

Maximum Torque Values for Progressing Cavity Pump Applications

Norris Drive Rods®

| 1" (25,40 mm) Drive Rods | SIZE | | | | Maximum | | | | | |
|--------------------------|--------|---------|--------|---------|-----------|-----------|----------|-----------|-----------|-----------|
| | Body | | Pin | | 78 and 90 | | 75 | | 96 and 97 | |
| | inches | (mm) | inches | (mm) | Ft.-lbs. | (Nm) | Ft.-lbs. | (Nm) | Ft.-lbs. | (Nm) |
| | 1 | (25,40) | 7/8 | (22,23) | 1,100 | (1 491,4) | 1,110 | (1 505,0) | 1,200 | (1 627,0) |

Maximum 35,000 lbs (15 568,8 daN) Axial Load

• Use O'Bannon E106 solid body sucker rod elevators for 1" (25,4 mm) drive rods.

| 1-1/4" (31,75 mm) Drive Rods | SIZE | | | | Maximum | | | | | |
|------------------------------|---------|---------|---------|---------|-----------|-----------|-----------|-----------|-----------|-----------|
| | Body | | Pin | | 78 | | 75 | | 97 | |
| | inches | (mm) | inches | (mm) | Ft.-lbs. | (Nm) | Ft.-lbs. | (Nm) | Ft.-lbs. | (Nm) |
| | 1-1/4 | (31,75) | 1 | (25,40) | 2,000 | (2 711,6) | 2,100 | (2 847,2) | 2,500 | (3 389,5) |
| 1-1/4 | (31,75) | 1-1/8 | (28,58) | 2,000 | (2 711,6) | 2,100 | (2 847,2) | 2,500 | (3 389,5) | |

Maximum 50,000 lbs (22 241,1 daN) Axial Load

• Use O'Bannon E108 solid body elevators for 1-1/4" (31,75 mm) drive rods.

| 1-1/2" (38,1 mm) Drive Rods | SIZE | | | | Maximum | | | | | |
|-----------------------------|--------|--------|--------|---------|----------|-----------|----------|-----------|----------|-----------|
| | Body | | Pin | | 78 | | 75 | | 97 | |
| | inches | (mm) | inches | (mm) | Ft.-lbs. | (Nm) | Ft.-lbs. | (Nm) | Ft.-lbs. | (Nm) |
| | 1-1/2 | (38,1) | 1-1/8 | (28,58) | 3,000 | (4 067,5) | 3,150 | (4 270,8) | 3,750 | (5 084,3) |

Maximum 80,000 lbs (40 034,0 daN) Axial Load

• Use O'Bannon E109 solid body elevators for 1-1/2" (38,1 mm) drive rods.

Norris Sucker Rods and Pony Rods

| Sucker Rods and Pony Rods | SIZE | | | | API Class D | | | | | | Special Service | |
|---------------------------|---------|---------|---------|---------|-------------|---------|-----------|---------|-----------|---------|-----------------|---------|
| | Body | | Pin | | D54 | | D78 & D90 | | D75 | | Type 96 & 97 | |
| | inches | (mm) | inches | (mm) | Ft.-lbs. | (Nm) | Ft.-lbs. | (Nm) | Ft.-lbs. | (Nm) | Ft.-lbs. | (Nm) |
| | 3/4 | (19,05) | 3/4 | (19,05) | 430 | (583,0) | 460 | (623,7) | 470 | (637,2) | 500 | (677,9) |
| 7/8 | (22,23) | 7/8 | (22,23) | 675 | (915,2) | 735 | (996,5) | 750 | (1 016,9) | 800 | (1 084,7) | |
| 1 | (25,40) | 1 | (25,40) | 1,010 | (1 369,4) | 1,100 | (1 491,4) | 1,110 | (1 505,0) | 1,200 | (1 627,0) | |
| 1-1/8 | (28,58) | 1-1/8 | (28,58) | - | - | 1,570 | (2 128,6) | - | - | 1,700 | (2 304,9) | |
| 1-1/4 | (31,75) | 1-1/8 | (28,58) | - | - | 2,000 | (2 711,6) | 2,100 | (2 847,2) | 2,500 | (3 389,5) | |

- Use O'Bannon E105 solid body sucker rod elevators for 3/4" (19,05 mm) and 7/8" (22,23 mm) Norris sucker rods and pony rods.
 - Use O'Bannon E106 solid body sucker rod elevators for 1" (25,4 mm) Norris sucker rods and pony rods.
- Use O'Bannon E107 solid body sucker rod elevators for 1-1/8" (28,58 mm) Norris sucker rods and pony rods.
- Use O'Bannon E108 solid body sucker rod elevators for 1-1/4" (31,75 mm) Norris sucker rods and pony rods.

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Norris Polished Rods

| Polished Rods | SIZE | | | | Piston Steel | | Alloy Steel | | Norloy® | | Stainless Steel | |
|------------------------|---------|---------|---------|---------|--------------|-----------|-------------|-----------|-----------|-----------|-----------------|-----------|
| | Body | | Pin | | C1045 | | 4140 | | 8620 | | 431 | |
| | inches | (mm) | inches | (mm) | Ft.-lbs. | (Nm) | Ft.-lbs. | (Nm) | Ft.-lbs. | (Nm) | Ft.-lbs. | (Nm) |
| | 1-1/4 | (31,75) | 3/4 | (19,05) | 1,500 | (2 033,7) | 1,500 | (2 033,7) | 1,500 | (2 033,7) | 1,500 | (2 033,7) |
| 1-1/4 | (31,75) | 7/8 | (22,23) | 1,800 | (2 440,5) | 1,800 | (2 440,5) | 1,800 | (2 440,5) | 1,800 | (2 440,5) | |
| 1-1/2 | (38,1) | 1 | (25,40) | 2,800 | (3 796,3) | 2,800 | (3 796,3) | 2,800 | (3 796,3) | 2,800 | (3 796,3) | |
| 1-1/2" Upset (special) | | | | - | - | 3,750 | (5 084,3) | - | - | - | - | |

- Use O'Bannon E113 solid body elevators for 1-1/4" (31,75 mm) Norris polished rods.
- Use O'Bannon E115 solid body elevators for 1-1/2" (38,1 mm) Norris polished rods.
- Use O'Bannon E109 solid body elevators for 1-1/2" (38,1 mm) upset (special) Norris polished rods.

NOTICE

1. Because Norris Drive Rods are specifically designed for torsional strength, Norris recommends their use in all PCP applications.
2. Torque values are based on actual torsion testing of the rod body on new Norris sucker rods, drive rods, pony rods and polished rods. These maximum values should only be used if ideal operating conditions exist.
3. To maximize fatigue life, Norris recommends using a 0.8 safety factor in the design and operation of all new Norris sucker rods, drive rods, pony rods and polished rods installation as the maximum allowable torque value.
4. To maximize connection strength and torque capacity, Norris recommends high strength couplings in all PCP applications.
5. Following recommended makeup procedures is critical to the successful installation and continued operation of Norris sucker rods; drive rods, pony rods and polished rods in all PCP applications.
6. For 1" (25.4mm) drive rod with 7/8" (22.23 mm) modified pin connections, the use of high strength slimhole couplings is recommended for slimhole applications in 2-3/8" (60.3 mm) tubing. No additional derating factor is required for high strength slimhole couplings.



WARNING TO AVOID SERIOUS INJURY, SAFELY DISSIPATE THE ENERGY STORED IN THE ROD STRING AND PREVENT UNCONTROLLED BACKSPIN PRIOR TO SERVICING OPERATIONS.

