

CPA – Statewide Procurement

Revised June 2022

SNOWPLOW, GENERAL PURPOSE, TRUCK MOUNTED, WITH REVERSIBLE MOLDBOARD

PART I

GENERAL INFORMATION, REQUIREMENTS, AND CONDITIONS

1. The equipment furnished under this specification shall be the latest improved model in current production, as offered to commercial trade, and shall be of quality workmanship and material. The Contractor represents that all equipment offered under this specification shall be new. USED, SHOPWORN, DEMONSTRATOR, PROTOTYPE, REMANUFACTURED, RECONDITIONED, OR DISCONTINUED MODELS ARE NOT ACCEPTABLE.
2. All parts not specifically mentioned which are necessary for the unit to be complete and ready for operation or which are normally furnished as standard equipment shall be furnished by the Contractor. All parts shall conform in strength, quality and workmanship to the accepted standards of the industry
3. The unit provided shall meet or exceed all Federal and state of Texas safety, health, lighting and noise regulations and standards in effect and applicable to equipment furnished at the time of manufacture.
4. It is the intent of CPA to purchase goods, equipment, and services having the least adverse environmental impact, within the constraints of statutory purchasing requirements, the customer need, availability, and sound economic considerations. Suggested changes and environmental enhancements for possible inclusion in future revisions of this specification are encouraged.
5. Any example shown is an example to show type and class of equipment desired. Contractors are cautioned to read the specification carefully, as there may be special requirements not commonly offered by the equipment manufacturer. DO NOT ASSUME STANDARD EQUIPMENT MEETS ALL OF THE DETAILED SPECIFICATION REQUIREMENTS MERELY BECAUSE IT IS LISTED AS AN EXAMPLE. Contractors are cautioned that any unit which does not meet specifications in every aspect, will not be accepted.

PART II

SPECIFICATIONS

1. **SCOPE:** This specification describes a heavy-duty, 11-foot general purpose snowplow with power reversible moldboard for use in all types of snowplowing conditions where the removal of snow from road surfaces must be accomplished with right- or left-hand discharge at speeds up to 20 mph. The snowplow shall be equipped with a cannon or extension spring type trip assembly that will enable the moldboard to pass over a fixed object and automatically and immediately return to the plowing position without loss of vehicle control. The snowplow will be installed on a Customer's medium duty truck having a front gross axle weight rating (GAWR) of 12,000 pounds. The approximate weight of the moldboard furnished to this specification shall be between 1,800 to 2,100 pounds (less hitch and hydraulics) and meet or exceed all requirements. All units furnished to this specification shall meet or exceed the following:

EXAMPLES: Falls Model PR1143
Flink Model FSP 11PA38,
Henke Model 42R11ECT
or CPA approved equal.

2. **MOLDBOARD:** The moldboard shall be 11 feet wide and constructed of minimum 10-gauge steel. A minimum of five vertical braces and horizontal braces as normally recommended and furnished by the manufacturer shall be installed to enable the moldboard to withstand severe service under adverse operating conditions. The shape of the moldboard shall provide proper lift, roll, and discharge of snow for maximum plowing efficiency.
 - 2.1. The moldboard shall be a minimum of 38 inches and a maximum of 45 inches in height and have a minimum two-position manual pitch adjustment.
 - 2.2. A built-in deflector or integral shield shall be installed on the top leading edge of the moldboard to prevent snow from blowing over onto the truck windshield. Shield or deflector shall be as normally recommended and offered by the manufacturer. If rubber belting is provided, the belting shall be a minimum 1/4-inch-thick x 12 inches wide and extend the length of the moldboard.
 - 2.3. Curb bumpers shall be installed to protect the ends of the moldboard when plowing next to curbs.
 - 2.4. The moldboard bottom shall be constructed of minimum 4 inch x 4 inch x 5/8 inch structural angle steel with American Association of State Highway and Transportation Officials (AASHTO) Standard Highway Punching for mounting the cutting edge.
 - 2.5. Angle steel shall have minimum 3/8 inch steel gussets spaced evenly between each cutting edge mounting hole, except for a pair of holes on each end which shall have gussets on either side of holes.
 - 2.6. Moldboard shall be equipped with minimum of two replaceable carbide tipped wear shoes located immediately behind the cutting edge in the size and locations as normally furnished by the manufacturer to prevent damage to the moldboard bottom as the cutting edge wears.
 - 2.7. The top outermost edge of the moldboard shall be equipped with a flag holder or removable reflective pole marker as normally offered by the manufacturer.
3. **CUTTING EDGE:** The moldboard shall be equipped with a replaceable cutting edge constructed of high carbon steel, minimum 1/2 inch thick x 6 inches in height. Length of the cutting edge shall be a minimum of 11 feet unless another option is ordered by the Customer. Cutting edge bolt holes shall be edge punched in accordance with AASHTO Standard Highway Punching.

4. MOLDBOARD TRIP MECHANISM: Moldboard trip shall be of an external compression spring type. The plow shall trip and reset automatically when encountering an obstacle by means of two (2) external compression springs. Each spring shall be 5-5/8" in outer diameter, 23-1/4" long, of 23/32" wire, with a minimum of ten (10) active coils. The spring assembly shall attach to the plow moldboard by means of two (2) 3/4" thick steel ears which will allow the trip mechanism to be set at three (3) different positions. The ears are welded to 4" x 3" x 3/8" horizontal angles welded between vertical ribs. The spring assembly shall attach to the circle push frame on structural steel tubing, which is mounted inside the circle assembly for maximum support. The lower mounting ears shall wrap around the back of the tube for maximum support. IN NO INSTANCE SHALL THE MOLDBOARD BUILT-IN DEFLECTOR, INTEGRAL SHIELD OR RUBBER BELTING STRIKE THE PAVEMENT WHEN TRIP MECHANISM IS ACTIVATED.
5. PUSH FRAME AND A-FRAME: The snowplow shall be equipped with the manufacturer's regularly advertised push frame and A-frame assemblies meeting, but not limited to, the following:
 - 5.1. The push frame shall be formed of all structural steel members properly reinforced to withstand severe snowplowing conditions. The moldboard shall be pin connected to a minimum 4 inch x 4 inch x 1/4 inch tubular or angled structural steel member located at the front of the push frame by a minimum of four, equally spaced, 1-1/4 inch steel pins.
 - 5.2. The reversing of the moldboard shall be accomplished by two, minimum 3 inch diameter, heavy-duty, double-acting hydraulic cylinders mounted to the A-frame and pin connected to the push frame. The hydraulic cylinders shall reverse the moldboard a minimum of 35 degrees in either direction and provide smooth adjustment of the moldboard through its full range of movement.
 - 5.2.1. Reversing cylinders shall have a chrome polished piston rod and be equipped with replaceable chevron style vee packing seals.
 - 5.2.2. Reversing cylinders shall be located on the topside of the push frame assembly to allow easy and convenient access to the hydraulic cylinders, hoses and fittings.
 - 5.2.3. Snowplow shall be equipped with a cushion valve to protect the reversing cylinders and hydraulic circuit from sudden impact and fluid surges. The cushion valve shall be equipped with a means to prevent moldboard drift once the plowing angle has been set.
 - 5.2.4. Cushion valve shall be equipped with hydraulic hoses of sufficient length to extend from the cushion valve to the general area of the bumper-to-frame hitch. The hydraulic hose ends (at the bumper-to-frame hitch only) shall be equipped with 3/8-inch female quick-disconnect dripless couplers and dust caps for quick hook-up and disconnect of the snowplow.

NOTE: A latch lock type reversing mechanism may be provided in lieu of the two (2) hydraulic reversing cylinders and cushion valve.
 - 5.3. A-frame assembly shall have a quick-hitch feature to allow easy hook-up to and disconnect from the bumper-to-frame hitch. The quick-hitch feature shall be oscillating or swivel type and bolted to the A-frame to allow the moldboard to follow the contour of the road.
 - 5.4. All necessary mounting hardware, hydraulic hoses and hydraulic fittings shall be provided with each unit.
6. CASTER WHEELS: The push frame shall be equipped with two (2) caster assemblies meeting, but not limited to, the following:
 - 6.1. Caster assemblies shall be screw adjustable type, fully enclosed and lubricated. Caster housings and forks shall be as normally furnished by the manufacturer. Wheels shall be free swivel type and made of cast steel.

