



DITCH WITCH® JT100, JT4020, JT3020 DIRECTIONAL DRILLS

# ALL TERRAIN



ALL TERRAIN. ALL THE DRILL YOU'LL EVER NEED.



**3020**  
**ALL-TERRAIN**

**Ditch Witch®**

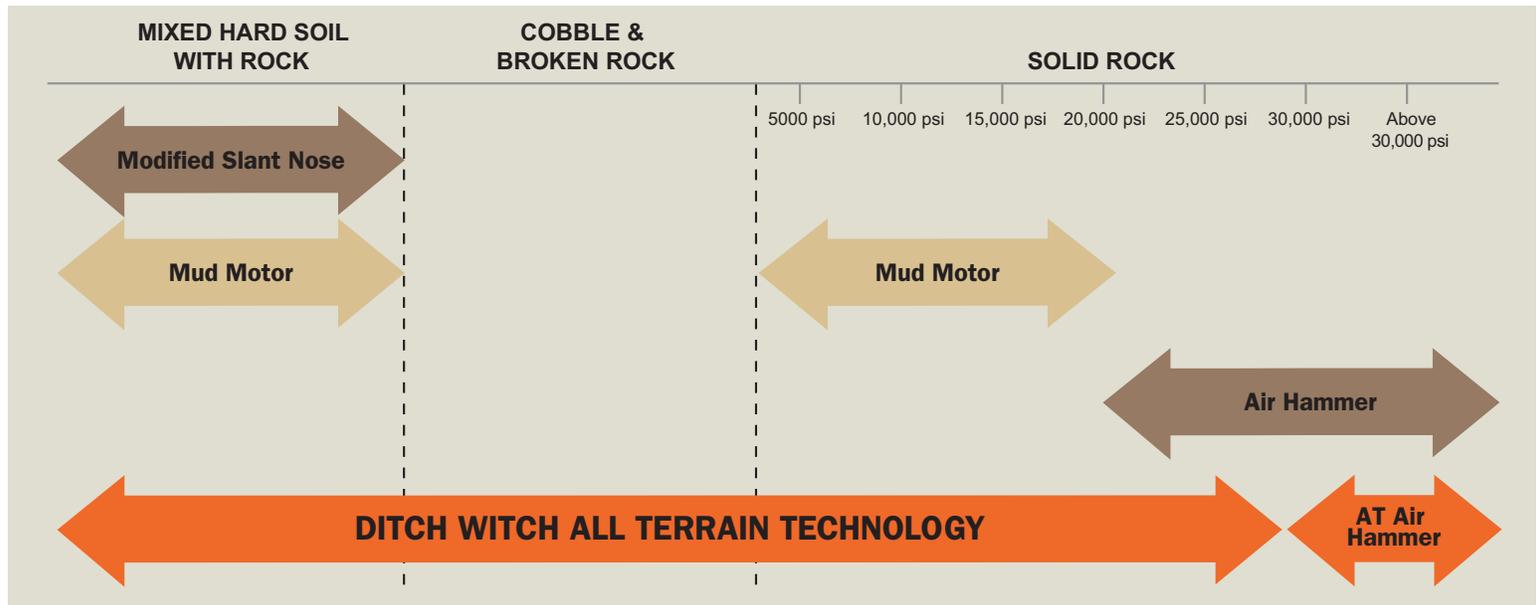


## DITCH WITCH All Terrain. There Is No Better Name.

Why *All Terrain*? Because it's the directional drill that's most effective in the widest range of ground formations, including solid rock. Its patented shaft-within-a-pipe design features a hex-shaped rod that turns inside an outer pipe to allow continuous rotation of the drill bit. Can your machine drill and steer simultaneously through rock and rocky soil? Only if it has the name *All Terrain*.



# DITCH WITCH Drilling Technology Effectiveness



All Terrain technology's patented shaft-within-a-pipe design features a strong, hex-shaped rod that turns inside an outer pipe, which allows continuous rotation of the drill bit.



