**Load Cell Comparison Chart**

<table>
<thead>
<tr>
<th></th>
<th>Analog Load Cells</th>
<th>Digital Load Cells</th>
<th>Hydraulic Load Cells</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lightning Immunity</td>
<td>Fair to Good</td>
<td>Good to Very Good</td>
<td>Excellent</td>
</tr>
<tr>
<td>Service Life</td>
<td>Good</td>
<td>Good</td>
<td>Excellent</td>
</tr>
<tr>
<td>Spare Part Availability</td>
<td>Excellent</td>
<td>Limited</td>
<td>Limited</td>
</tr>
<tr>
<td>Number of Manufacturers</td>
<td>Many</td>
<td>Few</td>
<td>Few</td>
</tr>
</tbody>
</table>

- Electric Analog load cells were determined to be the elite load cell operating system.
- Hydraulic Load cells have 3x the initial cost compared to Analog Load cells.

**Concrete Decking Outlines Steel**

<table>
<thead>
<tr>
<th>Steel</th>
<th>Concrete</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very portable and easy to move from one</td>
<td>Not Portable at all and difficult to move after deck</td>
</tr>
<tr>
<td>spot to the other</td>
<td>has been poured</td>
</tr>
<tr>
<td>Low inertia, very low resistance to lateral</td>
<td>High inertia, very high resistance to lateral forces</td>
</tr>
<tr>
<td>forces which increase wear on moving parts</td>
<td>which reduces wear on moving parts</td>
</tr>
<tr>
<td>Steel deck tends to be slippery when wet</td>
<td>Concrete deck can have a broom finish applied which</td>
</tr>
<tr>
<td>or when covered with ice or snow</td>
<td>forms a very rough surface and is excellent for traction</td>
</tr>
<tr>
<td>Deck plate is subject to wear over long</td>
<td>Minimal to no wear on the concrete deck</td>
</tr>
<tr>
<td>periods of time</td>
<td></td>
</tr>
<tr>
<td>Can typically be installed and weighing in</td>
<td>Once installed and deck is poured, the concrete can</td>
</tr>
<tr>
<td>1 day</td>
<td>take up to 28 days to cure.</td>
</tr>
<tr>
<td>Repairable if structure is damaged</td>
<td>If concrete is damaged, it must be removed and deck</td>
</tr>
<tr>
<td></td>
<td>has to be repoured</td>
</tr>
</tbody>
</table>

- Concrete decking is superior to steel in terms of life expectancy, safety in wet conditions, and appeal.

**Above Ground Scales Outweigh the Competition**

<table>
<thead>
<tr>
<th>Scale Type</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pit Type</td>
<td>1. No ramps required, level with pavement</td>
<td>1. Requires expensive pit construction</td>
</tr>
<tr>
<td></td>
<td>2. Easy access to scale components</td>
<td>2. Not good for high water table locations</td>
</tr>
<tr>
<td></td>
<td>3. No accumulation of snow / dirt under deck</td>
<td>3. Hazardous gases can collect in scale pit</td>
</tr>
<tr>
<td></td>
<td>4. Can accept dump access to conveyor below</td>
<td>4. Safety issues, confined spaces</td>
</tr>
<tr>
<td>Above Ground</td>
<td>1. Less expensive to purchase</td>
<td>1. Have to have ramps at both ends of scale</td>
</tr>
<tr>
<td></td>
<td>2. Less complex foundation requirements</td>
<td>2. May require guard rails to keep truck on scale</td>
</tr>
<tr>
<td></td>
<td>3. Available in a portable model</td>
<td>3. Inexperienced drivers may find it more difficult</td>
</tr>
<tr>
<td></td>
<td>4. Fewer problems with water drainage</td>
<td>4. Debris / snow can accumulate under deck</td>
</tr>
<tr>
<td></td>
<td>5. Can clean out with water hose easily</td>
<td></td>
</tr>
</tbody>
</table>