- 6.2. Caster wheels shall be minimum 8 inches in diameter x 2-1/4 inches wide and equipped with heavy duty, roller bearings and oil seals designed to withstand severe winter operations. Wheel hubs shall be equipped with grease zerks to allow greasing of the roller bearings.
- 6.3. A hand crank with rotating knob or handle shall be installed on the end of the adjusting screw with a self-locking device to secure the hand crank to the caster assembly until needed. Hand crank shall operate without the use of any tools.
7. TRUCK HITCH: A heavy-duty, bumper-to-frame, low profile truck hitch shall be furnished with each snowplow. The truck hitch shall have the following items as a minimum:
 - 7.1. The hitch shall have a tilting type frame to allow for easy access to the engine compartment on trucks with a forward tilting hood.
 - 7.2. The hitch shall be equipped with a telescoping lift arm of appropriate length and construction, with appropriate chains and lifting hardware, to hold the moldboard nearly level with the road surface in all transport positions, as described in the "level lifting system" section above.
 - 7.3. The telescoping lift arm shall include an outer tube of 4" x 4" x .38" square steel tubing and an inner tube of 3" x 3" x .38" square steel tubing. The telescoping lift arm shall have two adjustment positions only: operating position (fully extended) and storage position (fully retracted). The inner and outer tubes shall be joined by a minimum 1" diameter hitch pin.
 - 7.4. For optimum safety, the hitch lift arm shall fold down flat (vertical) and pin in storage position when not in use. When pinned in storage position, accidental operation of the hitch lift cylinder shall not result in any damage to the truck hitch or other items.
 - 7.5. The hitch shall include a "Quick Link" type coupling device, which must be fully interchangeable with a Flink Model PF91QL2 or Henke Model QL2 LP Tilt FD. All jaw plates and alignment plates of the coupling mechanism (six (6) total plates) shall be made from .625" thick T-1 steel (100,000 psi yield) for maximum durability. The main structure of the "Quick Link" coupling device shall be formed by two (2) 5" x 3.5" x .50" x 34" minimum horizontal angles.
 - 7.6. The lower "non-tilting" portion of the hitch shall include two (2) vertical uprights of 4" x 3" x .50" x 28" minimum angle, joined by two (2) horizontal .50" x 5" x 24.75" minimum flat bars, which are welded and gusseted to the Quick-Link style coupler assembly. The lower "non-tilting" portion shall include four (4) welded bushings measuring minimum .63" long and minimum .48" wall thickness: two (2) at the tilt pivot points and two (2) at the upper tilt pin attachment points.
 - 7.7. The upper "tilting" portion of the hitch shall include two (2) vertical uprights of 4" x 3" x .50" x 17" minimum angle. It shall include an upper horizontal brace of 3.5" x 3.5" x .50" x 23" minimum angle, braced at the center with a .25" x 3.5" x 20" minimum flat bar, forming a triangular box section. It shall include a cylinder ear mounting angle of 4" x 4" x .63" x 23" minimum, mounted with the apex pointing forwards for maximum strength, and braced at the center with a .188" x 4" x 6" minimum flat bar, forming a triangular box section. The cylinder ears shall be minimum .50" thick. The lift arm attachment angles shall be minimum 3.5" x 3.5" x .50" x 23" angle. The upper "tilting" portion shall include four (4) welded bushings measuring minimum .63" long and minimum .48" wall thickness: two (2) at the lift arm attachment points and two (2) at the upper tilt pin attachment points.
 - 7.8. The tilting mechanism shall include replaceable bushings at the pivot points. It shall use minimum 1" bolts at the pivot points, and minimum 1" hitch pins for the tilt lock pins.
 - 7.9. The hitch shall include a heavy duty, Single-acting hydraulic lift cylinder, minimum 3" bore x 10" stroke x 2" diameter rod.
 - 7.10. Lift cylinder rod shall be nitride coated for corrosion resistance and chip resistance. Lift cylinder shall have a minimum working pressure rating of 3000 psi.
 - 7.11. Lift cylinder shall include rod wiper and Polypak Type B or Hallite rod seals. Lift cylinder shall include a wear ring of minimum .38" width in the piston, and a wear ring of minimum .50" width in the head gland.

- 7.12. An appropriate counterbalance valve shall be provided to ensure that the plow will not drop in the event of a hydraulic failure, if it is being transported in lifted position. All required hoses and fittings for the installation of the counterbalance valve shall be provided.
- 7.13. The hitch shall include manufacturer's standard heavy duty truck hitch attachments to provide for mounting to standard Class 7 & Class 8 truck frames with integral front frame extensions.
- 7.14. The snowplow shall be equipped with a level lift system that will hold the moldboard level with the road surface at all times. IN NO INSTANCE SHALL THE MOLDBOARD LEAN, TILT OR DIP TO ONE SIDE WHEN REVERSING SIDE-TO-SIDE WHILE THE MOLDBOARD IS IN THE RAISED POSITION OFF THE PAVEMENT
8. ELECTRIC HYDRAULIC PUSH-BUTTON CAB CONTROL: A push-button control head suitable for mounting in the truck cab and electric or hydraulic pump shall be furnished to reposition the snowplow electrically or hydraulically from the operator's position during snow removal operations. Push-button control head shall have UP, DOWN, LEFT, RIGHT functions and be equipped with a minimum 14-foot control head cable.
 - 8.1. The hydraulic pump shall be equipped with the largest capacity hydraulic reservoir offered by the manufacturer.
 - 8.2. The two hydraulic hoses from the pump to the cushion valve shall be minimum 16 feet in length and be equipped with 3/8 inch male quick-disconnect dripless couplers and dust caps. The third hydraulic hose from the pump to the lift cylinder shall be minimum 16 feet in length and be equipped with the manufacturer's standard hydraulic fitting.

EXAMPLE: Monarch M688-102 (double acting cylinders – cushion valve type plows)
or CPA approved equal
9. SAFETY PLAQUES OR DECALS
 - 9.1. Product safety plaques or decals shall be furnished and affixed at the operator's station and at any hazardous area. The safety plaques or decals shall describe the nature of the hazard, level of hazard seriousness, how to avoid the hazard, and the consequence of human interaction with the hazard. Permanent plaques are preferred to decals. Type, size and location of product safety plaques or decals shall be in accordance with current ANSI Z535.4 standard.
 - 9.2. A permanent lubrication plaque shall be furnished and visible from the outside of the unit. The plaque shall note all lubrication points and recommended periodic oil changes and lubrication intervals.
10. PAINTING: The unit shall be painted with lead-free black paint except for glass, rubber and those accessories or fixtures constructed of rust-resistant or plated material not normally painted. Lead paint is not acceptable.
 - 10.1. The truck hitch, A-frame, push frame and entire rear and front surface of the moldboard shall be painted with an approved manufacturer's lead-free primer and finish coat of semi- gloss, black paint as normally recommended and offered by the manufacturer.
 - 10.2. SURFACE PREPARATION: All surfaces of the moldboard, push frame, A-frame, and truck hitch assembly shall be thoroughly cleaned to remove all dirt, oil, grease, rust, slag, scale, and other foreign matter prior to priming and painting. All welds shall be ground to a smooth finish. The cleaned and prepared surfaces shall be given a shop coat of primer and then thoroughly dried. The primer used shall be compatible with the finish coat in order to ensure proper adhesion of the finish coat. The finish coat shall be first quality air drying paint. The minimum dry film thickness of the finish coat shall be 4 mil. The final color shall be as specified above.
11. INSTRUCTION ON SAFETY, OPERATION AND PREVENTIVE MAINTENANCE: The Contractor shall provide the services of a competent factory trained technician thoroughly trained in the use and operation of the unit to the customer a minimum of two hours instruction on safety, operation and preventive maintenance of the unit. The service shall be provided after the unit has been delivered and is ready for operation but prior to payment.

