



Volume V

NH RAPTOR AND NH 200 OSPREY

Owner's Manual

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ABOUT YOUR SWEEPER

Congratulations on the purchase of your new NiteHawk Raptor – the newest, most powerful and worry free 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. To order parts, call our technical service line at 1-800-448-9364, Monday-Friday, 8-5 PST or visit us online at www.nitehawkssweepers.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.

SAFETY SECTION

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.* (SG-1)

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. (SG-2)

**¡ LEA EL
INSTRUCTIVO!**



Si no lee ingles, pida ayuda a alguien que si lo lea para que le traduzca las medidas de seguridad. (SG-3)



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. (SWG-4)

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. (SWG-5)

PARTS INFORMATION

NiteHawk Sweepers use balanced and matched system components for Curb Brooms, Pick-up heads, and other components. 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)



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. (SWS-1)



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. (SWS-2)

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. (SWS-6)



WARNING

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. (SWS-6)

DRIVER 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. (SWD-01)

⚠ 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. (SWD-2)

⚠ 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. (SWD-3)

⚠ 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. (SWD-4)



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. (SG-41)



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. (SWD-5)



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. (SWD-6)



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. (SWD-7)

OPERATION SAFETY INSTRUCTIONS AND PRACTICES

▲ 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. Never use the Sweeper control levers for support when boarding the sweeper. (SWO-1)

▲ 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. (SWO-2)

▲ 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. (SWO-3)

▲ 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 Auxiliary engines are running. Operate the Sweeper controls from the Truck seat only. (SWO-4)

▲ WARNING 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. (SWO-5)

▲ DANGER Start the Truck and Auxiliary engine 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 Auxiliary Engine operator's manuals for proper starting instructions. (SWO-6)

▲ 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. (SWO-7)

▲ DANGER 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. (SWO-8)



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.** (SWO-9)



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. (SWO-10)



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. (SWO-11)



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. (SWO-12)



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. Normal ground speed range is between 1 and 3 mph. 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. (SWO-13)



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. (SWO-14)



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. (SWO-15)



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. (SWO-

16)



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. (SWO-17)



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. (SWO-18)



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. (SWO-19)



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. (SWO-21)



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. (SWO-22)



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. (SWO-23)



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. (SWO-25)



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. (SWO-26)



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 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. (SWO-28)



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. (SWO-29)

▲ 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. (SWO-30)

▲ 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. (SWO-31)

▲ 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. (SWO-32)

▲ 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. (SWO-33)

▲ 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. (SWO-34)

▲ 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. (SWO-35)

▲ 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. (SWO-39)

▲ WARNING 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. (SWO-42)

▲ DANGER

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. (SWS-3)

▲ WARNING

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 AND SERVICE 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. (SWM-1)

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. (SWM-2)

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. (SWM-3)

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. (SWM-4)



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. (SWM-5)



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.

(SWM-6)



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. (SWM-7)



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. (SWM-8)



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.

(SWM-9)



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. (SWM-10)



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. (SWM-11)



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. (SWM-12)



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. (SWM-13)



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. (SWM-14)



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. (SWM-15)



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. (SWM-16)



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. (SWM-17)



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. (SWM-18)



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. (SWM-19)



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.

▲ WARNING 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.

▲ WARNING 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.

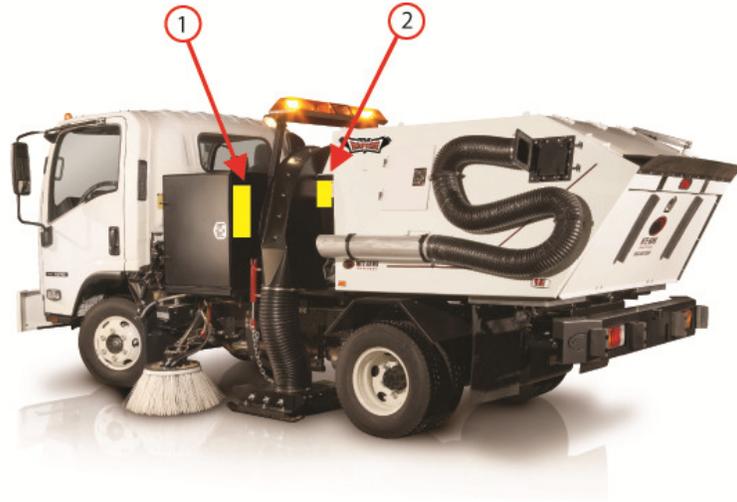
▲ WARNING Remove the negative battery cable from the battery before performing any maintenance on the electrical system to prevent an accidental circuit shorting and sparks. Sparks can result in wiring damage, fire or personal injury.

▲ DANGER 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.