- Pit scales are becoming obsolete in grain elevators.
- Above ground scales are more common and have greater advantages.
Objectives:

- Explore the different types of truck scales used in the grain industry and propose the best possible system for Archer Daniels Midland
- Research different aspects of the scale system to find the elite truck scale
- Provide a technical report of the best products we have found

ELITE TRUCK SCALE SYSTEM

Rice Lake Survivor OTR Flat-top Truck Scale 70’ x 11’ Concrete Deck

- Top access electronic analog canister load cells and junction boxes
  - Greater accessibility
  - Compatibility with replacement parts
    - Cheaper parts
    - Less downtime
- 75,000 lb electric analog load cells
- Up to 270,000 lb full scale capacity
- 6” concrete deck
- Five year weighbridge warranty
- Two year parts warranty
Other aspects of truck scales researched:
- Ticket Printers
- Thermal Transfer
- Direct Thermal
- Safety
- Guide Rails, Lighting, Cameras
- Communication
- Stop and Go Lighting, CB radio
- Location
- Drainage, Traffic Flow, Approach Length

23,600 lbs Contains More Structural Steel for the Price When Compared to the Competitors

### Truck Scale Competitive Matrix

<table>
<thead>
<tr>
<th>MANUFACTURER</th>
<th>SERIES</th>
<th>MODEL</th>
<th>CAPACITY</th>
<th>PLATFORM SIZE</th>
<th>DECK MATERIAL</th>
<th>DTA</th>
<th>NUMBER OF LOAD CELLS</th>
<th>SHIPPING WEIGHT</th>
<th>LIST PRICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rice Lake-Flat Top</td>
<td>Survivor</td>
<td>OTR-7011-SC-100</td>
<td>100 Ton</td>
<td>70' x 11'</td>
<td>Concrete</td>
<td>90,000 lbs</td>
<td>8</td>
<td>23,600 lbs</td>
<td>$29,400</td>
</tr>
</tbody>
</table>

### Weigh-Tronix
- **Weigh-Tronix BMC**
  - Bridge: Mont Heavy Duty: BMC-7010
  - Capacity: 100 ton
  - Platform Size: 70' x 10'
  - Deck Material: Concrete
  - DTA: 80,000 lbs
  - List Price: $20,995

- **Weigh-Tronix FCXT**
  - Bridge: Mont Heavy Duty: FCXT-7010
  - Capacity: 100 ton
  - Platform Size: 70' x 10'
  - Deck Material: Concrete
  - DTA: 90,000 lbs
  - List Price: $34,746

### Mettler Toledo
- **Mettler Toledo**
  - Truck: Mate Commercial
  - Capacity: 7400
  - Platform Size: 70' x 11'
  - Deck Material: Concrete
  - DTA: 60,000 lbs
  - List Price: $37,373

- **Mettler Toledo**
  - Truck: Mate Commercial
  - Capacity: 7500
  - Platform Size: 70' x 11'
  - Deck Material: Concrete
  - DTA: 80,000 lbs
  - List Price: $36,615

### Fairbanks
- **Fairbanks (Field Pour)**
  - Model: Talon HV Series
  - Capacity: 89600
  - Platform Size: 70' x 10'
  - Deck Material: Concrete
  - DTA: 90,000 lbs
  - List Price: $28,147

### Cardinal
- **Cardinal**
  - Model: EPR Series
  - Capacity: 135670
  - Platform Size: 70' x 11'
  - Deck Material: Concrete
  - DTA: 80,000 lbs
  - List Price: $38,560

### Emery Winslow
- **Emery Winlow**
  - Model: Genesis II
  - Capacity: 94-10070-10
  - Platform Size: 70' x 10'
  - Deck Material: Concrete
  - DTA: 80,000 lbs
  - List Price: $31,790

**Special Thanks to These Companies for Their Contribution**

**Discussing truck scale issues with an ADM superintendent at the Frankfort, IN elevator**