Electronically Controlled Air Suspension System (Height Gage Version)

Products use handbook V1.0.

Shenzhen DEPCON Auto Electronic Tecnology Co., LTD.

Directory

Preface

Thank you very much for the "**DOWN**" electronic control unit (ECU) for air suspension products.

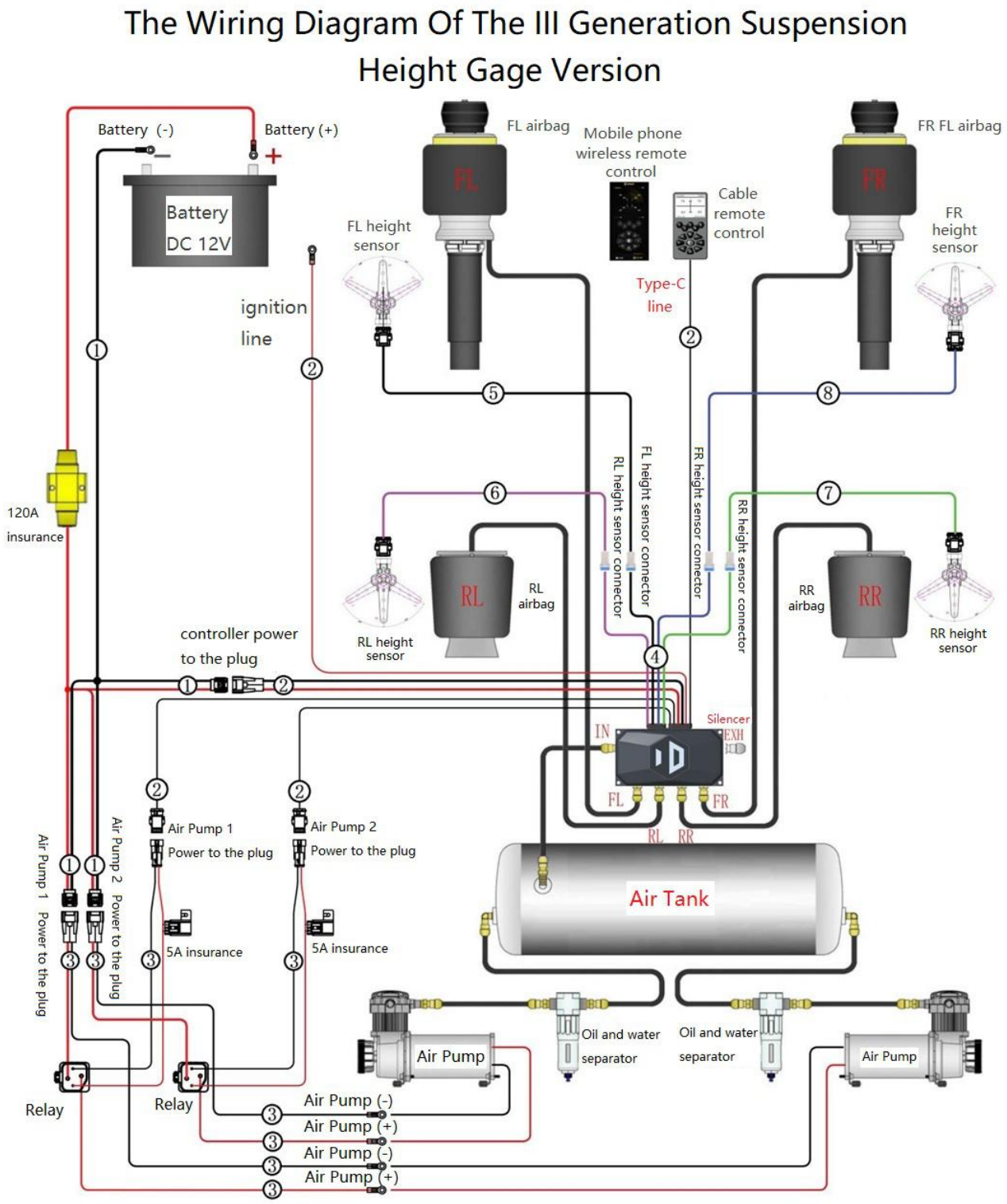
The product through the application of the world's leading level sensor measurement technology, the instantaneous detection of vehicle status, and adjust the height of the 4 airbags, thus management body posture. Whether driving or parking state, the system will be automatically adjusted according to the load change, of course, the driver can manually for a variety of highly mode choice. In order to enhance the performance and reliability of the whole system, and meet the personalized requirements, we offer four different height of memory state:

1. High mode (usually set in 90% of the suspension stroke to increase mobility and away from obstacles).
2. Driving mode (regular driving vehicle height, usually set in fifty percent of the suspension stroke).
3. Low mode (general set in the suspension of twenty percent).
4. Low down mode (4 airbags all empty, its lowest level in suspension travel, only for static display vehicles).

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

Note: this product belongs to the part of the electronically controlled air suspension system, should be used with other parts.

I. System structure arrangement



Number	Wiring harness		Number	Wiring harness
1	The main power supply wire		5	FL height gage wire
2	ECU control wiring harness		6	RL height gage wire
3	The pump beam		7	RR height gage wire
4	Height gage wire		8	FR height gage wire

II. Installation instructions

When you have completed the chassis airbags, shock absorber after installation, and then install "**DOWN**" electronic control suspension control components.

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

The whole system mainly consists of electric control unit ECU, handheld remote control, electric pump and electromagnetic valve group, the driver according to the state of body height, independent suspension height to adjust driving, so as to optimize the driver's driving experience.

Attention:

Ensure the parts away from heat source. Design of wiring harness and sheath can be through the vehicle. Remove all may wear sharp edges. When through the carriages using corrugated pipe protection.

According to the plan before the installation of gas supply device, need to confirm the air supply device is placed, can generally be placed on the vehicle trunk or spare tire position, also can according to the space integrated installation or child widgets installed separately.

Warning: the installation of the wiring harness process, be sure to keep the disconnect the vehicle battery power supply ground wire.

III. Wiring harness

(I) In the system installation, the first step is to disconnect earthing line of the system battery.

(II) According to the system structure and the label on the wire harness indicates, decorate the vehicle wiring harness to the suitable location.

(III) Electric pump, solenoid valve group, the relay.
i. Click system structure layout and wiring harness on the label instructions, will harness connector to connect to the corresponding parts, stuck when they hear "click". ECU connector need put overhand card buckle lock.
ii. Use bolt or self-tapping screws to electric pump, solenoid valve, relay and other parts fixed in the default location.
iii. Wire harness for extended, need to ensure stable and reliable connection, bare metal parts should be dealt with effective insulation.

(IV) Cable remote control installation

i. Select a driver convenience operation and watch the position of the cable remote place.
ii. Based on the label instructions and wiring harness connector wiring harness after docking card buckle lock connection.

(V) Public ground
Public ground wire connected to the vehicle by iron (ensure that the rust and paint in order to fully removed grounding).

(VI) Battery/ignition connections

i. According to the wiring harness on the label instructions, connect the power cord at one end to the battery positive, one end connected to the relay pins, bolts.
ii. Find the vehicle ignition signal (the signal only after the engine ignition power), and connect with the ignition line (note the bare metal part must be effectively insulated handle).

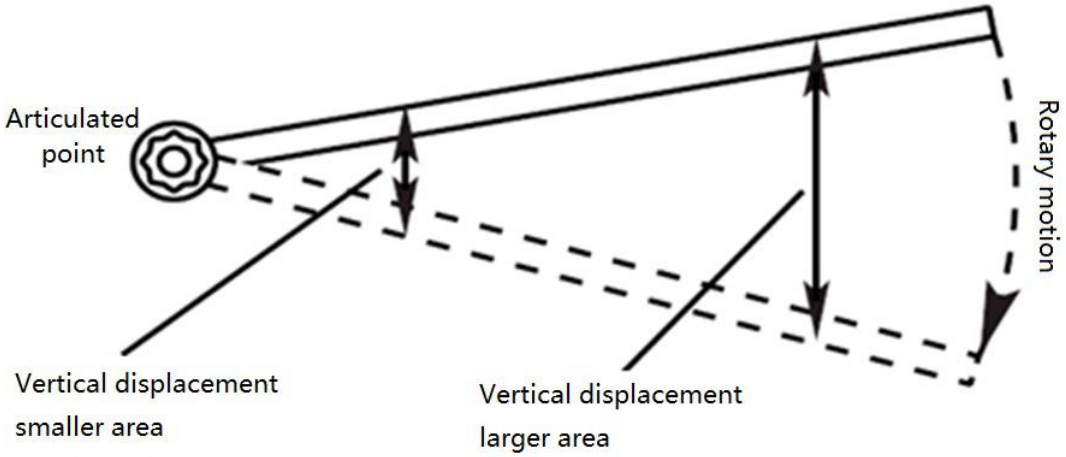
Attention:

1. Wiring harness plug must be inserted in the correct direction, do not forcibly insert does not match the connector.
2. Ensure that the connector is firm, locking position can hear the voice of "cut".
3. The wiring harness to stay away from the exhaust pipe road or other high temperature.
4. In metal part of the rubber ring to prevent a sharp torn wire harness.

