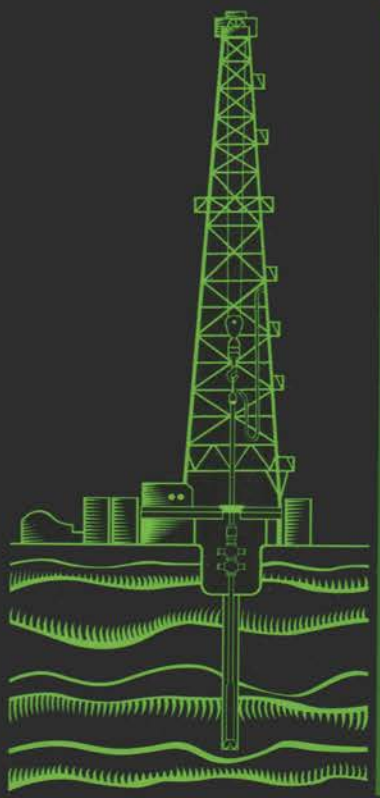
Toro Downhole Tools



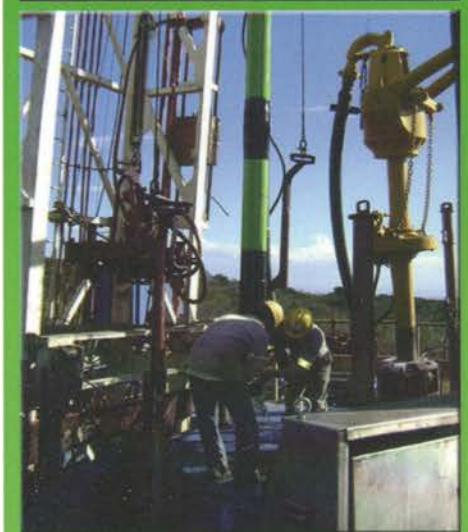
DRILLING TOOLS CATALOG

Toro Downhole Tools

Unleash the Power of the Bull

Sales, Rental, Technical & Engineering Services

Directional
Vertical
Horizontal
Workover
Coiled Tubing
Coalbed Methane
Geothermal
Sacrificial
Minning



Drilling Motors
Motor Optimizers
Shock Subs
Data Loggers
Stabilizers
Drilling Jars
Jar Accelerators
Fishing Tools
Service Equipment

16626 FM 2920, Tomball, TX 77377 USA Toll Free: 1-888-662-TORO www.torotools.com

Toro Downhole Tools

Toro Downhole Tools was established in 2007 to provide quality performance downhole equipment, services and support to the oil and gas industry. With over 100 years of combined downhole drilling, engineering, design, manufacturing and service experience, Toro Downhole Tools has a unique staff of highly experienced and knowledgeable personnel.

Toro Downhole Tools specializes in the sales, lease, rental, services and support of downhole drilling equipment worldwide. Our primary line of downhole drilling products includes:

- **Downhole Drilling Mud Motors (OD 1-11/16" to 11-1/4")**
- **Drilling Motor Optimizers**
- **Downhole Data Logger**
- **Shock Subs (Hydraulic)**
- **Drilling Jars (Hydraulic, Hydraulic-Mechanical, Mechanical)**
- **Jar Accelerators**
- **Drill Collars (Straight, Spiral, Non-Mag)**
- **Stabilizers (Straight, Spiral, Non-Mag, Integral, Replaceable Sleeve)**
- **Subs (Bumper, Crossover, Dump, Float, Junk, Lift, Orientation)**
- **Casing Scrapers**
- **Roller & Under Reamers**
- **Hole Openers**
- **Kelly Valves, Safety Valves & Joints**
- **Fishing Tools (Baskets, Jars, Hooks, Magnets, Mills, Overshot, Spears)**
- **Cutters (Mechanical Internal & External), Hydraulic Multi-String)**
- **Service Equipment (Hydraulic Breakout Unit, Hydraulic Jar Tester)**

Toro currently maintains a domestic fleet of over 120 tools and has sold tools to over two dozen international countries. Toro has recently moved into a new 25,000 square foot corporate headquarters and service facility located in Tomball, Texas, USA.

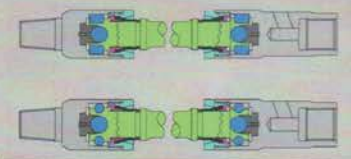
Having established itself as one of the leading downhole drilling companies in the market, Toro Downhole Tools is uniquely positioned to provide our customers the most dependable, reliable and quality products in the industry.

Toro Downhole Tools has a long-term commitment to offer superior downhole equipment to the worldwide oil and gas industry while providing the best customer service and technical support available.

Toro Downhole Tools
16626 FM 2920
Tomball, Texas 77377 USA
Toll Free: 1-888-662-TORO
Tel: (+1) 281-580-8676
Fax: (+1) 281-580-8675
Website: www.torotools.com

Toro Services

Toro Downhole Tools is continuously expanding our domestic and international services to provide a full suite of solutions for all our customers. Our goal is to become a one-stop shop where we are capable of offering all downhole drilling tool services to meet our customer's needs. Below is a list of drilling services we currently offer:



- **ENGINEERING & DESIGN**
- **MACHINING**
- **RENTAL**
- **MAINTENANCE & REPAIR**
- **SALES**
- **TECHNICAL SUPPORT**
- **TRAINING**

Our customers can be assured that when they purchase or rent a Toro tool, they are backed by a team of professional and qualified experts. Toro technical staff also provide the following additional services:

- 24 hour on-call support
- Custom tool design
- Customer requested modifications
- Technical operations & service manuals
- Notice bulletins
- Troubleshooting
- Field incident reports
- Technical presentations
- Training with tool operation & service equipment
- Support and assistance with start-up service facility

Next time your looking for downhole drilling equipment, please consider Toro Downhole Tools as your complete solution provider for downhole drilling equipment worldwide.

Toro Downhole Tools
16626 FM 2920
Tomball, Texas 77377 USA
Toll Free: 1-888-662-TORO
Tel: (+1) 281-580-8676
www.torotools.com

Note: Technical specifications are derived from theoretical, calculated, and/or controlled testing environment. Actual performance may vary.

Toro Downhole Tools — Downhole Drilling Motors

Toro Downhole Tools offers a complete line of quality and reliable drilling motors, shock subs, and drilling jars. Our tools are designed for many drilling applications including:

- Directional Drilling
- Vertical / Performance Drilling
- Workover / Coil Tubing Drilling
- Horizontal Drilling (HDD)
- Coal-Bed Methane Drilling
- Disposable / Sacrificial BHA

Toro Downhole motors utilize a field proven design for maximum power and torque. Our motors have been engineered for increased drilling penetration and durability. All Toro motors include the following components:

- Upper crossover sub with available float bore
- Safety Catch System for added security
- Extended Power section with performance stator elastomer
- Articulated CV coupling for smooth operation
- Adjustable Bend Housing (ABH) easily adjusted in the field
- All-Metal Bearing Section reliable, durable, and field proven
- Forged Output Shaft with Bit Box for maximum strength

MOTOR OD (IN)	MODEL NUMBER	FULL LOAD BIT SPEED (RPM)	FLOW RATE (GPM)	PEAK TORQUE (FT-LBS)	REV/GAL
1-11/16	169-56-2	140 - 385	25 - 45	105	8.56
	169-56-4.5	70 - 275	25 - 45	225	6.11
2-1/16	206-45-3	70 - 430	20 - 50	160	8.60
	206-45-7	100 - 725	20 - 50	310	14.50
	206-56-3	50 - 240	20 - 50	220	5.50
2-7/8	288-56-3	100 - 260	40 - 100	690	2.60
	288-78-4	100 - 350	60 - 120	1,000	2.92
3-1/8	313-56-3	100 - 260	40 - 100	690	2.60
	313-78-4	100 - 350	60 - 120	1,000	2.92
3-1/2	350-56-3	100 - 240	70 - 160	960	1.50
	350-78-4	100 - 250	70 - 160	1,300	1.56
3-3/4	375-12-4	200 - 550	60 - 140	650	3.93
	375-56-3	100 - 260	80 - 190	1,340	1.37
	375-910-4	50 - 150	60 - 140	1,550	1.07
4-3/4	475-56-3	70 - 175	100 - 250	2,110	0.70
	475-56-4	70 - 175	100 - 250	2,810	0.70
	475-56-5	70 - 175	100 - 250	3,515	0.70
	475-56-6	70 - 175	100 - 250	4,220	0.70
	475-78-3	40 - 150	100 - 250	2,840	0.60
	475-910-2	50 - 175	100 - 250	2,500	0.70
	475-910-3	70 - 175	100 - 250	3,750	0.70
	475-910-3.5	20 - 70	100 - 250	5,950	0.28
	475-910-4	70 - 175	100 - 250	5,000	0.70
5-0	500-56-3	140 - 280	150 - 350	2,110	0.80
	500-56-4	140 - 280	150 - 350	2,810	0.80
	500-56-5	140 - 280	150 - 350	3,515	0.80
	500-78-4	130 - 260	200 - 400	3,620	0.65
	500-910-4	100 - 230	200 - 400	5,000	0.57
5-1/2	550-56-4	100 - 200	200 - 400	4,220	0.50
6-1/2	650-12-4	150 - 400	150 - 300	1,000	1.33
	650-56-4	75 - 180	200 - 500	4,910	0.36
	650-56-5	75 - 180	200 - 500	6,630	0.36
	650-56-6	75 - 180	200 - 500	6,900	0.36
	650-910-3	20 - 70	200 - 500	12,000	0.14
	650-910-4	50 - 180	200 - 500	11,000	0.36
6-3/4	675-12-4	100 - 400	250 - 600	2,510	0.67
	675-34-6	90 - 300	250 - 600	7,500	0.50
	675-56-4	80 - 180	250 - 600	5,540	0.30
	675-56-5	80 - 180	250 - 600	6,700	0.30
	675-56-6	80 - 180	250 - 600	7,850	0.30
	675-78-5	70 - 150	250 - 600	9,100	0.25
	675-910-2	50 - 180	250 - 600	8,000	0.30
	675-910-3	20 - 70	250 - 600	13,500	0.14
	675-910-4	50 - 180	250 - 600	12,500	0.30
	675-910-5	50 - 180	250 - 600	15,000	0.30
8-0	800-56-4	80 - 180	300 - 900	8,500	0.20
	800-56-5	80 - 180	300 - 900	14,460	0.20
	800-56-6	80 - 180	300 - 900	17,300	0.20
	800-910-3	20 - 70	300 - 900	18,000	0.08
	800-910-4	50 - 180	300 - 900	14,800	0.20
8-1/2	850-56-4	80 -180	400 - 1000	11,660	0.18
	850-56-5	80 -180	400 - 1000	14,460	0.18
	850-56-6	80 -180	400 - 1000	17,300	0.18
9-5/8	963-34-6	100 - 250	500 - 1200	22,800	0.21
	963-56-4	80 - 180	500 - 1200	16,200	0.15
	963-56-5	80 - 180	500 - 1200	16,920	0.15
	963-56-6	80 - 180	500 - 1200	17,100	0.15
11-1/4	1125-34-4	80 - 180	1000 - 1500	17,500	0.12

Toro Downhole Tools

16626 FM 2920
Tomball, Texas 77377 USA
Toll Free: 1-888-662-TORO
Tel: (+1) 281-580-8676
www.torotools.com

Note: Technical specifications are derived from theoretical, calculated, and/or controlled testing environment. Actual performance may vary.

Drilling Motor Design

TORO DRILLING MOTOR DESIGN

The drilling motor is a hydraulically actuated tool that converts hydraulic energy into mechanical energy. The purpose of the motor is to generate the rotational speed (RPM) and torque needed to operate the drill bit. The drilling motor takes its energy from a succession of isolated working fluid volumes that force their way, under pressure, through the motor by displacing or deforming the spaces in which they are confined.

The downhole drilling motor has undergone substantial changes and improvements over the past 50 years making it a proven and reliable tool even in the most rigorous of drilling environments. Today, most all drilling applications have become a planned routine operation. The technological advances in downhole drilling tools have helped to lower the cost of drilling a well. With the development of durable and reliable downhole tools, the odds of bringing in a successful well have been improved significantly from years past. The Toro Downhole Tools (Toro) line of drilling motors is well suited for the drilling applications of today.

The Toro drilling motor is a positive-displacement motor (PDM). As drilling fluid is pumped down the drill-string, the fluid flows through the cavities in the power section. The fluid pressure reacts against the lobes of the rotor and the walls of the stator causing the rotor to rotate. Torque is then transmitted through the coupling section, bearing section and down to the drill bit.

