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It is the intent of this specification to describe a high performance, articulated side walk tractor that supports a variety of attachments. Power is supplied to those attachments through an auxiliary hydraulic supply or engine driven PTO shaft.

M-B Multi Service Vehicle (MSV) General Specifications

1. The MSV vehicle design incorporates a high quality, fabricated steel frame with camber and toe-in for improved handling and control at transport speeds.
2. The frame allows articulation of up to 45 degrees left or right. The front and rear frames are allowed to oscillate relative to each other up to +/- 15 degrees providing improved traction and superior control of vehicle mounted implements/attachments. The "off-set pin" articulation joint is designed to force the front and rear frame sections back into alignment when oscillation does occur.
3. The articulated steering is accomplished through the use of twin, dual acting 2-inch, steering rams.
4. The vehicle provides fulltime four-wheel drive via four hydrostatically driven wheel motors, on four (4) equally sized tires.
5. Standard equipment includes a nitrogen charged accumulator to compensate for front end load on 3-point arms.
6. The MSV has the capacity to carry 1 cubic yard dump body and ½ cubic yard drop spreader.

M-B Multi Service Vehicle Engine Specifications

1. Cummins, QSB4.5, 4 Cylinder, Tier 3, Turbo Charged and Charge Air Cooled.
 - a. 110 HP @2500 RPM
 - b. 115 HP @ 2300 RPM
2. Bore / Stroke: 4.21/4.88 in. (107 mm/124 mm)
3. Displacement : 275 cu-in (4.5L)
4. Engine comes standard with factory installed grid heater cold starting aid. Other available cold starting aids include oil pan heater and block heater.
5. Compression Ratio: 17.2 to 1
6. Maximum Torque: 360 lb-ft. @ 1500 RPM (488 N-m)
7. Power Unit Weight: 818 lbm
8. Fuel Consumption at max torque: .385 lbs./hp-hr

9. Air cleaner maintenance and engine coolant level sensors are networked to CANBUS vehicle controls. The controller provides an audible alarm and a message on the operator's console when filter maintenance is required.
10. Cummins engine ECM is also networked to the vehicle control network. All diagnostic and maintenance messages generated by the Cummins engine are read and displayed on the operator's console.

M-B Multi Service Vehicle Ground Drive Specifications

1. The standard vehicle configuration features 10-ply, "winter lugged" 10.5 x 80 - 18 tires mounted on heavy duty 10-bolt steel wheels. Summer turf and other tire options are available.
2. The wheel motor based ground drive incorporates four (4) Poclain drive motors. Two speed shift on-the-fly operation. When operated in work mode the speed is variable from 0 to 10 mph. Transport mode allows vehicle speeds from 0 to 25 mph (The top speed is dependent on tire size that is installed on the vehicle.)
3. Eighteen gallon hydraulics reservoir shared by both the attachment hydraulic and hydrostatic ground drive systems.
4. Engine mounted 20-inch suction fan forces air through rear mounted hydraulic cooler.
5. Sauer Danfoss piston type, electronic variable displacement pump operating at 6000 psi supplies the wheel motors
6. Dry type power take-off clutch, electronic-over-hydraulic engagement, multi-plate design, 6-spline, 1-3/8" diameter. Standard PTO is front 540 R.P.M @ 2160 engine RPM. Optional rear PTO operates at 540 RPM @ 2160 engine RPM.
7. Steering system is an articulated, two cylinder, load-sensing design. Articulating joints feature greasable, spherical bearings.
8. The MSV features three separate braking systems: Primary hydrostatic braking using all four wheel motors and the hydraulic ground drive; Secondary automotive style disc brakes on the front wheels; Hydraulically actuated, mechanical parking brakes sealed in the front wheel motors.
9. Parking brake is engaged/disengaged through the operator's console. Parking brake status is also displayed on operator's console. Audible alarm provides warning if the ground drive is engaged while brake is applied.

