

# INSTALLATION INSTRUCTIONS



**VW T5 (Van/Bus Version)**

**FULL AIR INTELLIRIDE ECAS  
Rear 2 Corner System**

**W21 - 760 - 3483**

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## **Thank you for purchasing a Driverite-Firestone Air Suspension System.**

All work should be carried out in a properly equipped workshop with due regard to Health and Safety Regulations. No further reference to Health and Safety Regulations will be made, but they must be considered at all times.

The kit should be opened and the contents checked against the kit contents provided. Identify the various components and familiarise yourself with them using pictures and information provided.

### ***WARNING***

*Do not inflate this assembly when it is unrestricted.*

### ***IMPORTANT***

This kit is not designed to increase the GVW of your vehicle. For your safety and to prevent possible damage to your vehicle, do not exceed the maximum load recommended by the vehicle manufacturer.

# Pre-Assembly Information

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The fitting of the Driverite Air Suspension System must be carried out by Driverite trained personnel in an authorized workshop, equipped with appropriate equipment and tools.

When routing the tubing avoid sharp bends as these can lead to airline blockages in the long term. All tubing must be cut at right angles with a sharp blade. Do not use a pliers to cut the tubing as this will lead to deforming the tubing and can cause air leaks.

**Secure the tubing to the vehicle where necessary and ensure it is not fastened to brake lines.**

If it is necessary to route the tubing through sheet metal then you must protect it from abrasion against the metal edges using rubber grommets or conduit.

If the paintwork or corrosion protection layer is damaged it must be re-coated immediately. This can be done using corrosion prevention paint. Ensure only the metal work is coated and protect all other items within close proximity from any paint spray.

Any OEM parts that have been removed in order to fit the air suspension must be replaced back in their original position and condition. If there are any parts that require a torque setting (such as the shock absorbers) then the vehicle manual must be referred to in order to establish the correct torque setting.

Only tighten and torque the shock absorber bolts when the vehicle is at ride height. If the torque setting in this fitting instructions differs from the torque setting stated by the vehicle manufacturer always use the one recommended by the vehicle manufacturer.

Ensure that surrounding components on the vehicle can still be maintained and the air suspension components cannot inhibit servicing these components.

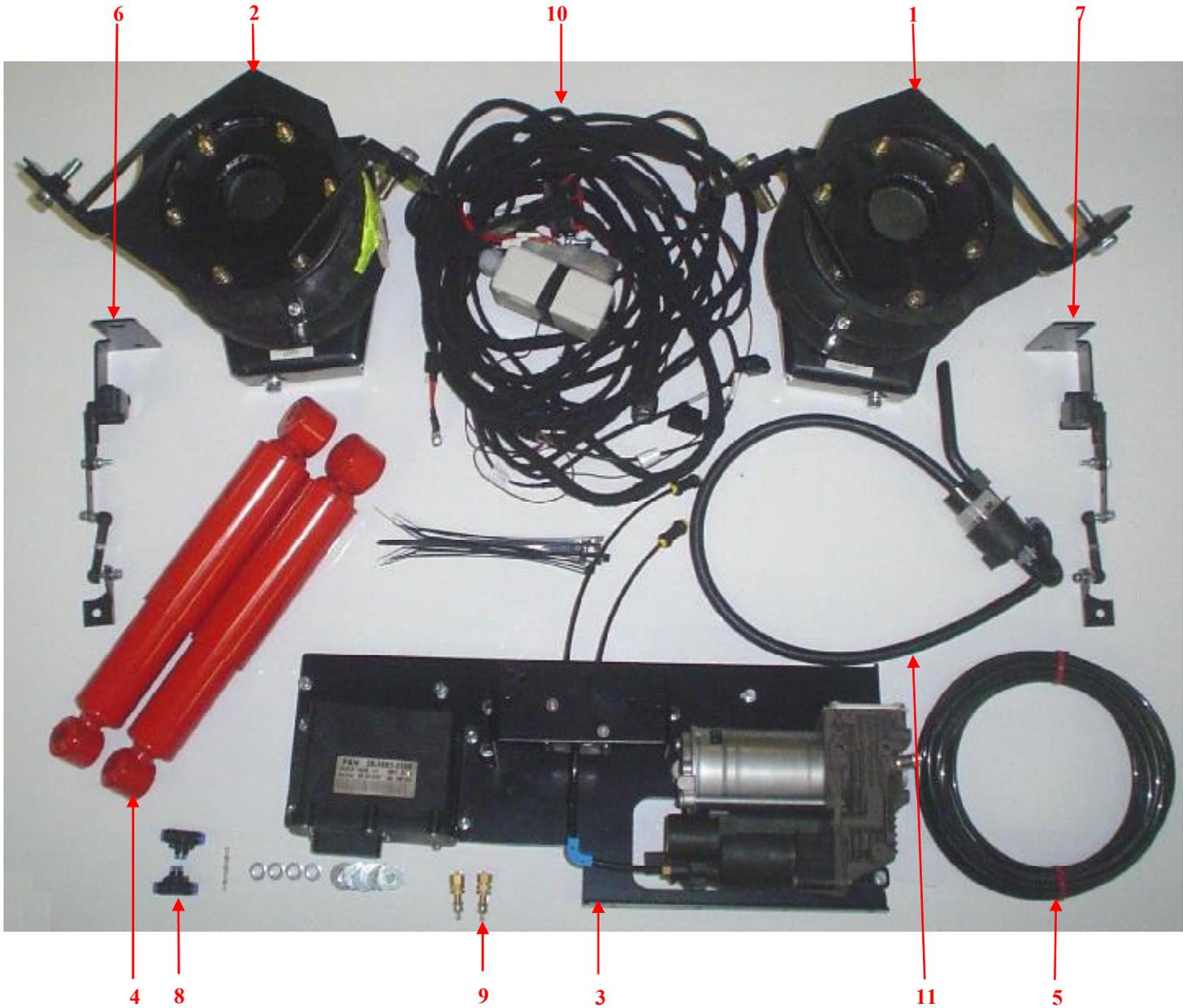
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# Kit Contents

