



State of West Virginia
 Department of Administration
 Purchasing Division
 2019 Washington Street East
 Post Office Box 50130
 Charleston, WV 25305-0130

Request for Quotation

RFQ NUMBER
7011EC09

PAGE
1

ADDRESS CORRESPONDENCE TO ATTENTION OF
BUYER 33
304-558-2402

VENDOR

Leslie Equipment
 P O Box 299
 Norton WV 26285

SHIP TO

DIVISION OF HIGHWAYS
 EQUIPMENT DIVISION
 ROUTE 33
 BRUSHY FORK ROAD
 BUCKHANNON, WV
 26201 304-472-1750

DATE PRINTED	TERMS OF SALE	SHIP VIA	F.O.B.	FREIGHT TERMS
12/09/2010				

BID OPENING DATE: **01/18/2011** BID OPENING TIME **01:30PM**

LINE	QUANTITY	UOP	CAT NO	ITEM NUMBER	UNIT PRICE	AMOUNT
0001	1	EA		765-59		
<p><i>See Attachment</i></p> <p>MOTOR GRADER ARTICULATED ALL WHEEL SNOWPLOW</p> <p>REQUEST FOR QUOTATION (RFQ) OPEN END CONTRACT</p> <p>THE WEST VIRGINIA STATE PURCHASING DIVISION FOR THE AGENCY, THE WEST VIRGINIA DIVISION OF HIGHWAYS, IS SOLICITING BIDS FOR AN OPEN END CONTRACT TO PROVIDE MOTOR GRADER, ARTICULATED ALL WHEEL DRIVE, REVERSIBLE FRONT MOUNTED SNOWPLOW, PER THE ATTACHED SPECIFICATIONS.</p> <p>MANDATORY PRE-BID A MANDATORY PRE-BID WILL BE HELD ON MONDAY, 01/04/11 AT 10:00 AM, BRUSHY FORK RD IN BUCKHANNON, WV 26201. ALL INTERESTED PARTIES ARE REQUIRED TO ATTEND THIS MEETING. FAILURE TO ATTEND THE MANDATORY PRE-BID SHALL RESULT I DISQUALIFICATION OF THE BID. NO ONE PERSON MAY REPRESENT MORE THAN ONE BIDDER.</p> <p>AN ATTENDANCE SHEET WILL BE MADE AVAILABLE FOR ALL POTENTIAL BIDDERS TO COMPLETE. THIS WILL SERVE AS THE OFFICIAL DOCUMENT VERIFYING ATTENDANCE AT THE MANDATOR PRE-BID. FAILURE TO PROVIDE YOUR COMPANY AND REPRESENTATIVE NAME ON THE ATTENDANCE SHEET WILL RESULT IN DISQUALIFICATION OF THE BID. THE STATE WILL NOT ACCEPT ANY OTHER DOCUMENTATION TO VERIFY ATTENDANCE. THE BIDDER IS RESPONSIBLE FOR ENSURING THEY HAVE COMPLETED THE INFORMATION REQUIRED ON THE ATTENDANCE</p>						

RECEIVED
 2011 FEB -7 AM 9:55
 WV PURCHASING DIVISION

SEE REVERSE SIDE FOR TERMS AND CONDITIONS

SIGNATURE	TELEPHONE	DATE
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<p>SHEET. THE PURCHASING DIVISION AND THE STATE AGENCY WILL NOT ASSUME ANY RESPONSIBILITY FOR A BIDDER-S FAILURE TO COMPLETE THE PRE-BID ATTENDANCE SHEET. IN ADDITION, WE REQUEST THAT ALL POTENTIAL BIDDERS INCLUDE THEIR E-MAIL ADDRESS AND FAX NUMBER.</p> <p>ALL POTENTIAL BIDDERS ARE REQUESTED TO ARRIVE PRIOR TO THE STARTING TIME FOR THE PRE-BID. BIDDERS WHO ARRIVE LATE, BUT PRIOR TO THE DISMISSAL OF THE TECHNICAL PORTION OF THE PRE-BID WILL BE PERMITTED TO SIGN IN. BIDDERS WHO ARRIVE AFTER CONCLUSION OF THE TECHNICAL PORTION OF THE PRE-BID, BUT DURING ANY SUBSEQUENT PART OF THE PRE-BID WILL NOT BE PERMITTED TO SIGN THE ATTENDANCE SHEET.</p> <p>TECHNICAL QUESTIONS CONCERNING THIS SOLICITATION MUST BE SUBMITTED IN WRITING TO SHERI SLONE IN THE WEST VIRGINIA STATE PURCHASING DIVISION VIA MAIL AT THE ADDRESS SHOWN IN THE BODY OF THIS RFQ, VIA FAX AT 304-558-2596, OR VIA EMAIL AT SHERI.D.SLONE@WV.GOV. DEADLINE FOR ALL TECHNICAL QUESTIONS IS 12/27/2010 AT THE CLOSE OF BUSINESS. ANY TECHNICAL QUESTIONS RECEIVED WILL BE ANSWERED BY FORMAL ADDENDUM TO BE ISSUED BY THE PURCHASING DIVISION AFTER THE DEADLINE HAS LAPSED.</p> <p>EXHIBIT 2</p> <p>LIFE OF CONTRACT: THIS CONTRACT BECOMES EFFECTIVE ON ----- AND EXTENDS FOR A PERIOD OF ONE (1) YEAR OR UNTIL SUCH "REASONABLE TIME" THEREAFTER AS IS NECESSARY TO OBTAIN A NEW CONTRACT OR RENEW THE ORIGINAL CONTRACT. THE "REASONABLE TIME" PERIOD SHALL</p>						

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<p>NOT EXCEED TWELVE (12) MONTHS. DURING THIS "REASONABLE TIME" THE VENDOR MAY TERMINATE THIS CONTRACT FOR ANY REASON UPON GIVING THE DIRECTOR OF PURCHASING THIRTY (30) DAYS WRITTEN NOTICE.</p> <p>UNLESS SPECIFIC PROVISIONS ARE STIPULATED IN THIS CONTRACT DOCUMENT, THE TERMS, CONDITIONS, AND PRICING SET HEREIN ARE FIRM FOR THE LIFE OF THE CONTRACT.</p> <p>RENEWAL: THIS CONTRACT MAY BE RENEWED UPON THE MUTUAL WRITTEN CONSENT OF THE SPENDING UNIT AND VENDOR, SUBMITTED TO THE DIRECTOR OF PURCHASING THIRTY (30) DAYS PRIOR TO THE EXPIRATION DATE. SUCH RENEWAL SHALL BE IN ACCORDANCE WITH THE TERMS AND CONDITIONS OF THE ORIGINAL CONTRACT AND SHALL BE LIMITED TO TWO (2) ONE (1) YEAR PERIODS.</p> <p>CANCELLATION: THE DIRECTOR OF PURCHASING RESERVES THE RIGHT TO CANCEL THIS CONTRACT IMMEDIATELY UPON WRITTEN NOTICE TO THE VENDOR IF THE COMMODITIES AND/OR SERVICES SUPPLIED ARE OF AN INFERIOR QUALITY OR DO NOT CONFORM WITH THE SPECIFICATIONS OF THE BID AND CONTRACT HEREIN.</p> <p>OPEN MARKET CLAUSE: THE DIRECTOR OF PURCHASING MAY AUTHORIZE A SPENDING UNIT TO PURCHASE ON THE OPEN MARKET, WITHOUT THE FILING OF A REQUISITION OR COST ESTIMATE, ITEMS SPECIFIED ON THIS CONTRACT FOR IMMEDIATE DELIVERY IN EMERGENCIES DUE TO UNFORESEEN CAUSES (INCLUDING BUT NOT LIMITED TO DELAYS IN TRANSPORTATION OR AN UNANTICIPATED INCREASE IN THE VOLUME OF WORK).</p> <p>QUANTITIES: QUANTITIES LISTED IN THE REQUISITION ARE APPROXIMATIONS ONLY, BASED ON ESTIMATES SUPPLIES BY THE STATE SPENDING UNIT. IT IS UNDERSTOOD AND AGREED THAT THE CONTRACT SHALL COVER THE QUANTITIES ACTUALLY ORDERED FOR DELIVERY DURING THE TERM OF CONTRACT,</p>						

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<p>WHETHER MORE OR LESS THAN THE QUANTITIES SHOWN.</p> <p>ORDERING PROCEDURE: SPENDING UNIT(S) SHALL ISSUE A WRITTEN EQUIPMENT CONTRACT ORDER (FORM NUMBER WV-35) FOR COMMODITIES COVERED BY THIS CONTRACT. THE ORIGINAL WV-35 MUST BE SENT TO THE PURCHASING DIVISION OF THE DEPARTMENT OF ADMINISTRATION. AFTER APPROVAL AND ENCUMBRANCE, ONE COPY OF THE PURCHASE ORDER WILL BE RETURNED TO THE SPENDING UNIT AND ONE COPY FORWARDED TO THE VENDOR AS AUTHORIZATION FOR SHIPMENT. NO ORDER IS VALID UNLESS APPROVED AND ENCUMBERED BY THE PURCHASING DIVISION.</p> <p>BANKRUPTCY: IN THE EVENT THE VENDOR/CONTRACTOR FILES FOR BANKRUPTCY PROTECTION, THE STATE MAY DEEM THE CONTRACT NULL AND VOID, AND TERMINATE SUCH CONTRACT WITHOUT FUTHER ORDER.</p> <p>REV. 5/2009</p> <p>EXHIBIT 10</p> <p style="text-align: center;">REQUISITION NO.:</p> <p>ADDENDUM ACKNOWLEDGEMENT</p> <p>I HEREBY ACKNOWLEDGE RECEIPT OF THE FOLLOWING CHECKED ADDENDUM(S) AND HAVE MADE THE NECESSARY REVISIONS TO MY PROPOSAL, PLANS AND/OR SPECIFICATION, ETC.</p> <p>ADDENDUM NO.'S:</p> <p>NO. 1 ... <i>PPG</i> ...</p> <p>NO. 2 ... <i>PPG</i> ...</p>						

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Morton, WV 26285

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NO. 3	<i>DP6</i>					
NO. 4					
NO. 5					
<p>I UNDERSTAND THAT FAILURE TO CONFIRM THE RECEIPT OF THE ADDENDUM(S) MAY BE CAUSE FOR REJECTION OF BIDS.</p> <p>VENDOR MUST CLEARLY UNDERSTAND THAT ANY VERBAL REPRESENTATION MADE OR ASSUMED TO BE MADE DURING ANY ORAL DISCUSSION HELD BETWEEN VENDOR'S REPRESENTATIVES AND ANY STATE PERSONNEL IS NOT BINDING. ONLY THE INFORMATION ISSUED IN WRITING AND ADDED TO THE SPECIFICATIONS BY AN OFFICIAL ADDENDUM IS BINDING.</p> <p>..... <i>David Maasevel</i> SIGNATURE</p> <p>..... <i>Leslie Equipment Co</i> COMPANY</p> <p>..... <i>2-3-11</i> DATE</p> <p>NOTE: THIS ADDENDUM ACKNOWLEDGEMENT SHOULD BE SUBMITTED WITH THE BID.</p> <p>REV. 09/21/2009</p> <p>EXHIBIT 4</p>						

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LINE	QUANTITY	UOP	CAT. NO.	ITEM NUMBER	UNIT PRICE	AMOUNT
BID OPENING DATE:				01/18/2011		
BID OPENING TIME:				1:30 PM		
PLEASE PROVIDE A FAX NUMBER IN CASE IT IS NECESSARY TO CONTACT YOU REGARDING YOUR BID:						
				<i>304-366-3516</i>		
CONTACT PERSON (PLEASE PRINT CLEARLY):						
				<i>David Gaaserv</i>		
***** THIS IS THE END OF RFQ 7011EC09 ***** TOTAL:						

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WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
EQUIPMENT DIVISION

BIDDER'S EVALUATION REPORT

PROCUREMENT SPECIFICATIONS FOR OPEN END CONTRACT
NO. 405-1-I

MOTOR GRADER, ARTICULATED ALL WHEEL DRIVE,
REVERSIBLE FRONT MOUNTED SNOWPLOW

NOTE TO BIDDER: Procurement Specification No. 405-1-I, Paragraph 2.0 recommends the completion and submittal of this Report with your bid. Purpose of this Report is to enable the West Virginia Division of Highways Evaluation Committee to make full and fair evaluation of the bid. Addendums in order, along with a summary of exception as a separate attachment, should be with Bidder's Evaluation Report. FAILURE TO SUBMIT THIS REPORT, COMPLETE IN ITS ENTIRETY, MAY SUBJECT THE BIDDER TO DISQUALIFICATION.

Reference Requisition No.: 7011EC09

Bidder's Name: Leslie Equipment Company

Address: P.O. Box 299 / Route 33 West, Norken, WV 26285

Telephone Number: 304-636-6421

Years Bidder has been registered to do business with the State of West Virginia: 35 YRS.

Years Company has been an authorized dealer for proposed unit: 35 YRS.

X3.2 Have you complied with all mandatory specifications? YES NO

X4.2 DELIVERY:

X4.2.1 Delivery date of completed representative unit: 120 Calendar Days After
Receipt of Purchase Agreement

X4.2.2 Delivery date of balance of completed units: 180 Calendar Days After Receipt of
Purchase Agreement

X5.0 AWARD CRITERIA;

X5.1 Price per unit:

\$224,817 per unit
(see Attachment)

X6.0 SPECIFICATIONS - GENERAL

X6.1 Manufacturer, model, series, and date of manufacture of proposed unit:

John Deere G72G 2011
Is descriptive literature, fully describing proposed unit attached to your bid? YES NO

If not, why? _____

X6.2 Will the required number of service manuals, and complete parts list be delivered to the Equipment Division at Buckhannon upon completion of delivery of total units?

YES NO

Will the required Equipment Preventive Maintenance Form (Section X6.2 of Bidders Evaluation Report) be provided upon inspection of the pilot unit?

YES NO

X6.2
2-10-00

EQUIPMENT PREVENTATIVE MAINTENANCE QUESTIONNAIRE

THIS FORM MUST BE COMPLETED IN ITS ENTIRETY BY SUCCESSFUL BIDDER OR MANUFACTURER'S TECHNICAL REPRESENTATIVE PRIOR TO DELIVERY OF PILOT MODEL TO THE WVDOH.