IV. Height sensor installation

Noun terminology:
Swing arm: through ball hinge or bushing elastic to the wheel and body together is the bar, to guarantee the wheel in a certain track movement, also known as the control arm.
Vertical displacement: process of rotary swing arm when decorate the highs and lows of the vertical distance.

Determine the altitude sensor position:
Vehicle up and down movement, rotation of the swing arm will be articulated point around, there is no vertical displacement on the articulated point, near the articulated point area, small vertical displacement, away from the articulated point position, the vertical displacement is larger. If the sensor is installed in the vertical displacement of small area, as a result of the sensor effective stroke is not fully used, can reduce the control precision of the suspension system. If the sensor is installed in the region of the vertical displacement is larger, too much travel will damage the sensor structure, sensor failure.



Therefore, highly sensors should be installed within a proper range, as shown in the figure below:

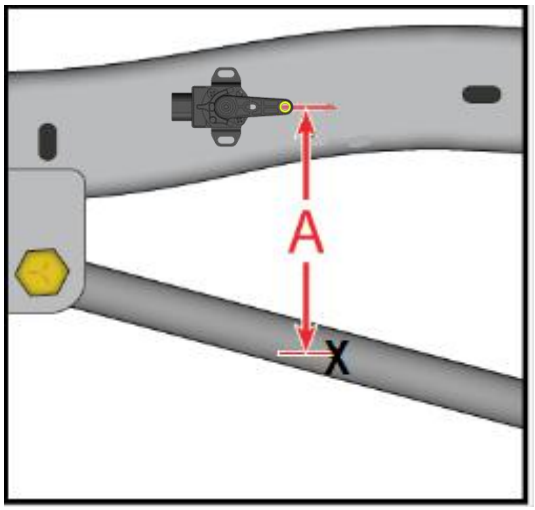
Determine the installation position of level sensor, the sensor should be within the positioning card allows the Angle of the swing arm swing, swing can not too small at the same time, try to locate CARDS allow maximum swing Angle.

Installation height sensor supports only one direction.

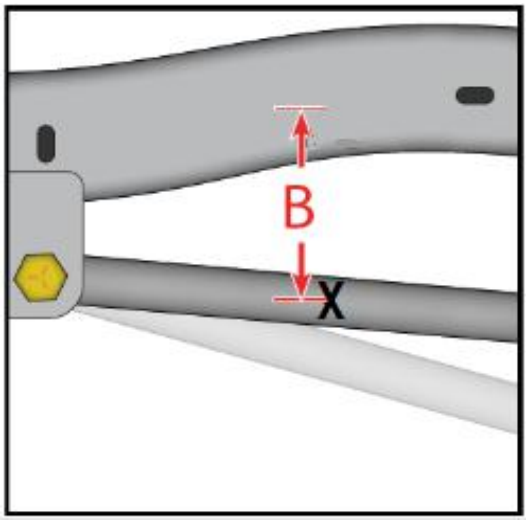
Attention:

Sensor installation shall observe the wheel up and down movement, motion sensors, Suggestions on the lifting machine, must ensure that the vehicle will not shake.
It is prohibited to operat when the vehicle parked on the ground or jack!!!!!!
Height sensor before the installation, pay attention to the steering wheel rotates the interference sensor and other vehicle components, such as tires, drag link, stabilizer bar, etc.), in the condition of the maximum and minimum two wheels should be turned to interference experiment was carried out.

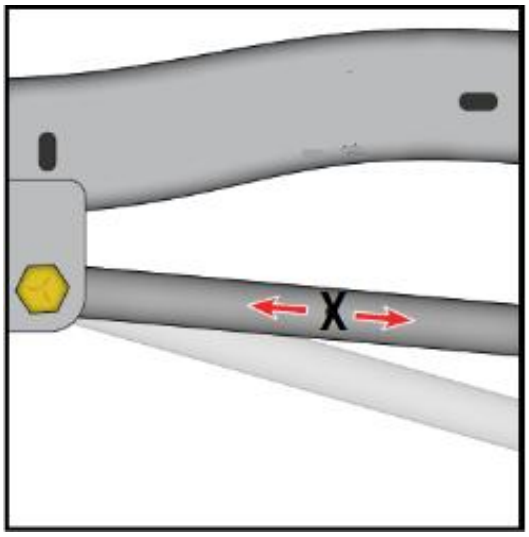
Height sensor installation steps:



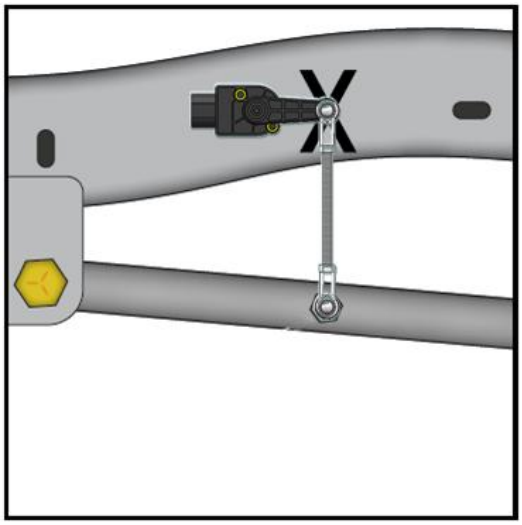
(I) To find a suitable installation point on body girder to locate the height sensor. Put the height sensor at that point. At the vertical below of this point, find a point on the suspension swing arm, and make "X" mark. When the suspension swing arm is in the bottom position, place the height sensor swinging rod in the bottom position, on positioning the ball under the articulated head connected to the "X" mark points.



(II) Suspension pendulum arm moving up to the top position, check to see if the altitude sensor pendulum bar within the scope of the positioning card point of view.

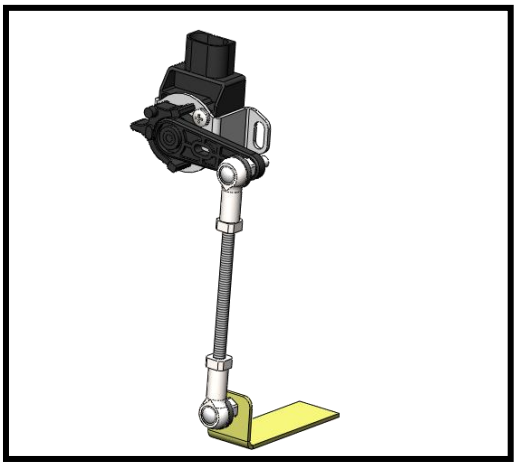


(III) If high sensor swinging rod is beyond the scope of the positioning card Angle, will point towards the "X" close to the articulated point position, then repeat step 1 to 2. If the height sensor variations in the Angle of swinging rod in positioning card is too small, will be marked points facing away from the hinged points move, then repeat step 1 to 2.

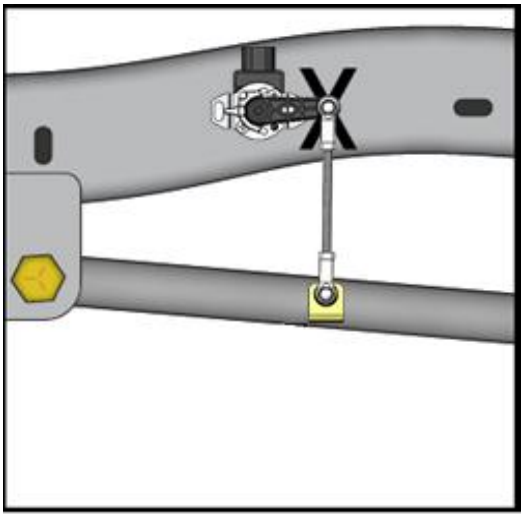


(IV) In the intermediate position of the vehicles in suspension travel, the threaded rod connected to the sensor on the swinging rod, determine whether to truncated hang lever.

(V) With the method of self tapping screws to sensor bracket on the frame, can also be marking, punching, adopt fixed pull rivet nut.



(VI) According to the step 3 and 4 to determine the "X", make the bracket, can use commonly hem arm hole under an installation bracket, the number of the if there is no need to consider to punch or welding.



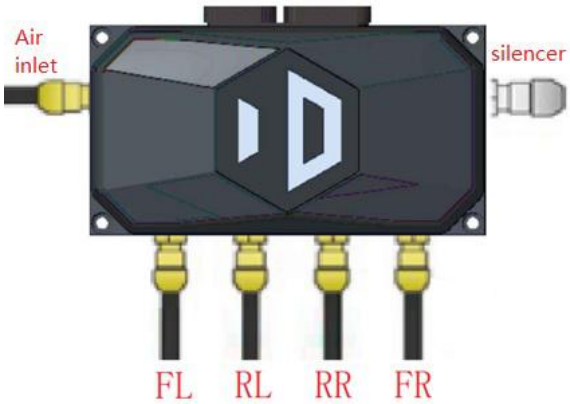
(VII) After installed the sensor bracket in the intermediate position of the vehicles in suspension travel, to setup the vertical rod length, the sensor beam vertically or horizontally with ontology. The suspension arm and then reach the top and fell to the lowest, fine-tuning the vertical rod, the sensor swinging Angle of swinging rod and horizontal Angle kept the same.

