

# TOP TEN REASONS YOU NEED A FOREMOST DUAL ROTARY RIG IN YOUR FLEET!

Since 1979, Foremost's Dual Rotary drills have delivered on the promise of better performance. They continue to make significant contributions to the productivity and profitability of operators worldwide. For a growing number of contractors, there's simply no better way to drill. Consider these top DR features:

- 1. Exceptional Overburden Performance:** Foremost DR drills have been proven repeatedly in some of the toughest unconsolidated overburden formations, including sand, gravel, glacial till, and boulders. The DR method minimizes the likelihood of loss circulation and aquifer cross-contamination. Because the DR can drill without fluids, the ability to detect water in low-flow formations is improved.
- 2. Open-Hole Versatility:** In addition to its overburden drilling ability, the DR can be configured for a variety of drilling methods including mud, reverse circulation, and flooded reverse circulation.
- 3. Straight Holes:** The rotation of the casing by the lower drive results in a very straight hole. This minimizes stress on casing and casing welds, and eases the task of installing screens and pumps in water well applications. It also makes the DR ideal for drilling hydraulic elevator shaft holes and foundation piles.
- 4. Basin Extraction:** The lower drive is equally effective at pulling back casing; thereby simplifying the process of exposing a well screen or abandoning a well.
- 5. Conventional Tools:** Foremost DR drills utilize conventional tools. The drill string can be equipped with down-the-hole hammer, roller cone, or drag bit.
- 6. Control of Discharge:** Cuttings are diverted through the discharge swivel and can be directed to a safe and convenient dumping or monitoring point. This is a useful feature when drilling at homeowner sites or when cuttings must be contained for environmental or safety reasons.
- 7. Ease of Maintenance:** Foremost DR rigs feature a directly connected hydraulic feed system - which means no chains, sheaves, or sprockets to maintain. This type of feed system generates zero load on the mast crown, permitting a simple and lightweight mast design that does not sacrifice pullback capability.
- 8. Reduced Operational Risk:** The DR's overburden drilling capability gives you the confidence to go into areas you might once have considered off-limits. Its flexibility allows you to expand into new applications. Knowing that you have the right equipment to get the hole down the first time will help reduce the risk to your company when bidding on projects.
- 9. Resale Value:** There is arguably no drill on the market today that holds its value better than a Foremost DR. Dual Rotary owners tend to hold onto their rigs, making used inventory scarce. Demand for used DR drills remains strong, and consequently, prices favour the seller. Excellent resale potential provides an added level of comfort and financial security for those who might consider investing in a Foremost Dual Rotary drill.
- 10. Foremost Technical Support:** Foremost Dual Rotary rigs are backed by the considerable product and application expertise of its product management team, field technicians, and one of the largest engineering departments in the industry. Foremost is committed to providing superior customer support. Repeat sales are proof of customer satisfaction.

## SPECS & PERFORMANCE

	DR-12	DR-24	DR-24HD	DR-40
<b>TOP DRIVE</b>				
Stroke	25 ft (7.62 m)	26 ft (7.92 m)	26 ft (7.92 m)	29 ft (8.84 m)
Hoist Speed	Up 180 ft/min (55 m/min)	125 ft/min (38 m/min)	80 ft/min (24 m/min)	80 ft/min (24m/min)
Hoist Capacity	Pullback 40,000 lbs (18,100kg) 12,000lbs (5,440 kg)	60,000 lbs (27,200 kg) 20,000 lbs (9,070 kg)	80,000 lbs (36,300 kg) 12,000lbs (5,440 kg)	80,000 lbs (36,300 kg) 25,000 lbs (11,300 kg)
Low Speed <b>Standard Option</b>	10,000 ft-lbs (13,600 Nm)	10,000 ft-lbs (13,600 Nm)	14,000 ft-lbs (18,900 Nm)	22,000 ft-lbs (29,800 Nm)
High Speed <b>Standard Option</b>	0 - 85 rpm 6,600 ft-lbs (9,000 Nm) 0 - 125 RPM	0 - 85 rpm 6,600 ft-lbs (9,000 Nm) 0 - 125 RPM	0 - 90 rpm 9,300 ft-lbs (12,600 Nm) 0 - 90 RPM	0 - 42 rpm

