

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.

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 37,000 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).

C. POWER TRAIN OVERVIEW:

NOTE: 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.

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I. GENERAL TRUCK SPECIFICATIONS: (Continued)

C. POWER TRAIN OVERVIEW: (Continued)

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 – ALLISION 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.

NOTE: All rear axles must provide axle shafts with a minimum diameter of 2.19 inch at the spline.

NOTE: REAR AXLE/S SHALL HAVE AN EXTENDED BREATHER TUBE TO PREVENT DEBRIS BUILDUP.

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I. GENERAL TRUCK SPECIFICATIONS: (Continued)

D. VEHICLE COMPONENTS:

1. ALARM - BACKUP:

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

2. AXLE FRONT:

14,600 LB capacity, minimum. The front axle, drag links and tie rods shall have grease zerks installed.

3. AXLE REAR:

See POWER TRAIN OVERVIEW for acceptable axle. Magnetic drain plug.

NOTE:

Rear axle ratio selection will be made after the award and may be a mix of ratios as required.

4. 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.

Buzzer-type, low air pressure indicator.

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.

NOTE: Four (4) wheel disc brakes are acceptable.

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I. GENERAL TRUCK SPECIFICATIONS: (Continued)

D. VEHICLE COMPONENTS: (Continued)

5. CAB:

Steel or aluminum cab stamped and welded, tilt cab.

Seats: The best air suspension driver seat 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.

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.

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.

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 pre build meeting.

AM/FM radio, with integral or individual clock.

Cab floor covering shall be heavy-duty rubber.

Air conditioning: manufacture's highest output.

Cruise Control

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

Reflectivity enhancement per EQN-127

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 back ground affixed by the driver side door handle stating the overall maximum travel height of the completed and unloaded unit.

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

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I. GENERAL TRUCK SPECIFICATIONS: (Continued)

D. VEHICLE COMPONENTS: (Continued)

6. CHASSIS:

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.

ON BOARD GREASE SYSTEM Centralized on board chassis lubrication system installed.

Ref: EQN-501.

7. LIGHTING SYSTEM:

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

1 - 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 - M6AD Amber warning lights with brush guard mounted to the rear of bed

2 - M6BTDD Stop, Tail, Turn lights with brush guard

2 - M6BUWD Back-up lights with brush guards

6- M6BRUSH Brush guards.

4 - LINZ6AD Amber warning lights, grommet mounted, flush mounted 1 to each side (middle/center) of bed and 2 flush mounted, equally spaced in the front Grill per EQN – 120Q. Warning lights are to be wired in conjunction with above light bar.

4 - LINZ6 Grommet Kits

10 - 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 water tight. 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.

8. 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.

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I. GENERAL TRUCK SPECIFICATIONS: (Continued)

D. VEHICLE COMPONENTS: (Continued)

9. 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.

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.

GPS Combo Radio Antenna: There shall be a pedestal mount base with built-in GPS, PCTEL model GPPB-204-54-12-S1-M1 and a low profile black antenna, PCTEL model BMLPU700. Assembly shall be mounted on pedestal with mini light bar, with the antenna cable routed to the front dash area between the seats towards windshield. There shall be a minimum of 1 feet of antenna cable coiled at the base of the dash to allow for connection to department radio. Antenna shall be prewired with a MINI - UHF MALE connection. (No substitute, standardization). No mounting in roof. REF. EQN-120Q

Power Distribution Center: There shall be a 4-way power/ground distribution center located on the underside of the dash for connection of department state radio. The lugs shall be 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.

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)

10. ENGINE:

See POWER TRAIN OVERVIEW for acceptable engines.

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.

11. ENGINE ACCESSORIES:

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**)

OPTION: 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)

12. 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.

13. 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.

14. 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.

15. INSTRUMENTATION:

All instruments illuminated and dash-mounted except where specified otherwise.

All standard instruments shall be supplied, including but not limited to the following:

Gauges: Oil pressure gauge.

Air pressure: gauge(s) for dual circuit, dual indicator pressure audible alarm.

Coolant temperature.

Fuel

Hourmeter, that records only when the engine is running, Ref: DATCON or equal.

Speedometer with odometer.

Tachometer

Voltmeter or ammeter

Parking brake indicator light.

