

SPECIFICATIONS
A-B7-AX-A-AL

060900

TRUCK - CAB OVER (TILT CAB) - 37,000 LB GVWR (MIN), WITH POTHOLE PATCHER (060900)

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I. GENERAL TRUCK SPECIFICATIONS:

A. INTENT STATEMENT:

The purpose of these specifications is to describe a cab over (tilt cab) truck with single-rear-axle, two-wheel-drive, equipped with dual rear wheels and automatic transmission.

NOTE: Pennsylvania Department of General Services, PCID No. 1075, "*General Requirements for Bidding PENNDOT Vehicles/Equipment*", most current version effective at the time and date of bid opening, is included as a part of this specification. PCID No. 1075 may be reviewed and downloaded from the Department of General Services website, <http://www.dgs.state.pa.us>.

Delivery as required per Department of General Service PCID NO. 1075 Section "G". All units must be delivered within **270** days after receipt of the purchase order by the successful bidder.

Awarded OEM vendor shall be responsible for contacting the Specification Section of the Fleet

Management Division at (717) 787-1567 to set up a pre-build meeting for all chassis and body mounting component locations prior to chassis build. Any deviations to the specification must be granted in writing by the Chief of the Specification Section, previous acceptance will not be considered pre-approved. It shall be understood that any discrepancies/deviations between the specification and the completed unit(s), chassis or body up-fitter related, must be addressed and corrected prior to the delivery deadline and the Departments acceptances.

Unit shall be delivered clean, washed, with current PA state Inspection and a full tank of fuel.

All component manuals and weight distribution sheets shall be completed and supplied with the delivery of each unit.

Department representatives will review the final design of the unit before work begins on the pilot model.

The successful bidder will provide detailed drawings of the various systems, i.e., heating, electrical, hydraulic, etc.

The Department reserves the right to have its representative(s) periodically inspect each unit during assembly at the successful bidder's assembly point.

B. WEIGHT DISTRIBUTION:

Weight slip must be submitted with the Pilot Model.

It is understood that the components specified are minimum and if the truck manufacturer's Engineering Department recommends or deems necessary, due to their particular weight distribution, a larger component or a large GAWR totally, the burden of responsibility is hereby placed upon the manufacturer's Engineering Department to supply a unit that is totally engineered.

1. Frame
2. Axle
3. Tires
4. Steering unit components
5. Rims
6. Suspension
7. Brakes
8. Any other items as required

The dynamic and static loads created by the unit, plus operational stresses, must be reviewed to ensure the Commonwealth of a properly designed/engineered unit.

The vehicle shall be certified for 37,600 LB Gross Vehicle Weight Rating (GVWR). The GVWR shall be identified in the cab or on the door as the final complete certification label (minimum rating).

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I. GENERAL TRUCK SPECIFICATIONS: (Continued)

C. POWER TRAIN OVERVIEW:

LUBRICANTS FOR FRONT AXLE HUBS AND DIFFERENTIALS, AUTOMATIC TRANSMISSIONS, TRANSFER CASES AND ALL REAR DIFFERENTIALS SHALL MEET OR EXCEED ALL APPROPRIATE MIL AND SAE SPECIFICATIONS FOR SYNTHETIC LUBRICANTS AND SHALL HAVE ALL PLUGS IDENTIFIED AS SYNTHETIC OR PAINTED RED.

The following power train components are acceptable in the noted combination.

ENGINE DIESEL-, MIN. 365 HP AT GOVERNED RPM, MIN. PEAK TORQUE OF 1,340 LB/FT TORQUE.

TRANSMISSION – ALLISON AUTOMATIC, 4500RDS 6 speed Series.
Automatic transmission cooler lines shall be stainless steel or a **preapproved** no-rusting material.

REAR AXLE – 23,000 LB. Min. DANA, Meritor or Mack in accordance with the specification.

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I. GENERAL TRUCK SPECIFICATIONS: (Continued)

D. VEHICLE COMPONENTS:

1. AXLE FRONT:

14,600 LB capacity, minimum.

The front axle drag links and tie rods shall have grease zerks installed. Kingpin or bushings shall be grooved to permit grease flow. Sufficient tire clearance at maximum turning angles. Complete oil seal assembly, including hub, plug type window, and seal. Each unit shall receive a front-end alignment prior to delivery.

2. AXLE REAR:

23,000 LB capacity at ground each rear spring.

Suspension tailored to axle loads and adequate to sustain maximum GVW without overload or permanent set.

Aluminum or lightweight housing is unacceptable. Only heaviest duty housing will be accepted.

All rear axles must provide axle shafts with a minimum diameter of 2.19 inch at the spline. All rear axle(s) shall have an extended breather tube to prevent debris buildup from entering axle housing. There shall be a torque-proportioning traction-assist device, which is full locking within the differential housing. The device shall provide maximum traction to the rear wheels when actuated and shall be a self-relieving designed to prevent gear damage and/or axle shaft breakage under extreme service conditions. The traction-assist device shall be driver actuated by a dash mounted traction control switch.

Lubricants for all rear axles shall meet or exceed all appropriate MIL and SAE specifications for synthetic lubricants and shall have all fill plugs identified as synthetic oil, or painted red.

Stemco guardian or SKF Scotseal, Chicago Rawhide rear wheel seals, or approved equal. All axles shall have magnetic drain plugs.

This information shall be presented at the pre-build meeting.

Rear axle selection shall be made after the award and may be a mix of ratios as required. The successful vendor/manufacture shall present three (3) computer runs showing the three most likely ratios for consideration for a top speed range of 65 MPH max. Gear selections shall include probable gear selection to maintain a 5-8 mph speed during the seal coating operation.

3. BRAKE SYSTEM:

Full air in compliance with the most current FMVSS requirements.

The ABS shall incorporate a diagnostic fault switch that is capable of illuminating a fault light for diagnostic purposes. The switch shall be easily accessible and can be either dash or under-dash mounted. A dash-mounted display that will show all SAE message descriptions for the ABS is an acceptable means of diagnostics in lieu of the fault switch.

Rear Brakes: 16.5-inch x 7 inch "S" cam with quick-change type single or double pin. **(No substitute, standardization).**

Steer axle brake: Steer-axle-brake: 16.5-inch x 5 inch or a power front disc brake system providing equal performance. Quick-change type single or double anchor pin if drum type brakes are furnished.

