



***PERFORATION
WITHOUT EXPLOSIVES
(hydro-mechanical connectivity system)***

We are presenting for your consideration the innovative technology of soft well drilling for oil and gas industry with hydro-mechanical tool application. Our company is a designer and copyright holder of the cutting-edge hydro-mechanical perforation technology. We obtained various patents for the tool itself and its parts.



Piercing hydro-mechanical perforation is a part of second method formation perforation. The working method is the usage of hydraulic principles. The tool – is a hydro-mechanical device which working component consists of two sharp blades and four jet nozzles.

The tool is dropped into the well with the production pipe or coiltubing with flexible pipe platforms. Along with the tool you can also dip the pump by jet, packer, contender with manometer / thermometer autonomous, well conditioner.

Tool usage allows you to obtain the following results:

1. Maximum usage of formation potential;
2. Extended operation of the object without water cut increase;
3. Long repair periods.



OPENING OF PRODUCING INTERVALS

Connection of intervals and opening of new producing zones or reopening of opened zones for production or injection of fluids.

MAKING JETTING INTO THE FORMATION

Perforating with high pressure jetting the producing formation, and cemented zone generating the open zones to production and/or injection.

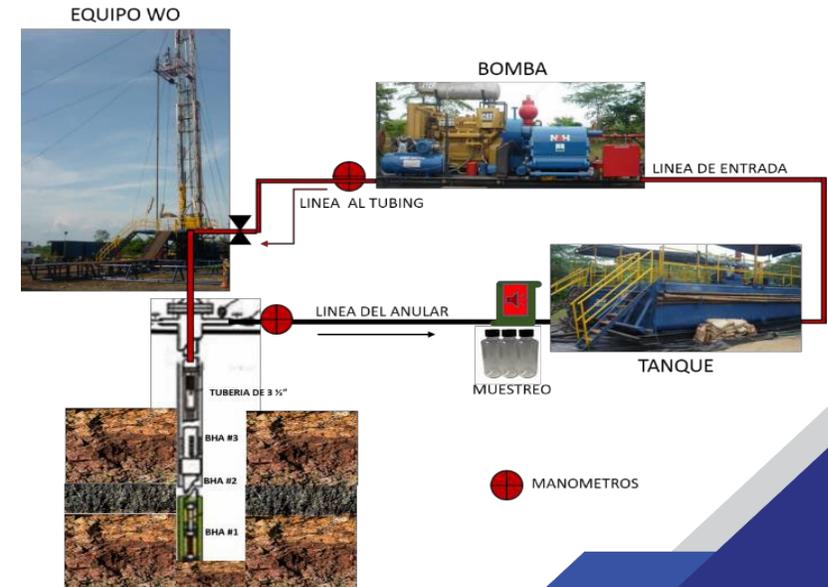
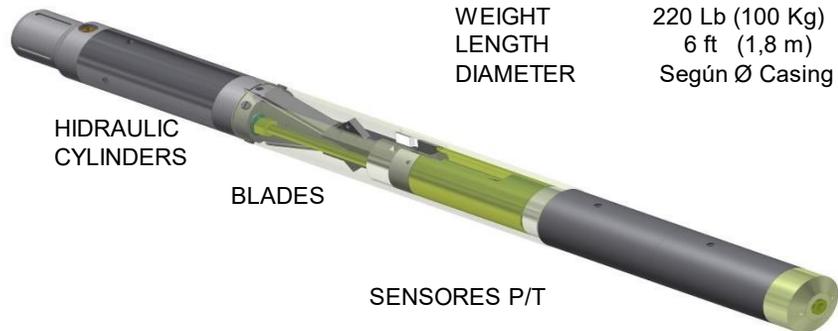
PENETRATE THE DAMAGE ZONE (CRUSHED ZONE) OF THE FORMATION

Penetration of crushed zone after the cased and cemented zone generating better conditions and exposure of the reservoir for fluids production, depending of its characteristics.

INCREASE OF THE FLOW AREA

Increase of flow area of cased hole for light entrance of fluids from/to the reservoir

- RIG SERVICE – COILED TUBING (2 " OD)
- DRILL PIPE OR PRODUCTION PIPE
- INJECTION PUMP- 3000 PSI & 3 BPM (126 GPM)
- WORKING FLUID-WATER, BRINE, CRUDE, OTHER HYDRO-MECHANICAL PERFORATOR
- SENSORES DE FONDO – PRES / TEMP (optional)



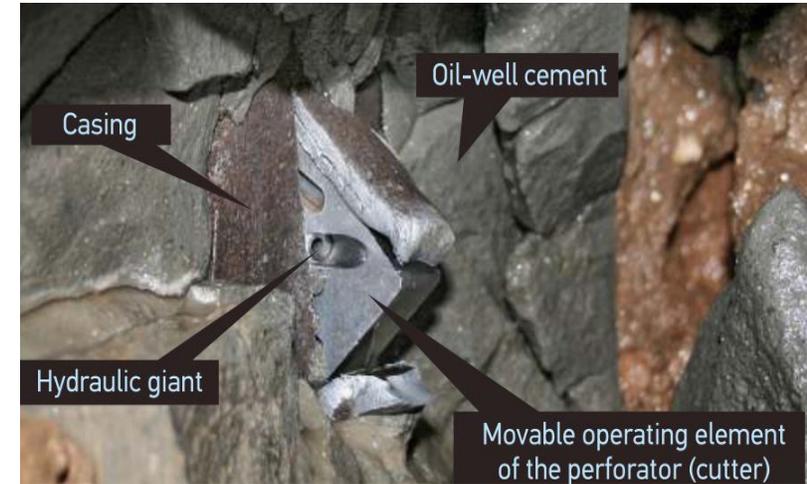
CASING PENETRATION

The hydro-mechanical device activates the blades that mechanically cut the casing.

