

Air Suspension Electronic Control System (economical

version)

Product manual v1.0



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Preface

Thank you very much for your support of 'DOWN' air suspension electronic control unit products.

The product adopts the principle of single-chip computer control, receiving remote control input instructions, control solenoid valve group to perform the corresponding action, so as to complete the corresponding suspension action, the product control logic is clear, the production is excellent to ensure the reliability of the product.

We are committed to developing advanced suspension control technology to provide you with stable and reliable products and high quality service. To experience a quality driving experience, please visit our website (https://www.depcon.com.cn/) and tell us about your driving experience.



-. System Component Layout 悬架经济版电气原理图 DN-VP Wiring Diagram





二. Installation Guide

Once you have completed the installation of the chassis airbags and shock absorber, the next step is to install the 'DOWN' electronically controlled suspension control kit;

- System structure layout (see page 3)
- Describe of system structure

The whole system mainly consists of an electronic control unit ECU, a solenoid valve group, an electric air pump and a handheld remote control and wireless remote control. The driver adjusts the suspension height independently to suit the driving according to the body height status, so as to optimise the driver's driving experience.

Attention:

- Be sure to keep parts away from heat sources. Design the harness and sheath to be able to pass through the vehicle. Remove all sharp edges that may fray. Use bellows for protection when passing through the vehicle.
- Before installing the air supply unit in accordance with the layout plan, it is necessary to confirm the location of the air supply unit, which can generally be placed in the boot of the vehicle or in the spare wheel position, or you can choose to integrate the installation or install the subcomponents individually according to the space available.
- Warning: the installation of the wiring harness process, be sure to keep the disconnect the vehicle battery power supply ground wire.

三. Wiring harness

- 1. When installing the system, first disconnect the system battery earth wire.
- 2. According to the "system structure layout" and the label indication on the wiring harness, arrange each wiring harness in the appropriate position of the vehicle;
- 3. Electric air pump, solenoid valve group, relay



- ① According to the "system structure layout" and the label indication on the wiring harness, connect the wiring harness connector to the corresponding parts, and the sound of "clicking" will be heard when it is plugged firmly. The ECU connector needs to lock the anti-removal buckle.
- (2) use bolts or self-tapping screws to fix the electric air pump, electromagnetic valve group, relay and other parts in the preset position.
- (3) if the wiring harness needs to be extended, it is necessary to ensure that the connection mode is stable and reliable, and the exposed metal parts must be effectively insulated.
- 4. Wired remote control installation
- ① Select a location convenient for the driver to operate and watch and place the wired remote controller;
- 2 lock the connection after connecting with the corresponding connector of the harness according to the label indication on the harness.
- 5. Public grounding

Connect the public grounding wire with the whole vehicle (make sure that the rust and paint are removed so as to be completely grounded).

- 6. Battery/ignition connection
- (1) Connect one end of the power wire to the positive battery terminal and one end to the relay pin as indicated by the label on the wiring harness and bolt tightly.
- (2) Find the ignition signal line of the vehicle (the signal line is electrified only after the engine is ignited) and connect it with the ignition line (note that the exposed part of the metal must be effectively insulated).

Note:

- 1. When the wiring harness is plugged in, it must be inserted in the correct direction. Do not forcibly insert mismatched connectors.
- 2. Make sure that the connector is firm and you can hear the "bang" sound in the locked position.
- 3. Keep the wiring harness away from exhaust lines or other high temperature areas.
- 4. Use rubber rings on the sharp part of the metal to prevent the wire harness from being worn out.

四. Air Line

1. Connect the solenoid valve set

①Solenoid valve set A port, connecting A airbag



②Solenoid valve set B port, connection B airbag

③Solenoid valve set IN port for air inlet ④Solenoid valve set EXH port for air outlet

If the airbag is installed left and right, port A is connected to the left and Port B is connected to the right.

If the airbag is installed back and forth, port A is connected to the front and Port B is connected to the rear.



2. Connect airbag/electric air pump/air tank

According to the instructions of "system structure layout", the electric air pump, air tank and electromagnetic valve group are connected by air pipe.

Air filters must be installed recommend, and air filters must be installed in cold weather to ensure stable operation of the gas circuit system.

Note:

- 1. Use standard pipe cutter or blade to ensure that the end is as round and flat as possible.
- 2. Keep air lines away from sharp edges and heat sources, using insulated sleeves if necessary.



Connector assembly instruction

- 1. Check the interface screw holes and connector studs to ensure there is no contamination, excessive adhesive and cracks.
- 2. Apply sealant to the joint thread. Do not apply the initial two-circle thread.
- 3. Screw the joint thread into the interface screw hole and tighten it

Warning:

Do not exit the tightened thread for alignment. Loosening it will destroy the seal and lead to air

leakage.



五. Installation Testing

After the wiring harness, valve body and air circuit are installed and connected, the system test can be carried out.

Note: The test process is carried out on a lift as follows.