	DR-12	DR-24	DR-24HD	DR-40
<b>LOWER DRIVE</b>				
Stroke	12 ft (3.66 m)	12 ft (3.66 m)	12 ft (3.66 m)	12 ft (3.66 m)
Hoist Capacity	Pullback 42,500 lbs (19,300 kg) 18,500 lbs (8,400 kg)	75,000 lbs (34,000 kg) 33,000 lbs (15,000 kg)	118,000 lbs (53,500 kg) 42,500 lbs (19,300 kg)	75,000 lbs (34,000 kg) 33,000 lbs (15,000 kg)
Low Speed <b>Standard Option</b>	500,000 in-lbs (56,500 Nm) 0 - 14 rpm	1,000,000 in-lbs (127,000 Nm)	2,500,000 in-lbs (226,000 Nm) 0 - 5 rpm	3,000,000 in-lbs (315,900 Nm) 0 - 5 rpm
High Speed <b>Standard Option</b>		6,600 ft-lbs (9,000 Nm) 0 - 125 rpm		

	DR-12	DR-24	DR-24HD	DR-40
<b>COMPRESSOR</b>				
Air Flow	900-1070 cfm (25.5 m <sup>3</sup> /min)	900-1070 cfm (25.5-30.3 m <sup>3</sup> /min)	1250 cfm (35.4 m <sup>3</sup> /min)	
Pressure	350 psi (24.1 bar)	350 psi (24.1 bar)	350 psi (24.1 bar)	
Engine Power	605 hp (451 kW)	605 hp (451 kW)	675 hp (503 kW)	

	DR-12	DR-24	DR-24HD	DR-40
<b>DIMENSIONS</b>				
Length	37 ft (11.28 m)	38 ft 9 in (11.81 m)	41 ft 11 in (12.77 m)	
Height	13 ft (3.96 m)	13 ft 6 in (4.11 m)	13 ft 6 in (4.11 m)	
Width	8 ft (2.44 m)	8 ft (2.44 m)	9 ft 6 in (2.90 m)	
Weight	51,600 lbs (23,400 kg)	56,000 - 72,000 lbs (25,400 - 32,650 kg)	105,000 lbs (47,630 kg)	

	DR-12	DR-24	DR-24HD	DR-40
<b>JIB BOOM WINCH</b>				
Wire Rope Length	140 ft (42.67 m)	140 ft (42.67 m)	120 ft (36.58 m)	
Wire Rope Diameter	1/2" (12.70 mm)	1/2" (12.70 mm)	5/8" (15.88 mm)	
Line Pull on Bare Drum	6,000 lbs (2,720 kg)	6,000 lbs (2,720 kg)	12,000 lbs (5,440 kg)	
Line Speed on Full Drum	100 ft/min (30.48 m/min)	100 ft/min (30.48 m/min)	175 ft/min (53.34 m/min)	

	DR-12	DR-24	DR-24HD	DR-40
<b>WATER &amp; FOAM INJECTION</b>				
Capacity	18 gpm (45 l/min)	18 gpm (45 - 94 l/min)	24 gpm (94 l/min)	
Pressure	550 psi (41.4 bar)	550 psi (41.4 bar)	550 psi (41.4 bar)	

	DR-24XHD	DR-40XHD	DR-40SHD
<b>TOP DRIVE</b>			
Stroke	29 ft (8.84 m)	29 ft (8.84 m)	29 ft (8.84 m)
Hoist Speed	Up 115 ft/min (35 m/min)	115 ft/min (35 m/min)	115 ft/min (35 m/min)
Hoist Capacity	Pullback 130,000 lbs (59,000 kg) 30,000 lbs (13,600 kg)	130,000 lbs (59,000 kg) 30,000 lbs (13,600 kg)	130,000 lbs (59,000 kg) 30,000 lbs (13,600 kg)
Torque (stall)	22,000 ft-lbs (29,800 Nm)	22,000 ft-lbs (29,800 Nm)	22,000 ft-lbs (29,800 Nm)
Rotation Speed	85 rpm Spindle Thru Hole = 6"	85 rpm	85 rpm Spindle Thru Hole = 6"