M-B Multi Service Vehicle Hydraulic System and 3-point capacities.

1. Eaton, piston-type, load sensing, flow compensated, hydraulic pump driven by the engine supplies up to 26 gpm to auxiliary attachment drive circuit. Optional 31 gpm pump is available. Auxiliary hydraulic flow can be adjusted from the operator's control console in the cab. Max operating pressure 3000 psi (207 bar).

2. Front three point hitch configuration, with (2) double acting lift cylinders, to support a front lift capacity of 6000 lbs. Front quick attach hitch linkage accommodates category 1 and category 2 attachments.
3. Front attachment control hydraulics feature four function hydraulic manifold. All hydraulic functions are double acting and are controlled from the operator's joystick. Six hydraulic quick couplers provide hydraulic connection for front mounted attachments.
4. Hydraulic reservoir supplies both the hydraulic ground drive and vehicle auxiliary hydraulics. Reservoir capacity is 18 gallons, (68 liters) which is cooled by a 20" engine driven fan and oil cooler. The ground drive and auxiliary circuits are supplied by three separate hydraulic system filters.

M-B Multi Service Vehicle Operator's Cab

1. One man cab certified to comply with SAE specification J 1040C and ISO 3471. Operator's three point seat belt system complies with Seat Belt Anchorage Test SAE J 2292.
2. Operator's cab has wide opening door on left hand side for operator entry and exit. Right and left side windows slide open and latch closed. Standard roof hatch provides ventilation and can be used as an emergency exit.
3. Door can be removed and replaced without tools and is positioned with a pressurized gas cylinder.
4. Operator's cab is undercoated to provide sound and temperature insulation. Interior of cab has foam sound absorbing lining and thermoformed headliner and trim panels. Foam lining, headliner, and trim panels also provide sound and temperature insulation.
5. AM/FM radio with weather band and two stereo speakers are standard. Other radio/sound packages are available.
6. Tilt steering column has automotive style controls with directional light activation and indication, hazard light switch and indication, two speed wiper controls with intermittent function, headlight and clearance light switch with high/low beam activation, and three speed heater/air conditioner fan controls.
7. Air ride, operator's seat with head and arm rests allows three-way adjustment. Operator presence switch in seat bottom must be activated to allow the engagement of the ground drive, auxiliary hydraulic, and PTO functions.
8. Standard high performance heater provides 25,800 BTU of heat transfer capacity with 460 cubic meter/hour of air circulation. Cab has a replaceable fresh air filter with three-speed ventilation fan. Headliner contains molded air ducts with vents that can be directed at the operator for cooling or at the window for clearing and defrost.
9. Optional integrated air conditioning (Not rooftop mounted!) provides 18,000 BTU of cooling capacity with 382 cubic meter/hour of air circulation capacity.
10. Vehicle comes standard with two (2) front headlights and two front clearance/directional lights. Standard rear configuration includes two red tail/signal/clearance lights, two clear back-up lights, and SAE rated audible back-up alarm.
11. Front windshield wiper is of pantograph design. Wiper and windshield washer controls are steering column mounted. Washer fluid reservoir is accessed and filled from operator's cab.

12. Left and right side exterior breakaway rear view mirrors are adjustable from inside the cab through side slide windows. Interior rear view mirror is mounted in front upper left corner of cab and is adjustable directly by operator.
13. For ease of connection, PTO shaft can be accessed through interlocked door in the floor of the cab.

M-B Multi Service Vehicle Vehicle Control/Electrical System

1. Three phase 95-amp, 12-volt alternator with 1000 CCA battery.
2. All vehicle controls are electric over hydraulic type. Vehicle and engine ECM is networked and controlled by CAN (Controller Area Network) serial bus technology.
3. The “main” operator’s console in the vehicle cab incorporates the MDC (Monitor, Diagnose, and Control) 7-inch liquid crystal, 5-button, color display screen.
4. All vehicle system and engine diagnostics are displayed on the MDC screen.
5. The MDC screen displays are defined below.
6. High visibility MDC screen is easily viewed in direct sunlight and is backlit for night viewing.

