**Air Ride Controller**

**Hardware**

**Height Sensors:** Delphi ER10031 **Tank Pressure Sensor:** 150PSI

**Processor:** Arduino Mega 2560

**Arduino Inputs**

**Item Variable Name Pin Number**

Right Front Sensor RFheightCurr Pin A1

Left Front Sensor LFheightCurr Pin A2

Right Rear Sensor RRheightCurr Pin A3

Left Rear Sensor LRheightCurr Pin A4

Tank Pressure Sensor TankPressure Pin A0

IgnitionState IgnState Open = Ignition Off

Closed = Ignition On

**Arduino Outputs**

**Item Variable Name Pin Number**

Right Front Up RFup Pin 22

Right Front Down RFdown Pin 23

Left Front Up LFup Pin 24

Left Front Down LFdown Pin 25

Right Rear Up RRup Pin 26

Right Rear Down RRdown Pin 27

Left Rear Up LRup Pin 28

Left Rear Down LRdown Pin 29

Compressor On CompControl Pin 30

**Compressor Control**

**Compressor Control Variables**

CompControl = Controls Compressor - Set Output to: High = On Low=Off

CompOnPressure = Compressor On Default - 90PSI \*

CompOffPressure = Compressor Off Default - 120PSI \*

CompRunTime = Compressor Run Time Duty Cycle

CompRunTimeSet = Maximum Compressor Run Time per cycle Default - 5 mins \*

CompRestTime = Compressor Rest Time Rest Cycle

CompRestTimeSet = Maximum Compressor Rest Time per cycle Default -20 mins \*

CompFaultTime = Time to CompOff pressure Default - 10 mins \*

TankPressHigh = High Tank Pressure Default –150PSI \*

TankPressLow = Low Tank Pressure Default –TBD \*

**Operation**

Compressor activation is controlled by the Tank Pressure Sensor(TankPressure).

To turn on Compressor

If CompRestTime => CompRestTimeSet & If CompOnPressure => TankPressure set CompControl = High

CompRunTime = 0 and Start counter for CompRunTime

To turn off Compressor

If CompOffPressure=> TankPressure set CompControl = Low

If CompRunTime => CompRunTimeSet set CompControl = Low and display Error Msg “Compressor Fault”

Stop counter for CompRunTime

CompRestTime = 0 and Start counter for CompRestTime

**Error Messages**

Compressor Fault - If the pressure fails to rise in CompRunTimeSet to CompOffPressure.

High Pressure Warning – If the tank pressure overshoots TankPressHigh pressure.

Low Pressure Warning – If the tank pressure is below TankPressLow.

**Ride Height Variables**

**Current Ride Height**

RFheightCurr – Current Ride Height from Right Front Sensor

LFheightCurr – Current Ride Height from Left Front Sensor

RRheightCurr – Current Ride Height from Right Rear Sensor

LRheightCurr – Current Ride Height from Left Rear Sensor

**Maximum Height**

RFheightMax – Right Front Maximum Height \*

LFheightMax – Left Front Maximum Height \*

RRheightMax – Right Rear Maximum Height \*

LRheightMax – Left Rear Maximum Height \*

**Minimum Height**

RFheightMin – Right Front Minimum Height \*

LFheightMin – Left Front Minimum Height \*

RRheightMin – Right Rear Minimum Height \*

LRheightMin – Left Rear Minimum Height \*

**Height Tolerance**

This adjustment controls the height tolerance of the Height Sensors. This controls how close the system will try to get to the target preset height.

RFheightTol – Right Front Tolerance \*

LFheightTol – Left Front Tolerance \*

RRheightTol – Right Rear Tolerance \*

LRheightTol – Left Rear Tolerance \*

**Ride Height Presets**

PresetName1 = Preset Name for first preset on screen \*

RFheight1 = Right Front User Stored Value \*

LFheight1 = Left Front User Stored Value \*

RRheight1 = Right Rear User Stored Value \*

LRheight1 = Left Rear User Stored Value \*

PresetName2 = Preset Name for second preset on screen \*

RFheight2 = Right Front User Stored Value \*

LFheight2 = Left Front User Stored Value \*

RRheight2 = Right Rear User Stored Value \*

LRheight2 = Left Rear User Stored Value \*

A total of 6 presets. Naming convention to follow above.

**Ignition Rise to Preset**

IGN\_On\_Height = After turning on Ignition automatically goes to a predetermined preset. If this variable is set to 0, then no preset is selected.

**Stance Preset \***

StancePreset = After turning off Ignition automatically goes to one of the six presets. If this is set to 0 then no action.

**Time to Stance \***

StanceTime = After turning off Ignition automatically goes to a predetermined preset in the stored time. Time in seconds.

**Pulse Air Valves**

**Speed Lift**

This adjustment controls the pulse frequency for when the vehicle is lifting an airbag. This

speed control only applies when using the height presets buttons and when Pulse On Manual Controls is turned on. The settings range from 1-6.

RFSpeedLift – Pulse frequency for Right Front – Lift \*

LFSpeedLift – Pulse frequency for Left Front – Lift \*

RRSpeedLift – Pulse frequency for Right Rear – Lift \*

LRSpeedLift – Pulse frequency for Left Rear – Lift \*

**Speed Drop**

This adjustment controls the pulse frequency for when the vehicle is dropping an airbag. This speed control only applies when using the height presets and when Pulse On Manual Controls is turned on.

The settings range from 1-6.

RFSpeedDrop - Pulse frequency for Right Front – Drop \*

LFSpeedDrop - Pulse frequency for Left Front – Drop \*

RRSpeedDrop - Pulse frequency for Right Rear – Drop \*

LRSpeedDrop - Pulse frequency for Left Rear – Drop \*

**Settings Valve On Valve Off**

**Time Secs Time Secs**

1 Full 0

2 0.1 secs 0.1 secs

3 0.5 secs 0.3 secs

4 0.1 secs 0.5 secs

5 0.5 secs 0.8 secs

6 0.1 secs 1.0 secs

**Pulse on Manual Control \***

When set to ON – Use Air Valve Duty Cycle

When set OFF – Air Valves stay on constantly.

**This only applies to the manual controls.**