12. MANUALS: Original manuals containing illustrated parts lists and operating and service instructions shall be delivered with each snowplow. The manuals shall be as detailed as possible and outline all necessary installation, adjusting, operating, service and storing instructions. Parts lists shall cover all components of the snowplow. Necessary warnings and safety precautions shall be included in the operating and service manuals.
13. MANUFACTURER'S STATEMENT OF ORIGIN (MSO): Contractor shall furnish MSO to the Customer with each unit at time of delivery. CUSTOMER WILL NOT ACCEPT THE UNIT AND PROCESS PAYMENT WITHOUT THE MSO.

PART III

DELIVERY AND ACCEPTANCE

1. **DELIVERY REQUIREMENTS:** Delivery of all equipment on this order shall be completed within the number of days specified on the purchase order. Any unit(s) not delivered within this time frame may be canceled from the purchase order or, at the Customer's option, an extension may be granted in writing, whichever is in the Customer's best interest.
 - 1.1. If any unit is canceled for non-delivery, the needed equipment may be purchased elsewhere and the Contractor may be charged any additional increase in cost and handling.
 - 1.2. **LIQUIDATED DAMAGES:** Unless a delivery extension is granted for acceptable reasons due to circumstances beyond the Contractor's control, liquidated damages of \$160 per unit will be deducted from the invoice for every working day after the expiration of the number of days shown on the purchase order until the units are delivered. This provision is not intended as a penalty but for ease of administration and the avoidance of disputes. The parties agree that \$160 per day is the nearest practicable estimate of cost to rent replacement equipment.
2. **ACCEPTANCE INSPECTION:** All equipment ordered will be subject to acceptance inspection and performance testing upon receipt. Acceptance inspection and performance testing will not take more than five working days, weather permitting. The Contractor will be notified within this time frame of any units not delivered in full compliance with the purchase order specifications. If any units are canceled for non-acceptance, the needed equipment may be purchased elsewhere and the Contractor may be charged any additional increase in cost and handling.
3. **WORKING DAY:** A working day is defined as a calendar day, not including Saturdays, Sundays, or regularly observed state and federal holidays.

PART IV

WARRANTY

1. WARRANTY: The unit shall be warranted against all defects in material and workmanship for a period of not less than 12 months or 1,200 hours of use, whichever comes first, and shall cover 100% parts and labor for the unit. If the manufacturer's standard warranty period exceeds 12 months or 1,200 hours, then the standard warranty period shall be in effect. The warranty begins on the date the unit is determined to meet specifications and accepted into the Customer's fleet.
- Warranty
_____ Months
_____ Hours
whichever
comes first

NOTE: A delayed warranty in service start date may be requested.

2. INTENT: During the warranty period the Contractor shall be responsible for labor, materials, and other costs as outlined below associated with required warranty repair. It is the intent of this warranty that the Contractor performs warranty repair work. At the Customer's option, the Customer may perform minor warranty repairs to the unit at the Contractor's expense.
- 2.1. EXCLUSIONS: The Customer will assume the expense for replacement tires and tubes, tire repairs, lubricating oils, hydraulic fluids, greases, filters, fuel, antifreeze, batteries, lights, hoses, belts, cleaning, painting and other minor items normally consumed in day-to-day operations. The Customer will assume responsibility for cost of repairs resulting from collision, theft, vandalism, operator negligence or acts of God.
- 2.2. EQUIPMENT MAINTENANCE: It is the Customer's practice to maintain the equipment in accordance with the manufacturer's published recommendations.
- 2.3. MINOR WARRANTY REPAIRS: It is the intent of this warranty that the Contractor performs minor warranty repairs; however, at Customer's option, warranty repairs deemed by the Customer to be minor in nature may be performed by the Customer at the Contractor's expense. Parts required for repairs made by the Customer will be OEM parts and obtained from the Contractor or any commercial source, at no cost to the Customer. Only the actual time required for repairs shall be reimbursed. The Customer will not request reimbursement for additional time incurred such as mechanic's travel time or diagnostic time. Reimbursement by the Contractor to the Customer for the cost of warranty repairs shall be computed as follows:
- 2.3.1. Labor: Labor for warranty repairs will be calculated at the composite rate for the mechanic in effect at the time of the warranty repairs. Labor rate will not exceed \$40 per hour. The time allowed for each repair will be determined by the manufacturer's standard time schedule. Manufacturer's time schedule shall be furnished to the receiving district with the unit at the time of delivery (if available). If a manufacturer's time schedule is not available, the actual time for repairs, as noted above, will be used.
- 2.3.2. Warranty Repair Claims: The Customer may track and bill warranty repairs through the Customer's fleet management software or on the Contractor's standard forms.
- 2.3.3. Parts: Replaced parts will be held 30 calendar days and will be available for inspection by the Contractor or authorized representative. Copies of invoices for all parts will be provided to the Contractor. The cost of parts other than those furnished to the Customer at no cost by the Contractor will be billed at actual cost.

- 2.4. **MAJOR WARRANTY REPAIRS:** When major warranty repairs are required, the Customer will notify a representative of the Contractor's Texas dealer by telephone at the location and the telephone number designated by the Contractor. Major warranty repair work for the purpose of this specification means major repairs to the engine and major repairs to any other components of the unit. Diagnosis of the actual repairs required shall be the responsibility of the Contractor. The unit will be made available at a Customer's facility within a 100-mile radius of the FOB point shown on the purchase order. The repair work may be performed by the Contractor or Contractor's authorized representative.
- 2.4.1. At the Contractor's option, the unit may be taken by the Contractor to a commercial repair facility. The Contractor shall be responsible for the cost of the round trip transportation of the unit to and from that location.
- 2.4.2. If mutually agreed upon between the Contractor and the Customer, the Customer may transport the unit to the Contractor's location or authorized repair facility, within the boundaries of the state of Texas. The cost of equipment and manpower necessary to haul the unit for the round trip will be billed back to the Contractor at the rental rate of the equipment and composite hourly rate for the driver in effect at the time for the equipment required. The composite hourly rate for the driver will not exceed \$30 per hour. Rental rate for the truck and trailer will not exceed \$0.80 per mile for the truck and \$8 per hour for the trailer.
3. **RESPONSE TIME:** Warranty repair action shall begin within two working days after notification is made to the Contractor for need of warranty repairs. A representative of the Contractor's Texas dealer will be notified by telephone at the location and telephone number designated by the Contractor's point of contact. The Contractor shall notify the Customer immediately of any changes in this location and telephone number. The warranty repairs should be completed and the unit returned to the Customer (or picked up by the Customer at the Contractor's expense as outlined above) within a reasonable period of time. For the purpose of the specification eight working days is defined as a reasonable period of time. Excessive delays incurred for the performance of warranty repairs by the Contractor may adversely affect the Contractor's status as a qualified Contractor.
4. **BILLING AND PAYMENT FOR WARRANTY REPAIR EXPENSES:** Cost will be accumulated for transportation of the unit by the Customer to the Contractor's location or authorized repair facility. Payment for transportation costs as provided for in this section shall be made within 30 calendar days of the billing date.
5. **PARTS AND SERVICE:** The manufacturer of the equipment furnished shall have an authorized dealer within the state of Texas. The authorized dealer shall have factory-trained personnel available for warranty repairs and the performance of service. The dealer shall also maintain an inventory of high-usage parts and a quick source for low-usage parts.

