

**STATE OF MINNESOTA  
CONTRACT RELEASE S-863(5)  
SNOW PLOW TRUCK COMPONENTS & ACCESSORIES  
SPECIFICATIONS**

**INTRODUCTION**

Responders must offer products that meet the specifications which is available to MnDOT, other State Agencies, and Cooperative Purchasing Venture (CPV) members.

This contract applies to pickups through class 8 trucks, front plows, sanders and hitches applying to smaller than class 6 trucks are on T-673 Truck, Light Duty, Components and Options contract.

Requirement for sections 1.0 through 11.0:

- If requested by the purchaser, the Contract Vendor must furnish (if available) non-proprietary, electronic digital box illustration(s), in one of the following file formats: .sldasm, .asmdot, .sldprt, .step, .igs, .sat, Parasolid, ProE or AutoDesk Inventor. The purchaser must use the files as a resource in the body design process. The Contract Vendor must furnish the electronic files at no additional cost to the purchaser.
- Hydraulic Requirements: All hydraulic hose ends must be JIC 37 degree female swivel fittings. Male pipe hose ends are not acceptable. Galvanized hydraulic fittings are not acceptable. Any deviation must be approved in writing by MnDOT prior to the build.

**SNOW PLOW TRUCK BODY: SPECIFICATION: 330/350-612**

This specification contains twelve different sections for items which would make a Cab and Chassis into a snow plow truck. They are:

1.0	Dump Box (includes pre-wet tanks)
2.0	Box Hoist Section
3.0	Underbody Plows
4.0	Wing Plows Section
5.0	Front Hitch Section
6.0	Front Plows
7.0	Pup Hitch
8.0	Sanders Section
9.0	Hydraulics Section
10.0	Airbags Section
11.0	Anti-Icing Section
12.0	Wiring Harness/Switch Panel Section
13.0	Airport Airfield Equipment Section
14.0	Tow Behind Type Plow Section
15.0	Hydraulic Driven Front Axle
16.0	Ice Breakers
17.0	Road Temperature Sensors
18.0	Auto Lubrication System

## **1.0 DUMP BOX REQUIREMENTS**

### **1.1 Dump Box Requirements Includes Single Axle Bodies and Tandem Axle Bodies**

- Box must have a minimum of a two-year warranty on parts, labor, workmanship, cracking, or bending.
- Box must be mounted on truck Chassis behind Cab depending on Cab and Chassis exhaust system dimensions from the January, 2010 diesel engine emissions requirements per MnDOT approval. Box must be mounted without drilling into flange part of truck frame.
- All fasteners (bolts, washers and nuts) used on the box and attached items must be grade 8 with steel locking nuts. Nyloc type nuts will not be accepted.
- Installation of box must be compatible and mate properly with hoist system.
- Installation of box must include converting FMVSS incomplete vehicle manufacturer's certificate to a completed FMVSS vehicle certificate.
- All boxes for MnDOT must have wiring standoffs (Securing Points). This can be a option item listed on price page.

### **1.2 Painting of Box Requirements**

1.2.1 The following items must be painted black with zinc based lead free paint:

- Underside of box, including long sills, between longsills, and 8" minimum past lapping seam of stainless steel side and floor.
- All non-plated carbon steel components on underside of body, or any exterior surface.
- Hoist assembly and Sub-frame
- Main-frame of truck to be over-sprayed from rear of truck Cab to rear frame of truck.
- Front plow hitch and bumper extensions
- Miscellaneous hoist sub-frame to frame attaching brackets.
- Paint facility must meet all Federal, State, and EPA requirements.

## **2.0 HOIST REQUIREMENTS:**

- Hoists must have permanently installed safety props (any kind of tubing in the props is not allowed and solid block rear hinge point. Box hinge pins must be grease able hinge pins with grease zerks, readily accessible when box is raised and must be approved prior to the build.
- All pivot points must have grease fittings.

## **3.0 UNDERBODY PLOW REQUIREMENTS:**

- All moving parts must have easy access to grease zerks.
- All functions of underbody plow must be controlled from Cab.
- Paint must be lead free and the manufacturer's standard color.

### **3.1 Installation of Underbody Plows**

- Installation must be with bolt on hardware and does not include plumbing to hydraulics.
- Location to be approved by purchasing agency in writing prior to the build.

#### **4.0 WING REQUIREMENTS:**

- Wing plows must be able to be raised and lowered on both the leading attachment point and trailing edge.
- Wing plows and attaching assemblies must be painted with lead free paint.
- Options may include hydraulic push poles
- For the purposes of this contract, a wing assembly will include all parts necessary to attached the wing to the truck frame and the wing, unless it is marked, like “Wing Plow Only” or “attaching assembly’s only”
- Vendors may want to consider offering the wing plow only and or the attaching assembly’s only as they are sometimes damaged during plowing operations and need to be replaced.

