Dynamometer DYN 17

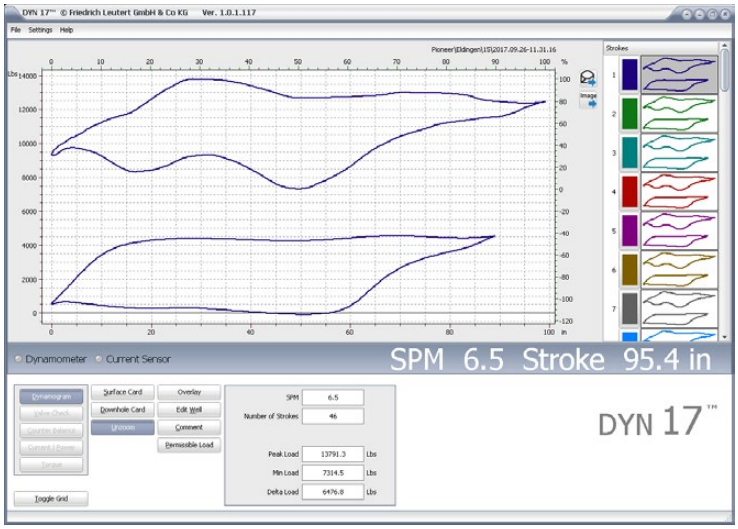
Artificial Lift

The Dynamometer DYN 17 helps to increase production in sucker rod pumped wells. Dyno cards can be recorded during the pumping cycle, without the need to stop the pump or to change the plunger setting-depth.

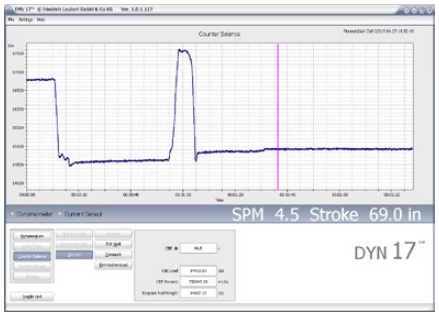
How does the Leutert dynamometer work?

The Leutert Dynamometer DYN 17 records the load on the polished rod of sucker rod pumped wells. A position transducer measures the travel of the polished rod versus time. This transducer will travel up and down with the DYN 17 as the pumping unit moves through each stroke cycle. Both signals, load and position, will be sent to a laptop computer via bluetooth. Put into relation the data set provides accurate information about pump efficiency and production that may be expected from it.

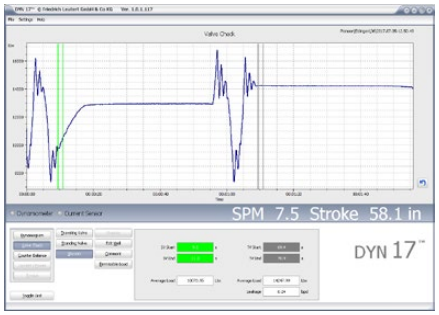
A powerful windows based software will calculate downhole cards at site and in real time. Counterbalance test and standing or traveling valves checks may also be performed using the DYN 17.



DYN 17 software: downhole card



DYN 17 software: counter balance



DYN 17 software: valve check

Why use dynamometers?

The ability to recognize the onset of pump failures, such as plunger or barrel wear and worn or sticking valves, allows the operator to take action prior to a production drop becoming apparent. If production drops, a dynamometer log will provide evidence quickly to diagnose the fault. Regular dynamometer logging will therefore reduce expensive servicing time and costly loss of production and give the following principal advantages:

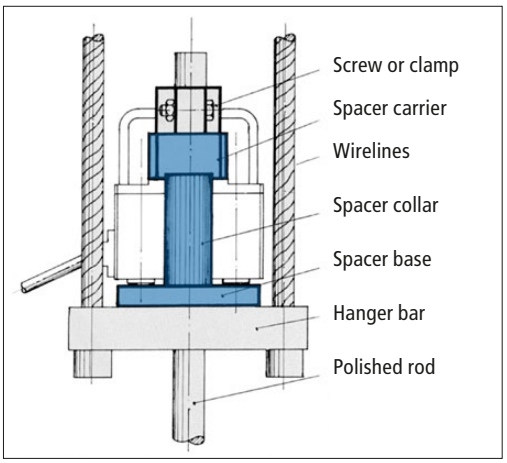
- It provides a permanent record of pump efficiency.
- It will reveal paraffin accumulation, damage to tubing and friction between tubing and sucker rod string or stuffing box and polished rod. It will furnish data on which to base calculations of the depth of sucker rod failures. Leaking valves, tubing or pump barrel can be detected easily.
- A comparative study of dynamometer diagrams will indicate various changes of reservoir conditions such as gas or water encroachment. Regular dynamometer logging, without interruption of the pump, has the added advantage that changes in fluid level can be recognized.

Why is a known zero offset important?

If the pumping unit is down it is important to know the true load that acts on the unit before restart. Software based theoretical calculations of load are insufficient to give advice to the operator. E. g. the true load may already be above the permissible structural load due to stuck rods. Restarting the unit based on theoretically calculated loads will cause serious damage to the unit. While competitive dynos are capable of recording differential loads only, operators using the DYN 17 know the zero base line and measure the actual load acting on the unit. This is achieved as the polished rod load acts on two jacks built into the DYN 17. An internal hydraulic pressure is generated and recorded by a pressure transducer. Before jack up the internal hydraulic pressure is zero.

Never stop the pump!