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- 1. Right Hand Airspring Assembly (x1)
- 2. Left Hand Airspring Assembly (x1)
- 3. Hardware Assembly (x1)
- 4. Shock Absorbers (x2)
- 5. Tubing (x5M)
- 6. Left Height Sensor Assembly (x1)
- 7. Right Height Sensor Assembly (x1)
- 8. Tee Piece (x1)
- 9. Inflation Valves (x2)
- 10. Harness (x1)
- 11. Air Filter Assembly (x1)

For clarity purposes only the main items have been listed above

# Preparation

Take note of the ride height by measuring from the centre of the wheel to a fixed point on the chassis. (See page 28)  
Raise the vehicle and support the chassis using axle stands.

**CHECK**



Remove the original shock absorbers. To do this you need to remove the original bolts. (Circled in blue on the picture on the right)  
This should be carried out when the vehicle is at ride height.

**CHECK**



Please note - do not discard these bolts as they are to be re-used.

**NOTE:** To avoid damage or injury always secure the rear axle and chassis to prevent tension in the parts.  
The rear wheels can be removed to create more working room but this kit can be fitted with the rear wheels in place.

With the shock absorbers removed it is possible to further lower the rear axle.  
Lower the axle until the coil spring becomes loose.  
Ensure the brake lines are not stressed during this procedure.

**CHECK**



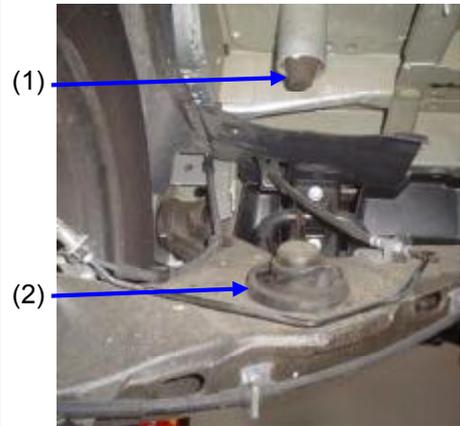
It is now possible to remove the coil.

**NOTE:** Do not hang the rear axle as this will create too much tension in the brake lines.

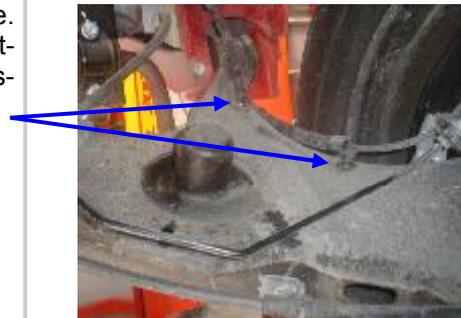
The rear coils can now be removed



Remove the rubber bump stop (1) and lower spring seat (2).



Temporarily remove the cable grommets from the wishbone. The purpose of this step is to prevent these cables from getting pinched and damaged when inserting the airspring assembly.



The bracket securing the brake line to the wishbone must be chamfered on the outboard side on the left and right side of the vehicle. The purpose is to prevent the 90 degree corner from touching and damaging the airspring.

**CHECK**



**NOTE:** The brake lines must be protected during this procedure to prevent any possible damage.

→ Outboard



Once the chamfer has been made it is necessary to file down the rough edges to ensure no sharp edges remain.

The cut surface must be coated with a suitable primer and paint to prevent any corrosion from occurring.

**CHECK**



# Fitting the Air Spring Assembly

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Identify the left air spring assembly and the right air spring assembly.