At this point, to complete the installation of the altitude sensor, tighten all bolts, nuts. When the front height sensor installed, if it is need to install the tires for turning test, turn the wheel left to the end and then turn right to the end, check whether there is interference conditions respectively, the test must be in the suspension of the highest and lowest separately.

V. Air line

(I) Connection solenoid valve group

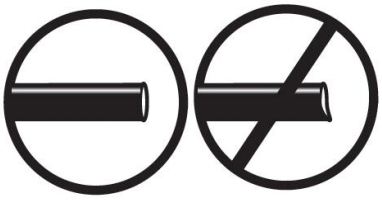
i. Electromagnetic valve group of FL, connecting the front left airbag.
ii. Electromagnetic valve group of RL, connecting the rear left airbag.
iii. Electromagnetic valve group of RR, connecting the right rear airbag.
iv. Electromagnetic valve group of FR, connecting the front right airbag.
v. Electromagnetic valve group IN mouth, for the air inlet.
vi. Electromagnetic valve group EXH mouth, for the outlet.



(II) Connect the air/electric pump/propane tanks.
According to the system structure arrangement, connect the electric pump, gas storage, electromagnetic valve groups by trachea.
Recommended to install the air filter, cold climate environment must be equipped with air filter the stable operation of the gas circuit system can be ensured.

i. **Attention:**

(i) Use the standard pipe cutter or blade, ensure the end round and smooth.
(ii) Keep the air line away from sharp edges and heat source. If necessary, use insulating casing.



ii. **Joint assembly instruction**

(i) Check the interface screw hole and joint stud, make sure that no contaminated and too much glue and cracks.
(ii) Apply sealant to the nipple, the initial two laps thread may not be blotted out.
(iii) The joint thread screw in interface screw hole and tighten.

iii. **Warning:**

Don't unscrew the thread in order to align. Unscrew will damage the sealing and cause leakage.

VI. Installation testing

When the wiring harness, the body and gas path, height gage are set after the connection, you can proceed to system test.
Note: the test process according to the following instructions, in the lifting machine.

- **The system test:**

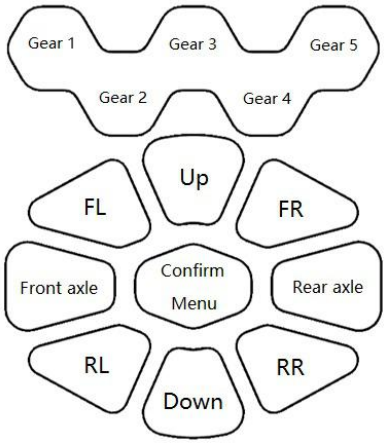
(I) Start the car, electric air pump will start and start to propane tanks. Electric pump air to the maximum pressure set, electric pump shut down automatically. When the gas tank volume 20 l, double pump work, the process need about 2 to 3 minutes.

(II) As shown in the left, group of adjusting cable remote control buttons, check whether the corresponding position of the wheel will rise, in the process of the rise in car body consumes air, electric pump will automatically start when necessary.

(III) Vehicles on the lifting machine set, can do the inspection of the mechanical system appropriately. Check air gap within the scope of the whole trip and surrounding parts.

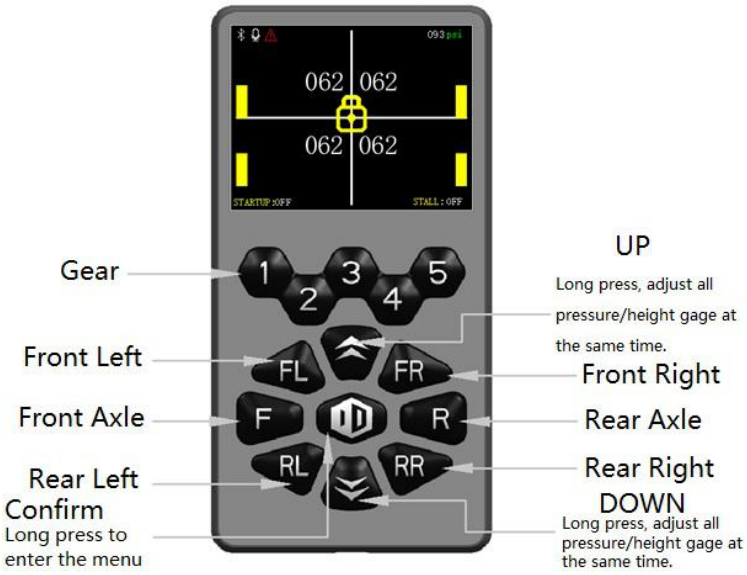
(IV) Check air gap within the scope of the whole trip and surrounding parts. When fixing a flat parts, the first thing is to put the lifting machine, and then turn off the ignition and put off gas inside the storage tanks.

Key areas as shown below:

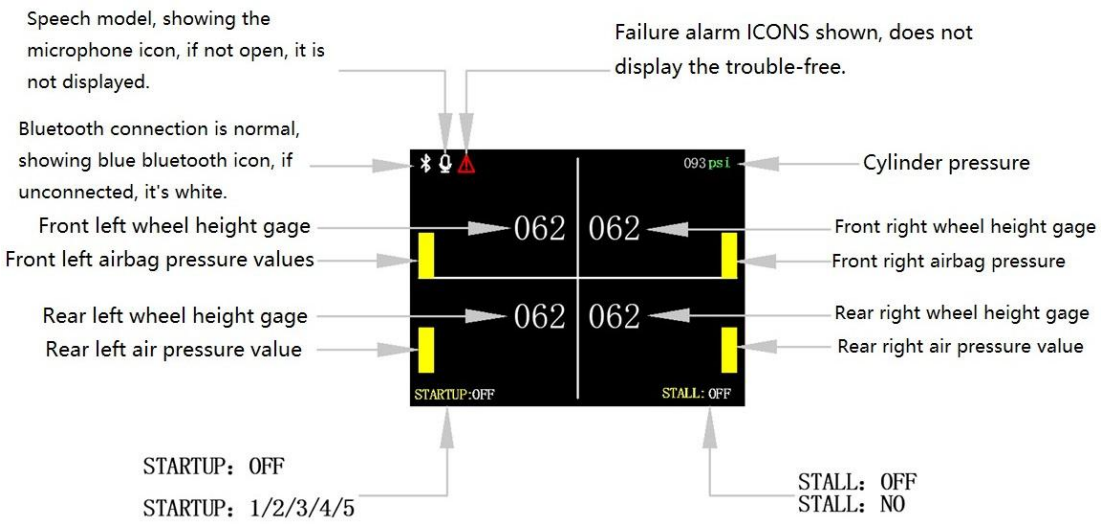


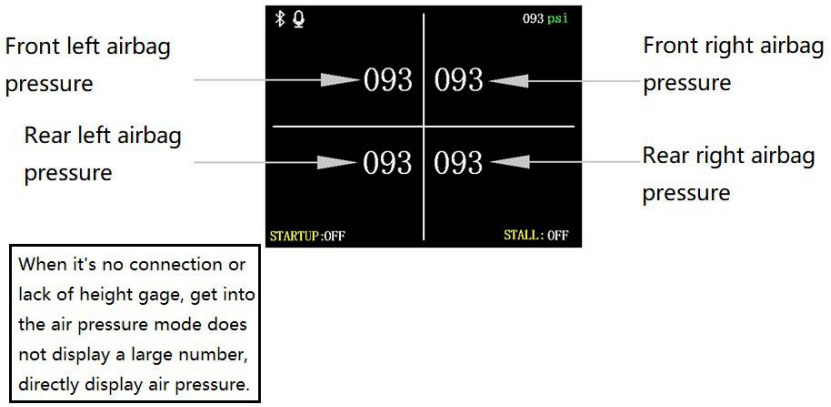
VII. The remote control display function