Drum brakes shall have automatic slack adjusters and they shall be clearance-sensing type only, with adjustment on application of the brake. **(No substitute, standardization).** Backing plates shall be installed on all drum brakes.

Air compressor: Sized per manufacturer's recommendations.

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I. GENERAL TRUCK SPECIFICATIONS: (Continued)

D. VEHICLE COMPONENTS: (Continued)

3. BRAKE SYSTEM: (Continued)

Low air pressure indicator: Buzzer-type and dash light. Must meet current Federal DOT guideline requirements. Air gauge shall display in 5lb. increments. Digital numerical readout is acceptable. Air gauge and low air warning buzzer shall operate with key switch **on** and engine **off**. Function shall not have capabilities of being deactivated by the operator.

Vehicle shall have a parking brake.

Air dryer: With heater, mounted away from road splashing and a minimum of 20 inches above road surface. Dryer shall be compatible with the body company clearance requirements for sub-frame, valve body, etc. Ref. Meritor Wabco 1800 with coalescing filter installation made in concurrence with the air compressor manufacturer's recommendations.

Air dryer shall be placed to accommodate the changing of filter cartridges without disconnecting any hoses or removing dryer base from its mounting location. Final mounting location shall be determined at Pre-Build meeting (outside of frame rail). All electrical connectors for drain valve and air dryer shall be covered with heat shrink material or have sealed connections.

4. CAB TILT:

Steel or aluminum cab stamped and welded, tilt cab.

Seats: high grade air suspension driver seat that is available from OEM. Passenger seat non suspension. Bucket or Bench. Seat material shall be vinyl. All seating shall **have high visibility orange** seat belts.

Heater, manufacturer's highest output.

Tinted Safety glass throughout.

Dual sun visors.

Dual windshield defrosters.

Dual windshield wipers: Arctic wipers and heaviest, motor, arms and linkages available. Wiper blades, maximum length, shall follow windshield contours. They shall be minimum two (2) speed intermittent. Washer system shall be electric. Washer tank shall be a minimum capacity of two (2) quarts of washer fluid. It shall be filled with an anti-freeze type solvent. Washer fill point shall be located to be accessed from ground level, without overhead reaching. With unobstructed and unrestricted flow from a one-gallon jug.

Emergency triangle warning kit, with hold down.

KD-610-4645, KD Lamp Co. (Tel. (513) 621-4211), or equal, stowed (fastened) in the cab. There shall be a triangle storage bracket per EQN-66A mounted in the cab. Dual windshield wipers: Heaviest wipers, arms, motor and linkages available. Wiper blades, maximum length, shall follow windshield contours. Washer system shall be electric. Washer tank shall be a minimum capacity of one (1) qt. of washer fluid. It shall be filled with an anti-freeze type solvent.

Mirror(s) Drivers and passenger's side power mirrors. 6-inch x 16-inch, minimum, West Coast type with four (4) heavy duty extension arms. Mirrors and arms shall be stainless steel with mirror glass shock mounted and sealed. There shall be convex mirrors, rectangular 5.5-inch H x 8.5-inch W both sides. Arms, brackets and hardware shall be stainless steel, aluminum or chrome plated.

Air horn(s): minimum 1 with protective cover(s).

All controls and knobs shall be properly identified.

Inside dome light shall be provided.

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I. GENERAL TRUCK SPECIFICATIONS: (Continued)

D. VEHICLE COMPONENTS: (Continued)

4. CAB TILT: (Continued)

Fenders: Front fenders shall have extensions to cover the width of the front tires.

Fire extinguisher: Rechargeable, with vehicle mount. Mounted in the cab for easy and quick access. Ref. 3A:40BC (5 LB).

Top of the first step shall be at a maximum of 22 inch above the ground.

Grab handles shall be supplied on all cab entry locations. Three points of contact shall be achievable at all cab entry locations. Handrails shall be coated with non-skid paint (non-skid tape is unacceptable) or have OEM anti-slip rubber inserts, both non-skid paint or rubber inserts must extend the full length of the grab handle.

Exterior grab handles shall be supplied if available from OEM.

Steps: Drivers and passenger entrance steps: Shall be aluminum, serrated. **The outer step edge must be serrated in lieu of plain. (Overlay is not acceptable).** Step design material must be the same, both left and right side. Ref: Bustin.

Top of the first step shall be approximately 21 inch above the ground.

Step design material must be the same both left and right side.

AM/FM radio, with integral or individual clock.

Cab floor covering shall be heavy-duty rubber.

Air conditioning: manufacture's highest output.

Cruise Control

Halogen headlights, all other cab lighting shall be L.E.D.

Drivers and passenger side windows shall be non-powered manually operated (sliding windows will not be acceptable).

Reflectivity enhancement per EQN-127A

Anti-slip paint is required on all handholds, for the entire length, (tape is unacceptable) All handrails, ladders, and step configurations shall be built for three points of contact.

There shall be a permanent decal, 2-inch-high red letters on white background affixed by the driver side door handle stating the overall maximum travel height of the completed and unloaded unit.

(Example) HT-__' __" Ref. EQN-552

There shall be a permanent decal, "Three Point Contact" located at each entry point of the truck cab and at the bed ladder area per EQN – 552-1. Exact location to be determined at prebuild meeting.

Wiring Pass Through: All wiring entering the cab shall be made through a rubber boot assembly and be weather tight. There shall be no connectors in the wiring at the pass-through point. Wiring shall be protected against sharp edges and from rubbing / chaffing. Boot design shall be pre-approved.

5. CHASSIS:

37,600 LB GVWR, manufacturer's rating.

Cab-axle (CA) dimension: Shall be determined by the truck manufacturer and the body company.

Front Bumper: Mounted to the frame.

License plate bracket: Securely mounted with light.

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I. GENERAL TRUCK SPECIFICATIONS: (Continued)

D. VEHICLE COMPONENTS: (Continued)

6. LIGHTING SYSTEM:

All lights provided shall meet Pennsylvania Motor Vehicle Code. All lights shall be sealed, shock mounted. Wiring shall conform in gauge and color with ATA Standard. There shall be no connections made outside of a weatherproof box. Body lights shall have their own dedicated complete circuit. All lights shall be LED, except for halogen headlights.

