HDD ASSIST – OVERCOMING DIFFICULT SITUATIONS

Presented by: Amanda Kitchin
Business Development Trenchless Technology

Venue: UKSTT Roadshow – Reading
Mammoth Equipment Ltd and MTS Suction Systems UK Ltd

Are two associated companies are based in Ely, Cambridgeshire and provide a range of equipment for use in the trenchless installation and safe excavation market place.

The companies are owned and run by Russell Fairhurst & Frank Gowdy who’s backgrounds and experience has been predominately in these markets for over 30 years each.

With sole distribution rights within the UK and Ireland for all of the equipment they offer Mammoth/MTS pride themselves on being forward thinking, innovative and always willing to discuss solutions to their client requirements.
Mammoth provide a range of specialist equipment to the UK Utility and construction industry. Equipment aimed at reducing excavation size, limiting disturbance to the prevailing ground surface, increasing safety, reducing damages and having a beneficial effect on the environment.

All equipment is backed up with full service and technical support for the products in the UK and Ireland.
TRENCHLESS & SAFE-DIG EQUIPMENT

- Soil displacement hammers from 50mm – 200mm.
- Small Footprint Rope Pipe Bursters for 2” – 8” works
- Hydraulic Rod Pipe Bursters for 2” – 36” works
- Pipe Rammers for 4” – 180” casing installations
- Twin Capstan pulling winches from 2.5 – 20 ton
- Safe-Dig Non-Conductive Air Lances
- Safe-Dig Non-Conductive Digger Buckets
MTS is a subsidiary of Mammoth Equipment and MTS GmbH that provides a range of specialist suction excavation equipment to the Utility and Construction industry aimed at improving safety & reduced damages whilst excavating. The use of the technique can also greatly reduce excavation sizes for many utility applications.

All equipment is backed up with full service and technical support for the products in the UK and Ireland.
• Suction Boxes from 20 – 80Kw
• Small footprint, high performance City units
• Core & Vac units for ‘Keyhole’ works
• Large capacity, high performance construction unit
• Three & four fan units, distance and depth
• Track mounted for difficult access & all terrain
• RRV for specialist rail applications
Overcoming Difficult Situations

Some directional drilling jobs may require some assistance either before or during the project.

How can we help – HDD Assist

BEFORE – WASHOVER CASINGS

Designed to overcome situations where ground conditions are difficult

DURING – PULLBACK ASSIST

Designed to aid in the final installation / pullback of the product pipe to help prevent hydra lock and keep a momentum

AFTER – PIPE REMOVAL / DRILL STEM REMOVAL

To remove stuck pipe from a failed installation or recover expensive drill rods
• Start your job off right in tough conditions.
• Casings are rammed through difficult soil conditions to more desirable drill starting points.
• Guide down hole or mud motors to rocky soils through the wash over casing.
• Provide friction free section for pullback.
WASHOVER CASING

Wash-Over Casings

- Used for a pilot for large HDD projects
- Casing is hammered down to bed rock or solid soil formation
- Surface soils are removed from the casing
- Large HDD machine is set up and casing is used as the pilot for the crossing
- The casing provides path for drill fluid returns for mud recycling and reduces the loss of drilling fluids in surface soils
WASHOVER CASING CLEANOUT
• Overcome hydra lock conditions

• Rammer attached to product pipe during pullback

• Percussive action keeps pipe moving and helps prevent high levels of pullback stress

• Percussive power frees immobilized product pipes.
Rammer is locked into steel casing via collets. Steel casing is installed using pullback force of HDD and percussive force of the rammer.
Rammer is locked into steel casing via collets. The steel casing is connected to the HDPE product pipe via steel to HDPE flange compression kit. HDD pull force is used in conjunction with the rammer to install the pipe.
Rammer is locked into steel casing via collets. Steel casing is welded to steel ring that is flush with HDPE face, and welded to steel sleeve. Steel sleeve is bolted to HDPE product pipe. HDD pull force is used in conjunction with the rammer to install the pipe.
• Remove stuck product pipe and bore again.

• Rammer attached to product pipe after pullback fails.

• Percussive action pulls product pipe, removing it from the bore.