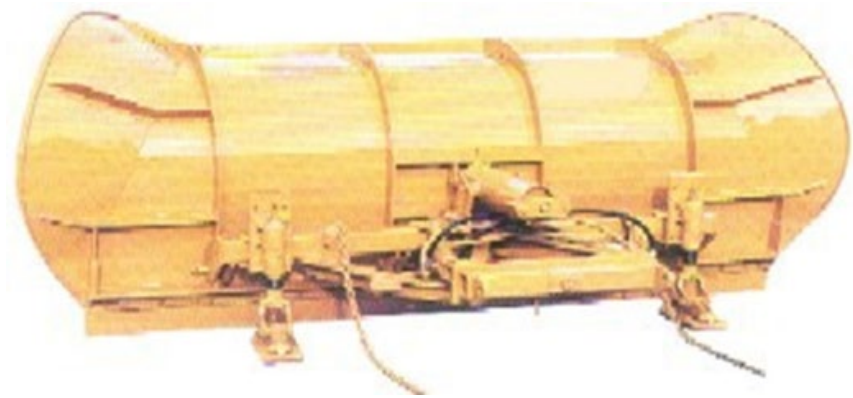
PART V

OPTIONAL EQUIPMENT

1. OPTION NO. 1 - PNEUMATIC RUBBER TIRES: In lieu of the steel caster wheels specified in Part II, Para. 6, the snowplow shall be equipped with two, minimum 4 ply tread and sidewall, 16-inch diameter, pneumatic rubber tires mounted on minimum 4.80" x 8 inch heavy-duty rims. Wheel hubs shall be equipped with grease zerks to allow greasing of the wheel bearings.
2. OPTION NO. 2 – DISCHARGE WINGS: The snowplow ends and upper portion of the outside corners shall be equipped with the manufacturer's regularly offered discharge wings (example shown below) to cast the material greater distances when plowing at speeds up to 20 mph.

NOTE: This option only available on 10 foot and 11 foot moldboards.

EXAMPLE



3. OPTION NO. 3 - 10 FOOT MOLDBOARD: In lieu of the 11-foot wide moldboard specified in Part II, Para. 2., the moldboard shall be 10 feet wide. Length of cutting edge shall be not less than 10 feet. The approximate weight of the moldboard (less hitch and hydraulics) shall be a maximum 2,000 pounds.
4. OPTION NO. 4 - 12 FOOT MOLDBOARD: In lieu of the 11-foot wide moldboard specified in Part II, Para. 2., the moldboard shall be 12 feet wide. Length of cutting edge shall be not less than 12 feet. The approximate weight of the moldboard (less hitch and hydraulics) shall be a maximum 2,450 pounds.
5. OPTION NO. 5 – MUSHROOM SHOES: In lieu of the caster wheels referenced in Part II, Para. 6, unit shall be furnished with manufacturer's standard, hard steel mushroom shoes.
6. OPTION NO. 6 – DOUBLE ACTING CYLINDER w/ LOCKOUT VALVE: Heavy duty, double-acting hydraulic cylinders, minimum 3" bore x 10" stroke x 2" diameter rod, attached with minimum 1" diameter pins at each end. Cylinder rods shall be nitride coated for corrosion resistance and chip resistance.

**SNOWPLOW, GENERAL PURPOSE, TRUCK MOUNTED, WITH REVERSIBLE
MOLDBOARD, PARALLEL LIFT WITH MECHANICAL FLOAT**

PART I

GENERAL INFORMATION, REQUIREMENTS, AND CONDITIONS

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5. Any example shown is an example to show type and class of equipment desired. Contractor are cautioned to read the specification carefully, as there may be special requirements not commonly offered by the equipment manufacturer. DO NOT ASSUME STANDARD EQUIPMENT MEETS ALL OF THE DETAILED SPECIFICATION REQUIREMENTS MERELY BECAUSE IT IS LISTED AS AN EXAMPLE. Contractors are cautioned that any unit delivered to the FOB destination, which does not meet specifications in every aspect, will not be accepted.

PART II

SPECIFICATIONS

1. **SCOPE:** This specification describes a heavy-duty, 10-foot general-purpose snowplow with power reversible moldboard for use in all types of snowplowing conditions where the removal of snow from road surfaces must be accomplished with a right- or left-hand discharge at speeds up to 20 mph. The snowplow shall be equipped with an ECT (external compression trip) spring assembly that will enable the moldboard to pass over a fixed object and automatically and immediately return the plowing to the proper position without loss of vehicle control. The general-purpose snowplow shall be mounted on a Customer's medium duty truck having a front gross axle weight rating (GAWR) of 20,000 pounds. The approximate weight of the moldboard furnished to this specification shall be between 1,800 to 2,200 pounds (less hitch and hydraulics) and meet or exceed all requirements.

EXAMPLES: Falls PR1143
Flink Model FSP 11PA38,
Henke Model 42R11 ECT, PLPM
or CPA approved equal.

2. **MOLDBOARD:** Moldboard shall be a smooth rolled, curved shape, made from minimum 10 Gauge Grade 50 steel, 10 feet in length. Shall include a minimum of eight (8) vertical ribs. Ribs shall be made of ½" steel plate, measuring 4" wide at the bottom. All ribs shall have drain holes where they are welded to the top angle, to prevent pooling of water. The shape of the moldboard shall provide proper lift, roll, and discharge of snow for maximum plowing efficiency.
 - 2.1. The moldboard shall be a minimum of 38 inches and a maximum of 45 inches in height and have a minimum three position for manual attack angle adjustment.
 - 2.2. The moldboard shall have a minimum of five (5) connection points to the push frame. There shall be a minimum span of 119.5" between the outermost hinge points. Reversing frame shall connect to moldboard using minimum 1.25" diameter cold-finished steel pins. Each connection points shall be reinforced with a fully welded 2.25" diameter steel bushing, 1.5" in length.
 - 2.3. The moldboard shall include a steel integral shield, with the moldboard radius extended forward along with a rubber shield to prevent snow from blowing over the top of the moldboard when plowing at maximum speed. When set at 14° attack angle, the top of the moldboard curve shall extend forward of the cutting edge by a minimum of twenty 20". The rubber shield shall be a minimum 1/4-inch-thick x 12 inches wide and extend the length of the moldboard.
 - 2.4. The moldboard bottom shall be constructed of minimum 4 inch x 4 inch x .75 inch structural angle steel with American Association of State Highway and Transportation Officials (AASHTO) Standard Highway Punching for mounting the cutting edge.
 - 2.5. Angle steel shall have minimum .50 inch steel gussets spaced evenly between each cutting edge mounting hole, except for a pair of holes on each end which shall have gussets on either side of holes.
 - 2.6. Shall include horizontal brace angles measuring 4" x 3" x .38" at locations where trip devices attach and measuring at least 4" x 3" x .25" at all locations outboard of the outermost hinge points.
 - 2.7. The top outermost edge of the moldboard shall be equipped with a flag holder or removable reflective pole marker as normally offered by the manufacturer.
3. **CUTTING EDGE:** The moldboard shall be equipped with a replaceable cutting edge constructed of high carbon steel, minimum 1/2 inch thick x 6 inches in height. Length of the cutting edge shall be a minimum of 10 feet. Bolt holes shall be edge punched in accordance with AASHTO Standard Highway Punching.
 - 3.1. 6-inch Carbon Steel curb guards shall be installed to protect the ends of the moldboard when plowing

next to curbs. The cutting edge shall be equipped with minimum of two (2) replaceable Carbon Steel wear shoes. Located immediately behind the cutting edge in **the size and locations as normally furnished by the manufacturer to prevent damage to** the moldboard bottom as the cutting edge wears.

