



ZJ30 T (1000 HP) 10,000' RIG (REF#1909N)

- New, Never Used- Trailer mounted, double drum, 2 C15 Cat diesel engine 540 hp x 2 @ 2100 rpm, Allison transmission, 124' x 400,000# mast, 19'8" substructure.

1.1 Design reference and standard

- SY/T5609-1999 Types and basic specifications of drilling rig
- API Spec 4F 2nd edition Mast and substructure specification for workover / drilling rig
- API Spec Q1 6th edition Quality outline
- API Spec 8C 4th edition Drilling and production hoisting equipment
- API Spec 7K 3rd edition Drilling equipment specification
- API Spec 7 40th edition Rotary equipment specification
- API Spec 7F 7th edition Chain and sprocket specification
- SY5202-1991 Technical specifications for workover rig
- API Spec 9A 25th edition Wireline specification
- Quality control system: ISO9001
- As per HSE requirements

1.2 Specifications:

- Drilling depth 9800 ft ($\phi 4\text{-}1/2''$ DP)
- Max. static hook load 404,656 lbf
- Rated horsepower, engine 540hp x 2/2100rpm
- Clear height, mast 124'-8"
- Height, monkey board [above drill floor] 50'-6", 56'-5"
- Height, substructure 19'-8"
- Clear height under rotary beam 16'-1" above the steel mat
- Traveling system 5x6
- Towing truck (recommended) VOLVO FH12 6x4
- Overall dimensions in mobilization 81'-5"x10'-10"x14'-9" [including tractor truck]
- 72'-10"x10'-10"x14'-9" [excluding tractor truck]
- Driving system 8X4
- Trailer 4 axles
- Opening diameter, rotary table 27-1/2"
- Diameter, wirelines $\phi 1\ 1/8''$
- Max. speed speed limit 45km/h
- Total weight in mobilization 176,400 lbs
- Turing diameter 118'

1.3 Main components and specifications

1.3.1 Diesel engine

- ◎ CAT C15 diesel engine, featured with alarms for low oil pressure, high water temperature, high revolution, high oil temperature. Designed with electronic full range speed regulating device, even load, over load protection system and various indicating gauges. Muffler and spark arrestor are installed on air vent pipeline of engine. Noise within area of 5' in any direction is less than 85Db. Operation time totalizer is also provided. Model C 15 Horsepower 540 hp X 2/2100rpm Cylinder numbers and arrangement 6 in line

1.3.2 Transmission

- ◎ Allison transmission consists of hydraulic torque converter and planetary gearbox. When turbine speed exceeds certain value, the torque converter will be locked up automatically. In this case, the power will be delivered directly through planetary gearbox. The transmission is equipped with PTO and PTO port, originally imported main oil pump. The driller can shift gear manually with pneumatically controlled hydraulic gear shifter on driller's console. Transmission oil is cooled by heat exchanger via cooling water tank of diesel engine. Transmission has the function of down slope speed reducing and is equipped with oil level screw and checking ruler.
- ◎ Model: ALLISON S5610HR x 2
- ◎ Gear ratio:
- ◎ 1 2 3 4 5 R
- ◎ 4:1 2.684:1 2.013:1 1.351:1 1:1 5.12:1

1.3.4 Trailer

- ◎ Trailer is fabricated of especially reinforced beam with wide wheel tread and heavy duty axles.
- ◎ The diameter of the towing pin is 3 ½" [90#] and the load capacity of the saddle is 24t.
- ◎ Dimensions 60'-9" x 10'-8" x 10'-6"
- ◎ 72'-10" X 10'-8" X 10'-6"
- ◎ Axle base 51 3/16"+51 3/16"+ 51 3/16"
- ◎ Wheel tread 86"
- ◎ Departure angle 18.88°
- ◎ Min. ground clearance 13 3/8"



1.3.5 Compound Box

- ⦿ Compound box is equipment for high power input and output. It is used to combine power from two engines and deliver the power to deck equipment through one of the power output ports. If the double power is not needed, each one of engine is also able to supply power in order to avoid wasting of energy. It is characterized by simplified drive line, effective and reliable power transmission, high torque transmission, stable running and long service life without adjustment of center distance. Type gear compounding
- ⦿ Gear ratio to output end of rotary table 1:1.65

1.3.6 Right Angle Gear Box

- ⦿ Right angle gearbox mainly consists of input shaft, output shaft, spiral taper bull gear and pinion, output bearing seat, box, cradle, flange, sprocket and bearings. The box is made of casting mono block with compact structure. Spiral taper gear drive has advantages of stable drive and high power. Input and output shaft are made of premium alloy steel. Bearing have two types: double row tapered roller bearing and single row radial short cylindrical roller bearing; oil bath splashing lubrication with multi-stage seals is reliable.
- ⦿ Gear ratio: 1:1.57

1.3.7 Driving device for rotary table

- ⦿ It includes the following: chain driving device for lower part of rotary table and that for upper part of rotary table. Chain driving device for lower part of rotary table consists of ATD318H clutch, sprocket, box body, input and output shaft, bearing, output flange, etc. ATD118H clutch acts as brake for rotary table. Chain driving device for upper part of rotary table consists of sprocket, box body, input shaft, bearing, input flange, etc. On the box body there is an interface for sensor of torque of rotary table.