JETTING OPERATION INTO THE CEMENTED ZONE AND FORMATION

Holding the pressure for a certain time, the cemented area is removed and the formation is penetrated with the fluid pressure.

By raising the working fluid pressure (filling fluid, crude oil, etc.) in the production pipe up to 170 atmospheres (2500 psi), with the assistance of the pumping unit (triplex pump), drilling of the production pipe. Maintaining the same working fluid pressure, hydraulic treatment of the formation (cavern erosion in four projections) is done by means of hydro-monitors located on the blades. If necessary, it can be carried out hydro-monitor treatment of formation with composition acid or with the application of active surface substances. Crude oil also can be used in fluid quality.





7" CASING SECTION



FIELD TEST JETS



CASING OPENING WITH BLADE



PENETRATE THE COVERING MECHANICALLY

It can be used in Casing Grade H – J – K – L – N – D – K - E including the Grades P-110 and Q-125

Available for Casing diameter of :

7" 5 ½" 4 ½" 4"

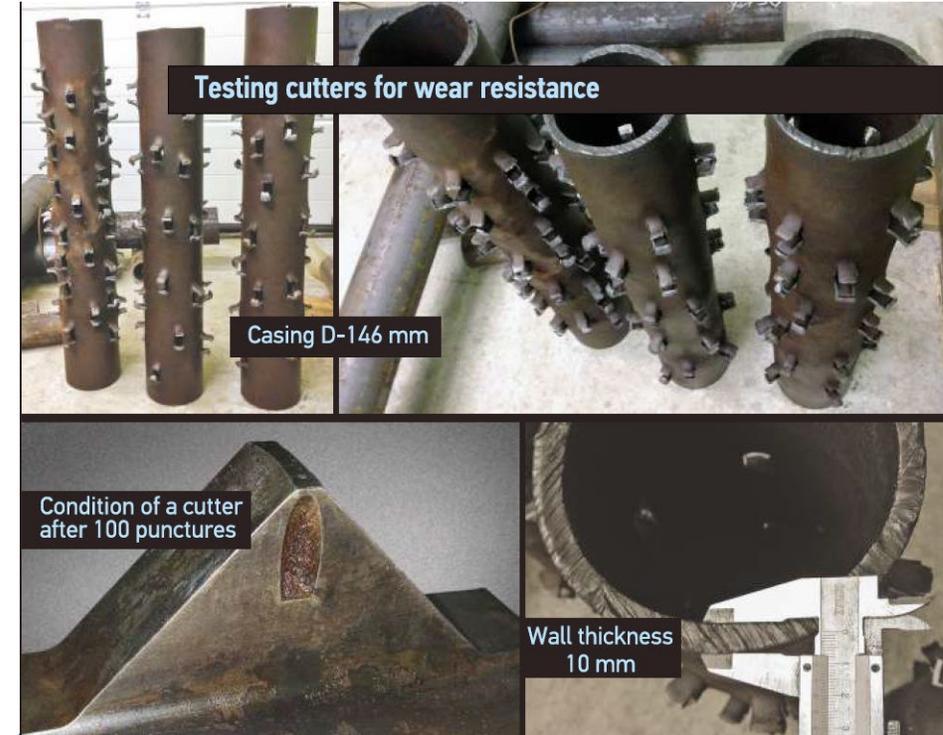
Can be projected and fabricated perforator for any type of casing diameter.

DURATION OF BLADES

You can make openings up to 400 ft during one operation

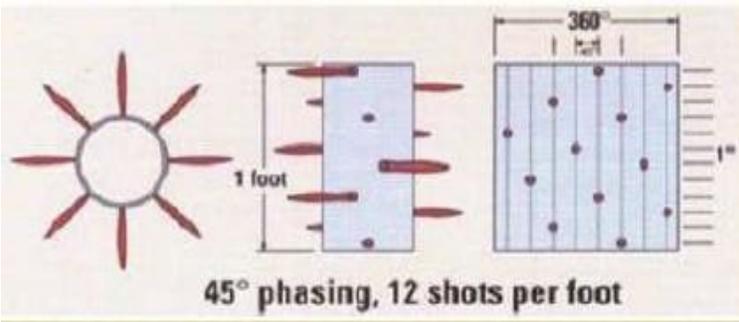
HSEQ:

- ✓ DUE TO NOT USE OF EXPLOSIVES :
- ✓ ITS OPERATION IS SAFE
- ✓ DOES NOT REQUIRE PERMITS FOR HANDLE OF EXPLOSIVES
- ✓ DOES NOT REQUIRE SPECIAL TRANSPORT



