



Drilling Fluids, Inc.

TECHNICAL SERVICES NEWSLETTER

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QUINTUPLEX

**QUINTUPLEX MUD PUMP MORE EFFICIENTLY
CONVERTS INPUT HORSEPOWER TO
HYDRAULIC HORSEPOWER**

When I began as a roughneck in California I thought most rigs had duplex pumps. These pumps operate at a slow rate of strokes per minute and each cylinder pumps in both directions. They are self priming and require no external power other than the power to drive the pistons in and out.

We had a little backup pump that was a triplex. This pump was too small for drilling but would keep the mud moving while we repaired the big pump. Like all triplex pumps in the oilfield it had a charge pump. This centrifugal pump forced mud into the cylinders. Also, like all triplex pumps, it only pumped on the outgoing stroke.

QUINTUPLEX
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The toughest question to answer is "Why?" We can accept that there is no reason for the rain that ruins a picnic but we search for reasons when fate strikes down our loved ones.

<http://caringbridge.org/visit/samuelphilips>

WHAT DO YOU WANT IT TO BE?

1. The Mf is always: a) an indicator if CO₂, b) at least 1.0, c) higher than the Pf, d) measured in Oil Based Mud.
2. The filter press result is reported as: a) Filtrate b) Fluid Loss, c) Water Loss, d) two times the amount of liquid collected in 30 minutes.
3. 25 bbls of water added to 250 bbls of mud is: a) too much, b) less than one ppb, c) more than one ppb, d) too little.

ANSWERS ON PAGE 4

CELL PHONE WHILE DRIVING

July 1, 2008

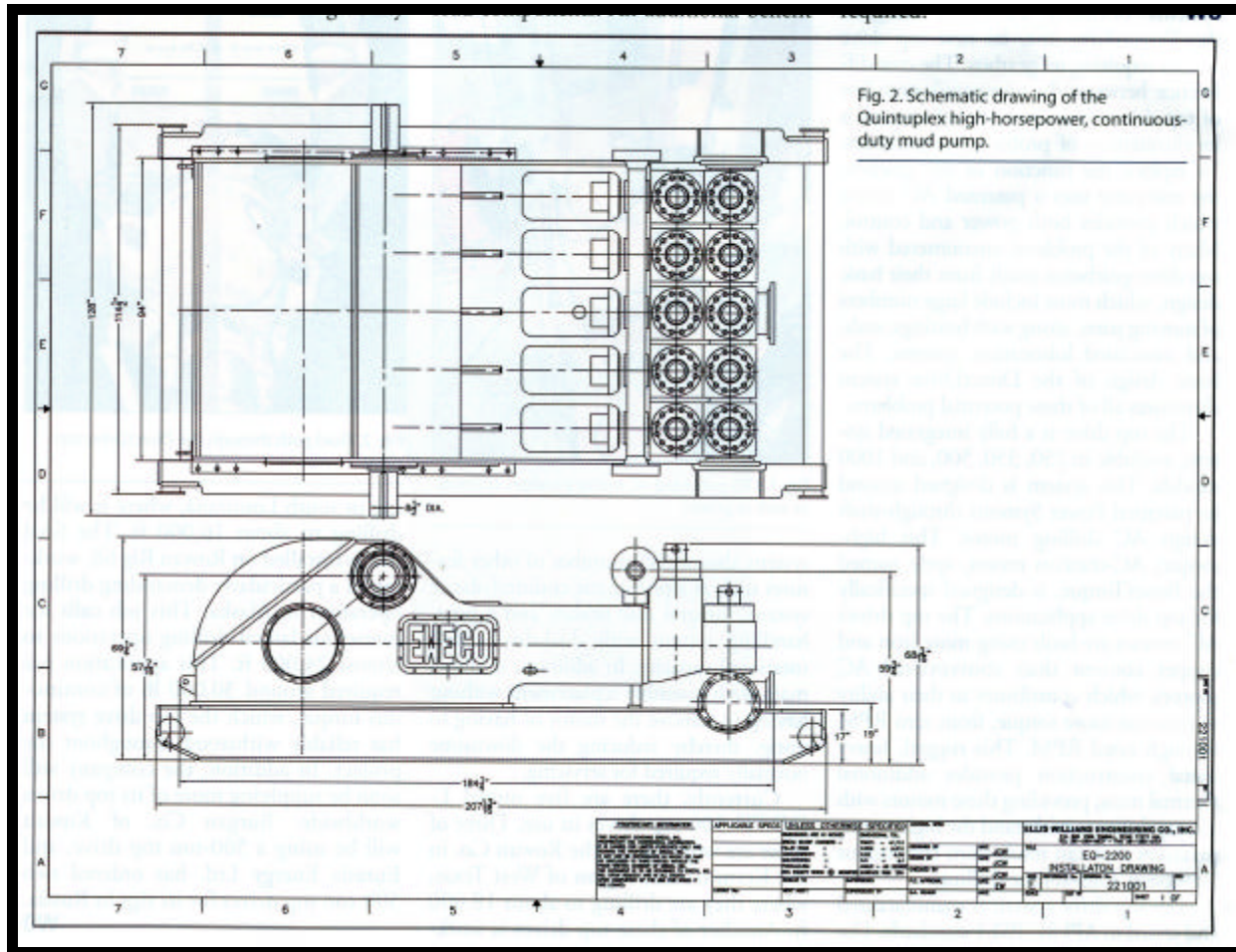
California drivers, effective July 1, 2008, legislation goes into effect which prohibits drivers from using a wireless telephone while operating a motor vehicle unless the driver uses a hands-free device. Drivers who violate the law will face a base fine of \$20 for a first offense and \$50 for each subsequent offense.