▲ WARNING 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.

▲ DANGER 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.

LOCATIONS OF DECALS





Decal # 1 -Multi Hazard Decal Sheet



Decal # 2 - Multi Hazard Decal Sheet



D505

Decal # 3 - Multi Hazard Decal Sheet

FEDERAL 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 Tractor and Implement operation, it is the employer’s responsibility to:

1. Train the employee in the proper and safe operation of the Tractor and Implement.
2. Require that the employee read and fully understand the Tractor and Implement Operator’s manual.
3. Permit only qualified and properly trained employees to operate the Tractor and Implement.
4. Maintain the Tractor and Implement in a safe operational condition and maintain all shields and guards on the equipment.

5. Ensure the Tractor is equipped with a functional ROPS and seat belt and require that the employee operator securely fasten the safety belt and operate with the ROPS in the raised position at all times.
6. Forbid the employee operator to carry additional riders on the Tractor or Implement.
7. Provide the required tools to maintain the Tractor and Implement 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.

TERMS AND LOCATIONS OF IMPORTANT PARTS

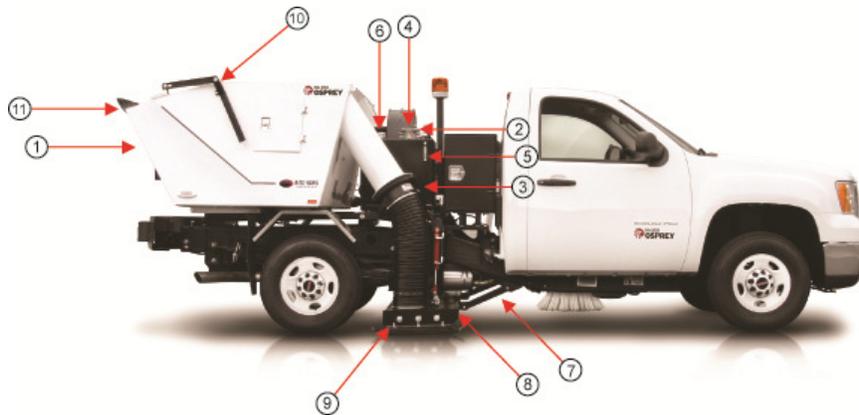


Fig. 1 – Passenger side view.

1. Hopper
2. Hydraulic Filter Gauge
3. Hydraulic Fluid Reservoir
4. Hydraulic Fluid Return Filter
5. Hydraulic Fluid Sight Gauge
6. Breather Cap
7. Pick-Up Head Drag Bars
8. Pick-Up Head
9. Pick-Up Head Skid Plate and Skid
10. Door Prop (if equipped)
11. Whale Tail (if equipped)



Fig. 2 – Driver side view.

1. Sweeper Fan
2. Hopper Side Door
3. Pick-Up Head
4. Curb Broom
5. Tool Box

TERMS AND LOCATIONS OF IMPORTANT PARTS – INSIDE VIEW OF CAB



Fig. 3 – Inside view of Conventional Cab with Sweeper Control Panel (Broom model).



Fig. 4 – Inside view of Diesel Cab Over with Sweeper Control Panel (Broom model).

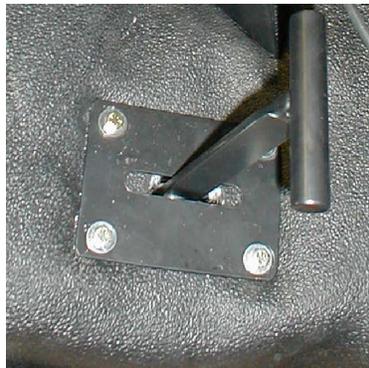


Fig. 5 – Inside view of Cab with T-Handle Control Lever (Non-Broom model).

OPERATING THE SWEEPER UNIT

Adjusting the Power Setting

To adjust the Power Setting, use the Power Level Adjustment Switch to increase or decrease the Relief % (Fig. 6) or Sweeping Power Setting Gauge. To increase move the switch toward the “Rabbit”  , to decrease move toward the “Turtle”  .



Fig. 6 – Sweeper Power Setting Display – NH Raptor Models



Fig. 7 – Sweeper Power Setting Gauge and Sweep Mode indicator Light – NH 200 Osprey Models

For normal sweeping the power setting should be set at 70. When using the curb broom, increase the power setting to 90 or 100 to compensate for the slight diversion of power.

Lowering the Pick-up Head/Raising the Hopper

Lowering and raising the pick-up head and hopper is controlled by a single switch and is a simple, two-step operation. The head will always lower before the hopper raises, and the hopper will always lower completely before the head rises.