#### **5.0 FRONT HITCH REQUIREMENT:**

- Front hitch is used to attach front plows to the truck and the hitch must attach to the chassis frame rails. If the hitch is bolted to frame on class 6 and above chassis, grade 8 bolts must be used, class 5 and below chassis grade 8 bolts are preferred.
- MnDOT uses the Monroe or Falls 46B style hitch.

#### **6.0 FRONT PLOW REQUIREMENTS:**

- To include but not limited to; One-Way, Two-Way Reversible with or without high wing, V-Plows and variable pitch, etc...
- Base unit plow must not include shoes, cutting edge, plow unit push bar, parking stand, snow deflector, Nitrate rods, and curb protector or 411H moldboard option. These items must be priced out as options on price page.
- Front plows Must be for chassis 20,000 lbs. or greater.
- If the plow part of the front hitch is not listed in the section options with the front hitches then the plow part of the hitch should be included with the plow options.

#### **7.0 PUP HITCH REQUIREMENTS:**

- Hydraulic Requirements: All hydraulic hose ends must be JIC 37 degree female swivel fittings. Male pipe hose ends are not acceptable. Galvanized hydraulic fittings are not acceptable. Any deviation must be approved prior to the build.
- Hitch must include safety chain loops, installed, with proper rating to match hitch rating.
- For MnDOT the hitch should include two of the trailer cord plug holes, glad hand holes and the pintle hitch holes.
- Vendors may want to include Trailer cord plugs, glad hand and pintle hitches as Pup Hitch options.
- MnDOT will require two Trailer Plug styles on each hitch, RV style and the 7-Pin with round pins wired to the attached drawing. The RV plug should be to the industry standard wiring diagram.

#### **8.0 SANDER REQUIREMENTS:**

- Hydraulic Requirements: All hydraulic hose ends must be JIC 37 degree female swivel fittings. Male pipe hose ends are not acceptable. Galvanized hydraulic fittings are not acceptable. Any deviation must be approved prior to the build.
- Sander options may include but not limited to: different augers, sander side plates, optional spinners, auger and spinner sensors, pre-wet piping, Sander stands, sander chutes, reversing valves, Lighting if sander blocks truck lights, quick couplers, sander pins and sander attaching hardware.

### **9.0 HYDRAULIC REQUIREMENTS:**

- Hydraulic requirements: All hydraulic hose ends must be JIC 37 degree female swivel – male pipe hose ends are not acceptable. Galvanized hydraulic fittings are not acceptable. Any deviation must be approved prior to the build.
- MnDOT may be purchasing 57 plow truck hydraulic systems, state charges to deliver systems to MnDOT Central Shop, in bulk, 10 or more at one time.

### **10.0 AIRBAG REQUIREMENTS:**

- Bottom mounting bracket must be cast iron.
- Air bag must be located between axle and vehicle frame.
- Air pressure must be controlled by pressure regulator which is manually adjusted from truck Cab, control location within easy access from driver position.
- Unit must include a pressure gauge located in Cab within easy view of driver station.
- Air must be supplied via Cab and Chassis air compressor.

### **11.0 ANTI-ICING REQUIREMENTS**

- System provided must not interfere with body access ladder, or rear corner posts.
- Tank(s) must be form fit where applicable, and that the overall width of components do not exceed the DOT maximum legal width of 102”.
- Pre-wet systems must include installation on box and installation of tank vent line.
- All hose, which is supplied, must be nylon reinforced PVC hose with a working pressure of no less than 200 psi with maximum temperature rating of 100 degrees F
  - Anti-icing systems must not be vegetation spray systems with anti-icing spray bar option.
  - Anti-icing systems must not have the ability to spray different chemicals without emptying the tank and changing the chemical that is in the tank.
  - Anti-icing systems must be able to handle all de-icing chemicals offered by vendors.
  - Anti-icing section is where portable water tank options should be listed and priced out.

### **12.0 WIRING HARNESS AND SWITCH PANEL**

- TXL crosslink wire must be used
- Nylon braiding loom for wiring harness cover.
- Sealed connectors on all ends of the wiring harness.
- Wires must be printed on the wiring insulation of the circuit function, the printing must be oil resistant.
- Color coded to match the truck manufacturer’s wiring harness, unless otherwise specified.
- Detailed wiring schematic, with each of the wires routing, color, name, number and function, also pin locations on the connector itself. This shall be provided with every wiring kit and electronic copy if requested PDF preferred.
- Wiring harness packages must be box for individual trucks and separated between single axle and tandem axle chassis.
- Wiring harness must include the following harnesses: front plow lamps, fog lamps, PTO control, box vibrator, hydraulic high temp and low level. Cab shield strobe lighting, cab shield turn / tail / brake, and license plate lamps. Wiring to the rear of the truck for 2 trailer connectors, tail / turn / brake lamps and ICC lamps. Rear box pillar tail, turn, brake and strobe lights. Wiring for the Auxiliary switches

from the chassis cab. Wing and underbody scraper lamps, wing strobe lamps. Sander lamps. AVL, hydraulic, two way radio communication, power and grounds to each of the control boxes if needed.