Whelen Light Kit Part # PADOTSY8, Kit contains the following lighting. EQN – 120Q

- 1) 01-0687181A1PA (R10PADOT) Light Bar to be pedestal mounted on the driver's side. In no case shall the light bar be mounted on the roof of the vehicle.
- 2) 01-066A797-A1H (M6AD) Amber warning lights with brush guard mounted to the rear of bed
- 2) 01-066B1866R1J (M6BTDD) Stop, Tail, Turn lights with brush guard
- 2) 01-066B160112G (M6BUD) Back-up lights with brush guards
- 6) 01-046C334-000 (M6BRUSH) Brush guards.
- 4) 01-066D363310D (IONAD) Amber warning lights, grommet mounted, flush mounted 1 to each side (middle/center) of bed and 2 flush grommet mounted and equally spaced in the front grill per EQN – 120Q. All amber warning lights (rear amber, ION and light bar) are to be wired in conjunction on the same illuminated and permanently labeled switch.
- 4) 01-046D378-00B (IONGROM) Grommet Kits
- 10) 01-0416467-410 (W441D) Harness side mating Deutsch connectors.

The above lights are supplied with male and female Deutsch connectors that shall be utilized to connect the vendor supplied harness to each light source.

There shall be a Truck-Lite Model# 36140C LED license plate light with light bracket PN# 36710. (Installed) Body builder to supply remaining marker and ICC lighting, they shall be protected against damage and shall also be shock mounted. Connections shall be watertight. All Body lighting shall be LED.

The Warning lights / Light bar shall have a lighted, permanently labeled toggle switch located in the dash. Body wiring shall be Grote, Trucklite, or Prior Approved Equal.

There shall be no splices outside of a sealed box or fixture.

A color-coded electrical wiring chart and schematic shall accompany each body.

7. DRIVE LINE:

Main driveline: Spicer Life XL or Meritor MXL Series. "Factory balanced" greasable, (one zerk minimum). Heavy-duty driveline shall be engineered and be compatible to engine, drive train and transmission torque. Heavy-duty center bearing, if required, with due consideration to drive shaft angles, length, location, proper bolting based upon engine and transmission selection. Inter-axle driveline: Spicer Life XL or Meritor MXL Series.

8. ELECTRICAL:

Batteries: Two (2), heavy-duty, 12-volt. 1070.

Battery Mounting: It shall include the following:

- a.) 0.250-inch-thick rubber shock pad under the battery.
- b.) Box with cover. Cover shall be constructed of fiberglass, poly, or aluminum (if aluminum, there shall be an insulating liner).
- c.) Mounting bolts, grade 8, with self-locking nuts.

Mounting of accessories within the battery box is prohibited. Fuses and circuit breaker shall be labeled.

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I. GENERAL TRUCK SPECIFICATIONS: (Continued)

D. VEHICLE COMPONENTS: (Continued)

8. ELECTRICAL: (Continued)

All OEM connections within the battery box shall have attached non-metallic embossed labels/tags. Labels/tags applied with self-adhesives or stickers will not be accepted.

Mounting of accessories within the battery box is prohibited. Any connections that are essential in the battery box must be pre-approved by the Chief of the Specification unit at the Fleet Management Division in writing (717) 787-1567. Any circuit deemed necessary for connection in the battery box by the body up fitter or component manufacturer shall have attached non-metallic embossed labels/tags. Labels/tags applied with self-adhesives or stickers will not be accepted.

All circuits shall be individually permanently labeled.

Cables shall conform to RCC Practice 105 with "sealed" terminal ends for stud-type battery posts.

Electrical system: Circuit-breaker-equipped in easily accessible location weatherproof Fuses are acceptable in circuit so identified by manufacturer as safety factor. Any fuse or circuit-breaker liable to be damaged during truck operation shall have an easily removable protective cover. All wire splices must be heat shrink material. Ref: Thomas & Betts Tel: (201) 707-2145.

Alternator: Delco 36SI (No substitute, Standardization) 160 A minimum, high performance, solid state (brushless).

Starter motor: Delco 39 MT (No Substitute, Standardization) with thermal over-crank protection and high torque capacity. Suitable for the diesel engines offered as per starter manufacturer's recommendation.

Radio Antenna: There shall be an antenna base, PCTEL Maxrad NMO-52-360-XX-N and a VHF StiCO Roof-FT-NITI-M whip shall be cut to 18.0 inches per manufactures cut sheet. Assembly shall be mounted to the stationary beacon light bracket, (to the street side, of the light bar) with the antenna cable routed (within protective conduit) to the floor area between the seats. There shall be a minimum of 4 feet of antenna cable coiled at the base of the floor to allow for connection of radio on spreader control pedestal. Antenna shall be prewired with a UHF MALE connection. **(No substitute, standardization)**. Antenna shall be mounted to not interfere with cab shield.

Power Distribution Center: There shall be a 4-way power/ground distribution center located near the console for connection of 800 MHz state radio. The lugs shall be labeled and configured in the following manner: (1) lug shall be a 30-ampere constant hot circuit, (1) lug shall be a 10-ampere ignition-controlled circuit. (2) lugs shall be chassis ground. All connections shall be enclosed in a weatherproof enclosure: EQN-120Q

Each circuit shall be supplied individually, labeled, properly sized, protected from weather and sealed to be watertight.

Electrical wiring: Chassis and body wiring harness shall be protected at areas prone to cause chafing by installing convoluted plastic conduit and clamped using steel band clamps with rubber inserts.

Power supply for two-way radio: Dash mounted. Supplied at the dash. EQN-78

There shall be no wire splices outside of a sealed weatherproof box.

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I. GENERAL TRUCK SPECIFICATIONS: (Continued)

D. VEHICLE COMPONENTS: (Continued)

9. ENGINE:

Replaceable heavy-duty, full-flow type fuel filter(s) and oil filter(s) as recommended by the engine manufacturer, bearing a legible OEM part number.

Cooling system: The system shall be the largest factory engine cooling capacity, compatible with engines and transmissions referenced for continuous high engine output under extreme temperatures and/or operating conditions due to prolonged operation in low gears. The water pump shall be adequately sized to provide proper cooling and be of sufficient size to accommodate the larger pulley to adequately handle the specified options. Shall be fitted with provisions for visually monitoring coolant without necessitating removal of the cap from the radiator or expansion tank (e.g., sight glass, transparent expansion tank). The antifreeze solution shall meet all applicable EPA requirements. A non-charged spin-on coolant filter shall be installed if required by engine manufacturer.