The law allows drivers to use a wireless telephone for emergency purposes. Drivers of commercial vehicles can continue to use push-to-talk phones until July 1, 2011. Drivers of emergency response vehicles can continue to use a cell phone without a hands-free device.

OPTION FOR HANDS-FREE

Voice Dialing: To avoid looking at the phone while dialing a number use a phone with voice dialing. With one touch you activate the phone and then

CELL PHONES
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QUINTUPLEX

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Most duplex pumps have two cylinders and four sets of valves. They have long stroke lengths and there is usually a visible pause in pressure as the valves open and close causing the Kelly hose to jump in time to the stroke rate. I once saw a three cylinder duplex but it was a monster and it must have been very hard to work on the middle rod.

Most triplex pumps have three cylinders and three sets of valves. Because of the odd number of valves and the higher pump rate these pumps put out a much smoother flow and pressure spikes are greatly reduced. This type of pump is used in pressure washers with one inch heads. Cement trucks use this type of pump with about 3" heads. Drilling rigs use triplex pumps with 5"-6" heads, more or less.

A special pump design from Scandinavia uses a pair of very long rods with a piston on each end of each rod. It makes a very long stroke, powered by an electric motor in the center. There are two rods

with a head on each end. Each of the four liners only pumps in one direction, like a triplex.

Now the Ellis Williams Engineering Company (EWECO) has come up with a next generation pump. Their "Quintuplex" (five cylinder) high-horsepower (1,700, 2,200 and 3,000) continuous-duty mud pump with their patent-pending design of a crankshaft driven by internal herringbone gears. The crankshaft will have a piston firing order of 1-3-5-2-4 with four main bearings, which isolates all crankshaft loads, unlike a typical triplex, where two eccentrics are always fully loaded between two mains at any given time. The pinion shaft will be driven from both sides by electric motors much like a conventional triplex pump, which allows for true interchangeability on every drilling rig.

The design provides for a more efficient transfer to hydraulic horsepower by spreading the piston rod loads evenly over five as opposed to three cylinders. The reduced load significantly increases the

QUINTUPLEX

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CELL PHONES*(Continued from page 1)*

by speaking the name the number is dialed.

Plug-in Earphones: These plug into the cell phone directly. They function with virtually all phones, are inexpensive, and provide a high quality sound.

Bluetooth Earpiece: The wireless earpiece takes a bit of initial setup. The phone has to be Bluetooth compatible and both phone and earpiece have to be kept charged.

Hands-free Through the Car Radio: The non-blue tooth type connects by wire to the radio. Some newer vehicle radios are Bluetooth compatible and will pick up the signal from the phone.

Abstain from Cell Use While Driving: Studies have shown that using a cell phone while driving impairs the driver's response time. The best way to reduce their impact on your safety is to not use the cell phone at all while driving.

Cell phone use is just a small piece of the puzzle when it comes to improving driver safety. The biggest risk factor that a driver can control is paying attention to the road. Anything that you do that takes away from the task of operating your vehicle and observing the road conditions around you diminishes your ability to deal with rapidly changing conditions.

Among the behaviors that are commonly observed are talking on a cell phone, holding a cell phone, dialing a cell phone, eating, drinking, smoking cigarettes, talking to passengers, and disciplining children. Some of the more unbelievable but true behaviors of drivers include text messaging, typing on a computer, reading books and newspapers, putting on makeup, shaving, etc.

Anything you can do to improve the situation is good. Not holding the phone is a small step. More important is to avoid all those other distractions, especially anything that takes your eyes off the road for more than a split second.

This new law was just amended before it even went into effect. The additional provision reads:

Prohibits a person under the age of 18 from driving a motor vehicle while using a wireless telephone, even if equipped with a hands-free device, or while using a mobile service device, as defined.

