

*Robert Young's*  
AUTO & TRUCK



**ROBERT YOUNG'S AUTO & TRUCK**

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**2024 PETERBILT 389 TRI-AXLE - TWIN STEER 356" WHEELBASE w/NRC 85-TON  
ROTATOR**

1. **TOTAL SPECIFICATIONS (Driver's and Passenger's Side)**
  - a. Total Length.....477" (39.75')
  - b. Wheelbase.....380" (31.6')
  - c. Gross Vehicle Weight Rating.....67,500 lbs.
  - d. Tare Weight (Estimated & Max Weight Preferred)...61,000 lbs.
  - e. 23,000 lbs Front Steer Axle Center Hub Location (Front to Rear).....31" (2.5')
  - f. 23,000 lbs. Twin Steer Axle Center Hub Location (Front to Rear).....160" (13.3')
  - g. Peterbilt 389 Stainless Steel 100 - Gallon Fuel Tank with Steps (Front to Rear).....81" to 129"
  - h. Zips In The Ditch SP50000 Sidepuller, (2) 25,000 lbs. Winches Boom 50,000 lbs. Capacity Intergrated (Front to Rear):.....132" to 138"
  - i. Vulcan Omnipro 220 Industrial Multiprocess Welder with 120/240V Input - Enclosure
  - j. Fortress 5-Gallon 225 psi High Performance Wheeled Jobsite Air Compressor - Enclosure
  - k. Predator 3500 Watt Super Quiet Inverter Generator w/CO Secure Technology - Enclosure
  - l. Titanium 65-Amp Plasma Cutter Cuts 1 3/16" Thick Metal - Enclosure
  - m. (2) Heavy Duty Spreader Bars
  - n. Front Outrigger (Front to Rear).....203" to 221"
  - o. 23,000 lbs. Lift Steerable Axle Hub Location (Front to Rear).....299"
  - p. 23,000 lbs. Front Drive Axle Hub Location (Front to Rear).....353"
  - q. 23,000 lbs. Rear Drive Axle Hub Location (Front to rear) .....407"
  - r. Rear Outrigger (Front to Rear).....434" to 452'
  - s. Boom in Travel Position (Front to Rear).....477"
  - t. Peterbilt 46,000 lbs. Tandem Drive Axle Hub Location (Front to Rear).....355" & 409"



***NRC 85-TON ROTATOR LIFTING CAPABILITIES LIMITATIONS***

*Stage #1 - 30' Max. Height / Stage #2 - 43' Max. Height / Stage #3 - 53' Max Height*

<b><i>LIFTING CAPABILITY</i></b>	<b><i>BOOM STAGE Angle</i></b>	<b><i>BOOM HEIGHT</i></b>	<b><i>MAX. WEIGHT RECOVERY HEIGHT</i></b>	<b><i>MIN. WEIGHT RECOVERY HEIGHT</i></b>	<b><i>EQUIPMENT</i></b>	<b><i># OF ROTATORS REQUIRED</i></b>
<i>79.2 to 26.5 Tons 158,400 lbs. To 53,000 lbs.</i>	<i>70 Degrees</i>	<i>53' Max</i>	<i>30'</i>	<i>53'</i>	<i>Cat 374 Excavator (Stage #1 Boom 30')</i>	<i>Recovery Lift 1' Distance or more Need 2-Rotators</i>
<i>77.2 to 18.2 Tons 154,400 lbs. To 36,400 lbs.</i>	<i>60 Degrees</i>	<i>50' Max</i>	<i>27'</i>	<i>50'</i>	<i>Cat D9 Dozer (Stage #1 Boom 27')</i>	<i>Recovery Lift 2' Distance or more Need 2-Rotators</i>
<i>59.4 to 14.1 Tons 118,800 lbs. To 28,200</i>	<i>50 Degrees</i>	<i>45' Max</i>	<i>25'</i>	<i>45'</i>	<i>Cat 988K Loader (Stage #1 Boom 25')</i>	<i>Recovery Lift 5' Distance or</i>

