Hydraulic Block Connections

**Background and Objective:**
To produce an efficient way to connect mostly large and some small implements to power units that utilize hydraulic and/or electrical power. The complexity of many new implements can become overwhelming, and if not properly connected, damage or even harm may be caused. A potential solution must be comprised of many elements that are important to the consumer. The final product utilizes safety, correct placement, handles large quantities, boasts great impurity protection, overcomes pressure gradients, and overall reduces time consumption while promoting ease of connection. All of these criteria have been accomplished while staying within tight budget constraints and time allowance.

**Design Components/Evaluation:**
- **Handle Added for added leverage during connection**
- **Promotes clean connection**
- **Designed for ease of use**
- **Mitigates pressure gradients**
- **Easily aligns hoses correctly**
- **Reduces connection duration**
- **Promotes safe connection**

**Constraints and Troubleshooting:**
- **Mounting location not to interfere with other functions**
- **Budget awareness**
- **Material availability**
- **Power unit simulation**
- **Accidental implement detachment simulation**

**Alternative Solutions/Designs:**
- Hard-mounted block specific to each model tractor with specific design options for Selective Control Valves (SCV’s).
- In-line implement block with loose hold on fittings to ensure correct placement.
- Single implement block with hydraulic fittings hard mounted in exact position to fit into SCV’s.

**Economics:**

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
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<tbody>
<tr>
<td>Salvage Quick Connect Block</td>
<td>$425</td>
</tr>
<tr>
<td>Hardware: Bolts, Spring</td>
<td>$10</td>
</tr>
<tr>
<td>Parker Hydraulic Hoses</td>
<td>$0 On Hand</td>
</tr>
<tr>
<td>Hydraulic Fittings</td>
<td>$0 On hand</td>
</tr>
<tr>
<td>Aluminum: 4 lb Block</td>
<td>$0 On hand</td>
</tr>
<tr>
<td>Electrical Connections/Wire</td>
<td>$30</td>
</tr>
<tr>
<td>Machining Services</td>
<td>$0 Donated by Purdue University</td>
</tr>
</tbody>
</table>

Total: Slightly <$500

**Sustainability/Impact:**
- Payback period
- Previous success in various applications
  - Harvest machines
  - Loader attachments
- Reduces risk dramatically
- Economic benefit adds to cost savings

**Final Solution:**
Universal In-line Butterfly Handle Quick Connect Block

**Block:**
- Utilizes two hydraulic connections
- Contains one electrical connection
- Universal for attachment to various power units
- Handle for added support
- Displays safe hydraulic connection

**Mount:**
- Mounts to 3-point hitch attachment points
- Provides general area of mounting below 3-pt. hitch
- Utilizes extension spring for easy access and movement of block

**Timeline/Schedule:**

<table>
<thead>
<tr>
<th>Spring 2016 Schedule</th>
<th>Hydraulic Block Design</th>
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</thead>
<tbody>
<tr>
<td>Parts Ordered</td>
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<tr>
<td>Final Measurements</td>
<td></td>
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<tr>
<td>Machining (if needed)</td>
<td></td>
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<tr>
<td>Parts Fitment</td>
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<td>Troubleshooting</td>
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<tr>
<td>Final Report</td>
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