• System test:

- Start the car, and the electric air pump will start and begin to inflate the air tank. When the electric air pump inflates to the set maximum pressure, the electric air pump automatically closes. When the volume of the air tank is 20L and the double pumps work, this process takes about 2-3 minutes.
- 2. As shown in the left figure, adjust the button Group of the wired remote controller to check whether the corresponding wheel position will rise or fall. Air will be consumed in the process of body rise, and the electric air pump will start automatically when necessary.
- 3. When the vehicle is put on the car lifts, it can do some mechanical system inspection work appropriately: check the clearance between the whole travel range of the airbag and the surrounding parts.
- 4. Use soapy water to check the air leakage of all threaded joints. When repairing the leaking part, first place the car lifts, then turn off the ignition and drain the air in the air tank.

The key description in the key area is as follows:





六. Remote control display interface function comparison

IButton function comparison





Ilnterface function comparison



七.Use of the remote control

I .Basic Operation

Main Functions	Subfunctions	Function	Factory value
Gear calibration	1	Calibrate the value and save it to gear 1	10 10
	2	Calibrate the value and save it to gear 2	59 59
	3	Calibrate the value and save it to gear 3	129 129
Low lying setting	Low Down	Empty the airbags to minimize the car.	/
	Low Down With Ignition Off	Automatically activate the low lying function when the car is turned off.	Close
lgnition setting	1	The car automatically enters into gear 1 when the ignition is turned on.	Close
	2	The car automatically enters into gear 2 when the ignition is turned on.	CIOSE



	3	The car automatically enters into gear 3 when the ignition is turned on.	
Other Settings	Language Settings Modify the display language		Chinese
	Barometric Units	Modify the unit of displaying air pressure (it will be converted automatically).	psi
	Air pump control Set the air pressure value for pumping and stopping the air pump		100 ~ 169Psi 0.69 ~ 1.17MPa
	Display selection	Select the display mode of the 2 airbags	Left-right display
	Wireless pairing	Pairing wireless remote control	/
	Factory Restore Reset all parameters to the factory state.		/
	Fault logging	Display the current fault of the valve body	/
	About device	Displays the version number of the current system	/

1. One way adjustment

1. Press the up/down button to adjust the airbag to the desired height

(2) . Full vehicle adjustment

1. Long press the overall upper button to raise all directions, long press the overall lower to lower all directions

2. Adjust to the desired height



${\rm I\hspace{-.1em}I}$.Gear calibration

①. Setting the gear calibration.



The heights used in different environments will be saved in the corresponding gears through the settings.

Method one:

- 1. Long press the confirmation button to enter the menu interface, select the gear calibration
- 2. Select the gear you need to adjust
- 3. Adjust the value of the gear, press the confirmation key to confirm after adjustment.
- 4. Select Confirm to save the setting, select cancel to not save

Method two:

- 1. Adjust the value directly in the initial interface
- 2. Long press the gear key corresponding to the gear you want to save after the adjustment is finished.
- 3. Select Confirm to save the setting, select Cancel to not save.
- 2. Use the gear

Quickly enter the height set by the corresponding gear (using the gear or automatic adjustment will have $\pm 2\%$ error value)

1. In the initial interface, press the key of the gear you want to use.



WARNING: If you find the car tilted condition before use, you should check the tires first to see if there is a flat tire.

I.Low Down Settings



(1). Low down settings Low Down: clear the airbag to minimize the suspension of the car Low Down: when the car is turned off, the low down function will be executed automatically.

1. Press and hold the confirmation button to enter the menu interface, select the low down setting.

(1) Execute low down function

1. Select Execute Low Down

2. After confirming, it will automatically return to the initial interface and reduce all airbags air pressure to 0.

(2) Switch of flameout low down

1. Select the Switch of flameout low down

2. Turn on or turn off the Switch of flameout low down

3. When it is on, it will automatically reduce all airbags' air pressure to 0 when the car is turned off.

IV.Ignition Settings





①. **Ignition setting** When the car is ignited, it will automatically enter the set gear.

- 1. Press and hold the confirm button to enter the menu interface, and select "Ignition Settings."
- 2. Select the desired gear and press the confirm button.

(1) Enable: Select "Yes." After selection, press the confirm button to automatically return to the initial interface, and the car will automatically use the corresponding gear upon ignition.

(2) Disable: Select "No." After selection, press the confirm button to automatically return to the initial interface and disable the ignition-to-gear function.

V.Other setting

① . Language setting Change the display language of the remote control



1. Press and hold the confirm button to enter the menu interface, select other settings2. Select Language Settings

- 3. Select the desired language
- 4. After selecting, it will automatically return to the initial interface
- ②. Air pressure unit

Modify the unit of air pressure display (1MPa=10bar=145psi)





- 1. Press and hold the confirm button to enter the menu interface, select other settings
- 2. Select the air pressure unit
- 3. Select the desired air pressure unit.
- 4. After selecting, it will return to the initial interface automatically.

