



## Oil & Gas

# A STANDOUT SYSTEM FOR DRILLOUT SERVICES

<b>Who</b>	Axis Energy Services & Freemyer Industrial Pressure
<b>What</b>	<b>mtu</b> Series 2000 Tier 4i engine
<b>Why</b>	Performance, efficiency and EPA Tier 4i certification
<b>Where</b>	Longview & Fort Worth, Texas, USA

Drilling tens of thousands of feet for oil and gas is demanding. Every piece of equipment must work seamlessly. Many trucks and rigs are part of the well completion process, including mobile units built for frac plug drillout services. This type of equipment tackles the most strenuous part of the job—continuous-duty pumping. The challenge is designing a drillout rig that can deliver without fail, helping an operation drive down costs and cycle times.

When Axis Energy Services was established in 2018, it set out to build the best pumping system for frac plug drillouts in the United States. Headquartered in Longview, Texas, Axis was formed with the union of three trusted well service companies. Pooling decades of experience together, Axis focused on developing a pump that could provide reliable, efficient and safe service under continuous duty.



The *mtu*-powered drillout rigs work at much lower loads than other units in the field, reducing the risk of costly downtime.

#### A powerful combination

Axis partnered with Freemyer Industrial Pressure (FIP), one of the world's leading manufacturers of oil and gas well service equipment, to develop a solution. Based in Texas, FIP equipment can be found in 26 countries across the globe. "To achieve optimal results, we recognize that different jobs have different requirements," says Len Freemyer, FIP owner. "With this in mind, our equipment is custom designed to meet the needs of our customers."

Axis shares the same philosophy toward custom manufacturing. Every time Axis bids on a job, the engineering team researches every detail about the location, which dictates various factors such as pumping rates and pressures. A shale formation in West Texas, for example, requires much lower pumping pressure than a location in Ohio.

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**Fred Moses**

VP Maintenance, Axis Energy Services

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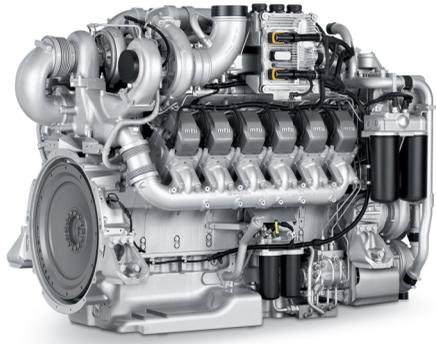
"Before we leave the facility, we make sure we have the right equipment to do the job safely and efficiently," says Fred Moses, VP Maintenance, Axis Energy Services. "FIP builds great equipment and they stand by it. But just as important, they work with us to customize the system to the job. Instead of building cookie-cutter solutions, they allow us to put our twist on components such as plumbing, hydraulics and controls to ensure a purpose-engineered system."

#### Steady under pressure

When the proper system is in place, costs and cycle times can be reduced, and give a drilling operation a competitive edge. For fluid pumps in frac plug drillouts, the perfect amount of horsepower must be achieved for continuous-duty operation. A constant rate and pressure ensures smooth drilling operations while maintaining a turbulent flow to remove sand and debris from the wellbore. If a pump fails, circulation is lost and equipment may get stuck downhole. This issue costs customers time and significant revenue waiting on repairs or a pump replacement.

The pump must also be able to operate over a broad range of requirements, with pump pressures up to 10,000 psi (690 bar). Based on Axis and Freemyer's vast experience, the 1500 hp *mtu* Series 2000 Tier 4i engine was chosen for its optimal combination of power, fuel consumption and reliability. "A 2250 or 2500 horsepower engine would be overkill. The 1500 horsepower Series 2000 really hit the sweet spot for performance and efficiency," says Freemyer.

It's critical for a pump to be productive without being overtaxed. An underrated piece of equipment may cause a failure that injures employees. It also increases fuel costs, which add up quickly at a job site, where multiple units are burning up to 1500 gallons per day. "On average, we burn from one-half to three-quarters of a gallon every minute on these units. When you send a lower horsepower unit out to do the same amount of work, you can burn more fuel because it gets overloaded. And if you go with a 2250 horsepower engine, that burns a lot of fuel, too. It's a double-edged sword. Both a pump that's too small or too big ends up burning more fuel. Yet that's what most of our competitors are doing," says Moses.



### Born to run

The 1500 hp **mtu** Series 2000 combines efficiency with reliability under extreme conditions. Axis equipment can be found working around the clock in every major oil and gas basin in the United States. From blazing hot summers in Texas' Permian Basin to frigid winters in North Dakota, the company has helped operators complete hundreds of drillout jobs using 1500 hp pumps with no major downtime.

And if a part or support is needed, **mtu's** distribution network is always nearby. "Pretty much everywhere we operate, there's an **mtu** distributor there too. This helps tremendously, since time is always of the essence. It's also something other engine manufacturers just don't offer," says Moses.

The Series 2000 provides other important benefits, according to Moses. Its lightweight, compact design offers a low center of gravity and added versatility when engineering a system. The innovative engine runs quietly and meets Tier 4i emission standards, helping oil and gas operations reduce their carbon footprint.

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### Mission accomplished

With a fleet of 1500 hp **mtu**-powered frac plug drillout rigs in the field, Axis Energy Services' goal of building the industry-leading pumping system has been achieved. Yet the company isn't satisfied with resting on its laurels.

"We've built a unit that can run for days on end without fear of failing. Where most of our competitors are running their equipment at 90 to 100 percent loads, we're barely working ours at 40 to 60 percent. These 1500 hp units have put us ahead of the competition, and also gave us insight on efficiencies we can create down the road," says Moses.

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Rolls-Royce provides world-class power solutions and complete lifecycle support under our product and solution brand **mtu**. Through digitalization and electrification, we strive to develop drive and power generation solutions that are even cleaner and smarter and thus provide answers to the challenges posed by the rapidly growing societal demands for energy and mobility. We deliver and

service comprehensive, powerful and reliable systems, based on both gas and diesel engines, as well as electrified hybrid systems. These clean and technologically advanced solutions serve our customers in the marine and infrastructure sectors worldwide.