**NOTE:** There should be a sticker on each assembly to tell you which side is left and which side is right.

**Right**



**Left**



For ease of installation the assembly can be compressed. Insert a short length of tubing into the elbow. To prevent it from returning to its original position the opposite end is plugged using one of the inflation valves.



Remove the rubber grommet in the wishbone.



Insert the lower bracket fastener and line up with the hole in the lower bracket on the opposite side of the wishbone.



Bolt the lower bracket to the lower bracket fastener using the M10 bolts, spring washers and flat washers (in that order).  
Do not tighten fully at this stage.

**CHECK**



Place a second lower bracket fastener into the wishbone from the opposite side of the outboard flange. Line it up with the hole in the bracket on the opposite side of the wishbone.



The upper bracket now needs to be bolted in place.



There is a tubular recess in the upper bracket indicated by the circle with the solid line. The upper bump stop tube, circled with the broken line, must sit inside this cavity in the upper bracket.



Release the air from the airspring assembly and rest the front face of the upper bracket against floor plate. Bolt in place using the M8 x 40 bolt, spring washer and penny washer.



Due to tolerances there may be a gap between the front face of the upper bracket and the floor plate when tightening. If this occurs do not continue to tighten the bolt as this will cause the floor plate to deform. The space must be filled using a spacer. Remove the bolt and insert the M8 penny washers until the clearance is approximately 1mm.



Ensure the rear of the upper bracket is firmly clamping the rear floor plate.

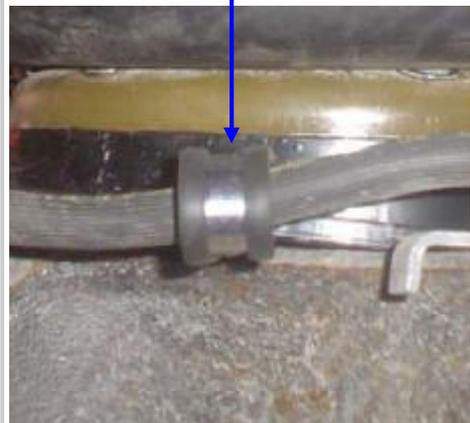


Now that the upper bracket is correctly seated the M8 bolt can be tightened.



Check the top and bottom brackets to ensure they are seated correctly and tighten. Relocate the brake lines so they will not make contact with the airspring during its travel.

**CHECK**



Decide on a convenient location for the emergency inflation valves.  
Run a length of tubing from the airspring to the inflation valve.  
Repeat on the opposite side.  
Use the inflation valves to bring the vehicle to ride height.



# Fitting The Shock Absorbers

Adjust the shock absorbers to their softest setting. This can be done by compressing the shock absorber to its shortest length and rotate the end with the rotating arrow clockwise to its fullest position.

CHECK



The shock absorbers are placed in position. Bolt loosely in place. Ensure the vehicle is at ride height (see page 15) and torque to the settings outlined below

Shock absorber upper bolt=70Nm

CHECK

Shock absorber lower bolt=120Nm

CHECK



Repeat this procedure on the left side.



# Fitting The Compressor Assembly

Remove the plastic guard that is located to the rear of the front right wheel. This is where the hardware box will be located.



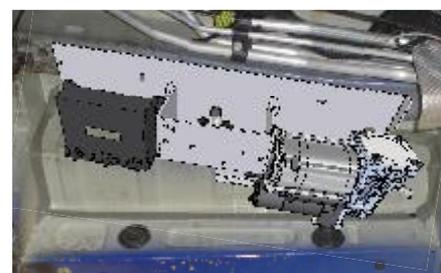
There are 3 holes along the chassis and one in the foot well (Circled in the picture on the right). Use the 4 supplied M6 inserts and rivet in each of these holes.

**CHECK**



Offer the hardware bracket in place with the ECU towards the front of the vehicle and the connector facing outboard. Bolt in place using the M6 bolts, flat washers and spring washers. Ensure the spring washer is between the head of the bolt and the flat washer.

**CHECK**



# Fitting The Height Sensors

Loosen the bolts used to secure the anti-roll bar to the vehicle. This procedure should be carried out when the vehicle is at ride height.



Slide the left hand upper height sensor bracket between the rubber bush and the securing bracket. Line up the holes on the Driverite bracket with the holes on the anti roll bar bracket and re-insert the 2 bolts



**Torque to 60Nm**

**CHECK**



Loosen the inboard bolt that secures the anti roll bar to the wish bone.



Place the square end of the left lower height sensor bracket in place as shown with opposite flange facing up and forward. The blue line indicates the direction of the front of the vehicle.



Attach the height sensor to the lower height sensor bracket using the 6mm threaded bar.



Check that the distance from the centre of the upper ball joint is 55mm from the centre of the lower ball joint as shown.

