**Air Ride Controller**

**Hardware**

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

**Processor:** Arduino Micro Pro

**Arduino Inputs**

**Item Variable Name Pin Number**

Right Front Height Sensor RFheightCurr A0

Left Front Height Sensor LFheightCurr A1

Right Rear Height Sensor RRheightCurr A2

Left Rear Height Sensor LRheightCurr A3

Right Front Pressure Sensor RFpresCurr A6

Left Front Pressure Sensor LFpresCurr A7

Right Rear Pressure Sensor RRpresCurr A8

Left Rear Pressure Sensor LRpresCurr A9

Tank Pressure Sensor TankPres A10

IgnitionState IgnState D4 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 Control CompControl Pin 30

**EEprom – Stored User Data**

**Variable Description Type Location**

**General**

Config Status of system set-up Binary

Set bit 0 – Not Configured

Set bit 1 – Configured

**Compressor Control**

CompOnPres Compressor On Pressure Numeric

CompOffPres Compressor Off Pressure Numeric

CompRunTimeSet Maximum Compressor Run Time Numeric

CompRestTimeSet Maximum Compressor Rest Time Numeric

CompFaultTime Time to CompOff to pressure Numeric

TankPressHigh High Tank Pressure Numeric

TankPressLow Low Tank Pressure Numeric

**Ride Height Input Control Type**

RideheightMode Ride Height Mode Binary

Set to 0 for Height Sensor Control

Set to 1 for Pressure Sensor Control

RFheightMax Right Front Maximum Height Numeric

LFheightMax Left Front Maximum Height Numeric

RRheightMax Right Rear Maximum Height Numeric

LRheightMax Left Rear Maximum Height Numeric

RFheightMin Right Front Minimum Height Numeric

LFheightMin Left Front Minimum Height Numeric

RRheightMin Right Rear Minimum Height Numeric

LRheightMin Left Rear Minimum Height Numeric

RFheightTol Right Front Tolerance % Numeric

LFheightTol Left Front Tolerance % Numeric

RRheightTol Right Rear Tolerance % Numeric

LRheightTol Left Rear Tolerance % Numeric

PresetName1 Preset Name for first preset on screen Alpha/Numeric

RFheight1 Right Front User Stored Value Numeric

LFheight1 Left Front User Stored Value Numeric

RRheight1 Right Rear User Stored Value Numeric

LRheight1 Left Rear User Stored Value Numeric

PresetName2 Preset Name for 2nd preset on screen Alpha/Numeric

RFheight2 Right Front User Stored Value Numeric

LFheight2 Left Front User Stored Value Numeric

RRheight2 Right Rear User Stored Value Numeric

LRheight2 Left Rear User Stored Value Numeric

PresetName3 Preset Name for 3rd preset on screen Alpha/Numeric

RFheight3 Right Front User Stored Value Numeric

LFheight3 Left Front User Stored Value Numeric

RRheight3 Right Rear User Stored Value Numeric

LRheight3 Left Rear User Stored Value Numeric

PresetName4 Preset Name for 4th preset on screen Alpha/Numeric

RFheight4 Right Front User Stored Value Numeric

LFheight4 Left Front User Stored Value Numeric

RRheight4 Right Rear User Stored Value Numeric

LRheight4 Left Rear User Stored Value Numeric

PresetName5 Preset Name for fifth preset on screen Alpha/Numeric

RFheight5 Right Front User Stored Value Numeric

LFheight5 Left Front User Stored Value Numeric

RRheight5 Right Rear User Stored Value Numeric

LRheight5 Left Rear User Stored Value Numeric

PresetName6 Preset Name for sixth preset on screen Alpha/Numeric

RFheight6 Right Front User Stored Value Numeric

LFheight6 Left Front User Stored Value Numeric

RRheight6 Right Rear User Stored Value Numeric

LRheight6 Left Rear User Stored Value Numeric

**Ignition Rise to Preset**

IGN\_On\_Height Ignition on height preset Numeric

Set to 0 for no preset

**Stance Preset**

StancePreset Ignition Off height preset Numeric

Set to 0 for no preset

**Time to Stance**

StanceTime Ignition off - Time in seconds Numeric

**Pulse Air Valves - Speed Lift and Drop**

RFSpeedLift Pulse frequency for Right Front – Lift Numeric

LFSpeedLift Pulse frequency for Left Front – Lift Numeric

RRSpeedLift Pulse frequency for Right Rear – Lift Numeric

LRSpeedLift Pulse frequency for Left Rear – Lift Numeric

RFSpeedDrop Pulse frequency for Right Front – Drop Numeric

LFSpeedDrop Pulse frequency for Left Front – Drop Numeric

RRSpeedDrop Pulse frequency for Right Rear – Drop Numeric

LRSpeedDrop Pulse frequency for Left Rear – Drop Numeric

**Pulse Speed**

PulseSpOn1 Pulse frequency in seconds Numeric

PulseSpOn2 Pulse frequency in seconds Numeric

PulseSpOn3 Pulse frequency in seconds Numeric

PulseSpOn4 Pulse frequency in seconds Numeric

PulseSpOn5 Pulse frequency in seconds Numeric

PulseSpOn6 Pulse frequency in seconds Numeric

PulseSpOff1 Pulse frequency in seconds Numeric

PulseSpOff2 Pulse frequency in seconds Numeric

PulseSpOff3 Pulse frequency in seconds Numeric

PulseSpoff4 Pulse frequency in seconds Numeric

PulseSpOff5 Pulse frequency in seconds Numeric

PulseSpOff6 Pulse frequency in seconds Numeric

**Pulse on Manual Control**

PulseSpMan Set pulse speed to Man/Auto Binary - Set bit 0 – Auto

Set bit 1 - Manual

**Compressor Control**

**Compressor Control Variables**

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

CompOnPres = Compressor On Pressure Default - 90PSI \*

CompOffPres = Compressor Off Pressure 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 CompOnPres => TankPres set CompControl = High

CompRunTime = 0 and Start counter for CompRunTime

To turn off Compressor

If CompOffPres=> TankPres 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 CompOffPres

High Pressure Warning – If the tank pressure overshoots TankPressHigh pressure

Low Pressure Warning – If the tank pressure is below TankPressLow

**Ride Height Variables**

**Ride Height Mode**

RideHeightMode – Ride Height Mode – Binary

Set to 0 for Height Sensor Control

Set to 1 for Pressure Sensor Control

**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 \*

**Recommended Settings**

**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 \***

**PulseSpMan -** When set to ON – Use Air Valve Duty Cycle - When set OFF – Air Valves stay on constantly.

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