

Compliant

## **BASIC SPECIFICATIONS**

**Machine shall be designed and built by the manufacturer.**

Y\_\_ N\_\_ Base Machine Weight shall not be less than 33000 lbs average. Weight shall include standard machine configuration, lubricants, coolants, full fuel tank and operator.

Y\_\_ N\_\_ The rear frame shall have two box section channels with an integrated bumper as standard.

Y\_\_ N\_\_ A toolbox shall be provided.

## **ENGINE**

Y\_\_ N\_\_ Engine shall be designed and built by the manufacturer.

Y\_\_ N\_\_ Engine shall be a turbo-charged, direct injection, four stroke, 6-cylinder diesel engine.

Y\_\_ N\_\_ Engine shall be certified EPA Tier 4

Y\_\_ N\_\_ Engine shall be electronically controlled for more efficient fuel injection and fuel burn.

Y\_\_ N\_\_ Engine will increase its low idle speed to 1,000 rpm when the battery voltage is below 24.5 volts for more than 5 minutes to ensure adequate system voltage and battery reliability.

Y\_\_ N\_\_ Engine enclosure and daily service points shall be accessible from ground level and grouped.

Y\_\_ N\_\_ Engine fan shall automatically adjust fan speed via temperature sensors to meet engine and hydraulic cooling requirements thus reducing demand on the engine, putting more horsepower to the ground, reducing noise, improving fuel economy, and reducing heat.

Y\_\_ N\_\_ Engine shall be isolation/resilient mounted to minimize sound and vibration.

Y\_\_ N\_\_ Engine compartment doors shall be lockable without the use of external locks.

Y\_\_ N\_\_ Engine shall automatically lower engine torque and alert the operator if critical conditions are detected.

Y\_\_ N\_\_ Engine shall have an air-to-air after cooler for superior engine performance.

- Y\_\_ N\_\_ Engine oil cooler shall be water to oil shell and tube cooler system.
- Y\_\_ N\_\_ DEF tank reservoir shall have a heater to thaw DEF fluid.
- Y\_\_ N\_\_ DEF lines should be heated to prevent freezing during extremely cold ambient conditions.
- Y\_\_ N\_\_ Transmission shall be designed and built by the machine manufacturer.
- Y\_\_ N\_\_ Transmission shall be a direct drive, power shift, countershaft type.
- Y\_\_ N\_\_ Transmission shall be equipped with built-in self-diagnostic capability.
- Y\_\_ N\_\_ Transmission shall preferably have 8 forward speeds and 6 reverse speeds
- Y\_\_ N\_\_ Transmission shall be isolated /resilient mounted to reduce sound and vibration.
- Y\_\_ N\_\_ Transmission shall be controlled with "cane style" shifting lever on right side of operator.
- Y\_\_ N\_\_ A load compensating system for the transmission shall be standard to ensure consistent shift quality in all applications.
- Y\_\_ N\_\_ Differential Lock/Unlock will be manual engagement with easy to reach switch on steering console.
- Y\_\_ N\_\_ Differential Lock/Unlock shall be electro-hydraulically controlled, as a standard feature.
- Y\_\_ N\_\_ Differential Lock/Unlock shall be a multi-disc design.
- Y\_\_ N\_\_ Final drive shall be a planetary design.
- Y\_\_ N\_\_ Machine shall be equipped with electronic over-speed protection to prevent the engine and transmission from over speeding, as a standard feature.

## STEERING & IMPLEMENT CONTROLS

- Y\_\_ N\_\_ Steering wheel is required to operate machine.
- Y\_\_ N\_\_ Operation of wheel lean, articulation, drawbar, circle and moldboard, as well as optional auxiliary hydraulics will be low effort short throw mechanical controls.
- Y\_\_ N\_\_ Primary left side control levers will include: 1) Left lift cylinder lift, lower and float control, 2) Blade side shift (left and right), 3) Blade pitch and 4) Circle rotate.
- Y\_\_ N\_\_ Primary right side control levers will include: 1) Right lift cylinder lift, lower and float control, 2) Wheel lean (left and right), 3) Machine articulation and 4) Drawbar, circle and moldboard (DCM) Center shift.
- Y\_\_ N\_\_ Standard Secondary steering shall have a primary power supply in the event the primary steering is lost.