③. Air pump control Setting the start and stop air pressure of the air pump.



1. Press and hold the confirm button to enter the menu interface, and select "Other Settings."

2. Select "Air Pump Control."

3. Use the confirm button to adjust the required air pressure for the slider (the minimum pressure must not be lower than 100 psi, and the maximum must not be higher than 200 psi).

4. Use the up or down button to switch the slider (inflation starts when the pressure is below the set minimum, and stops when the pressure is above the set maximum).

5. After adjusting, it will return automatically.

(4). Display Selection The initial interface shows the air pressure of two airbags. (When displaying left and

right, the left side shows Airbag A, and the right side shows Airbag B. When displaying top and bottom, the top shows Airbag A, and the bottom shows Airbag B.)



1. Press and hold the Confirm button to enter the menu interface, and select other Settings

- 2. Select Display selection
- 3. Select a display mode
- 4. Press to confirm. The system automatically returns to the initial screen.



(5).Wireless pairing Pairing wireless remote control



- 1. Press and hold the confirm button to enter the menu interface, and select other Settings
- 2. Select wireless pairing
- 3. Select Yes to automatically delete the original wireless remote ID.

4. Press any button of the wireless remote control in front of the valve body within 10 seconds, and the valve body will show that the pairing is successful after receiving it, and then return to the initial interface

(6).Restore to factory *Restore the data to the factory state*



- 1. Press and hold the confirma button to enter the menu interface, select other settings
- 2. Select Restore Factory



3. Select Confirm

4. It will return to the initial interface automatically after the data restore the initial value.

⑦ . Error Recording View the current fault



- 1. Press and hold the confirm button to enter the menu interface, and select "Other Settings."
- 2. Select "Error Recording."
- 3. After checking, it will return automatically.

(8) . About the Device View the device version number



- 4. Press and hold the confirm button to enter the menu interface, and select "Other Settings."
- 5. Select "About Device."
- 6. After checking, it will return automatically.



八.Wireless remote control use



1. It is necessary to pair the wireless remote control first. After the pairing is successful, long press the corresponding button to realize the corresponding airbag lifting.

After the car is turned off, if the car battery voltage is greater than 12v, it can continue to use the wireless remote control to control the lifting (the premise is that the air pressure in the tank is sufficient, and the air pump will not be started after the flame off); If the car battery voltage is less than 12v, the valve body will automatically power off, and the wireless remote control can not be controlled.
After the wireless remote control is finished, turn off the wireless remote control switch, which can save electricity and extend the use time of the remote control. Remote control distance is about 15 meters.

九. Troubleshooting Guide

SN	Fault Code	Fault Code Schematic	Solution
1	E-01	Air tank air pressure sensor failure	Replace the valve body
2	E-02	Air pump inflation abnormal	Check if the air pump harness is properly connected or directly replace the air pump.
3	E-03	Pressure sensor A is faulty	Replace the valve body
4	E-04	Pressure sensor B is faulty	Replace the valve body
5	E-05	/	/

1. Wired Remote Control Display Fault Indication Code Table



6	E-06	Low ignition voltage	/
7	E-07	High ignition voltage	/
8	E-08	Low Battery Voltage	/
9	E-09	Battery voltage high	/

(2). Leak testing and repair

Find a leak

1. The direct proportional change of pressure change and temperature change in the closed container is not a leak.

a. For every 5 ° C reduction, the pressure is reduced by 2psi.

b. Pressure changes due to the presence of air in the system, such as air in a pipe.

2. Apply soapy water to suspicious joints or pipe connections, and wipe clean with a rag.

3. Soapy water configuration: 1/5 clear soap to 4/5 water.

Note: Soap will not corrode metals (aluminum, copper, steel).

Leak test

1. Allowable leakage rate <7sccm@-40 ° C (for a single connector).

2. Give an example:

a. 0.98MPa after being placed at -40° for 12 hours at 1MPa pressure in 10L gas storage tank.

b. 0.99MPa after being placed at -40° for 12 hours at 1MPa pressure in a 20L gas storage tank.

③. FAQ

A. The air circuit is faulty

1. Phenomenon: A certain pressure value changes, but the body does not rise or fall.

Measure: Check whether the corresponding air pipe is bent. If no, return it to the factory for testing. **2. Phenomenon:** A certain pressure value drops rapidly.

Measures: Check whether there is air leakage in the gas pipe joints, gas pipes, and air bags. If there is no air leakage, return to the factory for testing.

B. The gear is faulty

1. Phenomenon: When entering the gear, the displayed value is inconsistent with the calibration value.

Measures: The difference between the calibration value and the display value is within 3, which is a normal phenomenon. If it is greater than 3, you can try to enter the gear again. If there is still a large difference, you need to return to the factory for testing.

2. Symptom: When entering gear, one or more pressure bars are in the 0 pressure state.

Measures: If the pressure sensor is faulty, stop using the gear immediately and return to the factory for maintenance.