1.3.8 Drive System

- ⦿ After the engine power is transferred to compound transfer case via transmission, the power is divided into two parts. One part will be transferred to main drum via right angle gear box and sand drum; the other part will be transferred to the rotary table via rotary table driving device, propeller shaft. The driving chain size is as follows: Right angle gear box→Sandline drum 13/4" double chain Sandline drum→main drum 13/4"double chain
- ⦿ Elevated chain case →rotary table 2" double chain



1.3.9 Drawworks

- ⦿ Drawworks mainly consists of frame and guard, main drum and braking system, sand drum and braking system, air-controlled water-cooling disc type brake. Drum shaft is made of premium alloy steel. Brake rims are all mono block alloy steel. ATD-330H air thrust disc clutch for main drum. Brake rim of main drum is cooled by circulating water. The main drum is Lebus grooved, which ensures orderly arrangement and long service life of 1 1/8" wire line. Main brake is belt/drum type and auxiliary brake is EATON WCB324 type. An 280 cubic feet circulating water tank is installed on an independent skid c/w radiator water tank for cooling of brake rims and auxiliary disc brake. Clutches of drum and rotary table are axial ATD type. On the drum crown block saver is set to limit the movement of traveling block and avoid the collision between traveling block and crown block. Newly designed high strength structure is adapted to the fabrication of frame and guard with features of easy assembly and disassembly.
- ⦿ Dia., main drum: 25" with Lebus grooveing
- ⦿ Length, main drum: 41 9/16"
- ⦿ Dia. and width, brake rim: 50" X 10 1/2"
- ⦿ Model, clutch: ATD-330H
- ⦿ Cooling, brake rim: Circulating water
- ⦿ Capacity, circulating water tank: 280 cubic Feet

1.3.10 Mast system

- ⦿ The mast is made of rectangular tubing and its structure is "Π"-shaped, double section and telescoping. It can be used with a top drive. Its clear ground clearance is 124'-8", vertical distance from crown block beam to ground. It includes upper mast section, lower mast section, base, sway brace, crown block and racking board. Hydraulic cylinder controls the raising, lowering of mast and telescoping of upper mast section. Clear Height, mast: 124'-8"
- ⦿ Tilting angle: 3° complete with inclinometer
- ⦿ Max. Hook load: 382,175 lbf
- ⦿ Racking board capacity 4-1/2" DP, 9800 feet
- ⦿ 5" DP, 8200 feet
- ⦿ Racking board height: 50'-6", 56'-5"
- ⦿ Finger beam: adjustable, transverse
- ⦿ Max. Wind rate: 69 mph



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1.3.11 Standpipe

- ⦿ Bore size 4" [single standpipe]
- ⦿ Working pressure 5000 psi

1.3.12 Rotary hose

- ⦿ Bore size 4"
- ⦿ Working pressure 5000 psi
- ⦿ Length 62' -4"
- ⦿ Qty 1

1.3.13 Rotary system

- ⦿ Rotary system includes swivel, rotary table, etc.
- ⦿ ZP275 rotary table c/w 31/2"、 41/4"、 51/4" split Kelly bushing
- ⦿ Rotary table Model: ZP275
- ⦿ Max. Load: 1,011,640 lbf
- ⦿ Max. rpm: 300r/min
- ⦿ Max. opening dia.: $\Phi 27 \frac{1}{2}$ "
- ⦿ Rotary table clutch: Push disc ATD318
- ⦿ Swivel with air spinner
- ⦿ Model: XSL -225
- ⦿ Max. Static hook load: 500,000 lbf
- ⦿ Max. Working pressure: 5,000 psi
- ⦿ Connection thread: 65/8"REG LH
- ⦿ Gooseneck connection with rotary hose
- ⦿ Thread, pipe; 4"-8 teeth/in [API std 5b]
- ⦿ Length of rotary hose: 62'-4"
- ⦿ Max. Pressure: 5,000 psi
- ⦿ The swivel is equipped with spinner, which is used to makeup breakout. Air spinner is used to accomplish forward and reverse. The corresponding pipeline and valves should be added to air system and drillers console. The main air source should be provided to the customer.



