol.

⚠ WARNING Always wear OSHA approved Personal Protective Equipment (PPE) while operating, servicing, repairing, and/or cleaning the Sweeper. PPE is designed to provide bodily protection during such activities.

Personal Protective Equipment includes:

- Protective Eye Wear
- Steel Toed Safety Footwear
- Gloves
- Hearing Protection
- Close Fitted Clothing
- Hard Hat-When working around a raised hopper.
- Respirator-Depending on conditions and material being swept or cleaned.

Specialized protective equipment may be required if dangerous or hazardous material is being swept by or cleaned from the Sweeper

⚠ CAUTION Repeated or substantial breathing of hazardous dusts, including crystalline silica, could cause fatal or serious respiratory disease including silicosis. Concrete, masonry, many types of rock, and various other materials contain silica sand. California lists respirable crystalline silica as a substance known to cause cancer. Operation of this equipment under certain conditions may generate airborne dust particles that could contain crystalline silica. In those conditions, personal protective equipment including an appropriate respirator must be used. If excessive dust is generated, a dust collection or suppression system should also be used during operation

⚠ CAUTION Prolonged operation of the Sweeper may cause operator boredom and/or fatigue affecting the safe operation of the Sweeper. It is recommended that the operator take scheduled work breaks to help prevent these potentially impaired operating conditions. If possible, completely shut down the Sweeper, exit the cab and move around stretching your arms and legs. Never operate the Sweeper in a fatigued or bored mental state that impairs proper and safe Sweeper operation

⚠ CAUTION **PROLONGED EXPOSURE TO LOUD NOISE MAY CAUSE PERMANENT HEARING LOSS!** Sweeper operation can often be noisy enough to cause permanent hearing loss. We recommend that you always wear hearing protection if the noise in the Operator's position exceeds 80db. Noise over 85db over an extended period of time will cause severe hearing loss. Noise over 90db adjacent to the Operator over an extended period of time will cause permanent or total hearing loss. Note: Hearing loss from loud noise [from sweepers, chain saws, radios, and other such sources close to the ear] is cumulative over a lifetime without hope of natural recovery

⚠ DANGER Do not operate, or perform maintenance to, the Sweeper while wearing loose fitting clothing. Entanglement of loose clothing with the rotating elements can result in serious injury or death. Stay clear of all rotating elements at all times

⚠ WARNING Use both hands for support when getting on and off the Sweeper. Use handholds and steps on the Sweeper for support when boarding the Sweeper.

⚠ WARNING Use available Sweeper handholds and steps to exit the Sweeper. Make sure you have solid footing before stepping down. Be careful of your step and use extra caution when mud, ice, snow, or other matter has accumulated on the steps or handrails. Never rush to exit or jump off the Sweeper.

⚠ DANGER Do not attempt to mount the Sweeper or Truck while the machine is moving. Never attempt to mount a runaway Sweeper. Serious injury or death may occur from being run over by a moving Sweeper

⚠ DANGER BEFORE leaving the Truck's seat, always engage the parking brake and/or set the Truck's transmission in parking gear, stop the engine, remove the key, and wait for all moving parts to stop. Never dismount a Truck that is moving or while the Truck and engine are running. Operate the Sweeper controls from the Truck seat only.

Always wear a seat belt while driving the Sweeper during operation and transport.



Serious injury or even death could result from falling out of the Truck or from being involved in a collision.



Start the Truck and Sweeper only when seated and belted in the Truck's operator seat. Operate the Sweeper controls only while properly seated with the seat belt secured around you. Inadvertent movement of the Truck and/or Sweeper components may cause serious injury or death to the operator and passersby. Read the Truck and Sweeper's manuals for proper starting instructions.



Do not operate, or perform maintenance to the Sweeper while wearing loose fitting clothing. Entanglement of loose clothing with the rotating elements can result in serious injury or death. Stay clear of all rotating elements at all times.



Sweep only in conditions where you have clear visibility of the area being swept in daylight or with adequate artificial lighting. Never sweep in darkness or foggy conditions where you cannot clearly see at least 50 feet in front and to the sides of the Sweeper. Make sure that you can clearly see and identify passersby, steep slopes, ditches, drop offs, overhead obstructions, power lines, oversized debris and foreign objects. If you are unable to see these types of items, discontinue sweeping until visibility improves.



Transport the Sweeper only at safe speeds. Serious accidents and injuries can result from driving this Sweeper at unsafe speeds. Become familiar with the driving characteristics of the Truck and how it handles before operating or transporting on streets and highways. Make sure the Truck's steering, brakes, and wheels are in good condition and operate properly.

Before transporting the Sweeper determine the safe transport speeds for you and the machine. Make sure you abide by the following rules:

1. Test the Sweeper at a slow speed and increase the speed slowly. Apply the brakes smoothly to determine the stopping characteristics of the Truck equipped with the Sweeper. As you increase the speed of the Truck, the stopping distance increases. Determine the maximum safe transport speed for you and the Sweeper. When driving down a hill or on wet or rain slick roads, the braking distance increases: use extreme care and reduce your speed. Do not operate the Sweeper with weak or faulty brakes.
2. Obey all traffic laws and regulations. Never exceed the posted speed limit.
3. The Sweeper has a high center of gravity that may be further increased when carrying a loaded hopper and/or a full water tank. Use extreme caution when transporting at highway speeds. Slow down for sharp corners to avoid tipping or turning the Sweeper over.
4. Only transport the Sweeper at the speeds determined as safe and which allow for proper control of the machine while driving and stopping during an emergency.

5. When operating in traffic, use the Sweeper's directional indicator or signal lights to indicate your movement. Always use the Sweeper's flashing signal lights and other equipped warning features to alert motorists of your presence and slow moving speed when sweeping in traffic. **Be Aware of Traffic Around You and Watch Out for the Other Guy.**

⚠ WARNING When transporting the Sweeper between locations, follow all local traffic laws and regulations. Disengage all Sweeper controls, raise all sweeping components, gutter brooms, sweeper heads, make sure the hopper is completely lowered, and disengage all warning signals prior to entering vehicle traffic

⚠ WARNING Before starting to sweep, the sweeping components must be engaged and operating at the rated speed before moving forward. Sweeping debris before the Sweeper has reached its rated operation speed may result in debris binding between the sweeping components or obstruction in the suction tubes.

⚠ WARNING Do not exceed the rated operating speed for the Truck engines. Excessive operating speeds can cause engine and Sweeper component failures resulting in possible serious injury or death.

⚠ WARNING Sweep at a speed that allows you to safely operate and control the Sweeper. Safe sweeping speed depends on street condition and the type and amount of debris being collected. Slow down for corners, curbs, parked cars, protruding signs and other obstacles. Use slow traveling speeds when operating on or near steep slopes, ditches, drop-offs, overhead obstructions, power lines, or when debris and foreign objects are to be avoided.

⚠ DANGER KEEP AWAY FROM ROTATING ELEMENTS including the Sweeper gutter brooms and sweeping head to prevent entanglement and possible serious injury or death. Be aware that rotating elements can pull bystanders into the Sweeper.

⚠ WARNING Never reach outside the Truck cab to pick up a foreign item or to clear an obstacle such as a tree limb or road sign impeding passage. Stop the Sweeper, shut down all sweeping components, wait for all moving parts to come to a complete stop, and then exit the cab to handle objects that are hindering Sweeper operation and passage.

⚠ WARNING Do not operate the Sweeper if excessive vibration or noise exists. Shut down the Sweeping components and the Truck and Auxiliary engines. Inspect the Sweeper to determine the source of the vibration or noise. If brooms are loose, damaged, or missing, replace them immediately. Do not operate the Sweeper until all necessary repairs have been performed and the Sweeper operates smoothly. Operating the Sweeper with excessive vibration can result in component failure and broken objects being thrown outward at high velocities. To reduce the possibility of property damage, serious injury, or even death, never operate the Sweeper with missing or damaged components.

⚠ WARNING Never attempt to sweep debris that is too large for the Sweeper to pick up

(oversized objects such as broken limbs and discarded tires). Such objects may plug the sweeping components and cause serious mechanical damage to the Sweeper. If possible, carefully place such objects out of the Sweeper and traffic path until properly removed by another means.

 DANGER

Objects such as wire, cable, rope, and chain can become entangled in the rotating parts of the sweeping components causing mechanical damage. Entangled items caught in the brooms can sling outward possibly injuring or entangling the operator or passersby. Any objects that might become entangled in a sweeping component and those which could plug the suction tubes should be removed from the area before beginning to sweep.

 WARNING

Piled debris and water puddles left behind the Sweeper might pose a driving hazard to vehicle traffic colliding with the debris or losing traction on the material. It is recommended to post warning signs alerting drivers of the Sweeper's presence and the need to reduce vehicle speed. If such hazards are left behind following the Sweeper's passage, the area should be swept a second time and any remaining hazards removed by an alternative method.

 DANGER

Air enters the fan housing inlet with great force. Caution should be used when the power module is running and the hopper is raised. To avoid being pulled into the fan, do not wear loose clothes, or position yourself, or allow others near the fan housing inlet. Possible injury or death could occur from being pulled into the fan.

 DANGER

KEEP AWAY FROM SUCTION ELEMENTS including the suction head and suction hoses to prevent being drawn into the Sweeper and possible serious injury or death. Keep items that might be drawn into the Sweeper head such as tools and replacement parts clear of the Sweeper before starting operation.

 DANGER

Use extreme caution when dumping contents of the Sweeper. Be aware of bystanders and animals in the area. Select a dump site on level ground and clear of overhead obstructions that could be hit when raising the hopper. Serious injury or death to the operator, bystanders and animals could occur if precautions are not taken when dumping the contents of the hopper.

- When positioning the truck at the dump station, choose an accessible location only on level ground. Raising the hopper on unlevel ground increases the possibility of tipping.
- Make sure the area is clear of ground and overhead obstructions.
- Never raise the hopper bin unless you can clearly see all overhead structures. Make sure you stay clear of all utility lines.
- Do not dump the hopper over a pit area where the ground may cave in or is unstable.
- Stay in the cab of the sweeper with the windows rolled up when dumping the hopper.

- Use care when positioning the Sweeper to the dump station. Your vision, especially to the side and rear of the Sweeper may be reduced by the size of the Sweeper. Use side and rear view mirrors to aid vision. If you cannot see the dump site clearly, stop the Truck and examine the area. If necessary, request assistance to guide you while backing the Truck into position.
- If the hopper will be in the raised position for more time than is normally required to dump, or if someone is going to get under the hopper for repair, maintenance, cleaning or any other reason, secure the safety prop into position.
- Never drive the Sweeper with the hopper in the raised position. Traveling with the hopper in the raised position increases the chances of colliding with overhead obstructions. In addition, the center of gravity of the Sweeper is higher with a raised hopper, making the unit more prone to tipping over.



Do not allow the Sweeper to come in contact with potentially dangerous and/or hazardous material. Such hazards may include, but are not exclusively limited to, the following:

- Fire Hazards- Fuel spills, burning material,
- Chemical Hazards- Chemical spills, discarded chemical containers, batteries,
- Biological Hazards- Decaying Carcasses, Biomedical Waste,
- Radioactive Hazards-Radioactive Waste, Radioactive Material,
- Cutting Hazards-Broken Glass, Lumber with Protruding Nails,
- Carcinogenic Materials-Asbestos,
- Corrosive Materials-Batteries, Acids and Bases.

In most areas, these types of material require special handling requirements for safe collection and proper disposal and should not be collected by the Sweeper, nor can they be disposed of in a general landfill site like most swept waste. Contact the appropriate authority for the collection and disposal requirements of such dangerous and/or hazardous material.



Always wear required OSHA approved Personal Protective Equipment (PPE) when coming in contact with and removing potentially dangerous and hazardous material that has been collected by the Sweeper or which is obstructing one or more Sweeper components. Pay close attention to dangerous and hazardous material including, but not exclusively limited to, chemicals, decaying carcasses and sharp objects.



Never sweep into hot or burning debris. A burning object, even as small as a lit cigarette, has the potential of igniting the collected waste inside the hopper, possibly destroying the Sweeper and inflicting serious injury or death to the operator or passersby. (SWO-27)

Verbal communication near a Sweeper is difficult and dangerous. Operating instructions and **⚠ WARNING** sweeping directions should be made prior to starting the Sweeper. Unclear and misunderstood communication may lead to operator and bystander injury or death and equipment damage. If communication to a bystander is necessary, completely shutdown and exit the Sweeper. Never allow anyone to approach the Sweeper while in operation.

⚠ DANGER Never allow children to play on, under, or around the Sweeper nor allow children to operate Sweeper controls. Children can slip or fall off the Sweeper and be injured or killed. Children can cause the Sweeper components to shift or fall crushing themselves or others.