Curb Broom Models

Directional valves are located on the diver side of the unit behind the cab. Electrical wire runs from the valves to the toggle switches located in the truck cab. Each switch is labeled on the instrument panel. Using the Power Level Adjustment Switch set the power level to at least 70. Hold the “Head” toggle toward the “down” position and the pick-up head will lower. Keep holding the toggle in this position and the hopper will lift (both functions run off of the “Head” toggle). By holding the “Head” toggle in the “up” position the hopper will lower again. Keeping the toggle in this position will then lift the head.

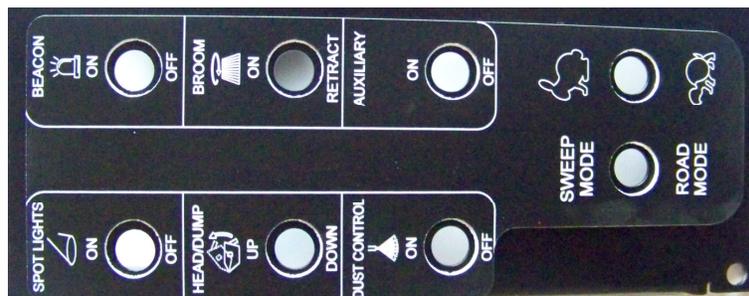


Fig. 8 – Control Panel on Broom model.

Overrides

Curb broom models are equipped with manual override buttons on each valve. In case of an electrical failure, push in the override button located on the ends of the directional valves for the function you wish to operate (see fig. 9 below). Manual overrides are discussed in greater detail on page 44-45.



Be sure to have everything clear of danger when using manual overrides.

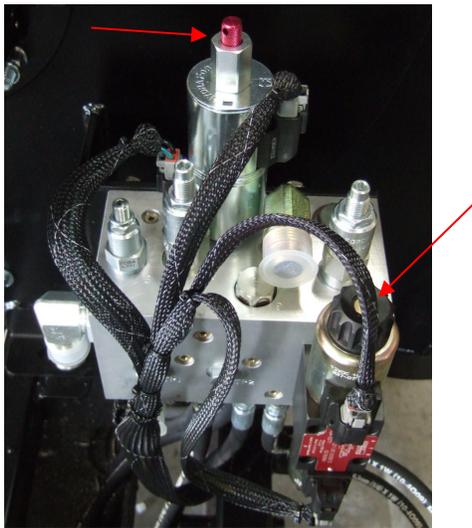


Fig. 9 – Manual Overrides for Hopper (right) and Curb Broom (left).

Non-Curb Broom Models

A manual directional valve is located in the center of the unit below the dump-frame. A control rod runs from an actuating arm on the valve to a “T” handle control lever in the cab. Using the hydraulic pressure throttle cable set the pressure to at least 700 psi. Push the T-lever forward to lower the head and raise the hopper. Pulling back on the T-lever will lower the hopper and raise the head.



The pick up head is adjusted for maximum clearance at the factory. Tightening the chains will void your warranty and could cause damage to your pickup head system, your lift cylinders, or chassis components.

CURB BROOM USE AND ADJUSTMENT



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.

When the broom motor is on the fan speed will decrease slightly. Increase the power setting to 90 or 100 to compensate for the slight diversion of power.

Use

Set the power setting to 90-100 and turn the broom on by pushing the “Broom On” toggle. The broom will extend and begin spinning clockwise. To stop the broom, simply push and hold the “Broom In” toggle until the curb broom is fully retracted.

Angle Adjustment

A hydraulic cylinder located along the truck frame operates the broom arm. The broom follows a fixed axis. Adjust the tilt of the broom by loosening the nut, which attaches the motor mount hinge to the curb broom arm. The pitch of the broom is adjusted by loosening the motor mount hinge (See fig. 10).



Fig. 10 – Adjusting broom tilt and Pitch.

Turnbuckle Adjustment

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, remove the turnbuckle from the curb broom arm, loosen the two jam nuts and spin the turnbuckle counterclockwise and reinstall. To retract the broom further, spin the turnbuckle clockwise and reinstall.



Fig. 11 – Curb Broom Turnbuckle.

Spring Adjustment

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.

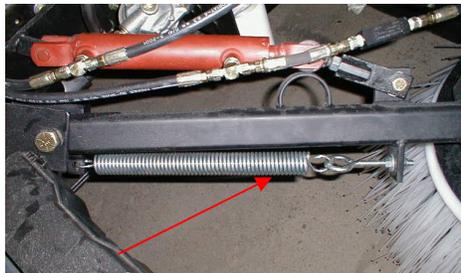


Fig. 12 – Curb Broom Spring.

Speed Adjustment

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.

