



Consolidated Rig Works
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PUMPING UNITS



Skid Mounted Pumping Unit

1. This high pressure pumping system consists of a remanufactured 8v92-TA Detroit Diesel engine. Power from this engine is transferred to the triplex pump via an Allison 5 speed transmission. The triplex pump is a SPM type 600 Short. This pump is built with 4" plungers. The power skid contains all well fluid components. The triplex pump is a horizontal single acting triplex. The power end has welded steel alloy housing and the fluid end is made from a forged steel block. The pump incorporates hard surfaced plungers that are capable of pumping cement slurry, acid, water, diesel, solvents, drilling fluids and other corrosive and non-corrosive fluids.
2. This unit has a minimum of 500 BHP and is capable of operating in ambient temperature ranges of 32 degrees F to 113 degrees F without exceeding 205 degrees F radiator top tank temperature and without exceeding 180 degrees F pump oil temperature.
3. Physical dimensions of the skid: 24 ft. long x 8 ft. wide x 8 ft. high. This skid system is made of heavy duty steel longitudinal beams and cross members. The skid is equipped with heavy duty lifting eyes located inside of the frame at each corner of skids. These are sufficient to lift the skid using the lifting eyes. This skid is equipped with welded drip pans to contain any fluids that may leak from the engine, transmission or pump. There is an oil sump drain with a valve at each edge of the skid. This skid has a 100 US gallon fuel tank that is equipped with a vent fill cap and a drain.
4. Diesel Engine: Detroit Diesel 8v92-TA (turbocharged) is shock mounted onto the skid. This engine will transfer power to the triplex pump via an Allison 5 speed transmission and a Spicer driveline. The engine is equipped with all required monitoring devices, lube oil pump and distribution system, as well as:
 - a. Electronic throttle control and governor
 - b. Fuel filters, primary and secondary
 - c. Full flow engine oil filter
 - d. Oversized radiator and fan assembly with anti-static fan and belts
 - e. Exhaust manifold with flexible exhaust connection
 - f. Spark arresting muffler and rain cap blanketed for heat
 - g. Oil cooler mounted for cooling transmission oil
 - h. Engine filter brackets
 - i. Air compressor and air receiver system. Air dryer is installed.
 - j. Air starter
 - k. Heavy duty lighting system complete with 130 amp alternator and 2 heavy duty batteries in and enclosed battery box.



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5. **Cooling System:** The cooling system is capable of cooling the jacket water, transmission, and torque converter oil (in lockup), and down hole pump oil at sustained maximum horsepower output. Pumping at the maximum allowed fluid head pressure rating at 113 degrees F ambient temperature at 3,000 ft. altitude without exceeding Detroit Diesel and Allison's maximum allowable top jacket water temperature will not be exceeded. The maximum allowable converter oil temperature or without exceeding 180 degrees F down hole pump temperature is designed into the cooling design. The foregoing should be accomplished without exceeding the fan manufacture's maximum allowed rpm.
6. **Transmission:** An Allison transmission model HT 750 DRD power shift with a lock up clutch. Power shift operation will allow the operator to shift the transmission under load and at full speed. The transmission is equipped with a lock up clutch which engages at speed above 1300 rpm and allows the transmission to run as a mechanical transmission rather than the torque converter. Transmission fluid cooling is provided by an oil cooler located on the engine skid.
7. **Driveline:** Heavy duty Spicer "Wing Bearing Series" driveline with service free type SF universal joints assembly with heavy duty universal joint are installed between transmission and triplex pump. Driveline is equipped with a metal guard assembly for safety.
8. **Hydraulic System:**
 - a. A 60 gallon carbon steel hydraulic tank with pump inlet suction strainer, oil level sight glass, man way style access hatch, baffle protection and drainage with connection and valve is provided for oil storage and additional cooling.
 - b. The tank is equipped with a suction strainer and a return hydraulic filter is added to the unit for filtration of solid contaminants from the hydraulic fluid.
 - c. Hydraulic power is provided by a commercial gear type hydraulic pump driven off the 8V92-TA cam tower.
 - d. The pump drives a gear type hydraulic motor with anti-cavitation check valve to provide power to the centrifugal pump (4" x 3")
 - e. An air to oil type oil cooler is mounted for cooling the hydraulic fluid.
9. **High Pressure Pumping System:** The triplex pump model SPM type 600 Short with 4" hard surfaced plungers. The maximum input horsepower is rated at 600 bhp. The pump has forged steel fluid ends with removable suction and discharge covers, fabricated steel suction manifold (4"), threaded packing glands with removable stuffing box assemblies, spring loaded plunger packing, replaceable urethane valve disc, bronze packing followers, crankcase breather and dry sump.
10. **Centrifugal Pumps:** One (1) 4" x 3" x 11" centrifugal pump is used to boost slurry fluids to the triplex pump from a fluid holding tank and displacement tank. This pump will also have the capability to supply to the fluid holding tanks. Centrifugal pump brand is Mission Magnum. One (1) 2x3x8 centrifugal pump for displacement tank loading.
11. **Fluid Handling System:** Located above the triplex pump in the pump skid is a twenty (20) bbl., two 10 bbl. each, capacity displacement tanks. This tank is designed to eliminate sidewall pop out, which can affect fluid displacement. Also, included are calibrated level markets in barrels, dump valves, drain sump, overflow lines (3"), rock guards, full suction, return and loading piping manifold, etc. the tank manifold is equipped with sufficient Victaulic couplings as to allow complete disassembly of the piping.
12. **Controls and Instrumentation:** The unit control console is installed on a centrally located elevated walkway with access ladders on both sides with "no slip grips". The control console will include all controls required to operate the unit. This includes engine and transmission controls and gauges for operating and monitoring the engine and transmission. It also includes the necessary controls and gauges for operating and monitoring the hydraulic system.
13. **Unitization and Completion:** This unit is fully assembled, unitized and complete to the above technical specification. This unit will include the installation of all other electrical systems, pneumatic systems, hydraulic systems and other operating systems as to ensure a fully operations unit. All fluids are filled to the maximum recommended levels (except for those prohibited by law for transportation purposes). All necessary steel fittings, hoses, adapters, bolts and nuts are included. A steel tool box capable of storing 500 lbs. of tools. All labor necessary to complete this unit. All workmanship is of good quality and appearance.