4. TRIP MECHANISM: Moldboard trip shall be of an external compression spring type. The plow shall trip and reset automatically when encountering an obstacle by means of two (2) external compression springs.
 - 4.1. Each spring shall be 5-5/8" in outer diameter, 23-1/4" long, of 23/32" wire, with a minimum of ten (10) active coils. The spring assembly shall attach to the plow moldboard by means of two (2) 3/4" thick steel ears which will allow the trip mechanism to be set at three (3) different positions.
 - 4.2. The ears are welded to 4" x 3" x 3/8" horizontal angles welded between vertical ribs. The spring assembly shall attach to the circle push frame on structural steel tubing, which is mounted inside the circle assembly for maximum support. The lower mounting ears shall wrap around the back of the tube for maximum strength.
 - 4.3. IN NO INSTANCE SHALL THE MOLDBOARD, BUILT-IN DEFLECTOR, INTEGRAL SHIELD OR RUBBER BELTING STRIKE THE PAVEMENT WHEN THE PLOW IS TRIPPED.
5. REVERSING FRAME ASSEMBLY
 - 5.1. The reversing frame assembly shall include a lower tube made from 6" x 4" x .38" square steel tubing, 119.5" long, and an upper tube of 5" x 2" x .25" rectangular steel tubing, 43.94" long. There shall be two (2) fully welded vertical supports joining the outer ends of the upper tube to the lower tube measuring 24.5" x 10" x .50" thick.
 - 5.2. At the center of the reversing frame, there shall be a center swivel structure, with a main plate measuring 9.0" x 32.94" x .50" thick, attached to the reversing frame by two (2) full-height welded supports. All holes and slots in center swivel structure shall be reinforced by .38" thick welded stiffener plates for increased strength and wear resistance.
 - 5.3. Between the outer supports and the center swivel structure, there shall be two (2) cylinder attaching structures, each consisting of a formed channel measuring 8" x 4" x .38" thick, and two (2) 1" thick horizontal mounting plates for cylinder attachment.
 - 5.4. Across the front of the reversing frame, there shall be ten (10) fully welded ears (14 ears on seven (7) connection point version) for attaching the push frame assembly to the moldboard assembly. The ears shall measure 63" thick x 4.00" tall.
 - 5.5. The reversing frame shall attach to the moldboard assembly using 1.25" diameter cold-finished steel pins pinned through each pair of push frame ears.
 - 5.6. There shall be two (2) rollers attached on each end of the reversing frame assembly, between both outer supports. These rollers shall serve as reversing stops, contacting the plow portion flat plate hitch when the plow is fully reversed. The rollers shall be made of 3" OD cold-finished round tubing. Each roller shall rotate on a 2" diameter pin assembly secured by a .50" thick fully welded head. The pin shall include an integral grease fitting in one end, with drilled grease path to allow for lubrication of the roller.

- 5.7. If optional running gear is not supplied on the plow, two adjustable parking stands shall be supplied, which support the plow when parked, and allow the plow to be hydraulically lifted off of the flat plate hitch truck portion. Note: if running gear is supplied, the parking stands are not needed. The parking stands shall include two (2) brackets bolted to the reversing frame and two (2) inner tube assemblies with lift handles and welded feet. The brackets shall include an outer tube of 3.00" OD x 2.44" ID round steel tubing welded between two (2) .38" thick steel plates. The inner tubes shall be made of 2" Sch. 80 black pipe with ten (10) adjustment holes, allowing for height adjustments in 1" increments. The welded feet shall be made from .50" x 3.00" flat bar, 13.63" long after forming, braced with a 7" x 3" welded gusset.

6. SWIVEL ASSEMBLY:

- 6.1. The swivel assembly shall attach the upper and lower arm assemblies to the push frame, in conjunction with the center pivot shaft.
- 6.2. The swivel assembly shall include a 9.0" x 32.94" x .50" thick main plate, stiffened by two fully welded .50" x 2.5" full-height bars. There shall be four .75" thick bushing supports fully welded to the main plate and stiffener bars, spaced approximately equally along the main plate.
- 6.3. Four greaseable 4.00" OD x 3.03" ID x 3" long bushings shall be fully welded to the bushing supports. The center pivot shaft shall install through these bushings.
- 6.4. The swivel assembly shall attach to the push frame using a 1.5" Grade 5 bolt in the center and four (4) 1" Grade 8 bolts spaced above and below the center bolt. The bolts shall be secured using slotted nuts and hardened washers, and the 1" bolts shall be further secured with .38" thick fabricated washers. All five (5) swivel bolts shall be assembled with replaceable bushings which prevent the swivel bolts from being over-tightened.
- 6.5. A .25" thick replaceable wear plate, made from UHMW poly, shall be installed between the swivel plate and the reversing frame.
- 6.6. The swivel assembly shall allow the plow to swivel 3 degrees each direction (6 degrees total) so that it can effectively follow the contour of the road surface.
- 6.7. The swivel assembly shall automatically center the plow in the unswiveled position when swivel is not required, using two compression springs installed between the push frame and swivel assembly. The two centering springs shall be 7.00" long, 3.63" OD, of .63" diameter wire, with a nominal spring rate of 1499 lbs./inch. The spring force of the centering springs shall be adjustable by means of two (2) screw assemblies made of 1.25" diameter Acme threaded rod

7. UPPER AND LOWER ARM ASSEMBLIES:

- 7.1. The upper arm assembly shall be constructed using two (2) 3" x 3" x .38" thick square steel tubes, joined at the rear by a third 3" x 3" x .38" thick square steel tube. This rear tube shall include four (4) 3" tall x .75" thick ears with 2" OD x 1.28" ID welded bushings. The upper arm assembly shall also include two (2) 3.5" tall x .75" thick plates spanning from the front tubes to the rear tube, which serve as structural members and to connect the upper arm assembly to the center pivot shaft.
- 7.2. Attached to the upper arm shall be a float link assembly constructed of two (2) parallel steel plates measuring 11" x 3" x .75" thick, joined together by a 1.75" OD tube. This float link assembly shall be attached to the upper arm on one end, and to the lift cylinder on the other end.
- 7.3. The float link assembly shall be able to be restrained from motion by the installation of a .75" diameter float lockout pin, thereby fixing it to the upper arm. By removing the float lockout pin, the linkage is free to rotate independently of the upper arm, thereby disengaging the lift cylinder from the upper arm and allowing the plow to "float" over the ground independently of the lifting system.

- 7.4. The lower arm assembly shall be constructed using two (2) 3" x 3" x .38" thick square steel tubes, joined by a gusseted, triangular steel plate measuring 30" x 10.8" x .50" thick. The rear of each tube shall include two (2) 3" tall x .75" thick ears with 2" OD x 1.28" I.D. welded bushings, welded to .50" thick steel plates. The upper arm assembly shall also include two (2) 3.5" tall x .75" thick ears at the front, which serve as structural members and to connect the upper arm assembly to the center pivot shaft.
- 7.5. The upper and lower arm assemblies shall include 2.25" OD x 1.28" ID x .50" thick steel bosses welded to each ear at the front of the arm assemblies to maximize the strength of the connection point between the arm assembly and the center pivot shaft.

8. CENTER PIVOT SHAFT

- 8.1. The upper and lower arm assemblies shall be attached to the swivel assembly by a 3" diameter cold-finished solid steel shaft, 35.75" long, with two (2) machined flats at the points of arm attachment. To achieve maximum strength, ensure a direct line of force transmission, and eliminate the possibility of knuckle failures due to off-center loading, the upper and lower arm assemblies shall be attached directly to the center pivot shaft using 1.25" diameter cold-finished steel pins. Knuckles shall not be used to attach the upper and lower arm assemblies to the center shaft or swivel assembly.
- 8.2. To provide for ease of maintenance, the pins used to connect the upper and lower arm assemblies shall not be welded in place. The pins must be able to be removed by removing standard fasteners with standard tools; no torching or cutting shall be required.
- 8.3. The center pivot shaft shall be secured to the swivel assembly using a 4" OD x 3.03" ID x 6.88" long steel bushing and a 1" diameter Grade 8 bolt with a nyloc nut and hardened washer.

9. HYDRAULICS

- 9.1. The plow shall be designed to install and uninstall from the truck hitch hydraulically, using its own lift cylinder. No external lifting device shall be required to install and uninstall the plow from the truck hitch.
- 9.2. The hydraulic lift cylinder shall be 4" diameter bore, 2" diameter rod, and minimum 13.13" stroke. The cylinder rods shall have nitride finish for corrosion resistance and chip resistance.
- 9.3. The hydraulic reversing cylinders shall be 4" diameter bore, 2" diameter rod, and minimum 15" stroke. The cylinder rods shall have nitride finish for corrosion resistance and chip resistance.
- 9.4. To minimize maintenance issues, the cylinders shall be of a single-stage, non-telescoping design.
- 9.5. To optimize the discharge of snow, the plow reversing system shall be designed to allow for a full 35 degrees of rotation in both left and right directions, measured with the plow on the ground in plowing position.
- 9.6. Plow lift cylinder shall attach at each end with 1.25" diameter, cold-finished steel pins.
- 9.7. The hydraulic reversing cylinders shall attach to the plow portion flat plate hitch and the reversing frame using single piece cast or machined knuckles, which are designed so that the line of force of the cylinder travels directly through the axis of the pins which attach the knuckle to the hitch or reversing frame, regardless of reversing angle or plow position. This ensures maximum strength of the attachment and prevents knuckle failures due to off-center loading. The knuckles shall be 5.88" long and 3.25" across and shall be attached at the top and bottom using 1" diameter pin assemblies with welded heads, which are each secured using two (2) ½" Grade 8 bolts. The hydraulic cylinder shall be secured to the knuckle on each end using a 1" diameter clevis pin.