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I. GENERAL TRUCK SPECIFICATIONS: (Continued)

D. VEHICLE COMPONENTS: (Continued)

16. PAINT:

Cab shall be painted PennDOT yellow Ref: DuPont F9885, PPG 85246, Sherwin Williams 73266, Sikkens 4017 or NAPA 73266 for shade only. Frame and all underside components shall be painted black. Front bumper and plow frame shall be primed and painted black (with hardener) low VOC. All bare metal surfaces shall be coated using etching primer prior to paint. All surfaces shall be properly cleaned and prepared prior to paint, with all weld splatter and debris removed. Pothole patcher equipment shall be the same color as the cab. 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.

17. 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.

18. SUSPENSION: FRONT:

14,000 LB capacity at ground each front spring, minimum.

19. SUSPENSION: REAR:

23,000 LB capacity at ground each rear spring, minimum.

20. 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)

21. 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 28828or 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: All tires shall be radials.

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

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

MANUFACTURER

Goodyear

Michelin

Bridgestone

FRONT TIRE

G-287 MSA

XZY3

M860A

REAR TIRE

G-287 MSA

XZY3

M860A

22. TRANSMISSION: See POWER TRAIN OVERVIEW for acceptable transmission.

Automatic transmission cooler lines shall be stainless steel or a **preapproved** no-rusting material.

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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.

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II. AUTOMATED POTHOLE PATCHER: (Continued)

I. HYDRAULICS: (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.

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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.

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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" 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 night time 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, back-lighted 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.

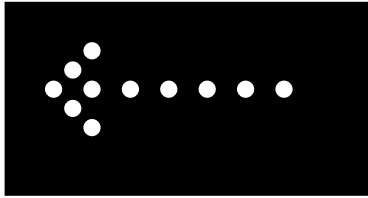
All exposed wiring shall be sheathed cable or be enclosed in looms or conduit and be routed to minimize chafing and interference. Short circuit protection shall be provided and the system shall be protected from overload by fuses or similar protective devices and be reverse polarity protected.

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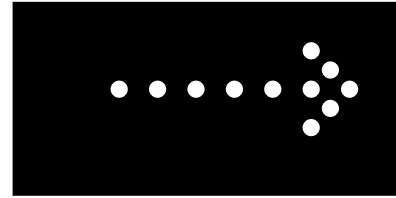
II. AUTOMATED POTHOLE PATCHER: (Continued)

N. ARROW BOARD: (Continued)

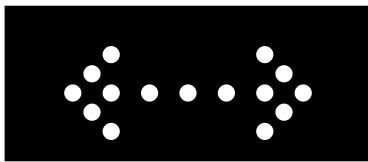
The board shall be capable of displaying all of the following modes:



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:

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-127

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 pre build meeting.

T. REFERENCED ACCEPTABLE MODEL:

Schwarze Industries Road Patcher.

ROSCO Model, RA-300, meeting these 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. 08-06-12	1 sheet	UNIVERSAL TRUCK LIGHTING
EQN-127	dated	Rev. 03-01-07	1 sheet	CONSPICUITY TAPE
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. 5-29-13	1 sheet	MAX. TRAVEL HEIGHT
EQN-552-1	dated	Rev. 3-23-15	1 sheet	THREE POINT CONTACT

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.

Delivery of these manuals shall be completed within a maximum of 90 days after the pilot model is accepted.

Manuals may be supplied on CD Disc in lieu of paper manuals.

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V. TRAINING:

Mechanic:

The successful vendor shall provide services of qualified factory trained technicians for not more than 2 training sessions of not more than 15 hours at 2 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 2 training sessions of not more than 15 hours at 2 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.

ENGINE WARRANTY:

The successful vendor and or supplying OEM shall provide the Department with a 100% parts and labor engine warranty FOR 60 months / 150,000 miles / 5,400 hours minimum. In addition to the engine warranty, the engine block shall be warranted against external perforation from corrosion for 60 months, 100% parts and labor.

NOTE: The oil pan shall be warranted against corrosion, rust, rust thru etc. regardless of atmospheric conditions for 60 months, 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 / 150,000 miles / 5,400 hours minimum. Shall be warranted against corrosion, rust, rust thru etc. regardless of atmospheric conditions.

RADIATOR WARRANTY:

Manufacturer service and warranty policy for radiator shall be for two (2) years, 100% parts and labor plus an additional three (3) years, 100% parts only.

TRANSMISSION WARRANTY:

Manufacturer service and warranty policy for automatic and manual transmissions shall be 60 months 100% parts and labor.

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.

NOTE: 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.