TCP 12 TPP

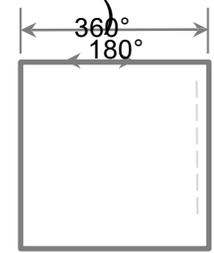
OPEN AREA Total = 1,33 in²



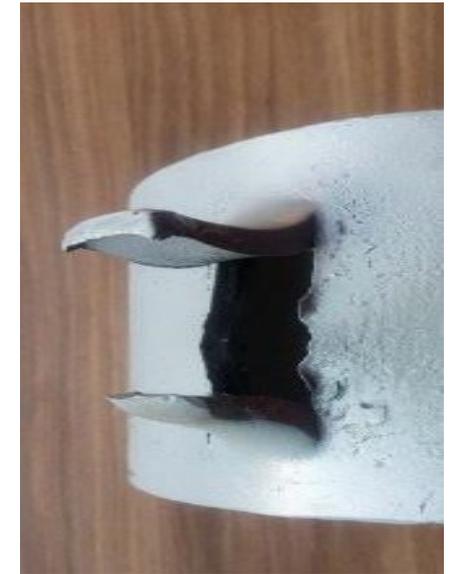
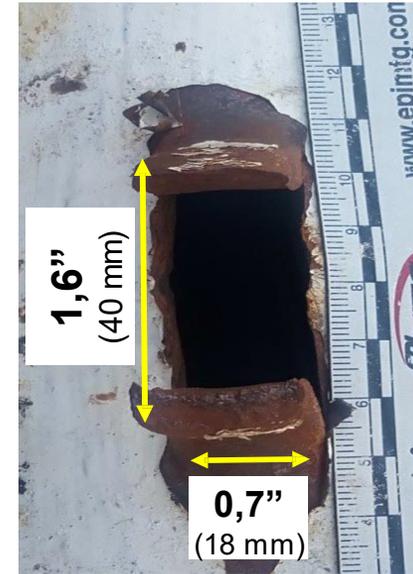
Ø 3/8" = 0,375"
9,525 mm

HIDRO-MECANICAL
PUNCHING PERFORATION
OPEN AREA Total = 2,20 in²

(+65%)

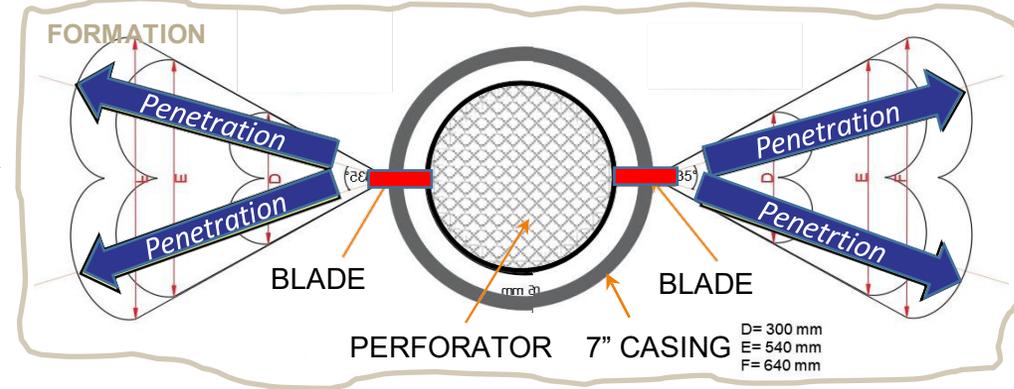
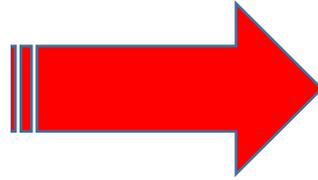
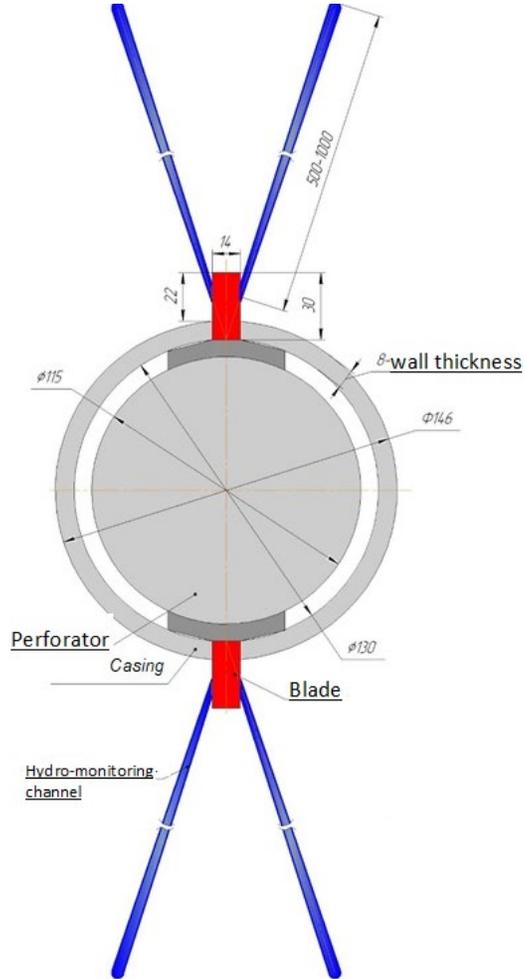