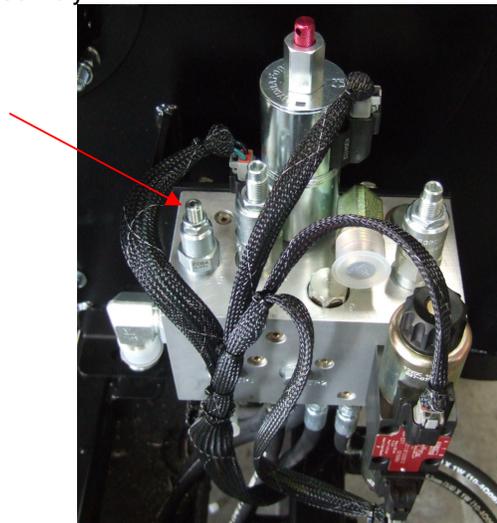


Fig. 13 – Curb Broom Relief Valve.

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.



Every 1/4 turn of the relief valve is equal to 400 psi. Adjusting the relief valve all the way in will void your warranty and could cause damage to your curb broom cylinder.

Curb Broom Bristle Block Removal and Installation

To remove the curb broom bristle blocks loosen the six bolts located on the curb broom dish.

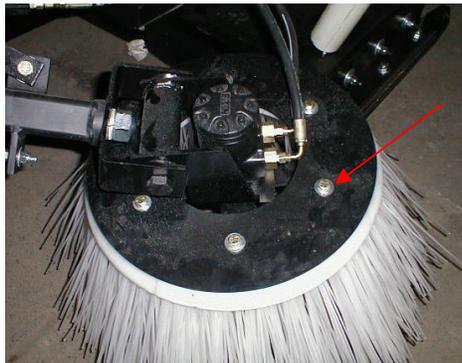


Fig. 14 – Curb Broom Dish.

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 33 gallons on conventional cab units, and 55 or 100 gallons on cab over units. 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 the back of the tank behind the back door on conventional units, and on top of the tank on cab over models. On custom models with two tanks, always fill the lowest tank first. To drain the system, twist the drain handle so that it runs parallel with the hose.



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.

SAFETY STAND USE



Never work under a raised hopper without a safety stand or counterbalance.



Always remove safety stand before lowering hopper. Failure to do so could cause damage to your cylinder yolk and dump-frame.

MAINTAINING THE SWEEPER UNIT

Maintenance Schedule

| <u>Weekly Maintenance</u> | <u>Monthly Maintenance</u> | <u>Annual Maintenance</u> |
|--|---|------------------------------------|
| Check fluid level | Check belt for wear and tension | Change hydraulic fluid and filters |
| Check all lines, fittings, pumps and motors for wear and leaks | Check seals for wear | Check all wiring for wear |
| Clean and vent hopper | Clean water strainer (if equipped with dust suppression option) | |
| Check broom and flaps for wear | | |
| Check skid plate alignment | | |

WEEKLY MAINTENANCE

Checking the Hydraulic Fluid Level

The hydraulic fluid sight glass is located on the hydraulic reservoir on the passenger side of the unit. The reservoir is full when the fluid level is halfway up the Fluid Sight Glass.

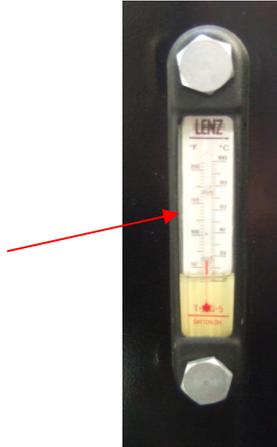


Fig. 15 – Hydraulic Fluid Sight Gauge.



Never allow the unit to run with no fluid registering on the sight glass. This will void your warranty and could cause severe damage to your hydraulic system.

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.

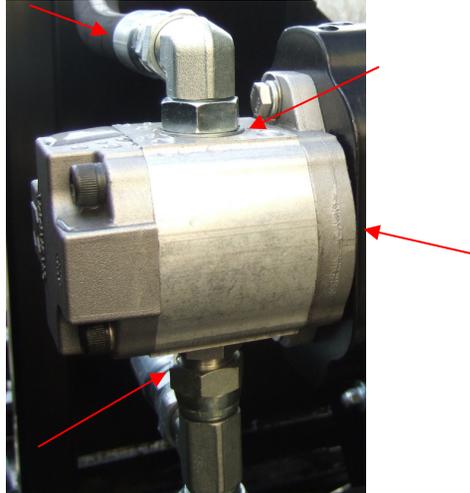


Fig.16 – Examples of possible hydraulic leak locations.

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.

