4” HORSESHOE DYNAMOMETER TRANSDUCER DATA SHEET

The 4” horseshoe dynamometer transducer accurately measures polished rod load using 12 strain gauges, mounted on three supporting members. Off loading or side loading due to the carrier bar being tilted does not affect the accuracy of the load measurement.

Features

- Installed between pumping unit carrier bar and permanent polished rod clamp.
- Accurately measures polished rod load and position.
- Does not require routine maintenance.
- For use with the Well Analyzer.
- Data from device processed by Well Analyzer software TWM.

Specifications

- Includes built-in accelerometer
- 1.5” throat
- Rated to 30,000 lbs

Additional Product Information

The data collected by the 4” Horseshoe Transducer is processed by the Well Analyzer software to obtain a surface dynamometer and pump cards. The loads and horsepower requirements of the surface dynamometer card and the pump card are both shown in the software analysis. A traveling valve and standing valve test can be performed. The standing valve test measures the polished rod load when the rods are supported by the liquid in the tubing. A comparison of the measured load to the calculated buoyant rod weight is an excellent check that the well’s rod data are entered correctly.

The traveling valve and standing valve tests allow the calculation of pump intake pressure, pump leakage, traveling valve and plunger performance and standing valve leakage performance. Gearbox loading is calculated by software using the polished rod load and position data. The counterweight moment must be calculated using the known properties of the cranks, counterweights and counterweight positions or the counterweight moment can be determined by measurement of the counter balance effect using the accurate 4” horseshoe transducer. Gearbox loadings and a permissible load diagram are calculated and displayed.

The 4” horseshoe transducer also includes an accelerometer. Acceleration data is obtained using the same cable through which load measurements are obtained. An external string box or position transducer is not required since the small accelerometer is built into the 4” horseshoe transducer. The accelerometer is a solid-state device and does not require routine maintenance, as does the string type potentiometer. The acceleration data is integrated twice in the software to determine polished rod position as load measurements are obtained.

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Calibration

The 4” horseshoe transducer was originally calibrated at Echometer Company’s manufacturing facility. The factory calibrated zero offset coefficient is C1. The span is recorded in C2. C6 is the factory calibrated accelerometer sensitivity coefficient. C1 and C6 can be recalibrated in the field using software instructions. This improves the accuracy of the 4” horseshoe transducer due to temperature changes and unintentional overloading of the horseshoe transducer due to sticking rods, poor pumping unit brake operation or other inadvertent shock loadings.

Installation

The 4” horseshoe transducer is installed between the pumping unit carrier bar and the permanent polished rod clamp. To install the 4” horseshoe transducer a temporary polished rod clamp is positioned on the polished rod about 4 inches above the stuffing box while the polished rod is at the bottom of the stroke. A temporary knock-off block is located on the stuffing box as the polished rod with the temporarily installed clamp is on the down stroke. Also on the down stroke, the motor is turned off. The momentum of the system causes the polished rod to continue downward until the temporarily installed polished rod clamp comes in contact with the knock-off assembly. The pumping unit brake is set when the polished rod is at the bottom of the stroke. This causes the permanently installed polished rod clamp that normally rests on the carrier bar to be several inches above the carrier bar. The 4” O.D. transducer is 3” high, and it is positioned into the free space between the carrier bar and the permanent polished rod clamp.

The pumping unit brake is released causing the load to be transferred from the knock-off block to the carrier bar. Then the knock-off block is removed and the well is started again. Dynamometer tests can be performed after the well has stabilized or as desired.

Wellsite Optimization Services

Senior Tech (now Hamdon Energy Solutions) provides oil and gas well optimization services that both enhance and sustain well efficiency and production. With effective optimization solutions and a mobile service fleet, SeniorTech (now Hamdon Energy Solutions) offers professional expertise and a diverse selection of optimization equipment across Canada and internationally.

Service areas include:

- Production Optimization
- Regulatory Compliance
- Training
- Equipment Repair and Maintenance

Senior Tech (now Hamdon Energy Solutions) is an authorized Echometer distributor in Canada and internationally, providing equipment sales, rentals, training and service. Echometer’s Well Analyzer equipment is used to determine well productivity, reservoir pressure, overall efficiency, equipment loading and well performance, which are calculated based on a combination of measurements of surface pressure, acoustic liquid level, dynamometer, power and pressure transient response.

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