(I) Button functions contrast



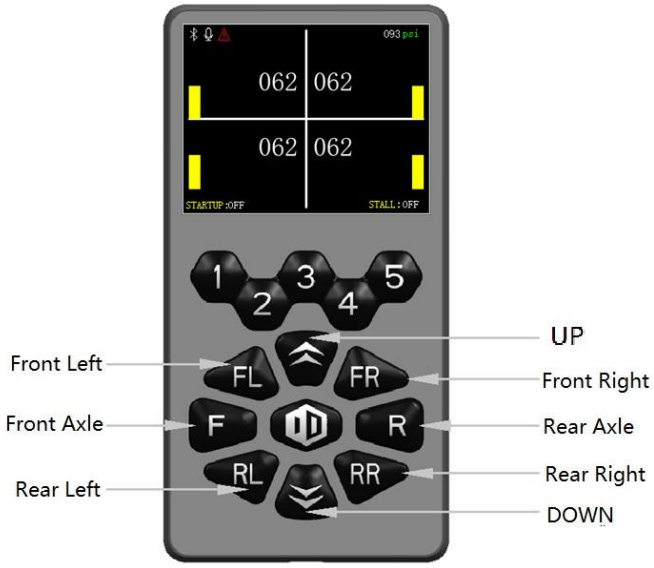
(II) Interface functions contrast





VIII. The use of remote control

(I) Basic operation



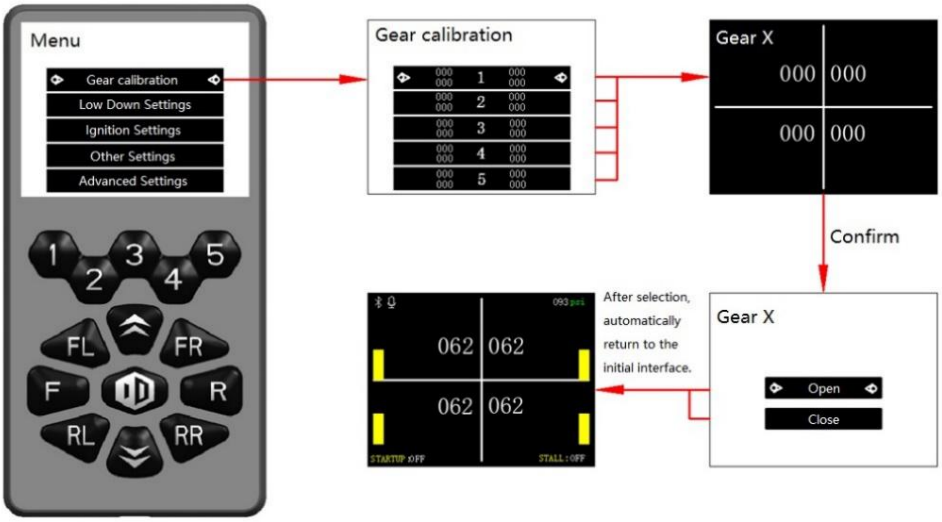
i. Unilateral adjustment
(i) Press the button of position which required to adjust (FL, FR, RL, RR, respectively means front left, front right, rear left and rear right).
(ii) Use the up and down keys to adjust to the required height.

ii. Adjustment of front and rear bridge
(i) Press the button of bridge position which required (F, R, respectively means front bridge, rear bridge)
(ii) Use the up and down keys to adjust to the required height.

iii. Adjust at the same time
(i) Long press on the up key and push up all bearings at the same time, long press down key and reduce all bearings.
(ii) Adjust to the required height.

(II). Gear calibration

i. Set the gear calibration



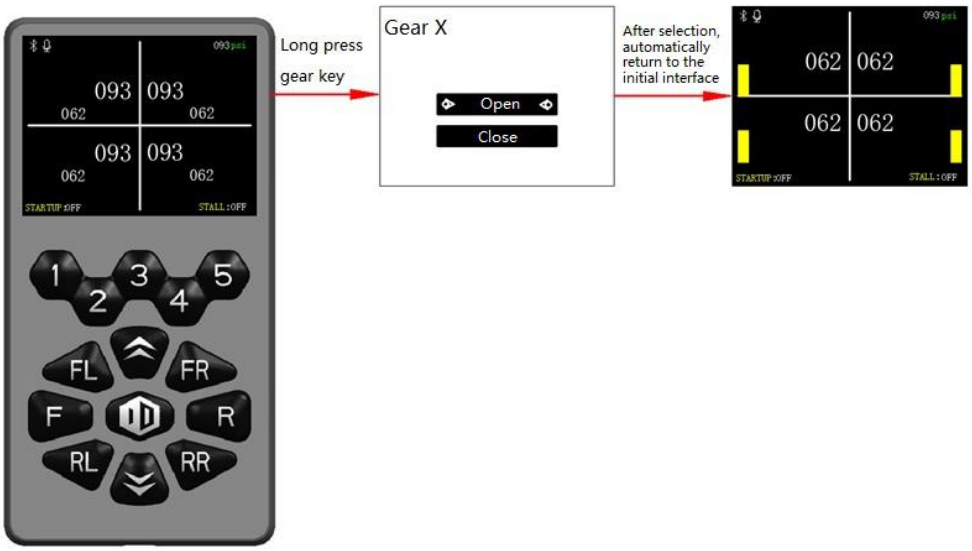
Method one:

(i) Long press confirm button to enter the menu interface, select gear calibration.

(ii) Choose the required gear adjustment.

(iii) Adjust the gear. After the adjustment, press the confirmation key.

(iv) Select open to save Settings, select close to do not save.



Method two:

(i) Directly adjust in the initial interface.

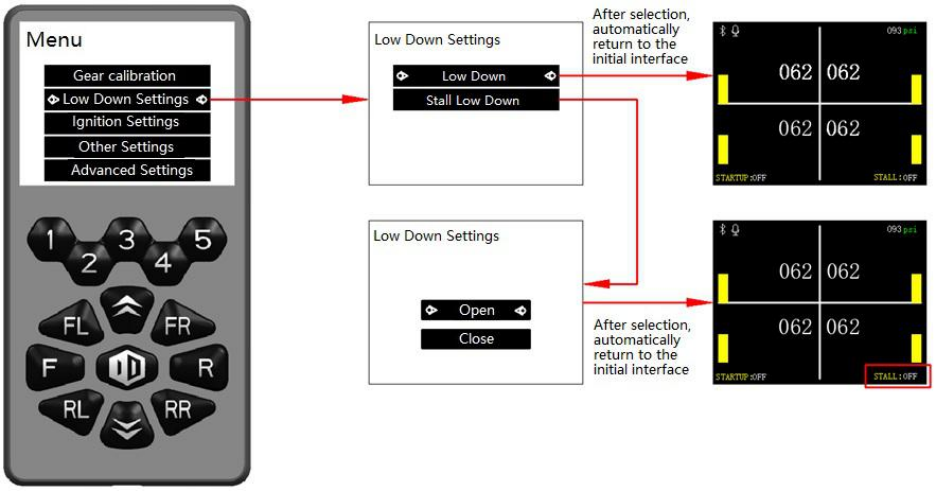
(ii) After the adjustment, long press the gear key which is needed to preserve gear.

(iii) Select open to save Settings, select close to do not save.

ii. Use the gear

In the initial interface, press the gear which is needed to use.

(III) Low down Settings



i. Low down Settings

(i) Long press confirm button to enter the menu interface, select the low down setting.

1. Low down

1) Choose low dow

2) After choosing, it will automatically return to the interface of the initial and put all the gasbag pressure drop to zero.

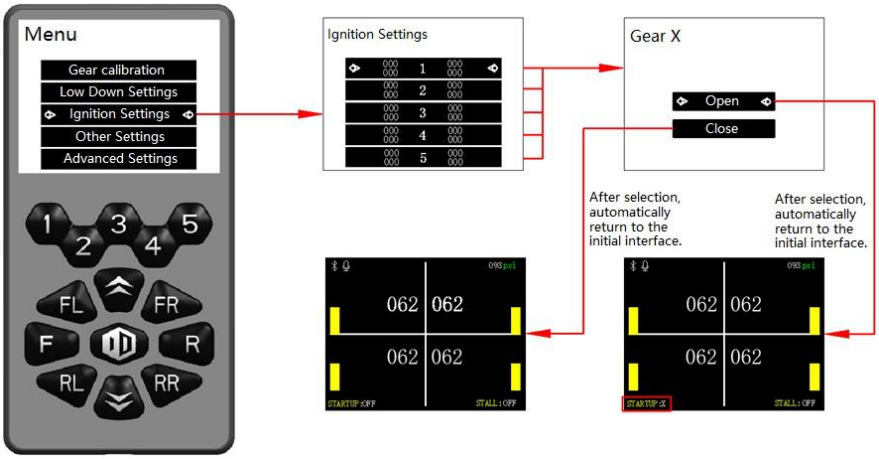
2. Stall low down

1) Choose the stall low down

2) Select open to start the stall low down, select close to unselect.

3) After selection, it will automatically return to the initial interface, and automatically drop all air pressure drop to 0 after the engine stalled.

(IV) Set the ignition



i. Set the ignition

(i) Long press confirm button to enter the menu interface, select the ignition Settings.