CHECK



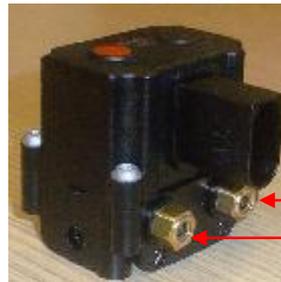
Repeat on the opposite side

## Connecting The Air Lines/Emergency Valves

Connect an airline from the left air spring to the port on the valve block marked 2.  
Connect an airline from the right air spring to the port on the valve block marked 1.  
Check that there is an airline connecting the air drier on the compressor to the port at the back of the valve block. This port is marked P on the valve block.



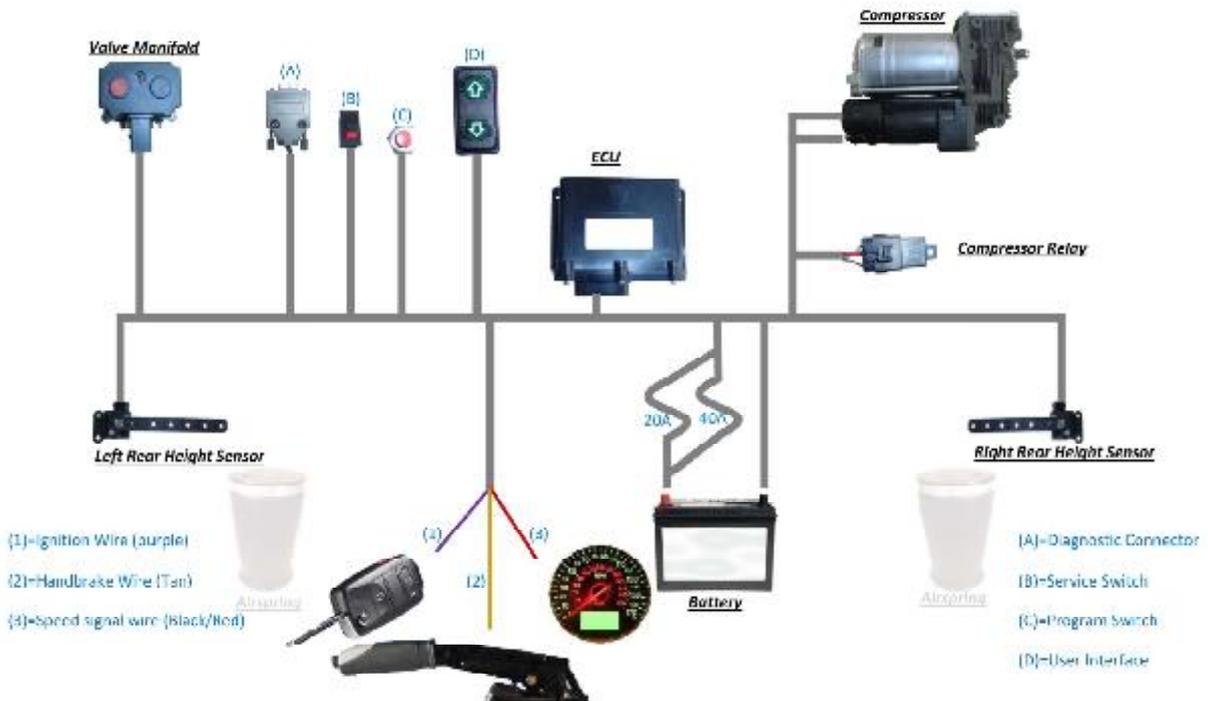
CHECK



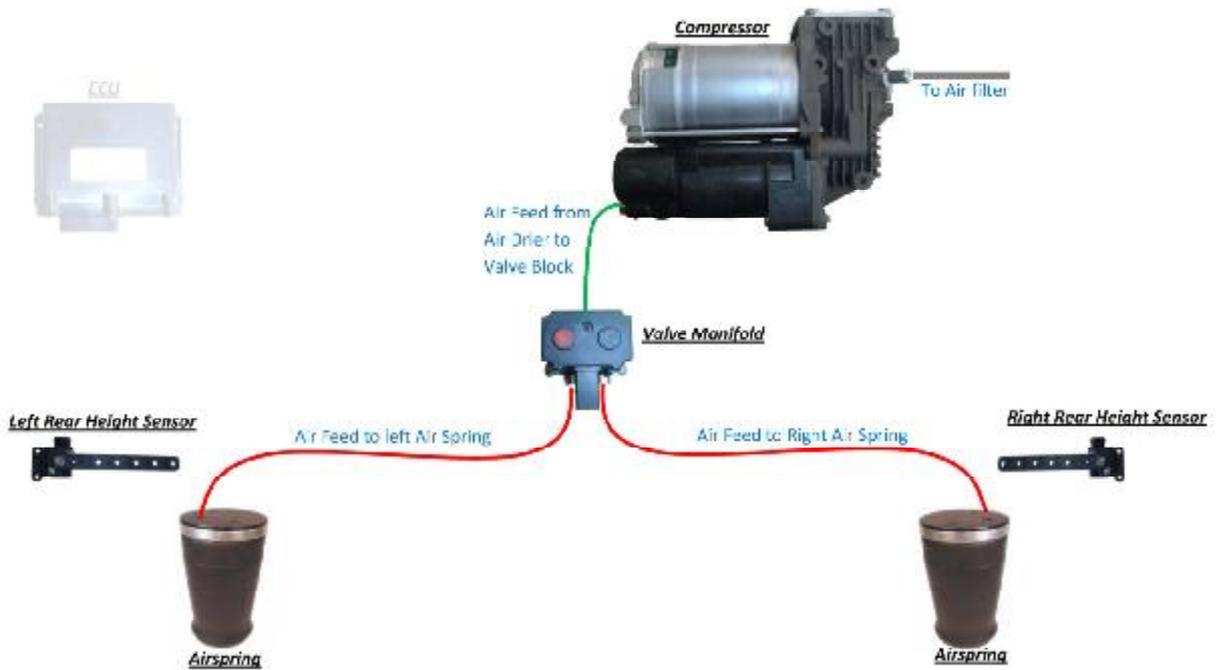
Connect the air filter assembly to the air inlet on the compressor.  
Locate the air filter in a clean, dry location.