The Toro drilling motor is comprised of 6 basic components:

- Top Sub
- Safety Catch
- Power Section
- Coupling Section
- Bearing Section
- Bit Box

Toro Downhole Tools designs, sells, rents and services all our tools. Each Toro drilling motor can be purchased as an entire tool or components can be purchased separately. Through Toro's engineering group, Toro can assist in incorporating any Toro drilling motor component into your existing fleet of motors. For more information, please contact your Toro representative or our main office below.

Toro Downhole Tools
16626 FM 2920
Tomball, Texas 77377 USA
Toll Free: 1-888-662-TORO
Tel: (+1) 281-580-8676
www.torotools.com

Toro Downhole Tools

Model MO Motor Optimizer

The Toro Model MO Motor Optimizer is a new tool designed to get optimum power and torque from a downhole motor. The Motor Optimizer improves the rate of penetration (ROP) by controlling both the vertical and rotational reactive forces of the motor. The Toro Model MO Motor Optimizer helps to improve drilling performance by maintaining the weight on bit (WOB) on the motor thus keeping the drill bit firmly on bottom. Using a Toro Motor Optimizer will also extend the life of the downhole motor since it helps to prevent the motor from being overworked. The Toro Motor Optimizer is a self actuated hydraulic tool that requires no special handling or field adjustments. The Toro Model MO Motor Optimizer provides the following features:

- **Controls Downhole Motor Vertical Reactive Forces**
- **Controls Downhole Motor Rotational Reactive Torque**
- **Optimizes the WOB applied to the Downhole Motor**
- **Optimizes the ROP**

Motor Optimizer Model	MO-475	MO-625	MO-650	MO-700	MO-800	MO-900	MO-950
OD (in)	4 3/4	6 1/4	6 1/2	7.0	8.0	9.0	9 1/2
ID (in)	1 1/2	1 3/4	1 3/4	2 1/4	2 1/2	2 3/4	2 3/4
Length (ft)	14.7	16.9	16.9	18.4	18.1	17.9	17.9
Weight (lbs)	705	1,213	1,323	1,543	2,205	2,866	3,307
Standard Connection	3-1/2 IF NC 38	4 IF NC 46	4-1/2 IF NC 50	4-1/2 IF NC 50	6-5/8 REG	7-5/8 REG	7-5/8 REG
Maximum WOB Load (lb)	44,962	76,435	76,435	89,924	107,908	121,397	121,397
Maximum Torque Load (ft-lb)	7,376	11,063	11,063	11,063	14,751	14,751	14,751
Maximum Pull to Yield (lb)	224,809	337,213	337,213	337,213	440,626	440,626	440,626

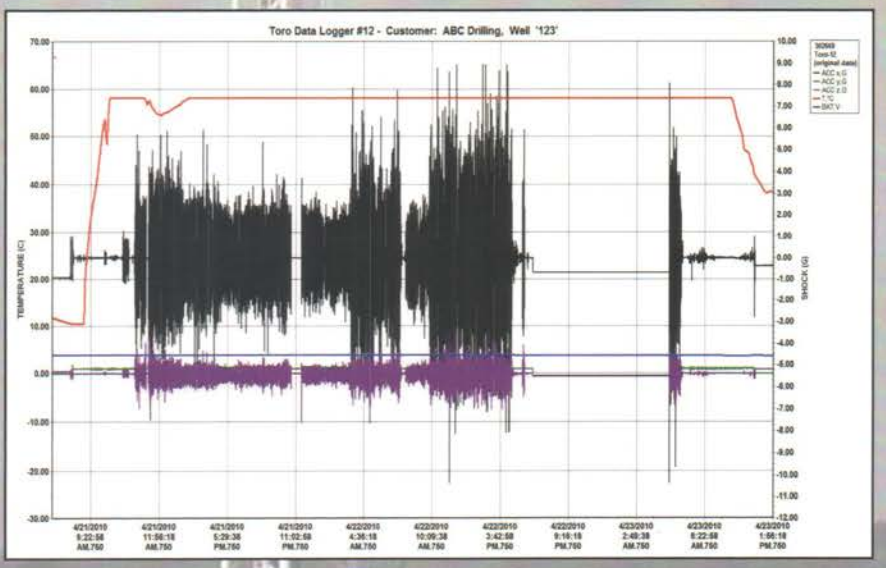
Toro Downhole Tools

16626 FM 2920
Tomball, Texas 77377 USA
Toll Free: 1-888-662-TORO
Tel: (+1) 281-580-8676
www.torotools.com

Note: Technical specifications are derived from theoretical, calculated, and/or controlled testing environment. Actual performance may vary.

Model DL-10 / DL-15
Downhole Data Logger

The Toro Downhole Data Logger is a special sub joint that is able to record downhole temperature, time, and downhole vibration forces. It can be easily installed anywhere on the drill string or onto any downhole tool, such as a drill collar or drilling motor. The Toro Downhole Data Logger includes a high resolution 3-axis acceleration sensor, temperature sensor, and internal clock. It is capable of recording up to ±15 g of shock force and up to 1600 measurements per second of acceleration (shock, vibrations) in three directions. Due to its high-performance 3-axis accelerometer, the Toro Downhole Data Logger has an extremely low power requirement which allows it to operate up to six months of recording duration. The internal memory is capable of storing over two million measurement parameters which is sufficient for over 10,000 shock readings. The robust Toro Downhole Data Logger is fully self contained and requires no adjustments or special handling in the field. It is an ideal tool for determining temperature and vibration of your drill string and bottom hole assembly.



Toro Downhole Data Logger Technical Specifications

Tool OD Sizes:	For 2-7/8" OD and larger tools	For 6-1/2" OD and larger tools
Measured Parameters:	3-Axis Acceleration/Shock (G) Temperature (C) Battery Voltage (V) Time/Date (MM:DD:YYY:hh:mm:ss)	3-Axis Acceleration/Shock (G) Temperature (C) Battery Voltage (V) Time/Date (MM:DD:YYY:hh:mm:ss)
Acceleration Range:	± 10 G	± 15 G
Acceleration Accuracy:	± 0.15 G	± 0.15 G
Acceleration Recording Rate:	50/sec to every 12 hours	1600/sec to every 12 hours
Temperature Range:	0 to 250 °F (0 to 120 °C)	0 to 250 °F (0 to 120 °C)
Temperature Accuracy:	± 0.2 °F (± 0.2 °C)	± 0.2 °F (± 0.2 °C)
Temperature Recording Rate:	1/sec to every 12 hours	1/sec to every 12 hours
Memory Capacity:	Over 2,000,000 measurements	Over 2,000,000 measurements
Recording Duration:	3 months at a measurement rate of 1/minute	6 months at a measurement rate of 1/minute

Toro Downhole Tools

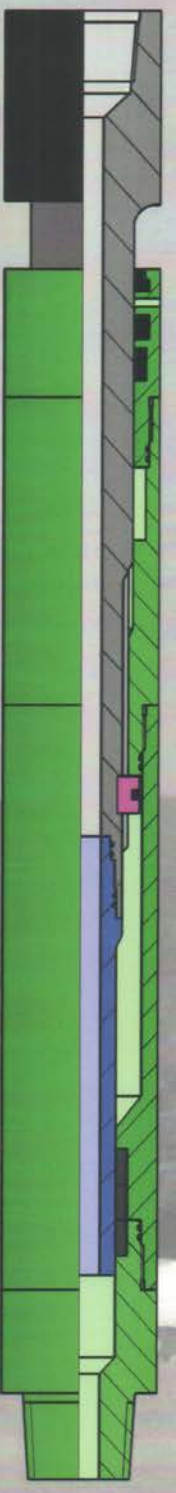
16626 FM 2920
Tomball, Texas 77377 USA
Toll Free: 1-888-662-TORO
Tel: (+1) 281-580-8676
www.torotools.com

Note: Technical specifications are derived from theoretical, calculated, and/or controlled testing environment. Actual performance may vary.

Model SH
Hydraulic Shock Subs

The Toro Model SH Shock Subs are designed to provide maximum protection against BHA vibrational damage while keeping the drill bit firmly on the bottom. Toro shock subs are engineered to reduce severe vibrations caused by hard formation drilling. By eliminating drill string bounce, the Toro Shock Sub helps to reduce drill string connection fatigue and prolong drill string life.

The Toro Model SH Shock Subs are a hydraulic design for maximum flexibility. The Toro Shock Sub features a spline assembly encased by a hydraulic piston and reservoir. The SH shock subs are fully sealed preventing the drilling fluid from contacting the internal mechanical components.



Shock Sub Model	Shock Sub Type	OD (in)	ID (in)	Length (ft)	Weight (lbs)	Standard Connection	Maximum Compression Load (lbs)	Maximum Pull to Yield (lbs)
SH-475	Hydraulic	4 3/4	1 1/2	13.0	617	3-1/2 IF NC 38	59,574	224,809
SH-625	Hydraulic	6 1/4	1 3/4	13.5	882	4 IF NC 46	77,109	337,213
SH-650	Hydraulic	6 1/2	1 3/4	13.5	1,058	4 IF NC 46	77,109	337,213
SH-700	Hydraulic	7.0	2 1/4	12.5	1,235	4-1/2 IF NC 50	88,125	337,213
SH-800	Hydraulic	8.0	2 1/2	13.5	1,631	6-5/8 REG	110,156	449,618
SH-900	Hydraulic	9.0	2 3/4	12.5	2,161	7-5/8 REG	121,397	449,618
SH-950	Hydraulic	9 1/2	2 3/4	12.5	2,425	7-5/8 REG	121,397	449,618

Toro Downhole Tools
16626 FM 2920
Tomball, Texas 77377 USA
Toll Free: 1-888-662-TORO
Tel: (+1) 281-580-8676
www.torotools.com

Toro Downhole Tools

Model H
Hydraulic Drilling Jars

The Toro Model H Full Hydraulic Drilling Jar has been specifically engineered to withstand the rugged abuse of demanding applications. It is a versatile tool utilizing a field proven design for the utmost reliability. The Model H Drilling jar is a single unit (one -piece) that is hydraulically operated to deliver a heavy upward or downward (double-acting) jarring action.

Both the up and down jarring forces are actuated hydraulically. The jar is designed to deliver a 1 to 2 minute delay before releasing the jarring force. The jar is fully hydraulic with no mechanical release components.

The single unit design makes it easy to transport and handle at the rig location. The Model H jar has a minimum of internal components for maximum life and reliability. All components are sealed to keep wear at a minimum and to prevent well fluid contamination.

Toro Model H Hydraulic Jar Features:

- Up and Down Jarring in One Unit
- Fully Hydraulic—No Mechanical Releasing
- Hydraulic Release Up
- Hydraulic Release Down
- 1-2 Minute Up and Down Jarring Delay
- Simple and Reliable Design

Drilling Jar Model		H-475	H-650	H-675	H-700	H-800	H-900	H-950
Drilling Jar Type		Full Hydraulic	Full Hydraulic	Full Hydraulic	Full Hydraulic	Full Hydraulic	Full Hydraulic	Full Hydraulic
OD (in)		4 3/4	6 1/2	6 3/4	7.0	8.0	9.0	9 1/2
ID (in)		2.0	2 3/4	2 3/4	3.0	3.0	3.0	3 1/4
Length (ft)		31.0	31.0	31.0	31.0	34.5	34.5	34.5
Weight (lbs)		1,235	2,800	2,943	3,876	4,608	6,195	6,415
Standard Connections		3-1/2 IF NC 38	4-1/2 IF NC 50	4-1/2 IF NC 50	4-1/2 IF NC 50	6-5/8 REG	7-5/8 REG	7-5/8 REG
Total Stroke	Up (in)	5.5	7.5	7.5	7.5	7.5	7.5	7.5
	Down (in)	7.0	7.5	7.5	7.5	7.5	7.5	7.5
Max. Release Load (±15%)	Up (lbs)	58,450	89,924	89,924	89,924	89,924	89,924	89,924
	Down (lbs)	38,218	49,458	49,458	49,458	49,458	49,458	49,458
Max. Pull Load (lbs)		449,618	899,236	899,236	899,236	1,573,663	1,978,319	1,978,319
Max. Torsional Load (lbs-ft)		20,652	59,005	59,005	118,010	162,263	184,390	184,390
Time Delay (sec)		40 - 180	40 - 180	40 - 180	40 - 180	40 - 180	40 - 180	40 - 180

Toro Downhole Tools
16626 FM 2920
Tomball, Texas 77377 USA
Toll Free: 1-888-662-TORO
Tel: (+1) 281-580-8676
www.torotools.com

Note: Technical specifications are derived from theoretical, calculated, and/or controlled testing environment. Actual performance may vary.

Model HM
Hydro-Mechanical Drilling Jars

The Toro Model HM Hydro-Mechanical Drilling Jar has been specifically engineered to withstand the rugged abuse of demanding applications. It is a versatile tool utilizing a field proven design for the utmost reliability. The Model HM Drilling Jar consists of single unit for both up and down jarring action.

