Dynamic Automated Tuning Air Suspension System

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Product Definition

Function

• The DATA Suspension System is an air suspension system designed to automatically facilitate smooth riding and prevent body damage by dynamic air adjustment to the vehicle’s air springs.

Application

• This air suspension system is geared toward passenger vehicles but can be expanded to all vehicles.
Initial Specifications

Sonar Module
- Detect speedbumps and driveways
- Estimated power requirement: 2.5-5V
- Estimated Frequency: 42kHz

GPS/Speed Module
- Monitor vehicle’s speed
- Estimated power requirement: 3.1-5.5V
- Estimated Frequency: 10Hz
Initial Specifications (cont.)

LCD Module

- Display pressure and ride height of all four corners
- Estimated Power Requirement: 4.5-5.5V
- Estimated Driving Voltage: 8-17V

Height Sensors

- Monitor the ride height of all four corners of the vehicle
- Estimated Power Requirement: XXXX
- Estimated Frequency: XXXX
Initial Specifications (cont.)

PSI Sensors

• Monitor the pressure of all four air suspension bags
• Estimated Power Requirement: XXXX
• Estimated Frequency: XXXX

Wireless/Radio Module

• Remotely notify the driver if anything is affecting the vehicle
• Estimated Power Requirement: 2.3-3.6V
• Estimated Frequency: 40MHz
Initial Specifications (cont.)

NFC Module

• Uniquely identify the driver present in the vehicle

Solenoid

• Device that directly controls all air suspension bags

Switchbox

• Device that manually adjusts all air suspension bags
High Level Block Diagram
## Development Plan

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<tr>
<th>Milestone</th>
<th>Task</th>
<th>Start Date</th>
<th>End Date</th>
<th>Responsible</th>
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</thead>
<tbody>
<tr>
<td>Initial Design Review</td>
<td>Create powerpoint for system level design, as well as find parts that are going to be used</td>
<td>10/19/2015</td>
<td>10/26/2015</td>
<td>Everyone</td>
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<tr>
<td>Milestone #3: Subsystem Requirements and Component Selection</td>
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<td>10/19/2015</td>
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<tr>
<td>Processor Definition</td>
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<tr>
<td>Sonar Module</td>
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<td>Jonathan</td>
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<td>GPS/Speed Module</td>
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<td>LCD Module</td>
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<td>Height Sensors</td>
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<td>PSI Sensors</td>
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<td>Wireless/Radio Module</td>
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<td>10/26/2015</td>
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<td>Final Schematic</td>
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Technology/ IP Reuse

- LPC 4088 Processor
- Solenoids
- LCD Display
- WiFi/Radio Module
- NFC Module
Critical Elements

Height Sensors
• Must work for the system to be automated

Solenoids
• Must work to regulate air bags for suspension system

Sonar Module
• Must work for the system to be automated