⚠ WARNING Allow Sweeper passengers only in situations where their presence is involved in the sweeping operation (operator training, supervision, maintenance inspection). Never carry passengers whose presence distracts from the safe operation or transport of the Sweeper. Passengers must be seated securely and belted in the cab's passenger seat. Never allow any person to ride on any other location of the Sweeper during operation or transport.

⚠ WARNING Extreme caution should be used by the Sweeper operator when operating near passersby. Stop sweeping if anyone comes within 25 feet of the Sweeper to prevent possible passerby injury or death from being struck from a thrown object, entanglement with the brooms, or run over.

⚠ CAUTION Under certain conditions, the Sweeper's brooms are capable of propelling objects up to 25 feet. Be extremely careful when sweeping large dense objects, such as gravel or broken glass, that might become propelled and cause bodily injury to passersby or damage to property such as windows and vehicles

⚠ WARNING Make sure that no bystander, animal or obstruction such as a vehicle, building, or street sign are behind the Sweeper when backing up. The design of the Sweeper impairs operator rear vision when backing. Use extreme caution to ensure that the Sweeper is not backed into the path of pedestrian or vehicle traffic. Serious injury or death and property damage could result from running into, being crushed by, or run over by a Sweeper.)

⚠ DANGER Make sure no bystanders or animals are within 25 feet of the Sweeper when dumping contents from or cleaning the hopper. Hopper contents, which may exceed several thousand pounds, could fall and crush a bystander or an animal resulting in possible injury or death.

⚠ WARNING Do not operate the sweeper if the fan exhaust hose is removed, damaged or improperly installed on the outlet tube or sweeper head. The fan can throw objects resulting in bodily injury to the operator or bystanders.

⚠ DANGER Stay clear of hopper when it is being dumped. Make sure that no coworkers or bystanders are near the hopper when it is being raised or lowered. Serious injury could result from entanglement with the hopper dump mechanism.



Avoid body contact with collected debris in the hopper. Use protective clothing including gloves and eye protection when servicing or working in or around hopper. Collected debris in the hopper can cut or puncture resulting in serious bodily injuries and the transmittal of diseases.



Use extreme caution when operating the Sweeper in traffic. To alert motorists of the Sweeper's presence, the Sweeper is equipped with warning signals. Optional electrical lights, flashers and a warning bar light, strobe, or beacon may be positioned on top of the cab. Use all equipped warning signals to alert motorists and pedestrians of the Sweeper's presence and relatively slow speed. Serious injury or death and property damage may occur if a vehicle collides with the Sweeper.



Before starting a sweeping operation, make sure all the warning signal lights are connected, visible and working. Routinely inspect the Sweeper's headlights, brake lights, backup lights, and turn signal lights for operational condition. Immediately repair non-functioning lighting. Always follow all local traffic regulations while operating the Sweeper. (SWS-4)

MAINTENANCE SAFETY INSTRUCTIONS AND PRACTICES



⚠ WARNING

Periodically inspect all moving parts for wear and replace when necessary with authorized service parts. Look for loose fasteners, worn or broken parts, and leaky or loose fittings. Make sure all pins have cotter pins and washers. Serious injury may occur from not maintaining this Sweeper in good working order.

⚠ WARNING

Inspect the entire Sweeper before each use. Accidents may occur or damage to the Sweeper may result if the Sweeper is not maintained in good mechanical working order.

- Check for loose bolts, worn or broken parts, pinched hydraulic hoses, and leaky or loose fittings.
- Make sure all pins are secure and safety pins equipped.
- Make sure replacement parts (gutter broom heads) are the correct size and properly installed.
- Make sure all fluid levels are full and replenish as necessary.
- Make sure fuel, oil, and coolant caps are replaced and tightened.
- Make sure that the water tank cap is replaced.
- Check tire condition for tread wear and tire pressure at the rated PSI.
- Make sure that all safety shields and guards are attached and in good condition.
- Make sure all scheduled maintenance is up to date.

⚠ WARNING

Do not modify or alter this Sweeper. Do not permit anyone to modify or alter this Sweeper, any of its components or any Sweeper function.

⚠ DANGER

Use extreme care when climbing onto the Sweeper to perform repairs, maintenance, and cleaning. Use proper stands and ladders to access areas that cannot be reached from ground level. Slipping and falling off the Sweeper can cause serious injury or death.

⚠ DANGER

Never attempt to repair, lubricate, adjust, clean, remove obstructions or perform any other type of service to any Sweeper component while the Sweeper is in motion or

while the Truck engine is running. Completely shut down the sweeping components and the Truck engine and wait for all motion to come to a complete stop before servicing the Sweeper.

⚠ DANGER Never leave the Sweeper unattended while the hopper bin is in the raised position. Accidental operation of the lifting lever or a hydraulic failure may cause a sudden drop of the unit which could result in injury or death by crushing. If the hopper must be raised for a purpose other than the time required to normally dump, or if someone is going to get under the hopper for any reason, always secure the hopper safety prop into position.

⚠ DANGER Never crawl under the hopper bin while the hopper is in the raised position unless properly secured with the safety prop in position. Accidental operation of a lifting lever or hydraulic failure may cause a sudden drop of the unit with injury or death by crushing.

⚠ WARNING Use proper protective equipment (gloves, safety eyewear, face shield, arm protection, possible respirator or particle mask) when handling gutter and sweeper brooms during replacement, adjustment, and maintenance. Broom bristles, which are sharp and coarse, could inflict puncture and stab wounds to the hands, arms, and/or eyes if proper protective equipment is not worn.

⚠ DANGER Never crawl under any raised Sweeper component (gutter broom, sweeper head, suction head, or hopper bin) unless the component is securely supported or blocked up and hydraulic pressure relieved. Accidental operation of the lifting lever or hydraulic failure may cause a sudden drop of the unit with possible injury or death by crushing.

⚠ WARNING Never remove the Sweeper exhaust head hose to perform repairs or maintenance while the Sweeper is operating. Objects propelled from an open hose at a high velocity could cause serious injury or death. Always shut down the Truck engine completely and wait for all motion to come to a complete stop before working on any Sweeper component.

⚠ DANGER Escaping pressurized hydraulic oil generated by hydraulic pumps has the potential to inflict serious injury and possible death. Never attempt to repair a pump or hose or tighten a connection while the system is pressurized. Always shut down the Truck engine and relieve hydraulic oil pressure before performing any repairs to the hydraulic system.

⚠ WARNING Hydraulic pressure must be relieved from the Sweeper's hydraulic circuit prior to doing any maintenance or repair work and when the Sweeper is parked at the end of the day. Place the Sweeper's gutter brooms, sweeper broom, suction head, and outriggers on the ground or securely blocked up with the safety pins installed. Make sure the hopper bin is lowered onto the chassis or secured in the raised position with the safety prop in position. Turn off the Truck engine then engage the hydraulic remote cylinders several times to relieve hydraulic pressure prior to performing any maintenance or repair work.

⚠ WARNING Water pressure generated by the high pressure water pump has the potential

to inflict serious injury. Never attempt to repair a pump or hose or tighten a connection while the system is pressurized. Always shut down the Truck engine and relieve water pressure by activating the system before performing any repairs to the high pressure water system

⚠ DANGER NEVER work on or near any engine component that has generated heat until it has cooled down. Use extra caution around the exhaust manifold near the water valve and the turbo charger manifold tubes. NEVER check or replenish the fluid levels of the Truck engine coolant or hydraulic circuit oil levels until sufficient time has passed (up to 2 hours) to allow the system to cool down. Contact with a hot engine component or operating fluid may result in serious injury from burns, scalding and possible death

⚠ DANGER Never remove debris from or unclog jams in the suction hoses, gutter brooms, pickup brooms, and all other areas of the Sweeper until both the Truck Engine have been completely shutdown, all sweeping components have come to a complete stop and are lowered to ground level and hydraulic pressure relieved. Always wear PPE when removing collected material from the Sweeper. Serious injury or death may occur if any of these precautions are not followed when removing plugged or jammed sweeping components)

⚠ WARNING Use extreme caution when working in confined areas of the hopper bin or water tank for an extended period of time. Confined work areas may pose a danger because of the physical constraints imposed on the body. Routinely exit the confine to stretch and correct posture to prevent physical stress imposed on the body before bodily injury occurs.

⚠ DANGER Use extreme caution when entering confined areas of the hopper bin to perform repairs, maintenance, and cleaning. Depending on any hazardous contents and/or fumes contained within the hopper bin, specialized Personal Protective Equipment such as a specialized respirator, artificial oxygen source, and protective body suit may be required. Always use the buddy system when hazardous or oxygen depleting material is contained within the hopper. Never enter an enclosed area without Personal Protective Equipment if contents are unknown, possible injury and death may result if required precautions are not taken

⚠ DANGER Use extreme caution when refueling the Sweeper, fuel is highly flammable and explosive if not handled safely. Always follow these precautions to reduce the dangers involved in refueling:

1. Completely shut down the Truck Engine before refueling.
2. Do NOT refuel while smoking or near an open flame.
3. Do NOT store Sweeper with fuel in the tank in a building where fumes can reach an ignition source.
4. To prevent a fire and explosion caused by static electric discharge while filling the tank, use a plastic funnel. Avoid using a funnel that has a metal screen or filter.
5. Avoid spilling fuel. Fuel is expensive and can damage plastic and painted surfaces. Clean up spilled fuel immediately.

6. Store fuel and all oils at a site protected from moisture, dirt, and other contaminants



Never run the Truck engine in a closed building or without adequate ventilation. The exhaust fumes can be hazardous and deadly to your health. If it is necessary to run the Truck engine in an enclosed area, remove the exhaust fumes from the area to the outdoors with an exhaust pipe extension. If you do not have an exhaust pipe extension, or if it is not possible to use one (Sweeping within a building), open doors and circulate outside air into the area



Engine Exhaust, some of its constituents, and certain vehicle components contain or emit chemicals known to the state of California to cause cancer and birth defects or other reproductive harm.



Do not operate this Sweeper with hydraulic oil or fuel leaking. Oil and fuel are expensive and their presence could present a hazard. Do not check for leaks with your hand! Use a piece of heavy paper or cardboard. High-pressure oil streams from breaks in the line could penetrate the skin and cause tissue damage including gangrene. If oil does penetrate the skin, have the injury treated immediately by a physician knowledgeable and skilled in this procedure.



Always read carefully and comply fully with the manufacturer's instructions when handling fuels, oils, solvents, cleansers, and any other chemical agent.



Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the state of California to cause cancer, birth defects or other reproductive harm.



Avoid contact with hot surfaces on the bottom of the skid shoes. Use gloves and eye protection when servicing hot components. Contact with a hot surface can cause serious injury from burns or scalding.



Remove the negative battery cable from the battery before performing any maintenance on the electrical system to prevent an accidental circuit shorting and sparks. Sparks can result in wiring damage, fire or personal injury.



Use caution when working around the hopper doors. Do not let the doors fall uncontrolled onto bystanders or coworkers. Use the door locks to hold the doors open while cleaning or performing maintenance in or around the hopper.



Before conducting maintenance on the sweeper stop the truck, place the

transmission in park and set the parking brake. Turn the Truck engine off and remove the keys to prevent inadvertent or accidental starting of the engines. Unexpected engine start up or truck movement can result in serious bodily injuries or death.



Do not inspect or approach the sweeper fans while they are rotating. Serious bodily injury including dismemberment can result. Shut down the Truck engine and wait for all rotating motion to stop completely before attempting to inspect or perform maintenance on or near the fans.

LAWS AND REGULATIONS

This section is intended to explain in broad terms the concept and effect of federal laws and regulations concerning employer and employee equipment operators. This section is not intended as a legal interpretation of the law and should not be considered as such.

Employer-Employee Operator Regulations

U.S. Public Law 91-596 (The Williams-Steiger Occupational and Health Act of 1970) OSHA

This Act Seeks:

“...to assure so far as possible every working man and woman in the nation safe and healthful working conditions and to preserve our human resources...”

DUTIES

Sec. 5 (a) Each employer-

(1) shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees;

(2) shall comply with occupational safety and health standards promulgated under this Act.

(b) Each employee shall comply with occupational safety and health standards and all rules, regulations and orders issued pursuant to this Act which are applicable to his own actions and conduct.

OSHA Regulations

OSHA regulations state in part: “At the time of initial assignment and at least annually thereafter, the employer shall instruct every employee in the safe operation and servicing of all equipment with which the employee is, or will be involved.”

