Conceptual Specification of Forest Residue Balers
Why Bale? Enable Cost-Effective Collection of Tops and Branches

Benefits of Large Rectangular Bales

» Increase transport payload compared to roll-off containers and chip trailers

» Enable use of conventional flatbed trucks (with tarps or curtains)

» Increase storage density

» Enable efficient grinding with horizontal grinders

» Rectangular bales handle just like other baled recyclables and hay.
Customer Needs Drive Two Baler Types - Light Modular System and High-Production

Light Modular Baler (Forest Utility Baler)
» Mount on All-Wheel-Drive truck, forwarder, trailer, etc.
» Access logging debris that has to come off the site, stranded landings, roadside windrows, …
» Support thinning, pruning, fuels reduction, roadside vegetation management, and other uses
» Replaces tow-behind chipper and arborist truck or loader and roll-off containers

High Production Self-Propelled Baler (Forest Biomass Large Baler)
» Track undercarriage (much like self-propelled horizontal grinders)
» Supported by and Tele-Operated by trackhoe grapple loader operator…
» Replaces in-woods grinding operation
» Uses flatbed trucks and trailers for hauling bales
» Hauling can be decoupled from baling by weeks or months
Modular Baler
» 40-80 hydraulic horsepower
  » From prime mover or onboard power-pack
» 8,000 – 11,000 lb weight
» Optional engine power pack and self-loader

Universal Mounting for
» On-road and off-road trailers
» Log forwarder – replace log bunk
» Truck chassis or bolt to flatbed truck
» Flatbed hook-lift skid
Forest Biomass Large Baler

High Hydraulic Power and Flow (250-350 hp)
» Fast cycle times and high compression pressures
» Hydraulic track drives

Trackhoe Support and Tele-Operation
» Single operator much like horizontal grinding operations today
» Power and size enable larger, heavier bales
» Baler could be programmed to follow trackhoe around the forest during moving
Woody Biomass Baler Family of Models

<table>
<thead>
<tr>
<th></th>
<th>FCLLC Engineering Prototype (FCEP)</th>
<th>Urban Chipper Replacement</th>
<th>Forest Biomass Utility Baler</th>
<th>Forest Biomass Large Baler</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bale Size (inches)</td>
<td>32x48x56</td>
<td>36x48x72</td>
<td>32x48x56</td>
<td>34x48x96</td>
</tr>
<tr>
<td>Bale Density (lb/cu.ft – @ 50% MC wb)</td>
<td>15-25</td>
<td>15-20</td>
<td>20-30</td>
<td>20-30</td>
</tr>
<tr>
<td>Bale Weight (lb)</td>
<td>800 – 1,400</td>
<td>1,000 – 1,400</td>
<td>1,000 – 1,500</td>
<td>2,000 – 2,700</td>
</tr>
<tr>
<td>Loader</td>
<td>Self-loading grapple</td>
<td>Self-loading grapple</td>
<td>Self-loading grapple</td>
<td>Track-hoe with brush grapple</td>
</tr>
<tr>
<td>Theoretical/Operational Capacity (bales/hr)</td>
<td>3/2</td>
<td>5/3</td>
<td>10/4</td>
<td>18/10</td>
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<tr>
<td>Horsepower</td>
<td>28</td>
<td>49</td>
<td>49</td>
<td>260</td>
</tr>
<tr>
<td>Crew</td>
<td>2 (manual tie)</td>
<td>2 (manual tie)</td>
<td>1 (auto-tie)</td>
<td>0 (remote-operated)</td>
</tr>
<tr>
<td>Running Gear</td>
<td>5th Wheel Trailer</td>
<td>Category 3 trailer</td>
<td>Modular</td>
<td>Tracked</td>
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<tr>
<td>Capital Cost ($) Est.</td>
<td>$110,000</td>
<td>$130,000</td>
<td>$350,000</td>
<td></td>
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</tbody>
</table>
Thank you!

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* * Peterson is a brand of Peterson Pacific Corporation
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