ST35 Specifications

Unitized Steel Weldment Frame of High Tensile Steel. All hydraulic lines and wiring are encased internally to the frame for protection from loads and sunlight with the exception of the hoses that make the connections to the hydraulic swivels on top of each fork tube. SAE toe boxes are installed inside the frame for operator access to the cabin. Brake, fuel and hydraulic tanks are installed internally to the frame structure for protection and containment.

Hydraulic Hoist System. Four double acting hoist cylinders lift capacity loads with ease. Integrated cylinder position sensors provide precise cylinder position feedback for closed loop automatic lift cylinder synchronization. Four direct acting swing cylinders are utilized to open and close the load shoes. One variable displacement hoist pump supplies pressure and flow to operate the hoist and swing cylinders. Lift system pressures and temperatures are monitored at the two three section control valves including a pressure limiting function for the swing circuit. All lift valves are solenoid proportional controlled for smooth and precise lift shoe positioning. Counterbalance valves are mounted internal to each hoist cylinder for excellent load holding capability.

Filtration. Full flow return filtration with electronic and visual filter bypass indicators are installed. Pressure filtration is utilized for the drive pump charging circuits, steering circuit and hydraulic fan drive circuit. No Bypass three micron filtration is provided for adding hydraulic oil.

Hydraulic Fluid Coolers. Dual coolers with hydraulically driven fan are used to keep operating fluids cool. The fan speeds are thermostatically controlled to maintain optimum fluid viscosities.

Powertrain. A single Cummins QSL9 rated 350hp @ 2100 rpm drives a four pad pump drive to provide power to the hoist, steering, drive and charging pumps. The brake pump is driven off an aux PTO pad on the front of the engine. Two variable displacement drive pumps are connected to two double variable displacement hydraulic motors to provide motive power. Hydrostatic braking is user selected and also provided by this system. All pumps and motors are controlled with proportional solenoid valves. Hydraulic motors are direct coupled to the right angle wheel planetaries without the use of driveshafts or cv joints.

The wheel planetaries are pressure lubricated for long service life. Extreme Duty Radiator and Charge Air Cooler Assembly is epoxy coated for corrosion resistance and equipped with remote expansion tank, coolant level sensor. Air conditioning is R134a compatible and compressor is engine mounted.

Four Wheel Independent Suspension. Four heavy duty coil springs with upper and lower antifriction bushings and oversized tapered roller bearings support the laden vehicle weight. Bushing and bearing retainers are black phosphate treated to provide corrosion resistance. Dual shock absorbers are mounted on each corner to provide excellent ride quality. Heavy duty fork tubes are mounted in each corner and support the wheel fender assemblies. Four 16:00R25 Tubeless Radial Tires are installed. Rims are center disc style and are attached using 24 flange nuts on studs for positive tire retention. Center discs pilot on the wheel ends to ensure wheel alignment (no demountable wheel clamps are used).

Brakes. Four multi disc wet hydraulic brakes are installed one per wheel for excellent braking performance. Spring set hydraulic release parking brakes are installed on the non driven wheels for fail safe braking. Four hydraulic accumulators are installed to provide hydraulic pressure after an engine shutdown. Primary brake control is provided by the master control module. In the event of a master control module shutdown, a redundant brake controller takes over and operates the service and parking brakes from the third brake pedal channel. Braking system is by wire and includes redundancies to ensure the system is safe against any one failure. Six hydroelectric proportional solenoid valves are used for parking brake release and service brake actuation.

Steering System. Four independently controlled steering cylinders are mounted one per each wheel. Heavy duty tie rod ends are connected to each end of the steering cylinder. Redundant internal linear position transducers are installed in each cylinder and feed the cylinder position back to the steering safety computer. The steer by wire system is built to the stringent German TUV vehicle standard for steer by wire systems. The straddle carrier offers four steering modes; four wheel coordinated steering, two wheel (front) automotive steering, two wheel (rear) forklift steering, and four wheel parallel (crab) steering. The steering safety computer synchronizes all wheels during maneuvering and virtually eliminates tire scrub due to steering geometry errors.