Up jarring is actuated hydraulically and is designed to deliver a delayed jar action while downward jarring is mechanically actuated designed to deliver an instant jar action.

The Toro Model HM Hydro-Mechanical Drilling Jar is a single unit design making it easy to transport and handle at the rig location. All internal components are sealed in an oil bath to keep wear at a minimum and to prevent well fluid contamination.

Toro Model HM Drilling Jar Features:

- Up and Down Jarring in One Unit
- Mechanical Release Down
- Fully Hydraulic Release Up
- Hydraulic Delay when Jarring Up
- Simple and Reliable Design
- No Safety Clamps Required
- No Special Handling Required

Drilling Jar Model		HM-475	HM-650	HM-675	HM-800	HM-900
Drilling Jar Type		Hydraulic Mechanical	Hydraulic Mechanical	Hydraulic Mechanical	Hydraulic Mechanical	Hydraulic Mechanical
OD (in)		4 3/4	6 1/2	6 3/4	8.0	9.0
ID (in)		2.0	2 1/4	2 1/4	2 3/4	3.0
Length (ft)		14.8	17.0	17.0	18.9	20.1
Weight (lbs)		631	1,407	1,764	2,511	3,532
Standard Connections		3-1/2 IF NC 38	4-1/2 IF NC 50	4-1/2 IF NC 50	6-5/8 REG	7-5/8 REG
Total Stroke	Up (in)	9.0	8.8	8.8	9.5	12.0
	Down (in)	5.9	5.9	5.9	6.9	6.2
Max. Release Load (±15%)	Up (lbs)	85,120	161,280	161,280	244,160	212,800
	Down (lbs)	56,202	112,404	112,404	134,885	146,126
Max. Pull Load (lbs)		314,733	494,580	494,580	809,312	944,198
Max. Torsional Load (lbs-ft)		9,588	11,063	11,063	14,751	16,226

Toro Downhole Tools
16626 FM 2920
Tomball, Texas 77377 USA
Toll Free: 1-888-662-TORO
Tel: (+1) 281-580-8676
www.torotools.com

Note: Technical specifications are derived from theoretical, calculated, and/or controlled testing environment. Actual performance may vary.

Model HM2
Hydro-Mechanical Drilling Jars

The Toro Model HM2 Hydro-Mechanical Drilling Jar has been specifically engineered to withstand the rugged abuse of demanding applications. It is a versatile tool utilizing a field proven design for the utmost reliability. The Model HM2 Drilling Jar consists of two independent sections. The upper section is a hydraulic operated unit designed to deliver a heavy upward jarring action while the lower section is a mechanically operated unit designed to deliver a heavy downward jarring action.

The Toro Model HM2 Hydro-Mechanical Drilling Jar sections may be run together as a single unit or may be installed as separate units at different locations within the drill string. The two section design makes it easy to transport and handle at the rig location. All internal components are sealed in an oil bath to keep wear at a minimum and to prevent well fluid contamination.

Drilling Jar Model		HM2-475	HM2-575	HM2-625	HM2-650	HM2-700	HM2-775	HM2-800	HM2-900
Drilling Jar Type		Hydraulic Mechanical	Hydraulic Mechanical	Hydraulic Mechanical	Hydraulic Mechanical	Hydraulic Mechanical	Hydraulic Mechanical	Hydraulic Mechanical	Hydraulic Mechanical
OD (in)		4 3/4	5 3/4	6 2/7	6 1/2	7.0	7 3/4	8.0	9.0
ID (in)		1 3/4	2 1/4	2 1/4	2 1/4	2 3/4	2 3/4	2 3/4	3.0
Section Length	Upper (ft.)	17.4	18.8	17.6	17.6	17.8	18.1	18.1	17.9
	Lower (ft.)	15.6	16.4	17.1	17.1	17.1	17.2	17.2	18.2
Total Weight (lbs)		1,433	1,918	2,403	2,646	2,976	4,299	4,683	5,732
Standard Connections		3-1/2 IF NC 38	4 -1/2 FH	4 IF NC 46	4 IF NC 46	4-1/2 IF NC 50	6-5/8 REG	6-5/8 REG	7-5/8 REG
Total Stroke	Up (in)	12.0	13.1	13.6	13.6	13.6	14.5	14.5	9.5
	Down (in)	7.0	7.1	7.0	7.0	7.0	7.0	7.0	10.0
Max. Release Load (±15%)	Up (lbs)	60,698	101,164	123,645	123,645	123,645	168,607	168,607	224,809
	Down (lbs)	56,202	89,924	112,404	112,404	123,645	134,885	134,885	146,126
Max. Pull Load (lbs)		314,733	449,618	494,580	494,580	517,061	562,022	562,022	629,465
Max. Torsional Load (lbs-ft)		9,588	11,063	11,063	11,063	11,063	13,276	14,751	16,226

Hydraulic Up Jar Section

Mechanical Down Jar Section

Toro Downhole Tools
16626 FM 2920
Tomball, Texas 77377 USA
Toll Free: 1-888-662-TORO
Tel: (+1) 281-580-8676
www.torotools.com

Note: Technical specifications are derived from theoretical, calculated, and/or controlled testing environment. Actual performance may vary.

Model M
Mechanical Drilling Jars

The Toro Model M Mechanical Drilling Jar has been specifically engineered to withstand the rugged abuse of demanding applications. It is a versatile tool utilizing a field proven design for the utmost reliability. The jar is a mechanically operated single unit designed to deliver a heavy upward or downward jarring action.

The single unit design makes it easy to transport and handle at the rig location. All internal components are sealed in an oil bath to keep wear at a minimum and to prevent well fluid contamination.

Toro Model M Drilling Jar Features:

- Up and Down Jarring in One Unit
- Fully Mechanical Release Up
- Fully Mechanical Release Down
- Simple and Reliable Design
- Suitable for High Temp Applications
- No Safety Clamps Required
- No Special Handling Required

Drilling Jar Model		M-625	M-650	M-700	M-800
Drilling Jar Type		Full Mechanical	Full Mechanical	Full Mechanical	Full Mechanical
OD (in)		6 1/4	6 1/2	7.0	8.0
ID (in)		2 1/4	2 1/4	2 1/4	2 3/4
Length (ft)		34.2	34.2	33.4	34.0
Weight (lbs)		2,535	2,734	2,976	3,924
Standard Connections		4-1/2 IF NC 50	4-1/2 IF NC 50	4-1/2 IF NC 50	6-5/8 REG
Total Stroke	Up (in)	5.6	5.6	5.9	5.7
	Down (in)	6.8	6.8	6.6	7.0
Max. Release Load (±15%)	Up (lbs)	139,382	139,382	141,630	179,847
	Down (lbs)	80,931	80,931	80,931	101,164
Max. Pull Load (lbs)		494,580	494,580	494,580	562,022
Max. Torsional Load (lbs-ft)		11,063	11,063	11,063	14,751

Toro Downhole Tools
16626 FM 2920
Tomball, Texas 77377 USA
Toll Free: 1-888-662-TORO
Tel: (+1) 281-580-8676
www.torotools.com

Model JA
Jar Accelerator

The Toro Model JA Jar Accelerator is a downhole tool used in conjunction with a fishing jar. The Jar Accelerator stores energy that is suddenly released when the fishing jar is activated. The stored energy provides an impact force that increases the jarring motion to the associated fishing jar. It operates automatically with the fishing jar, increasing reliability and ease of use, while protecting the drill-string and surface equipment from damaging shock waves. The Toro Model JA Jar Accelerator can also be used in conjunction with a drilling jar to assist in releasing stuck pipe.

The Toro Model JA Jar Accelerator tool is designed with an upward jarring motion and uses a spring housed in hydraulic fluid for maximum jarring impact. By increasing the velocity of the mass applied to the fishing jar, the Jar Accelerator tool ensures optimum impact force from the fishing jar.

The fluid compression inside the Model JA Jar Accelerator compensates for limited drill-pipe stretch in shallow or crooked holes, providing stored energy so that the fish is hit hard regardless of depth. The tool also optimizes jar performance in extended-reach, directional, and horizontal wells, where the stored energy in the drill-pipe is lost because of hole drag. See table below for available sizes and technical specifications.

MODEL NUMBER	OD (in)	ID (in)	OAL (ft)	WEIGHT (lbs)	STANDARD CONNECTION	MAX. STROKE FORCE (lbs-ft)	MAX. STROKE LENGTH (in)	MAX. TENSILE LOAD (lbs)	MAX. WORKING TORQUE (lbs-ft)
JA-313	3-1/8	1-0	9.81	265	2-3/8 REG	33,000	8.47	67,400	2,200
JA-375	3-3/4	1-1/4	10.20	375	2-3/8 IF (NC26)	44,000	8.47	123,600	2,950
JA-425	4-1/4	1-1/2	10.96	410	2-7/8 IF (NC31)	66,000	9.84	157,300	4,425
JA-450	4-1/2	1-1/2	10.96	445	2-7/8 IF (NC31)	66,000	9.84	179,800	5,160
JA-475	4-3/4	1-1/2	10.96	510	3-1/2 IF (NC38)	77,000	9.84	202,300	5,900
JA-625	6-1/4	2-1/4	14.76	1,170	4-1/2 IF (NC50)	143,300	13.00	337,200	11,000
JA-650	6-1/2	2-1/4	14.76	1,235	4-1/2 IF (NC50)	143,300	13.00	337,200	11,000
JA-700	7-0	2-1/4	13.12	1,325	4-1/2 IF (NC50)	187,300	12.21	404,600	12,500
JA-775	7-3/4	2-3/4	13.16	1,900	6-5/8 REG	147,700	13.00	472,000	14,750
JA-800	8-0	2-3/4	13.16	1,985	6-5/8 REG	147,700	13.00	494,500	14,750
JA-900	9-0	3-0	13.35	2,275	7-5/8 REG	187,300	13.00	562,000	16,200

Toro Downhole Tools
16626 FM 2920
Tomball, Texas 77377 USA
Toll Free: 1-888-662-TORO
Tel: (+1) 281-580-8676
www.torotools.com

Note: Technical specifications are derived from theoretical, calculated, and/or controlled testing environment. Actual performance may vary.

Toro Downhole Tools

Model DC Drill Collar

Toro Model DC Drill Collars are basic components used in the BHA to provide weight on bit and to help keep the drill string under required tension. Toro Model DC Drill Collars are manufactured from 4145H modified quenched and tempered steel. Strict metallurgical guidelines and specifications are followed during the manufacturing process to insure that the full length heat treating process produces a consistent maximum depth of hardness.

Features & Benefits:

- A hardness range from 285 to 341 BHN and a Charpy impact value of 40 ft-lbs. are guaranteed at evenly distributed 16 points in any section at room temperature;
- Connections are completed (phosphate coated) to protect them from all elements after machining and to help prevent galling upon initial make-up;
- Thread roots are cold rolled on API and H-90 connections;
- Pressed steel thread protectors are supplied for all drill collars that are equipped with standard connections;
- Standard (slick), spiral and flex design available;
- Standard alloyed steel or non-magnetic material available.

See table below for available sizes, lengths and technical specifications.