	DR-24XHD	DR-40XHD	DR-40SHD
<b>LOWER DRIVE</b>			
Stroke	12 ft (3.66 m)	12 ft (3.66 m)	16 ft (4.87 m)
Hoist Capacity	Pullback 118,000 lbs (53,500 kg) 42,500 lbs (19,300 kg)	118,000 lbs (53,500 kg) 42,500 lbs (19,300 kg)	118,000 lbs (53,500 kg)
Torque	2,500,000 in-lbs (282,400 Nm)	3,000,000 in-lbs (339,000 Nm)	5,000,000 in-lbs (565,000 Nm)
Rotation Speed	0 - 5 rpm	0 - 5 rpm	0 - 6 rpm
Max. Casing Diameter	24" (610 mm)	40" (1,016 mm)	40" (1,016 mm)

	DR-24XHD	DR-40XHD	DR-40SHD
<b>COMPRESSOR</b>			
Air Flow	1350-1150 cfm, dual pressure	1350-1150 cfm, dual pressure	Motor = 400 HP AC (298 kW)
Pressure	350/500 psi (24.1/34.5 bar)	350/500 psi (24.1/34.5 bar)	
Engine Power	800 hp (596 kW)	800 hp (596 kW)	

	DR-24XHD	DR-40XHD	DR-40SHD
<b>DIMENSIONS</b>			
Length	51 ft 9 in (15.77 m)	51 ft 9 in (15.77 m)	55 ft 4 in (16.86 m)
Height	13 ft 6 in (4.11 m)	13 ft 6 in (4.11 m)	14 ft 4 in (4.36 m)
Width	10 ft 6 in (3.20 m)	12 ft (3.65m)	12 ft (3.65 m)
Weight	110,000 lbs (50,000 kg)	120,000 lbs (54,400 kg)	139,000 lbs (63,050 kg)

	DR-24XHD	DR-40XHD	DR-40SHD
<b>JIB BOOM WINCH</b>			
Wire Rope Length	140 ft (42.67 m)	140 ft (42.67 m)	126 ft (38.40 m)
Wire Rope Diameter	1/2" (12.70 mm)	1/2" (12.70 mm)	5/8" (15.90 mm)
Line Pull on Bare Drum	8,000 lbs (3,630 kg)	8,000 lbs (3,630 kg)	12,000 lbs (5,440 kg)
Line Speed on Full Drum	170 ft/min (51.8 m/min)	170 ft/min (51.8 m/min)	175 ft/min (53.3 m/min)

	DR-24XHD	DR-40XHD	DR-40SHD
<b>WATER &amp; FOAM INJECTION</b>			
Capacity	24 gpm (90.8L/min)	24 gpm (90.8L/min)	24 gpm (90.8L/min)
Pressure	550 psi (48.3 bar)	550 psi (48.3 bar)	550 psi (48.3 bar)

*\*Performance specifications are theoretical maximums. Actual performance may vary.  
\*\*All DR rigs can be ordered without compressor.*

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# THE ORIGINAL DUAL ROTARY

Foremost Dual Rotary (DR) drills have been working successfully around the world since 1979. Over the years, the DR method has earned an enviable reputation for exceptional drilling performance in unconsolidated overburden. DR operators regularly drill and case through hundreds of feet of tough overburden where casing hammers and under-reamers have been unsuccessful. The Foremost DR also delivers excellent productivity for a variety of open-hole applications; making it one versatile, powerful, and truly unique machine.



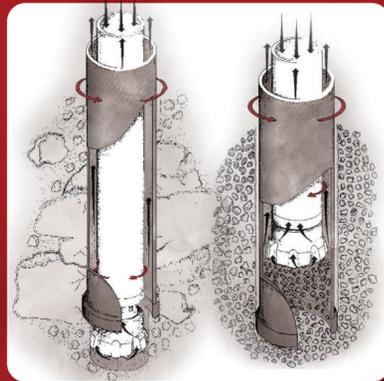
DUAL ROTARY DRILLS • PRODUCT OVERVIEW

# BETTER PRODUCTIVITY THROUGH BETTER TECHNOLOGY

Foremost Dual Rotary drills feature a unique lower rotary drive that is used to advance steel casing through unconsolidated overburden, such as sand, gravel, glacial till, and boulders. Pullback, pulldown, and rotational forces are effectively transmitted to the casing via high-strength steel jaws with carbide inserts.