Automatic idle shutdown shall be set to five (5) minutes. An audible warning alarm shall be provided to alert operator prior to engine shutting down. Automatic idle shutdown shall be programmed to be overridden when the PTO Mode is engaged.

ECM shall be set to a maximum of sixty-five (65) miles per hour.

Governor: Set at manufacturer's recommended maximum engine speed (rpm).

Engine Heater: Immersion in-block type for cooling flush-mounted in an accessible location at the outside the cab/hood. 115 volt, 3-prong plug. The electrical cable from the heater to plug shall be one-piece and waterproof. Fan: Thermostatically controlled viscous type or manufacturer's recommended automatic fan.

Screening system: Mounted in front of radiator grill that protects radiator from stones and bugs. System to be approved by engine and truck manufacturer(s).

Air Cleaner: Air filter shall be manufacturer's heaviest air filter that meets all requirements of an extended engine warranty.

Diesel Fuel Filter: There shall be a DAVCO 382, or a 482-filtration unit installed and mounted (Higher than fuel tank) per manufactures recommendations in a location to accommodate filter replacements, yet be protected from road debris **(No substitute, standardization)**. Mounting location to be determined at pre-build meeting.

Davco 382 Unit shall be equipped with engine coolant heat and 120-volt heater circuit. The 120-volt circuit and engine block heater shall be powered via the same electrical connection. **(No substitute, standardization)**

Davco 482 shall be equipped with a 12 volt and 120-volt heater circuit. 12-volt heater circuit will activate with the ignition key switch, the 120-volt heater circuit and engine block heater shall be powered via the same electrical connection. **(No substitute, standardization)**

Engine shall be equipped with a minimum 2 stage, full engine compression brake, **Brake lights shall activate when engine brake is activated Ref: Jacobs.**

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I. GENERAL TRUCK SPECIFICATIONS: (Continued)

D. VEHICLE COMPONENTS: (Continued)

10. EXHAUST:

DPF (diesel particulate filter) and exhaust system shall meet the latest EPA emission requirements. Vertical tailpipe with elbow and muffler system or horizontal muffler and vertical tail pipe with elbow.

Exhaust system shall neither interfere with the operation of the body or equipment, nor shall it be close to any fluid tank. The tail pipe shall be installed in a manner that will keep the muffler and tail pipe away from body. The flex in the body, when operating on an uneven terrain, must be considered in the design. The DPF, muffler and tail pipe shall be shielded or insulated to protect personnel from burns when entering or exiting the cab. The shield shall be 180 degrees to 360 degrees and shall be of non-rust able material such as stainless steel or aluminum. Ref: Riker or equal.

11. FAST LUBE OIL CHANGE SYSTEM (FLOCS):

This FLOCS system shall be installed with all fittings, brackets, clamps and hoses. Hose from oil pan to FLOCS fitting shall be hydraulic hose with a 100R2 rating and properly secured. The system shall be compatible with all fittings presently used by the Department. The final placement of the male half of the snap coupler, on the equipment, shall be determined at the pre-build meeting. Ref: EQN-351A.

12. FRAME:

700,000 RBM (minimum).

No welding shall be done, and no holes drilled on the main frame rails without approval of the frame manufacturer.

The vendor shall select main frame rails of adequate length to suit the body.

Underride protection per EQN-118.

Welded or bolted frame extensions are not acceptable.

13. INSTRUMENTATION:

All instruments and gauges shall be illuminated and dash-mounted, except where specified otherwise. All standard instruments shall be supplied, including, but not limited to the following:

Oil pressure gauge with warning light or audible alarm.

Air pressure gauge(s) for dual circuit, dual indicator with low-pressure audible alarm and warning light.

Coolant temperature with warning light or audible alarm.

Transmission oil temperature gauge with warning light or audible alarm.

Fuel gauge.

Hour meter that records only when the engine is running. In – dash, integral with instrument panel and readable from the operator's seat.

DEF level gauge.

Speedometer with odometer and a dual speedometer lead to interface with the ground speed spreader control system.

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I. GENERAL TRUCK SPECIFICATIONS: (Continued)

D. VEHICLE COMPONENTS: (Continued)

13. INSTRUMENTATION: (Continued)

Low air pressure indicator: Buzzer-type and dash light. Must meet current Federal DOT guideline requirements. Air gauge shall display in 5lb. increments. Digital numerical readout is acceptable. Air gauge and low air warning buzzer shall operate with key switch **on** and engine **off**. Function shall not have capabilities of being deactivated by the operator.

Tachometer.

Voltmeter.

Parking brake indicator light.

Hydraulic fluid level gauge shall be installed within the dash face, exterior installation will not be accepted.

Air Restriction Gauge: Vehicle OEM equipped electronic dash that incorporates an air restriction gauge or indicator light, shall be required.

14. PAINT:

Cab shall be painted with OEM manufactures standard painting process PENNDOT yellow Ref: DuPont F9885, PPG 85246, Sherwin Williams 73266, Sikkens 4017 and NAPA 73266 for shade only. Entire cab except for glass, rubber and those metallic accessories or fixtures constructed of rust-resistant (Aluminum and Stainless Steel) or plated material not normally painted. Base coat and clear coat. Ref: Axalita Imron for durability

OEM frame manufactures standard procedures shall be acceptable, all underside and attached components shall be ground to eliminate weld splatter, scale, sharp edges, rust and oils prior to a rust preventive primer and topcoat of black paint. Powder coating is acceptable. Rims shall be painted as specified in the tire and wheel section of this specification.

Body up fitter prior to painting **all** body and upfit attachments shall be ground to eliminate splatter, scale, and sharp edges. All metal surfaces shall be cleaned to eliminate rust and oils prior to primer and final painting. All surfaces to be primed and painted, except for glass, rubber and those metallic accessories or fixtures constructed of rust-resistant (Aluminum and Stainless Steel) or plated material not normally painted shall be coated with one (1) coat of a rust preventive etching primer, (1) coat of epoxy primer and two (2) coats of the body up fitters lead free Acrylic urethane black paint to match frame. Aerosol can touch up paint and primer will not be accepted and will be rejected at the time of delivery inspection.

Pothole patcher equipment shall be the same color as the cab.