0,70" x 1,60"
18 x 40 mm

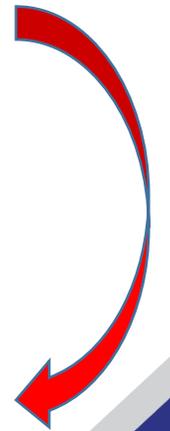
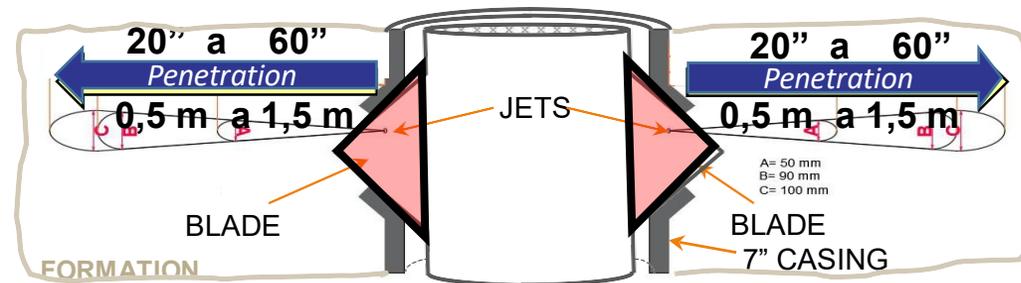


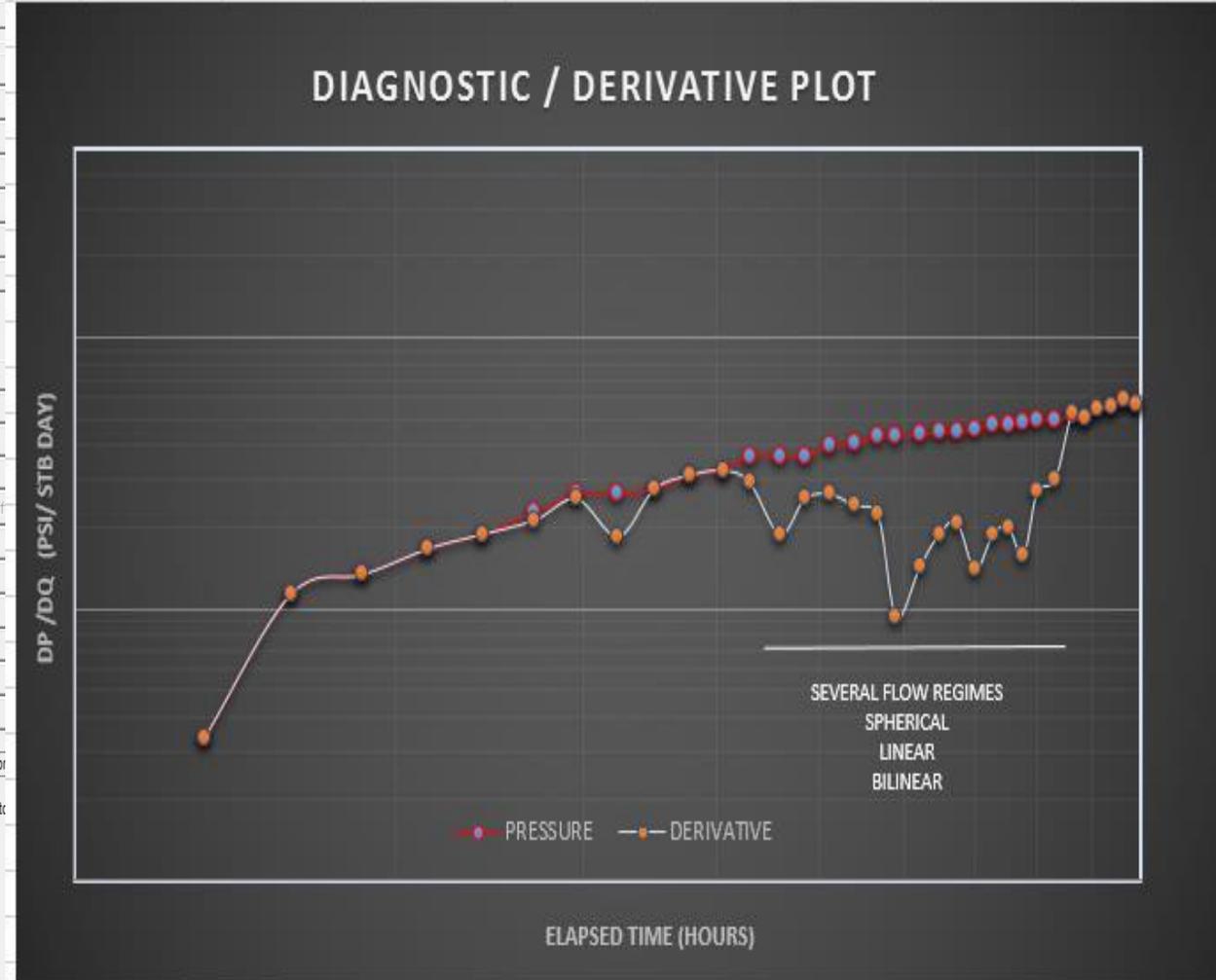
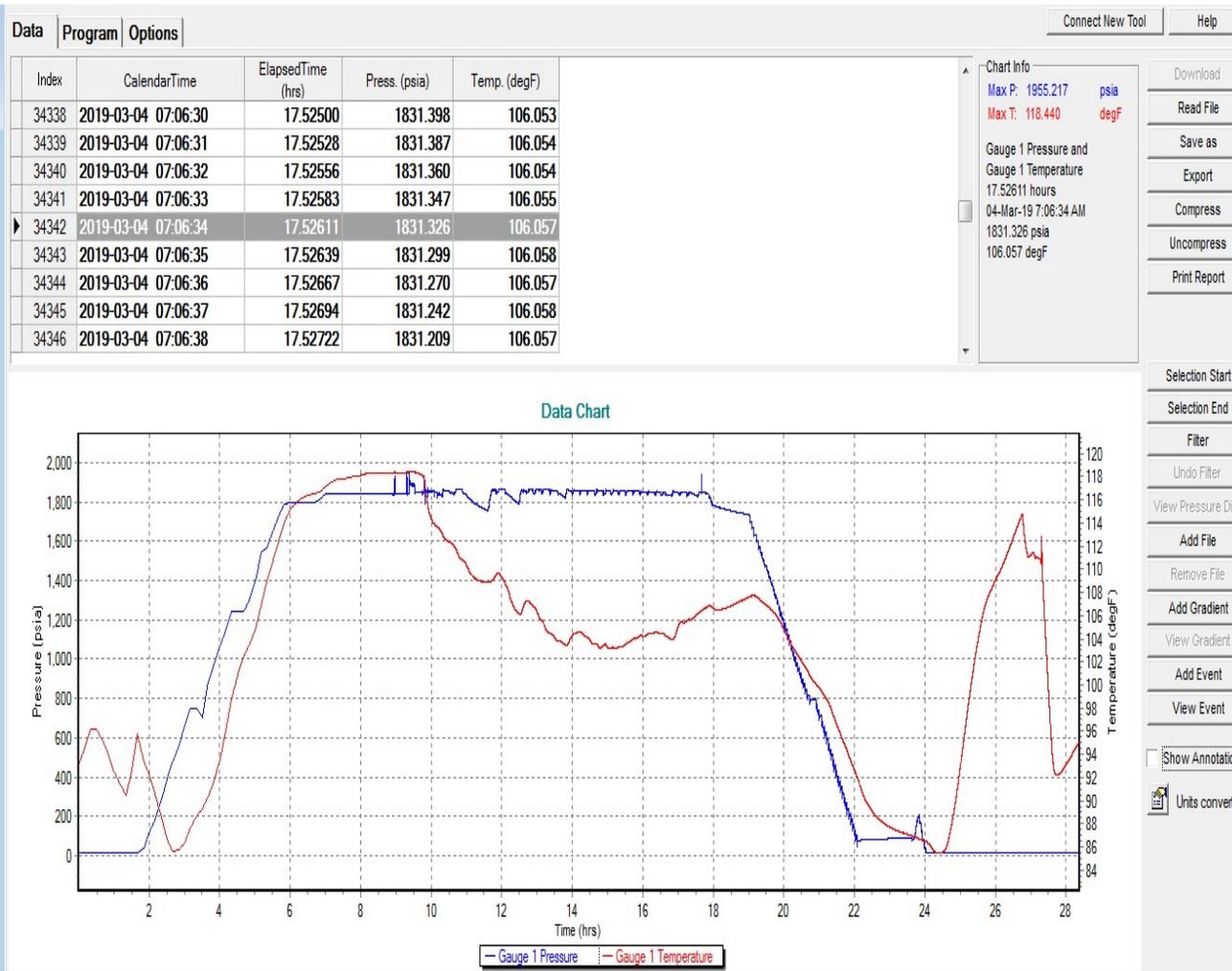
Fluid diagram