(ii) Select the needed gear

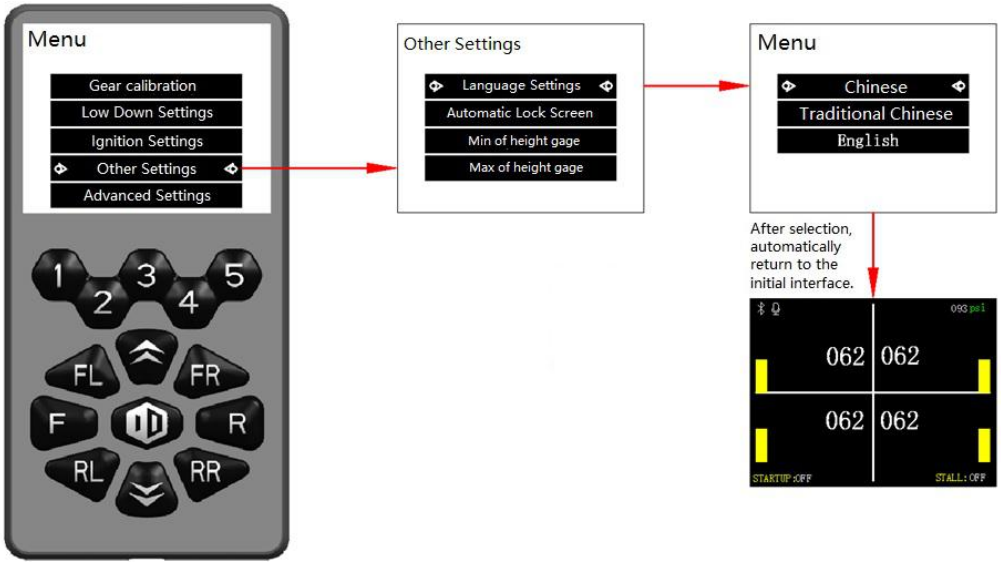
1. Open

1). Select open

2). After selecting, it will automatically return to the initial interface, and automatically use the corresponding gear after ignition.
2. Close
1). Select close
2). After selecting, it will automatically return to the initial interface.

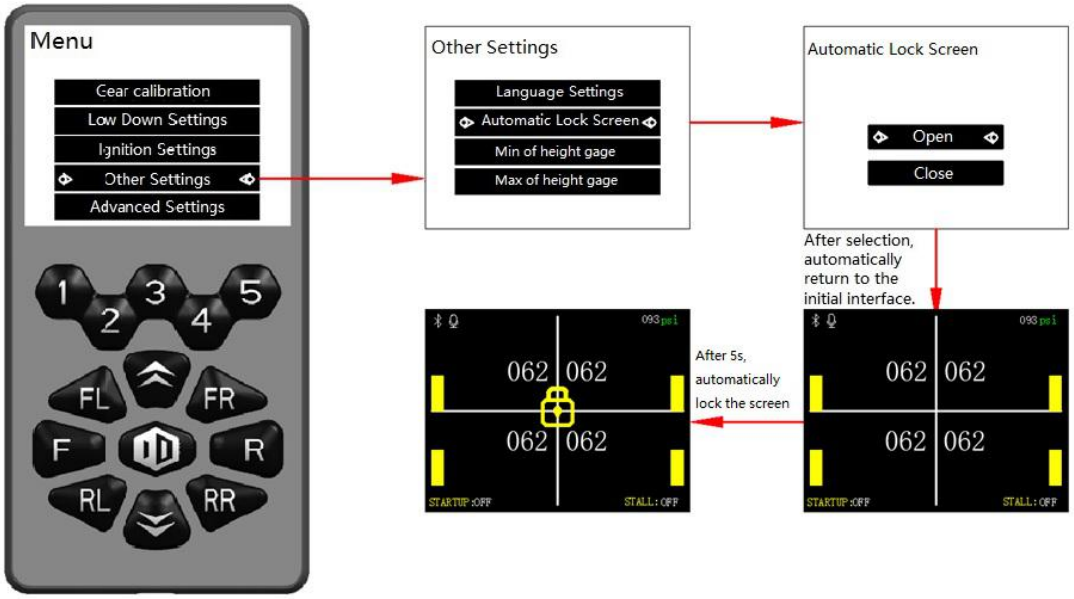
(V) Other Settings

i. Language Settings



(i) Long press ok button to enter the menu interface, select the other Settings.
(ii) Select the language Settings
(iii) Select the desired language
(iv) After selecting, it will automatically return to the initial interface.

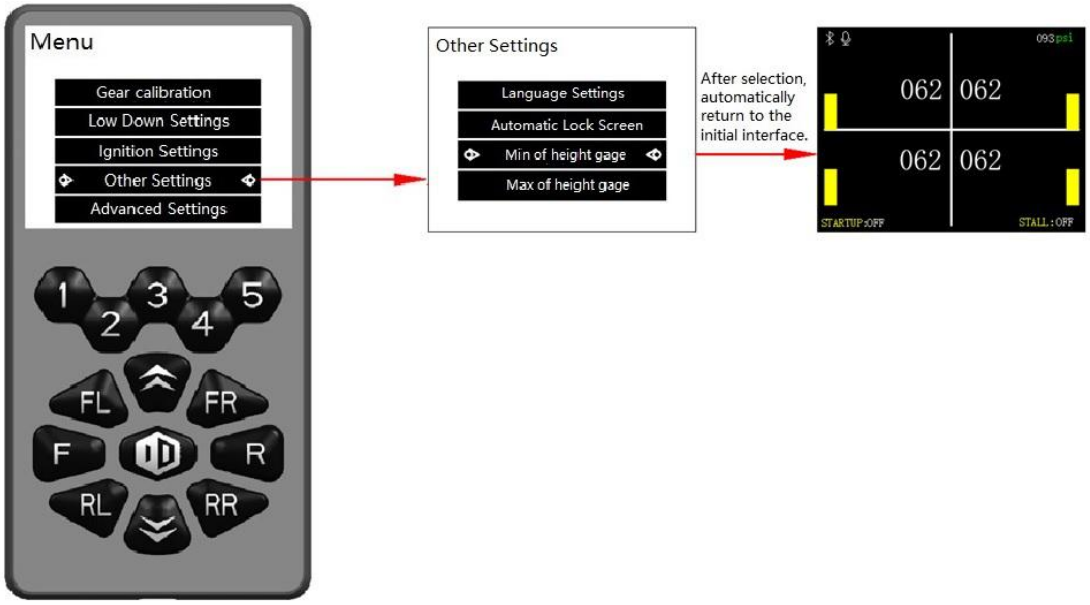
ii. Automatic lock screen



(i) Long press confirm button to enter the menu interface, select the other Settings.
(ii) Choose to automatically lock screen.
(iii) Select open.

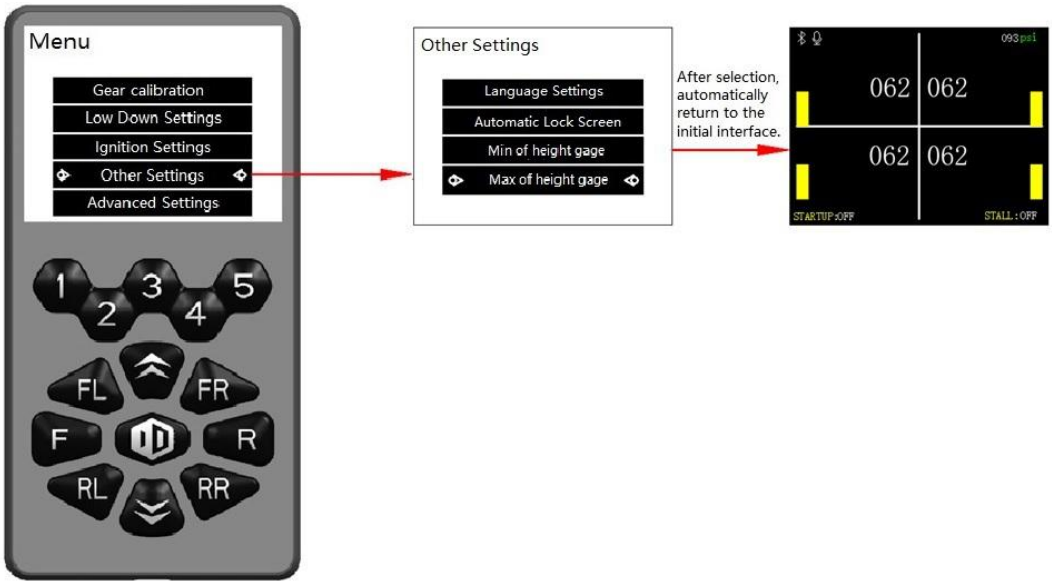
(iv) After selecting, it will automatically return to the initial interface, and lock screen automatically after 5 seconds.
(v) Double-click the confirmation key, it will automatically return to the main page when unlock.

iii. Minimum value of height gage



(i) When height gage is minimum, long press the confirm button to enter the menu interface, choose other Settings.
(ii) Choose height gage minimum, calibration airbags pressure at present.
(iii) After selecting, it will automatically return to the initial interface.

