

DYNOMAX

Shock Subs

DYNOMAX™
DRILLING
TOOLS INC



DYNOMAX supplies
leading performance drilling products
engineered for the oil and gas industry.

We provide high value products and services for vertical, directional and horizontal drilling operations worldwide.

Our product lines include Mud Motors, Shock Subs, Drilling Jars and Slide Reamers, which bear our industry-leading technologies backed by experience in the field—tools that are built for extended uses. Our QA/QC Program ensures that every tool meets or exceeds expectations in the field.

THE CHALLENGE

During drilling operations, the drill bit imparts various dynamic impact loads to the drill string. These loads are cyclical in nature and can lead to premature failure of the drill string & rig equipment, and lead to low ROP & hole problems. These translate into higher drilling costs.

THE ANSWER

DYNOMAX Drilling Tools' Shock Sub is designed to absorb and dampen the variable axial dynamic loads produced by the drill bit during "normal" drilling operations, by interrupting the harmonic cycle created at the bit.

Bi-directional spring action allows the shock sub to automatically adjust to a wide range of weight on bit values which can be further customized using a low compression spring stack. As axial loads are produced, energy is absorbed through the use of the Belleville spring assembly, while force dampening is accomplished by mechanical friction.

Dynomax can offer shock subs for higher temperature applications with specially designed seals for temperatures above 350°F (175°C).

CORPORATE

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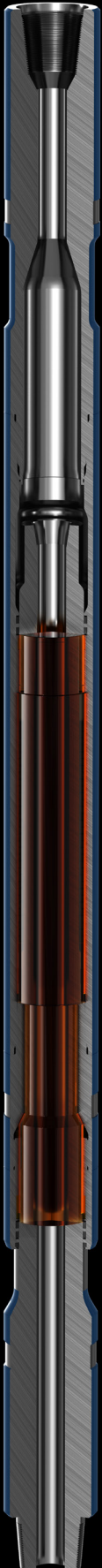
DynoMax Corporate Head Office
is proud to be
ISO 9001 Quality Certified.

Available Sizes and Specifications on Subsequent Pages

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	2.88" (73 mm)	2.88" (73 mm)	3.13" (80 mm)	3.13" (80 mm)
SERIES/ARRANGEMENT	2 / 1X1	2 / 2X2	2 / 1X1	2 / 2X2
TOOL ID	0.88 in (22 mm)	0.88 in (22 mm)	1.0 in (25 mm)	1.0 in (25 mm)
LENGTH	4.5 ft (1.37 m)	4.5 ft (1.37 m)	5.2 ft (1.58 m)	5.2 ft (1.58 m)
WEIGHT	74 lb (34 kg)	74 lb (34 kg)	106 lb (48 kg)	107 lb (49 kg)
AXIAL LOAD CAPACITY	8,400 lb (3737 daN)	16,800 lb (7473 daN)	10,700 lb (4760 daN)	21,350 lb (9497 daN)
SPRING RATE	8,000 lb/in (1401 N/mm)	30,100 lb/in (5271 N/mm)	9,000 lb/in (1576 N/mm)	30,500 lb/in (5341 N/mm)
ABSOLUTE OVERPULL	130,600 lb (58094 daN)	130,600 lb (58094 daN)	207,500 lb (92301 daN)	207,500 lb (92301 daN)
MAX TORQUE	3,100 ft-lb (4203 Nm)	3,100 ft-lb (4203 Nm)	5,000 ft-lb (6779 Nm)	5,000 ft-lb (6779 Nm)
PUMP OPEN AREA	2.49 in ² (16.1 cm ²)	2.49 in ² (16.1 cm ²)	2.80 in ² (18.1 cm ²)	2.80 in ² (18.1 cm ²)
OPENING TRAVEL	0.89 in (23 mm)	0.48 in (12 mm)	1.01 in (26 mm)	0.60 in (15 mm)
CLOSING TRAVEL	0.90 in (23 mm)	0.48 in (12 mm)	1.01 in (26 mm)	0.60 in (15 mm)
TOTAL TRAVEL	1.79 in (45 mm)	0.97 in (25 mm)	2.02 in (51 mm)	1.20 in (30 mm)

	3.75" (95 mm)	3.75" (95 mm)
SERIES/ARRANGEMENT	2 / 1X1	2 / 2X2
TOOL ID	1.25 in (32 mm)	1.25 in (32 mm)
LENGTH	7.2 ft (2.19 m)	7.2 ft (2.19 m)
WEIGHT	197 lb (89 kg)	198 lb (90 kg)
AXIAL LOAD CAPACITY	10,550 lb (4693 daN)	21,100 lb (9386 daN)
SPRING RATE	6,000 lb/in (1051 N/mm)	21,300 lb/in (3730 N/mm)
ABSOLUTE OVERPULL	243,200 lb (108181 daN)	243,200 lb (108181 daN)
MAX TORQUE	7,400 ft-lb (10033 Nm)	7,400 ft-lb (10033 Nm)
PUMP OPEN AREA	4.69 in ² (30.3 cm ²)	4.69 in ² (30.3 cm ²)
OPENING TRAVEL	0.96 in (24 mm)	0.85 in (22 mm)
CLOSING TRAVEL	1.50 in (38 mm)	0.85 in (22 mm)
TOTAL TRAVEL	2.46 in (62 mm)	1.70 in (43 mm)