MODEL NUMBER	OD (in)	ID (in)	LENGTH (ft)	BEVEL DIAMETER (in)	BENDING STRENGTH RATIO	STANDARD CONNECTION
DC-313	3-1/8	1-1/2	30	3-0	2.57:1	NC23-31
DC-350	3-1/2	1-1/2	30	3-1/4	2.42:1	2-3/8 IF (NC26-35)
DC-413	4-1/8	2-0	30	4-0	2.43:1	2-7/8 IF (NC31-41)
DC-475	4-3/4	2-0	30	4-1/2	2.58:1	NC35-47
DC-500	5-0	2-1/4	30	4-3/4	2.38:1	3-1/2 IF (NC38-50)
DC-600-1	6-0	2-1/4	30 or 31	5-5/8	2.49:1	NC44-60
DC-600-2	6-0	2-13/16	30 or 31	5-5/8	2.84:1	NC44-60
DC-625	6-1/4	2-1/4	30 or 31	5-7/8	2.91:1	NC44-62
DC-650-1	6-1/2	2-13/16	30 or 31	5-7/8	2.63:1	4 IF (NC44-62)
DC-650-2	6-1/2	2-1/4	30 or 31	6-0	2.76:1	4 IF (NC44-65)
DC-650-3	6-1/2	2-13/16	30 or 31	6-0	3.05:1	4 IF (NC44-65)
DC-675-1	6-3/4	2-1/4	30 or 31	6-1/4	3.18:1	4 IF (NC44-67)
DC-675-2	6-3/4	2-13/16	30 or 31	6-1/4	2.37:1	4-1/2 IF (NC50-67)
DC-700-1	7-0	2-1/4	30 or 31	6-1/2	2.54:1	4-1/2 IF (NC50-70)
DC-700-2	7-0	2-13/16	30 or 31	6-1/2	2.73:1	4-1/2 IF (NC50-70)
DC-725	7-1/4	2-13/16	30 or 31	6-5/8	3.12:1	4-1/2 IF (NC50-72)
DC-775	7-3/4	2-13/16	30 or 31	7-1/4	2.70:1	NC56-77
DC-800	8-0	2-13/16	30 or 31	7-1/2	3.02:1	NC56-80
DC-825	8-1/4	2-13/16	30 or 31	7-3/4	2.93:1	6-5/8 REG
DC-900	9-0	2-13/16	30 or 31	8-3/8	3.17:1	NC61-90
DC-950	9-1/2	3-0	30 or 31	8-7/8	2.81:1	7-5/8 REG
DC-975	9-3/4	3-0	30 or 31	9-1/8	2.57:1	NC70-97
DC-1000	10-0	3-0	30 or 31	9-3/8	2.81:1	NC70-100
DC-1100	11-0	3-0	30 or 31	10-1/2	2.84:1	8-5/8 REG

Toro Downhole Tools

16626 FM 2920
Tomball, Texas 77377 USA
Toll Free: 1-888-662-TORO
Tel: (+1) 281-580-8676
www.torotools.com

Toro Downhole Tools

Model IBS
Integral Blade Stabilizer

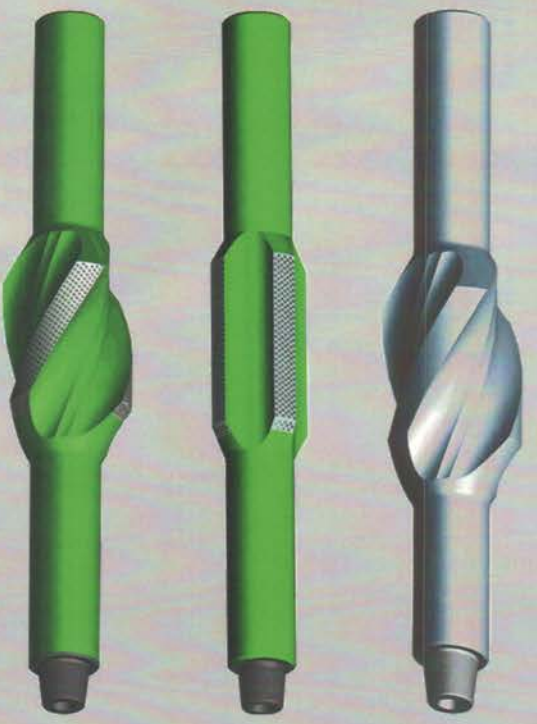
The Toro Model IBS Integral Blade Stabilizers are a helpful tool that prevents differential sticking of the drill string by stabilizing the BHA and keeping both drill collars and drill pipe away from the borehole wall. Toro stabilizers help reduce vibration, drill pipe whirl and helps maintain drilling trajectory for straight, horizontal and directional wells.

The Toro Model IBS Integral Blade Stabilizer is a single piece stabilizer which can be placed in the drill string or near the bit. Toro stabilizers are manufactured from a high strength alloy steel (non-magnetic material is optional).

The Toro Model IBS Integral Blade Stabilizers are available with 3 or 4 standard blades and come in several options:

- Spiral Integral Blade Stabilizer
- Straight Integral Blade Stabilizer
- Non-Magnetic Integral Blade Stabilizer

See below for available sizes and technical details.



Spiral Integral Blade Stabilizer | Straight Integral Blade Stabilizer | Non-Magnetic Integral Blade Stabilizer

MODEL NUMBER	BODY OD (In)	BLADE OD (In)	ID (In)	LENGTH (In)	STRING CONNECTION		NEAR BIT CONNECTION	
					TOP	BOTTOM	TOP	BOTTOM
IBS-475-01	4-3/4	6-0	2-0	47.25	3-1/2 IF (NC38)	3-1/2 IF (NC38)	3-1/2 IF (NC38)	3-1/2 REG
IBS-475-02	4-3/4	6-1/4	2-0	47.25	3-1/2 IF (NC38)	3-1/2 IF (NC38)	3-1/2 IF (NC38)	3-1/2 REG
IBS-475-03	4-3/4	6-1/2	2-0	47.25	3-1/2 IF (NC38)	3-1/2 IF (NC38)	3-1/2 IF (NC38)	3-1/2 REG
IBS-625-01	6-1/4	7-1/2	2-1/4	63.00	4 IF (NC46)	4 IF (NC46)	4 IF (NC46)	4-1/2 REG
IBS-625-02	6-1/4	7-7/8	2-1/4	63.00	4 IF (NC46)	4 IF (NC46)	4 IF (NC46)	4-1/2 REG
IBS-650	6-1/2	8-1/2	2-3/4	70.00	4-1/2 IF (NC50)	4-1/2 IF (NC50)	4 IF (NC46)	4-1/2 REG
IBS-775	7-3/4	9-1/2	2-3/4	70.00	4-1/2 IF (NC50)	4-1/2 IF (NC50)	4-1/2 IF (NC50)	6-5/8 REG
IBS-800	8-0	12-1/4	3-0	70.00	6-5/8 REG	6-5/8 REG	6-5/8 REG	7-5/8 REG
IBS-900	9-0	16-0	3-0	86.50	7-5/8 REG	7-5/8 REG	7-5/8 REG	7-5/8 REG
IBS-950-01	9-1/2	17-1/2	3-0	86.50	7-5/8 REG	7-5/8 REG	7-5/8 REG	7-5/8 REG
IBS-950-02	9-1/2	24-0	3-0	100.0	7-5/8 REG	7-5/8 REG	7-5/8 REG	7-5/8 REG
IBS-950-03	9-1/2	26-0	3-0	100.0	7-5/8 REG	7-5/8 REG	7-5/8 REG	7-5/8 REG
IBS-1000	10-0	28-0	3-0	100.0	7-5/8 REG	7-5/8 REG	7-5/8 REG	7-5/8 REG

Toro Downhole Tools

16626 FM 2920
Tomball, Texas 77377 USA
Toll Free: 1-888-662-TORO
Tel: (+1) 281-580-8676
www.torotools.com

Note: Technical specifications are derived from theoretical, calculated, and/or controlled testing environment. Actual performance may vary.

Toro Downhole Tools

Model RSS
Replaceable Sleeve Stabilizer

The Toro Model RSS Replaceable Sleeve Stabilizer is a downhole tool used in the bottom hole assembly (BHA) of a drill string. Its purpose is to mechanically stabilize the BHA in the borehole in order to avoid unintentional sidetracking, vibrations, and ensure the quality of the hole being drilled.

The Toro Model RSS Replaceable Sleeve Stabilizer is composed of an integral mandrel and a sleeve, both made of high-strength steel. The blades can be either straight or spiraled, and are hard-faced for wear resistance.

See below for available sleeve and mandrel sizes and technical details.

Sleeve Specifications:

MODEL NUMBER	HOLE SIZE (in)	MANDREL SERIES	DRILL COLLAR SIZE RANGE (in)	SLEEVE LENGTH (in)	RECOMMENDED MAKE-UP TORQUE (ft-lbs)
RSS-850-01	8-1/2	62	6-1/4 to 6-3/4	14	4500 - 5400
RSS-850-02	8-1/2	65	6-1/2 to 7-3/4	14	3500 - 4500
RSS-875-01	8-3/4	62	6-1/4 to 6-3/4	14	4500 - 5400
RSS-875-02	8-3/4	65	6-1/2 to 7-3/4	14	3500 - 4500
RSS-988-01	9-7/8	62	6-1/4 to 6-3/4	19	4500 - 5400
RSS-988-02	9-7/8	65	6-1/2 to 7-3/4	19	3500 - 4500
RSS-1225-01	12-1/4	77	7-3/4 to 8-1/4	22	6900 - 8000
RSS-1225-02	12-1/4	85	8-1/2 to 9-0	22	8000 - 9000
RSS-1225-03	12-1/4	96	9-0 to 10-0	22	10100 - 11900
RSS-1475-01	14-3/4	77	7-3/4 to 8-1/4	23	6900 - 8000
RSS-1475-02	14-3/4	85	8-1/2 to 9-0	23	8000 - 9000
RSS-1475-03	14-3/4	96	9-0 to 10-0	23	10100 - 11900
RSS-1750-01	17-1/2	77	7-3/4 to 8-1/4	23	6900 - 8000
RSS-1750-02	17-1/2	85	8-1/2 to 9-0	23	8000 - 9000
RSS-1750-03	17-1/2	96	9-0 to 10-0	23	10100 - 11900
RSS-2200	22-0	96	9-0 to 10-0	27	10100 - 11900
RSS-2400	24-0	96	9-0 to 10-0	27	10100 - 11900
RSS-2600	26-0	96	9-0 to 10-0	27	10100 - 11900
RSS-2800	28-0	96	9-0 to 10-0	27	10100 - 11900

Mandrel Specifications:

MANDREL SERIES	SLEEVE SIZE RANGE (in)	FISHING NECK RANGE (in)	FISHING NECK LENGTH (in)	UPSET OD (in)	UPSET LENGTH (in)	BOTTOM NECK OD (in)	OVERALL LENGTH (in)
62	8-1/2 to 9-7/8	6-1/4 to 6-3/4	22	7-1/2	7-4/5	6-1/4	65
65	8-1/2 to 9-7/8	6-1/2 to 7-1/4	22	7-3/4	7-4/5	6-1/2	65
77	12-1/4 to 17-1/2	7-3/4 to 8-1/4	22	9-1/4	7-4/5	7-3/4	67
85	12-1/4 to 17-1/2	8-1/2 to 9-0	25	9-7/8	7-4/5	8-1/2	67
96	14-3/4 to 20-0	9-1/2 to 10-0	27	11-0	7-4/5	9-5/8	80
	22-0 to 28-0	9-1/2 to 10-0	27	11-0	7-4/5	9-5/8	90

Toro Downhole Tools

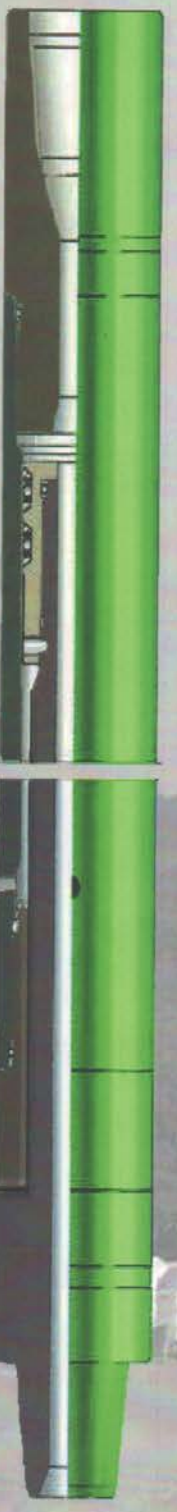
16626 FM 2920
Tomball, Texas 77377 USA
Toll Free: 1-888-662-TORO
Tel: (+1) 281-580-8676
www.torotools.com

Toro Downhole Tools

Model BS Bumper Sub

Toro Model BS Bumper Subs are used as a percussion tool on a fishing string to jar downward or upward on a stuck fish to knock it free. The tool delivers a sharp downward blow and the necessary torque required to disengage a fish when it is impossible to pull the fish out of the hole. The tool can repeatedly bump in either direction or alternately bump up and down to dislodge drill pipe, reamers, drill collars, bits, or any other tool that has become stuck.

The Toro Model BS Bumper Sub's dependable mechanical design is suited for all fishing operations such as harsh downhole applications, deep fishing and workover operations, light to medium drilling applications and coring operations. Constructed from high-strength, heat-treated alloy steel, the tool can withstand severe stress caused by tension, jarring and torque. See below for available sizes and technical specifications.