## KEY FEATURES

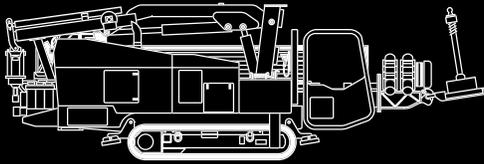
- Only technology that enables simultaneous drilling and steering through rock and rocky soil.
- Inner hex shaft works as a mechanical motor that drives the bit during the bore; the outer pipe thrusts the bit forward, steers the drill shaft and works to transmit full machine torque during backreaming.
- All Terrain drills provide more power to the bit than any competing rock-drilling systems in their horsepower class.
- Low drilling fluid volume means less waste, less cleanup, and less environmental impact.
- Cruise-control feature for pilot boring and backreaming reduces operator fatigue and increases productivity.
- Hydraulic, heavy-duty anchor system firmly secures the unit in all types of ground conditions, including rock.
- Patented, field-proven pipeloading system features hydraulically powered shuttle grippers, hydraulic pipe row selection, and single pipeloading capability.

All Terrain horizontal directional drills have high drilling torque and a wide range of speeds, making them the most effective drills for the widest range of ground formations.

## DITCH WITCH JT100 All Terrain Directional Drill

It's serious business when you need a rock-drilling machine as big as the JT100 All Terrain, so you expect some serious power. The JT100 All Terrain delivers, with 100,000 lb (445 kN) of pullback supported by a monstrous, 268-hp (200-kW) engine. Because all of this earth-shaking power requires some serious stability, the JT100 All Terrain is equipped with an exclusive dual-pivot drill frame that allows the entry angles you need without compromising stability—or operator comfort—while drilling.





## SPECIFICATIONS

DIMENSIONS	U.S.	METRIC
Length	368 in	9.35 m
Height	110 in	2.79 m
Width	101 in	2.57 m



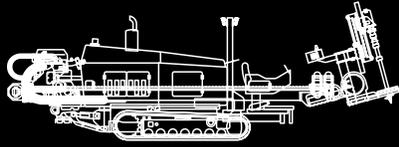
## KEY FEATURES

- A 268-hp (200 kW) engine delivers more raw power more efficiently to all machine functions so the installation can be completed faster.
- With 100,000 lb (445 kN) of pullback and 12,000 ft-lb (16 270 N-m) of torque, the JT100 is the ideal directional drilling unit for extended-range bores—up to 1500 ft (457 m)—and installations of large-diameter pipe.
- Standard, fully enclosed cab features instrument panel gauges that are positioned for visibility, conveniently placed controls, and an excellent view of the tool joint.
- The only rock drill in its class that enables the operator to transfer drill pipe from one box to another—and add or remove the upper pipe box—without additional support equipment, so the pipe box is never empty.
- Assisted makeup feature greatly extends the life of your drill pipe—one of your biggest downhole investments.
- (Photograph A) Exclusive dual-pivot drill frame allows steep entry angles without compromising machine stability or operator comfort.
- With its infinitely variable rotary drive, the JT100 All Terrain is the only rock drill in its class that can truly match spindle speed and torque to find that “sweet spot” that will power through infinitely varying ground formations.
- Double rack-and-pinion thrust drive is field-proven and heavy-duty enough to push through—and pull you through—the long, tough bores.
- (Photograph B) Optional onboard crane is designed to load and unload pipe boxes, anchor the unit, and handle drill pipe, reducing the need for additional support equipment.

## **DITCH WITCH JT4020 All Terrain Directional Drill**

For its weight and size, the 190-hp (142 kW) JT4020 All Terrain is the premier horizontal directional drill for larger product installations at mid-range distances (up to 1000 feet/305 m). The 190-hp (142 kW) JT4020 All Terrain has all the power you need, and a heavy-duty anchor system and adjustable drill frame that provide the stability you need in tough drilling conditions, including solid rock.