FLOOR VIEW



SIDE VIEW





Index	CalendarTime	ElapsedTime (hrs)	Press. (psia)	Temp. (degF)
25874	2019-03-04 04:45:26	15.17389	1856.162	103.230
25875	2019-03-04 04:45:27	15.17417	1856.006	103.232
25876	2019-03-04 04:45:28	15.17444	1855.987	103.229
25877	2019-03-04 04:45:29	15.17472	1856.103	103.227
25878	2019-03-04 04:45:30	15.17500	1856.052	103.229
25879	2019-03-04 04:45:31	15.17528	1856.041	103.228
25880	2019-03-04 04:45:32	15.17556	1856.143	103.227
25881	2019-03-04 04:45:33	15.17583	1855.990	103.228
25882	2019-03-04 04:45:34	15.17611	1856.180	103.230

Chart Info
 Max P: 1955.217 psia
 Max T: 118.440 degF
 Gauge 1 Pressure and Gauge 1 Temperature
 15.17500 hours
 04-Mar-19 4:45:30 AM
 1856.052 psia
 103.229 degF

- Download
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- Selection Start
- Selection End
- Filter
- Undo Filter
- View Pressure Diff.
- Add File
- Remove File
- Add Gradient
- View Gradient
- Add Event
- View Event
- Show Annotations
- Units convertor