MODEL NUMBER	OD (in)	ID (in)	CLOSED LENGTH (ft)	WEIGHT (lbs)	STANDARD CONNECTION	MAX. STROKE LENGTH (in)	MAX. TENSILE LOAD (lbs)	MAX. WORKING TORQUE (lbs-ft)
BS-313	3-1/8	1-0	4.63	100	NC23	20.0	67,400	2,200
BS-350	3-1/2	1-1/8	4.72	110	2-3/8 IF (NC26)	20.0	89,900	2,580
BS-375	3-3/4	1-1/4	4.63	130	2-3/8 IF (NC26)	20.0	112,400	2,950
BS-425	4-1/4	1-1/2	5.28	210	2-7/8 IF (NC31)	20.0	157,300	4,425
BS-450	4-1/2	1-1/2	6.89	290	2-7/8 IF (NC31)	40.0	251,700	5,160
BS-475	4-3/4	1-1/2	6.92	325	3-1/2 IF (NC38)	40.0	269,700	5,900
BS-625	6-1/4	2-0	8.54	530	4-1/2 IF (NC50)	55.0	321,400	9,580
BS-650	6-1/2	2-0	8.54	630	4-1/2 IF (NC50)	55.0	321,400	9,580
BS-700	7-0	2-3/4	8.69	730	4-1/2 IF (NC50)	55.0	343,900	11,060
BS-775	7-3/4	2-3/4	8.96	950	6-5/8 REG	60.0	366,400	14,750
BS-800	8-0	2-3/4	8.96	1,005	6-5/8 REG	60.0	366,400	14,750
BS-863	8-5/8	3-0	5.80	845	6-5/8 REG	20.0	366,400	14,750
BS-900	9-0	3-0	9.06	1,455	7-5/8 REG	60.0	494,500	18,430

Toro Downhole Tools
16626 FM 2920
Tomball, Texas 77377 USA
Toll Free: 1-888-662-TORO
Tel: (+1) 281-580-8676
www.torotools.com

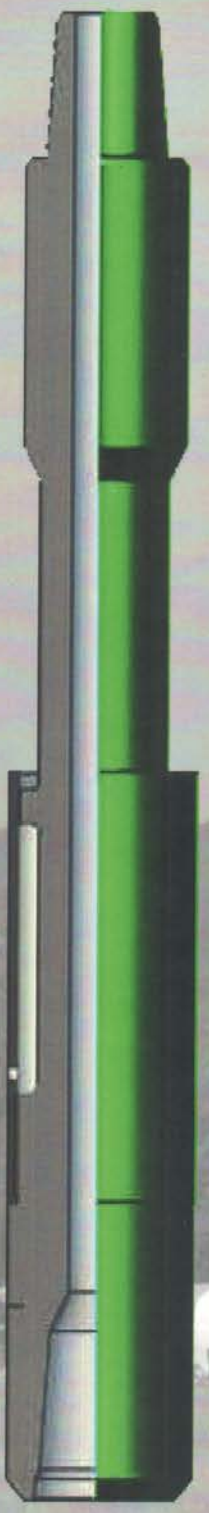
Note: Technical specifications are derived from theoretical, calculated, and/or controlled testing environment. Actual performance may vary.

Toro Downhole Tools

Model JS Junk Sub

The Toro Model JS Junk Sub is an accessory tool used in milling or drilling operations. The tool is designed to prevent and capture debris, cuttings and other junk that are too heavy to be circulated from settling at the bottom of the hole. The tool can be run in an open hole or inside casing.

The Toro Model JS Junk Subs are placed directly above the mill or drill bit. For severe milling jobs, it is customary to run two or three junk subs in tandem above the mill to increase cutting removal capacity and provide extra stabilization for the mill. Toro Model JS Junk Subs are manufactured from high strength, heat-treated alloy steel to withstand wear. See available junk sub sizes, hole sizes and technical specifications below.



MODEL NUMBER	OD (In)	ID (In)	MIN. HOLE SIZE (In)	MAX. HOLE SIZE (In)	STANDARD CONNECTION
JS-375	3-3/4	3/4	4-1/4	4-5/8	2-3/8 REG
JS-400	4-0	1-1/4	4-5/8	4-7/8	2-7/8 REG
JS-450	4-1/2	1-1/2	5-1/8	5-7/8	3-1/2 REG
JS-500	5-0	1-1/2	6-0	6-3/8	3-1/2 REG
JS-550	5-1/2	1-1/2	6-1/2	7-1/2	3-1/2 REG
JS-663	6-5/8	2-1/4	7-1/2	8-1/2	4-1/2 REG
JS-700	7-0	2-1/4	8-5/8	9-5/8	4-1/2 REG
JS-750	7-1/2	2-1/4	9-0	10-3/4	4-1/2 REG
JS-775	7-3/4	2-3/4	9-1/4	11-0	4-1/2 IF
JS-863	8-5/8	3-0	9-5/8	11-5/8	6-5/8 REG
JS-900	9-0	3-0	10-0	12-0	6-5/8 REG
JS-963	9-5/8	3-0	11-1/2	13-0	6-5/8 REG
JS-1100	11-0	3-0	13-0	14-3/4	7-5/8 REG
JS-1225	12-1/4	3-0	12-7/8	14-3/4	7-5/8 REG
JS-1288	12-7/8	3-0	14-3/4	17-1/2	7-5/8 REG
JS-1338	13-3/8	3-0	15-1/8	18-0	7-5/8 REG

Toro Downhole Tools

16626 FM 2920
Tomball, Texas 77377 USA
Toll Free: 1-888-662-TORO
Tel: (+1) 281-580-8676
www.torotools.com

Note: Technical specifications are derived from theoretical, calculated, and/or controlled testing environment. Actual performance may vary.

Toro Downhole Tools

Model CS Casing Scraper

The Toro Model CS Casing Scraper is ideal for the removal of mud, cement, bullets, rust, scale, paraffin, perforation burrs and other obstructions from the inside walls of casing.

Maintaining a clean casing I.D. is important when operating drilling, fishing, or wireline tools. Likewise, packers, patches, spears, and similar tools require clean surfaces to grip. Obstructions on casing walls will frequently cause these tools to fail or become difficult to operate.

Utilizing a simple one-piece mandrel design, the Toro Model CS Casing Scraper is constructed to be rugged, yet simple to operate and maintain. The Scraper conditions more surface area than most other tools on the market. The full circle blades are spaced to contact 360° (full circle) of casing surface at once.

Short and compact, the Toro Model CS Casing Scraper also incorporates a long taper on the blades for passing through joints without hanging. The Scraper works in vertical or rotary operations and may be run on drill pipe or wireline.

Toro Model CS Casing Scrapers are available to condition pipe ranging from 4-1/2-inch tubing to 9-5/8-inch casing. See available models and technical specifications below.

MODEL NUMBER	CASING SIZE OD (in)	MINIMUM BLADE OD (in)	MAXIMUM BLADE OD (in)	STANDARD CONNECTION
CS-450	4-1/2	3-3/4	4-1/8	2-3/8 IF (NC26)
CS-500	5-0	4-1/8	4-5/8	2-3/8 IF (NC26)
CS-550	5-1/2	4-5/8	5-1/8	2-7/8 IF (NC31)
CS-663	6-5/8	5-1/2	6-1/4	3-1/2 REG
CS-700	7-0	5-7/8	6-1/2	3-1/2 REG
CS-963	9-5/8	8-3/8	9-0	4-1/2 REG

Toro Downhole Tools
16626 FM 2920
Tomball, Texas 77377 USA
Toll Free: 1-888-662-TORO
Tel: (+1) 281-580-8676
www.torotools.com

Note: Technical specifications are derived from theoretical, calculated, and/or controlled testing environment. Actual performance may vary.

Model RR
Roller Reamer

The Toro Model RR Roller Reamer is an efficient Bottom Hole Assembly (BHA) reaming and torque reducing tool. It provides reaming action for improved borehole shape, size and quality. It also provides stabilization action by centralizing the BHA, minimizing down-hole vibrations, preventing the BHA from resting on the low side of the deviated hole, and minimizing BHA fatigue. Torque reduction results from touching the formation with a set of rollers spinning around their axes as a result of rotation of the central body.

The Toro Model RR Roller Reamer is engineered and optimized to comprise a set of advanced features for enhanced reaming, high durability and maximum reliability. Toro Model RR Roller Reamers are designed with one stage of cutters to allow the Roller Reamer to fit in almost every directional application. See available rollers, roller reamer sizes and technical specifications below.

Type B

Hard Formations

Type F

Medium to Hard Formations

Type T

Soft Formations

MODEL NUMBER	OD (In)	ID (In)	HOLE SIZE (In)	STANDARD CONNECTION
RR-613	6-1/8	1-1/4	6-1/8	3-1/2 IF (NC38)
RR-788	7-7/8	1-1/2	7-7/8	4 IF (NC46)
RR-838	8-3/8	1-3/4	8-3/8	4-1/2 IF (NC50)
RR-850	8-1/2	1-3/4	8-1/2	4-1/2 IF (NC50)
RR-963	9-5/8	2-1/4	9-5/8	4-1/2 IF (NC50)
RR-1225	12-1/4	2-3/4	12-1/4	6-5/8 REG
RR-1750	17-1/2	3-0	17-1/2	7-5/8 REG
RR-2200	22-0	3-0	22-0	7-5/8 REG
RR-2600	26-0	3-0	26-0	7-5/8 REG
RR-2800	28-0	3-0	28-0	7-5/8 REG
RR-3600	36-0	3-0	36-0	7-5/8 REG

Toro Downhole Tools

16626 FM 2920

Tomball, Texas 77377 USA

Toll Free: 1-888-662-TORO

Tel: (+1) 281-580-8676

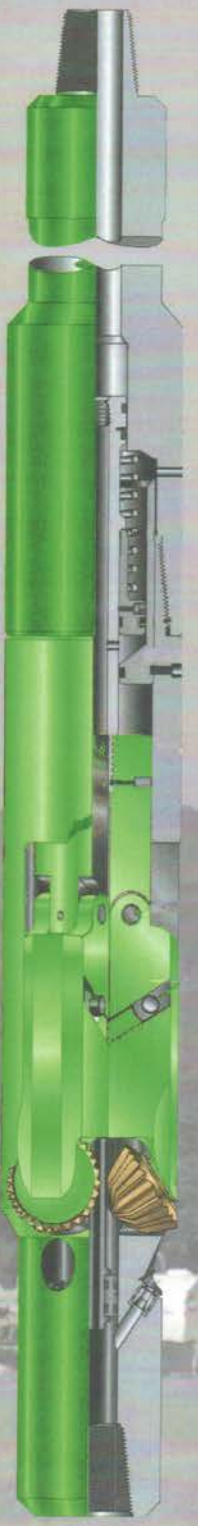
www.torotools.com

Note: Technical specifications are derived from theoretical, calculated, and/or controlled testing environment. Actual performance may vary.

Toro Downhole Tools

Model UR Under Reamer

The Toro Model UR Drilling Type Underreamer was created for well bore enlargement in a variety of applications. Once the Underreamer has passed through the restricted zone and reached the desired depth, the rotary and pumps are engaged allowing the arms to open.



FEATURES:

- Cutter arms, which are held in the body by a hinge pin attached to a yoke, move upward and out in the body simultaneously; making it virtual-ly impossible for the hinge pins to vibrate loose.
- Hydraulic power combined with reverse actuating mechanism maintains that the tool is open while drill string weight on cutter arms prevents tool closure.
- Without changing internal or external parts, the Underreamer can be adjusted to any size within its operating range in minimal time in a shop or at a rig site.
- Roller cone cutters are specifically designed for Underreamers. Internal cage reduces bearing revolution thus increasing bearing and seal life of cutter.
- Machined from heat-treated steel bar giving it exceptional strength.
- Integral Jet sub near bottom of Underreamer allows cutter washing for longer tool life, better penetration rates, and fewer down hole trips.
- Jet nozzles in top sub allow for increased GPM through the tool.

See available Toro Model UR Underreamer sizes, cutting arm options and technical specifications below.