## SPECIFICATIONS

DIMENSIONS	U.S.	METRIC
Length	337 in	8.56 m
Height	96 in	2.44 m
Width	87 in	2.21 m



A



B

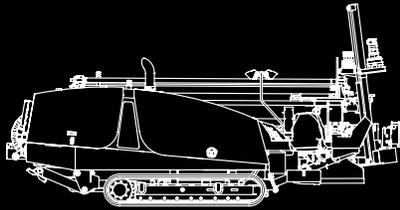
## KEY FEATURES

- (Photograph A) Instrument panel gauges are positioned for visibility, controls are conveniently placed, and a single lever controls drilling and backreaming adjustments.
- Re-engineered with 44 percent more thrust force, the JT4020 All Terrain enables you to drill further and faster than ever before.
- Field-proven, heavy-duty rack and pinion thrust drive with double rack offers minimum maintenance and maximum reliability.
- Drilling fluid flow: an on-board pump enables productive drilling at extended distances; normal flow rate can be operated simultaneously with thrust/pullback and rotation.
- Dual thrust drive motors provide exceptional low-speed drilling control as well as the higher speeds necessary for rapidly loading drill pipe.
- Adjustable drill frame design allows setup at normal drilling angles without raising the tracks off the ground.
- (Photograph B) Optional enclosed, climate-controlled cab offers ample legroom and keeps you dry and out of the elements.

## DITCH WITCH JT3020 All Terrain Directional Drill

The compact JT3020 All Terrain is an outstanding, utility-class directional drill capable of steering, drilling and backreaming up to 650 feet (198 m), depending on soil conditions. It is the smallest drill capable of installing product in rocky soil and solid rock. The 148-hp (110 kW) JT3020 All Terrain also requires very low drilling fluid volume, for minimal environmental impact.





## SPECIFICATIONS

DIMENSIONS	U.S.	METRIC
Length	221 in	5.61 m
Height	119 in	3.02 m
Width	80 in	2.03 m



## KEY FEATURES

- Mechanical motor system greatly expands the capacity to drill in tough ground conditions; most bores are accomplished with minimal drilling fluid flow, reducing jobsite cleanup time and expense.
- Re-engineered with 50 percent more thrust force, the JT3020 All Terrain enables you to drill further and faster than ever before.
- *(Photograph A)* Optional enclosed, climate-controlled cab offers ample legroom, a swiveling door for easy entry/exit, and an unrestricted view of drilling operations.
- *(Photograph B)* Rugged, long-wearing fluid pump delivers 42-viscosity drilling mud at 50 gpm (189 L/min).
- Open-top vise wrenches are angled toward the operator for an excellent view of the tool joint, and they require no daily maintenance.
- Heavy-duty anchor system uses as much torque as drills twice its size to anchor and hold in virtually any drilling condition; anchor motors don't have to be disconnected, so setup is quick and easy.
- JT3020 All Terrain is designed so that its drill pipe can level off at shallower depths.
- Industry-exclusive double-pivot drill frame allows steep entry angles without raising the tracks off the ground, for maximum stability while drilling.
- Quiet operation makes the JT3020 All Terrain an ideal choice for applications in noise-sensitive residential areas.

# DITCH WITCH All Terrain Air Hammer

Equipped with the All Terrain Air Hammer, Ditch Witch® All Terrain directional drills are capable of boring in the hardest rock.



## KEY FEATURES

- Compatible with the Ditch Witch JT4020 All Terrain and JT100 All Terrain directional drill, the All Terrain Air Hammer quickly and cost-effectively cuts through the hardest rock.
- Advanced technology enables the All Terrain Air Hammer to continuously drill as it is being steered, an exclusive All Terrain drill feature that results in superior productivity; other air hammers require stopping the drill rotation to change directions.
- All Terrain Air Hammer is designed to penetrate exceptionally hard rock, where rotary units and mud motors lose effectiveness.
- Peak performance is achieved when used with the Rockmaster Air Housing (included in All Terrain Air Hammer kit), which features larger air ports that help increase production.
- Both the JT4020 All Terrain and JT100 All Terrain have standard cruise control that maintains thrust and rotation settings, which reduces operator effort and increases productivity.
- Unlike other air hammers on the market, the All Terrain Air Hammer requires no oiler or drilling mud, which reduces overall cost of production (severe cases may require a foaming agent in the water).
- Minimal cost of spoils cleanup: used properly, the All Terrain Air Hammer leaves only dry cuttings and a relatively small amount of foam used downhole to remove cuttings.
- A very low flow rate—4 gpm (15 L/min)—means low fluid costs.
- All Terrain Air Hammer is lubricated by water and able to work in even the most sensitive environmental areas.
- This is an optional attachment to the standard All Terrain for working in extremely hard rock formations.