Checking Pick-Up Head Flaps for Wear

The pick-up head flaps are in need of adjustment when there is a 1/4" gap between the pavement and the bottom of the flaps. Your NiteHawk is designed to make flap height adjustment quick and easy. As the flaps wear and a gap appears between the ground and flaps, simply remove one of the skid spacers from each side of the head to allow the flaps to come in contact with the ground.



Fig. 17 – Pick-Up Head Skid Spacers.

To adjust the angle of the skid, loosen the 3-nylock nuts that hold the skid plate to the head (see *fig. 19*), place the skid at the desired angle and re-torque.

Pick-Up Head Flap Replacement

When a 1/4" gap appears between the rubber flaps and the pavement and there are no more spacers to remove, 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.

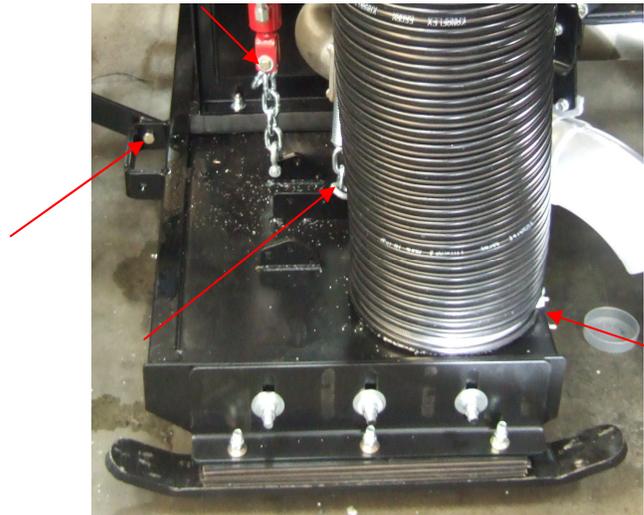


Fig. 18 – Pick-Up Head Drag Bar, Lift Cylinder, Spring and 10" Hose (arrows left to right).

2. Slide the head out from under the truck on the driver's side and turn the head upside down.

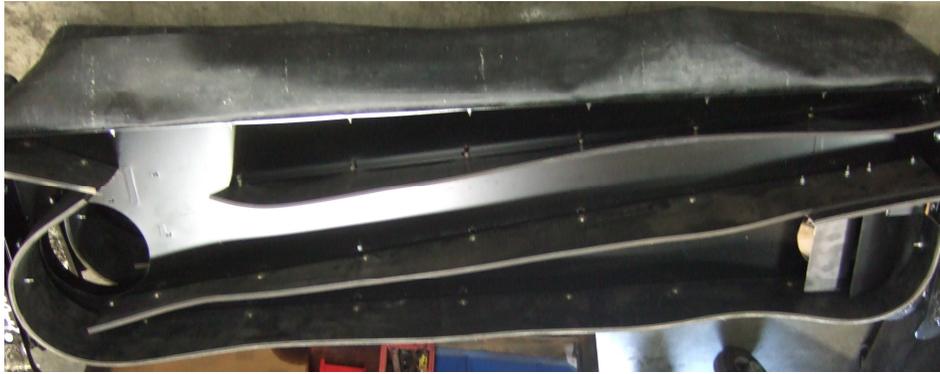


Fig. 19 – Bottom view of Pick-Up Head with Flaps.

3. Note that most of the bolts face toward the back of the truck. Also take note of which bolts face different directions.
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 1/4" x 1" bolts, and nylock nuts. Install 1/4" washers anywhere the flap meets a nut or bolt.
6. Reinstall rubber skid spacers making sure there are four on each side (*see fig. 19*).
7. Reinstall head making sure that all chains are at the proper length and that the springs are set to the proper tension. (See Curb Broom Spring Adjustment on page 10).

| | <i>91" Pick-up Head</i> | <i>81" Pick-up Head</i> |
|---|---|---|
| Thin Flap | 91" X 9" 1/8" SBR | 81" X 9" 1/8" SBR |
| Front Flap | 8" X 72" 1/8" X 1/16" 3 Ply Belting | 8" X 62" 1/8" X 1/16" 3 Ply Belting |
| Center Flap | 6" X 86" 1/8" X 1/16" 3 Ply Belting | 6" X 76" 1/8" X 1/16" 3 Ply Belting |
| Rear Flap (Both 12" and 10" Flaps are cut from this flap.) | 7" X 136" 1/8" X 1/16" 3 Ply Belting | 7" X 126" 1/8" X 1/16" 3 Ply Belting |

MONTHLY MAINTENANCE

Main Hydraulic Pump Belt Replacement

NH Raptor

The main hydraulic pump is attached to the engine of the truck chassis with a series of brackets. The automatic spring loaded tensioner is designed to eliminate the need for periodic belt tensioning. With minimal maintenance this system should give you many years of service.