MODEL NUMBER	BODY OD (in)	RETRACTED OD (in)	SMALLEST ID (in)	MAX. OPENING (in)	DRILLING WEIGHT (lbs)	MAX. FLOW (GPM)	ROTARY SPEED (RPM)	TOP CONNECTION (Pin)	BOTTOM CONNECTION (Box)
UR-575	5-3/4	5-3/4	3/4	8-1/2	0-7,000	350	70-100	3-1/2 REG	3-1/2 REG
UR-725	7-1/4	7-1/4	1-0	9-7/8	0-7,000	500	70-110	4-1/2 REG	4-1/2 REG
UR-800	8-0	8-1/4	1-0	13-1/2	0-12,000	500	70-110	6-5/8 REG	6-5/8 REG
UR-950	9-1/2	9-1/2	1-1/2	14-3/4	0-15,000	900	70-110	6-5/8 REG	6-5/8 REG
UR-1175	11-3/4	11-3/4	1-1/2	22-0	0-15,000	1,000	70-110	7-5/8 REG	6-5/8 REG
UR-1450-1	14-1/2	14-1/2	2-1/4	24-0	0-20,000	1,400	70-110	7-5/8 REG	7-5/8 REG
UR-1450-2	14-1/2	17-1/4	2-1/4	28-0	0-20,000	1,400	70-110	7-5/8 REG	7-5/8 REG
UR-1600-1	16-0	17-1/4	2-1/4	30-0	0-25,000	1,400	60-90	7-5/8 REG	7-5/8 REG
UR-1600-2	16-0	22-0	2-1/4	40-0	0-25,000	1,400	50-70	7-5/8 REG	7-5/8 REG
UR-2200-1	22-0	22-0	2-1/4	40-0	0-30,000	1,400	40-60	7-5/8 REG	7-5/8 REG
UR-2200-2	22-0	34-0	2-1/4	50-0	0-30,000	1,400	40-60	7-5/8 REG	7-5/8 REG

CUTTING ARM OPTIONS
Seal Bearing Mill Tooth
Seal Bearing Tungsten Carbide Insert
ADD Cutter (Advanced Drilling Design)
PDC Cutter

Toro Downhole Tools

16626 FM 2920
Tomball, Texas 77377 USA
Toll Free: 1-888-662-TORO
Tel: (+1) 281-580-8676
www.torotools.com

Model HO Hole Opener

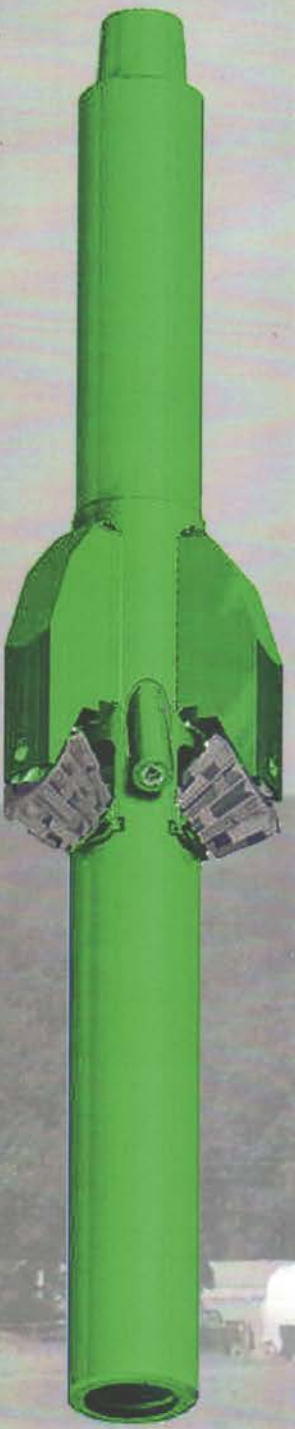
The Toro Model HO Hole Openers are useed to expand the size of a pre-drilled hole to a larger diameter or to drill large diameter holes. Toro Hole Openers are designed and custom built to provide an efficient cutting action that can provide hole enlargement for various reasons, ranging from rig and equipment capabilities to job specifications. Applications range from hydrocarbon drilling operations to water drilling or horizontal drilling.

Toro Hole Openers are designed with a one-piece integral body, three to four primary cutters and mud nozzles to clean the cutters and hole simultaneously. The Toro Hole Opener is manufactured to be easily maintained in the field for simplified assembly and disassembly. Several types of insert cutters are available to meet field drilling requirements and for various drilling formations. See available cutters, hole opener sizes and technical specifications below.

Tooth Type (SMF) for Soft to Medium Formations

Tooth Type (MHF) for Medium to Hard Formations

Button Type (HF) for Hard Formations



MODEL NUMBER	HOLE OPEN DIAMETER (In)	ID (In)	OVERALL LENGTH (In)	MIN. PILOT HOLE SIZE (In)	FISHING NECK DIAMETER (In)	TOP PIN CONNECTION	BOTTOM BOX CONNECTION
HO-1225	12-1/4	1-1/2	55	8-1/2	8-0	6-5/8 REG	6-5/8 REG
HO-1600	16-0	2-1/4	59	10-0	9-1/2	7-5/8 REG	6-5/8 REG
HO-1750	17-1/2	2-1/4	59	10-0	9-1/2	7-5/8 REG	6-5/8 REG
HO-2200	22-0	2-1/3	69	12-3/4	9-1/2	7-5/8 REG	6-5/8 REG
HO-2300	23-0	3-0	69	12-3/4	8-0	7-5/8 REG	6-5/8 REG
HO-2400	24-0	3-0	69	14-0	10-0	7-5/8 REG	7-5/8 REG
HO-2600	26-0	3-0	69	17-1/2	10-0	7-5/8 REG	7-5/8 REG
HO-3600	36-0	3-1/2	87	26-0	10-0	7-5/8 REG	7-5/8 REG

Toro Downhole Tools

16626 FM 2920
Tomball, Texas 77377 USA
Toll Free: 1-888-662-TORO
Tel: (+1) 281-580-8676
www.torotools.com

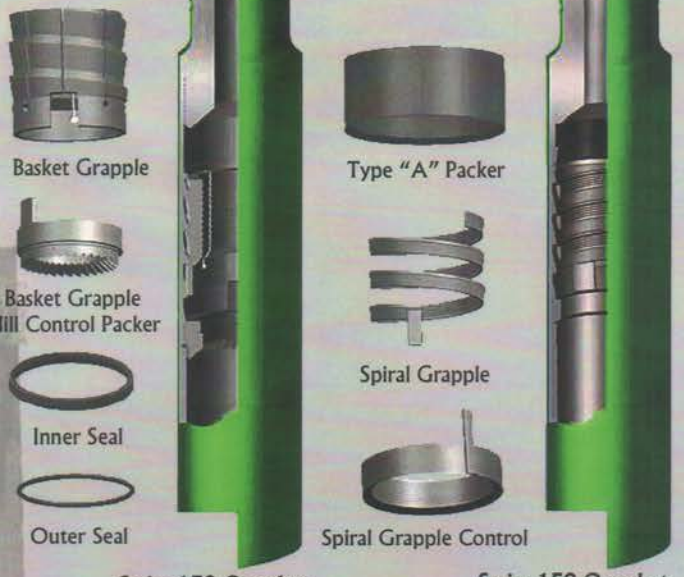
Note: Technical specifications are derived from theoretical, calculated, and/or controlled testing environment. Actual performance may vary.

Model OS
Series 150 Overshot

The Toro Model OS Series 150 Releasing and Circulating Overshot is an external catch fishing tool designed to retrieve tubular items from the well bore. It is rugged, economical, and easy to use. The Overshot comes with a wide range of available accessories. These fishing tools have proven to be the most versatile and reliable in the field.

The basic assembly consists of a top sub, bowl, and standard guide. The internal components are used to establish a secure grip on the fish to retrieve it easily.

The selection of these components is determined by the diameter of the fish to be retrieved. When the fish diameter approaches the maximum catch of the overshot, a spiral grapple is required. This must also be equipped with a spiral grapple control and type A packer. When the diameter is approximately 1/2 inch (or more) under the maximum catch of the overshot, a basket grapple is used. It must be assembled with either a basket grapple control or a mill control packer.



Series 150 Overshot with Basket Grapple

Series 150 Overshot with Spiral Grapple

See below for available Toro Model OS Series 150 Releasing and Circulating Overshot sizes for both spiral and basket grapples.

MODEL NUMBER	OD (in)	MAX. CATCH SIZE (in)		STANDARD CONNECTION
		SPIRAL GRAPPLE	BASKET GRAPPLE	
OS-350	3-1/2	2-3/8	1-7/8	2-3/8 IF (NC26)
OS-363	3-5/8	2-7/8	2-1/2	2-3/8 IF (NC26)
OS-375	3-3/4	3-0	2-5/8	2-3/8 IF (NC26)
OS-400	4-0	2-7/8	2-3/8	2-3/8 IF (NC26)
OS-413	4-1/8	3-3/8	2-7/8	2-7/8 IF (NC31)
OS-450	4-1/2	3-1/2	3-0	2-7/8 IF (NC31)
OS-463	4-5/8	3-1/2	3-0	2-7/8 IF (NC31)
OS-500	5-0	3-3/4	3-1/8	3-1/2 IF (NC38)
OS-563	5-5/8	4-3/4	4-0	3-1/2 IF (NC38)
OS-600	6-0	5-0	4-3/8	3-1/2 IF (NC38)
OS-663-01	6-5/8	5-0	4-1/2	4-1/2 IF (NC50)
OS-663-02	6-5/8	5-1/2	4-3/4	4-1/2 IF (NC50)
OS-713	7-1/8	5-3/4	5-0	4-1/2 IF (NC50)

MODEL NUMBER	OD (in)	MAX. CATCH SIZE (in)		STANDARD CONNECTION
		SPIRAL GRAPPLE	BASKET GRAPPLE	
OS-763	7-5/8	6-1/4	5-1/2	4-1/2 IF (NC50)
OS-788	7-7/8	6-1/4	5-1/2	4-1/2 IF (NC50)
OS-813-01	8-1/8	7-0	6-3/8	4-1/2 IF (NC50)
OS-813-02	8-1/8	6-5/8	6-0	4-1/2 IF (NC50)
OS-863	8-5/8	7-0	6-1/4	4-1/2 IF (NC50)
OS-913	9-1/8	8-0	7-3/8	4-1/2 IF (NC50)
OS-963	9-5/8	8-1/8	7-1/4	6-5/8 REG
OS-1025	10-1/4	8-5/8	7-7/8	6-5/8 REG
OS-1063	10-5/8	9-0	8-1/4	6-5/8 REG
OS-1075	10-3/4	9-1/2	8-1/2	6-5/8 REG
OS-1125	11-1/4	9-5/8	8-7/8	6-5/8 REG
OS-1175	11-3/4	10-1/8	9-3/8	6-5/8 REG
OS-1338	13-3/8	11-1/4	10-1/4	6-5/8 REG

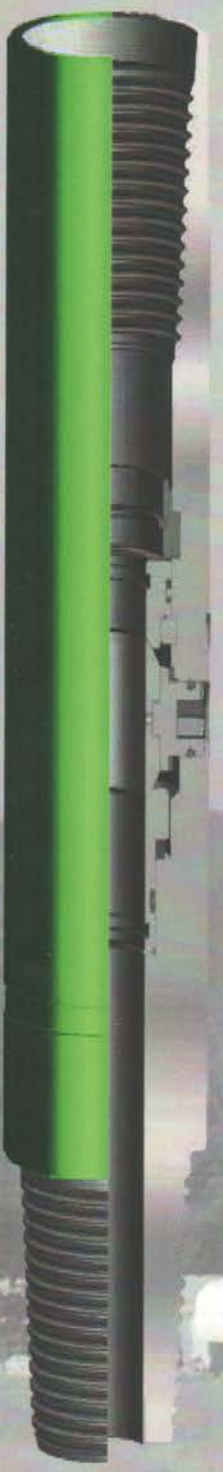
Toro Downhole Tools
16626 FM 2920
Tomball, Texas 77377 USA
Toll Free: 1-888-662-TORO
Tel: (+1) 281-580-8676
www.torotools.com

Toro Downhole Tools

Model KV Kelly Valve

The Toro Model KV Kelly Valve is an automatic ball driven valve that is used to prevent the mud in the kelly joint from pouring out on the derrick floor each time the kelly is disconnected from the drillpipe. When the mud pump is stopped, the kelly valve automatically closes. After a joint of drillpipe is added to the string and the kelly is made up tight, the pumps are started and the mud pressure opens the kelly valve and drilling resumes. The valve saves valuable mud, keeps the rig floor dry, and speeds up the job of making a connection.

The Toro Model KV Kelly Valve can be used as either an upper or lower kelly cock. The **Upper Kelly Cock** is connected between the kelly and swivel and provides a positive means for shutting off flow in the drill string at any time. The **Lower Kelly Cock** is connected between the upper end of the drillpipe and the lower end of the kelly and provides a closure to stop mud loss when the kelly is disconnected from the drill string See available sizes for both upper and lower kelly cocks and technical specifications below.



Upper Kelly Cock

MODEL NUMBER	OD (in)	ID (in)	MAX. PRESSURE (psi)	STANDARD CONNECTION
KV-575	5-3/4	2-0	9,950	4-1/2 REG
KV-787	7-7/8	3-0	9,950	6-5/8 REG

Lower Kelly Cock

MODEL NUMBER	OD (in)	ID (in)	MAX. PRESSURE (psi)	STANDARD CONNECTION
KV-413	4-1/8	1-5/8	9,950	2-7/8 IF (NC31)
KV-475	4-3/4	2-0	9,950	3-1/2 IF (NC38)
KV-500	5-0	2-0	9,950	3-1/2 IF (NC38)
KV-650	6-1/2	2-3/8	9,950	4-0 IF (NC46)
KV-700	7-0	2-7/8	9,950	4-1/2 IF (NC50)

Toro Downhole Tools
16626 FM 2920
Tomball, Texas 77377 USA
Toll Free: 1-888-662-TORO
Tel: (+1) 281-580-8676
www.torotools.com

Note: Technical specifications are derived from theoretical, calculated, and/or controlled testing environment. Actual performance may vary.