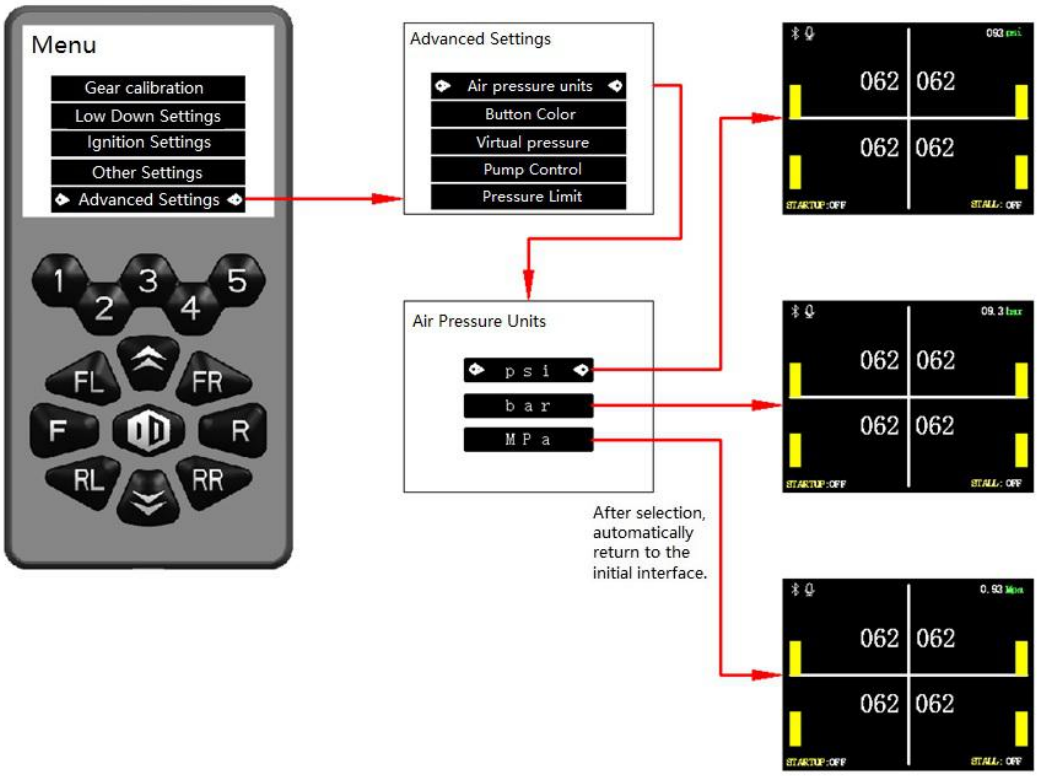
iv. Height gage maximum.



(i) In height gage maximum, long press the confirm button to enter the menu interface, choose other Settings.
(ii) Select the maximum height gage, calibration airbags pressure at present.
(iii) After selecting, it will automatically return to the initial interface.

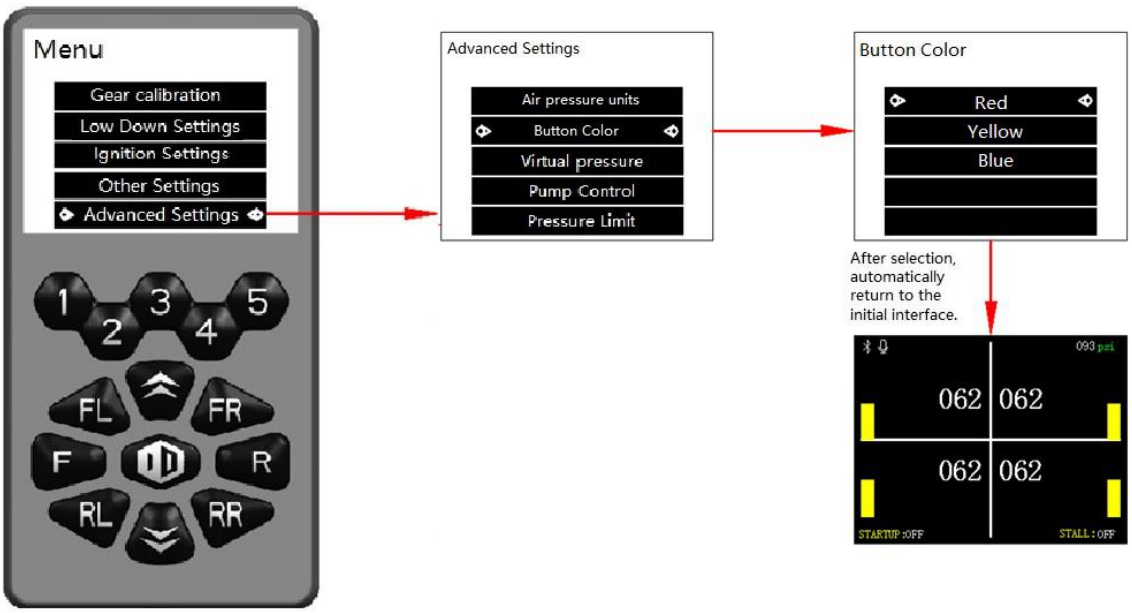
(VI) Advanced Settings

i. Pneumatic unit



(i) Long press confirm button to enter the menu interface, select the other Settings.
(ii) Select pneumatic unit.
(iii) Select the needed pressure unit (1 mpa = 10 bar = 145 psi).
(iv) After selecting, it will automatically return to the initial interface.

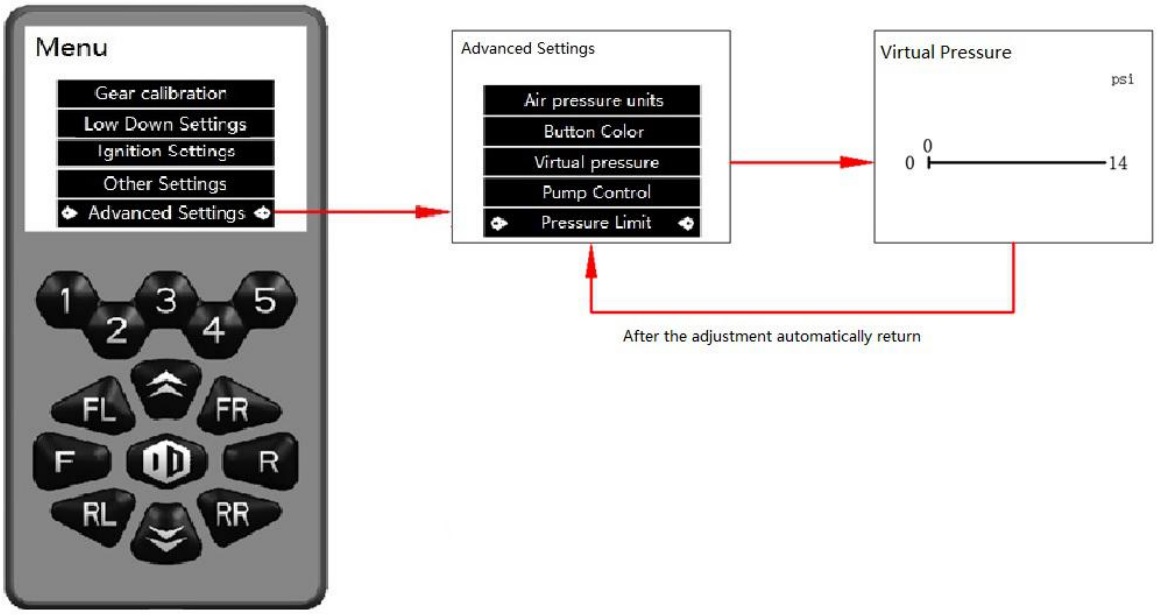
ii. Button color



(i) Long press confirm button to enter the menu interface, select advanced Settings.
(ii) Select the button color.
(iii) Select the desired color.

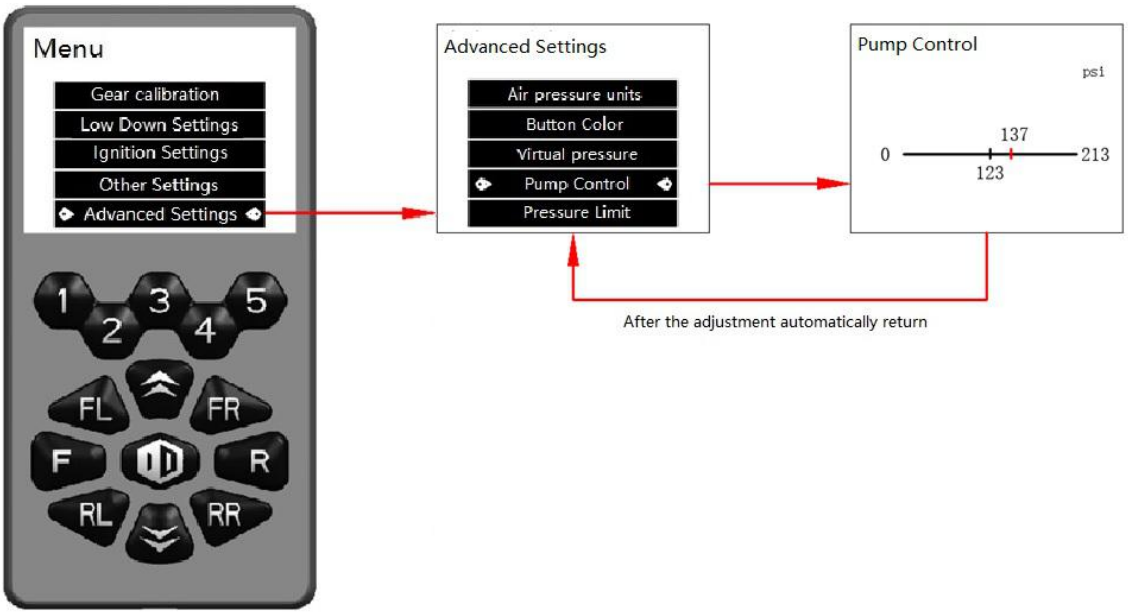
(iv) After choosing, it will automatically return to the initial interface, and modify the color of the button on the remote control.