15. SAFETY:

ECCO 450 back up alarm installed with rubber grommet (**No substitute, standardization**)

Cab shall have reflective enhancement per EQN-127A.

Anti-slip paint is required on all handholds, for the entire length, (tape is unacceptable). All handrails, ladders, and step configurations shall be built for three points of contact.

There shall be a permanent decal, 2-inch-high red letters on white background affixed by the driver side door handle stating the overall maximum travel height of the completed and unloaded unit. (Example) HT-__' __" Ref. EQN-552.

There shall be a permanent decal, "Three Point Contact" located at each entry point of the truck cab and at the bed ladder area per EQN – 552-1. Exact location to be determined at prebuild meeting.

Steps: Shall be serrated. The outer step edge must be serrated in lieu of plain. (Overlay is not acceptable). Step design material must be the same, both left and right side. Ref: Bustin.

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D. VEHICLE COMPONENTS: (Continued)

15. SAFETY: (Continued)

There shall be two-wheel chocks per truck Ref: buyers WC1467 or equal with a rope. Mounting location will be determined at pre-build meeting.

All corners shall be angled or rounded for safety.

There shall be a triangle warning kit mounted in the cab.

Fire extinguishers 3A:40BC 5lb. rechargeable with vehicle mount. Mounted in the cab for easy and quick access. Ref: EQN-66A, EQN-82.

The side of the patcher shall have (both sides), entire length red/silver continuous backing 2-inch-wide material. Reflexite Conspicuity 11 System or 3M Scotchlite Conspicuity Sheeting Series 980. Additionally, conspicuity tape shall be placed across the rear.

16. STEERING:

Dual integral or single integral type hydraulic power steering.

The pump shall not be the integral filter type unit.

Steering system (e.g., flow, pressure, relief valve etc.) shall be selected considering the full front-GAWR axle loading. Ref: ROSS or SHEPPARD gear assembly.)

Hydraulic supply pump, vane type or roller type supply pump with sufficient oil flow to permit one (1) steering wheel revolution per second with front axle loaded to rated capacity, in a "park" condition.

Power Steering Reservoir, "remote mounted", incorporating a filter which is easy to remove and replace. The remote filter referenced above shall be factory mounted.

The remote filter referenced above shall be factory mounted.

Glidecoat steering shaft, Bendix wedge lock lube-for-life shaft or ZF type steering shaft.

17. TANK - FUEL:

Safety - type fuel tank as per the requirements of FMVSS.

80-GAL minimum total capacity. **Dual Tanks are unacceptable.**

Heavy duty mounting straps with rubber shims/liners.

Tank Mounting Hardware and brackets shall be for "severe duty" applications. Heavy-Duty aluminum or stainless-steel minimum 1.9-inch-wide straps with rubber shims/liners shall be utilized.

Accessible fill pipe (located at either end of tank to avoid interference with steps).

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I. GENERAL TRUCK SPECIFICATIONS: (Continued)

D. VEHICLE COMPONENTS: (Continued)

18. TIRES/WHEELS:

The truck shall be equipped with hub piloted steel disc wheels for tubeless tires. The wheel end shall be equipped with outboard cast brake drums, and 15-degree tubeless steel wheels, hub piloted, 10 hole - 285.75mm bolt circle with 22mm two-piece flange nuts.

Front: Wheels: 22.5 x 9.00, 10 hole - 285.75mm bolt circle with 220mm bore, tubeless steel disc wheel rated at 10,000 LBS at a maximum inflation pressure of 120 PSIG. Accuride part number 29039 or 50344PG. **(No substitute, standardization).**

Rear: Wheels: 22.5 x 9.00, 10 hole - 285.75mm bolt circle with 220mm bore, tubeless steel disc wheel rated at 10,000 LBS at a maximum inflation pressure of 120 PSIG. Accuride part number 28828 or 50344PG. **(No substitute, standardization).**

The dual rear wheel/tire assembly shall have clearance between the tires, which permits the use of dual tire chains.

Wheel-Guard Separators: The wheel ends shall be equipped with the Accuride part number 5903 Wheel Guard Separator as follows:

Front axle - between the wheel and the brake drum.

Rear axle - between the inner dual and the brake drum and between the inner and outer duals.

Paint: The wheels shall be topcoat painted with TGIC Polyester Powder Paint MLD-82008 High Gloss Gray or equal applied over Cathodic Electro-Disposition Gray Primer.

Tires: Drive tires shall be mud/snow tread. All tires shall be radials and have minimum 25/32 thread depth.

Front Tires: 315/80R22.5 Min. Load range L

Rear Tires: 315/80R22.5 Min. Load range L

MANUFACTURER

Goodyear

Michelin

Bridgestone

19. TRANSMISSION:

ALLISION AUTOMATIC, 4500RDS 6 speed Series.

All vehicles shall have a transmission (auto) operated safety starting switch that will avoid engine starting with drivetrain in gear.

Unit shall be programed to require a service brake application for transmission to shift into any gear from neutral.

Dash mounted console with push button shift selector or steering column mounted stalk style selector.

An external, Allison approved cooling system shall be installed. Cooler shall be sized to keep the transmission fluid at an acceptable operating temperature (Water to oil type cooler). Automatic transmission cooler lines shall be stainless steel, Braided hoses will not be accepted, and all plumbing shall be routed to prevent rub-through with hanging brackets and P-style clamps.

All transmission modules shall be routed and installed in the cab.

20. ON BOARD GREASE SYSTEM

There shall be a centralized-on board chassis lubrication system installed, manufactured by SKF Lincoln Industrial Model# 94012 **(No Substitute, standardization)** Ref: EQN-501.

SPECIFICATIONS
A-B7-AX-A-AL

II. AUTOMATED POTHOLE PATCHER:

A. OVERALL DIMENSIONS:

Length - Boom in travel position – maximum 24 feet (approx.)
Length - Boom down, retracted - minimum 30 feet (approx.)
Length - Boom down, extended – minimum 35 feet 5 inch (approx.)
Width - 85.5 inch (approx.)
Clearance Height - 12 feet (approx.)
Dimensions are approximate depending on truck application.

B. AGGREGATE HOPPER BODY:

Heavy gauge 5.0 cubic yard water level capacity, welded, hopper type with adjustable feed control turnbuckle on driver side. Air pressurized delivery for minimal moving and wear parts. Hinged steel lid for cover. Tarpolian lid.