Toro Downhole Tools

Model SV Safety Valve

The Toro Model SV Safety Valve is a dual-body full-opening safety tool used to stop flow through the drill string when the drill string is being removed from the well. The valve provides positive pressure control of the fluids in the drill string. The valve is connected to the top joint of the drill pipe or tubing string at the rig floor and designed to close quickly in case a well kick.

The Toro Model SV Safety Valve is a ball driven safety valve which does not interfere with running tools in the drill string such as core barrels or survey instruments. The compact design is easy to handle and maintained on the rig floor. Standard test pressure is 10,000 PSI but higher pressure ratings are available.

See available safety valve sizes and technical specifications below.

MODEL NUMBER	OD (in)	ID (in)	LENGTH (in)	STANDARD CONNECTION
SV-413	4-1/8	1-3/4	28.82	2A10 x 2A11
SV-438	4-3/8	2-0	28.58	210 x 211
SV-488	4-7/8	2-1/2	22.75	2-7/8 EUE
SV-500	5-0	2-1/2	22.75	2-7/8 EUE
SV-525-1	5-1/4	2-1/4	30.43	XT39
SV-525-2	5-1/4	2-1/4	46.18	4-1/2 VAM
SV-525-3	5-1/4	2-1/2	31.50	310 x 311
SV-525-4	5-1/4	2-3/8	22.84	4-1/2 NU
SV-575	5-3/4	2-0	32.76	NC31
SV-600-1	6-0	3-0	25.20	3-1/2 NU
SV-600-2	6-0	3-0	24.29	3-1/2 EUE
SV-700-1	7-0	3-0	26.58	3-1/2 EUE
SV-700-2	7-0	3-0	34.84	4A10 x 4A11
SV-750	7-1/2	3-1/4	35.24	410 x 411

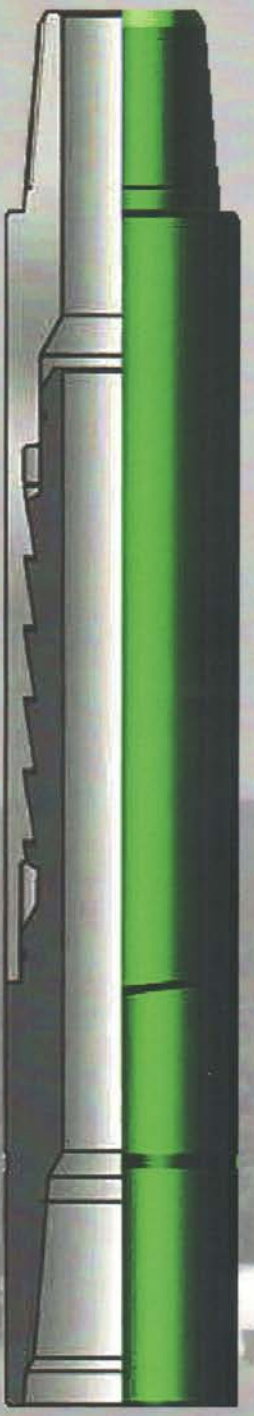
Toro Downhole Tools
16626 FM 2920
Tomball, Texas 77377 USA
Toll Free: 1-888-662-TORO
Tel: (+1) 281-580-8676
www.torotools.com

Toro Downhole Tools

Model SJ Safety Joint

The Toro Model SJ Safety Joint is manufactured to provide safe and easy release and make-up whenever disengagement becomes necessary. This dependable, field-tough tool is designed to transmit torque in either direction when placed in the drill, fishing, or wash-over string.

The Toro Model SJ Safety Joint consists of a Pin Section, Friction Ring and Box Section. The internal connection of the safety joint is a coarse acme thread used to facilitate easy pack-off and re-engagement. A knurled release ring between the box and pin sections maintain torsion integrity until back-off procedure is initiated. An O-ring seal contains pressure while the safety joint is made up.



MODEL NUMBER	OD (in)	ID (in)	STANDARD CONNECTION
SJ-338	3-3/8	1-1/2	2-3/8 IF (NC26)
SJ-375	3-3/4	1-3/4	2-3/8 IF (NC26)
SJ-413	4-1/8	2-0	2-7/8 IF (NC31)
SJ-475	4-3/4	2-1/4	3-1/2 IF (NC38)
SJ-625	6-1/4	2-7/8	4-0 IF (NC46)
SJ-650	6-1/2	2-7/8	4-1/2 IF (NC50)
SJ-700	7-0	2-7/8	4-1/2 IF (NC50)
SJ-800	8-0	3-0	6-5/8 REG
SJ-900	9-0	3-0	7-5/8 REG

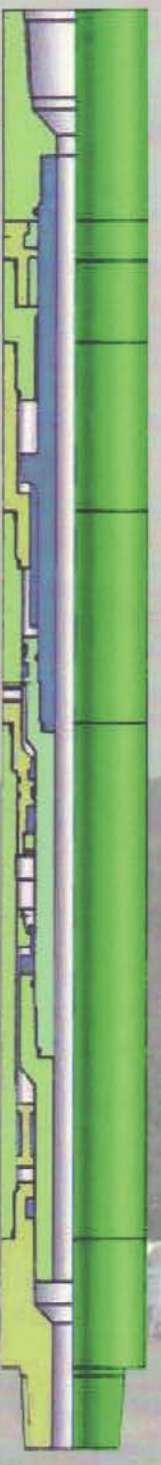
Toro Downhole Tools
16626 FM 2920
Tomball, Texas 77377 USA
Toll Free: 1-888-662-TORO
Tel: (+1) 281-580-8676
www.torotools.com

Toro Downhole Tools

Model FJ
Hydraulic Fishing Jar

Toro Model FJ Hydraulic Fishing Jars are used for drilling, fishing, coring, reaming, testing, side tracking, and washover operations. The jar combines proven principles of mechanics and hydraulics in a simple to assemble and easy to operate design. It can transmit full torque in either direction at all times during operation. Settings and adjustments are not required before going into the hole or after the fish has been engaged. The tool does not interfere with the free operation of other fishing tools or safety joints.

The Toro Model FJ Hydraulic Fishing Jar's closed hydraulic system contains hydraulic fluid within the Jar which prevents well fluids from entering the tool. The internal working parts are constantly lubricated by the hydraulic fluid within the tool, resulting in long-life wear of the parts. A series of rapid jarring blows can be delivered when needed. The operator can easily and simply control the intensity of the blow, from very light to heavy impact without prior adjustment. Impact control is made possible by the metering action of the piston assembly. Toro Model FJ Hydraulic Fishing Jars are available in various sizes to meet operational requirements. See table below for available sizes and technical specifications.



MODEL NUMBER	OD (in)	ID (in)	OAL (ft)	WEIGHT (lbs)	STANDARD CONNECTION	MAX. STROKE FORCE (lbs-ft)	MAX. STROKE LENGTH (in)	MAX. TENSILE LOAD (lbs)	MAX. WORKING TORQUE (lbs-ft)
FJ-313	3-1/8	1-0	12.56	180	2-3/8 REG	33,700	11.75	67,400	2,200
FJ-350	3-1/2	1-0	12.57	320	2-3/8 IF (NC26)	40,400	11.75	89,900	2,580
FJ-375	3-3/4	1-1/4	12.71	345	2-3/8 IF (NC26)	44,900	11.75	112,400	2,950
FJ-425	4-1/4	1-1/2	12.96	430	2-7/8 IF (NC31)	56,200	12.00	157,300	4,425
FJ-450	4-1/2	1-1/2	13.34	575	2-7/8 IF (NC31)	76,400	12.00	175,300	5,160
FJ-475	4-3/4	1-3/4	13.34	665	3-1/2 IF (NC38)	89,900	12.00	220,300	5,900
FJ-625	6-1/4	2-1/4	14.47	1,215	4-1/2 IF (NC50)	157,300	12.50	285,500	11,000
FJ-650	6-1/2	2-1/4	14.47	1,325	4-1/2 IF (NC50)	168,600	12.50	307,900	11,000
FJ-700	7-0	2-3/8	14.53	1,545	4-1/2 IF (NC50)	179,800	12.50	352,900	12,500
FJ-775	7-3/4	2-3/4	14.55	1,900	6-5/8 REG	179,800	13.00	420,300	14,750
FJ-800	8-0	2-3/4	14.55	1,985	6-5/8 REG	179,800	13.00	472,000	16,200
FJ-900	9-0	3-0	14.76	2,470	7-5/8 REG	224,800	13.00	494,500	18,400

Toro Downhole Tools
16626 FM 2920
Tomball, Texas 77377 USA
Toll Free: 1-888-662-TORO
Tel: (+1) 281-580-8676
www.torotools.com

Note: Technical specifications are derived from theoretical, calculated, and/or controlled testing environment. Actual performance may vary.

Toro Downhole Tools

Model JB
Reverse Circulating Junk Basket

The Toro Model JB Reverse Circulation Junk Basket is designed to effectively retrieve all types of junk that accumulates at the bottom of a well such as rock bit cones and bearings, tong pins, broken slips, bits of wireline, small hand tools, debris from twisted-off drill strings, mill cuttings, and similar items.

The Toro Model JB Reverse Circulation Junk Basket consists of a top sub, barrel assembly, catcher and mill shoe. Junk embedded in the bottom formation can be core milled where the mill cuttings and the core itself are removed by the tool. By using a Magnet Insert for the catcher, the tool is easily converted to Fishing Magnet. The tool can also be used for drilling full gauge holes or hole reaming with the cuttings being retained in the basket. See available junk basket sizes, shoes and technical specifications below.

Type B Mill Shoe

Type C Mill Shoe

Magnet Insert

Finger Shoe

MODEL NUMBER	OD (In)	MAX. HOLE SIZE (In)	MAX. FISHING OD (In)	MILL SHOE SIZE OD (In)	STANDARD CONNECTION
JB-350	3-1/2	4-1/2	2-1/8	3-3/4	2-3/8 IF (NC26)
JB-375	3-3/4	5-0	2-1/2	4-0	2-3/8 IF (NC26)
JB-450	4-1/2	5-1/2	3-1/4	4-3/4	2-7/8 IF (NC31)
JB-475	4-3/4	6-0	3-1/2	5-0	2-7/8 IF (NC31)
JB-513	5-1/8	6-1/2	3-3/4	5-3/8	2-7/8 IF (NC31)
JB-663	6-5/8	8-1/4	4-3/4	6-7/8	4-1/2 IF (NC50)
JB-700	7-0	8-1/4	5-1/8	7-1/4	4-1/2 IF (NC50)
JB-763	7-5/8	9-1/2	5-7/8	8-0	4-1/2 IF (NC50)
JB-813	8-1/8	9-1/2	6-1/4	8-1/4	4-1/2 IF (NC50)
JB-913	9-1/8	10-5/8	7-0	9-1/2	4-1/2 IF (NC50)
JB-963	9-5/8	11-5/8	7-1/2	10-0	4-1/2 IF (NC50)
JB-1000	10-0	11-5/8	7-5/8	10-1/4	6-5/8 REG
JB-1100	11-0	13-1/2	8-1/4	11-1/4	6-5/8 REG
JB-1138	11-3/8	13-5/8	8-1/2	11-3/4	6-5/8 REG
JB-1250	12-1/2	16-0	9-3/4	12-3/4	6-5/8 REG
JB-1500	15-0	17-1/2	11-1/8	15-1/8	7-5/8 REG

Toro Downhole Tools
16626 FM 2920
Tomball, Texas 77377 USA
Toll Free: 1-888-662-TORO
Tel: (+1) 281-580-8676
www.torotools.com

Note: Technical specifications are derived from theoretical, calculated, and/or controlled testing environment. Actual performance may vary.

Model MIC
Mechanical Internal Cutter

The Toro Model MIC Mechanical Internal Cutters are used internally to cut tubing, casing or drill pipe and may also be used on sucker rods and macaroni strings. The cutter is operated mechanically and permits alternate sizes of pipe to be cut when redressing an assembly.

Toro Model MIC Casing Cutters feature a device that permits the operator to set the cutter to any depth, release the tool and reset the tool to another depth without coming out of the hole.

Each cutter is designed to cut a given range of tubing when dressed with correctly sized components. Collar finders are also available for each size cutter.

See table below for available cutter sizes and technical specifications.