Employer Responsibilities:

To ensure employee safety during Sweeper operation, it is the employer’s responsibility to:

1. Train the employee in the proper and safe operation of the Sweeper.
2. Require that the employee read and fully understand the Sweeper Operator’s manual.
3. Permit only qualified and properly trained employees to operate Sweeper
4. Maintain the Sweeper in a safe operational condition and maintain all shields and guards on the equipment.
5. Ensure the Sweeper is equipped with a functional seat belt and require that the employee operator securely fasten the safety belt at all times
6. Forbid the employee operator to carry additional riders on the Sweeper

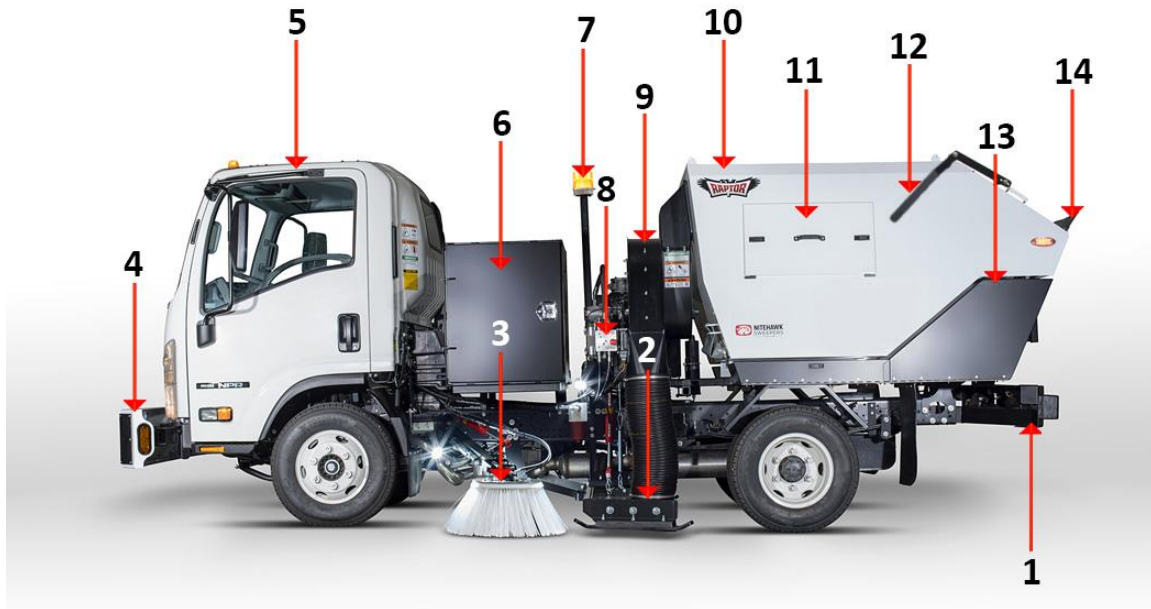
7. Provide the required tools to maintain the Sweeper in a good safe working condition and provide the necessary support devices to secure the equipment safely while performing repairs and service.
8. Require that the employee operator stop operation if bystanders or passersby come within 25 feet.

Child Labor Under 16 Years of Age

Some regulations specify that no one under the age of 16 may operate power machinery. It is your responsibility to know what these regulations are in your own area or situation. (Refer to U.S. Dept. of Labor, Employment Standard Administration, Wage & Home Division, Child Labor Bulletin #102.

3 SWEEPER SYSTEM DESCRIPTIONS & IDENTIFICATION

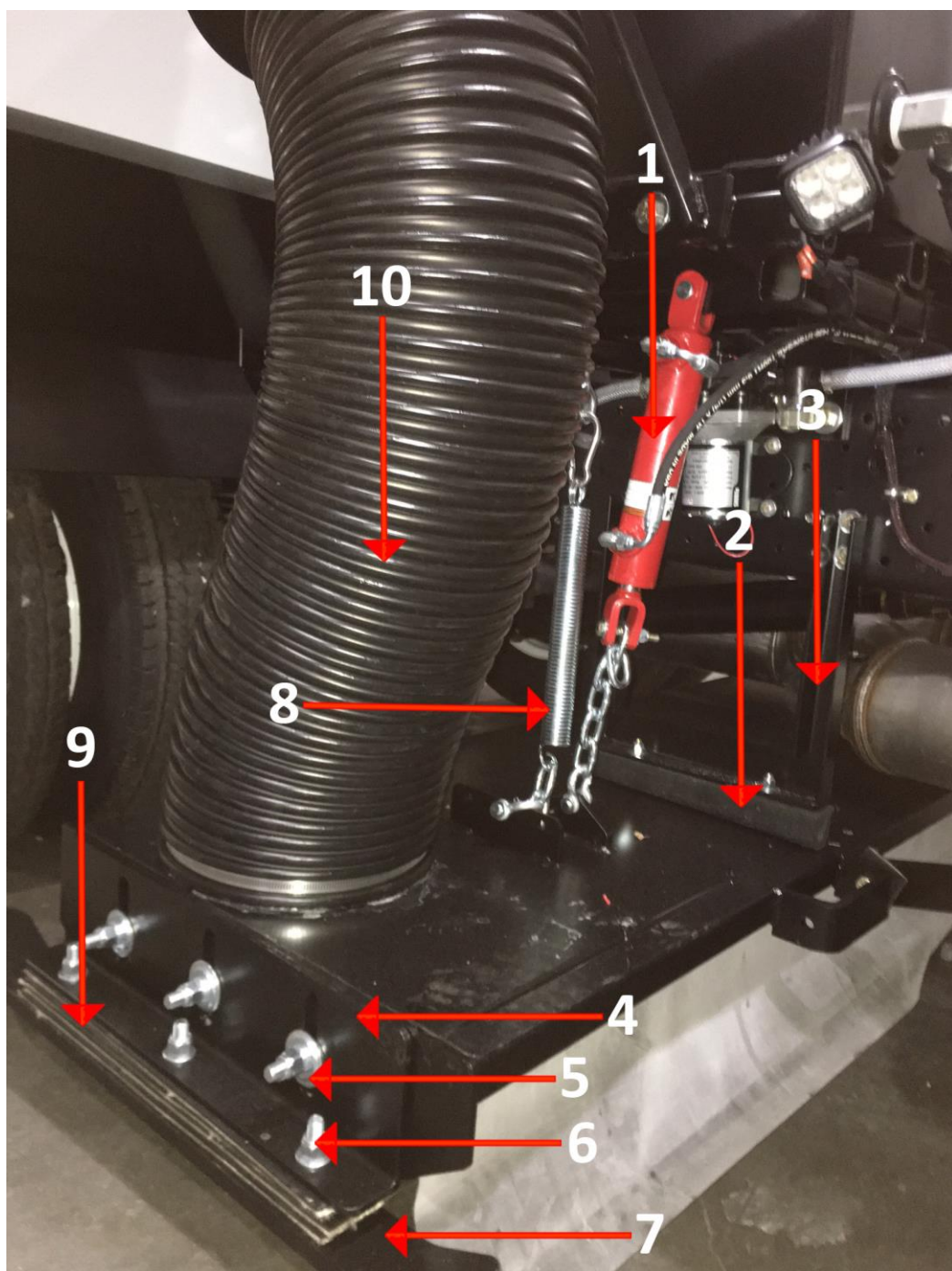
SWEEPER COMPONENTS



1. Rear Bumper
2. Sweeping Head
3. Curb Broom (if equipped)
4. Heavy Duty Front Bumper (if equipped)
5. In Cab Controls
6. Tool Box (if equipped – Vertical Style Shown)
7. Safety Beacon
8. Hydraulic Manifold
9. Fan Housing
10. Hopper
11. Hopper Side Door
12. Dump Door Handle
13. Rear Tool Box
14. Dump Flap



1. Rear Toolbox
2. Hoper Side Door
3. Hopper Intake Tube
4. 10" Flex Intake Hose
5. Sight Gauge – Hydraulic Fluid
6. Hydraulic Fluid Reservoir
7. Water Reservoir (if equipped)
8. Battery
9. Toolbox (if equipped – Vertical Style Shown)

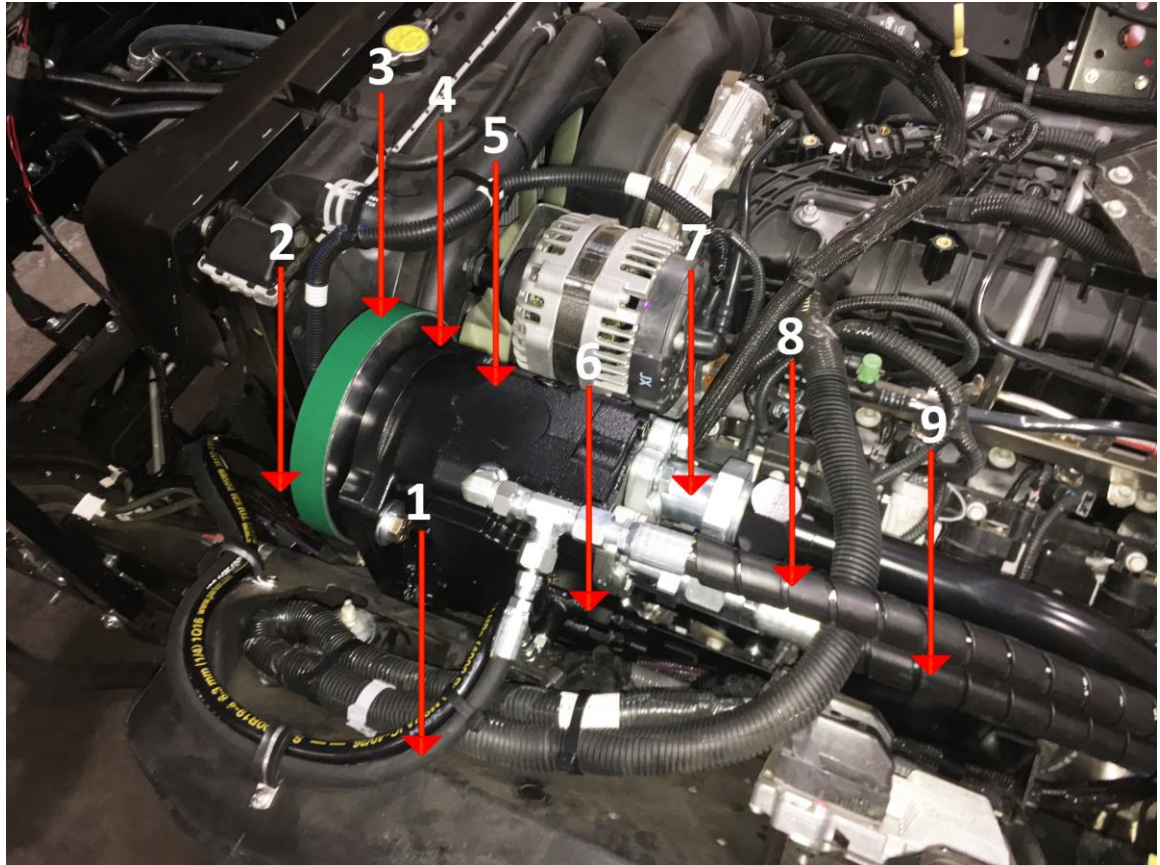


Pickup Head, Driver Side

1. Pickup Head Cylinder
2. Upstop Pad
3. Upstop
4. Skid Plate
5. Skid Plate Bolt
6. Skid Bolt
7. Skid (Double Row Tungsten)
8. Pickup Head Spring
9. Skid Spacer
10. 10" Flex Intake Hose

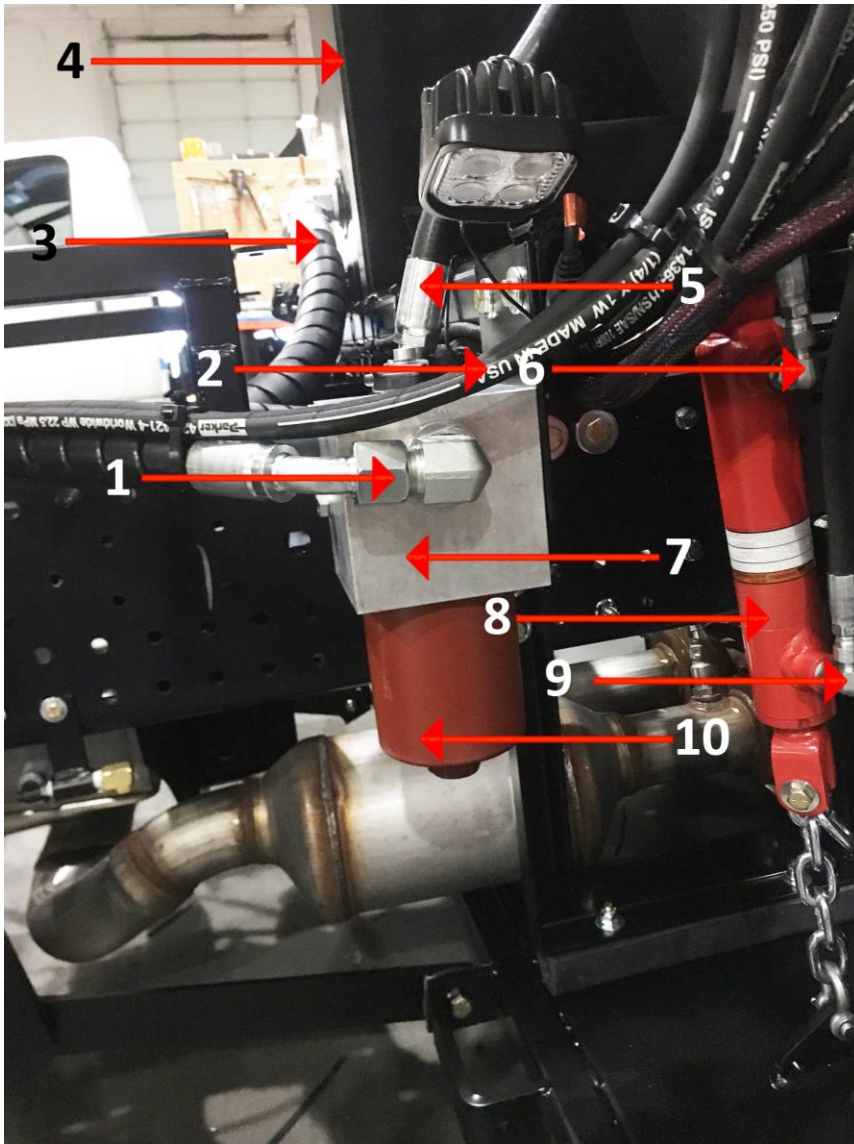
HYDRAULIC SYSTEM

This section will take you through the entire hydraulic system, front the front of the truck to the back, identifying all major components