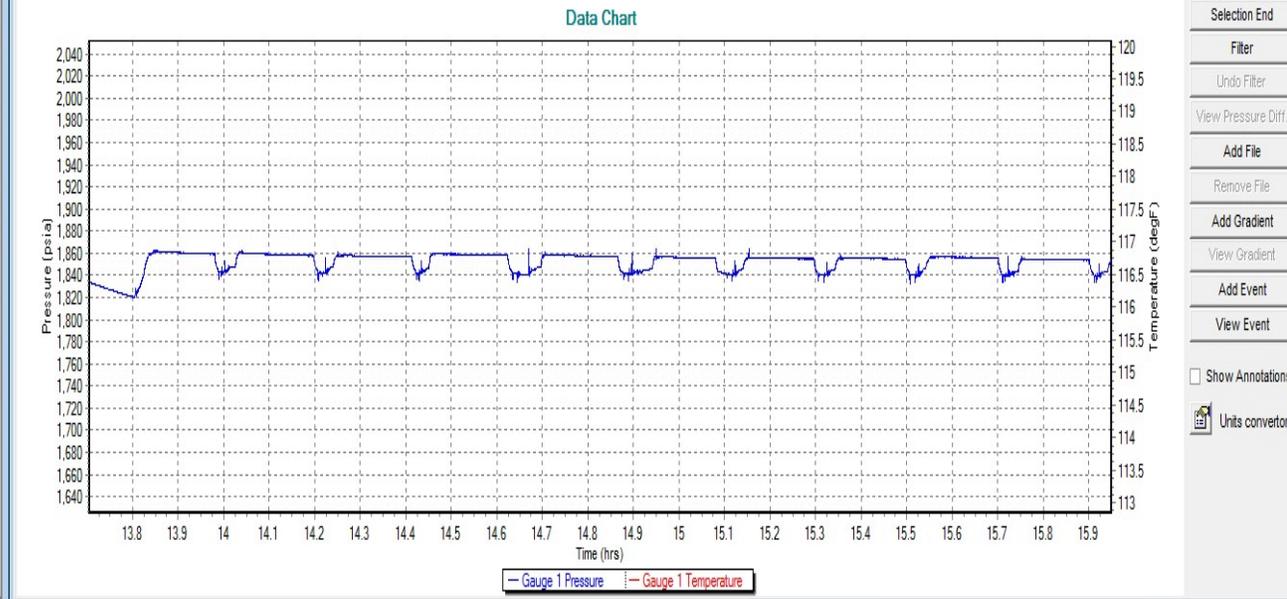


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28663	2019-03-04 05:31:55	15.94861	1853.446	104.273
28664	2019-03-04 05:31:56	15.94889	1853.243	104.278
28665	2019-03-04 05:31:57	15.94917	1853.467	104.273
28666	2019-03-04 05:31:58	15.94944	1854.244	104.276
28667	2019-03-04 05:31:59	15.94972	1853.548	104.273
28668	2019-03-04 05:32:00	15.95000	1852.908	104.270
28669	2019-03-04 05:32:01	15.95028	1853.865	104.278
28670	2019-03-04 05:32:02	15.95056	1853.304	104.274
28671	2019-03-04 05:32:03	15.95083	1852.106	104.277

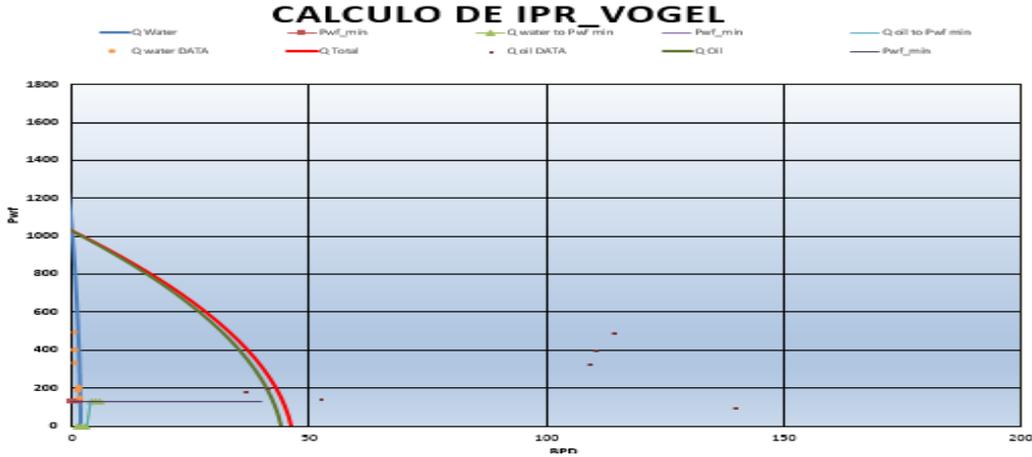
Chart Info
 Max P: 1955.217 psia
 Max T: 118.440 degF
 Gauge 1 Pressure and Gauge 1 Temperature
 15.94972 hours
 04-Mar-19 5:31:59 AM
 1853.548 psia
 104.273 degF