iii. The virtual pressure



(i) Long press confirm button to enter the menu interface, select advanced Settings.
(ii) Select the virtual pressure.
(iii) Use the up and down keys to adjust the virtual pressure required.
(iv) After the adjustment returns on its own.

iv. Pump control

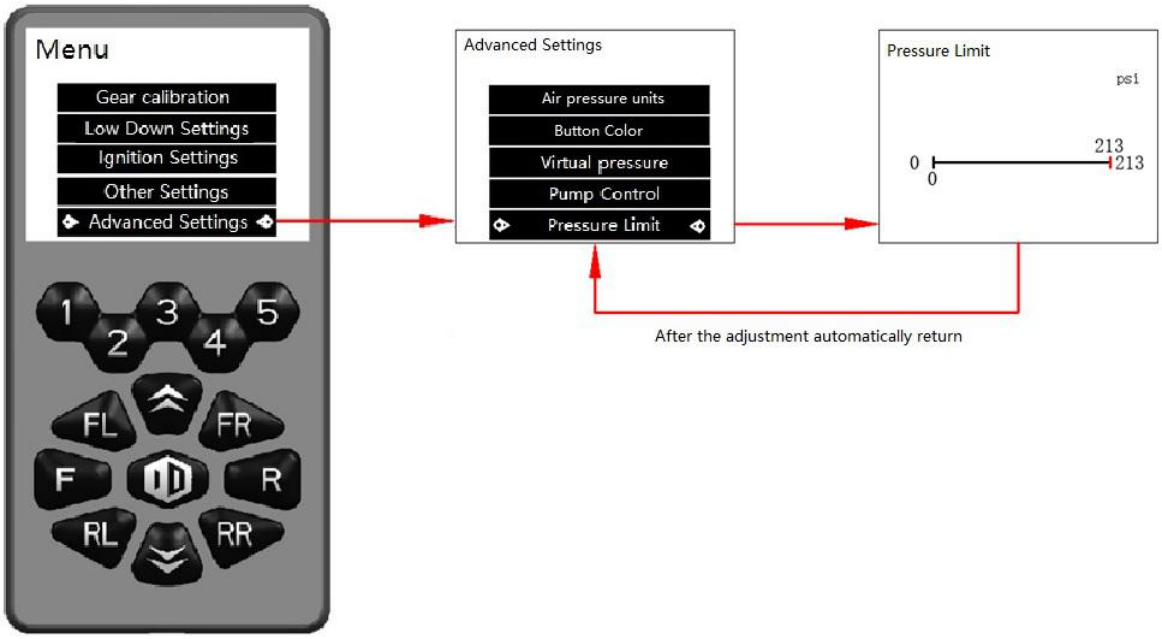


(i) Long press confirm button to enter the menu interface, select advanced Settings.
(ii) Select pump control.
(iii) Use up and down keys to adjust the air pressure required by black brace.
(iv) Using F or R key switch brace.

(v) After the adjustment returns on its own.

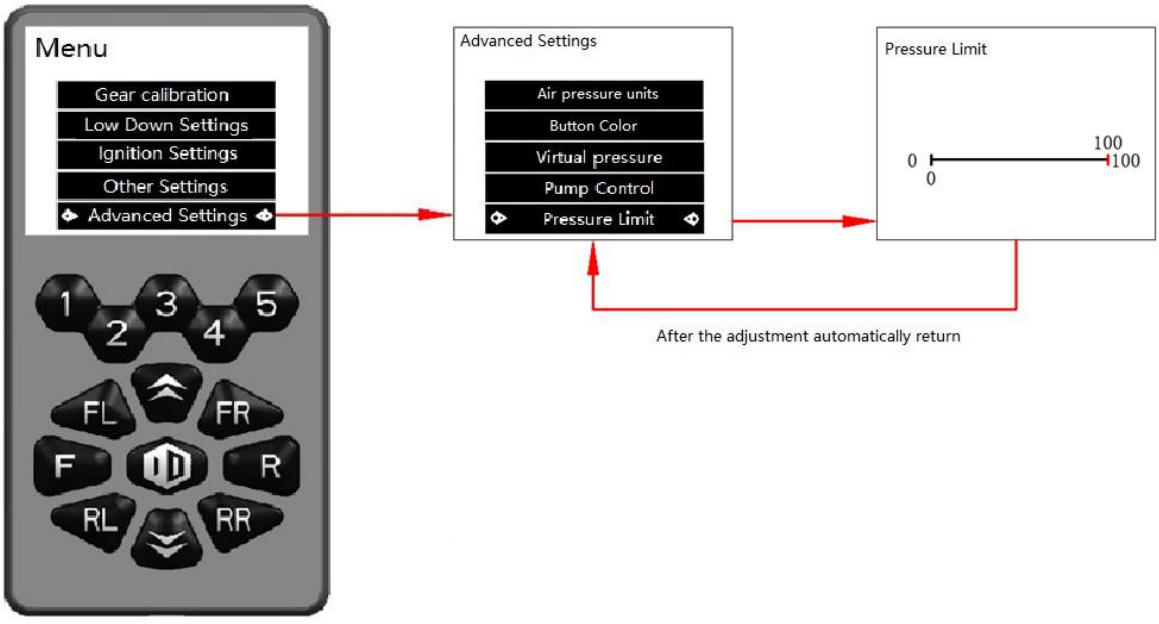
v. Pressure limit

(I) Air pressure version



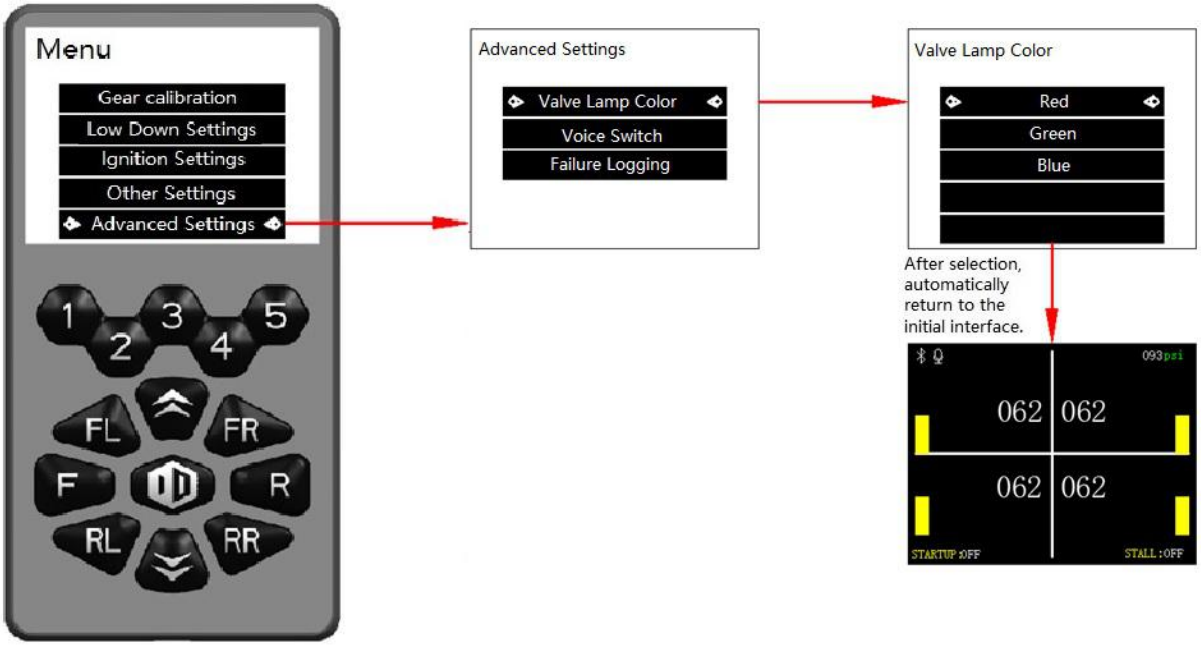
1. Long press confirm button to enter the menu interface, select advanced Settings.
2. Selection pressure limit.
3. Use the up and down keys to adjust the required pressure limit.
4. After the adjustment returns on its own.