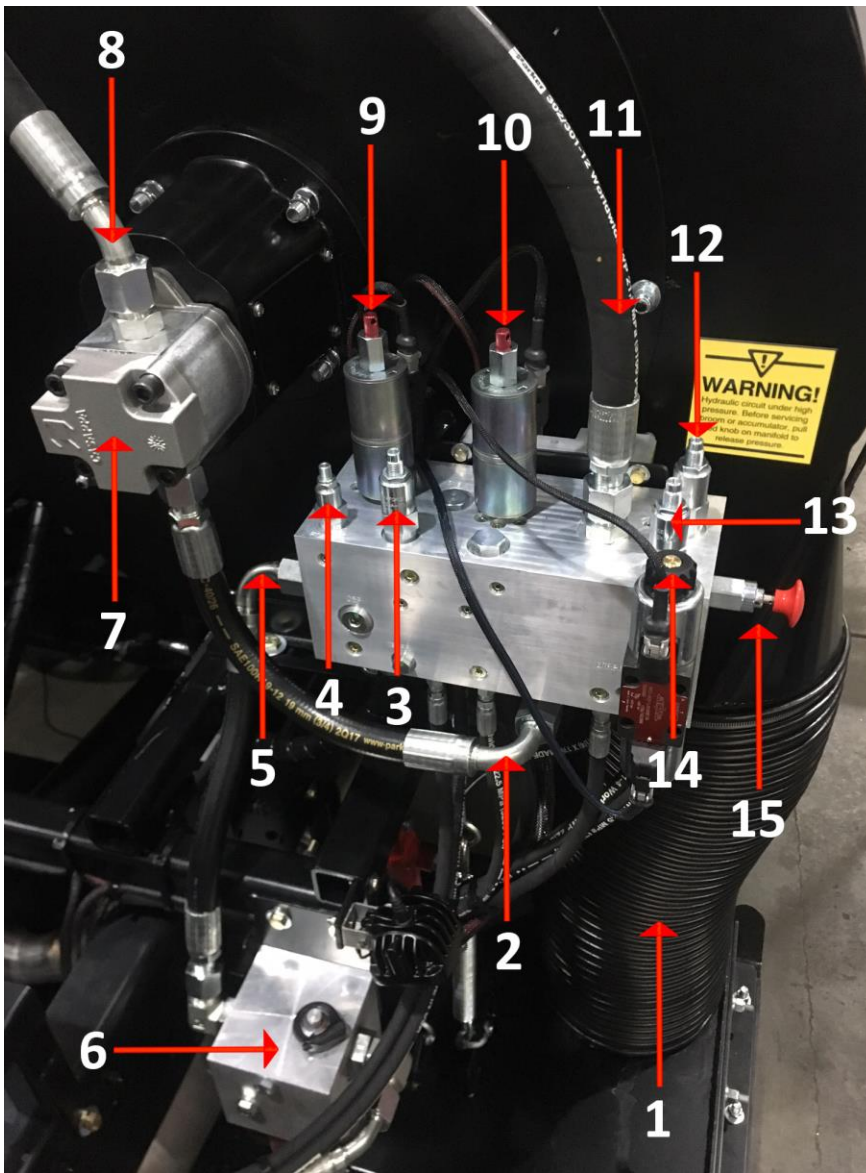
Hydraulic System, Engine Compartment

1. Hydraulic Lines – Proportioning Valve
2. Proportioning Valve
3. Pump Belt
4. Pump Mount
5. Pump Body
6. Compensator
7. Suction Header (Reservoir to Pump Supply Line)
8. Case Drain Line (Pump Body to Reservoir)
9. Pump to Pressure Filter



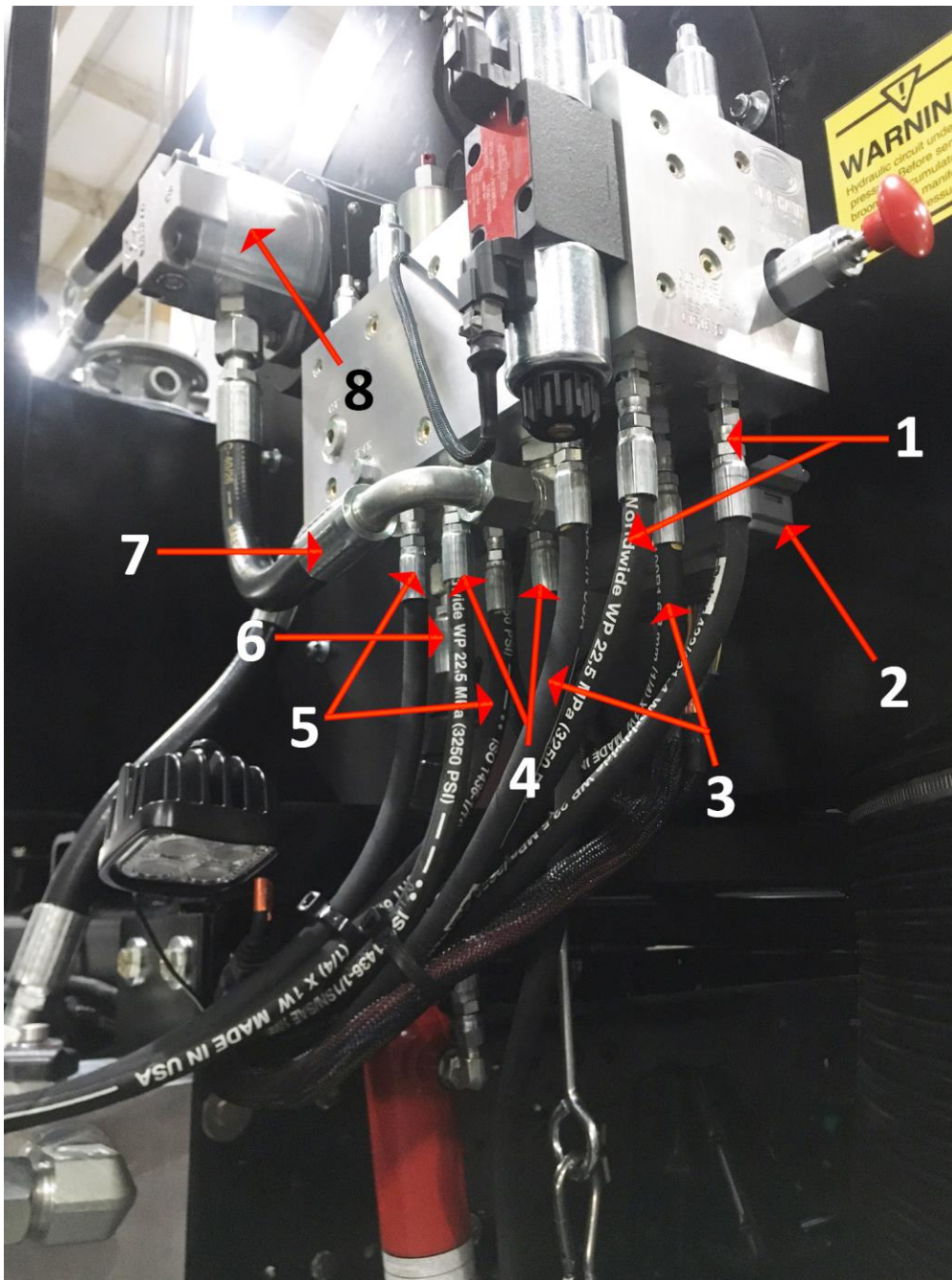
Hydraulic System, Driver Side, Behind Cab

1. Main Pump to Pressure Filter Line
2. Curb Broom Lines
3. Reservoir to Pump Supply Line (Suction Line)
4. Hydraulic Reservoir
5. Pressure Filter to Manifold Line
6. Pickup Head Cylinder Upper Port (Lowers Head)
7. Pressure Filter Housing
8. Pickup Head Cylinder
9. Pickup Head Cylinder Lower Port (Raises Head)
10. Pressure Filter Bowl (Lower Housing)



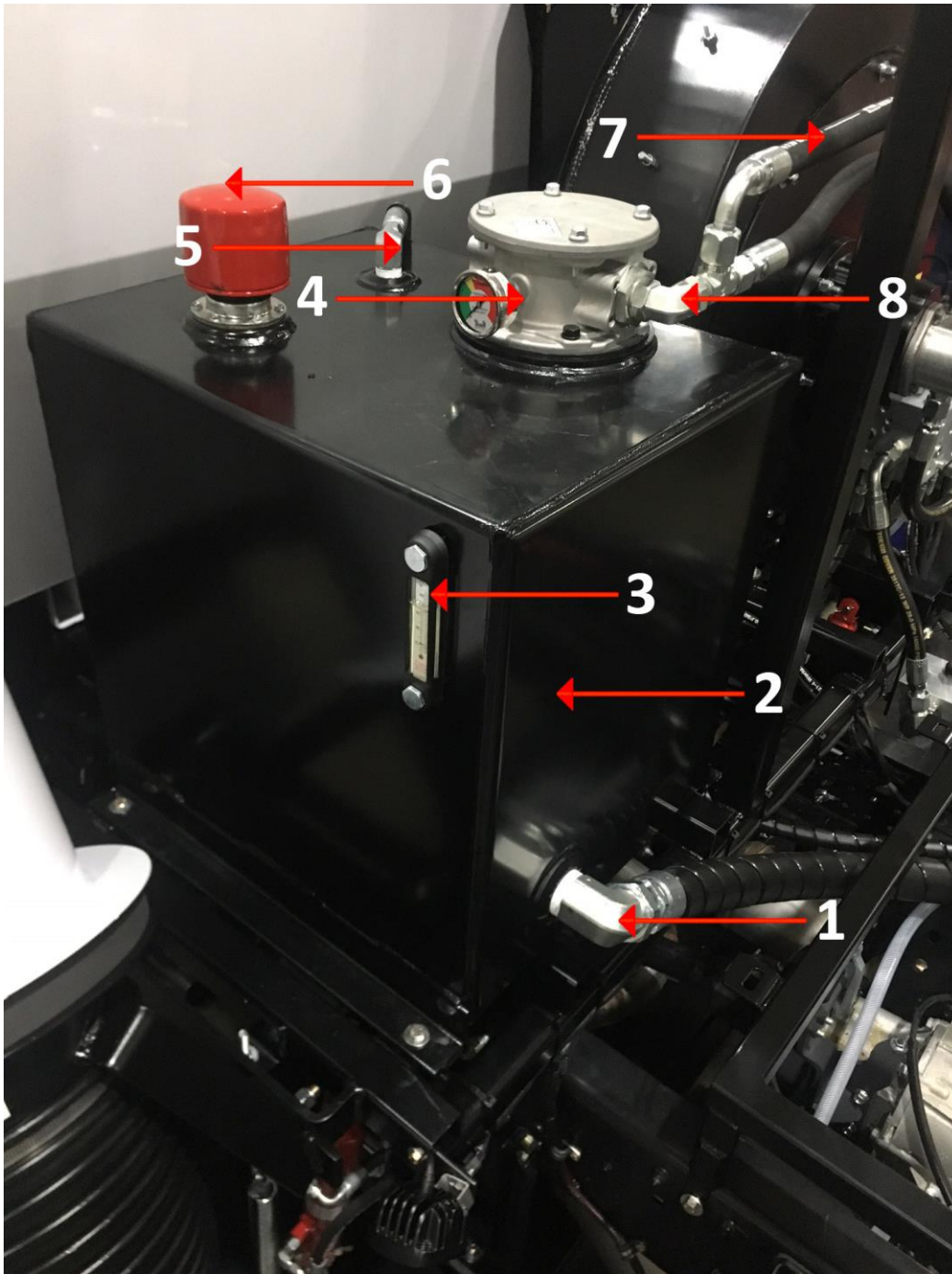
Hydraulic System Manifold, Driverside, Top View