	4.75" (121 mm)	4.75" (121 mm)	5 in (127 mm)	5 in (127 mm)
SERIES/ARRANGEMENT	2 / 1X1	2 / 2X2	2 / 1X1	2 / 2X2
TOOL ID	1.75 in (44 mm)	1.75 in (44 mm)	1.75 in (44 mm)	1.75 in (44 mm)
LENGTH	8.1 ft (2.47 m)	8.1 ft (2.47 m)	8.1 ft (2.47 m)	8.1 ft (2.47 m)
WEIGHT	365 lb (166 kg)	367 lb (166 kg)	408 lb (185 kg)	408 lb (185 kg)
AXIAL LOAD CAPACITY	29,650 lb (13189 daN)	59,300 lb (26378 daN)	29,650 lb (13189 daN)	59,300 lb (26378 daN)
SPRING RATE	14,000 lb/in (2452 N/mm)	50,250 lb/in (8800 N/mm)	14,000 lb/in (2452 N/mm)	50,250 lb/in (8800 N/mm)
ABSOLUTE OVERPULL	323,100 lb (143722 daN)	323,100 lb (143722 daN)	406,800 lb (180954 daN)	406,800 lb (180954 daN)
MAX TORQUE	12,200 ft-lb (16541 Nm)	12,200 ft-lb (16541 Nm)	20,500 ft-lb (27794 Nm)	20,500 ft-lb (27794 Nm)
PUMP OPEN AREA	7.22 in ² (46.6 cm ²)	7.22 in ² (46.6 cm ²)	7.22 in ² (46.6 cm ²)	7.22 in ² (46.6 cm ²)
OPENING TRAVEL	0.96 in (24 mm)	0.96 in (24 mm)	0.98 in (25 mm)	0.98 in (25 mm)
CLOSING TRAVEL	1.81 in (46 mm)	1.01 in (26 mm)	1.81 in (46 mm)	1.01 in (26 mm)
TOTAL TRAVEL	2.77 in (70 mm)	2.02 in (51 mm)	2.79 in (71 mm)	1.99 in (51 mm)

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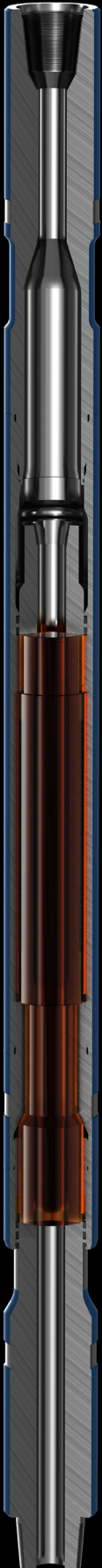
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	6.5" (165 mm)	6.5" (165 mm)	6.5" (165 mm) LIGHT	6.5" (165 mm) LIGHT
SERIES/ARRANGEMENT	2 / 1X1	2 / 2X2	2 / 1X1	2 / 2X2
TOOL ID	2.50 in (64 mm)	2.50 in (64 mm)	2.50 in (64 mm)	2.50 in (64 mm)
LENGTH	9.6 ft (2.93 m)	9.6 ft (2.93 m)	9.6 ft (2.93 m)	9.6 ft (2.93 m)
WEIGHT	781 lb (354 kg)	786 lb (357 kg)	781 lb (354 kg)	784 lb (356 kg)
AXIAL LOAD CAPACITY	55,150 lb (24532 daN)	110,250 lb (49042 daN)	55,150 lb (24532 daN)	61,900 lb (27534 daN)
SPRING RATE	23,900 lb/in (4186 N/mm)	85,000 lb/in (14886 N/mm)	23,900 lb/in (4186 N/mm)	31,250 lb/in (5473 N/mm)
ABSOLUTE OVERPULL	728,500 lb (324053 daN)	728,500 lb (324053 daN)	728,500 lb (324053 daN)	728,500 lb (324053 daN)
MAX TORQUE	39,100 ft-lb (53013 Nm)	39,100 ft-lb (53013 Nm)	39,100 ft-lb (53013 Nm)	39,100 ft-lb (53013 Nm)
PUMP OPEN AREA	14.73 in ² (95 cm ²)	14.73 in ² (95 cm ²)	14.73 in ² (95 cm ²)	14.73 in ² (95 cm ²)
OPENING TRAVEL	1.46 in (37 mm)	1.12 in (28 mm)	1.46 in (37 mm)	1.46 in (37 mm)
CLOSING TRAVEL	1.98 in (50 mm)	1.12 in (28 mm)	1.98 in (50 mm)	1.71 in (43 mm)
TOTAL TRAVEL	3.44 in (87 mm)	2.24 in (57 mm)	3.44 in (87 mm)	3.17 in (81 mm)

