

Product Technical Specifications

Wheel loader
 3 Yard Capacity
 16.2 HP Engine Net

Section 0 - Description

0.1	<p>The purpose of the below technical specification is for the [Newton County] to purchase one articulated front-end loader with pneumatic tires, general purpose bucket, bolt-on cutting edge, rear-mounted engine, with operator cab which includes HVAC, radio, and 360 degree camera with color LCD screen. Adequate cooling and fuel capacity shall be provided for continuous operation during one full shift. Unit shall also be built from the ground up as an integral loader for front-end loading operations. Units supplied to this contract specification shall meet or exceed these requirements. Technical specification compliance and acceptance is determined at the discretion of the Agency/Department's engineers and/or staff. The supplied unit shall be new, and of the latest design of a model in current production or an update of an existing model. The supplied unit shall also be furnished with identical equipment, options and features as listed below. It shall be furnished completely assembled, fully serviced, and ready for immediate operation. The right is reserved to reject any and all bids proposing to furnish equipment, which, in the opinion of the agency's engineers and/or staff, is not satisfactory for the Agency/Department's use in the proposed application.</p>
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Section 1 - Dimensions, Weight, & Performance w/ Bucket

Specification Number	Specification Description	Specification Compliance		
		Compliant	Non-Compliant	Notes
1.1	Unit shall have a minimum SAE operating weight of 31800 lbs. without counterweight. No counterweight shall be provided.			
1.2	Tip load full turn at 17,000 lbs. minimum.			
1.3	Z - bar linkage system with "bucket float" and "auto return to dig" modes			
1.4	Height to top of cab of 11' (132 inches)			
1.5	Height to top of beacon 11' 2" (134 inches)			
1.6	Length overall w/ bucket 24' 8" (296 inches)			
1.7	Wheelbase of 9' 10" (118 inches)			
1.8	Dump clearance bucket at 45° 8' 10" (106 inches)			
1.9	Overall height bucket raised 15' 3" (185 inches)			
1.10	Dig depth 4.8 inches			
1.11	Bucket width 8' 4" (100 inches)			
1.12	Width over tires 7' 4" (96 inches)			
1.13	Turning radius inside of tires 6' 7" (69 inches)			
1.14	Turning radius outside of tires 7' 10" (114 inches)			
1.15	Rack angle at full lift 61°			
1.16	Dump angle at full lift 45°			
1.17	Rack angle at carry 43°			
1.18	Articulation Angle ± 40°			
1.19	Bucket capacity 3.0 cubic yards			
1.20	Breakout force 27000 lb Minimum			
1.21	Max bucket reach 3' 3" (39 inches)			

Section 2 - Engine

Specification	Specification Compliance
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Specification Number	Specification Description	Compliant	Non-Compliant	Notes
2.1	Engine rated net power shall be at least 162 hp (121 kW) according to ISO 9249 at 2100 RPM.			
2.2	Engine rated net torque shall be at least 567 lbf (789 Nm) according to ISO 9249 at 2100 RPM			
2.3	Engine shall be heavy-duty, liquid-cooled, diesel engine			
2.4	Engine shall be US EPA Tier 4 Final / EU Stage IV compliant and Tier 4 final compliance certificate shall be available upon request.			
2.5	Engine aftertreatment shall be equipped with a system that uses, Exhaust Gas Recirculation (EGR), a Diesel Oxidation Catalyst (DOC) and Selected Catalytic Reduction (SCR). No DPF (Diesel Particulate Filter) shall be used.			
2.6	Engine aftertreatment system shall use Diesel Exhaust Fluid (DEF) to meet emission requirements			
2.7	DEF tank shall be located away from the diesel fuel tank, configured with a blue cap to prevent fluid mix up and a sight gauge to prevent overfilling.			
2.8	Machine shall have Fuel and DEF level gages on the primary display to help with fluid fill management			
2.9	Emissions requirements shall meet or exceed worldwide requirements and be EPA Tier 4 Final (EU Stage IV) compliant.			
2.10	Regeneration shall be passive and not require any input from operator or disrupt work.			
2.11	Engine shall be 6.7 L six-cylinder, with electronically controlled fuel injection for precise timing.			
2.12	Engine shall have the capability to operate at least three power modes based on operator choice.			
2.13	Engine bore shall be 6.7 (4.21mm) and stroke shall be 107 " (4.88 mm).			
2.14	Engine shall be direct injection turbocharged for reliability, durability and performance.			
2.15	Engine shall have a high pressure common rail fuel system.			
2.16	CCA (minimum capacity) maintenance free batteries mounted in bolt-on, lockable battery boxes.			
2.17	Automatic Electronic Fuel priming pump and fuel/water separator shall be standard. Fuel filters should be replaced as dry and primed automatically to minimize fuel contamination.			
2.18	Easily accessible Emergency Engine Shutdown switch shall be standard.			
2.19	Machine shall have an alternator with 95 amps or greater.			