## BRAKES

- Y\_\_ N\_\_ Machine shall have primary and secondary service brakes.
- Y\_\_ N\_\_ Entire braking system shall meet all requirements of ISO 3450: 1996.
- Y\_\_ N\_\_ Two separate left and right hydraulic brake accumulators shall be standard for safety.
- Y\_\_ N\_\_ Parking brake shall be multi-disc, oil-cooled, spring-applied, hydraulically released, sealed, adjustment-free, and integrated into the transmission. Park brake shall not be externally located.
- Y\_\_ N\_\_ Parking brake shall be serviceable without removing the transmission.
- Y\_\_ N\_\_ Service brakes shall be multi-disc, oil-cooled and completely sealed; they will also provide access to check and determine brake wear without removing or disassembling the brake assembly.
- Y\_\_ N\_\_ Service brake disc surfaces shall be grooved and carry oil between discs and plates with brakes fully applied.
- Y\_\_ N\_\_ Service brakes shall be hydraulically actuated, utilizing dual independent brake circuits.
- Y\_\_ N\_\_ Brakes shall be continuously pressurized, filtered, oil cooled.

Y\_\_ N\_\_ Machine shall have individual brake pods for each rear wheel, located at each rear wheel inside the tandem box, independent of tandem chains.

Y\_\_ N\_\_ Compensation components shall be required at all four tandem brake pods in addition to the brake wear indicator.

Y\_\_ N\_\_ Brake line protection, including tandem walkways and hydraulic brake line guarding, shall be required to prevent line damage.

## **HYDRAULIC SYSTEM**

Y\_\_ N\_\_ A standard triple-redundant hydraulic relief system shall protect machine hydraulic components.

Y\_\_ N\_\_ Hydraulic implement pump shall produce between 0 and 45.0 gal/min

Y\_\_ N\_\_ Hydraulics system shall be a closed center, load sensing type with a variable displacement, axial piston-type pump.

Y\_\_ N\_\_ The hydraulic tank shall have a baffling system to reduce potential pump cavitation.

Y\_\_ N\_\_ The maximum hydraulic system pressure shall be no more than 3,500 psi average

Y\_\_ N\_\_ Implement valves shall be proportional priority pressure compensating for consistent response when multi-functioning any combination of implement controls and independent of engine speed.

Y\_\_ N\_\_ Lock valves shall be integrated into the main implement valve to prevent cylinder drift.

Y\_\_ N\_\_ Left and right blade lift cylinders shall have independent float capability, as a standard feature.

Y\_\_ N\_\_ A sight gauge will be provided for checking hydraulic reservoir fluid.

## **FRONT AXLE AND TANDEMS**

Y\_\_ N\_\_ Front axle oscillation shall be no less than 32 degrees total average per side 16 degrees up and 16 degrees down average.

Y\_\_ N\_\_ Front axle shall be an arched design for maximum ground clearance.

Y\_\_ N\_\_ Front spindle shall be heat induction hardened.

Y\_\_ N\_\_ Front wheel spindle bearings shall be a double-tapered design with the larger diameter bearing mounted closest to the centerline of the front tire.

Y\_\_ N\_\_ Front wheel steering angle shall be no less than 50.0 average degrees left or right.

Y\_\_ N\_\_ Maximum front wheel lean shall be no less than 18 degrees average left or right.

Y\_\_ N\_\_ Machine turning radius shall not exceed 24 ft.average using front steering, full articulation and unlocked differential.

Y\_\_ N\_\_ Distance between center of tandem wheels shall be no greater than 59.0 in average for optimum clearance and mobility.

Y\_\_ N\_\_ Tandems shall be capable of oscillating 15 degrees front tandem up and 22 degrees front tandem down, with full machine articulation and having no interference between tandem wheel and machine structure.

Y\_\_ N\_\_ Mechanical steering stops located at each wheel and steering cylinder relief valves shall be present to prevent Steering system damage during normal operation.

Y\_\_ N\_\_ Steering tie rod ends shall be heat induction hardened.

Y\_\_ N\_\_ Machine shall provide 2 steering cylinders for maximum steering force.

Y\_\_ N\_\_ When equipped with a ripper.

## **TIRES AND RIMS**

Y\_\_ N\_\_ A 10 in (25.4 cm) by 24 in (60.96 cm) size 3-piece tire rim shall be standard to provide mounting for 14.00-24 tires and 14.00R24 conventional tires

## **OPERATORS STATION**

Y\_\_ N\_\_ Heater shall have an integral pressurizer and three-speed fan along with A/C.

Y\_\_ N\_\_ Standard Seat shall be a vinyl-covered suspension seat with 3 in (76 mm) retractable seat belts, with adjustments for fore-aft position.