- Must offer price for a wiring set/ package for MnDOT plow trucks ( one set for single axle and another set for Tandem axle trucks) with all the harness parts packaged together for one truck each package and delivered to MnDOT. Package must be marked for single or tandem axle truck with model year.
  - Optional items may include individual harnesses or other packages.
- 12.1 Must offer price for a wiring set/package for MnDOT single axle plow trucks with all the harness parts packaged together for one truck each package and delivered to MnDOT. Package must be marked for single or tandem axle truck.
- 12.2 Must supply pricing for a MnDOT Tandem axle plow trucks with all the harness parts packaged together for one truck each package and delivered to MnDOT. Package must be marked for single or tandem axle truck.
- 12.3 As a option, vendors may supply a “Turn Key” truck option that can be a single axle or a tandem axle truck with the wiring from the drivers compartment to the back of the truck harnesses.

### **13.0 AIRPORT AIRFIELD MAINTENANCE EQUIPMENT:**

- Airport Airfield Maintenance Equipment offered in this section must be specifically built and intended for airport airfield maintenance functions only. It must not be the type of equipment which can be offered on other existing equipment contracts listed on the [www.dot.State.mn.us/equipment](http://www.dot.State.mn.us/equipment) web site.
- Airport Airfield Maintenance Equipment must be designed and built to accomplish its intended function within the size and scope of an airport environment and must not be a lesser piece of equipment adapted from other intended uses.
- Airport Airfield Maintenance Equipment offered in this section must not be designed, built, intended or practical for highway use.
- Any truck Chassis offered on this contract must meet the current EPA Tier standards or be approved by the EPA for off road use only. The Chassis must not be able to meet the specifications of contract T-647 Truck Single & Tandem Axle Cab & Chassis 26,000 lbs. and larger.

### **14.0 TOW BEHIND TYPE PLOW**

- Plow must be between 24.5’ to 26’ in length.
- Moldboard must have round holes for mounting cutting edge with AASHTO carbide spacing.
- Dual axles must be rated at 16,000 lbs. each, with hydraulic steerable with connecting linkage.
- Unit must be equipped with ABS brakes and poly fenders.
- Unit must be equipped with either a 1,100 gallon poly tank (can be two 550 gal tanks) or material hopper for ballast.
- Trailer must meet all current Federal and Minnesota safety codes.
- Lights must remain perpendicular to the travel lane when plow is in operation.
- Unit must include a parts and instruction manual in either digital or paper format.

### **15.0 HYDRAULIC DRIVEN FRONT AXLE**

- The front wheel drive system (the system) must include its own hydraulic pump, PTO, hydraulic tank, filters, axle hardware for driving the front wheels, and lines.
- The system can be automatic or manual control. The operator must be able to turn the system on and off from the driver’s seat.
- The system must not interfere with the original turning radius of the truck Chassis and use the original tires.
- The Hydraulic Drive System must not change the Chassis frame height.
- The system must not change the original manufacturer’s original braking system

- The system must not lower the original manufacturers GVW rating.
- If the system requires different rims for the tires, the new rims must be sized for the original tires and be painted. If the rims are different than original, there must be rims listed on the price page so customer can purchase rims for spare tires.
- The system must be able to be used in combination with the rear drive line. It must also be able to drive the truck with the transmission in neutral if needed.
- The system must work both in forward and reverse.
- When the system is not in use, the front wheels must be able free wheel to conserve fuel.
- The system cost must include one extra set of filters for the system and the truck must be delivered to the customer with the extra set of filters.
- The cost of the equipment must include training to up to 10 of the customer’s employees. The training must include, but is not limited to, equipment operating preventive maintenance and safety instructions. The Contract Vendor will provide the training before the purchase of equipment will be considered complete. No additional training fees must be charged to the customer.
- There must be a Parts, Operator, and Repair manuals included at the time of delivery. The manuals can be in paper or digital format.