<i>lbs.</i>						<i>more Need 2-Rotators</i>
<i>41 to 11.8 Tons 82,000 lbs. To 23,600 lbs.</i>	<i>40 Degrees</i>	<i>39' Max</i>	<i>23'</i>	<i>39'</i>	<i>Cat MH3022 Wheel Material Handlers (Stage #1 Boom 23')</i>	<i>Recovery Lift 8' Distance or more Need 2-Rotators</i>
<i>33.3 to 10.5 Tons 66,600 lbs. To 21,000 lbs.</i>	<i>30 Degrees</i>	<i>33' Max</i>	<i>19'</i>	<i>33'</i>	<i>Cat 973K Track Loader (Stage #1 Boom 19')</i>	<i>Recovery Lift 10' Distance or more Need 2-Rotators</i>
<i>29.3 to 9.7 Tons 58,600 lbs. To 19,400 lbs.</i>	<i>20 Degrees</i>	<i>25' Max</i>	<i>16'</i>	<i>25'</i>	<i>Volvo EC220E Excavator (Stage #1 Boom 16')</i>	<i>Recovery Lift 11' Distance or more Need 2-Rotators</i>
<i>27.2 to 9.2 Tons 54,400 lbs. To 18,400 lbs</i>	<i>10 Degrees</i>	<i>17' Max</i>	<i>13'</i>	<i>17'</i>	<i>Volvo L120H Wheel Loader (Stage #1 Boom 13')</i>	<i>Recovery Lift 12' Distance or more Need 2-Rotators</i>
<i>26.6 to 9.1 Tons 53,200 lbs. To 18,200 lbs.</i>	<i>0 Degrees</i>	<i>9' Max</i>	<i>9'</i>	<i>9'</i>	<i>Volvo ABG PTR240 Asphalt Compactor (Stage #1 Boom 8')</i>	<i>Recovery Lift 13' Distance or more Need 2-Rotators</i>



## ***NRC 85-TON ROTATOR BOOM RECOVERY PULLING CAPABILITIES LIMITATIONS***

*Stage #1 - 30' Max. Height / 0 - 70 Degrees*

*THERE ARE 4 TYPES OF RESISTANCE ENCOUNTERED IN OUR INDUSTRY*

### ***1. ROLLING RESISTANCE***

*1.1. ROLLING HARD: Hard Flat Ground and the load on the wheels on concrete and tires are inflated*

*1.2. ROLLING SOFT: It is on soft surface such as grass or gravel*

### ***2. MIRE RESISTANCE***

*2.1. TIRE MIRE: When tire is sunk into the dirt, gravel, mud, sand or other soft surface*