(ii) Height gage version



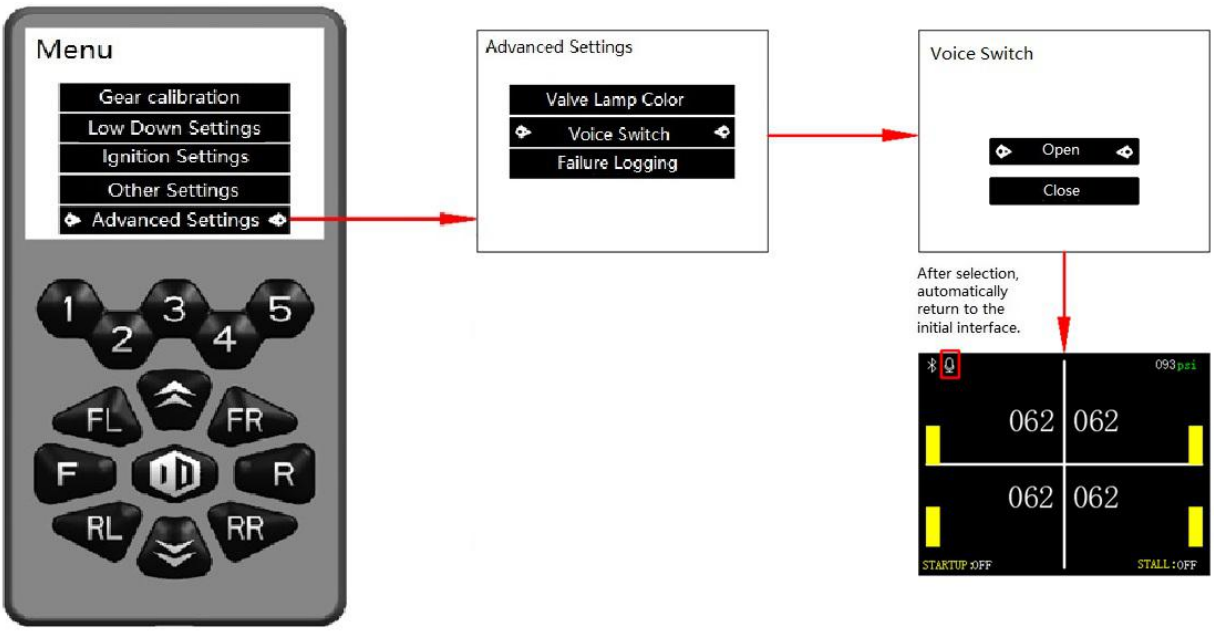
1. Long press confirm button to enter the menu interface, select advanced Settings.
2. Selection pressure limit.
3. Use the up and down keys to adjust the required height gage percentage limit.
4. After the adjustment returns on its own.

The valve body light color



(i) Long press confirm button to enter the menu interface, select advanced Settings.
(ii) Move the cursor down to the second page.
(iii) Select the valve body light color.
(iv) Select the desired valve body light color.
(v) After selecting automatically return to the initial interface, and modify the color of lamp body.

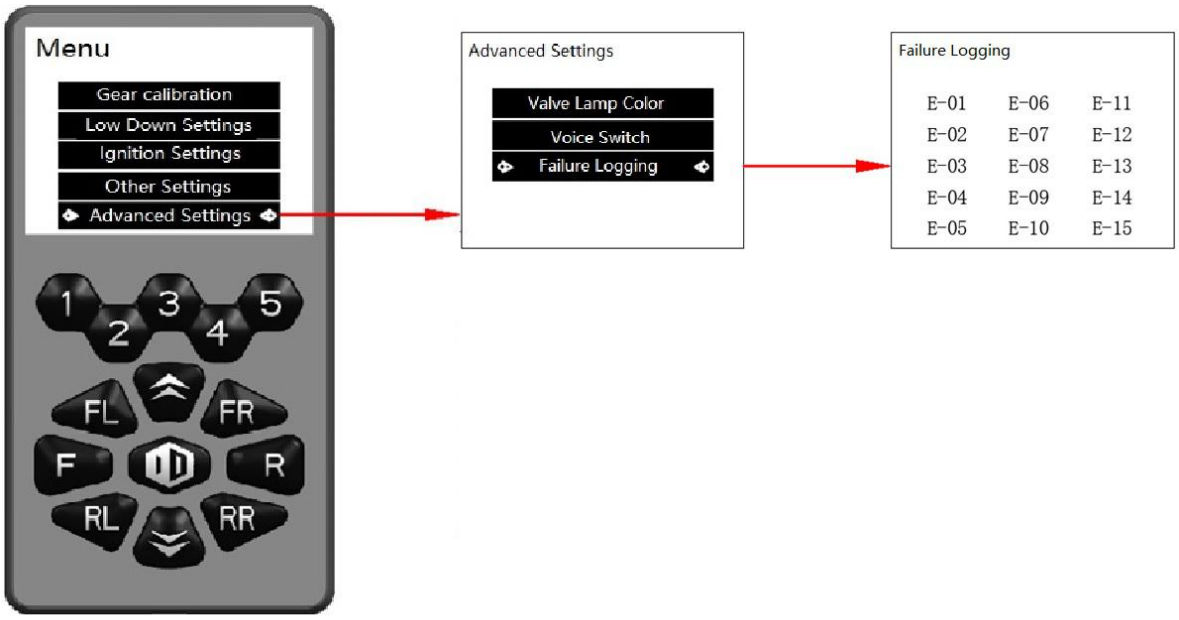
vii. Voice switch



(i) Long press confirm button to enter the menu interface, select advanced Settings.
(ii) Move the cursor down to the second page.
(iii) Select the voice switch.

(iv) Choose open or close.
(v) After selecting, automatically return to the initial interface.

viii. Fault record



(i) Long press confirm button to enter the menu interface, select advanced Settings.
(ii) Move the cursor down to the second page.
(iii) After the query returns on its own.

(VII). Operational guidelines for voice

Password	Function	Response to broadcast
Xiaodang xiaodang	Wake up	I'm in
Into 1 gear	Into 1 gear	Ding
Into 2 gear	Into 2 gear	Ding
Into 3 gear	Into 3 gear	Ding
Into 4 gear	Into 4 gear	Ding
Into 5 gear	Into 5 gear	Ding
Front axle rise	Front axle rise (0.5s)	Ding
Front axle lower	Front axle lower (0.5s)	Ding
The left front rise	The left front rise (0.5s)	Ding

The left front lower	The left front lower (0.5s)	Ding
The right front rise	The right front rise (0.5s)	Ding
The right front lower	The right front lower (0.5s)	Ding
Rear axle rise	Rear axle rise (0.5s)	Ding
Rear axle lower	Rear axle lower (0.5s)	Ding
Left rear rise	Left rear rise (0.5s)	Ding
Left rear lower	Left rear lower (0.5s)	Ding
The right rear rise	The right rear rise (0.5s)	Ding
The right rear lower	The right rear lower (0.5s)	Ding
Low down	Perform low down	Ding
Open the ignition enter gear	Open the ignition enter gear	Ding
Close the ignition enter gear	Close the ignition enter gear	Ding
Close the language patterns	Close the language module	Call me when needed

IX. Troubleshooting guide

i. Cable remote control display fault indicator code table

Number	Fault code	Fault code hint	Solve
1	E-01	/	/
2	E-02	Pump damage	Check whether the air pump harness connected/direct replace pump
3	E-03	/	/
4	E-04	FL pressure sensor fault	Replace the valve body
5	E-05	/	/
6	E-07	/	/
7	E-06	FR pressure sensor fault	Replace the valve body
8	E-08	/	/
9	E-09	/	/
10	E-10	RL pressure sensor fault	Replace the valve body
11	E-11	/	/

12	E-12	/	/
13	E-13	RR pressure sensor fault	Replace the valve body
14	E-14	/	/
15	E-15	FL height gage sensor fault	Check whether the air pressure sensor is connected/directly replace the sensor.
16	E-16	/	/
17	E-17	FR pressure sensor fault	Check whether the air pressure sensor is connected/directly replace the sensor.
18	E-18	/	/
19	E-19	RL pressure sensor fault	Check whether the air pressure sensor is connected/directly replace the sensor.
20	E-20	/	/
21	E-21	RR pressure sensor fault	Check whether the air pressure sensor is connected/directly replace the sensor.
22	E-22	/	/
23	E-23	Low voltage ignition	/
24	E-24	/	/
25	E-25	Battery low	/
26	E-26	/	/

ii. Leak test and repair

(i) Find the leak point

1. Airtight container pressure change and temperature change is not leakage.

   1). Every 5 degrees lower, reduce 2 psi pressure.

   2). Caused by system exist in the air pressure changes, such as the air in the pipe.

2. Soap daub in suspicious joint or pipe joint, finished with cloth to wipe clean.

3. Soap and water ratio: 1/5 soap + 4/5 water.

Note: soap won't corrode metal (aluminum, copper, steel).

(ii) Leak test

1. Allow the leak rate < 7 SCCM @ - 40 ℃ (single joint).

2. For example:

   1). In 10L jar with 1 MPa pressure, after placed 12 hours of -40 ℃, 0.98 MPa.

   2). In 20L jar with 1 MPa pressure, after placed 12 hours of -40 ℃, 0.99 MPa.