DESCRIPTION: GWD Motor Grader MAKE: John Deere

MODEL: 6726 YEAR: 2011 PURCHASE AMOUNT: _____

ENGINE: MAKE: JD MODEL: 6090 H FUEL TYPE: Diesel

HORSEPOWER: 195 CYLINDER: 6 ENGINE SERIAL: _____

COOLING SYSTEM CAPACITY: 12 gallons

BELTS: DESCRIPTION: Serpentine 8 rib belt PART NUMBERS: R135600

GVW: 42,682 AXLE CAPACITY: FRONT: 13,505 305 REAR: 29,377

TIRES: FRONT MAKE & SIZE: 14R24 G2

REAR MAKE & SIZE: " "

DIMENSIONS OF UNIT: LENGTH: 31' 9" WIDTH: 97" HEIGHT: _____

VENDOR CONTACT PERSON: David Gaasend PHONE: 304-636-6421

PARTS:

BATTERY MAKE: Deere MODEL: BCI 4D CCA: 1000
 TOP OR SIDE POST: Top DIMENSIONS: LENGTH 21" WIDTH 9" HEIGHT 10"
 SPARK PLUGS OR FUEL INJECTORS MAKE: Deere PART #: RE524382
 FUEL PUMP OR INJECTION PUMP MAKE: " MODEL: RE527528
 ALTERNATOR MAKE: " PART #: AT300167
 STARTER MAKE: " PART #: RE539695
 TURBO CHARGER MAKE: " PART #: RE535699
 TRANS. MAKE: _____ MODEL: _____ AUTO/MANUAL: _____
 HYDRAULIC PUMP MAKE: Deere MODEL: AT302661

FILTERS	MAKE	PART NO.	LUBRICANT	MANUFACTURER TYPE
OIL	<u>Deere</u>	<u>RE504836</u>	ENGINE	<u>Deere</u>
AIR INNER	}	<u>AT178517</u>	TRANSMISSION	}
AIR OUTER		<u>AT178516</u>	POWER STEERING	
FUEL PRIMARY		<u>RE525523</u>	HYDRAULIC	
FUEL SECONDARY		<u>" "</u>	DIFFERENTIALS	
COOLANT		<u>TY26573</u>	BRAKE FLUID	
HYDRAULIC		<u>TY25287</u>	COOLANT	
OTHER			OTHER	

X6.3 TRAINING:

Will training seminar be conducted on Preventive Maintenance, Operator and Mechanic Training YES NO

Will you conduct training with each purchase order against this open end contract? YES NO

Will training be conducted within 2 working days from the delivery of the pilot unit on the individual purchase order? YES NO

If NO, explain time frame _____

Will an Operator's Manual be furnished directly to Training Academy prior to the delivery of the pilot? YES NO

X6.4 If you are the successful vendor, will you furnish all training aids, i.e., videos, projectors, required in conducting the training? YES NO

X6.4.1 Will all manuals, booklets, etc. explaining preventive maintenance, operator procedures, and service schedule be delivered with each unit? YES NO
If NO, explain _____

X6.5 WARRANTY AND SERVICE POLICY

Will the warranty and service you provide comply with all areas as stated in Section 6.5 of specifications YES NO

Is warranty literature attached? YES NO

Is a minimum two (2) year bumper to bumper basic parts and labor warranty excluding abuse and normal wear items included? YES NO

Describe: Travel time and/or Hauling Expenses are not included
in a Standard Warranty

X6.5 WARRANTY AND SERVICE POLICY QUESTIONNAIRE

THIS FORM MUST BE COMPLETED IN ITS ENTIRETY AND SUBMITTED WITH YOUR BID.

(If additional lines are needed, make copies of form.)

1. Define the terms of the standard warranty. If not offered, so state. (Attach copy)

See Attached Copy

2. Define warranty service to be performed at DOH facilities and warranty service to be performed at manufacturer's representative facility. List name and location of manufacturer's representative.

See Attached Copy

3. List locations for parts inventories that are within the State of West Virginia. Also, list availability levels, if known.

Cowan, WV, Beaver WV, Cross Lanes, WV, Fairmont WV, Norton, WV
Also have locations in Chillicothe Oh, Marietta Oh, Cambridge Oh
Ashland Ky, Pikeville, Ky

4. During the term of warranty, list the guarantee discount to manufacturer's published list price for parts that bidder will sell the parts to owner.

- A. Terms: Net 30 Manufacturer's published list price less: N/A % discount
- B. Terms: Net 60 Manufacturer's published list price less: N/A % discount
- C. Terms: Net 90 Manufacturer's published list price less: N/A % discount

5. During the term of warranty, will all manufacturers or engineering improvements be submitted to Division of Highways? YES NO

6. During the term of warranty, list the guaranteed rates charged for repair to the unit.

- A. Shop Rate \$ 870.⁰⁰ per mechanic hour
- B. Travel Time Charge \$ 50.⁰⁰ per mechanic hour
 (Specify if one-way) ~~7.95~~ ; port to port _____
- C. Mileage Charge \$ 1.95 per vehicle mile
 (Specify if one-way) _____ ; port to port _____
- D. Field Mechanic Rate \$ 80.⁰⁰ per mechanic hour
- E. Specify period of time that prices are in effect: 12 months
- F. Surcharge for miscellaneous items: 3 %
of total Labor Charge

X6.6 EVALUATION COMMITTEE REQUIREMENTS

Is all component specifications, product literature, component models provided for Evaluation Committee bid determination? YES NO

X6.7 Will all parts, equipment, accessories, material, design and performance characteristics not specified herein, but which are necessary to provide a complete unit, be furnished with the unit and conform in strength, quality of material, and quality of workmanship to those which are advertised and provided to the market in general by the unit industry?

YES NO

X6.7.1 Are all parts and accessories adequate and regularly supplied as standard to be included except those which may be duplications of specifications herein, and except these by specification are not to be furnished?

YES NO

X6.7.2 Are all standard safety features that are required by Federal and State statutes of law included?

YES NO

X7.0 SPECIFICATIONS OF THE GRADER ARE AS FOLLOWS:

The bidder should complete the following schedule in order for the Division to compare the actual bid unit to the specifications. Should the bidder except a requirement, then such exception may be only on the basis that such feature is not offered by the manufacturer. The Division will have the sole discretion as to whether the bidder's substitution meets the requirements of the specifications.

X8.0 GENERALSPECIFICATIONS OF THE QUOTED UNIT - Grader

The bidder should complete the following schedule in order for the Division to compare the actual bid unit to the specifications. Should the bidder except a requirement, then such exception may be only on the basis that such feature is not offered by the manufacturer. **The Division will have the sole discretion as to whether the bidder's substitution meets the requirements of the specifications.**

Manufacturer: John Deere Model: 672G

Is proposed motor grader an articulated frame all wheel drive front wheel steerable, with diesel engine, full power shift transmission **conventional design and heavy duty construction delivered complete with all manufacturers currently advertised standard features unless specifically addressed herein?**

YES NO

X8.1 Operational Use:

Does the grader perform the following types of work under full control, completely free of conditions requiring undue operator effort:

1. General maintenance and improvements to existing roads YES NO
2. Coarse and fine grading and spreading YES NO
3. High and low bank sloping YES NO
4. Clearing slides YES NO
5. Scarifying YES NO
6. Ditching, including reconditioning old ditches and cutting new ditches, which at time will include deep ditching YES NO
7. Wind Rowing YES NO
8. Snow and Ice Removal YES NO

X8.1.1 Is the grader capable of carrying out any of the above operations under all types of conditions ranging from light soils to rocky materials? YES NO

X8.1.2 Is the grader capable of operating on mountain roads of low construction standards having sustained grades in excess of 7% and steep pitches up to 18%? YES NO

- X8.1.3 Is a copy of required test results attached that proves the motor grader meets the reserve tractive effort requirements listed in Section 8.1.4? YES NO
- X8.1.4 Blade HP point: 41,120
- X8.1.5 Does the operating weight exclude:
- | | | |
|-----------------------------|---|--|
| (A) Front mounted scarifier | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO |
| (B) Hydro-inflation | <input type="checkbox"/> YES | <input checked="" type="checkbox"/> NO |
| (C) Wheel or tire ballast | <input type="checkbox"/> YES | <input checked="" type="checkbox"/> NO |
- X8.1.6 What is the basic operating weight of grader: 42,682 lbs.
- X8.1.7 Wheelbase: 243 inches
- X8.1.8 Percentage of weight carried by the tandem driving axles: 66 %
- X8.2 Engine: Is it designed and built by manufacturer YES NO
- Manufacturer: John Deere Model: 6090H
- X8.2.1 Is it EPA Tier 3 certified EPA Tier 4 YES NO
Is engine turbo charged, direct injection, 4 stroke 6 cylinder diesel engine
 YES NO
- X8.2.2 Engine displacement: 548 Cubic Inches
- X8.2.3 Flywheel HP 195 with all wheel drive system engine
- X8.2.4 Engine C.I.D.: 548 Cu In
- X8.2.5 Is engine equipped with adequate and efficient lubrication system and fuel injection mechanism? YES NO
- X8.2.6 Is fuel filtering system engine manufacturers heavy duty system? YES NO
- X8.2.7 Is oil filter engine manufacturers full flow type lubricating type? YES NO
- X8.2.8 Is the air cleaner dual element type (primary and safety dry type elements) with a built-in precleaner section and automatic dust ejection? YES NO
- X8.2.9 Is air cleaner hose metal or heavy duty flexible non-collapsible type, with metal or molded rubber elbows? YES NO
- X8.2.10 Are all air cleaner connections banded? YES NO
- X8.2.11 Is the filter located inside of hood or at location protected from contaminants thrown by tandem wheels? YES NO

X8.3 Engine Governor:

X8.3.1 Is the engine equipped with a variable speed governor of the mechanical or hydraulic type and driven from the engine? YES NO

X8.3.2 Are provisions made for permitting regulation of the governed speed-setting throughout the engine load range while engine is in operation? YES NO

X8.4 Cooling System:

X8.4.1 Is engine cooling system maximum available from manufacturer and have an operating ambient temperature range of -34°F to +125°F? YES NO

X8.4.2 Is coolant system filled with extended life anti-freeze with freeze protection to -34°F YES NO

X8.4.3 Does cooling system include manufacturers heavy duty radiator protected by a guard, a rearward exhaust fan, a circulating water pump, and a thermostat and by pass for warm up? YES NO

Does engine fan automatically adjust fan speed by a variable hydraulic fan pump to meet engine cooling requirements YES NO

X8.5 Engine Housing:

X8.5.1 Is engine protected with a metal hood and manufacturers lockable side panels (keyed alike)? YES NO

X8.6 Engine Starting System:

X8.6.1 Is grader provided with manufacturers heavy duty starting system and keyed ignition system with two (2) keys? YES NO

X8.6.2 Is starting system capable of cranking the engine in ambient temperature of -30°F? YES NO

X8.6.3 Is a concealed electrical disconnect switch provided to prevent unauthorized starting of the grader? YES NO

X8.7 Fuel Tank(s):

X8.7.1 Is (are) fuel tank(s) manufacturers standard 110 gallon located so as not to be affected by heat from engine, exhaust piping or muffler? YES NO

X8.8 Power Shift Transmission: Is transmission designed and built by machine manufacturer YES NO

X8.8.1 Is the transmission direct drive, power shift, counter shaft type? YES NO

- X8.8.2** Is transmission direction and gear shift electronically and proportionally controlled from forward to reverse and from gear to gear? YES NO
- X8.8.3** Number of forward speeds: 8 and number of reverse speeds 8
- X8.8.4** Is there electronic throttle control YES NO
- X8.9** Travel Speeds:
- X8.9.1** Lowest gear speed - forward 2.4 MPH
- X8.9.2** Highest gear speed - forward 28.1 MPH
- X8.9.3** Lowest gear speed - reverse 2.4 MPH
- X8.9.4** Highest gear speed - reverse 28.1 MPH
- X8.10** Final Drive:
- X8.10.1** Are all shafts, gears, sprockets, chains, bearings, etc. of sufficient strength and capacity to safely transmit full power of the engine to the driving wheels without component failure? YES NO
- X8.10.2** Are all gears and sprockets machine cut? YES NO
- X8.10.3** Do drive gears run in oil bath? YES NO
- X8.10.4** Are all driving mechanisms fully enclosed and protected against lubricant leakage, dust, dirt, water, etc? YES NO
- X8.10.5** Are tandem frames mounted on and pivot about the axle so that equal weight is carried on all four (4) wheels when operating over rough terrain without effecting the evenness of the blade cut? YES NO
- X8.10.6** Tandem oscillation from the horizontal in either direction: 10 ° and 10 ° down
- X8.10.7** Is a stop permanently attached to the grader to limit or prevent tandem oscillation lifting attachment may be located at the center of the tandem to prevent tandem case oscillation or damage during loading or shipment? YES NO
- X8.10.8** The differential lock/unlock controlled by? Rocker Switch YES NO
- X8.10.9** The differential lock/unlock electro-hydraulically controlled with no speed restrictions for engaging/disengaging YES NO

X8.11 Front Axle:

- X8.11.1 Is the front axle arched design for maximum YES NO
- X8.11.2 Is axle fitted with leaning type wheels and operating mechanism? YES NO
- X8.11.3 Does the wheel tilting mechanism eliminate locking and jumping? YES NO
- X8.11.4 The front wheel lean is 20 ° to the right and left of vertical
- X8.11.5 Is positive means provided to prevent tires from rubbing when in extreme leaning position? YES NO
- X8.11.6 Do front wheel hubs extend beyond the tire line? YES NO
- X8.11.7 Is unit equipped with manufacturers all wheel drive system in order to improve tractive effort and steering control in slippery conditions? YES NO
- X8.11.8 Stall torque of all wheel drive system 20,072 lb ft
- X8.11.9 Does the all wheel drive system offered include warranties which are covered by the motor grader manufacturer? YES NO
- X8.11.10 Is all wheel drive system engage/disengage accessible at operators station and without any manual connect/disconnect procedure YES NO

X8.12 Electrical:

- X8.12.1 Is the voltage rating of the electrical system that regularly provided by the manufacturer as standard equipment? YES NO
- X8.12.2 Is wiring enclosed in a harness formed of non-metallic loom and securely anchored to the frame in protected locations? YES NO
- X8.12.3 Is wiring in exposed locations subject to damage in normal use enclosed in conduit? YES NO
- X8.12.4 Is all electrical wiring between the engine and alternator to other parts of the unit connected by a plug type disconnect block with a prong and a receptacle configuration such that it will fit together only one way and located convenient to the engine? YES NO

X8.12.5 Lighting Equipment:

- X8.12.5.1 Are two (2) sealed beam halogen headlights with high/low beam switch operated from the cab provided? YES NO
- X8.12.5.2 Headlights mounted within the width of the cab? YES NO

- X8.12.5.3 Separate front (amber) and rear (red) turn signals? YES NO
- X8.12.5.4 Lamps mounted within the width of cab on front and rear or rear lamps mounted within the width of the radiator or engine housing? YES NO
- X8.12.5.5 Lamp sockets are brass or other corrosion resistant material? YES NO
- X8.12.5.6 Turn signals incorporate a heavy duty flasher? YES NO
- X8.12.5.7 Operator controlled four way hazardous warning signal with convenient cab located switch? YES NO
- X8.12.5.8 Sealed beam halogen work light provided on each side of front lower section of the cab? YES NO
- X8.12.5.9 Are work lights swivel mounted to facilitate lighting of the blade working area, switched and marked at cab location? YES NO
- X8.12.5.10 Sealed beam back up light provided? YES NO
- X8.12.5.11 Manufacturers stop-tail lights recessed and shock mounted? YES NO
- X8.12.5.12 Manufacturers standard instrument lighting package? YES NO
- X8.12.5.13 Interior cab light manufacturers standard for proposed model? YES NO
- X8.12.6 Warning horn mounted at the front of the operators compartment and horn switch within easy reach of the operator? YES NO
- X8.12.7 Manufacturers OSHA approved backup alarm provided? YES NO
- X8.12.8 Lights controlled by manufacturers heavy duty switches mounted and marked at instrument panel? YES NO
- X8.12.9 All circuits protected by re-set circuit breakers or fuses? YES NO
- X8.12.10 Lighting circuits wired so that if a short occurs engine shutdown will not occur? YES NO
- X8.12.11 Are the batteries the type commonly used by manufacturer in a heavy duty application with maximum CCA capacity available from the motor grader manufacturer? YES NO
- X8.12.12 Batteries are maintenance free heavy duty? YES NO CCA: 7000 1400
- X8.12.13 Is a hold down device provided for manufacturers battery(ies)? YES NO
- X8.12.14 Are battery(ies) easily accessible for servicing and delivered with electrolyte installed? YES NO

X8.13 Wheels/Tires:

- X8.13.1 Are graders provided with six (6) wheels, two (2) wheels on front axle and four (4) wheels arranged in tandem on the rear axle with manufacturers drive available on all six (6) wheels? YES NO
- X8.13.2 Are front and rear tires 14.00 x 24, 12 ply rating tubeless type radial? YES NO
- X8.13.3 Are tires mounted on 10 inch wide rims? YES NO
- X8.13.4 Do rims, valves, caps conform to the standards of the Tire and Rim Association? YES NO
- X8.13.5 Are tires capable of accomplishing to the State's satisfaction all applications listed in Section 8.1 with special mention made of deep ditching and traction for steep grades when performing heavy grading functions? YES NO

X8.14 Braking System:

- X8.14.1 Are the service brakes multi-disc, oil cooled, and completely sealed YES NO
- X8.14.1.1 Are service brakes hydraulically actuated, utilizing dual independent brake circuits YES NO
- X8.14.1.2 Wet disc type inboard on all wheels? YES NO
- X8.14.2 Is parking brake multi-disc, oil cooled, spring applied, hydraulically released, sealed adjustment free and integrated into the transmission? YES NO
- X8.14.3 Do all brake lines and hoses conform to SAE-J1047? YES NO
- X8.14.4 Does service brake system incorporate a stored energy source and accumulator or other means to effectively allow full operator application of the brake system in the event of engine failure, hydraulic failure, or air pump failure? YES NO
- X8.14.5 Does the service braking, emergency stopping, and parking systems conform to SAE-J11152? YES NO

X8.15 Controls:

- X8.15.1 Are controls for steering and operating the grader, including leaning of the front wheels, full hydraulic type? YES NO
- X8.15.2 Do controls permit simultaneous operation of at least three (3) functional components without appreciable loss of component speed or power? YES NO
- X8.15.3 Will links, cams, gears, etc. in the control mechanisms withstand the maximum stresses imposed upon them under normal operating conditions? YES NO

- X8.15.4 Are ball joints and split bearing provided with shims or other means of adjusting for wear and equipped with high pressure lubrication fittings? YES NO
- X8.15.5 Is hydraulic power steering system provided with stopped engine steering capability meeting SAE-J53? YES NO
- X8.15.6 Is hydraulic system protected against the entrance of contamination and complete with the manufacturers recommended operating accessories to include and efficient filtering system easily accessible for cleaning and replacement? YES NO
- X8.15.7 Are high pressure lines suitable for the system design pressure? YES NO
- X8.15.8 Is hydraulic control system equipped with a pressure relief valve and an overload relief which will automatically reset when overload is cleared or pressure-compensated system? YES NO
- X8.15.9 Is hydraulic system capable of providing a moldboard lift speed of at least 3 inches per second? YES NO
- X8.15.10 Does hydraulic system have double acting anti-drift check valves on blade lift, tilt, circle shift, articulation, leaning wheels, and scarifier? YES NO
- X8.16 Circle and Moldboard:
- X8.16.1 Is the moldboard circle and drawbar assembly such as to permit the grader to perform all operations specified herein and should be attached to the frame by a swivel hitch mechanism? YES NO
- X8.16.2 Is moldboard equipped with a hydraulically operated side shift to the right and left of cover position? YES NO
- X8.16.3 Do moldboard controls provide a float position? yes YES NO
- X8.16.4 Is moldboard constructed of high carbon steel or ally steel securely mounted and designed to give a rolling tumble of materials? YES NO

X8.16.5 Dimensions:

- X8.16.5.1 Length: 12 feet
- X8.16.5.2 Width (measured along curve): 2 feet
- X8.16.5.3 Thickness: 7/8 inches
- X8.16.5.4 Depth of cut: ~~28~~ 30 inches
- X8.16.5.5 Lift above ground level: ~~20~~ 19.3 inches
- X8.16.5.6 Reach outside tire line left: 82 inches right: 82 inches
- X8.16.5.7 Bank slipping angle - 90 ° left and 90 ° right

- X8.16.6 Is moldboard punched for standard replaceable cutting blades and replaceable end bits?
 YES NO
- X8.16.7 Are all holes for cutting edges drilled or punched to accommodate a standard 5/8 inch plow bolt with hex nut?
 YES NO
- X8.16.8 Is moldboard circle provided with shims or other adequate means of adjustment for wear?
 YES NO
- X8.16.9 Is hydraulically operated power tilt moldboard furnished?
 YES NO
- X8.16.10 Is the design of the moldboard such that full 360° rotation can be accomplished with the blade slightly raised without manipulation of controls other than power shifting to clear tires, transmission or other integral parts of the machine?
 YES NO
- X8.16.11 Is the normal operating range controlled from the operators station and not less than from a position of ditching forward and backward on either side of the grader to a bank-sloping position of 90° on the right side without removing the scarifier?
 YES NO
- X8.16.12 For bank-sloping positions of 45° or more, is the lower point of the blade at ground level at, or outside of, the line of tires so that a smooth cut to the bottom of the slope may be obtained without placing the wheels on the slope?
 YES NO
- X8.16.13 Does any movement or combination of movements or adjustments of the moldboard assembly, when operated in accordance with manufacturers guidelines, cause any part of the actuating mechanism to contact any structural mechanism or structural part of the grader in such a manner as to damage structure or mechanism?**
 YES NO
- X8.16.14 Does the grader blade lower its position more than 1/4 inch per hour when the blade is in the raised position and all controls are in neutral and engine off?
 YES NO
- X8.16.15 Is the unit equipped with manufacturer's blade lift accumulators and side shift accumulators?
 YES NO
- X8.17 Scarifier:
- X8.17.1 Is a scarifier furnished with each grader, front mounted?
 YES NO
- X8.17.2 Is the scarifier of the V-type, power control operated, and equipped with removable teeth having replaceable points?
 YES NO
- X8.17.3 Scarifier cutting width: 48 inches
- X8.17.4 Number of teeth: 5
- X8.17.5 Weight: 1873 lbs.
- X8.17.6 Does scarifier allow grader to ditch when in raised position?
 YES NO

- X8.17.7 Scarifier
 Manufacturer: John Deere Model: Front ✓
 Mounted on front of grader? YES NO
- X8.18 ROPS Cab (Low Profile):
- X8.18.1 Are graders furnished with R.O.P.S. cabs, conforming to SAE J-1040? YES NO
- X8.18.2 Are cabs completely enclosed, with door on each side, constructed of heavy gauge materials and equipped with manufacturers tinted safety glass at all locations to provide 360° visibility? YES NO
- X8.18.3 Are all controls for operating and steering mounted inside of the cab? YES NO
- X8.18.4 Are cab doors lockable, keyed alike, and provided with fasteners to hold doors open during operation? YES NO
- X8.18.5 Is windshield and rear window provided with manufacturers electrically operated windshield wipers and washers? YES NO
- X8.18.6 Is an adjustable review convex mirror provided and mounted inside cab to afford a clear vision to the rear of the grader? YES NO
- X8.18.7 Does cab have heat and air, front and rear windshield defroster? YES NO
- X8.18.8 Is instrument panel located convenient to the seated operator? YES NO
- X8.18.9 Is manufacturers following standard instrumentation furnished including a positive means of monitoring vital systems: Yes
- X8.18.9.1 Engine oil pressure, engine coolant temperature, electrical system, torque converter temperatures and transmission pressure (if applicable) and hydraulic oil temperature? YES NO
- If NO, specify _____
- X8.18.10 Manufacturers warnings: Audio and/or lights on engine oil pressure, engine coolant temperature, and electrical system? YES NO
- If NO, specify _____
- X8.18.11 Does operators position include seat fully cushioned of the full suspension type, cloth covered, vertical and horizontal adjustments, padded arm rests, and manufacturers recommended seat belt system with retractors? YES NO
- If NO, specify _____

X8.19 Equipment and Accessories:

- X8.19.1 Vandalism protection kit including locking type caps for all exposed filler caps? YES NO
- X8.19.2 Weather resistant, lockable tool box YES NO
- X8.19.3 Articulation position indicator YES NO
- X8.19.4 Hour meter at dash board location (engine oil pressure activated?) YES NO
- X8.19.5 Air cleaner rain cap YES NO
- X8.19.6 Dash mounted air filter service indicator YES NO
- X8.19.7 Engine block heater; thermostat controlled YES NO
- X8.19.8 Deflector type exhaust stack YES NO
- X8.19.9 Muffler YES NO
- X8.19.10 Fuel gauge dial type dash mounted YES NO
- X8.19.11 AM/FM radio, installed complete with antenna mounted in such a manner as to prevent being damaged by tree limbs, etc. YES NO
- X8.19.12 Manufacturers installed pressurized cab air conditioning system? YES NO
- X8.19.13 Strobe light hinged and protected, dual flash high intensity type? YES NO.

Manufacturer: Service Mark

Model: Sm 4216 Description: Strobe light

X8.20 Paint:

- X8.20.1 Is motor grader and attachments painted manufacturers standard? YES NO

X8.21 Safety:

- X8.21.1 Will all exposed parts subject to high operating temperature or energized electrically be located, insulated, enclosed, or guarded so as to prevent hazards to operating personnel? YES NO
- X8.21.2 Will all moving parts which are of such a nature or so located as to be a hazard to operating personnel be enclosed or guarded? YES NO
- X8.21.3 Do protective devices impair operating functions? YES NO

X8.21.4 Are handles and non-skid steps of size, shape, and located to permit safe mounting and dismounting? YES NO

X8.22 Does proposed unit meet or exceed the "OSHA OF 1970" and/or subsequent changes? YES NO

X8.23 Does unit conform to the advertising guidelines? YES NO

X8.24 Preventive Maintenance and Operators Orientation/Training:

X8.24.1 Attach a copy of Proposed Training Program. NOTE: ATTACH SCHEDULE DESCRIBING COURSE OFFERED WITH A BRIEF EXPLANATION OF EACH SUBJECT WITH THE TIME REQUIRED FOR EACH CLASS. DO NOT ATTACH INSTRUCTION MATERIAL OR MANUALS.

X8.24.2 Will you conduct a minimum of one (1) day preventive maintenance/operator orientation seminar at the Equipment Division in Buckhannon, W. Va.? YES NO

X8.24.3 If you are the successful vendor, will you furnish all training aids? YES NO

X9.0 HYDRAULICALLY CONTROLLED REVERSIBLE FRONT MOUNTED SNOW PLOW

Manufacturer: Henke Model: SDD 612

X9.1 Is plow designed to fit and be fully compatible with the proposed motor grader? YES NO

Is plow designed for use in snow and light earthmoving? YES NO

Are they easily removable for transportation? YES NO

X9.1.1 Are blades complete with all necessary cab controls and mounting hardware? YES NO

X9.2 Specification for Plow:

X9.2.1 Is manufacturer's standard warranty provided and attached? YES NO

X9.2.2 Moldboard length: 12 feet

X9.2.3 Moldboard height: 48 inches

X9.2.4 Reversing Cylinders:

X9.2.4.1 Does plow consist of two (2) double acting hydraulic cylinders? YES NO

Inside diameter: 3 3/4 inch with a piston rod 2 inches

Chrome plated with a stroke of 18 inches

X9.2.4.2 Are these cylinders capable of reversing the plow from 35° right and 35° left minimum? YES NO

X9.2.4.3 Diameter of cylinder mounting pins: 1.25 inches

X9.2.5 Cushion Valves:

X9.2.5.1 Is a cushion valve included in the hydraulic reversing system as a safety factor to help protect the cylinders? YES NO

X9.2.6 Cutting Edge: 3/4 inch x 6 inches x 144 inches

Is it compatible with the plow? YES NO

X9.2.7 Number of wear shoes: 2

X9.2.8 Vertical Ribs: 5

X9.2.9 Is the hitch front mounted, quick coupler, coupling system? YES NO

PREBID ADDENDUM #3
70-11-EC09

OPEN END CONTRACT
MOTOR GRADER ARTICULATED ALL WHEEL DRIVE,
REVERSIBLE FRONT MOUNTED SNOWPLOW

CHANGES TO BIDDER'S EVALUATION REPORT:

FROM:

X8.1.3 Is a copy of required test results attached that proves the motor grader meets the reserve tractive effort requirements listed in Section 8.1.4? YES NO

TO:

X8.1.3 Is a copy of required test results attached that proves the motor grader meets the reserve tractive effort requirements listed in Section 8.1.4? YES NO

Will these efforts be performed on asphalt 0-195 MPH? YES NO

FROM:

X8.1.4 Blade HP point: _____

TO:

X8.1.4 Blade HP point: 41, 120 lbs. force with use of all wheel drive unit being quoted at coefficient of 0.9? YES NO

NO CHANGE REQUIRED

X8.1.7 Wheelbase: 245 inches

FROM:

X9.1 Is plow designed to fit and be fully compatible with the proposed motor grader? YES NO

Is plow designed for use in snow and light earthmoving? YES NO

Are they easily removable for transportation? YES NO

TO:

X9.1 Is plow designed to fit and be fully compatible with the proposed motor grader? YES NO

Is plow designed for use in snow and earthmoving YES NO

And blade accepts machine down pressure YES NO

Are they easily removable for transportation? YES NO

State of West Virginia

VENDOR PREFERENCE CERTIFICATE

Certification and application* is hereby made for Preference in accordance with West Virginia Code, §5A-3-37. (Does not apply to construction contracts). West Virginia Code, §5A-3-37, provides an opportunity for qualifying vendors to request (at the time of bid) preference for their residency status. Such preference is an evaluation method only and will be applied only to the cost bid in accordance with the West Virginia Code. This certificate for application is to be used to request such preference. The Purchasing Division will make the determination of the Resident Vendor Preference, if applicable.

- 1. Application is made for 2.5% resident vendor preference for the reason checked: Bidder is an individual resident vendor and has resided continuously in West Virginia for four (4) years immediately preceding the date of this certification; or, Bidder is a partnership, association or corporation resident vendor and has maintained its headquarters or principal place of business continuously in West Virginia for four (4) years immediately preceding the date of this certification; or 80% of the ownership interest of Bidder is held by another individual, partnership, association or corporation resident vendor who has maintained its headquarters or principal place of business continuously in West Virginia for four (4) years immediately preceding the date of this certification; or, Bidder is a nonresident vendor which has an affiliate or subsidiary which employs a minimum of one hundred state residents and which has maintained its headquarters or principal place of business within West Virginia continuously for the four (4) years immediately preceding the date of this certification; or,
2. Application is made for 2.5% resident vendor preference for the reason checked: Bidder is a resident vendor who certifies that, during the life of the contract, on average at least 75% of the employees working on the project being bid are residents of West Virginia who have resided in the state continuously for the two years immediately preceding submission of this bid; or,
3. Application is made for 2.5% resident vendor preference for the reason checked: Bidder is a nonresident vendor employing a minimum of one hundred state residents or is a nonresident vendor with an affiliate or subsidiary which maintains its headquarters or principal place of business within West Virginia employing a minimum of one hundred state residents who certifies that, during the life of the contract, on average at least 75% of the employees or Bidder's affiliate's or subsidiary's employees are residents of West Virginia who have resided in the state continuously for the two years immediately preceding submission of this bid; or,
4. Application is made for 5% resident vendor preference for the reason checked: Bidder meets either the requirement of both subdivisions (1) and (2) or subdivision (1) and (3) as stated above; or,
5. Application is made for 3.5% resident vendor preference who is a veteran for the reason checked: Bidder is an individual resident vendor who is a veteran of the United States armed forces, the reserves or the National Guard and has resided in West Virginia continuously for the four years immediately preceding the date on which the bid is submitted; or,
6. Application is made for 3.5% resident vendor preference who is a veteran for the reason checked: Bidder is a resident vendor who is a veteran of the United States armed forces, the reserves or the National Guard, if, for purposes of producing or distributing the commodities or completing the project which is the subject of the vendor's bid and continuously over the entire term of the project, on average at least seventy-five percent of the vendor's employees are residents of West Virginia who have resided in the state continuously for the two immediately preceding years.