- Y\_\_ N\_\_ An enclosed cab with ROPS (Rollover Protective Structure) according to ISO 3471: 1986-1997 shall be provided.
- Y\_\_ N\_\_ Cab doors shall have a hold-open clasp with a ground-level release in addition to a release in the cab.
- Y\_\_ N\_\_ Cab shall have fixed front window of laminated glass with intermittent wiper.
- Y\_\_ N\_\_ FOPS (Falling Object Protective Structure) shall be provided according to ISO 3449.
- Y\_\_ N\_\_ Radio ready arrangement will include 24V to 12V converter, two speakers, antenna and wiring.
- Y\_\_ N\_\_ An instrument cluster shall be provided that includes a speedometer, tachometer, coolant temperature, fuel and articulation angle gauge.
- Y\_\_ N\_\_ Operator cab fresh air-filter shall be accessible for clean out and replacement from inside the cab.
- Y\_\_ N\_\_ Machine shall have the Grade with Cross Slope system fully integrated into the machine design with integral hydraulic and electrical components.
- Y\_\_ N\_\_ A real-time information system shall monitor all system data and alert the operator of any faults through a digital text display. This performance and diagnostic information system shall be programmable for multiple languages .
- Y\_\_ N\_\_ Left and right side cab doors shall be provided.
- Y\_\_ N\_\_ Wipers shall be provided on side and rear windows.
- Y\_\_ N\_\_ Digital machine hour meter shall be provided.
- Y\_\_ N\_\_ An electronic message system shall provide real-time machine performance and diagnostic data.
- Y\_\_ N\_\_ The forward visibility shall be continuous and unobstructed glass from roofline to floor providing visibility of the blade, heel and toe, back of the cutting edge, and front tires.
- Y\_\_ N\_\_ Access to cab shall be three anti-skid steps.
- Y\_\_ N\_\_ Cab shall have storage compartment for operator's manual, with a molded floor mat.

Y\_\_ N\_\_ Window washer fluid bottle refill spout shall be located inside the cab.

Y\_\_ N\_\_ DEF gauge must be visible to the operator at all times.

Y\_\_ N\_\_ Integrated Cross Slope System shall be available from the factory in order to ensure proper calibration and installation for improved accuracy and performance.

Y\_\_ N\_\_ Integrated display and wiring for a rear vision camera shall be available with capability to view at all times without interfering with the gauge and diagnostic display.

Y\_\_ N\_\_ Automatic blade control system attachment ready option shall be available from the factory. This option shall include additional mounting brackets and electrical harnesses for easy installation of the electronics kit.

Y\_\_ N\_\_ Machine shall have integrated Grade with Control Cross Slope (automatic) available from the factory.

Y\_\_ N\_\_ Machine shall have integrated Grade Control with Cross Slope Indicate available from the factory.

Y\_\_ N\_\_ Machine shall have an integrated cross slope system with cross coupling software to prevent automatic response lag (or saw-toothing) in order to maintain consistency and ensure accuracy.

Y\_\_ N\_\_ Machine shall have a display for cross slope information that is separate from critical machine information such as engine RPM, ground speed and fluid temperature monitoring to ensure safe operation.

Y\_\_ N\_\_ Machine shall have Digital Blade Slope Meter available from the factory.

### **Operator training for technology**

Y\_\_ N\_\_ CIRCLE & MOLDBOARD

Y\_\_ N\_\_ Optional drawbar wear strips shall be replaceable drop-in inserts made from nylon composite material, replaceable and adjustable from the top of the drawbar plate via removable cover plates.

Y\_\_ N\_\_ Standard drawbar wear strips shall be replaceable inserts made from nylon composite material and be replaceable.

Y\_\_ N\_\_ The drawbar shall feature welded protective wear plates to prevent lift group contact with the primary drawbar structure.

Y\_\_ N\_\_ The standard moldboard shall be at least 12 ft (3657 mm) long, 24 in (610 mm) high and no less than 7/8 in (22 mm) thick.

Y\_\_ N\_\_ Moldboard shall have a bank slope angle capability of at least 90 degrees to both sides.

Y\_\_ N\_\_ Optional Top Adjust DCM will have Moldboard wear strips shall be adjusted with lock screws, providing shim-less adjustment capability both vertical & horizontal.

Y\_\_ N\_\_ The moldboard shall be pre-stressed during manufacturing for superior strength and durability.

Y\_\_ N\_\_ Moldboard slide rails shall be constructed of a heat-treated, high carbon steel and have replaceable bronze alloy wear inserts on top and bottom.

Y\_\_ N\_\_ Circle shall be a single piece, rolled-ring forging with raised wear surfaces on the top and bottom.

Y\_\_ N\_\_ Circle teeth contact surfaces shall be induction-hardened on the front 240 degrees of the circle.

Y\_\_ N\_\_ Blade lift and center shift cylinders shall have replaceable bronze-alloy wear inserts in the ball sockets with removable shims to insure the ability to remove free play throughout the useful wear insert life.

Y\_\_ N\_\_ The lift cylinder casting shall be welded to the front frame for added strength and structural integrity.

Y\_\_ N\_\_ The draft frame pivot connection shall have a single ball stud with grease zerk. Ball stud shall be bolt-on, shamble and adjustable to allow for quick and easy field serviceable design.

Y\_\_ N\_\_ There shall be 3 side shift anchor positions shall be provided for extended reach capability as standard.

## **ELECTRICAL**

Pinion Gear

Y\_\_ N\_\_ Machine shall have a 145 amp-hour, 1125 CCA heavy-duty battery.

