DEALER SALES

NITEHAWK® SWEEPERS

Congratulations on becoming a NiteHawk Sweepers Dealer!

We are excited you have chosen to partner with us. For decades, NiteHawk Sweepers has been the leader in hydraulic sweepers. We continue to grow thanks to our amazing partnerships all over the world.

NiteHawk Sweepers provides an opportunity to service a growing market with a unique and proven product. If you invest the time to educate your current and potential customers, we are confident that the product will find a home for years to come.

We recognize that representing a new product line requires a significant investment on your part. We are confident that we can support this investment with high-quality products, sales support, and customer service that will contribute to your organizations success.

We have designed the unit to be simple, efficient, and powerful to make the sales process as easy as possible. We hope you will find the information helpful. In addition to the sales information contained in this book, our website and talented staff at NiteHawk are eager and available to answer any questions.

We look forward to a successful partnership with your company for many years.

Sincerely,

NiteHawk Sweepers

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DEALER PROGRAM

NITEHAWK SWEEPERS DEALER PROGRAM

The NiteHawk Sweepers Dealer Program provides the support to ensure the successful marketing, sales, and service of NiteHawk Sweepers. Our goal is to increase education in the sweeping industry and provide support to generate ongoing sales for the individual dealer.

Sweeping Business Expertise

NiteHawk Sweepers draws on decades of experience in the industry to help end users strategically plan their sweeping equipment mix, optimize operations, analyze cost benefit of using alternative fuels, determine the optimal preventive maintenance plan, and facilitate best practices and safety.

Competitive Finance Program

NiteHawk Sweepers has relationships with many lending institutions and have negotiated competitive financing rates and terms. Dealers will have access to these services for their customers. Please contact your dealer service representative for the latest programs and rates.

Marketing Support

NiteHawk Sweepers provide direct marketing support to dealers including templates for direct mail and email. In addition, NiteHawk will provide support for social media marketing, content for lead generation, customer cultivation, brand awareness, dealership branding, and customer loyalty campaigns.

Industry Advertising

NiteHawk Sweepers will provide national advertising in industry publications and websites to promote and build brand awareness. Leads generated by these campaigns will be forwarded to the dealer within the territory the lead originates. NiteHawk may also participate in local or regional advertising dedicated to generating leads in support of dealer sales and marketing efforts.

Dealer Cooperative Advertising

NiteHawk Sweepers will share with the dealership, on a 50/50 basis, the cost of exclusive display advertising of NiteHawk Sweepers. Cooperative advertising must be approved by the factory prior to eligibility.

Dealer Open Houses

NiteHawk Sweepers will support Dealer Open Houses where current and prospective customers are invited. NiteHawk can also provide onsite training and educational classes upon the request of the dealer.

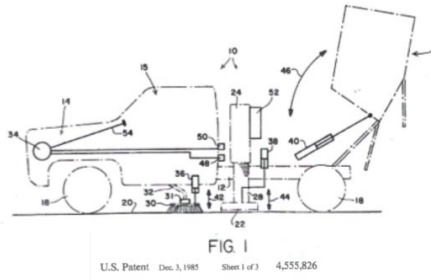
Industry Shows

NiteHawk Sweepers may attend national, regional, or local municipal industry shows to increase brand awareness and generate leads. The focus of these shows is the Municipal Market Place. Please advise your dealer development manager for additional assistance.

ABOUT NITEHAWK SWEEPERS

OUR HISTORY

NiteHawk Sweepers is a worldwide leading manufacturer of parking lot and street sweepers. Over four decades ago the innovative founder, Jack Rogers set out to produce a different type of sweeper. With a fluid power background, he experimented with many different designs ultimately landing on hydraulic power as the answer. The combination of simplicity, power, cost effectiveness and reliability was a perfect match for the constant demand of sweeping.



The pioneering Jack submitted a patent application and was awarded the first hydraulic parking lot sweeper patent in 1985. He continued to build his sweeper under the model name Night Hawk in central California. In 1993, Brad Morris another entrepreneur, bought the rights to the patent and changed the company name to NiteHawk Sweepers, LLC. A short while later, Tracy Day, became involved with company as a partner and the two set out to expand the company. In 1997, the company moved from central California to Seattle, WA.

Over the next decade, the product line expanded to include low cab forward models and several new hydraulic advancements always under the mission of keeping the product powerful, simple, and efficient. In 2000, NiteHawk produced the first alternative fuel powered hydraulic sweeper. NiteHawk's drive for innovation continues to lead the alternative fuel powered market producing many EPA and CARB certified units.

In addition to developing state of the art hydraulic sweepers, NiteHawk has always cultivated a passion for helping our customers succeed and grow. This passion has evolved over the years as the team has become more involved in both the contractor and municipal market. Creating innovative tools to help owners and operators prosper is a hallmark of NiteHawk's customer relationships.

In the early 2000's, the municipal and international markets demanded a solution for the medium size sweeper market. Primarily a direct to contractor model, NiteHawk expanded its network to incorporate additional dealer partners who educate and service the market directly.

In 2006, NiteHawk was acquired by the Alamo Group Corporation (NYSE: ALG). As a member of the Alamo Group, NiteHawk stands together with its sister companies as market leaders in industrial equipment manufacturing. While this membership provides the stability and vast resources of a large publicly traded business, NiteHawk continues to operate and work as an independent dynamic company. This flexibility allows us to quickly identify and respond to the ever-changing demands of our industry.

In 2015, the company moved to a larger production facility located just south of Seattle, WA. Today, NiteHawk Sweepers are found on 5 different continents with dealers located throughout the US and the world. Our passion to innovate, hire the best and brightest, and to bring our municipal, dealer and contractor partners the best sweepers in the world resonates through our company and the industry.

We succeed when you succeed.

SWEEPER MARKET OVERVIEW

The industrial sweeper market is categorized into small, medium, and large equipment. Each segment has a generally accepted application. Sweepers in each category do have some limited crossover potential into adjacent markets.

Municipalities will often have a variety of equipment for different sweeping applications. For example, they may have a small sidewalk sweeper for narrow paths, a medium sweeper for parking lots and residential streets, and a larger sweeper for arterials and highways.

NiteHawk Sweepers primary core market is the medium market. However, for some applications we may overlap into both the small and large categories.

SMALL ($80-150K)

- Sidewalks
- Parking Garages
- Interior Corridors
- Interior Warehouses
- Pathways
- Retail Store Fronts

MEDIUM ($70-150K)

- Parking Garages
- Parking Structures
- Airport Aprons
- Runways & Taxiways
- Grounds
- Residential Streets

LARGE ($150-450K)

- Street and Construction
- Airports
- Highways
- Raceways

SMALL SWEEPER

Overview – Small units typically carry the advantages of maneuverability, cost (although increasingly less of a factor), and flexibility. The disadvantages may include transport, complexity, small hopper, sweeping path, productivity, water capacity, and storage.

Applications – The clear majority are not designed to travel over the road. They are normally trailered between sites or located on an individual site. They are almost all purpose built, meaning the design of both the unit, propulsion system, and undercarriage are integrated. They may be walk behind or self-propelled units. Application examples include interior corridor sweeping, warehouse, small parking garages, and pathways.

Competitors Example – Advance, Power Boss, and Tennant

MEDIUM SWEEPERS

Overview – NiteHawk is the worldwide leader in this segment of the market. Medium units generally have the advantages of increased sweeping power, larger hopper capacity, commercial chassis, customizable features, and can be driven at highway speeds. The majority are also non-CDL. The disadvantages include less maneuverability, costlier to operate, and may have increased maintenance requirements.

Applications – Because of the ease at which they travel between locations, medium sweepers have a wide range of applications. Application examples include airport aprons, docks, grounds, parking lots, parking structures, pathways, residential streets, roads, runways, streets, and taxiways.

Competitors Example – Masco, Schwarze, Tymco, and Victory

LARGE SWEEPERS

Overview – Large units typically have a bigger power plant to drive sweeping operations. Large sweepers may be both air or broom machines. Advantages to operating a large sweeper may include increased power, hopper size, wider sweeping head, larger brooms, and specialized leaf handling functionality. They are typically used for heavy debris such as construction material and heavy buildup of granular materials such as millings, mud, gravel, sand, and wood.

Applications – Large sweepers are built on large highway truck chassis designed for big loads. Application examples include airports, construction, highways, streets, and raceways.

Competitors – Elgin, Global, Johnston, Schwarze, Tymco, and Vacall.

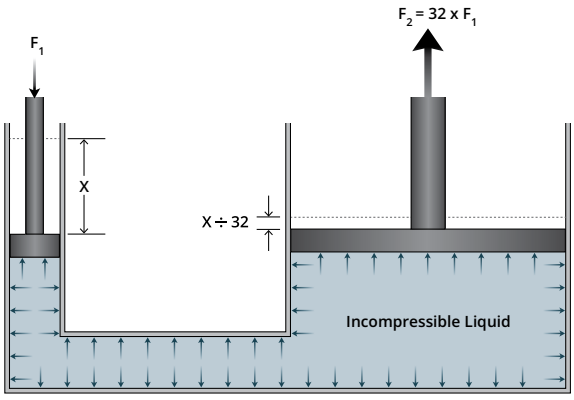
HYDRAULIC SYSTEMS

HYDRAULIC POWER

The use of hydraulics in modern machinery has been commonplace for centuries. Hydraulics are used in just about every application from cars, trucks, cranes, diggers, dumpers, excavators, bulldozers and of course sweepers. The main difference in the NiteHawk is how we harness hydraulics as our main sweeper power system.

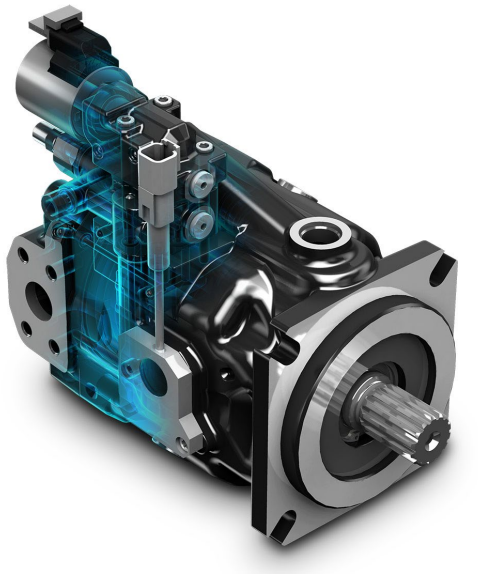
HYDRAULIC BASICS

Hydraulics use incompressible liquids (usually oil in modern machinery) to move around energy. The basis for all hydraulic systems is expressed by Pascal's law which states that the pressure exerted anywhere upon an enclosed liquid is transmitted undiminished, in all directions, to the interior of the container. This principle allows large forces to be generated with relatively little effort. For example, a 5-pound force exerted against a 1 inch square area creates an internal pressure of 5 psi. This pressure, acting against the 10-square inch area develops 50 pounds of force.



This is why hydraulic systems are so powerful and efficient. In mobile applications, the size of the pump or motor relative to the force and power generated gives hydraulics a significant advantage in the size to production ratio. And because they contain few moving parts and can operate for an extended periods of time with little maintenance, they are a popular means of controlling motion.