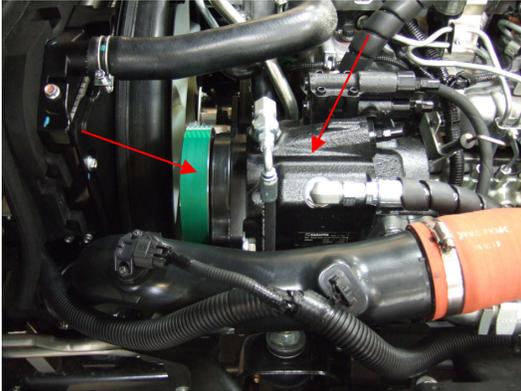


Fig. 20 – Main Hydraulic Pump, Belt – NH Raptor (Driver side).

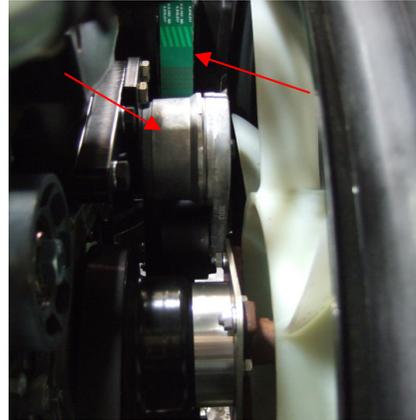


Fig. 21 – Engine Tensioner and Belt - NH Raptor

NH 200 Osprey

The NH 200 Osprey uses the truck chassis's main serpentine belt. Like the NH Raptor system it is designed to eliminate the need for periodic belt tensioning.

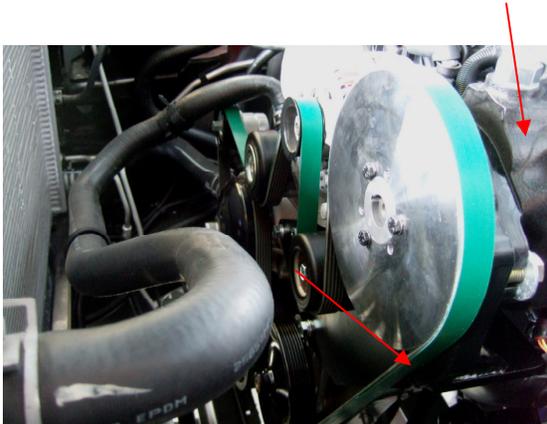


Fig. 22 – Main Hydraulic Pump, Belt – NH 200 Osprey (Driver side).

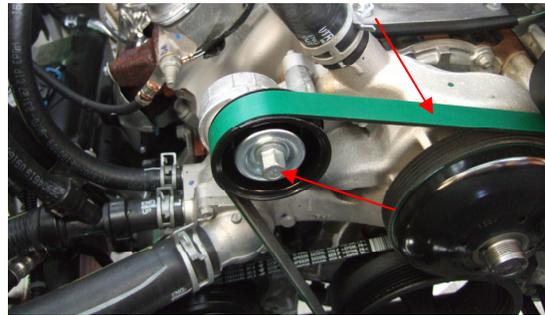


Fig. 23 – Engine Tensioner and Belt - NH 200 Osprey.



Never adjust the belt while the truck is running.

1. Release the tension on the main tensioner using a 5/8 socket and ratchet (Osprey) or a 1/2" drive ratchet (Raptor).
2. While tension is released, remove the old belt, taking note of the belt routing and which side of the belt each pulley rides against.
3. Install the new belt.
4. Allow tensioner to load against the belt.

Fresh Air Blower Belt Adjustment (if equipped)

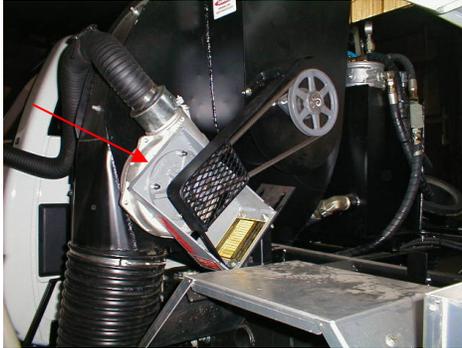
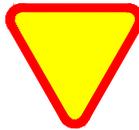


Fig. 24 – Fresh Air Blower.

To tension the fresh air blower, loosen the four bolts that hold the blower to the slide plate. Slide the blower down to increase the tension on the belt and re-tighten the bolts to secure the blower in place.



Never disable or remove any belt guard. Always keep hands and loose clothing away from the spinning fan; failure to do so could cause severe injury.