C. AGGREGATE FEEDER:

Shall be an air lock system.

D. AIR DELIVERY:

4-inch x 6-inch-high volume, low pressure, lobe-type blower with jack shaft drive from truck power take-off capable of producing 300 cfm (Transmission PTO).

E. AGGREGATE DELIVERY HOSE:

Acceptable hoses 3-inch I.D. Parker Super Flex 7363-3000 industrial material handling hose or 3-inch I.D. Boston Sabertooth H034748-100 industrial material handling hose, or preapproved equal. Aggregate hose shall be routed and secured to prevent low spots and run straight as possible to avoid excessive bends. Hose shall be protected at boom pivot point from pinching and hose collapse.

F. DELIVERY NOZZLE:

Steel mixing chamber with removable spray nozzles.

G. AIR FILTER:

Two stage, replaceable filter element dry-air cleaner.

H. BOOM:

One-piece, double acting boom. Location, center front mount on .500-inch steel plate bumper, reinforced and welded. Quick lock hose clamps for delivery hose. Boom controls front mount - cab mounted electrical control by stick for boom extension, swing and hoist.

SPECIFICATIONS
A-B7-AX-A-AL

II. AUTOMATED POTHOLE PATCHER: (Continued)

I. HYDRAULICS:

PTO operated. An electric-clutch operated system can be offered in lieu of a pony engine. If a pony engine is utilized; it shall be a water-cooled engine.

Cylinders: (2) 3-inch x 16-inch double acting, single stage.
(1) 2.50-inch x 96-inch double acting, single stage.

Hose: Thermoplastic hydraulic hose - meets SAE spec. I00-R7.

2000 PSI working pressure. 8000 PSI burst pressure minimum.

30-GAL hydraulic reservoir with provisions to drain and clean at recommended service intervals. 10-micron, tank immersed hydraulic filter to withstand flows of 50 GPM at 100 PSI. Element replaceable through tank cover.

J. EMULSIFIED ASPHALT DELIVERY:

Air pressurized delivery at 60 PSI minimum. Petroleum resistant delivery hose with push-on fittings. 400 gal minimum horizontally mounted asphalt storage tank. ASME certified foam insulated tank and hoses. Heater element - 220 volt. Cab mounted asphalt delivery control valve. Fill opening shall be 8-inch diameter fill hole with safety cap. Delivery lines to have simple-to-operate cleaning/blow-out system.

K. POWER TAKEOFF:

Rated X-Heavy Duty 2 gear/single speed. Electric shift from cab control. Chelsea, 271 series, if applicable.

L. FLUSH TANK:

30-GAL air pressurized. To withstand 100 PSI mm. working pressure and stamped per ASME code Section 8, Division 1. Pressurized from vehicle air supply protected by priority valve and regulator valve.

M. CONTROL PANEL:

Cab floor mounted steel box type panel with easy driver access and driver positioning feature. Each function protected by push-to-reset circuit breakers.

SPECIFICATIONS
A-B7-AX-A-AL

II. AUTOMATED POTHOLE PATCHER: (Continued)

N. LED ARROW BOARD:

Intent Statement:

This specification is to provide minimum requirements for LED illuminated, self-contained, arrow panel which is to be used on a truck in the Commonwealth to direct and warn traffic of lane closures, roadway diversions and slow-moving maintenance operations. The purpose of these specifications is to describe a warning traffic control unit which shall consist of an all-weather sign panel containing illuminated directional arrow with indicators capable of being readily understood from a distance of one mile minimum during either daytime or nighttime operation. The unit shall be mounted on the rear of a vehicle and shall be remote-controlled from the cab. The unit shall be used on public streets and highways in the Commonwealth to direct and to warn traffic of lane closures, road diversions, and slow-moving maintenance operations. Only arrow panel models that have been reviewed in accordance with this specification and for which a Certificate of Approval has been issued by the Department shall be used or offered for sale or use on any public highway within the Commonwealth.

- Message board manufacture must have a repair facility within the Commonwealth.
- **Unit model must be approved and listed for use on PA Bulletin 15.**

Arrow Panel:

Arrow panel: shall be sandwich type and 15 lamps, LED, shall be mounted on it. Panels shall be fabricated from 0.063-inch-thick aluminum sheets of grade 3003H14 riveted to 3-inch aluminum channels. An access panel shall be provided on the rear of the sign panel to allow access to any internal electronic components or wiring connections. The arrow board controller shall be contained in the arrow panel with a wired remote in the cab of the truck.

Weather Resistance: The arrow panel on which lamps are to be mounted shall be fabricated with adequate internal stiffening and shall be sealed at the edges and all openings so as to be weather or water resistant, except weep holes shall be provided in the bottom of the panel to permit drainage of condensation.

Aluminum panels shall be etched and finished with a minimum of two coats of non-reflective flat black enamel on front and back surfaces.

Panels shall be 48-inch-high x 96 inch wide (+/- 1 inch).

The perimeter frame and internal vertical members shall be from extruded aluminum alloy .250-inch-thick x 3-inch x 1 inch, minimum, a minimum of two (2) spacers, maximum 30 inch apart. Internal cross members and/or stiffeners shall be heli-arc welded or riveted using 1.5-inch x 1.5-inches x 3-inch aluminum angles with four (4) rivets minimum, per angle. The panel shall be adequately mounted and braced against vibration and shock.

The frame supporting the sign shall be fabricated from 2-inch x 2-inch steel tubing with a wall thickness minimum of .250 inch. The frame members shall be bolted or welded together.

SPECIFICATIONS
A-B7-AX-A-AL

II. AUTOMATED POTHOLE PATCHER: (Continued)

N. LED ARROW BOARD: (Continued)

Sign Lamps:

The lamp case shall have a weep hole to allow the escape of moisture. The lamp assembly of each LED lamp shall be so constructed and enclosed as to exclude moisture that would affect the specified operation of the light. The lamps shall be par 46 (5-inch diameter) LED. The lamp housing shall be constructed of high impact acrylic.

The LED lamps shall incorporate a pulse burst of white light prior to the amber flash. The white flash burst shall be on for 35 milliseconds and off for 50 milliseconds prior to the normal amber flash. The white flash shall be produced by 8 super bright LED's and not affect the normal MUTCD operation of the amber LED flash sequences.