HOW A VARIABLE DISPLACEMENT PISTON PUMP WORKS



Casappa MVPD Pump

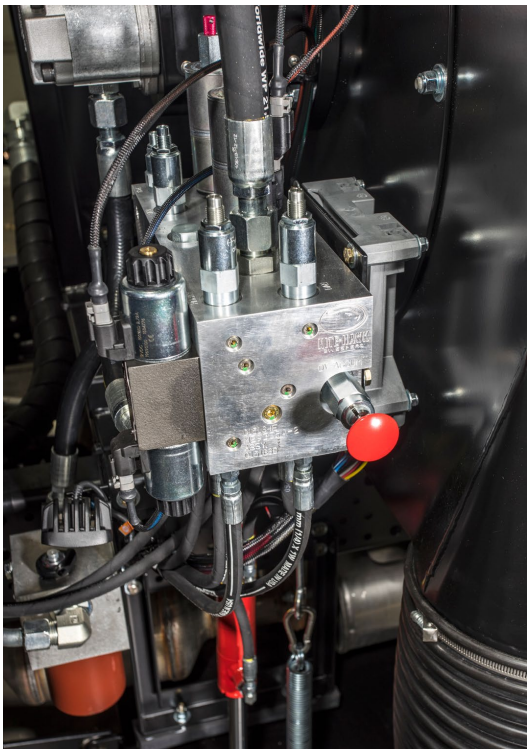
The pump has pistons in cylinders arranged parallel to each other and rotating around a central shaft. A swashplate at one end is connected to the pistons. As the pistons rotate, the angle of the plate causes them to move in and out of their cylinders. A rotary valve at the opposite end from the swashplate alternately connects each cylinder to the fluid supply and delivery lines. By changing the angle of the swashplate, the stroke of the pistons can be varied continuously. If the swashplate is perpendicular to the axis of rotation, no fluid will flow. If it is at a sharp angle, a large volume of fluid will be pumped. At NiteHawk we use an electrically actuated compensator to control the pump and thereby allowing the operator to adjust the sweeping performance based on application.

WHY NITEHAWK AND WHY HYDRAULIC?

At the heart of every NiteHawk Sweeper is our revolutionary hydraulic system that keeps us as the domestic leader in the medium-size sweeper market.

Performance

Whether your challenge is routine trash pickup or light sand, rock, or gravel our units are versatile and powerful. Purpose built curved fan blades modeled after the turbofan in a jet engine achieve unmatched capability with a fraction of the input horsepower. Our partnership with organizations like Casappa have facilitated an impressive size to output power ratio to achieve best in class performance.



Reliability

Our advanced series pumps and motors are rated for far higher pressures than our typical operating range. These components are specifically designed to handle the harsh environments in which we operate. Millions of actual sweeping hours logged each year demonstrate our system can withstand the rigors of everyday sweeping and give us the confidence to offer the longest warranty in the industry.

Simplicity

The sweeper incorporates a sleek electronic controller to operate all sweeping functions. The interface allows the operator the ability to adjust sweeper settings to match the operating environment with minimal training.

CAN bus allows for microprocessor control of pressure and rpm input, leading to precision tuning of the hydraulic system with the chassis engine. Intuitive hydraulic component gauges give immediate feedback for easy inspection and maintenance. A non-CDL chassis platform gives the flexibility to train operators quickly and thoroughly.

Longevity

NiteHawk Sweepers has produced hydraulic sweepers for close to four decades. Our warranty is the longest in the industry because we have the confidence derived from those decades of experience and real world testing.

The natural lubricating ability of our hydraulic pumps and motors allows for a longer life cycle. The open design hydraulic system coupled with the large capacity baffled reservoir keeps oil temperatures well within specified operating range. Filters on both the pressure and return side offer additional protection against potential contamination. Our three-stage filter system cleans the oil thoroughly for long component life. The hopper unit is stainless steel and powder coated to further protect against the harshest environments. NiteHawk Sweepers are designed to operate 7 days a week and 365 days a year.

Eco-Friendly

No auxiliary engine, no emissions! With NiteHawk you won't sacrifice performance for the environment. Eliminating the complicated and everchanging maintenance pit of an auxiliary engine reduces your carbon footprint. We don't exhaust any air while sweeping, which reduces particulate matter and fugitive dust expelled into the air. Sweeping is also a best management practice and integral part of a sustainable storm water runoff plan. We also offer biodegradable hydraulic fluid as an option.

Reduced Maintenance

Routine system inspections, with yearly fluid and filter changes, are all that's needed to keep the hydraulics running optimally. Assuming normal operation and routine service, your major hydraulic components will provide years of high output service at minimal cost. Fluid and filter conditions are shown by simple indicators available for visual inspection. Flaps, skids, and other wear parts are easy to inspect, repair, or replace. Controller USB ports allow for quick diagnostic feedback for troubleshooting. Training mechanics and service personnel can be done onsite in less than a day by our training staff.

Quiet

Simply put, no other sweeper is as quiet as a NiteHawk. The sweeper unit may operate in the most discerning environments like hospitals or HOA's. Decibel levels outside the truck are in the low 70's enabling the unit to stealthily sweep where others can't. Sound levels inside the cab are even lower, increasing operator comfort and reducing fatigue. Driver safety and comfort is paramount, and NiteHawk stands alone in the reduction of sound pollution.

Operational Efficiency

Total cost of operation is the lowest in its class. By eliminating the auxiliary engine, we have reduced fuel usage by as much as 50% in comparison to our competitors. Our maintenance to run time ratio exceeds any other sweeping unit. The ability to drive at freeway speeds makes the unit suited for any environment.

The piston pump is considered the most efficient of all the hydraulic pumps. The hydraulic variable displacement piston pump converts the mechanical energy of the truck motor into hydraulic energy for use in the fan motor and the other hydraulic components of the sweeper system. The efficiency of this energy transference allows the sweeper to operate with lower input energy (horsepower and torque) than an auxiliary engine. Eliminating the complexity and reduced reliability of an auxiliary engine is key in maximizing operational efficiency.

Warranty

Simply put, we have the longest warranty in the business. We can offer the comprehensive coverage because we have the confidence to back it up. The thousands of NiteHawk sweepers in operation are a testament to our product quality and longevity. Our 5-year unlimited hydraulic warranty and our commercial chassis supplied coverage create the strongest warranty in the industry.

Customer Service

Our knowledgeable customer service representatives have years of experience and our fully stocked parts department has overnight service. Our online parts store is open 24 hours a day. Equipment schematics, factory training, and real time troubleshooting are also available to keep you up and running.

Innovation

NiteHawk continues to push forward with advanced fuel solutions like liquid propane gas (LPG) and compressed natural gas (CNG). We design and test to rigorous standards. Our engineering team can customize options to meet individual RFP standards and our marketing team can create customized wraps for promotional use.

APPLICATION SPECIFIC DESIGN

The ability of NiteHawk Sweepers to perform in a variety of unique operating environments is the foundation of a successful customer relationship. Equally as important is recognizing the end user's desire, or often mandate, to operate "greener". NiteHawk Sweepers are the most environmentally friendly units on the planet.

AIRPORTS

Overview - Keeping airport tarmacs, ramps, aprons, taxiways and terminals free and clear of Foreign Object Debris (FOD) is critical to the safety and efficiency of airports small and large. FOD is classified as any material foreign to an airplane that can cause damage to any of the systems resulting in costly delays, maintenance, safety of passengers, safety of airline personnel and safety of airport personnel. Foreign Object Debris may also include very small material overlooked by visual inspection. Many airports may also require "green" alternatives or alternative fuels as a requirement.

Applications -The NiteHawk Raptor II would be an excellent choice for sweeping aprons, parking lots, roads, runways and taxiways in and around the airport. The Osprey II is required in any low clearance sweeping parking structures.

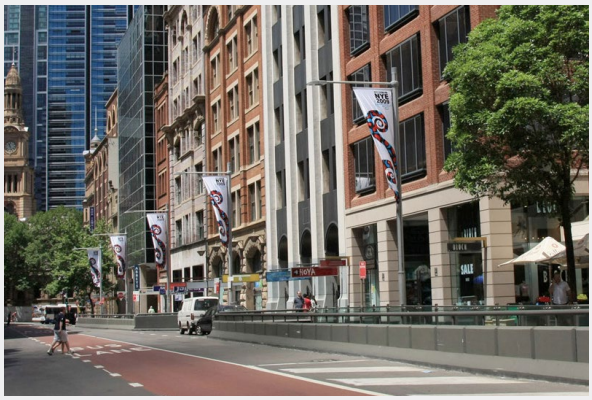
SAMPLE INSTALLATIONS

Dallas Fort Worth Airport, Dulles International Airport, Honolulu International Airport, Lambert – Saint Louis International Airport, Palm Springs International Airport, San Diego Regional Airport, Sarasota – Bradenton International Airport

CITY, COUNTIES AND TOWNS

Overview - Cities, Counties and Towns have initiatives to keep their public streets, roads, squares and residential areas clean for health, safety, and aesthetic purposes. Additionally, sweeping is acknowledged as a best management practice from the EPA in conjunction with storm water runoff management programs. Communities recognize the benefits to local commerce and to the wellbeing of their citizens to attract people, businesses, and visitors to their city. NiteHawk Sweepers quiet and efficient operation meets strict city noise ordinances. Examples include downtown business districts and residential areas.

Applications - The NiteHawk Raptor II is an appropriate solution in low and medium use right of way applications, public building maintenance, Commercial City Centers, Convention Center, Alleyways, Residential Neighborhoods, Roads and Streets



SAMPLE INSTALLATIONS

Bethlehem Parking Authority, City of Exeter, Chelan County PUD, LA County Department of Public Works, Massachusetts Bay Transit Authority, Monroe County, New Hope Borough, City of Los Angeles, City of Mannington West Virginia, Borough of Millville, City of Monterey, City of Palo Alto, City of Tempe, City of White Plains, Santa Cruz County, Skagit County, Township of Upper Chichester. City of Baltimore, City of Buena Park, City of Greenville, City of White Plains

COLLEGES

Overview - Colleges focus on keeping campus grounds clean for health, beauty, safety, quality of life, and prestige reasons. It is important to colleges to create an inviting environment for faculty, students and visitors to live and work. Colleges have a wide range of sweeping needs. Keeping debris off the grounds also aids in the management of storm water runoff. NiteHawk's quiet operation furthermore allows sweeping around residence halls and classrooms.

Applications - The NiteHawk Raptor II is recommended for cleaning up after sports and school events, streets, grounds, pathways, residence halls, parking lots, performance centers, sports complexes and stadiums. The Osprey is recommended for sweeping parking structures.

SAMPLE INSTALLATIONS

California State University Long Beach, California State University Northridge, California State University Fullerton, Cal Poly Pomona, Chabot College, Edmonds Community College, Emory University, Georgia Regents University, Orange Coast College, Suffolk County Community College, Tidewater Community College

HOSPITALS

Overview - Hospitals keep grounds, parking areas, paths, roads and streets clean and free of debris helping to reduce contamination and bacteria that may enter the hospital environment. NiteHawk's quiet operation permits sweeping around patient rooms and medical clinics where there may be noise restrictions. Operating with dust suppression will also keep particulate matter and fugitive dust to a minimum.

Applications - The NiteHawk Raptor II is recommended for sweeping around medical clinics, hospital streets, grounds, parking lots and paths. The NiteHawk Osprey II is recommended for sweeping parking structures.

SAMPLE INSTALLATIONS

Beaumont Hospital, Morristown Hospital, Saint Johns Health System, Staten Island University Hospital

MILITARY AND GOVERNMENT INSTALLATIONS

Overview - Keeping all areas on base clear of dirt and debris meets strict military standards for maintaining a healthy environment and quality of life. Military installations who have aircraft regularly sweep to keep all areas free and clear of Foreign Object Debris. NiteHawk's quiet operation permits sweeping around offices and residential areas where there are noise pollution restrictions.