Dust Suppression System (if equipped)

The NiteHawk dust suppression system uses 8 Whirljet® hollow cone nozzles that spray a fine mist of water to control the amount of dust the sweeper kicks up during normal operation. The water is pumped from an onboard storage tank to pressurized lines with nozzles located in different areas of the truck.

As part of your periodic maintenance you should inspect and clean the inline strainer, this will keep debris from entering and damaging your pump.

The strainer is located on the inlet side of your water pump. The water pump is located on the valve plate on cabover models and under the passenger side tool tray on conventional models.



Fig. 25 – Dust Suppression Water System Pump and Strainer (arrow).

To clean the strainer, separate the two sections by pushing in and twisting. Remove any debris and spray thoroughly, then reinstall.



Fig. 26 – Cleaning the Dust Suppression System Water Pump Strainer.

ANNUAL MAINTENANCE

Hydraulic Fluid and Filter Replacement



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 bolts that hold the filter cap to the filter housing.

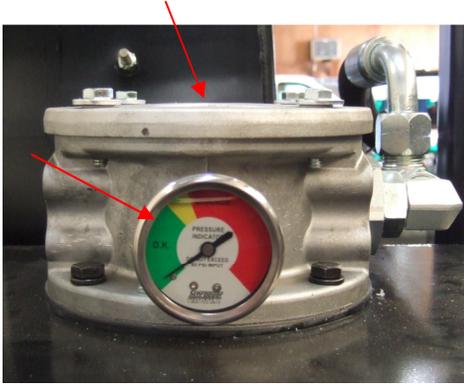


Fig. 27 – Hydraulic Fluid Return Filter Cap and Gauge (Passenger side).



Fig. 28 – K10 Hydraulic Fluid Return Filter Element. PN - HY-1300

4. Remove the filter element and replace it with a K10 Filter Element NiteHawk Sweepers PN – HY-1300 and replace the cap.
5. Remove the lower housing of the Pressure Filter
6. Remove the filter element and replace it with a Pressure Filter Element NiteHawk Sweepers PN – HY-1350 and replace lower housing.

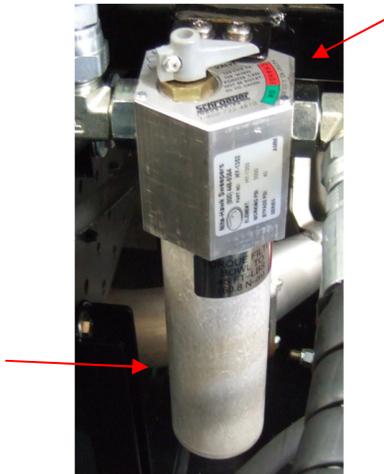


Fig. 29 – Hydraulic Fluid Pressure Filter Housing (Driver side).



Fig. 30 – Hydraulic Fluid Pressure Filter Element. PN - HY-1350

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



Fig. 31 – Hydraulic Fluid Sight Gauge.



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.

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

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.

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

Cold Weather Information

The hydraulic lines in your NiteHawk sweeper are rated to operate in temperatures of -40° F. Factory supplied 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.

TROUBLESHOOTING GUIDE

Power Level gauge is working, but fan does not turn

1. Front Belt is broken
2. Bearings are seized
3. Leak in hydraulic lines
4. Fluid level is low

Pick-up head or hopper will not raise or lower

1. Power Level is too low - increase power level
2. Hopper is overloaded
3. Pick-up head chain is broken
4. Control rod from T-handle control lever is disconnected or broken (non-curb broom units)
5. Check toggle switch and wire connections
6. Blown fuse
7. Valve sticking - check manual overrides
8. Adjust relief valve – (see page 54)

Main hydraulic pump belt makes noise

1. Belt is worn

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.

On Curb Broom Models

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

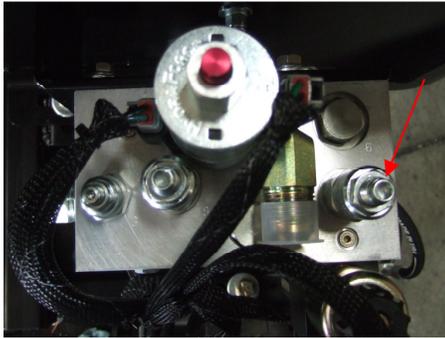


Fig. 32 – Valve Assembly with Relief Valve (arrow) – (Curb Broom models).

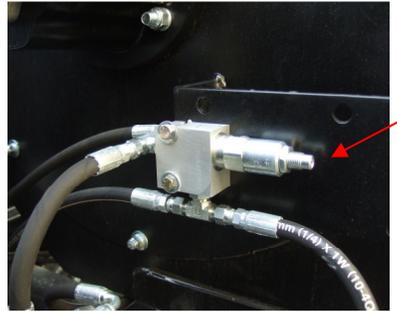


Fig. 33 – Relief Valve (arrow) on Relief Valve Body (Non-Curb Broom models).