# Electrical Diagram



# Pneumatic Diagram

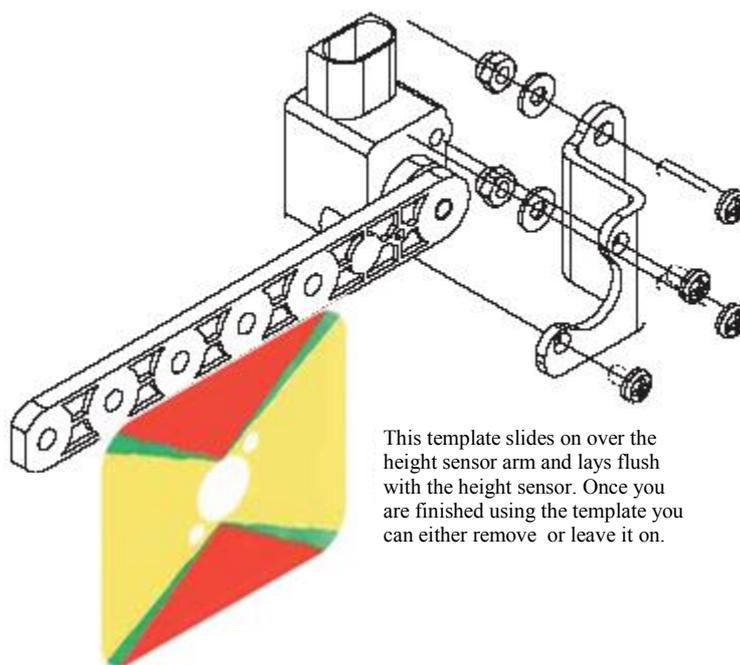


# Height Sensor Template

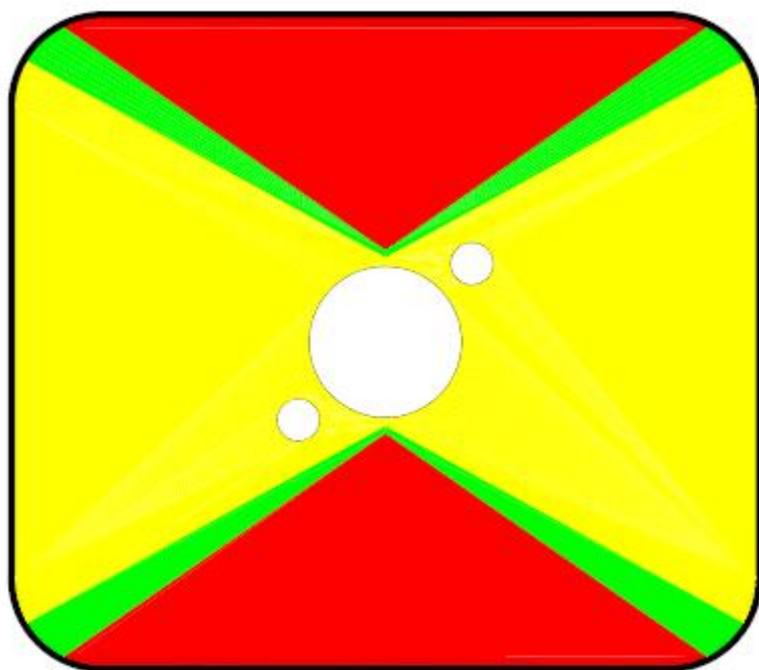
The height sensor arrangement has already been tested for this kit to ensure it is working within its tolerance.

When the axle is hanging (max rebound) the height sensor arm must not enter the lower red section on the template.