- 9.8. The plow shall come standard with a 750-psi crossover relief valve and 200 psi down pressure relief valve, which are both included in a single, integrated hydraulic manifold. The plow shall also come standard with a hydraulic accumulator, which is plumbed through the integrated hydraulic manifold. All of these components shall be factory-installed on the product. The crossover relief valve helps to prevent damage due to severe shock loading. The down pressure relief valve helps to prevent accidental product damage due to inadvertent application of down pressure. The hydraulic accumulator helps to prevent product damage by preventing excessive pressure buildup in hydraulic cylinders.

10. FLAT PLATE HITCH, PLOW PORTION:

- 10.1. The flat plate hitch plow portion serves to attach the plow to the truck. It attaches to the flat plate hitch truck portion at the rear, and to the upper and lower arm assemblies, reversing cylinders, and lift cylinder at the front. It must mate with a standard Henke or Wausau flat plate hitch (see Flat Plate Hitch – Truck Portion section of specification for details).
- 10.2. The flat plate hitch plow portion shall include a main plate measuring 44" x 30.5" x .63". It shall include two (2) full-height outer vertical supports measuring 3.63" x .75" thick, with drilled holes reinforced with 2.0" OD x 1.28" I.D. cold-rolled steel bushings for attachment of the upper and lower arm assemblies using 1.25" diameter cold-finished steel pins. Outer vertical supports must include an integrated stop which limits the amount of upward travel of the lower lift arm.
- 10.3. The flat plate hitch plow portion shall include two (2) horizontal bars for mounting cylinder knuckles, measuring 2.75" x 1" thick, and a lower horizontal tube made of 3" x 3" x .38" structural tubing, which span horizontally across the plow portion hitch. There shall be two additional vertical supports measuring 17.5" long x .50" thick which span from the lower structural tube to the upper cylinder knuckle mounting bar. The lower square tube shall have two (2) .75" thick ears welded to it to attach the barrel end of the lift cylinder.
- 10.4. Outside of the outer vertical supports, two reversing stops shall be mounted, which are formed of 1" diameter cold-finished round bar, 30" long, rolled into a smooth arc, and welded to a support plate measuring 28.5" tall x .38" thick. These reversing stops serve as mechanical stops to limit the reversing angle of the plow and protect the reversing cylinders from damage. The reversing stops must be bolt-removable from the main weldment of the plow portion hitch, to allow for easy replacement. Each reversing stop shall be attached with a minimum of five (5) ¾" Grade 8 bolts. These reversing stops must be formed into a specific arc shape, which helps to ensure that the plow stays against the stop as the plow is raised or lowered. The structures that the reversing stops bolt to must be designed at the proper angle such that the rollers contact the reversing stops at an angle of 90 degrees to the long axis of the roller.
- 10.5. On the back of the flat plate hitch plow portion, two cast steel or machined steel hooks serve to attach the plow portion and truck portion of the hitch together at the upper end. The hooks must be appropriately welded to the plow portion hitch such that there will be no weld failure of any kind while plowing or transporting the plow.
- 10.6. The flat plate hitch plow portion includes two (2) mounting ears, measuring 4" x 10.5" x .50" thick, which serve to secure the plow portion and truck portion of the flat plate hitch together at the lower end. For ease of plow engagement, the design of the mounting ears allows for a horizontal misalignment of 1.75" in either direction. Within this range, the two portions will be automatically guided together into a centered position as the truck pulls forward. Each mounting ear is braced at the top and the bottom by full-length, .50" thick welded gussets for severe-duty service. Each mounting ear must include a fully welded bushing at the connection point, measuring 2.5" OD x 1.63" I.D. x 1.00" thick.
- 10.7. The plow portion and truck portion flat plate hitch shall be secured at the lower end using two (2) 1.5" diameter cold-finished attaching pins. The pins shall be engaged and disengaged using a spring-loaded mechanism operated with a single lever.

11. SAFETY PLAQUES OR DECALS:

- 11.1. Product safety plaques or decals shall be furnished and affixed at the operator's station and at any

hazardous area. The safety plaques or decals shall describe the nature of the hazard, level of hazard seriousness, how to avoid the hazard, and the consequence of human interaction with the hazard. Permanent plaques are preferred to decals. Type, size and location of product safety plaques or decals shall be in accordance with current ANSI Z535.4 standard.

- 11.2. A permanent lubrication plaque shall be furnished and visible from the outside of the unit. The plaque shall note all lubrication points and recommended periodic oil changes and lubrication intervals.
12. PAINTING: The unit shall be painted with lead-free black paint except for glass, rubber and those accessories or fixtures constructed of rust-resistant or plated material not normally painted. Lead paint is not acceptable.
 - 12.1. The Moldboard Face shall be painted Federal Standard Yellow.
 - 12.2. All other surfaces of the plow, and the entire truck hitch, shall be painted with an approved manufacturer's lead-free primer and finish coat of semi- gloss, black paint as normally recommended and offered by the manufacturer.
13. SURFACE PREPARATION: All surfaces of the moldboard, push frame, A-frame, and truck hitch assembly shall be thoroughly cleaned to remove all dirt, oil, grease, rust, slag, scale, and other foreign matter prior to priming and painting. All welds shall be ground to a smooth finish. The cleaned and prepared surfaces shall be given a shop coat of primer and then thoroughly dried. The primer used shall be compatible with the finish coat in order to ensure proper adhesion of the finish coat. The finish coat shall be first quality air drying paint. The minimum dry film thickness of the finish coat shall be 4 mil. The final color shall be as specified above.
14. INSTRUCTION ON SAFETY, OPERATION AND PREVENTIVE MAINTENANCE: The Contractor shall provide a minimum four hours of instruction on setup, installation, adjustment, operation, service, and preventive maintenance of the snowplow by factory-trained personnel after the snowplow has been delivered and is ready for operation but prior to payment. The instruction shall include, as a minimum, the manufacturer's recommended setup, installation, adjustment, operating, servicing, and storing procedures and all safety precautions relating to snowplow operations. Contractor shall coordinate the delivery and training dates with the district equipment supervisor at least ten days before the scheduled delivery of the snowplow(s). Training shall be provided at each FOB point listed on Purchase Order.
15. MANUALS: Manuals containing illustrated parts lists and operating and service instructions shall be delivered with each snowplow. The manuals shall be as detailed as possible and outline all necessary installation, adjusting, operating, service and storing instructions. Parts lists shall cover all components of the snowplow. Necessary warnings and safety precautions shall be included in the operating and service manuals.
16. MANUFACTURER'S STATEMENT OF ORIGIN (MSO): Contractor shall furnish MSO to the Customer with each unit at time of delivery. CUSTOMER WILL NOT ACCEPT THE UNIT AND PROCESS PAYMENT WITHOUT THE MSO.