	6.75" (171 mm)	6.75" (171 mm)	6-3/4" (171 mm) LIGHT	6-3/4" (171 mm) LIGHT
SERIES/ARRANGEMENT	2 / 1X1	2 / 2X2	2 / 1X1	2 / 2X2
TOOL ID	2.50 in (64 mm)	2.50 in (64 mm)	2.50 in (64 mm)	2.50 in (64 mm)
LENGTH	9.6 ft (2.93 m)	9.6 ft (2.93 m)	9.6 ft (2.93 m)	9.6 ft (2.93 m)
WEIGHT	835 lb (379 kg)	835 lb (379 kg)	835 lb (379 kg)	835 lb (379 kg)
AXIAL LOAD CAPACITY	55,150 lb (24532 daN)	110,250 lb (49042 daN)	30,950 lb (13767 daN)	61,900 lb (27534 daN)
SPRING RATE	23,900 lb/in (4186 N/mm)	85,000 lb/in (14886 N/mm)	8,600 lb/in (1506 N/mm)	31,250 lb/in (5473 N/mm)
ABSOLUTE OVERPULL	728,500 lb (324053 daN)	728,500 lb (324053 daN)	728,500 lb (324053 daN)	728,500 lb (324053 daN)
MAX TORQUE	39,400 ft-lb (53419 Nm)	39,400 ft-lb (53419 Nm)	39,400 ft-lb (53419 Nm)	39,400 ft-lb (53419 Nm)
PUMP OPEN AREA	14.73 in ² (95 cm ²)	14.73 in ² (95 cm ²)	14.73 in ² (95 cm ²)	14.73 in ² (95 cm ²)
OPENING TRAVEL	1.46 in (37 mm)	1.12 in (28 mm)	1.46 in (37 mm)	1.46 in (37 mm)
CLOSING TRAVEL	1.98 in (50 mm)	1.12 in (28 mm)	3.08 in (78 mm)	1.71 in (43 mm)
TOTAL TRAVEL	3.44 in (87 mm)	2.24 in (57 mm)	4.54 in (115 mm)	3.17 in (81 mm)

	8" (203 mm)	8" (203 mm)	8" (203 mm) LIGHT	8" (203 mm) LIGHT
SERIES/ARRANGEMENT	2 / 1X1	2 / 2X2	2 / 1X1	2 / 2X2
TOOL ID	2.81 in (71 mm)	2.81 in (71 mm)	2.81 in (71 mm)	2.81 in (71 mm)
LENGTH	11.2 ft (3.41 m)	11.2 ft (3.41 m)	11.2 ft (3.41 m)	11.2 ft (3.41 m)
WEIGHT	1,340 lb (608 kg)	1,348 lb (611 kg)	1,339 lb (607 kg)	1,345 lb (610 kg)
AXIAL LOAD CAPACITY	86,850 lb (38633 daN)	173,700 lb (77266 daN)	39,050 lb (17370 daN)	78,100 lb (34741 daN)
SPRING RATE	28,000 lb/in (4904 N/mm)	99,500 lb/in (17425 N/mm)	10,000 lb/in (1751 N/mm)	36,600 lb/in (6410 N/mm)
ABSOLUTE OVERPULL	725,300 lb (322630 daN)	725,300 lb (322630 daN)	725,300 lb (322630 daN)	725,300 lb (322630 daN)
MAX TORQUE	49,900 ft-lb (67656 Nm)	49,900 ft-lb (67656 Nm)	49,900 ft-lb (67656 Nm)	49,900 ft-lb (67656 Nm)
PUMP OPEN AREA	24.58 in ² (158.6 cm ²)	24.58 in ² (158.6 cm ²)	24.58 in ² (158.6 cm ²)	24.58 in ² (158.6 cm ²)
OPENING TRAVEL	1.46 in (37 mm)	1.46 in (37 mm)	1.46 in (37 mm)	1.46 in (37 mm)
CLOSING TRAVEL	2.65 in (67 mm)	1.50 in (38 mm)	3.31 in (84 mm)	1.83 in (46 mm)
TOTAL TRAVEL	4.11 in (104 mm)	2.96 in (75 mm)	4.77 in (121 mm)	3.29 in (84 mm)