# All Terrain Air Hammer System

Everything you need is contained in a complete kit that includes:



5-inch (127 mm) Rockmaster Air Housing



All Terrain Air Hammer



6.5-inch (165 mm) convex bit with spherical inserts



Two slide pins



Convex bit jaw



Fluid pump/air adapter kit



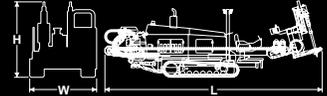
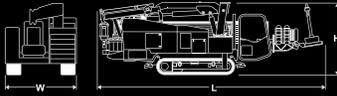
4-inch (102 mm) jaw assembly

## SPECIFICATIONS

## ALL TERRAIN AIR HAMMER

GENERAL	STANDARD	US	METRIC
STANDARD DRILL PIPE CONNECTION	3.5 IN API REG PIN		
OUTSIDE DIAMETER (MM & IN)		5.4	138.2
LENGTH WITHOUT BIT SHOULDER TO SHOULDER (MM & IN)		44.6	1131.8
LENGTH WITH BIT EXTENDED (MM & IN)		49.5	1256.3
LENGTH WITH BIT RETRACTED (MM & IN)		48.1	1220.7
WEIGHT WITHOUT BIT (KG & LB)		200	90.9
BIT SIZE* (MM & IN)		6.5	165.1
RECOMMENDED AIR PRESSURE (BAR & PSI)		350	24.1
MAKE-UP TORQUE (N•M & FT•LB)		6000	8124.0
RECOMMENDED FLUID FLOW	3-4 GPM/L		
AIR CONSUMPTION 24.1 BAR/350 PSI (L/S & SCFM)		973	458
BLOWS PER MINUTE	1770		

\*OTHER BITS ARE AVAILABLE.



## SPECIFICATIONS

## JT100 ALL TERRAIN

## JT4020 ALL TERRAIN

### DIMENSIONS

OVERALL MACHINE LENGTH*
OVERALL MACHINE WIDTH*
OVERALL MACHINE HEIGHT*
OPERATING WEIGHT
ENTRY ANGLE*
ANGLE OF APPROACH
ANGLE OF DEPARTURE

U.S.	METRIC
368 IN	9.35 M
101 IN	2.57 M
110 IN	2.79 M
47,260 LB	21 400 KG
10° - 15°	
13°	
17°	

U.S.	METRIC
337 IN	8.56 M
87 IN	2.21 M
96 IN	2.44 M
28,200 LB	12 790 KG
10° - 16°	
17°	
13°	

### ALL TERRAIN PIPE

LENGTH OF DRILL PIPE, NOMINAL*
DIAMETER OF DRILL PIPE, TOOL JOINT END*
DIAMETER OF DRILL PIPE*
MINIMUM BEND RADIUS
WEIGHT OF DRILL PIPE (WITH INNER PIPE)*
WEIGHT OF DRILL PIPE AND LARGE BOX
WEIGHT OF DRILL PIPE AND SMALL BOX

U.S.	METRIC
169.5 IN	4.31 M
4.5 IN	114 MM
3.63 IN	92 MM
205 FT	62 M
284 LB	130 KG
4430 LB (12 PIPE)	2010 KG (12 PIPE)
N/A	

U.S.	METRIC
171 IN	4.34 M
4.13 IN	105 MM
3.63 IN	92 MM
205 FT	62 M
264 LB	120 KG
5580 LB (18 PIPE)	2530 KG (18 PIPE)
3150 LB (9 PIPE)	1430 KG (9 PIPE)

### POWER PIPE (FOR DIRT DRILLING)

LENGTH OF DRILL PIPE, NOMINAL*
DIAMETER OF DRILL PIPE, TOOL JOINT END*
DIAMETER OF DRILL PIPE*
MINIMUM BEND RADIUS*
WEIGHT OF DRILL PIPE*
WEIGHT OF DRILL PIPE AND LARGE BOX
WEIGHT OF DRILL PIPE AND SMALL BOX