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.

On Non-Curb Broom Models

The relief valve is located on the dump valve assembly, in the directional valve body.

1. Remove the cap and adjust the screw $\frac{1}{4}$ turn in.
2. Check to see if the desired result is achieved.
3. Adjust the relief valve back to its original position and replace cap.

Manual Overrides (Curb Broom Models)

Your unit is equipped with manual overrides, which can be used at any time if you blow a fuse or have any other electrical problem. The overrides control the hopper dump, the pick-up head, and the broom only.

The hopper and pick-up head override is located at both ends of each valve. To use the hopper and pick-up head valve override, completely depress and hold the small button located at both ends of the valve.

The curb broom override is located at the top of the curb broom valve. To use the curb broom valve override, completely depress or lift the red, knurled button.

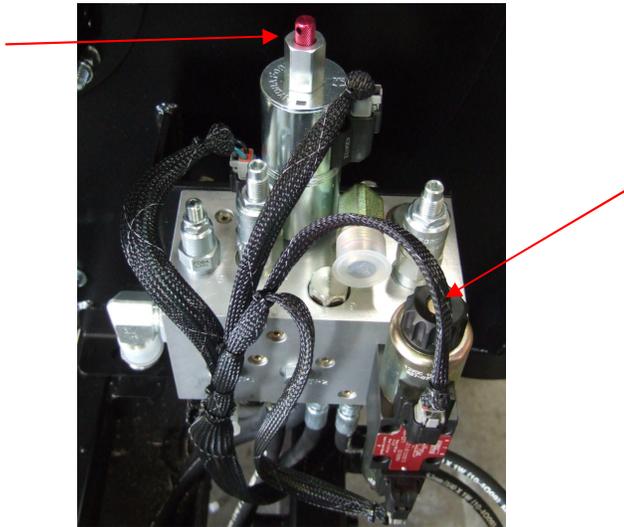


Fig. 34 – Manual Overrides on Dump Valve (right) and Curb Broom Valve (left) - (Curb Broom models only).

LUBRICATION OF 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.

WARRANTY INFORMATION

| NiteHawk Sweepers Warranty Information: 5 & 5 Warranty Summary | | |
|---|---|----------------|
| RAPTOR, NH200 OSPREY, 400-DX AND 200-XLP SWEEPER UNIT COVERAGE | 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 | 0-24 months | Unlimited |
| Hardware - Latches, Hinges | 0-24 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 |
| 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 | |
| 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

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 | Parts and Labor |
| Basic | 0 - 36 | 0 - 36,000 | No Charge |
| Engine: - Transmission - Drive Axles - Propeller Shafts - Front Axle I-Beam - Crossmembers | 0 - 60 | 0 - 75,000 | No Charge |
| Frame Rails | 0 - 36 <i>36 - 60</i> | 0 - 36,000 <i>Unlimited</i> | No Charge <i>50%</i> |
| 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

GMC Warranty Information: Sierra 2500HD

| SIERRA 2500HD VEHICLE COVERAGE | WARRANTY LIMITATIONS (time or mileage, whichever comes first)* | | PERCENTAGE OF DEALER'S NORMAL CHARGE PAID BY OWNER |
|------------------------------------|--|---------|--|
| | Time | Mileage | Parts and Labor |
| Engine | 0-60 Months | 100,000 | No Charge |
| Transmission | 0-60 Months | 100,000 | No Charge |
| Drive Systems | 0-60 Months | 100,000 | No Charge |
| Roadside Assistance | 0-60 Months | 100,000 | No Charge |
| Courtesy Transportation | 0-60 Months | 100,000 | No Charge |
| Rust | 0-72 Months | 100,000 | No Charge |
| Basic Limited | 0-36 Months | 36,000 | No Charge |
| | 0-48 Months | 50,000 | No Charge |

Please note: All the above items are not covered for damage due to accident, misuse, alteration, insufficient or improper maintenance, contaminated or poor quality fuel. Medium Duty trucks, including the C4500, are excluded from this power train coverage. For complete details refer to your Warranty and Owner Assistance Information booklet.

This is a supplement to the express conditions and warranties described in the Warranty and Owner Assistance Information booklet. Other coverages are not extended or altered due to this supplement.

For model year passenger car, light duty truck and van owners requiring a more comprehensive coverage than what is provided with this warranty and the New Vehicle Limited Warranty, an authorized GM service contract (GM Protection Plan, Saturn Service Plan or Saab) is available through your dealer/retailer. These are the only plans recommended by General Motors. See your dealer/retailer for details.