1.3.14 Traveling Block

- ⦿ Type: Integral
- ⦿ Rated load: 382,175 lbf
- ⦿ Sheave No.: 5
- ⦿ Dia., wireline: $\Phi 1 \frac{1}{8}$ "

1.3.15 Substructure

- ⦿ The substructure is a conventional (non trailer type) parallelogram structure. It is equipped with walkways, guardrails, ladders, slide and ramp; c/w mouse hole and rat hole. The diameter of mouse hole is $\Phi 11 \frac{3}{4}$ " and the diameter of rat hole is $\Phi 10 \frac{1}{4}$ ". The plane of mouse hole and rat hole is parallel with the substructure. Square tubing is used for guardrail with insert-type construction. Anchors for tong lines and drill pipe tong lines, trolley for installing BOP. Sleeper for setback is dismountable structure and another setback is steel plate structure.
- ⦿ Height, substructure: 19'-8"
- ⦿ Clearance height: 16'-1"
- ⦿ Area of floor: 17'-8" x 24'-3"
- ⦿ Capacity, setback: 10,500 ft ($\Phi 4 \frac{1}{2}$ " DP)
- ⦿ 8,530 ft ($\Phi 5$ " DP)

1.3.16 Hydraulic System

- ⦿ Main hydraulic system is made up of oil reservoir, filter, gear oil pump, overflow valves, etc. to supply clean and high pressure hydraulic power. Main hydraulic system is used to control rig adjustment and wellhead hydraulic machines and tools. Rig adjustment includes leveling of carrier, raising, lowering, and telescoping of mast. Manual six valve bank is set at the rear of carrier. Well head hydraulic machines and tools include hydraulic winch, cathead cylinder and standby hydraulic fluid connection. Hydraulic winch is of pneumatic actuated hydraulic control with pneumatic control valve installed on driller console. Cathead cylinder is manually controlled with two valve bank installed at the bottom of the driller console. Key hydraulic components are imported.
- ⦿ Pressure: 2000 psi
- ⦿ Displacement, main oil pump: 44 gal/1800rpm
- ⦿ Hydraulic winch: 3t, 5t one for each
- ⦿ Tong cylinder: travel 63", 2sets



1.3.17 Air System

- ⦿ Air system includes air system for deck equipment operation and air system for carrier. Air system is made up of air compressor, pressure regulating valve, dryer, air receiver, filter, defroster etc. Compressed air is processed at multiple stages resulting in clean and dry air supply. Pneumatic valves for wellhead operation are centralized on the driller console for not only controls of engine startup, revolution and shutdown, gearing shifting of hydraulic transmission, clutch for drawworks, auxiliary brake and air release of crown saver, but also controls of clutch for rotary table and brake for anti reverse rotation, wellhead machines and tools, including hydraulic winches and air spider, and clutch for mud pump etc. Main control valves are imported. Driller console is made of stainless steel plated with double hinges vertical installation. It is highly adjustable to meet the different operation practices of drillers. Pneumatic control valves for rig carrier are centralized in the cab for controls of engine startup, RPM and shutdown, gear shifting of hydraulic transmission.
- ⦿ Rated displacement: 177 gal/1250rpm
- ⦿ Working pressure: 120-135 psi
- ⦿ Capacity, main air tank: 58 gal

1.3.18 Electrical System

- ⦿ Electrical system consists of electrical system for chassis and external lighting and power system. 12V DC power for chassis is from battery and SCR alternator driven by the engine. It is mainly
- ⦿ used for engine, instrument of torque converter, lighting for chassis, and signal devices. Power distribution cabinet with AC110V, 60Hz is equipped for the carrier. Three subcircuits (AC110V) are for lighting of mast, substructure and carrier and two subcircuits (460V) are for motor of water colling circulating system.
- ⦿ e) HPU YZ-120, rated WP 2400 psi, rated flow 32 gpm,
- ⦿ effective volume 155 gal, water cooling. 1 pc

1.4 Documents [English]

- ⦿ 1). Operation and maintenance manual 3 sets
- ⦿ 2). Documents for engine and transmission 1 sets
- ⦿ 3). Certificates 1 set
- ⦿ 4). Operation manuals for rotary table, traveling hook, swivel, WCB324 auxiliary brake, and hydraulic winch 3 sets
- ⦿ 5). Copies of certificates of main purchased parts 1 set
- ⦿ 6). Packing list 2copies
- ⦿ 7). Copies API certificates and ISO9001 certificates 1 copy

1.5 One year consumable parts: 1 set

1.6 Tools supplied with rig 1 set

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