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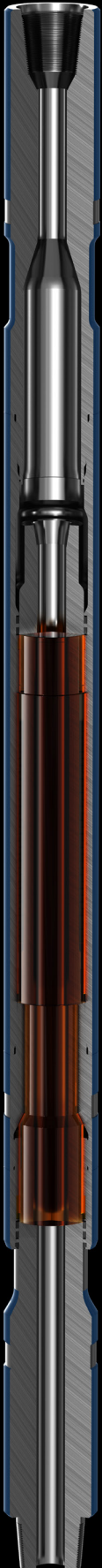
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	9.5" (241 mm)	9.5" (241 mm)	9.5" (241 mm) LIGHT	9.5" (241 mm) LIGHT
SERIES/ARRANGEMENT	2 / 1X1	2 / 2X2	2 / 1X1	2 / 2X2
TOOL ID	3.00 in (76 mm)	3.00 in (76 mm)	3.00 in (76 mm)	3.00 in (76 mm)
LENGTH	13.8 ft (4.21 m)	13.8 ft (4.21 m)	13.8 ft (4.21 m)	13.8 ft (4.21 m)
WEIGHT	2,466 lb (1119 kg)	2,483 lb (1126 kg)	2,473 lb (1122 kg)	2,480 lb (1125 kg)
AXIAL LOAD CAPACITY	143,050 lb (63632 daN)	286,100 lb (127264 daN)	74,100 lb (32961 daN)	148,200 lb (65923 daN)
SPRING RATE	33,850 lb/in (5928 N/mm)	120,400 lb/in (21085 N/mm)	18,400 lb/in (3222 N/mm)	69,900 lb/in (12241 N/mm)
ABSOLUTE OVERPULL	1,439,800 lb (640455 daN)	1,439,800 lb (640455 daN)	1,439,800 lb (640455 daN)	1,439,800 lb (640455 daN)
MAX TORQUE	109,500 ft-lb (148462 Nm)	109,500 ft-lb (148462 Nm)	109,500 ft-lb (148462 Nm)	109,500 ft-lb (148462 Nm)
PUMP OPEN AREA	34.33 in ² (221.5 cm ²)	34.33 in ² (221.5 cm ²)	34.33 in ² (221.5 cm ²)	34.33 in ² (221.5 cm ²)
OPENING TRAVEL	2.39 in (61 mm)	2.03 in (52 mm)	2.39 in (61 mm)	1.82 in (46 mm)
CLOSING TRAVEL	3.60 in (91 mm)	2.03 in (52 mm)	3.43 in (87 mm)	1.82 in (46 mm)
TOTAL TRAVEL	5.99 in (152 mm)	4.06 in (103 mm)	5.82 in (148 mm)	3.64 in (92 mm)

	11.25" (286 mm)	11.25" (286 mm)	12" (305 mm)	14" (356 mm)
SERIES/ARRANGEMENT	2 / 1X1	2 / 2X2	2 / 1X1	2 / 1X1
TOOL ID	3.50 in (89 mm)	3.50 in (89 mm)	3.25 in (83 mm)	3.25 in (83 mm)
LENGTH	15.3 ft (4.66 m)	15.3 ft (4.66 m)	13.3 ft (4.05 m)	15.0 ft (4.57 m)
WEIGHT	3,796 lb (1722 kg)	3,828 lb (1736 kg)	3,841 lb (1742 kg)	5,934 lb (2692 kg)
AXIAL LOAD CAPACITY	192,000 lb (85406 daN)	384,000 lb (170812 daN)	100,000 lb (44482 daN)	140,450 lb (62475 daN)
SPRING RATE	36,350 lb/in (6366 N/mm)	129,300 lb/in (22644 N/mm)	25,159 lb/in (4406 N/mm)	27,000 lb/in (4728 N/mm)
ABSOLUTE OVERPULL	2,776,300 lb (1234960 daN)	2,776,300 lb (1234960 daN)	2,176,700 lb (968244 daN)	3,288,400 lb (1462753 daN)
MAX TORQUE	160,100 ft-lb (217067 Nm)	160,100 ft-lb (217067 Nm)	156,200 ft-lb (211779 Nm)	184,500 ft-lb (250149 Nm)
PUMP OPEN AREA	43.96 in ² (283.6 cm ²)	43.96 in ² (283.6 cm ²)	48.45 in ² (312.6 cm ²)	66.37 in ² (428.2 cm ²)
OPENING TRAVEL	2.36 in (60 mm)	2.36 in (60 mm)	2 in (51 mm)	3 in (76 mm)
CLOSING TRAVEL	4.51 in (115 mm)	2.55 in (65 mm)	3.4 in (86 mm)	4.43 in (113 mm)
TOTAL TRAVEL	6.87 in (174 mm)	4.91 in (125 mm)	5.4 in (137 mm)	7.43 in (189 mm)

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