MODEL NUMBER	TOOL OD (in)	STANDARD CONNECTION	PIPE STRING OD (in)	PIPE STRING ID RANGE (in)
MIC-350	3-1/2	2-3/8 IF (NC26)	4-1/2	3-7/8 to 4-0
MIC-400	4-0	2-3/8 IF (NC26)	5-0	4-1/4 to 4-1/2
MIC-450	4-1/2	2-7/8 IF (NC31)	5-1/2	4-5/8 to 5-0
MIC-550	5-1/2	3-1/2 IF (NC38)	6-5/8	5-5/8 to 6-0
MIC-575	5-3/4	3-1/2 IF (NC38)	7-0	6-0 to 6-1/2
MIC-825	8-1/4	4-1/2 IF (NC50)	9-5/8	8-1/2 to 9-0

Toro Downhole Tools
16626 FM 2920
Tomball, Texas 77377 USA
Toll Free: 1-888-662-TORO
Tel: (+1) 281-580-8676
www.torotools.com

Note: Technical specifications are derived from theoretical, calculated, and/or controlled testing environment. Actual performance may vary.

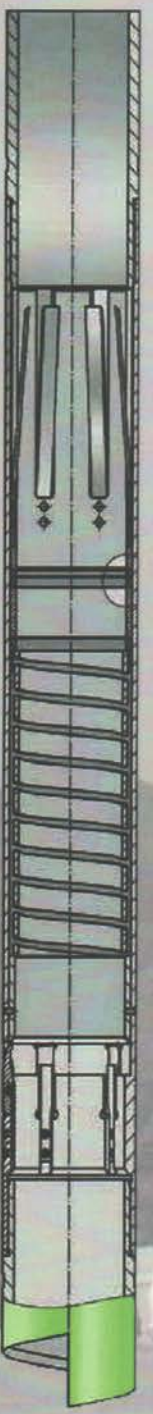
Model MEC
Mechanical External Cutter

The Toro Model MEC Mechanical External Cutters are used externally to cut tubing, casing or drill pipe . The tool is designed with automatic spring fed cutters that provides fast and efficient external cutting.

The automatic spring-fed feature prevents excessive strain from being applied from the rig floor that could cause the knives to burn or break prior to completing the cutting process.

Each cutter is designed with a top sub, body, guide knives, spring dog assembly, thrust washer, thrust bearing, preload sleeve, feed ring, main spring and shear pins.

See table below for available cutter sizes and technical specifications.



MODEL NUMBER	MEC-600
TOOL OD (In)	6-0
TOOL ID (In)	4-7/8
STANDARD CONNECTION	5-1/2" LCSG
PIPE SIZE OD RANGE (In)	2-1/2 to 4-0
MIN. HOLE SIZE (In)	6-1/4
MAX. FISHING SIZE (In)	4-3/4

Toro Downhole Tools
16626 FM 2920
Tomball, Texas 77377 USA
Toll Free: 1-888-662-TORO
Tel: (+1) 281-580-8676
www.torotools.com

Model CC
Multi String Casing Cutter

The Toro Model CC Casing Cutter provides a fast and efficient means to cut intermediate casing strings. The cutter is equipped with knives that are pivoted into the pipe to server the casing.

The Toro Model CC Casing Cutter is designed to withstand extreme shock encountered in cutting multiple strings of conductor pipe. Due to the unique construction of this tool, the rugged cutter arms expand outward up to five (5) times the diameter of the tool body and achieves maximum stability under all types of adverse cutting conditions.

Knives of different lengths are available to cut a single pipe or to progressively cut multiple stings. An adjustable internal stop is set to control the maximum knife-cutting diameter.

The main features and benefits of the Toro Model CC Casing Cutters include:

- Cuts multiple strings smoothly even if the strings are not concentric;
- Allows for maximum expansion of blades up to five (5) times the body diameter;
- Rugged 3-blade design provides fast and efficient cutting at high speeds;
- Cutter arms can be changed on rig floor.

See table below for available cutter sizes and cutter arm ranges.

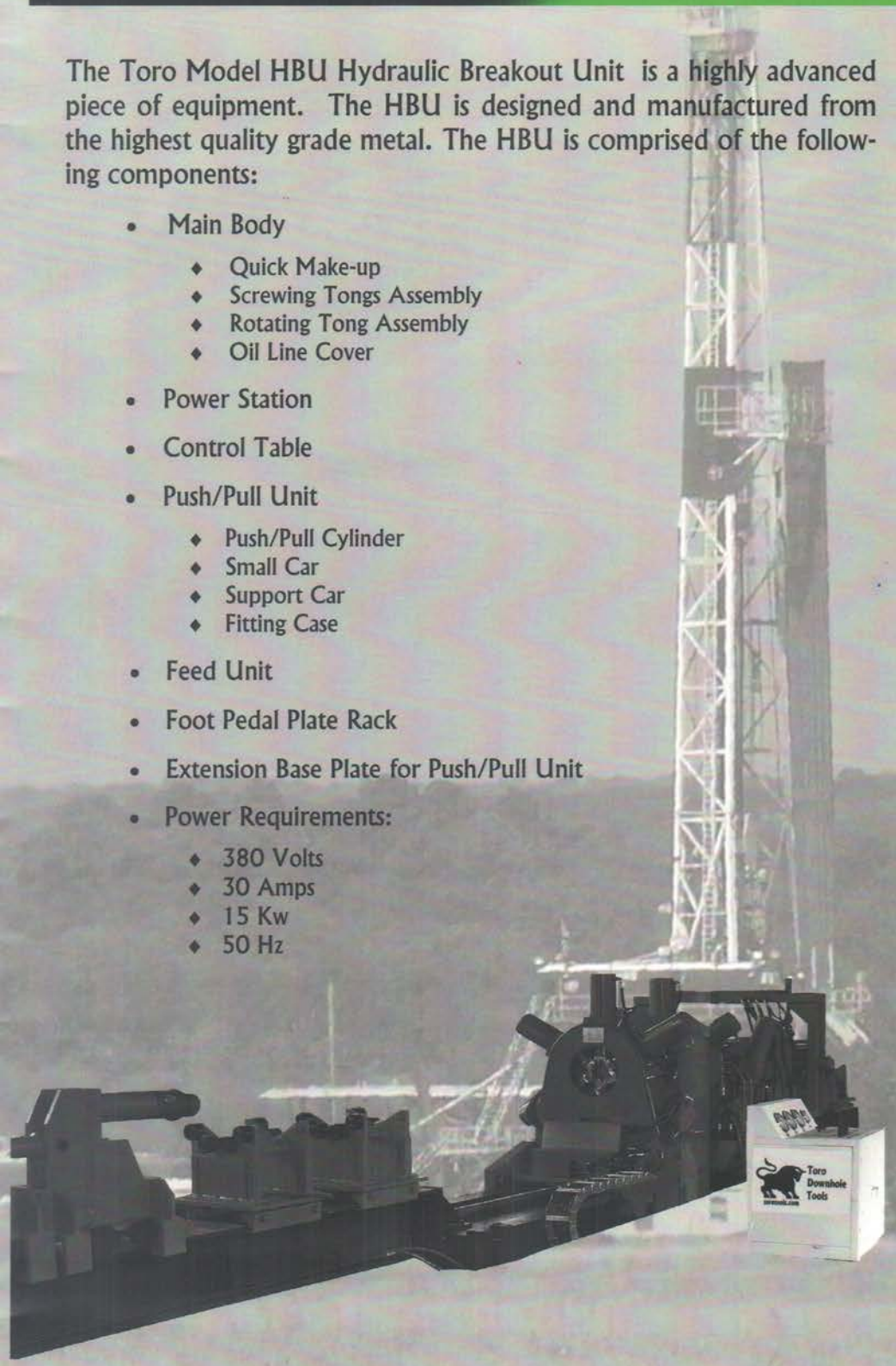
MODEL NUMBER	BODY SIZE OD (in)	CASING OD RANGE (in)	CUTTER ARM RANGE (in)	STANDARD CONNECTION
CC-438	4-3/8	5-1/2	5-1/2	2-7/8 REG
CC-575	5-3/4	7 ~ 16	7 7 ~ 9-5/8 9-5/8 ~ 13-3/8 13-3/8 ~ 16	3-1/2 REG
CC-825	8-1/2	9-5/8 ~ 30	9-5/8 9-5/8 ~ 13-3/8 13-3/8 ~ 20 16 ~ 20 20 ~ 30	4-1/2 IF (NC50)
CC-1175	11-3/4	13-3/8 ~ 60	13-3/8 13-3/8 ~ 16 16 ~ 20 20 ~ 30 30 ~ 60	6-5/8 REG

Toro Downhole Tools
16626 FM 2920
Tomball, Texas 77377 USA
Toll Free: 1-888-662-TORO
Tel: (+1) 281-580-8676
www.torotools.com

Model HBU
Hydraulic Breakout Unit

The Toro Model HBU Hydraulic Breakout Unit is a highly advanced piece of equipment. The HBU is designed and manufactured from the highest quality grade metal. The HBU is comprised of the following components:

- Main Body
  - Quick Make-up
  - Screwing Tongs Assembly
  - Rotating Tong Assembly
  - Oil Line Cover
- Power Station
- Control Table
- Push/Pull Unit
  - Push/Pull Cylinder
  - Small Car
  - Support Car
  - Fitting Case
- Feed Unit
- Foot Pedal Plate Rack
- Extension Base Plate for Push/Pull Unit
- Power Requirements:
  - 380 Volts
  - 30 Amps
  - 15 Kw
  - 50 Hz



MODEL NO.	HBU-513	HBU-1140	HBU-1750
Tool Diameter Range (In.)	1-1/4" to 5-3/25"	2-3/8" to 11-2/5"	2-3/8" to 17-1/2"
Max. Make-up/ Break-out Torque (ft.-lbs.)	8,850	84,818	132,758
Max. Spinner Torque (ft.-lbs.)	2,950	2,950	2,950
Max. Push Force (tons)	0.36	25.00	28.00
Max. Pull Force (tons)	0.30	20.00	24.00
Bed Length (ft.)	19	59	59
Full Dimensions (ft.)	7.2 x 4.9 x 28.7	5.6 x 5.6 x 59.0	7.2 x 7.2 x 59.0
Net Weight (lbs.)	5,521	17,637	28,219

Toro Downhole Tools
16626 FM 2920
Tomball, Texas 77377 USA
Toll Free: 1-888-662-TORO
Tel: (+1) 281-580-8676
www.torotools.com

Note: Technical specifications are derived from theoretical, calculated, and/or controlled testing environment. Actual performance may vary.

Model HJT
Hydraulic Jar Tester

The Toro Model HJT Hydraulic Jar Tester is used to test tensile strength and pressure performance of downhole drilling jars, shock subs and jar intensifiers.

The Model HJT Hydraulic Jar Tester is designed and manufactured from the highest quality grade metal. The main body of the HJT is composed of a bed unit with maximum safety features. The control table ensures easy and smooth operations. The large capacity push/pull unit is designed to accommodate various types and size tools.

Model No.	HJT-29
Motor Power (hp)	20
Motor Speed (rev/min.)	1,460
Max. Oil Tank Volume (gal)	105
Max. Oil Cylinder Stroke (ft.)	3
Testing Length (ft.)	3—29
Max. Working Pressure (psi)	3,625
Max. Push Force (lbs)	300,000
Max. Pull Force (lbs)	260,000

Toro Downhole Tools
16626 FM 2920
Tomball, Texas 77377 USA
Toll Free: 1-888-662-TORO
Tel: (+1) 281-580-8676
www.torotools.com

Note: Technical specifications are derived from theoretical, calculated, and/or controlled testing environment. Actual performance may vary.

Toro Downhole Tools

Contacts

Head Quarters:

• Product Sales and Rental	Tel: 1-888-662-8676
• Accounting / Billing	Tel: (+1) 281-580-8676
• Technical Support	Tel: (+1) 832-421-0404
• Email: Sales & Product Inquiry	sales@torotools.com
• Email: Human Resources	hr@torotools.com

U.S.A. Operations:

• North Texas | Oklahoma | Kansas	Tel: (+1) 832-247-5757
• West Texas | New Mexico	Tel: (+1) 281-813-9222
• Arkansas | East Texas | Louisiana	Tel: (+1) 832-530-7979
• South Texas | Gulf Coast | East Coast	Tel: (+1) 832-530-7979
• Colorado | California | Wyoming | North Dakota	Tel: (+1) 281-477-0751
• All other U.S. areas	Tel: (+1) 281-580-8676

International Operations:

• Mexico | Central America | South America	Tel: (+1) 832-421-0388
• Russian Federation (Neftepromservice)	Tel: (+7) 48458-30540
• India (Well-Tech Services)	Tel: (+91) 94350-38029
• Middle East (Compass Oil Services)	Tel: (+968) 9515 8369
• All Other Countries	Tel: (+1) 281-580-8676

Toro Downhole Tools
16626 FM 2920
Tomball, Texas 77377 USA
Toll Free: 1-888-662-TORO
Tel: (+1) 281-580-8676
www.torotools.com

Toro Downhole Tools
16626 FM 2920
Tomball, Texas 77377 USA
Toll Free 1-888-662-TORO
Tel: (+1) 281-580-8676
sales@torotools.com
www.torotools.com