Bidder understands if the Secretary of Revenue determines that a Bidder receiving preference has failed to continue to meet the requirements for such preference, the Secretary may order the Director of Purchasing to: (a) reject the bid; or (b) assess a penalty against such Bidder in an amount not to exceed 5% of the bid amount and that such penalty will be paid to the contracting agency or deducted from any unpaid balance on the contract or purchase order.

By submission of this certificate, Bidder agrees to disclose any reasonably requested information to the Purchasing Division and authorizes the Department of Revenue to disclose to the Director of Purchasing appropriate information verifying that Bidder has paid the required business taxes, provided that such information does not contain the amounts of taxes paid nor any other information deemed by the Tax Commissioner to be confidential.

Under penalty of law for false swearing (West Virginia Code, §61-5-3), Bidder hereby certifies that this certificate is true and accurate in all respects; and that if a contract is issued to Bidder and if anything contained within this certificate changes during the term of the contract, Bidder will notify the Purchasing Division in writing immediately.

Bidder: Leslie Equipment Co Signed: Mark Hundert
Date: 2-3-11 Title: branch manager

*Check any combination of preference consideration(s) indicated above, which you are entitled to receive.

RFQ No. 7011E209

STATE OF WEST VIRGINIA
Purchasing Division

PURCHASING AFFIDAVIT

West Virginia Code §5A-3-10a states: No contract or renewal of any contract may be awarded by the state or any of its political subdivisions to any vendor or prospective vendor when the vendor or prospective vendor or a related party to the vendor or prospective vendor is a debtor and the debt owed is an amount greater than one thousand dollars in the aggregate.

DEFINITIONS:

"Debt" means any assessment, premium, penalty, fine, tax or other amount of money owed to the state or any of its political subdivisions because of a judgment, fine, permit violation, license assessment, defaulted workers' compensation premium, penalty or other assessment presently delinquent or due and required to be paid to the state or any of its political subdivisions, including any interest or additional penalties accrued thereon.

"Debtor" means any individual, corporation, partnership, association, limited liability company or any other form or business association owing a debt to the state or any of its political subdivisions. "Political subdivision" means any county commission; municipality; county board of education; any instrumentality established by a county or municipality; any separate corporation or instrumentality established by one or more counties or municipalities, as permitted by law; or any public body charged by law with the performance of a government function or whose jurisdiction is coextensive with one or more counties or municipalities. "Related party" means a party, whether an individual, corporation, partnership, association, limited liability company or any other form or business association or other entity whatsoever, related to any vendor by blood, marriage, ownership or contract through which the party has a relationship of ownership or other interest with the vendor so that the party will actually or by effect receive or control a portion of the benefit, profit or other consideration from performance of a vendor contract with the party receiving an amount that meets or exceeds five percent of the total contract amount.

EXCEPTION: The prohibition of this section does not apply where a vendor has contested any tax administered pursuant to chapter eleven of this code, workers' compensation premium, permit fee or environmental fee or assessment and the matter has not become final or where the vendor has entered into a payment plan or agreement and the vendor is not in default of any of the provisions of such plan or agreement.

Under penalty of law for false swearing (*West Virginia Code §61-5-3*), it is hereby certified that the vendor affirms and acknowledges the information in this affidavit and is in compliance with the requirements as stated.

WITNESS THE FOLLOWING SIGNATURE

Vendor's Name: Leslie Equipment Company

Authorized Signature: Mark Harless Date: 2-4-11

State of West Virginia

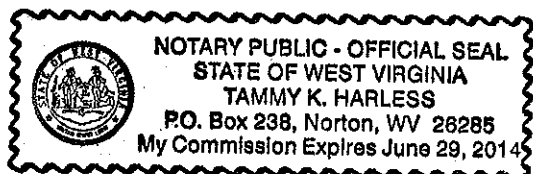
County of Randolph, to-wit:

Taken, subscribed, and sworn to before me this 4 day of Feb, 20 11

My Commission expires 6-29-2014, 20 14

AFFIX SEAL HERE

NOTARY PUBLIC Tammy K Harless



HENKE LIMITED WARRANTY

1. LIMITED WARRANTIES

- 1.01. Henke warrants for one year from the purchase date to the original non-commercial, governmental, or municipal purchaser ("Purchaser") and warrants for twelve months to the original commercial or industrial purchaser
- 1.02. Manufacturer will repair or replace for the Purchaser any part or parts found, upon examination at one of its factories, to be defective under normal use and service due to defects in material or workmanship.
- 1.03. This limited warranty does not apply to any part of the goods which has been subjected to improper or abnormal use, negligence, alteration, modification, or accident, damaged due to lack of maintenance or use of wrong fuel, oil, or lubricants, or which has served its normal life. This warranty does not include normal wear items such as cutting edges, wear guards, scarifier teeth, etc. or improper installation. HMC warranty for any purchased components, such as hydraulic cylinders will be superceded by, and equal to the component manufacturer warranty.
- 1.04. Except as provided herein, no employee, agent, Dealer, or other person is authorized to give any warranties of any nature on behalf of Manufacturer.

2. REMEDIES AND PROCEDURES.

- 2.01. Warranty claims must be filled within 30 days of repair work during the one year warranty period and will be honored only if the completed warranty registration form has been returned. Henke reserves the right to require proof of purchase of original Henke replacement parts. If warranty is approved any allowed shipping expenses will be based on and will not exceed standard base shipping charges.
- 2.02. Purchaser claims must be made in writing to the Authorized Dealer ("Dealer") from whom Purchaser purchased the goods or an approved Authorized Dealer ("Dealer") within 30 days after Purchaser learns of the facts on which the claim is based.
- 2.03. Purchaser is responsible for returning the goods in question to the Dealer.
- 2.04. If after examining the goods and/or parts in question, Manufacturer finds them to be defective under normal use and service due to defects in material or workmanship, Manufacturer will:
 - (a) Repair or replace the defective goods or part(s) or
 - (b) Reimburse Purchaser for the cost of the part(s) and reasonable labor charges (as determined by Manufacturer) if Purchaser paid for the repair and/or replacement prior to the final determination of applicability of the warranty by Manufacturer.

The choice of remedy shall belong to Manufacturer.

- 2.05. Purchaser is responsible for any labor charges exceeding a reasonable amount as determined by Manufacturer and for returning the goods to the Dealer, whether or not the claim is approved. Purchaser is responsible for the transportation cost for the goods or part(s) from the Dealer to the designated factory.

3. LIMITATION OF LIABILITY.

- 3.01. MANUFACTURER DISCLAIMS ANY EXPRESS (EXCEPT AS SET FORTH HEREIN) AND IMPLIED WARRANTIES WITH RESPECT TO THE GOODS INCLUDING, BUT NOT LIMITED TO, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.
- 3.02. MANUFACTURER MAKES NO WARRANTY AS TO THE DESIGN, CAPABILITY, CAPACITY, OR SUITABILITY FOR USE OF THE GOODS.
- 3.03. EXCEPT AS PROVIDED HEREIN, MANUFACTURER SHALL HAVE NO LIABILITY OR RESPONSIBILITY TO PURCHASER OR ANY OTHER PERSON OR ENTITY WITH RESPECT TO ANY LIABILITY, LOSS, OR DAMAGE CAUSED OR ALLEGED TO BE CAUSED DIRECTLY OR INDIRECTLY BY THE GOODS INCLUDING, BUT NOT LIMITED TO, ANY INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES RESULTING FROM THE USE OR OPERATION OF THE GOODS OR ANY BREACH OF THIS WARRANTY. NOT WITHSTANDING THE ABOVE LIMITATIONS AND WARRANTIES, MANUFACTURER'S LIABILITY HEREUNDER FOR DAMAGES INCURRED BY PURCHASER OR OTHERS SHALL NOT EXCEED THE PRICE OF THE GOODS.
- 3.04. NO ACTION ARISING OUT OF ANY CLAIMED BREACH OF THIS WARRANTY OR TRANSACTIONS UNDER THIS WARRANTY MAY BE BROUGHT MORE THAN TWO (2) YEARS AFTER THE CAUSE OF ACTION HAS OCCURRED.

4. MISCELLANEOUS.

- 4.01. Proper Venue for any lawsuits arising from or related to this limited warranty shall be only in Leavenworth County, Kansas.
- 4.02. Manufacturer may waive compliance with any of the terms of this limited warranty, but no waiver of any terms shall be deemed to be a waiver of any other term.
- 4.03. If any provision of this limited warranty shall violate any applicable law and is held to be unenforceable, then the invalidity of such provision shall not invalidate any other provisions herein.
- 4.04. Applicable law may provide rights and benefits to purchaser in addition to those provided herein.

KEEP FOR YOUR RECORDS

ATTENTION: Purchaser should fill in the blanks below for his reference when buying repair parts and/or for proper machine identification when applying for warranty.

Henke Implement Model _____ Serial Number _____
 Date Purchased _____ Dealer _____

ATTENTION:

READ YOUR OPERATOR'S MANUAL

HENKE MANUFACTURING
 An Alamo Group Company
 3070 Wilson
 Leavenworth, KS 66048
 888-682-0300



STANDARD WARRANTY FOR NEW JOHN DEERE CONSTRUCTION, UTILITY, AND FORESTRY PRODUCTS – US & Canada

- **Construction, Forestry & Commercial Worksite Products:** 12 months Full Machine Standard Warranty
- **Pull-Type Scrapers:** 6 months Full Machine Standard Warranty
- **Scraper Tractors:** 24 Months or 2000 Hours (whichever occurs first) Full Machine Standard Warranty
- **Forestry Attachments:** 12 Months or 2000 Hours (whichever occurs first) Full Machine Standard Warranty
- **Frontier Equipment:** 6 months Full Machine Standard Warranty (90 days in rental applications)

The "Standard Warranty" is part of the warranty protection package available from John Deere Construction & Forestry Company (John Deere Limited in Canada) ("John Deere") to purchasers of new John Deere products ("product"):

STANDARD Warranty is John Deere's standard new product warranty, described in this document, provided at no additional charge to the purchaser.

EXTENDED Warranty is a separate repair contract made available by John Deere for purchasers who wish to complement their Standard Warranty coverage. Complete Extended Warranty details, including coverage options and limitations, are set forth in the Application for Extended Warranty, which is available from authorized John Deere dealers.

STRUCTURAL Warranty applies to certain structural components as listed below and as described in this document.

FACTORY-INSTALLED UNDERCARRIAGE Warranty applies to certain undercarriage components as listed below and as described in this document.

A. STANDARD WARRANTY - GENERAL PROVISIONS

John Deere will repair or replace, at its option, any parts (except those specified below) of a new John Deere product that, as delivered to the original retail purchaser(s), are defective in material or workmanship. Performance of this warranty will be free of charge for parts and labor/labour, except as otherwise stated below. Standard Warranty applies only to purchases from John Deere and authorized John Deere dealers and, except as otherwise provided in the next sentence and section L below, is extended only to the original retail purchaser of the product. Remaining Standard Warranty applicable to a used John Deere product is transferred to a subsequent purchaser of the product only if the subsequent purchaser requests a transfer from an authorized John Deere dealer before the product's Standard Warranty expires. Coverage begins on the date of delivery of the product to the original retail purchaser. For purposes of this warranty, a product that has been rented, used for demonstration purposes for 150 or more hours, or otherwise used prior to its original retail purchase has been "used" for the total duration of such use. Warranty statements required by law covering engine emissions-related parts and components are found on a separate written warranty certificate provided to the purchaser at the time of the original retail purchase.

B. WHAT IS COVERED BY STANDARD WARRANTY -

All parts of a new John Deere product (except those noted in Sections D and E below) are covered during the Standard Warranty period set out above.

C. EXCLUSIVE REMEDY -

The repair or replacement of covered parts or components that are defective, as provided in Sections A, B, D.2 and D.3 herein, shall be the purchaser's exclusive remedy for any defect in the product. However, if after repeated attempts such repair or replacement fails to correct the performance problem caused by the defect, the purchaser's sole remedy shall be a refund of the amount paid for the product (in exchange for a return of the product), excluding any transportation charges, license fees, taxes and insurance premiums, and less a reasonable allowance for use of the product prior to its return. In no event will the dealer, John Deere or any company affiliated with John Deere be liable for any incidental or consequential damages, including but not limited to loss of profits, rental of substitute equipment or other commercial loss. Correction of defects in the manner provided above shall constitute fulfillment of all liabilities of the Dealer, John Deere, or any company affiliated with John Deere to the purchaser or any other person, whether based upon contract, tort, strict liability, or otherwise. This limitation does not apply to claims for personal injury.

D. ITEMS COVERED SEPARATELY -

1. Standard Warranty does not apply to batteries, radios, tires, cameras, or to Cummins, MTU or Detroit Diesel Engines installed in John Deere products, which are covered by separate written warranties.

2. Factory-Installed Undercarriage Warranty covers all non-rubberized factory-installed undercarriage wear components for 3 years or 4,000 hours after the product's original retail purchase or first rental or demonstration use prior to the first retail purchase, whichever occurs first (unless terminated earlier under Section F, below). In addition to the items listed in section E below, Factory-Installed Undercarriage Warranty does not cover: failures due to wear, machine application, maintenance practices, or improper machine configuration; removal and installation labor/labour; transportation or hauling costs; unapproved parts; non-wear items; and rubberized undercarriage components such as rubber tracks. Warranty claims will be pro-rated based upon wear of the failed component and whether track shoe width is approved by John Deere. Factory-Installed Undercarriage Warranty does not apply to Scraper Tractors.
3. StructurALL Warranty for new John Deere Products (except Compact Excavators & Loaders, Skid-Steer Loaders, Compact Track Loaders, Scraper Tractors, Pull-Type Scrapers, and Forestry Attachments, which are not eligible for StructurALL Warranty) begins at the end of the product's Standard Warranty and ends (unless terminated earlier under Section F, below) three (3) years, or 10,000 hours (whichever occurs first) after the product's original retail purchase or first rental or demonstration use prior to the first retail purchase. **StructurALL Warranty applies only to the following structural components listed below as installed on the product at the time of original manufacture.** If a particular component is not listed below it is not covered by StructurALL Warranty.

Arm; Articulation Joint (incl. pins & bushings); Bin Frame; Boom; Carbody; C-Frame*; Circle Frame; Coupler (John Deere built ONLY); Dipperstick; Draft Frame; Engine Frame; Equipment Frame; Grapple Arch and Grapple Boom; Loader Arm; Loader Frame; Mainframe; Moldboard Lift Arm; NeverGrease™ Pin Joints [Includes steering pin and bushing joints (standard equipment), roller elements (roller bearings) in bucket to boom joints and sliding elements (bushing) for boom and linkage joints (optional equipment)]; Rollover Protection Structure (ROPS); Side Frame; Swing Frame; Track Frame; Undercarriage Frame; X-Frame; Z-bar loader linkage (including bell crank and bucket driver link); Specialty booms and arms marketed as "heavy duty" by John Deere.

Items Covered by StructurALL for Cut-to-Length Forestry Machines: Front frame (welded assembly); Rear frame (welded assembly); Crane king post with basement; Middle joint; Cab turntable; Main Boom

StructurALL Warranty does not apply to:

1. Any product used primarily in extreme duty or severe duty applications such as but not limited to: demolition and wrecking, chemical plant (including fertilizer plants), salt mines, steel mill, land fill and transfer stations, scrap handling, scarifying and other applications that are similarly destructive or similarly heavy duty except specialty booms and arms as stated in Section D.3 above.
2. C-Frames on H-Series & J-Series Crawlers equipped with root rakes or used in forestry applications unless equipped with an "extreme duty" reinforcement package.
3. Cut-to-Length Forestry Heads and Slash Bundler Units.
4. Crawlers equipped with optional side booms.
5. Excavator and Log Loader swing bearings.
6. Motor Graders equipped with front- or rear-mounted snow wings.