Dynamometer logging only achieves maximum significance, if the instrument can be fitted quickly and without interruption of the pumping process or change of the plunger setting-depth. In contrast to competitive dynamometers in the market, the wireless DYN 17 fits these basic requirements ideally as there is no need to stop the pump jack to install the dyno. It may be fitted to the traveling polished rod and register actual cyclic fluctuations of pump loading within minutes without disturbance of sub surface conditions. Therefore each pumping unit to be logged must be equipped with a set of spacers (blue marked) fitted to the polished rod above the hanger bar between the two wire lines. Once fitted, the attachment gear remains as a permanent fixture to the pump and provides the unique advantage to instantly check the pump with the Leutert DYN 17.



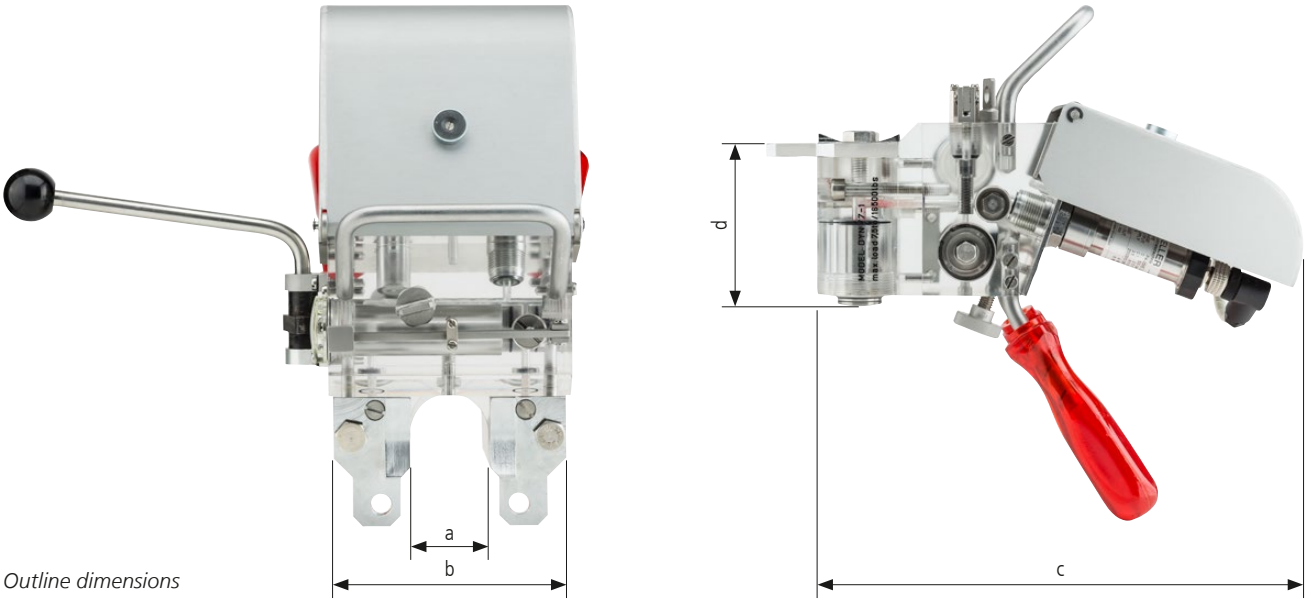
Installation of the spacers

Min. distance between the wirelines	
120 mm (4 3/4")	DYN 17.0
140 mm (5 1/2")	DYN 17.1
190 mm (7 1/2")	DYN 17.2
150 mm (6")	DYN 17.3

Features of the DYN 17

- The zero offset is known.
- The plunger setting depth remains unchanged to the normal operation.
- Subsurface conditions remain unchanged.
- Load transducer and the displacement transducer in one compact system.
- No cable is required for data transmission
- Optional Amp Clamp available to measure motor current
- Well analysis with the DYN 17 may be supplemented with sonoecho™ fluid level recorder.

Polished rod diameter	Max. load			Dynamometer Type	Size of spacers
	kN	tons	lbs		
1 1/8"	45	4.5	10,000	DYN 17.0	DYA 76.1
1 1/8"	75	7.5	16,500	DYN 17.1	DYA 76.2
1 1/8"	250	25.0	50,000	DYN 17.3	Pioneer spacers
1 1/4"	45	4.5	10,000	DYN 17.0	DYA 76.3
1 1/4"	75	7.5	16,500	DYN 17.1	DYA 76.4
1 1/4"	140	14.0	31,000	DYN 17.2	DYA 76.5
1 1/4"	250	25.0	50,000	DYN 17.3	Pioneer spacers
1 1/2"	140	14.0	31,000	DYN 17.2	DYA 76.7
1 1/2"	250	25.0	50,000	DYN 17.3	Pioneer spacers



Outline dimensions

	DYN 17.0	DYN 17.1	DYN 17.2	DYN 17.3
Dimensions				
• a	115 mm (4.527")	135 mm (5.315")	184 mm (7.244")	184 mm (7.244")
• b	45 mm (1.772")	45 mm (1.772")	52 mm (2.047")	52 mm (2.047")
• c	275 mm (10.827")	275 mm (10.827")	291 mm (11.457")	291 mm (11.457")
• d	92 mm (3.622")	95 mm (3.740")	110 mm (4.331")	110 mm (4.331")
Weight				
• String pod transducer	7.0 kg (15.5 lbs)	7.2 kg (15.9 lbs)	9.1 kg (20.0 lbs)	9.1 kg (20.0 lbs)
• Accelerometer	5.7 kg (12.5 lbs)	5.9 kg (13.0 lbs)	6.8 kg (15.0 lbs)	6.8 kg (15.0 lbs)
Max. stroke				
• String pod transducer	6.0 m (236")			
• Accelerometer	no restriction			
Power supply	rechargeable battery, wireless charge			
Operating temperature	-20 to 60°C (-4 to 140°F)			
Continuous operation	up to 10 days			
Memory capacity	unlimited			
Certifications	ATEX, CE			