Applications - The NiteHawk Raptor is recommended for sweeping on airport aprons, runways, taxiways, grounds, residential areas, roads and streets.

SAMPLE INSTALLATIONS

U. S Department of Veterans Affairs, Houston, Texas and Seattle, United Department of State, Selfridge Airbase, BAE Systems, General Dynamics, TACOM LCMC, National Renewable Energy Laboratory, Boeing Shared Services Group, Tennessee DOT, Denver Regional Transportation District

SCHOOLS

Overview - Keeping grounds, parking areas, paths and playgrounds clean and clear of debris is important to the safety, health and wellbeing of students, faculty and staff. NiteHawk Sweeper's quiet operation permits sweeping when class is in session.

Applications - The NiteHawk Raptor II is recommended for sweeping roads, streets, play grounds, parking lots and after event clean-up.

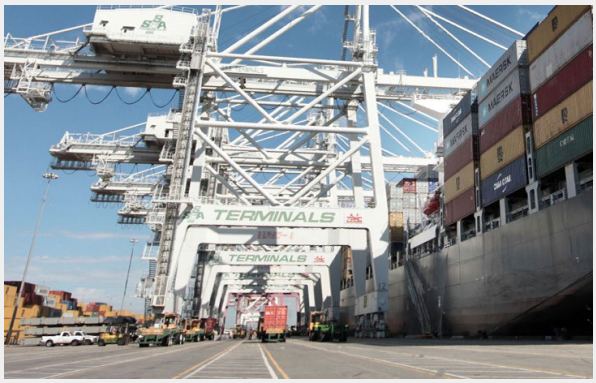
SAMPLE INSTALLATIONS

Edmonds School District, Los Banos Unified District, South Kitsap School District, Porterville Public Schools

PORTS

Overview - Keeping docks, port roads, staging areas and parking areas clean and clear of debris that could contaminate the loading areas, the port docks and ultimately the ships is critical to the safety and efficiency of port operations. Contamination can cause costly delays. Strict regulation governing water contamination often necessitates sweeping to stay in compliance with local water quality standards. Some US port operations may also require alternative fuel options and or greener solutions for sweeping equipment.

Applications - The NiteHawk Raptor II is recommended for sweeping docks, roads, streets, pathways, parking lots and staging areas. The Osprey II is recommended for sweeping parking structures.



SAMPLE INSTALLATIONS

Port of Bermuda, Port of Long Beach

STADIUMS

Overview - Keeping the stadium, roads, streets and paths around the stadium after major events maintains a healthy and efficiently operating complex. Regular sweeping maintenance will manage storm water runoff.

Applications - The NiteHawk Raptor II is recommended for sweeping the fields, cleaning up after games or events, parking lots, paths, and streets around the stadium and sports complexes. The NiteHawk Osprey II is recommended for sweeping parking structures.

SAMPLE INSTALLATIONS

Soldier Field, Yankee Stadium, Philadelphia Sports Complex, Santa Clara University

PARKS AND HOMEOWNERS ASSOCIATION

Overview - Maintaining the aesthetic beauty of parks and residential grounds, roads, pathways and parking lots ensures the safety and wellbeing of visitors and residents. Storm water runoff is managed by regular sweeping with an environmentally friendly unit. NiteHawk's quiet and efficient operations permits sweeping day and night around and through neighborhoods.

Applications - The NiteHawk Raptor II is recommended for sweeping around community centers, grounds, parking lots, streets, roads and pathways. The Osprey II is recommended for sweeping parking structures.

SAMPLE INSTALLATIONS

Marin County Parks, Roxborough State Park, California Exposition & State Fair, Century Drive Mobile Home Park

AMUSEMENT PARKS, SHOPPING CENTERS AND MALLS

Overview - Keeping shopping centers and malls clear and clean of debris creates an inviting, healthy, and safe environment for customers. NiteHawk's quiet operation permits sweeping where there are noise restrictions around parks and shopping centers. In addition, the large hopper volume and tight turning radius make the unit ideal for this application.

Applications - The NiteHawk Raptor II is recommended for sweeping parking lots, pathways, streets and roads around parks and shopping centers as well as around Theaters, Pavilions and event clean–up. The NiteHawk Osprey II is recommended for sweeping parking structures.

SAMPLE INSTALLATIONS

Fashion Square Mall, Kahala Mall, Northridge Mall, North Riverside Mall, Marquette Mall, Rosedale Center, Simon Properties – Roosevelt Field, Simon Properties – Rushmore Mall, The Commons at Federal Way, Westwood Shopping Center

INDUSTRIAL FACILITIES

Overview - Keeping clean areas around industrial complexes, commercial buildings, casinos, hotels, manufacturing facilities and office parks helps enhance and maintain the value of commercial real estate, provide healthy environment for tenants and visitors, and manages storm water runoff. Quiet operation permits sweeping when facilities are occupied.

Applications - The NiteHawk Raptor II is recommended for sweeping roads and streets, pathways, factory floors, parking lots. The NiteHawk Osprey II is recommended for sweeping parking structures.

SAMPLE INSTALLATIONS

Angel of the Winds Casino, Bicycle Casino, Comidas Y Bedidas Catering (Ecuador), Casino Reinvestment Development Authority, Corona Beer Factory, Fiat Chrysler Automobiles, Ford World Headquarters, General Motors World Headquarters, Jones Lang LaSalle, Mohegan Sun Casino Hotel and Casino and New Orleans Hotel and Casino, Tropicana Las Vegas Casino/Hotel

PARKING STRUCTURES

Overview - Keeping parking structures clean of leaves, sand, dirt, gravel, rocks and debris for the health of users and efficiency of operations. This helps in managing storm water runoff. NiteHawk's quiet, efficient operation permits sweeping during business hours. Additionally, frequent sweeping will reduce dust.

Applications - The NiteHawk Osprey II is recommended for sweeping commercial office building garages associated with high-rise residential buildings, sports complexes and colleges and universities.

SAMPLE INSTALLATIONS

ACC International, Central Jersey Property Management, Diamond Properties, Fidelity Management, Georgia Regents University, NEM, Tidewater Community College, Simon Properties – Roosevelt Field.

ALTERNATIVE FUELS

WHAT ARE ALTERNATIVE FUELS

Alternative Fuels are derived from resources other than petroleum. Most are cleaner burning, produced domestically, and often cheaper than gasoline.

CNG - Made by compressing natural gas, a hydrocarbon gas mixture consisting primarily of methane. Used at high pressures, clean burning, limited infrastructure

LPG - A by-product of natural gas processing. The most popular alternative fuel available today. Used at low pressures, clean burning, easy to obtain.

LPG CNG

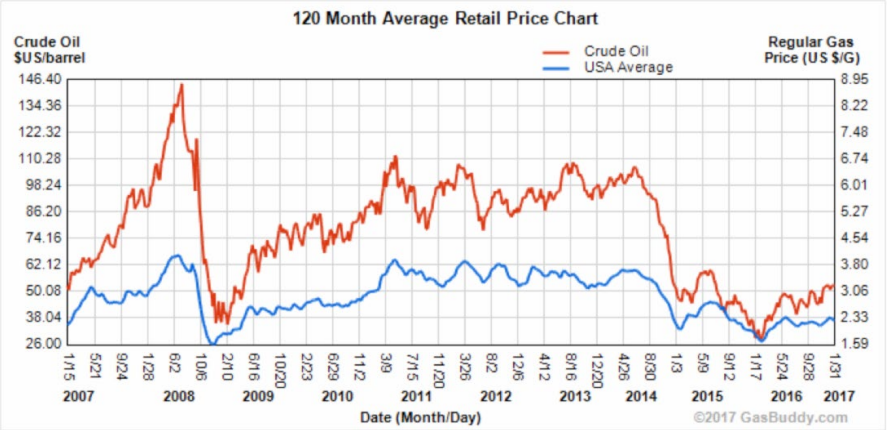
Viable Alternative Fuels

Liquid Propane Gas and Compressed Natural Gas are the most economically viable alternative fuels in the US. Over 90% of CNG and LPG are produced in North America, helping mitigate our dependence on foreign oil.

Established Alternative Fuels

LPG and CNG are also the most widely available fuels with substantial existing infrastructure. These fuels have a long history of use in Public Transportation, Waste Management, Residential and Commercial Construction, Landscaping, as well as many more.

AVERAGE FUEL PRICING



CNG:

$.54 - $2.50
per gallon (equivalent)

LPG:

$.85 - $3.65
per gallon (equivalent)

PROPANE FUEL BASICS

Also known as liquefied petroleum gas (LPG) or propane autogas, propane is a clean-burning, high-energy alternative fuel that's been used for decades to power light, medium, and heavy-duty propane vehicles.

Propane is a three-carbon alkane gas (C3H8). It is stored under pressure inside a tank and is a colorless, odorless liquid. As pressure is released, the liquid propane vaporizes and turns into gas that is used in combustion. An odorant, ethyl mercaptan, is added for leak detection.

Propane has a high-octane rating, making it an excellent choice for spark-ignited internal combustion engines. It presents no threat to soil, surface water, or groundwater. Propane is produced as a by-product of natural gas processing and crude oil refining. It accounts for about 2% of the energy used in the United States. Of that, less than 2% is used for transportation fuel. Its main uses include home and water heating, cooking and refrigerating food, clothes drying, and powering farm and industrial equipment. Rural areas without natural gas service commonly rely on propane as a residential energy source. The chemical industry also uses propane as a raw material for making plastics and other compounds.

PROPANE AS AN ALTERNATIVE FUEL

Interest in propane as an alternative transportation fuel stems mainly from its domestic availability, high-energy density, clean-burning qualities, and its relatively low cost. It is the world's third most common transportation fuel and is considered an alternative fuel under the Energy Policy Act of 1992.

Propane autogas is specified as HD-5 propane and is a mixture of propane with smaller amounts of other gases. According to the Gas Processors Association's HD-5 specification for propane, it must consist of at least 90% propane, no more than 5% propylene, and 5% other gases, primarily butane and butylene.

Propane is stored onboard a vehicle in a tank pressurized to about 150 pounds per square inch—about twice the pressure of an inflated truck tire. Under this pressure, propane becomes a liquid with an energy density 270 times greater than its gaseous form. Propane has a higher octane rating than gasoline, which prevents engine knocking. However, it has a lower British thermal unit (Btu) rating than gasoline, so it takes more fuel to drive the same distance.

PROPANE BENEFITS AND CONSIDERATIONS

Also known as liquefied petroleum gas (LPG), propane is a domestically produced, well-established fuel. Using propane as a vehicle fuel increases energy security, provides convenience and performance benefits, and improves public health and the environment.

ENERGY SECURITY

In 2014, the United States imported about 27% of the petroleum it consumed and transportation accounted for more than 69% of total U.S. petroleum consumption. With much of the worldwide petroleum reserves located in politically volatile countries, the United States is vulnerable to supply disruptions.

Fueling vehicles with propane is one way to diversify U.S. transportation fuels. The vast majority of propane consumed in the United States is produced here and distributed via an established infrastructure. Using propane vehicles instead of conventional vehicles increases U.S. energy security.

VEHICLE AND INFRASTRUCTURE AVAILABILITY

A variety of light, medium, and heavy-duty propane vehicle models are available through original equipment manufacturers (OEMs) and select dealerships

While propane vehicles can cost several thousand dollars more than comparable gasoline vehicles, the cost of propane is typically lower than gasoline, so the return on investment can be quick. Fleets and consumers also have the option of economically, safely, and reliably converting in-use light, medium, and heavy-duty gasoline vehicles for propane operation using qualified system retrofitters. It's critical that all vehicle and engine conversions meet the emissions and safety regulations and standards instituted by the U.S. Environmental Protection Agency, the National Highway Traffic Safety Administration, and state agencies like the California Air Resources Board.