E. ITEMS NOT COVERED -

John Deere is NOT responsible for the following:

1. Freight
2. Adjustments to compensate for wear, for periodic maintenance or adjustments that result from normal wear and tear.
3. Damage caused by unapproved adjustments (electronic or mechanical) to machine or machine components outside of published specifications including but not limited to engine, hydraulic components and relief valves.
4. Program updates, calibrations, and pressure adjustments.
5. Diagnostic Time
6. Additional Labor/Labour Time - Above SPG/Labor/Labour Rate
7. Additional Cleaning - Above SPG/Labor/Labour Rate
8. Rental Fees
9. Depreciation or damage caused by normal wear or application, lack of reasonable and proper maintenance, failure to follow operating instructions, misuse, negligence, collision or other accidents.
10. Premiums charged for Overtime Labor/Labour
11. Transportation to and from the dealership.
12. Travel time, mileage or service calls by the dealer.
13. Non-John Deere components or modifications, Rotobec grapples, and attachments installed aftermarket.
14. Shop supplies and maintenance items such as, but not limited to: filters, fuels, oil, hydraulic fluid, lubricants, coolants, conditioners, shop towels, cleaners and degreasers. Note: Reimbursement for refills of oils/coolants lost

due to a warrantable failure is covered when a system failure occurs outside the boundaries of a normal oil change (within 25% of specified change interval as provided in the Operator's Manual).

15. Torn, cut, or worn hoses.
16. Wear items, such as, but not limited to: body liner, belts, blades, bulbs, lubricated joints (including pins and bushings), dry brakes, brake linings, dry clutch linings, saw blades, chains, skidder grapple shocks, color marking nozzles, and articulation bumpers.
17. Items such as cutting edge parts, delimiting knives, bucket teeth and rubber track are not warranted for depreciation or damage caused by normal wear, lack of proper maintenance, misuse, failure to follow operating instructions, the elements or accident.
18. Any defect in a non-covered component, or damage to or failure of a covered component caused by a defect in a non-covered component.
19. Secondary damage which occurs from continued operation of a product after recognition of the occurrence of a failure.
20. Parts supplied or modifications done by third party suppliers.
21. Topping off fluids when fluid levels fall in the range between low and full
22. Parts/Kits not ordered on machine and installed aftermarket. These parts will be covered by any applicable parts warranty.
23. Attachments installed aftermarket – i.e. Winch not installed at factory.
24. Custom options installed outside the factory – i.e. G.R. Manufacturing option packages.
25. Used Products (except as otherwise provided in section L below).

F. TERMINATION OF WARRANTY-

John Deere is relieved of its obligations under Standard Warranty, StructurALL Warranty, Factory-Installed Undercarriage Warranty and/or Extended Warranty if:

1. Service (other than normal maintenance and replacement of service items) is performed by someone other than an authorized John Deere dealer; or
2. The product is modified or altered in ways not approved by John Deere; or
3. Any unapproved or improperly sized attachment is installed on the product. Approval and attachment size shall be at John Deere's sole discretion. (Consult dealer prior to installing attachments or product modification).
4. The product is moved outside the US and/or Canada.

G. PARTS REPLACED UNDER WARRANTY -

Only new or remanufactured parts or components furnished or approved by John Deere, will be used if John Deere elects to repair the product. If any such part or component is defective in material or workmanship when installed in the product, John Deere will repair or replace, as it elects, such defective part or component, provided the defect is reported to an authorized John Deere dealer within 90 days (12 months or 1500 hours, whichever occurs first, for remanufactured components) after installation or before expiration of the applicable Standard Warranty, Factory-Installed Undercarriage Warranty and/or StructurALL Warranty whichever is later.

H. TELEMATICS

NOTICE: Products may be equipped with telematics hardware and software ("Telematics") that transmit data to John Deere/ Dealer. Purchaser may deactivate Telematics at www.jdlink.com.

Notwithstanding Purchaser's right, title or interest in the Products, Purchaser agrees that John Deere and Dealer (their affiliates, successors and assigns), without further notice to Purchaser have the right to:

1. Access, use, collect and disclose any data generated by, collected by, or stored in, Products or any hardware or devices interfacing with Products ("Machine Data");
 2. Access Machine Data directly through data reporting devices integrated within, or attached to, Products, including Telematics ("Data Reporting Systems"); and
 3. Update the Data Reporting Systems software from time to time. Machine Data will only be used in accordance with John Deere's Machine Data Policy, located at www.JohnDeere.com/MachineDataPolicy.
- Machine Data may be transferred out of the country where it is generated, including to the U.S.A.

I. OBTAINING WARRANTY SERVICE -

To obtain warranty service, the purchaser must request warranty service from a John Deere dealer authorized to sell the product to be serviced. When making such a request, the purchaser must present evidence of the product's delivery date, make the product available at the dealer's place of business, and inform the dealer in what way the purchaser believes the product to be defective. Standard Warranty, Factory-Installed Undercarriage Warranty and/or StructurALL Warranty repairs may be made in the field if the purchaser and servicing dealer so desire. However, John

Deere will not be responsible for any charges (such as dealer travel time, mileage or extra labor/labour) that would not have been incurred had the product been repaired at the dealer's place of business.

J. NO IMPLIED WARRANTY, CONDITIONS OR OTHER REPRESENTATION -

Where permitted by law, neither John Deere nor any company affiliated with it makes any warranties, representations, conditions or promises, express or implied, as to the quality, performance, or freedom from defect of its products, other than those set forth in this document and **NO IMPLIED WARRANTY OF MERCHANTABILITY, CONDITIONS OR FITNESS IS MADE.**

K. NO DEALER WARRANTY -

The selling dealer makes no warranty of its own on any item covered by this warranty, and makes no warranty on other items unless the dealer delivers to the purchaser a separate written warranty certificate specifically warranting the item. **The dealer has no authority to make any representation or promise on behalf of John Deere, or to modify the terms or limitations of this warranty in any way.**

L. USED JOHN DEERE PRODUCTS ONLY -

John Deere will transfer remaining Standard Warranty, Factory-Installed Undercarriage Warranty and/or StructurALL Warranty to the purchaser of a used John Deere construction and/or forestry product that has been used for less than the full warranty period provided at the product's original retail purchase. This transfer is not effective until change of ownership is registered by a John Deere dealer. **ALL THE TERMS, INCLUDING LIMITATIONS AND EXCLUSIONS, OF THE JOHN DEERE STANDARD WARRANTY, FACTORY-INSTALLED UNDERCARRIAGE WARRANTY, AND/OR STRUCTURALL WARRANTY ORIGINALLY PROVIDED FOR THE PRODUCT REMAIN IN EFFECT AND APPLICABLE.**



2GP



G

MOTOR GRADERS

670G/GP | 672G/GP | 770G/GP | 772G/GP | 870G/GP | 872G/GP

MOTOR GRADER FEATURES

Models to Fit Your Job

- Three variable-power engines are available to support global markets:
 - John Deere PowerTech™ 6068H 6.8L (414 cu. in.) engine; certified EPA Tier 2 and EU Stage II emissions; uses emissions credits when sold in USA and Canada
 - Worldwide (670G)
 - Outside USA, Canada, and Europe (672G)
 - John Deere PowerTech Plus™ 6090H 9.0L (548 cu. in.) engine; certified EPA Tier 3 and EU Stage IIIA emissions
 - USA, Canada, and Europe (670G, 672G, 770G, 772G, 870G, and 872G)
 - John Deere PowerTech 6090H 9.0L (548 cu. in.) engine; certified EU Stage II emissions
 - Outside USA, Canada, and Europe (770G, 772G, 870G, and 872G)
- A choice of blade controls are offered on the G-Series. Console-mounted controls and steering wheel are standard. The Grade Pro (GP) option provides armrest-mounted fingertip controls with a lever steer feature, along with the conventional steering wheel.
- Dual-path hydrostatic six-wheel drive with operator-selectable wheel speed matches front and rear wheels via 15-speed rotary aggressiveness control (672G/GP, 772G/GP, and 872G/GP). This allows the operator to adjust for different conditions like sand, grading, ditching, or mud.
- Transmission provides Event-Based Shifting (EBS) for smooth shifting at all engine speeds that delivers industry-leading power to the ground. It has the capability to change directions without using the inching pedal (clutch). The transmission software automatically protects the transmission against clutch wear damage, overheating, and operator abuse.
- Moldboards are available in both 24- and 27-inch heights.
- JDLink™ Ultimate is standard equipment.
- Six-wheel-drive inching capability down to 0 mph promotes excellent finish grading (672G/GP, 772G/GP, and 872G/GP).
- Six-wheel drive — low-speed gears 1 through 4 with high-speed gears 5 through 7 (672G/GP, 772G/GP, and 872G/GP).
- Precision mode — available in gears 1 through 3 (672G, 772G, and 872G), the infinitely adjustable precision mode lets you grade as slow as 0.25 mph. It is adjusted using a 15-position rotary dial, the gear selector, and the foot throttle.

- Automatic differential lock feature engages the differential lock in gears 1 through 4, both forward and reverse and automatically disengages based on steering and articulation angle.
- Steering compensation — to get maximum benefit from the six-wheel-drive system, all of the six-wheel-drive models are equipped with steering sensors. These sensors measure the steering angle and adjust front-wheel speed to keep all tires pulling equally during a turn.
- Ground-engagement tools — rear-mounted ripper as well as two scarifier options, front- or mid-mount, are available from the factory.

Operator Station Features

- Large cab for greater visibility and operator comfort.
- Industry's quietest cab (72 db).
- Industry's lowest lever efforts.
- Fully adjustable control console and steering wheel.
- Electronic monitor and sealed switch module for improved reliability and operator information. Twenty-five switches use only four wires and one connector in the system.
- Standard HVAC package designed for operator comfort. No manual cooling fan or bus fan required. Includes standard rear window electric defogger.
- Standard convenience equipment: two 12-volt power adapters, lunch-box storage, cup holder, and cell-phone holder.
- Eight standard hydraulic functions, with optional maximum of 14 factory-installed functions.
- Optional accessories include auto-shift, full-height ROPS cab, rear window shade, front window sunshade, choice of seats, multiple light packages, plus many more.

Grade Pro (GP) Option Features

- Grade Pro machines use two main control valves. The front control valve is located in the draft frame of the machine. The rear control valve is located under the left side of the cab. This reduces the number of hoses needed to control hydraulic functions on the front and rear of the machine.
- Fingertip armrest controls replace the conventional controls on the front console. These controls are mounted directly into the seat armrests and are configured exactly the same as conventional controls.

Grade Pro (GP) Option Features *(continued)*

- Nine control configurations for the fingertip controls are available from the factory. Up to six auxiliary hydraulic functions can be used. Operators can customize which fingertip control lever operates a particular auxiliary function through the monitor.
- Lever steering allows the operator to steer the machine using the blade side-shift lever on the left armrest. The conventional steering wheel is still on the front console.
- Cross slope is an exclusive feature that automatically controls one side of the blade. Operators can set a desired slope in the monitor, choose the side to be automatically controlled, and grade a consistent slope while only having to control one side of the blade.
- TOPCON and Trimble™ systems can be installed in two hours or less and then can quickly be calibrated with no activation fees. All GP machines come from the factory with all the controls, harnesses, and mounting hardware needed to accept both systems from both grade-control suppliers. Systems can be swapped with no modifications.
- Return-to-straight feature allows the operator to straighten the machine from an articulated position with one press of a button.
- Excellent visibility to the front of the machine and moldboard is achieved by moving the controls from the front console to the armrests.
- Premium heated seat with leather inserts come standard.

Service / Support

- High-torque large displacement engines with individually replaceable, wet-type engine liners that dissipate heat for longer life and easy service.
- Nylon or bronze circle wear strips are easily replaceable with a single wrench.
- Adjustable moldboard inserts can be adjusted in five minutes and are designed to maximize the life of the wear inserts.
- Thirty-two of the 57 lubrication joints use John Deere NeverGrease™ technology and never need to be greased.
- Transmission, hydraulic, and axle oil filters and sampling ports are conveniently located in the filter bank on the right side of the machine and can be easily accessed through the right side service doors. Easy access to these filters significantly reduces the amount of time it takes to service the machine.
- Cooling package provides superior access for cleaning through the use of swing-out oil coolers and a swing-out rear fan door. One size wrench opens all coolers.

- A hydraulic reversing fan is standard on all machines.
- Ground level fuelling is available with an optional fast-fuel system, which can fill the tank in less than one minute.
- All daily service checks can be accessed from the left side of the machine for quick, easy, and convenient service.
- Service compartment lights are located in the engine and rear-service compartments for easy service of all fluid levels in low light conditions.
- Periodic maintenance charts on every machine show when and where service is needed.
- Parts availability at the dealer and at John Deere parts depots.
- Quick-disconnect test ports for transmission, six-wheel drive, and hydraulic system save time.
- Quick fluid service bank option allows a service truck to hook up to the grader using "quick disconnect couplers" and quickly evacuate engine oil, hydraulic oil, transmission oil, and coolant from their reservoirs. New fluid can be pumped back in through the same lines.

MOTOR GRADER BASICS

Motor graders are classified in terms of net engine horsepower by the Association of Equipment Manufacturers. They are also discussed in terms of weight. The model numbers of motor graders are unique to each manufacturer, and they do not use similar naming conventions. Motor graders are also called road graders or maintainers.

Applications

Typical operations for motor graders include constructing roads, spreading materials, maintaining gravel/dirt roads, grading cul-de-sacs, crowning roads, V-ditching, flat-bottom ditching, cutting banks, finishing steep slopes, finishing low or high gentle slopes, cleaning wet ditches, finish grading, grading slopes, and plowing snow. With attachments they can also scarify or rip hard surfaces.

Moldboard or Blade Versatility

The ability to adjust the blade or moldboard on a motor grader is what gives it so much versatility to fit different grading jobs. The blade can be moved in multiple directions by hydraulic cylinders and the rotate motor. The blade-movement controls are all hydraulic. There is an industry-preferred placement of hand-lever function controls. It includes blade-float position and eight functions: left blade lift, blade side shift, blade pitch, circle rotation, circle side-shift, articulation, wheel lean, and right blade lift. Refer to "Blade or Moldboard Pitch" at right for a description of the effects and the importance of blade pitch on productivity and operation.

Six-Wheel Drive (6WD)

Six-wheel drive (6WD) can achieve the blade pull of a heavier machine with a lighter motor grader; this gives more power and traction with a lighter motor grader. Six-wheel drive does more than just improve traction in mud and snow. It allows a smaller motor grader to do the work of a bigger, heavier unit. A six-wheel-drive machine is up to 30-percent more productive than the same size tandem-drive grader.

Tire Pressure

Tire pressure is critical to the proper operation of a motor grader. Tire pressure must be set correctly and maintained at the proper settings. Refer to the Operator's Manual or manufacturer's specifications for the proper air pressure for each tire. The Operator's Manual gives a complete list of pressures depending on tire size, tire type (bias vs. radial), load range, ambient air temperature, types of equipment attachments, etc. The correct pressure is based mostly on the weight of the vehicle on each individual tire. This makes the front and rear tire pressures different. Tire pressure information is also included in the preventive maintenance chart.