2.2	Machine shall be standard equipped with a three-stage Pre-Cleaner for engine air intake.			
2.21	Machine shall be standard equipped with a backup alarm.			
2.22	Machine shall have a standard master battery disconnect switch accessible from ground level.			
2.23	Engine shall have a 4 valve per cylinder crossflow head.			
2.24	Machine ECM shall automatically derate the engine for protection during overheating.			
2.25	Engine shall be contained in a sealed compartment, separated from the cooling compartment by a firewall, to prevent potential fire hazard.			

Section 3 - Powertrain/Transmission

Specification Number	Specification Description	Specification Compliance		
		Compliant	Non-Compliant	Notes
3.1	Machine shall have a forward/neutral/reverse switch standard on the implement control joystick.			
3.2	Machine shall be equipped with a powershift transmission with four forward and three reverse speed ranges with a maximum of 24 mph (40 kph).			
3.3	Machine shall have ground accessible ports to sample engine and transmission oil.			
3.4	Machine shall have transmission oil sight gauge and fill spout on the same side of the machine.			
3.5	Machine shall have the ability to electronically limit the maximum machine speed to comply with a site specific speed limit.			
3.6	Machine shall have the ability to electronically set the maximum machine speed to comply with site specific multiple speed limit zones.			
3.7	Machine shall have an adjustable clutch cutoff with a minimum of three programable settings based on operator preference.			
3.8	Machine shall have the ability to electronically adjust the shift aggressiveness with three modes based upon operator preference.			

Section 4 - Axels

Specification Number	Specification Description	Specification Compliance		
		Compliant	Non-Compliant	Notes
4.1	Front axle shall be rigidly mounted to the front loader frame.			

4.2	Rear axle shall have a remote trunnion lubrication fitting to simplify maintenance.			
4.3	Axle configuration shall be limited slip front axle with manual differential lock and a conventional rear differential.			
4.4	Seals on the axle and housing shall keep oil in and lock contaminants out to prevent contamination of internal components.			
4.5	Axle shall have fully-enclosed brakes and final drives.			
4.6	Planetary final drives shall be lubricated from the main oil sump.			
4.7	Final drives shall have high contact ratio gears for quiet, durable operation.			

Section 5 - Brakes

Specification Number	Specification Description	Specification Compliance		
		Compliant	Non-Compliant	Notes
5.1	Service brake shall feature completely closed and sealed standard outboard oil-immersed disc brakes on front and rear axles that are adjustment free.			
5.2	Audible alarm and Indicator light shall alert operator if brake pressure drops below normal operating parameters.			
5.3	Machine shall have continually charged nitrogen accumulators to provide stopping capability after loss of engine power.			
5.4	Machine shall feature an electronic park brake switch mounted in operator station on panel.			
5.5	Parking brake shall be disk and caliper type on driveline for positive operation which is spring applied and hydraulically released. The transmission shall be automatically neutralized when parking brake is applied.			