Propane stations are categorized as either primary or secondary, and the methodologies section explains the categories, based upon their experience fueling vehicles. Fleets can use existing public infrastructure or work with local propane marketers to establish private infrastructure. It is important that fleets understand how to negotiate a supply contract. Costs will depend on the volume of fuel that's indicated in the contract and the complexity of the equipment being installed.

FUEL ECONOMY AND PERFORMANCE

Propane at primary infrastructure sites costs less per gallon than gasoline and offers a comparable driving range to conventional fuel. Propane has a higher-octane rating than gasoline (104 to 112 compared with 87 to 92 for gasoline) and potentially more horsepower, but its lower British thermal unit (Btu) rating per gallon results in lower fuel economy. However, the price per gallon can quickly offset the lower fuel economy.

The potential for lower maintenance costs are one reason behind propane's popularity for high-mileage vehicles. Propane's high octane rating, combined with its low-carbon and low oil-contamination characteristics, has resulted in improved engine life compared to conventional gasoline engines. Because the fuel's mixture of propane and air is completely gaseous, cold start problems often associated with liquid fuels can be reduced.

PUBLIC HEALTH AND ENVIRONMENT

Compared with vehicles fueled by conventional diesel and gasoline, propane vehicles can produce lower amounts of some harmful air pollutants and greenhouse gases, depending on vehicle type, drive cycle, and engine calibration.

PROPANE FUELING INFRASTRUCTURE DEVELOPMENT

Infrastructure availability is a driving force behind the acceptance of any fuel. Fleets depend on being able to locate fuel within a reasonable distance at a competitive price, and propane infrastructure is well-established across the United States.

TYPES OF INFRASTRUCTURE

Fuel providers and fleets can place propane dispensers alongside gasoline, diesel, or other alternative fuels. The infrastructure needed for propane is very similar to gasoline and diesel refueling equipment. Propane is transported to the site via a delivery truck and put into onsite storage, traditionally above ground. The fueling dispenser is also similar to a gasoline dispenser. The difference is that propane is delivered to the vehicle under a low pressure so it remains a liquid. When the vehicle tank is full, the dispenser stops automatically, just like gasoline dispensers.

CODES AND SAFETY

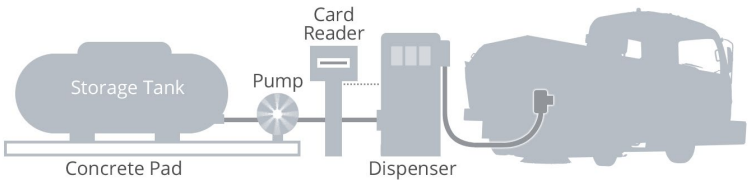
As with any fuel, it's important to know and consider the safety guidelines when establishing infrastructure. This includes the National Fire Prevention Association's NFPA 58 Vehicular Liquefied Petroleum Gas Code, which applies to the design and installation requirements of propane refueling facilities. Your local fire marshal can help with this. In addition, your local propane supplier can help determine the right amount of storage needed to adequately meet vehicle fueling needs.

LPG autogas is less flammable than gasoline, diesel, or CNG and nontoxic. Autogas tanks are 20x stronger than conventional fuel tanks. In the event of an accident autogas dissipates in the air unlike diesel or gasoline.

COST OF FUELING INFRASTRUCTURE

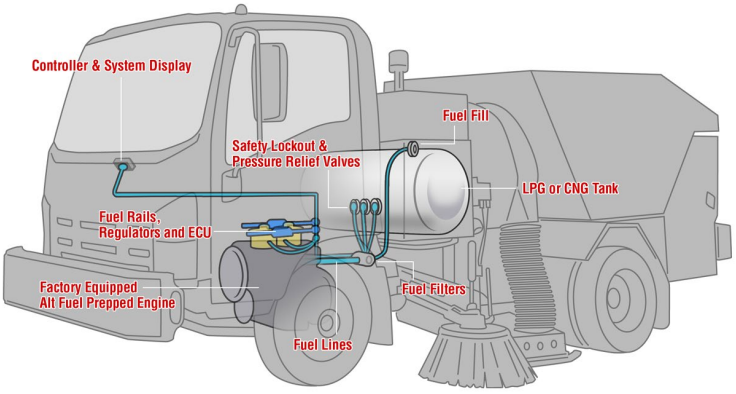
Fortunately, propane production, storage, and bulk distribution capabilities already exist across most of the U.S. That means establishing propane fueling infrastructure for vehicle refueling only requires the build-out of dispensing equipment—including the storage tank, pump, dispenser, and card reader at a station.

PROPANE STATION



Building a New Station: Many suppliers offer an inexpensive lease of the tank, pump, and dispensing equipment in return for a fuel supply contract. In these cases, the station owner or fleet is only responsible for the cost of equipment that cannot be removed from the site when the fuel contract expires, such as the electricity line or the concrete pad for the storage tank. This can make the upfront cost of propane infrastructure very affordable. The cost of establishing private infrastructure, not through a lease, includes purchasing and installing the necessary equipment for storing and dispensing propane and typically runs from $30,000 to $175,000, but varies based on situation and need.

Upgrading Existing Retail Sites: Most propane vehicles can refuel at existing retail sites that sell propane in small volumes, for example to fill grill canisters and mowers. With adequate demand, those sites may upgrade their dispensing equipment to a retail-style metering dispenser with a card reader to accommodate broader vehicle refueling. The pump may also need an upgrade to give vehicles a faster fill rate. It is important to be knowledgeable about what fuel will cost when using existing retail sites that are not primarily vehicle fueling sites.

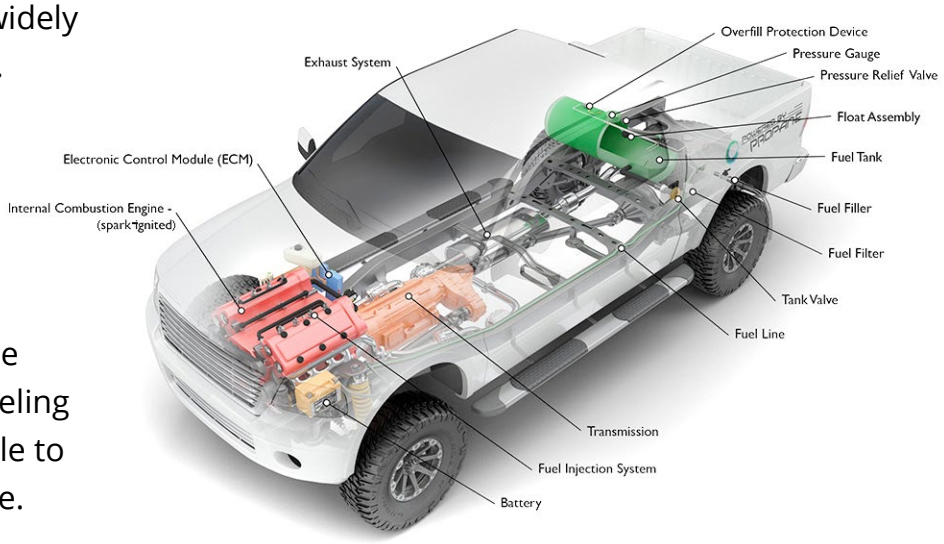


PROPANE VEHICLES

Per the Propane Education and Research Council, there are more than 270,000 on-road propane vehicles in the United States and over 25 million vehicles worldwide. The availability of new light and medium duty propane vehicles has surged in recent years, especially for fleet use. Propane vehicles can either be from an original equipment manufacturer (OEM) or conversions. Engines and fueling systems are also available for heavy-duty vehicles, such as street sweepers and school buses, including some prep-ready engines from OEMs, which are included in equipment packages with components that allow conventional vehicles to run on propane.

TYPES OF PROPANE VEHICLES

Propane vehicles have been widely used and refined for decades. There are two types of propane vehicles: dedicated and bi-fuel. Dedicated propane vehicles are designed to run only on propane, while bi-fuel propane vehicles have two separate fueling systems that enable the vehicle to use either propane or gasoline.



A propane vehicle's power, acceleration, and cruising speed are similar to those of conventionally fueled vehicles. The driving range for dedicated and bi-fuel vehicles is also comparable. Extra storage tanks can increase range, but the tank size and additional weight affect payload capacity.

The potential for lower maintenance costs are one reason behind propane's popularity for use in light and medium duty vehicles. Propane's low carbon and low oil contamination characteristics may result in longer engine life. Propane performs well in cold weather climates because the fuel's mixture (propane and air) is completely gaseous. This factor allows propane-powered vehicles to avoid many cold-start issues associated with using liquid fuels.

270,000

Compared to vehicles fueled with conventional diesel and gasoline, propane vehicles can produce lower amounts of harmful tailpipe emissions, depending on vehicle type, age, and drive cycle.

Propane vehicles are similar to their gasoline counterparts with regard to power, acceleration, cruising speed, and driving range. Because a gallon of propane has 27% less energy than a gallon of gasoline, the fuel economy of propane vehicles is slightly lower. However, propane has a higher octane rating than gasoline (104-112 compared to 87-92 for gasoline), and some original equipment manufacturers (OEMs) offer dedicated engines optimized to take advantage of this higher rating. This can result in improved performance and fuel economy over non-optimized engines.

PROPANE VEHICLE EMISSIONS

Propane has a lower carbon content. When used as a vehicle fuel, propane can offer life cycle greenhouse (GHG) emissions benefits over conventional fuels, depending on vehicle type, age, and drive cycle.

Increasingly stringent emissions regulations have led to the development of improved emissions control systems in conventional light and heavy duty vehicles. These systems effectively control the levels of air pollutants emitted from the vehicle as a result of the combustion of gasoline or diesel fuel. Consequently, emissions from propane vehicles are comparable to those of gasoline and diesel vehicles with modern emissions controls.

Propane is frequently used to replace gasoline in smaller applications, such as forklifts and commercial lawn equipment. Because propane is a low-carbon fuel, a switch to propane in these applications can result in substantial reductions of GHGs.

LIFE CYCLE EMISSIONS

Life cycle analysis is a technique used to assess the environmental impacts of all stages of a product's life, including raw material extraction, processing, manufacturing, distribution, use, and disposal or recycling. When comparing fuels, a life cycle analysis may focus on particular portions of a fuel's life cycle, such as extraction-to-use or well-to-wheels, to determine the merits or problems associated with each fuel.

Argonne National Laboratory's GREET model estimates the life cycle petroleum use and GHG emissions for multiple fuels. When this model is used to evaluate vehicles running on propane, it found that propane use reduced GHG emissions by nearly 10%, and when derived as a by-product of natural gas production, propane reduced petroleum use by 98% to 99%, The Propane Education and Research Council compared GHG emissions from forklifts, buses, and light-duty trucks operating on various fuels in Propane Reduces Greenhouse Gas Emissions: A Comparative Analysis.

CONVERTED VEHICLES

Converting conventional vehicles is a viable option for incorporating propane into medium- and heavy-duty fleet operations. EPA requires conversion system manufacturers to demonstrate that converted vehicles or engines meet or exceed the same emissions standards as the original vehicle or engine. Therefore, it's important that conversions be performed by careful and reputable qualified system retrofitters.

NATURAL GAS FLEET VEHICLES

What is a Natural Gas Vehicle (NGV)?

It's a vehicle powered by natural gas rather than traditional gasoline or diesel fuel. NGVs operate on the same basic principles as traditionally-fueled vehicles but are cleaner for the environment, quieter and more economical.