Operator's Cabin. A center mounted sound and thermally insulated panoramic view operators cab is installed on vibration isolating mounts for exceptional visibility and comfort. A suspension seat with tilt steering wheel and joystick

control pods is mounted on a 180 degree rotatable base to enable the straddle carrier to be operated in either direction. The seat features adjustable arm rests, lumbar support tilt and fore and aft adjustment to provide a comfortable environment for the largest and smallest of operators. A thermostatically controlled heat and air conditioning system is installed with air handling ductwork and forced air defrost of front and rear windows. Two roof mounted windows are installed to provide the operator a view of overhead clearances and any overhead crane operations in the production area. An AM/FM/CD Stereo with four speakers and MP3 input is installed in the overhead panel. Also installed is a dome light, front and rear wipers including two speed plus intermittent operation.

Electrical System. A dual 24VDC electrical system is standard. Two independent sets of batteries are used for starting and house power requirements. A battery isolator provides charging to both sets of batteries as well as functions as a booster to the starting batteries during cranking. The straddle carrier features four corner mounted steered headlights with LED Brake and LED Marker Lights. Driving lights include high and low beams with integrated turn signals and flash to pass function on turn signal switch. Four way hazards are activated by a switch on the overhead panel and four corner mounted amber strobe lights are installed. Three load lights are installed to provide nighttime illumination of the load space. All lights are coordinated to seat position and back up lights come on automatically when reverse is selected. Both battery banks are used to power critical straddle carrier systems including the master controller, steering safety computer and redundant brake controller.

Enclosures: Rock guards and weather enclosure panels are installed on both lower frames. Hinged access panels enable ground level routine maintenance.

Control System. The straddle carrier is equipped with an advanced control system which monitors all critical straddle carrier functions. A 24 position indicator panel with ISO symbols provides visual alerts, additionally a panel mounted warning buzzer provides audible alarms for alert messages. J1939 communications are used to control nearly all machine functions. Plain text displays of out of specification parameters are displayed on the color LCD mounted in the overhead panel. Multiple display screens are provided to assist with troubleshooting and routine maintenance. Startup testing functions check the status and continuity of wiring connections and alert the operator if a problem is detected. Optionally available is an on board load weighing system which utilizing four load cells calculates the weight of the load being carried and

prevents the carrier from being overloaded. Also optionally available is a telematics package that provides GPS position tracking, broadcasting of active fault codes, load weights, dispatch instructions and remote troubleshooting / reprogramming capability.

Load Shoes. Load shoes are fabricated from abrasion resisting steel and are mounted on combination load and side roller bearing assemblies. Heavy rolled channel sections are used to fabricate the shoe guides for long life. Heavy duty leaf chain is used over roller sheave assemblies attached to the hydraulic lift cylinders to hoist the load. All hydraulic cylinders are interchangeable with like type to reduce spare parts inventory requirements.

Wheel Fenders. Heavy duty wheel fenders are fabricated from HSLA steel and feature internal reinforcement.

Other Design Features. The ST35 is designed for production mill duty and all components have been selected to meet or exceed expected engine life to overhaul. Unit is designed for 4 turn operation for 6,000 to 8,000 operating hours per year with the lowest possible operating cost per hour.

Fuel Capacity: 99 US Gallons, Number 2 Low Sulfur Diesel
Hydraulic Capacity: 110 US Gallons ECO Safe Biodegradable and Fire Resistant

Empty Vehicle Weight (dependant on frame size); 51,000 to 60,000 Pounds
Wheel Steering Angles; +48 Degrees, -48 Degrees
Max Operating Speed Fully Loaded; 25mph, 40km/hr (for higher speeds consult factory)
Braking Performance; Exceeds ISO3450 and ANSIB56.1
Standard Shoe Travel; 30 inches (36” Optional)
Lifting Speed Auto Mode; 13.5 ft/min, 11.1 seconds full lift at 30” Stroke Fully Loaded.
Standard Shoe Swing; 12 inches (extended shoe travel available)

Specifications Subject to Change Without Notice and Per Special Customer Application Requirements