BUILD MUD UTILITY

If you have Quattro Pro 8 on your computer let me share a little utility I created that helps figure out exactly how much material to add. The inputs include desired mud weight, oil water ratio if it is oil base, final volume, and ppb of each additive. Mike and Dave both use this program to figure mixes. Just send me an e-mail and ask for Build Mud Utility v.3.0 or come by the office to pick up a copy on your flash drive.

QUINTUPLEX*(Continued from page 2)*

life of all load components. An additional benefit is the reduction of flow variation, which is proportional to pressure variation. The variation is reduced to 70% of the conventional triplex pump. The reduction in piston loads appreciably reduces the stress and strain on the drill string and its associated MWD and LWD tools.

This new pump will provide high horsepower for deep wells with a 30% reduction in weight. The footprint of this pump is the same or smaller than triplex pumps with a similar horsepower rating. The consumables making up the power and fluid ends of the "Quintuplex" pump are all conventional parts used in modern triplex pumps. This should keep maintenance for this pump as simple as for triplex pumps currently in use. No special tools or training will be required.

As technology advances and inquisitive minds attack age old problems, innovative solutions keep coming to the fore. While it may not be as revolutionary as running cattle through the sump to raise the viscosity* it is an incremental step in making drilling tools last longer.

* "In 1900, while drilling an oil well in Spindletop, Texas, workers ran a herd of cattle through a pit filled with water. The mud that resulted, a viscous, muddy slurry of water and clay, was pumped into the borehole. Drilling fluids are still called mud, but engineers no longer rely only on water and clay. Instead, they carefully design compounds and mixtures to meet specific needs under various drilling conditions. Modern drilling fluids are truly the lifeblood of the well. Today's deep wells could not exist without them."

<http://www.seed.slb.com/en/scictr/watch/mud/index.htm>

“Early to bed and early to rise makes a man healthy wealthy and wise.”

Attributed to Benjamin Franklin but found in a book written by John Clarke in 1639, 67 years before Franklin’s birth. Rob McNabb, GEO Mud Engineer, suggests that there are other behaviors besides sleeping that lead to health, wealth, and wisdom.

In the magazine "Men's Health" with LeBron James on the cover there are quite a few little tidbits about how to better manage life and money. I found most of the information to be helpful, quite a bit of it is common sense (an oxymoron, I know). Then there is the part about this 22 year old basketball star.

"Ask a man if he takes life seriously and you'd no doubt get a yes. But does he really? Trends say no way. Two-thirds of men in the United States are overweight or obese. The average guy carries \$2,369 in credit card debt. Three out of 10 drink too much. More than 23 percent of men smoke. About 4 percent gamble too much. Only 60 percent are saving enough money for retirement. The stats go on and on, and none indicate that men in the United States take their lives seriously. What's worse, a big chunk of those men, like the men who read this magazine, are what demographers refer to as affluent and college educated (i.e., allegedly intelligent)."

That's what the article says about me and my peers. It goes on, about the young LeBron.

This early-maturity phenomenon runs along the same lines as the Investing 101 advice you hear about how the earlier you start socking money away, the bigger the pot will grow later on. Same goes for career, fitness, and even character: The earlier you take things seriously, the more you'll have to show for them later on. James never asked himself that classic guidance-counselor question, "What do you want to do with your life?" Instead, he always asked, "What are you actually doing with your life?" Small distinction. Major difference. James distilled it to one word: "Commitment."

LeBron goes on to ask how committed are you to friends, family, children, etcetera. "There's that moment every morning when you look in the mirror: Are you committed, or are you not?"

MONEY

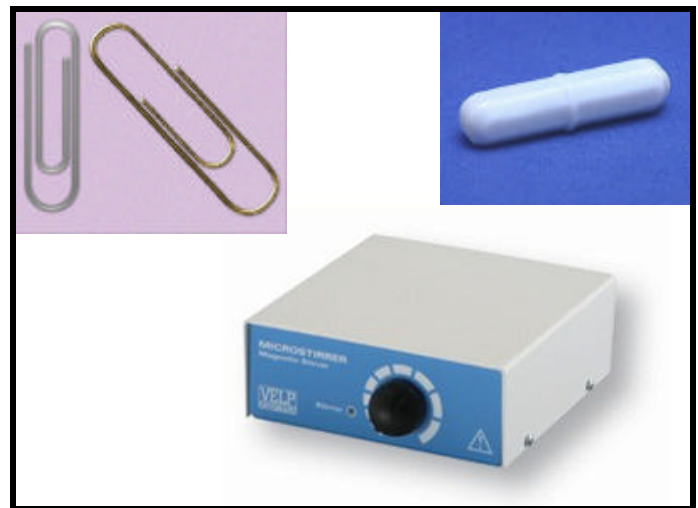
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OIL BASED MUD TESTING

Thank you to Matt Morgan for an innovative solution to a too common problem. Running oil based mud requires the use of a magnetic stirrer to do the titrations which can take a half hour or more to complete. When cleaning up it is not uncommon for someone to pour out the Teflon coated stirring magnet along with the water/mud/solvent mix. Usually it is easy to find, but when the fluid is tossed out into the sump it is a different matter. This is what happened to Matt.