Urban transportation is a leading cause for poor air quality. Many environmentally conscious individuals are looking hard at NGVs as an energy efficient, cleaner alternative to gasoline vehicles. Many corporations, governmental agencies and other institutions also can benefit greatly by incorporating NGVs into their fleet plans.

Compressed Natural Gas (CNG) vehicles operate on natural gas that has been compressed to take up less storage space. CNG also may be used in diesel-type engines where natural gas replaces the majority of the fuel, but a small amount of diesel is injected as the ignition source.

Liquefied Natural Gas (LNG) also may be used in some applications because the fuel occupies even less space in liquid form. LNG vehicles operate basically the same way as CNG vehicles but the fuel is stored in liquid form and then is vaporized before being introduced to the engine.

KEY BENEFITS OF AN NGV FLEET

- Proven and Reliable – nearly 9 million NGVs are in use worldwide, with more than 120,000 in the U.S.
- Eco-conscious – CNG vehicles are cleaner than traditional vehicles, producing up to 90% fewer emissions than gasoline or diesel. They greatly reduce pollutants from emissions such as CO and NOX, and produce little or no evaporative emissions during fueling and use.
- Energy Efficient – natural gas supplies are abundant domestically, reducing our dependence on foreign oil and weather-related shortages
- Economical – Recent trends in geopolitical events and fuel supply have increased the cost advantage of natural gas over oil and gasoline.
- Reduced Greenhouse Gases - NGVs reduce greenhouse gases 20-29% over diesel and gasoline.
- Quieter – Heavy-duty NGVs have an 80-90% lower decibel level than comparable diesel vehicles

SAFETY

Natural gas is an inherently safe fuel and, unlike gasoline, dissipates into the atmosphere in the event of an accident. The high ignition temperature and limited flammability range make accidental ignition or combustion of natural gas unlikely.

How do I compare the cost/fuel economy of CNG vs. gasoline?

Natural gas is sold in Gasoline Gallon Equivalents (GGE).

One GGE = 1.25 therms of natural gas (approximately)

For example: if the cost of natural gas were $1 per therm, it would be $1.25 per GGE. Now compare that to today's cost of gas at the pump.

There typically is no difference in fuel economy between a CNG vehicle and a gasoline vehicle – if you get 25 mpg with gasoline, you would average 25 miles per GGE with natural gas but it would likely cost much less to fill up.

NGV FUELING

At CNG stations, the gas is typically taken from the local gas utility's line at low pressure, compressed, then dispensed into the vehicle's storage tanks at high pressure. There are two basic types of fueling equipment: fast-fill and time-fill.

- Fast-fill systems combine a compressor and a high-pressure storage system. The storage system, called a cascade, fills the vehicle's fuel tank in about the same time it takes to fuel a regular vehicle.
- Time-fill systems do not have a storage system and typically refuel vehicles overnight at a rate of about one gallon per hour.

Public CNG stations are currently limited, but individual consumers or public/private fleet operators may choose to install their own CNG fueling stations.

WEBSITES

www.afdc.energy.gov

www.buyaltfuels.com

ALTERNATIVE VEHICLE TAX INCENTIVE SUMMARY

JANUARY 2017 | Source: US Department of Energy

FEDERAL LAWS AND INCENTIVES FOR PROPANE

The list below contains summaries of all Federal laws and incentives related to Propane.

PROGRAMS

Clean Ports USA

Clean Ports USA is an incentive-based program designed to reduce emissions by encouraging port authorities and terminal operators to retrofit and replace older diesel engines with new technologies and use cleaner fuels. The U.S. Environmental Protection Agency's National Clean Diesel Campaign offers funding to port authorities and public entities to help them overcome barriers that impede the adoption of cleaner diesel technologies and strategies. For more information, see the Clean Ports USA website.

Point of Contact

Jennifer Keller
National Clean Diesel Campaign
U.S. Environmental Protection Agency
Phone: (202) 343-9541
keller.jennifer@epa.gov
http://www.epa.gov/cleandiesel/

Air Pollution Control Program

The Air Pollution Control Program assists state, local, and tribal agencies in planning, developing, establishing, improving, and maintaining adequate programs for prevention and control of air pollution or implementation of national air quality standards. Plans may emphasize alternative fuels, vehicle maintenance, and transportation choices to reduce vehicle miles traveled. Eligible applicants may receive federal funding for up to 60% of project costs to implement their plans. (Reference 42 U.S. Code 7405)

Point of Contact

U.S. Environmental Protection Agency
Phone: (202) 272-0167
http://www.epa.gov

State Energy Program (SEP) Funding

The SEP provides grants to states to assist in designing, developing, and implementing renewable energy and energy efficiency programs. Each state's energy office receives SEP funding and manages all SEP-funded projects. States may also receive project funding from technology programs in the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy (EERE) for SEP Special Projects. EERE distributes the funding through an annual competitive solicitation to state energy offices. For more information, see the SEP website.

Point of Contact

U.S. Department of Energy
Phone: (202) 586-5000
Fax: (202) 586-4403
http://www.energy.gov

Congestion Mitigation and Air Quality (CMAQ) Improvement Program

The CMAQ Program provides funding to state departments of transportation (DOTs), local governments, and transit agencies for projects and programs that help meet the requirements of the Clean Air Act by reducing mobile source emissions and regional congestion on transportation networks. Eligible activities include transit improvements, travel demand management strategies, congestion relief efforts (such as high occupancy vehicle lanes), diesel retrofit projects, and alternative fuel vehicles and infrastructure. Projects supported with CMAQ funds must demonstrate emissions reductions, be located in or benefit a U.S. Environmental Protection Agency-

designated nonattainment or maintenance area, and be a transportation project. For more information, see the FAST Act CMAQ fact sheet and CMAQ Improvement Program website. (Reference Public Law 112-141, 23 U.S. Code 149, and 23 U.S. Code 151)

Propane Education, Research, and Training

The Propane Education and Research Act of 1996 established the Propane Education and Research Council (PERC) to develop programs education and training programs for safe propane use. The propane industry funds and operates PERC, and PERC helps coordinate efforts to promote the use of propane as an alternative fuel. The Propane Education and Research Enhancement Act of 2014 expanded PERC's duties by tasking the council with developing training programs to reduce the effects of future propane price spikes for propane distributors and consumers. For more information, see the PERC website. (Reference Public Laws 113-269 and 104-284)

Point of Contact

U.S. Department of Energy
Phone: (202) 586-5000
Fax: (202) 586-4403
http://www.energy.gov

Clean Cities

The mission of Clean Cities is to advance the energy, economic, and environmental security of the United States by supporting local initiatives to adopt practices that reduce the use of petroleum in the transportation sector. Clean Cities carries out this mission through a network of nearly 100 volunteer coalitions, which develop public/private partnerships to promote alternative fuels and advanced vehicles, fuel blends, fuel economy, hybrid vehicles, and idle reduction. Clean Cities provides information about financial opportunities, coordinates technical assistance projects, updates and maintains databases and websites, and publishes fact sheets, newsletters, and related technical and informational materials. For more information, see the Clean Cities website.

Point of Contact

U.S. Department of Energy
Phone: (202) 586-5000
Fax: (202) 586-4403
http://www.energy.gov

Vehicle Acquisition and Fuel Use Requirements for Private and Local Government Fleets

Under the Energy Policy Act (EPAct) of 1992, the U.S. Department of Energy (DOE) was directed to determine whether private and local government fleets should be mandated to acquire alternative fuel vehicles (AFVs). In January 2004, DOE published a final rule announcing its decision not to implement an AFV acquisition mandate for private and local government fleets. In response to a March 2006 ruling by a U.S. District Court, DOE issued a subsequent final rulemaking on the new Replacement Fuel Goal in March 2007, which extended the EPAct 1992 goal to 2030. The goal is to achieve a domestic production capacity for replacement fuels sufficient to replace 30% of the U.S. motor fuel consumption. In March 2008, DOE issued its determination not to implement a fleet compliance mandate for private and local government fleets, concluding that such a mandate is not necessary to achieve the Replacement Fuel Goal. For more information on the Private and Local Government Fleet Rule compliance, visit the EPAct Private and Local Government Fleet Determination website. (Reference 42 U.S. Code 13257)

Alternative Fuel Definition

The following fuels are defined as alternative fuels by the Energy Policy Act (EPAct) of 1992: pure methanol, ethanol, and other alcohols; blends of 85% or more of alcohol with gasoline; natural gas and liquid fuels domestically produced from natural gas; propane; coal-derived liquid fuels; hydrogen; electricity; pure biodiesel (B100); fuels, other than alcohol, derived from biological materials; and P-Series fuels. In addition, the U.S. Department of Energy may designate other fuels as alternative fuels, provided that the fuel is substantially non-petroleum, yields substantial energy security benefits, and offers substantial environmental benefits. For more information, see the EPAct website. (Reference 42 U.S. Code 13211)

Point of Contact

U.S. Department of Energy
Phone: (202) 586-5000
Fax: (202) 586-4403
http://www.energy.gov

High Occupancy Vehicle (HOV) Lane Exemption
States are allowed to exempt certified alternative fuel vehicles (AFVs) and plug-in electric vehicles (PEVs) from HOV lane requirements within the state. Eligible AFVs are defined as vehicles operating solely on methanol, denatured ethanol, or other alcohols; a mixture containing at least 85% methanol, denatured ethanol, or other alcohols; natural gas, propane, hydrogen, or coal derived liquid fuels; or fuels derived from biological materials. PEVs are defined as vehicles that are recharged from an external source of electricity and have a battery capacity of at least 4 kilowatt-hours. States are also allowed to establish programs allowing low-emission and energy-efficient vehicles to pay a toll to access HOV lanes.
Vehicles must be certified by the U.S. Environmental Protection Agency (EPA) and appropriately labeled for use in HOV lanes. The U.S. Department of Transportation (DOT) is responsible for planning and implementing HOV programs, including the low-emission and energy-efficient vehicle criteria EPA established. States that choose to adopt these requirements will be responsible for enforcement and vehicle labeling. The HOV exemption for AFVs and PEVs expires September 30, 2025 and low-emission and energy-efficient vehicle toll-access to HOV lanes expires September 30, 2019.
(Reference Public Law 114-94 and 23 U.S. Code 166)

Alternative Fuel Excise Tax
Propane and compressed natural gas (CNG) are subject to a federal excise tax of $0.183 per gasoline gallon equivalent (GGE). The liquefied natural gas (LNG) tax rate is $0.243 per diesel gallon equivalent (DGE). For taxation purposes, one GGE is equal to 5.75 pounds (lbs.) of propane and 5.66 lbs. of CNG. One DGE is equal to 6.06 lbs. of LNG. (Reference Public Law 114-41 and 26 U.S. Code 4041 and 4081)

Point of Contact
Excise Tax Branch
U.S. Internal Revenue Service Office of Chief Counsel
Phone: (202) 317-6855
http://www.irs.gov/

INCENTIVES

Alternative Fuel Infrastructure Tax Credit
This incentive expired December 31, 2016, but will remain posted until the federal tax filing deadline. Fueling equipment for natural gas, propane, liquefied hydrogen, electricity, E85, or diesel fuel blends containing a minimum of 20% biodiesel installed between January 1, 2015, and December 31, 2016, is eligible for a tax credit of 30% of the cost, not to exceed $30,000. Permitting and inspection fees are not included in covered expenses. Fueling station owners who install qualified equipment at multiple sites are allowed to use the credit towards each location. Consumers who purchased qualified residential fueling equipment prior to December 31, 2016, may receive a tax credit of up to $1,000. Unused credits that qualify as general business tax credits, as defined by the Internal Revenue Service (IRS), may be carried backward one year and carried forward 20 years. For more information about claiming the credit, see IRS Form 8911, which is available on the IRS Forms and Publications website. (Reference Public Law 114-113; 26 U.S. Code 30C and 38; and IRS Notice 2007-43(PDF))

Point of Contact
U.S. Internal Revenue Service
Phone: (800) 829-1040
http://www.irs.gov/

Improved Energy Technology Loans
The U.S. Department of Energy (DOE) provides loan guarantees through the Loan Guarantee Program to eligible projects that reduce air pollution and greenhouse gases, and support early commercial use of advanced technologies, including biofuels and alternative fuel vehicles. The program is not intended for research and development projects. DOE may issue loan guarantees for up to 100% of the amount of the loan for an eligible project. Eligible projects may include the deployment of fueling infrastructure, including associated hardware and software, for hydrogen, electricity, natural gas, and biofuels. For loan guarantees of over 80%, the loan must be issued

and funded by the Treasury Department's Federal Financing Bank. For more information, see the Loan Guarantee Program website and the Alternative Fuel Infrastructure(PDF) fact sheet. (Reference 42 U.S. Code 16513)

Point of Contact

Loan Guarantee Program
U.S. Department of Energy
Phone: (202) 586-8336
Fax: (202) 586-7366
lgprogram@hq.doe.gov
http://www.energy.gov/lpo/loan-programs-office

Alternative Fuel Excise Tax Credit

This incentive expired December 31, 2016, but will remain posted until the federal tax filing deadline.

