2004 AAR CAR REPAIR BILLING WHEEL REMOVAL ANALYSIS

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RWMEC

Who we are

Approved AAR Wheel Manufacturers

Mission - Support the WABL Committee and the Railroad Industry
WHEEL REMOVAL CATEGORIES

Categories

- Administrative
- Wear Related
- Environment
- Wheel Failure

0 100000 200000 300000 400000
Administrative

Administrative Wheels

- 07 Obsolete
- 11 Good Condition
- 23 Govt. Reg.
- 25 Owner's Req.
- 90 Mate Wheel

0 100000 200000 300000
Unusual Trends

- Why Made Code 11 Removals have increased 75,000 during the past three years.
- Why Made Code 90 removals have decreased 55,000 during the past five years.
6 Year Trend – Administrative Wheels
Wear Related

- 60=Thin Flange
- 64=High Flange
- 73=Thin Rim
- 98=Reapplication

Wear Related

0 10000 20000 30000 40000 50000
6 Year Trend – Wear Related Wheels
6 Year Trend-Environmental Wheels

![Graph showing Environmental Wheels from 1999 to 2004. The graph indicates a trend with a decrease from 140,000 in 1999 to 120,000 in 2000, then an increase to 140,000 in 2001, followed by another increase to 160,000 in 2004.]
Cause for Removal

☐ 3 Most Frequent Cause for Removal of Environmental Wheels

  ■ Shelled
  ■ High Impact
  ■ Slid Flat
Wheel Failures

Failed Wheels

- 66 = Flange Cracked
- 68 = Rim Cracked
- 71 = Rim Shattered
- 72 = Rim Spread

0 100 200 300 400
6 Year Trend – Wheel Failures

Failed Wheels

<table>
<thead>
<tr>
<th>Year</th>
<th>1999</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Count</td>
<td>1,200</td>
<td>1,000</td>
<td>1,100</td>
<td>900</td>
<td>800</td>
<td>700</td>
</tr>
</tbody>
</table>
25-Year Trend Shell/Spall Wheels

Tread Shelles (Spalled) Wheels

Year

Distribution of Failed Wheels by Year

2004 Failed Wheel Year Bluetooth Distribution

[Graph showing the distribution of failed wheels by year, with a peak around the year 2000]
Wheel Removals by Year Manufactured

Year Blt Distribution

50000
40000
30000
20000
10000
0

55 60 65 70 75 80 85 90 95 00
<table>
<thead>
<tr>
<th>Category</th>
<th>Average Life</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administrative</td>
<td>8.2 Years</td>
</tr>
<tr>
<td>Wear Related</td>
<td>10.0 Years</td>
</tr>
<tr>
<td>Environmental</td>
<td>7.1 Years</td>
</tr>
<tr>
<td>Wheel Failure</td>
<td>10.7 Years</td>
</tr>
<tr>
<td>Type of Car</td>
<td>Wheel Life, Years</td>
</tr>
<tr>
<td>------------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>Box</td>
<td>9.6</td>
</tr>
<tr>
<td>Gondola</td>
<td>6.9</td>
</tr>
<tr>
<td>Hopper</td>
<td>7.9</td>
</tr>
<tr>
<td>Covered Hopper</td>
<td>10.0</td>
</tr>
<tr>
<td>Tank</td>
<td>10.3</td>
</tr>
<tr>
<td>Flat</td>
<td>6.8</td>
</tr>
<tr>
<td>Articulated</td>
<td>4.4</td>
</tr>
</tbody>
</table>
## Distribution of Wheel Types

<table>
<thead>
<tr>
<th>Wheel Type</th>
<th>HT-CP</th>
<th>NHT-CP</th>
<th>HT-SP</th>
<th>NHT-SP</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAR Raw</td>
<td>89.3%</td>
<td>7.2%</td>
<td>1.1%</td>
<td>2.4%</td>
</tr>
<tr>
<td>AAR Accel.</td>
<td>90.5%</td>
<td>7.3%</td>
<td>0.7%</td>
<td>1.5%</td>
</tr>
</tbody>
</table>
Distribution of SP Wheels

S P Wheel Dist. By Car Type

- Cov. Hop.: 6500
- Gondola: 2000
- Tank Car: 5000

0 2000 4000 6000 8000
Comparison of Proposals to Normalize Wheel Data
RWMEC Recommendations

- Already Implemented
  - accelerate removal of straight plate wheels
  - improving their wheel marking procedures
  - Proposal to accelerate earlier removal of Non-Heat Treated Curve Plate Wheels
RWMEC Recommendations

- Improve air brake testing methods.
- Train employees about the proper use of hand brakes.
Comparisons

- Removals for high impact are more common for 36-inch and 38-inch wheels.
- 36-inch wheels have a higher percentage of wheels removed for slid flat, thin flange, built-up-tread and out-of-round.
Comparisons

- Covered Hopper Cars have the most wheels for all causes.
- Tank cars and covered hopper cars have the most wheel removals for shelling.
Future

- Wheel manufacturers continue to revise their wheel designs and process controls
- RWMEC continues to review information from the CRB database
THANKS

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