Evaluation of Positive Grip Span Locks
By Hardesty and Hanover

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The Project

- Started July, 2011. to be completed in 18 months.
- The overall objective is to develop an improved positive grip span lock system for double leaf trunion bascule spans.
Evaluation Criteria

- Effectiveness
- Maintenance
- Emergency Disengagement
- Constructability
- Durability and cost
Issues Considered

- **Alignment**: the accepted tolerances for fabrication and installation vs. cost and practicality.
- **Structural effectiveness**:
  - Shear transfer/Total and differential deflection/Impact at the joint
- **Horizontal loading on the trunnion**
- **Live load bearings**
- **Imbalance loading**
Span Lock systems

- **Friction Lock**
- **Jaw Concept**
- **Improved Taper Concept**
- **Clamping Lock**
- **Pincer Concept**
Span Lock systems

MOMENT LOCK BAR  CAM LOCK  FIN BRAKE

INTERNALLY EXPANDED LOCK BAR  CYLINDRICAL NOSE-RECEIVER LOCK
## Cost Summary

<table>
<thead>
<tr>
<th>Concept</th>
<th>Estimated Cost</th>
<th>Cost Relative to Standard Span Lock (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Lock Bar (Base Comparison)</td>
<td>$100,000.00</td>
<td>100.00%</td>
</tr>
<tr>
<td>Hybrid Positive Grip Span Lock</td>
<td>$125,250.00</td>
<td>125.25%</td>
</tr>
<tr>
<td>Clamping Lock</td>
<td>$132,000.00</td>
<td>132.00%</td>
</tr>
<tr>
<td>Internally Expanded</td>
<td>$134,000.00</td>
<td>134.00%</td>
</tr>
<tr>
<td>Friction Lock</td>
<td>$189,000.00</td>
<td>189.00%</td>
</tr>
<tr>
<td>Fin Brake</td>
<td>$232,250.00</td>
<td>232.25%</td>
</tr>
<tr>
<td>Improved Taper</td>
<td>$133,450.00</td>
<td>133.45%</td>
</tr>
<tr>
<td>Cylindrical Nose-Receiver</td>
<td>$128,950.00</td>
<td>128.95%</td>
</tr>
<tr>
<td>Pincer</td>
<td>$168,000.00</td>
<td>168.00%</td>
</tr>
<tr>
<td>Jaw</td>
<td>$168,000.00</td>
<td>168.00%</td>
</tr>
<tr>
<td>Cam</td>
<td>$153,000.00</td>
<td>153.00%</td>
</tr>
<tr>
<td>Moment Lock Bar</td>
<td>$284,500.00</td>
<td>284.50%</td>
</tr>
</tbody>
</table>
Span Lock systems

- Improved Taper
- Pincer Type
- Jaw Type
- Friction Locks (multiple finger type)
- Clamping Lock
- Fin Brake
- Cylindrical Nose-Receiver Lock
- Cam Lock
- Internally Expanded Bar
- Moment Lock
- Hybrid Positive Grip Span Lock