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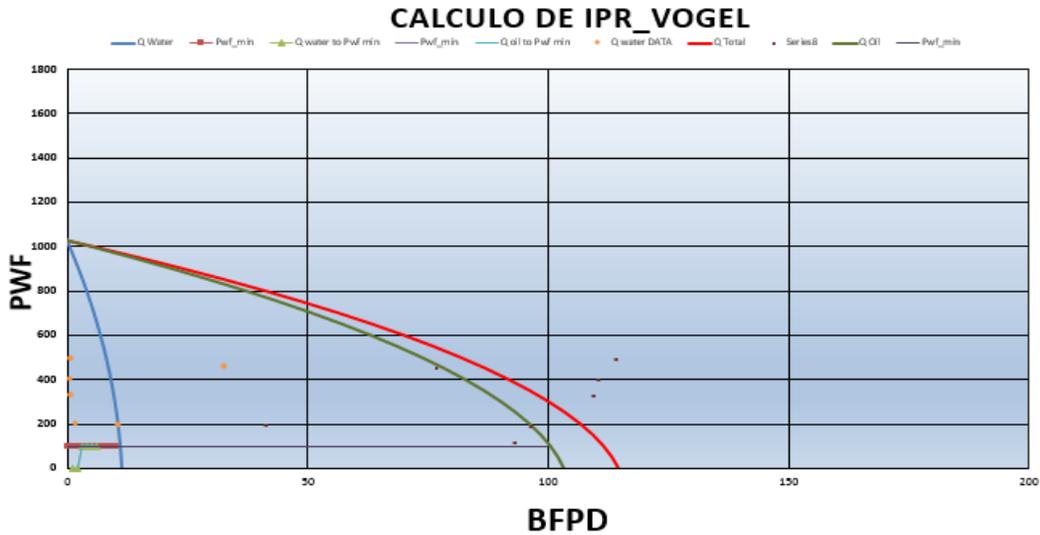
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- Units convertor



BEFORE



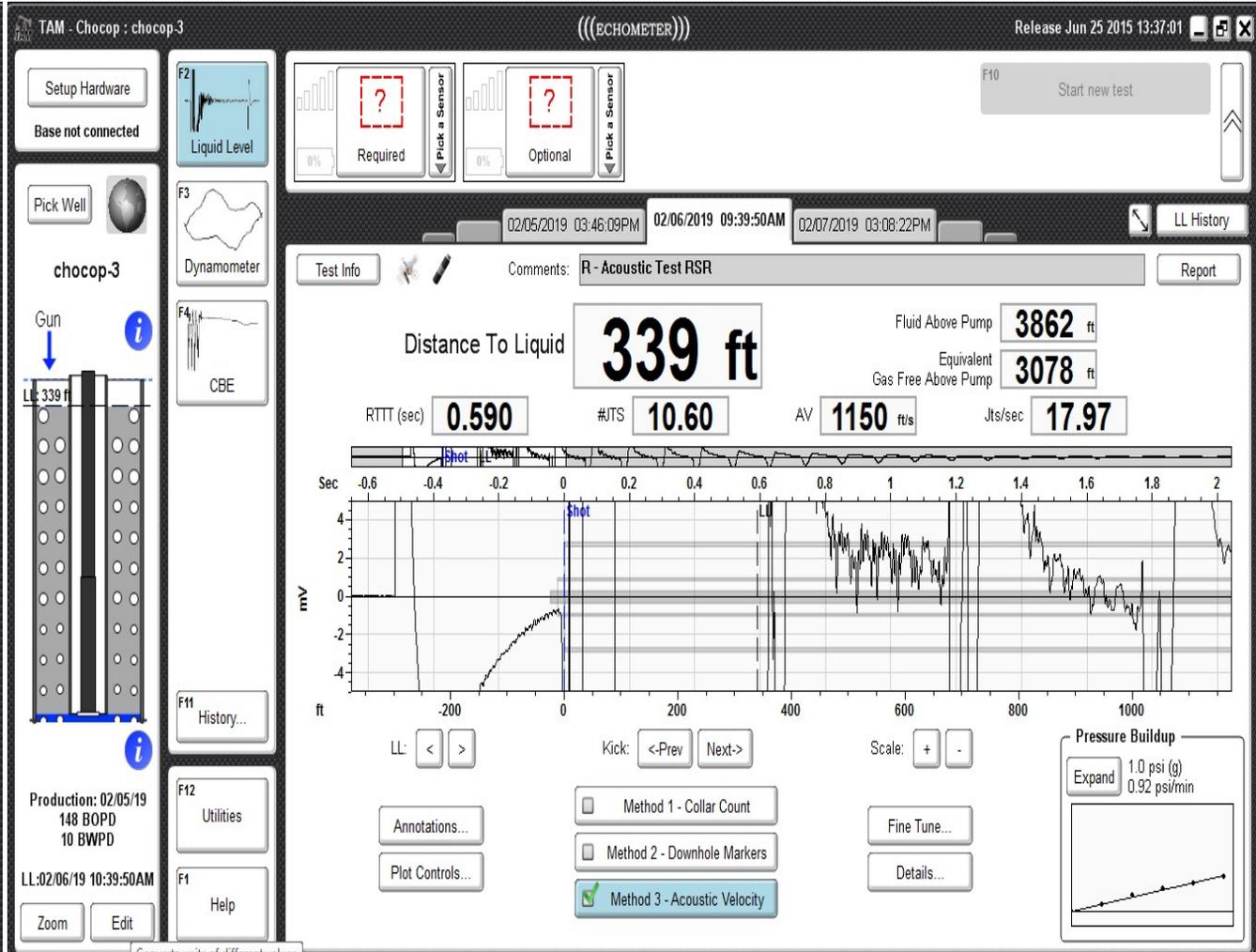
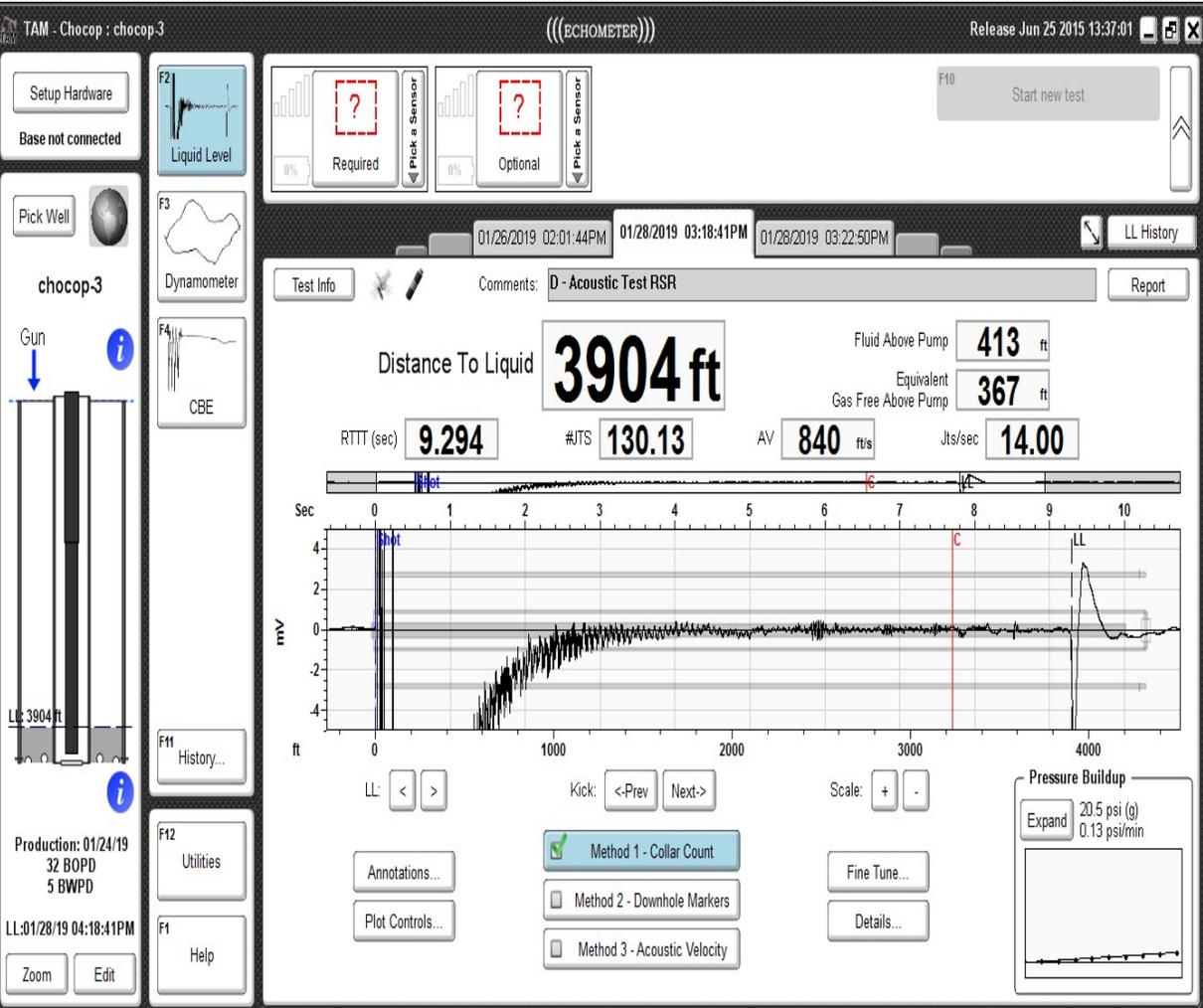
AFTER