*2.2. WHEEL MIRE: If it is sunk up to lower part of the wheel Rim*

*2.3. BODY MIRE: If it is sunk up to the body*

### ***3. GRADIENT RESISTANCE***

*3.1. 15% OF GRADIENT: The force of gravity moving up or down a grade*

*3.2. 30% OF GRADIENT: The force of gravity moving up or down a grade*

3.3. 45% OF GRADE: The force of gravity moving up or down a grade

**4. DAMAGE RESISTANCE**

4.1. DAMAGE: Is the force that resist the movement when rolling object is damaged

<b>LIFTING CAPABILITY</b>	<b>BOOM STAGE Angle</b>	<b>12" x 30' HEAVY DUTY RECOVERY STRAP (134,250 lbs. Working Load Limit)</b>	<b># OF ROTATORS REQUIRED</b>
<p><b>RECOVERY PULL MAX.</b> 53.1 Tons 106,308 lbs.</p> <ol style="list-style-type: none"> <li>1. Rolling Hard Resistance (lbs. X 0.05)               <ol style="list-style-type: none"> <li>a. 5,315.4 lbs.</li> <li>b. 111,623.4 lbs (total)</li> </ol> </li> <li>2. Rolling Soft Resistance (lbs. X 0.15)               <ol style="list-style-type: none"> <li>a. 15,946.2 lbs.</li> <li>b. 122,254.2 lbs. (total)</li> </ol> </li> <li>3. Tire Mire Resistance (lbs. X 0.75)               <ol style="list-style-type: none"> <li>a. 79,731 lbs.</li> <li>b. 186,039 lbs. (total)</li> </ol> </li> <li>4. Wheel Mire Resistance (lbs. X 1.0)               <ol style="list-style-type: none"> <li>a. 106,308 lbs.</li> <li>b. 212,616 lbs. (total)</li> </ol> </li> <li>5. Body Mire (lbs. X 1.5)               <ol style="list-style-type: none"> <li>a. 159,462 lbs.</li> <li>b. 265,770 lbs. (total)</li> </ol> </li> <li>6. Resistance @ Gradient of 15 Degrees (lbs. X 0.25)               <ol style="list-style-type: none"> <li>a. 26,577 lbs.</li> <li>b. 132,885 lbs. (total)</li> </ol> </li> <li>7. Resistance @ Gradient of 30 Degrees (lbs. X 0.50)               <ol style="list-style-type: none"> <li>a. 53,154 lbs.</li> <li>b. 159,462 lbs. (total)</li> </ol> </li> <li>8. Resistance @ Gradient of 45 Degrees (lbs. X 0.75)               <ol style="list-style-type: none"> <li>a. 79,731 lbs.</li> <li>b. 186,039 lbs. (total)</li> </ol> </li> <li>9. Damage Resistance (lbs.</li> </ol>	<p>70 Degrees @ 30' Height</p>	<ol style="list-style-type: none"> <li>1. # of Straps per 20' Length:.. 1</li> <li>2. # of Snatch Blocks per Strap: 2               <ol style="list-style-type: none"> <li>a. One on Rotator Stabilizer, Front Tow Hook on Front Bumper or Rear Anchor</li> <li>b. One on Cable Hook</li> </ol> </li> <li>3. How many Straps on a Hook: 2</li> <li>4. # of 4 Leg Chain Sling on a Hook: 1</li> <li>5. Can you use a Spreader Bar if the length is greater than 40': Yes if you are pulling the the entire machine Longitude towards the rotator to be lifted up</li> </ol>	<p>At the max limit of pulling i will need more than one rotator to assist in this recovery</p>

<p><i>X 0.6660</i></p> <p>a. 70,801.1 lbs.</p> <p>b. 177,109.1 lbs.</p>			
<p><b>RECOVERY PULL MAX.</b> 51.8 Tons 103,624.1 lbs.</p> <p>10. Rolling Hard Resistance (lbs. <i>X 0.05</i>)</p> <p>a. 5,181.2 lbs.</p> <p>b. 108,805.3 lbs. (total)</p> <p>11. Rolling Soft Resistance (lbs. <i>X 0.15</i>)</p> <p>a. 15,543.6 lbs.</p> <p>b. 119,167.7 lbs. (total)</p> <p>12. Tire Mire Resistance (lbs. <i>X 0.75</i>)</p> <p>a. 77,718.0 lbs.</p> <p>b. 181,342.1 lbs. (total)</p> <p>13. Wheel Mire Resistance (lbs. <i>X 1.0</i>)</p> <p>a. 103,624.1 lbs.</p> <p>b. 207,248.2 lbs. (total)</p> <p>14. Body Mire (lbs. <i>X 1.5</i>)</p> <p>a. 155,436.1 lbs.</p> <p>b. 259,060.2 lbs. (total)</p> <p>15. Resistance @ Gradient of 15 Degrees (lbs. <i>X 0.25</i>)</p> <p>a. 25,906.0 lbs.</p> <p>b. 129,530.1 lbs. (total)</p> <p>16. Resistance @ Gradient of 30 Degrees (lbs. <i>X 0.50</i>)</p> <p>a. 51,812.0 lbs.</p> <p>b. 155,436 lbs. (total)</p> <p>17. Resistance @ Gradient of 45 Degrees (lbs. <i>X 0.75</i>)</p> <p>a. 77,718 lbs.</p> <p>b. 181,342 lbs. (total)</p> <p>18. Damage Resistance (lbs. <i>X 0.6660</i>)</p> <p>a. 69,013.5 lbs.</p> <p>b. 172,637.5 lbs.</p>	<p>60 Degrees</p> <p>27' Height</p>	<p>6. # of Straps per 20' Length:..1</p> <p>7. # of Snatch Blocks per Strap: 2</p> <p>a. One on Rotator Stabilizer, Front Tow Hook on Front Bumper or Rear Anchor</p> <p>b. One on Cable Hook</p> <p>8. How many Straps on a Hook: 2</p> <p>9. # of 4 Leg Chain Sling on a Hook: 1</p> <p>10. Can you use a Spreader Bar if the length is greater than 40': Yes if you are pulling the the entire machine Longitude towards the rotator to be lifted up</p>	<p>At the max. Limit at this angle or degree i will need to be accompany with another rotator</p>
<p><b>RECOVERY PULL MAX.</b></p>	<p>50 Degrees</p>	<p>11. # of Straps per 20' Length:..1</p>	<p>At the weight describe. I will</p>