1. 10" Flex Exhaust Tube
2. Manifold to Fan Motor Pressure Line
3. Curb Broom Pressure Relief Valve
4. Curb Broom Flow Control Valve
5. Pressure Filter to Manifold Pressure Line
6. Pressure Filter Housing
7. Fan Motor
8. Fan Motor to Reservoir Return Line
9. Directional Valve Curb Broom
10. Directional Valve Pickup Head
11. Manifold to Reservoir return line
12. Hopper Pressure Relief Valve
13. Sweeping Head Pressure Relief Valve
14. Directional Valve Hopper
15. Accumulator Dump Valve



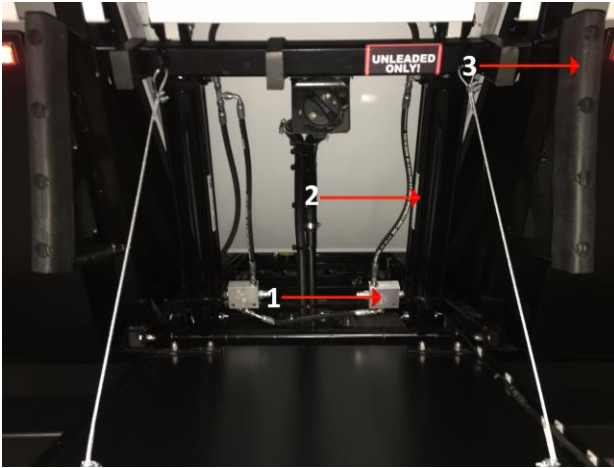
Hydraulic System Manifold, Driver Side, Bottom View

1. Dump Cylinder Lines
2. Controller
3. Pickup Head Cylinder Lines
4. Pickup Head Cylinder Lines
5. Curb Broom Lines
6. Accumulator to Manifold Pressure Line
7. Fan Motor Line
8. Fan Motor



Hydraulic System Reservoir, Passenger side, Top View

1. Reservoir to Pump Supply Line (Suction Line)
2. Hydraulic Fluid Reservoir
3. Reservoir Sight Gauge
4. Low Pressure Filter Housing
5. Case Drain Line (Pump Body to Reservoir)
6. Reservoir Breather Filter
7. Manifold to Reservoir return line
8. Fan Motor to Reservoir return line



Behind Back Drop Down Door – Rear Sweeper



Accumulator – If Curb Broom only

1. Counterbalance Valve (same on left and right)
2. Dump Cylinder 18" (same on left and right)
3. Dumpster Bracket Bumper

HYDRAULIC SYSTEM – INDICATORS



1. Pressure Filter – the clear disc on top will turn red if the filter is clogged and being bypassed



2. Return Filter – the gauge will indicate to the red if filter is clogged and being bypassed. Also check fluid quality in gauge free of contaminants

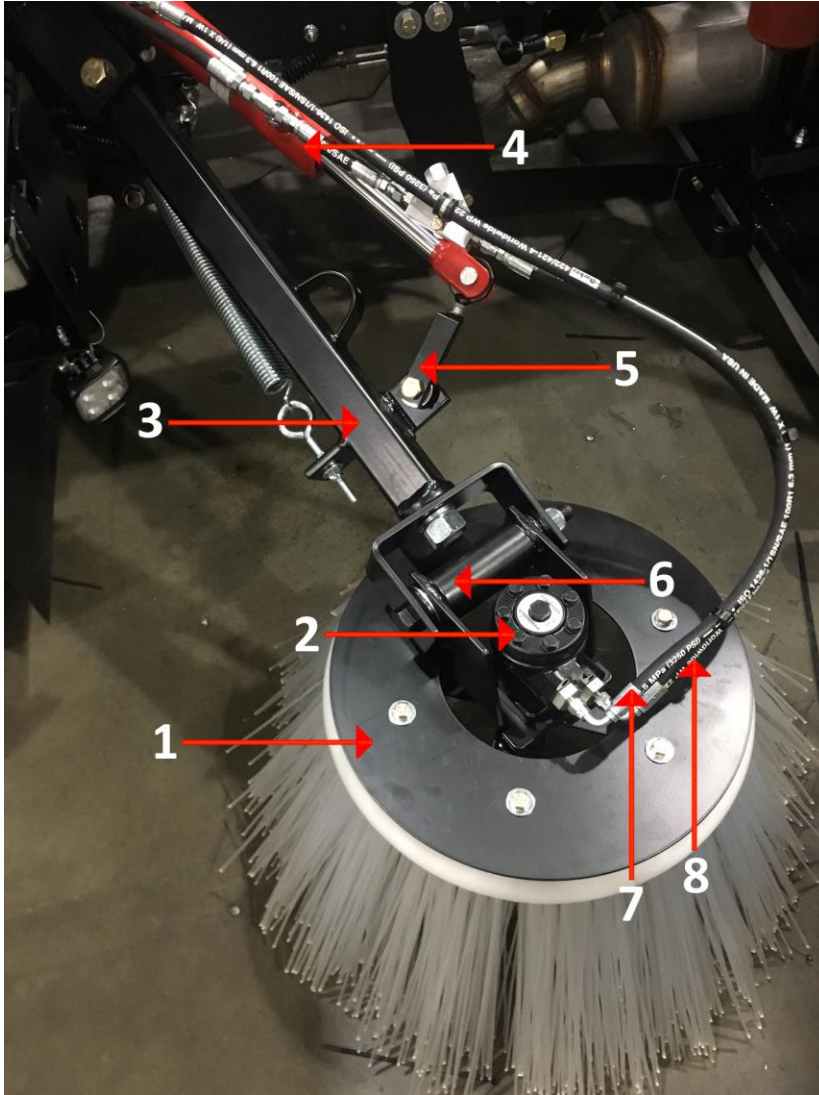


3. Sight Gauge (Reservoir) – if you cannot see fluid in this gauge, inspect system for leaks and don't operate sweeper until fluid level is half way up the gauge. Also check fluid quality – free of contaminants

OPTIONAL EQUIPMENT

CURB BROOM (DRIVER SIDE AND/OR PASSENGER SIDE MOUNTED)

In order to minimize amount of time spent with back pack blower cleaning a parking lot, you can equip your NiteHawk Raptor II with a curb broom. For proper curb broom usage, please refer to the "CONTROLS AND OPERATION" section of the manual. See below for component call outs.



Curb Broom, Driver Side

1. Curb Broom Dish
2. Curb Broom Motor
3. Curb Broom Arm
4. Curb Broom Cylinder
5. Turnbuckle
6. Curb Motor Mount
7. Curb Broom Pressure Line
8. Curb Broom Return Line

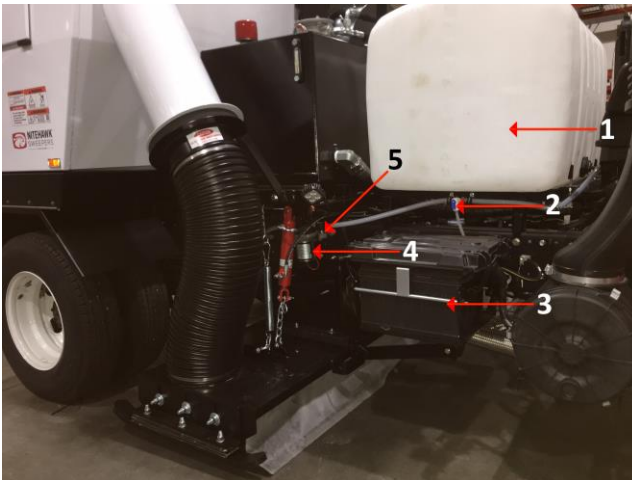
DUST SUPPRESSION SYSTEM

To increase the efficiency of your sweeper and reduce the amount of dust generated by the vacuum system, a water spray system can be added to your NiteHawk Sweeper



Water System, Reservoir

The water system is equipped with a 100 gallon tank mount directly behind the cab. The fill port is located on top of the tank, passenger side of vehicle



Water System, Passenger Side

1. Water Tank
2. Water Sys Drain Valve
3. Battery
4. Water Pump Assembly
5. Water Sys Filter/Strainer

Water System Nozzles (5 Front Spray Bar, 1 Curb Broom, 1 Driver Side Sweeping Head, 1 Passenger Side Sweeping Head)



CONTROLS AND OPERATION



Your new NiteHawk Raptor II has the latest in highly reliable, rugged, simple, easy to use controls to control all sweeping functions on your Sweeper with a Heads Up Display.

OPERATING REMINDER

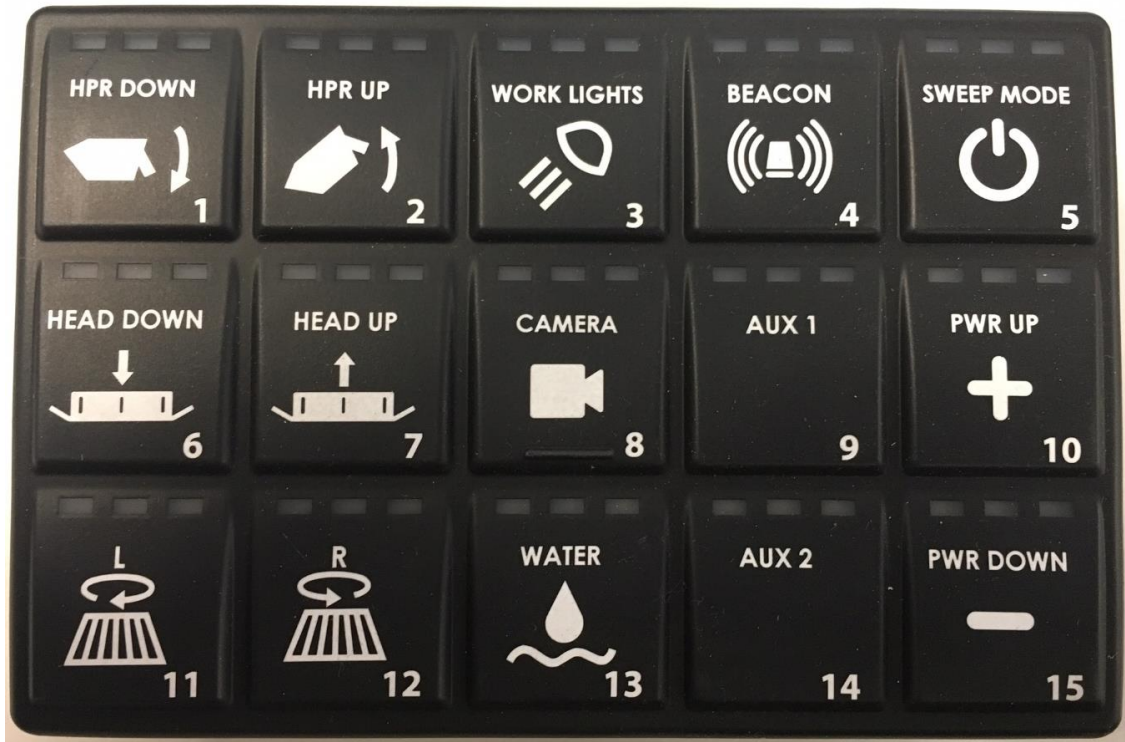
The Raptor II must be in "Sweep Mode" with the Hydraulic System running at a minimum of 70% Power Setting to raise and lower the Sweeping Head and raise and lower the Hopper.

The Raptor II should be at 100% power setting for optimal curb broom performance

The control panel and display are a one piece system connected to a RAM mount.

This RAM mount has 360 degree adjustability that can be customized to fit any operator





SWEEP MODE / ROAD MODE (5)

Press this button once to turn on "Sweep Mode" and once to turn off "Sweep Mode"
You will see "Sweep Mode" or "Road Mode" in the Heads Up Display depending on your selection

SWEEPER POWER SETTINGS (10 and 15)

Press button 10 to raise sweep power / hydraulic pressure. *The power bar on left of display will raise in 10% increments*

Press button 15 to lower sweep power / hydraulic pressure in 10% increments.

SWEEPING HEAD (6 and 7)

Press and hold button 6 to lower the sweeping head all the way to ground

Press and hold button 7 to raise the sweeping head to the stowed position

The heads up display will show the direction you are moving the sweeping head

CURB BROOM – DRIVER SIDE (11) if equipped

Press button 11 to extend broom. *Indicator on display will show broom operation*

Press and hold button 11 to raise the broom to stowed position

CURB BROOM – PASSENGER SIDE (12) if equipped

Press button 12 to extend broom. *Indicator on display will show broom operation*

Press and hold button 12 to raise the broom to stowed position

HOPPER – DUMPING DEBRIS (1 and 2)

Press and hold button 1 until the hopper is completely vertical. *Display will show warning indicator of "hopper up"*

Press and hold button 2 to lower the hopper to normal position. *When hopper is completely lowered, the "hopper up" warning will go away*

WORK LIGHTS and BEACON(S) (3 and 4)

Press button 3 to illuminate side mounted white LED worklights. Press again to turn off.