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Y\_\_ N\_\_ Machine shall have a minimum 115-amp alternator at 24 volts provided.

Y\_\_ N\_\_ A 24 V to 12 V converter with 10-amp capacity shall be provided.



Y\_\_ N\_\_ Starting system shall be a 24V direct electric type.

Y\_\_ N\_\_ LED white reversing lamps and LED stop lamps shall be provided.

Y\_\_ N\_\_ Electrical system shall have a master disconnect switch with a removable key (in addition to the ignition switch), accessible from the ground level.

Y\_\_ N\_\_ All core machine systems shall be electronically connected, optimizing performance and preventing machine damage.

Y\_\_ N\_\_ All wiring shall be arranged and located so as to facilitate regular visual inspections, not be in contact with hot surfaces and not routed with other services lines (e.g. fuel, oil, etc.).

Y\_\_ N\_\_ All harnesses / cabling are secured with clipping clamps providing a gap between the conduit/harness and the mounting surface preventing material build-up.

## SERVICEABILITY

Power must

Y\_\_ N\_\_ The dip stick for checking transmission fluid shall be at ground level.

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Y\_\_ N\_\_ Hydraulic tank site gauge shall be readable from the ground.

Y\_\_ N\_\_ Hydraulic tank filter shall be a cartridge style filter inside the hydraulic tank.

Y\_\_ N\_\_ Ability for ground level fueling shall be provided.

Y\_\_ N\_\_ Sampling test ports shall be accessible from the tandem level and provide access to the engine, hydraulic, and coolant ports.

Y\_\_ N\_\_ A two-way communication tool shall give service technicians easy access to stored diagnostic data and allow configuration of machine parameters.

Y\_\_ N\_\_ The articulation joint shall have mechanical locking device to prevent frame articulation while servicing or transporting machine.

Y\_\_ N\_\_ Left and right side tandem case assemblies shall be covered with punched steel plate to provide an adequate platform for standing and walking.

Y\_\_ N\_\_ Engine shall have primary fuel filter with water in filter sensor, quick release dual stage filter and primer pump.

Y\_\_ N\_\_ Cartridge style filters (engine oil filter, fuel filters) shall have ability to drain filter canisters prior to removal for cleaner and easier filter changes.

Y\_\_ N\_\_ Hydraulic Oil filter will be cartridge style filter located inside hydraulic oil tank

Y\_\_ N\_\_ The centralized lube bank shall be at the articulation joint to give access to difficult zerks.

Y\_\_ N\_\_ Transmission filter restriction indicator shall be displayed in the cab.

Y\_\_ N\_\_ Lock out Tag out capabilities shall be provided standard and increase the safety levels during down time. This ensures that an energy isolating device and the machine which are being worked on and cannot be operated

Y\_\_ N\_\_ DEF tank fill shall be located accessible from ground level.

## **MINIMUM SERVICE FILL CAPACITIES**

Option Circle

Y\_\_ N\_\_ Standard fuel tank capacity shall not be less than 100 gallons average

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## **SAFETY AND ENVIRONMENTAL**

Standard DE

Y\_\_ N\_\_ A standard circle drive slip clutch shall be provided to reduce horizontal moldboard impact damage.

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Y\_\_ N\_\_ An external emergency kill switch shall be available for ground level engine shut down.

Y\_\_ N\_\_ Secondary, electric steering pump shall be provided as a backup to the primary implement hydraulic pump.

Y\_\_ N\_\_ Machine shall have laminated glass for the front windows and doors, to protect the operator from shattered glass.

Y\_\_ N\_\_ Machine shall provide dual exits allowing for emergency egress should one side become obstructed.

Y\_\_ N\_\_ Electrical system shall have a master disconnect switch with a removable key and lock for added safety.(in addition to the ignition switch).

Y\_\_ N\_\_ Machine shall have back-up lights and sounding alarm when reverse gears are selected.

Y\_\_ N\_\_ Environmentally friendly drain valves shall be provided for the hydraulic oil, engine oil, and engine coolant

Y\_\_ N\_\_ Cooling fan shall have both a shroud and rear grill for protection during service.

Y\_\_ N\_\_ Machine shall allow cab interior and exterior lights to remain on separate from ignition switch, for safe exit of the machine during night operation.

Y\_\_ N\_\_ Engine and transmission shall be rubber isolation mounted to reduce noise and vibration.

## ADDITIONAL FEATURES

Rear vision c

Y\_\_ N\_\_ An integrated communication tool providing flow of vital machine data and location shall be available. This system Shall give automatic updates on machine parameters such as machine hours, machine condition, location, fault codes and alarms.

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Y\_\_ N\_\_ A mid-mount scarifier shall be available.

Y\_\_ N\_\_ 5 year 5000hr premier warranty coverage