<p style="text-align: center;"><b>39.8-Tons</b> <b>79,731.5 lbs.</b></p> <p>19. <i>Rolling Hard Resistance (lbs. X 0.05)</i>  a. 3,986.5 lbs.  b. 83,718.0 lbs  (total)</p> <p>20. <i>Rolling Soft Resistance (lbs. X 0.15)</i>  a. 11,959.7 lbs.  b. 91,691.2 lbs.  (total)</p> <p>21. <i>Tire Mire Resistance (lbs. X 0.75)</i>  a. 59,798.6 lbs.  b. 139,530.1 lbs.  (total)</p> <p>22. <i>Wheel Mire Resistance (lbs. X 1.0)</i>  a. 79,731.5 lbs.  b. 159,463.0 lbs.  (total)</p> <p>23. <i>Body Mire (lbs. X 1.5)</i>  a. 119,597.2 lbs.  b. 199,328.7 lbs.  (total)</p> <p>24. <i>Resistance @ Gradient of 15 Degrees (lbs. X 0.25)</i>  a. 19,932.8 lbs.  b. 99,664.3 lbs.  (total)</p> <p>25. <i>Resistance @ Gradient of 30 Degrees (lbs. X 0.50)</i>  a. 39,865.7 lbs.  b. 119,597.2 lbs.  (total)</p> <p>26. <i>Resistance @ Gradient of 45 Degrees (lbs. X 0.75)</i>  a. 59,798.6 lbs.  b. 139,530.1 lbs.  (total)</p> <p>27. <i>Damage Resistance (lbs. X 0.6660)</i>  a. 53,101.1 lbs.  b. 132,832.6 lbs.</p>	<p><b>25' Height</b></p>	<p>12. # of Snatch Blocks per Strap: 2  a. One on Rotator Stabilizer, Front Tow Hook on Front Bumper or Rear Anchor  b. One on Cable Hook</p> <p>13. How many Straps on a Hook: 2</p> <p>14. # of 4 Leg Chain Sling on a Hook: 1</p> <p>15. Can you use a Spreader Bar if the length is greater than 40': Yes if you are pulling the the entire machine Longitude towards the rotator to be lifted up</p>	<p><i>need to be accompany with Tire Mire Resistance, Wheel Resistance, Body Resistance and Gradient Resistance</i></p>
<p><b>RECOVERY PULL MAX.</b> <b>27.5-Tons</b> <b>55,033.5 lbs.</b></p> <p>28. <i>Rolling Hard Resistance (lbs. X 0.05)</i>  a. 2,751.6 lbs.</p>	<p><b>40 Degrees</b> <b>23' Height</b></p>	<p>16. # of Straps per 20' Length:..1</p> <p>17. # of Snatch Blocks per Strap: 2  a. One on Rotator Stabilizer, Front Tow Hook on Front Bumper or Rear Anchor  b. One on Cable Hook</p>	<p><i>At the current weight. I will need another rotator assistance with Wheel Mire &amp; Body Mire recovery</i></p>