Section 6 - Hydraulic System

Specification Number	Specification Description	Specification Compliance		
		Compliant	Non-Compliant	Notes
6.1	Maximum working pressure shall be 3481 psi (24,000 kPa).			
6.2	Minimum hydraulic output at 2100 engine RPM shall be 58 gal/min (223 L/min).			
6.3	Machine shall have standard 3rd function hydraulics available for use with work tools that require hydraulic power			
6.4	Machine shall have an adjustable 3rd function flow feature allowing flow adjustability from 0% to 100% of maximum as standard.			
6.5	Total hydraulic cycle time shall be no more than 9.5 seconds.			

6.6	Double acting lift cylinders shall be 4.3" X 29.1" (110 X 738 mm).			
6.7	Double acting tilt cylinder shall be 4.9" X 19.9" (125 X 505 mm).			
6.8	Hydraulic attachment system shall detect when the lift and tilt kick outs approach the setting automatically reducing cylinder velocity to provide a smooth stop.			
6.9	Machine shall feature an operator selected electric safety valve to disable implement functions.			
6.10	Attachment hydraulics shall be load-sensing.			
6.11	Seat mounted low effort joystick control shall offer simultaneous lift and tilt functions.			
6.12	Boom lift circuit shall have four positions: raise, hold, lower and float.			
6.13	Tilt circuit shall have three positions: tilt back, hold and dump.			
6.14	Machine shall use hoses with a minimum 4,000 psi (28.0 MPa) working pressure.			
6.15	Steering and implement pumps shall be separate.			
6.16	Machine shall have pressure taps to allow quick diagnosis of complete hydraulic system. Pressures should also be accessible through a 7" color touchscreen monitor.			
6.17	Machine shall have a hydraulically driven, reversible fan.			
6.18	Machine shall have three section implement control valve for lift, tilt and attachment functions.			
6.19	A Ride Control system shall be standard for smooth operation in rough roading conditions. Ride Control system shall be programmable for different speed settings.			

Section 7 - Wheels & Tires

Specification Number	Specification Description	Specification Compliance		
		Compliant	Non-Compliant	Notes
7.1	Standard radial tire size shall be 20.5R 25 with 3 piece rim			

Section 8 - Operator's Station

Specification Number	Specification Description	Specification Compliance		
		Compliant	Non-Compliant	Notes
8.1	Front Hinged door shall lock open 90 degrees with the capability to open and close door from the operators seat. Door shall have a sliding glass window.			

8.2	Seat mounted joystick control shall operate both lift and tilt functions. Joystick shall integrate forward/reverse direction switch, and adjustable 3rd function hydraulic control.			
8.3	An Engine Speed Control feature shall be available to set engine RPM which can be set and maintained through the monitor.			
8.4	Standard heated seat shall include cloth with fully adjustable fore/aft position, seat back angle, bottom cushion height, armrest angle and air-suspension stiffness.			
8.5	Automatic cabin climate control shall be standard.			
8.6	Seat shall include a 3" (75 mm) wide retractable seat belt.			
8.7	Front and rear wipers with washers shall be standard.			
8.8	Steps shall have large aggressive-tread steps and shall keep debris buildup to a minimum.			
8.9	Machine shall be equipped with programmable in-cab kick outs for lift, lower, rack and dump kickouts with on the fly adjustments at any linkage position.			
8.10	(2) 12V outlets for powering electronics, a Bluetooth radio with remote auxiliary input and hands free calling, adjustable sun screen for front and rear window, external mirrors with heated defrost.			
8.11	Machine cab shall meet ROPS and FOPS criteria, regulations for sound exposure and ISO 3449:2005 and ISO 3471:2008.			
8.12	Machine shall have gauges including hydraulic, engine and transmission temperatures as well as fuel level.			
8.13	Warning/indicator and diagnostic functions shall include: Primary steering malfunction, electrical system voltage low, coolant temperature, engine oil pressure low, parking brake applied, brake charge pressure low, transmission oil temperature, transmission oil filter bypass, and hydraulic oil filter bypass.			
8.14	Machine shall have an additional mounting provisions with a power connection in cab for auxiliary equipment as standard			
8.15	Auxiliary LED front and rear working lighting packages shall be available.			
8.16	Machine shall have a 7" color touchscreen LCD display in the cab with capabilities of enhanced diagnostics, machine control adjustments, and detailed system parameters for machine and engine including fuel consumption.			
8.17	Machine shall have a factory installed 360° camera system visible through the 7" color touchscreen display.			