An independent rotary top drive simultaneously handles a drill string equipped with a down-the-hole hammer, drag bit, or roller cone bit. Cuttings are typically evacuated with air, but Foremost DR drills can also be configured with pumps for mud or flooded reverse circulation drilling.

The top and lower drives feed independently, meaning that the bit position can vary relative to the bottom of the casing. Once the desired casing depth has been achieved, the DR continues drilling open-hole like a conventional top drive drill. With a Foremost DR drill, there is no need to trip out or change tools when transitioning to open-hole drilling.



**NORMAL BIT POSITION**  
In most situations, the drill bit is advanced flush with or slightly ahead of the casing shoe for best penetration rates.

**BIT POSITION IN HEAVING FORMATION**  
In heaving formations, the casing is advanced ahead of the drill bit to create a plug in the casing. This allows drilling to continue in a controlled fashion. This method is also recommended where sample accuracy is important, as it helps to minimize cross-contamination of cuttings.

## AVAILABLE MODELS

### DR-12



The DR-12 is a light, yet powerful PTO rig popular among domestic water well contractors drilling in moderate to severe overburden. It will handle casing up to 12" (305 mm) in diameter, and has been field tested to depths beyond 550 ft (168 m) for a typical 6" (152 mm) cased well. The DR-12 is available with an optional pipe tub, single pipe loader arm and telescopic casing jib. The configuration accommodates diverse site conditions.

### DR-24



The DR-24 will set casing up to 24" (610 mm) in diameter. This model is commonly used for domestic and municipal wells, and construction applications such as foundation piling projects and holes for hydraulic elevator jacks. The DR-24 is available in PTO or deck engine configurations and can be mounted on a truck, trailer or self-propelled tracked carrier. Available in a stock tandem (pictured above) or tridem configuration.

### DR-24HD



The DR-24HD ('heavy-duty') features a heavy-duty gear-driven lower drive, which generates two and a half times the torque of the standard DR-24. The DR-24HD is also configured with a heavy-duty mast to withstand the additional torque and larger hoist cylinders for increased pullback capabilities. The DR-24HD is most commonly used in deep, large diameter applications such as municipal/industrial wells and mine de-watering.

### DR-40



The DR-40 handles casing up to 40" (1,000 mm) in diameter. The DR-40 excels in large diameter construction and industrial water well applications. Standard configurations include tracked undercarriage or crane carrier with deck engine and on-board air compressor.

## AVAILABLE MODELS

### DR-24XHD



The DR-24XHD features the DR-24HD lower drive with increased top drive torque and pullback capability. The DR-24XHD is also configured with an angle package, with the ability to drill on an angle from 0-45 degrees. The DR-24XHD excels in deep hole waterwell and mine dewatering applications.

### DR-40SHD



Foremost's first fully electric drill features a remote console for operator safety. The DR-40SHD features a brand new 40" lower drive with increased capacity and improved chucking system. Utilizing the flexibility to drill anywhere from vertical to horizontal angles, the DR-40SHD can be used in a wide variety of applications including de-salination projects and deep hole water wells.

### DR-40XHD



Building on the technology behind the DR-24XHD, the DR-40XHD features the DR-40 lower drive with increased pullback capability. The DR-40XHD can also be configured with an angle package, with the ability to drill on an angle from 0-45 degrees. The DR-40XHD excels in deep hole large diameter waterwell and construction applications.

## CRANE LEAD SYSTEM & DECK KIT



For some applications, the Foremost DR Drill may not be suitable on a traditional chassis. All the versatility of the Foremost Dual Rotary Drill can be mounted on virtually any non-standard North American Chassis (pictured top-right), or installed and mounted onto crane leads (pictured top-left).

## OVERVIEW OF DR FEATURES

Since acquiring the Dual Rotary technology from Barber Industries in 1993, Foremost has continually updated, refined and expanded the DR line with the goal of enhancing its functionality and extending its range of applications. Today, Foremost offers several DR models, each packed with features that deliver heightened safety, productivity, and profitability across a variety of drilling activities.