<p>b. 57,785.1 lbs (total)</p> <p>29. Rolling Soft Resistance (lbs. X 0.15)</p> <p>a. 8,255.0 lbs. b. 63,288.5 lbs. (total)</p> <p>30. Tire Mire Resistance (lbs. X 0.75)</p> <p>a. 41,275.1 lbs. b. 96,308.6 lbs. (total)</p> <p>31. Wheel Mire Resistance (lbs. X 1.0)</p> <p>a. 55,033.5 lbs. b. 110,067 lbs. (total)</p> <p>32. Body Mire (lbs. X 1.5)</p> <p>a. 82,550.2 lbs. b. 137,583.7 lbs. (total)</p> <p>33. Resistance @ Gradient of 15 Degrees (lbs. X 0.25)</p> <p>a. 13,758.3 lbs. b. 68,791.8 lbs. (total)</p> <p>34. Resistance @ Gradient of 30 Degrees (lbs. X 0.50)</p> <p>a. 27,516.7 lbs. b. 82,550.2 lbs. (total)</p> <p>35. Resistance @ Gradient of 45 Degrees (lbs. X 0.75)</p> <p>a. 41,275.1 lbs. b. 96,308.6 lbs. (total)</p> <p>36. Damage Resistance (lbs. X 0.6660)</p> <p>a. 36,652.3 lbs. b. 91,685.8 lbs.</p>		<p>18. How many Straps on a Hook: 2</p> <p>19. # of 4 Leg Chain Sling on a Hook: 1</p> <p>20. Can you use a Spreader Bar if the length is greater than 40': Yes if you are pulling the the entire machine Longitude towards the rotator to be lifted up</p>	
<p><b>RECOVERY PULL MAX.</b> 23.3-Tons 44,697.9 lbs.</p> <p>37. Rolling Hard Resistance (lbs. X 0.05)</p> <p>a. 2,234.8 lbs. b. 46,932.7 lbs (total)</p> <p>38. Rolling Soft Resistance (lbs. X 0.15)</p> <p>a. 6,704.6 lbs.</p>	<p>30 Degrees  19' Height</p>	<p>21. # of Straps per 20' Length:..1</p> <p>22. # of Snatch Blocks per Strap: 2</p> <p>a. One on Rotator Stabilizer, Front Tow Hook on Front Bumper or Rear Anchor</p> <p>b. One on Cable Hook</p> <p>23. How many Straps on a Hook: 2</p> <p>24. # of 4 Leg Chain Sling on a Hook: 1</p> <p>25. Can you use a Spreader Bar if the length is greater than 40': Yes if you are pulling the the entire machine Longitude towards the</p>	<p>I will need assistance with Body Mire Recovery at the current weight limit</p>

<p>b. 51,402.5 lbs. (total)</p> <p>39. Tire Mire Resistance (lbs. X 0.75)</p> <p>a. 33,523.4 lbs. b. 78,221.3 lbs. (total)</p> <p>40. Wheel Mire Resistance (lbs. X 1.0)</p> <p>a. 44,697.9 lbs. b. 89,395.8 lbs. (total)</p> <p>41. Body Mire (lbs. X 1.5)</p> <p>a. 67,046.8 lbs. b. 111,744.7 lbs. (total)</p> <p>42. Resistance @ Gradient of 15 Degrees (lbs. X 0.25)</p> <p>a. 11,174.4 lbs. b. 55,872.3 lbs. (total)</p> <p>43. Resistance @ Gradient of 30 Degrees (lbs. X 0.50)</p> <p>a. 22,348.9 lbs. b. 67,046.8 lbs. (total)</p> <p>44. Resistance @ Gradient of 45 Degrees (lbs. X 0.75)</p> <p>a. 33,523.4 lbs. b. 78,221.3 lbs. (total)</p> <p>45. Damage Resistance (lbs. X 0.6660)</p> <p>a. 29,768.8 lbs. b. 74,466.7 lbs.</p>		<p>rotator to be lifted up</p>	
<p><b>RECOVERY PULL MAX.</b> 19.6-Tons 39,328.8 lbs.</p> <p>46. Rolling Hard Resistance (lbs. X 0.05)</p> <p>a. 1,966.4 lbs. b. 41,295.2 lbs (total)</p> <p>47. Rolling Soft Resistance (lbs. X 0.15)</p> <p>a. 5,899.3 lbs. b. 45,228.1 lbs. (total)</p> <p>48. Tire Mire Resistance (lbs. X 0.75)</p> <p>a. 29,496.6 lbs.</p>	<p>20 Degrees  16' Height</p>	<p>26. # of Straps per 20' Length:..1 27. # of Snatch Blocks per Strap: 2</p> <p>a. One on Rotator Stabilizer, Front Tow Hook on Front Bumper or Rear Anchor b. One on Cable Hook</p> <p>28. How many Straps on a Hook: 2 29. # of 4 Leg Chain Sling on a Hook: 1 30. Can you use a Spreader Bar if the length is greater than 40': Yes if you are pulling the the entire machine Longitude towards the rotator to be lifted up</p>	<p>No other rotators is required for a recovery</p>