We have plenty of extra Teflon coated magnets in the lab but Matt was on a well on the North coast of California, 500 miles from Bakersfield when this occurred. He went on-line to see what kind of store in Eureka might sell Teflon coated magnets. In his search he found a project someone had done making a magnetic stirrer out of a computer cooling fan. Creating the stirrer wasn't the problem but in the illustration of the completed project they showed a paper clip being used to stir water.

Matt dug out a paper clip and put it into his beaker, turned on the stirrer and Voila! He was back in business.



- ANSWERS TO WHAT DO YOU WANT IT TO BE?**
1. c) higher than the Pt
 2. a) Filtrate
 3. b) less than one ppt

MONEY

(Continued from page 4)

Well, now I've got to ask myself those questions: Am I serious about life, am I committed?

SAVING MONEY

How much do you save? If you are like me and you realize some time in your early 30's that you have less than one month's salary in retirement savings and a ton of collateral debt from a divorce, and 40 pounds of extra weight, you may realize that things have got to change.

Sometimes life is less fun than I'd like. I can't pursue every whim. I should say I won't. I have decided to set aside 25% of what I make for retirement and to do my best to limit my debt. When possible I am moving, it raises my heart rate and hopefully limits my chances of a slow death. I try to eat lots of veggies and limit alcohol consumption. I quit smoking.

I'd be able to spend more money now if I had saved money as a snot-nosed kid working at the record store. I would find exercise easier if it had been part of my lifestyle as a young adult. Today I eat as well as I do because I had a mother who passed on a love of all foods nutritious. If I had only been serious about life.

We've got some young (in their 20's) guys working with us at GEO. These guys have the greatest potential to make mistakes now and still land on their feet. What they have is time. Time is the only thing that we are all born with. It's the only thing that we trade for money when we go to work.

A young man who contributes to his 401k and does a minimal amount of work managing his profit sharing money can retire a multi-millionaire. It's a little harder for us late bloomers (25% is a horrendous amount of income to be putting aside, necessary because of my late start) but it's possible. The key here is compounding.

I am always amazed at how this works. What would you rather have? A penny at the beginning of the month, that will double in total value every day for the month, or a \$1,000.00 a day for a month? At the end of the month, if you took option number two, you would have \$30,000.00.

At the end of the 15th day, if you had started with a penny, you'd have \$163.84. Not bad for starting with a single cent. Then it gets crazy. By the end of the 25th day, doubling your money daily, you would have over \$167,722.16. Five days later

that total would be \$5,368,709.12. That's the effects of compounding. It takes time. Compounding is what grows your retirement account to a comfortable level, given enough time.

At 8% interest (a conservative figure if you look at the stock market over any long period of time) money will double every nine years. A person aged 25 gets to double their money one more time before retirement than a person aged 34. At 10% interest (the traditional return of the stock market) that money doubles in size every seven years. That 25 year old now gets to double his money twice more than an old guy (my age) of 39 years of age. Some of our choices in GEO's retirement plan have had returns over 20%.

Right now it would seem that I am writing this article to all the people working for GEO that are in their twenties. Advice about being committed and planning ahead is always better when followed when we are young (less chance for regret, right?). Us old guys should not give up, however. We do have the advantage that we are, generally, farther along in our lives. Hopefully we've got our lives more on auto-pilot than some kid. We know where we can scrimp and pinch and come up with a larger contribution to the 401k, and we can start a Roth IRA on the side, we can afford to set aside more money (hopefully) because we're old and don't drink as much and aren't getting married for the first time.

Like the article in Men's Health stated, being serious about life (health, wealth and happiness) and committed to achieving when we are young is the best way to go. We can work hard and still gain peace of mind even when we start late; it's just much more difficult and comes with less room for error. The same can be said for your health as your money; that was covered in an article called, "Big 'Un". Who wants to retire sick and broke?

If you've watched the news in the last ten years you might be aware that Social Security and health care are in possible jeopardy. When we go to retire neither one of those services may be available to us in the way they've been for prior generations. The best way to be prepared is to be seriously committed, right now, to planning for the future. This may mean more visits to the doctor, exercising and, definitely, participation in GEO's 401k. Oh... and don't get divorced.