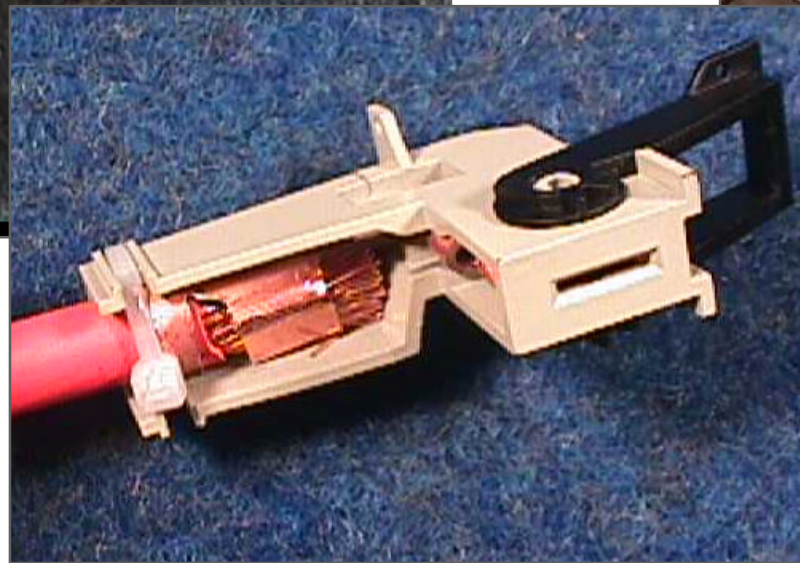
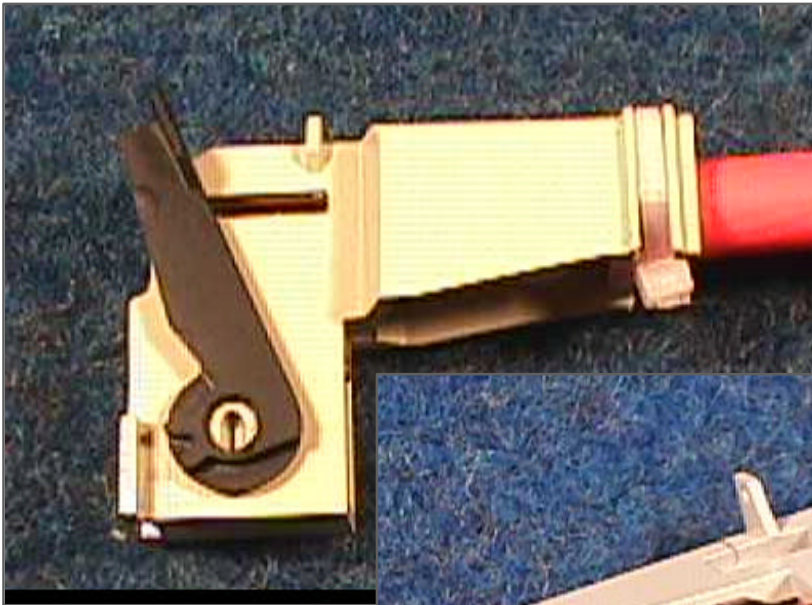


Integrated Battery Interconnection



Standard Side

Questions	Comments
1. Battery or harness side? Should the “standard” design be on the battery or the wiring harness?	<ul style="list-style-type: none"> □ Cheapest part on the battery side □ Connector technology on the harness side □ The more open design on the battery side (many different solutions can be adapted to the battery)
2. Description of the standard terminal (blade, pin, cone, screw, ?)	Blade or Pin Related to question # 5 – Materials
3. Number of sizes recommended to cover the current range? (See the file “Vehicle OEM Response” at http://auto.mit.edu/consortium/ for several vehicle OEM projected current ranges) Would you recommend one size for all applications or several? (state #) (Can be answered after testing)	Only one for the standard side If high conductivity material
4. Dimensions of standard terminal(s)? (Can be answered after testing)	Same equivalent section as the connected wire
5. Material(s) of standard terminal(s)? (Can be answered after testing)	High conductivity material Low creep material Plated Copper or Copper alloy



Connection Side

Questions	Comments
<p>Method for mating and unmating the connection?</p> <ul style="list-style-type: none"> • Hand plug? <ul style="list-style-type: none"> • Maximum force required in Newtons (N) • Mechanical assist? <ul style="list-style-type: none"> • On connection? (Force required?) • Separate tool? (Force required?) 	<p>Quick tool-less mating with mechanical assist. Unmating can be designed to require a tool for safety reasons, otherwise tool-less.</p> <p>Mechanical assist on connection. $F_{mating} < 75 \text{ N}$</p>
<p>Method to assure connection retention?</p>	<p>Strong indexing features contribute to the retention in 2 directions. The locking of the lever contributes to the last direction.</p>
<p>Method to index the connection?</p> <ul style="list-style-type: none"> • (positive & negative) (12V & 36V) (3-4 battery technologies) 	<p>Combination of keying ribs.</p>
<p>Method to limit access for jump starting with alligator clamps?</p>	<p>Male terminals recessed in the battery cover. No access when mated.</p>

Connection Side

<p>Wire dress</p> <ul style="list-style-type: none"> • Degree of freedom? <ul style="list-style-type: none"> • Can the battery cable leave the connection in multiple directions? <ul style="list-style-type: none"> • Is the angle determined by the terminal design or by bending the cable? • Vehicle OEMs have stated a desire to have multiple conductors connected to the harness terminal (doubles/triples in the crimp) • Space required? • Ability to maintain orientation of the wire dress? 	<p style="text-align: center;">Blade</p> <p>Two insertion directions possible. From the top and from one side.</p> <p>The cable leave direction is defined by the housing design.</p> <p>Multiple crimp possible.</p>	<p style="text-align: center;">Pin</p> <p>One insertion direction possible: from the top</p> <p>The cable leave direction is more flexible.</p> <p>Multiple crimp possible.</p>
<p>Space required to make the connection?</p> <ul style="list-style-type: none"> • Include access for hand connection or a mechanical assist mechanism 	<p>The connector and mechanical assist could be completely integrated in the battery housing</p>	

Connection Side

<p>Recommendations to meet environmental requirements?</p> <ul style="list-style-type: none"> • Open?, splashproof?, sealed? (remember the possibility for multiple cables in a crimp) 	<p>Many different techniques with varying degrees of sealing effectiveness and cost.</p>
<p>Do you have any test data or experience in mating or unmating a 42 V connection under power? How much current can be flowing before permanent damage is possible? Are there any design characteristics in your proposal that should help this situation?</p>	<p>Mating under power damages permanently the contact interfaces. Test results available at our German lab. Design in process.</p>
<p>Ability to place an electronic module between the battery and the wiring harness?</p> <ul style="list-style-type: none"> • Some vehicle OEMs have expressed the need for an electronic module for power/energy management. This module may be directly connected to the positive battery post and the wiring harness will then connect to the module. Please comment on how your design can accommodate this situation. 	<p>The housing could be enlarged to accept an integrated electronic module.</p>
<p>Serviceability?</p> <ul style="list-style-type: none"> • How will the service personnel repair a damaged connection? 	<p>As it is today.</p>