A tax incentive is available for alternative fuel that is sold for use or used as a fuel to operate a motor vehicle. A tax credit in the amount of $0.50 per gallon is available for the following alternative fuels: natural gas, liquefied hydrogen, propane, P-Series fuel, liquid fuel derived from coal through the Fischer-Tropsch process, and compressed or liquefied gas derived from biomass. For propane and natural gas sold after December 31, 2015, the tax credit is based on the gasoline gallon equivalent (GGE) or diesel gallon equivalent (DGE). For taxation purposes, one GGE is equal to 5.75 pounds (lbs.) of propane and 5.66 lbs. of compressed natural gas. One DGE is equal to 6.06 lbs. of liquefied natural gas.

For an entity to be eligible to claim the credit they must be liable for reporting and paying the federal excise tax on the sale or use of the fuel in a motor vehicle. Tax exempt entities such as state and local governments that dispense qualified fuel from an on-site fueling station for use in vehicles qualify for the incentive. Eligible entities must be registered with the Internal Revenue Service (IRS). The incentive must first be taken as a credit against the entity's alternative fuel tax liability; any excess over this fuel tax liability may be claimed as a direct payment from the IRS. The tax credit is not allowed if an incentive for the same alternative fuel is also determined under the rules for the ethanol or biodiesel tax credits. Under current law, this tax credit is applicable to fuel sold or used between January 1, 2015, and December 31, 2016. For more information about claiming the credit, see IRS Publication 510 and IRS Forms 637, 720, 4136, and 8849, which are available on the IRS Forms and Publications website. (Reference Public Law 114-113 and 26 U.S. Code 6426)

Point of Contact

Excise Tax Branch
U.S. Internal Revenue Service Office of Chief Counsel
Phone: (202) 317-6855
http://www.irs.gov/

WARRANTY INSTRUCTIONS

TO EXPEDITE THE WARRANTY PROCESS, PLEASE FOLLOW THE STEPS BELOW:

1. After warranty has been authorized from the factory and a Return Authorization Number (RAN) has been issued, you will receive via ground freight the replacement parts needed.

2. Included with this package will be a copy of this instruction sheet, a packing slip and a UPS return-shipping document.

3. An oil sample is required to warranty all pumps and motors. (Sample Vial may be Included)

4. Please verify that all parts have been received in good condition. If any parts are damaged please call NiteHawk Service at 1-800-448-9364.

5. Install parts per NiteHawk Specifications, and package the warranty items in the same packaging that you received the replacement parts in. If packaging is not usable please call NiteHawk Service at 1-800-448-9364.

6. Place UPS return-shipping document on outside of package and take the package to the nearest UPS drop location.

CONDITIONS AND EXCLUSIONS

1. Warranty covers defects in materials and workmanship only, and does not cover any part that is found defective due to abuse, neglect, accident, or act of God.

2. Warranty covers parts only including ground freight to customer.

3. Warranty covers parts only and does not include labor to disassemble, reinstall, install or otherwise perform any act consisting of paid labor. The responsibility of said tasks rests exclusively with the customer.

4. Warranty does not cover loss of use of the Chassis or Sweeper Unit, towing charges, storing charges, or expedite charges.

5. Warranty does not cover expedite freight charges other than typical ground freight to customer.

6. NiteHawk Sweepers LLC will provide a shipping call tag or return-shipping label for all parts replaced under warranty.

7. Parts that are not returned within 30 days of receipt of replacement parts will be charged as new purchased parts.

8. Warranty items may be authorized at the discretion of NiteHawk Sweepers LLC upon examination of defective parts.

9. Any warranty work must be authorized in writing prior to any work performed.

10. Warranty items allowed are based on the sole discretion of NiteHawk Sweepers LLC.

11. If NiteHawk Sweepers LLC determines the warranty part failed for a reason other than a defect in materials or workmanship. NiteHawk Sweepers LLC will require payment for replacement part and all freight charges from the customer.

12. Parts not installed by NiteHawk Sweepers are subject to the rules and restrictions of the individual venders who installed them.

BID SPECIFICATIONS

MINIMUM SPECIFICATIONS – (5 CUBIC YARD) AIR SWEEPER
NITEHAWK RAPTOR II - DIESEL 5.2 L OR EQUIVALENT

1. Cab and Chassis

1.1 The gross vehicle rating of this unit shall be 14,500 lbs.
1.2 The front axle of this unit shall be rated for 5,360 lbs.
1.3 The rear axle of this unit shall be rated for 9,880 lbs.
1.4 The frame on this unit shall be rated at 44,000 lbs.
1.5 This unit shall have a minimum wheelbase of 109 inches
1.6 This unit shall have Front Tapered Leaf Suspension
1.7 This unit shall have Rear Multi-Leaf Suspension
1.8 This unit shall have Front Reverse I-Beam Axle
1.9 This unit shall have Rear Full-Floating Axle
1.10 This unit shall have 215/85R 16E Tires on the Front
1.11 This unit shall have 215/85R 16E Tires on the Rear
1.12 This unit shall have Power Steering
1.13 This unit shall have Steering Ratio (:1), On Center 18.8 - 20.9
1.14 This unit shall have Steering Ratio (:1), At Lock 18.8 – 20.9
1.15 This unit shall have Turning Diameter – Curb to Curb 33.5 Feet
1.16 This unit shall have Turning Diameter – Wall to Wall 38.8 Feet
1.17 This unit shall have Power Brakes
1.18 This unit shall have ABS System 4 – Wheel
1.19 This unit shall have Rear Wheel Drive Train
1.20 This unit shall have Air Conditioning
1.21 This unit shall have AM/FM CD Radio with Clock
1.22 This unit shall have Power Windows and Door Locks

2. Engine and Transmission

2.1 The engine on this unit shall be a minimum of 5.2 liter, SAE 215 horsepower at 2550 rpm, SAE Net Torque 452 horsepower at 1850
2.2 This unit shall be equipped with a 6L90-E Hydra-Matic Transmission
2.3 This unit shall have a Turbocharged DI
2.4 This unit shall have an Engine Oil Cooler
2.5 This unit shall have an engine governed speed of 2600rpm
2.6 This unit shall have Cold Cranking Amps at 0 degrees F (Primary) 750
2.7 This unit shall have Maximum Alternator Capacity (amps) 145

3. Sweeper Dimensions

3.1 The approximate height of this unit shall be 92”
3.2 The approximate width of this unit shall be 82’
3.3 The approximate length of this unit shall be 227”
3.4 The approximate empty weight of this unit shall be 8,330 lbs.
3.5 The overall sweeping width of this unit with both left and right gutter brooms shall be approximately 102”

4. Sweeper System Power

4.1 The units sweeper power shall be powered by hydraulic system without an auxiliary engine. The main hydraulic pump to be integrated with the chassis engine.
4.2 This unit shall have a HFP Hydraulic System
4.3 The main pump shall be a Pressure Compensated Piston MVP45
4.4 The Hydraulic Reservoir capacity shall be minimum 30 gallons.
4.5 The hydraulic fluid flow shall be 20gpm at the maximum rpm.
4.6 The Maximum Pressure shall be 3,500 PSI
4.7 The Return Filter shall be a KZ-10
4.8 The Pressure Filter shall be a MZ-10
4.9 The Sweeper Head shall have Cylinders 1.5 x 6, 2000 lbs.

5. Fan Unit

5.1 The fan unit shall be a 8 Blade High Flow Cambered with lining Type.
5.2 The fan unit material shall be 10g A36 Side Plates, 3/16 Blades
5.3 The fan unit liner shall be rubber 1/8 x 1/16, 2 ply belting
5.4 The fan unit shaft size shall be 1 ¼ Stress Proof G & P
5.5 The fan unit Bearings shall be 1 ¼ 2 Blot Flange
5.6 Fan size shall be 24”
5.7 The fan unit shall have a direct drive fan coupling
5.8 The fan unit exterior shall be Powder Coated.
5.9 The fan motor shall be Axial Gear Fixed Displacement

6. Hopper

6.1 The hopper unit on this machine shall have a capacity of 5.0 cubic yards.
6.2 The hopper unit on this machine shall be constructed of 3CR12 Stainless Steel.
6.3 The screen shall be Non-clogging
6.4 The Screen Material shall be #9 – ¾ Expanded Metal
6.5 The hopper shall have passenger side pick – up
6.6 The hopper shall have a hopper drain
6.7 The hopper exterior shall be Powder Coated
6.8 The hopper shall have a rubber whale tail
6.9 The hopper shall have Dump Head Cylinders 3 X 18, 18,000 lbs.

7. Gutter Brooms

7.1 This unit shall be equipped with both left and right side gutter booms
7.2 The diameter of the left and right side gutter brooms shall be 16”
7.3 The left and right gutter brooms shall be vertical digger type
7.4 The left and right gutter brooms shall be Free Floating Spring Extension
7.5 The left and right gutter brooms shall be poly.
7.6 The left and right gutter brooms shall have Fixed Displacement Gear Motor, Displacement – 2.8 cubic inches maximum.

8. Dust Suppression System

8.1 The dust suppression system of his unit shall be equipped with an electric pump – 2.8 GPM
8.2 The dust suppression system of this unit shall be equipped with a 100-gallon water tank.
8.3 The dust suppression system of this unit shall be equipped with a minimum of eight (8) Hollow Cone Mist nozzles.