PART III

DELIVERY AND ACCEPTANCE

1. **DELIVERY REQUIREMENTS:** Delivery of all equipment on this order shall be completed within the number of days specified on the purchase order. Any unit(s) not delivered within this time frame may be canceled from the purchase order or, at the Customer's option, an extension may be granted in writing, whichever is in the Customer's best interest.
 - 1.1. If any unit is canceled for non-delivery, the needed equipment may be purchased elsewhere and the Contractor may be charged any additional increase in cost and handling.
 - 1.2. **LIQUIDATED DAMAGES:** Unless a delivery extension is granted for acceptable reasons due to circumstances beyond the Contractor's control, liquidated damages of \$160 per unit will be deducted from the invoice for every working day after the expiration of the number of days shown on the purchase order until the units are delivered. This provision is not intended as a penalty but for ease of administration and the avoidance of disputes. The parties agree that \$160 per day is the nearest practicable estimate of cost to rent replacement equipment.
2. **ACCEPTANCE INSPECTION:** All equipment ordered will be subject to acceptance inspection and performance testing upon receipt. Acceptance inspection and performance testing will not take more than five working days, weather permitting. The Contractor will be notified within this time frame of any units not delivered in full compliance with the purchase order specifications. If any units are canceled for non-acceptance, the needed equipment may be purchased elsewhere and the Contractor may be charged any additional increase in cost and handling.
3. **WORKING DAY:** A working day is defined as a calendar day, not including Saturdays, Sundays, or regularly observed state and federal holidays.

PART IV

WARRANTY

1. WARRANTY: The unit shall be warranted against all defects in material and workmanship for a period of not less than 12 months or 1,200 hours of use, whichever comes first, and shall cover 100% parts and labor for the unit. If the manufacturer's standard warranty period exceeds 12 months or 1,200 hours, then the standard warranty period shall be in effect. The warranty begins on the date the unit is determined to meet specifications and accepted into the Customer's fleet.
- Warranty
_____ Months
_____ Hours
whichever
comes first

NOTE: A delayed warranty in service start date may be requested.

2. INTENT: During the warranty period the Contractor shall be responsible for labor, materials, and other costs as outlined below associated with required warranty repair. It is the intent of this warranty that the Contractor performs warranty repair work. At the Customer's option, the Customer may perform minor warranty repairs to the unit at the Contractor's expense.
- 2.1. EXCLUSIONS: The Customer will assume the expense for replacement tires and tubes, tire repairs, lubricating oils, hydraulic fluids, greases, filters, fuel, antifreeze, batteries, lights, hoses, belts, cleaning, painting and other minor items normally consumed in day-to-day operations. The Customer will assume responsibility for cost of repairs resulting from collision, theft, vandalism, operator negligence or acts of God.
- 2.2. EQUIPMENT MAINTENANCE: It is the Customer's practice to maintain the equipment in accordance with the manufacturer's published recommendations.
- 2.3. MINOR WARRANTY REPAIRS: It is the intent of this warranty that the Contractor performs minor warranty repairs; however, at Customer's option, warranty repairs deemed by the Customer to be minor in nature may be performed by the Customer at the Contractor's expense. Parts required for repairs made by the Customer will be OEM parts and obtained from the Contractor or any commercial source, at no cost to the Customer. Only the actual time required for repairs shall be reimbursed. The Customer will not request reimbursement for additional time incurred such as mechanic's travel time or diagnostic time. Reimbursement by the Contractor to the Customer for the cost of warranty repairs shall be computed as follows:
- 2.3.1. Labor: Labor for warranty repairs will be calculated at the composite rate for the mechanic in effect at the time of the warranty repairs. Labor rate will not exceed \$40 per hour. The time allowed for each repair will be determined by the manufacturer's standard time schedule. Manufacturer's time schedule shall be furnished to the receiving district with the unit at the time of delivery (if available). If a manufacturer's time schedule is not available, the actual time for repairs, as noted above, will be used.
- 2.3.2. Warranty Repair Claims: The Customer may track and bill warranty repairs through the Customer's fleet management software or on the Contractor's standard forms.
- 2.3.3. Parts: Replaced parts will be held 30 calendar days and will be available for inspection by the Contractor or authorized representative. Copies of invoices for all parts will be provided to the Contractor. The cost of parts other than those furnished to the Customer at no cost by the Contractor will be billed at actual cost.

- 2.4. **MAJOR WARRANTY REPAIRS:** When major warranty repairs are required, the Customer will notify a representative of the Contractor's Texas dealer by telephone at the location and the telephone number designated by the Contractor on the attached Data Sheet as the point of contact. Major warranty repair work for the purpose of this specification means major repairs to the engine and major repairs to any other components of the unit. Diagnosis of the actual repairs required shall be the responsibility of the Contractor. The unit will be made available at a Customer's facility within a 100-mile radius of the FOB point shown on the purchase order. The repair work may be performed by the Contractor or Contractor's authorized representative.
- 2.4.1. At the Contractor's option, the unit may be taken by the Contractor to a commercial repair facility. The Contractor shall be responsible for the cost of the round trip transportation of the unit to and from that location.
- 2.4.2. If mutually agreed upon between the Contractor and the Customer, the Customer may transport the unit to the Contractor's location or authorized repair facility, within the boundaries of the state of Texas. The cost of equipment and manpower necessary to haul the unit for the round trip will be billed back to the Contractor at the rental rate of the equipment and composite hourly rate for the driver in effect at the time for the equipment required. The composite hourly rate for the driver will not exceed \$30 per hour. Rental rate for the truck and trailer will not exceed \$0.80 per mile for the truck and \$8 per hour for the trailer.
3. **RESPONSE TIME:** Warranty repair action shall begin within two working days after notification is made to the Contractor for need of warranty repairs. A representative of the Contractor's Texas dealer will be notified by telephone at the location and telephone number designated by the Contractor on the attached Data Sheet as the point of contact. The Contractor shall notify the Customer immediately of any changes in this location and telephone number. The warranty repairs should be completed and the unit returned to the Customer (or picked up by the Customer at the Contractor's expense as outlined above) within a reasonable period of time. For the purpose of the specification eight working days is defined as a reasonable period of time. Excessive delays incurred for the performance of warranty repairs by the Contractor may adversely affect the Contractor's status as a qualified Contractor.
4. **BILLING AND PAYMENT FOR WARRANTY REPAIR EXPENSES:** Cost will be accumulated for transportation of the unit by the Customer to the Contractor's location or authorized repair facility. Payment for transportation costs as provided for in this section shall be made within 30 calendar days of the billing date.
5. **PARTS AND SERVICE:** The manufacturer of the equipment furnished shall have an authorized dealer within the state of Texas. The authorized dealer shall have factory-trained personnel available for warranty repairs and the performance of service. The dealer shall also maintain an inventory of high-usage parts and a quick source for low-usage parts.

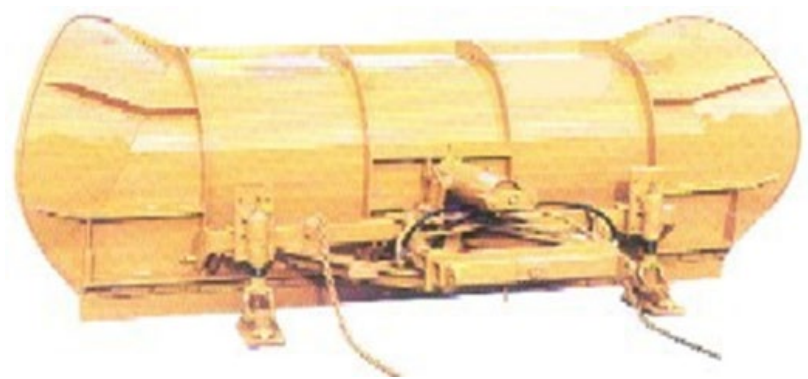
PART V

OPTIONAL EQUIPMENT

1. OPTION NO. 1 – DISCHARGE WINGS: The snowplow ends and upper portion of the outside corners shall be equipped with the manufacturer's regularly offered discharge wings (example shown below) to cast the material greater distances when plowing at speeds up to 20 mph.

NOTE: This option only available on 10 foot and 11 foot moldboards.