FORMACIÓN:
 DEPTH:
 CASING:
 HEAVY OIL:
 LIFTING: FT
 PERFOREATED:

COBAN (LIMESTONES)
 4.200 ft (1.280 m)
 7"
 13 °API
 MECANICAL PUMPING
 30 ft

	BOPD	DISTANCE TO LIQUID
BEFORE	32	3.904 ft
AFTER	148	339 ft



Converts units of different values.

Advantages of hydro-mechanical perforation

-  do not generate CO2
-  the cement ring outside drilling interval is not damaged
-  do not break the geometry, strength and stability of the column
-  punching occurs immediately when working fluid pressure rises
-  one of the best and gentle methods of opening and reopening
-  great resource of blades-up to 500 punctures (1000 holes with bilateral perforator)



450 POZOS
400 PRODUCTORES
50 INYECTORES

EFFECTIVIDAD 100%

REDUCCION DEL
40% DE COSTOS EN
DISPAROS

300 POZOS
PRODUCTORES

INCREMENTO DE
PRODUCCION

MINIMIZACION
DEL TIEMPO
OPERATIVO

210 POZOS
PRODUCTORES

INYECCION DE
QUIMICOS

REDUCCION DE
COSTOS
OPERATIVOS

11 POZOS
9 PRODUCTORES
2 INYECTORES

INCREMENTO DE
PRODUCCION

OPTIMIZACION
EN POZOS DE 5 ½"

2 POZOS
PRODUCTORES

INCREMENTO DE
PRODUCCION

1 POZO
INYECTOR

INYECCION DE
QUIMICOS

REDUCCION DE
COSTOS
OPERATIVOS

Thank you for your attention!