U.S.	METRIC
177 IN	4.5 M
4 IN	102 MM
3.63 IN	92 MM
205 FT	62 M
229 LB	104 KG
3760 LB (12 PIPE)	1710 KG (12 PIPE)
N/A	

U.S.	METRIC
177 IN	4.5 M
3.5 IN	89 MM
2.81 IN	71 MM
185 FT	56 M
158 LB	72 KG
6000 LB (32 PIPE)	2720 KG (32 PIPE)
3100 LB (16 PIPE)	1410 KG (16 PIPE)

### OPERATION

MAXIMUM SPINDLE SPEED*
MAXIMUM SPINDLE SPEED (AT INNER SPINDLE)*
MAXIMUM SPINDLE TORQUE
MAXIMUM SPINDLE TORQUE (AT INNER SPINDLE)
CARRIAGE THRUST TRAVEL SPEED*
CARRIAGE PULLBACK TRAVEL SPEED*
THRUST FORCE*
PULLBACK FORCE
BORE DIAMETER
BACKREAM DIAMETER
GROUND TRAVEL SPEED (FORWARD)*
GROUND TRAVEL SPEED (REVERSE)*

U.S.	METRIC
210 RPM	
270 RPM	
12,000 FT•LB	16 300 N•M
2000 FT•LB	2700 N•M
150 FPM	46 M/MIN
150 FPM	46 M/MIN
70,000 LB	311 KN
100,000 LB	445 KN
6.25 IN	159 MM
SOIL DEPENDENT	
3.6 MPH	5.8 KM/H
3.6 MPH	5.8 KM/H

U.S.	METRIC
240 RPM	
250 RPM	
5000 FT•LB	6800 N•M
2000 FT•LB	2700 N•M
120 FPM	37 M/MIN
120 FPM	37 M/MIN
36,000 LB	160 KN
40,000 LB*	178 KN*
6.25 IN	159 MM
SOIL DEPENDENT	
2.5 MPH	4 KM/H
2.5 MPH	4 KM/H

### POWER

ENGINE
FUEL
COOLING MEDIUM
INJECTION
ASPIRATION
NUMBER OF CYLINDERS
DISPLACEMENT
BORE
STROKE
MANUFACTURER'S GROSS POWER RATING**
RATED SPEED
EMISSIONS COMPLIANCE

U.S.	METRIC
DEUTZ TCD2013L06-2V	
DIESEL	
LIQUID	
DIRECT	
TURBOCHARGED & CHARGE AIR COOLED	
6	
436 IN <sup>3</sup>	7.15 L
4.25 IN	108 MM
5.1 IN	130 MM
268 HP	200 KW
2300 RPM	
EPA TIER 3	EU STAGE IIIA

U.S.	METRIC
CUMMINS QSB6.7	
DIESEL	
LIQUID	
DIRECT	
TURBOCHARGED & CHARGE AIR COOLED	
6	
409 IN <sup>3</sup>	6.7 L
4.21 IN	107 MM
4.88 IN	124 MM
190 HP	142 KW
2400 RPM	
EPA TIER 3	EU STAGE IIIA

### DRILLING FLUID SYSTEM

MAXIMUM DRILLING FLUID PRESSURE*
MAXIMUM DRILLING FLUID FLOW*

U.S.	METRIC
1000 PSI	69 BAR
120 GPM	450 L/MIN

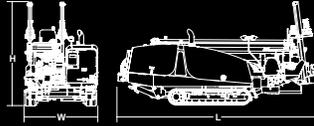
U.S.	METRIC
1300 PSI	90 BAR
70 GPM	260 L/MIN