When the suspension is compressed onto the bump stops in the shock absorbers (max jounce) the height sensor arm must not enter the upper red section on the template.



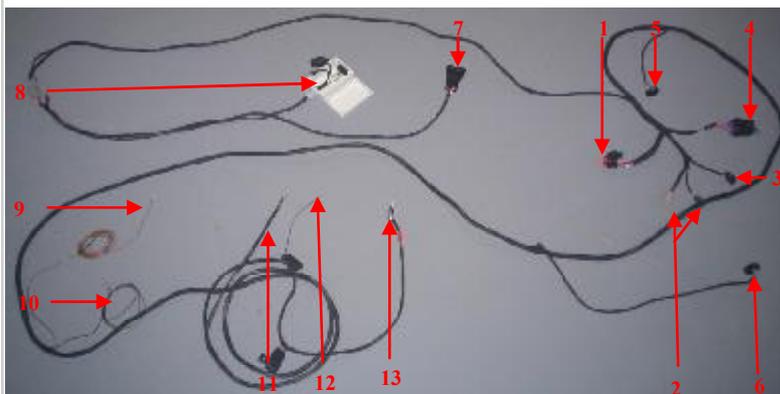
This template slides on over the height sensor arm and lays flush with the height sensor. Once you are finished using the template you can either remove or leave it on.



This template is to scale and can be cut out of the manual and placed over the height sensors as outlined above to establish if the height sensors are working within their tolerances.

# Connecting/Routing the Harness

## Harness Layout



1. ECU Connection
2. Compressor Connections
3. Valve Block Connection
4. Compressor Relay
5. Right Height Sensor Connection
6. Left Height Sensor Connection
7. User Interface
8. Programme Box
9. Handbrake Wire (Brown)
10. Speed Signal Wire (Black/Red)
11. Ground Wire (Black)
12. Ignition Wire (Purple)
13. Constant Live Wire (Red)

The harness is routed starting from the compressor.  
 Connect the large compressor connection on the on the harness to the motor of the compressor  
 Connect the small compressor connection on the harness to the solenoid on the air drier.



CHECK



Connect the valve block to the harness as shown.



CHECK



Connect the ECU to the harness as shown.  
 Secure any excess harness to the chassis using cable ties.



CHECK



**NOTE:**  
 Ensure the harness is not exposed to any sharp objects or close to the exhaust.  
 Do not attach the harness to the brake lines.

Connect the right height sensor connection to the right height sensor. Repeat for opposite side.



**CHECK**

**NOTE:**

That there are 3 wires in each height sensor connection on the harness. 2 of these are common—black/blue and red/blue.

The remaining third wire can be used to identify the left from the right height sensor.

The connection with the green wire goes to the right height sensor while the connection with the brown/white wire goes to the left height sensor.

Left Height Sensor Connection



Right Height Sensor Connection



## Connecting The Handbrake Wire

Route the brown handbrake wire into the cabin of the vehicle and to the base on the handbrake. Cut to length. There are 2 wires that are attached to the handbrake (Brown and Blue).

The blue wire is cut and the brown wire from the Driverite harness is attached to one end of the cut wire.

The blue wire that was cut is then reconnected using the supplied soldering butt connector.

**CHECK**



**Note:**

When heating the soldering butt connector ensure the surround area is protected from the heat gun.

(1)



(2)



# Connecting The Ignition & Constant Live Wires

Remove the plastic cover, battery and battery base.  
Feed the harness along the bulkhead into the battery compartment.



The removal of these items will reveal the location of strip fuses and the midi fuse housing.



**Connection A**  
Locate ignition controlled fuse in small fuse box.  
Remove connection from ignition live side of fuse. Snip old terminal off and re-install including cable A.

**Connection B**  
Install in vacant fuse housing (1).

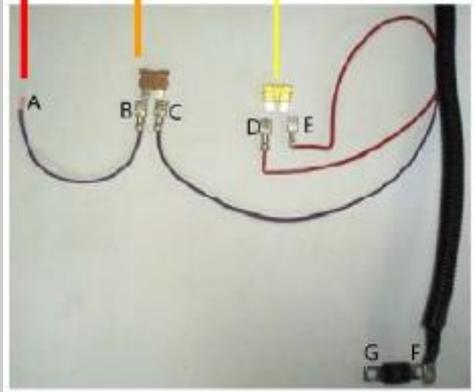
**Connection C**  
Install in opposite side of vacant fuse housing (1) and connect 5 Amp fuse.

**Connection D**  
Install in vacant fuse housing (2).

**Connection E**  
Install in opposite side of vacant fuse housing (2) and connect 20 Amp Fuse.

**Connection G**  
Connect to permanent live side of main busbar.

**Connection E**  
Connect to G via 40 Amp Strip fuse



Use an empty slot to fix the 40A and strip fuse in place.  
Replace the protective cover.