<p>b. 68,825.4 lbs. (total)</p> <p>49. Wheel Mire Resistance (lbs. X 1.0)</p> <p>a. 39,328.8 lbs. b. 78,657.6 lbs. (total)</p> <p>50. Body Mire (lbs. X 1.5)</p> <p>a. 58,993.2 lbs. b. 98,322 lbs. (total)</p> <p>51. Resistance @ Gradient of 15 Degrees (lbs. X 0.25)</p> <p>a. 9,832.2 lbs. b. 49,161 lbs. (total)</p> <p>52. Resistance @ Gradient of 30 Degrees (lbs. X 0.50)</p> <p>a. 19,664.4 lbs. b. 58,993.2 lbs. (total)</p> <p>53. Resistance @ Gradient of 45 Degrees (lbs. X 0.75)</p> <p>a. 29,496.6 lbs. b. 68,825.4 lbs. (total)</p> <p>54. Damage Resistance (lbs. X 0.6660)</p> <p>a. 26,192.9 lbs. b. 65,521.7 lbs.</p>			
<p><b>RECOVERY PULL MAX.</b> 18.2-Tons 36,510.0 lbs.</p> <p>55. Rolling Hard Resistance (lbs. X 0.05)</p> <p>a. 1,825.5 lbs. b. 38,335.5 lbs (total)</p> <p>56. Rolling Soft Resistance (lbs. X 0.15)</p> <p>a. 5,476.5 lbs. b. 41,986.5 lbs. (total)</p> <p>57. Tire Mire Resistance (lbs. X 0.75)</p> <p>a. 27,382.5 lbs. b. 63,892.5 lbs. (total)</p> <p>58. Wheel Mire Resistance (lbs. X 1.0)</p> <p>a. 36,510.0 lbs. b. 73,020 lbs. (total)</p> <p>59. Body Mire (lbs. X 1.5)</p>	<p>10 Degrees  13' Height</p>	<p>31. # of Straps per 20' Length:..1 32. # of Snatch Blocks per Strap: 2</p> <p>a. One on Rotator Stabilizer, Front Tow Hook on Front Bumper or Rear Anchor b. One on Cable Hook</p> <p>33. How many Straps on a Hook: 2 34. # of 4 Leg Chain Sling on a Hook: 1 35. Can you use a Spreader Bar if the length is greater than 40': Yes if you are pulling the the entire machine Longitude towards the rotator to be lifted up</p>	<p>No other rotator is required for this recovery</p>