Blade or Moldboard Pitch

There is no "correct" pitch angle for all applications. If the job demands movement of lots of material, the best pitch angle is achieved when the material flows smoothly off the moldboard. A good rolling action, almost like an ocean wave, provides the desired effect. Also, moisture content, speed, type of material, and blade angle will affect the rolling action.

Use blade or moldboard pitch to:

- Make refined blade-raise or -lower adjustments. When pitch is tilted forward, the moldboard moves closer to the ground. The opposite is true when pitched rearward. If a slight increase in cut is needed, it's much easier to pitch the blade slightly forward than it is to lower the blade using both blade-lift cylinders.
- When you approach an intersection or when you need to feather-out material, begin pitching the blade back before you reach the intersection. As you travel and pitch rearward, the moldboard will raise and feather-out material smoothly.
- Using proper pitch will keep the cutting edge sharp. If the moldboard is pitched too far forward, the cutting edge will eventually dull. If the moldboard is pitched so the thickest portion of the cutting edge is in contact with the ground, the moldboard will stay sharp and you will extend the life of the cutting edge.
- Using proper pitch will decrease fuel consumption. Proper blade pitch demands less horsepower from the engine. Moldboard pitch is directly related to the amount of material the grader can move. If too much forward pitch is used, less material will be moved. Experiment with this. Try different degrees of pitch. See what works best for your conditions.

Blade Pull of Six-Wheel-Drive vs. Tandem Motor Grader

Weight is a major determinant of blade pull or the ability of the motor grader to push material. The heavier the machine, the more material it can move, but the weight must be matched with the engine horsepower to prevent loss of traction. Blade pull is equal to the weight on drive wheels times the coefficient of traction.

The weight on the drive wheels of a tandem grader is approximately $\frac{2}{3}$ the weight of the machine, with the remaining $\frac{1}{3}$ of the weight on the two front non-drive wheels. This allows just the rear $\frac{2}{3}$ of the weight to be included in total rim pull. The front $\frac{1}{3}$ of the weight does not aid rim pull. With a six-wheel-drive system all the weight is used to increase rim pull, as the front $\frac{1}{3}$ of the weight is added to the equation because the front two wheels are powered and produce rim pull with the front wheels.

If you're grading with a tandem-drive machine and you are running out of traction, you can raise the blade to lighten the load and prevent the tires from spinning. This, however, results in a smaller cut, so you will have to come back a second time to finish the cut. With the increased traction of six-wheel drive, you may be able to do it all in one pass.

TYPE OF MACHINE	WEIGHT ON DRIVE WHEELS	COEFFICIENT OF TRACTION	BLADE PULL
32,000-lb. Tandem Drive	22,400 lb.	0.9	20,160 lb.
32,000-lb. 6-Wheel Drive	22,400 lb. (+ 9,600 lb.)	0.9	28,800 lb.
40,000-lb. Tandem Drive	28,000 lb.	0.9	25,200 lb.
40,000-lb. 6-Wheel Drive	28,000 lb. (+ 12,000 lb.)	0.9	36,000 lb.

The table above shows that a six-wheel-drive motor grader in one size class may develop more blade pull than a four-wheel-drive machine in the next class.

670G/GP



Engine	670G/GP	Optional engine: For use in U.S., Canada, and Europe
Manufacturer and Model	John Deere PowerTech™ 6068H	John Deere PowerTech Plus 6090H
Non-Road Emissions Standard	EPA Tier 2/EU Stage II	EPA Tier 3/EU Stage IIIA
Cylinders	6	6
Displacement	6.8 L (414 cu. in.)	9.0 L (548 cu. in.)
Rated Speed	2,100 rpm	2,100 rpm
Net Engine Power		
Gear 1	108 kW (145 hp)	116 kW (155 hp)
Gear 2	108 kW (145 hp)	119 kW (160 hp)
Gear 3	108 kW (145 hp)	127 kW (170 hp)
Gear 4	123 kW (165 hp)	138 kW (185 hp)
Gear 5	123 kW (165 hp)	142 kW (190 hp)
Gear 6	138 kW (185 hp)	145 kW (195 hp)
Gear 7	138 kW (185 hp)	145 kW (195 hp)
Gear 8	138 kW (185 hp)	145 kW (195 hp)
Net Peak Torque	848 Nm (625 lb.-ft.) at 1,000 rpm	1098 Nm (810 lb.-ft.) at 900 rpm
Net Torque Rise	45%	72%
Aspiration	Turbocharged, charge air cooled	Turbocharged, charge air cooled
Lubrication	Full-flow spin-on filter and integral cooler	Full-flow spin-on filter and integral cooler
Air Cleaner with Restriction Indicator	Dual element, dry	Dual element, dry
Cooling	Cooling on demand, hydraulic-driven, variable-speed fan drive to optimize fuel consumption; auto-reversing fan to keep coolers clean; swing-out rear fan door and foldout coolers for easy cleaning of all cooling components	
Engine Coolant, Extended Life, Rating	-37 deg. C (-34 deg. F)	
Powertrain	Direct-drive John Deere PowerShift Plus™, modulated shift-on-the-go, Event-Based Shifting (EBS), inching pedal; independent transmission reservoir with separate filtration and cooling system with 125-L/min. (33 gpm) gear pump	
Transmission		
Gears		
Forward	8	
Reverse	8	
Maximum Travel Speeds	<i>With no tire slip at 2,180 rpm, 14.0-R24 tires</i>	
Shift Lever Position 1	3.9 km/h (2.4 mph)	
Shift Lever Position 2	5.4 km/h (3.4 mph)	
Shift Lever Position 3	7.7 km/h (4.8 mph)	
Shift Lever Position 4	10.9 km/h (6.8 mph)	
Shift Lever Position 5	16.3 km/h (10.1 mph)	
Shift Lever Position 6	23.0 km/h (14.3 mph)	
Shift Lever Position 7	32.1 km/h (19.9 mph)	
Shift Lever Position 8	45.2 km/h (28.1 mph)	
Front Axle	Heavy-duty welded fabrication	
Oscillation (total)	32 deg.	
Wheel Lean Angle (each direction)	20 deg.	
Differentials	Spiral bevel; hydraulically actuated, clutch type can be applied on-the-go; selectable manual or automatic differential lock	
Steering (all models include steering wheel)	All-hydraulic power-frame articulation for maneuverability and productivity; crab steering reduces side drift, positions tandems on firm ground, and increases side-slope stability; return-to-straight control included in "Grade Pro" option	
Turning Radius (front steer and articulation)	7.21 m (23 ft. 8 in.)	
Articulation (both right and left)	22 deg.	
Final Drives	Inboard-mounted planetary sealed in cooled, filtered oil	
Drive-Chain Pitch	51 mm (2 in.)	
Brakes	Foot-controlled, hydraulically operated, multiple wet-disc brakes sealed in pressurized, cooled, filtered oil; both independent systems effective on all 4 tandem wheels	
Primary and Secondary Brakes	Hydraulically actuated, inboard of tandem pivot; self-adjusting, sealed in cooled and filtered oil, multi-disc (ISO 3450)	
Parking Brake	Automatically spring applied, hydraulically released, oil cooled, self-adjusting (ISO 3450)	



Hydraulics 6700/01

Closed-center, pressure-compensated load-sensing (PCLS), variable-displacement piston pump, O-ring face-seal fittings	
Maximum Pump Flow	212 L/min. (56 gpm)
Maximum System Pressure	18 961 kPa (2,750 psi)
Pump Displacement	90 cm ³ (5.5 cu. in.)

Blade Information

All-hydraulic, industry-standard lever placement of blade-function controls; includes float position; 7 discrete saddle positions

Blade Range

Lift Above Ground	490 mm (19.3 in.)
Blade Side Shift (right or left)	683 mm (26.9 in.)
Pitch at Ground Line	
Forward	42 deg.
Back	5 deg.
Shoulder Reach Outside Wheels (frame straight, right or left)	2083 mm (6 ft. 10 in.)
Bank Cut Angle (right or left)	90 deg.

Productivity

Blade Pull (maximum weight [21 228 kg (46,800 lb.)], 0.9 coefficient of traction)	12 800 kg (28,220 lb.)
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Electrical

Solid-state load center and sealed-switch module	
Voltage	24 volt
Number of Batteries	2
Battery Capacity	1,400 CCA
Reserve Capacity	440 min.
Amp-Hour Rating	224 amp-hour
Alternator Rating	100 amp
Lights	Driving lights; 2 high- and 2 low-beam halogen headlights; front and rear LED turn signals and marker lights; LED brake and hazard warning lights

Blade Frame

Type	Welded box construction
Width (minimum)	307 mm (12.1 in.)
Height (minimum)	307 mm (12.1 in.)
Thickness	
Side	16 mm (0.63 in.)
Top and Bottom Plate	23 mm (0.89 in.)
Modulus	
Minimum Vertical Section	1445 cm ³ (88 cu. in.)
Average Vertical Section at Saddle	2245 cm ³ (137 cu. in.)

Drawbar (Drawbar)

Welded box construction machined for flatness with double ball-and-socket pivot connection equipped with quick-change replaceable wear inserts

Circle

Welded construction, heat-treated, machined for flatness, equipped with quick-change replaceable wear inserts	
Circle Diameter	1524 mm (60 in.)
Rotation	360 deg.
Drive	Hydraulic motor and worm gear with positive lock
Circle Side Shift (right and left)	787 mm (31 in.)

Blade Edge

High-strength, pre-stressed for higher strength, wear-resistant, high-carbon steel and reversible end bits; blade side-shift wear system includes quick-change replaceable wear inserts and quick-adjust jackscrew system

Length	3.66 m (12 ft. 0 in.)
Height (measured along arc, including cutting edge)	610 mm (24 in.)
Thickness	22 mm (0.88 in.)

Duramax Edge

Dura-Max [®] through-hardened steel edge	
Thickness	16 mm (0.62 in.)
Width	152 mm (6 in.)

Scarfiers		G/09/GP
		<i>Front</i>
Type	V-type toolbar with manual 2-pitch positions, with hydraulic float	<i>Mid-mount</i>
Width of Cut	1.20 m (4 ft. 0 in.)	Radial linkage, with NeverGrease™ pin joints; V-type manual 3-pitch positions, with hydraulic float
Number of Shanks/Teeth	5 (maximum capacity 9)	1.19 m (3 ft. 11 in.)
Lift Above Ground	589 mm (23.2 in.)	11
Maximum Penetration	335 mm (13.2 in.)	335 mm (13.2 in.)
Shank		325 mm (12.8 in.)
Spacing	146 mm (5.75 in.)	
Size	25 x 76 mm (1 x 3 in.)	117 mm (4.6 in.)
		25 x 76 mm (1 x 3 in.)

Front Link Group (Ball Bearings Style)	
Parallel linkage, mechanical pins, hydraulic float	
Lift	
Above Ground	1864 mm (73.4 in.)
Range	988 mm (38.9 in.)

Rear Ripper/Scarifier	
Parallelogram linkage, with NeverGrease pin joints, hydraulic float, integrated hitch	
	<i>Ripper</i>
Width of Cut	2.21 m (7 ft. 3 in.)
Number of Shanks/Teeth	3 (maximum capacity 5)
Lift Above Ground	602 mm (23.7 in.)
Maximum Penetration	426 mm (16.8 in.)
Shank Size	61.5 x 133 mm (2.42 x 5.25 in.)
	<i>Rear Scarifier</i>
	2.18 m (7 ft. 2 in.)
	None standard (maximum capacity 9)
	810 mm (31.9 in.)
	323 mm (12.7 in.)
	25 x 76 mm (1 x 3 in.)

Operator/Station	
Low-profile cab with ROPS (ISO 3471-2008) and FOPS (ISO 3449-2005)	

Tires/Wheels			
	<i>13.00-24 on 229-mm (9 in.) Rim</i>	<i>14.00-24 on 254-mm (10 in.) Rim</i>	<i>17.5-25 on 356-mm (14 in.) Rim</i>
Wheel Tread on Ground (front and rear)	2.08 m (82 in.)	2.08 m (82 in.)	2.16 m (85 in.)
Overall Width (top of tires, front and rear)	2.46 m (97 in.)	2.49 m (98 in.)	2.64 m (104 in.)
Ground Clearance (front axle, front and rear)	559 mm (22.0 in.)	587 mm (23.1 in.)	587 mm (23.1 in.)

Serviceability	
Refill Capacities	
Fuel Tank	416.4 L (110 gal.)
Cooling System (6.8L engine)	45.4 L (12 gal.)
Engine Oil with Filter (6.8L engine)	26.1 L (6.9 gal.)
Transmission Fluid (refill)	22.7 L (6 gal.)
Differential Housing	36.0 L (9.5 gal.)
Tandem Housings (each)	75.7 L (20 gal.)
Circle Gearbox	5.7 L (1.5 gal.)
Hydraulic Reservoir	53.0 L (14 gal.)

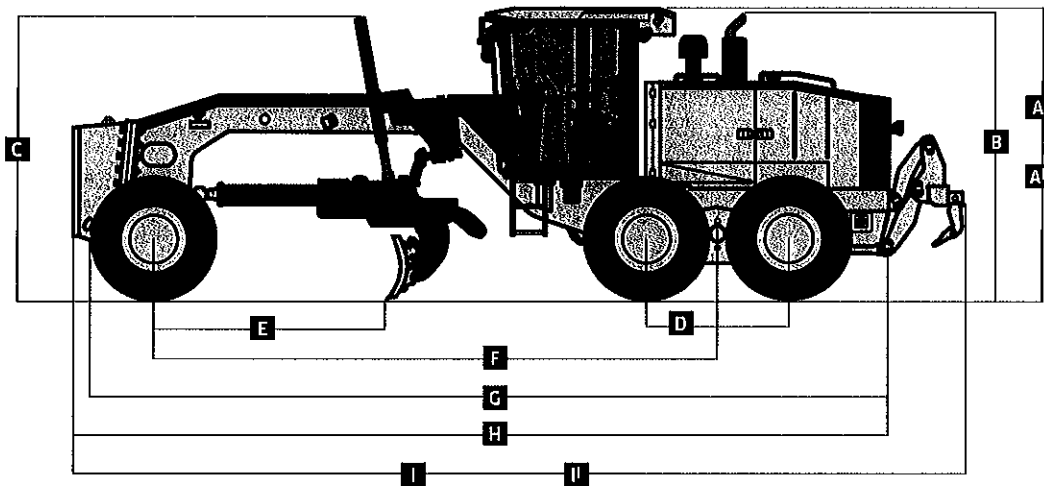
Operating Weights	
With full fuel tank, 79-kg (175 lb.) operator, 3.66-m x 610-mm x 22-mm (12 ft. x 24 in. x 7/8 in.) moldboards, and 14.00-24, 12 PR G2 tires	
Front	4191 kg (9,240 lb.)
Rear	11 149 kg (24,580 lb.)
Total	15 340 kg (33,820 lb.)
Typical Operating Weight with Front Push Block and Ripper	
Front	5542 kg (12,218 lb.)
Rear	13 049 kg (28,768 lb.)
Total	18 591 kg (40,986 lb.)
Maximum Operating Weight	21 228 kg (46,800 lb.)