The lamps shall be secured to the sign panel face by lamp hoods/visors via (4) four stainless steel screws, threaded into insertion nuts. The hoods shall be of high impact, UV protected, non-reflective, black plastic. Each hood shall have (4) four "keyhole" indexing mounting holes. The sign panel face shall be "notched" or indexed to mate with an indexing tab on each lamp to insure horizontal alignment of all lamps. The lamp hood shall circumscribe each lamp 360 degrees and extend outward from the sign panel face 5" to shade the lamps from sunlight. Each lamp shall incorporate a neoprene foam gasket between the lamp and the sign panel face to secure the lamp and prevent movement and protect against vibration.

Control and Circuitry:

The system shall incorporate an automatic, ambient light monitoring system to maximize system efficiency and reduce nighttime glare. Dimming for nighttime operation shall be 50% reduction in intensity to eliminate glare. The lamps shall be operated electronically. An automatic lamp intensity regulator shall keep the lamp output constant with varying battery voltages. The controller shall be enclosed in the arrow panel with an access panel for service. The remote shall be in the cab of the vehicle within easy reach of the driver.

All sign panel lamp wiring shall be protected to prevent damage to lamps or panel harness in the event of a short circuit. The remote shall be provide graphic lamp intensity and battery voltage display. The remote shall have an LCD display to indicate and verify mode selection and operation. The remote display shall show the operator a preview of the selected mode prior to arrow panel activation. **Instantaneous mode switching is not acceptable.**

The controller shall be, microprocessor controlled, touch pad, backlighted for nighttime operation, and reverse polarity protected with audible and visual low battery alarm.

All wire, cable and other electrical components shall be properly sized/rated for the unit and its operations and shall be suitable for exposed outdoor installations subject to adverse weather conditions and ambient temperatures ranging from 125 degrees F down to -40 degrees F. Wiring and cable shall be UL approved for use under required operating conditions. All exposed junctions shall be waterproof and sealed against salt.

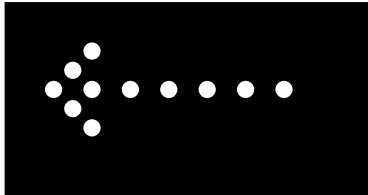
All exposed wiring shall be sheathed cable or be enclosed in looms or conduit and be routed to minimize chafing and interference. Short circuit protection shall be provided, and the system shall be protected from overload by fuses or similar protective devices and be reverse polarity protected.

SPECIFICATIONS
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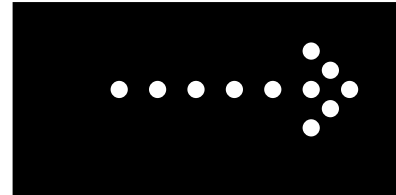
II. AUTOMATED POTHOLE PATCHER: (Continued)

N. ARROW BOARD: (Continued)

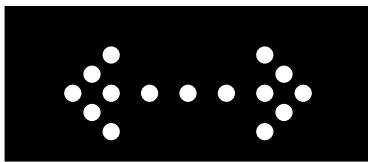
The board shall be capable of displaying all of the following modes:



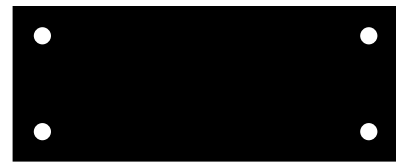
SINGLE FLASHING ARROW LEFT MODE



SINGLE FLASHING ARROW RIGHT MODE



DOUBLE FLASHING ARROW MODE



CAUTION MODE

The caution mode may be either the four corner or bar or any other combination of four or more lamps arranged in a pattern which will not indicate a direction.

O. HEATED NOZZLE & TANK:

To use vehicle heat water heater by tapping into hose for warming source. It shall be insulated over length of exposed hosing. Tank shall maintain heat source.

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II. AUTOMATED POTHOLE PATCHER: (Continued)

P. BODY COVER:

Hydraulically operated steel hopper lid or Tarpoleon Cover.

Q. TACK & CRACK WAND:

0.50-inch x 30 feet asphalt delivery line attached to normal equipment asphalt delivery at rear of body with hand-controlled valve at wand. Ability to flush delivery line by existing flush cistern.

R. SPARE PARTS:

1 hydraulic filter element, of each type installed.
2 spray nozzles.
1 two stage, air filter element.

S. SAFETY:

Shall be an Ecco Back-up Alarm Model 450 with shock mounting (installed).

All patcher areas likely to be stepped or walked upon including patcher ladder and steps: Shall be aluminum, Bustin No. NST4 full size or Ohio Grating No. JA2119SG4 serrated or IKG Industries Type BS4 serrated swage lock, with end band. The size and strength shall be in accordance with the truck manufacturer's step design, but the material shall be as noted above. The outer step edge must be serrated in lieu of plain, smooth metal edge. All edges shall be banded (skirting) on the outer perimeter. Overlay not acceptable. Top of the first step shall be (approximately) 21 inch above ground. Step design and material shall be the same design and material on the left and right side. All railings, hand holds, and grab handles shall be coated with non-skid paint, for the entire length. Non-skid tape is unacceptable.

There shall be two-wheel chocks per truck with a rope. EQN-82
Reflectivity enhancement per EQN-127A

All necessary labels, decals and placards to meet Federal and Pennsylvania law shall be mounted accordingly.

Grab handles shall be supplied on all cab entry locations. Three points of contact shall be achievable at all cab entry locations. Handrails shall be coated with non-skid paint (non-skid tape is unacceptable) or have OEM anti-slip rubber inserts, both non-skid paint or rubber inserts must extend the full length of the grab handle.

Exterior grab handles shall be supplied if available from OEM.

There shall be a permanent decal, 2-inch-high red letters on white background affixed by the driver side door handle stating the overall maximum travel height of the completed and unloaded unit.
(Example) HT-__' __" Ref. EQN-552.

There shall be a permanent decal, "Three Point Contact" located at each entry point of the truck cab and at the bed ladder area per EQN – 552-1. Exact location to be determined at prebuild meeting.

T. REFERENCED ACCEPTABLE MODEL:

Schwarze Industries Road Patcher.
ROSCO Model, RA-300, meeting these specifications.