• Salvage the job and bore again.
16”: uses 8” or 12” Hammerhead Rammer. Used on 6” – 16” steel casing
24”: uses 16” or 20” Hammerhead Rammer. Used on 18” – 30” steel casing
36”: uses 20” or 24”/26” Hammerhead Rammer. Used on 30” – 48” steel casing
• Recover expensive stuck drill stems.
• Pipe rammer is fitted with a special sleeve.
• Stuck drill stem welded to the back of the rammer sleeve.
• Percussive power frees drill stem, saving time and money.
DRILL STEM RECOVERY
CONCLUSION

- Project Planning is Paramount
- Assess the conditions, pipe size and machine
- Select the correct Hammer Size for installation of Casings and Pullback Assist
- Don’t wait until it has gone wrong – ACT FIRST
AIR HAMMER ROCK DRILLING SYSTEM

A rock drilling system designed for the Horizontal Directional Drilling Industry

How to be successful!!!!

• Know your job
  • Solid Rock (how hard), Cobble Rock, Mixture of solid and cobble?

• Know your options
  • Air Hammer, AT, AT with Air Hammer, Trihawk Rock Tooling

• Use available resources
  • Dealer and factory experts who need you to be successful!!!
AIR HAMMER
ROCK DRILLING SYSTEM

WHY USE AN AIR HAMMER OVER ROCK DRILL OR MUD MOTOR?

• No high volumes of water resulting in less plant on site, Air only requires 1-2 gal per minute of polymer/foam mix.
• Turn any existing drill into a rock drill with our products
• The Air Hammer and support packages are economical, meaning you’ll see a return on your investment quickly
• Cost per foot is generally lower than traditional methods of rock drilling
• The polymer foam drilling fluid for the air hammer is environmentally safe. Frac-outs are not a threat to the environment.
• Using air with oil injection reduces internal wear on a hammer v. using a mud motor that uses recycled fluids
• Monthly rental cost of an air compressor is roughly 1/3 of the monthly rental cost of a recycler.
• Air only requires a 2-man crew – Operator and a Locator.
• Only items that require monitoring are the oil level & the polymer foam mix.
• Air compressor, drill rig, and service truck does not require a large area for set up. This produces a much smaller footprint versus a traditional mud motor.
AIR HAMMER ROCK DRILLING SYSTEM

- Custom front and rear heads specifically designed for our market not borrowed from another industry.

- Innovative offset steering rock bit design provides additional steering in rock.

- Integrated and patented back check located within bit stopping contamination where it starts.
AIR HAMMER ROCK DRILLING SYSTEM

FEATURES

• Innovative offset steering rock bit design provides additional steering in rock.
• Increased diameter of the bit shank / spline.
• Custom thread design for the horizontal market
• Integrated and patented back check located within bit stopping contamination where it starts.
• Light weight control station with integrated electronics maximizes system control.
• High Flow Universal HDD Beacon housings accepts Ditch Witch and DCI electronics Including the 19” (480mm) and wireline options.
• Integrated bent sub reducing overall tool length and weight.
• Spanner wrench system makes tear down simple.
• Turn ANY directional drill into a ROUGHNECK rock drilling machine!!!
AIR HAMMER ROCK DRILLING SYSTEM

• Air pressure from 150 - 350 psi. (10.5 to 24 bar)

• Air requirements: 620 - 950cfm (21,000 liters per min)

• Oiler capacity/output: 13.5 liters, 0-10 liters per hour.

• Water output range: 0 – 19 litres per hour

• Operator station controls, air blast feature cleans rods prior to connection, air pressure shut off, fluid and flow control
AIR HAMMER ROCK DRILLING SYSTEM

• **Straight Bit**
  • The driller’s choice for everyday rock drilling.
  • Greater number of engaged carbides providing extended bit life

OFFSET BIT

• The best choice for high production in solid rock conditions.
• Advanced design promotes smooth rotation rock drilling.
AIR HAMMER ROCK DRILLING SYSTEM

JOB PROFILE

Retford – 120m in Sandstone 7m Deep under Road and Culvert to install 315mm Water Main

Picture shows how Air Hammer Rock Drilling can be set up in a small built up area
CONCLUSION

Air Hammer rock Drilling can be:

• Cost Effective – less expensive plant hire costs

• Copes with more variable conditions than other methods making a successful installation more achievable

• Used in Areas where there is a risk frac out of drilling fluids

• Faster than other methods due the percussive nature of the method

• Available for drilling machines from 10t to 50t utilising existing equipment

• DON’T DISCOUNT DIRECTIONAL DRILLING IN ROCK FORMATIONS USE AN AIR HAMMER