Option/Weight	G/OC/GP
Moldboards with Through-Hardened Dura-Max Cutting Edge	
3.66 m x 610 mm x 22 mm (12 ft. x 24 in. x 7/8 in.) with 203-mm x 19-mm (8 in. x 3/4 in.) cutting edge and 16-mm (5/8 in.) hardware	45 kg (100 lb.)
3.66 m x 686 mm x 25 mm (12 ft. x 27 in. x 1 in.) with 203-mm x 19-mm (8 in. x 3/4 in.) cutting edge and 16-mm (5/8 in.) hardware	126 kg (277 lb.)
3.96 m x 686 mm x 25 mm (13 ft. x 27 in. x 1 in.) with 203-mm x 19-mm (8 in. x 3/4 in.) cutting edge and 16-mm (5/8 in.) hardware	180 kg (396 lb.)
4.27 m x 610 mm x 22 mm (14 ft. x 24 in. x 7/8 in.) with 152-mm x 16-mm (6 in. x 5/8 in.) cutting edge and 16-mm (5/8 in.) hardware	105 kg (231 lb.)
4.27 m x 610 mm x 22 mm (14 ft. x 24 in. x 7/8 in.) with 203-mm x 19-mm (8 in. x 3/4 in.) cutting edge and 16-mm (5/8 in.) hardware	156.9 kg (346 lb.)
Extensions, 610 mm (2 ft.) (right or left)	
For Use with 610-mm (24 in.) Moldboards	115.7 kg (255 lb.)
For Use with 686-mm (27 in.) Moldboards	120.2 kg (265 lb.)
Overlay End Bits, Reversible (one pair)	
For 152-mm (6 in.) Cutting Edge	19.1 kg (42 lb.)
For 203-mm (8 in.) Cutting Edge	22.7 kg (50 lb.)
Extended-Wear Moldboard Side-Shift Wear Inserts	0 kg (0 lb.)
Extended-Wear Circle Wear Inserts	19.5 kg (43 lb.)
Circle-Drive Slip Clutch	9.1 kg (20 lb.)
Moldboard Impact-Absorption System	45.4 kg (100 lb.)
Ripper/Scarifier, Rear Mounted with Hitch and Ripper Shanks (3)	1200 kg (2,645 lb.)
Scarifier Shanks with Teeth (9 for rear ripper/scarifier)	68 kg (150 lb.)
Ripper Shanks and Teeth (2)	64 kg (140 lb.)
Rear Counterweight with Integral Rear Hitch	725.7 kg (1,600 lb.)
Rear Hitch	54.4 kg (120 lb.)
Push Block, Front	1361 kg (3,000 lb.)
Scarifier	
Front Mount with Teeth (5)	850 kg (1,874 lb.)
Mid-Mount with Teeth (11)	1471 kg (3,243 lb.)
Front Lift Group (Balderson-style)	782.9 kg (1,726 lb.)

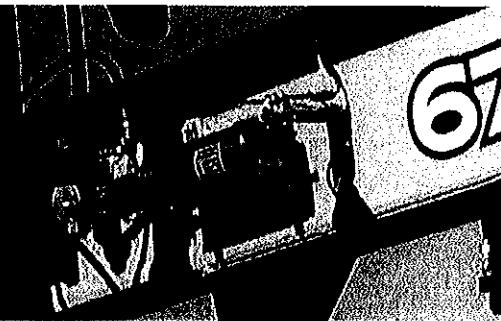
Machine Dimensions	
A Height to Top of Cab	3.18 m (10 ft. 5 in.)
A1 Height to Top of Full-Height Cab	3.40 m (11 ft. 2 in.)
B Height to Top of Exhaust (6.8L engine)	3.09 m (10 ft. 2 in.)
C Height to Top of Blade-Lift Cylinders	3.05 m (10 ft. 0 in.)
D Tandem Axle Spacing	1.54 m (5 ft. 1 in.)
E Blade Base	2.57 m (8 ft. 5 in.)

Option/Weight (Continued)	G/OC/GP
Tires	
13.00-24, 12 PR G2	- 38.1 kg (- 84 lb.)
14.00-24, 12 PR G2	0 kg (0 lb.)
17.5-25, 12 PR G2/L2	119.7 kg (264 lb.)
14.00-R24, Radial, G2/L2 General Purpose	215 kg (474 lb.)
14.00-R24, Radial, G2/L2 Snow	296.6 kg (654 lb.)
17.5-R25, Radial, L2 General Purpose	269.4 kg (594 lb.)
17.5-R25, Radial, G2/L2 Snow	291.2 kg (642 lb.)
17.5-R25, Radial, G3/L3 General Purpose	329.3 kg (726 lb.)
One-Piece Rims	
229 mm x 610 mm (9 in. x 24 in.)	0 kg (0 lb.)
330 mm x 635 mm (13 in. x 25 in.)	73.5 kg (162 lb.)
Multi-Piece Rims	
254 mm x 610 mm (10 in. x 24 in.)	170.1 kg (375 lb.)
356 mm x 635 mm (14 in. x 25 in.)	256.3 kg (565 lb.)
Fenders	
Front	62.1 kg (137 lb.)
Rear	119.7 kg (264 lb.)
Cab	
Low with Opening Front and Side Windows	15.9 kg (35 lb.)
With Armrest Electrohydraulic (EH) Controls	49.9 kg (110 lb.)
Tall with Fixed Front and Side Windows	57.2 kg (126 lb.)
Tall with Opening Front and Side Windows	59.9 kg (132 lb.)
Canopy, Low Profile with ROPS	- 161.5 kg (- 356 lb.)
Premium Seat, Air Suspension, Heated, with Adjustable Arm- and Headrests	12.7 kg (28 lb.)
Coolant Heater	3.6 kg (8 lb.)
Rotary Ejector Precleaner	7.7 kg (17 lb.)
Lighting Packages	
10 Halogen Lights	3.6 kg (8 lb.)
16 Halogen Lights	7.7 kg (17 lb.)
18 Halogen Lights	9.1 kg (20 lb.)
High-Front Light Bar for Snowplowing	44 lb. (20 kg)
24- to 12-Volt, 30-Amp Converter	1.4 kg (3 lb.)
Auxiliary Hydraulic Control Valve Section and Controls	6.8 kg (15 lb.)
Hydraulics For Front-Mounted Equipment	8.6 kg (19 lb.)
Wipers/Washers, Lower-Front Windows	4.1 kg (9 lb.)

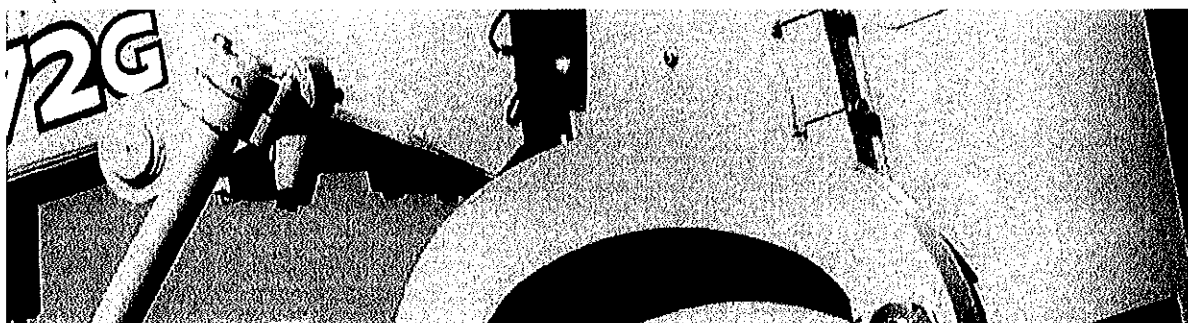
Machine Dimensions (Continued)	
F Wheelbase	6.16 m (20 ft. 3 in.)
G Overall Length	8.89 m (29 ft. 2 in.)
H Overall Length with Scarifier	9.69 m (31 ft. 9 in.)
I Overall Length with Push Block and Ripper	9.99 m (32 ft. 9 in.)
II Overall Length with Scarifier and Ripper	10.59 m (34 ft. 9 in.)
For Overall Width see Tires/Wheels on page 9-6.	



672G/GP



Rating	672G/GP	672G/GP
Manufacturer and Model	For use in U.S., Canada, and Europe John Deere PowerTech™ Plus 6090H	For use outside U.S., Canada, and Europe John Deere PowerTech 6068H
Non-Road Emissions Standard	EPA Tier 3/EU Stage IIIA	EPA Tier 2/EU Stage II
Cylinders	6	6
Displacement	9.0 L (548 cu. in.)	6.8 L (414 cu. in.)
Rated Speed	2,100 rpm	2,100 rpm
Net Engine Power		
Gear 1 (6WD on)	127 kW (170 hp)	123 kW (165 hp)
Gear 2 (6WD on)	130 kW (175 hp)	123 kW (165 hp)
Gear 3 (6WD on)	134 kW (180 hp)	123 kW (165 hp)
Gear 4 (6WD on)	142 kW (190 hp)	123 kW (165 hp)
Gear 5	142 kW (190 hp)	123 kW (165 hp)
Gear 6	145 kW (195 hp)	138 kW (185 hp)
Gear 7	145 kW (195 hp)	138 kW (185 hp)
Gear 8	145 kW (195 hp)	138 kW (185 hp)
Net Peak Torque	1098 Nm (810 lb.-ft.) at 900 rpm	848 Nm (625 lb.-ft.) at 1,000 rpm
Net Torque Rise	72%	45%
Aspiration	Turbocharged, charge air cooled	Turbocharged, charge air cooled
Lubrication	Full-flow spin-on filter and integral cooler	Full-flow spin-on filter and integral cooler
Air Cleaner with Restriction Indicator	Dual element, dry	Dual element, dry
Cooling	Cooling on demand, hydraulic-driven, variable-speed fan drive to optimize fuel consumption; auto-reversing fan to keep coolers clean; swing-out rear fan door and foldout coolers for easy cleaning of all cooling components	
Engine Coolant, Extended Life, Rating	-37 deg. C (-34 deg. F)	
Powertrain	Automatic dual-path hydrostatic drive; increases tractive effort and front-end control; includes separate left and right systems with variable-displacement pumps, axial-piston wheel motors, and freewheel at transport speeds; operator-selectable 15-position rotary aggressiveness control and inching capability down to 0 mph; precision mode (propelled by front wheels only)	
Six-Wheel Drive	Automatic dual-path hydrostatic drive; increases tractive effort and front-end control; includes separate left and right systems with variable-displacement pumps, axial-piston wheel motors, and freewheel at transport speeds; operator-selectable 15-position rotary aggressiveness control and inching capability down to 0 mph; precision mode (propelled by front wheels only)	
Conventional Mode Effective Gears	1-4 forward and reverse	
Precision Mode		
Effective Gears	1-3 forward only	
Operating Speeds	0.4-8.0 km/h (0.25-5.0 mph)	
Hydrostatic Pumps (2 each)	64 cm³ (3.9 cu. in.)	
Wheel Motors	60 cm³ (3.7 cu. in.)	
Final Reduction	38.7:1	
Transmission	Direct-drive John Deere PowerShift Plus™, modulated shift-on-the-go, Event-Based Shifting (EBS), inching pedal; independent transmission reservoir with separate filtration and cooling system with 125-L/min. (33 gpm) gear pump	
Gears		
Forward	8	
Reverse	8	
Maximum Travel Speeds	With no tire slip at 2,180 rpm, 14.0-R24 tires	
Shift Lever Position 1	3.9 km/h (2.4 mph)	
Shift Lever Position 2	5.4 km/h (3.4 mph)	
Shift Lever Position 3	7.7 km/h (4.8 mph)	
Shift Lever Position 4	10.9 km/h (6.8 mph)	
Shift Lever Position 5	16.3 km/h (10.1 mph)	
Shift Lever Position 6	23.0 km/h (14.3 mph)	
Shift Lever Position 7	32.1 km/h (19.9 mph)	
Shift Lever Position 8	45.2 km/h (28.1 mph)	
Front Axle	Heavy-duty welded fabrication	
Oscillation (total)	32 deg.	
Wheel Lean Angle (each direction)	20 deg.	
Differentials	Spiral bevel, hydraulically actuated, clutch type can be applied on-the-go; selectable manual or automatic differential lock	
Steering (all models include steering wheel)	All-hydraulic power-frame articulation for maneuverability and productivity; crab steering reduces side drift, positions tandems on firm ground, and increases side-slope stability; return-to-straight control included in "Grade Pro" option	
Turning Radius (front steer and articulation)	7.21 m (23 ft. 8 in.)	
Articulation (both right and left)	22 deg.	



Powertrain (continued)	
Final Drives	Inboard-mounted planetary sealed in cooled, filtered oil
Drive-Chain Pitch	51 mm (2 in.)
Brakes	Foot-controlled, hydraulically operated, multiple wet-disc brakes sealed in pressurized, cooled, filtered oil; both independent systems effective on all 4 tandem wheels
Primary and Secondary Brakes	Hydraulically actuated, inboard of tandem pivot, self-adjusting, sealed in cooled and filtered oil, multi-disc (ISO 3450)
Parking Brake	Automatically spring applied, hydraulically released, oil cooled, self-adjusting (ISO 3450)
Hydraulics	
Closed-center, pressure-compensated load-sensing (PCLS), variable-displacement piston pump, O-ring face-seal fittings	
Maximum Pump Flow	212 L/min. (56 gpm)
Maximum System Pressure	18 961 kPa (2,750 psi)
Pump Displacement	90 cm ³ (5.5 cu. in.)
Blade Function	
All-hydraulic, industry-standard lever placement of blade-function controls; includes float position; 7 discrete saddle positions	
Blade Range	
Lift Above Ground	490 mm (19.3 in.)
Blade Side Shift (right or left)	683 mm (26.9 in.)
Pitch at Ground Line	
Forward	42 deg.
Back	5 deg.
Shoulder Reach Outside Wheels (frame straight, right or left)	2083 mm (6 ft. 10 in.)
Bank Cut Angle (right or left)	90 deg.
Productivity	
Blade Pull (maximum weight [21 228 kg (46,800 lb.)], 0.9 coefficient of traction)	19 105 kg (42,120 lb.)
Electrical	
Solid-state load center and sealed-switch module	
Voltage	24 volt
Number of Batteries	2
Battery Capacity	1,400 CCA
Reserve Capacity	440 min.
Amp-Hour Rating	224 amp-hour
Alternator Rating	100 amp
Lights	Driving lights; 2 high- and 2 low-beam halogen headlights; front and rear LED turn signals and marker lights; LED brake and hazard warning lights
Blade Frame	
Type	Welded box construction
Width (minimum)	307 mm (12.1 in.)
Height (minimum)	307 mm (12.1 in.)
Thickness	
Side	16 mm (0.63 in.)
Top and Bottom Plate	23 mm (0.89 in.)
Modulus	
Minimum Vertical Section	1445 cm ³ (88 cu. in.)
Average Vertical Section at Saddle	2245 cm ³ (137 cu. in.)
Drive Frame (Power)	
Welded box construction machined for flatness with double ball-and-socket pivot connection equipped with quick-change replaceable wear inserts	
Circle	
Welded construction, heat-treated, machined for flatness, equipped with quick-change replaceable wear inserts	
Circle Diameter	1524 mm (60 in.)
Rotation	360 deg.
Drive	Hydraulic motor and worm gear with positive lock
Circle Side Shift (right and left)	787 mm (31 in.)
Motorboard	
High-strength, pre-stressed for higher strength, wear-resistant, high-carbon steel and reversible end bits; blade side-shift wear system includes quick-change replaceable wear inserts and quick-adjust jackscrew system	
Length	3.66 m (12 ft. 0 in.)
Height (measured along arc, including cutting edge)	610 mm (24 in.)
Thickness	22 mm (0.88 in.)