## Connecting The Ground Wire

Feed the black -Ve (ground) wire from the harness into the battery compartment and attach it to the -Ve terminal on the battery.  
Replace the plastic cover.

**CHECK**



Check all connections.  
Ensure all bolts are securely fastened  
Follow the setting instructions on the following pages to programme and calibrate the heights.

**NOTE:**

There is a time delay in the system.

**Place the sticker that states "This vehicle is fitted with DriveRite air suspension" on a visible location on the vehicle.**

# Programming The System (Program Switch)

## Step 1: Programming Setup

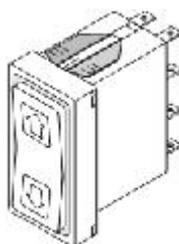
- Chock the front wheels to stop the vehicle from moving during the programming process.
- Leave the handbrake off until you are finished programming the suspension system.
- Turn the IntelliRide system off using the service switch. When the system is off the side of the switch will be red.



- Locate the push button program switch in the harness. This is in the programme box (Grey box) together with the service switch and the diagnostic connector.



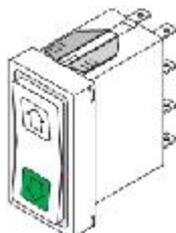
- Turn on the vehicle's ignition and leave it on until the entire programming of the vehicle's heights is completed.
- There should be no lights on the height selection switch at this time.



- Push the program switch three times within six seconds.



- The lower light on the height selection switch should start blinking. This will be indicating that lowered height needs to be programmed into the ECU.



## Step 2: Programming the Lowest Vehicle Height

- Set the lowest height of your vehicle's suspension by either using inflation valves at each corner or jack stands.

### **Note:**

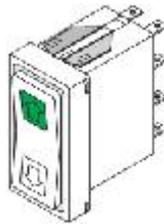
**The lowest height cannot be fully deflated. The lowered position should be a minimum of 5mm from where the jounce bumper stops. This small gap is required to allow for a tolerance as the suspension height is controlled by the ECU. Without this small tolerance, the ECU will not achieve the lowered height if the suspension is stopped before the ECU believes the lowest vehicle height is reached.**

**The recommended lowered height is 385mm from the wheel arch to the centre of the wheel.**

- When both rear corners of the vehicle are at the lowered height that you determine, hold the program switch in for eight seconds.



- The top light on the height selection switch should start blinking indicating that the ride height needs to be programmed into the ECU.



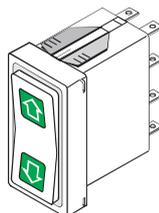
## Step 3: Programming the Vehicle Design (Ride) Height

- Set the ride height of your vehicle's suspension by either using inflation valves at each corner or jack stands. When the vehicle is at the ride height that you determine, hold the program switch for eight seconds.

**The recommended ride height is 450mm from the wheel arch to the centre of the wheel.**



- Both lights on the height selection switch should start blinking back and forth. This will indicate that the calibration height needs to be programmed into the ECU.

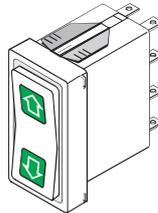


#### Step 4: Programming Calibration Height

- This calibration step teaches the relative suspension reaction to the IntelliRide system. Specifically this sets the internal tolerance bands and provides a relationship between the voltage that the ECU reads and the suspension height.
- Lower the height of each corner by 25mm by either using inflation valves at each corner or jack stands.
- When the vehicle is at the calibration height, hold the program switch for eight seconds, and then release.



- Both lights in the height selection switch should be on at the completion of programming.



- Turn off the vehicle's ignition, and switch the service switch off so that it is all black and not showing red. After the vehicle's ignition is turned back on, the system will put the vehicle at standard ride height.

#### **Additional Note – 3<sup>rd</sup> Height Function:**

***INTELLIRIDE offers a very versatile and flexible computer system that allows you to regulate the height and lowering of the vehicle.***