SPECIFICATIONS
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III. DRAWINGS:

EQN-66A	dated	Rev. 07-20-09	1 sheet	TRIANGLE STORGAGE BOX AND BRACKET
EQN-78	dated	Rev. 10-27-06	1 sheet	C.B. RADIO CONNECTIONS
EQN-82D	dated	Rev. 07-22-15	1 sheet	CHOCK AND HOLDER
EQN-118	dated	Rev. 06-26-09	1 sheet	UNDERRIDE PROTECTION
EQN-120Q	dated	Rev.01-28-20	1 sheet	UNIVERSAL TRUCK LIGHTING
EQN-127A	dated	Rev. 01-02-09	1 sheet	CONSPICUITY TAPE STRIPPING REQUIRMENTS
EQN-351A	dated	Rev. 6-19-13	2 sheets	FAST LUBE OIL CHANGE SYSTEM
EQN-501	dated	Rev. 6-08-09	2 sheets	CENTRALIZED LUBE SYSTEM
EQN-552	dated	Rev. 07-25-18	1 sheet	MAX. TRAVEL HEIGHT
EQN-552-1	dated	Rev. 07-24-18	1 sheet	THREE POINT CONTACT
EQN-562	dated	Rev. 01-08-14	1 sheet	POWER DISTRIBUTION STATE RADIO

The above referenced drawings shall become part of these specifications.

These drawings reflect the intent of the Department and any discrepancies shall be resolved at the line setting ticket meeting between the vendor the Equipment Chief, or the pre-production inspection of the truck.

DRAWINGS APPEAR AT THE END OF THE SPECIFICATIONS.

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IV. MANUALS:

The successful vendor shall furnish all applicable manuals per unit:

- 1 Operator's
- 1 Parts
- 1 Service
- 1 Engine
- 1 Transmission (Automatic or Manual)
- 1 Body and Sub-frame (Parts and Service)
- 1 Complete set of manuals for any additional items/equipment added to a piece of equipment.

The manuals listed shall be official O.E.M. publications supplemented with technical manuals for all components as published by sub-vendors/manufacturers.

Parts Manual presented must be a relative to "all" items utilized to build these units, with appropriate part numbers.

All manuals shall be supplied on thumb drive in PDF format that can be loaded to a dedicated website. Paper manuals may be supplied if available from manufacture. Paper manuals do not relieve the requirement for the thumb drives.

Delivery of manuals shall be completed with the delivery of each unit.

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V. TRAINING:

Mechanic:

The successful vendor shall provide services of qualified factory trained technicians for not more than 1 training sessions of not more than 7.5 hours at 1 PennDOT locations to train personnel for in-depth preventive maintenance, overhaul and review of the proper usage of parts and service manuals, as well as component/system adjustments that need to be monitored at specified service intervals.

Operator:

The successful vendor shall provide services of qualified factory trained technicians for not more than 1 training sessions of not more than 7.5 hours at 1 PennDOT locations to train personnel in the proper operation, safety and servicing of the equipment.

The successful vendor shall submit a training plan to the Fleet Management Division for approval within 45 days after receipt of the Purchase Order. The training plan shall consist of course outline and class schedule.

All training must be completed within 60 days after the dates established in the approved training plan unless an extension is mutually agreed to in writing by the Chief of the Fleet Management Division.

All training shall be coordinated with the District Equipment Managers, with the exception of Asphalt related training, which must be coordinated with the Statewide Training Coordinator (717) 787-4836, Fax (717) 783-4438.

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VI. WARRANTY: Per PCID No.1075.

Per PCID 1075: E.1. Construction Equipment - 2 years or 4000 hours whichever first occurs.
1 year starting from the Department's in-service date.

The warranty start-up date shall be defined as the date of transfer from the PennDOT Fleet Management Division to the designated county location. This will be considered the date of delivery to the county and NOT the date of delivery by the successful bidder to the Department. The PennDOT Fleet Management will supply the actual start-up date, equipment number, and serial number of the machine, via email, to the successful bidder. It is the responsibility of the successful bidder to ensure that the equipment manufacturer recognizes and applies the Department's actual warranty start-up date in their database.

This warranty is in effect as follows, starting from date of acceptance by the Department. Warranty shall not be voided due to Department operation as explained in the Intent Statement. It is understood that the components specified are minimum and if the manufacturer's Engineering Department recommends or deems necessary a more robust component, other than specified, be installed to meet the vehicles intent statement and to not void the warranty, it shall be the bidders/vendors responsibility.

ENGINE WARRANTY:

The successful vendor and or supplying OEM shall provide the Department with a 100% parts and labor engine warranty, shall include all engine components internal and external FOR 60 months / 150,000 miles minimum.

The oil pan shall be warranted against corrosion, rust, rust thru etc. regardless of atmospheric conditions for 5 years, 100% parts and labor.

EMISSION WARRANTY: The successful vendor and or supplying OEM shall provide the Department with a 100% parts and labor warranty for all emission related components to include the diesel particulate filter (DPF) FOR 60 months / 100,000 miles, unlimited engine hours. Shall be warranted against corrosion, rust, rust thru etc. regardless of atmospheric conditions.

RADIATOR WARRANTY:

Manufacturer's standard service and warranty policy for radiator minimum shall be for one (1) year, 100% parts and labor.

TRANSMISSION WARRANTY:

Manufacturer's service and warranty policy for automatic shall be three (3) years 100% parts and labor. This warranty shall include all internal and external components related to the automatic transmission.

BODY ELECTRICAL/LIGHTING:

Wiring harness shall be 5 years 100% parts. First year shall include 100% labor.
All LED lights shall be 5 years 100% parts.

WARRANTY REPAIRS SHALL BE COMPLETED AT THE MANUFACTURER'S LOCATION OR IN-HOUSE FIELD REPAIR COMPLETED BY PENNDOT. IT SHALL BE THE DEPARTMENTS DISCRETION TO REPAIR INTERNALLY OR TRANSPORT THE UNIT TO THE DEALERSHIP. THE MANUFACTURER SHALL REIMBURSE THE DEPARTMENT AT THE MANUFACTURERS STANDARD PUBLISHED IN-HOUSE LABOR RATE. THE LABOR RATE SHALL BE MUTUALLY AGREED UPON BETWEEN THE DEPARTMENT AND VENDOR/BIDDER. ALL IN-HOUSE WARRANTY DOCUMENTATION SHALL BE DELIVERED WITH THE PILOT MODEL. ALL WARRANTY DOCUMENTATION SHALL BE DELIVERED WITH THE PILOT MODEL.