<p>a. 54,765 lbs. b. 91,275 lbs. (total)</p> <p>60. Resistance @ Gradient of 15 Degrees (lbs. X 0.25) a. 9,127.5 lbs. b. 45,637.5 lbs. (total)</p> <p>61. Resistance @ Gradient of 30 Degrees (lbs. X 0.50) a. 18,255.0 lbs. b. 54,765 lbs. (total)</p> <p>62. Resistance @ Gradient of 45 Degrees (lbs. X 0.75) a. 27,382.5 lbs. b. 63,892.5 lbs. (total)</p> <p>63. Damage Resistance (lbs. X 0.6660) a. 24,315.6 lbs. b. 60,825.6 lbs.</p>			
<p><b>RECOVERY PULL MAX.</b> 17.8-Tons 35,704.6 lbs.</p> <p>64. Rolling Hard Resistance (lbs. X 0.05) a. 1,785.2 lbs. b. 37,489.8 lbs. (total)</p> <p>65. Rolling Soft Resistance (lbs. X 0.15) a. 5,355.6 lbs. b. 41,060.2 lbs. (total)</p> <p>66. Tire Mire Resistance (lbs. X 0.75) a. 26,778.4 lbs. b. 62,483.0 lbs. (total)</p> <p>67. Wheel Mire Resistance (lbs. X 1.0) a. 35,704.6 lbs. b. 71,409.2 lbs. (total)</p> <p>68. Body Mire (lbs. X 1.5) a. 53,556.9 lbs. b. 89,261.5 lbs. (total)</p> <p>69. Resistance @ Gradient of 15 Degrees (lbs. X 0.25) a. 8,926.1 lbs. b. 44,630.7 lbs.</p>	<p>0 Degrees 9' Height</p>	<p>36. # of Straps per 20' Length:..1 37. # of Snatch Blocks per Strap: 2 a. One on Rotator Stabilizer, Front Tow Hook on Front Bumper or Rear Anchor b. One on Cable Hook 38. How many Straps on a Hook: 2 39. # of 4 Leg Chain Sling on a Hook: 1 40. Can you use a Spreader Bar if the length is greater than 40': Yes if you are pulling the the entire machine Longitude towards the rotator to be lifted up</p>	<p>No other rotator is required for this recovery</p>

*(total)*

*70. Resistance @ Gradient of  
30 Degrees (lbs. X 0.50)*

*a. 17,852.3 lbs.*

*b. 53,556.9 lbs.*

*(total)*

*71. Resistance @ Gradient of  
45 Degrees (lbs. X 0.75)*

*a. 26,778.4 lbs.*

*b. 62,483.0 lbs.*

*(total)*

*72. Damage Resistance (lbs.  
X 0.6660)*

*a. 23,779.2 lbs.*

*b. 59,483.8 lbs.*



***NRC 85-TON ROTATOR SIDE RECOVERY w/(2) 25,000 lbs. WINCHES  
PULLING CAPABILITIES LIMITATIONS***

*One Line Recovery - 16,778.5 lbs.*

*One Line with Snatch Block - 33,557.0 lbs.*

*Two Line Recovery - 33,557.0 lbs.*

*Two Line Recovery with Two Snatch Blocks - 67,114.0 lbs.*

*THERE ARE 4 TYPES OF RESISTANCE ENCOUNTERED IN OUR INDUSTRY*

***5. ROLLING RESISTANCE***

*5.1. ROLLING HARD: Hard Flat Ground and the load on the wheels on concrete and tires are inflated*

*5.2. ROLLING SOFT: It is on soft surface such as grass or gravel*

***6. MIRE RESISTANCE***

*6.1. TIRE MIRE: When tire is sunk into the dirt, gravel, mud, sand or other soft surface*