#### **16.0 ICE BREAKERS**

- The ice breaking equipment must be available in sizes up to 8’ 6” or greater.
- The ice breaker is to have an option to have a blade behind the ice breaker for clearing the road. The blade should be listed as an option with an installed price.
- The ice breaker is to have a hitch to install on MnDOT plow trucks in place of a front plow. The hitch is to be the same as a Falls 46B.
- The ice breaker is to be able to remove ice on pavement with minimal or no damage to the road.
- The ice breaker must be able to be lifted when on the truck, by the truck hydraulics into a transport position, where it is not in contact with the road.
- The unit must be able to work in a “float” position for trucks with no down pressure.
- Ice breakers must be able to have optional tilt cylinders.
- Ice breakers must be designed so to be able to follow the contours of the road.
- Roller elements must be replaceable.
- Roller elements must have replaceable bearings.
- Spiked roller elements must be able to be replaced as a single unit or as a complete unit.
- Unit must have a stand so unit can easily be coupled to truck.
- Ice breaker must come with a parts, repair, and operator manual(s). They may be in digital or paper formats.
- The must be an option to not have hydraulic tilt from side to side and be free floating with no rams.

#### **17.0 ROAD TEMPERATURE SENSORS**

- Surface of Pavement Temperature Sensor must measure road surface temperature and ambient air temperature and that temperature must be readable in the truck cab in real time.
- Please list prices for lots for 0-50
- More than 50 on price page.
- The temp sensors must be offered with all necessary cables and other necessary items needed to operate and display temperature in the cab of the vehicle. All cables and items must be listed on price page incase repairs need to be made.
- A wireless option in lue of wired sensors is acceptable.
- Mounting Brackets to mount temp sensor to plow truck or pickup truck must be included in price list.

- MnDOT will be using the 6100 series Spreader control in their plow trucks, the cables and items that are needed to interface with the spreader control must be offered. MnDOT would like to have a package price listed on the price page for the MnDOT Plow trucks using the 6100 spreader control and all cables and other items needed. Package order totals would be for lots of 0-50 and lots of more than 50
- MnDOT will also be installing Sensors in pickup trucks without sanders or other equipment that would connect to the sensors. The temperature must read out on a dash mounted display that is to be included. MnDOT would also like a Pickup truck package listed on the price page if offered, and would include everything need to install sensor and read in the pickup cab. Package order totals would be for lots of 0-20 and lots of more than 20

## **18.0**

## **AUTO**

### **LUBRICATION SYSTEM**

- The pump must be able to pump grease to 1800 psi.
- The pump must be able to provide .5in<sup>3</sup>. It is of grease per minute at 1800 psi.
- The pump must come with an adjustable timer to program the lubrication system on and off time.
- The pump system must have an electrical over load protection for the motor, which shuts down the motor and must be electrically or manually reset.
- The pump must have a low temperature protection to stop the pump when the grease would be too cold to pump.
- The pump must be connected to the ignition system on the truck so the pump will be inactive when the ignition switch is off.
- The pump must be rated for IP69K intrusion protection or better.
- The pump must be able resist UV, chemical and corrosive environment exposure.
- The pump must have a low grease or out of grease shut down that will not re-set until refilled.
- The pump system must have at least one main grease line that distributes to grease to modules that have adjustable metering devices controlling the grease dispense. The modules must be close to the locations being greased to keep the individual lines of grease as short as possible.
- The system lubricant supply lines must be connected with compression-style, NPT, JIC, SAE-ORB or equivalent connections.
- The modules must be able to adjust the amount of grease that goes to each greaseable item on the Chassis
- All wires must be crimped or soldered and sealed to protect from water getting into the connection. Both positive and negative connections to the Chassis to be approved by customer before installation begins.
- Additional insurance will be required if installation is done at a MnDOT facility.
- A Parts and Service Manual must be provided in electronic or paper formats with each set of trucks that have a lube system installed. MnDOT must be able to reproduce or distribute multiple copies to multiple MnDOT locations around the State of Minnesota. If the customer cannot reproduce the manuals then a copy must be provided with each system, whether the customer installs the system or not.

**Auto Lube system Installation**

- The vendor must work out the installation schedule, the start date, and end delivery date before the work starts. In the case of MnDOT Snow Plow trucks, the installation can be done in stages. The stages and timing should be worked out with the MnDOT Shop Supervisor in writing prior to the build. The schedule could change due to shop schedule, staffing, weather, and part availability.
- All grease lines and electrical wires must be tied or clamped down to prevent the movement or rubbing, of the grease line to prevent a hole being worn in the grease line. In the case of the high likelihood of rubbing, there should be protective covering installed on the grease line or wire insulation.
- All modules and pump must be bolted to the Chassis Frame or a customer approved location. For MnDOT Plow trucks the locations should be approved in writing before installation begins due to MnDOT may be having to install more equipment after the greasing system. In addition, make sure modules, pumps, and grease lines, are not in the way or interfering with other MnDOT equipment that will be installed later.