DEPTH RANGES AS REPORTED BY DR OPERATORS			
CASING DIAMETER	DEPTH RANGE		
6" - 8"	152 - 203mm	200 - 1300 ft	60 - 400 m
10" - 14"	254 - 356mm	100 - 800 ft	30 - 244 m
16" - 24"	406 - 610mm	100 - 500 ft	30 - 244 m
26" - 40"	660 - 1016mm	50 - 350 ft	15 - 106 m
> 40"	> 1016mm	For surface casing only	



**CYCLONE COLLECTOR**  
The optional cyclone sample collecting system slows discharge velocity to allow accurate and continuous sampling of the formation.



**TILTING TOP DRIVE**  
The independent hydraulic top drive tilts for convenient loading of drill pipe and casing with the operator standing at ground level.



**LOWER DRIVE**  
The lower rotary drive is also used as a powerful breakout and spinner for drill pipe, hammers, bits, and thread casing.



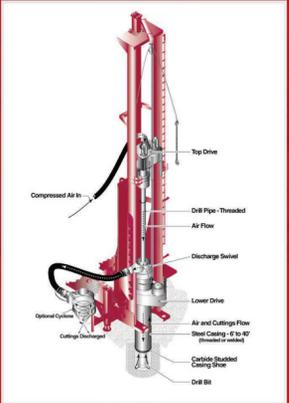
**CASING JAWS**  
Rotation and feed forces are effectively transmitted from the lower drive to the casing via a set of three carbide inserts. Casing jaws are available for all common casing sizes and can be changed out quickly in the field.



**CASING SHOE**  
A carbide-studded casing shoe is welded to the casing bottom. The shoe I.D. is flush with the casing I.D. so that there is no reduction in the bore hole diameter when switching to open-hole drilling.



**DISCHARGE SWIVEL**  
All drill cuttings rise to the surface between the drill pipe and casing, and exit through the discharge swivel attached to the top of the casing. The discharge swivel directs cuttings to a safe dumping point or to an optional cyclone collection system.



<b>Hydraulic Breakout</b>	Lower rotary casing drive is used as a breakout and spinner wrench for drill pipe joints, drill bits, and threaded casing.
<b>Hydraulic System</b>	A closed loop hydraulic system is used for the lower casing rotator. Variable displacement pumps are used for all other hydraulic systems.
<b>Hoist System</b>	The hoist feed is direct by hydraulic cylinder; no cables, sheaves, chains, or sprockets are used in the hoist system.
<b>Carrier</b>	Truck, trailer, crane carrier, or self-propelled track carrier.
<b>Popular Options</b>	RC drilling package, sandline winch, mud pumps, hydraulic welder, and cyclone separator.

### DRILLING PENETRATION RATES (BASED ON INDEPENDENT THIRD-PARTY OBSERVATIONS)

	FOREMOST DR	CONVENTIONAL AIR ROTARY	AUGER	CABLE TOOL
<b>Drilling Speed (1)</b>				
Sand and Gravel	20 - 40 min	45 - 90 min	30 - 60 min	1 - 4 hrs
Till	30 - 60 min	45 - 90 min	30 - 120 min	2 - 8 hrs
Rock	30 - 90 min	30 - 90 min	N/A	N/A
<b>Casing Integrity</b>	Excellent	Moderate - Poor	N/A	Moderate
<b>Split Spoon Sampling Ability</b>	Moderate - Poor	Poor - None (3)	Excellent	Good
<b>Cross-Contamination Prevention</b>	Good - Excellent	Moderate - Poor	Moderate - Poor	Moderate - Poor
<b>Versatility</b>	Excellent	Good (3)	Moderate - Excellent	Poor
Air	Yes	Yes	(3)	No
Mud	Yes	Yes	(3)	(3)
Water	Yes	Yes	(3)	Yes

**Other Advantages/Disadvantages**

- Casing removal simplified
- Controlled discharge sampling
- Good casing seat in bed-rock
- Poor casing seat by jutting and drive shoe removal
- Mobile rig for tough access
- Rig simplicity

(1) Drilling speed shown represents average time required to drill and install 20 feet over a 100 foot well depth. (2) N/A denotes Not Applicable (3) Rig type dependent. Reprinted with the permission of the National Ground Water Association. Copyright 1988.