9. Tool Box

9.1 The Tool Box shall be Single Door with light
9.2 The Tool Box shall have a locking latch
9.3 The Tool Box shall have a minimum capacity of 12 Cubic Feet
9.4 The Tool Box shall be fabricated in 14g Mild Steel
9.5 The Tool Box shall have a Powder Coated Finish

10. Lighting

10.1 The unit shall have three (3) Halogen Spot Lights
10.2 The unit shall have two (2) Clearance Lights
10.3 The unit shall have a third (3rd) Brake Light
10.4 The unit shall have an Amber Warning Beacon
10.5 The unit shall have a 17" LED Bar Light

11. Electrical – Sweeper

11.1 The unit shall have CAN bus Keypad with Heads Display to control the Sweeper
11.2 The unit shall have a "Sweep Mode/Road Mode" Switch to control pump functions
11.3 The unit shall have adjustable cab mounted control for proportion and pressure settings
11.4 The unit shall have in cab Power Level Control Display with "Sweep Mode" indicator light
11.5 The unit shall have "last setting memory " feature
11.6 The unit shall have a five (5) second ramp – up delay upon switching to "Sweep Mode"
11.7 The unit shall blade type automotive fuses
11.8 The unit shall have duestch style water tight connections on hydraulic control valve coils

BID SPECIFICATIONS

MINIMUM SPECIFICATIONS – (5 CUBIC YARD) AIR SWEEPER
NITEHAWK RAPTOR II - GAS 6.0 L OR EQUIVALENT

1. Cab and Chassis

1.1 The gross vehicle rating of this unit shall be 12,000 lbs.
1.2 The front axle of this unit shall be rated for 4,860 lbs.
1.3 The rear axle of this unit shall be rated for 8,840 lbs.
1.4 The frame on this unit shall be rated at 44,000 lbs.
1.5 This unit shall have a minimum wheelbase of 109 inches
1.6 This unit shall have Front Tapered Leaf Suspension
1.7 This unit shall have Rear Multi-Leaf Suspension
1.8 This unit shall have Front Reverse I-Beam Axle
1.9 This unit shall have Rear Full-Floating Axle
1.10 This unit shall have 215/85R 16E Tires on the Front
1.11 This unit shall have 215/85R 16E Tires on the Rear
1.12 This unit shall have Power Steering
1.13 This unit shall have Steering Ratio (:1), On Center 18.8 - 20.9
1.14 This unit shall have Steering Ratio (:1), At Lock 18.8 – 20.9
1.15 This unit shall have Turning Diameter – Curb to Curb 33.5 Feet
1.16 This unit shall have Turning Diameter – Wall to Wall 38.8 Feet
1.17 This unit shall have Power Brakes
1.18 This unit shall have ABS System 4 – Wheel
1.19 This unit shall have Rear Wheel Drive Train
1.20 This unit shall have Air Conditioning
1.21 This unit shall have AM/FM CD Radio with Clock
1.22 This unit shall have Power Windows and Door Locks

2. Engine and Transmission

2.1 The engine on this unit shall be a minimum of 6.0 liter, V8, SAE 297 horsepower at 4300rpm, SAE Net Torque 372 horsepower at 4000rpm engine.
2.2 This unit shall be equipped with a 6L90-E Hydra-Matic Transmission
2.3 This unit shall have a SPFI fuel system
2.4 This unit shall have an Engine Oil Cooler
2.5 This unit shall have an engine governed speed of 3050rpm
2.6 This unit shall have Cold Cranking Amps at 0 degrees F (Primary) 750
2.7 This unit shall have Maximum Alternator Capacity (amps) 145

3. Sweeper Dimensions

3.1 The approximate height of this unit shall be 92”
3.2 The approximate width of this unit shall be 82’
3.3 The approximate length of this unit shall be 227”
3.4 The approximate empty weight of this unit shall be 8,330 lbs.
3.5 The overall sweeping width of this unit with both left and right gutter brooms shall be approximately 102”

4. Sweeper System Power

4.1 The units sweeper power shall be powered by hydraulic system without an auxiliary engine. The main hydraulic pump to be integrated with the chassis engine.
4.2 This unit shall have a HFP Hydraulic System
4.3 The main pump shall be a Pressure Compensated Piston MVP45
4.4 The Hydraulic Reservoir capacity shall be minimum 30 gallons.
4.5 The hydraulic fluid flow shall be 20gpm at the maximum rpm.
4.6 The Maximum Pressure shall be 3,500 PSI
4.7 The Return Filter shall be a KZ-10
4.8 The Pressure Filter shall be a MZ-10
4.9 The Sweeper Head shall have Cylinders 1.5 x 6, 2000 lbs.

5. Fan Unit

5.1 The fan unit shall be a 8 Blade High Flow Cambered with lining Type.
5.2 The fan unit material shall be 10g A36 Side Plates, 3/16 Blades
5.3 The fan unit liner shall be rubber 1/8 x 1/16, 2 ply belting
5.4 The fan unit shaft size shall be 1 ¼ Stress Proof G & P
5.5 The fan unit Bearings shall be 1 ¼ 2 Blot Flange
5.6 Fan size shall be 24”
5.7 The fan unit shall have a direct drive fan coupling
5.8 The fan unit exterior shall be Powder Coated.
5.9 The fan motor shall be Axial Gear Fixed Displacement

6. Hopper

6.1 The hopper unit on this machine shall have a capacity of 5.0 cubic yards.
6.2 The hopper unit on this machine shall be constructed of 3CR12 Stainless Steel.
6.3 The screen shall be Non-clogging
6.4 The Screen Material shall be #9 – ¾ Expanded Metal
6.5 The hopper shall have passenger side pick – up
6.6 The hopper shall have a hopper drain
6.7 The hopper exterior shall be Powder Coated
6.8 The hopper shall have a rubber whale tail
6.9 The hopper shall have Dump Head Cylinders 3 X 18, 18,000 lbs.

7. Gutter Brooms

7.1 This unit shall be equipped with both left and right side gutter booms
7.2 The diameter of the left and right side gutter brooms shall be 16”
7.3 The left and right gutter brooms shall be vertical digger type
7.4 The left and right gutter brooms shall be Free Floating Spring Extension
7.5 The left and right gutter brooms shall be poly.
7.6 The left and right gutter brooms shall have Fixed Displacement Gear Motor, Displacement – 2.8 cubic inches maximum.

8. Dust Suppression System

8.1 The dust suppression system of his unit shall be equipped with an electric pump – 2.8 GPM
8.2 The dust suppression system of this unit shall be equipped with a 100-gallon water tank.
8.3 The dust suppression system of this unit shall be equipped with a minimum of eight (8) Hollow Cone Mist nozzles.

9. Tool Box

9.1 The Tool Boxes shall be environmentally sealed with Dual Doors and light, rear mounted.
9.2 The Tool Boxes Doors shall be capable of being used as work tables.
9.3 The Tool Boxes shall have a locking latch
9.4 The Tool Boxes shall have a minimum combined capacity of 20.5 Cubic Feet
9.5 The Tool Boxes shall be fabricated in 14g Mild Steel
9.6 The Tool Boxes shall have a Powder Coated Finish

10. Lighting

10.1 The unit shall have three (3) Halogen Spot Lights
10.2 The unit shall have two (2) Clearance Lights
10.3 The unit shall have a third (3rd) Brake Light
10.4 The unit shall have an Amber Warning Beacon
10.5 The unit shall have a 17” LED Bar Light

11. Electrical – Sweeper

11.1 The unit shall have CAN bus Keypad with Heads Display to control the Sweeper
11.2 The unit shall have a “Sweep Mode/Road Mode” Switch to control pump functions
11.3 The unit shall have adjustable cab mounted control for proportion and pressure settings
11.4 The unit shall have in cab Power Level Control Display with “Sweep Mode” indicator light
11.5 The unit shall have “last setting memory “ feature
11.6 The unit shall have a five (5) second ramp – up delay upon switching to “Sweep Mode”
11.7 The unit shall blade type automotive fuses
11.8 The unit shall have duestch style water tight connections on hydraulic control valve coils

BID SPECIFICATIONS

MINIMUM SPECIFICATIONS – (5 CUBIC YARD)
COMPRESSED NATURAL GAS (CNG) AIR SWEEPER
NITEHAWK RAPTOR II - CNG 6.0L HD OR EQUIVALENT

1. Cab and Chassis

1.1 The gross vehicle rating of this unit shall be 14,500 lbs.
1.2 The front axle of this unit shall be rated for 6,630 lbs.
1.3 The rear axle of this unit shall be rated for 14,500 lbs.
1.4 The frame on this unit shall be rated at 44,000 lbs.
1.5 This unit shall have a minimum wheelbase of 109 inches
1.6 This unit shall have Front Tapered Leaf Suspension
1.7 This unit shall have Rear Multi-Leaf Suspension
1.8 This unit shall have Front Reverse I-Beam Axle
1.9 This unit shall have Rear Full-Floating Axle
1.10 This unit shall have 215/85R 16E Tires on the Front
1.11 This unit shall have 215/85R 16E Tires on the Rear
1.12 This unit shall have Power Steering
1.13 This unit shall have Steering Ratio (:1), On Center 18.8 - 20.9
1.14 This unit shall have Steering Ratio (:1), At Lock 18.8 – 20.9
1.15 This unit shall have Turning Diameter – Curb to Curb 33.5 Feet
1.16 This unit shall have Turning Diameter – Wall to Wall 38.8 Feet
1.17 This unit shall have Power Brakes
1.18 This unit shall have ABS System 4 – Wheel
1.19 This unit shall have Rear Wheel Drive Train
1.20 This unit shall have Air Conditioning
1.21 This unit shall have AM/FM CD Radio with Clock
1.22 This unit shall have Power Windows and Door Locks

2. Engine and Transmission

2.1 The engine on this unit shall be a minimum of 6.0 liter, V8, SAE 297 horsepower at 4300rpm, SAE Net Torque 372 horsepower at 4000rpm Compressed Natural Gas (CNG) engine.
2.2 This unit shall be equipped with a 6L90-E Hydra-Matic Transmission
2.3 This unit shall have a SPFI fuel system
2.4 This unit shall have an Engine Oil Cooler
2.5 This unit shall have an engine governed speed of 3050rpm
2.6 This unit shall have Cold Cranking Amps at 0 degrees F (Primary) 750
2.7 This unit shall have Maximum Alternator Capacity (amps) 145

3. Alternative Fuel System - Compressed Natural Gas (CNG)

3.1 This unit shall have the CNG HPP System.
3.2 This unit to have CNG Fuel tank with a minimum 30 Gasoline Gallon Equivalent (GGE) Capacity.
3.3 This unit shall have Type 4 ANSI/NGV2-07 Approved 30 or 60 Gallon Tank Configuration.

4. Sweeper Dimensions

4.1 The approximate height of this unit shall be 92”
4.2 The approximate width of this unit shall be 82’
4.3 The approximate length of this unit shall be 227”
4.4 The approximate empty weight of this unit shall be 8,330 lbs.
4.5 The overall sweeping width of this unit with both left and right gutter brooms shall be approximately 102”

5. Sweeper System Power

5.1 The units sweeper power shall be powered by hydraulic system without an auxiliary engine. The main hydraulic pump to be integrated with the chassis engine.
5.2 This unit shall have a HFP Hydraulic System
5.3 The main pump shall be a Pressure Compensated Piston MVP45
5.4 The Hydraulic Reservoir capacity shall be minimum 30 gallons.
5.5 The hydraulic fluid flow shall be 20gpm at the maximum rpm.
5.6 The Maximum Pressure shall be 3,500 PSI
5.7 The Return Filter shall be a KZ-10
5.8 The Pressure Filter shall be a MZ-10
5.9 The Sweeper Head shall have Cylinders 1.5 x 6, 2000 lbs.