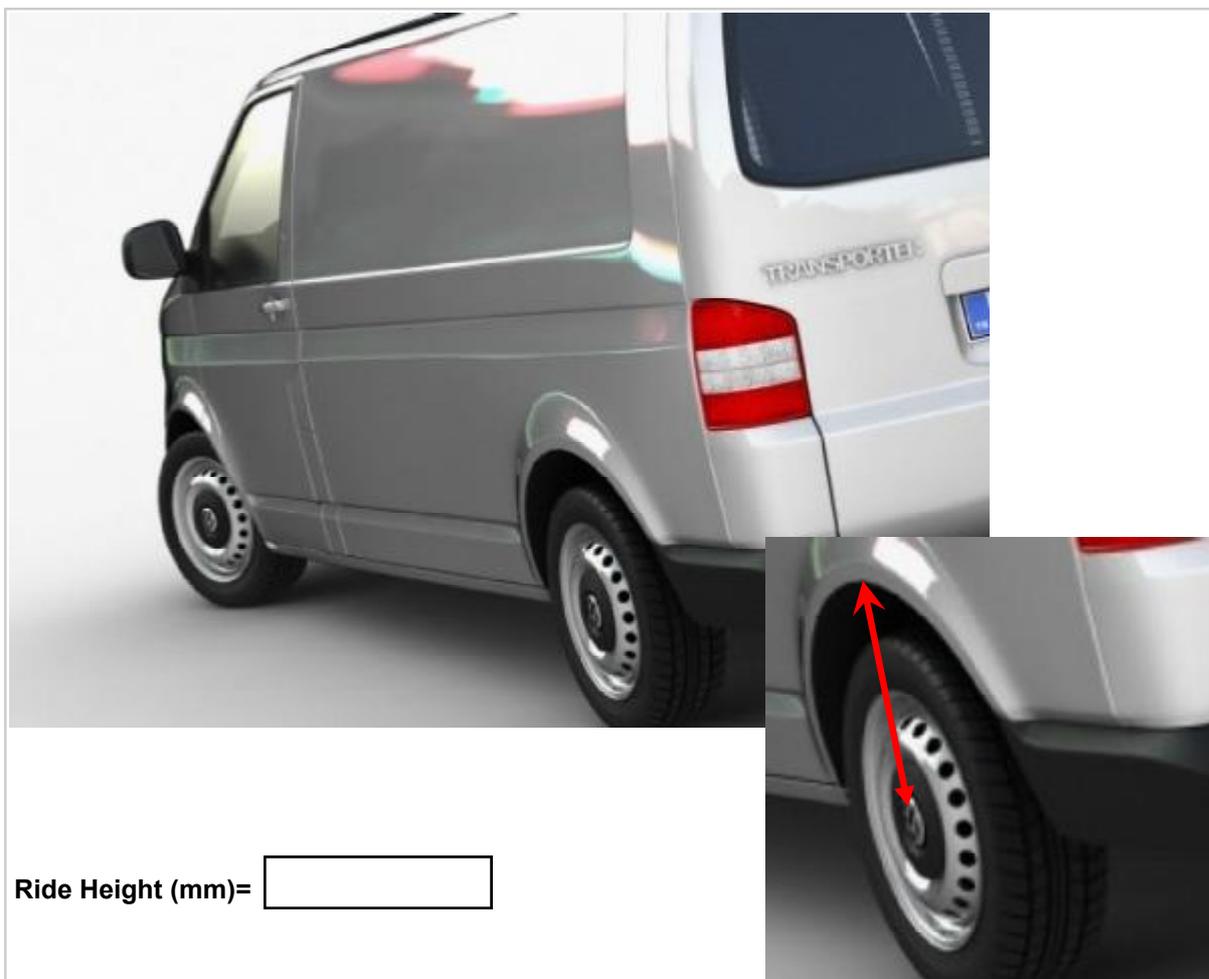
***Typically 2 heights are provided :***

- 1) Ride Height***
- 2) Access lowered height.***

***We can also provide an IntelliRide ECU that gives a 3<sup>rd</sup> height option for extra height typically used for off-road or multiple height settings if required. In this case the speed signal wire must be connected.***

# Ride Height

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# Checklist

<b>Height Sensor Checklist</b>	<b>CHECK</b>
1. Height sensor orientation is correct	<input type="checkbox"/>
2. Is the threaded bar set to the correct length?	<input type="checkbox"/>

<b>General Checklist</b>	<b>CHECK</b>
1. Ride , access and raised heights have been set at the correct measurement	<input type="checkbox"/>
2. Shock absorbers have been torqued at ride height and to the correct torque setting	<input type="checkbox"/>
3. All other nuts and bolts are secure and torqued where stated	<input type="checkbox"/>
4. Harness, air-line and connectors are secure	<input type="checkbox"/>
5. The system was checked for air leaks	<input type="checkbox"/>
6. There is 15mm clearance around the airsprings	<input type="checkbox"/>
7. The ECU, compressor and valve blocks have been connected to the harness. An audible click is heard when the connection is sealed.	<input type="checkbox"/>
8. Height sensors connection are in their correct side and have been connected to the harness. An audible click is heard when the connection is sealed.	<input type="checkbox"/>
9. When the airsprings are fully deflated the arm of the height sensor does not come into contact with the vehicles body.	<input type="checkbox"/>
10. When the axle is hanging the arm of the height sensors are not under tension and cannot invert.	<input type="checkbox"/>
11. The back page titled "Service Information" on the User Operation Manual (which will be kept in the vehicles glove box) has been completed.	<input type="checkbox"/>
12. User Operation Manual has been placed in the glove box	<input type="checkbox"/>

**For troubleshooting please refer to the "User Operation Manual" supplied with this kit.**

**Note:**

**The "User Operation Manual" should be stored in the vehicle that has been installed with the air suspension. This can be referred to by the end user for reference.**





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