### FLUID CAPACITIES

FUEL TANK
HYDRAULIC RESERVOIR

U.S.	METRIC
97 GAL	370 L
47 GAL	180 L

U.S.	METRIC
55 GAL	208 L
36 GAL	136 L



## SPECIFICATIONS

## JT3020 ALL TERRAIN

	U.S.	METRIC
<b>DIMENSIONS</b>		
OVERALL MACHINE LENGTH*	221 IN	5.61 M
OVERALL MACHINE WIDTH*	80 IN	2.03 M
OVERALL MACHINE HEIGHT*	119 IN	3.02 M
OPERATING WEIGHT	22,200 LB	10 070 KG
ENTRY ANGLE*	10° - 16°	
ANGLE OF APPROACH	19°	
ANGLE OF DEPARTURE	18°	
<b>ALL TERRAIN PIPE</b>		
LENGTH OF DRILL PIPE, NOMINAL*	112 IN	2.84 M
DIAMETER OF DRILL PIPE, TOOL JOINT END*	3.25 IN	83 MM
DIAMETER OF DRILL PIPE*	2.23 IN	57 MM
MINIMUM BEND RADIUS	145 FT	44 M
WEIGHT OF DRILL PIPE (WITH INNER PIPE)*	100 LB	45 KG
WEIGHT OF DRILL PIPE AND LARGE BOX	4800 LB (35 PIPE)	2180 KG (35 PIPE)
WEIGHT OF DRILL PIPE AND SMALL BOX	3100 LB (20 PIPE)	1410 KG (20 PIPE)
<b>POWER PIPE (FOR DIRT DRILLING)</b>		
LENGTH OF DRILL PIPE, NOMINAL*	118 IN	3 M
DIAMETER OF DRILL PIPE, TOOL JOINT END*	3 IN	76 MM
DIAMETER OF DRILL PIPE*	2.38 IN	60 MM
MINIMUM BEND RADIUS*	155 FT	47 M
WEIGHT OF DRILL PIPE	90 LB	41 KG
WEIGHT OF DRILL PIPE AND LARGE BOX	5500 LB (48 PIPE)	2500 KG (48 PIPE)
WEIGHT OF DRILL PIPE AND SMALL BOX	3200 LB (24 PIPE)	1450 KG (24 PIPE)
<b>OPERATION</b>		
MAXIMUM SPINDLE SPEED*	225 RPM	
MAXIMUM SPINDLE SPEED (AT INNER SPINDLE)*	400 RPM	
MAXIMUM SPINDLE TORQUE	4000 FT•LB	5420 N•M
MAXIMUM SPINDLE TORQUE (AT INNER SPINDLE)	800 FT•LB	1080 N•M
CARRIAGE THRUST TRAVEL SPEED*	120 FPM	37 M/MIN
CARRIAGE PULLBACK TRAVEL SPEED*	120 FPM	37 M/MIN
THRUST FORCE*	24,800 LB	110 KN
PULLBACK FORCE	30,000 LB*	133 KN*
BORE DIAMETER	4.5 IN	114 MM
BORE DIAMETER (W/ ROCKMASTER 822)	4.75 IN	121 MM
BORE DIAMETER (W/ ROCKMASTER 86)	5.5 IN	140 MM
BACKREAM DIAMETER	SOIL DEPENDENT	
GROUND TRAVEL SPEED (FORWARD)*	2.4 MPH	3.9 KM/H
GROUND TRAVEL SPEED (REVERSE)*	2.2 MPH	3.5 KM/H
<b>POWER</b>		
ENGINE	CUMMINS QSB4.5	
FUEL	DIESEL	
COOLING MEDIUM	LIQUID	
INJECTION	DIRECT	
ASPIRATION	TURBOCHARGED & CHARGE AIR COOLED	
NUMBER OF CYLINDERS	4	
DISPLACEMENT	275 IN <sup>3</sup>	4.5 L
BORE	4.02 IN	102 MM
STROKE	5.42 IN	138 MM
MANUFACTURER'S GROSS POWER RATING**	148 HP	110 KW
RATED SPEED	2300 RPM	
PEAK GROSS POWER @ 2000 RPM	156 HP	116 KW
EMISSIONS COMPLIANCE	EPA TIER 3	EU STAGE IIIA
<b>DRILLING FLUID SYSTEM</b>		
MAXIMUM DRILLING FLUID PRESSURE*	1500 PSI	103 BAR
MAXIMUM DRILLING FLUID FLOW*	50 GPM	189 L/MIN
<b>FLUID CAPACITIES</b>		
FUEL TANK	42 GAL	159 L
HYDRAULIC RESERVOIR	27 GAL	102 L



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