Cars—Work Done in Change of Velocity

The eight situations below show before and after "snapshots" of a car's velocity. Rank these situations, in terms of work done on the car, from most positive to most negative, to create these changes in velocity for the same distance traveled. All cars have the same mass. Negative numbers, if any, rank lower than positive ones (-20 m/s < -10 m/s < 0 < 5).

<table>
<thead>
<tr>
<th>BEFORE</th>
<th>AFTER</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>+10 m/s</td>
</tr>
<tr>
<td>B</td>
<td>+10 m/s</td>
</tr>
<tr>
<td>C</td>
<td>+10 m/s</td>
</tr>
<tr>
<td>D</td>
<td>+20 m/s</td>
</tr>
<tr>
<td>E</td>
<td>+20 m/s</td>
</tr>
<tr>
<td>F</td>
<td>+30 m/s</td>
</tr>
<tr>
<td>G</td>
<td>-10 m/s</td>
</tr>
<tr>
<td>H</td>
<td>+30 m/s</td>
</tr>
</tbody>
</table>

Most Positive 1 2 3 4 5 6 7 8 Most Negative

Or, the work done on the cars is the same (but not zero) for all of these. _________

Or, the work done on the cars is zero for all of these. _________

Or, it is not possible to determine the work done on the cars for all these cases. _________

Please carefully explain your reasoning.

How sure were you of your ranking? (circle one)

<table>
<thead>
<tr>
<th>Basically Guessed</th>
<th>Sure</th>
<th>Very Sure</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
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<tr>
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<td>8</td>
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<tr>
<td>10</td>
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</tbody>
</table>

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