*6.2. WHEEL MIRE: If it is sunk up to lower part of the wheel Rim*

*6.3. BODY MIRE: If it is sunk up to the body*

***7. GRADIENT RESISTANCE***

*7.1. 15% OF GRADIENT: The force of gravity moving up or down a grade*

*7.2. 30% OF GRADIENT: The force of gravity moving up or down a grade*

7.3. 45% OF GRADE: The force of gravity moving up or down a grade

**8. DAMAGE RESISTANCE**

8.1. DAMAGE: Is the force that resist the movement when rolling object is damaged

<b>LIFTING CAPABILITY</b>	<b>BOOM STAGE Angle</b>	<b>12" x 30' HEAVY DUTY RECOVERY STRAP (134,250 lbs. Working Load Limit)</b>	<b># OF ROTATORS REQUIRED</b>
<p><b>RECOVERY PULL MAX.</b> 16.7 Tons 33,557 lbs.</p> <p>73. Rolling Hard Resistance (lbs. X 0.05) a. 1,677.8 lbs. b. 35,234.8 lbs (total)</p> <p>74. Rolling Soft Resistance (lbs. X 0.15) a. 5,033.5 lbs. b. 38,590.5 lbs. (total)</p> <p>75. Tire Mire Resistance (lbs. X 0.75) a. 25,167.7 lbs. b. 58,724.7 lbs. (total)</p> <p>76. Wheel Mire Resistance (lbs. X 1.0) a. 33,557.0 lbs. b. 67,114 lbs. (total)</p> <p>77. Body Mire (lbs. X 1.5) a. 50,335.5 lbs. b. 83,892.5 lbs. (total)</p> <p>78. Resistance @ Gradient of 15 Degrees (lbs. X 0.25) a. 8,389.3 lbs. b. 41,946.3 lbs. (total)</p> <p>79. Resistance @ Gradient of 30 Degrees (lbs. X 0.50) a. 16,778.5 lbs. b. 50,335.5 lbs. (total)</p> <p>80. Resistance @ Gradient of 45 Degrees (lbs. X 0.75) a. 25,167.7 lbs. b. 58,724.7 lbs. (total)</p> <p>81. Damage Resistance (lbs. X 0.6660</p>	<p>20 Degrees w/Snatch Block on Stabilizer</p>	<p>41. # of Straps per 20' Length:..1 42. # of Snatch Blocks per Stabilizer: 2 a. One on Rotator Stabilizer, to Recovery Straps b. Return from Recovery Strap to Side Pull Anchor</p> <p>43. How many Straps on a Hook: 2 44. # of 4 Leg Chain Sling on a Hook: 1 45. Can you use a Spreader Bar if the length is greater than 40': On when overhead clearance is limited. The spreader bar will hook to container bottom and stop to ensure a rollover without the boom</p>	<p>At the max limit on one of the side pull winches. Requires both side pull winches</p>

- a. 22,348.9 lbs.
- b. 55,905.9 lbs.

**RECOVERY PULL MAX.  
25 Tons  
50,000 lbs.**

- 82. Rolling Hard Resistance (lbs. X 0.05)
  - a. 2,500 lbs.
  - b. 52,500 lbs (total)
- 83. Rolling Soft Resistance (lbs. X 0.15)
  - a. 7,500 lbs.
  - b. 57,500 lbs. (total)
- 84. Tire Mire Resistance (lbs. X 0.75)
  - a. 37,500 lbs.
  - b. 87,500 lbs. (total)
- 85. Wheel Mire Resistance (lbs. X 1.0)
  - a. 50,000 lbs.
  - b. 100,000 lbs. (total)
- 86. Body Mire (lbs. X 1.5)
  - a. 75,000 lbs.
  - b. 125,000 lbs. (total)
- 87. Resistance @ Gradient of 15 Degrees (lbs. X 0.25)
  - a. 12,500 lbs.
  - b. 62,500 lbs. (total)
- 88. Resistance @ Gradient of 30 Degrees (lbs. X 0.50)
  - a. 25,000 lbs.
  - b. 75,000 lbs. (total)
- 89. Resistance @ Gradient of 45 Degrees (lbs. X 0.75)
  - a. 37,500 lbs.
  - b. 87,500 lbs. (total)
- 90. Damage Resistance (lbs. X 0.6660)
  - a. 33,300 lbs.
  - b. 83,300 lbs.

20 Degrees w/Snatch Block on Stabilizer

- 46. # of Straps per 20' Length:..1
- 47. # of Snatch Blocks per Stabilizer: 2
  - a. One on Rotator Stabilizer, to Recovery Straps
  - b. Return from Recovery Strap to Side Pull Anchor
- 48. How many Straps on a Hook: 2
- 49. # of 4 Leg Chain Sling on a Hook: 1
- 50. Can you use a Spreader Bar if the length is greater than 40': On when overhead clearance is limited. The spreader bar will hook to container bottom and stop to ensure a rollover without the boom

At the max. Limit at this angle or degree i will need to be accompany with another rotator When recovery is Tire Mire, Wheel Mire, Body mire and Gradient Recovery