Press button 4 to illuminate center mounted flashers, AND BUMPER MOUNTED FLASHERS IF EQUIPPED. *Display will indicate work lights and beacon separately*

DUST SUPPRESSION (13) if equipped

Press button 13 to turn on water system. *Display will indicate water is on.*

REAR VIEW CAMERA (8)

Press button 8 to turn on camera – view will show on the display

The camera will automatically turn on any time truck is put in Reverse

AUX 1 – CUSTOM OPTIONS (9)

This button can control additional options with a max 10-amp load

AUX 2 – AUTO RETRACT OR CUSTOM OPTIONS (14)

If there is not a secondary option installed, press and hold button 14 to retract Sweeping Head, retract Curb Broom(s), and Lower Hopper.

SAFETY AND LIGHTING

When operating the sweeper, it is the drivers' responsibility to maintain proper clearance between all obstacles, vehicles and people. If a person comes within 25 feet of the sweeper, cease operation until person has moved on. Reference Safety Section 2 for more detailed safety procedures and best practices

For all sweeper operations, it is highly recommended that operators use all safety lighting options available to them: This can include: Standard Safety Beacon (standard) – Center mounted, LED Light Bar – Center Mount (optional), LED Bumper Flashers (optional), Chassis Warning Flashers (standard)

VIDEO RESOURCES – SWEEPER OPERATION

NiteHawk Sweepers YouTube Channel

<https://www.youtube.com/user/nitehawkssweepers11>

DAILY INSPECTIONS (PRE/POST OPERATION)

Recommended Daily Inspections

Inspection Task	Looking For
Tires	<i>Flats, Punctures, Abnormal Wear Patterns</i>
Mirrors	<i>Proper Adjustment and Visibility</i>
Lights	<i>Proper Operation and</i>
Hydraulic Pump	<i>Belt, pump and mount aligned, no leaks</i>
Hydraulic Fluid Level	<i>Fluid is visible in reservoir sight gauge, fluid is clean</i>
Hydraulic Hoses / Manifold / Cylinders	<i>No evidence of leaks</i>
Skids, Plates, Bolts	<i>Aligned Properly and no damage</i>
Head and Drag Bars	<i>Aligned Properly and no damage</i>
Hopper and Dump Frame	<i>No visible cracks, warping or damage</i>
Broom Wear	<i>Proper length of bristle, smooth operation</i>
10" Hoses (Intake/Exhaust)	<i>No holes or tears, clamps properly secure</i>



Never allow the sweeper to operate with no fluid registering on the sight glass. This will void your warranty and may cause severe damage to your hydraulic system.

RECOMMENDED SERVICE SCHEDULE

Recommended Service Schedule - 3,000 Intervals / Repeat Every 30,000 Miles

	Mileage	3	6	9	12	15	18	21	24	27	30
1	Hydraulic Pump Mount Bolts	I	I	I	I	I	I	I	I	I	I
2	Front Pump Belt	I		I		I		I		I	
3	Intake and Suction Hoses	I	I	I	I	I	I	I	I	I	I
4	Hose Wear	I		I		I		I		I	
5	Hydraulic System Leaks	I	I	I	I	I	I	I	I	I	I
6	Cylinders (Broom, Head, Dump)		I		I		I		I		I
7	Valve Manifold			C			C			C	
8	Accumulator (if equipped)			C			C			C	
9	Fan Motor Coupling	I	I	I	I	I	I	I	I	I	I
10	Fan Gut		I		I		I		I		I
11	Fan Bearings				I				L		
12	Head / Flaps / Drag Bars	I	I	I	I	I	I	I	I	I	I
13	Curb Broom (if equipped)										
14	Skid Plates and Skids		A		A		A		A		A
15	Controls, Fuses and Wiring		I		I		I		I		I
16	Fenders and Bumpers			T			T			T	
17	Water System / Filter (if equipped)		I		I		I		I		I
18	Hopper Intake and Fan Seal		I		I		I		I		I
19	Hopper Side/Dump Door Seals		I		I		I		I		I
20	* Hydraulic Fluid / Reservoir *		I		I		I		I		I
21	* Hydraulic Return Filter *			I			I			I	
22	* Hydraulic Pressure Filter *			I			I			I	
23	* Breather Cap Filter *			I			I			I	

I - Inspect (Adjust or Replace if Necessary)

R - Replace

T - Tighten to Spec Torque

L - Lubricate

C - Clean

S - Service

* Per NiteHawk Warranty, Hydraulic Fluid and Filters must be replaced on an **ANNUAL** basis

ANNUAL MAINTENANCE

REPLACING HYDRAULIC FLUID AND FILTERS:

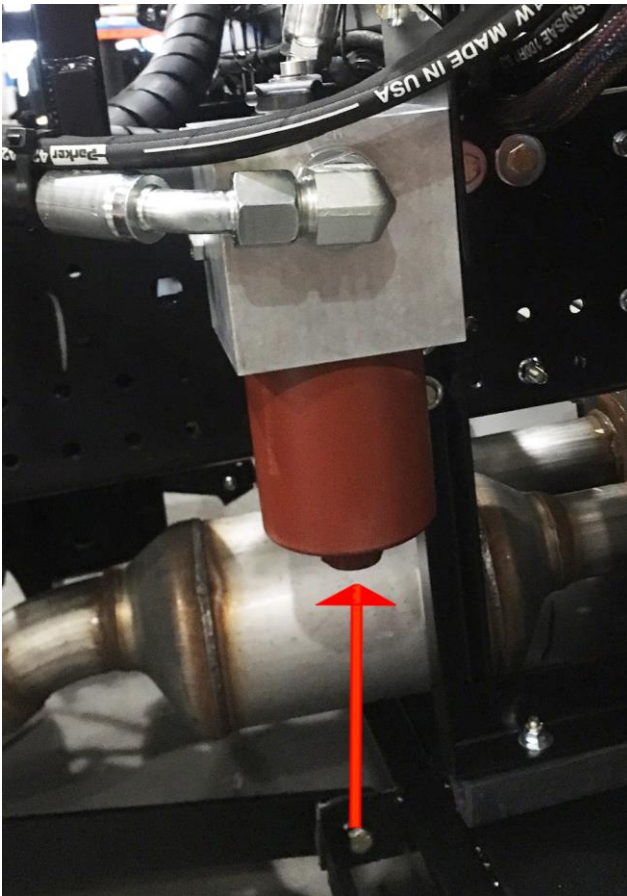


Never replace hydraulic fluid when the engine or truck exhaust system is hot or warm.

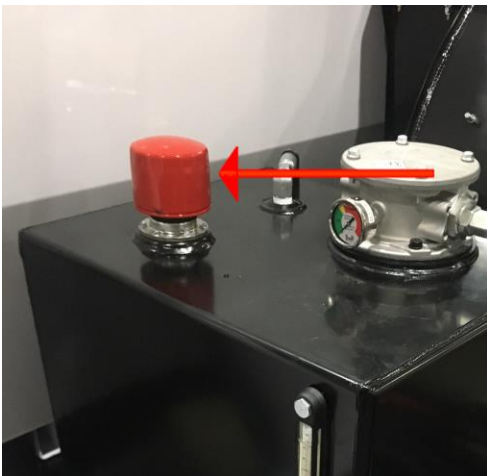
1. Remove the drain plug located on the bottom of the hydraulic reservoir.
2. Completely drain all the fluid and replace the plug.
3. Remove the 4 top bolts that hold the return filter cap to the filter housing.



4. Remove the low pressure filter element and replace it with a K10 Filter Element (PN – HY-1300) and rebolt the filter cap to housing
5. Remove the red colored Pressure Filter holder (bottom portion) from the upper filter housing



6. Unscrew the red filter bowl, remove and replace with a Pressure Filter Element (PN – HY-1355) and reinstall to upper housing.
7. Remove and replace the red breather filter (Part Number HY-1202) on top of reservoir





8. Refill the hydraulic reservoir to the center of the site gauge with AW 46 hydraulic fluid.



Do not run the pump until the reservoir has been refilled. This will void your warranty and could cause severe damage to your hydraulic system.

9. Start the truck and allow the fluid to re-circulate through the system.
10. If needed, refill the reservoir to the center of the site gauge.

COLD WEATHER INFORMATION

- . Factory supplied hydraulic fluid AW 46 has a pour point of -25°F .



Starting the vehicle with the main pump belt connected, at or below -25°F will void your warranty and could cause severe hydraulic system damage.

SERVICE AND ADJUSTMENT GUIDES

FLAP ADJUSTMENT

For optimal sweeping performance, the flaps adjustment should be performed anytime a gap greater than $\frac{1}{4}$ " is worn between bottom of back flap and flat/level ground.



Primary Flap Adjustment

1. Power up sweeper and lower the sweeping head to ground
2. Loosen the 3 bolts holding the skid plate to the sweeping head (this needs to be done to both sides of the sweeping head simultaneously)
3. Drive the sweeper with head on ground for 20-30 seconds, which allows the head to self adjust the flaps down to contact with ground again.
4. Tighten the 3 skid plate bolts on both sides of sweeping head
5. Continue this procedure until you have reach the limits of adjustment slots on the skid plate.



Secondary Flap Adjustment

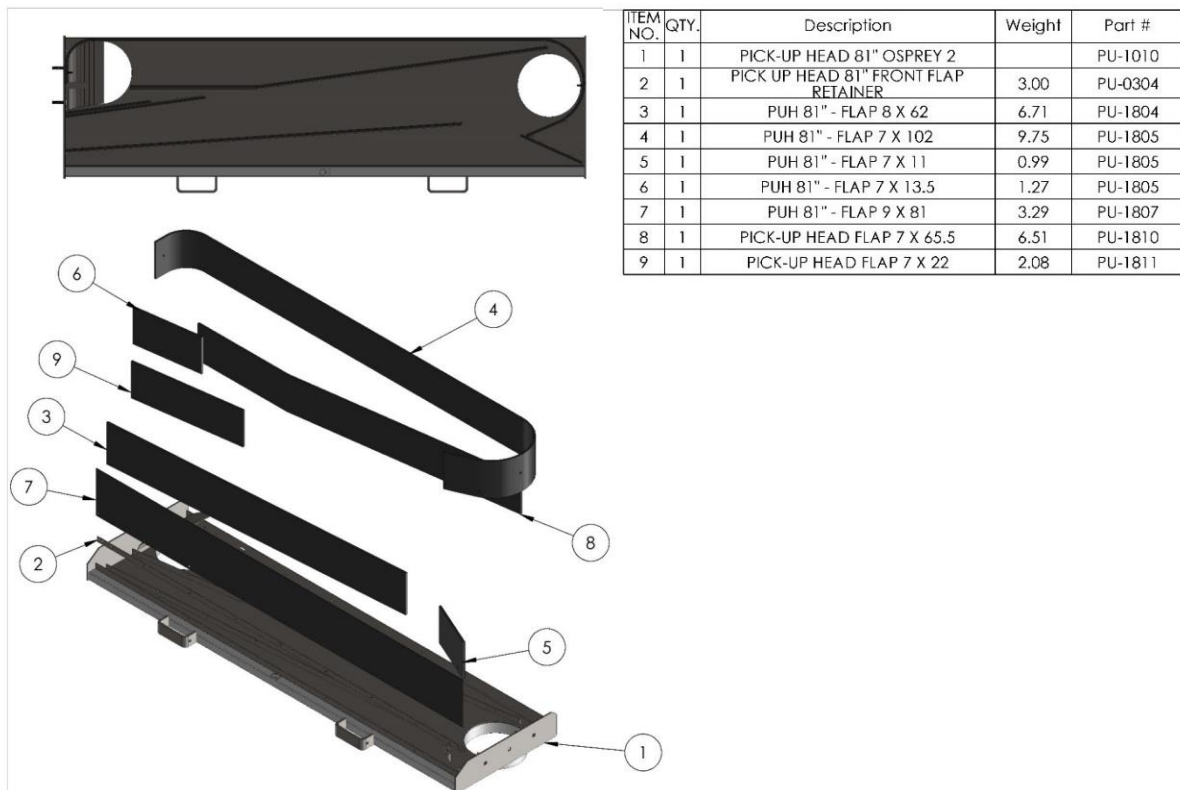
1. To maximize life span of sweeping flaps, NiteHawk designed in a secondary adjustment system when you have reached limits of the Primary Flap Adjustment
2. Keep the sweeping head in the up position
3. Loosen the 3 skid bolt nuts, remove skid
4. Remove 1 skid spacer
5. Reinstall skid and tighten 3 skid bolt nuts
6. Repeat procedure for other side of sweeping head
7. You can continue this Secondary Adjustment until 1 skid spacer is remaining. The next step is to replace sweeping flaps with new set.