6. Fan Unit

6.1 The fan unit shall be a 8 Blade High Flow Cambered with lining Type.
6.2 The fan unit material shall be 10g A36 Side Plates, 3/16 Blades
6.3 The fan unit liner shall be rubber 1/8 x 1/16, 2 ply belting
6.4 The fan unit shaft size shall be 1 ¼ Stress Proof G & P
6.5 The fan unit Bearings shall be 1 ¼ 2 Blot Flange
6.6 Fan size shall be 24”
6.7 The fan unit shall have a direct drive fan coupling
6.8 The fan unit exterior shall be Powder Coated.
6.9 The fan motor shall be Axial Gear Fixed Displacement

7. Hopper

7.1 The hopper unit on this machine shall have a capacity of 5.0 cubic yards.
7.2 The hopper unit on this machine shall be constructed of 3CR12 Stainless Steel.
7.3 The screen shall be Non-clogging
7.4 The Screen Material shall be #9 – ¾ Expanded Metal
7.5 The hopper shall have passenger side pick – up
7.6 The hopper shall have a hopper drain
7.7 The hopper exterior shall be Powder Coated
7.8 The hopper shall have a rubber whale tail
7.9 The hopper shall have Dump Head Cylinders 3 X 18, 18,000 lbs.

8. Gutter Brooms

8.1 This unit shall be equipped with both left and right side gutter booms
8.2 The diameter of the left and right side gutter brooms shall be 16”
8.3 The left and right gutter brooms shall be vertical digger type
8.4 The left and right gutter brooms shall be Free Floating Spring Extension
8.5 The left and right gutter brooms shall be poly.
8.6 The left and right gutter brooms shall have Fixed Displacement Gear Motor, Displacement – 2.8 cubic inches maximum.

9. Dust Suppression System

9.1 The dust suppression system of his unit shall be equipped with an electric pump – 2.8 GPM
9.2 The dust suppression system of this unit shall be equipped with a 100-gallon water tank.
9.3 The dust suppression system of this unit shall be equipped with a minimum of eight (8) Hollow Cone Mist nozzles.

10. Tool Box

10.1 The Tool Boxes shall be environmentally sealed with Dual Doors and light, rear mounted.
10.2 The Tool Boxes Doors shall be capable of being used as work tables.
10.3 The Tool Boxes shall have a locking latch
10.4 The Tool Boxes shall have a minimum combined capacity of 20.5 Cubic Feet
10.5 The Tool Boxes shall be fabricated in 14g Mild Steel
10.6 The Tool Boxes shall have a Powder Coated Finish

10. Lighting

11.1 The unit shall have three (3) Halogen Spot Lights
11.2 The unit shall have two (2) Clearance Lights
11.3 The unit shall have a third (3rd) Brake Light
11.4 The unit shall have an Amber Warning Beacon
11.5 The unit shall have a 17” LED Bar Light

12. Electrical – Sweeper

12.1 The unit shall have CAN bus Keypad with Heads Display to control the Sweeper
12.2 The unit shall have a “Sweep Mode/Road Mode” Switch to control pump functions
12.3 The unit shall have adjustable cab mounted control for proportion and pressure settings
12.4 The unit shall have in cab Power Level Control Display with “Sweep Mode” indicator light
12.5 The unit shall have “last setting memory “ feature
12.6 The unit shall have a five (5) second ramp – up delay upon switching to “Sweep Mode”
12.7 The unit shall blade type automotive fuses
12.8 The unit shall have duestch style water tight connections on hydraulic control valve coils

BID SPECIFICATIONS

MINIMUM SPECIFICATIONS – 3 CUBIC YARD
NITEHAWK OSPREY II OR EQUIVALENT

1. Cab and Chassis

1.1 The gross vehicle rating of this unit shall be 9,200 lbs.
1.2 The front axle of this unit shall be rated for 4,400 lbs.
1.3 The rear axle of this unit shall be rated for 6,200 lbs.
1.4 This unit shall have a minimum wheelbase of 133.7 inches
1.5 This unit shall have Front Independent Suspension
1.6 This unit shall have Rear Multi-Leaf Suspension
1.7 This unit shall have Front Independent Axle
1.8 This unit shall have Rear Semi Floating
1.9 This unit shall have LT245/75R17 Tires on the Front
1.10 This unit shall have LT245/75R17 Tires on the Rear
1.11 This unit shall have Power Steering
1.12 This unit shall have Steering Ratio (:1), Overall N/A
1.13 This unit shall have Steering Ratio (:1), On Center 3.57
1.14 This unit shall have Turning Diameter – Curb to Curb 44.9 Feet
1.15 This unit shall have Turning Diameter – N/A
1.16 This unit shall have Power Brakes
1.17 This unit shall have ABS System 4 – Wheel
1.18 This unit shall have Rear Wheel Drive Train
1.19 This unit shall have Air Conditioning
1.20 This unit shall have AM/FM CD Radio with Clock
1.30 This unit shall have Power Door Locks

2. Engine and Transmission

2.1 The engine on this unit shall be a minimum of 6.0 liter, V8, SAE 322 horsepower at 4400rpm, SAE Net Torque 380 horsepower at 4200rpm Gasoline
2.2 This unit shall be equipped with a MYD Automatic Transmission
2.3 This unit shall have a Electronic Fuel Injection fuel system
2.4 This unit shall have an Engine Oil Cooler
2.5 This unit shall have Cold Cranking Amps at 0 degrees F (Primary) 600
2.6 This unit shall have Maximum Alternator Capacity (amps) 125

3. Sweeper Dimensions

3.1 The approximate height of this unit shall be 79”
3.2 The approximate width of this unit shall be 87”
3.3 The approximate length of this unit shall be 232”
3.4 The approximate empty weight of this unit shall be 6,100 lbs.
3.5 The overall sweeping width of this unit with both left and right gutter brooms shall be approximately 102”

4. Sweeper System Power

4.1 The units sweeper power shall be powered by hydraulic system without an auxiliary engine. The main hydraulic pump to be integrated with the chassis engine.
4.2 This unit shall have a HFP Hydraulic System
4.3 The main pump shall be a Pressure Compensated Piston MVP45
4.4 The Hydraulic Reservoir capacity shall be minimum 30 gallons.
4.5 The hydraulic fluid flow shall be 20gpm at the maximum rpm.
4.6 The Maximum Pressure shall be 3,500 PSI
4.7 The Return Filter shall be a KZ-10
4.8 The Pressure Filter shall be a MZ-10
4.9 The Sweeper Head shall have Cylinders 1.5 x 6, 2000 lbs.

5. Fan Unit

5.1 The fan unit shall be a 8 Blade High Flow Cambered with lining Type.
5.2 The fan unit material shall be 10g A36 Side Plates, 3/16 Blades
5.3 The fan unit liner shall be rubber 1/8 x 1/16, 2 ply belting
5.4 The fan unit shaft size shall be 1 ¼ Stress Proof G & P
5.5 The fan unit Bearings shall be 1 ¼ 2 Blot Flange
5.6 Fan size shall be 24”
5.7 The fan unit shall have a direct drive fan coupling
5.8 The fan unit exterior shall be Powder Coated.
5.9 The fan motor shall be Axial Gear Fixed Displacement

6. Hopper

6.1 The hopper unit on this machine shall have a capacity of 3.0 cubic yards.
6.2 The hopper unit on this machine shall be constructed of 3CR12 Stainless Steel.
6.3 The screen shall be Non-clogging
6.4 The Screen Material shall be #9 – ¾ Expanded Metal
6.5 The hopper shall have passenger side pick – up
6.6 The hopper shall have a hopper drain
6.7 The hopper exterior shall be Powder Coated
6.8 The hopper shall have a rubber whale tail
6.9 The hopper shall have Dump Head Cylinders 3 X 14, 14,000 lbs.

7. Gutter Brooms

7.1 This unit shall be equipped with both left and right side gutter booms
7.2 The diameter of the left and right side gutter brooms shall be 16”
7.3 The left and right gutter brooms shall be vertical digger type
7.4 The left and right gutter brooms shall be Free Floating Spring Extension
7.5 The left and right gutter brooms shall be poly.
7.6 The left and right gutter brooms shall have Fixed Displacement Gear Motor, Displacement – 2.8 cubic inches maximum.

8. Dust Suppression System

8.1 The dust suppression system of his unit shall be equipped with an electric pump – 2.8 GPM
8.2 The dust suppression system of this unit shall be equipped with a 100-gallon water tank.
8.3 The dust suppression system of this unit shall be equipped with a minimum of eight (8) Hollow Cone Mist nozzles.

9. Tool Box

9.1 The Tool Boxes shall be environmentally sealed with Dual Doors and light, rear mounted.
9.2 The Tool Boxes Doors shall be capable of being used as work tables.
9.3 The Tool Boxes shall have a locking latch
9.4 The Tool Boxes shall have a minimum combined capacity of 12 Cubic Feet
9.5 The Tool Boxes shall be fabricated in 14g Mild Steel
9.6 The Tool Boxes shall have a Powder Coated Finish

10. Lighting

10.1 The unit shall have two (2) Halogen Spot Lights
10.2 The unit shall have two (2) Clearance Lights
10.3 The unit shall have a third (3rd) Brake Light
10.4 The unit shall have an Amber Warning Beacon
10.5 The unit shall have a 17" LED Bar Light

11. Electrical – Sweeper

11.1 The unit shall have CAN bus Keypad with Heads Display to control the Sweeper
11.2 The unit shall have a "Sweep Mode/Road Mode" Switch to control pump functions
11.3 The unit shall have adjustable cab mounted control for proportion and pressure settings
11.4 The unit shall have in cab Power Level Control Display with "Sweep Mode" indicator light
11.5 The unit shall have "last setting memory " feature
11.6 The unit shall have a five (5) second ramp – up delay upon switching to "Sweep Mode"
11.7 The unit shall blade type automotive fuses
11.8 The unit shall have duestch style water tight connections on hydraulic control valve coils

OFF-LOAD INSTRUCTIONS

Thank you for your recent purchase of a NiteHawk Sweeper, the most cost effective sweeper you can buy. The sweeper units may arrive on a tractor/trailer transport with the flatbed trailer either being dock height (48”) or step deck (30”). These instructions are provided as a help in the off-loading process of your sweeper.

1. If you do not have a loading dock with a grade level ramp attached, arrange for a local towing company to assist in the offloading process. A standard roll back tow truck, with a rear wheel lift is adequate for the task. The Raptor weighs approximately 9200 lbs, and the Osprey weighs approximately 7000 lbs.

2. The transport company will call 24 hours before the delivery time and again 2 hours before the delivery time to make arrangements to off-load. If you have questions, or need to give specific instructions or directions, please call NiteHawk Sweepers at 1-800-448-9364, and we will be happy to assist.

3. Upon arrival of the transport, inspect the unit and chassis. We take great care to ensure that your new sweeper arrives ready to sweep, but occasionally damage does occur during shipping. Any damages should be immediately reported to NiteHawk Sweepers, by calling 1-800-448-9364. We will work with you to correct any mishap that may occur.

4. After an inspection of the unit, please sign the Acceptance Sheet, Bill of Lading, and the Warranty Acceptance Sheet provided by the transport driver. After signing the acceptance sheets, please return them to the transport driver, along with any COD funds due. The transport driver will deposit the documents into a NiteHawk provided UPS overnight envelope that will be dropped in a UPS drop box the same day as the delivery. NiteHawk will administer your warranty upon receipt of the acceptance documents.

5. The off-loading process occurs in five steps:

   a. Align the roll back tow truck to the rear of the flat bed.

   b. Adjust the height of the tow truck deck to match the height of the flatbed trailer by moving the wheel lift up or down.

   c. Drive the sweeper unit off the flatbed trailer, unto the roll back tow truck deck.

   d. Move the roll back tow truck away from the flatbed trailer.

   e. Tilt the tow truck and drive the sweeper unit off.

Thank you for your business. Please sign below and return this acknowledgement, via fax, to 253-872-0772. If you have any questions, please feel free to call us at 1-800-448-9364.

I have received and understand the above off-loading instructions.

SIGNED_____DATE_____

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