M-B Multi Service Vehicle Operator Display Screens

Five mechanically sealed pushbuttons allow access to the following screens:

1. Vehicle main operating screen.
 - a. Engine oil pressure with visual and audible alarms.
 - b. Coolant temperature with visual and audible alarms.
 - c. Hydraulic oil temperature with visual and audible alarms.
 - d. Low fuel visual and audible alarms.
 - e. Engine tachometer both digital and graphical indication.
 - f. Vehicle speed both digital and graphical indication.
 - g. Voltmeter and warning indicator.
 - h. Air filter restriction warning and audible alarm.
 - i. PTO engagement indication.
 - j. Ground drive mode indication.
 - k. Engine hour readout.
 - l. Selected front attachment.
 - m. Selected rear attachment.
 - n. Head light high beam/low beam indication.
 - o. Signal light and hazard flasher indication.
 - p. Auxiliary hydraulic flow (gallons-per-minute) indication.
2. Main menu selection screen: specific MDC functions are accessed through this screen.

3. Joystick Diagnostics
 - a. Throttle: Increase/decrease.
 - b. Ground Drive: Forward/Neutral/Reverse.
 - c. Ground Drive: High Range/Low Range.
 - d. PTO: Enable/Disable.
 - e. Front Hitch: Up/Down.
 - f. Rear Hitch: Up/Down (Optional).
 - g. Hydraulic (Aux 1): Left/Right.
 - h. Hydraulic (Aux 2): Up/Down.
 - i. Hydraulic Drive (Aux 3): On/Off.
 - j. Dump Body (Aux 4): Up/Down.
 - k. Right Wing (Aux 5): Up/Down (Future).

4. Attachment Selection.
 - a. Front Attachment Selection.
 - b. Rear Attachment Selection.
 - c. Right Wing Selection (Future).
 - d. Dump Box Selection.

5. Lighting
 - a. Beacons: On/Off.
 - b. Auxiliary 1: On/Off.
 - c. Auxiliary 2: On/Off.

6. System Hydraulics
 - a. Aux 3 (Set auxiliary flow.).
 - b. Set Front Weight Transfer Pressure.

7. Vehicle Diagnostics
 - a. Listing of any vehicle faults or service minders.

8. Input/Output Diagnostics.
 - a. Diagnostic listing of Input and Output status.

9. Engine Diagnostics
 - a. Listing of any vehicle faults or service minders.

10. Joystick Layout
 - a. Visual layout of joystick and description of each function.

11. Vehicle Setup
 - a. Listing of serial number, version number, and installed options.

M-B Multi Service Vehicle Dimensions and Capacities

1. Fuel tank capacity is 19 gallons (71.9 liters) with remote fill. Fitted with 25-micron fuel filter.
2. Overall vehicle length is 156.78 inches (3982 mm) without rear hitch.
3. Maximum overall vehicle cab width (48 inches.)
4. Maximum overall track width is 49.5 inches (1258 mm) with 10.5 x 80 - 18 tires.
5. Overall height is 82 inches (2095 mm) with 10.5 x 80 - 18 tires.
6. Ground Clearance is 10 inches (254 mm) with 10.5 x 80 - 18 tires.
7. Inside turning radius is 70 inches. (1778 mm)
8. Outside turning radius is 120 inches. (3048 mm)
9. Wheel Base is 83 inches. (2108 mm)
10. Curb Weight is 5800 lbs. (2537 kg)
11. 12,000 lbs gross vehicle weight (5436 kg).
12. Maximum allowable individual front axle load or rear axle load is 8,000 lbs (3625 kg).
Maximum allowable axle load is determined by tire selection and not based on wheel motor load capacity.