FLAP REPLACEMENT

When a ¼" gap appears between the rubber flaps and the pavement and, there is no more adjustment in the skid plates and there is only 1 skid spacer remaining, it is time to change the flaps. In order to change the flaps the pick-up head must be removed from under the truck.

1. Remove the chains from the cylinders, the bolts that connect the drag bars to the head, the head springs, and the 10" hoses.
2. Slide the head out from under the truck on the driver's side and turn the head upside down.
3. Note that the majority of bolts face toward the back of the truck. Take note of the few bolts face the other direction.
4. To prevent confusion, remove, mark and replace only one flap at a time, taking note of which side of the metal strips the flap is on.
5. Fasten the flaps with ¼" x 1" bolts, and nylock nuts. Install ¼" washers anywhere the flap meets a nut or bolt.
6. Reinstall rubber skid spacers making sure there are four on each side
7. Reinstall head making sure that all chains are at the proper length and that the springs are set to the proper tension.



The pick up head is adjusted for optimum clearance at the factory.

Over-tightening the chains will void your warranty and could cause damage to your pickup head system, your lift cylinders, or chassis components.

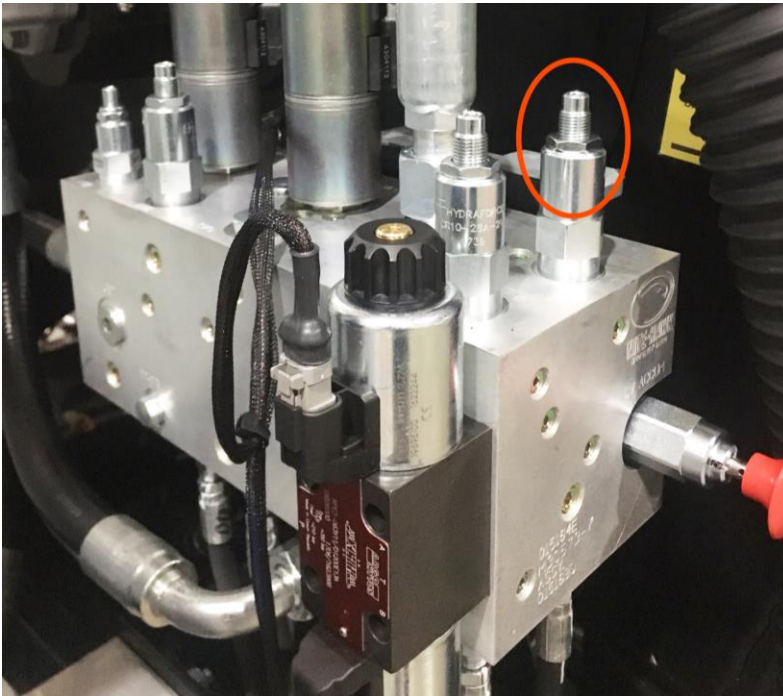
RELIEF VALVE ADJUSTMENT - HOPPER

The relief valve is factory preset to lift 900 lbs. and should only be adjusted if all other possibilities have been exhausted. Before you adjust the relief valve you should check to see if the hopper is overloaded.



Do not adjust the relief valve with the engine on. This will void your warranty and could cause damage to your relief valve.

The relief valve is located on the valve plate below the dump valve assembly.



1. Loosen the jam nut and screw the stud in $\frac{1}{4}$ turn.
2. Re-tighten the jam nut and check to see if the desired result is achieved.
3. Adjust the relief valve back to its original position.

CURB BROOM ADJUSTMENT (IF EQUIPPED)

Refer to the “Controls and Operation” section for operational use of curb broom.

ALWAYS USE CURB BROOM AT 100% POWER SETTINGS FOR OPTIMAL PERFORMANCE

A Hydraulic cylinder located along the truck frame operates the broom arm. The broom follows a fixed axis.



The curb broom extends beyond the width of the wheels of the truck on all models. Care should be taken to avoid a collision with the broom and any stationary object.

- BROOM TILT

Adjust the tilt of the broom by loosening the broom arm nut, which attaches the motor mount hinge to the curb broom arm.



- BROOM PITCH

The pitch of the broom is adjusted by loosening the motor mount hinge, setting broom to preferred angle, retighten bolts



- **EXTENSION / RETRACTION**

The curb broom turnbuckle adjusts how far the broom extends and retracts. Adjusting how far the broom extends also affects how far the broom retracts and vice versa.

To extend the broom further, unbolt the turnbuckle body from the curb broom arm, rotate the turnbuckle body around the threaded washer – extending reach of turnbuckle. Reinstall turnbuckle body to curb broom arm

To retract the broom in further, follow the same procedure rotating the turnbuckle to reduce the reach.



- **EXTENSION ASSIST**

The curb broom spring is located on the curb broom arm. It is attached to the frame mount on one side, and an eyebolt on the other side. To adjust the spring tension, simply loosen the jam nut on the eyebolt and tighten the tension nut for more tension or loosen for less tension.



- BROOM SPEED

The speed of the broom is factory preset, but it can be adjusted, using the curb broom relief valve to fit your individual needs. The curb broom relief valve is located on the driver side of the unit on the curb broom valve assembly.



Loosen the jam nut on the relief valve and turn the screw counter-clockwise for more speed and clockwise for less. Note that this relief valve also controls the speed at which the broom extends and retracts.



Only adjust curb broom relief valve in ¼ turn increments (mark with paint pen or marker to ensure proper adjustment) Adjusting the relief valve all the way in will void your warranty and could cause damage to your curb broom cylinder.

- BROOM REPLACEMENT

1. Loosen and remove curb broom dish bolts
2. Remove 2 segments of curb broom
3. Verify there are 3 nylock nuts installed in each segment of curb broom
4. Install new segments and tighten bolts, mark bolts with paint pen for ease of visual inspection



DUST SUPPRESSION SYSTEM (IF EQUIPPED)

The dust suppression system keeps surface dust to a minimum by misting water along the sweeping path. Each system has 7 or 8 nozzles, a water pump, strainer, drain and tank. The tank holds approximately 100 gallons. There are five nozzles located along the front bumper of the truck, two nozzles mounted near the head on each side of the unit, and one nozzle mounted near the broom, if equipped. The filler neck is located on top of the water reservoir. To drain the system, twist the drain handle so that it runs parallel with the hose.

To clean the strainer, unthread the clear lower portion of the strainer assembly. Remove the metal strainer and clear any debris and clean out strainer thoroughly, then reinstall.



Do not run the pump dry. Running the pump without any water in it could cause the pump to overheat and damage may occur. To avoid this, never turn the system on without water in the tank.

LUBRICATION - FAN BEARINGS



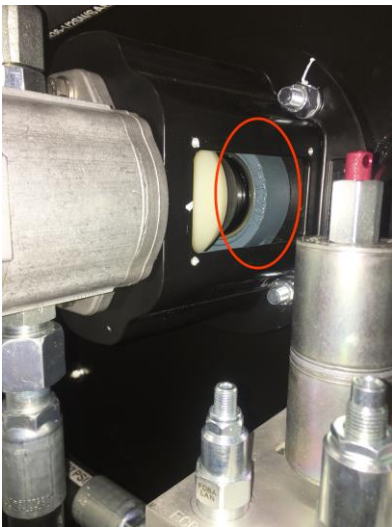
Do not attempt to lubricate or adjust the blower fan while the fan is turning.
The fan spins at a high RPM and is dangerous.



The fan bearings only require minimal lubrication to keep them spinning quiet and effective. Most bearings will last years with no additional lubrication at all. Over- lubrication will void your warranty and can cause the bearings to separate from the housing and damage your impeller shaft.
Over-lubrication occurs when grease begins to be pushed outside the bearing housing. Bearings should be lubricated only when a noise has been detected from the bearing.

The fan bearings are lubricated with a standard grease gun and the grease is applied to the grease zerk on both the front and rear bearings. Only clean automotive grade grease should be used to lubricate the fan bearings.

Front and Rear Fan Bearings



TROUBLESHOOTING & REPAIRS

CHECKING FOR LEAKS

Inspect all fittings and hoses for leaks. The most common places for leaks to start are at the crimp of the hose, and on all unions and junctions. Pumps and motors can start to leak from the fitting ports and also from the shaft seals.

To correct leaks at pipe or JIC junctions, always try to disconnect the part first and clean the threads, then reinstall using clean Teflon thread compound. To correct leaks at Boss O-ring fittings, simply change the O-ring. The hydraulic system on your NiteHawk Sweeper is vented so it is not uncommon to have a mist of fluid on top of your reservoir; this can sometimes be mistaken for a leak. If a leak does occur call the NiteHawk Service Line at 1-800-448-9364.

MANUAL OVERRIDES

All models are equipped with manual override buttons on each directional valve. In case of an electrical failure, manually operate the override button located on the ends of the directional valves for the function you wish to operate

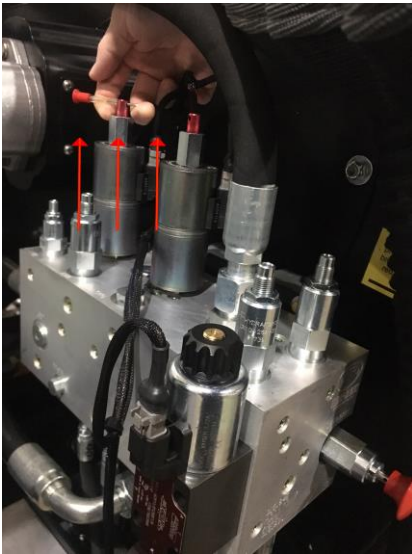
Left – Curb Broom Right – Pickup Head





Be sure to have everything clear around moving parts prior to operating manual overrides.

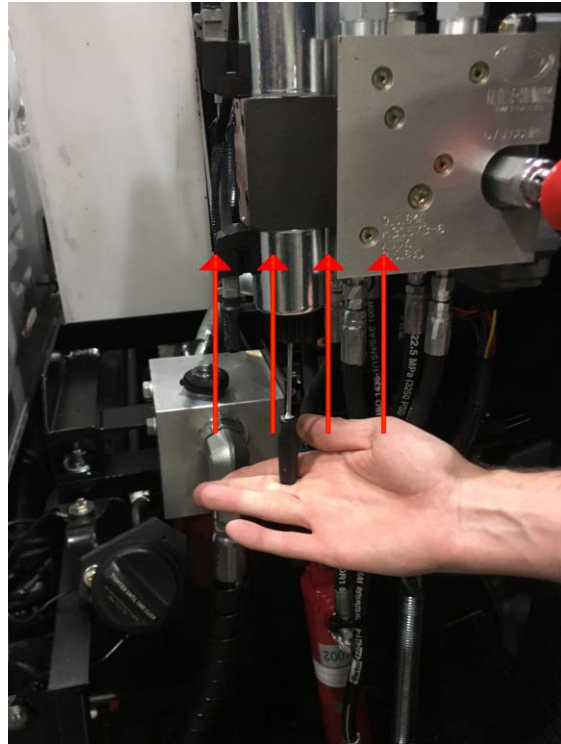
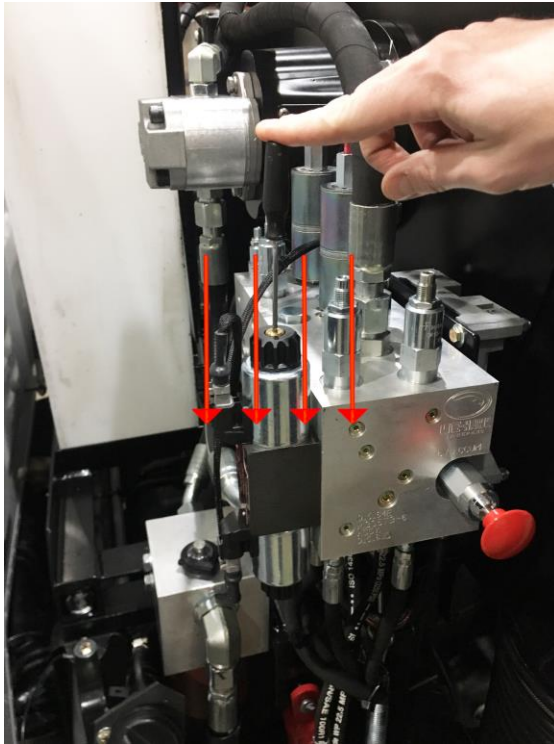
To lift the override button, insert a small narrow tool into the opening on the red override button and pull up. This works for both curb broom and pickup head directional valves



Simply push and hold down on the button to operate valve in other direction. This works for both curb broom and pickup head directional valves



Hopper Manual Override – Use a small screwdriver



HYDRAULIC LINE REPLACEMENT



Do not replace hydraulic lines with the hopper in raised position, or with the hydraulic system running. Removing a hydraulic line with the hopper up could cause the hopper to drop causing severe injury or death.