8.18	Machine shall have the ability to provide Maintenance reminders based on hours of operation.			
8.19	Machine shall be capable of storing a minimum of 4 unique user profiles.			
8.20	Machine shall warn the operator if the seat belt is not engaged			
8.21	Machine shall have standard equipped heated mirrors.			
8.22	Machine shall be standard equipped with a rear-view camera visible within the 7" color touchscreen monitor.			
8.23	Operator station shall expose the operator to sound pressure of no greater than 69 dB to provide maximum operator safety.			

Section 9 - Machine Serviceability

Specification Number	Specification Description	Specification Compliance		
		Compliant	Non-Compliant	Notes
9.1	Radiator, transmission and charge air cooler shall be vertically stacked. Hydraulic oil cooler and a/c condenser will swing away a minimum 60°.			
9.2	All service points shall be accessible from ground level, on the same side of the machine.			
9.3	Radiator coolant and transmission and hydraulic oil levels shall have sight gauges.			
9.4	Spin on filters for engine oil and hydraulic oil shall be vertically mounted for easier servicing.			
9.5	Scheduled oil sampling ports shall be factory installed for improved access to engine, transmission and hydraulic oils.			
9.6	Machine shall have easy access to engine and cooling compartments through a rear access door that swings up, an electrically actuated hood that raises up and two access doors on each side of the hood.			
9.7	Cooling fan shall be hydraulically driven and separate from the engine compartment.			
9.8	Machine shall have a standard automatic reversing fan with programmable controls within the monitor.			
9.9	Machine error codes shall be accessible from the standard 7" color touchscreen monitor.			
9.10	Standard service features shall include: Standard hydraulic oil cooler; adjustment free brakes; adjustment free engine fuel system; grouped grease fittings; positive torque hose clamps; braided, color coded, labeled and numbered wiring.			
9.11	Machine shall have remote drains for engine and hydraulic oil accessible from ground level.			
9.12	Machine shall have a full machine warranty for 5 years or 5,000 hours			

9.13	Machine shall have a limited lifetime warranty covering the center pivot bearings of the machine.			
9.14	Hydraulic site gauge shall be visible from ground with operator station door open or closed.			

Section 10 - Machine Service Fill Capacity Minimums

Specification Number	Specification Description	Specification Compliance		
		Compliant	Non-Compliant	Notes
10.1	Fuel tank shall have a 60 gal (227 L) capacity.			
10.2	DEF Fluid tank shall have a 2.6 gal (10 L) capacity.			
10.3	Cooling system shall have a 8.7 gal (33 L) capacity.			
10.4	Crankcase shall have a 4.1 gal (15.5 L) capacity.			
10.5	Transmission shall have a 13.2 gal (50 L) capacity.			
10.6	Hydraulic system (including tank) shall have a 58 gal (130 L) capacity.			
10.7	Hydraulic tank shall have a 34 gal (129 L) capacity.			
10.8	Differentials and final drives capacities shall a minimum capacity: front 9.2 gal (34.8 L) rear 9.2 gal (34.8 L)			

Section 11 - Additional Specifications

Specification Number	Specification Description	Specification Compliance		
		Compliant	Non-Compliant	Notes
11.1	3 CY Bucket			
11.2	Unit shall come standard with operator, preventative maintenance, and safety training within 30 days of delivery at no extra charge.			
11.3	Shall come equipped with a Hydraulic Quick Coupler			