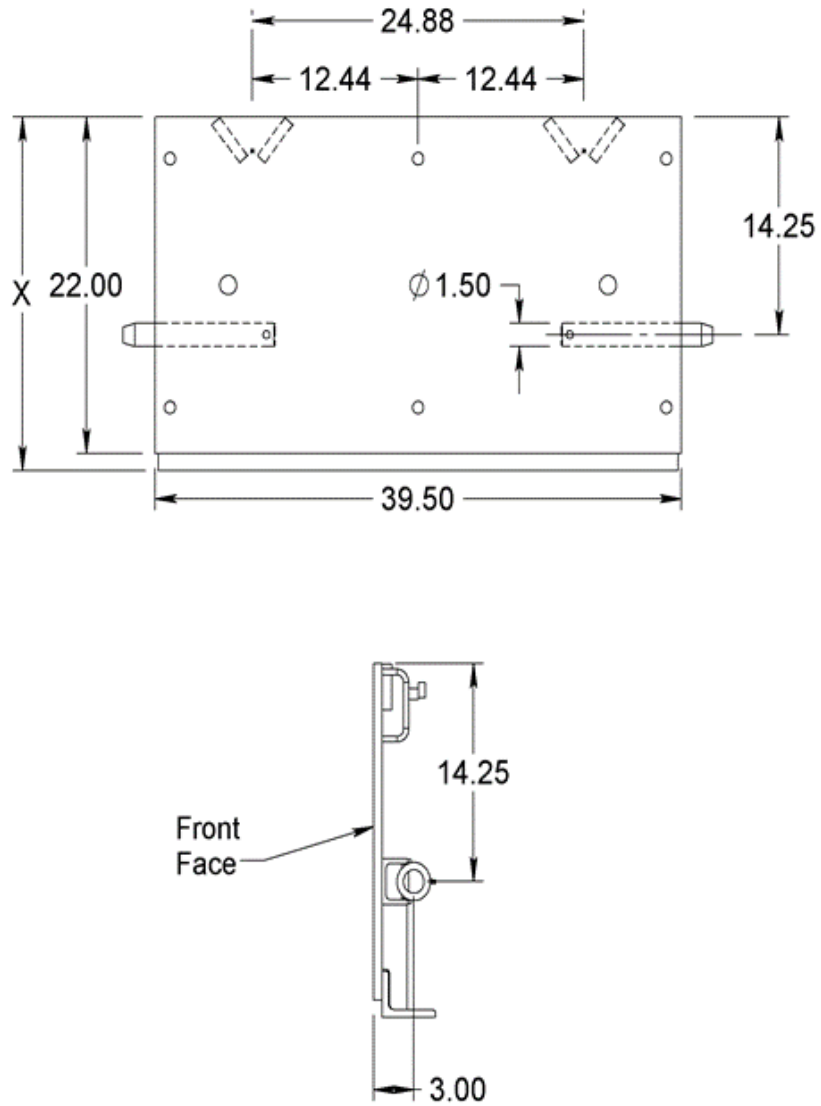
EXAMPLE:



2. OPTION NO. 2 – 11 FOOT MOLDBOARD: In lieu of the 10-foot-wide moldboard specified in Part II, Para. 2., the moldboard shall be 11 feet wide. Length of cutting edge shall be not less than 11 feet. The approximate weight of the moldboard (less hitch and hydraulics) shall be a maximum 2,450 pounds.
3. OPTION NO. 3 – 12 FOOT MOLDBOARD: In lieu of the 10-foot-wide moldboard specified in Part II, Para. 2., the moldboard shall be 12 feet wide. Length of cutting edge shall be not less than 12 feet. The approximate weight of the moldboard (less hitch and hydraulics) shall be a maximum 2,450 pounds.
4. OPTION NO. 4 – MUSHROOM SHOE RUNNING GEAR: The snowplow shall be equipped with a pair of height adjustable heavy duty 11" mushroom shoe running gear. The running gear shall include two height adjustment methods: course adjustment through a series of bolt holes, and fine adjustment through a hand crank screw assembly. The screw assembly shall be 1.25" Acme threaded rod minimum. Running gear inner tube shall be 3" x 3" x .25" square tubing minimum. Running gear outer tube shall be 3.5" x 3.5" x .188" square tubing minimum, with a fully welded lower reinforcement collar of 4" x 4" x .188" square tubing minimum near the bottom of the lower tube assembly. Mushroom shoe shall measure 11" diameter x 2.75" height minimum.
5. OPTION NO. 5 – SPRING LOADED 1X6 RUNNERS TYPE SKID SHOE RUNNING GEAR: In lieu of the caster wheels referenced in Part II, Para. 6, snowplow shall be equipped with a pair of height adjustable heavy duty running gear with 1x6 skid shoe runners. The running gear shall include two height adjustment methods: course adjustment through a series of bolt holes and fine adjustment through a hand crank screw assembly. The running gear shall be spring cushioned and include a thrust bearing. The skid shoes shall be 1" thick x 6" wide, brake formed at the front and rear to avoid catching edges and fabricated from abrasion-resistant steel with a minimum Brinnell hardness of 235. Running gear inner tube shall be fabricated from round tubing, 2.88" OD x 2.32" ID x .276" wall minimum. Running gear outer tube shall be fabricated from round tubing, 3.50" OD x 3.00" ID x .25" wall minimum.
6. OPTION NO. 6 - FLAT PLATE HITCH – TRUCK PORTION:
 - 6.1. Truck portion hitch shall include a flat plate measuring 39.5" x 22" x .63" thick, made from ASTM A572 Grade 50 steel plate.

- 6.2. Truck portion hitch shall include a welded, formed channel near the top of the flat plate, measuring 39" x 4.75" x 2.00", which serves to reinforce the top of the flat plate. The formed channel shall include two (2) cutouts on its upper surface. Within each cutout, two (2) fully welded flat bars measuring 3.25" x .75" x .75" shall be mounted at angles to each other, forming "pockets" which facilitate the coupling of the plow to the truck hitch, by nesting with the "hooks" on the back of the plow.
- 6.3. A reinforcing angle measuring 39" x 4" x 3" shall be welded near the bottom of the flat plate, protruding 1.13" past the bottom of the flat plate.
- 6.4. A channel measuring 39" long, MC3x7.1# minimum, shall be welded to the flat plate. Two (2) steel tubes, 2.5" OD x 7.5" long minimum, shall be welded to the channel, to act as guide bushings for the latch pins.
- 6.5. Two (2) spring-loaded latch pins, 1.50" diameter x 11.38" long, with tapered ends, shall secure the truck portion hitch to the plow portion hitch. A handle measuring 35" long x .38" thick shall serve to engage and disengage the latch pins through a system of linkages. A latch lock assembly must be provided which allows the lever and latch pins to be locked in the "engaged" position.
- 6.6. To ensure compatibility between truck portion hitches and snowplows, all dimensions shown in Figure 2 must be held.
- 6.7. Two (2) truck side plates of minimum .50" thickness shall be supplied. Side plates shall be custom designed to weld around the channels and angles on the back of the flat plate hitch, in order to most effectively transfer plowing forces from the plow, through the flat plate hitch, and into the truck frame.
- 6.8. Two (2) cross braces of minimum 2.5" x 2.5" x .38" angle shall be supplied, for the purpose of cross bracing the side plates underneath the truck frame rails, to help prevent frame rail twisting.
- 6.9. Two (2) stiffeners of minimum 2.5" x .5" flat bar shall be provided. These are intended to be welded to the outside of the side plates on standard frame width trucks, and to the inside of the side plates on wide frame trucks, to prevent side plate bending.
- 6.10. On wide frame trucks, two formed channels of .50" thick steel shall be provided. These channels shall bolt inside of the existing truck frame channels as "sleeves", and weld to the hitch side plates.

FIGURE 2



Authorized Warranty Service Provider

Name and address of firm nearest the FOB point that will provide warranty service and repair parts.

Firm Name

Address

City, State, Zip

Individual Contact Name

Phone

Email Address

Fax Number

Website – URL

If servicing dealer furnishes parts for minor repairs by Customer personnel, will this affect the warranty? (Y/N)

If answer is “yes” please attach explanation.

Name of Firm Submitting Response

Individual Contact Name

Phone Number

Fax Number

Email Address

Website URL

Contractor’s Signature

Print or Type Contractor’s Name