Always pull out the accumulator relief valve (large red handle on side of hydraulic manifold) prior to doing any work to the hydraulic system

If you must replace a hydraulic line with the hopper raised always use a safety stand. To order a hydraulic line, measure the overall length of the line from the ends of the fittings.

TROUBLESHOOTING CHECKLISTS

Pick-up head or hopper will not raise or lower

1. Power Level is too low - increase power level
2. Check for external hydraulic leaks
3. Valve sticking - check manual overrides
4. Check relief valve, adjust if necessary
5. Check each cylinder individually for internal leak

Main hydraulic pump belt makes noise

1. Belt is worn
2. Tensioner damaged or broken

Curb broom does not fully retract

If the curb broom does not fully retract this could be one of two things. It is either a problem with the cylinder or a problem with the broom itself.

- 1: If the **Cylinder** does not fully retract: Verify that you are trying to lift with sufficient power. Increase hydraulic pressure.
- 2: If the cylinder retracts, but the **broom** still doesn't fully retract: This most likely means you have worn components. The broom arm or mount is worn out, or the turnbuckle is out of adjustment.

Loss of power at control panel

1. Check resettable circuit breaker in engine compartment (see hydraulic system component location diagram for location)
2. Check for loose or broken power wire

Excess fan vibration/Abnormal fan noises

If the sweeper has recently undergone maintenance, improper refitting of the motor housing will cause excessive vibration. Try the following:

1. Does the hopper intake hood come in contact with the fan housing (other than the rubber seal)? If so adjust fan accordingly so that the intake hood is not in contact at any point in the hopper raising/lowering cycle.
2. Raise hopper, install safety stand, check the intake/fan for any stuck debris—Remove any debris.
3. Ensure the engine is off. Spin the fan turbine by hand and ensure that the fan turbine is not coming in contact with any part of the inside of the fan housing—Adjust fan turbine by moving the fan shaft in the bearing housing. *See Appendix 1 for “How to replace bearings.”
4. Remove inspection cover on fan motor adapter. Inspect fan coupler for wear and excessive play—Replace coupler if needed.
5. Localize the sound of the bearings by placing a screwdriver handle (or similar metal object) close to ear and place the opposite end of the screwdriver on the desired bearing to verify. Start the fan and listen for clicking or roaring noises. If either these sounds occur or the bearing becomes excessively hot the bearings are worn or malfunctioning—Replace bearings as needed.

6. Check for missing weights-- Check for missing weights by visual inspection. Remove the blast hose and inspect each fan blade. Replace fan turbine if needed.

Fan does not spin after raise in pressure

1. Remove inspection cover on fan motor adapter. Inspect fan coupler for wear and excessive play – replace coupler if worn, damaged or broken
2. Raise hopper, install safety stand, check intake/fan for any stuck debris
3. Turn off sweeper and truck engine, manually attempt to spin fan – if fan doesn't spin the bearings may be seized. Replace both bearings at same time

Hydraulic oil on top of reservoir

1. The oil on top of the reservoir is due to the breather filter on the hydraulic system **performing as designed**, which is designed to release small amounts hydraulic fluid if the pressure begins to exceed maximum levels. When the system reaches high pressure, the filter releases a fine mist of hydraulic fluid, which prevents damage to your hydraulic system.

To help keep your reservoir free of fluid and dirt/dust a loose fitting foam filter or rag may be installed VERY loosely around breather filter. Replace this filter when it becomes soaked.

SWEeper WARRANTY

NiteHawk Sweepers Warranty Summary		
Raptor II	WARRANTY LIMITATIONS (time or mileage, whichever comes first)*	
	Time	Mileage
Main Hydraulic Pump (Piston)	0-60 months	Unlimited
Compensator	0-60 months	Unlimited
Fan Motor	0-60 months	Unlimited
Curb Broom Pump	0-60 months	Unlimited
Switching Valves	0-60 months	Unlimited
Check Valves: Inline	0-60 months	Unlimited
Check Valves: CKCB XCN	0-60 months	Unlimited
Manifold: New HFP System	0-60 months	Unlimited
Level/Temperature Gauge	0-60 months	Unlimited
Filter Assembly (Excluding Element)	0-60 months	Unlimited
Hopper Stainless	0-60 months	Unlimited
Doors Stainless	0-60 months	Unlimited
Dump Frame	0-60 months	Unlimited
Reservoir	0-60 months	Unlimited
Cylinders: Energy 1506	0-36 months	Unlimited
Cylinders: Spencer 3x14, 3x18	0-36 months	Unlimited
Curb Broom Motor: Eaton Gear	0-36 months	Unlimited
Hydraulic Hoses and Fittings: Parker	0-36 months	Unlimited
Fan Assembly, Turbine and Housing	0-36 months	Unlimited
Water System - Pump, Strainer, and Water Nozzles	0-12 months	Unlimited
Hardware - Latches, Hinges	0-24 months	Unlimited
Brackets and Braces	0-12 months	Unlimited
Hopper Mild	0-12 months	Unlimited
Doors Mild	0-12 months	Unlimited
Fenders	0-12 months	Unlimited

Tool Box	0-12 months	Unlimited
Electrical Switches, Display	0-12 months	Unlimited
Fan Bearings	0-12 months	Unlimited
Lights Sealed Beam Spotlights	0-12 months	Unlimited
Rust and Corrosion, Bearings	0-12 months	12,000
Breather Cap	NOT COVERED	
Belts	NOT COVERED	
Rubber Suction and Blast Hoses - 10", 6", 3"	NOT COVERED	
Pick-up Head	NOT COVERED	
Skids	NOT COVERED	
Fan Motor Coupling	NOT COVERED	
Brooms	NOT COVERED	
LED Lights	Lifetime	

Please note: This is only a summary of the NiteHawk Sweepers limited warranty. Complete and current information may be found in your Sweeper's Owner's Manual. Specifications subject to change without notice.

* The warranty coverage is determined by the mileage of the vehicle and the number of months from the delivery date. The warranty coverage is limited by whichever occurs first. For more comprehensive details contact NiteHawk Sweepers 800-448-9364

** Warranty covers parts and ground freight only

*** Materials and Workmanship only

CHASSIS WARRANTY

This data is for informational purposes only. Please refer to your chassis owner's manual for most accurate warranty descriptions

Isuzu Warranty Information: N-Series Gas

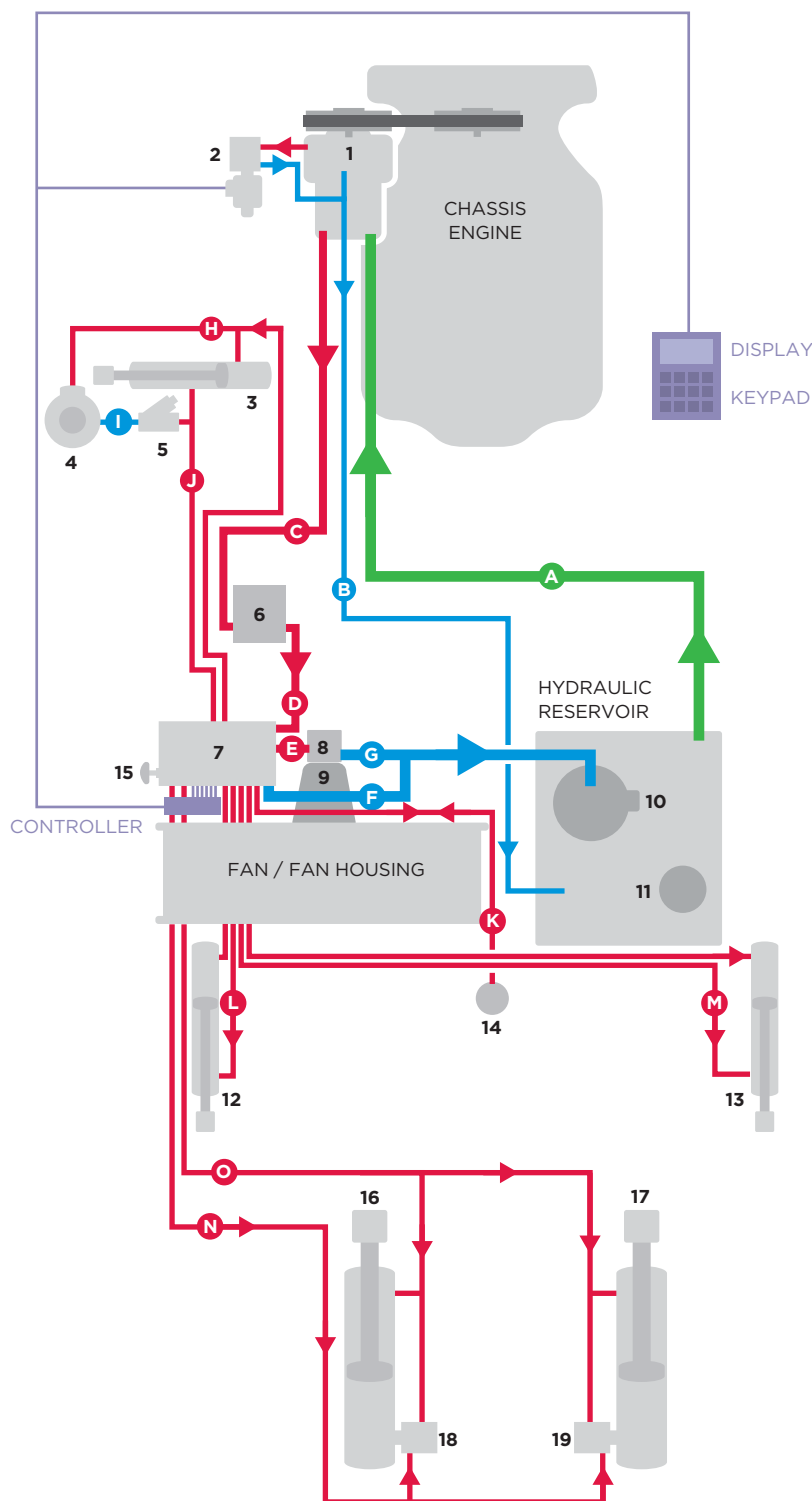
NPR VEHICLE COVERAGE	WARRANTY LIMITATIONS (time or mileage, whichever comes first)*		PERCENTAGE OF DEALER'S NORMAL CHARGE PAID BY OWNER
	Time in Months	Mileage	
Basic	0 - 36	0 - 36,000	No Charge
Engine: <ul style="list-style-type: none"> - Transmission - Drive Axles - Propeller Shafts - Front Axle I-Beam - Crossmembers 	0 - 60	0 - 75,000	No Charge
Frame Rails	0 - 36 36 - 60	0 - 36,000 Unlimited	No Charge 50%
Federal Emissions	0 - 60	0 - 50,000	No Charge
Engine Emissions Control System (NPR Model) California**	0 - 36	0 - 50,000	No Charge
Engine Emissions Control System (NPR Model) California**	0 - 84	0 - 70,000	No Charge
Corrosion (rust through)	0 - 48	Unlimited	No Charge
Batteries	0 - 12	Unlimited	No Charge

Please note: This is only a summary of the Isuzu commercial truck cab/chassis limited warranty. Complete and current information may be found in your truck's warranty booklet. Specifications subject to change without notice.

All the above items are not covered for damage due to accident, misuse, alteration, insufficient or improper maintenance, contaminated or poor fuel quality

* The warranty coverages are determined by the mileage of the vehicle and the number of months from the delivery date. The warranty coverages are limited by whichever occurs first.

** See your authorized Isuzu Dealer for warranty details.



1. Main Hydraulic Pump
2. Proportioning Valve
3. Curb Broom Cylinder
4. Curb Broom Motor
5. Curb Broom Check Valve
6. Pressure Filter
7. Manifold
8. Fan Motor
9. Fan / Motor Coupling
10. Suction Filter
11. Breather Filter
12. Pickup Head Cylinders
13. Pickup Head Cylinders
14. Curb Broom Accumulator
15. Curb Broom Accumulator Dump Valve
16. Dump Cylinder
17. Dump Cylinder
18. Counter Balance Valve
19. Counter Balance Valve

- A. Reservoir To Pump Supply Line
- B. Pump To Reservoir - Case Drain
- C. Pump To Pressure Filter Line
- D. Pressure Filter To Mainfold Line
- E. Manifold To Fan Motor Pressure Line
- F. Manifold Return To Reservoir Line
- G. Fan Motor Return To Reservoir Line
- H. Curb Broom Cylinder Down/Motor Line
- I. Curb Broom Motor Return Line
- J. Curb Broom Cylinder Up Line
- K. Curb Broom Accumulator Line
- L. Pickup Head Cylinder Lines (Pair)
- M. Pickup Head Cylinder Lines (Pair)
- N. Raise Dump Cylinder Line
- O. Lower Dump Cylinder Line

RAPTOR II HYDRAULIC SCHEMATIC