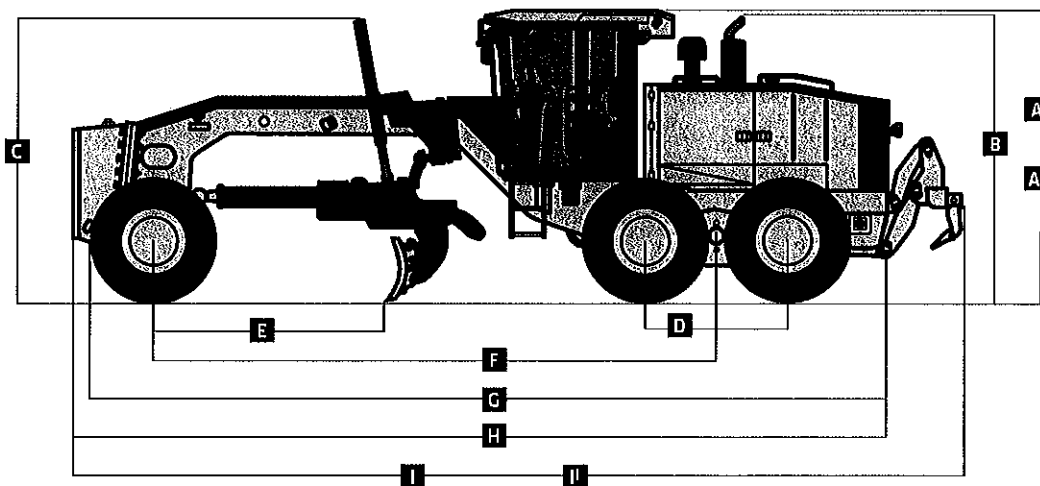
Cutting Edge		8720/OP		
Dura-Max® through-hardened steel edge				
Thickness	16 mm (0.62 in.)			
Width	152 mm (6 in.)			
Scarifier				
Type	<i>Front</i> V-type toolbar with manual 2-pitch positions, with hydraulic float		<i>Mid-mount</i> Radial linkage, with NeverGrease™ pin joints; V-type manual 3-pitch positions, with hydraulic float	
Width of Cut	1.20 m (4 ft. 0 in.)		1.19 m (3 ft. 11 in.)	
Number of Shanks/Teeth	5 (maximum capacity 9)		11	
Lift Above Ground	589 mm (23.2 in.)		335 mm (13.2 in.)	
Maximum Penetration	335 mm (13.2 in.)		325 mm (12.8 in.)	
Shank				
Spacing	146 mm (5.75 in.)		117 mm (4.6 in.)	
Size	25 x 76 mm (1 x 3 in.)		25 x 76 mm (1 x 3 in.)	
Front Lift/Range (Baldor 604V10)				
Parallel linkage, mechanical pins, hydraulic float				
Lift				
Above Ground	1864 mm (73.4 in.)			
Range	988 mm (38.9 in.)			
Rear Ripper/Scarifier				
Parallelogram linkage, with NeverGrease pin joints, hydraulic float, integrated hitch				
	<i>Ripper</i>		<i>Rear Scarifier</i>	
Width of Cut	2.21 m (7 ft. 3 in.)		2.18 m (7 ft. 2 in.)	
Number of Shanks/Teeth	3 (maximum capacity 5)		None standard (maximum capacity 9)	
Lift Above Ground	602 mm (23.7 in.)		810 mm (31.9 in.)	
Maximum Penetration	426 mm (16.8 in.)		323 mm (12.7 in.)	
Shank Size	61.5 x 133 mm (2.42 x 5.25 in.)		25 x 76 mm (1 x 3 in.)	
Operator Station				
Low-profile cab with ROPS (ISO 3471-2008) and FOPS (ISO 3449-2005)				
Tires/Weights				
	13.00-24 on 229-mm (9 in.) Rim	14.00-24 on 254-mm (10 in.) Rim	17.5-25 on 356-mm (14 in.) Rim	
Wheel Tread on Ground (front and rear)	2.08 m (82 in.)	2.08 m (82 in.)	2.16 m (85 in.)	
Overall Width (top of tires, front and rear)	2.46 m (97 in.)	2.49 m (98 in.)	2.64 m (104 in.)	
Ground Clearance (front axle, front and rear)	559 mm (22.0 in.)	587 mm (23.1 in.)	587 mm (23.1 in.)	
Serviceability				
Refill Capacities				
Fuel Tank	416.4 L (110 gal.)			
Cooling System (9.0L engine)	49.2 L (13 gal.)			
Engine Oil with Filter (9.0L engine)	26.9 L (7.1 gal.)			
Transmission Fluid (refill)	22.7 L (6 gal.)			
Differential Housing	36.0 L (9.5 gal.)			
Tandem Housings (each)	75.7 L (20 gal.)			
Circle Gearbox	5.7 L (1.5 gal.)			
Hydraulic Reservoir	53.0 L (14 gal.)			
Operating Weights				
With full fuel tank, 79-kg (175 lb.) operator, 3.66-m x 610-mm x 22-mm (12 ft. x 24 in. x 7/8 in.) moldboards, and 14.00-24, 12 PR G2 tires				
Front	4790 kg (10,560 lb.)			
Rear	11 567 kg (25,500 lb.)			
Total	16 357 kg (36,060 lb.)			
Typical Operating Weight with Front Push Block and Ripper				
Front	6035 kg (13,305 lb.)			
Rear	13 325 kg (29,377 lb.)			
Total	19 360 kg (42,682 lb.)			
Maximum Operating Weight	21 228 kg (46,800 lb.)			

Options/Weight	G/2G/GP
Moldboards with Through-Hardened Dura-Max	
Cutting Edge	
3.66 m x 610 mm x 22 mm (12 ft. x 24 in. x 7/8 in.) with 203-mm x 19-mm (8 in. x 3/4 in.) cutting edge and 16-mm (5/8 in.) hardware	45 kg (100 lb.)
3.66 m x 686 mm x 25 mm (12 ft. x 27 in. x 1 in.) with 203-mm x 19-mm (8 in. x 3/4 in.) cutting edge and 16-mm (5/8 in.) hardware	126 kg (277 lb.)
3.96 m x 686 mm x 25 mm (13 ft. x 27 in. x 1 in.) with 203-mm x 19-mm (8 in. x 3/4 in.) cutting edge and 16-mm (5/8 in.) hardware	180 kg (396 lb.)
4.27 m x 610 mm x 22 mm (14 ft. x 24 in. x 7/8 in.) with 152-mm x 16-mm (6 in. x 5/8 in.) cutting edge and 16-mm (5/8 in.) hardware	105 kg (231 lb.)
4.27 m x 610 mm x 22 mm (14 ft. x 24 in. x 7/8 in.) with 203-mm x 19-mm (8 in. x 3/4 in.) cutting edge and 16-mm (5/8 in.) hardware	156.9 kg (346 lb.)
Extensions, 610 mm (2 ft.) (right or left)	
For Use with 610-mm (24 in.) Moldboards	115.7 kg (255 lb.)
For Use with 686-mm (27 in.) Moldboards	120.2 kg (265 lb.)
Overlay End Bits, Reversible (one pair)	
For 152-mm (6 in.) Cutting Edge	19.1 kg (42 lb.)
For 203-mm (8 in.) Cutting Edge	22.7 kg (50 lb.)
Extended-Wear Moldboard Side-Shift Wear Inserts	
Extended-Wear Circle Wear Inserts	0 kg (0 lb.)
Circle-Drive Slip Clutch	19.5 kg (43 lb.)
Moldboard Impact-Absorption System	9.1 kg (20 lb.)
Ripper/Scarifier, Rear Mounted with Hitch and Ripper Shanks (3)	45.4 kg (100 lb.)
Scarifier Shanks with Teeth (9 for rear ripper/scarifier)	1200 kg (2,645 lb.)
Ripper Shanks and Teeth (2)	68 kg (150 lb.)
Rear Counterweight with Integral Rear Hitch	64 kg (140 lb.)
Rear Hitch	725.7 kg (1,600 lb.)
Push Block, Front	54.4 kg (120 lb.)
Scarifier	1361 kg (3,000 lb.)
Front Mount with Teeth (5)	850 kg (1,874 lb.)
Mid-Mount with Teeth (11)	1471 kg (3,243 lb.)
Front Lift Group (Balderson-style)	782.9 kg (1,726 lb.)

Machine Dimensions	
A Height to Top of Cab	3.18 m (10 ft. 5 in.)
A1 Height to Top of Full-Height Cab	3.40 m (11 ft. 2 in.)
B Height to Top of Exhaust (9.0L engine)	3.13 m (10 ft. 3 in.)
C Height to Top of Blade-Lift Cylinders	3.05 m (10 ft. 0 in.)
D Tandem Axle Spacing	1.54 m (5 ft. 1 in.)
E Blade Base	2.57 m (8 ft. 5 in.)

Options/Weight (Continued)	G/2G/GP
Tires	
13.00-24, 12 PR G2	- 253.1 kg (- 558 lb.)
14.00-24, 12 PR G2	- 215 kg (- 474 lb.)
17.5-25, 12 PR G2/L2	- 95.3 kg (- 210 lb.)
14.00-R24, Radial, G2/L2 General Purpose	0 kg (0 lb.)
14.00-R24, Radial, G2/L2 Snow	81.6 kg (180 lb.)
17.5-R25, Radial, L2 General Purpose	54.4 kg (120 lb.)
17.5-R25, Radial, G2/L2 Snow	76.2 kg (168 lb.)
17.5-R25, Radial, G3/L3 General Purpose	114.3 kg (252 lb.)
One-Piece Rims	
229 mm x 610 mm (9 in. x 24 in.)	0 kg (0 lb.)
330 mm x 635 mm (13 in. x 25 in.)	85.3 kg (188 lb.)
Multi-Piece Rims	
254 mm x 610 mm (10 in. x 24 in.)	113.9 kg (251 lb.)
356 mm x 635 mm (14 in. x 25 in.)	207.3 kg (457 lb.)
Fenders	
Front	62.1 kg (137 lb.)
Rear	119.7 kg (264 lb.)
Cab	
Low with Opening Front and Side Windows	15.9 kg (35 lb.)
With Armrest Electrohydraulic (EH) Controls	49.9 kg (110 lb.)
Tall with Fixed Front and Side Windows	57.2 kg (126 lb.)
Tall with Opening Front and Side Windows	59.9 kg (132 lb.)
Canopy, Low Profile with ROPS	- 161.5 kg (- 356 lb.)
Premium Seat, Air Suspension, Heated, with Adjustable Arm- and Headrests	12.7 kg (28 lb.)
Coolant Heater	3.6 kg (8 lb.)
Rotary Ejector Precleaner	7.7 kg (17 lb.)
Lighting Packages	
10 Halogen Lights	3.6 kg (8 lb.)
16 Halogen Lights	7.7 kg (17 lb.)
18 Halogen Lights	9.1 kg (20 lb.)
High-Front Light Bar for Snowplowing	20 kg (44 lb.)
24- to 12-Volt, 30-Amp Converter	1.4 kg (3 lb.)
Auxiliary Hydraulic Control Valve Section and Controls	6.8 kg (15 lb.)
Hydraulics For Front-Mounted Equipment	8.6 kg (19 lb.)
Wipers/Washers, Lower-Front Windows	4.1 kg (9 lb.)

Machine Dimensions (Continued)	
F Wheelbase	6.16 m (20 ft. 3 in.)
G Overall Length	8.89 m (29 ft. 2 in.)
H Overall Length with Scarifier	9.69 m (31 ft. 9 in.)
I Overall Length with Push Block and Ripper	9.99 m (32 ft. 9 in.)
I1 Overall Length with Scarifier and Ripper	10.59 m (34 ft. 9 in.)
<i>For Overall Width see Tires/Wheels on page 9-10.</i>	



Case ID: 11307034

Dealer: [179621] LESLIE EQUIPMENT CO. **City:** NORTON **State:** WV

Contact: CHEWNING, RICK **Phone:** 304-636-6421 **Email:** CHEWNINGRICK@LEC1.COM

Usage: 1.0 **Units:** Hours **PIN:** 1DW672GXA0630955

Problem Statement: NEED STALL TORQUE

Problem Details:

Udell, Bill, 04 Feb 2011 16:37 GMT

The maximum stall torque for the All Wheel Drive system of the 672G is 20,672 ft lb.

Udell, Bill, 04 Feb 2011 16:24 GMT

The bid spec wording is:

The All Wheel Drive System shall produce a maximum torque of no less than 10,325 lb ft.

CHEWNING, RICK, 03 Feb 2011 18:12 GMT

******Relevant Information******

We are working up a quote on a new machine and one of the customers questions on the quote is the STALL TORQUE OF ALL WHEEL DRIVE SYSTEM And we are not sure what this is?

Division of Highways
Equipment Division
Route 33, Brushy Fork Road
Buckhannon, WV 26201
Attn: Sheri D Slone

February 3, 2011

2011 John Deere 672G 6WD Motor Grader
with Henke Snow Blade and Lift Group

672G 6WD Motor Grader
Standard Hydraulic Controls
9.0 Liter, EPA Certified Tier 4 Engine (195HP)
100 Amp Alternator
Standard Fuel Lines
Hydraulic Pump Disconnect
JD Link Ultimate Tracking System (1 Year Contract included)
Black Exhaust Stack
12' X 24" X 7/8" Mold Board with 8" Cutting Edges
Nylon Circle Inserts
English Operators Manual
14R24 G2 Michelin Tires with 1 Piece Rim
Low Cab with Fixed Windows
Lower Front Intermittent Windshield Wipers
Radio AM/FM/WB with CD
Auto Shift Transmission
Transmission Valve Solenoid Guard
Deluxe Air Suspension Cloth Seat
Right Hand Seven Function Control Valve
Left Hand Five Function Control Valve
Front Mounted Scarifier
Rear Hitch and Pin
Standard Lighting Package
1400 CCA Battery
Converter, 25 AMP 24V to 12V
Convex Exterior Mirror
Fire Extinguisher
SMV Sign with Bracket

Total Governmental Pricing

\$206,672.00

(1) Henke SDDB 12 Sever Duty Dozer Blade, 12' Length

- 48" tall, box reinforced, 1/4" thick, rolled plate steel moldboard
 - 12" x 35lb/ft horizontal S&C channel center support and (5) 1/2" intermediate ribs
 - bottom angle constructed using 4" x 6" x 3/4" angle
 - top of moldboard supported by fully welded, full length 2 1/2" x 2 1/2" x 3/16" steel tubing
 - A-frame constructed with heavy, 4" S&C channel and reinforced with 4" x 6" SMT tubing
 - two (2) 4" x 20 3/4" double acting hydraulic cylinders provide up to 35° rotation left or right
 - 2 1/4" center pin with (3) grease zerks
 - shim adjustable wear runners
 - cushion valve
 - scarifier sockets

Governmental Pricing

\$11,995.00

(1) Henke STB-HX Lift Group--Scarifier Toolbar lift Group

- backplate assembly is gusseted, box-reinforced 1" weldment
 - (4) lift arms with 1.75" solid pins locked into fully welded bosses
 - 1.25" upper lift arms with 1.5" stiffener and 1.5" x 5" lower with 4" x 4" x 3/8" tubular stiffener.
 - includes fully welded, 3 3/4" pin bosses
 - lift mechanism: 5" heavy-duty dual acting cylinder with 2.0" chrome plated rod
 - scarifier head: fully welded, gusseted 3/4" box construction, with 1" welded pin bosses and 1 3/4" solid pins. Three (3) reinforced pin positions for optimum ripping angle. Nine (9) teeth positions available. Five (5) teeth provided with

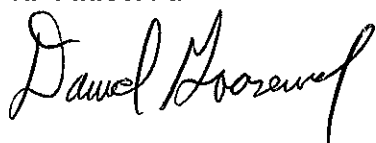
Governmental Pricing

\$6,150.00

Total Package Pricing

\$224,817.00

David Gaaserud



Leslie Equipment Company-Sales